

CSiBridge® Version 21.0.1 Release Notes

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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 v21.0.0 (Released 2018-12-26)

Installation and Licensing

Enhancements Implemented

*	Incident	Description
*	228283	The version number has been changed to v21.0.1 for a new minor release.

External Import/Export

Enhancements Implemented

*	Incident	Description
	94426	The option to export the analysis model to Perform-3D has been added to the 64-bit version. Previously this was only available for the 32-bit version, which is no longer available starting with v21.0.0. Note that this export option is provided in Menu mode, but not under Ribbon mode.

User Interface

Incidents Resolved

*	Incident	Description
	226593	An incident was resolved where an abnormal termination could occur when viewing a staged-construction load case and selecting a stage that has a "Set Traveler for Segment" operation. This was a user interface issue only and did not affect results. This error did not occur when defining or viewing load cases in the Scheduler or database tables. This error only affected v21.0.0.
	227646	An incident was resolved in which an error would occur when attempting to edit a precast I-girder frame section from the quick bridge template.

Bridge Modeler

Incidents Resolved

*	Incident	Description
	225755 226338	An incident was resolved for the Construction Scheduler where opening an existing schedule that contained a Pour Concrete or Remove Forms operation would cause an internal error that prevented being able to save changes made to that schedule. Results were consistent with the schedule before modification. No other results were affected.

* Incident	Description
* 227696	An incident was resolved for the Bridge Modeler affecting steel I-girder, steel U-girder, and precast I-girder bridge sections where the girder length within a span could be incorrectly calculated in the case where staggered diaphragms are located using the layout line as the reference. The calculated girder length is used to determine nonprismatic section transitions, rebar layout, and unbraced lengths for superstructure design of steel I-girders. As a result, analysis and design results could be incorrect. The error was limited to cases where staggered diaphragms cross global (full-width) section cuts, which typically only occurs near skewed supports. Note that the use of the layout line as a reference for locating staggered diaphragms was new in version 21.0.0, so models created in previous versions were not affected when run in v21.0.0 unless the reference was changed to use the layout line. Previously, staggered diaphragms could only be located with reference to adjacent girders, which was not affected by this error.
227758	An incident was resolved for the Bridge Modeler where beam-type diaphragms assigned to spans with steel and precast I-girder bridge sections could be located at the incorrect elevation if the frame section used for the diaphragm was non-prismatic. Results agreed with the model as generated, and the elevation used was obvious when looking at the extruded view of the model. The primary effect was an incorrect moment in the beam diaphragm itself and locally in the connected girders due to the incorrectly offset axial force in the diaphragm.

Modeling

Incidents Resolved

* Incident	Description
* 223823	An incident was resolved where tendons modeled as elements within curved frames were not connected to the curved frames elements. Tendons modeled as loads worked as expected.
225550	An incident was resolved where models created in v20.1.0 and earlier, could generate an error when attempting to open the tendon layout form from within a precast I-girder frame section. The precast I-girder has also been corrected to allow all tendons to be removed.

Loading

Incidents Resolved

* Incident	Description
226273	An incident was resolved where external tendons (those not contained inside a frame, shell, or solid object) could exhibit instabilities and excessively large deflections. This is due to a change made for versions 20.2.0 to 21.0.0 to model tendons as having axial stiffness only. This works well for tendons elements connected to other objects, but not for external tendons which need transverse stiffness for stability. Now only tendon elements with both ends constrained to a containing object will neglect transverse stiffness. Tendon elements with either or both ends external to other objects will include transverse stiffness based on the section and material properties, similar to the behavior before v20.2.0. Note that tendons that are completely straight may now report torsional instability if any portion of them is external: the instability in this case is insignificant and has no effect on results, and the warnings can be safely ignored.
* 226489	An incident was resolved for the Bridge Modeler where haunch loads and SIP-form loads specified in the bridge section for composite bridges (steel I-girder, steel U-girder, and precast I-girder) were not being generated for any span that had more girders than the first span, and all subsequent spans after that. When this occurred, the haunch and SIP-form loads were lost and the total dead load reduced in the affected spans. The lost load was generally small compared to the weight of the slab.

* Incident	Description
* 227808	An incident was resolved where the bounding box used to connect tendons to frame elements was set to zero in certain models. This could cause prestress load to be lost for tendons modeled as elements, or cause tendons to be connected only at their ends for tendons modeled as elements. Bounding boxes can be displayed using the option under command View > Set Display Options. When the error occurred, the affected frame objects showed no bounding box. Whether or not a model was affected depended on the number of frame objects, frame and tendon section properties.

Analysis

Incidents Resolved

* Incident	Description
* 227289	An incident was resolved where staged construction load cases were sometimes not able to converge in stages that applied load if all the previous stage(s) in the same load case had no applied loads. The tolerance used in stages without loads was very small and was not being changed when loads were applied in later stages. Now the tolerance will be reset for each stage according to the magnitude of the load applied. When this issue occurred, results were not available. This issue only affected v21.0.0.

Bridge Design

Incidents Resolved

* Incident	Description
* 225518	An incident was resolved for bridge superstructure design of steel I-girder and U-girder bridge sections using the "Constructibility Staged" type of design request where the design results could be incorrect because the calculated stresses were not considering the "Flag As Composite" or "Unflag As Composite" operations in the assigned staged-construction load cases. Now the flagging operations in the staged construction load case will be properly considered. However, if the slab is determined not to be present at a given stage, it will be treated as non-composite regardless of the flag. Note that this error did not affect design requests of type "Constructibility NonStaged", which correctly considered the "Flag/Unflag as Composite" operations.
227030	An incident was resolved where importing a model from text file or database tables would fail to bring in the definitions of bridge superstructure rating requests for AASHTO Serviceability checks of Flat Slab, Concrete Box and Precast Concrete (I and U) bridge sections. These needed to be redefined after importing the model. No other type of bridge superstructure rating or design requests were affected.
227073	An incident was resolved where bridge superstructure design requests of type strength, service, or constructability for steel I-girder or U-girder bridge sections would fail to run under the following uncommon situation: (1) The parameter "Use Stage Analysis" is set to "Yes", (2) multiple demand sets are defined in the design request, (3) all load combinations in the demand sets are of type "Envelope", and (4) the load combinations reference the same load case. Normally the load combinations would be of type "Linear Add" when combining dead and live load, for example. The design request will now run, although the results may not be meaningful. The engineer is responsible for creating meaningful load combinations and demand sets. This issue affected design requests for the following codes: AASHTO, British BS, Canadian CAN/CSA, Eurocode, and Indian IRC.

*	Incident	Description
*	227306	<p>An incident was resolved that addressed two issues for bridge superstructure design and rating of precast concrete I-girder bridge sections:</p> <p>(1) When the number of spans, the number of girders, or the number of tendons in any of the PCI girders was more than nine (i.e., two digits), the bridge superstructure design/rating process could fail to find the correct tendon name. In such a case, the design/rating request would generate an error message and fail to complete, and no results were available.</p> <p>(2) Bridge section cuts used to calculate bridge superstructure response and used for bridge superstructure rating and design did not include some tendon forces at the skewed ends of spans. This only affected tendons defined inside the precast I-girder and located on the side (left or right) of the I-girder that is interior to the span due to the skew. Tendons on the other side of the girder that protruded beyond the skew were correctly included in the section cut. This affected bridge superstructure response when the "Include Tendon Forces" option was selected, and also the calculations for design and rating that use the secondary prestressing forces. No other results were affected, although the effect on design and rating could be significant, generally conservative.</p> <p>These two issues affected versions 20.2.0 to 21.0.0.</p>
*	227460	<p>An incident was resolved for bridge superstructure design of steel I-girder and U-girder bridge sections where the composite flag used for design requests of type "Constructibility-Staged" could be incorrectly set under the following conditions: (1) The staged construction sequence was defined through multiple sequential load cases, (2) Some of these staged construction load cases were included in the demand sets of a "Steel-I Comp Construct Stgd" or "Steel-U Comp Construct Stgd" design request, and (3) The operations "Flag As Composite" or "Unflag As Composite" were assigned to more than one of these load cases. Under these three conditions, the design request was not always able to determine the correct composite status of the slab and the design results could be invalid. On the other hand, for the case where the entire staged-construction sequence was defined in a single load case, the design request was able to trace the composite status correctly and the result were valid. In either case, the composite status assumed for design was being reported with the results, and the results were consistent with that status.</p>
*	227487	<p>An incident was resolved for bridge superstructure rating of steel U-girder bridge section where the "Steel U Composite Rating Strength" request was using incorrect shear demands when evaluating rating factor for shear. The demands for one U-girder were incorrectly assumed to be resisted by one web only, thus producing over-conservative rating factors. In the corrected algorithm, the shear for each U-girder is resisted by two webs. An additional correction was made to report the shear along the web rather than just the vertical component. This decreases the rating for inclined webs by the cosine of the angle from vertical. However, the net effect is still to increase the rating factor for the web.</p>
	227506	<p>An incident was resolved where the command Design/Rating > Load Combinations > Add Defaults would not create any bridge load combinations for the AASHTO code if the Amendment option was changed from "None". Load combinations could be added by other means, including from the New Model template or database tables. Only the AASHTO code was affected. Only version 21.0.0 was affected.</p>

*	Incident	Description
*	228377	An incident was resolved for bridge superstructure design and rating of precast I-girder bridge sections where the location of the tendon in the precast I-girders could be incorrect when used to determine the flexural resistance (capacity). In particular, the vertical location of all tendons in the frame section was taken to be the same as one of the tendons in the section. This could result in the positive or negative flexural resistance being incorrect. The area and center of gravity (CG) of the tendons used to compute the positive and negative resistance were correctly reported in the design output tables and reports. This error only affected tendons that were defined as part of the precast I-girder frame section, not those created directly as part of the bridge objects. This error only affected the design and rating requests of type "Precast Comp Flexure". The only affected versions are 20.2.0 to 21.0.0. Models designed and/or rated using these versions should have their flexure checks re-run for confirmation. No other results are affected. Note that models imported from text files (.SBR, .B2K) or database tables should have their bridge objects updated. Models opened directly from the model file (.BDB) do not need to be updated.

Results Display and Output

Incidents Resolved

*	Incident	Description
	227225	An incident was resolved for bridge superstructure rating where the demand calculation reports could not be created for concrete bridge sections when the live-load distribution factors (LLDF) option was set to "Use directly forces from analysis". This impacted all AASHTO rating requests for multi-cell concrete box girder, precast I-girder, and precast U-girder bridge sections. It only affected availability of the detailed demand calculation reports, not results presented graphically or in the tables. The results themselves were correct.
	227436	An incident was resolved where the software could sometimes terminate when trying to get section-cut results for a moving load case when the requested section cut(s) included solid elements. No other results were affected.