SAP2000® Version 21.0.2
Release Notes

Notice Date: 2019-02-19

This file lists all changes made to SAP2000 since the previous version. **Most changes do not affect most users.** Incidents marked with an asterisk (*****) in the first column of the tables below are more significant.

Changes from v21.0.1 (Released 2019-01-22)

Loading
Enhancements Implemented

*	Incident	Description
	228776	An enhancement was implemented to improve the speed of tendon load generation during creation of the analysis model.

Analysis
Enhancements Implemented

*	Incident	Description
*	229428	Convergence behavior of the tension-compression friction-pendulum isolator link element has been improved, particularly to deal with large variations in the axial force, which can cause alternating slip-stick behavior during lateral loading. Models that exhibited slow convergence behavior in previous versions should be re-run in the new version to verify the results. The new results will be more accurate in cases where a significant difference is observed between the old and new results. Furthermore, the friction model has been changed from the previous Wen formulation that exhibited a gradual transition between sticking and slipping to a bilinear model that exhibits a sudden transition. Some difference in results can be expected due to the new formulation, particularly for models where the initial stiffness specified for the isolator was small. Similar changes were made to the formulations of the friction-pendulum and triple-pendulum isolator link elements in previous releases of the software. Finally, the new formulation supports event stepping, which can be used as part of the iteration and stepping strategy specified for nonlinear static, staged-construction, and nonlinear direct-integration time-history load cases.
*	229433	Nonlinear static analysis, including staged-construction, has been enhanced to allow the use of line search and event-stepping at the same time. Previously only one of these two options could be used for a given load case, and event-stepping took precedence. Now, when both options are selected, event stepping will be used for the first iteration, and line search will be used for subsequent iterations. By default, events and iteration without line search will be enabled for newly created load cases, which is equivalent to the previous behavior. When opening existing models from a previous version, load cases that had both options enabled will have the line search turned off to reproduce the previous behavior. Note that line search is never used for load cases that use event-stepping only, i.e., that have iteration turned off. Note also that line search is never used for nonlinear static load cases under displacement control, only for load cases under force control. Staged construction load cases always use force control.

Installation and Licensing
Enhancements Implemented

*	Incident	Description
*	229291	The version number has been changed to v21.0.2 for a new minor version release.

Frame Design
Incidents Resolved

*	Incident	Description
*	225176 228049 228867 229047 229113	An incident was resolved where steel sections that are not from a steel sections database, but are created by providing dimensions in the new sections form or modified there may have their shape identified incorrectly for steel frame design. This may result in unconservative demand capacity ratios. This only affects frame sections that were added or modified in v20.2.0, v21.0.0, or v21.0.1. Analysis results are not affected. Older models that did not add any new sections or modified existing ones are not affected.
	228884	An incident was resolved in which auto-select section assignments to frames were being replaced by the last analysis section when the model was opened. This affected v21.0.0 and v21.0.1. This had the effect of not further optimizing steel sections, no other results were affected.

Database Tables
Incidents Resolved

*	Incident	Description
	229352	An incident was resolved where certain edits to hinge definition tables were not being accepted. Specifically, (1) In table “Hinge Def 08”, any changes made to RCRatio were not reflected in the tables or hinge definition forms. The values would revert back to the original values. (2) In table “Hinge Def 11” the IntType value was unable to be set to “Steel: ASCE 41-13”.

Results Display and Output
Incidents Resolved

*	Incident	Description
*	229172 229186	An incident was resolved where an abnormal termination error sometimes occurred after analysis was completed but before the results were fully saved. When this occurred, the model became unlocked and results were lost. This error was intermittent on machines that were affected.