

TERZAGHI'S BEARING CAPACITY (FDN ENGG BY BM DAS)
(CHAPTER 3.3 PP 86)

COHISION OF A SOIL	c'	15.20	KN/M ²	
DENSITY OF SOIL	γ	1800	KN/M ³	
VALUE OF PI	π	3.142		
ANGLE OF INTERNAL FRICTION	Φ	20	DEGREE (26 to 45 degree)	0.349 RADIANS
DEPTH OF FOUNDATION	Df	1.20	M	Df is less than or equal to its width
BREADTH/ DIA OF FOUNDATION	B	1.00	M	
PASSIVE PRESSURE COEFFICIENT	Kpy	7.00		
SURCHARGE	q	2160	KN/M ²	q=γ*Df

GENERAL SHAER FAILURE FACTOR

BEARING CAPACITY FACTOR (3.4)	Nc	17.69	(Nq-1)/tan(Φ)
BEARING CAPACITY FACTOR (3.5)	Nq	7.44	(e(2(3PI/4-Φ/2)tan(Φ/(2cos^2(45+Φ/2))))
BEARING CAPACITY FACTOR (3.6)	Ny	1.26	(1/2(Kpy/cos^2(Φ)-1)tan(Φ)

ULT BC FOR STRIP FOUNDATION	qu	17471	KN/M ²	C Nc+qNq+0.5yBNy
ULT BC FOR SQUARE FOUNDATION (3.7)	qu	17325	KN/M ²	1.3 C Nc+qNq+0.4yBNy
ULT BC FOR CIRCULAR FOUNDATION (3.8)	qu	17098	KN/M ²	1.3 C Nc+qNq+0.3yBNy

FACTOR OF SAFETY

SBC FOR STRIP FOUNDATION	qs	11647	KN/M ²
SBC FOR SQUARE FOUNDATION	qs	11550	KN/M ²
ULT BC FOR CIRCULAR FOUNDATION	qs	11399	KN/M ²

LOCAL SHAER FAILURE FACTOR

20	0.24	RADIANS	TAN ⁻¹ (2/3TAN(Φ))
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BEARING CAPACITY FACTOR	Nc	11.85	°
BEARING CAPACITY FACTOR	Nq	3.88	
BEARING CAPACITY FACTOR	Ny	0.7779	

ULT BC FOR STRIP FOUNDATION	qu	9191	KN/M ²
ULT BC FOR SQUARE FOUNDATION	qu	9087	KN/M ²
ULT BC FOR CIRCULAR FOUNDATION	qu	8947	KN/M ²

b) Square footing bearing capacity considering local shear failure

$$q_u = 0.867cN_c + \gamma D_f N_q + 0.4\gamma B N_y$$

	General Shear Failure $\phi > 36^\circ$			Local Shear Failure $\phi < 28^\circ$		
Φ	Nc	Nq	Ny	Nc'	Nq'	Ny'
0	5.7	1.0	0.0	5.7	1.0	0.0
5	7.3	1.6	0.5	6.7	1.4	0.2
10	9.6	2.7	1.2	8.0	1.9	0.5
15	12.9	4.4	2.5	9.7	2.7	0.9
20	17.7	7.4	5.0	11.8	3.9	1.7
25	25.1	12.7	9.7	14.8	5.6	3.2
30	37.2	22.5	19.7	19.0	8.3	5.7
35	57.8	41.4	42.4	25.2	12.6	10.1
40	95.7	81.3	100.4	34.9	20.5	18.8
45	172.3	173.3	297.5	51.2	35.1	37.7
50	347.6	415.1	1153.2	81.3	65.6	87.1

FACTOR OF SAFETY

SBC FOR STRIP FOUNDATION	Fs	1.50	
SBC FOR SQUARE FOUNDATION	qs	6127	KN/M ²
ULT BC FOR CIRCULAR FOUNDATION	qs	6058	KN/M ²
	qs	5965	KN/M ²

BEARING CAPACITY FOR WATER TABLE (FDN ENGG BY BM DAS)

(CHAPTER 3.5 PP 90)

WIDTH OF FOUNDATION	B	1.00	M	
DEPTH OF FOUNDATION	Df	1.20	M	
DEPTH OF WATER TABLE FROM GL	D1	0.00	M	2.00
DEPTH OF WATER TABLE BELOW FDN	d	2.00	M	
DENSITY OF SOIL	γ	1800	KN/M ³	
DENSITY OF SATURATED SOIL	γ_{sat}	2400	KN/M ³	
DENSITY OF WATER	γ_w	1000	KN/M ³	
$\gamma' = \gamma_{sat} - \gamma_w$	γ'	1400	KN/M ³	
γ FACTOR IN LAST TERM OF BC EQN	γ''	1800	KN/M ³	
SURCHARGE	q	1680	KN/M ²	$q = \gamma \cdot Df$

BEARING CAPACITY FACTOR	Nc	17.69
BEARING CAPACITY FACTOR	Nq	7.44
BEARING CAPACITY FACTOR	Nγ	1.2607

ULT BC FOR STRIP FOUNDATION	qu	13901	KN/M ²
ULT BC FOR SQUARE FOUNDATION	qu	13754	KN/M ²
ULT BC FOR CIRCULAR FOUNDATION	qu	13527	KN/M ²

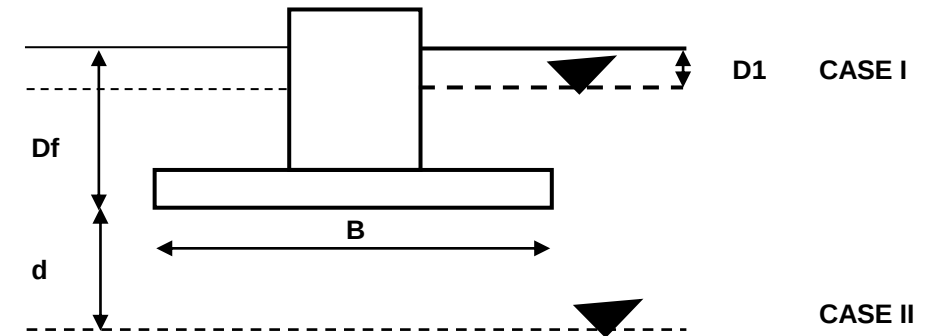
FACTOR OF SAFETY

SBC FOR STRIP FOUNDATION	Fs	1.50	
SBC FOR SQUARE FOUNDATION	qs	9267	KN/M ²
SBC FOR SQUARE FOUNDATION	qs	9170	KN/M ²
ULT BC FOR CIRCULAR FOUNDATION	qs	9018	KN/M ²

GENERAL BEARING CAPACITY (FDN ENGG BY BM DAS)

(CHAPTER 3.6 PP 91)

COHISION OF A SOIL	c'	1.00	
DENSITY OF SOIL	γ	180	KN/M ³
VALUE OF PIE	π	3.142	
ANGLE OF INTERNAL FRICTION	Φ	20	DEGREE (26 to 45 degree) 0.349 RADIANS
DEPTH OF FOUNDATION	Df	1.20	M Df is less than or equal to its width
BREADTH/ DIA OF FOUNDATION	B	1.20	M
LENGTH OF FOUNDATION	L	1.20	M



a) Square footing bearing capacity considering general shear failure

$$q_u = 1.3cN_c + \gamma D_f N_q + 0.4\gamma B N_\gamma$$

SURCHARGE	q	216	KN/M ²	q=γ*Df	
INCLINED LOAD	Qu	100	KN		
ANGLE OF INCLINATION WITH VERTICAL	β	0	DEGREE	0.000	RADIANS

GENERAL SHAER FAILURE FACTOR

BEARING CAPACITY FACTOR	Nc	14.83
BEARING CAPACITY FACTOR	Nq	6.40
BEARING CAPACITY FACTOR	Ny	11.53

SHAPE FACTOR	Fcs	3.32
SHAPE FACTOR	Fqs	1.36
SHAPE FACTOR	Fys	0.60

DEPTH FACTOR	Fcd	1.40
DEPTH FACTOR	Fqd	1.32
DEPTH FACTOR	Fyd	1.00

INCLINATION FACTOR	Fci	1.00
INCLINATION FACTOR	Fqi	1.00
INCLINATION FACTOR	Fyi	1.00

ULT BC FOR STRIP FOUNDATION	qu	3295	KN/M ²
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FACTOR OF SAFETY	Fs	2.50	
SBC FOR STRIP FOUNDATION	qs	1318	KN/M ²