Slab Flexural Strength

Material Properties

fc'= 28 N/mm² β= 0.85

Fy= 420 N/mm²

Cross Section Properties

b= 1000 mm

t= 500 mm

Cover= 50 mm Effective depth (d)= 450 mm (Depth to the center of reinforcing steel)

Reinforcement Data

5 T 16 Area Steel Used= 1005.3 mm², ρ= 0.002

ρ_{max}= 0.021

ρ_{min}= 0.0018

Section Flexural Strength

Flexural reduction factor ϕ= 0.9

a= 15.97 mm

ϕMn= 151.2 KN.m

More Reinforcement Options and Relevant Flexural Capacities:

s/n	Main Reinforcement			Additional Reinforcement			A_s used	Flexural Strength	% As Check
1	6.6667	T	32	6.6667	T	32	10723	2455.2	
2	0	T	20	0	T	10	0	0.0	Less than min.
3	0	T	25	0	T	10	0	0.0	Less than min.
4	0	T	25	0	T	25	0	0.0	Less than min.
5	0	T	25	0	T	25	0	0.0	Less than min.
6	0	T	25	0	T	25	0	0.0	Less than min.
7	0	T	32	0	T	16	0	0.0	Less than min.
8	0	T	32	0	T	25	0	0.0	Less than min.
9	0	T	32	0	T	25	0	0.0	Less than min.
10	0	T	32	0	T	25	0	0.0	Less than min.
11	0	T	32	0	T	32	0	0.0	Less than min.
12	0	T	32	0	T	32	0	0.0	Less than min.
13	0	T	32	0	T	32	0	0.0	Less than min.
14	0	T	32	0	T	32	0	0.0	Less than min.
15	0	T	10	0	T	10	0	0.0	Less than min.
16	0	T	10	0	T	10	0	0.0	Less than min.
17	0	T	10	0	T	10	0	0.0	Less than min.
18	0	T	10	0	T	10	0	0.0	Less than min.
19	0	T	10	0	T	10	0	0.0	Less than min.
20	0	T	32	0	T	10	0	0.0	Less than min.

Beam Shear Strength

Shear reduction factor ϕ= 0.75

Stirrups used 0 @ 150 No. of branches = 2

Vc = 404.8 KN

Vs = 0.0 KN Vs_{max} = 1571.6 KN

ϕVn = 303.6 KN

Vu = 609.0 KN > Vn ---- UNSAFE

ACI 318M-08 10.2.7.3

ω= 0.030

ACI 318M-08 10.3.5

ACI 318M-08 10.5.1

ACI 318M-08 9.3.2.1

ACI 318M-08 10.2

fc'	β
17	0.85
18	0.85
19	0.85
20	0.85
21	0.85
22	0.85
23	0.85
24	0.85
25	0.85
26	0.85
27	0.85
28	0.85
29	0.843
30	0.836
31	0.829
32	0.821
33	0.814
34	0.807
35	0.800
36	0.793
37	0.786
38	0.779
39	0.771
40	0.764
41	0.757
42	0.750
43	0.743
44	0.736
45	0.729
46	0.721
47	0.714
48	0.707
49	0.700
50	0.693
51	0.686
52	0.679
53	0.671
54	0.664
55	0.657
56	0.650
57	0.650
58	0.650
59	0.650
60	0.650

fc'		
1	24	2
2	28	28
3	32	
4	36	
5	40	
6	45	
7	50	
8	55	
9	60	

fy		
1	360	2
2	420	420
3	460	

61	0.650
62	0.650
63	0.650
64	0.650
65	0.650

Bar Diameter		
1	8	2
2	10	10
3	12	
4	14	
5	16	
6	18	
7	20	
8	22	
9	25	
10	28	
11	32	

	Beam Flexural Strength
1005.31	Slab Flexural Strength

BEAM	2
SLAB / FOOTING	

Revisions Log

RevisionNo.	Date
00	2008-12-31
01	2009-1-4
02	2009-2-16
03	2009-5-5
04	2012
05	2009-10-9

Description
First release.
File saved as xlsm (Macros enabled) and ACI refernce for min. persentage of steel added.
Macro has been ammended to correctly copy the results from the solver.
Differentiate between Beam and slab in the title and min. percentage of steel
Shear reinforcement calculations added
As min updated with the value of 1.3 As req & shrinkage reinf. To be w.r.t. concrete gross area