ETABS® 2015 Version 15.0.0
Release Notes

Notice Date: 2015-02-18

This file lists all changes made to ETABS 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 deemed more significant.

Changes from v13.2.2 (2014-12-19)

Graphics and User interface
Enhancements Implemented

*	Incident	Description
*	65718	An enhancement has been made to add DirectX capability for drafting and displays. This allows for better and faster graphics on most computers. This capability is hardware and software dependent and may not be available on some machines.
	72425	An enhancement was implemented to provide the ability to access mass source definitions from the Model Explorer tree.
	74045	An enhancement has been implemented providing the new command Help > Check for Updates which allows the user to determine if they are running the latest version. The software will also display an icon in the upper right corner when an update is available. Both the icon and the menu command will display a webpage with additional details on how to obtain the update.

Modeling
Enhancements Implemented

*	Incident	Description
	24191	An enhancement was implemented to allow modification of the model geometry based on the mode shape of a buckling or modal load case. This can be used to simulate imperfections or other scenarios. Once applied, the geometry can be reset to the original.
*	34973	A bilinear Maxwell viscous damper has been implemented as a new link property. This device is a linear spring in series with a dashpot whose force-velocity relationship exhibits linear viscous behavior up to a specified force-velocity limit. When the force and velocity exceeds this limit, the additional damping force is proportional to the additional velocity by a different, smaller damping coefficient. The behavior is symmetrical with the sign of the velocity.
*	58758	An enhancement has been made to better model Buckling Restrained Braces (BRB) for both linear and nonlinear analysis. The frame section property form has been modified to obtain more detailed information on the BRB linear and nonlinear properties. A special BRB type nonlinear hinge has been added to model the nonlinear behavior that includes hardening with plastic deformation.
*	62241	A friction-spring hysteretic damper has been implemented as a new link property. The force-displacement relationship exhibits linear slipping stiffness when loading, but unloads with a smaller slipping stiffness. A pre-compression displacement and a displacement stop-limit may be specified. The behavior may be specified as tension-only, compression-only, or symmetrical in tension and compression.

*	Incident	Description
*	70191	The hysteresis models for nonlinear energy dissipation have been expanded and enhanced. They are all available for nonlinear materials used in fiber hinges and the layered shell, for single degree-of-freedom (non-interacting) frame hinges, and for the multi-linear plastic link. These models include: (1) Isotropic model, which dissipates the most energy; this was previously available only for frame hinges. (2) Kinematic model, typically suitable for metals; this was previously available. (3) Takeda model for simple degradation; this was previously available. (4) Pivot model, typically for reinforced concrete; this was previously available for hinges and links but not materials; the reloading behavior has been slightly modified so as to load from the pivot point to the backbone curve along the secant line, rather than along the backbone curve as done previously. (5) Concrete model, representing compression and tension behavior differently; this is new and similar to the model in Perform3D; it can also be used in reverse to represent tension-only behavior. (6) Degrading model, capturing energy and stiffness degradation with kinematic behavior; this is new and similar to the model in Perform3D. (7) BRB Hardening model, for representing buckling-restrained braces; this is new and similar to the model in Perform3D. The behavior of the existing models has been improved for the cyclic behavior during strength loss.
*	70479	An enhancement has been made to allow nonlinear hinges to be assigned to walls. Specifically a hinge type Fiber P-M3 has been added to allow modeling of axial and flexural behavior in walls. The wall hinges are currently restricted to rectangular wall objects of reinforced concrete that are not to be further meshed for analysis. The hinge represents the nonlinear behavior of the vertical membrane forces. Horizontal and shear membrane forces, as well as out-of-plane bending moments and shear forces, all exhibit linear behavior. It is noted that the introduction of fiber hinges in the model changes the elastic behavior of walls and frames and results for linear load cases will be slightly different with and without hinges.
	73360	An enhancement has been implemented to provide a warning message if a mass source definition includes both element self-mass and at least one load pattern with a self-weight multiplier greater than zero, possibly resulting in double counting of the self-mass. The check is performed both when defining the mass source and when using the check model command.
	73734	For mass-source definitions, the option to include "Element Self Mass and Additional Mass" has been separated into the two independent options "Element Self Mass" and "Additional Mass", similar to ETABS versions 13.1.5 and earlier. These options had been combined when multiple mass sources were introduced in version 13.2.0.
*	73735	An enhancement has been implemented that adds a new option under "Mass Sources" definitions to adjust diaphragm lateral mass so as to move the mass centroid by a given amount. This allows for easy modeling of mass eccentricity for both rigid and semi-rigid diaphragms.
*	75912	The parametric material stress-strain curves for steel, concrete, and rebar have been simplified by reducing the number of points. This includes removing the yield plateau for steel and rebar materials. The material stress-strain curves are used for fiber hinges and nonlinear layered shells. The simplified material curves are more appropriate for performance-based design (PBD) where they represent the backbone curve for cyclic loading. The default acceptance-criteria strain values for PBD have been adjusted for all materials to better represent current practice. In addition, the PBD state identifiers (A, B, C, D, E) have been updated to match the new stress-strain points. NOTE: Models run in the new version may produce slightly differently results from previous versions for fiber hinges and nonlinear layered shells due to the change in parametric stress strain curves for steel, concrete, and rebar. User-defined stress-strain curves are not affected.

Loading

Enhancements Implemented

*	Incident	Description
*	58854	An enhancement has been implemented to generate spectrum-compatible time history functions by performing spectral matching in the frequency domain. The implementation adjusts the Fourier amplitude spectrum of the reference time history based on the ratio of the target response spectrum to the response spectrum of the reference history while keeping the Fourier phase of the reference time history fixed.
*	67706	Automated response-spectrum functions have been implemented for Argentina, Chile, Colombia, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, and Venezuela.
*	70188	An enhancement has been implemented to generate spectrum-compatible time history functions by performing spectral matching in the time domain. The implementation adds wavelets to the reference time function such that its computed response spectrum matches the target spectrum across the whole frequency range while maintaining realistic velocity and displacement time series as well as preserving the non-stationary character of the reference time function.
	73795	Live-load reduction factor (LLRF) calculation has been implemented for the Korean Building Code (KBC 2009).
*	73796	Automated seismic lateral loads and response-spectrum functions have been implemented for the Korean Building Code (KBC 2009).
	74602	Auto seismic loading and response-spectrum functions for Eurocode 8-2004 have been updated to include the Norway National Annex EN 1998-1:2004 NA:2014.

Analysis

Enhancements Implemented

*	Incident	Description
*	59493	An enhancement has been implemented that provides two alternatives to how frame nonlinear hinges are represented in the analysis model. Previously the hinge was internal to the frame element, but now the hinges may be modeled instead as a zero-length link elements connecting multiple frame elements that represent the full length of the member. The main reason for doing this is to allow nonlinear modal time-history analysis (Fast Nonlinear Analysis, FNA) to account for nonlinearities in frame hinges, as well as to provide more damping control for nonlinear direct-integration time-history analysis. This new feature are available only with the Ultimate license level. This change has several implications: (1) When performing FNA for such a model, it is important to use Ritz modal analysis to capture the modes that represent the link nonlinear deformations. (2) This approach introduces a very small amount of elastic flexibility at the hinge locations, which may cause slight differences in both linear and nonlinear behavior compared to a frame member without hinges. For the same reason, slight differences in results for all load cases may be expected from previous versions of ETABS in models having frame hinges. Isotropic hinges will now be slightly more flexible (previously they were rigid before yield), fiber and non-isotropic hinges will be slightly less flexible (these previously had some flexibility before yield). (3) Additional rotational mass degrees of freedom may be present at the hinge locations. (4) Convergence behavior should generally be improved for nonlinear static and direct-integration time-history load cases, particularly for cases where multiple hinges in the same frame object were dropping load at the same time. (5) For hinges modeled as links, the stiffness-proportional damping used for direct-integration time-history analyses may now be specified by the user to be proportional to the initial stiffness of the hinge (the current behavior), the tangent stiffness, or a mixture of the two. Tangent-stiffness damping is generally more realistic, but may increase computation time. Initial-stiffness damping generally leads to faster convergence during analysis, but may overestimate damping and hence be unconservative.
	67570	An enhancement has been made to update the Displacement Coefficient Method for determining the performance point for pushover analysis from the method of ASCE 41-06 to that of ASCE 41-13. The main difference is in the effect of soil-structure interaction.

*	Incident	Description
*	68092	A new option has been added to enable running displacement-controlled nonlinear static (pushover) load cases quasistically. When this option is selected, the load case is run as a nonlinear direct-integration time-history with time steps and damping as specified by the user. Typically the loading would be applied very slowly to minimize dynamic effects. This approach can be useful in certain cases where instability makes convergence difficult for a pushover load case that is run statically. Although the analysis is performed dynamically, results are presented as a static load case, enabling plotting of the pushover curve.

Frame Design

Enhancements Implemented

*	Incident	Description
*	69086	Concrete frame design and shear wall design have been implemented for the Canadian CSA A23.3-14 code.
*	69087	Steel frame design has been implemented for the Canadian CSA S16-14 code.
*	72284	Concrete frame design has been implemented for the ACI 318-14 code.
	72907	An enhancement was implemented to add the Ireland national annexes for Eurocode 2 concrete frame and shear wall design, Eurocode 3 steel frame design, and Eurocode 4 composite beam design.
*	73297	Concrete frame design and shear wall design have been implemented for the Korean Building Code (KBC 2009).
*	73891	Steel frame design has been implemented for the Korean Building Code (KBC 2009).
*	75074	The Buckling Restrained Braced (BRB) has been added as a new type of frame section property, and steel frame design for the BRB section and framing systems has been added for the AISC 360-10 code. In addition, a new database of StarSeismic BRB frame sections properties has been provided.

Composite Beam Design

Enhancements Implemented

*	Incident	Description
	72907	An enhancement was implemented to add the Ireland national annexes for Eurocode 2 concrete frame and shear wall design, Eurocode 3 steel frame design, and Eurocode 4 composite beam design.

Shear Wall Design

Enhancements Implemented

*	Incident	Description
*	69086	Concrete frame design and shear wall design have been implemented for the Canadian CSA A23.3-14 code.
*	72285	Shear wall design has been implemented for the new ACI 318-14 code.
	72907	An enhancement was implemented to add the Ireland national annexes for Eurocode 2 concrete frame and shear wall design, Eurocode 3 steel frame design, and Eurocode 4 composite beam design.
*	73297	Concrete frame design and shear wall design have been implemented for the Korean Building Code (KBC 2009).

Results Display and Output

Enhancements Implemented

*	Incident	Description
*	70193	An enhancement has been made to display on screen and in tables the Demand/Capacity ratios for nonlinear hinges assigned to frames and walls. Specifically, a Performance Check case has been added that allows as input a series of nonlinear time history analysis cases, an acceptance limit state, and an option whether to report the maximum D/C ratios or a mean plus some factor on the standard deviation of the D/C ratios. The acceptance criteria for the different limit states are specified with the hinge properties except for fiber hinges. For fiber hinges the acceptance criteria are specified with the material properties assigned to each fiber and the D/C ratio reported is the maximum for any fiber.
	73771	An enhancement has been implemented to add a built-in summary report that is equivalent to the summary report that existed in ETABS v9. This report is not saved with the model, but can be generated on-demand. The contents of the report are defined in the file 'Summary Report.xml' within the installation folder, which can be modified by the user if desired.
	75216	Plotting of nonlinear fiber hinge response has been made faster, particularly for load cases with many steps.

Application Programing Interface (API)

Enhancements Implemented

*	Incident	Description
	56149	An enhancement has been made to allow retrieval of the analysis elements corresponding to frame objects through the use of the API.
	60793	An enhancement was made to the API adding new functions to obtain lists of object names and labels (GetLabelNameList), to obtain names from labels (GetNameFromLabel), and to obtain labels from names (GetLabelFromName). These functions are available for shells (areas), frames, and joints (points).
*	65689 69760	Several enhancements have been made to the API: (1) ETABS.exe is now started in its own process for standalone API clients. This change will typically increase the execution speed and size of models that can be handled. (2) It is now possible to attach to a running instance of ETABS.exe that has not been started from the API. (3) The API is cross-platform compatible, i.e. a 32-bit client can access 64-bit ETABS and vice-versa.

Documentation

Enhancements Implemented

*	Incident	Description
	74304	Several of the published design Verification Examples supplied as part of the product installation have been modified to remove warnings that appeared in the analysis log file (.LOG) indicating that the model was unstable. These messages applied to degrees of freedom (DOF) that were unrelated to the behavior being tested, and had no effect upon the results. These unstable DOF have now been restrained. The computed behavior and the published results have not changed.

Miscellaneous

*	Incident	Description
	71920	The version number has been changed to v15.0.0 for a new major release. ETABS v15 will be known as "ETABS 2015".

Graphics and User Interface
Incidents Resolved

*	Incident	Description
	56533	Minor enhancements and corrections have been made to the keyboard shortcuts: (1) Most tool-buttons without a corresponding menu command (such as Set Default 3D View) may now be assigned a shortcut key, where previously this was not possible. (2) A tool-tip now shows the shortcut key, if any, assigned to a tool-button when the mouse is held over the tool-button. (3) The keys PageUp and PageDown are now assigned to the tool-buttons Move Up in List and Move Down in List, respectively, for selecting different planes when displaying plan and elevation views. These key assignments cannot be changed at the present time. (4) In addition, minor corrections have been made to the order in which the Tab key moves between entries in certain forms.
	72893	An incident was resolved where the software terminated with an "Abnormal Termination" error in the graphical user interface for models with no load patterns defined. This is not normally allowed but could be caused by importing a text file with no load patterns defined. A default load pattern is now created as necessary to avoid this issue.
	73184	A typographical error was corrected in the form "Slab Information" for Floor Mesh Options for "Defining Rigid Diaphragm & Mass Only". This was only a display issue in the form. No results were affected.
	73434 73900	An incident was resolved where the tool buttons "Assign Deck Section" and "Assign Wall Section" under toolbar "Assign Shell" were always disabled and not available for use. The corresponding menu items worked properly.

Modeling
Incidents Resolved

*	Incident	Description
	70937	An incident was resolved where the concrete frame design results were not being saved when the model was unlocked. This later prevented frame hinges assigned with hinge type "Auto" from being generated using the designed reinforcement. Hinges were still accounting for reinforcement if it was specified with the frame section property.
	73575	An incident was resolved where automatic beam end-length offsets were being incorrectly calculated if the beam was supported on columns with section properties of type Section Designer. The width (t2) and depth of (t3) the column section when used for the beam offset calculation were switched. The error was obvious by looking at the lengths assigned to the end offsets. No other properties or behavior were affected.

Section Designer
Incidents Resolved

*	Incident	Description
	73206	An incident was resolved where the section name of a Section designer section was not editable when first copied, and instead a default name was always used. Later modification of the name was possible. No results were affected.
	74767	An incident was resolved for Section Designer where, for some wall sections with auto-generated reinforcing, the Edge Reinforcing form was displayed instead of the Corner Reinforcing form when right-clicking on corner bars to change sizes. This was not common.
	74805	An incident was resolved where, if a Section Designer section that included steel plate section shapes was imported from a text file (.e2k), the frame section properties would not be calculated correctly until the section was opened in the Section Designer form.

Loading
Incidents Resolved

*	Incident	Description
	73058	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 that was reported as being used.
*	73248	An incident was resolved where loads assigned to null areas were not being converted to mass if the load could not be transferred to other non-null areas, even if they were part of a rigid diaphragm. This only affected v13.2.0 to v13.2.2. Now ETABS uses the same assumption for load conversion to mass as was used in ETABS v9, that is, mass and/or load assigned to null areas will be available to be counted in mass calculations if the null areas area part of a rigid diaphragm.
	74344 75241	An incident was resolved for NBCC 2010 auto seismic load pattern definition where value specified for the parameter Sa(4.0) was not being saved and always being reset to the default value of 0.1. This only affected NBCC 2010 load patterns where the Structure Type was set to "Shear Wall". This error was over-conservative for typical values of Sa(4.0) less than 0.1.
	75465	An incident was resolved where some deleted or replaced loads that were assigned to joints, frames, or shells were not properly exported to the text files. This could create additional loads if the text file was later imported. Results were consistent with the model as imported from the text file. Results were not affected for the original model that was exported.

Analysis
Incidents Resolved

*	Incident	Description
	74028	An incident was resolved where a modal time history load case would run repeatedly without stopping if it depended upon a modal case that could not find any modes, such as for a model without any mass. When this occurred the user could terminate the analysis by clicking the Cancel button. No results were affected. Neither the modal time-history load case nor the prerequisite mode case had any results, as expected. This issue affected versions 13.2.0 to v13.2.2.
	74414	An incident was resolved where the modes calculated for a Ritz modal load case could be corrupted if not all of the requested modes could fit into the available physical memory and the solution had been carried out by processing the modes in blocks. This error only affected Ritz modal cases requesting many modes for large models that were run on systems with limited physical memory. The error was obvious when it occurred because the mode shapes and periods for affected Ritz modal cases were physically unrealistic.
	74642	An incident was resolved where certain load cases were tagged as "Not Run" when they had actually completed. This was rare and could occur when certain load cases were automatically re-run after updating the loads from a previous run, such as when auto lateral load cases are re-run after being updated for computed periods of the structure. Results for all load cases that were available were correct and unaffected. Re-running the wrongly tagged load cases produced correct results.
*	74723	An incident was resolved for staged-construction load cases where links used as point springs, as defined in the point spring properties, were not being included in the structure. Only staged-construction load cases and those load cases that depended upon them were affected. The effect was usually obvious as the structure would typically be unstable.

Frame Design
Incidents Resolved

*	Incident	Description
	69534	An incident was resolved for Eurocode 2-2004 concrete frame and shear wall design in which the limiting slenderness ratio was incorrectly calculated. The value was less than permitted, possibly resulting in second order moments being included when they weren't necessarily required.

*	Incident	Description
	71970	An incident was resolved for steel frame design using the AISC 360-10 code where the error message regarding seismically compact or non-compact sections for moderately and highly ductile frames was not correct. In some cases the section was classified as compact when it should not have been, and vice-versa. This affected the error message only. All calculations were correct and no other results were affected.
	71781	An incident was resolved for all steel frame design codes where the Design Overwrite for individual members to ignore deflection checks did not work. Instead the Design Preference for deflection checks, which applies to the whole model, was taking precedence. Now the Design Overwrite, if specified for a member, takes the precedence. No results were affected except that an unnecessary (but correct) check was performed.
	71925	An incident was resolved where the command Design > Composite Beam Design > Verify All Members Passed reported that all composite beams passed the design check even though some stress ratios may have exceeded the user specified stress ratio limit if that limit was set to less than unity. When this happened, the beams stress ratios were more than the user specified stress ratio limit, but still less than unity. This incident was resolved in ETABS 2013 version 13.2.0 but inadvertently omitted from the Release Notes.
	73887	An incident has been resolved for concrete frame design and shear wall design where the option to Set to Default Values did not work properly in the Design Preferences form. Results agreed with the values as actually set and shown in the Design Preferences form.
	74363	An incident was resolved for concrete frame design per the Turkish TS 500-2000 code where joint shear design was determined using concrete and reinforcement characteristic strength instead of design strength. The results were always conservative.
	74532	An incident was resolved for Steel Frame design for Eurocode 3-2005 where Framing Type reported in the steel design report was incorrectly reported. This was just a reporting issue and design was performed correctly for the selected framing type.
	74832	An incident was resolved for Eurocode 2-2004 concrete frame design where concrete modulus of elasticity was incorrectly computed. The actual value as computed was shown in the design output, and design results agreed with that value. The difference in the modulus of elasticity as computed by ETABS and presented in EC2 Table 3.1 and the resulting effect on the design results was insignificant for all practical purposes.

Composite Beam Design

Incidents Resolved

*	Incident	Description
	70484	An incident was resolved which affected the design of composite beams under the American, Canadian and Chinese codes. When ETABS checked the strength of a beam during construction using only the automatically generated design load combinations, it generated a single load combination of dead load and construction live load with their applicable factors but did not generate a separate load combination consisting of only dead load times the applicable factor. For American, Canadian and Chinese codes this latter factor is higher than the factor for dead load in combination with live loads. This affected all versions of ETABS through 13.2.2. This did not affect the results when the user explicitly specified the load combinations to use for composite beam design. For the automated combinations, the results agreed with the combinations as generated, and the strength and serviceability of the beams under final loads were not affected. Composite beam designs per the British code were not affected because it prescribes the same load factor for dead loads alone and dead load with live loads. Composite beam designs per the European code were not affected either because, for the European code, ETABS treats the construction dead load as a live load. The composite beam design manuals for the various codes have been revised accordingly.

*	Incident	Description
	74025	An incident was resolved that addresses three issue for composite beam design: (1) When the model auto-merge tolerance was set to a larger value (say several times the default value of 0.1 inches or 1 mm) and the sum of the beam dead load deflection plus the auto-merge tolerance was greater than the total deflection limit, then the beam would be designed for 100% composite action, resulting in more shear studs being called for than required. Furthermore, if the bending moment was markedly unsymmetrical so that the maximum moment was near one end of the beam, the 100% composite action was impossible to satisfy due to excessive shear-stud crowding between the end of the beam and the maximum moment and an appropriate design for the beam could not be found. This issue affected versions 13.2.0 through 13.2.2. (2) The Composite Beam Design Overwrites option to set the maximum number of shear studs per row, which was available in versions 13.1.5 and earlier, was omitted in versions 13.2.0 to 13.2.2. In these latter versions, all beams were designed with a maximum number of three shear shear studs per row, except that any beams which could be designed with a section lighter than an AISC W30X108 were not affected. This option has been reinstated in the Design Overwrites. As an enhancement, the maximum number of shear studs per row is now also available in the Composite Beam Design Preferences, and the number of studs per rib is listed in the composite beam calculations output when the deck is perpendicular to the beam - on one side only or on both sides. (3) As an enhancement, price optimization is now set to be included by default in new models, and the default prices for steel, shear studs, and camber have been revised to be more practical.
	74124	An Incident was resolved that corrected two issues with the design of composite beams per the Canadian code CSA S16-09: (1) ETABS did not account for the effect of concrete creep when checking beam deflections. (2) ETABS did not check that bottom flange tension stresses remained in the elastic range under service load. This affects all versions of ETABS through 13.2.2. When this error occurred, the strength of the beams was not affected. The CSA S16-09 Composite Beam Design Manual and CSA S16-09 composite beam design verification model and Verification Manual sections have been revised accordingly.
	74170	An incident was resolved for composite beam design according to Eurocode 4-2004 in which choosing a specific country did not update the factors specified by the countries national annex. The values displayed in the preferences form were used for the design. The country value for composite beam design was also not being saved and recovered when exporting/importing the model via a text file.

Shear Wall Design

Incidents Resolved

*	Incident	Description
	72813	An incident was resolved for shear wall design using the CSA A23.3-04 design code where the design overwrite for "Seismic Design Grade", when specified by the user, was not being used. If this value was not changed, the seismic design grade as set in the design preferences was used. If this value was modified by the user, then the default value "Ductile Flexural Wall" was being used. In such a case, the design results were conservative. In addition, the Seismic Design Grade for "Moderately Ductile Wall" was incorrectly labeled as "Nominal Wall" in the design overwrites form.
	73887	An incident has been resolved for concrete frame design and shear wall design where the option to Set to Default Values did not work properly in the Design Preferences form. Results agreed with the values as actually set and shown in the Design Preferences form.
	74169	An incident was resolved for Eurocode 2-2004 shear wall design in which changing the Country preference value did not modify the respective preference values that differed from the CEN Default values. The values shown on the preferences form, in the tables, and on the design details calculation sheets represented the actual factors used during design.

*	Incident	Description
	74364	An incident was resolved for shear wall design per the TS 500-2007 code where the pier shear design was reporting the section capacity as "infinity". As a result, the reported shear rebar was not correct. Pier shear design should be rerun with the new version. Minor typographical corrections to the TS 500-2007 Shear Wall Design manual were also made.
	74834	An incident was resolved for shear wall design code per the Indian IS 456:2000 code where C&T pier design was assuming the concrete strength to be zero for compression design. The designed reinforcement was always conservative.
	75493 75513	An incident was resolved for ACI 530-11 masonry shear wall design where the boundary-stress limit reported in the wall design report was amplified by a factor of 0.2/0.15. This was a reporting error only and the design was not affected.

Results Display and Output

Incidents Resolved

*	Incident	Description
	72531	An incident was resolved where the on-screen values shown when moving the mouse cursor over the display of frame/pier/spandrel forces for an envelope-type load combination were always the minimum values; instead the display should have shown either the maximum or minimum value, whichever had the larger magnitude. This also affected the values shown in the status bar at the bottom left corner of the main window when viewing frame/pier/spandrel forces. No other results were affected, including tabular values, right-click values, and the values used for design.
	73041	An incident was resolved where it was possible to select a link object assigned a "None" property when using the command Display > Quick Hysteresis > Links. This could sometimes generate an abnormal termination error, or otherwise display a blank plot. Such link objects may no longer be selected for plotting.
	73328	An incident was resolved where an "Abnormal Termination" error was sometimes generated when using the command File > Create Video > Multi-Step Animation with certain load cases. No results were affected.
	73912	An incident was resolved where the Story Response plot (command Display > Story Response Plots) could, in some instances, produce a runtime error if the model was unlocked and then the user attempted to change the plot settings.
	75342	An incident was resolved where, in some cases, an open results display form (commands Display > Deformed Shape, Force/Stress Diagrams, etc.) could give an error message if the model was unlocked and then the Apply or OK button on the form was clicked.

Database Tables

Incidents Resolved

*	Incident	Description
	53380	An incident was resolved where the hinge status (LS, IO, CP) shown in the frame “Hinge States” and “Fiber Hinge States" tables 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.
	72904	An incident was resolved for the design table "Composite Beam Envelope" where the "Net Defl." column was showing zero values. This was just a reporting error and design was not otherwise affected.
	73221 74324	An incident was resolved where the "Shear Wall Pier Summary" table was not available for some models and instead the error message "Error switching between tables" was displayed. No results that were being displayed were affected.

*	Incident	Description
	73491	An incident was resolved where the database tables for story and diaphragm masses could in some cases differ from the tables for assembled mass. This was due to the presence of mass or load (to be converted to mass) being applied to null areas. All tables should now give the same mass value. The assumption that existed in ETABS V9 that mass/load applied to null areas will be effective for mass calculations if the area is part of a rigid diaphragm has been reinstated. This only affected v13.2.0 to v13.2.2.
	73499	An incident was resolved in which the "Yes/No" types of design preference values for all design types (steel frame, shear wall, etc.) were always reported as "Yes" in the database tables and reports. This was a reporting issue only and did not affect results, which were consistent with the values set and shown in the Design Preferences forms.
	74060	An incident was resolved in which the Concrete Column Rebar Data table was sometimes unable to be populated, and was blank. This was a database table issue only and did not affect any other results.
	74446	An incident was resolved for composite beam design using the Eurocode 4-2004 code where Design Preferences and Design Overwrites tables were blank. This was just a table display issue and the design results were not affected.
	74820	An incident was resolved for the database tables displaying load case definitions in which the scale factor for acceleration loads was not reported with the correct units. This was a database table issue only and did not affect results.

Data Files (.EDB, .E2K, .$ET)

Incidents Resolved

*	Incident	Description
	72895	An incident was resolved in which generalized displacement results were not being displayed in tables after exporting and importing the model using the *.e2k text file.

External Import/Export

Incidents Resolved

*	Incident	Description
	72995	An incident was resolved for exporting loads from ETABS to SAFE where the names of load cases with spaces in them were truncated at the first space. This caused applied loads to either be lost or added into the wrong load case when the F2K file was imported into SAFE. Results in SAFE agreed with the model as imported.
	73239	An incident was resolved which affected the import of 3D model geometry from DXF files. AutoCAD polylines drawn at elevation zero were imported at a non-zero elevation in ETABS if they were preceded in the DXF file by other polylines drawn at an elevation other than zero. This affected ETABS version 13.1.2 through 13.2.2. When this occurred, the results agreed with the model as imported.

Documentation

Incidents Resolved

*	Incident	Description
	55179	A documentation error was corrected for the AISC 360-10 Steel Frame Design Manual (sections 4.4, 4.6, 4.9.5, 4.9.6, 4.9.7, and 4.9.8) where it was stated that for seismic load combinations, columns are checked for amplified seismic loads only when Pu/(phi*Pn) is greater than 0.4. This condition of "Pu/(phi*Pn) > 0.4" was from an older version of AISC 341 (AISC 341-05) and no longer applies to AISC 341-10. See AISC 341-10 section D1.4a. The condition "when Pu/(phi*Pn) > 0.4" has been removed from the documentation. This was a documentation error only. Design results were and are correctly calculated and were not affected.
	72628	An incident was resolved in which the context sensitive (F1) help incorrectly described the 'Clear Cover for Confinement Bars' input field in the 'Frame Section Property Reinforcement Data Form' topic. This was a documentation error only.

*	Incident	Description
	73825	Several corrections were made to the composite beam design manuals for the AISC 360-05, AISC 360-10, BS5950 1990, and Eurocode 4-2004 codes. In addition, some deprecated content was removed from all composite beam design manuals. These were documentation errors only. The correct equations were used for design calculations and no results were affected. (1) The formula for the effective moment of inertia in AISC 360-5 and AISC 360-10 codes was corrected in version 13.2.2 under Incident 72836, but the manual was not updated accordingly. (2) For the BS5950 code, the formulas listed for the effective moment of inertia of a composite section have been revised to conform with BS5950 Clause 6.1.4. The documented minimum percentage of composite action was changed to 40%. In addition, a disclaimer was added to clarify that ETABS does not check BS5950 Clause 6.2 - Irreversible Deformation. (3) For the Eurocode 4-2004, the equations for load combinations per Clause 6.10 were corrected. These were previously based on default values for the gamma, xi, and psi factors. (4) Content relative to composite bending capacity evaluated per allowable stress design was removed from the composite beam design manuals as all current codes evaluate composite bending capacity based on limit state design.
	74090	Minor corrections have been made to the Verification Manual: (1) Updated various benchmark values due to previously documented changes to the product for which the Verification Manual was not then updated. (1a) Composite Beam Design examples "AISC-360-10 Example 001" and "BS-5950-90 Example 001" due to changes previously reported under Incident 56782. (1b) Composite Beam Design example "CSA-S16-09 Example 001" due to changes previously reported under Incident 71303. (1c) Shear Wall Design example "Eurocode 2-2004 Wall-002" due to changes previously reported under Incident 56569. (1d) Shear Wall Design example "AS 3600-09 Wall-001" due to changes previously reported under Incident 56113. (1e) Concrete Frame Design example "CSA A23.3-04 Example 002" due to changes previously reported under Incident 71922. (1f) Shear Wall Design example "CSA A23.3-04 Example 001" due to changes previously reported under Incident 71922. (1g) Analysis "Example 14" due to changes previously reported under Incident 67283. (2) Other minor cosmetic and formatting changes that do not affect results.
	74290	An incident was resolved for ETABS > Help option where Define > Load Case > Modify/Show case followed by pressing F1 was displaying the "Load Combination Data form" Instead of "Load Case Data form".
	74605	Minor typographical errors in the ACI 318-11 Shear Wall Design manual, Chapter 2, section 2.2.1 (pages 2-21 to 2-24) have been corrected. These were documentation errors only, and design results were not affected.