

ETABS v19.1.0 Release Notes

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This document lists changes made to ETABS since v19.0.2, released 23-December-2020. Items marked with an asterisk (*) in the first column are more significant.

Analysis

Enhancements Implemented

*	Ticket	Description
*	4958	A new Summary tab has been added to the Analysis Monitor form that displays the status for all cases that are set to be run in parallel. The status can be running, scheduled, or completed.
	5240	A change was made to nonlinear static analyses run with the solution scheme "Event-to-Event Only" so that results will be saved at the first event that occurs during the first step of the analysis. For analyses that start with zero or very small events, the results will be saved at the first event with a step size ratio that is equal to or exceeds the smaller of 0.0001 times the minimum number of saved states and 0.01. This change allows for a better representation of the initial stiffness of the structure for analyses with a small specified number of saved states. This change is not expected to affect existing results, but may slightly change the load factor of each saved step and may result in the number of saved states being one more than the minimum number of saved states specified in the Results Saved for Nonlinear Static Load Cases form. Code-based pushover plots may be affected if the initial stiffness changes and the generated curve is sensitive to that. The new results should be improved compared to previous results.
*	5658	An enhancement has been made to speed up initialization and finalization of the analysis process when running cases in parallel. This should significantly reduce the time between the completion of a parallel load case and the start of the next parallel load case in the queue, especially for models with multiple nonlinear cases having many saved steps.
*	5659	An enhancement has been made to speed-up nonlinear stiffness formation, event determination, and state update operations for small to moderate sized models where the number of frame and/or link elements are less than 10 times the number of requested analysis threads.
	5984	The analysis log can now be displayed using the Show Log button on the Analysis Message form which appears after running an analysis that generates warning or error messages, or later using the command Analyze > Show Analysis Messages. This is the same analysis log that can be displayed directly using the command Analyze > Last Analysis Run Log.
	6072	An enhancement has been made to increase the resiliency of file operations when running the analysis on a network drive. While it is not recommended to use network drives for running the analysis, this enhancement should increase the likelihood that long runs will finish despite minor intermittent network issues. Still, the use of local hard drives is still recommended whenever possible for both speed and reliability, since the analysis, design, and results presentation make extensive use of file IO. Folders containing models and their results files can later be copied to network drives for sharing and storage when the model is not in use.
	6176	An enhancement was made so line-spring supports can be assigned to lines with null properties. This capability is limited to straight lines. If line-spring supports are assigned to curved lines, the curved lines should be assigned frame properties.

API

Enhancements Implemented

*	Ticket	Description
	5953	The utility that unregisters the Application Programming Interface (API) library types has been enhanced. Previously, not all references to the API were removed from the Windows Registry upon uninstallation of the software. This could cause difficulties using the API with later versions of ETABS. Uninstalling the new version will now fully clean the registry of references to the ETABS API.
	5971	A new Python API example has been added. This new example does not rely on COM as an intermediate layer to connect to the API, instead communicating directly with the underlying .NET objects. Use of .NET rather than COM is generally more reliable and more efficient, and is recommended whenever possible.
	6024	The ETABS API is now limited to start and/or connect to a running instance of ETABS on a remote computer that is using a Network or Cloud license.

Database Tables

Enhancements Implemented

*	Ticket	Description
	2070	An enhancement was implemented to allow interactive database editing for Section-Designer (SD) sections, including the general pier SD sections. This enhancement was released in version 19.0.0 but inadvertently omitted from the Release Notes.
	5050	An enhancement was implemented to allow tables to be exported from the Model Explorer to Excel without having to specify a name for the Excel file. Now a default name will be assumed. This is similar to the existing behavior for exporting tables from the command Display > Show Tables.
	5136	An enhancement was made to add the pier length and thickness of each pier leg in the "Table - Shear Wall Summary Data".

Design – Composite Beam

Enhancements Implemented

*	Ticket	Description
	6394	An enhancement to the reported composite beam output of some beams was implemented. When the maximum positive bending moment in a composite beam occurs at noticeably different locations for the design-strength load combinations and the design-deflection load combinations, and as a result, the percentage of composite action provided by a given shear studs distribution differs for strength checks and deflection checks, the Section Properties table included in the beam design output reports the section properties of the beam obtained with both percentages.

Design – Concrete Frame

Enhancements Implemented

*	Ticket	Description
	2116	Concrete frame design for the Eurocode 2-2004 code has been enhanced to consider the extra longitudinal reinforcement required due to shear according to equation 6.18 of Eurocode 2-2004 clause 6.2.3.
*	5934	An enhancement has been made to the concrete beam and strip-based slab design to allow users control of either including or excluding axial compression in flexural design if the axial compression reduces the required reinforcement. Axial tension and axial compression that increases the required flexural reinforcement is always considered. For post-tensioned construction all axial load is always considered. This user option is accessed through concrete beam-design and slab-design preferences.

Design – Steel Frame
Enhancements Implemented

* Ticket	Description
5207	An enhancement has been made in steel frame design codes "Eurocode 3-2005" and "Italian NTC 2018" in which Design Overwrites are now available for the warping constant, I _w ; the elastic torsional buckling force, N _{cr,T} ; and the elastic torsional-flexural buckling force, N _{cr,TFy} .

Documentation
Enhancements Implemented

* Ticket	Description
6123	A note has been added to the Application Programming Interface (API) documentation for the functions cFrameObj.AddByCoord and cFrameObj.AddByPoint to clarify that the End I and End J joints of the added frame object are determined based on the orientation of the object and may not be the in same order as specified in the parameters of the API functions. Only the documentation was changed, not the behavior of the functions.

External Import and Export
Enhancements Implemented

* Ticket	Description
5034	An enhancement was made to the interoperability of models imported from Revit. The mapping of ETABS object GUID's to Revit element ID's and element unique ID's can now be exported to output reports and to Excel spreadsheet tables for further processing by third-party applications. Area objects Revit element ID's are only available for Revit projects imported in this version of ETABS.

Installation and Licensing
Enhancements Implemented

* Ticket	Description
5773	The version number has been changed to 19.1.0 for a new intermediate release.

Loading
Enhancements Implemented

* Ticket	Description
1304	An enhancement was made to make uniform area loads assigned to floor objects with properties to be additive if the objects overlap at any location. This was already true for floor objects with null properties that overlapped objects with properties. Older models where drop panels overlap slab areas and have identical uniform load specifications will have their duplicated loads deleted to maintain the same total loads.
3950	Auto-seismic loading per the AS 1170.4-2007 code has been revised to limit the seismic base shear obtained using a Program Calculated period to be not less than 70% of the base shear obtained using the approximate period as stipulated by Amendment 1. Previously the limit was 80% of the base shear obtained using the approximate period.
5002	The Chinese 2010 response spectrum function was enhanced by reducing the period step from 0.2 seconds to 0.05 seconds for better detail.
5275	An enhancement was added for the ASCE 7-16 auto-seismic loading where the exception contained in ASCE 7-16 section 11.4.8 is now implemented: The value of C _s must be set to 1.5 times the value computed from equations 12.8.3 and 12.8.4 for structures on Site Class D with S ₁ >= 0.20 and with period > 1.5 T _s .

Results Display and Output *Enhancements Implemented*

*	Ticket	Description
	5242	An enhancement has been implemented to allow including the point object connectivity table in reports.

Structural Model *Enhancements Implemented*

*	Ticket	Description
*	4692	Several enhancements have been made to the tendon vertical layout form designed to collate all editable information related to tendon profile, geometry, loads, and losses in one location. In addition, the drawing of the tendon profile has been enhanced and certain parameters added to the display options in order to improve the readability of the tendon profile and other information related to it. The right-click information form has been removed as the enhancements implemented provide all necessary information on the tendon layout form itself.
	5023	An enhancement was made to include shear rebar in the yield-strength calculation of shear hinges in concrete members when the hinge force-deformation specification is set to scale the forces by the yield strength. This was already being done when the member had been previously designed. Now the rebar specification will be taken from the concrete column-type section property. If this property is tagged to be checked, then the rebar specification will overwrite any designed rebar. If the property is tagged to be designed, then the designed rebar governs if design has been performed. It should be noted that column-type concrete properties may be assigned to columns or beams, when applicable.

**Analysis
Incidents Resolved**

*	Ticket	Description
	5739	An incident was resolved where, when a non-isotropic single-degree-of-freedom hinge was modeled as a separate link element (Analyze menu > Analysis Model for Nonlinear Hinges) and assigned a hinge sub-divide length (Assign menu > Frame > Hinge Overwrites) such that the magnitude of elastic stiffness of the hinge length was comparable to or larger than that of the plastic deformation of point C of the hinge backbone curve, the hinge results would display a noticeably flexible initial stiffness and a backbone curve where point C did not account for the elastic part of the deformation. Additionally, when this issue occurred, the backbone curve displayed in the Hinge Property Data form for the generated hinge (Define menu > Section Properties > Frame/Wall Nonlinear Hinges) and Hinge Response display (Display menu > Hinge Results) would be incorrect and was not representative of the behavior of the hinge. This issue was uncommon and primarily affected hinges with limited ductility, such as shear hinges. This issue did not affect hinges modeled within elements and did not affect multi-degree-of-freedom hinges such as the fiber or interacting P-M2-M3 hinges.
*	5857	An incident was resolved where an analysis could inadvertently get canceled while performing a license check. This issue was not common. It was timing-dependent and was most likely to occur when running long, multi-stepped load cases. Running such load cases in parallel and/or network connectivity issues that interfered with the license check increased the prevalence. When the issue occurred, full results for completed load cases were available, as well as partial results for load cases that were already running. No results were available for load cases that had not started when the cancellation occurred.
*	5976	An incident was resolved where, when a steel Parametric PMM hinge underwent a strain reversal between points C and D of the backbone curve, the final strength of the hinge was fixed at the level where the reversal occurred and did not drop further to the force/moment defined for point E of the backbone curve. This issue affected only the steel-type Parametric PMM hinge, but did not affect the concrete-type Parametric PMM hinge or other hinge types. This behavior was not common because load reversal when losing strength is not common in most practical models.
*	6410	An incident was resolved where restraint-displacement loading applied in a nonlinear direct-integration time-history load case using the Hilber-Hughes-Taylor (HHT) integration method was being scaled by the factor one minus alpha ($1 - \alpha$), where the HHT alpha value can range from $-1/3 \leq \alpha \leq 0$. The default and most common value is zero, corresponding to the Newmark method, for which there was no error. In the worst case with $\alpha = -1/3$, the applied load could be 33% too large. Displacement loads applied through springs and one-joint link elements were not affected, only loads applied through restraints. No other type of loading was affected. No other type of load case was affected. In particular, FNA and linear direct-integration load cases were not affected.
*	6487	An incident was resolved where, if a nonlinear load case or stage continued from a previous load case or stage that had large unbalanced forces in the frame element due to nonlinear hinges being present, the unbalance in the frame element could grow larger and/or prevent the load case from reaching convergence. This issue only affected ETABS v19.0.0 to v19.0.2. This issue only occurred in models where the analysis model for nonlinear hinges (Analyze menu > Analysis Model for Nonlinear Hinges) was set to "Model Hinges within Elements" and could affect nonlinear static, staged construction, and nonlinear direct-integration time-history load cases. When the issue occurred, it would manifest as a significant difference in frame element and hinge results between the zeroth (0th) step of the affected load case or stage and the final step in the previous load case or stage. This difference could also be present in global force results such as a base reactions and section cuts. In models affected by this issue, the error could be reduced by using more load or time steps in the previous load case or stage to reduce the frame element unbalance at the end of that previous load case or stage. This error was not common because significant hinge nonlinearity is not common in predecessor load cases.

API

Incidents Resolved

*	Ticket	Description
*	2642	An incident was resolved for the Application Programming Interface (API) where the function <code>cAreaObj.SetOpening</code> did not work as expected. Slab openings created by this function would appear graphically in the model, but the slab was still present in the analysis model. Results agreed with the model as if the opening was not present.
	4859	An incident was resolved for the application Programming Interface (API) where the function <code>cDesignSteel.VerifyPassed</code> did not perform the expected action. No results were affected.
	5556	An incident was resolved for the Application Programming Interface (API) where the functions to delete a large number of area or line objects would be very slow if the Model Explorer was open. No results were affected.
*	6130	An incident was resolved in the Application Programming Interface (API) where following change broke compatibility with earlier API versions: In ETABS v19.0.0 (ETABSV1.dll version 1.10 and CSiAPIV1.dll version 1.10), the <code>eMatTypeSteel_Chinese_Q345</code> enumeration got renamed to <code>eMatTypeSteel_Chinese_Q355</code> . Affected products: ETABS v19.0.0, v19.0.1, v19.0.2. Affected API clients: (a) Compiled COM clients (e.g. VB6, Delphi) failed to start. (b) Interpreted COM clients (e.g. VBA) failed to compile/run if the affected enumeration was used. Fix: <code>eMatTypeSteel_Chinese_Q345</code> enumeration got reinstated. ETABS versions 19.0.0, 19.0.1, and 19.0.2 and the corresponding ETABSV1.dll versions 1.10, 1.11, and 1.12 and CSiAPIV1.dll versions between 1.9 and 1.13 should not be used for developing plug-ins and/or API scripts to ensure full compatibility with past and future API versions. The <code>cOAPI.GetOAPIVersionNumber()</code> method can be used to check for incompatible API versions before using affected interfaces to prevent run-time errors.
	6207	An incident was resolved for the Application Programming Interface (API) where setting the function <code>cAnalysisResultsSetup.SetOptionMultiStepStatic</code> to use the Envelope value would produce step-by-step results instead. This has been corrected. To obtain more control of the output it is recommended that the newly implemented database functions available through the API be used.
	6396	An incident was resolved for the Application Programming Interface (API) where the function <code>cLineElm.GetInsertionPoint</code> did not return insertion-point offsets in the present units, but instead always returned them in the internal database units (the consistent units in effect when the model was created or imported).
	6421	An incident was resolved for the Application Programming Interface (API) where COM clients sometimes could not launch or attach to instances of the software on a remote computer running the <code>CSiAPIService.exe</code> . This was generally not a problem if the client first launched a local instance of the software before attempting to work with a remote instance.
	6472	An incident was resolved for the Application Programming Interface (API) where the function <code>GetTableForEditingArray</code> was returning the Field Names Included instead of the expected Field Keys Included. No results were affected.

Database Tables

Incidents Resolved

*	Ticket	Description
	5616	An incident was resolved where table named sets exported to Excel, Access, XML and Test files from the model explorer included the correct tables but did not necessarily include the correct settings specified in the named set. These included the specified load cases, load combinations, output options, etc.
	5716	An incident was resolved where the Step Number field may not always display when it should in analysis result tables. No results were affected.
	6031	An incident was resolved where the Diaphragm Accelerations output table did not display negative values for step-by-step results. The Diaphragm Accelerations output table is expanded to show both the maximum and minimum acceleration values when step-by-step output is requested.

* Ticket	Description
6038	An incident was resolved where using the Apply to Model button in the interactive database form for the Beam Object Connectivity table could result in an error.
6097	An incident was resolved where table filtering may not work if the item being filtered has a special character like an equals sign (=).
6204	An incident was resolved where changes to the tables "Functions - Response Spectrum - Italian NTC2018" and "Load Pattern Definitions - Auto Wind - Italian NTC 2018" in the interactive database would not be applied. This issue affected changes to fields as well as the addition or removal of records. Changes to the affected tables are now applied.
* 6470	An incident was resolved where the results tables (displacements, forces, stresses, etc.) displayed the wrong name for load cases whose display order got changed using the Define Load Cases form after the analysis was run. Adding new load cases without changing the order of existing load cases did not cause this problem. Re-running the analysis corrected the displayed load case names in the results tables.
6495	A change has been made to the database table for CoreBraceBRB details to report Keff as Kf*Klwp when Kf has been overwritten by the user. Earlier the Keff value shown was the one calculated by the program using CoreBraceBRB rules. The Keff value used in the analysis was always Kf*Klwp if Kf was overwritten by the user. No results are affected and this is only a reporting change.

Design – Composite Beam Incidents Resolved

* Ticket	Description
4674	An incident was resolved for the database tables where importing various types of frame section overwrites (steel, composite beam, etc.) could fail with an error message saying that the design procedure was not specified for the frame. This could also affect trying to apply changes to the model after interactive database editing.
6010	An incident was resolved that corrected a reporting error for composite beam design. It affected beams designed assuming composite action for some design load combinations but not for others, with the design controlled by one of the load combinations for which no composite action was assumed. The Section Properties tables reported in the output for such beams incorrectly listed the non-composite bending design capacity instead of the composite beam design capacity. When the reporting error occurred, the beam was still correctly designed, and the error in the output was obvious because the Strength Check table nearby reported the correct bending capacities. A typical example of affected beams are beams with point loads that (1.) are too close to the start or end of the beam for reasonably spaced shear studs to develop any significant composite action between their locations and the nearest end of the beam, (2.) produce for some of design load combinations a maximum bending moment located under the point load and small enough to be resisted without composite action, and (3.) produce for the other design load combinations a maximum bending moment located closer to the mid-span and too large to be resisted without composite action. This reporting error affected composite beams designed in ETABS 2017 or later. Note that beams were designed assuming composite action for all design load combinations, or for none, in earlier versions of ETABS, occasionally resulting in heavier designs.
6441	An incident was resolved which affected composite beam design per the AISC 360-16 code. ETABS interpreted the AISC Commentary Section I3.2d to require a minimum average of one shear stud per foot for composite beams with spans exceeding 30 ft., while the requirement is for a minimal average nominal shear connector capacity of 16 kips per ft. This resulted in designs with slightly more shear studs than required in the case of ¾-in. diameter shear studs, and fewer than required in the case of shear studs with a smaller diameter. This has been corrected and the Composite Beam Design Manual AISC 360-16 has been revised accordingly. All prior versions of ETABS capable of designing beams per AISC 360-16 were affected. Note that designs were performed as documented in the Manual, and that beams with spans of 30 ft or less, or designed assuming 50% or more partial-composite action, were not affected.

**Design – Concrete Frame
Incidents Resolved**

* Ticket	Description
6126	An incident was resolved for Eurocode 2-2004 and Italian NTC 2008 concrete frame design where theta angle was reported as zero for beam design report. This was just a reporting issue and design was not affected.

**Design – Shear Wall
Incidents Resolved**

* Ticket	Description
3882	An incident was resolved for the CSA A23.3-14 Shear Wall Design Preference form where item "Force Modification Factor for Shear Design" was showing an incorrect code reference in the "Item Description". Design results were not affected.
3920	An incident has been resolved in shear wall design per the "Eurocode 2-2004" code so that now the minimum eccentricity is enforced in one direction at a time. Previously, the program conservatively enforced the minimum eccentricities in both directions simultaneously.
5680	An incident was resolved for Eurocode 2-2004 pier design where "Edge Length" of a boundary zone could be overly conservative. The minimum boundary width was being computed as the larger of $0.15 * \text{pier-length}$ and $1.5 * \text{pier-thickness}$ instead of using the smaller of the two values.

**Design – Steel Frame
Incidents Resolved**

* Ticket	Description
3983	An incident has been resolved in steel frame design codes in which the axial capacity of steel members of unequal-legged angle sections can be overestimated if lateral-torsional and torsional buckling mode governs. If any of the flexural modes governs, the results will be correct. The capacity calculation for the lateral-torsional and torsional buckling mode is based on the solution of a cubic equation. For certain situations, the largest root of the cubic equation was used instead of the minimum roots. This issue was resolved with the release of ETABS v18.1.1 but was inadvertently omitted from the Release Notes.
6052	An incident has been resolved in steel frame design codes AISC 360-16, AISC 360-10, and AISC360-05/IBC2006 where a member with a singly-symmetric section like a channel section or tee section was fully-braced, the program calculated the axial compression capacity for the torsional and flexural-torsional limit state as zero. This was due to a numerical sensitivity in the equation for F_e in the limiting case of F_{ez} . Now for the limiting case the value of F_e is taken as either F_{ex} (for channel) or F_{ey} (for tee) based on the axis of symmetry of the section. The error was obvious as the D/C ratio became infinity.
6426	An incident has been resolved in the Russian steel frame design code SP 16.13330.2017 in which the limit slenderness of steel axially compressed members was calculated in accordance with SP 16.13330.2017 steel design code, the program used ϕ_e factor (cl.9.2.2, Table E.3) instead of the ϕ factor (cl.7.1.3, Table E.1). The limit slenderness of elements, subjected to axial compression, is now calculated using the ϕ factor. The limit slenderness of elements, subjected to axial compression with bending is now calculated using the ϕ_e factor.
6461	An incident has been resolved in the Russian steel frame design code SP 16.13330.2017 for singly-symmetric sections when plastic strains are allowed, where now the minimum values of the section modules $W_{x,min}$ and $W_{y,min}$ are used in the calculation of interaction ratios per Eqn. 105 of SP 16.13330.2017 section 9.1.1. Now the design is more conservative. All singly-symmetric sections (singly-symmetric I-shape, Channel, T-shape, and Double Angle) are affected.

**Drafting and Editing
Incidents Resolved**

*	Ticket	Description
	4373	An incident was resolved where the tendon vertical profiles were getting changed in the replicated tendons when compared to the source tendon(s) being replicated. The vertical profiles of replicated tendons are now kept the same as the source tendon being replicated for all replication types. User must ensure that replicated tendon(s) fall within the structure (slabs, beams, etc.) at the replicated locations as the replicate process will not check this aspect.
	5983	An incident was resolved where brace line objects would divide at story levels and reference planes but not divide at grid lines in plan when objects were selected to be divided at visible grids.
	5985	An incident was resolved where the slab rebar objects, once drawn in the GUI or added through the command Edit > Add/Edit Slab Rebar, could not be deleted. Now selected slab rebar objects can be deleted using either command Edit > Delete or by pressing the Delete key on the keyboard.

**External Import and Export
Incidents Resolved**

*	Ticket	Description
	5630	An incident was resolved where exporting a model from ETABS to Perform 3D v7 was not able to run in Perform 3D v7 when self-weight multiplier was 1 for more than one load patterns. This issue was resolved with the release of ETABS v19.0.1, but was inadvertently omitted from the ReleaseNotes.
	5714	An incident was resolved where, when importing an Architectural plan from .DXF files, the beam and wall lines would come in at the base level irrespective of the level at which it was being imported.
	5715	An incident affecting the import of DXF files containing polylines has been resolved. When a DXF file contained polylines with vertex coordinates relative to the polyline "object coordinates system", ETABS imported the polyline as if its vertex coordinates were relative to the "world coordinates system". When this occurred, the error was visually obvious and the results agreed with the model. Note that not all polylines were affected. In particular lightweight polylines were not affected. This incident affected all previous versions of ETABS capable of importing DXF files. Vertex coordinates are now translated to the world coordinate system if required when polylines are imported from DXF files.
	5860	An incident was resolved which affected the export of ETABS models to Revit 2019 or earlier. Attempting to export a model with steel frame objects to an .EXR file and selecting the Export to Revit 2019 or earlier option caused ETABS to display an error message without generating a file. Export to Revit 2020 or Revit 2021 was not affected, and versions of ETABS earlier than v19.0 were not affected.
	5861	An incident was resolved which affected the re-export of ETABS models to Revit. When a model had been previously imported from Revit or previously exported to Revit was later re-imported in Revit, duplicate floor objects were created for the floors that had been moved in ETABS. When this occurred, the error was obvious. De-selecting the Floor Slabs in the list of Revit elements to update when running the Import to Update Existing Revit Project from ETABS SAFE or SAP2000 command in Revit prevented the problem from occurring. Models exported from versions of ETABS earlier than v19.0.0 were not affected.
	5904	An incident affecting the export back to Revit .exr files of models originally imported from Revit was resolved. When a Revit project contained concrete square columns defined using the Revit "Concrete-Rectangular-Column" family instead of the "Concrete-Square-Column" family, the ETABS model created by importing the Revit project could not be exported back to Revit. Attempting to export it caused ETABS to display an error message without generating an .EXR file. This incident affected ETABS 2014 and later. A workaround was to turn off columns display, select all the other ETABS objects, and export the selected objects only. Revit concrete square columns defined using the Revit "Concrete-Rectangular-Column" family will no longer prevent re-exporting from ETABS to Revit.

* Ticket	Description
5987	An incident was resolved where certain entities could not be read when importing an IGES file due to incorrect column widths.
6292	An incident was resolved where a a model exported from ETABS to Perform3D was not able to read results correctly due to the number of exported section cuts being incorrect.
6457	An incident was resolved where the gravitational constant exported from ETABS to Perform3D was incorrect when the model was in N-mm units.

Loading Incidents Resolved

* Ticket	Description
5856	An incident was resolved for the KDS 41 17 00:2019 auto-seismic loading where the seismic coefficient was not correct when the building period was less than TL. The error was obvious in the table "Load pattern Definitions - Auto Seismic - KDS 41 17 00:2019", and results were consistent with the values shown in that table.
5859	An incident was resolved where, when acceleration-type loads were used in staged construction load cases, the acceleration loading was automatically deleted when the analysis was run. This issue prevented acceleration loading from being used in staged construction load cases. After analysis was complete, the staged construction load case definition (Define menu > Load Cases) correctly reflected the loading actually used for the analysis results and would not contain any acceleration loads.
5885	An incident was resolved where the value of Ag in the definition of Response Spectrum Function based on the Italian NTC 2008 or NTC 2018 codes was not being updated when specified by geographical location. This has now been corrected. This error affected version 19.0.0 to 19.0.2. The results were consistent with the value of Ag shown in the form and in the database.
6025	An incident was resolved for NTC 2008 and NTC 2018 auto seismic load cases where the topography factor was always used as 1.0.
6127	An incident was resolved for Eurocode 8-2004 auto seismic load pattern where for the Country set to "Other", any modified parameters were not saved. This error was inadvertently introduced in v19.0.0 to v19.0.2.

Results Display and Output Incidents Resolved

* Ticket	Description
5206	An incident was resolved in which an error could occur when generating a report containing plot functions where the load case(s) used by the plot function(s) did not have results available. This was a reporting issue only and did not affect results.
6000	An incident was resolved where the story shear and moment plots for multivalued cases/combos would zig-zag between max and min values when only the max or min were requested. This has been corrected and both max and min values are now properly shown on the same plot.
6142	An incident was resolved where, when linear-type links with non-zero damping coefficients were used in a nonlinear modal time-history (FNA) load case, the link viscous damping energy for these links was incorrect reported as being zero. When this issue occurred, the missing linear-link viscous damping energy would be included in the energy error, so that the total energy and other energy components were not affected. No other results were affected. Only ETABS v19.0.1 and v19.0.2 were affected.

Structural Model Incidents Resolved

* Ticket	Description
4028	An incident was resolved where, when using the reshaper tool to move a joint of an area object in a plan view, the Z-coordinate of the moved joint would be set to the story level even if the area object was originally in a non-story plane.

*	Ticket	Description
	5941	An incident was resolved in which the ultimate strain capacity value in the Italian material library for the B450C rebar material was incorrectly defined as 0.675 when it should actually be 0.0675. Models using this material and nonlinear analysis features that utilize this value should be reviewed.
	6255	An incident was resolved where the torsion constant (J) and warping constant (Cw) were being calculated incorrectly for imported double-angle sections. It should be noted that J and Cw values are calculated if and only if the J and Cw values are not available in the section database used for importing the double-angle sections. These values are shown in the section properties displayed using the command Define > Section Properties > Frame Sections and in the corresponding tables.
*	6499	An incident was resolved where, when multiple overlapping hinges were defined at the end of a frame element (relative distance = 0 or 1) and the model was set to model hinges as separate link elements (Analyze menu > Analysis Model for Nonlinear Hinges), an error message "Error in creating Frame element hinges" could have occurred during model creation. When this issue occurred, the affected hinges would not be present in the analysis model and results would not be available for the affected hinges. This issue did not affect models that were set to model hinges within elements.

User Interface Incidents Resolved

*	Ticket	Description
	4066	An incident was resolved where the architectural plan on a reference plane would not display if the "Set Plan View" command was used. It would display if the plan view was changed using the Up/Down key on the toolbar.
	5938	An incident was resolved where duplicate frame section properties using the same material were unintentionally allowed to be imported from a section-property (XML) file when using the command Define > Section Properties > Frame Sections, but the duplicated properties were not supported when using the interactive database editor. Now both procedures are consistent: duplicate frame section properties imported from a section-property file are not permitted when they use the same material.
	6467	An incident was resolved where drawing or editing Dimensions Lines after the model had been analyzed could make the analysis results unavailable, even though they had not been deleted. Saving the model and reopening it would correct this problem, but now that is no longer necessary.