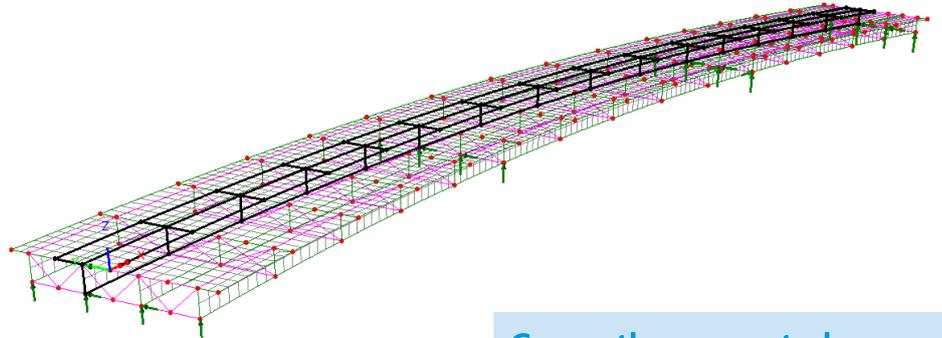


Composite Bridge Deck Design

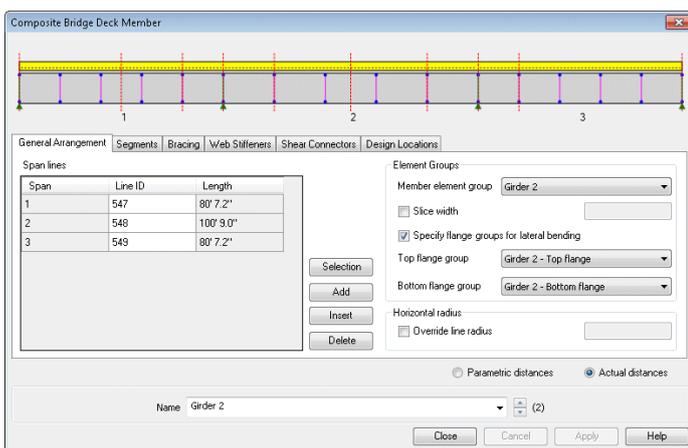
The Composite Bridge Deck Design software option carries out comprehensive calculations on design members for steel or steel/composite bridge decks to AASHTO LRFD 8th Edition, allowing otherwise time-consuming and error-prone manual design calculations to be carried out efficiently.



Currently supported:

- AASHTO LRFD 8th Edition (2017)

- Provides full details of the calculations made, referencing all relevant clauses and equations from the design code. Full details of design checks undertaken can also be written to a model report.
- Allows for the complexity of the analysis model to be increased without changing the design data, and also permits a number of changes to be made to the design information to see what the effect of a particular change would be, without having to change or solve the analysis model each time.
- For use with 2D Grillage/Plate and 3D element model types. When used with LUSAS Bridge LT, only 3D beam and 2D grillage models are permitted.



Design members

Use the Steel Composite Bridge Wizard to automatically create the required Composite Bridge Deck Design members when bridge design materials are additionally specified for all I-girders. Add details for transverse stiffener design too.

Define additional design details for each design member using a tabbed dialog. Span lengths, segments (a portion of a span defined by a constant or tapered section), bracing locations, web stiffeners, shear connectors and locations at which design checks will be made, can all be specified.

Summary results

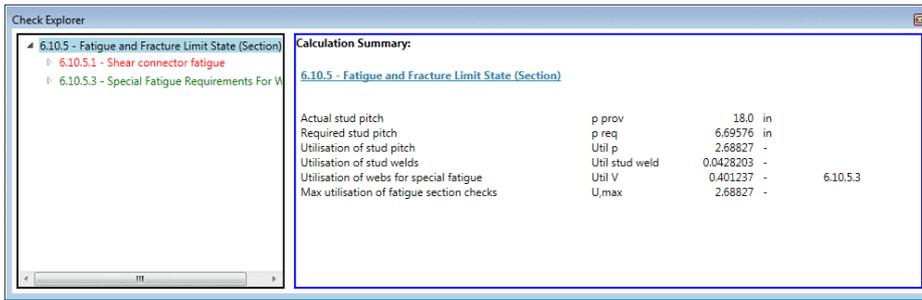
Display design check results in a summary format that references the checks carried out and the values obtained. Click on separate tabs to show full results for each check.

Design checks are colour coded green to indicate a pass, and red to indicate a failure. Each result cell provides a context menu to allow further investigation of a design check value.

Design Check	Span	Section ID	Location [in.]	Design Combination	Primary Component	Flexure	Utilisation
6.10.2 - Cross section Proportions		16 / 1					1.000
6.10.3 - Constructibility	2	19 / 1	2176.200	Stage 4	My (Max)	"negative"	0.402
6.10.4.2 - Service Limit State - Permanent Deformations	2	19 / 1	2176.200	Service II	My (Max)	"negative"	0.476
6.10.5 - Fatigue and Fracture Limit State (Section)	2	19 / 1	2176.200	Fatigue I	Fz (Range)	"negative"	2.688
6.10.5 - Fatigue and Fracture Limit State (Fatigue Details)	3	16 / 1	2563.080	Fatigue I	My (Range)	"positive"	0.317
6.10.6 - Strength Limit State	2	19 / 1	2176.200	Strength I	Fz (Min)	"negative"	0.782
6.10.11.1 - Transverse Stiffeners	1	16 / 1	193.440	Strength I	My (Max)	"positive"	Fail
6.10.11.2 - Bearing Stiffeners		16 / 1	0.000	Strength I	Fz (Max)	"negative"	Fail

Outline results

Drill-down into the outline results to examine the various parts of the design check.



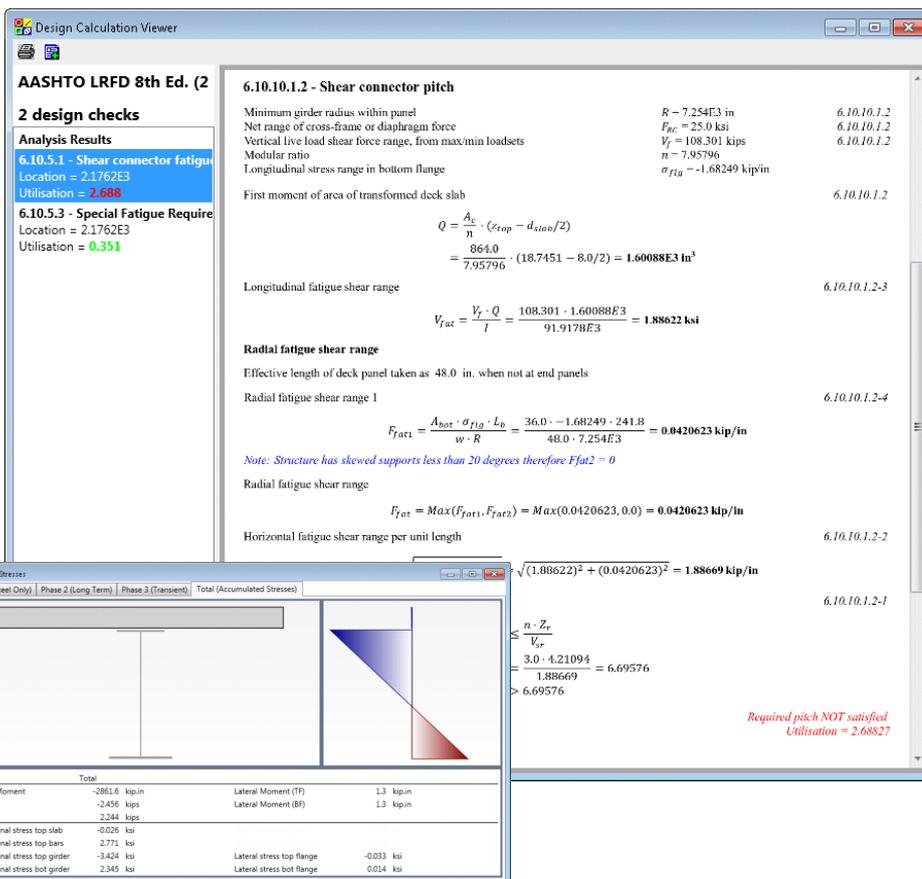
Detailed calculations

View detailed calculations to see the full details of the design checks carried out for a selected design value.

Display analysis data such as section dimensions and section materials, and forces, properties and stresses used in the various phases of design, to allow checking of such details.

Click on a clause reference and utilisation value to view detailed calculations for that check and result.

Print or add analysis data and rendered design checks to a model report. Each time the model report is generated, the member report data will be updated to match the current state of the model.



Other capabilities

View section stress profiles for the various load phases and section properties used in the design check.

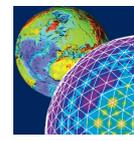
Edit section dimensions and see the design check calculations re-evaluated instantly based on the new section data using the previously solved results from the model. This provides the ability to make what-if design changes to try and ensure a valid design before re-visiting and updating the bridge model.

Composite Deck Design

- Extend your workflow from analysis into detailed design.
- Produce summary information in tabular and report-based formats and quickly see pass/fail criteria.
- See full details of the calculations made, referencing all relevant design clauses and equations.
- Create design reports individually or append them to the report for the whole model.
- Each time a model report is generated the data is updated to match the current state of the model.

AASHTO 8th Ed. clauses supported:

- 6.10.1.6 Flange stresses
- 6.10.2 Cross-section proportion limits
- 6.10.3 Constructability
- 6.10.3.2 Flexure
- 6.10.3.3 Shear
- 6.10.4 Service
- 6.10.4.2 Permanent Deformations
- 6.10.5 Fatigue and Flexure
- 6.10.5.1 Fatigue (Shear connectors and web stiffener/flange connections)
- 6.10.5.3 Special Fatigue for Webs
- 6.10.6 Strength
- 6.10.6.2 Flexure
- 6.10.6.3 Shear
- 6.10.7 Positive Flexure
- 6.10.8 Negative Flexure or Appendix A6 as applicable
- 6.10.11.1 Transverse Stiffeners
- 6.10.11.2 Bearing Stiffeners



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