

Module Specifications B.01_{US} – Design of steel/concrete composite beams

- Graphical Section generator and beam elevation generator for composite beams comprising:
 - Rolled steel standard beam section or I section plate girder
 - Rectangular concrete slab on top of girder
 - One or two layers of reinforcement in the slab
 - Rectangular or trapezoidal concrete haunch between the steel girder and concrete slab.
 - Concrete slab edge detail of any shape.
 - Option for top flange cast into slab
 - Lateral bracing to compression flanges.
 - Web stiffeners
- The beam elevation may comprise up to 5 different sections specified at up to 20 different locations along the beam. In addition the elevation of the bottom flange may be described using a series of straight lines, arcs or parabola.
- Loadings which may be specified are Strength Limit State and Service Limit State moments and shears for:
 - Temperature gradient secondary moments - positive case, and reverse case.
 - Shrinkage modified by creep secondary moments (long term effects)
- Settlement of supports
- Beam constructibility
- Construction stages (up to 3 allowed) for staged concreting along the elevation of the beam.
- Wearing surface and other superimposed dead loads.
- Moments and associated Shears for worst positive and negative moment live load cases.
- Worst live load Shears and associated Moments.
- Shear Force range for fatigue.
- The load effects data may be entered by:
 - Direct entry on screen.
 - Reading from ASCII text file.
 - Direct transfer from SAM analysis module results, if licensed.
- Calculation to AASHTO LRFD Article 6.10.4, Article 6.10.5, Article 6.10.6 and Article 6.10.7 as appropriate for the following options:
 - Moments during construction at the relevant stages
 - Moments for worst positive or negative moment load case
 - Shear Force
 - Shear Force + associated Moments (Interaction plot may be produced)
 - Longitudinal Shear Force for Strength and Fatigue Limit States
 - Shrinkage modified by creep, primary stresses.
 - Temperature Gradient primary stresses
- Options to include effects of shrinkage / creep or temperature gradient; to use the Q formulae if applicable, and to include or exclude the haunch stiffness. Calculation of distribution factors to AASHTO LRFD Article 4.6.2.2
- Graphical results plot of permissible stresses and actual stresses (or permissible and actual moments (Strength Limit State) or permissible and actual shears as appropriate)
- Logical selection of loadings during design (e.g. differential shrinkage/creep included only if adverse).
- Fully detailed hand calculation style output and tabular summaries are produced for all the calculations listed above.
- for all the calculations listed above.

Module Specifications B.03_{US} – Design of pre-tensioned pre-stressed concrete beams

- Graphical Section generator and beam elevation generator for beams comprising:
 - Standard precast concrete beams:
 - Bulb-Tee, I-Girder, Multi-stem Tee, Double Tee, Channel, Single Tee, Box Beam, Voided Slab and Solid Slab.
 - User defined precast concrete beam shape.
 - Standard in situ concrete shapes.
 - User defined in situ concrete shapes (e.g. for parapet upstands).
 - Additional steel reinforcement.
- Graphical tendon editor for fast insertion and removal at standard locations, or de-bonding, or deflecting. The editor is accessible directly from calculations screen allowing fast modification and repeat analyses.
- The beam elevation may comprise up to 5 different sections specified at up to 20 different locations along the beam, with varying soffit and/or crown heights.
- Loadings which may be specified are Strength Limit State and Service Limit State moments and shears for:
 - Temperature gradient secondary moments - positive case and reverse case.
 - Shrinkage modified by creep secondary moments (long term effects).
 - Settlement of supports.
 - Beam erection (e.g. temporary supports).
 - Construction stages (up to 3 superimposed stages allowed, stage 1 may be split into 2 longitudinal stages)
 - Wearing surface load.
 - Moments and associated shears (5 cases allowing for both simply supported and continuous loadings).
 - The transient loading items for the Service Limit State may be given as either Service I or Service II.
- The load effects data may be entered by:
 - Direct entry on screen
 - Reading from ASCII text file
 - Direct transfer from SAM analysis module results, if licensed.
- Calculation to AASHTO LRFD Article 5.7.2.1 for Strength Limit State and Article 5.9 for Service Limit State, for the following options:
 - Moments at transfer
 - Moments during erection
 - Moments at construction stages
 - Transient load moments for simply supported condition, and for continuous condition
 - Shear + associated Moments
 - Longitudinal Interface Shear
 - Shrinkage modified by creep, primary stresses.
- Temperature gradient primary stresses Calculation of distribution factors to AASHTO LRFD Article 4.6.2.2
- Graphical results plot of permissible stresses and actual stresses (or permissible and actual moments (Strength Limit State) or permissible and actual shears as appropriate)
- Logical selection of loadings during design (e.g. differential shrinkage/creep included only if adverse).
- Fully detailed hand calculation style output and tabular summaries are produced for all the calculations listed above.