Location:BH7

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2.5 m

Width(B)M= 2	Length L = 2

Soil parameter

Cohesion, C= 0.35 kg/scm= 3.5 t/sqm Saturated density , γ (Metric ton/m3) = 1.80

Angle of internal friction,Ø(deg)= 8 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	8	Nc	Nq	Nγ
Ø m	5	6.49	1.57	0.45

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.27	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

$q_d = \{2/3\ c\ Nc\ sc\ dc\ ic\ \} + \{\gamma\ D\ (Nq - 1) sq\ dq\ iq\ \} + \{0.5\ \gamma\ B\ N\gamma\ s\gamma\ d\gamma\ i\gamma\ W'\}$

q_d = {0.67x 3.5 x 6.49 x 1.3 x 1.27 x 1 }

.+ { 1.8 x 2.5 x (1.57 .- 1) x 1.2 x 1 x 1 }

.+ { 0.5 x 1.8 x 2 x 0.45 x 0.8 x 1 x 1 x 1 }

q_d = 25.18 .+ 3.078 .+ 0.324 .= 28.58 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 28.58 Metric tonne/sqm

F= factor of safety =2.5

q_{ns} =	11.43 Metric tonne/sqm
q_{ns} =	112 KN/sqm

RELIANT FOUNDATIONS PVT. LTD.

Location: BH8

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2.0 m

Width(B)M=	2	Length L =	2

Soil parameter

Cohesion, C= 0.28 kg/scm= 2.8 t/sqm Saturated density , γ (Metric ton/m3) = 1.80

Angle of internal friction,Ø(deg)= 7 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	7	Nc	Nq	Nγ
Ø m	4	6.22	1.45	0.36

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.21	ic=	1	W' = 0.5
Sq=	1.2	dq=	1	iq=	1	
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

$q_d = \{2/3\ c\ Nc\ sc\ dc\ ic\} + \{\gamma\ D\ (Nq - 1) sq\ dq\ iq\} + \{0.5\ \gamma\ B\ N\gamma\ s\gamma\ d\gamma\ i\gamma\ W'\}$

q_d = {0.67x 2.8 x 6.22 x 1.3 x 1.21 x 1 }
.+ { 1.8 x 2 x (1.45 .- 1) x 1.2 x 1 x 1 }
.+ { 0.5 x 1.8 x 2 x 0.36 x 0.8 x 1 x 1 x 1 }

q_d = 18.42 .+ 1.944 .+ 0.2592 .= 20.62 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 20.62 Metric tonne/sqm

F= factor of safety = 2.5

q_{ns} =	8.25 Metric tonne/sqm
q_{ns} =	80.84 KN/sqm

Location: BH9

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 3 m

Width(B)M= 2	Length L = 2

Soil parameter

Cohesion, C= 0.35 kg/scm= 3.5 t/sqm Saturated density , γ (Metric ton/m3) = 1.88

Angle of internal friction,Ø(deg)= 8 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	8	Nc	Nq	Nγ
Ø m	5	6.49	1.57	0.45

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.33	ic=	1	W' = 0.5
Sq=	1.2	dq=	1	iq=	1	
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

q_d= {2/3 c Nc sc dc ic } + {γ D (Nq – 1)sq dq iq } + {0.5 γ B Nγ sγ dγ iγ W' }

q_d = {0.67x 3.5 x 6.49 x 1.3 x 1.33 x 1 }
.+ { 1.88 x 3 x (1.57 .- 1) x 1.2 x 1 x 1 }
.+ { 0.5 x 1.88 x 2 x 0.45 x 0.8 x 1 x 1 x 1 }

q_d = 26.26 .+ 3.8578 .+ 0.3384 .= 30.45 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 30.45 Metric tonne/sqm

F= factor of safety =2.5

q_{ns} =	12.18 Metric tonne/sqm
q_{ns} =	119.4 KN/sqm

Location:BH10

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2.0 m

Width(B)M= 2	Length L = 2

Soil parameter

Cohesion, C= 0.43 kg/scm= 4.3 t/sqm Saturated density , γ (Metric ton/m3) = 1.84

Angle of internal friction,Ø(deg)= 7 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	7	Nc	Nq	Nγ
Ø m	4	6.22	1.45	0.36

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.21	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

q_d= {2/3 c Nc sc dc ic } + {γ D (Nq – 1)sq dq iq } + {0.5 γ B Nγ sγ dγ iγ W' }

q_d = {0.67x 4.3 x 6.22 x 1.3 x 1.21 x 1 }

.+ { 1.84 x 2 x (1.45 .- 1) x 1.2 x 1 x 1 }

.+ { 0.5 x 1.84 x 2 x 0.36 x 0.8 x 1 x 1 x 1 }

q_d = 28.29 .+ 1.9872 .+ 0.265 .= 30.54 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 30.54 Metric tonne/sqm

F= factor of safety = 2.5

q_{ns} =	12.22 Metric tonne/sqm
q_{ns} =	119.7 KN/sqm

Location: BH12

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2.5 m

Width(B)M=	2	Length L =	2

Soil parameter

Cohesion, C= 0.29 kg/scm= 2.9 t/sqm Saturated density , γ (Metric ton/m3) = 1.68

Angle of internal friction,Ø(deg)= 8 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	8	Nc	Nq	Nγ
Ø m	5	6.49	1.57	0.45

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.27	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

$q_d = \{2/3\ c\ Nc\ sc\ dc\ ic\} + \{\gamma\ D\ (Nq - 1) sq\ dq\ iq\} + \{0.5\ \gamma\ B\ N\gamma\ s\gamma\ d\gamma\ i\gamma\ W'\}$

q_d = {0.67x 2.9 x 6.49 x 1.3 x 1.27 x 1 }

.+ { 1.68 x 2.5 x (1.57 .- 1) x 1.2 x 1 x 1 }

.+ { 0.5 x 1.68 x 2 x 0.45 x 0.8 x 1 x 1 x 1 }

q_d = 20.86 .+ 2.8728 .+ 0.3024 .= 24.04 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 24.04 Metric tonne/sqm

F= factor of safety =2.5

q_{ns} =	9.61 Metric tonne/sqm
q_{ns} =	94.23 KN/sqm

Location: BH13

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2.0 m

Width(B)M= 2	Length L = 2

Soil parameter

Cohesion, C= 0.25 kg/scm= 2.5 t/sqm Saturated density , γ (Metric ton/m3) = 1.68

Angle of internal friction,Ø(deg)= 7 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	7	Nc	Nq	Nγ
Ø m	4	6.22	1.45	0.36

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.21	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

q_d= {2/3 c Nc sc dc ic } + {γ D (Nq – 1)sq dq iq } + {0.5 γ B Nγ sγ dγ iγ W' }

q_d = {0.67x 2.5 x 6.22 x 1.3 x 1.21 x 1 }

.+ { 1.68 x 2 x (1.45 .- 1) x 1.2 x 1 x 1 }

.+ { 0.5 x 1.68 x 2 x 0.36 x 0.8 x 1 x 1 x 1 }

q_d = 16.45 .+ 1.8144 .+ 0.2419 .= 18.5 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 18.50 Metric tonne/sqm

F= factor of safety = 2.5

q_{ns} =	7.40 Metric tonne/sqm
q_{ns} =	72.53 KN/sqm

RELIANT FOUNDATION LTD. GHANA

Location: BH14

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2 m

Width(B)M= 2	Length L = 2

Soil parameter

Cohesion, C= 0.21 kg/scm= 2.1 t/sqm Saturated density , γ (Metric ton/m3) = 1.68

Angle of internal friction,Ø(deg)= 7 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	7	Nc	Nq	Nγ
Ø m	4	6.22	1.45	0.36

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.21	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

q_d= {2/3 c Nc sc dc ic } + {γ D (Nq – 1)sq dq iq } + {0.5 γ B Nγ sγ dγ iγ W' }

q_d = {0.67x 2.1 x 6.22 x 1.3 x 1.21 x 1 }
.+ { 1.68 x 2 x (1.45 .- 1) x 1.2 x 1 x 1 }
.+ { 0.5 x 1.68 x 2 x 0.36 x 0.8 x 1 x 1 x 1 }

q_d = 13.82 .+ 1.8144 .+ 0.2419 .= 15.87 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 15.87 Metric tonne/sqm

F= factor of safety =2.5

q_{ns} =	6.35 Metric tonne/sqm
q_{ns} =	62.22 KN/sqm

RELIANT FOUNDATIONS PVT. LTD. GHAZIABAD

Location: BH15

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 3.0 m

Width(B)M=	2	Length L =	2

Soil parameter

Cohesion, C= 0.17 kg/scm= 1.7 t/sqm Saturated density , γ (Metric ton/m3) = 1.68

Angle of internal friction,Ø(deg)= 7 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	7	Nc	Nq	Nγ
Ø m	4	6.22	1.45	0.36

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.32	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

$q_d = \{2/3\ c\ Nc\ sc\ dc\ ic\} + \{\gamma\ D\ (Nq - 1) sq\ dq\ iq\} + \{0.5\ \gamma\ B\ N\gamma\ s\gamma\ d\gamma\ i\gamma\ W'\}$

q_d = {0.67x 1.7 x 6.22 x 1.3 x 1.32 x 1 }
.+ { 1.68 x 3 x (1.45 .- 1) x 1.2 x 1 x 1 }
.+ { 0.5 x 1.68 x 2 x 0.36 x 0.8 x 1 x 1 x 1 }

q_d = 12.17 .+ 2.7216 .+ 0.2419 .= 15.13 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 15.13 Metric tonne/sqm

F= factor of safety = 2.5

q_{ns} =	6.05 Metric tonne/sqm
q_{ns} =	59.33 KN/sqm

RELIANT FOUNDATIONS PVT. LTD. GHY-35

Location: BH16

CALCULATION OF NET SAFE BEARING CAPACITY
(SHEAR CRITERIA)

Depth of foundn , Df = 2.5 m

Width(B)M=	2	Length L =	2

Soil parameter

Cohesion, C= 0.29 kg/scm= 2.9 t/sqm Saturated density , γ (Metric ton/m3) = 1.80

Angle of internal friction,Ø(deg)= 7 , shear condition **Local**

Angle of shearing resistance for local failure = $Ø_m = \tan^{-1} 2/3 \tan Ø$

		Bearing capacity factor		
Ø	7	Nc	Nq	Nγ
Ø m	4	6.22	1.45	0.36

Shape, Depth and inlination factor

Shape factor		Depth factor		Inclination factor		Water table corection factor
Sc=	1.3	dc=	1.27	ic=	1	
Sq=	1.2	dq=	1	iq=	1	W' = 0.5
Sγ =	0.8	dγ =	1	iγ =	1	

Ultimate bearing capacity (qd) (Local shear Condition)

$q_d = \{2/3\ c\ Nc\ sc\ dc\ ic\} + \{\gamma\ D\ (Nq - 1) sq\ dq\ iq\} + \{0.5\ \gamma\ B\ N\gamma\ s\gamma\ d\gamma\ i\gamma\ W'\}$

q_d = {0.67x 2.9 x 6.22 x 1.3 x 1.27 x 1 }

.+ { 1.8 x 2.5 x (1.45 .- 1) x 1.2 x 1 x 1 }

.+ { 0.5 x 1.8 x 2 x 0.36 x 0.8 x 1 x 1 x 1 }

q_d = 19.92 .+ 2.43 .+ 0.2592 .= 22.61 Metric tonne/sqm

Net Safe bearing capacity , q_{ns} .= q_d /F = 22.61 Metric tonne/sqm

F= factor of safety =2.5

q_{ns} =	9.04 Metric tonne/sqm
q_{ns} =	88.63 KN/sqm

Location:-BH1

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2) I / Es$ $\qquad$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	10.91

E (t/m^2)=	3600
μ=	0.5

Settlement (m), Si =	0.005091
Settlement (mm), Si =	5.091333

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.14
eo=	0.73
H (m)=	4
field density (t/m^3)=	1.88
P=	9.4
ΔP = (at H/2 m depth)	2.7275
Settlement Sc (m)=	0.03582
Settlement Sc (mm)=	35.815

Total settlement Sc = A+B = 40.907

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 21.2714 mm <40MM Safe

Location:-BH2

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	12.11

E (t/m^2)=	3600
μ=	0.5

Settlement (m), Si =	0.005651
Settlement (mm), Si =	5.651333

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.16
eo=	0.79
H (m)=	4
field density (t/m^3)=	1.88
P=	9.4
ΔP = (at H/2 m depth)	3.0275
Settlement Sc (m)=	0.04335
Settlement Sc (mm)=	43.354

Total settlement Sc = A+B = 49.005

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 25.48281 mm <40MM Safe

Location:BH3

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ $\qquad$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	9.29

E (t/m^2)=	3600
μ=	0.5

Settlement (m), Si =	0.004335
Settlement (mm), Si =	4.335333

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.17
eo=	0.84
H (m)=	4
field density (t/m^3)=	1.8
P=	9
ΔP = (at H/2 m depth)	2.3225
Settlement Sc (m)=	0.03685
Settlement Sc (mm)=	36.846

Total settlement Sc = A+B = 41.181

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 21.41408 mm <40MM Safe

Location:-BH4

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	10.15

E (t/m^2)=	3600
μ=	0.5

Settlement (m), Si =	0.004737
Settlement (mm), Si =	4.736667

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.14
eo=	0.73
H (m)=	4
field density (t/m^3)=	1.82
P=	9.1
ΔP = (at H/2 m depth)	2.5375
Settlement Sc (m)=	0.03458
Settlement Sc (mm)=	34.577

Total settlement Sc = A+B = 39.314

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 20.44312 mm <40MM Safe

Location:-BH-5

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	11.51

E (t/m^2)=	3600
μ=	0.5

Settlement (m), Si =	0.005371
Settlement (mm), Si =	5.371333

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.12
eo=	0.68
H (m)=	4
field density (t/m^3)=	1.85
P=	9.25
ΔP = (at H/2 m depth)	2.8775
Settlement Sc (m)=	0.03361
Settlement Sc (mm)=	33.608

Total settlement Sc = A+B = 38.980

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 20.26948 mm <40MM Safe

Location:-BH6

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	10.72

E (t/m^2)=	3600
μ=	0.5

Settlement (m), Si =	0.005003
Settlement (mm), Si =	5.002667

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.17
eo=	0.84
H (m)=	4
field density (t/m^3)=	1.88
P=	9.4
ΔP = (at H/2 m depth)	2.68
Settlement Sc (m)=	0.04026
Settlement Sc (mm)=	40.260

Total settlement Sc = A+B = 45.263

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 23.53664 mm <40MM Safe

Location:-BH-7

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	2
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	10.2

E (t/m^2)=	1980
μ=	0.5

Settlement (m), Si =	0.008655
Settlement (mm), Si =	8.654545

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.17
eo=	0.85
H (m)=	4
field density (t/m^3)=	1.8
P=	7.2
ΔP = (at H/2 m depth)	2.55
Settlement Sc (m)=	0.04840
Settlement Sc (mm)=	48.398

Total settlement Sc = A+B = 57.053

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.00	√(LB) / D=	1.00

Total Corrected settlement , Sc = 29.66753 mm <40MM Safe

Location:-BH8

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	2
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	8.25

E (t/m^2)=	1200
μ=	0.5

Settlement (m), Si =	0.01155
Settlement (mm), Si =	11.55

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.22
eo=	1
H (m)=	4
field density (t/m^3)=	1.68
P=	6.72
ΔP = (at H/2 m depth)	2.0625
Settlement Sc (m)=	0.05115
Settlement Sc (mm)=	51.150

Total settlement Sc = A+B = 62.700

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.00	√(LB) / D=	1.00

Total Corrected settlement , Sc = 32.60374 mm <40MM Safe

Location:-BH-9

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2) I / Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	3
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	12.18

E (t/m^2)=	1980
μ=	0.5

Settlement (m), Si =	0.010335
Settlement (mm), Si =	10.33455

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.16
eo=	0.79
H (m)=	4
field density (t/m^3)=	1.84
P=	9.2
ΔP = (at H/2 m depth)	3.045
Settlement Sc (m)=	0.04440
Settlement Sc (mm)=	44.396

Total settlement Sc = A+B = 54.731

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.50	√(LB) / D=	0.67

Total Corrected settlement , Sc = 28.46005 mm <40MM Safe

Location:-BH10

Settlement Analysis as per IS 8003-1976

Total settlement , St = Si+Sc

St= Total settlement , Si= Immediate (elastic) settlement , Sc = Primary consolidation settlement

$Si = pB(1-\mu^2)I/Es$ Sc = Soed = (Ht/ 1+eo) Cc log10 (po + Δp)/ po

p = Load intensity , B = Width of foundation , μ = Poissons ratio

I = Influence factor , Es = Modulus of elasticity of soil

Ht = Thickness of soil layer , eo = Initial void ratio at mid height of of layer

Cc = Compression Index , Po = Initial effective pressure at mid height of layer

Δp = Average pressure increment due to foundation loading

1. Settlement of clay strata

A. Calculation of Immediate settlement (Si)

Depth of foundation Df (M) =	2
LENGTH (L) in m =	2
BREATH (B) in m =	2
L/B=	1
INFLUNCE FACTOR (If)=	1.12
Load intensity (t/m^2)=	12.22

E (t/m^2)=	2400
μ=	0.5

Settlement (m), Si =	0.008554
Settlement (mm), Si =	8.554

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.15
eo=	0.79
H (m)=	4
field density (t/m^3)=	1.84
P=	7.36
ΔP = (at H/2 m depth)	3.055
Settlement Sc (m)=	0.05054
Settlement Sc (mm)=	50.541

Total settlement Sc = A+B = 59.095

Correction factors

i	Depth correction factor from Fig 12 of IS -8009 Pt1. C.F=	0.65
ii	Rigidity factor (for raft foundation) cl 9.5.2	0.800
iii	λ= (Pore pressure correction factor, Cl9.2.3 of IS 8009, Pt1)	0.8

L/B=	1.00		
D/√(LB)=	1.00	√(LB) / D=	1.00

Total Corrected settlement , Sc = 30.72954 mm <40MM Safe