PontiEC4

Steel and steel-concrete composite bridge decks
Eurocode design calculations

PontiEC4 is a standalone software program carrying out comprehensive calculations to the Eurocodes for grillage and box decks with composite or steel sections also including stiffened flanges as orthotropic plate. The software deals with cross references in Eurocode suite, that make design calculations time-consuming and error-prone without use of Ponti EC4.

The user enters moments and shears from an analysis model, dimensions and selects material data from a library. PontiEC4 carries out design calculations covering ULS bending, stress, shear and interaction; SLS stress, web breathing and cracking and fatigue checks for main members and connectors. Output uses intuitive graphics and tables and a report is produced automatically in rtf format.

Rapid and well-structured input

Input is designed to be rapid, using graphics together with Excel spreadsheet-style for design envelopes of stress resultants; PontiEC4 has a direct interface to LUSAS Modeller and format conversion of design results for other FE systems is achieved in Excel.

A library of steel & concrete material properties makes input rapid, while retaining full flexibility for the user to tweak parameters to suit project requirements.

Sections are described by the engineer in a simple dialog box and organized in a tree structure

Load effects for the various sections to be checked are entered in a spreadsheet style. Construction stages and in-service conditions are assimilated and design combinations organised in groups

Automated ULS, SLS & fatigue calculations

- Section properties
- Primary (isostatic) effects of shrinkage and temperature change
- Creep & shrinkage coefficients (EN1992-1-1, App B)
- Classification of sections (EN1993-1-1, Table 5.2)
- Ultimate bending check for Class 1 & 2 sections (EN1993-1-1, 6.2.5)
- Stress checks for Class 3 & Class 4 sections (EN1993-1-5, Section 4)
- Ultimate shear & web buckling (EN1993-1-5, Section 5)
- Bending-shear interaction (EN1993-1-5, Section 7)
- SLS stress checks (EN1994-2, 7.2.2 (5) & EN1993-2, 7.3)
- SLS web-breathing check (EN1993-2, 7.4)
- RC crack checks (EN1994-2, 7.4.2)
- ULS, SLS and fatigue checks for connectors (EN1994-2, 6.6 & 6.8)
- ULS, SLS bolted connections (EN 1993-1-8)
- Fatigue checks for both structural steel and reinforcement components (EN 1993-1-9, EN 1994-2, EN 1993-2)
- Longitudinal and transversal stiffeners check (EN 1993-1-5, 9.2.1, (4), (8), (9), 9.3.3 (3))

Advanced options for the top flange (D)

Shear lag and / or the buckling of longitudinally stiffened flanges is considered
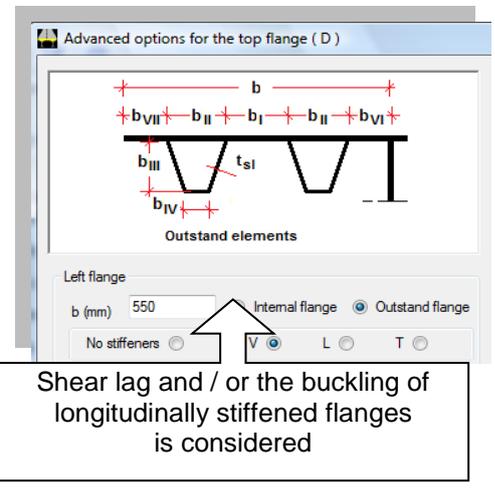
Output & reporting

A multi-page form gives the summary results from the checks for each section.

Emphasis on descriptive graphics e.g. bending-shear interaction diagram with the web contribution included or excluded.

A report is produced automatically in rtf format, containing all input data and output with references to the Eurocode clauses.