ETABS v21.1.0 Release Notes

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Notice Date: 11-August-2023

This document lists changes made to ETABS since v21.0.1, released 11-May-2023. Items marked with an asterisk (*) in the first column are more significant.

API
Enhancements Implemented

*	Ticket	Description
	9638	An enhancement has been made to the Application Programming Interface (API) to add updated functions cPropFrame.GetChannel_2, SetChannel_2, GetDblAngle_2, SetDblAngle_2, GetDblChannel_1, SetDblChannel_1, GetISection_1, SetISection_1, GetTee_1, and SetTee_1 to include the fillet radius. Previous versions of these functions did not include the fillet radius, but were otherwise identical. In the new functions, a fillet radius of zero indicates no fillet radius.
	9730	An enhancement has been made to the Application Programming Interface (API) to add new functions cPropArea.SetDeck_1 and cPropArea.GetDeck_1. These functions have the arguments for all slab and deck properties for all three types of deck including filled, unfilled, and solid slab. They will check for the type of deck to assign and retrieve corresponding properties. They supersede the functions cPropArea.SetDeck and cPropArea.GetDeck, which previously did not set and retrieve the slab/filled material correctly.

Data Files
Enhancements Implemented

*	Ticket	Description
	9322	An enhancement has been implemented where high-strength steel materials per JGJ/T 483-2020 standard have been added to the Chinese material library. The steel frame design per the Chinese 2018 code has also been updated to account for these materials.
	9378	The Indian frame section library has been updated where numerous new double-angle and double-channels sections have been added to the library. Additionally, (1.) The overall depth for one of the existing sections (ISMC250) has been corrected. The depth was incorrectly listed as 350mm instead of 250mm in the XML library. (2.) Missing section properties have been added for some of the existing frame sections. Previously, the missing properties for the affected sections were being calculated internally by the program when importing the section.
	9696	An enhancement has been made to Function definition (response spectrum, time history) to allow the specification of a Default Function Folder that applies to all functions of type "From File". This is a global setting: It applies to the current ETABS session, but it is not saved with the model; instead, it is saved for the user when ETABS is closed. If the function data file is not found in the path specified in the function definition, the software will recursively search the following locations in the order given below, then load and use the first matching data file: (1) Folder where the model file is saved, (2) Default Function Folder, (3) Program installation folder. The corresponding API (Application Programming Interface) functions have been updated as well.

Database Tables
Enhancements Implemented

*	Ticket	Description
	6128	An enhancement was made to include the Story and the Pier or Spandrel label fields in the Pier Design Overwrites tables and Spandrel Design Overwrites tables.

*	Ticket	Description
	9752	The following database tables were added: "Frame Assignments - Hinge - ASCE 41-17 - Conc Shear Wall - Flex", "Frame Assignments - Hinge - ASCE 41-17 - Conc Shear Wall - Shear", "Frame Assignments - Hinge - ASCE 41-17 - Conc CouplingBm - Flex", "Frame Assignments - Hinge - ASCE 41-17 - Conc CouplingBm - Shear". Additionally, the model text file (.$ET) for import and export has been enhanced to include data for ASCE 41-17 concrete coupling-beam type auto-hinges.

Design – Concrete Frame
Enhancements Implemented

*	Ticket	Description
	9748	An enhancement has been made to concrete frame design for the IS 456:2000 code to include a check for the axial compression limit of 0.4fck according to IS 13920:2016 for the column design under seismic loads. The warning/error message, when applicable, will be displayed in the right-click design details form as well as in the design results table.
	9777	An enhancement has been made in IS 456-2000 concrete frame design to include reference to clause IS 13920:2016 Section 7.1 for the column axial compression limit check for seismic design in both the right-click design details and the database output table.
	9887	Several enhancements were made for the Chinese 2010 concrete frame design code: (1.) Table 5-6 for Chinese concrete frame design in which an extra factor 1.1 was removed for SDG "I". (2.) Table 5-8 for Chinese concrete frame design in which an extra factor 1.1 was removed for SDG "9 SI and I" and "III". (3.) The limit ACR < 0.15 is no longer applied to transition columns for determining the MMF and SMF factors for column design. (4.) Corrected an issue for incorrectly reporting Seismic Design Grade Details. No design results were affected.

Detailing
Enhancements Implemented

*	Ticket	Description
*	9607	An enhancement was made to show PT tendon vertical profiles in slabs and beams in Detailing drawings. Previously the PT profiles were shown in the on-screen Detailing, but not in the drawing sheets produced for printing and/or export.

Drafting and Editing
Enhancements Implemented

*	Ticket	Description
	9832	An enhancement was made to the working-plane draw mode to add the fine-grid snap option, to allow drawing of multiple line objects, and to allow drawing of 3- and 4-joint area objects. Area objects drawn in the working plane must be within the bounds of the current structure and grid system.

External Import and Export
Enhancements Implemented

*	Ticket	Description
	1220	An enhancement has been implemented to allow more than one multi-step lateral load case to be included in the design load combinations that are exported to SAFE.f2k model text files. Corresponding steps of each multi-step load case are added together. All multi-step lateral load cases in a design combination must have an identical number of steps, producing a load combination with the same number of steps. Previously, only one multi-step load case was supported in an exported load combination.
	9705	An incident affecting the import of DXF files as floor plans was resolved. Layers containing block inserts in the DXF file were not listed in the list of layers from which to import Columns in the "DXF Import - Floor Plan" form. As a result, block inserts could not be imported. The issue affected ETABS v20.1.0 through v21.0.1. Results agreed with the model as imported.

*	Ticket	Description
*	9722	An enhancement to the export of .EXR files to Revit 2024 and their import from Revit 2024 has been implemented. ETABS line and area objects with "None" section properties are now exported as Revit analytical frames and panels with no properties and no companion physical elements. Revit analytical frames and panels with no properties are now imported as ETABS line and area objects with "None" section properties. This feature requires the forthcoming CSiXRevit 2024 and was developed to support the round-trip import and export of point loads, line loads, and area loads assigned to such objects. Note that the round-trip import and export of these loads to and from Revit 2023 is unchanged but that their round trip import and export between ETABS and Revit 2024 requires this latest version of ETABS.

Installation and Licensing
Enhancements Implemented

*	Ticket	Description
	9532	The version number has been changed to 21.1.0 for a new intermediate release.

Loading
Enhancements Implemented

*	Ticket	Description
*	9789	Two enhancements have been made to the handling of time-history and response-spectrum functions: (1.) The addition of new functions and the modification of existing functions is now allowed after the analysis is run and the model is locked. Modified functions used by load cases that have already been run will cause their analysis results to be deleted, with warning and an option to cancel. (2.) During analysis, only functions that are actually referenced by the load cases currently selected to run will be processed. For models with very long functions, this may increase the speed and slightly reduce the storage requirements for analysis.

Results Display and Output
Enhancements Implemented

*	Ticket	Description
*	5370	An enhancement has been made to concrete frame design to add a new crack-width (serviceability) design or check according to Eurocode 2-2004 and Italian NTC 2008 codes. This feature is available for beam (M3) design and for the design or check of column reinforcement. The crack width, concrete stress, and steel stresses are calculated and compared against the limits imposed by the Eurocode 2-2004. The design/check results are displayed in the right-click design detail report, display design info, and database tables. The feature is currently limited to prismatic frame sections only.
*	9814	An enhancement has been made to the parallelized design and response-recovery algorithms to increase the speed and reduce the memory usage and disk IO for models with large analysis models and/or many long time-history functions. Parallelized response recovery affects certain larger output tables and time-consuming graphical displays. In addition, the "Program Determined" values for the number of threads to be used for parallelized design and response recovery are now set to number of "Performance" cores on CPUs with hybrid architecture (e.g., Intel 12th generation Core and newer) for better efficiency over a larger range of models. This is set using command Analyze > Advanced Design and Response Recovery Options.

Structural Model
Enhancements Implemented

*	Ticket	Description
	9715	An additional parameter "Ultimate Strength Limit" has been added to ASCE 41-17 auto frame hinges with the hinge tables "Table 10-7 (Concrete Beams - Flexure)", "Table 10-8 (Concrete Columns)", and "Table 10-19 (Concrete Coupling Beams - Flexure)". This parameter is added to allow the user to specify a maximum limit to the C-point, or ultimate strength, of the program-generated backbone curve, and it is set to 1.1 times the yield strength by default.
	9732	An enhancement was made to increase efficiency of slab meshing when the floor is manually divided into several area objects, which would result in many meshing lines per floor level.

Analysis

Incidents Resolved

*	Ticket	Description
	2873	An incident was resolved where section cuts that included forces from a shell object which had an edge release assigned (Assign menu > Shell > Edge Releases) could be incorrect. When the shell object with the edge release was assigned with auto-meshing, the discrepancy in the reported section cut results was small. For unmeshed shell objects, forces exerted by the shell along the released edges may not have been included in the computed section cut results.
	9551	A change has been made to not to allow multi-stepped wind and seismic load pattern assignments to time history load cases and stages of nonlinear staged construction load cases. When run, such load cases will be skipped and a corresponding message will be added to Analysis Messages. Previously such assignments were permitted, but the load was not applied or it used the first step of the load pattern, which was not consistent with the multi-stepped nature of load pattern itself.
*	9617	An incident was resolved where the nonlinear stiffness of link elements that is used for iteration and response recovery for nonlinear modal time-history (FNA) load cases could be incorrect when all of the following conditions were met: (1.) The link property was not of type "Damper – Exponential" and had at least one nonlinear degree of freedom. (2.) The link property had "Stiffness Used for Linear and Modal Load Cases" set to "Nonlinear". (3.) The modal case used as the basis for the FNA load case did not use P-Delta or nonlinear stiffness. (4.) More than one FNA load case was selected to be run in the same session. Note that when the option to run load cases in parallel was selected, all FNA load cases were in separate runs and therefore none were affected. When these conditions were met, zero link stiffness was being used for the affected link properties certain for response-recovery calculations for the second and subsequent FNA load cases is a given run (the first FNA load case in any run was not affected). These calculations include joint reactions at affected links, base reactions, and section cuts that include the affected link elements. No other response quantities (displacements, member forces and stresses) were directly affected. However, the iteration during the FNA analysis could be affected, and in some cases this could cause a minor effect on other response quantities.
	9682	An incident was resolved where a direct integration time history load case having proportional damping specified as period ratio of a mode failed to run unless the modal load case used for proportional damping had previously been run or was explicitly set to be run in the same analysis session with the direct integration time history load case itself. When this occurred, results were not available for the direct integration load cases. Now the modal case will automatically be run, if not already done, when the direct integration load case is run.
	9688	An incident was resolved where mass or mass from loads that was specified on a null line whose ends were unsupported would generate instability warnings during analysis because the joints at the end of the null line were not included in the analysis mesh. This did not affect loads on a null line, because they were being distributed to the underlying shells. Null lines with mass or loads are now included in the mesh.
	9784	An incident was resolved where the element model data file (with extension .MSH) that is created when running the analysis inadvertently used a truncated file name for models with dot(s) in their file names (e.g., "model.rev01.EDB" creating "model.MSH"). This could cause results to not be available when another model with a similar name was run in the same folder (e.g., "model.rev02.EDB", again creating and overwriting "model.MSH"). Results were otherwise not affected.

API
Incidents Resolved

*	Ticket	Description
	2054	An incident was resolved for the Application Programming Interface (API) where the toolbars would not show next time ETABS was opened if certain API functions had been called. Now the toolbar settings will not be saved when ETABS is closed if any API calls had been made during the session.
	9555	An incident was resolved for the Application Programming Interface (API) function cPropFrame.GetTube_1 in which the corner radius was retrieved incorrectly. Previously, it was always returned in database units, which are the internal units of the model. Now it is returned correctly in the current units as previously set using the API.
	9563	An incident was resolved for the Application Programming Interface (API) where the functions cFrameObj.SetInsertionPoint and SetInsertionPoint_1 would trigger an exception when called and not perform the expected function.

Database Tables
Incidents Resolved

*	Ticket	Description
	8364	An incident was resolved where importing a duplicate CoreBrace BRB section property through the database tables caused an abnormal termination. Now the duplicated section property will be ignored or will replace the original, according to the specified options for importing from tables.
	9553	An incident was resolved where the table for cold-formed material property data would not be displayed unless an aluminum material property had also been defined. No results were affected.
	9699	An incident was resolved for the AS 3600:2018 shear wall design preferences where the Wall ductility Type was incorrectly shown in the tables. This was just a reporting issue and design was not affected.
	9714	An incident was resolved for concrete frame design codes "ACI 318-19" and "ACI 318-14" where the reported torsion values for governing torsion stirrup bars and governing longitudinal torsion rebars in the database table "Concrete Beam Shear Envelopes…" were not correct. This was a reporting problem only. The detailed calculation reported in the "Concrete Beam Design Information …" form was correct, and no other design results were affected. The database tables "Concrete Beam Shear Envelopes..." for all codes have been updated to add a new field key "VTorsion" which reports associated Torsion for Av/s. For these tables, the following field keys and corresponding field names have been changed: (1.) Key "At" --> "VRebar", Name "At" --> "VRebar (Av/s)", which reports VRebar (Av/s), (2.) Key "TComboAt" --> "TTrnCombo", Name "T for At Combo" --> "TTrnCombo", which reports the Torsion combination, (3.) Key "TAt" --> "TTrnTorsion", Name "T for At" --> "Torsion for TTrnRebar", which reports design Torsion, (4.) Key "TorsionAt" --> "TTrnRebar", Name "At Torsion" --> "TTrnRebar (At/s)", which reports At/s, (5.) Key "TComboAs" --> "TLngCombo", Name "T for As Combo" --> "TLngCombo", which reports the Torsion combination for longitudinal torsional rebar, (6.) Key "TAs" --> "TLngTorsion", Name "T for As" --> "Torsion for TLngTorsion", which reports design Torsion for longitudinal torsional rebar, (7.) Key "TorsionAs" --> "TLngRebar", Name "As Torsion" --> "TLngRebar (Al)", which reports longitudinal torsional rebar Al. In addition, the following database tables have been renamed. However, their table keys are unchanged: (1.) "Concrete Bm Design Summary - AS 3600-09" --> "Concrete Beam Design Summary - AS 3600-09", (2.) "Concrete Bm Design Summary - AS 3600-2018" --> "Concrete Beam Design Summary - AS 3600-2018", (3.) "Concrete Bm Design Summary - Chinese 2010" --> "Concrete Beam Design Summary - Chinese 2010".

*	Ticket	Description
	9746	An incident was resolved where the Yes/No value of the "Use Yield Moment?" and "Use Yield Rotation?" fields in the database table "Panel Zone Property Definitions - User Nonlinear Data" table were reversed when the table data was imported. This issue only affected the behavior when importing. The values of the fields were correct when the table was exported, displayed through Display >Show Tables, or shown in the forms of the graphical user interface. The import error affected interactive database editing (Edit menu > Interactive Database), import from a database table file (text, Excel, Access, XML), or import of the table using the API (Application Programming Interface). The model text file (.$ET) was not affected.
	9758	An incident was resolved where the nonlinear damping coefficient field "Trans NL Damping" for an exponential damper type link property could be incorrectly shown when accessing the "Link Property Definitions - Damper - Exponential" tables through the interactive database (Edit menu > Interactive Database). If changes were made in any of the database tables in the interactive editor and the results saved back into the model, then the incorrect damping coefficients would be used in the model. Note that this issue did not affect the database table when displayed or exported from the model, only in the interactive database editor. This issue occurred when the display units were different than the database units of the model. The database units are the internal consistent units used when the model is first created. These are usually N-mm or lb-in, and can be seen in the .LOG file after an analysis is run.
	9830	An incident was resolved for the database table "Frame Section Property Definitions - Concrete Beam Reinforcing" where the rebar area values were given in Length units instead of Length^2 units. This also affected the unit conversion of the displayed values. This only affected the values shown in the table, and did not affect the model unless this table was imported in units different from the database units.
	9856	An incident was resolved where the damping coefficient of the nonlinear exponential damper link property was being unnecessarily converted for units when the damping exponent was changed in the Link/Support Direction Properties form and the current units were different from the database units. This occurred when the property was first saved after changing the exponent, and the damping coefficient would be different next time the Link/Support Direction Properties form was opened. This only occurred once when the exponent was changed, and unit conversion after that was correctly performed. Also fixed a similar issue in the interactive database.

Design – Composite Beam
Incidents Resolved

*	Ticket	Description
	6548	An incident has been resolved where composite beam design overwrites were getting reset to default values when interactive editing was used to edit/assign overwrites. Consequently, the overwrites were missing in the .E2k and .$ET files as well.
	9769	An incident was resolved where composite beam design per any of the AISC 360 codes was sometimes incorrectly rejecting adequate trial beam sections when the beam design was controlled by shear capacity. This was because while performing a preliminary design check, ETABS was using a phi value of 0.9 for shear instead of 1.0 as allowed by the AISC code for most rolled sections. However, if the trial section did pass the preliminary design check, then the shear capacity in the output or in the interactive design form was subsequently correctly computed and reported. This affected all versions of ETABS capable of designing composite beams and when it occurred, the error was slightly conservative.
	9797	An incident was resolved for the Eurocode 4-2004 composite column design in which the properties of the concrete effective section have been changed to correctly account for the concrete cover limits for fully encased sections in accordance with Clause 6.7.3.1(2) in the EN 1994-1-1:2004. Previously, the full concrete section was used in the calculation, resulting in slightly under-conservative design.

*	Ticket	Description
	9853	An incident was resolved for composite column design code "Chinese 2010" where the design reported values of M33, M22, V2, and V3 inconsistently for a concrete-filled tube when the magnification factors MMF-Column Top, MMF-Column Bottom, and SMF-Column were overwritten. The reported forces were only calculated using the overwritten values of the amplification factors when N/fcAg > 0.15. When N/fcAg was less than 0.15, the overwritten values did not take effect. Now, if any MMF or SMF is overwritten, the overwritten values will be used regardless of the value of N/fcAg. Where overwrites are not specified, the MMF and SMF will still be calculated based on the value of N/fcAg.
	9854	An incident was resolved for composite column design code "Chinese 2010" where the software could terminate abnormally or stop responding when exporting the design details for a concrete-filled tube to a Word document.

Design – Concrete Frame
Incidents Resolved

*	Ticket	Description
	1966	An incident has been resolved for the torsion design of concrete beams with trapezoidal sections and angle and tee sections with tapered webs. Previously, the outside area, the area enclosed by the centerline of the torsional reinforcement (or the centerline of the connecting wall), the outside perimeter, and the perimeter of the centerline of the torsional reinforcement were not determined correctly to account for the trapezoidal shape or the tapered web of the sections. The affected concrete design codes are ACI 318-19, ACI 318-14, ACI 318-11, ACI 318-08, AS 3600-2018, AS 3600-2009, CSA A23.3-19, CSA A23.3-14, Eurocode 2-2004, Italian NTC 2008, KBC 2016, KBC 2009, NZS 3101:2006, TS 500-2000(R2018), and TS 500-2000.
	2489	An incident was resolved for concrete frame design where the moments for negative bending were sometimes reported as zeroes in the table "Flexural Design Moment Mu3" of the design-envelope details, based on whether the tension-side required rebar (top) for the negative moment was less than the compression-side required rebar (top) for the positive moment, or vice-versa. The affected table can be accessed by right-clicking on the designed beam, then Details > Envelope tab. The design procedure and all other results were not affected. The design procedure considers all the steps within a multi-step load case or multi-valued load combination so that the net enveloping rebar requirements are reported correctly. The corresponding database tables are updated accordingly. This was a reporting issue only.
	4657	An incident was resolved for the Chinese 2010 concrete frame design code where the MMF and SMF factors for columns were not matching for the top and bottom columns when all the column lines did not have the same height. The design has been updated to now pick up the factors based on Table 5.3.2.1 (GB 50011-2010 6.2.2, 6.2.5, JGJ 3-2010 3.10.2-2) correctly. For SDG = I, the SMFs have been corrected to exclude the factor 1.1.
	9616	An incident was resolved for Eurocode 2-2004 and Italian NTC 2008 concrete frame design where the transverse torsional reinforcement area was calculated incorrectly. It was also enveloped incorrectly when multiple load combinations and/or a load combination with seismic loads were selected for design.

Design – Shear Wall
Incidents Resolved

*	Ticket	Description
	9565	An incident was resolved for IS 456:2000 shear wall design of spandrels where the bottom rebar of very deep link beams with a short span (i.e., where the span/depth ratio was 0.4 or less) was not able to be designed.

*	Ticket	Description
	9821	An incident was resolved for concrete shear wall design code "Chinese 2010" where the SMF and MMF factors were not program-determined by default. The design overwrites only allowed the option to set a user value, with a default value of 1.0. Now these factors are program-determined by default, with values calculated based on code sections GB 50011-2011 6.2.2, 6.2.5, JGJ 3-2010 3.10.2-2, and they can be overwritten with user-values as before.

Design – Steel Frame
Incidents Resolved

*	Ticket	Description
	4194	An incident was resolved for composite column design code "Chinese 2010" where the design reported a stress-check message "Section is Slender" for a concrete-filled tube whenever e0/rc was greater than one, even when the column was in tension. Now this condition is checked only if the column is in compression.
	7855	An incident has been resolved for the Eurocode 3-2005, Italian NTC 2008, and Italian NTC 2018 steel frame design codes to perform the design of angle sections about the principal axes instead of the geometric axes. The design includes the calculation of the design moments, the effective section moduli (Weff,y and Weff,z), the equivalent uniform moment factor (Cm), the critical moment coefficients (C1, C2, and C3), etc. Previously, these design parameters were computed about the geometric axes.
	9525	An incident was resolved for the CSA S16-19 steel frame design code where the Seismic Category was not saved in the design preference form. Results were consistent with the Design Category as shown when revisiting the form, as well as in the tables and report. In addition, the text description of the Seismic Category was not updated correctly on the design preferences form when design code was changed in the same session.
	9601	An incident was resolved for the AS 4100-2020, AS 4100-1998 and NZS 3404-1997 steel frame design codes where some steel frame overwrites were not written to .$ET (or .E2K) text files, and these overwrites were lost when model was imported from a text file. In addition, importing a model from a database-table file (text, Excel, Access, or XML) was resetting the steel frame design code to AISC 360-16, and any assigned steel overwrites were lost. All design codes were affected by the latter issue.
	9703	An incident was resolved for the Chinese 2018 Steel frame design code where section Class was not reported correctly. This was just a reporting issue and design was not affected.
	9719	An incident was resolved for the CSA S16-19 steel frame design and CSA A23.3-19 concrete frame and slab design codes where the default design load combinations used a scale factor of 0.5 instead of 1.0 for companion snow load with live load.
	9760	An incident was resolved for steel frame design codes "AISC 360-16", "AISC 360-10" and "AISC 360-05" in which the design manuals have been updated for minor editorial changes: (a) In section 3.6, the default value of the D/C ratio limit is 0.95 instead of 1.0. (b) In sections 3.6.1 and 3.6.2, the exception clause of AISC H1.3 is applicable to the "doubly symmetric rolled compact section" instead of just the "doubly symmetric section." (c) In section 3.6, there are additional minor editorial changes. These changes affect the documentation only. Results are not affected.
	9831	An incident was resolved for steel frame design where using auto-section selection when a group selection was also defined was not working correctly. Auto-selection without group selection did not have this issue.

Detailing
Incidents Resolved

*	Ticket	Description
	9680	An incident was resolved for detailing where the section views of columns with insertion points were not correct as the rebar cages were shown outside the concrete surface.
*	9697	An incident was resolved where the drawing size was not correct when the model was in metric units. This did not affect the use of US Customary units.

*	Ticket	Description
	9700	An incident was resolved related to Detailing Rebar Selection Rules for columns and walls stacks where rebars were not immediately updated when changing the reinforcement bar size. Now all rebars will be cleared and a new set will be added conforming to the updated rules.

Documentation
Incidents Resolved

*	Ticket	Description
	9658	Help documentation now has updated information for the Detailing command Column Bar Selection and Curtailment Rules > Story > Splice Location.

Drafting and Editing
Incidents Resolved

*	Ticket	Description
	9698	An incident was resolved where the operation Quick Draw Drop Panel would draw the drop panel at an incorrect location if another area object was present at same X-Y location in another story level.

External Import and Export
Incidents Resolved

*	Ticket	Description
	1281	An incident was resolved where an inconsistency could have existed in older models between story heights and the internally stored elevations. Now, when this is detected, the user is notified and the story elevations are recomputed from story heights. This may have affected models imported from text files into ETABS v13 or earlier versions, and the discrepancy showed up in displays of the model.
	1679	An incident was resolved where on-screen editing of a line (i.e., reshaping the line connectivity) to create a brace or column was causing the local-1 axis of the brace or column to be reversed. When this issue occurred, the affected brace or column was not correctly imported from the .E2K or .$ET model text file.
	8790	An incident was resolved where, when exporting a story from an ETABS model to SAFE (File > Export > Story as SAFE v12 .f2k File), horizontal modal forces for response-spectrum load cases were not always fully exported to the SAFE .F2K file at joints that were included in rigid-diaphragm constraints. This issue did not affect joints assigned to semi-rigid diaphragms or without a diaphragm assignment.
	9735	An incident was resolved where user-defined P and V values specified as parameters for program-generated ASCE 41-13 and ASCE 41-17 concrete hinges may not be correctly imported from an ETABS .e2k text file. When the issue occurred, the model was imported with the effected P and V values set to zero (0). The behavior of the model agreed with the parameter value shown in the imported model.

Loading
Incidents Resolved

*	Ticket	Description
	8751	An incident was resolved where deleting one or more intermediate stories was adding the joint loads from the last deleted story to the story below instead of deleting those loads.
*	9474	An incident was resolved where seismic or wind loads that depend on mass were not always updated to use the current mass when applied in a staged-construction load case. Running a linear case with aforementioned seismic or wind loads before running staged construction cases prevented the issue from occurring.

Results Display and Output
Incidents Resolved

*	Ticket	Description
	1678	An incident was resolved where link elements connected to a restraint were not drawn correctly when displaying reactions as arrow plots and when the deformed shape was displayed prior to displaying the restraint reactions.
	9512	An incident was resolved where the seismic load tables were not available in the project report that was presented in the user interface for certain models where the seismic load force diagram and the seismic load table required more than one page to display. This did not affect the seismic load table when the project report was sent to a printer or a Word file.
	9642	An incident was resolved where the design report did not include all pages for steel frame design for certain models. Design results presented graphically and in tables were not affected.
	9686	An incident was resolved where analysis results were not available and the model was unlocked when opening a model file from a read-only folder. This could occur by closing the model after running the analysis, and then setting the read-only flag on the folder containing the model, or by copying the model and all results files to a read-only location. Analysis results became available again after making the model folder and its contents writable. Now results are available for display and output from a read-only location, but no changes to the model can be saved (including modifying, deleting, or running load cases) while the location is read-only.
	9708	An incident was resolved in steel frame design codes "AISC 360-10", "AISC 360-16", "Italian NTC 2018", as well as composite column design codes "AISC 360-10" and "AISC 360-16", in which the reported L_{ltb} factor in the "Parameters for Linear Torsional Buckling" table in the Design Details form for ETABS Steel Frame Design was sometimes incorrect. The reported value was taken from the governing load combination and governing station. The actual value of the L_{ltb} factor that is used in the design is dependent on both the the load combination and the design station, and this was correctly done. It was only the reported value of L_{ltb} that could be incorrect.
	9742	An incident was resolved for Indian IS 456:2000, Russian SP 63.13330.2012, and Vietnamese TCVN 5574:2012 concrete frame design codes where the column headings were incorrect for the rebar area and rebar percentage in the design report for Table: "Axial Force and Biaxial Moment Design For P_u , M_{u2} , M_{u3}". This only occurred when column rebar was to be checked instead of designed.
	9857	An incident was resolved for the AS 3600-2018 shear wall design report for Moderately Ductile Walls where the Boundary Element check was always showing the Status as "Required" instead of "Not Required" when the compressive stress was less than the stress limit.
	9883	An incident has been resolved where, for output type MaxMin, the minimum joint displacement values at story levels plotted in the story response plots for multi-step cases were incorrect. The maximum joint displacement values were not affected. Also, the minimum values reported in the database table for joint displacement were correct.

Section Designer
Incidents Resolved

*	Ticket	Description
	9870	An incident was resolved where a steel angle section, when included as reinforcement in a concrete section, had only part of its axial area considered when calculating the PMM interaction surface. This issue did not affect other types of steel shapes. Section properties were correct for the section when an angle was included; only the interaction diagram was missing a portion of the angle area.

Structural Model
Incidents Resolved

*	Ticket	Description
	1811	An incident was resolved where wind-pressure coefficients applied to three-noded area objects was not displayed in the user interface. This was just a display issue and load application was not affected.
	9548	An incident was resolved where some of the section properties for the sole double-channel section in the AISC15 and AISC15M section libraries were incorrect. The double-channel section has been updated to 2C15X50 and 2C380X74 in the AISC15 and AISC15M libraries, respectively, with a back-to-back distance of zero. It should be noted that v15.0 of the AISC Shapes Database does not provide any double-channel sections. A single double-channel section, however, has been given in the included AISC15 and AISC15M libraries as a template for users to add more double-channel sections, if desired.
	9768	An incident was resolved where, for a Panel Zone with User-defined Nonlinear Properties, the panel zone nonlinear behavior beyond point E was always extrapolated even when the "Load Carrying Capacity Beyond Point E" option was set to "Drops to Zero" in the User Nonlinear Panel Zone Data form. This behavior has been fixed so that the behavior beyond point E correctly reflects the chosen "Load Carrying Capacity Beyond Point E" option.

User Interface
Incidents Resolved

*	Ticket	Description
	2004	An incident was resolved where customized keyboard shortcuts for plugins that have been added to the Tools menu were not being saved when ETABS was closed. Now shortcuts created using the Options menu > Customize Toolbars > Keyboard > Tools will be retained next time ETABS is opened.
	8472	An incident was resolved where, for models with multiple towers, plan views only displayed the first tower when the perspective toggle was turned on.
	9644	An incident was resolved where the "Force Deformation Data" form for Parametric Steel and Concrete P-M2-M3 hinges (Define menu > Section Properties > Frame/Wall Nonlinear Hinges) disabled the "Show Scaled Data" checkbox when the model was locked, preventing the force-deformation plot display from being displayed using the scale factors in a locked model. This was a display issue in this form only and did not affect analysis or results output.
	9655	An incident was resolved where Deck or One-way membrane section properties were duplicated in plan view in Standard Graphics mode. This made the view hard to read, but no results were affected.
	9723	An incident was resolved where selection/deselection by material property was not working correctly for line objects that were assigned non-prismatic sections.
	9761	An incident has been resolved where the shell forces/stresses were plotting in color even after selecting the grayscale theme for screen colors in the output color options. An enhancement was also implemented where the themes for the output color options have been made the same as that for display colors for consistency. Previously, four themes were available for display color options but only two themes for output color options.