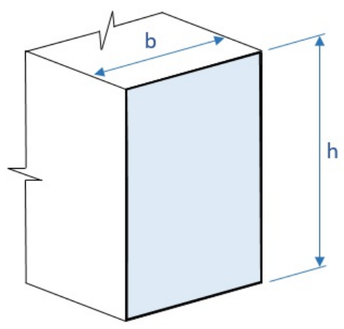
REFERENCES	CALCULATIONS	RESULTS
Code: AS 3600-2009	**MEMBER #2 (SECTION POSITION 0.0 mm) COLUMN DESIGN REPORT** **Project details** **Project Name:** **Project ID:** Company: Designer: Client: Project Notes: Project Units: Metric **General member design information** Dimentions:  Height $h = 500\ \mathrm{mm}$ Width $b = 300\ \mathrm{mm}$ Member length = $8000\ \mathrm{mm}$ Material properties: Concrete strength $\acute{f}_c = 25\ \mathrm{MPa}$ Steel strength of longitudinal rebar $f_{sy} = 500\ \mathrm{MPa}$ Steel strength of shear rebar $f_{syv} = 500\ \mathrm{MPa}$ Design Factors and Settings: Reinforcement Class : N **Load Combinations (Ultimate Limit State)** For axial force in section: LC1: USER = $0\ \mathrm{kN}$ For bending moment in section (major axis): LC1: USER = $0\ \mathrm{kN\text{-}m}$ For bending moment in section (minor axis): LC1: USER = $0\ \mathrm{kN\text{-}m}$ **Load Combinations (Serviceability Limit State)** For axial force in section: LC1: USER = $0\ \mathrm{kN}$ For bending moment in section (major axis): LC1: USER = $0\ \mathrm{kN\text{-}m}$ For bending moment in section (minor axis): LC1: USER = $0\ \mathrm{kN\text{-}m}$	
10.7.1(b) 10.7.1(a)	**Detailing of Members** DETAILING RULES FOR COLUMN (LONGITUDINAL REINFORCEMENT) Section input data: Section concrete area $A_g = 150000.00\ \mathrm{mm}^2$ Longitudinal rebar area $A_{st} = 3217.00\ \mathrm{mm}^2$ 1. Maximum allowed longitudinal reinforcement (10.7.1(b)) $$A_{s,max} = 0.04 \cdot A_g = 0.04 \cdot 150000.00 = 6000.00\ \mathrm{mm}^2$$ 2. Minimum allowed longitudinal reinforcement (10.7.1(a)) $$A_{s,min} = 0.01 \cdot A_g = 0.01 \cdot 150000.00 = 1500.00\ \mathrm{mm}^2$$ 3. Check of allowed longitudinal reinforcement	

$$A_{st} = 3217.00\ \text{mm}^2 \leq A_{s,max} = 6000.00\ \text{mm}^2\ (\text{Ratio: } 0.536)$$

STATUS OK!
Ratio: 0.536

$$A_{st} = 3217.00\ \text{mm}^2 \geq A_{s,min} = 1500.00\ \text{mm}^2\ (\text{Ratio: } 0.466)$$

STATUS OK!
Ratio: 0.466

Column check

MAXIMUM AXIAL COMPRESSION

Section input data:
Section concrete area $A_g = 150000.00\ \text{mm}^2$
Longitudinal rebar area $A_{st} = 3217.00\ \text{mm}^2$

$$\alpha_1 = 1.0 - 0.003 \cdot \acute{f_c} = 1.0 - 0.003 \cdot 25 = 0.93$$

$$\alpha_1 > 0.85 \rightarrow \alpha_1 = 0.85$$

Calculate the axial load capacity for concentric loading (10.6.2.2)

$$\phi = 0.6$$

$$\phi \cdot N_{uo} = \alpha_1 \cdot \acute{f_c} \cdot (A_g - A_{st}) + f_{sy} \cdot A_{st} =$$

$$= 0.6 \cdot (0.85 \cdot 25 \cdot (150000.00 - 3217.00) + 500 \cdot 3217.00) = 2836.58\ \text{kN}$$

MAXIMUM AXIAL TENSION

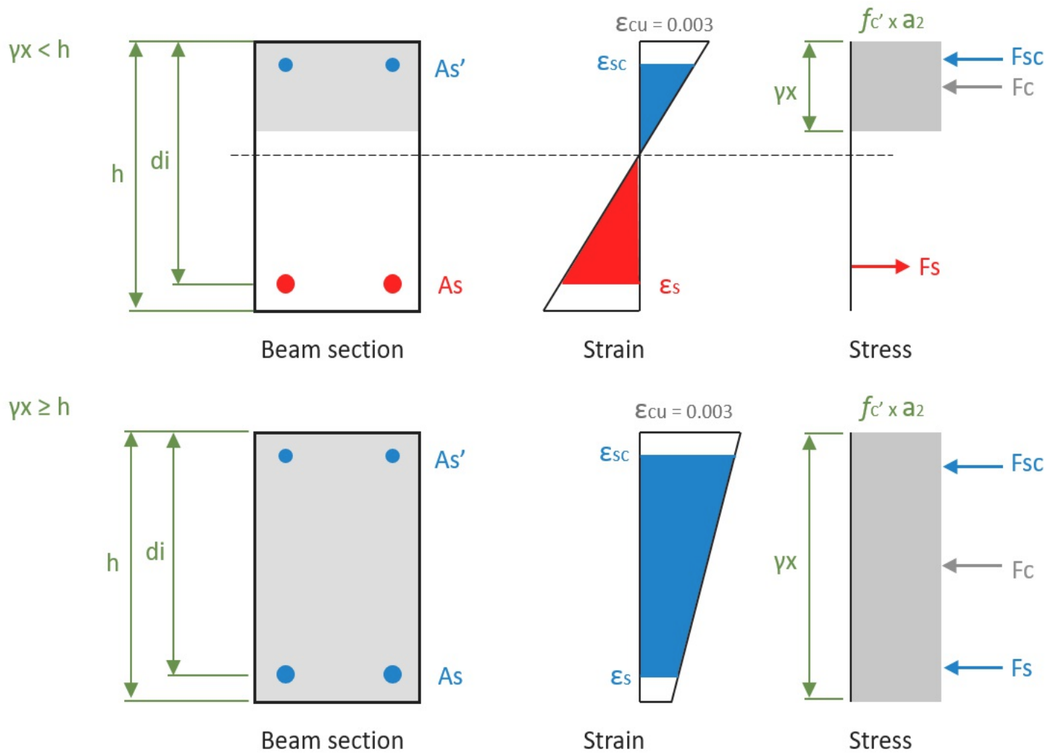
Section input data:
Longitudinal rebar area $A_{st} = 3217.00\ \text{mm}^2$

Calculate the axial load capacity for concentric loading

$$\phi = 0.8$$

$$\phi \cdot N_{ut} = -f_{yd} \cdot A_{st} = 0.8 \cdot (-500 \cdot 3217.00) = -1286.80\ \text{kN}$$

M-N INTERACTION



Calculation is based on iterative process:
- Calculate plastic centroid location $\overline{x}$
- Assume x in tension control zone and compression control zone
- Calculate strain e_s and e_{sc} when x < h:

$e_{sc} = e_{cu} \cdot ((x - \acute{d})/x)$
$e_s = e_{cu} \cdot ((d - x)/x)$
and x > h:
$e_{sc} = 0.002 \cdot (7 \cdot (x - \acute{d})/(7 \cdot x - 3 \cdot h))$
$e_s = 0.002 \cdot (7 \cdot (x - d)/(7 \cdot x - 3 \cdot h))$
- Calculate reinforcement stresses $f_s = \{e_s E_s\ (e_s \leq e_y),\ e_y\ (e_s > e_y)\}$
- Calculate equilibrium forces:

$N = F_{cc} + F_{sc} + F_s$
$\gamma x < h$: $N = \acute{f_c} \cdot b \cdot \gamma \cdot x + \sum f_{sci} \cdot \acute{A_{si}} + \sum f_{si} \cdot A_{si}$
$\gamma x \geq h$: $N = \acute{f_c} \cdot b \cdot h + \sum f_{sci} \cdot \acute{A_{si}} + \sum f_{si} \cdot A_{si}$
$\gamma x < h$: $M = F_{cc} \cdot (\overline{x_p} - \gamma x/2) + \sum f_{sci} \cdot (\overline{x_p} - \acute{d_i}) - \sum f_{si} \cdot (d_i - \overline{x_p})$
$\gamma x < h$: $M = F_{cc} \cdot (\overline{x_p} - h/2) + \sum f_{sci} \cdot (\overline{x_p} - \acute{d_i}) - \sum f_s \cdot (d_i - \overline{x_p})$

1. Axial + positive flexure about major axis

Section input data:
Section height h based on major axis: 500 mm
Section width b based on major axis: 300 mm
Rectangular compression block factors (8.1.3(1), 8.1.3(2))

$$\alpha_2 = 1.0 - 0.003 \cdot \acute{f_c} = 1.0 - 0.003 \cdot 25 = 0.93$$

$$\alpha_2 > 0.85 \rightarrow \alpha_2 = 0.85$$

$$\gamma = 1.05 - 0.007 \cdot \acute{f_c} = 1.05 - 0.007 \cdot 25 = 0.88$$

$$\gamma > 0.85 \rightarrow \gamma = 0.85$$

Section Rebar

Depth di (mm)	bar diameter (mm)	bar area Asi (mm2)
450.00	32.00	804.25
450.00	32.00	804.25
50.00	32.00	804.25
50.00	32.00	804.25

Calculation of plastic centroid location

$$\overline{x_p} = \frac{\acute{f_c} \cdot A_g \cdot (h - \text{neutral axis}) + \sum F_{sci} \cdot a_{sci} + \sum F_{si} \cdot a_{si}}{\acute{f_c} \cdot A_g + f_{sy} \cdot A_s + f_{sy} \cdot \acute{A_s}} =$$

$$= \frac{25.00 \cdot 150000.00 \cdot (500 - 250) + 361912500.00 + 40212500.00}{25.00 \cdot 150000.00 + 500.00 \cdot 1608.50 + 500.00 \cdot 1608.50}$$
$$= 250.00 \text{ mm}$$

M-N interaction values

Iter.	x (mm)	φ	Nu (kN)	Mu (kN-m)	φNu (kN)	φMu (kN-m)	e (m)
Tension Control							
1	-	0.80	-1608.5	0	-1286.8	0	0
2	9.82	0.80	-1555.30	13.08	-1244.24	10.46	-0.01
3	19.64	0.80	-1502.10	25.71	-1201.68	20.57	-0.02
4	29.45	0.80	-1317.83	64.12	-1054.26	51.29	-0.05
5	39.27	0.80	-855.06	157.78	-684.04	126.22	-0.18
6	49.09	0.80	-556.11	218.23	-444.89	174.58	-0.39
7	58.91	0.80	-339.08	261.85	-271.26	209.48	-0.77
8	68.73	0.80	-168.86	295.67	-135.09	236.54	-1.75
9	78.55	0.80	-27.89	323.20	-22.31	258.56	-11.59
10	88.36	0.79	93.57	346.37	73.51	272.09	3.70
11	98.18	0.77	201.39	366.38	154.84	281.70	1.82
12	108.00	0.75	299.27	383.95	225.58	289.41	1.28
13	117.82	0.74	389.71	399.59	288.30	295.61	1.03

14	127.64	0.73	474.41	413.65	344.75	300.59	0.87
15	137.45	0.71	554.62	426.35	396.16	304.54	0.77
16	147.27	0.70	631.23	437.90	443.41	307.61	0.69
17	157.09	0.69	704.91	448.41	487.14	309.89	0.64
18	166.91	0.68	776.18	458.00	527.85	311.47	0.59
19	176.73	0.67	845.44	466.74	565.91	312.42	0.55
20	186.55	0.66	913.02	474.70	601.60	312.79	0.52
21	196.36	0.65	979.15	481.93	635.18	312.63	0.49
22	206.18	0.64	1044.06	488.47	666.81	311.97	0.47
23	216.00	0.63	1107.90	494.35	696.65	310.85	0.45
24	225.82	0.62	1170.81	499.61	724.83	309.30	0.43
25	235.64	0.61	1232.92	504.26	751.45	307.34	0.41
26	245.45	0.60	1294.31	508.32	776.59	304.99	0.39
Compression Control							
27	245.45	0.60	1294.31	508.32	776.59	304.99	0.39
28	255.64	0.60	1427.79	497.83	856.67	298.70	0.35
29	265.82	0.60	1555.26	487.83	933.16	292.70	0.31
30	276.00	0.60	1677.41	478.20	1006.44	286.92	0.29
31	286.18	0.60	1794.78	468.86	1076.87	281.32	0.26
32	296.36	0.60	1907.88	459.72	1144.73	275.83	0.24
33	306.55	0.60	2013.70	450.04	1208.22	270.02	0.22
34	316.73	0.60	2114.42	440.11	1268.65	264.07	0.21
35	326.91	0.60	2212.30	430.27	1327.38	258.16	0.19
36	337.09	0.60	2307.60	420.47	1384.56	252.28	0.18
37	347.27	0.60	2400.55	410.66	1440.33	246.40	0.17
38	357.45	0.60	2491.34	400.80	1494.80	240.48	0.16
39	367.64	0.60	2580.16	390.86	1548.10	234.52	0.15
40	377.82	0.60	2667.17	380.81	1600.30	228.49	0.14
41	388.00	0.60	2752.51	370.61	1651.50	222.37	0.13
42	398.18	0.60	2836.30	360.25	1701.78	216.15	0.13
43	408.36	0.60	2918.67	349.69	1751.20	209.81	0.12
44	418.55	0.60	2999.71	338.92	1799.83	203.35	0.11
45	428.73	0.60	3079.53	327.92	1847.72	196.75	0.11
46	438.91	0.60	3158.20	316.67	1894.92	190.00	0.10
47	449.09	0.60	3235.81	305.15	1941.48	183.09	0.09
48	459.27	0.60	3312.42	293.36	1987.45	176.01	0.09
49	469.45	0.60	3388.10	281.27	2032.86	168.76	0.08
50	479.64	0.60	3462.91	268.88	2077.75	161.33	0.08
51	489.82	0.60	3536.91	256.18	2122.14	153.71	0.07
52	500.00	0.60	3610.14	243.15	2166.08	145.89	0.07
53	-	0.60	4727.6	0	2836.6	0	0

2. Axial + negative flexure about major axis

Section input data:
Section height h based on major axis: 500 mm
Section width b based on major axis: 300 mm

Rectangular compression block factors (8.1.3(1), 8.1.3(2))

$$\alpha_2 = 1.0 - 0.003 \cdot \acute{f_c} = 1.0 - 0.003 \cdot 25 = 0.93$$

$$\alpha_2 > 0.85 \rightarrow \alpha_2 = 0.85$$

$$\gamma = 1.05 - 0.007 \cdot \acute{f_c} = 1.05 - 0.007 \cdot 25 = 0.88$$

$$\gamma > 0.85 \rightarrow \gamma = 0.85$$

Section Rebar

Depth di (mm)	bar diameter (mm)	bar area Asi (mm2)
450.00	32.00	804.25
450.00	32.00	804.25
50.00	32.00	804.25
50.00	32.00	804.25

Calculation of plastic centroid location

$$\overline{x_p} = \frac{\acute{f_c} \cdot A_g \cdot (h - \text{neutral axis}) + \sum F_{sci} \cdot a_{sci} + \sum F_{si} \cdot a_{si}}{\acute{f_c} \cdot A_g + f_{sy} \cdot A_s + f_{sy} \cdot \acute{A_s}} =$$

$$= \frac{25.00 \cdot 150000.00 \cdot (500 - 250) + 361912500.00 + 40212500.00}{25.00 \cdot 150000.00 + 500.00 \cdot 1608.50 + 500.00 \cdot 1608.50}$$
$$= 250.00 \text{ mm}$$

M-N interaction values

Iter.	x (mm)	φ	Nu (kN)	Mu (kN-m)	φNu (kN)	φMu (kN-m)	e (m)
Tension Control							
1	-	0.80	-1608.5	0	-1286.8	0	0
2	9.82	0.80	-1555.30	13.08	-1244.24	10.46	-0.01
3	19.64	0.80	-1502.10	25.71	-1201.68	20.57	-0.02
4	29.45	0.80	-1317.83	64.12	-1054.26	51.29	-0.05
5	39.27	0.80	-855.06	157.78	-684.04	126.22	-0.18
6	49.09	0.80	-556.11	218.23	-444.89	174.58	-0.39
7	58.91	0.80	-339.08	261.85	-271.26	209.48	-0.77
8	68.73	0.80	-168.86	295.67	-135.09	236.54	-1.75
9	78.55	0.80	-27.89	323.20	-22.31	258.56	-11.59
10	88.36	0.79	93.57	346.37	73.51	272.09	3.70
11	98.18	0.77	201.39	366.38	154.84	281.70	1.82
12	108.00	0.75	299.27	383.95	225.58	289.41	1.28
13	117.82	0.74	389.71	399.59	288.30	295.61	1.03
14	127.64	0.73	474.41	413.65	344.75	300.59	0.87
15	137.45	0.71	554.62	426.35	396.16	304.54	0.77
16	147.27	0.70	631.23	437.90	443.41	307.61	0.69
17	157.09	0.69	704.91	448.41	487.14	309.89	0.64
18	166.91	0.68	776.18	458.00	527.85	311.47	0.59
19	176.73	0.67	845.44	466.74	565.91	312.42	0.55

20	186.55	0.66	913.02	474.70	601.60	312.79	0.52
21	196.36	0.65	979.15	481.93	635.18	312.63	0.49
22	206.18	0.64	1044.06	488.47	666.81	311.97	0.47
23	216.00	0.63	1107.90	494.35	696.65	310.85	0.45
24	225.82	0.62	1170.81	499.61	724.83	309.30	0.43
25	235.64	0.61	1232.92	504.26	751.45	307.34	0.41
26	245.45	0.60	1294.31	508.32	776.59	304.99	0.39
Compression Control							
27	245.45	0.60	1294.31	508.32	776.59	304.99	0.39
28	255.64	0.60	1427.79	497.83	856.67	298.70	0.35
29	265.82	0.60	1555.26	487.83	933.16	292.70	0.31
30	276.00	0.60	1677.41	478.20	1006.44	286.92	0.29
31	286.18	0.60	1794.78	468.86	1076.87	281.32	0.26
32	296.36	0.60	1907.88	459.72	1144.73	275.83	0.24
33	306.55	0.60	2013.70	450.04	1208.22	270.02	0.22
34	316.73	0.60	2114.42	440.11	1268.65	264.07	0.21
35	326.91	0.60	2212.30	430.27	1327.38	258.16	0.19
36	337.09	0.60	2307.60	420.47	1384.56	252.28	0.18
37	347.27	0.60	2400.55	410.66	1440.33	246.40	0.17
38	357.45	0.60	2491.34	400.80	1494.80	240.48	0.16
39	367.64	0.60	2580.16	390.86	1548.10	234.52	0.15
40	377.82	0.60	2667.17	380.81	1600.30	228.49	0.14
41	388.00	0.60	2752.51	370.61	1651.50	222.37	0.13
42	398.18	0.60	2836.30	360.25	1701.78	216.15	0.13
43	408.36	0.60	2918.67	349.69	1751.20	209.81	0.12
44	418.55	0.60	2999.71	338.92	1799.83	203.35	0.11
45	428.73	0.60	3079.53	327.92	1847.72	196.75	0.11
46	438.91	0.60	3158.20	316.67	1894.92	190.00	0.10
47	449.09	0.60	3235.81	305.15	1941.48	183.09	0.09
48	459.27	0.60	3312.42	293.36	1987.45	176.01	0.09
49	469.45	0.60	3388.10	281.27	2032.86	168.76	0.08
50	479.64	0.60	3462.91	268.88	2077.75	161.33	0.08
51	489.82	0.60	3536.91	256.18	2122.14	153.71	0.07
52	500.00	0.60	3610.14	243.15	2166.08	145.89	0.07
53	-	0.60	4727.6	0	2836.6	0	0

3. Axial + positive flexure about minor axis

Section input data:
Section height h based on minor axis: 300 mm
Section width b based on minor axis: 500 mm
Rectangular compression block factors (8.1.3(1), 8.1.3(2))

$$\alpha_2 = 1.0 - 0.003 \cdot \acute{f_c} = 1.0 - 0.003 \cdot 25 = 0.93$$

$$\alpha_2 > 0.85 \rightarrow \alpha_2 = 0.85$$

$$\gamma = 1.05 - 0.007 \cdot \acute{f_c} = 1.05 - 0.007 \cdot 25 = 0.88$$

$$\gamma > 0.85 \rightarrow \gamma = 0.85$$

Section Rebar

Depth di (mm)	bar diameter (mm)	bar area Asi (mm2)
250.00	32.00	804.25
250.00	32.00	804.25
50.00	32.00	804.25
50.00	32.00	804.25

Calculation of plastic centroid location

$$\overline{x_p} = \frac{\acute{f_c} \cdot A_g \cdot (h - \text{neutral axis}) + \sum F_{sci} \cdot a_{sci} + \sum F_{si} \cdot a_{si}}{\acute{f_c} \cdot A_g + f_{sy} \cdot A_s + f_{sy} \cdot \acute{A_s}} =$$

$$= \frac{25.00 \cdot 150000.00 \cdot (300 - 150) + 201062500.00 + 40212500.00}{25.00 \cdot 150000.00 + 500.00 \cdot 1608.50 + 500.00 \cdot 1608.50}$$
$$= 150.00 \text{ mm}$$

M-N interaction values

Iter.	x (mm)	φ	Nu (kN)	Mu (kN-m)	φNu (kN)	φMu (kN-m)	e (m)
Tension Control							
1	-	0.80	-1608.5	0	-1286.8	0	0
2	5.45	0.80	-1559.24	7.28	-1247.39	5.82	-0.00
3	10.91	0.80	-1509.98	14.32	-1207.98	11.46	-0.01
4	16.36	0.80	-1460.72	21.14	-1168.57	16.91	-0.01
5	21.82	0.80	-1411.45	27.73	-1129.16	22.18	-0.02
6	27.27	0.80	-1362.19	34.09	-1089.75	27.27	-0.03
7	32.73	0.80	-1018.04	69.71	-814.43	55.77	-0.07
8	38.18	0.80	-758.14	96.68	-606.51	77.35	-0.13
9	43.64	0.80	-550.90	118.16	-440.72	94.52	-0.21
10	49.09	0.80	-378.77	135.89	-303.02	108.71	-0.36
11	54.55	0.80	-231.21	150.94	-184.97	120.75	-0.65
12	60.00	0.80	-101.53	163.97	-81.22	131.18	-1.62
13	65.45	0.80	14.76	175.44	11.76	139.85	11.89
14	70.91	0.78	120.73	185.64	93.78	144.20	1.54
15	76.36	0.76	218.60	194.81	165.68	147.65	0.89
16	81.82	0.74	309.99	203.10	229.48	150.36	0.66
17	87.27	0.72	396.11	210.64	286.67	152.44	0.53
18	92.73	0.71	477.90	217.51	338.33	153.99	0.46
19	98.18	0.69	556.07	223.79	385.31	155.07	0.40
20	103.64	0.68	631.20	229.54	428.23	155.73	0.36
21	109.09	0.66	703.74	234.81	467.62	156.02	0.33
22	114.55	0.65	774.06	239.62	503.86	155.98	0.31
23	120.00	0.64	842.47	244.01	537.29	155.62	0.29
24	125.45	0.62	909.22	248.01	568.17	154.98	0.27
25	130.91	0.61	974.51	251.64	596.72	154.08	0.26

26	136.36	0.60	1038.51	254.91	623.11	152.94	0.25
Compression Control							
27	136.36	0.60	1038.51	254.91	623.11	152.94	0.25
28	142.91	0.60	1194.87	250.27	716.92	150.16	0.21
29	149.45	0.60	1342.72	245.88	805.63	147.53	0.18
30	156.00	0.60	1483.11	241.65	889.87	144.99	0.16
31	162.55	0.60	1616.96	237.54	970.18	142.52	0.15
32	169.09	0.60	1745.03	233.47	1047.02	140.08	0.13
33	175.64	0.60	1867.95	229.43	1120.77	137.66	0.12
34	182.18	0.60	1986.29	225.36	1191.78	135.21	0.11
35	188.73	0.60	2100.52	221.23	1260.31	132.74	0.11
36	195.27	0.60	2211.06	217.02	1326.64	130.21	0.10
37	201.82	0.60	2318.26	212.71	1390.96	127.62	0.09
38	208.36	0.60	2422.44	208.26	1453.47	124.96	0.09
39	214.91	0.60	2523.88	203.67	1514.33	122.20	0.08
40	221.45	0.60	2622.81	198.92	1573.69	119.35	0.08
41	228.00	0.60	2719.46	194.00	1631.67	116.40	0.07
42	234.55	0.60	2814.01	188.88	1688.41	113.33	0.07
43	241.09	0.60	2906.64	183.56	1743.98	110.14	0.06
44	247.64	0.60	2997.49	178.04	1798.50	106.82	0.06
45	254.18	0.60	3086.71	172.29	1852.03	103.37	0.06
46	260.73	0.60	3174.42	166.31	1904.65	99.79	0.05
47	267.27	0.60	3260.73	160.10	1956.44	96.06	0.05
48	273.82	0.60	3345.74	153.65	2007.44	92.19	0.05
49	280.36	0.60	3429.54	146.95	2057.72	88.17	0.04
50	286.91	0.60	3512.21	139.99	2107.33	84.00	0.04
51	293.45	0.60	3593.83	132.78	2156.30	79.67	0.04
52	300.00	0.60	3674.47	125.30	2204.68	75.18	0.03
53	-	0.60	4727.6	0	2836.6	0	0

4. Axial + negative flexure about minor axis

Section input data:
Section height h based on minor axis: 300 mm
Section width b based on minor axis: 500 mm
Rectangular compression block factors (8.1.3(1), 8.1.3(2))

$$\alpha_2 = 1.0 - 0.003 \cdot \acute{f_c} = 1.0 - 0.003 \cdot 25 = 0.93$$

$$\alpha_2 > 0.85 \rightarrow \alpha_2 = 0.85$$

$$\gamma = 1.05 - 0.007 \cdot \acute{f_c} = 1.05 - 0.007 \cdot 25 = 0.88$$

$$\gamma > 0.85 \rightarrow \gamma = 0.85$$

Section Rebar

Depth di (mm)	bar diameter (mm)	bar area Asi (mm2)
250.00	32.00	804.25
250.00	32.00	804.25
50.00	32.00	804.25
50.00	32.00	804.25

Calculation of plastic centroid location

$$\overline{x_p} = \frac{\acute{f_c} \cdot A_g \cdot (h - \text{neutral axis}) + \sum F_{sci} \cdot a_{sci} + \sum F_{si} \cdot a_{si}}{\acute{f_c} \cdot A_g + f_{sy} \cdot A_s + f_{sy} \cdot \acute{A_s}} =$$

$$= \frac{25.00 \cdot 150000.00 \cdot (300 - 150) + 201062500.00 + 40212500.00}{25.00 \cdot 150000.00 + 500.00 \cdot 1608.50 + 500.00 \cdot 1608.50}$$
$$= 150.00 \text{ mm}$$

M-N interaction values

Iter.	x (mm)	φ	Nu (kN)	Mu (kN-m)	φNu (kN)	φMu (kN-m)	e (m)
Tension Control							
1	-	0.80	-1608.5	0	-1286.8	0	0
2	5.45	0.80	-1559.24	7.28	-1247.39	5.82	-0.00
3	10.91	0.80	-1509.98	14.32	-1207.98	11.46	-0.01
4	16.36	0.80	-1460.72	21.14	-1168.57	16.91	-0.01
5	21.82	0.80	-1411.45	27.73	-1129.16	22.18	-0.02
6	27.27	0.80	-1362.19	34.09	-1089.75	27.27	-0.03
7	32.73	0.80	-1018.04	69.71	-814.43	55.77	-0.07
8	38.18	0.80	-758.14	96.68	-606.51	77.35	-0.13
9	43.64	0.80	-550.90	118.16	-440.72	94.52	-0.21
10	49.09	0.80	-378.77	135.89	-303.02	108.71	-0.36
11	54.55	0.80	-231.21	150.94	-184.97	120.75	-0.65
12	60.00	0.80	-101.53	163.97	-81.22	131.18	-1.62
13	65.45	0.80	14.76	175.44	11.76	139.85	11.89
14	70.91	0.78	120.73	185.64	93.78	144.20	1.54
15	76.36	0.76	218.60	194.81	165.68	147.65	0.89
16	81.82	0.74	309.99	203.10	229.48	150.36	0.66
17	87.27	0.72	396.11	210.64	286.67	152.44	0.53
18	92.73	0.71	477.90	217.51	338.33	153.99	0.46
19	98.18	0.69	556.07	223.79	385.31	155.07	0.40
20	103.64	0.68	631.20	229.54	428.23	155.73	0.36
21	109.09	0.66	703.74	234.81	467.62	156.02	0.33
22	114.55	0.65	774.06	239.62	503.86	155.98	0.31
23	120.00	0.64	842.47	244.01	537.29	155.62	0.29
24	125.45	0.62	909.22	248.01	568.17	154.98	0.27
25	130.91	0.61	974.51	251.64	596.72	154.08	0.26
26	136.36	0.60	1038.51	254.91	623.11	152.94	0.25
Compression Control							

27	136.36	0.60	1038.51	254.91	623.11	152.94	0.25
28	142.91	0.60	1194.87	250.27	716.92	150.16	0.21
29	149.45	0.60	1342.72	245.88	805.63	147.53	0.18
30	156.00	0.60	1483.11	241.65	889.87	144.99	0.16
31	162.55	0.60	1616.96	237.54	970.18	142.52	0.15
32	169.09	0.60	1745.03	233.47	1047.02	140.08	0.13
33	175.64	0.60	1867.95	229.43	1120.77	137.66	0.12
34	182.18	0.60	1986.29	225.36	1191.78	135.21	0.11
35	188.73	0.60	2100.52	221.23	1260.31	132.74	0.11
36	195.27	0.60	2211.06	217.02	1326.64	130.21	0.10
37	201.82	0.60	2318.26	212.71	1390.96	127.62	0.09
38	208.36	0.60	2422.44	208.26	1453.47	124.96	0.09
39	214.91	0.60	2523.88	203.67	1514.33	122.20	0.08
40	221.45	0.60	2622.81	198.92	1573.69	119.35	0.08
41	228.00	0.60	2719.46	194.00	1631.67	116.40	0.07
42	234.55	0.60	2814.01	188.88	1688.41	113.33	0.07
43	241.09	0.60	2906.64	183.56	1743.98	110.14	0.06
44	247.64	0.60	2997.49	178.04	1798.50	106.82	0.06
45	254.18	0.60	3086.71	172.29	1852.03	103.37	0.06
46	260.73	0.60	3174.42	166.31	1904.65	99.79	0.05
47	267.27	0.60	3260.73	160.10	1956.44	96.06	0.05
48	273.82	0.60	3345.74	153.65	2007.44	92.19	0.05
49	280.36	0.60	3429.54	146.95	2057.72	88.17	0.04
50	286.91	0.60	3512.21	139.99	2107.33	84.00	0.04
51	293.45	0.60	3593.83	132.78	2156.30	79.67	0.04
52	300.00	0.60	3674.47	125.30	2204.68	75.18	0.03
53	-	0.60	4727.6	0	2836.6	0	0

5. Strength check

Section input data:
Actual axial force $N^* = 0.00$ kN
Actual bending moment about major axis $M_z^* = 0.00$ kN-m
Actual bending moment about minor axis $M_y^* = 0.00$ kN-m
Eccentricity of actual forces along major axis $e_y = 0.0000$ m
Eccentricity of actual forces along minor axis $e_z = 0.0000$ m
Limited axial force (Mx-N axis plane) $\phi \cdot N_{uz} = 0.00$ kN
Limited axial force (My-N axis plane) $\phi \cdot N_{uy} = 0.00$ kN
Limited bending moment about major axis $\phi \cdot M_{uz} = 0.00$ kN-m
Limited bending moment about minor axis $\phi \cdot M_{uy} = 0.00$ kN-m

Actual forces are not acting in section

STATUS OK!
Ratio: 0.000