TWO-WAY SLABS V5.02

Engineering Building & Infrastructure Pty Ltd

Geometry: **(Slab SL01) 5000mm long, 5000mm wide, 250mm thick, f'c=32MPa**
Thickness: **Thickness min. (L/250) = 136mm, Thickness min. (inc) (L/500) = 149mm** **OK**
Strength: **Refer slab and beam design**

Geometry - 1 short edge discont. (Corners prevented from uplift)

Concrete strength (f'c) =	32	MPa	Long edge length (Ly) =	5000	mm
Slab thickness (th) =	250	mm	Short edge length (Lx) =	5000	mm
Reinf't ductility class =	L	(N)ormal,(L)ow	Continuous long edges =	2	0, 1, 2
			Continuous short edges =	1	0, 1, 2

Loading

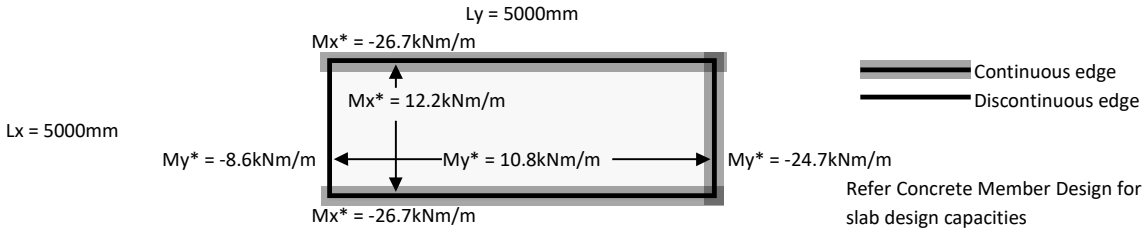
Include S.Wt =	Y	(Y)es,(N)o	Live load type =	N	(N)ormal, (S)torage, (R)oof
Superimposed dead load (wsdl) =	5.00	kPa	Short term LL factor (ψs) =	0.7	(Normal load use)
Live load (wll) =	3.00	kPa	Long term LL factor (ψl) =	0.4	AS/NZS 1170.0 - Table 4.1
S.Wt =	6.25	kPa			
wdl = S.Wt + wsdl =	11.25	kPa			
Fd = 1.2*wdl+1.5*wll =	18.00	kPa			

Analysis - Cl 6.10.3 (Class L reinforcement and/or no redistribution allowed - Table 6.10.3.2(B))

From Table 6.10.3.2(B)

βy =	0.024	αy =	2.29	Ly/Lx =	1.00
βx =	0.027	αx =	2.20		

		At discontinuous edge		**At continuous edge**	
		(0.8*M*)	Cl 6.10.3.2(c)	**(α*M*)**	Cl 6.10.3.2(b)
My* = βy*Fd*Lx² =	10.8 kNm/m	8.6	kNm/m	24.7	kNm/m
Mx* = βx*Fd*Lx² =	12.2 kNm/m	9.7	kNm/m	26.7	kNm/m



Refer Concrete Member Design for slab design capacities

Minimum strength requirements - Cl 9.1.1

Ast.min = 0.19*(D/d)²*f'ct.f/fsy*b*d = 374 mm²/m — Cl 9.1.1(b) Where supported by beams or walls on four sides

Deflection (Deemed to conform) - Cl 9.4.4.2

Warning - Compression steel in tension, Asc ignored for kcs

SL92 (main wires in main direction)

Tensile steel (Ast) =	290	mm²/m			
Yield strength of steel (fsy) =	500	MPa	p = Ast/ds =	0.00135	
Cover to bottom steel (cover) =	30	mm	pc = Asc/ds =	0.00134	
Nominal bar size (dia) =	8.6	mm	dc/ds =	0.13908	
Depth to tensile steel (ds=th-cover-dia/2) =	216	mm	n = Es/Ec =	6.99	
Depth to comp. steel (dc) =	30	mm from top	Neutral axis (ku) =	0.129	
Compression steel (Asc) =	290	mm²/m in positive region	Cracked NA = ku*ds =	27.8	mm

kcs = [2-1.2*(Asc/Ast)] ≥ 0.8 =	2.00		Cl 8.5.3.2		
Effective design service load (Fd.ef) =	38.25	kPa	Cl 9.4.4.1(a)	Use fcmi =	N (Y)es, (N)o
Incremental (Fd.ef.inc) =	27.00	kPa	Cl 9.4.4.1(b)	fcmi = f'c =	32.0 MPa
Mod. of elasticity (Ec = ρ^1.5*0.043*√fcmi) =	28600	MPa ± 20%	Cl 3.1.2	Concrete density (ρ) =	2400 kg/m³ Cl 3.1.3
k3 =	1.00		Cl 9.4.4.2		
k4 =	3.40		Table 9.4.4.2		
Lef/Δ =	250		Table 2.3.2		
Lef/Δ.inc =	500		Table 2.3.2		
d.min =	102	mm	OK	Thickness min. =	136 mm
d.min.inc =	115	mm	OK	Thickness min. (inc) =	149 mm