

**A BACKFILLED RAFT IN SAND:**

Enter the type of soil,1 for clay,2 for sand,3 for c-phi soil,4 for for layered soil

2

Depth of water table (Dw)(m).....=1.20

Total number of boreholes in the site =2

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BH. X-cor. Y-cor.  
No. (m) (m)

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1 12.0 9.0

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2 13.0 18.0  
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Enter the soil data from BH No..... 1

Interval at which data is entered(m).....= 2.0

Depth of the soil(m) .....=14.0

Number of depths with missing data...= 1

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Depth N-value N-corr. Unit wt.  
(m) (field) (kN/m3)

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0.00 --- --- ---

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2.00 9 13.23 16.2

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4.00 14 18.35 17.8

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6.00 18 21.53 18.3

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8.00 25 27.56 19.2

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10.00 20 20.72 18.0

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12.00 17 16.69 17.7

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14.00 19 17.74 18.0  
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Enter the soil data from BH No..... 2  
Interval at which data is entered(m)....= 2.0  
Depth of the soil(m) .....=14.0  
Number of depths with missing data...= 1

Depth (m)	N-value (field)	N-corr.	Unit wt. (kN/m <sup>3</sup> )
0.00	4	8.00	15.2
2.00	10	8.32	16.4
4.00	17	12.33	18.1
6.00	20	13.40	19.3
8.00	---	---	---
10.00	17	10.28	18.4
12.00	21	12.14	20.2
14.00	18	10.07	17.5

No. of footings to be designed:

4

Ftg. No.	X-cor. (m)	Y-cor. (m)	Load (kN)	B/L ratio	Df (m)
1	10.0	10.0	900.	1.0	2.0
2	16.0	10.0	1200	0.8	1.9
3	10.0	17.0	1400	0.7	2.1
4	16.0	17.0	1000	1.0	1.8

PRIMARY DESIGN OF INDEPENDENT FOOTINGS:

Permissible settlement for spread footing( $S_p$ )(mm)....= 50

Steps of iteration for spread footings(mm).....= 50

Ftg. No.	Nearest BH	$B_i$ (m)	$B$ (m)	$L$ (m)	$D$ (m) (assumed)	$NLI$ (kN/m <sup>2</sup> )	$SBP$ (kN/m <sup>2</sup> )	$S$ (mm)	No. of Iter.	Gov. Para.
1	1	1.80	2.50	2.50	0.46	148	442	49	14	S
2	1	1.85	2.65	3.35	0.47	139	425	50	16	S
3	2	2.35	3.55	5.10	0.59	83	419	49	24	S
4	2	2.40	3.80	3.80	0.60	75	385	49	28	S

REDESIGN FOR DIFFERENTIAL SETTLEMENT:

Permissible diff.settlement for footings( $dS_p$ )....= $C \times 0.0015$

Sl. No.	Ftg. pair	Dist. C(m)	$dS_p$ (mm)	Orig. $dS$ (mm)	Final $dS$ (mm)	No. of Iter.
1	1-2	6.00	9	1	1	0
2	1-3	7.00	10	0	0	0
3	1-4	9.22	14	0	0	0
4	2-3	9.22	14	1	1	0
5	2-4	7.00	10	0	0	0
6	3-4	6.00	9	1	1	0

FINAL DESIGN OF INDEPENDENT FOOTINGS:

Ftg. No.	$B$ (m)	$L$ (m)	$D_f$ (m)	$NLI$ (kN/m <sup>2</sup> )	$SBP$ (kN/m <sup>2</sup> )	$S$ (mm)
1	2.50	2.50	2.0	148	442	49
2	2.65	3.35	1.9	139	425	50
3	3.55	5.10	2.1	83	419	49
4	3.80	3.80	1.8	75	385	49

Sum area of footings(after revision)(m<sup>2</sup>)= 47.67  
Plan area (m<sup>2</sup>).....= 42.00  
Ratio(Sum area/Plan area).....= 114 %

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INDEPENDENT FOOTINGS ARE NOT FEASIBLE, SINCE FOOTING AREA  
EXCEEDS PLAN AREA  
TRY BACKFILLED RAFT

Assumed thickness(D)(m).....=0.60  
Depth of raft(Df)(m).....=2.30  
Minimum width(B) length(L) of raft(m)...=7.15, 8.50  
Enter the maximum width(m) & length(m) the site can permit  
8.00 9.00  
Permissible settlement for raft(Sp)(mm)= 75  
Steps of iteration for raft(mm).....= 50  
Design is based on the most unfavourable BH,which is BH No. 2

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FINAL DESIGN OF BACKFILLED RAFT:

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Width(B)(m).....=7.15  
Length(L)(m).....=8.50  
Depth of raft(Df)(m).=2.30

RESULTS:

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NLI (kN/m <sup>2</sup> )	SBP (kN/m <sup>2</sup> )	S (mm)	No.of Iter.	Gov. para.
79	635	50	0	---

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RETAIN BACKFILLED RAFT

-Exit-











