

Combined Footing Analysis and Design

Dimensions:

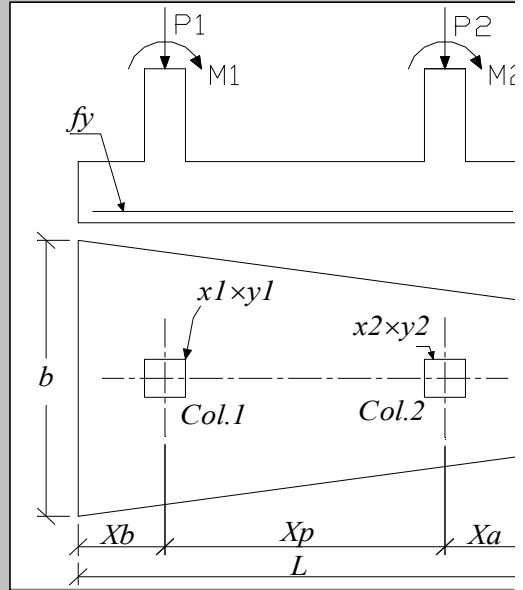
	Col.1	Col.2
Length, x (m)	0.46	0.46
Width, y (m)	0.46	0.46
Distance, Xp (m)	5.48	
Distance, Xb (m)	0.23	
Distance, Xa (m)	0.23	

Material Properties:

Conc comp strength f_c (Mpa)	21
Steel tensile strength f_y (Mpa)	400
Allow soil pressure, q_a (kPa)	192

Loads:

Col. Load	Working loads			
	Dead	Live	Wind	Seismic
P1 (kN)	1200	816	0	0
P2 (kN)	900	660	0	0
M1 (kN.m)	0	0	0	0
M2 (kN.m)	0	0	0	0



Factored Loads:

Col. Load	Load cases			
	1	2	3	4
P1 (kN)	3067.2	1080	2300.4	2300.4
P2 (kN)	2382	810	1786.5	1786.5
M1 (kN.m)	0	0	0	0
M2 (kN.m)	0	0	0	0

- Case 1: 1.4D+1.7L
- Case 2: 0.9D+1.3W
- Case 3: 0.75(1.4D+1.7L+1.7W)
- Case 4: 0.75(1.4D+1.7L+1.87E)

Suggested Footing Dimensions:

Left width, b (m)	4.24	Distance, Xb (m)	0.23	Length, L (m)	5.94
Right width, a (m)	2.03	Distance, Xa (m)	0.23	Effect. depth, d (m)	0.85
Area, (m ²)	18.6219				

User Input Footing Dimensions:

Left width, b (m)	4.24	Distance, Xb (m)	0.23	Length, L (m)	5.94
Right width, a (m)	2.03	Distance, Xa (m)	0.23	Effect. depth, d (m)	0.85
Area, (m ²)	18.6219				

Continue

Check User Input Dimensions:

Allowable soil pressure, q_a (kPa)	192
Maximum soil pressure, q_{max} (kPa)	192.1121
Minimum soil pressure, q_{min} (kPa)	107.1293

($q_{max} > q_a$) soil failure, increase area
($q_{min} > 0$) Ok

Check User Input Effective Depth:

Maximum wide beam shear, V_w (kN/m width)	598.5596
Maximum punching shear, V_p (kN/m width)	2303.534

Wide beam shear strength, V_{c1} (kN/m width)
Punching shear strength, V_{c2} (kN/m width)

$V_w < V_{c1}$, OK
 $V_p < V_{c2}$, OK

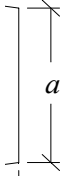
Area of Steel:

Use area of steel, A_s (cm²)

for bottom reinforcement

As (cm²) for top reinforcement

2



649.1982

3999.061



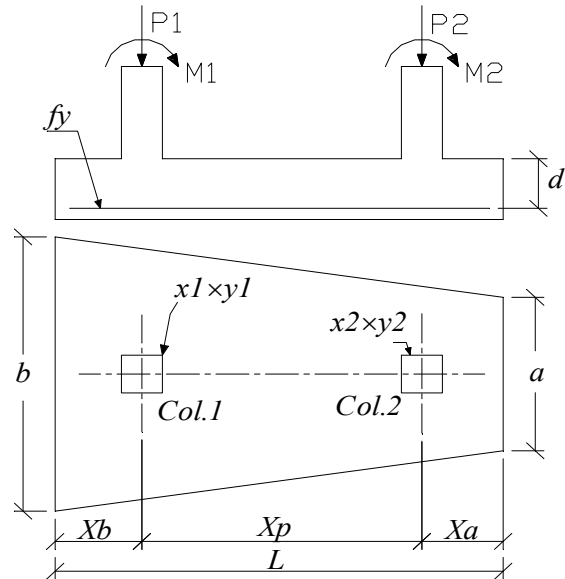
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Issue:	Design	Page
Date:		1 of 1
Revised by:		
Checked by:		

Project: Title

Dimensions:

	Col.1	Col.2	
Length, x (m)	0.46	0.46	
Width, y (m)	0.46	0.46	
Distance, Xp (m)	5.48	Left width, b (m)	4.29
Distance, Xb (m)	0.23	Right width, a (m)	2.05
Distance, Xa (m)	0.23	Length, L (m)	5.94
Eff. depth, d (m)	0.85	Area, (m ²)	18.6219



Material Properties:

Conc comp strength f'c, (Mpa)	21
Steel comp strength fy, (Mpa)	400
Allow soil pressure, qa (kPa)	192

Loads:

Col. Load	Working loads			
	Dead	Live	Wind	Seismic
P1 (kN)	1200	816	0	0
P2 (kN)	900	660	0	0
M1 (kN.m)	0	0	0	0
M2 (kN.m)	0	0	0	0

Checkings:

Allowable soil pressure, qa (kPa)	192	
Maximum soil pressure, qmax (kPa)	192.112	(qmax > qa) soil failure, increase area
Minimum soil pressure, qmin (kPa)	107.129	(qmin > 0) Ok
Maximum wide beam shear, Vw (kN/m width)	598.56	
Maximum punching shear, Vp (kN/m width)	2303.53	
Wide beam shear strength, Vc1 (kN/m width)	649.198	Vw < Vc1, OK
Punching shear strength, Vc2 (kN/m width)	3999.06	Vp < Vc2, OK

Area of Steel:

Use area of steel, As (cm²) 38 for bottom reinforcement
 As (cm²) 29.75 for top reinforcement

Details:

x	V, kN	M, kN-m	b, m	As, cm ² /m
0	0	0	4.24	29.75
0.594	-2352	-902.19	4.019	29.75
1.188	-1674.5	-2096.2	3.798	29.75
1.782	-1034.7	-2899	3.577	29.75
2.376	-432.67	-3332.9	3.356	33.9766
2.97	131.503	-3420.5	3.135	37.5103
3.564	657.745	-3184.2	2.914	37.5705
4.158	1145.99	-2646.6	2.693	33.6053
4.752	1596.16	-1830.3	2.472	29.75
5.346	2008.19	-757.92	2.251	29.75
5.94	0.00	0.00	2.03	29.75