software option

LUSAS
Finite Element Analysis

RC Frame Design

The LUSAS RC Frame Design option builds upon the renowned modelling and analysis capabilities of LUSAS and extends the engineer's workflow to allow design code checking of reinforced concrete members.

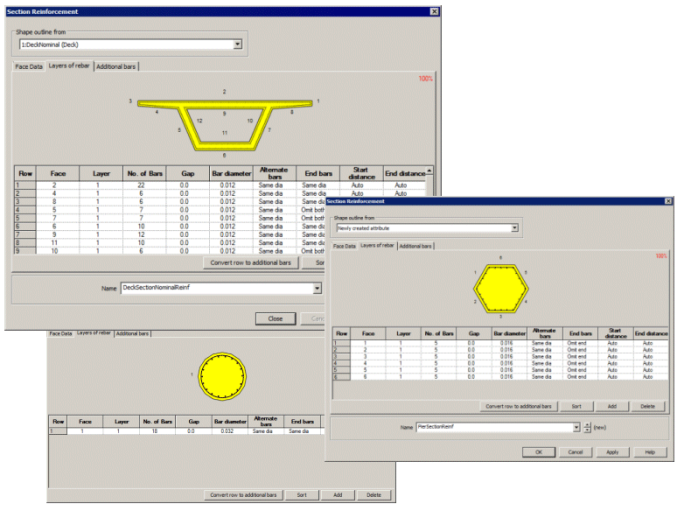
Carry out checking of reinforced concrete decks/beams, piers/ columns and piles subject to bending and axial force at Ultimate Limit State (ULS) and Serviceability limit states (SLS). Regular, arbitrary shaped, tapering and voided members are supported.

Design codes supported

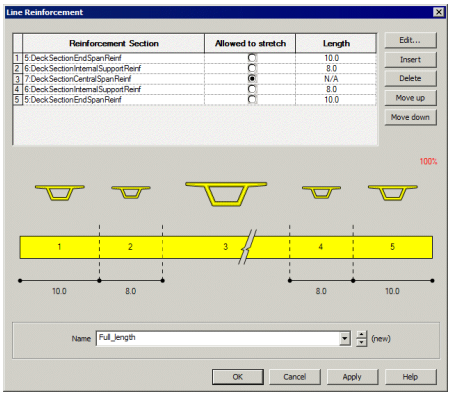
- AASHTO LRFD 8th LRFD Ed.
- AS5100.5:2017
- CSA S6-14
- IRC:112-2011
- EN1992-1:2004 - EN 1992-1-1:2004 +A1 Eurocode 2
- EN1992-2:2005 - EN1992-2: 2005 Eurocode 2

Defining reinforcement

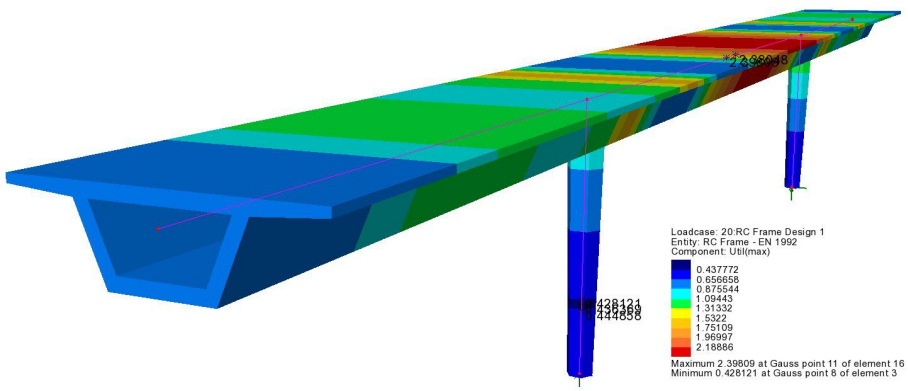
- Define layers of reinforcement by entering rows of table data (cover, allowance for links, number of bars, bar diameter etc.) for each numbered face in a chosen cross-section.
- Bars are spaced equally, and where bars in different faces are shown to clash, end bars from selected faces may be omitted.
- Use multiple rows of table data to position bars in multiple layers within a face, or to specify more dense or sparse reinforcement within a layer. Alternating bar arrangements and manual bar placements are also supported.
- Bar spacing, as used for determination of crack widths, is calculated by considering where each bar, or any bundled bars are with respect to other bars in the section.
- Specify how individual reinforcement arrangements apply over a length of a line, or over multiple lines that represent a concrete member.



Typical section reinforcement definitions



Specify multiple reinforcement arrangements for a member (or series of members)

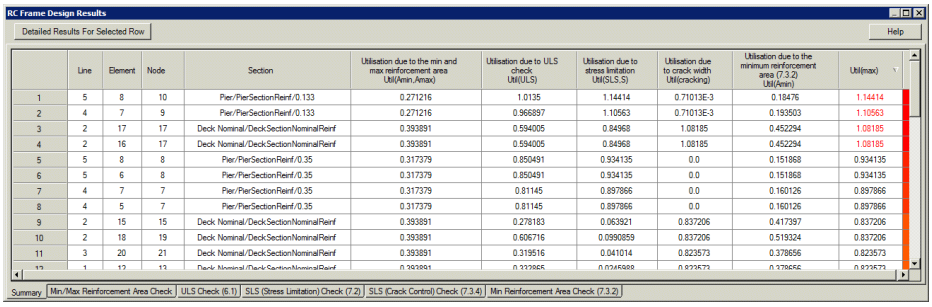


Utilisation contour plot with marked values

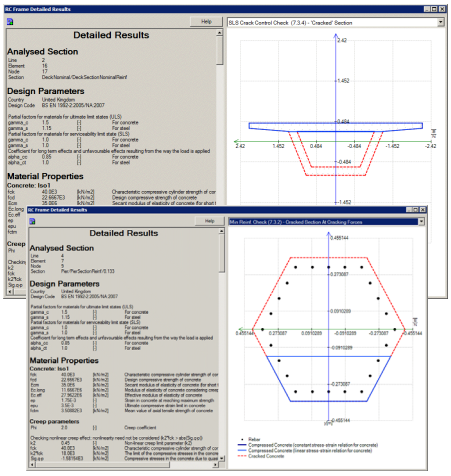
...continued

Viewing design results

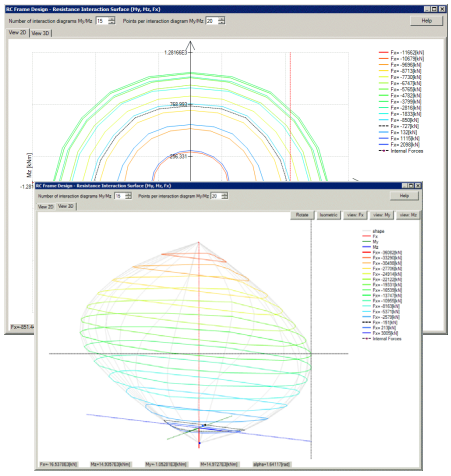
- Select results components for individual design checks, and obtain maximum utilisation factors in all, or selected members.
- View results as Utilisation ratios on a results viewing layer for a selected design code, and active loadcase, load combination or envelope.
- Produce a tabular summary of design check results for selected members and loadcases, view detailed results and generate interation diagrams.
- Save results for use with Microsoft Excel, or add them to a model report, and each time the report is generated the reported design data will be automatically updated to match the current state of the model.



View design check results in tabular form

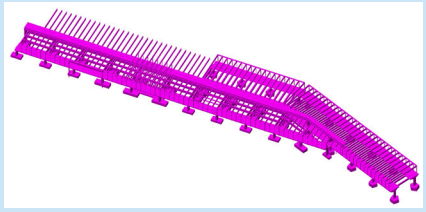


Examine detailed results



Display interaction diagrams

User testimonial



"The capacity of the RC frame design module to deal with complex section geometry has been fundamental in allowing us to carry out design checking of the individual members of the structure within a limited timescale. Its use is straightforward, from the definition of the geometric properties, to the post-processing and viewing of the results. Ultimate and serviceability limit state checks can be viewed by either plotting contour maps of the utilization coefficient on members of the structure, or by tabulating all or selected details for members of interest and including that data in a model calculation report."

Carlo Margheriti, Senior Engineer, Alhambra srl.

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- Extend your workflow from analysis into RC deck/beam, pier/column and pile design.
- View results as Utilisation ratios on a results viewing layer for a selected design code, and active loadcase, load combination or envelope.
- Produce summary information in tabular and report-based formats and easily see pass/fail values
- Create design reports individually or append them to the report for the whole model.
- Mix summary reports for the whole structure with detailed reports of critical members.
- Create templates to speed reproduction of similar content.
- Learn it fast. Existing users can easily apply the new RC frame designer because it works in a similar way to other tools they have become familiar with.

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