SAP2000® Version 17.2.0
Release Notes

Notice Date: 2015-05-18

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 v17.1.1 (Released 2014-10-01)

Modeling

Enhancements Implemented

*	Incident	Description
*	47359	An enhancement was implemented to allow modification of the model geometry based on the shape of a buckling or modal case mode. This can be used to simulate imperfections or other scenarios. Once applied, the geometry can be reset to the original.
	67719	An enhancement was made to always use longitudinal rebar specified in the frame section properties for calculating capacity of hinges assigned to beams and columns even if a design is available. Previously if a design was available then the designed rebars were used irrespective of what was specified.
	69221	An enhancement has been implemented to allow adding and importing of aluminum tee, angle, pipe, and tube sections.
	72276	An enhancement has been made to the replication of local axes when point, line, area, solid and link objects are replicated. The following rules apply: 1. If the option to replicate local axes is set to false the local axes are set to default values. 2. If the option to replicate local axes is set to true then the local axes definitions are replicated and the following two additional changes may apply: a) if the local axes are defined using the advanced option which uses two joints to define an axis then the joint numbers are incremented if the referenced joints are replicated in the same replicate operation. b) if the local axes are not defined using the advanced option, the replicate option is radial, the flag to rotate local axes for radial replication is on and also the object reference direction is parallel to the axes of rotation then the angle about the object reference axis is incremented. The object reference axis is axial for line and link objects and the normal for area object. For point and solid objects the reference axes are the Global X, Y and Z directions.
*	76109	An enhancement has been implemented to now allow mass assigned to null objects to be accounted for during analysis. Previously mass could be assigned to null objects but was not considered during analysis. Old models that had mass assigned to null objects will now have different results for any load cases that account for mass.
	76130	An enhancement was implemented to add a new trapezoidal concrete frame section property. This is similar to the rectangular concrete shape, except that the top and bottom widths may be different. Concrete frame design for these sections is not currently available, as they are intended primarily for use in the new Concrete Solid Girder bridge deck section.
*	76434	An enhancement has been implemented to allow specification of scale factors for the material time-dependent properties controlling creep, shrinkage, and stiffness for concrete; and relaxation for tendons. For creep, shrinkage and relaxation, these factors multiply the calculated strain. For stiffness, the factor multiplies the modulus of elasticity at any given time.

Section Designer
Enhancements Implemented

*	Incident	Description
	22355	Section Designer has been enhanced to allow prestressed tendon layouts to be drawn directly using the same tools used to draw rebar layout. Previously tendons could only be defined within Caltrans shapes. Selecting a tendon material for the drawn shape allows specification of the tendon force. Available shapes include point, line, rectangular, and circular layouts, as well as the reinforcing included as part of the rectangular, circular, and polygon concrete shapes. The tendon size, material, and prestress force affect the moment-curvature relationship, and hence affects Caltrans frame hinges defined from Section Designer sections. Fiber hinges and non-Caltrans PMM hinges are not affected. The PMM interaction surface used for design is not affected, but treats the tendon as reinforcement without prestress.

Loading
Enhancements Implemented

*	Incident	Description
*	53807	A new type of load pattern has been implemented called "Seastate" that will automatically apply accelerations due to vessel motions such as pitch, roll, yaw, heave, surge and sway based on user input parameters.
*	67707	An enhancement has been made to add automated response-spectrum functions for Argentina, Chile, Colombia, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, and Venezuela.
*	74610	Auto seismic loading and response spectrum function for Eurocode 8-2004 have been updated for Norway National Annex EN 1998-1:2004 NA:2014.

Analysis
Enhancements Implemented

*	Incident	Description
	76508	Computation of the nonlinear behavior of link elements has been parallelized to increase the speed of analysis for nonlinear static, nonlinear direct-integration time-history, and nonlinear modal time-history (FNA) load cases. This will primarily impact models having a large number of link objects or a large number of link elements generated to represent line or area spring supports. Analysis results may change slightly in sensitive or ill-conditioned models, but should otherwise not be affected.
	76511	The behavior of the isotropic interacting frame hinge has been improved, particularly with respect to the handling of changes in bending ductility due to changes in axial load. In addition, the behavior when the hinge is collapsing due to a drop in the moment capacity has been improved. In certain rare cases, the moment-rotation results would deviate significantly from the backbone curve during such drops, and this has been largely resolved. Note that deviations from the backbone curve are expected when the axial force or M2:M3 ratio changes due to movement around the interaction surface. The affected hinges types are P-M2-M3, P-M2, P-M3, M2-M3, excluding fiber hinges and single degree-of-freedom hinges. For most models, the effect of these changes will be insignificant.
	70912	The file-size limit for internal files used for analysis has been increased from its previous 2GB limit. The new limit defaults to 100GB, but this can be changed using the environment variable SAPFIRE_FILESIZE_MB to 1TB or more. This change will not affect most users and most models, since the previous limits were exceeded in very few cases. The new larger size limit applies to NTFS files systems only. FAT32 file systems are still limited to 2GB. Most files used for analysis will have the new larger capacity, although a few files may still exhibit limits for other reasons, such as the number of objects that can be handled. For most practical problems, the amount of disk space and other system resources will control the size of the model and associated analysis files that can be handled.

Frame Design
Enhancements Implemented

*	Incident	Description
	62984	An enhancement was implemented to add the Eurocode 2 concrete frame design and Eurocode 3 steel frame design national annexes for Ireland.
*	73290	An enhancement has been implemented to add concrete frame design according to the ACI 318-14 code.
*	73295	An enhancement has been implemented to add steel frame design according to the Canadian CSA S16-14 code.
*	73296	An enhancement has been implemented to add concrete frame design according to the Canadian CSA A23.3-14 code.

Results Display and Output
Enhancements Implemented

*	Incident	Description
	67448	The graphical display of frame forces and stresses has been made more efficient. The speed increase may vary depending upon the component and the load case or combination being displayed.

Database Tables
Enhancements Implemented

*	Incident	Description
	76207	An enhancement has been implemented to allow defining and editing of named sets for response spectrum and time history plots in the interactive database when the model is locked. When the model is locked it is not possible to delete the named sets.

External Import/Export
Enhancements Implemented

*	Incident	Description
	71583	Enhancements have been made to the StruCAD*3D model import, including: (1) TITLE card information is now imported into the SAP2000 project information. (2) The steel design code read from the OPTIONS card is now imported as AISC-ASD89 when ASD is specified in the StruCAD*3D model. (3) Frame section property names are now imported as the GRUP Id combined with the Section Label. This allows the names to be more descriptive in identifying standard section shapes.
*	76142	The import/export functionality between SAP2000 and Revit Structure has been enhanced: (1) It is now possible to update a Revit project previously exported to SAP2000 or imported from SAP2000 with changes made in SAP2000. (2) It is now possible to update a SAP2000 model previously exported to Revit Structure or imported from Revit Structure with changes made in Revit Structure. (3) The import of Revit Structure wall elements has been enhanced to include walls with complex geometry, i.e., with more than four sides and/or with some curved sides. (4) Curved Revit Structure framing elements are now imported into SAP2000 as curved frame members.

Application Programming Interface
Enhancements Implemented

*	Incident	Description
	75806	An enhancement has been made to the API to let developers store application specific collections of strings in SAP2000 models. Three new functions have been added to the general functions: SetStringsExtendedEntityData(),GetKeysWithStringsExtendedEntityData(), and GetKeyStringsExtendedEntityData() SetStringsExtendedEntityData() lets the developer specify an array of string values for a given string, a “key”, and application name. The developer is encouraged to choose a unique application name, such as a global unique identifier (GUID), to prevent other

*	Incident	Description
		developers from accessing and modifying their data. GetKeysWithStringsExtendedEntityData() lets the developer retrieve the keys for which extended data exists for a given application name.GetKeyStringsExtendedEntityData() lets the developer retrieve a previously stored array of string values for a given key and application.
	75810	An enhancement has been made to the CSi API. A new function called GetCurved_1() has been added to the Frame Object class. Its behavior is identical to GetCurve() but in addition to returning the values GetCurve(), it also returns the curved frame object names, if there are any.
	75813	New functions have been added to the CSI API (Application Programing Interface) to set and retrieve the GUID (Globally Unique Identifier) for point-object force loads, cable-object distributed loads, and frame object concentrated or distributed loads. A separate GUID applies for each individual load assignment to an object. The GUID is now automatically created whenever any of these load types is assigned to an object, whether by using the API, graphical user interface, or database tables. In addition, GUIDs are now automatically generated for each new object when created.

Documentation

Enhancements Implemented

*	Incident	Description
	23524	An enhancement was made to the context sensitive help topic 'Reinforcement Data Form' to more clearly define the 'Number of Confinement Bars' input parameters.
	70662 76601 77385	An enhancement has been implemented, updating the API documentation to include Visual C++, Python, MATLAB, and Fortran examples.
	73298	An enhancement has been implemented to add a listing of the default keyboard shortcuts to the context sensitive (F1) help.

Miscellaneous

Enhancements Implemented

*	Incident	Description
	71219	The version number has been changed to v17.2.0 for a new minor release.

User Interface

Incidents Resolved

*	Incident	Description
	70047	An incident was resolved in which the menus could sometimes remain open (dropped down) after selecting a command, possibly obscuring other information behind them. This was a user interface issue only and did not affect results.
	71091	An incident has been resolved that addressed several unreported "Abnormal Termination" errors that could occur when working with the graphical user interface. When these errors occurred, the model could be saved before the software terminated to prevent loss of data. Results were not affected.
	71585 72578 74080	An incident has been resolved where certain forms would not scale correctly on some versions of Windows when large font settings was used.
	73104	An incident was resolved in which an abnormal termination could occur when showing the definition of a load combination containing other load combinations, from the design Select Design Combos form.

*	Incident	Description
	73116	An incident was resolved in which an abnormal termination could occur when assigning frame hinges after previously using the interactive database to define frame hinges. This was a user interface error only and did not affect results.
	73218 73250	An incident was resolved in which an abnormal condition could occur when trying to show the wave plot in the wave load pattern definition if some of the input parameters were invalid.
	73308	An incident was resolved in which an abnormal condition would sometimes occur when showing the load case tree. This was a user interface issue only and did not affect results.
	73601	An incident was resolved where some forms and messages did not have language translations available. Also some operations were slow when using translated text. This has been significantly improved.
	73755	An incident was resolved in which an abnormal termination could occur when adding user-defined lateral bracing via the Design > Lateral Bracing command. This was a user interface issue only and did not affect results.
	73814 74671	An incident was resolved in which an abnormal termination could occur when clicking the 'Show Individual Fiber Data' button on the hinge results form. This was a user interface issue only and did not affect results.
	74084	An incident was resolved where it was not possible to add or modify vehicle classes in the graphical user interface. Vehicle classes could be added or modified using the interactive database editor. The automatic vehicle classes created for each individual vehicle were not affected. No results were affected.
	74228	An incident was resolved in which the name of a joint constraint could be lost when modifying an existing joint constraint. This was a user interface issue only.
	74229	An incident was resolved for the Frame Hinge Property Data form for interacting frame hinge definitions based on moment-curvature, in which the relative length option did not get saved when closing the form if the hinge length value was not edited. This was a user interface issue. Results will have matched the model.
	74375	An incident was resolved where the program error reporting is improved. Instead of reporting "Error reading mesh information" the program will show the actual reason which in this case the program was out of memory.
	74381	An incident was resolved in which the ability to define custom colors using the color picker was not available. This was previously available in v16 but inadvertently disabled in v17.
	75204	An incident was resolved in which the program could terminate when changing the design type of a concrete frame section from beam to column.
*	75504	An incident was resolved where editing joint coordinates graphically or through the interactive database would not immediately update the local axes of objects that used an advanced local axes specification that utilized a joint reference that they were themselves not connected to. Once the file was saved and reopened the local axes were updated. This could result in displaying the local axes incorrectly or even the results being incorrect if the file is not saved and reopened.
	75782	An incident was resolved where the calculated tendon force table would not display correctly when right-clicking on a tendon. This was a user interface error and did not affect results.
	76177	An incident was resolved in which the load case tree did not correctly show the relationships between different load cases in certain models. This was a form issue only and did not affect results.
	76226	An incident was resolved in which the program would sometimes terminate when repeatedly adding copies of grid systems. This was a user interface error only and did not affect results.
	76448	An incident was resolved where pushover plots might not display if they were based on user defined functions and some defined functions had been deleted. The problem affected ATC40, FEMA356, FEMA440EL and FEMA440DM named pushover parameter sets.
	76720	An incident was resolved where the Truck Loading tab of the Underground Concrete Structures template form could not be edited.
	76974	An incident was resolved in which the selected item on the Assign/Define Constraints form was always the top item instead of the item just added to the list. This was a user interface issue that could result in users incorrectly assigning joint constraints.

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	77338	An incident was resolved where entering an incorrect relative distance in the target force form could lead to an abnormal termination of the form.
	77547	An incident was resolved where the Cancel button did not always work correctly when canceling from the User Hinge Interaction Surface definition form. Changes made on the form would remain even when clicking the Cancel button.
	77579	An incident was resolved where the color coding on the design preferences and design overwrites forms to distinguish values between default/overwritten earlier/overwritten in this session, were sometimes not correct. This was a user interface issue only and did not affect results.

Drafting

Incidents Resolved

*	Incident	Description
	39705	An incident was resolved where the reshape tool when used at a joint of an area object would not work correctly and the object would end up with an illegal geometry and get deleted.
	62778	An incident was resolved in which panning a 3-D view while in a drawing mode did not always work as expected.
	70622	An incident was resolved for drawing while in DirectX mode, in which the Drawing Control Type options on the Properties of Object form were not working. These options worked when in Classical Plus graphics mode.

Graphics

Incidents Resolved

*	Incident	Description
	67873	An incident was resolved where the extruded shape drawn for frame objects was sometimes incorrectly shown when the insertion point for the frame objects was assigned to be the shear center. For all frame sections except the channel, the shear center is taken to be at the centroid of the section and the drawing has been corrected, as needed, to show this. For the channel, the correct location of the shear center is now shown. This was a graphical issue only and the results were unaffected.
	71256 72378	An incident was resolved where the software could terminate abnormally when attempting to set a 2D view using a grid system other than the Global grid system if either the Global grid system or the selected grid system was non-Cartesian. In certain cases the same issue could occur when both systems were Cartesian. No results were affected.
	71773 71777	An incident was resolved where the analysis model could not be displayed in few rare cases when the model had not been analyzed.
	72391	An incident was resolved in which the display of solids in 3-D would sometimes not show all of the faces of the solid objects when certain view settings were used. This was a display issue only and did not affect results.
	73686	An incident was resolved where objects imported using the DXF import would be in a selected state, but the display would not show them as selected. This was a graphical display issue only.
	73753 74540	An incident was resolved where certain small models would scale incorrectly on the screen.
	74919	An incident was resolved where the node symbols would show in the wrong place in multi-step animation windows. This was a graphical issue only.
	74921	An incident was resolved where the hovering over a displaced shape plot would show results for nodes that should have been hidden as a result of the "Show selection only" option being on.
	77444	An incident was resolved where the principal stress arrows on solid surfaces were not showing in all elevation views.

Modeling
Incidents Resolved

*	Incident	Description
	68423	An incident was resolved in which saved named displays were not always correctly recovered after saving the model. This was a display issue only and did not affect results.
	70928	An incident was resolved in which steel axial frame hinges would have an incorrect backbone curve when steel frame design overwrites were assigned for the unbraced length ratio of the member. The hinge backbone curves used during analysis could be seen by reviewing the generated hinge properties. This was not an issue when the specific design overwrites were not assigned.
	73354	An incident was resolved where springs assigned to line, area or solid elements were not included in staged construction analysis if lines, areas or solids were further meshed and the stage did not include group "All".
	75381	An incident was resolved in which the calculator used unitless units for the Drucker-Prager friction angle parameter on the Nonlinear Material Data form when it should have been angle units. This did not affect results.
	76044	An incident was resolved in which the Edit > Extrude > Convert Lines to Areas command resulted in the geometry modeled by areas not exactly matching the frame geometry. This was typically a minor difference equal to half of the thickness of intersecting members.

Section Designer
Incidents Resolved

*	Incident	Description
	70894	An incident was resolved where Section Designer would always start using the model database units instead of the currently selected units within SAP2000. This was a convenience issue only and did not affect results.
*	71170	An incident was resolved in Section Designer where the section properties were calculated incorrectly if the Section Designer section (1) Contained a structural shape assigned with a concrete material, and (2) the Reinforcing for this shape was set to "Yes", and (3) the Rotation Angle for this shape was not zero. The section properties were being transformed twice for the nonzero angle in this case. Structural shapes without reinforcing were not affected.
	71336	An incident was resolved where the screen refresh while drawing or editing in Section Designer was slow or did not show until the mouse button was released. No results were affected.
	74740 75324 77606	An incident was resolved in which Section Designer could sometimes crash when accessed multiple times in a row. This was due to incompatible Microsoft libraries on the client machine. The new version of the program no longer uses these Microsoft libraries.

Loading
Incidents Resolved

*	Incident	Description
*	71051	An incident was resolved in which auto-lateral wind loading was sometimes not applied to a diaphragm at the top of the structure because of a dimensional tolerance issue. The analysis results would have corresponded with the loads that were applied.
	72987	An incident was resolved for the NTC 2008 auto-seismic loading in which the approximate period method was incorrectly calculating the approximate period. The period used was reported in the database tables, but was not correct according to the equations from the code document. The results were consistent with the period reported as being used.
	75506	An incident was resolved where the option in the wind load pattern to turn off automatically generated wind loads on area objects would not turn the loads off if the model had been run initially with them being turned on and the wind load assignment to the area was not also deleted.

*	Incident	Description
*	78267	An incident was resolved in which the open structure wind loads for circular or pipe sections was in certain cases using the incorrect Cf factor based on ASCE 7-02, 7-05, and 7-10 when the model database units were something other than feet units. When there was an error it was unconservative. A review of the generated loads would reveal the incorrect loading when compared to hand calculations.

Analysis

Incidents Resolved

*	Incident	Description
*	61370 72159 72575 78810	An incident was resolved where a torsional release applied to the end of a frame object with a section property having shear-center eccentricity (e.g., a channel section) did not result in zero torsion where expected, and in some cases could cause an unexpected shear force V2. When this occurred, the error was obvious from the torsion and shear reported in the frame object. Load patterns used in a mass-source specification that caused large shear in an affected member could also cause errors in the calculated mass if the member was short and the shear error was large. Otherwise, the practical effect on structural response was generally insignificant outside the member itself. Now when torsional and/or shear releases are specified in a frame member, shear-torsion coupling is ignored for that member.
*	70951 73597	An incident was resolved where the convergence behavior of the triple-pendulum isolator (link property) was poor for circumferential behavior. This could cause time-history load cases with independent loading in two directions to run slowly or to not converge, in which case results were not available. Radial behavior (along a fixed shear direction in the U2-U3 plane of the isolator) was not strongly affected. The overall convergence behavior of the triple-pendulum isolator has been made more efficient, and some small difference in results may be expected even for radial behavior.
	71385	An incident was resolved where memory usage could grow when solving multi-step load cases using the Advanced solver. The effect was usually small except for structures with many disconnected parts. No results were affected.
	71398 73971	An incident was resolved where modal time-history load cases could fail to run when the prerequisite modal case was analyzed in a previous run rather than in the same run as the time-history case. When this occurred the results were unavailable for the time-history load case.
*	71962	An incident was resolved where the results for the triple-pendulum isolator could be incorrect when recovered after running a nonlinear load case. The results of a nonlinear load case starting from zero initial conditions were not affected except for the triple pendulum isolators themselves: the results for the joints and all other elements were correct. However, the results for any nonlinear case continuing from a previous nonlinear case could be affected by the incorrect results for the triple pendulum isolators from the previous nonlinear case.
	73432	An incident has been resolved where the shear factors "factV2" and "factV3" in the formulas used to calculate shear stresses S12 and S13 for the circular frame section at the points 2, 3, 6 and 7 (angles 315, 225, 45 and 135 degrees, respectively) should have been R^2 / 6 instead of R^2 / (3*sqrt(2)). The computed results agreed with the formulas as documented in the technical note "Frame Stress Calculation". In addition, the shear factors "factV2" and "factV3" in the formulas for S12 and S13 for the pipe frame section at the same location have been enhanced to use an exact analytical solution without the thin-walled assumption. Only analysis results are affected by these changes. Design results are not affected.
	73916	An incident was resolved where certain models containing wave loads could generate an abnormal termination error message when trying to run the analysis. When this occurred, no results were available. This issue affected versions 17.0.0 to v17.1.1.
	74253	An incident was resolved in which an abnormal termination could occur when running the analysis of certain models containing auto seismic lateral loading.
	76847	An incident was resolved in which the program could terminate when attempting to analyze a model containing area objects with more than 4 points and the program was run from a location without administrator permissions.

Frame Design
Incidents Resolved

*	Incident	Description
	54893	An incident was resolved where the program allowed the same load combination to be selected for both strength and serviceability for frame design. This would cause the form to not maintain the data when the form was exited. A load combination can only be selected for either strength or serviceability.
*	67904 71495 72052 72674 73105 76255 77221	An incident has been resolved for steel frame design in which the program was failing to optimize for (a) group constraints, (b) lateral displacement targets, and (c) time period targets. The program no longer terminates when a time period target or a displacement target is deleted. The program was only optimizing for strength and was selecting one optimum member correctly for individual member design optimization. All steel frame design codes are affected. The results were obvious as all members of the group were not being assigned the same section, and the displacement and time period targets were not being met. The problem was introduced in v17.0.0.
	69927 71242 72985	An incident was resolved where the frame design on large models was taking too much time. This was simply a graphics issue of blinking the member that was being designed and did not affect any design results.
	70446	An incident was resolved in which an error was generated when using the Design > Concrete Frame Design > Verify All Members Passed command. This did not affect the design results.
	71163	An incident was resolved for frame design where attempting to right-click on a frame member while viewing design results saved from a previous SAP2000 session would cause an abnormal termination error. No results were affected or lost. Running the design, even for a single member, in the same session would prevent this problem. Only version 17.1.1 was affected.
	71350	An incident was resolved in which the auto generated ASD load combinations for AISC 360-10 steel frame design incorrectly used a scale factor of 0.75 for the combination of dead + live + wind load. The factor on the wind is permitted to be 0.75*0.6 per ASCE 7-10.
	71446	An incident was resolved for steel frame design using the Eurocode 3-2005 and NTC 2008 codes in which sections with 3mm thick elements were being reported as being too slender to design, while the design code permits 3mm thick elements to be designed. This limitation was conservative.
	71698 72996	An incident was resolved where the unbraced length, when over several members, may not have been traced correctly for frame design when the display was in a coordinate system other than the default Global system. The incorrect calculated unbraced length was reported.
	73415	An incident was resolved for steel frame design where all the design results could become null after displaying the design tables. Using the mouse right-button click on a member after displaying the design tables would show all results as zeros as if there was no load on the member. Saving and re-opening the model, or unlocking and re-running the analysis and design, would resolve the issue. The actual design results, when not shown as zeroes, were correct.
	74835	An incident has been resolved for steel frame design according to AISC 360-10 in which the error message about compact or non-compact sections for seismic moderately and highly ductile frames was not correct. It affects the error message only. All calculations are correct. Only the AISC 360-10 code was affected.
	74880 74955 75876 78314	An incident has been resolved in the program in which the K factor calculation was not correct for members which had restraints. This resulted in larger K factor values for sway conditions which eventually resulted in small capacities and large PMM ratios. The results are affected conservatively. The error was introduced in v17.0.0.
	74894	An incident was resolved for Eurocode 2-2004 concrete frame design where the concrete modulus of elasticity was incorrectly computed. The computed value was shown in the design output. The difference in computed values of modulus of elasticity of SAP2000 and EC2 Table 3.1 was insignificant for all practical purposes. There is no effect in design.
	76385	An incident has been resolved in which the automatic load combinations were not generated according to the Chinese 2010 steel frame design for the limit state of deflection.
	76386	An incident has been resolved in which the software would terminate during concrete frame design using the "Chinese 2010" design code. This was a problem only when there were two automatic seismic loads defined.

*	Incident	Description
	76395	An incident was resolved for the Chinese 2010, GB 50010-2010 concrete frame design in which the G_RE(PMM) value was always reported as 0.80 instead of varying based on the axial force ratio in which it should have been 0.75 when the P ratio was less than 0.15. For most cases there would either be no effect on the results or they would be conservative. For cases with high axial load the results will be unconservative by a maximum of 7%.
	76396	An incident was resolved for concrete frame design per the Chinese GB 50010-2010 code in which two problems have been fixed: (1) The effective length instead of the unbraced length was used in the expression of moment amplification factor eta. Now the expression uses the unbraced length. (2) The program now enforces Cm*eta to be at least equal to 1. If the product is less than one, the program uses the original factored moment as the design moment. No amplification is done.
	77553	An incident has been resolved in cold-formed steel frame design code AISI-LRFD96 in which the value of the phi factor for major direction shear was reported as zero in the design details. In addition, the Vn ratios for major and minor direction shear forces were not reported appropriately with decimal or scientific format dynamically based on how small they were. Both problems have been fixed. This does not affect the design results. This was a reporting problem only.
	78805	An incident was resolved where the "Make Auto Select Section Null" operation for frame design would not use the last design section for the next analysis. It required the analysis to be rerun after the design before this operation was performed.
	78864	An incident was resolved for steel frame design according Norsok N-004 and API RP-2A in which design results were not calculated when wave loads were considered and the 'Pressure Equalized' design overwrite was set to 'No'.

Results Display and Output

Incidents Resolved

*	Incident	Description
	62979 72926	An incident was resolved in which the graphical display of the joint punching check ratios did not display results for all joints.
	67470	An incident was resolved where non-fiber hinges with load carrying capacity after point E specified to be extrapolated (rather than dropping load) would report the hinge state as 'D to <=E' even for hinge deformations beyond point E. Now the hinge state will be reported as '> E' in the extrapolated region. Also resolved was an error where the stiffness of the extrapolated region of the force-deformation curve was taken to be a very small but finite stiffness instead of using the stiffness of the curve between points D and E as documented. This latter issue only affected non-isotropic, non-fiber hinges.
	71084	An incident was resolved in which the File > Print Graphics output always indicated the units as the database units even when the display units had been changed. The displayed output and contour bar (if present) was correct, but the units were incorrect if the current display units were different than the database units.
	71151 73283	An incident has been resolved for all steel frame design codes where the failures related to seismic provisions for steel frame design were not properly identified through color codes when displayed in the model window. Design details provided by right-button click on a member and most results presented in the tables were not affected, only the displayed color code and the error message shown in the "Steel Design 1 - Summary Data" database table. This error was introduced in v17.0.0.
	71250	An incident was resolved where concrete frame design results were not fully available after reopening a model in a new SAP2000 session. Design results could be displayed graphically on the model window, but attempting to right-click on a member for detailed results would produce an abnormal termination error. Similarly, tabular results were not available in this situation. Running the design, even for a single member, after reopening the model would enable the display and output of the correct design results for all members. Result values were not affected by this error, which affected only version 17.0.0 to v17.1.1.

*	Incident	Description
	71692 72314 73542 74135	An incident was resolved in which the File > Print Graphics command did not show symbols representing joints when these symbols were turned on in the set display options.
	71795	An incident was resolved in which saved named displays did not show text, such as object labels, when included in a report.
	73378	An incident was resolved where the hinge status (LS, IO, CP) shown in the table "Frame Hinge States" could be incorrect for load combinations and for load cases when enveloping results were requested. This could also affect the plotted hinge status for enveloped results. The hinge status was correct for individual steps of a load case. The hinge state (A, B, C, D, E) was not affected.
	73600	An incident was resolved where the frame stress plots (command Display > Show Frame/Cable/Tendon Force Diagrams) could be incorrect when consecutive frame objects were assigned a nonprismatic frame section property with the advanced setting, i.e., the length of the frame object was less than the full length of the nonprismatic section variation. This could also affect the stresses reported in the table "Element Stresses - Frames". This did not affect frame objects that contained the entire length of the nonprismatic variation (the most common case), even though the object could be meshed into multiple frame elements for analysis. No other results were affected (such as frame forces and moments, displacements, and reactions).
	73855	An incident was resolved in which the File > Print Graphics command did not display the plane ID when printing a planar view.
	74938 75224	An incident was resolved where the font size was too large for certain text items when printing an isometric view using the File > Print Graphics command. Printing of perspective views was not affected.
	75099	An incident was resolved for the generated reports in which the license number was not being populated on the cover page and the header of the report pages.
	75321	An incident was resolved where attempting to display results onscreen for a model with plane elements that had area springs would result in a runtime error if the link elements created by these springs were set to show. This was only a display problem and results were unaffected.
	76383	An incident was resolved for the Chinese 2010 steel frame design code where the Effective Length Factor and Length Factor were switched in the design details report. This was a display issue only and no design results were affected.
	78940	An incident was resolved where the values shown on the model for frame member forces when hovering over the frame member may not have been correct. This happened when the member forces shown were double valued or were for a combination. Frame member forces shown when the member was right clicked, or in tables or used for design were not affected.

Database Tables

Incidents Resolved

*	Incident	Description
	71345	An incident was resolved where the database did not correctly import cable shape data when the cable type was "Relative undeformed length".
	72056 73932	An error was corrected where export to Excel did not work if the computer had regional settings that used a comma for the decimal point. This affected versions 17.0.0 to v17.1.1.
	74496	An incident was resolved in which importing a model from Excel would fail if any of the Excel sheets were protected.
*	74549 76561	An incident was resolved where the section cut forces reported in the database table "Section Cut Forces - Design" may have been reported incorrectly for some section cuts if the following two conditions occurred: (1) Results were displayed for more than one load case at the same time, and (2) The load cases requested contained response spectrum cases. If both of these conditions occurred the response spectrum case results could be from one of the other selected load cases.

*	Incident	Description
	76147	An incident was resolved where exporting database files (Text, Excel, Access) was quite slow when an alternate language file, CSiLanguageResource.xml, was present in the installation folder. This also made saving the model file slow, since the *.$2k text file is written as a database file. No results were affected in any case.
	76380	An incident was resolved where the monitored joint id was not imported correctly for a nonlinear static pushover case.

External Import/Export

Incidents Resolved

*	Incident	Description
	71613	An incident was resolved which affected the import of CIS/2 files. When the name of a CIS/2 file to import had several extensions, i.e., it contained more than one period, the file was not imported.
	72570	An incident was resolved in which certain Nastran *.dat files were unable to be imported in v17.
	73446	An incident was resolved for the import of SACS models in which the imported material property modulus of elasticity and shear modulus were off by a factor of 1000. The analysis results agreed with the model as imported.
	74148	An incident was resolved for the import of SDNF files where non-default frame local axes were being imported but not always applied to the model. When this occurred, the default local axes were being used instead. Exporting the model to SAP2000 text file (.$2K or .S2K) and re-importing it would correct the problem. This affected all previous versions of SAP2000 that could import SDNF files.
	74507	An incident was resolved that improves the import of STAAD files with STAAD floor loads and one-way loads. Previously STAAD floor loads and one-way loads were imported as frame distributed loads assigned directly to the frame members located within the corresponding area, with the result that the load distribution did not necessarily match the STAAD frame distributed loads. Now these STAAD loads are imported as SAP2000 shell uniform-to-frame type loads that are assigned to shells imported from STAAD if they exist at matching locations, or assigned to shells with "None" properties created for the purpose of distributing these loads. SAP2000 results may still not match STAAD results exactly in all cases, as the algorithms for distributing loads may differ between the two products both in the horizontal plane and over an elevation range. In most well-defined cases, however, the agreement should be close. Previously and now, SAP2000 results agree with the model as imported.
	75231	An incident was resolved where the SAP2000 model could not be exported to Perform3D. This was a problem with v17.1.1 only.
	76175	An incident was resolved where nonuniform loads on shells were not correctly imported from STAAD models. In most cases results were unavailable for load cases where these loads were present. These models should be imported again.
	76883	An incident was resolved for the SACS import of prismatic sections in which the imported S22 and Z22 values were not correct. Results were consistent with the values of these properties as reported for the imported frame sections.

Data Files

Incidents Resolved

*	Incident	Description
	71979	An incident was resolved in which the active degrees of freedom settings were not imported from text (*.s2k, *.$2k), Excel, or Access files. After import the analysis results matched the model, which would have all degrees of freedom active. This error was introduced in v17.0.0.
	73128	An incident was resolved in which developed elevations were not correctly recovered after saving and reopening a model.
*	73159	An incident was resolved where old models were unable to be opened when the regional settings on the computer were set to “Turkey”.

*	Incident	Description
	74589	An incident was resolved in which an imported model would generate errors if the computer region settings used a comma (,) for the decimal separator.
	76286	An incident was resolved where the program was not correctly importing the Overwrites - Auto Wind Loads - Frame table and the Auto Seismic - IBC2012 table.
	76845	An incident was resolved where in some rare cases the import of certain section designer sections could fail.
	77888	An incident was resolved where an abnormal termination error occurred when reading a response-spectrum function from a file if the data was specified as frequency-value pairs and the first frequency value specified was zero. When converted to period, this resulted in division by zero. Now when a zero-frequency value is specified, an intermediate data point is interpolated as the average of the first two data points and used instead of the zero-frequency point. Functions specified as period-value pairs were not affected and have not been changed.

Documentation

Incidents Resolved

*	Incident	Description
	71731	The API documentation has been updated to include instructions in the documented API examples for attaching to running instances of SAP2000.
	72615	An incident was resolved in which the AISC 360-05, AISC 360-10, and CSA S16-01 steel frame design manuals referred to the design preference 'Maximum Number of Auto Iteration' which does not exist in SAP2000.
	74504	An incident was resolved in which the context sensitive help topic 'Welcome to SAP' referred to the Basic Analysis Reference manual which no longer exists. This was a documentation error only.

Application Programming Interface

Incidents Resolved

*	Incident	Description
	69472	An incident was resolved correcting two API function issues. (1) An issue in the API function SapModel.Analyze.GetCaseStatus prevented some COM clients from being able to successfully retrieve data. (2) An issue in the API function SapObject.Hide caused an error to be triggered in some COM clients.
	73478	An incident was resolved where the SAP2000 OAPI command SapModel.File.OpenFile could not open *.$2k files.