CSiBridge® 2016 (Version 18.1.0)
Release Notes

Notice Date: 2016-02-12

This file lists all changes made to CSiBridge since the previous version. **Most changes do not affect most users.** Incidents marked with an asterisk (*****) in the first column of the tables below are more significant.

Changes from v18.0.1 (Released 2015-11-12)

Graphics
Enhancements Implemented

*	Incident	Description
*	17606 18914 22354 42071 58825	An enhancement was implemented to display in a single view all loads (joint, frame, area, solid, and link) applied in a single load case using the Display > Show Load Assignments > Load Case command. Individual load patterns within a load case can also be displayed.
*	85379	An enhancement has been implemented to graphically display the loads acting on the model for each stage of a staged construction load case using the Analysis > Load Cases > Show Tree command.

Bridge Modeler
Enhancements Implemented

*	Incident	Description
	84013	The Bridge Modeler has been enhanced so that the steel U-girder bridge section for a single U-girder now permits unequal lengths for left and right overhangs. Previously the two overhangs had to be of the same length.
	85359	An enhancement has been implemented for the Bridge Modeler to now automatically create bridge section cuts at user-defined "All Space" splice locations for steel I- and U-girder bridges. Previously, user-defined discretization points needed to be created at these locations in order for AASHTO bridge superstructure design to consider the splice locations. The new section cuts will not be created if they are very close to another section cut for an in-span hinge, "All Space" diaphragm, or user discretization point. Sections cuts are not automatically created for splices specified for single girders; user-defined discretization points are still needed for this case to be considered in design.

Modeling
Enhancements Implemented

*	Incident	Description
	87412	An enhancement has been implemented to incorporate a library of New Zealand vehicles according to NZTA SP/M/022.
	87413	An enhancement has been implemented to incorporate a library of steel, concrete, and rebar material properties for New Zealand.

*	Incident	Description
*	88449	The behavior of fiber PMM hinges has been enhanced to remove double-counting of the elastic flexibility in frame members. The elastic flexibility of the frame section now will be set to zero for a tributary length of the member equal to the hinge length of the fiber hinge, so that all elastic flexibility over that length is represented only by the fibers in the hinge. For bending behavior this works best when the hinge is located at the center of its tributary hinge length (axial behavior is not affected significantly by location). The tributary hinge lengths will be shifted as necessary so that they do not overlap the ends of the member or end offsets, and so that they do not overlap each other in the case of multiple hinges. In some cases this may mean that the hinge is not centered in the tributary hinge length, particularly for hinges at the ends of the member. In this latter case better results will be obtained if the hinges are located a half hinge length from the end. For hinge lengths that exceed the length of the element, adjacent elements will not be adjusted and some double counting of elastic flexibility will remain in the model due to the adjacent elements. For this reason it is not recommended to use object or element discretizations that are smaller than the hinge lengths. When frame hinge overwrites are assigned to automatically subdivide at hinge locations, this discretization will now be limited at fiber hinges to be no smaller than the hinge length, provided that no other specified discretization is applied near the hinge. Overall this enhancement will tend to affect the results for all models that use fiber hinges when compared with previous versions of the software, although the effect will be limited in most models where the hinges do not dominate the model. Affected models will tend to be stiffer. Only fiber PMM hinges are affected by this enhancement.

Section Designer

Enhancements Implemented

*	Incident	Description
	83052	Section Designer has been enhanced such that a rotation angle can now be assigned to a Caltrans section. This can be useful for generating Section Designer sections that combine a Caltrans section with other shapes, and it also enhances the behavior of radial and mirror replication. Previously radial and mirror replication made multiple copies of the parent Caltrans section but did not change the orientation as expected. Note that the prestress tendons added in a Caltrans sections are defined with respect to the non-rotated coordinate system of the section for convenience.
*	86848	The calculation of the idealized Caltrans moment-curvature relationship has been changed to better capture the significant failure of concrete material. This may change results obtained from nonlinear static and nonlinear direct-integration load cases, including bridge seismic design requests, when using Caltrans hinges in frame members. Hinges with a single concrete model (one material, all confined or all unconfined) will not be affected. Affected models are likely to be more ductile now. By definition, the Caltrans idealized moment-curvature relationship exhibits an ultimate curvature based on the first failure of the steel (rebar or tendon), concrete, or a user-specified curvature. This enhancement affects only the determination of concrete failure. Previously, the failure curvature for concrete was determined as being when the extreme compression fiber over all concrete in the section reached a specified ultimate strain. That ultimate strain was either the maximum or minimum of the ultimate strains over all concrete models in the section, as specified by the user, with the default being to use the maximum. For the common case of a confined concrete core with an unconfined concrete outer ring, this resulted in checking when the outer edge of the unconfined concrete reached the ultimate strain of the confined concrete, which tended to be over-conservative. Three changes have been made: 1.) The user can choose whether to consider the maximum or minimum ultimate strain over all concrete models, or just over the confined concrete models. When the section has no confined concrete models, then both methods are the same and consider all the unconfined concrete. Note that materials having user-defined stress-strain curves are considered as unconfined for this purpose. 2.) The failure curvature for concrete is now determined as being when the extreme compression fiber of only the concrete having the controlling ultimate strain reaches its ultimate value. All other concrete is ignored. 3.) The default for Caltrans hinges is to consider the minimum ultimate strain over just the confined concrete if any confined concrete is present. If there are no confined concrete models in the section, then the previous default will be used, which will consider the maximum ultimate strain over all concrete models. Considering these three changes,

*	Incident	Description
		most models having confined concrete in the core will only be affected by the fact that the extreme fiber will now exclude the outer layer of unconfined concrete which spalls off. This will produce a more ductile and meaningful result. This new behavior is available in Section Designer for plotting the moment-curvature relationship, but the only effect upon results is for Caltrans frame hinges.

Analysis

Enhancements Implemented

*	Incident	Description
*	68068	An event-to-event solution strategy has been implemented as an option for nonlinear direct-integration time-history load cases. This is similar to the use of events as already available for nonlinear static load cases. Time steps will be automatically subdivided where significant changes occur in the stiffness of certain elements and hinges, such as at yielding, unloading, or strength loss. Iteration is performed at the end of the full time step as needed to achieve convergence. Previously the event-to-event option was available but had no effect. By default event-to-event stepping is turned off for each time-history load case so as to preserve the previous behavior. Additionally, events have been added for more types of elements and hinges. Previously events were only implemented in nonlinear static load cases for single-degree-of-freedom hinges and isotropic interacting hinges. Events are now implemented for the following nonlinear models: all frame hinges; layered shells with directional or coupled nonlinear behavior; and links with multi-linear plasticity, gap, hook, friction pendulum, and triple pendulum behavior. Event-to-event functionality has also been enhanced for frame hinges to better handle cyclic reversals. As a result of these additions, results for nonlinear static load cases using events may differ somewhat from previous versions, although the results are expected to be within the specified convergence tolerance for most models. Differences may be more pronounced for sensitive or ill-conditioned models. The purpose of using events is to increase the speed of analysis, but for certain models and load cases it may have little effect or even the opposite effect. Analysis verification example 6-003, has been updated to reflect this change.
*	86727	The option to change link properties has been added to staged-construction load cases. When this operation is performed on one or more link objects in a construction stage, the objects are effectively removed from the structure along with the loads they are supporting, new unstressed link objects added in their place having the specified new properties, and the previously supported loads reapplied. This is the same behavior as is currently available for changing frame sections and shell sections. In addition, link properties can be changed to and from "None", which is equivalent to the object being absent from the model. The "None" property can also be assigned to a link object as well, such that the default is for the link object to be absent from the model until the link property is changed during staged construction. Note, if the original link property is defined with any 'fixed' degrees of freedom, those 'fixed' degrees of freedom from the original link property will still be present after changing the link property.
	87273	The amount of time-dependent material data (creep and shrinkage strains) that was previously saved for a nonlinear direct-integration time-history load case that continued from a time-dependent staged-construction load case has been significantly reduced. Previously these data were stored for every time step, even though they did not change during a time-history load case. Now only the minimum amount of data is stored as needed to enable further time-dependent staged-construction load cases to continue after the time-history load case. This enhancement reduces the amount of disk space used to save results but does not affect any results.
	87461	The analysis log file (.LOG) now produces a warning message whenever negative stiffness eigenvalues are detected during the linear equation solution phase that precedes linear static, multi-step static, modal, buckling, moving load, and/or hyperstatic load cases. The number of negative stiffness eigenvalues was already being reported as the number of eigenvalues below the shift, but now an explicit warning is added when this number is not zero to emphasize that these may represent instabilities in the model, possibly due to P-delta effects.

Bridge Design

Enhancements Implemented

*	Incident	Description
*	38623 73293	Automated bridge seismic design using the AASHTO 2011 seismic code has been enhanced to allow consideration of superstructure effects when performing nonlinear static pushover analysis to calculate the capacity of the bents for Seismic Design Category (SDC) type D, and to add an new option for determining capacity based on the failure of the first bent column. 1.) In addition to the current method of pushing individual bents without the superstructure in both the longitudinal and transverse directions, two new options are available for longitudinal pushover: 1a.) Pushing the full bridge along the chord between the abutments, where the abutment support bearing are changed to rollers in the longitudinal direction, according to recommendations by Caltrans (California Department of Transportation), and 1b.) Pushing individual bents with the superstructure, where the support bearings at all bents and abutments are changed to provide vertical support only except for the bent being pushed. The method of pushing individual bents with the superstructure is also available for transverse pushover. Different methods can be used for the transverse and longitudinal pushover in a given design request. 2.) For determining capacity, in addition to the current method of using a drop in the static pushover curve, a new option is available to define capacity as when the first bent column reaches a specified limit state. This limit state may be one of the points B, C, D, or E specified for the moment-rotation curve of a hinge, or for the stress-strain curves of the material fibers in a fiber hinge. For concrete columns, unconfined concrete fibers are not considered for failure when confined concrete is present.
*	43730	The speed of performing bridge superstructure design and rating has been significantly increased for certain models, particularly steel I- and U-girder bridges, where repetitive calculations of section properties used for design have been eliminated.
	87016	For bridge superstructure design and rating, all tables for girder-based design results now include a new column (field) showing the girder distance measured from the start of the corresponding span. This new column is in addition to the existing column that shows the longitudinal location of results in terms of the station measured along the layout line.
	87417	Bridge superstructure design for steel I-girder and U-girder bridges has been revised for the calculation of steel stresses for positive flexure. Previously the area A used to calculate the P/A component for the axial force P was based on using the long-term composite section. This has been changed to now use the short-term composite section, resulting in a larger transformed area. The previous results were slightly over-conservative. This change affects positive flexure in the design requests for Steel-I Comp Strength (or Ultimate) and Steel-U Comp Strength (or Ultimate) for all versions of all design codes.

Results Display & Output

Enhancements Implemented

*	Incident	Description
	85439	An enhancement was implemented to display an error message when attempting to display shell reinforcement design data for shells with defined reinforcement cover values that are not valid compared to the thickness of the shell.

Miscellaneous

Enhancements Implemented

*	Incident	Description
	85448	The version number has been changed to v18.1.0 for a new intermediate release.

User Interface and Display
Incidents Resolved

*	Incident	Description
	84312	An incident was resolved in which the options under the File > Settings > Other Settings were reset to unchecked after opening the Bridge Girders Reinforcement Layout form.
	84535	An incident was resolved where the actual current units were different from those displayed in the drop down box in the lower right hand corner of the program window.
	85533	An incident was resolved where an Abnormal Termination error could be generated when trying to Modify/Show the definition of a previously defined Steel U-girder bridge section if that section contained only a single U-girder (command Components > Superstructure > Deck Sections > Modify/Show). The original definition was valid and unaffected, and no results were affected. The definition could be viewed and changed using the Interactive Database Editor.
	85948	An incident was resolved in which the input boxes on the Coupled 6x6 Joint Spring assignments form were not fully visible. This was a user interface issue only.
	86155	An incident was resolved for the Bridge Wizard form in which selecting certain items could cause the selected item in the Bridge Wizard Summary Table to change unexpectedly. This was a user interface issue only.
	87348	An incident was resolved in which two abnormal terminations were addressed. 1) When trying to review the defined rebar sizes an error could be generated if the model contained more tendon or cable properties than frame section properties. 2) When a bridge model contained both concrete box bridge sections and either T-beam or flat slab bridge sections, an error occurred when trying to show the bridge superstructure forces/stresses form. Users will need to update the linked bridge model to fix the second item.

Bridge Modeler
Incidents Resolved

*	Incident	Description
	83660	An incident was resolved for the Bridge Modeler where, in certain rare cases, a bridge object could not be updated to create a linked model when there was an extremely small coordinate difference between a control point on the layout line and the location of the end abutment. Tolerances have been improved to prevent this problem.
	83841 84854	An incident was resolved for the Bridge Modeler where the "Copy to All Girders" function in the Assign Prestress Tendons form did not work correctly if the source tendon name and the generated tendon names were such that the source tendon was listed after any of the generated tendons after sorting by tendon name. When this occurred, the first generated tendon was deleted along with the source tendon. For example, if source tendon TEN8 was used to generate tendons TEN9, TEN10, and TEN11, after sorting these become TEN10, TEN11, TEN8, and TEN9. Previously TEN10 was deleted along with source TEN8, but now only TEN8 is deleted after generation, as expected.
	85551	An incident was resolved for the Bridge Modeler where individual bearing overwrites, if any, assigned to the "After" side of a double-bearing bent were being ignored when a double-bearing bent was used at the start abutment. Instead, all bearings used the basic bearing assignments specified for the start abutment. This included the bearing and restrainer properties, elevation, rotation angle, and number of bearings for U girders. Results agreed with the model as generated by the Bridge Modeler. Double-bearing bents used elsewhere in the bridge object were not affected, and abutment properties used at the start abutment were not affected. Versions 17.3.0 to 18.0.1 were affected.
	86892	An incident was resolved for the Bridge Modeler where support bearings were not correctly generated in the linked model for the following two cases: (1.) If the bearing assignment at an abutment or bent was of type "General" and the "Offset X From Reference Point To Insertion Point" in the bridge section definition was not zero, then an error message would be displayed when updating the linked bridge model, and the bearings would be generated assuming the Offset X was zero, and therefore might not connect properly to the bridge object. (2.) For a double-bearing bent assigned at an interior bent location, if the bearing assignment at the "Before" side of the bent was of type "General" and the bearing assignment at the "After" side of the bent was of type "Girder-by-

*	Incident	Description
		Girder", then the bearings at the "After" side would not be generated. These two errors affected all the modeling types: spine model, area model and solid model. Results agreed with the model as generated.
	88345	An incident was resolved for the Bridge Modeler where a bridge model was sometimes not correctly generated when the layout line used for the bridge object consisted of many short linear segments. This error affected bridge objects updated as spine models, area models, and solid models. When this occurred, the error was obvious and results agreed with the model as generated. This error affected versions 18.0.0 and 18.0.1.
	88394	An incident was resolved for the Bridge Modeler where a bridge object using the advanced concrete box bridge girder section might generate an incorrect model if either (1) The overhang length was set to zero, or (2) The horizontal or vertical dimensions of the fillets f7 to f10 or the fillets f15 to f18 were all set to zero and also the slope of the exterior web was such that the outside corner of the bottom slab was inside the mid-point of the exterior cell measured at top slab. This error was not common, and could affect both area models and solid models. When this occurred, the fixed links connecting the bottom exterior girders to the support bearing links could be incorrectly located, and the solid objects representing the box girder section might not be properly connected to each other. This error could also cause multi-cell concrete box design-check requests and load-rating request to generate an error message when run, in which case no results were produced.

Modeling
Incidents Resolved

*	Incident	Description
	85661	An incident was resolved where an unexpected "Cannot calculate tendon profile!" warning message occurred in the Define Parabolic Tendon Vertical Layout By Points form.
	85932	An incident was resolved where in some cases an older model containing a construction schedule could not be opened in the 64-bit version. When this happened, the construction schedule from the old model would be lost. This is still an issue when CSiBridge 64-bit is installed alongside Microsoft Access 32-bit due to limitations of the Microsoft database engine.
	86191	An incident was resolved in which the Schedule Wizard for segmental bridge objects could generate an incorrect schedule when the computer region settings were set to use a comma for the decimal separator. The comma is also used to specify predecessor tasks, and this error was affecting the ordering of tasks. The actual schedule generated could be viewed and modified using the command Analysis > Schedule Stages, and results were consistent with that schedule. Now the specification of predecessor tasks is no longer affected by regional settings.

Section Designer
Incidents Resolved

*	Incident	Description
*	81352	An incident was resolved where Fiber P-M2-M3 nonlinear hinges assigned to frame objects having Section Designer frame section properties used the fiber layout specified for the first Section Designer section that was defined in the model, regardless of the actual Section Designer section assigned to the frame object. This error only affected fiber hinges that took their fiber layout from the section, not user-defined fiber layouts. When this occurred, the actual fiber layout used could be seen in the definition of the generated hinge, and results were consistent with that layout.
*	84279	An incident was resolved for Section Designer where the stress-strain curve used for rebar when calculating the moment-curvature relationship could be incorrect in the case where: (1) the rebar material was defined with a parametric nonlinear stress-strain curve and the Parametric Strain Data option was selected to "Use Caltrans Default Controlling Strain Values (Bar Size Dependent)", and (2) the Section Designer (SD) section included either a rectangular or polygonal concrete shape with rebar or a rectangular rebar shape. When both were true, all rebar in the shapes of item (2) used the Caltrans controlling strain value corresponding to a #5 rebar (0.625 in. or 15.875 mm diameter), regardless of the specified rebar sizes. This could affect the displayed moment-curvature

*	Incident	Description
		relationship, as well as any frame hinge properties generated from the SD section, whether a Caltrans or fiber PMM hinge. Only nonlinear static and nonlinear direct-integration time-history load cases were affected by this error, including automated bridge seismic design. Concrete frame design and bridge superstructure design and rating were not affected except possibly to the extent that a nonlinear static or direct-integration load case with significant nonlinear deformation was included in a design load combination. Note that by default the option of item (1) is NOT selected, and hence most models were not affected. Caltrans and circular shapes were not affected. The actual stress-strain curve used for the rebar was shown in Section Designer by right-clicking on the concrete shapes of item (2). This has been enhanced to be displayed for individual rebar depending on their actual size.

Loading
Incidents Resolved

*	Incident	Description
	87688	An incident was resolved where an error message was sometimes generated when saving a construction schedule (command Analysis > Load Cases > Schedule Stages) due to invalid nonlinear parameter data in the schedule. The invalid data was previously imported from database tables or the interactive database editor. No results were affected, but the corresponding staged-construction load case(s) could not be changed in the scheduler. Such invalid data is now detected upon import and corrected.

Analysis
Incidents Resolved

*	Incident	Description
	86370 87128	An incident was resolved where a staged-construction load case that contained multiple null stages (i.e., stages with no loads applied, no added or removed structural components, and no time duration) would run but not get marked as having finished. This did not occur if the load case contained only a single null stage. When this did occur, no other load cases could continue from it. No other results were affected.
	87737	An incident was resolved where a file error message was generated when running the analysis using the Standard Solver and the equation block size was larger than 2 GB. This only occurred on machines having a large amount of RAM memory. When this occurred, analysis results were not available. This error did not occur when using the Advanced Solver (the default) or the Multi-threaded solver. This has been resolved by limiting the equation block size to 2 GB for the Standard Solver. Versions 17.2.0 to 18.0.1 were affected.

Bridge Design
Incidents Resolved

*	Incident	Description
*	84301	An incident was resolved for bridge superstructure design where an error message was generated when trying to run a design request of type AASHTO STD 2002 Concrete Box Stress Check, and no results were produced.
	84311	An incident was resolved for bridge superstructure design where rebar specified to run to the end of a span could be ignored when calculating flexural resistance due to an excessively small tolerance used to determine the end location of the rebar. When this occurred the error was over-conservative and usually obvious due to the small flexural resistance reported. This error affected all flexural design and rating requests for all types of bridge sections.
	84731	An incident was resolved for bridge superstructure design where an Abnormal Termination error was sometimes generated when trying to edit (Modify/Show) a previously defined superstructure design request of type Service Check for the CAN/CSA-S6-06 code. This would occur if the design request contained only a single demand set, even though this is legal. Design results were not

*	Incident	Description
		affected and could be viewed if such a design request had been run. The design request could be modified using the interactive database editor.
	85346	An incident was resolved for bridge design optimization where an error message "Error in applying modified beam plate size to analysis model. Error in PropFrame.SetHybridSection" was sometimes generated when trying to save a new model after modifying flange thicknesses during bridge superstructure design optimization. This could occur for certain curved bridges where section cuts were within the tolerance proximity of diaphragms (cross frames). When this error occurred, the modified beam plate sizes were not applied to the model, and the original model was unchanged. Subsequent results agreed with the model as unchanged.
*	85533	An incident was resolved for bridge superstructure design of steel U-girder bridge sections where there could be an unexpectedly large value of the reported D/C (demand/capacity) ratio for negative moment at bent locations for bridge models of two or more spans when using non-prismatic U-girder section properties. When this occurred, the error was obvious, localized at the bent, and tended to be over-conservative. This error affected design requests of types Strength, Service, and Constructability (Staged and Non-staged) for all design codes.
	85871	An incident was resolved for superstructure bridge design where running staged constructability design requests for steel I-girder and U-girder bridge sections would generate an error message if the staged-construction load case referenced in the design request had the "Provide Output" flag set to "No" for any stage prior to the last stage. When this error occurred, no results were available for the affected design requests. Note that setting the "Provide Output" flag to "No" for the final stage had no effect since results are always produced for the last step. This error was present in v18.0.0 and v18.0.1. Affected design requests were "Steel-I Comp Construct Stgd" and "Steel-U Comp Construct Stgd" for all codes that provide these type of request.
	85963	An incident was resolved for bridge superstructure design and rating of steel I-girder bridge sections using the AASHTO code where an error message "Error locating Section cut at diaphragm" could sometimes be generated while running a design or rating request if staggered diaphragms were assigned to a bridge span and the staggered diaphragms were not located right at a section cut. This error was not common and typically only affected curved spans. When this error did occur results were not available for that design or rating request. This error could affect the following design checks: Steel I Composite Strength and Steel I Composite Constructability for all AASHTO LRFD versions; and all Steel I Rating Requests for all AASHTO LRFD versions.
*	86095	An incident was resolved for bridge superstructure design and rating of steel I- and U-girder bridges where the calculation of the section modulus for the top flange in negative bending has been revised. Previously the design first determined if the slab rebar or the top girder flange yielded first, and based on that determination the section modulus was correspondingly calculated either at the slab-rebar or top-flange location. Now this procedure is used to determine only the negative yield moment My, but for the subsequent calculation of stresses the section modulus is always calculated to the top girder flange. This change affects all "Steel I Comp" and "Steel U Comp" design and rating requests for all codes when rebar are defined in the top slab and also the design parameter "Use Stage Analysis" is set to "No".
	86431	An incident was resolved for bridge superstructure design of steel I-girder and U-girder bridge sections using the AASHTO LRFD code that affected the calculation of stresses for negative bending when the design parameter "Use staged analysis?" was set as "No". Previously the area A used in the P/A term to calculate these stresses included the area of the steel beam (girder) plus the area of the composite slab divided by the long-term ratio of elastic moduli. Now the area A has been changed to include only the steel beam (girder) and the rebar in the slab, reflecting the fact that slab is assumed to be cracked for negative bending. The effect of this change will generally be to increase the calculated stresses, and the previous results could have been under-conservative. This change does not affect calculations performed when "Use staged analysis?" is set to "Yes". Affected design requests are Steel I Comp Strength, Steel I Comp Constructability, Steel U Comp Strength, and Steel U Comp Constructability for all supported versions of the AASHTO LRFD code.

*	Incident	Description
	86565	An incident was resolved for bridge superstructure design using the Eurocode code where the calculation of the reduced moment capacity in negative flexure to account for shear was incorrect. This error led to over-conservative demand-capacity ratios (DoverC values) being reported for flexure-shear interaction in negative moment regions for Steel I Comp Ultimate design requests. These results are presented in table "Bridge Super Design EUROCODE 18 - SteelICompUltimate-FlxShrNeg" and plotted as "D/C Ratio - FlexureShearInteract - Negative".
	86580	An incident was resolved for bridge superstructure design of steel I-girder and U-girder bridge sections using the AASHTO LRFD code where the Strength design check was incorrectly determining the nominal shear force in the region from the end of the member to the point of maximum positive design live load plus impact moment (taken as the center of the span) using Equation 6.10.10.4.2.-5 instead of the correct Equation 6.10.10.4.2-1. The effect of this was over-conservative. This affected all versions of the AASHTO LRFD code.
	86581	An incident was resolved for bridge superstructure design of steel I-girder bridge sections using the AASHTO LRFD code where the Strength design check classified panels that were shorter than 1.5D at the start or end of a bridge as being Internal Stiffened rather than the expected classification of End Stiffened. When this occurred, the results could be under-conservative. However, the classification being used was reported with the design results. This affected all versions of the AASHTO LRFD code.
	86596	An incident was resolved for bridge superstructure design using the AASHTO LRFD code for the steel I-girder Fatigue design check where the girder flange stresses were being incorrectly reported as the range from zero to maximum tension stress instead of being calculated as the difference between the maximum tension stress and the minimum compression stress if a flange sees any tension from fatigue loading. The reported stress could have been under-conservative. This affected all versions of the AASHTO LRFD code.
	87321	An incident was resolved for bridge superstructure rating using the AASTHO code for steel I-girder bridges where an error message "Error locating section cut at unbraced segment midpoint .." could occur while running the rating request if the bridge had skew supports and fanned diaphragms that were located in very close proximity to some of the section cuts. A fanned diaphragm is one that is not parallel to the nearby supports. When this error occurred, the rating request failed to run and no results were available for that request. This error could affect rating requests using the AASHTO code (all versions and interims) of types Steel-I Comp Strength and Steel-I Comp Service.
	87416	An incident was resolved for bridge superstructure design of curved composite steel I-girder bridges using the AASHTO LRFD code (all versions and interims) where the top and bottom flange demand-capacity ratios for negative flexure were incorrectly considering the bottom flange lateral bending stress flbot. Previously the demand for the continuously braced top flange in tension was evaluated as fbu + flbot/3, but this has been changed and is now evaluated as fbu. Previously the demand for the discretely braced bottom compression flange was evaluated as fbu, but this has been changed and is now evaluated as fbu + flbot/3 (eq 6.10.8.1.1.-1). This error affects only AASHTO LRFD design requests of type Steel I Comp Strength for negative flexure when the parameter "Use Stage Analysis" = "No". Previous results for the top flange could have been slightly over-conservative and for the bottom flange could have been slightly under-conservative.
	87716	An incident was resolved for bridge superstructure design and rating using the AASHTO code for steel I-girder and U-girder bridges where the longitudinal flexural stresses in the concrete deck due to all permanent and transient loads were being calculated using the long-term modular ratio, n. This has been changed so that the concrete stresses are now calculated based on short term modular ratio, in compliance with AASHTO LRFD 6.10.1.1.1d. In the previous versions using the long term modular ratio resulted in smaller calculated stresses in the deck. This issue was applicable only when the design/rating request parameter "Use Stage Analysis" = "No". The affected design requests are of types Steel-I/Steel-U Comp Strength and Service using the AASHTO LRFD code (all versions and interims), and rating requests of types Steel-I Comp Strength and Service using the AASHTO LRFD resistance code (all versions and interims).

Frame Design
Incidents Resolved

*	Incident	Description
	84672	An incident was resolved for concrete frame design according to AASHTO 2007, 2012, and 2014, in which the right-click design details sheets incorrectly reported the seismic zone. This was a reporting issue only and did not affect the design results.

Results Display and Output
Incidents Resolved

*	Incident	Description
	83017 87311	An incident was resolved where the plotting of frame forces could be slow for models containing nonprismatic sections, particularly for load combinations. No results were affected.
	84779	An incident was resolved where the Max and Min stress values were switched in the Bridge Response Data table of the Bridge Object Response Display form when the "Envelope Max/Min" option was available and selected for the multi-value option. The actual Max and Min values were correct but were reported in the wrong columns of the table. This table is displayed using the command Home > Display > Show Bridge Superstructure Forces/Stresses and clicking the Show Table button. Only stresses were affected, not forces, moments, or design results. This was only a reporting issue, and no other analysis or design results were affected.
*	85462 86681	An incident was resolved where load combination results might not be properly displayed in the Bridge Object Response Display form in certain cases when there were more load combinations defined than load cases. When this occurred, the displayed response did not change from that of the previously displayed load case or combination, or no response would be displayed if the affected load combination was selected when the form was first opened using the command Home > Display > Show Bridge Superstructure Forces/Stresses. No other results were affected.
	85845 85997	An incident was resolved that addressed two issues for the display of individual fiber results when using the command Display > Show Hinge Results for a fiber hinge: (1.) The displayed stress-strain curve was not correct in the Material Stress-Strain Curve Plot form after clicking the Show Current Fiber SS Curve Definition menu item in the Fiber Results form. The curve was being additionally scaled by the material yield stress and strain. This was a display issue and did not affect the analysis results. (2.) An Abnormal Termination error occurred when clicking the Show Individual Fiber Data button in the Hinge Results form (versions 18.0.0 and 18.0.1 only). This prevented the Fiber results form from being displayed, so that the first issue could not occur.
	88162	An incident was resolved where the backbone curve displayed for the stress-strain curve of an individual fiber when showing the hinge results for a fiber hinge could be incorrect in certain cases. This could occur when some fiber hinges were automatically generated from Section Designer sections and other fiber hinges were automatically generated from non-Section Designer sections. User-defined fiber hinges were not affected. This was a display issue affecting only the plotted backbone curve that is shown for reference. The actual stress-strain curve used for analysis was correct, and hence the calculated and displayed results were not affected.

Database Tables
Incidents Resolved

*	Incident	Description
	79390	An incident was resolved in which moving load cases would fail to run after using the interactive database to change the scale factors in the table "Case - Moving Load 1 - Lane Assignments" and applying to the model. In order for this to work correctly, the two linked tables "Case - Moving Load 1 - Lane Assignments" and "Case - Moving Load 2 - Lanes Loaded" must both be opened for editing, but only the first table needs to be edited. Previously both tables needed to be changed to properly apply changes to the first table, which is no longer required if the data of the second table is to remain the same.

*	Incident	Description
	82967	An incident was resolved in which exporting to Microsoft Excel could generate an abnormal termination when certain third party applications (such as Bentley ProjectWise) that also integrated with Excel were installed on the same machine. No results were affected. This issue was resolved for v18.0.0 and v18.0.1 as well but not previously reported in the ReleaseNotes pending customer experience.
	84838	An incident was resolved in which the 'Steel Design 3 - Shear Details - AASHTO-LRFD-2007' database table was not filling the VuMajDsgn, TuMajor, VuMinDsgn, and TuMinor columns. This was a database table issue only and did not affect results.
	85533	An incident was resolved where the database table for live-load distribution factor (LLDF) data was not being exported for the AASHTO steel U-girder superstructure design requests of types Strength, Service and Fatigue. When a previously exported model file (.B2K or .$BR text, Excel, Access) was re-imported, the LLDF for these types of design requests would be set to default values unless the data was explicitly added to the exported file by the user. Results agreed with the model as imported.

Data Files

Incidents Resolved

*	Incident	Description
	84839	An incident was resolved where a "+" character in a database table field name caused an error during the import of the table.