

SAFE v20.1.0 Release Notes

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This document lists changes made to SAFE since v20.0.0, released 30-September-2021. Items marked with an asterisk (*) in the first column are more significant.

Analysis

Enhancements Implemented

*	Ticket	Description
*	7870	A change has been made to how equilibrium errors are checked for convergence in nonlinear static load cases. Previously, the relative contributions of force unbalance to moment unbalance were dependent upon database length units. This tended to over-emphasize moments for small length units (mm, inch), which are the default database units. In certain cases, this could lead to larger force equilibrium errors than expected based on the relative convergence tolerance specified for a load case (the default is 0.0001). Now these equilibrium measures are independent of length units, and they are better balanced between force and moment for typical structural dimensions. Because of this change, the results of nonlinear static load cases may differ when run in the new version compared to the previous version. Generally any change will be small, but it may be more significant for sensitive or ill-conditioned models. For example, the uplift of isolated footings can be a sensitive problem that may be affected by this change, with the new results likely to be improved. Note that nonlinear static analysis is an approximate, iterative process. Results should be confirmed by engineering judgment, and re-running certain load cases using progressively smaller convergence tolerances may be necessary to get the expected equilibrium for some models.

Detailing

Enhancements Implemented

*	Ticket	Description
	519	An enhancement was implemented for Detailing where general grid systems are now available in frame layout and rebar drawings.
	7529	A message stating "Note: Previous changes will be discarded when you click OK" has been added in the "Bar Selection and Curtailment Rule" form for detailing.
*	7878	Detailing is now available for composite-beam floors modeled and designed in SAFE, and can be accessed using the menu command Detailing > Steel Detailing menu. Detailing can be viewed and edited within SAFE, and the results used for further design checks. Detailing performed in SAFE can be exported to CSiDetail v20, when it becomes available, to produce schematic drawing sheets that can be further edited.
*	7880	Slab and beam detailing have been enhanced to include PT tendon profiles. This includes showing the tendons and jacks in 3D views of slab reinforcement, and showing the tendon profiles in beam elevations and sections.
	7881	Waffle-slab and ribbed-slab detailing have been enhanced to include the following: (1.) Handling of reinforcement in waffles and ribs for small web widths, and (2.) The addition of a new rib-reinforcement view.
*	7946	The detailing Bill of Quantities (BOQ) table has been enhanced with the addition of quantities for steel beams and tendons.

Drafting and Editing *Enhancements Implemented*

*	Ticket	Description
	7514	An enhancement has been made to add on-screen tools for measuring line lengths, the angles between two lines, and the areas and perimeters of closed polygons. These tools can be accessed from View > Measure menu item.
	7767	An enhancement was made to allow on-screen editing of Rebar Objects using the reshaping tool.

External Import and Export *Enhancements Implemented*

*	Ticket	Description
	7874	An enhancement was made to speed up import of large architectural models from DXF files. Also a progress bar has been added for these imports.
	7945	An enhancement to the import of DXF files as floor plans has been implemented. The option to import joint locations from DXF files, which had been available in SAFE v16 and earlier but was no longer available in SAFE v20.0.0, has been restored.

Installation and Licensing *Enhancements Implemented*

*	Ticket	Description
	7471	The version number has been changed to v20.1.0 for a new intermediate release.

Structural Model *Enhancements Implemented*

*	Ticket	Description
	7758	An enhancement has been implemented to add tendon materials per GB 50010-2010 standard to the material library for Chinese region.

User Interface *Enhancements Implemented*

*	Ticket	Description
	7593	An enhancement was implemented to clarify the specification for the results to be saved for nonlinear static load cases: The option to save (or not to save) positive displacement increments has been removed as this option is not relevant to the types of nonlinear analyses available in SAFE.
	7956	An enhancement has been implemented adding tool buttons to the main tool bar for quick access to information on concrete slab design, concrete beam design, composite beam design, punching shear design, and crack width display.

Analysis
Incidents Resolved

*	Ticket	Description
*	7506	An incident was resolved where nonlinear static and staged-construction load cases could converge with equilibrium errors that were larger than expected when large external loads were applied. When this occurred, the errors were typically in a direction or region of the model not significantly affected by the external load. For example, horizontal reactions in one portion of the model may be out of balance due to large vertical loading in a different region of the model. The effect of this error was negligible for most models. Now equilibrium convergence is measured using the relative convergence tolerance times the magnitude of the internal forces, rather than the previous approach of considering the larger of the internal and external forces. This change will have no impact on most models, and will tend to increase iteration and improve equilibrium for other models. A few models that previously converged may now fail to converge under the tightened equilibrium requirements; this can usually be resolved by improving the stability or conditioning of the model. Note that the behavior of the pure event-to-event solution strategy is not affected by this change, except that the reported equilibrium error could be larger; no other results will be affected.
	7515	An incident was resolved where, when opening SAFE v16 or earlier files in SAFE v20, the assignment of "No Auto Mesh" to an area object was lost and the area object may have been further meshed for analysis. When this occurred, results agreed with the model as further meshed. In cases where this was applied to membrane or plate (not shell) objects, the additional meshing could cause instability or convergence problems. Simply reassigning "No Auto Mesh" resolved the issue. Now this assignment is preserved when opening models from older versions.
	7646	An incident was resolved when using the British, Indian, Hong Kong or Singapore concrete design codes where the procedure used for calculating cracked floor deflections was slightly different from that recommended for these codes. The difference was mostly in interpolating the stiffness between cracked and uncracked section stiffness. Instead of using a linear interpolation as expected, a parabolic interpolation as implemented for other design codes was being used. This only affected SAFE V20.0.0.
	7942	An incident was resolved for Waffle and Ribbed slab where inplane-stiffness was using total waffle/Ribbed slab system depth instead of using equivalent slab thickness. This behavior only affected the inplane deformations and out-of-plane behavior was not affected.
	8052	An incident was resolved where a tolerance issue related to intersection of nearly parallel lines was causing a problem with slab meshing in a particular model. When this occurred, the effect was visually obvious in the analysis mesh.

Data Files
Incidents Resolved

*	Ticket	Description
	7736	An incident was resolved where slab types designated as "Mat" or "Footing" in slab area sections were not written to *.F2K or *.SSF model text files. Importing such *.F2K or *.SSF file into SAFE would set these slab properties to the default thickness.

Design – Composite Beam
Incidents Resolved

*	Ticket	Description
	8088	An incident was resolved which affected composite beam design per AISC360-16, BS5950-1990 and CSA S16-14. The steel tensile elastic stress check was not being performed unless the beam happened to have an output station at the exact location of the maximum positive bending moment. Composite beams designed by other codes were not affected because these codes do not mandate that particular check. When this occurred, the strength of the beams was unaffected.

Design – Concrete Frame
Incidents Resolved

* Ticket	Description
7955	An incident was resolved for PT beam design where the design for strength was being performed over all load combinations selected for concrete design instead of just the load combinations selected specifically for strength design.

Design – Slab
Incidents Resolved

* Ticket	Description
7484	An incident was resolved where there was an inconsistency in the sizes between the analysis mesh and the area object created automatically to model the rigid area on top of a circular column. This resulted in the strip forces not being reported at the face of the rigid area. This issue only affected circular columns and general meshing when the option to automatically include a rigid area on top of the column was selected. It also only affected SAFE v20.0.0. Any models with these conditions satisfied should be rerun and results verified.

Detailing
Incidents Resolved

* Ticket	Description
7524	An incident was resolved for Slab/Mat/Footing Detailing Editor where Bar Length "End Offset" was not enforced correctly and always switched back to the value used for specifying "Bar Extension into Slab" in Bar Selection and Curtailment Rule form.
7533	An incident was resolved where the option "Provide bars above typical" was not copied along with the rebar when the operation to copy rebar between compatible beams performed.

Drafting and Editing
Incidents Resolved

* Ticket	Description
7483	An incident was resolved where the slab rebar object would become unavailable in the GUI when its width or any other parameter was edited in plan view through the right-click form.
7528	An incident was resolved where the assignment of a rib location to a ribbed or waffle slab would not show the ribs in the correct location. This was a display issue only and no analysis or design results were affected.
7594	An incident was resolved where trying to draw a wall in plan would not work if the wall was to be drawn only above the slab.
7801	An incident was resolved where quick drawing an area object around a point would trim the area if it was in or on the edge of another area object.
8041	An incident was resolved where, when drawing columns in a 3D view, the column was assigned default properties instead of what was specified on the dialog box. This issue only affected the recently released SAFE V20.0.0.

External Import and Export
Incidents Resolved

* Ticket	Description
7866	An incident was resolved where attempts to import a DXF file as a floor plan into a model that had been originally created in SAFE 2016 or earlier, and in which there was no story above the datum, caused an abnormal termination of SAFE. The issue affected SAFE v20.0.0 only when working with older models. SAFE models created in v20.0.0 with the New Model command were not affected.

Graphics
Incidents Resolved

*	Ticket	Description
	1061	An incident was resolved where the extruded shape plotted for inverted T-Beams with vertical offsets specified was incorrect. This was a display issue only and results were not affected.
	7748	An incident was resolved where extruded display of slabs did not account for the cardinal point offset. This was a display issue only and no results were affected. This issue only affected SAFE v20.0.0.

Loading
Incidents Resolved

*	Ticket	Description
*	7627	An incident was resolved where the self weight of waffle and ribbed slabs may have been under-calculated. The weight modifier as the ratio of waffle or ribbed slab versus solid slab was applied twice. This was an inadvertent change that only affects recently released SAFE v20.0.0. Waffle and ribbed slabs run in SAFE v20.0.0 should be rerun on this newer version and their design verified.
*	7670	An incident was resolved where nonuniform area loads were not translating correctly from SAFE v16 or earlier models to SAFE v20.0.0 models. This has been corrected. Also when already translated files are reopened in the new SAFE v20.1.0 the loads will be restored. Older SAFE models with nonuniform area loads that were opened and run in v20.0.0 should be re-run in v20.1.0.
*	8108	An incident was resolved where line loads specified through null lines and spanning several area elements were not getting transferred correctly to the area elements and a warning message was given by the program. This affected SAFE v20.0.0 only.

Results Display and Output
Incidents Resolved

*	Ticket	Description
	7749	An incident was resolved where user-defined rebar was not being considered when strip design rebar was displayed and the option to only show rebar required above the user-defined rebar was requested. This issue only affected the display of strip-design rebar. The display of FEM-design rebar was not affected. This issue only affected SAFE v20.0.0. This was a display issue only, and design was not affected.
	7807	An incident was resolved where, in very rare cases, displaying slab-strip results on screen would cause an abnormal termination. No results were affected.
	7832	An incident was resolved where slabs designated as "Stiff" or "Mat" or "Footing" in their slab section properties were not being written to the table "Area Section Property Definitions - Summary" and to the Project Report, which caused an incorrect slab thickness to be reported in the project report. This was just a reporting error, and analysis and design results were not affected.
	7834	An incident was resolved where punching shear details were not showing the unique point label as shown in the graphical display. This was just a reporting omission and design results were not affected.
	7913	An incident was resolved where the display of the punching-shear ratio was unnecessarily showing "N/C" (Not Calculated) at column bases where no slab was present.
	7997	An incident was resolved where the location shown for a snap point in plan view was incorrect if the graphics mode was DirectX and the display was in a grid system that was translated or rotated with respect to the global coordinate system. This could affect the values shown when moving the mouse over a display of results. This issue only affected the recently released SAFE v20.0.0.

Structural Model
Incidents Resolved

*	Ticket	Description
	7488	An incident was resolved where models brought into SAFE v20.0.0 from earlier versions of SAFE would have their wall insertion points changed from the middle to the face. These models should be checked and corrected, or be re-imported into the new version.
	7697	An incident was resolved where the option to automatically generate drop panels and stiff areas over column capitals when specified through column properties was not working. This issue only affected the recently released SAFE v20.0.0. Older versions did not have the problem.
	7835	An incident was resolved where the option to automatically add a rigid diaphragm constraint to the tops of the columns and walls above the slab was not working. This issue only affected the recently released SAFE v20.0.0. Older versions did not have the problem.

User Interface
Incidents Resolved

*	Ticket	Description
	7478	An incident was resolved where the analysis and design results would become unavailable if the tendon plan layout data was viewed from within the tendon vertical layout form after the analysis was run.
	7595	An incident was resolved where the option to add a story above the slab datum was not working.
	7656	An incident was resolved where, in rare cases, right-clicking on a tendon object to get more details on its definition would cause an abnormal termination. No results were affected.
	8010	An incident was resolved where slab areas not in view would also get selected when a Window selection was done on an elevation view. This issue only affected recently released SAFE v20.0.0.