

CSiBridge v27.0.0 Release Notes

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This document lists changes made to CSiBridge since v26.3.0, released 01-July-2025. Items marked with an asterisk (*) in the first column are more significant.

Analysis

Enhancements Implemented

*	Ticket	Description
	11653	A minor enhancement has been implemented to speed up the analysis model creation process while calculating section properties, including torsional constant J and plastic moduli Z22 and Z33, for all bridge section cuts if they are different. Previously, if the bridge contained non-prismatic girders and/or varied bridge section dimensions along the length, all section cuts could be different from each other, resulting in significant time to calculate the section properties. The torsional constant J of each bridge section cut is only used during analysis if the bridge is modeled as a spine model, and Z22 and Z33 are not needed. As a result, the calculation for the properties J, Z22 and Z33 of bridge section cuts are now ignored during analysis model creation when the bridge is not modeled as a spine model. However, the user can still get the J, Z22 and Z33 by visiting the frame section properties form for each bridge section cut (named as BRD plus bridge section cut number), click the 'Section Properties' button to bring up the Property Data form, then click the 'N/C' under any of these properties to get the values.

Bridge Design and Rating

Enhancements Implemented

*	Ticket	Description
*	10725	An enhancement was implemented to provide comprehensive calculation reports in Word format for precast concrete composite bridges designed in accordance with Eurocode EN 1992-2.
*	11477	An enhancement has been implemented to add bridge assessment/rating requests for multicell concrete boxes and precast concrete beams with composite slabs, in accordance with the British standard CS 454 for assessment of bridges.

Bridge Modeler

Enhancements Implemented

*	Ticket	Description
*	1761	The Bridge Modeler has been enhanced for the modeling of staggered diaphragms for precast concrete girder bridge sections providing the following features: (1.) Staggered interior diaphragms can now be assigned to the girders of precast concrete Super-T, precast concrete U-girder, and precast concrete box-girder bridges. (2.) Staggered exterior diaphragm can now be assigned between the girders of precast concrete U-girder bridges. (3.) Girder section cuts will be created normal to the precast girder lines even when the full-bridge section cuts are skewed at the same location. For precast concrete box-girder bridges under this situation, the adjacent girders will be sub-meshed and connected with link objects representing grout connections (shear-resistance only). (4.) In the Bridge Bent Assignment form for single-bearing bents, the "Mesh Girder to Match Bent Bearing" option will now be available for these three types of precast concrete girder bridges. When this option is set to "No", the girder local section cuts will remain normal to the girder line at skewed bents.
	11084	An enhancement has been implemented for the Bridge Modeler where bearings will be created for all girders at a single-bearing bent even when the girders before and after the bent are not aligned at the bent. Previously, the bearing links were only created for the girders that belong to the bridge section after the bent.

* Ticket	Description
11829	The Bridge Modeler has been enhanced for Super-T bridge sections providing the following features (1.) The option to specify one or two bearings per girder has been implemented at each support location. Previously only one bearing was allowed. (2.) Previously the flanges of adjacent girders were modeled as connected to the slab at the edges of the flanges. This connection has been removed and a very small gap is now modeled between flanges of adjacent girders. Super-T girders are now connected to the slab only at the web-flange junctions of the girders.

Data Files

Enhancements Implemented

* Ticket	Description
11696	An enhancement has been implemented that adds the material library for the Korean region. The library has materials from the following standards 1) Concrete materials per KBC2016, KS19 standards 2) Steel materials per KBC2016, KS22 standards 3) Tendon materials per KBC2016, KS22 standards 4) Rebar materials per KBC2016 standard.
11698	An enhancement has been implemented that adds a new steel section database for sections from Korea per the KS21 standard.

Installation and Licensing

Enhancements Implemented

* Ticket	Description
11514	The version number has been changed to v27.0.0 for a new major release.

Loading

Enhancements Implemented

* Ticket	Description
11483	An enhancement has been implemented for generating lane loading points in which the bridge deck superelevation is now considered in lane loading-point generation if the Objects Loaded By Lane is set to Program Determined in the Bridge Lane data form. Previously, the lane loading points were always in a horizontal plane that contained the associated layout line. When the bridge object was superelevated, the lane loading points were projected vertically down to the bridge slab to find the nearest point objects to load. When the bridge section webs/girders were set to be always vertical/plumb, the bridge section width was measured on the horizontal plane, in this case, there will be no effect of the present enhancement. If the webs or girders were rotated along with the superelevation, the bridge section width was measured along the superelevated plane. In this case, when the lane loading points were generated on the horizontal plane, the loading points at the edges of the lane could fall outside of the bridge section and would not be created if the distance between bridge-section edges and lane edges was nearly zero. With the current enhancement, this loss of lane loading points at the edges will not happen.

**Structural Model
Enhancements Implemented**

*	Ticket	Description
	11686	<p>An enhancement has been implemented for bridge template model generation in which a new option "Bridge Model Type" has been added to the Quick General Bridge Template form such that users can choose the model type (Spine, Area or Solid) to create the template bridge model. For composite bridges, when the "Generate Nonlinear Load Cases" checkbox is checked, the program will create "Girders and Diaphragms", "Deck Plus" and "Deck Cured NonComp" load cases. "Deck Plus" load case is to analyze the noncomposite bridge structure under wet concrete load and other permanent and temporary construction loads, and "Deck Cured NonComp" load case is to analyze the composite bridge under permanent dead load after concrete is hardened, and form is removed. The loads are specified in the "Slab Wet Concrete Load Assignments" form. When the model is created as a spine model, the frame objects can only represent the composite bridge. As a results, the definition of the above three load cases are different: (1) In "Girders and Diaphragms" load case, the load pattern DEAD will apply to all the spine frame objects with the factor equal to total girders weight over the entire bridge section weight. Note that in spine model, only approximated weight of all-space diaphragms is included. Staggered diaphragm will be ignored. Also, the weight of all diaphragms in Steel U-girder bridge, Concrete Super-T bridge and Precast Concrete Box girder bridge will be ignored in spine model. (2) In "Deck Plus" load case, the load pattern DEAD will apply to all the spine frame objects with the factor equal to the slab weight over the entire bridge section weight. In addition, the program generated equivalent haunch bridge line loads if any, equivalent SIP form bridge area loads if any, and equivalent permanent and temporary construction bridge area loads if any, will apply to the spine frame objects. (3) In "Deck Cured NonComp" load case, everything is the same as in "Deck Plus" load case except that the temporary construction load, if any, will not be included.</p> <p>Note: (1) The definition of the program generated bridge groups ALL_BUT_SLAB, GIRDER_DIAPH will be the same and include all superstructure spine frame objects plus all space diaphragms, if any. The program generated group SLAB includes all superstructure spine frame objects. (2) After the template bridge model is created, if the bridge model type is changed (i.e., from area object model to spine mode, or the other way around), then the program generated load cases will be regenerated and all the changes in these load cases from users will be deleted. (3) For spine models, the weight ratio between slab and girder of the entire bridge will be updated after the model is updated.</p>

Analysis

Incidents Resolved

*	Ticket	Description
*	11306	An incident has been resolved where an abnormal termination could occur when attempting to modify a staged-construction load case with a pour-concrete operation that referenced a concrete-pour definition that did not exist due to model corruption. This was not common.

Bridge Design and Rating

Incidents Resolved

*	Ticket	Description
	11519	An incident has been resolved for steel I-girder bridge design and rating where the bridge design and rating would fail when the bridge object was assigned a bridge section that had more than nine girders and the 10th girder and/or above was assigned with longitudinal stiffeners. When this occurred, no results were available for the affected design or rating requests.
*	11557	An incident was resolved for bridge superstructure design and rating of steel I-girder bridge sections where the calculation of the positive M_y for a steel I-girder could result in an incorrect classification of shallow steel I-sections due to yielding under self-weight when the neutral axis for positive bending was located within the composite slab. When this occurred, no design/rating results were reported for the incorrectly classified sections. This affected the steel I-girder design and rating requests for all codes in version 26.3.0 only.
*	11583	An incident was resolved for bridge superstructure rating per the AASHTO code where the flange lateral bending stress f_l was zeroed out in Steel I Service Rating when Use Stage Analysis=No. Impacted Rating Requests: Steel I Service, where parameter Use Stage Analysis = No. In those cases, the rating factor may have been reported as too high, since the f_l lateral bending stresses in the bottom flange were not considered in the AASHTO LRD eq. 6.10.4.2.2-2. Impacted rating codes: AASHTO all releases.
	11625	An incident has been resolved for bridge design and rating in which an error message could have been displayed and the design/rating terminated when (1) any of the demand set load combinations in the design/rating requests was deeply nested with three or more levels and the load combination in the third level of the demand set load combination contained at least one load case, and (2) there were more load combinations than total number of defined load cases. This problem could be avoided by reducing the number of levels in the demand set combo.
	11726	An incident has been resolved for steel U-girder bridge design in which the moment of inertia of bottom flange stiffeners on steel U-girders was incorrectly calculated using the centroid of the stiffener frame section for determination of bottom flange buckling capacity. It is now corrected based on AASHTO that it should be the moment of inertia at the *base* of the stiffener. This affected the superstructure capacity for negative moment of steel U-girder bridges.
*	11727	An incident has been resolved for steel I-girder bridge design when the Overhang Bottom at Girder was set to bottom of top flange in the Bridge Section Data form and parametric variations assigned to bridge width and overhang length. This could trigger an error message "invalid thickness of composite slab" during the superstructure design/rating process and fail the design/rating. The users are required to update the bridge model in order to correct the problem in the newly released version.

**Bridge Modeler
Incidents Resolved**

*	Ticket	Description
	11493	An incident was resolved for the Bridge Modeler where precast-concrete girder tendons could become disconnected from their girders when number of bridge spans was changed after the precast-concrete girder prestress tendons were generated and some additional bridge groups were also added to the model. When this happened, the program-generated groups for the prestress tendons were not properly regenerated and the tendons would be assigned to an incorrect loading group.
	11565	An incident was resolved for the Bridge Modeler where unexpected jumps could appear in the bridge-girder response diagrams for the uncommon case where (1) the layout line was defined using many piecewise-linear segments with different bearing angles, creating kinks between the line-segments, (2) a support was located right at one of these kinks, and (3) the bridge section widths were different before and after the support at the kink. This could cause the slab to be disconnected from the girders at the supports, resulting in excessive jumps in the bridge section-cut response at the supports. This could also affect the bridge superstructure design or rating at the jump locations.
	11638	An incident has been resolved for the generation of the connection between bridge support bearings and girders. For curved bridges with curved two-web girders, such as steel-U or precast concrete U, with a wide enough bottom flange, if the supports were highly skewed and the number of bearings per girder was one, the bearing link may not have connected to the girder bottom flange at the mesh point.
	11641	An incident has been resolved for bridge modeling related to the setting of the North Arrow Direction when the bridge object superelevation was nonzero and not constant, and supports were skewed. Changing the North Arrow Direction angle could have resulted in a very small difference in joint coordinate calculations near the skewed support and caused disconnection between bridge girders and the bearing links.
*	11714	An incident has been resolved for Steel I-girder bridge staged construction load cases in which the stay-in-place (SIP) form load was incorrectly double counted once the operation Remove Forms was executed after Pour Concrete operation from a previous stage or load case. This error was introduced in v26.3.0.
	11743	An incident has been resolved for steel I-girder bridge modeling and superstructure design/rating in which (1) the bridge slab area objects could form a triangular hole if (a) the "Mesh Slab at Critical Steel I-girder Locations" check box in the Update bridge Structural Model form was checked, and (b) two adjacent girder (girder g and g+1) section transition locations were both within two adjacent global section cuts (cut-i and cut i+1), and the girder g's section transition was near the cut i within around 1/10 of the distance between two section cuts, and the girder (g+1)'s section transition was not. This problem might not affect the analysis results but could fail the design/rating. (2) the design/rating could fail if two of the section cut directions were in transition from positive angle to negative angle or the other way around (global X axis is the origin), and there was at least one critical steel I-girder location (section transition, staggered diaphragm or staggered girder splice). The users are required to update the bridge model in order to correct the problem in the newly released version. These two situations rarely happened. The workaround for the first item is to slightly shift the girder transition location where it happens, and for the second item is to change the initial bearing of the layout line to avoid the problem.
	11810	An incident was resolved for steel I-girder bridges where superstructure design and rating would not run in certain special cases when all of the following conditions were present: (1) the bridge-object section dimensions were varied along the length, (2) the layout-line orientation and bridge-section cut orientations were such that the change of bridge section-cut orientations along the bridge was gradually transitioning from first quadrant to fourth quadrant or vice-versa, or from second quadrant to third quadrant or vice-versa, and (3) a staggered diaphragm was assigned within one of these quadrant transitions. This could cause the bridge design or rating to fail when calculating girder stresses. When this occurred, results were not available. Results that were present were not affected by this issue and were correct.

* Ticket	Description
11851	An incident was resolved for the Bridge Modeler affecting voided-slab bridge sections where parametric variations assigned to the center-to-center distance between the voids were ignored, so that the distance between the voids was kept constant along the length of the spans. Results agreed with the model as generated.

Database Tables

Incidents Resolved

* Ticket	Description
11553	An incident was resolved where the rotational-stiffness values for area edge-release assignments were not included in the display table. This also affected the exported text file, and upon importing the text file that was missing the rotational-stiffness values, an error would appear in the import log and the rotational-stiffness values would be zero.
11662	An incident has been resolved to add missing database tables for bridge design request parameters of all IRC-112-2020 concrete design requests.
11855	An incident was resolved where, in certain rare cases, the results for one or more bridge design requests and/or bridge rating requests were missing in the database tables for display or export when using the database commands (e.g., Display > Show Tables). Table results were still available for individual design or rating requests using the "Show Table" option on the Bridge Response Display form.

Design – Steel Frame

Incidents Resolved

* Ticket	Description
11509	An incident has been resolved in the AASHTO steel frame design code, in which an error condition would occur during design if there was a user-defined lateral bracing assignment. The error was evident as there was no output.

Loading

Incidents Resolved

* Ticket	Description
11824	An Incident was resolved where selecting the option to "Ignore Vertical Loads if Horizontal Centrifugal or Braking Loads are Defined" when defining a vehicle would cause all loads to be ignored for that vehicle in multi-step "Vehicle Live" or "Train Live" load patterns. When this occurred, the results corresponding to that vehicle were all zero. Influence-based moving load cases were not affected by this issue.

Results Display and Output

Incidents Resolved

* Ticket	Description
11345	A minor change has been made to the Bridge Response Display form to disable the option to show the vehicle location if the result type is not Force or Stress, since this feature is only available for forces and stresses.
11427	An incident has been resolved in AASHTO Concrete 07, AASHTO LRFD 2012, AASHTO LRFD 2014, and AASHTO LRFD 2020 concrete frame design codes in which the displayed options on the Interaction Surface form were not labeled correctly for Section Designer sections. To fix the issue, the option 'phi' is changed to 'Non-Seismic Phi', the option 'no phi' is changed to 'Seismic Phi', and the option 'no phi with fy increased' is changed to 'No Phi'. This was a display issue only.
11615	An incident was resolved where the Bridge Response Display form showed no response (was blank) for a bridge object with concrete-box or tee-beam bridge sections if the bridge-section data was specified such that there was no overhang outside the exterior girders. This affected bridge objects modeled as area or solid objects, not spine models. This was a display issue only and did not affect the analysis and design results.

Structural Model
Incidents Resolved

*	Ticket	Description
	11549	An incident was resolved where the overall length of the cable-stayed bridge, created via the template, was always based on default span values instead of the values input by the user.

User Interface
Incidents Resolved

*	Ticket	Description
	11533	An incident was resolved where Points and Lines drop-down menus were missing from the Edit panel in the Advanced tab in the Ribbon layout.
*	11734	An incident has been resolved for assigning parametric variations to the super-T girder bridge girder spacing in which the program incorrectly reset the assignment to be constant for the i-th girder spacing and subsequent girder spacings ('i' was the number of girders in the span) in the Bridge Section Variation Definition form.
	11845	An incident was resolved affecting the user interface for defining Job Scripts where a NamedSet specified in the job scripts Table Export Named Set form that had been created by the Add Copy Option was unable to be edited, the OK button was disabled, and Delete function did not work as expected. This was a user-interface issue only and did not affect the functioning of the job scripts.