

## A COMPENSATED RAFT IN C-PHI SOIL

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

3

Depth of water table (Dw)(m).....=2.10

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 8.0 4.0

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 2 7.0 14.0  
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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) .....=12.0

Presumptive safe bearing pressure(kN/m<sup>2</sup>)=350

Number of depths with missing data.....= 1

1.Cc is given, 2.determined from WL, 3.determined from e<sub>0</sub>

1

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 Depth c Phi Cc e<sub>0</sub> Es Unit wt.  
 (m) (kN/m<sup>2</sup>) (deg) (kN/m<sup>2</sup>) (kN/m<sup>3</sup>)  
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0.00 --- --- --- --- ---

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 2.00 30.0 10 0.30 1.2 5000 16.7  
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4.00 67.5 15 0.10 1.1 6700 18.2

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 6.00 78.1 23 0.07 0.7 7800 19.1  
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8.00 100.0 16 0.08 0.9 7000 18.9

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 10.00 70.5 20 0.02 0.6 7500 19.3  
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12.00 50.0 17 0.01 0.5 8000 20.3  
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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) .....=12.0

Presumptive safe bearing pressure(kN/m<sup>2</sup>)=450

Number of depths with missing data.....= 2

1.Cc is given, 2.determined from WL, 3.determined from e<sub>0</sub>

2

Depth (m)	c (kN/m <sup>2</sup> )	Phi (deg)	WL (%)	Cc	e0	Es (kN/m <sup>2</sup> )	Unit wt. (kN/m <sup>3</sup> )
0.00	30.0	12	35	0.22	1.50	4000	15.6
2.00	---	---	---	---	---	---	---
4.00	100.0	20	26	0.14	1.10	6000	18.7
6.00	67.8	14	28	0.16	0.90	5600	17.8
8.00	78.0	23	17	0.06	0.70	8000	20.1
10.00	56.0	25	15	0.05	0.60	7600	20.0
12.00	---	---	---	---	---	---	---

No. of footings to be designed:  
4

Ftg. No.	X-cor. (m)	Y-cor. (m)	Load (kN)	B/L ratio	Df (m)
1	5.0	5.0	1000	1.0	2.0
2	10.0	5.0	1100	1.0	2.0
3	5.0	10.0	1050	0.8	1.8
4	10.0	10.0	1080	1.0	1.7

PRIMARY DESIGN OF INDEPENDENT FOOTINGS:

Permissible settlement for spread footing(Sp)(mm)....= 75  
Steps of iteration for spread footings(mm).....= 50

Ftg. No.	Nearest BH	Bi (m)	B (m)	L (m)	D (assumed) (m)	NLI (kN/m <sup>2</sup> )	SBP (kN/m <sup>2</sup> )	Se (mm)	Sc (mm)	S (total) (mm)	No.of Iter.	Gov. Para.
1	1	1.70	2.30	2.30	0.43	193	339	24	50	74	12	S
2	1	1.80	2.65	2.65	0.46	160	346	24	50	74	17	S

3	2	1.40	3.05	3.85	0.36	93	492	24	49	73	33	S	
4	2	1.55	3.50		3.50	0.39	92	514	24	50	74	39	S

REDESIGN FOR DIFFERENTIAL SETTLEMENT:

Permissible diff.settlement for footings(dS).....=C x 0.0015

Sl. No.	Ftg. pair	Dist. C(m)	dSp (mm)	Orig. dS(mm)	Final dS(mm)	No. of Iter.
1	1-2	5.00	8	0	0	0
2	1-3	5.00	8	1	1	0
3	1-4	7.07	11	0	0	0
4	2-3	7.07	11	1	1	0
5	2-4	5.00	8	0	0	0
6	3-4	5.00	8	1	1	0

FINAL DESIGN OF INDEPENDENT FOOTINGS:

Ftg. No.	B (m)	L (m)	Df (m)	NLI (kN/m2)	SBP (kN/m2)	Se (mm)	Sc (mm)	S (total) (mm)
1	2.30	2.30	2.0	193	339	24	50	74
2	2.65	2.65	2.0	160	346	24	50	74
3	3.05	3.85	1.8	93	492	24	49	73
4	3.50	3.50	1.7	92	514	24	50	74

Sum area of footings(after revision)(m2)= 36.30

Plan area (m2).....= 25.00

Ratio(Sum area/Plan area).....= 145 %

INDEPENDENT FOOTINGS ARE NOT FEASIBLE, SINCE FOOTING AREA EXCEEDS PLAN AREA

TRY BACKFILLED RAFT

Assumed thickness(D)(m).....=0.46

Depth of raft(Df)(m).....=2.10

Minimum width(B) length(L) of raft(m)...=6.05, 6.20

Enter the maximum width(m) & length(m) the site can permit

6.10 6.25

Permissible settlement for raft( $S_p$ )(mm)= 100  
 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).....=9.10  
 Length(L)(m).....=9.25  
 Depth of raft( $D_f$ )(m)....=2.10

RESULTS:  
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NLI (kN/m <sup>2</sup> )	SBP (kN/m <sup>2</sup> )	Se (mm)	Sc (mm)	S (mm)	No.of Iter.	Gov. para.
54	575	35	64	99	61	S

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 BACKFILLED RAFT IS NOT FEASIBLE, SINCE IT CROSSES SITE BOUNDARIES  
 TRY COMPENSATED RAFT

Step of iterations on depth( $D_f$ ) for compensated raft(mm)= 150  
 Design is based on the most unfavourable BH, which is BH No. 2

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 FINAL DESIGN OF COMPENSATED RAFT:  
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Depth( $D_f$ )(m).....=2.65  
 Width(B)(m).....=6.05  
 Length(L)(m).....=6.20

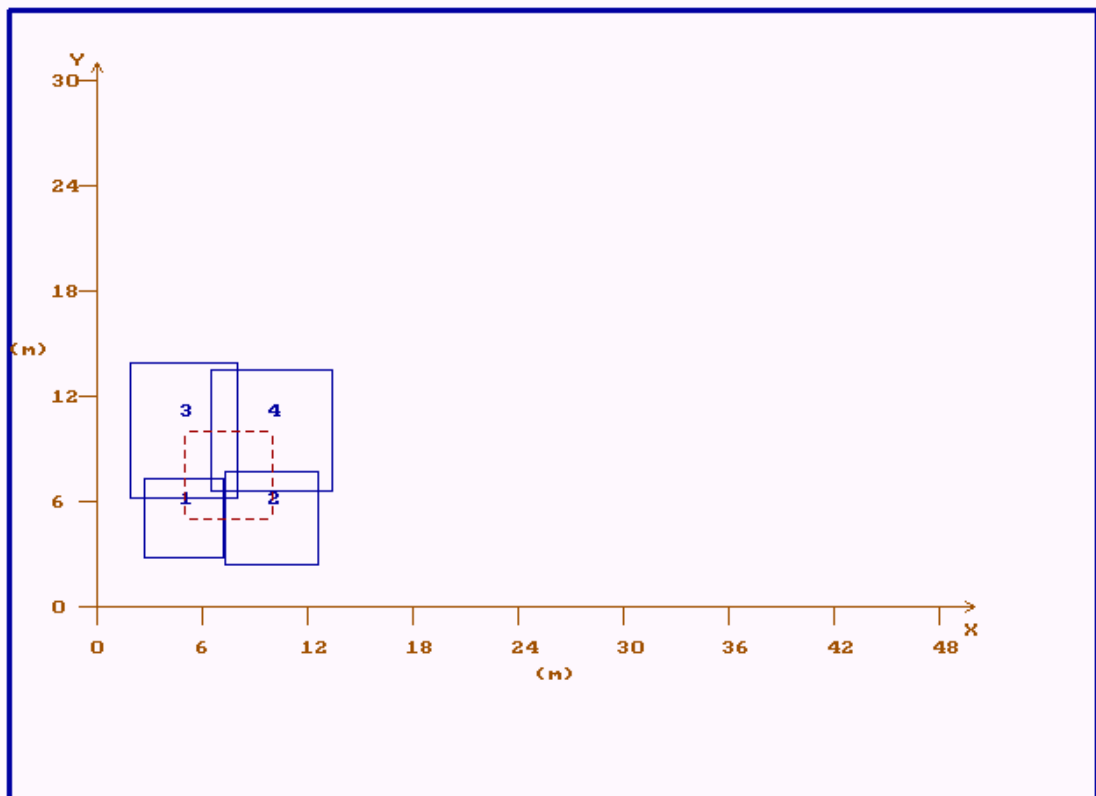
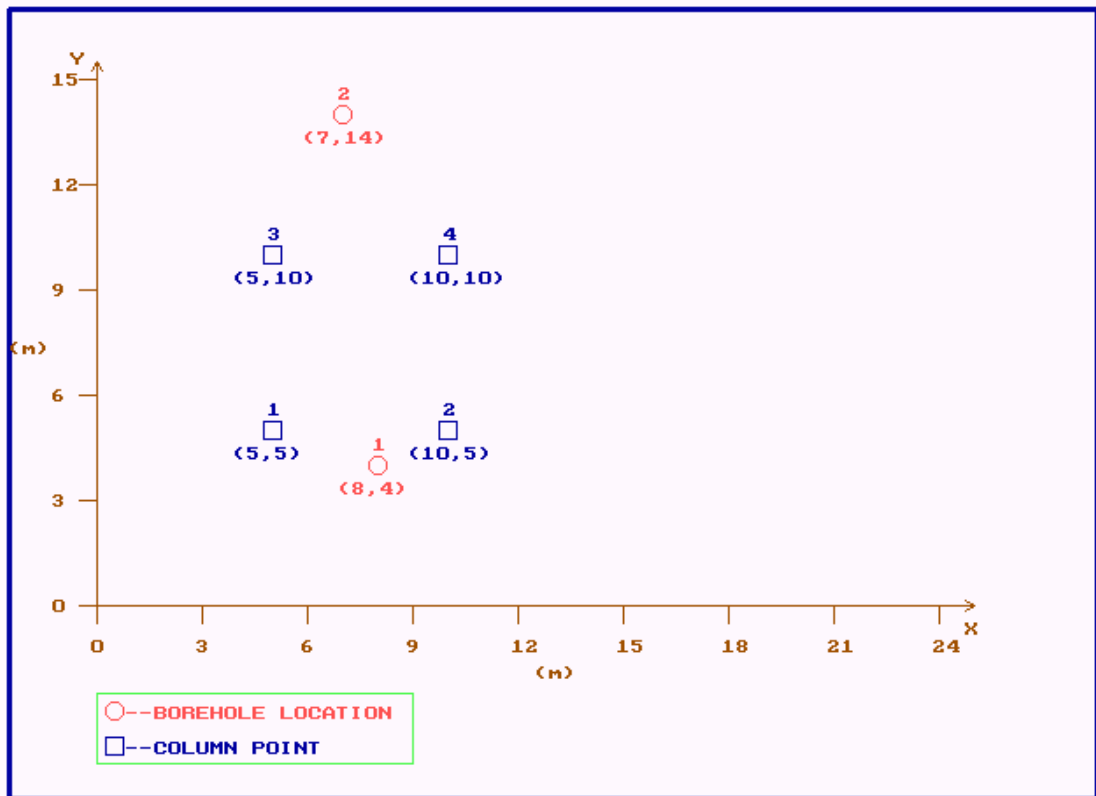
Assumed thickness(D)(m).=0.46

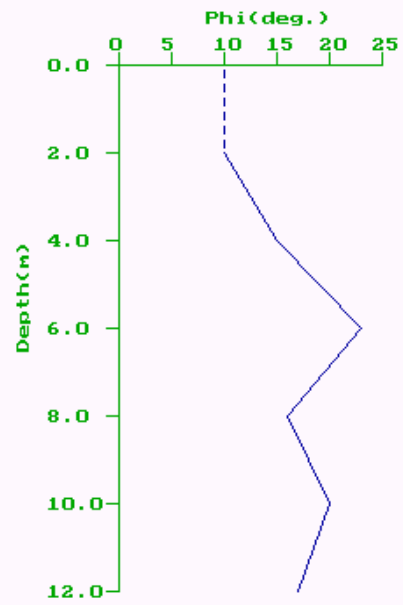
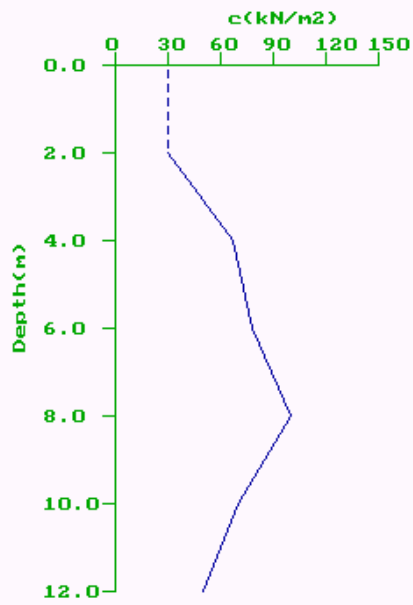
RESULTS:  
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NLI (kN/m <sup>2</sup> )	SBP (kN/m <sup>2</sup> )	Se (mm)	Sc (mm)	S (mm)	No.of Iter.	Gov. Para.
80	609	34	64	98	14	S

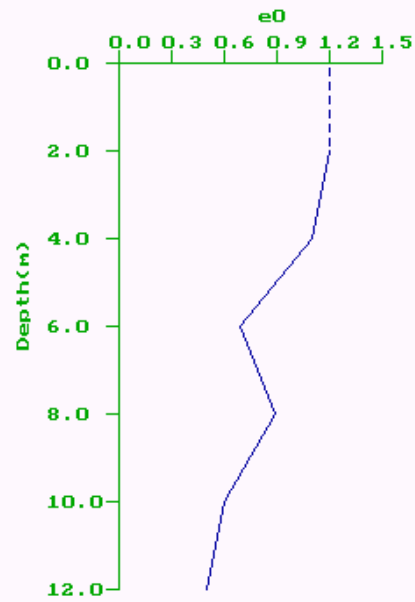
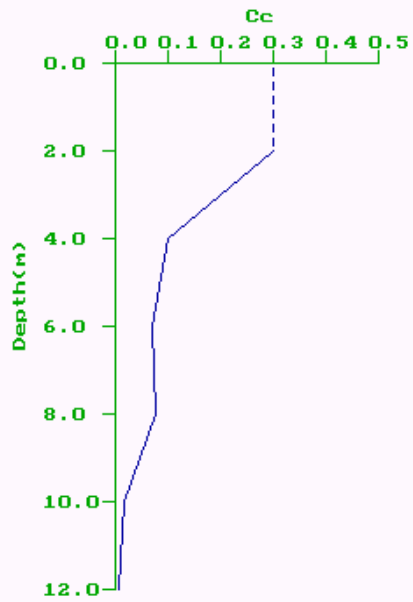
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 RETAIN COMPENSATED RAFT

-Exit-

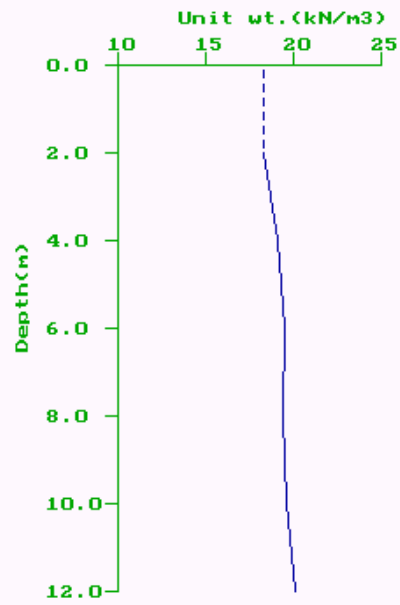
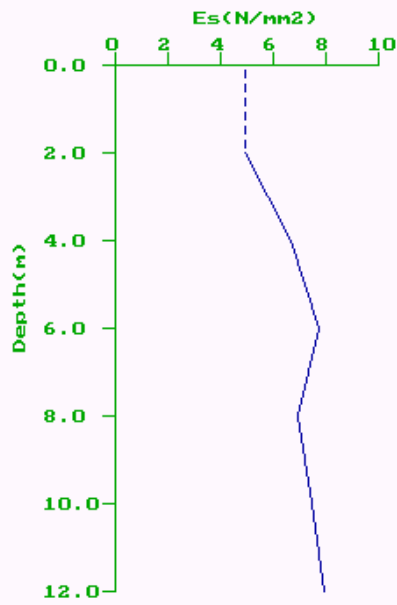




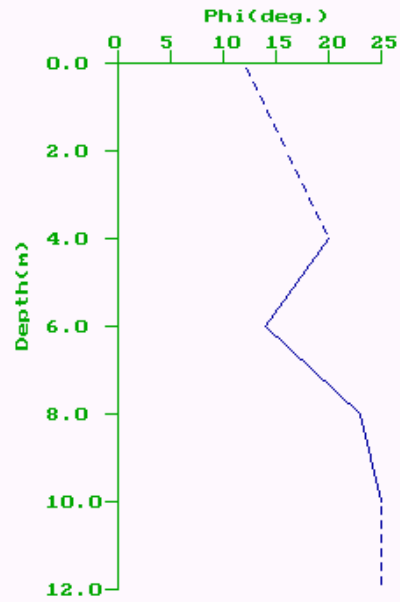
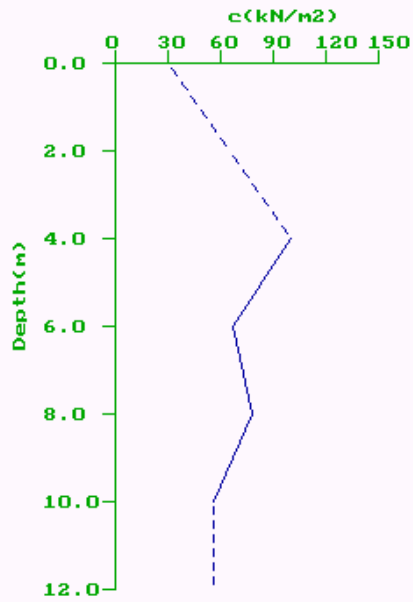
BOREHOLE No. 1



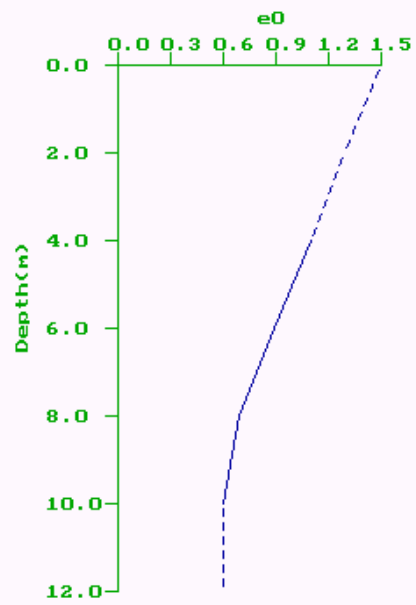
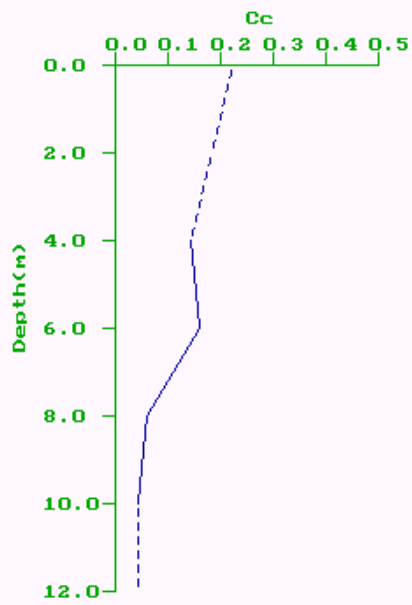
BOREHOLE No. 1



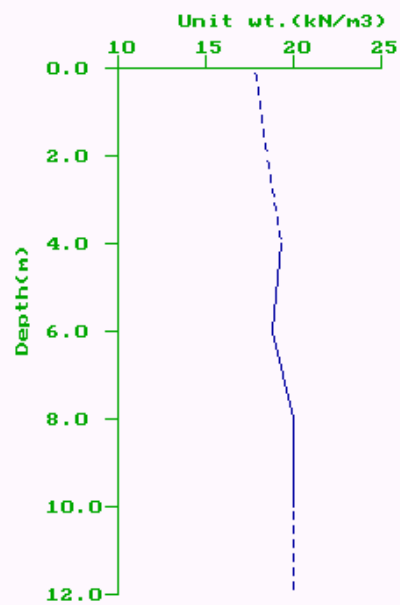
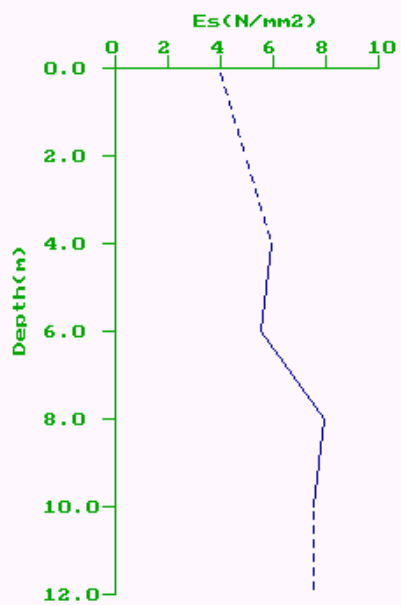
BOREHOLE No.1



BOREHOLE No.2



BOREHOLE No. 2



BOREHOLE No. 2



