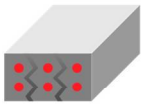


CRACK WIDTHS

BEAM AND SLAB CRACK WIDTH DESIGN

DESIGN | C15

Summary

Design reinforced concrete sections to meet specific crack requirements. Both rectangular beam and slab sections can be designed to resist the effects of axial tension, bending moment and temperature and the combination thereof. Temperature effects are also included to evaluate early cracking and long-term thermal cracking.

The module accounts for concrete shrinkage due to hydration by a combination of the thermal expansion coefficient and the restraint factor. The design method employed by the codes is ideally suited for non-temperate regions like Europe.

What makes this module special?

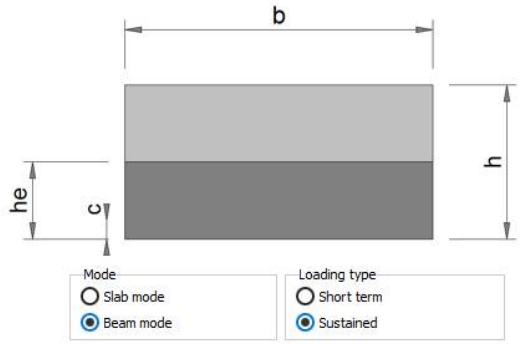
- Multiple section types
- Evaluate early and long-term cracking
- Multiple sets of bars calculated

Detailed Description

Crack Width can be used to design reinforced concrete sections to meet specific crack requirements. Both rectangular beam and slab sections can be designed to resist the effects of axial tension, bending moment and temperature and the combination thereof.

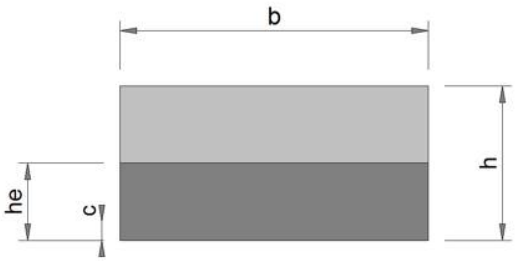
Up to four sets of suggested bar configurations are calculated for slab sections. Each set has a different diameter and spacing to comply with the crack width requirements. A fifth column is provided where you could enter a bar configuration of choice.

For beams, up to four sets of suggested bar configurations are calculated. The bar diameters are chosen to not differ by more than one size.



Load Case 1:DL		Optimum				User Defined
Configurations		1	2	3	4	
Bars		2Y25+1Y20	3Y25	2Y32+1Y25	3Y32	3Y16+2Y12
Crack width (M+T+T2)	(mm)	0.17	0.15	0.12	0.11	0.18
Crack width (T1 only)	(mm)	0.05	0.04	0.04	0.03	0.05
Crack width (T1+T2)	(mm)	0.12	0.11	0.10	0.08	0.12
Reinforcement area	(mm^2/m)	1296	1473	2099	2413	829
Reinforcement % Ro		1.04	1.18	1.68	1.93	0.66
Steel Stress	(MPa)	106	95	69	61	158
Mu capacity	(kNm/m)	110.9	125.2	176.9	201.4	72.4
Tu capacity	(kN/m)	48.2	54.4	76.9	87.6	31.5
3 day concrete tensile strength fct = 1.30 MPa fct/fb = 0.67 ; fb = bond strength				Critical load case: LC 1 Ro critical = 0.35		

Mode
Slab mode
Beam mode
Loading type
Short term
Sustained



Load Case 1:DL		Optimum				User Defined
Configurations		1	2	3	4	
Bars		2Y25+1Y20	3Y25	2Y32+1Y25	3Y32	3Y16+2Y12
Crack width (M+T+T2)	(mm)	0.17	0.15	0.12	0.11	0.18
Crack width (T1 only)	(mm)	0.05	0.04	0.04	0.03	0.05
Crack width (T1+T2)	(mm)	0.12	0.11	0.10	0.08	0.12
Reinforcement area	(mm^2/m)	1296	1473	2099	2413	829
Reinforcement % Ro		1.04	1.18	1.68	1.93	0.66
Steel Stress	(MPa)	106	95	69	61	158
Mu capacity	(kNm/m)	110.9	125.2	176.9	201.4	72.4
Tu capacity	(kN/m)	48.2	54.4	76.9	87.6	31.5
3 day concrete tensile strength fct = 1.30 MPa fct/fb = 0.67 ; fb = bond strength				Critical load case: LC 1 Ro critical = 0.35		

The module accounts for concrete shrinkage due to hydration by a combination of the thermal expansion coefficient and the restraint factor. The design method employed by the codes is ideally suited for non-temperate regions like Europe.

Theory used in this module

Concrete cracking has traditionally been correlated with the prevailing tensile steel stress. BS8007 - 1984 also takes account of the type of reinforcement, i.e., bond between concrete and reinforcement.

Supported Design Codes

Design codes

- BS8007 – 1987
- Eurocode 2 – 2004
- NZS 3101 – 2006
- SP 63.13330.2018
- AS 3600 - 2018