CSiBridge v25.1.0 Release Notes

Notice Date: 28-November-2023

This document lists changes made to CSiBridge since v25.0.0, released 07-July-2023. Items marked with an asterisk (*) in the first column are more significant.

Bridge Design and Rating

Enhancements Implemented

*	Ticket	Description
*	9740	An enhancement has been implemented to provide comprehensive calculation reports in Microsoft Word format for the following bridge superstructure design requests: Eurocode - Multicell Concrete Box - Flexure, and Eurocode - Multicell Concrete Box - Shear. The complement the design results already available in tabular format.
	9780	An incident was resolved where incorrect resistance axial force Pr23 and incorrect resistance moment Mr23 may have been reported in the "Bridge Substr Design IRC112-20 01 - Column Strength Results" output table for the IRC 112-2020 bridge substructure column design for scenarios where a permutation without second-order moments governed. This was a reporting issue only and the calculated DCR ratios were based on correct values of resistance axial force and resistance moment.
*	9874	An enhancement has been implemented to add superstructure design and comprehensive calculation reports for the precast concrete box bridge section according to AASHTO. The following design/rating requests are included: AASHTO Design - Precast Concrete Box - Stress, AASHTO Design - Precast Concrete Box - Flexure, AASHTO Design - Precast Concrete Box - Shear, AASHTO Rating - Precast Concrete Box - Flexure, AASHTO Rating - Precast Concrete Box - Shear, AASHTO Rating - Precast Concrete Box - Minimum Rebar.

Bridge Modeler

Enhancements Implemented

*	Ticket	Description
*	1354	An enhancement has been implemented for the Bridge Modeler to allow specifying bottom flange stiffeners for steel U-girders in the steel beam editor. The stiffeners are explicitly modeled as frame elements when the bridge object is generated using area objects. The presence and location of the stiffeners can affect analysis results, and they are accounted for in the superstructure strength design and strength rating requests for all codes that are implemented for steel U-girder bridge sections. In addition, there has been a change for the parameter "Orientation Side". Previously, this could be "Left", "Right", or "Both", referring to locating web stiffeners on the inside of the left web, right web, or both webs. Now the options are "Web" or "Bottom Flange", meaning the inside of both webs or the top surface of the bottom flange. Old models that are opened in the new version will have "Left", "Right", or "Both" translated to "Web", which is the same as the previous value "Both". Finally, an incident was resolved where design and rating requests were treating "Orientation Side" set to "Left" or "Right" as "Both", even though the analysis model did distinguish the three cases.
	9861	The Bridge Modeler has been enhanced for precast concrete box girder bridges for the following items: (1.) The New Model template now creates a beam-grouting bridge group by default, and excludes this grouting group from the template-generated load cases representing pretension and gravity load for the girder and diaphragm system before the slab is poured. (2.) The link objects created to represent the connection due to grouting have been changed to act only in shear degrees of freedom U2 (vertical) and U3 (longitudinal). Previous the grout properties also connected the adjacent girders linearly in the U1 (transverse) direction that represents contact (compression) or separation of the two girders.

*	Ticket	Description
	9862	The Bridge Modeler has been enhanced for the precast box-girder bridge section to adjust the weight, mass, and area of the shell objects used to model the chamfer regions of the precast box girders to account for the small excess where the shell elements overlap. This is done by automatically applying property modifiers to the chamfer objects.
	9919	An enhancement has been implemented for the Bridge Modeler to allow the assignment of diaphragms at the bearing supports before and after the closure pour for a bent of type "Double Bearing Line with Closure Pour". Previously diaphragms at the bearing supports were only allowed for bents of types "Single Bearing Line" and "Double Bearing Line".

External Import and Export

Enhancements Implemented

*	Ticket	Description
	10088	When importing CIS/2 files, nodes and elements are now imported with the same names as present in the CIS/2 file. Previously they were simply assigned sequential numbers.

Graphics

Enhancements Implemented

*	Ticket	Description
	9819	An enhancement has been implemented for displaying the extruded view of a frame section with precast concrete box section.

Installation and Licensing

Enhancements Implemented

*	Ticket	Description
	9792	The version number has been changed to v25.1.0 for a new intermediate release.
*	10169	An enhancement has been implemented to provide a new licensing option, "Cloud Sign-in" licensing, that utilizes user credentials to access licenses instead of activation keys. This licensing option can be selected when installing the software, and can be changed later by running the CSiLicenseAssistant from the Windows Start menu or found in the CSILicensing subfolder of the CSiBridge installation folder. With this licensing option, user credentials will be requested when CSiBridge is first started, unless they have already been supplied in an earlier session of CSiBridge or another CSI software product that uses Cloud Sign-in licensing. User credentials can be obtained from the customer's IT or other department that manages software access. Cloud Sign-in licensing requires an active internet connection while running the software. A commuter-license option is available which allows checking out a license for a time period up to 30 days, subject to the user's company policy, for use of the software without an internet connection. Until the commuter license is checked back in or the time period expires, no other user will have access to that license. Customers can use the CSI Customer Center to manage which users have access to various CSI products and product levels through user groups. The CSI Customer Center also provides tools to view license usage. Access to these features in the CSI Customer Center is subject to permissions set by the customer's department that manages software access.

Results Display and Output

Enhancements Implemented

*	Ticket	Description
*	9969	An enhancement has been made to the parallelized design and response-recovery algorithms to increase the speed and reduce the memory usage and disk IO for models with large analysis models and/or many long time-history functions. Parallelized response recovery affects certain larger output tables and time-consuming graphical displays. In addition, the “Program Determined” values for the number of threads to be used for parallelized design and response recovery are now set to number of “Performance” cores on CPUs with hybrid architecture (e.g., Intel 12th generation Core and newer) for better efficiency over a larger range of models. This is set using command Analyze > Design and Response Recovery Options.

Analysis

Incidents Resolved

*	Ticket	Description
*	10059	An incident was resolved where running one or more nonlinear direct-integration time-history load cases that started from a non-zero state and also applied displacement loading, when run in parallel along with other load cases, resulted in a file open error in one or more of the load cases. When this happened, the results were not available for the affected load cases. Disabling the "Run Load Cases in Parallel" option avoided this issue.
*	10118	An incident was resolved where applying more than one multi-stepped load patterns (e.g., wind, vehicle live, etc.) with differing numbers of load steps to a multi-stepped static load case could prevent the load case from being run, depending on the order in which the load patterns were added to the load case.

Bridge Design and Rating

Incidents Resolved

*	Ticket	Description
*	9946	An incident was resolved where the superstructure stresses calculated for display in the Bridge Response Display form and for superstructure design or rating stress checks could be slightly in error at skewed supports and/or skewed bridge section cuts where the bridge object also had parametric variations affecting section dimensions in transverse direction. In this case, stresses were calculated using the bridge section dimensions normal to the layout line, while the actual section dimensions could be different along the skewed section cut due to parametric variation. Now the sections dimensions along the skewed section cut are projected onto a plane normal to the layout line and used for calculating stresses. The effect was generally small except in the case of large skew where there is large transverse parametric variation. Only the transverse dimensions were affected, not the vertical dimensions.
	9989	An incident was resolved for superstructure design and rating of steel I-girder bridges in which the determination of web panels could be incorrect, causing the superstructure design/rating to fail to run, if (1) the supports at the span ends were skewed, and (2) two or more staggered diaphragms using the layout line as a reference line were assigned very close to each other (but not at the same distance), and (3) the staggered diaphragms were very close to a global section cut that was generated due to the Maximum Segment Length for Deck spans. This was not a common case. When this occurred, the affected design/rating results were not available.
	10100	An incident was resolved for bridge superstructure design and rating of steel I- and U-girder bridge sections where the design/rating check would fail to complete when the girder top flange thickness was greater than the bridge section girder haunch height (which includes the top flange thickness) at any section cut used for design. Now, the design/rating process will ignore such invalid section cuts and continue to run the design/rating check. Warning messages will be provided in the tabular results for the affected section cuts.
	10141	An incident was resolved for bridge superstructure design of steel I-girder bridge sections per the AASHTO code with PennDOT amendments where the calculation report showed the incorrect D/C ratio for the PennDOT Steel I paragraph 6.10.1.9.3P-1 for positive flexure. The results presented in the design request output tables were correct, only the calculation report value was in error. Impacted design request - Steel I Strength, AASHTO (all editions) with PennDOT amendments.

*	Ticket	Description
	10171	An incident was resolved where calculation reports for bridge superstructure rating for AASHTO steel I-girder non-composite Strength and Service checks were incorrectly shown as available in Rating Report Dashboard form under the Request Name drop-down list and allowed to create reports. However, these reports are currently under development and are not complete. A warning message will now be provided when these reports are selected, and the reports will not be generated. Note that rating checks for AASHTO steel I-girder non-composite Strength and Service are available, and the plotted and tabular results produced are correct. Only the detailed calculation reports not currently available. Also note that detailed calculation reports are available and correct for AASHTO steel I-girder composite Strength and Service rating checks.
*	10200	An incident has been resolved for bridge superstructure design of steel U-girder bridge sections where, for the constructability staged design check, the U-girder top-flange stress was calculated incorrectly for design such that the design D/C ratio could be lower than expected if the top flange stress was the governing stress. The area of the top flanges used to calculate the stress was based on the full width at the top of the section rather than just the combined width of the two top flanges. Only the top-flange stress used for design was affected, not the girder stress plots for load cases and load combinations in the Bridge Response Display form. Note that the plotted stresses are shown for the top edges of the top flange and bottom edge of the bottom flange, and include the effect of bending moment in the flange, while the design stresses assume constant stress in the flange due to axial force in the flange itself. As a result, the design stresses will be very close to, but not exactly the same as, the plotted stresses at the top center and bottom center of the section.

Bridge Modeler

Incidents Resolved

*	Ticket	Description
	9704	An incident was resolved for the Bridge Modeler where the work points for brace-type diaphragms in a steel I girder bridge could be incorrectly located in a staggered diaphragm for the special case where two staggered diaphragms shared the same longitudinal location on either side of a steel I-girder, and their longitudinal location was specified as a distance measured from the start of the previous span. This could occur near a skewed support where the distance was measured along a girder line to a point in the previous span, but the projected location to the girder where the staggered diaphragms connect in in the subsequent span. When this occurred, the work points for the diaphragm on the right side of the girder could be incorrect, causing the vertical location of the connection to the girder to be incorrect. Results agreed with the model as generated.
*	9855	An incident was resolved for the Bridge Modeler where the diaphragm assignments in the Bridge Object In-Span Cross-Diaphragm Assignment form were not applied to the model, so no in-span internal diaphragms were created in the model.
	9864	An incident was resolved for the Bridge Modeler where the transverse location of the girders and their support bearings could be incorrect for a precast box girder bridge section for any of the box girders that had unequal left and right web thicknesses. Only the individual precast box girders with differing web thicknesses were affected. The slab and any box girders with equal web thicknesses were correctly located.
	9889	An incident was resolved for the Bridge Modeler where the bounding boxes created for connecting tendons to a precast box-girder frame section could be incorrect at the web-flange junction in the presence of significant skew. This only affected precast box-girder sections modeled as areas, as is the case for the precast box-girder bridge section, and when the skew near the supports was sufficient to cause the meshing of the area objects for the flange and the web to be mismatched at the edge. Precast box-girder frame sections modeled as frame objects (outside of a bridge object) were not affected. Where this error occurred, any tendons located close to the outside of the corners of the section might not be connected to the box girder, causing local instability in the model. Most models were not affected since the web-flange meshing usually matches, even in the presence of modest skew.

*	Ticket	Description
	9909	An incident was resolved for the Bridge Modeler where the distribution of the equivalent point loads representing wet-concrete weight in a Pour Concrete operation of a staged-construction analysis could be inaccurate near skewed section cuts. However, the total load representing the wet concrete was still correct, and the effect was limited by the degree of skew.
	10035	An incident has been resolved for the Bridge Modeler regarding the generation of support bearings at double-bearing bents where the bridge section on one side of the double-bearing bent was a composite bridge section, which does not allow general bearings, and the other side was a concrete box bridge section with general bearings specified. When the number of general bearings specified for the box girder was less than the number of girders for the composite bridge section, not all of the bearings for the composite bridge section were created.
	10074	An incident was resolved for the Bridge Modeler, affecting steel-plate longitudinal stiffeners for steel I-girder and U-girder bridge sections, where some longitudinal stiffeners assigned through steel beam editor would not be generated if two or more stiffeners had the same vertical-position ratio. When this occurred, only the first of the longitudinal stiffeners with the same vertical-position ratio would be processed and generated.
*	10149	An incident was resolved for the Bridge Modeler affecting precast box-girder bridge sections where the locations of the support bearings could be incorrect at a skewed abutment. When this occurred, the bearings were located as if the abutment was skewed in the opposite direction (i.e., at -30 degrees instead of 30 degrees). While the bearing locations were incorrect, the top of the bearings were connected rigidly to the correct location on the bottom of the precast box girders themselves. When this occurred, the effect was obvious in the generated model, and results agreed with the model as generated. This issue did not occur when bent properties (rather than abutment properties) were assigned to the start or end of the bridge object. No other bridge sections were affected.
*	10165	An incident was resolved for the Bridge Modeler where an abnormal termination could occur when trying to add or modify a bridge group definition when a bent property with a wall-type support was assigned to the bridge object.
	10177	An incident was resolved for the Bridge Modeler where, in certain rare cases, bridge object user-discretization points could not be assigned to certain spans. When this occurred, it could be resolved by exporting/import the model or by renaming the first span.

Data Files

Incidents Resolved

*	Ticket	Description
	10084	An incident has been resolved where importing a model from a text file could sometimes fail with an error message if the model contained one or more bridge seismic design requests.

Database Tables

Incidents Resolved

*	Ticket	Description
	10048	An incident was resolved where an error was reported if a formatted table with one or more columns specified to not be printed was printed as a text file.

Design – Concrete Frame

Incidents Resolved

*	Ticket	Description
	10067	An incident has been resolved to now show the design results in the database table for concrete frame design of nonprismatic frame sections. Previously, in the tabular data in the right-click design form, the PMMArea and/or PMMRatio was not shown for nonprismatic sections. Also, using Display > Show Tables, the entire row of design results for nonprismatic sections was not shown.

Design – Steel Frame

Incidents Resolved

*	Ticket	Description
*	9189	An incident was resolved for the AASHTO steel frame design code "AASHTO LRFD 2020" where the section classification for pipe and box sections was incorrect. They were always treated as Too Slender sections. The design checks were not performed, and the results were incorrect.

External Import and Export

Incidents Resolved

*	Ticket	Description
	10091	An incident was resolved where CSiBridge did not import CIS/2 files with measures in units that had prefixes other than milli, centi, kilo, or mega. For example, CSiBridge could not import a CIS/2 file in which masses were measured in decigrams. When this occurred the error was obvious: an error message was displayed and no model was created. The full range of CIS/2 unit prefixes, from 'atto' to 'tera', is now supported.
	10103	An incident was resolved affecting the import of CIS/2 files where the shape, dimensions, and properties of steel sections defined by reference to a catalog name were not imported. Instead these sections were imported with a default shape and default dimensions and properties, with warnings alerting the user of the issue. This incident affected CSiBridge v23.3.0 and later.

Results Display and Output

Incidents Resolved

*	Ticket	Description
	10101	An incident was resolved where exporting analysis results from the Bridge Object Response Display form would create an empty Excel table if two or more staggered diaphragms using the layout line as a reference line were assigned at the same distance. This only affected the export operation. No analysis or design results were affected. When opening an affected model in the new version, any affected bridge object will need to be updated to correct this export issue.

User Interface

Incidents Resolved

*	Ticket	Description
	9747	An incident was resolved in the Bridge Modeler for concrete tee beam bridge sections where the values for interior and exterior girder thickness above the flare, t3 and t4 respectively, could not be changed from their default values in the "Define Bridge Section Data" form.
	9995	An incident was resolved for the Bridge Bent Data form where a units conversion issue was occurring if the Bridge Bent Column Data form was opened, the length units on the form were changed, then both the Bridge Bent Column Data and Bridge Bent Data forms were closed with the OK button. When this happened the Bridge Bent Data form used the units from the Bridge Bent Column Data form which could incorrectly scale the length inputs on the Bridge Bent Data form.