

SAP2000 v25.3.0 Release Notes

© 2024 Computers and Structures, Inc.

Notice Date: 05-June-2024

This document lists changes made to SAP2000 since v25.2.0, released 29-March-2024. Items marked with an asterisk (*) in the first column are more significant.

Database Tables

Enhancements Implemented

*	Ticket	Description
	10599	An enhancement has been made for steel frame design code AISC 360-22 to provide the design result database tables.

Design – Steel Frame

Enhancements Implemented

*	Ticket	Description
*	2185	An enhancement was implemented to add a new database table that contains the details of the deflection check for steel frame design, for all codes, when the design preferences have been set to consider deflection.
	9406	The following enhancements have been made to the steel frame design code NZS 3404:1997 based on the determination of whether a member or a segment of a member is fully lateral restrained or not. A member or segment is now considered to be fully laterally restrained if $M_{bx} = M_{sx}$ (NZS 5.3.2.2.1) for that member or segment, which implies that $\alpha_m * \alpha_s > 1$ according to NZS 5.6.1.1(1). (1.) For a member with axial compression and bending about the x-axis, the following moment ratio is checked per NZS 8.4.4.1.1 only when the member or segment does not have full lateral restraint: $M^*_x / \phi * M_{ox}$. Here M^*_x is the design moment, and M_{ox} is the nominal out-of-plane member moment capacity. Previously, the ratio was checked irrespective of whether the member or segment had full lateral restraint. (2.) When a member or segment is fully laterally restrained, and the PMM interaction for a compression member with biaxial bending is checked per NZS 8.4.5.1, then M_{cx} is set to M_{ix} instead of $\min(M_{ix}, M_{ox})$. For members that are not fully laterally restrained, M_{cx} is set to the minimum of M_{ix} and M_{ox} , as done previously. (3.) When a member or segment is fully laterally restrained, and the PMM interaction for a tensile member with biaxial bending is checked per NZS 8.4.5.2, then M_{tx} is set to M_{rx} instead of the minimum of M_{rx} and M_{ox} . M_{tx} is still set to the minimum of M_{rx} and M_{ox} , as done previously, for members that are not fully laterally restrained.
	10504	An enhancement was made in steel frame design codes AISC 360-10, AISC 360-16, and AISC 360-22, where now the design amplifies the moments with B1 and B2 factors for all members when the analysis method is set to "Limited First Order Analysis." Previously, this amplification was ignored since this method applies only when all ratios of axial forces to their corresponding Euler buckling capacities were less than 0.5, and it was assumed that the amplifications were small.
	10506	An enhancement was made to steel frame design codes AISC 360-10, AISC 360-16, and AISC 360-22, where now the design amplifies the moments with any user-specified overwritten B1 and B2 factors for all members when the second order method is chosen as "General Second Order Method." This applies to both the "Direct Analysis Method" and the "Effective Length Method". Previously, amplifying the moments and axial forces with calculated or overwritten B1 and B2 was done only when the second-order method was chosen as the "Amplified First Order Method." Allowing specification of overwritten B1 and B2 factors provides more flexibility to the user. By default, B1 and B2 factors are not calculated and are taken as one, if not overwritten, for the "General Second Order Method", preserving the previous behavior.

Documentation

Enhancements Implemented

*	Ticket	Description
	10502	A documentation modification was made for steel frame design per the AISC 360-16 and AISC 360-22 codes where the corresponding manuals have been updated for single angle sections to remove the phrase “unsymmetric (unequal leg)” from the paragraph in section 3.6.3, “Unsymmetric Members Subjected to Flexure and Axial Force.” This modification is a documentation change only, and the calculated design results remain unaffected.

External Import and Export

Enhancements Implemented

*	Ticket	Description
*	10475	An enhancement to the import of DXF files was implemented. Polyface mesh objects, created with the AutoCAD PFACE command, can now be imported as frame objects, shell objects, and/or solid objects depending on the user's choices. Note that polyface mesh objects can be imported as solid objects irrespective of the order in which their vertices and faces are defined.
	10602	Three enhancements to the import of DXF files were made: (1) It is now possible to import DXF files that do not include a table of layers. (2) The DXF Import form in which the user specifies the DXF layers from which objects are to be imported now only lists the relevant layer names for each type of SAP2000 object to import - i.e. only the DXF layers containing objects that can be converted to a given type of SAP2000 object. (3) During the import, SAP2000 displays progress bars showing the degree of completion of the various import operations.
	10608	Two related enhancements to the import of .exr files from Revit and their export to it were implemented. (1) SAP2000 now recognizes square, rectangular and round bars family types exported from Revit and imports them as steel rectangular and circular sections. (2) SAP2000 now exports steel rectangular and circular sections to Revit where they are imported as square, rectangular, and round bars family types. Note that both enhancements only work with Revit and CSiXRevit 2025.

Installation and Licensing

Enhancements Implemented

*	Ticket	Description
*	10471	The version number has been changed to v25.3.0 for a new intermediate release.

Results Display and Output

Enhancements Implemented

*	Ticket	Description
	3617	The hinge status results for deformation-controlled (ductile) Interacting P-M2, P-M3, M2-M3 and P-M2-M3 hinges has been improved so that the hinge status is computed during each step of analysis based on acceptance criteria strain limits that correspond to location of the hinge state on its interaction surface at each step of analysis. This change resolves the issue where, in previous versions, the acceptance criteria strain limits used to determine hinge status were locked at the first instance of yielding, leading to unexpected hinge status results when a hinge yielded in one primary direction and had significant deformation in the orthogonal direction. The backbone curve shown in the Hinge Response plot (Display menu>Show Hinge Results) is unchanged and will still display the backbone curve and acceptance criteria strains corresponding to the first instance of yield for interacting hinges.

User Interface***Enhancements Implemented***

*	Ticket	Description
	758	An enhancement was implemented in the design overwrites form to sort the frame section names in alphanumerical order in the Current Design Section drop-down list.

Database Tables

Incidents Resolved

*	Ticket	Description
	10524	An incident was resolved where the editing the table "Hinges Def 09 - Interacting - Deform Control - Acceptance" through Interactive Database Editing (Edit menu > Interactive Database Editing) could cause the Force-Deformation data of the Interacting P-M2-M3 hinge to be reset to default values. Additionally, the tolerance used for identifying the Axial Force for Force-Deformation and Acceptance Criteria data in the "Hinges Def 08 - Interacting - Deform Control - Force-Deform" and "Hinges Def 09 - Interacting - Deform Control - Acceptance" tables have been changed to be relative to the maximum and minimum axial forces to prevent round-off sensitivity that sometimes caused errors when importing these tables.

Design – Aluminum Frame

Incidents Resolved

*	Ticket	Description
	10585	An incident has been resolved for the aluminum frame design codes AA 2015, AA 2020, and EN 1999:2007 in which the design of members with nonprismatic sections could not be performed. Now they are designed properly.

Design – Cold Formed Frame

Incidents Resolved

*	Ticket	Description
	10525	An incident was resolved for the AISI 2016 cold-formed steel frame design where the "Use Lateral Factor" option in the Design Preferences did not work as expected. Previously, the lateral factor was always being applied, irrespective of the "Use Lateral Factor" setting, when the design provision was set to Allowable Stress Design (ASD) and the design load combination had seismic, wind, wave, or a combination of different lateral loads.

Design – Concrete Shell

Incidents Resolved

*	Ticket	Description
	10614	An incident has been resolved for the Eurocode 2-2004 concrete shell design where the design for joints that had thickness overwrites showed inconsistent results when the model units were switched. This affected the design results in the database table and the contour plot. The issue could only be seen on the contour plot if the design result data for the contour plot was cleared by going to the Concrete Shell Design Preferences form and clicking OK in the form before displaying the design contour again with the different units.

**Design – Steel Frame
Incidents Resolved**

*	Ticket	Description
	9818	An incident has been resolved in the "Chinese 2018" steel frame design code in which the plate slenderness ratio b/t limits of the non-seismic and seismic load combinations were not reported correctly for some instances. The program sometimes reported the error message "Section is slender" unnecessarily. The following issues are resolved: (1) The program now automatically ignores the b/t check for tension and tensile-bending members. The users no longer need to overwrite the "Ignore b/t" check. (2) For compression-only (no flexure and no axial tension) members, b/t is checked according to GB50017 section 7.3.1 and doesn't check according to GB50017 section 3.5.1. Once b/t exceeds the limits per GB50017 7.3.1, the program gives the design message "Section is slender (GB50017 7.3.1)". For design combinations that include seismic effects, if b/t exceeds both GB50017 7.3.1 and GB50011 8.4.1, the program generates an error message: "Section is slender (GB50017 7.3.1, GB50011 8.4.1)". (3) For flexural members or flexo-compression (all beams and columns, and some braces) members, the program no longer checks b/t according to GB50017-2017 7.3.1. (4) For flexural or flexo-compression members (all beams and columns, and some braces), if the section class is S5 (GB50017 5.3.1) but the width-to-thickness ratio does not exceed the seismic design limit (GB50011 8.3.2 for beam and column, and 8.4.1 for brace), the program no longer cites the latter code sections in the error messages. The only code section that is cited in the error message is GB50017 3.5.1 in this case. At the same time, since it is not a compression-only (no moment and no axial tension) member, the code no longer cites section GB50017 7.3.1 in the error message. (5) For non-seismic members, specified by modifying the "Seismic Design Grade" to "Non Seismic" in the Overwrites, the program no longer outputs seismic limits. In such cases, the program no longer cites the seismic code sections (GB50011 8.3.2 for beam and column and 8.4.1 for brace) in the error messages. These changes do not affect the calculations but update the error messages with appropriate code references and suppress extra error messages displayed for members with longitudinal tensile forces.
	10327	An incident has been resolved in the Chinese 2018 steel frame design code, in which the design details available through Display Design Info, the database tables, and the Verify All Members Passed command were inconsistent regarding the failure status as the design details and database tables were not reporting the beam/column capacity ratio failures whereas the Verify All Members Passed command was reporting all failures including beam/column capacity failures. The design was okay. This was a reporting issue only. The reports are now consistent.
	10477	An incident was resolved where the documentation and Excel sheet for ten of the steel-frame design verification examples was not updated for changes to the expected results due to Ticket 10445, as reported in the ReleaseNotes for SAP2000 v25.2.0. Results produced by SAP2000 were correct, this was a documentation issue only.
	10495	An incident has been resolved for AISC 360-22, AISC 360-16, CSA S16-19, and CSA S16-14 steel frame design codes where the moment capacity for the lateral-torsional-buckling limit state of box sections was incorrect when $I_{22} > I_{33}$. In the AISC codes, the C_b factors, and in the CSA codes, Ω_{M2} factors were calculated for the M33 moment diagrams. Now they are calculated based on the moments about the major axis of bending, M22.
	10514	An incident has been resolved in steel frame codes "CSA S16-09" and "CSA S16-14" in which the slenderness ratio check has now been enforced as mandatory per CSA 10.4.2.1. The program used to issue a warning instead of an error. Now, the program issues an error message and fails the member.
	10600	An incident has been resolved in steel frame design code "AISC 360-22," in which L_b/r_y limits for SMF and IMF were erroneously being used as their limits from the older edition of the code. The report was " $L_b/r_y > 0.095 * E / (R_y * F_y)$ (AISC 341-22 E3.4b, D1.2b)" for SMF, and " $L_b/r_y > 0.19 * E / (R_y * F_y)$ (AISC 341-22 E2.4a, D1.2a)" for IMF. Now the report says, " $L_b/r_y > 0.086 * E / (R_y * F_y)$ (AISC 341-22 E3.4b, D1.2b)" for SMF, and " $L_b/r_y > 0.17 * E / (R_y * F_y)$ (AISC 341-22 E2.4a, D1.2a)" for IMF.

* Ticket	Description
10622	An incident has been resolved for the incorrect value of the warping constant (Cw) stored in section properties in old models. This incorrect value of Cw was used in steel frame design when the model was opened in v25.2.0. This does not affect the design results when the model is imported through text file as the Cw is re-calculated correctly in the text importing process. Now when the model is opened, the Cw will be re-calculated correctly and the steel frame design results will be corrected when re-designing.

External Import and Export

Incidents Resolved

* Ticket	Description
8982	An incident affecting import of .EXR files from Revit has been resolved. Revit sloping analytical elements drawn from highest point to lowest point and with an alignment other than top-center, middle-center, bottom-center, were imported with an incorrect cardinal point. When this occurred, the error was visible in extruded view and the analysis results agreed with the model. This incident affected all versions of SAP2000 capable of importing .EXR files from Revit.

Graphics

Incidents Resolved

* Ticket	Description
6811	An incident was resolved where displaying the constrained joint symbol while also showing the symbol for joints did not work as intended because the two symbols would overlap and the constrained joint symbol would not be visible in DirectX display mode. This was a display issue only.

Installation and Licensing

Incidents Resolved

* Ticket	Description
10496	An incident was resolved in the CSLicenseAssistant where clicking on the User page (for Cloud Sign-in license mode) would freeze on the 'Connecting' form and not sign in.

User Interface

Incidents Resolved

* Ticket	Description
10497	An incident was resolved on the Assign Frame Point Loads form where the moment input fields were disabled if a moment load was previously deleted using the form and then an attempt was made to assign a new load. This was a user interface issue only.
10510	An incident was resolved where adding a new KDS 41 17 00-2019 or NBCC 2020 response-spectrum function could cause an existing response-spectrum function to be overwritten.
10541	An incident was resolved in the precast U-girder frame-section definition form where the validation of inputs was checking the wrong values when trying to enforce $D2 + D3 + D6 + D7 \leq D1$. Results agreed with the values as actually defined.