

# RECTANGULAR BEAM

Project: Warehouse, Maniyanfushi  
 Floor: Roof  
 Member location: RB  
 Client

M = ?	30.00
M (Nmm) =	30000000
b = ?	200
h = ?	430
d = ?	358.5
$f_{cu}$ = ?	25
$f_y$ = ?	415

## BENDING

k =	0.047
k' =	0.156
k < k' ; Design as singly reinforced	
z (test) =	338.8
0.95d =	340.6
z =	338.8
x =	43.7
As (req'd) =	245.2

OK, section under-reinforced

cover	35
link dia	6
bottom bar dia	16
upper bar dia	
vertical bar spacing	
upper lever arm	373
lower lever arm	381
Total bar areas	402
As' (prov) =	
As (prov) =	402

## DEFLECTION

M/bd <sup>2</sup> =	1.17
$f_s$ =	158.23
Mod. Factor (test) =	1.84
Mod. Factor =	1.84

SUPPORT TYPE	BASIC l/d RATIO	Span	l/d ACTUAL	l/d ALLOWED	
Cantilever	5.6		0.0	10.3	OK
Simply supp.	16.0		0.0	29.4	OK
Continuous	20.8	3700	10.3	38.2	OK

## SHEAR

As (in shear zone) =	402
100As/(bd)(test) =	0.56
100As/(bd) =	0.56
400/d(test) =	1.12
400/d =	1.12
$f_{yv}$ = ?	250
V = ?	50,000
$v_c$ =	0.54
$v_c + 0.4$ =	0.94
0.8 / $f_{cu}$ =	4.00
v =	0.70
v < 0.8 / $f_{cu}$ and 5N/mm <sup>2</sup> Hence OK	
No. of legs = ?	2
bar diameter = ?	6
Asv =	56.55
link spacing (sv) =	154

## Min. reinf.

	Tension	Compression
Minimum percentage	0.18	0.2
Percentage provided	0.47	0.00

bar dia	bar areas	bottom layer	upper layer
10	78.5		
12	113		
16	201	2	
20	314		
25	491		
Layer areas		402	0

## MINIMUM LINKS

$f_{yv}$ for min. links = ?	250
No. of legs = ?	2
bar diameter = ?	6
Asv =	56.55
Where "V" is less than this, provide min. links	67,083
Link spacing, where minimum links used	154