

ETABS Version 9.7.0 Release Notes

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Release Date: 2010-01-19

This file lists all changes made to the ETABS since the last release. **Most changes do not affect most users.** Significant issues are indicated with an asterisk (*) in the first column of the tables below.

Changes from V9.6.0 (2009-07-02)

Import/Export — Revit Structure Enhancements Implemented

*	Incident	Description
	20652	CSIxRevit2009 and CSIxRevit2010 have been updated to be compatible with ETABS v9.7.0, and to work with any ETABS v9.5 license.

User Interface and Display Incidents Resolved

*	Incident	Description
	18718	An Incident was resolved in which the right-click mouse operation did not work for wall objects for displaying properties when viewing the undeformed shape, and for displaying design results after running shear-wall design.

Loading Incidents Resolved

*	Incident	Description
*	18399	An Incident was resolved that corrected two problems with the AS/NZS 1170.2 auto wind load case: (1) The leeward wind load distribution over the height was previously assumed to be the same as the windward load distribution. This has been corrected so that the distribution is now constant over the height based on the full height of the building. (2) The air density was previously assumed to be 1.25 kg/m3. This has been changed to use the code-specified value of 1.2 kg/m3.

Design Incidents Resolved

*	Incident	Description
*	18333	An Incident was resolved in which the D/C ratio calculated for design could be incorrect for unsymmetrical Section Designer sections due to an error in interpolating the capacity from P-M-M surface. Sections which are symmetrical for major (M3) bending were not affected.
	18605	An Incident was resolved for concrete frame design using the “Eurocode 2-2004” code in which the design for a beam was not able to be performed if it had a tensile axial force.
	18784 19062 19069	Incidents were resolved for composite steel-beam design using code “AISC360-05/IBC2006” in which an exception (runtime error) could be generated while checking the vibration amplitude using the DG11 vibration criteria for beams with no real deck.

*	Incident	Description
*	18873	An Incident was resolved for steel frame design using code AISC 360-05/IBC2006 in which the stress-based interaction equation H2-1 was not being used as required for sections which are not doubly symmetric and for which I_{yc}/I_y is outside of the range 0.1 to 0.9. This only affects the singly symmetric I-sections with I_{yc}/I_y outside of the range 0.1 to 0.9, all T-sections, all double-angle sections with I_{yc}/I_y outside of the range, and all equal-legged angle sections. For singly symmetric I-sections, the old implementation was slightly unconservative with a maximum factor of 8/9. For T-sections, double-angle sections, and equal-legged angle sections, old implementation was sometimes unconservative with a maximum factor of 8/9, sometimes conservative, and sometimes matching.
	18946	An Incident was resolved for steel-frame design using the “Indian IS:800-1998” code in which the reported Kl/r ratios for major and minor directions were swapped. The calculated values were correct.
	19010	An incident was resolved for composite beam design using code “AISC 360-05/IBC 2006” in which the frequency calculation needed for the vibration check failed with an exception (runtime error) when there was no dead load on the structure or the when the first load case did not include any dead load.
	19225	An Incident was resolved for shear-wall design using the “ACI 318-02” design code in which the reported values of $\Phi-V_n$ s and $\Phi-V_s$ in the text output file did not agree with those set by the user. This was a display issue only. The correct values were being used in the design, and no results were affected. The values reported in the database tables were also correct.
*	19305	An Incident was resolved for concrete frame design using the “Eurocode 2-2004” code in which the calculated imperfection inclinations (θ) were not correct if the base length unit for the model is anything other than meter. Since the α_h parameter is always taken in between 2/3 and 1, the effect of this error was limited. If the base length unit was mm, cm, or inch, the resulting θ was unconservative.

Import/Export — SAFE V12

Incidents Resolved

*	Incident	Description
*	18396	The export of the model from ETABS to SAFE has been modified from the behavior in v9.6.0 so as to NOT export restraints if they are at the BASE level. Also if restraints at other levels are present they will be exported with loads applied directly to the restraints. The users can then remove the restraints and substitute a footing, if need be, and still have the loads from ETABS. This affects both exports to SAFE v8 and to SAFE v12.

Results Display and Output

Incidents Resolved

*	Incident	Description
	18418 18950	Incidents were resolved in which some extraneous internal data had been added to the Displacement tables in v9.6.0. This has been corrected.
	18459	An Incident was resolved in which an error message was sometimes generated when printing the joint reactions to a printer or text file. This only happened if the point elements internally created by the program had restraints.

General

*	Incident	Description
	18458	The version number has been changed to 9.7.0. This release uses the same Version 9.5 license as v9.6.0. The analysis log (.LOG) file will show version 9.6.0.0, which is correct.

ETABS Version 9.6.0 Release Notes

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Release Date: 2009-07-02

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Changes from V9.5.1 (2008-11-12)

Modeling

Enhancements Implemented

*	Incident	Description
	14340	The IBC2006 auto seismic load has been updated as per Supplement # 2 to ASCE 7-05 where minimum Cs value is revised.
	17642	A new section database file CISC9.PRO has been provided for current Canadian steel sections.
*	18123	Automated lateral loading for Eurocode has been implemented: Wind according to Eurocode 1 (EN 1991-1-4:2005), Seismic according to Eurocode 8 (EN 1998-1:2004), and Response Spectrum according to Eurocode 8 (EN 1998-1:2004).
*	18124	Automated lateral loading for the Australian code has been implemented: Seismic according to AS 1170.4:2007, and Response Spectrum according to AS 1170.4:2007, and wind according to 2002 AS/NZS 1170.2.
*	18125	Automated lateral loading for the New Zealand code has been implemented: Seismic according to NZS 1170.5:2004, and Response Spectrum according to NZS 1170.5:2004, and wind according to 2002 AS/NZS 1170.2.

Results Display and Output

Enhancements Implemented

*	Incident	Description
	15608	Reaction output at internally meshed points is now available from the File > Print Tables > Analysis Output command. Previously these results were only available from the Display > Show Tables command and for plotting in the graphical display.
	16432 17128	Table output has been added for the reaction forces from line and area springs. Previously spring reaction force output was limited to point springs.
	18288	Database table display has been added for Indian auto lateral loads, including seismic, wind, and response-spectrum functions. These tables were previously only available for printing.

Design

Enhancements Implemented

*	Incident	Description
*	12692	A new manual has been added to document the steel frame design procedure for Canadian code "CAN/CSA S16-01."
*	13043 13428 18094	Concrete frame design has been enhanced to now include all Beams, Columns, and Braces in the design output tables according to their section type, independent of their orientation. For example, every Brace will be included in either the Beam or the Column results table, depending upon whether it is assigned a Beam or Column section type, respectively. Similarly, if a Column section type is assigned to a member with Beam (horizontal) orientation in order to consider the effect of axial force, it will now be reported in the Column results table. This enhancement applies to all

*	Incident	Description
		concrete codes.
*	14050	Vibration limit-state checking for floors according to <i>AISC/CISC Design Guide 11</i> has been added to composite beam design for code "AISC 360-05/IBC2006." See also Incident 16342.
*	14474	Concrete frame design has been added for Australian code AS 3600-2001, including seismic provisions.
	14492	The design documentation has been updated for steel frame design code "AISC 360-05/IBC2006" to describe how the column/beam capacity-ratio calculation is affected for SMF for all seismic design categories (SDC=A, B, C, D, E, F). The program has not been changed, only the documentation.
*	16342	Composite beam design has been added for code "AISC360-05/IBC2006". See also Incident 14050.
*	15880 16596 16597 16598 16600 16648 16649 16842 16888 16889 16890 16891	Several enhancements have been made to concrete frame design for Indian code "IS 456-2000". <ul style="list-style-type: none"> • 15880: A new manual has been added to document the design procedure. • 16596: Torsional design of concrete beams has been added, with output in a form that is similar to the ACI code for the detail sheet, text file, RTF file, and database tables. • 16597: Column shear demand is now calculated based on the beam moment capacity only, not the column moment capacity. Previously the demand was based on the minimum of the moment capacity of the beams and columns at the joint. • 16598: The column design moment now satisfies the minimum eccentricity that is amplified for slenderness. Previously the amplified moment was compared with the unamplified minimum eccentricity but it should be compared with the amplified minimum. Amplification is based on the P/Pcr ratio. Amplification is equivalent to the M-additional specified in the code. • 16648: A detail page has been added to provide beam/column joint-capacity check information. This is accessed by clicking the "Joint Shear" button on the "Concrete Column Design Information" window obtained by right-clicking on a column member after performing design. • 16649: Error messages that were previously given for failed beam/column capacity ratios or joint capacity checks have been removed, since these two items are for informational purposes only according to the current code. • 16600: A new design overwrite for concrete code IS 456-2000 to specify the top and bottom rebar at left and right of the beam to be used for the capacity shear calculation (beam, column, joint), not to overwrite the actual flexural rebar calculated and reported. • 16842: K factors for columns are now computed based on the Wood's chart as recommended by the code. Previously the K factors were being taken as one. • 16888: The design of T beams has been enhanced by now comparing the depth of neutral axis, xu, with the depth of the flange, Df. Previously the depth of an equivalent rectangular compression block depth, 0.84*xu, was being compared with Df. The new implementation matches the Appendix G closely. • 16889: The effect of axial force upon the allowable average shear stress, Tau_cd, is now being considered. Previously the effect of axial force was being ignored. The effect of this enhancement is usually small as beams do not carry significant axial force. The column shear design was already considering the effect of axial force. • 16890: Beam and column shear design have been enhanced by now providing at least the minimum shear rebar even when $\text{Tau}_v < 0.5 * \text{Tau}_{cd}$. Previously the minimum shear rebar was being provided only when Tau_v was in the range $0.5 * \text{Tau}_{cd} < \text{Tau}_v < \text{Tau}_{cd} + 0.4 * \text{MPa}$. • 16891: The moment amplification factors have been removed from the design overwrites. These factors were not being used, since the program assumes that P-Delta analysis is performed explicitly.
*	15882 16892 16893 16895 16896 16897	Several enhancements have been made to concrete shear-wall design for Indian code "IS 456-2000". <ul style="list-style-type: none"> • 15882: A new manual has been added to document the design procedure. • 16892: The design of spandrels as T beams has been enhanced by now comparing the depth of neutral axis, xu, with the depth of the flange, Df. Previously the depth of equivalent rectangular compression block depth, 0.84*xu was being compared with Df. The new implementation

*	Incident	Description
	16898 16899	<p>matches the Appendix G closely.</p> <ul style="list-style-type: none"> 16893: The effective span is now taken as 1.15 times the clear span. This affects the size of the lever arm, z. Previously the effective span was taken as the clear span. The new implementation matches the section 29.2 closely. 16895: Clauses IS 29.1 and 29.2 for the deep beam effect have now been implemented. Previously the deep beam effect on flexure was not being considered. 16896: C-T Simple Pier design has been enhanced by considering the axial capacity of a short column (IS 39.3). Previously the capacity was being calculated from the equivalent stress block with the basic assumptions in IS section 38.1, plus the reduction factor Pmaxfactor. The factor Pmaxfactor is still being applied on top of the equation given in IS 39.3. 16897: Boundary-zone calculation of all types of Piers has been enhanced by considering the axial capacity of the end zones as short columns (IS 456-2000 39.3) per the seismic code (IS 13920:1993 9.4). Previously the capacity was being calculated from the equivalent stress block with the basic assumptions in IS section 38.1. The Pmaxfactor that is used for Simplified C-T Pier axial capacity was not and still is not being applied. 16898: Spandrel beam shear design has been enhanced by providing at least the minimum shear rebar even when Tau_v is less than 0.5 times Tau_cd. Previously minimum shear rebar was being provided when Tau_v was in range of Tau_cd/2 to (Tau_cd + 0.4MPa). The new implementation is slightly more conservative. 16899: Boundary-zone calculation of all types of Piers has been enhanced to calculate the confinement rebar. In addition, boundary zone information is being provided for both ends separately.
	17053	<p>An enhancement was implemented by changing the column headings of database tables related to concrete shear wall boundary-zone width to make them consistent. The previous headings were “B-ZonLen”, “EdgeLen”, and “B-Zone” in different places. All of these strings have been consistently changed to “B-ZoneLen”. This affects the following shear wall design codes: “ACI 318-99”, “ACI 318-02”, “CSA A23.3-04”, “CSA A23.3-04”, and “CSA-A23.3-94”.</p>
	18095	<p>A reporting change has been made to the “Analysis Results > Building Output > Story Stiffness Table” where stories overwritten by user as irregular are also now reported with those that were calculated to be irregular. Originally only the calculated ones were being reported. There is no change to the design - all irregular stories, whether calculated or overwritten, were already considered for seismic modification factors. This table is only available for Chinese design codes.</p>
*	18134 18135 18136 18137 18138	<p>Several enhancements have been made to steel frame design for the “Chinese 2002” code.</p> <ul style="list-style-type: none"> 18134: Two new limits have been added to the overwrites: lo/r for compression and l/r for tension. Using these limits, the user can supersede all other such limits as recommended by the code. By default, program-recommended values will be used for both regular design and seismic design. If these new overwrites are assigned to a given member, then the overwrites control the design of that member. Setting the overwrites back to zero resumes default behavior using program-recommended values for that member. 18135: A new factor namely “Dual System Seismic Magnification Factor” has been introduced in the design overwrites. This allows the user to increase the forces to ensure that the steel frame takes at least 25% of base shear. This value is not calculated by the program, and its default value is 1. If the user overwrites this value, the program amplifies the forces by this factor when designing the member for load combinations that contain seismic loads. The program does not check framing type or element type for applicability, but simply uses the factor as specified by the user 18136: A new framing type namely “Braced Moment Resisting Frame” has been introduced in the preferences and overwrites. This is in addition to the previous types “Moment Resisting Frame”, “Concentrically Braced Frame”, and “Eccentrically Braced Frame”. Also, the previous type “Moment Resisting Frame” has been renamed as “Sway Moment Resisting Frame” for clarity. The framing type allows the program to choose the appropriate Mue factor to be calculated by default. 18137: The design now calculates the Mue factor (K factor) for Sway and Nonsway cases based on the equations provided in Appendix D of GB 50017 code. The factors are used as

*	Incident	Description
		<p>appropriate for Sway and Nonsway Moment Resisting Frame.</p> <ul style="list-style-type: none"> 18138: In addition to previous types “Column”, “Beam”, and “Brace”, a member can now be designated as “Truss” for design purposes. When a member is designated as a “Truss” all moments are ignored for design, which may be unconservative. Special lo/r limits are applied for truss members.
	18139	Concrete frame design using the “Chinese 2002” code has been enhanced to report the governing $N/(f_c \cdot A)$ for all columns, whether or not the combinations involve seismic load. Previously the program reported this information only for seismic design. Now it is always reported, but only for seismic design is it compared with its limiting value.
*	18167	Steel frame design has been added for “Eurocode 3-2005”, incorporating the National Annexes for Bulgaria, Slovenia, Norway, and the United Kingdom. Seismic provisions of Eurocode 8 are not included at this time.
	18251	The National Annexes for Slovenia and Norway have been added to concrete frame design for “Eurocode 2-2004”.
	18292	Steel frame joint design has been improved to now consider whether the joint being designed is at the top of the column or not. Previously the joint was always assumed to have a column above it, which could lead to an unconservative design for the topmost joint where there is less restraint. The affected codes are “AISC360-05/IBC2006”, “AISC-ASD 01”, “AISC-LRFD99”, “UBC97-ASD”, “UBC97-LRFD”, “CAN/CSA-S16-01”.

Import/Export — SAFE V12 Enhancements Implemented

*	Incident	Description
	13086	The export to SAFE V12 of point restraints and point springs has been added.
	14353	The export to SAFE V12 has been enhanced to include the beam section type. Previous all beams were being exported as rectangular.
	16667	When exporting modal loads to SAFE V12, joints with zero load are no longer written.
	18303	The export to SAFE V12 of column and wall distortions has been added. This capability already existed for export to SAFE V8.

Import/Export — Revit Structure Enhancements Implemented

*	Incident	Description
	17642 18099	Several enhancements have been made to CSiXRevit handle the situation where ETABS and Revit use different standard names for the same frame section property and no mapping file has been provided by the user for this section: (1) European and British sections names are mapped between the two programs in cases where the correspondence is known. This mapping is automatic and two-way. (2) When no corresponding section name can be found, a new section or family is created with the same name and given default properties. The user can then define the correct properties for the created section, and the correspondence will be maintained for all subsequent data transfer using that same model. (3) A new ETABS section database file CISC9.PRO has been provided for current Canadian steel sections.
*	17645	CSiXRevit for ETABS has been updated to support both Revit Structure 2009 and 2010, and is available in either 32- or 64-bit versions.
	18101	The “Frame Section Mapping” and the “.PRO Files” forms used to show the mapping between Revit models and ETABS models have been enhanced to make it easier to see the location of the ETABS section-property database files.
	18108	The CSiXRevit documentation has been updated to better describe the mapping of deck section properties/families between ETABS and Revit Structure.
	18302	An enhancement has been implemented that allows material properties that have been created or modified in ETABS to be updated in Revit when exporting the model from ETABS to Revit. For

*	Incident	Description
		this to work, at least one default concrete and one default steel material property must exist in the Revit model.

User Interface and Display

Incidents Resolved

*	Incident	Description
	13315	An incident was resolved in which the warning-message file (.WRN) and some stiffness-matrix files were not being deleted when the model was unlocked.
	13544 14506	An Incident was resolved in which the command View > Save Custom View did not function correctly.
*	14729	An Incident was resolved for the ASCE 7-02 Wind Load Definition form (dialog box) in which the labels for parameters e1 and e2 were transposed.
	15008	An Incident was resolved in which an error message was sometimes generated when displaying the table "Diaphragm Assignments to Points."
	15057 17145	An Incident was resolved in which the Help > Documentation command would sometimes not work if the user did not have administrative rights to the ETABS installation folder.
	15471	An Incident was resolved in which beam and column section property definitions were sometimes multiply repeated in the database output tables. Analysis and design results were not affected.
	16339	An Incident was resolved in which attempting to merge area objects that could not be merged (when they were not contiguous or overlapping) would sometimes delete one of the objects. Now a warning message is issued and the model is not changed.
	16839	An Incident was resolved in which wall meshing for openings did not function correctly in some cases due to the use of a tight tolerance. Now the user-controlled auto-merge tolerance is used to determine if the opening is on the wall.
	17123	An Incident was resolved in which a runtime error could occur when changing units while viewing the loads data for an unloaded area object.
	17163	An Incident was resolved in which an error was sometimes generated when displaying tables for response spectrum cases using the command Display > Show Tables.
	17187	An Incident was resolved in which a runtime error could be generated when trying to use the calculator (mathematical or units operations) to set the tolerance in the Check Model form.
	18084	An Incident was resolved in which the database table for coordinate system definition was not being correctly populated, including the grid-line definition.
	18237	The database table for the definition of auto-seismic loads per code IBC 2000 has been reinstated.

Results Display and Output

Incidents Resolved

*	Incident	Description
	17674	An Incident was resolved in which the story plots were not properly displaying the maximum magnitudes in some cases. The displacement plot was incorrect when the maximum magnitude was negative. The overturning moment plot was incorrect at the base if the value was negative. This has been corrected by plotting all values with their proper signs.

Design

Incidents Resolved

*	Incident	Description
*	13627	An Incident was resolved for concrete frame design using code "ACI 318-05/IBC 2003" in which column shear forces were not being properly amplified when Sway Ordinary frame design procedure was chosen and the Seismic Design Category was greater than or equal to B. Now the shear design of columns will be performed in this case according to the Sway Intermediate Frame

*	Incident	Description
		procedure. In addition, for such cases (Ductility=OMF, SDC >= B), the shear design of beams was previously being performed as beams in Sway Intermediate Frame. Now such beams are designed as Sway Ordinary beams irrespective of SDC.
	13695	An Incident was resolved in which an error was generated when printing shear-wall design results and not all of the walls had been designed.
	13789	An Incident was resolved for steel frame design using code "AISC360-05/IBC2006" in which the beam/column capacity ratios for steel columns were not being reported when required. No other design codes were affected.
	13869	The steel frame design documentation has been corrected to remove the reference to allowing a 4/3 increase in allowable stress for load combinations that contain wind or quake load for codes "AISC-ASD01", "UBC-ASD 1997", and "API-WSD". This increase should only be used for code "AISC-ASD89". Only the documentation has been changed. The program behavior was correct.
	14371	An Incident was resolved in which the design output for seismic spandrels had incorrect headings, and always reported that diagonal reinforcement was required even if seismic design was not performed.
	14706	An Incident was resolved in which an error message was sometimes generated when viewing the output table "Shearwalls - Gen Reinf. Pier Design Data."
	15833	An Incident was resolved in which the description of the Pattern Live Load Factor (Phi) was incorrect in the Appendices of the "ACI 318-02" and "ACI 318-05" Concrete Frame Design manuals.
*	16421	An Incident was resolved for steel frame design in which the panel-zone design shear force used to determine the doubler plate thickness was sometimes calculated incorrectly. This design shear force is the difference $ V_b - V_c $, where V_b is the shear force from the beam flanges connecting to the joint, and V_c is the shear force from the column above the joint. V_b is calculated as the larger of the capacity moment or the factored moment from the beams, divided by their mean flange distance. Normally the capacity moment governs, and this was being calculated correctly. However, when the factored moment governed, the design could be unconservative, since the moments from the two beams were added algebraically, but should have been added using their absolute values. The affected codes are "AISC-ASD 01", "AISC-LRFD99", "UBC97-ASD", "UBC97-LRFD", "CAN/CSA-S16-01".
*	16620	An Incident was resolved in which the positive-moment reinforcement for a beam at the joint face was not correct for ductile design per Indian code "IS 13920" and "IS 456-2000". The positive-moment steel at a joint face should be at least equal to half the negative-moment steel at that face. Other related provisions are now also enforced along the length of the beam.
	16636	An Incident was resolved in which the database table output for concrete joint design information was not always complete. Error reporting has also been improved. All codes that involve seismic design are affected: "ACI 318-05/IBC 2003", "ACI 318-02", "ACI 318-99", "UBC97", "AS 3600-01", "CSA A23.3-04", "CSA-A23.3-94", "Mexican RCDF 2001", "Indian IS 456-2000".
	16746	An Incident was resolved for steel frame design using the direct analysis method of code AISC 360-05/IBC2006" in which the reported value for modified EA was given as $0.8 \cdot \tau_b \cdot EA$ instead of $0.8 \cdot EA$, and the reported value of modified EI was given as $0.8 \cdot EI$ instead of $0.8 \cdot \tau_b \cdot EI$. The is a reporting error only. The correct values were being used for all calculations.
	16799	An Incident was resolved for concrete frame design in which the beam/column capacity ratios and the joint shear ratios were not being reported when the column was skewed with respect to a planar frame. This affected all concrete codes involving seismic design: "ACI 318-99", "ACI 318-02", "ACI 318-05/IBC 2003", "UBC97", "CSA-A23.3-94", "CSA A23.3-04", "Mexican RCDF 2001", "Chinese 2002", and Indian "IS 456:2000".
	16978	An Incident was resolved in which the Design Preference Form was switching the GammaS and GammaC factors for Eurocode2-04. The problem was limited to when these were changed or viewed in the Design Preference Form and accepted by clicking OK.

*	Incident	Description
	17054	An Incident was resolved in which boundary-zone width information for concrete shear wall design using the "ACI 318-05/IBC 2003" code was not properly reported in the database tables or the on-screen display. This has been resolved to correctly report the left and right boundary-zone information for the critical leg. The results were previously correct in the tabular text file and the details window.
	17348	An Incident was resolved for steel design using code "AISC360-05/IBC2005" in which the program failed to calculate the interaction ratio for a non-compact pipe section.
	18007	In Incident was resolved for steel frame design using the code "CAN/CSA-S16-01" in which the PMM interaction ratio for some angle sections was not being calculated because the section was incorrectly determined to be too slender. The error was conservative and obvious.
	18096	An Incident was resolved for steel frame design using the Chinese code where the reported shear stress could be the fictitious shear stress even when the calculated shear force was governing. The reported governing shear-stress ratios and the associated pass/fail status were being correctly reported. Only the shear stress value itself could be incorrect if the option to check the fictitious shear stress was chosen in the preferences.
	18097	An Incident was resolved for the rare case of the bottom-most story being underground and fully restrained laterally in which the story stiffness was not being calculated, but was being declared to be a soft story and considered as irregular. This is now being detected and not reported as irregular. No real change in design is expected. The previous assumption was conservative. This only affected the Chinese design codes.
	18147	An Incident was resolved for steel frame design using codes "Eurocode 3-1993" and "Eurocode 3-2005" in which the section classification was sometimes incorrect for sections in pure compression.
	18208	An Incident was resolved for concrete shearwall design using all codes in which the concrete rebar fy was being reported under the heading "fys" in the tabular output. Now both the fy and fys are correctly reported in tabular output. This was only a reporting error; the design calculations were correct.
*	18293	An Incident was resolved for steel frame design in which the panel-zone design shear force used to determine the doubler plate thickness was sometimes calculated incorrectly. This design shear force is the difference $ V_b - V_c $, where V_b is the shear force from the beam flanges connecting to the joint, and V_c is the shear force from the column above the joint. Previously V_c was taken as the shear force from the column below rather than above the joint. This error could be slightly unconservative, since V_c is usually much smaller than V_b . The affected codes are "AISC360-05/IBC2006", "AISC-ASD 01", "AISC-LRFD99", "UBC97-ASD", "UBC97-LRFD", "CAN/CSA-S16-01".

Data Files (.EDB, .E2K, .SET)

Incidents Resolved

*	Incident	Description
	15293	An Incident was resolved in which the notional load import from text file was losing the auto flag, causing the associated data for automatic generation to also be lost.
	17864	An Incident was resolved in which exported time-history and response-spectrum functions had an extra Time-Value pair of (0,0) appended to the data when the number of Time-Value pairs was a multiple of eight.

Import/Export — SAFE V12

Incidents Resolved

*	Incident	Description
	16437 16790	An Incident was resolved in which a runtime error could sometimes occur when exporting a model with response-spectrum analysis to SAFE V12.
	16647 18052	An Incident was resolved in which modal loads from the columns and walls above the slab were not being exported to SAFE V12, only the loads from the slab and the supports below.
	17803	An Incident was resolved in which the forces coming from the top of the column/walls above the

*	Incident	Description
		selected story level were not being exported to SAFE V12.
	18178	An Incident was resolved in which response-spectrum load case data exported to SAFE V12 omitted the damping value, directional combination type, and excitation angle. After import, SAFE V12 was previously using default values (5% damping, SRSS combination, and zero degree excitation angle).

Import/Export with Revit Structure

Incidents Resolved

*	Incident	Description
	16393 16466	An Incident was resolved in which undefined composite beam design results were being sent to Revit when design had not been performed, resulting in an error message.
	16459	An Incident was resolved in which walls meshed in ETABS did not always have their Revit GUIDs updated depending upon the type of area meshing used.
	16853 17643	An Incident was resolved in which using the File > Save command after importing file from Revit would sometimes save the file as "Untitled.EDB" in the root folder of the C: drive. The file will now be saved in the same location and with the same name as the imported .EXR file, but with extension .EDB. This can be changed using the File > Save As command.
	16862 16953	An Incident was resolved in which exporting the model to Revit could generate an exception (runtime error) if load combinations containing other combinations are present. These are not allowed by Revit and will no longer be exported to Revit.
	17070	An Incident was resolved in which exporting to Revit could generate an exception (runtime error) if the model contained any 3-noded wall objects.
	17569	An Incident was resolved in which the member offsets for columns were not properly imported from Revit. This did not affect the results unless these members were then modified in ETABS to activate the option to transform the stiffness to the insertion point, which is not the default.
	18098	An Incident was resolved in which certain section names could not be imported from Revit, and generated a warning message about duplicate section names.
	18112	An Incident was resolved in which CSIxRevit could not update the Revit model if the wrong shared parameter file was open in Revit. Now the model will be updated, but shared parameters will not be processed, and warning message will be generated.

General

*	Incident	Description
	16621	The version number has been changed to 9.6.0. A Version 9.5 license is required.

ETABS Version 9.5.1 Release Notes

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Release Date: 2008-11-12

This file lists all changes made to the ETABS since the last release. **Most changes do not affect most users.** Significant issues are indicated with an asterisk (*) in the first column of the tables below.

For this release, only CSiRevit2009 changed, and the change is implemented as a simple patch available for the few users who need it. ETABS itself is unchanged and will still indicate that it is Version 9.5.0.

Changes from V9.5.0 (2008-09-30) to V9.5.1 (2008-11-12)

Import/Export — Revit Structure ***Incidents Resolved***

*	Incident	Description
	16418	An Incident was resolved in which CSiRevit2009 was unable to find the ETABS PLUS license. Now, when CSiRevit2009 is invoked from within Revit Structure 2009, it will first look for an ETABS Nonlinear license, and if one is not found, it will look for a Plus license. To force CSiRevit2009 to look first for a PLUS license, you can add a text file called LEVEL.TXT file to the folder where CSiRevit2009 is installed. This file should contain the following single line of text: PLUS

ETABS Version 9.5.0

Release Notes

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Release Date: 2008-09-30

This file lists all changes made to the ETABS since the last release. **Most changes do not affect most users.** Significant issues are indicated with an asterisk (*) in the first column of the tables below.

Changes from V9.2.0 (2008-02-20) to V9.5.0 (2008-09-30)

Import/Export — Revit Structure Enhancements Implemented

*	Incident	Description
*	15692	ETABS is now compatible with Revit Structure 2009, Build 20080915_2100. If you wish to import Revit Structure 2008 files into ETABS, you must first convert them to Revit Structure 2009.
*	16070	Full round-trip data transfer between ETABS and Revit Structure 2009 is now supported. A model may be created in either program, transferred to the other program, modified in either program, and transferred back and forth in a continuous iterative loop.
*	12842	Revit Structure member families are now comprehensively supported, subject to user control, when transferring data to and from ETABS
*	13411	Comprehensive, two-way mapping of materials, section properties, and members is now supported for data transfer between ETABS and Revit Structure, all subject to user control.
*	15896	Two-way transfer of deck section properties between ETABS and Revit Structure is now supported
*	15888	Comprehensive, two-way transfer of point, line, and area loads between ETABS and Revit Structure is now supported.
*	15595	Incremental changes made in ETABS or Revit Structure may be transferred both ways without the need to transfer the entire model. This significantly increases speed and ease of use.
*	14765	ETABS now automatically breaks columns, braces, and walls defined in Revit Structure than span multiple floors. The link to the Revit Structure entity may be maintained or broken under user control.
*	15897	Walls, floors, beams, columns and/or braces that are defined in Revit Structure, transferred to ETABS, and meshed in ETABS may be sent back to Revit Structure as meshed objects or as the original object, subject to user control.
	14670	User control is now provided for the level of discretization to be used in ETABS for curved objects defined in Revit Structure.
	12840	End offsets and end releases set or changed in ETABS are now transferred to Revit Structure.
	15591	Cardinal point data for beams is now transferred between ETABS and Revit Structure.
	16058	The log file created when transferring data between ETABS and Revit Structure has been expanded and is now written in XML format. This format makes it easier to organize the messages. Use of an XML reader or editor is recommended.
*	16087	CSIXRevit2009 now uses ETABS technology and requires an ETABS license to run.
	16114	CSIXRevit2009, which installs with Revit Structure 2009 for communication with ETABS V9.5, is now available as part of the ETABS installation.

Import/Export — SAFE

Enhancements Implemented

*	Incident	Description
*	14984	Floors can be exported to SAFE Version 12, soon to be released, including mode shapes and response-spectrum data.

Design

Enhancements Implemented

*	Incident	Description
	14352 14518	The plain-text report format for steel and concrete frame design has been reinstated. This was removed when the RTF report format (for Microsoft Word) was introduced in Version 9.2.0. Both formats are now available using the File > Print Tables command. The plain-text report is the same as it was previously, and does not contain the expanded information that was added to the RTF report.

Graphical User Interface

Incidents Resolved

*	Incident	Description
	14358	Cardinal point information was not correctly displayed when right-clicking on a line object. This has been resolved.
	15804	Formulae and unit conversions entered into forms could be calculated incorrectly in rare cases. This has been resolved.

Import/Export with Revit Structure

Incidents Resolved

*	Incident	Description
*	12864 14738	Uniform load transferred from Revit Structure to ETABS was sometimes converted to non-uniform load. This has been resolved.
	13407	A runtime was sometimes generated when a user-selected .EDB file was used as the Default.EDB to import a Revit Structure file. This has been resolved.
	14550	Some items exported from Revit Structure were not imported into ETABS. This has been comprehensively resolved with the new enhancements of this release, subject to a few documented limitations.
	15152	Column orientations set in Revit Structure were not always correctly transferred to ETABS. This has been resolved.
	15547	Changes made in ETABS to a model imported from Revit Structure were not always properly transferred back to Revit Structure. This has been comprehensively resolved with the new enhancements of this release.
	15592	Various material and section properties were not always properly transferred between Revit Structure and ETABS. This has been comprehensively resolved with the new enhancements of this release, with user control permitted.
	15593	Various incompatibilities were present in the transfer of geometry, loads, and properties between Revit Structure and ETABS. This has been comprehensively resolved with the new enhancements of this release, with user control permitted.

Modeling

Incidents Resolved

*	Incident	Description
	14761	The k2 factor used for calculating the Indian Auto Wind-Load case (code IS 875-1987) was not correct when building height was greater than 150 m. this was resolved.

Results Display and Output

Incidents Resolved

*	Incident	Description
	15565	Shell forces and stresses displayed in tabular format did not properly change with length units. This has been resolved.
	15696	An error sometimes occurred preventing the display of the table for "Support Reactions". This has been resolved.
*	16073	An indexing error sometimes occurred that caused link results to be reported for the wrong object. This primarily affected panel-zone results. This has been resolved. Panel zone forces from previous versions should be reviewed.

Design

Incidents Resolved

*	Incident	Description
	13489	For steel frame design using code "AISC 360-05/IBC2006", an error message was printed whenever L/r was greater than 60, even though this strictly only applies to the case where there is an unbraced beam-column connection with no lateral bracing transverse to the seismic frame at the connection, per AISC Seismic 9.7b(2). This has been resolved by printing a warning message instead when L/r > 60, and completing the design and reporting. It is the user's responsibility to determine if this condition controls.
	14370	For concrete beam design, the controlling shear was sometimes incorrectly reported as zero. This has been resolved. The calculated rebar and the controlling load combination were and still are reported correctly.
	14511	A runtime error was generated (rarely) when trying to change the composite beam design code for some models. This has been resolved.
	14590	The steel frame design check was using the major unbraced length ratio to check the minor direction for the Section 9.8 of AISC 341-05 seismic requirement for SMF's. This check was usually over-conservative. The issue affects codes "AISC 360-05/IBC2006, AISC-LRFD99, and CAN/CSA-S16-01. This has been resolved.
	14648	The printing of the steel and concrete frame design reports in RTF format failed on some machines due to a missing component. This has been resolved.
	15080	Steel or concrete design tables results did not print for members that had their design type (steel or concrete) overwritten. This has been resolved.
	15725	The design iteration for optimizing steel sections sometimes accepted a PMM interaction ratio slightly greater than unity, thus terminating prematurely. This has been resolved.
	15739	The steel frame design check sometimes reported a stress ratio of -100 for both bending and shear when the load on the member is zero or if some error occurs that prevents complete calculation of the ratios. This has been resolved by reporting a stress ratio of zero in such cases.
	15806	The shear wall design table "Uni Reinf Pier Check Data" could not always be displayed for the ACI 318-02 code. This has been resolved.
	15922	The tensile ratio reported steel frame design of unequal-legged single angles per code "AISC 360-05/IBC2006" was being incorrectly computed by dividing by the compressive capacity. The effect was over-conservative. This has been resolved.
	15950	The steel frame design check for code "AISC 360-05/IBC2006" would not complete when the bracing for a member was specified to be continuous along the full length at the top and there was negative moment in a beam. This has been resolved.
	16013	The PMM interaction surface was being incorrectly calculated for Chinese concrete frame design of sections with concrete strength $f_{cu} > 50\text{MPa}$. This has been resolved.
	16065	For seismic steel frame design using codes "AISC 360-05/IBC 2006" or "CAN/CSA-S16-01", the column axial force demand from EBF beam shear capacities may in rare cases be incorrect for structures with mixed steel and concrete frame members. This has been resolved.
	16078	The shear wall design table "General Pier Design Data" could not always be displayed or printed. This has been resolved.

Data Files (.EDB, .E2K, .SET)***Incidents Resolved***

*	Incident	Description
	15629	The function damping value was not being saved in the exported text file for user-defined response-spectrum functions, and hence was always being imported as zero. This has been resolved.

General

*	Incident	Description
	15748	The version number has been changed to 9.5.0 and a new license is required.
	16113	The network license now requires License Manager version 8.0.5 (or higher.) This version now ships with the ETABS installation. If you are running the License Manager (not ETABS) on a Vista machine, please contact CSI for a later version. Version 8.0.5 is recommended for running on Windows XP and 2000.

ETABS Version 9.2.0

Release Notes

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Release Date: 2008-02-20

This file lists all changes made to the ETABS since the last release. **Most changes do not affect most users.** Significant issues are indicated with an asterisk (*) in the first column of the tables below.

Changes from V9.1.7 (2007-12-15) to V9.2.0 (2008-02-20)

Graphical User Interface **Enhancements Implemented**

*	Incident	Description
*	13131	The documentation available using the <i>Help > Documentation</i> command can now be modified by the user. There is a new Microsoft Access database file called EtabsDocs.mdb, located in the Manuals subfolder where ETABS is installed, which controls this menu command. You can copy this file and rename it to EtabsDocs <i>n</i> .mdb, where <i>n</i> can be any single digit from 0 to 9. If there are multiple files, the one with the highest digit <i>n</i> is used. Editing EtabsDocs <i>n</i> .mdb allows you to add your own documents, such as company standards or language translations, to the documents provided with ETABS. The menu structure displayed using the <i>Help > Documentation</i> command is defined by the table "Control" in the EtabsDocs <i>n</i> .MDB file. This table refers to other tables you can create which list the documents available from the menu. It is best not to modify the original EtabsDocs.mdb itself, since this may be overwritten in future updates of the program.

Modeling **Enhancements Implemented**

*	Incident	Description
*	12916	The "Automated Lateral Loads Manual" has been added which describes the code-based seismic and wind loads available in ETABS and SAP2000. It can be accessed using the command <i>Help > Documentation</i> .
*	14224	For auto seismic loads and response-spectrum cases, a new overwrite is provided to account for accidental torsion for joints that are not connected to rigid diaphragms. This was previously only available for joints connected to rigid diaphragms.

Results Display and Output **Enhancements Implemented**

*	Incident	Description
	13572	Story drift and displacement results in the summary output file for response-spectrum cases have been changed so that now only the results in a single direction (X or Y) are printed if the loading is applied in a single direction.

Design **Enhancements Implemented**

*	Incident	Description
*	12583	A printed report is now available for steel and concrete frame design using the <i>File > Print Tables</i> command. This report is produced in RTF format for Microsoft Word, and contains a cover page, tables of design input values, tables of design results, and an individual design summary sheet for

*	Incident	Description
		each selected member. See also Incident 13920.
	13006	For a given steel member, when lateral bracing has been assigned using the <i>Design > Lateral Bracing</i> command, and Design Overwrites are also specified for the Unbraced Length Ratio in either the minor bending direction or for lateral torsional buckling, the Design Overwrites values take precedence. Previously the assigned lateral bracing controlled.
*	13920	Concrete frame design output for enveloping results has been improved to include, in a single sheet, the controlling forces/moment, stations, and load combinations, as well as the resulting rebar and/or demand/capacity ratios. This is available by right-clicking on the member for design results, or as part of the printed design report of Incident 12583.
	14045	For load combinations containing a time-history case, design will now always be carried out in a step-by-step fashion, preserving the correspondence of forces and moments at each time step. Previously an option was available to design for the envelope of time-history results, but this was over-conservative and not much more efficient. Load combinations containing multiple time-histories, or containing combinations that contain time-histories, are still designed as envelopes.
	14046	For composite beam design, the default preference value for the deflection limit for "Super DL + LL Limit, L/" has been changed to 240.
	14048	For deck sections, the default tensile strength, Fu, of the studs has been changed from 60 ksi to 65 ksi. This only affects composite beam design for American and Indian design codes.
	14243	For "AISC360-05/IBC2006" steel-frame design of doubly symmetric sections with no minor moment present, two sets of interaction equations were checked, but the moment capacity was only reported for one of these. Now both capacities are reported. The design results themselves were previously correct and have not changed.

Data Files (.EDB, .E2K, .SET)

Incidents Resolved

*	Incident	Description
	14100	When importing ASCE 7-05 wind loading from an .E2K or .SET file, the exposure specification was being changed to a different value. This has been resolved.

Modeling

Incidents Resolved

*	Incident	Description
	12995	The K2 factor used for computing wind loading for the Indian code IS:875 (part 3)-1987 was incorrect. This has been resolved.
	13272	A runtime error was sometimes generated while creating template models that were too big for the available memory. This has been resolved.
	13748	An error that occasionally caused wall meshing to create objects at openings has been resolved.
	14101	The generation of a warning message regarding load distribution sometimes prevented analysis from running even though only a warning was needed. This has been resolved.
	14189	Under certain geometrical conditions, legal spandrel definitions were occasionally not recognized, resulting in no output for these spandrels. This has been resolved.

Results Display and Output

Incidents Resolved

*	Incident	Description
	12925	The time period used for seismic loading for the UBC 97 code was sometimes reported incorrectly in the output file, even though the correct period was being used for the analysis. This has been resolved.
	13130	A runtime error sometimes occurred when plotting time-history traces for multiple single-joint link elements at the same location. This has been resolved.
	13610	Eccentricity ratio values for wind loading under ASCE 7-02 or 7-05 printed in the output file were

*	Incident	Description
		being converted for length units even though these values should be unitless. This has been resolved. This is a reporting issue only. The values used for calculating the loading were and still are correct.

Design Incidents Resolved

*	Incident	Description
	12400	For concrete frame design, the program tried to design Section Designer sections even when they had been defined as No Check/Design. This has been resolved.
	13496	For concrete frame design code "CSA A23.3-04", certain load combinations were not being generated for design when the program determined that they would likely be redundant with other generated combinations. This has been resolved by generating all combinations. This will not usually affect results.
	13518	For steel frame design code "AISC-LRFD93", an error sometimes occurred when calculating the C_m factor for members that were not loaded and not stressed. This has been resolved.
	13559	For shear wall design code "Chinese 2002", the top edge member lengths reported for the left and right were reversed. This has been resolved.
	13560	For shear wall design code "Chinese 2002", the edge member lengths were sometimes incorrect for Seismic Grade II. This has been resolved.
	13561	For shear wall design code "Chinese 2002", the program failed to produce a warning when a pier design overwrite of the MMF factor produced overstress and a correspondingly large rebar area. This has been resolved.
	13562	For shear wall design code "Chinese 2002", the reported and displayed values for area of steel, A_s , do not match. This has been resolved.
	13563	For shear wall design code "Chinese 2002", the reported value of the ratio $N/Agfc$ was not consistently reported. This has been resolved.
	13565	For concrete frame design code "Chinese 2002", beams designed as columns sometimes reported shear failure when there was none. This has been resolved.
	13567	For concrete frame design code "Chinese 2002", rebar results plotted in plan view were sometimes switched between the I and J ends of the beam. This has been resolved.
	13568	For concrete frame design code "Chinese 2002", rebar area values plotted in plan view were sometimes switched between the top and bottom faces of the beam. This has been resolved.
	13569	For concrete frame design code "Chinese 2002", rebar area values in kN-m units used insufficient number of decimal places for accuracy. This has been resolved.
	13570	For steel frame design code "Chinese 2002", members were sometimes displayed in red even though no failure is reported in detailed design display or database output. The members had not failed. This has been resolved.
	13571	For steel frame design code "Chinese 2002", double-angle sections were considered to be class C but they should be class B. This has been resolved.
	13574	Same as Incident 12400.
	13577	For Chinese steel and concrete frame design codes, undecipherable characters were displayed on the screen while displaying "All Failures." This has been resolved by displaying English characters.
	13617	For steel frame design code "Chinese 2002", a runtime error occurred when clicking on the Deflection button of the stress-check information form. This has been resolved.
	13618	For steel frame design code "Chinese 2002", changing the design overwrite parameter for the axial stability coefficient, Φ Minor, changed the moment stability coefficient, Φ_b Minor. This has been resolved.
	13715	Design checks that permit a 4/3 increase in the allowable stress for load combinations that contain lateral loads were not taking advantage of this increase if the lateral load was contained in a static nonlinear case. This has been resolved.

*	Incident	Description
*	13808	For composite beam design, the moment capacity for certain non-AISC I-shaped members was too high because the k dimensions are specified as zeroes in the shape database. This could be slightly unconservative. This has been resolved approximately but adequately by correcting for the total area of the section.
	13833	A runtime error could occur during shear wall design for piers that contain a triangular element made by collapsing a quadrilateral. This has been resolved.
	13856	For steel frame design code "CAN/CSA-S16-01," the moment capacity of Class 1 rectangular and box sections was being underestimated. This has been resolved.
	13884	Duplicate names could occur when more than 999 automatic design load combinations were generated. This has been resolved.
*	13982	For steel frame design code "AISC 360-05/IBC2006," the design overwrite for axial capacity was input as a force but treated as a stress. This means that the capacity was incorrect by a factor equal to the area of the section, which could be over-conservative or under-conservative. This has been resolved.
	14110	For composite beam design, excessive error messages have been removed that would appear when designing a member before the analysis has been run.
	14223	For steel frame design code, two-story X braces were being treated as one-story chevron braces, leading to over-conservative axial forces in the braces. This has been resolved.
	14246	The boundary zone calculated for shear wall design sometimes produced very small lengths when no boundary zone was required. This has been resolved by enforcing that both the stress-based check and the compression-zone-length check require a boundary zone, rather than just one of these checks.
*	14258	The boundary-zone calculation for shear-wall design code "ACI 318-05/IBC 2003" has been significantly improved by considering the seismic inter-story drift. This is computed by using the elastic drift multiplied by the factor C_d/I , where C_d and I can be specified by the user as design preferences.
	14282	For shear-wall design using code "ACI 318-05/IBC 2003", the boundary-zone calculation sometimes failed with an error message for any piers having the design overwrite for Pier Section Type set to "Simplified T and C". This has been resolved.
	14305	Same as Incident 14282

External Import/Export

Incidents Resolved

*	Incident	Description
*	13890	Shear-wall forces exported to SAFE were not correct when edge constraints were present at the vertical edges of the wall. This has been resolved.

ETABS Version 9.1.7

Release Notes

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Release Date: 2007-12-15

This file lists all changes made to the ETABS since the last release. **Most changes do not affect most users.** Significant issues are indicated with an asterisk (*) in the first column of the tables below.

Changes from V9.1.6 (2007-09-13) to V9.1.7 (2007-12-15)

Graphical User Interface

Incidents Resolved

*	Incident	Description
	13171	Enhanced Windows metafiles (.EMF) screen captures did not always scale correctly for certain machines. This has been resolved.
	13581	The glue-to-gridline option did not work correctly when the grid data was accessed using the right-button mouse click. This has been resolved.

Data Files (.EDB, .E2K, .SET)

Incidents Resolved

*	Incident	Description
	13573	Z-direction earthquake loads based on the Chinese code were imported as being in the X direction. This has been resolved.

Modeling

Incidents Resolved

*	Incident	Description
*	12929	The values for Fa and Fv were not always computed correctly for the NBCC 2005 seismic lateral load and the automatic response-spectrum function. This has been resolved. Models using these loads should be checked and re-analyzed.
	12999	“Loss of Load” warnings printed in the .WRN file did not correctly account for units, so they could be either over-conservative or under conservative. This has been resolved.
	13667	The reported value of Ct for IBC 2008 loading was incorrect in displayed and printed table output. This is a reporting error only, and has been resolved. The calculated forces were and still are correct.

Design

Enhancements Implemented

*	Incident	Description
	12918	Minor updates have been made to the manual for the “AISC 360-05/IBC 2006” steel-frame design check. This manual is no longer considered a draft.
	12956	The concrete-frame design check for the “CAN/CSA A23.3-04” code has been enhanced to take the Rd and Ro values from the NBCC 2005 auto-seismic load definition, if any. If no NBCC 2005 auto-seismic load is defined, default values are used. The values of Rd and Ro can be overwritten using the concrete-frame design overwrites. Previously, the design was always using default values.
	12985	A practical how-to guide for using the Direct Analysis Method (DAM) of the “AISC 360-05/IBC 2006” design code has been added to the documentation in draft form.

*	Incident	Description
	13310	Boundary-element check data for the “ACI 318-05” shear-wall design check is now provided in displayed tables and printed output.
*	13388	Concrete frame design has been added for the Eurocode 2-2004 design code, including the CEN generic version and the United Kingdom National Annex. Seismic provisions to EC8 are currently not included. Users should review the included Eurocode 2-2004 manual for a description of assumptions and limitations.

Design Incidents Resolved

*	Incident	Description
	11666	The shear-wall design check for the “ACI 318-05” code calculates the diagonal rebar area for spandrel correctly. However, the area is sometimes required (mandatory) and sometimes optional (alternative). The program did not report the requirement correctly. This has been resolved.
*	11758	For the shear-wall design check for code “ACI 318-02,” the interpolation of alpha_c, a factor for calculating in-plane shear strength of shear-walls, was not correct. ACI 21.7.4.1 has alpha values ranging between 2.0 to 3.0, depending on the hw to lw ratio. The program sometimes produced an alpha that was out of range. This has been resolved.
	11968	When a pier failed in P-M-M interaction for a C/T wall, the program reported that it failed in shear. Affected codes were "ACI 318-02" and "ACI 318-05". This has been resolved.
	12047	The program sometimes reported an incorrect error message for the “AISC-LRFD 99” steel-frame design check. The message “Link rotation is too high” for an OCBF brace should have been “ $k_l/r > 4.23 \cdot \sqrt{E/f_y}$ ”. This has been resolved.
	12448	For concrete column design using codes “ACI 318-99”, “ACI 318-02” and “ACI 318-05, the program was showing an over-strength factor of 1.25 for all types of framing: Special-sway, Sway-intermediate, Sway-ordinary, and Non-sway. This was only a reporting issue. The program was correctly using this factor only for Special-sway frames. This reporting issue has been resolved.
	12844	For steel-frame design using code “Eurocode 3-1993”, the k factor for minor bending was negative for sections classified as “seismic”. This has been resolved.
	12852	A runtime error occurred while calculating B1 factor for steel-frame design using codes “AISC360-05/IBC2006” and “CAN/CSA-S16-01.” This only happened when the exact uniform bracing for any member was set equal to the whole length causing the effective length to be zero. This has been resolved.
	12854	The shear-wall design overwrites form for code “CSA A23.3-94” sometimes displayed wrong types in the drop-down list. This has been resolved.
	12858	For spandrel shear design using code “ACI 318-02”, the program was giving the correct vertical shear reinforcing but the wrong horizontal shear reinforcing. The horizontal shear reinforcing should be the minimum as per code (11.8.5 of ACI 318-02), however the horizontal shear reinforcing was reported to be the same as the vertical shear reinforcing, Avh. This has been resolved.
	12912	For steel-frame design using the direct-analysis method of code “AISC 360-05/IBC 2006,” the property modifiers were not always consistently changed for the effect of tau-b, and the user was not warned when analysis must be re-run to account for changed modifiers. This has been resolved.
	12922	For steel-frame design using codes “UBC97-LRFD” and “UBC97-ASD,” when the column $P_u/\Phi P_n$ is greater than 0.5, the special load combinations should only amplify the axial load while ignoring all the other components of the load. However, the moments were also being amplified by the omega factor. This was overconservative. This has been resolved.
	12974	For steel-frame design using code “CAN/CSA-S16-01,” the reported superimposed DL + LL deflection was zero whenever the Super DL deflection was zero, even if the LL deflection was not zero. This has been resolved.
	12998	Joint shear design was not being performed for concrete frame design using code “ACI 318-05.” This has been resolved. No other code was affected.
	13099	The documents for shear-wall design using codes “ACI 318-02” and “ACI 318-05” said that if the calculated V_s force is more than $10 \cdot \sqrt{f'_c} \cdot t_s \cdot d$ per ACI 11.5.6.9, failure is reported. This should

*	Incident	Description
		actually say $8\sqrt{f_c} \cdot t_s \cdot d$. The documents have been corrected. The program was and still is using the correct value, so design results are not affected.
	13123	The documents for concrete-frame design using codes “ACI 318-02” and “ACI 318-05” incorrectly include the term (A_{cp}^2/P_{cp}) under the square root in Eqn. (11.6.1c) for torsion design. The documents have been corrected. The program was and still is using the correct formula, so design results are not affected.
	13126	For concrete-frame design using codes “ACI 318-02” and “ACI 318-05,” the computation of A_{cp} and A_{oh} for the torsion check of T-beams was imposing the flange limit for L-beams. This was overconservative. This has been resolved.
	13144	See Incident 11968.
	13197	For shear-wall design using codes “ACI 318-05/IBC 2003,” “ACI 318-02,” and “ACI 318-99,” the boundary zone was being checked for load combinations that were not of seismic type. This was overconservative. This has been resolved so that only seismic load combinations are used for this check.
	13222	For composite-beam design using codes “AISC-LRFD99,” “AISC-LRFD93,” “Chinese 2002,” “CISC 95,” and “BS5950 90,” the moment capacities were not being updated when the shear studs were user-defined and when the computed PCC became 1.0. If the user specified fewer shear studs than that required for full composite action, the moment capacities were properly updated. This has been resolved.
	13274	For steel-frame design using codes “AISC-ASD01,” “AISC-ASD89,” and “UBC97-ASD,” the expression used for R_t for double-channel sections was slightly over-conservative, affecting flexural capacity. This has been resolved. The effect is very minor.
	13275	For steel-frame design using codes “AISC-ASD89” and “UBC97-ASD,” the expression used for L_c for box sections was slightly over-conservative, affecting flexural capacity. This has been resolved. The effect is very minor.
	13276	For steel-frame design using codes “AISC-LRFD93” and “UBC97-LRFD,” the flexural capacity of rectangular and box section did not account for the possibility that some sections may be rotated by 90 degrees so that $I_{22} > I_{33}$. This has been resolved.
	13277	For steel-frame design using codes “AISC-LRFD93,” the expression for the C_m factor has been modified to consider the Laterally Loaded and Constrained conditions with their modified definition.
*	13278	For steel-frame design using code “UBC97-LRFD,” the Importance factor specified in the design preferences was not being used. This has been resolved. Design results may need to be re-checked.
	13279	The Italian steel design check sometimes underestimated the equivalent moment used for ETB and PMM calculations with side-sway. This error was most significant when the frame member had only a few output stations assigned. This has been resolved.
*	13280	For concrete-frame design using code “ACI 318-02,” the SDC (Seismic Design Category) specified in the design preferences was not being used. This has been resolved. Design results may need to be re-checked.
	13281	For concrete-frame design using codes “ACI 318-02” and “ACI 318-05,” the upper yield limits of $f_y = 80\text{ksi}$ for longitudinal rebar and $f_y = 60\text{ksi}$ for shear steel was not being enforced. This has been resolved.
	13282	For concrete-frame design using code “CSA-A23.3-94,” when designing a column for Nominal ductility for shear, there are two options for capacity force calculation. The program was reporting failure if either option failed, but it should have reported failure only if both options failed. This was overconservative, and has been resolved.
	13283	For concrete-frame design of nonprismatic sections, the P-M interaction surface for the last station was sometimes obtained at the incorrect location in the member. The effect may have been conservative or unconservative, and is most significant when the section properties vary significantly along the length and few output stations are requested. This has been resolved.
	13305	See Incident 11968.

*	Incident	Description
	13306	For shear-wall design using code “CSA A23.3-94,” when the epsilon_v parameter of section CSA 21.7.3.2(b) exceeds 0.005, the maximum shear that can be carried should be reduced according to the Table 21-1, but it was being reduced by significantly more than that. This was overconservative, and has been resolved.
	13309	For shear-wall design using code “ACI 318-02,” the pier shear design is inaccurate. Regardless of the value of Phi (Shear Seismic) specified in the shear-wall design preferences, the value reported for PhiVc is 75% of the value for a Phi of 0.6. This has been resolved.
*	13311	For shear-wall design using code “ACI 318-05,” the program sometimes reported that a boundary element was not required when in fact it should have been. This has been resolved. Design results may need to be re-checked.
	13495	The load combinations 1.25 D + 1.5 L +/- 0.4 W were not included in the “CSA A23.3-04” documentation, even though the program was correctly using them. This has been resolved.
	13636	For steel-frame design, the program was reporting “Error during steel check of frame ...” when all loads on the member were identically zero. This has been resolved.
*	13659	For steel-frame design using code “AISC-LRFD99,” the special seismic load combination required when $P_u/f_i P_n > 0.5$ was not being considered. This has been resolved. Design results may need to be re-checked.
	13660	For steel-frame design using code “AISC 360-05/IBC2006,” for the case where when $P_u/f_i P_n > 0.5$, the detailed output reported that the special seismic load combination was being carried considered, but sometimes reported zero moments and zero axial force, while the D/C ratio calculation showed contribution from the axial load. This has been resolved. Design results may need to be re-checked.
	13671	For steel-frame design using the UBC97 codes, the check for seismic slenderness was sometime being carried out when not required by the seismic zone factor and importance factor chosen by the user. This was overconservative, and has been resolved.
	13697	In the documentation for steel-frame design code “AISC-LRFD99,” reference to torsion checks have been removed since these checks are not being performed by the program.
	13730	For steel-frame design using code “AISC 360-05/IBC 2006,” the program reported failure using the wrong error message: “ $l/r > 0.08 * r_y * E / F_y$.” The correct message should be: “ $l/r > 0.086 * E / F_y$.” This was an error in the message only, and it has been resolved.

External Import/Export Enhancements Implemented

*	Incident	Description
*	12841	The speed has been substantially improved for updating large models from ETABS to Revit Structure 2008.
	13412	For models imported from Revit Structure 2008, ETABS no longer assigns an auto-select frame section list to members that have only a single frame section property assigned to them in Revit.
	13448	A new CSIXRevit has been released that is compatible with ETABS v9.1.7.
	13612	Same as 12841

External Import/Export Incidents Resolved

*	Incident	Description
*	12963	The units-conversions for Young’s modulus and shear modulus of floor and wall materials, as well as for the thermal expansion coefficient for all materials, were not always handled correctly for models imported from Revit Structure 2008. This has been resolved.
	12977	The units-conversion for the thermal-expansion coefficient was not handled correctly for models imported from STAAD files. This has been resolved.
	13515	Camber data for composite beams was not correctly being exported to Revit Structure 2008. This has been resolved.
	13609	A runtime error sometimes occurred when importing elevator shafts from Revit Structure 2008. This has been resolved.

*	Incident	Description
	13655	Wall openings with less than two points were not being imported from Revit Structure 2008. This has been resolved.

ETABS Version 9.1.6 Release Notes

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Release Date: 2007-09-13

This file lists all changes made to the ETABS since the last release. **Most changes do not affect most users.** Significant issues are indicated with an asterisk (*) in the first column of the tables below.

Changes from V9.1.5 (2007-08-10) to V9.1.6 (2007-09-13)

Enhancements Implemented

*	Incident	Description
*	12295	New automated lateral loads have been added: <ul style="list-style-type: none"> NBCC 2005 wind loads, seismic loads, and response-spectrum functions IBC 2006 seismic loads and response-spectrum functions ASCE 7-05 wind loads
*	12451	Steel frame design check has been added for the CAN/CSA-S16-01 design code. Seismic provisions have been included at an initial level, similar to how they are implemented for AISC 2005
*	12455	Concrete frame design check has been added for the CAN/CSA A23.3-04 design code.
*	12456	Steel frame design check has been added for the AISC 360-05 and IBC 2006 design code, including the seismic provisions of AISC 314-05. The direct analysis method has been implemented, including second-order P-delta effects and tau-b fixed or variable. Automatic iteration for optimal member selection includes the effect of tau-b variable.
*	12599	Several improvements have been made for the export to and import from Revit Structure 2008 using CSiXRevit 2008: <ul style="list-style-type: none"> Member offsets and cardinal points are now imported from Revit to ETABS, however updating changed offsets and cardinal points from ETABS to Revit is not yet functional Floors deleted in ETABS are now updated to Revit Ramps created in ETABS can be exported/updated to Revit as inclined slabs. Inclined slabs in Revit can be imported into ETABS as ramps, however ramps in Revit are non-structural and are not imported into ETABS. CSiXRevit2008 has been modified to reduce the occurrence of a memory corruption error in Revit Structure 2008 Documentation has been updated A new version of CSiXRevit2008 is available for use with ETABS version 9.1.6.
	12637	Phi factors can now be set by the user as design preferences for the AISC-LRFD93, UBC-LRFD97, and CISC 95 design codes. This feature was already available for newer codes.
	12638	Design preference output tables now include all data for all codes. Previously, only certain data was included for each code.
	12640	Design overwrite output tables are now available for all codes. Previously this was available only for the Chinese codes.
*	12641	Automated notional loads have been added for the AISC 2005 design code.
*	12691 12694	Design manuals have been added or modified: <ul style="list-style-type: none"> Added steel frame design manual for AISC 2005 as DRAFT Combined older steel frame design codes into a single manual Added concrete frame design manuals for ACI 318-02 and ACI 318-05 Added concrete frame design manual for CAN/CSA A23.3-04 Combined older concrete frame design codes into a single manual

*	Incident	Description
		<ul style="list-style-type: none"> Added shear wall design manuals for ACI 318-02 and ACI 318-05
	12711	Implemented automated design load combinations that include companion wind load for CAN/CSA-S16-01 and CAN/CSA A23.3-04 codes.
	12746	Added new display options for design data: <ul style="list-style-type: none"> Identify all steel P-M failure Identify all steel shear failure Identify all steel failures

Incidents Resolved: Data Files (.EDB, .E2K, .SET)

*	Incident	Description
	12781	Automated response-spectrum functions for the Indian design codes were not being exported to nor imported from the .SET file, nor were they being written to output tables. This issue has been resolved.

Incidents Resolved: Modeling

*	Incident	Description
	10731	Automated wind load for ASCE 7-02 did not account for the different pressure coefficient needed for parapet walls. This has been resolved.
	12588	The automated V3 shear hinge did not properly take into account any rebar that is present in the section. This only affects shear in the minor direction. This has been resolved.
	12699	Meshing walls that contained openings sometimes lost elements, creating additional openings. This has been resolved.
	12757	Warning messages written to the .WRN file for the Check Model command did not properly take into account regional settings. This has been resolved.

Incidents Resolved: Analysis

*	Incident	Description
	12819	Automated lateral loads failed to be generated for analysis in rare cases when constraint conditions were changed from one model to the next. This issue has been resolved.

Incidents Resolved: Results Display and Output

*	Incident	Description
	12319	Graphical display of in-plane shear showed numerical values that were incorrectly dependent upon length units. This has been resolved.
	12553	Output tables for shear-wall design failed to be created when a design error message was too long. This did not affect results, only the ability to print them. This has been resolved.

Incidents Resolved: Design

*	Incident	Description
	12643	The composite beam deflection limit set for SDL+LL may be unintentionally overwritten by the deflection limit set for LL. This may result in an over-conservative design. This issue has been resolved.
	12654	The calculation of deflection for beams under superimposed loads was incorrect for steel frame design. This has been resolved.
	12684	The value of Asmin (minimum steel area) was reported as zero for all but Chinese concrete design codes. This is a reporting error only, and it has been resolved.
	12775	Changing any design preferences would reset all design overwrites even if the design code itself was not changed. This has been resolved so that design overwrites are reset to default values only when the design code is changed.

Incidents Resolved: External Import/Export

*	Incident	Description
*	12572	Reactions exported to SAFE were omitted at internal joints created by automatic wall meshing. This could result in a reduction of the load that is applied in SAFE. This has been resolved.
	12606	A runtime error occurred when updating certain models from ETABS to Revit Structure 2008. This has been resolved.

Incidents Resolved: Miscellaneous

*	Incident	Description
	12642	An internal change was made for increasing the capacity of language-translation data.