Location:-BH-12

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)=	10.2

E (t/m^2)=	1620
μ=	0.5

Settlement (m), Si =	0.010578
Settlement (mm), Si =	10.57778

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.19
eo=	0.9
H (m)=	4
field density (t/m^3)=	1.76
P=	8.8
ΔP = (at H/2 m depth)	2.55
Settlement Sc (m)=	0.04421
Settlement Sc (mm)=	44.205

Total settlement Sc = A+B = 54.783

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 = 28.48719 mm <40MM Safe

Location:-BH13

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)=	9.2

E (t/m^2)=	1620
μ=	0.5

Settlement (m), Si =	0.009541
Settlement (mm), Si =	9.540741

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.19
eo=	0.9
H (m)=	4
field density (t/m^3)=	1.76
P=	8.8
ΔP = (at H/2 m depth)	2.3
Settlement Sc (m)=	0.04034
Settlement Sc (mm)=	40.336

Total settlement Sc = A+B = 49.877

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 = 25.93597 mm <40MM Safe

Location:-BH-14

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)=	7.2

E (t/m^2)=	1200
μ=	0.5

Settlement (m), Si =	0.01008
Settlement (mm), Si =	10.08

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.22
eo=	1
H (m)=	4
field density (t/m^3)=	1.68
P=	8.4
ΔP = (at H/2 m depth)	1.8
Settlement Sc (m)=	0.03710
Settlement Sc (mm)=	37.101

Total settlement Sc = A+B = 47.181

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 = 24.53422 mm <40MM Safe

Location:-BH15

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)=	6.05

E (t/m^2)=	1620
μ=	0.5

Settlement (m), Si =	0.006274
Settlement (mm), Si =	6.274074

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.19
eo=	0.9
H (m)=	4
field density (t/m^3)=	1.76
P=	8.8
ΔP = (at H/2 m depth)	1.5125
Settlement Sc (m)=	0.02755
Settlement Sc (mm)=	27.553

Total settlement Sc = A+B = 33.827

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 = 17.58983 mm <40MM Safe

Location:-BH-16

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)=	1860
μ=	0.5

Settlement (m), Si =	0.009168
Settlement (mm), Si =	9.167742

B.Calculation of Primary consolidation settlement= Sc

Cc=	0.10
eo=	0.61
H (m)=	4
field density (t/m^3)=	1.98
P=	9.9
ΔP = (at H/2 m depth)	2.5375
Settlement Sc (m)=	0.02462
Settlement Sc (mm)=	24.621

Total settlement Sc = A+B = 33.788

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 = 17.56994 mm <40MM Safe

RELIANT FOUNDATIONS PVT. LTD.

Location:-BH1

Pile Length .(M)	8.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	2.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	0	
Cohesion at Pile tip (t/m2)	c	10.0	

Bearing Capacity Factor		
Nc	Nq	Ny
9	0.00	0.00

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	Cav, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	3.00			3.00	Ignored													
3.00	8.00			5.00	7.20	0.35	0.45	7.07						17.81				
		6.00					0.45							17.81	14.31	32.13	12.85	6.52

2 Pile dia (m) = 0.5

0.00	3.00			3.00	Ignored													
3.00	8.00			5.00	7.20	0.35	0.50	7.85						19.79				
		6.00					0.50							19.79	17.67	37.46	14.99	7.42

3 Pile dia (m) = 0.6

0.00	3.00			3.00	Ignored													
3.00	8.00			5.00	7.20	0.35	0.60	9.42						23.75				
		6.00					0.60							23.75	25.45	49.20	19.68	9.33

Location:-BH2

Pile Length .(M)	10.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	2.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	31	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	25	27.52	31

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	3.00			3.00	Ignored						0.0							
3.00	9.30			6.30	4.23	0.58	0.45	8.91		0	1.75	0.75	4.73	21.85				
9.30	10.00		0.70	0.70			0.45	0.99	1.00	31	1.75	0.75	4.99	2.97				
15D =	6.75	8.00	0.70	6.75			0.45			0	1.85	0.85	5.74	24.82	23.65	48.47	19.39	9.00

2 Pile dia (m) = 0.5

0.00	3.00			3.00	Ignored						0.0							
3.00	9.30			6.30	4.23	0.58	0.50	9.90		0	1.75	0.75	4.73	24.28				
9.30	10.00		0.70	0.70			0.50	1.10	1.00	31	1.75	0.75	4.99	3.30				
15D =	7.50	8.00	0.70	7.50			0.50			0	1.85	0.85	6.38	27.57	32.44	60.02	24.01	10.23

3 Pile dia (m) = 0.6

0.00	3.00			3.00	Ignored						0.0							
3.00	9.30			6.30	4.23	0.58	0.60	11.88		0	1.75	0.75	4.73	29.13				
9.30	10.00		0.70	0.70			0.60	1.32	1.00	31	1.75	0.75	4.99	3.95				
15D =	9.00	8.00	0.70	8.00			0.60			0	1.85	0.85	6.80	33.09	50.05	83.14	33.26	12.85

Location: BH3

Pile Length .(M)	8.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	2.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	0	
Cohesion at Pile tip (t/m2)	c	8.7	

Bearing Capacity Factor		
Nc	Nq	Ny
9	0.00	0.00

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	Cav, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	3.00			3.00	Ignored													
3.00	8.00			5.00	7.80	0.30	0.45	7.07						16.54				
		6.00					0.45							16.54	12.45	28.99	11.60	6.16

2 Pile dia (m) = 0.5

0.00	3.00			3.00	Ignored													
3.00	8.00			5.00	7.80	0.30	0.50	7.85						18.38				
		6.00					0.50							18.38	15.37	33.75	13.50	7.02

3 Pile dia (m) = 0.6

0.00	3.00			3.00	Ignored													
3.00	8.00			5.00	7.80	0.30	0.60	9.42						22.05				
		6.00					0.60							22.05	22.14	44.19	17.68	8.84

6.3

Location:BH4

Pile Length .(M)	9.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	2.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	31	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	25	27.52	31

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	3.50			3.50	Ignored						0.0							
3.50	8.10			4.60	4.23	0.58	0.45	6.50		0	1.70	0.70	3.22	15.95				
8.10	9.00		0.90	0.90			0.45	1.27	1.00	31	1.72	0.72	3.54	2.71				
15D =	6.75	7.00	0.90	6.75			0.45			0	1.80	0.80	5.40	18.66	22.26	40.92	16.37	7.00

2 Pile dia (m) = 0.50

0.00	3.50			3.50	Ignored						0.0							
3.50	8.10			4.60	4.23	0.58	0.50	7.23		0	1.70	0.70	3.22	17.73				
8.10	9.00		0.90	0.90			0.50	1.41	1.00	31	1.72	0.72	3.54	3.01				
15D =	7.50	7.00	0.90	7.00			0.50			0	1.80	0.80	5.60	20.74	28.57	49.31	19.72	7.99

3 Pile dia (m) = 0.60

0.00	3.50			3.50	Ignored						0.0							
3.50	8.10			4.60	4.23	0.58	0.60	8.67		0	1.70	0.70	3.22	21.27				
8.10	9.00		0.90	0.90			0.60	1.70	1.00	31	1.72	0.72	3.54	3.61				
15D =	9.00	7.00	0.90	7.00			0.60			0	1.80	0.80	5.60	24.89	41.45	66.34	26.53	10.08

Location:BH5

Pile Length .(M)	9.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	2.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	31	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	25	27.52	31

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + P_D Nq} +{ Sum (K P_{Di} tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	2.00			2.00	Ignored						0.0							
2.00	8.10			6.10	4.10	0.58	0.45	8.62		0	1.70	0.70	4.27	20.51				
8.10	9.00		0.90	0.90			0.45	1.27	1.00	31	1.70	0.70	4.59	3.51				
15D =	6.75	7.00	0.90	6.75			0.45			0	1.80	0.80	5.40	24.01	22.26	46.27	18.51	8.53

2 Pile dia (m) = 0.5

0.00	2.00			2.00	Ignored						0.0							
2.00	8.10			6.10	4.10	0.58	0.50	9.58		0	1.70	0.70	4.27	22.79				
8.10	9.00		0.90	0.90			0.50	1.41	1.00	31	1.70	0.70	4.59	3.89				
15D =	7.50	7.00	0.90	7.00			0.50			0	1.80	0.80	5.60	26.68	28.57	55.25	22.10	9.68

3 Pile dia (m) = 0.6

0.00	2.00			2.00	Ignored						0.0							
2.00	8.10			6.10	4.10	0.58	0.60	11.50		0	1.70	0.70	4.27	27.34				
8.10	9.00		0.90	0.90			0.60	1.70	1.00	31	1.70	0.70	4.59	4.67				
15D =	9.00	7.00	0.90	7.00			0.60			0	1.80	0.80	5.60	32.02	41.45	73.47	29.39	12.11

Location:BH6

Pile Length .(M)	7.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	2.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	31	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	25	27.52	31

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	2.00			2.00	Ignored						0.0							
2.00	2.80			0.80	2.65	0.78	0.45	1.13		0	1.68	0.68	0.54	2.34				
2.80	7.00		4.20	4.20			0.45	5.94	1.00	31	1.70	0.70	2.01	7.19				
15D =	6.75	5.00	4.20	5.00			0.45			0	1.80	0.80	4.00	9.52	16.69	26.22	10.49	3.91

2 Pile dia (m) = 0.5

0.00	2.00			2.00	Ignored						0.0							
2.00	2.80			0.80	2.65	0.78	0.50	1.26		0	1.68	0.68	0.54	2.60				
2.80	7.00		4.20	4.20			0.50	6.60	1.00	31	1.70	0.70	2.01	7.98				
15D =	7.50	5.00	4.20	5.00			0.50			0	1.80	0.80	4.00	10.58	20.72	31.30	12.52	4.50

3 Pile dia (m) = 0.6

0.00	2.00			2.00	Ignored						0.0							
2.00	2.80			0.80	2.65	0.78	0.60	1.51		0	1.68	0.68	0.54	3.12				
2.80	7.00		4.20	4.20			0.60	7.92	1.00	31	1.70	0.70	2.01	9.58				
15D =	9.00	5.00	4.20	5.00			0.60			0	1.80	0.80	4.00	12.70	30.14	42.84	17.14	5.75

Location: BH7

Pile Length .(M)	7.000	
Angle of Internal Friction at Pile Tip (Degree)	Ø	0
Cohesion at Pile tip (t/m2)	c	9.3

Bearing Capacity Factor			
Nc	Nq	Ny	
9	31.00	37.78	33

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45 Pile cutoff = 2 m

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	2.50			2.50	Ignored						0.0							
2.50	6.10			3.60			0.45	5.09	1.00	32	1.85	0.85	3.06	6.93				
6.10	7.00		0.90	0.90	4.96	0.58	0.45	1.27		0	1.95	0.95	3.49	3.66				
15D =	6.75	5.00		12.00			0.45			0				10.59	13.31	23.91	9.56	4.22

2 Pile dia (m) = 0.5 Pile cutoff = 2 m

0.00	2.50			2.50	Ignored						0.0							
2.50	6.10			3.60			0.50	5.65	1.00	32	1.85	0.85	3.06	7.70				
6.10	7.00		0.90	0.90	4.96	0.58	0.50	1.41		0	1.95	0.95	3.49	4.07				
15D =	7.50	5.00		11.70			0.50			0				11.77	16.43	28.21	11.28	4.84

2 Pile dia (m) = 0.6 Pile cutoff = 2 m

0.00	2.50			2.50	Ignored						0.0							
2.50	6.10			3.60			0.60	6.79	1.00	32	1.85	0.85	3.06	9.25				
6.10	7.00		0.90	0.90	4.96	0.58	0.60	1.70		0	1.95	0.95	3.49	4.88				
15D =	9.00	5.00		11.70			0.60			0				14.13	23.67	37.79	15.12	6.16

Location: BH8

Pile Length .(M)	13.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	1.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	30	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	20	22.4	30

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	2.00			2.00	Ignored						0.0							
2.00	11.90			9.90	2.65	0.78	0.45	14.00		0	1.68	0.68	6.73	28.93				
11.90	13.00		1.10	1.10			0.45	1.56	1.00	30	1.70	0.70	7.12	6.39				
15D =	6.75	12.00	6.75	5.00			0.45			0	1.80	0.80	4.00	35.32	13.36	48.68	19.47	12.95

2 Pile dia (m) = 0.5

0.00	2.00			2.00	Ignored						0.0							
2.00	11.90			9.90	2.65	0.78	0.50	15.55		0	1.68	0.68	6.73	32.14				
11.90	13.00		1.10	1.10			0.50	1.73	1.00	30	1.70	0.70	7.12	7.10				
15D =	7.50	12.00	7.50	5.00			0.50			0	1.80	0.80	4.00	39.24	16.59	55.83	22.33	14.74

3 Pile dia (m) = 0.6

0.00	2.00			2.00	Ignored						0.0							
2.00	11.90			9.90	2.65	0.78	0.60	18.66		0	1.68	0.68	6.73	38.57				
11.90	13.00		1.10	1.10			0.60	2.07	1.00	30	1.70	0.70	7.12	8.52				
15D =	9.00	12.00	9.00	5.00			0.60			0	1.80	0.80	4.00	47.09	24.14	71.23	28.49	18.54

Location :BH9

Pile Length .(M)	8.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	1.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	30	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	20	22.4	30

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	2.00			2.00	Ignored						0.0							
2.00	5.80			3.80	4.00	0.58	0.45	5.37		0	1.70	0.70	2.66	12.46				
5.80	8.00		2.20	2.20			0.45	3.11	1.00	30	1.70	0.70	3.43	6.16				
15D =	6.75	7.00	2.20	6.75			0.45			0	1.80	0.80	5.40	18.62	17.82	36.44	14.58	6.99

2 Pile dia (m) = 0.5

0.00	2.00			2.00	Ignored						0.0							
2.00	5.80			3.80	4.00	0.58	0.50	5.97		0	1.70	0.70	2.66	13.85				
5.80	8.00		2.20	2.20			0.50	3.46	1.00	30	1.70	0.70	3.43	6.84				
15D =	7.50	7.00	2.20	7.00			0.50			0	1.80	0.80	5.60	20.69	22.87	43.56	17.42	7.97

3 Pile dia (m) = 0.6

0.00	2.00			2.00	Ignored						0.0							
2.00	5.80			3.80	4.00	0.58	0.60	7.16		0	1.70	0.70	2.66	16.62				
5.80	8.00		2.20	2.20			0.60	4.15	1.00	30	1.70	0.70	3.43	8.21				
15D =	9.00	7.00	2.20	7.00			0.60			0	1.80	0.80	5.60	24.83	33.19	58.02	23.21	10.06

Location:BH10

Pile Length .(M)	7.000	If Liquified strata than liquified level	No
Pile cutoff Length (m)	1.000	Pile Terminating level	
Angle of Internal Friction at Pile Tip (Degree)	Ø	30	
Cohesion at Pile tip (t/m2)	c	0	

Bearing Capacity Factor			
Nc	Nq	Ny	
9	20	22.4	30

Ultimate pile capacity , Qu = QP + Qs = { Ap Nc Cp + Ap (1/2 D γ Nγ + PD Nq} +{ Sum (K PDi tan d Asi) + alpha x Ca As }
Qp = End bearing resistnce , Qs = Frictional resistsnce

1 Pile dia (m) = 0.45

Depth from	Depth to	Length below cutoff (m)	Thickness of sand layer	Li	C, T/m2	alpha	Pile dia D, m	Circumferential area As, m2	K	phi	Y (metric ton/m3)	Ysub (metric ton/m3)	po' ton/m2	Qs, Tonne	Qp, Tonne	Qu, Tonne	Qsafe in copression , Metric Tonne	Q safe Uplift, Metric Tonne
0.00	2.00			2.00	Ignored						0.0							
2.00	6.00			4.00	3.56	0.78	0.45	5.65		0	1.68	0.68	2.72	15.70				
6.00	7.00		1.00	1.00			0.45	1.41	1.00	30	1.70	0.70	3.07	2.51				
15D =	6.75	6.00	6.75	6.00			0.45			0	1.80	0.80	4.80	18.21	15.91	34.12	13.65	6.63

2 Pile dia (m) = 0.5

0.00	2.00			2.00	Ignored						0.0							
2.00	6.00			4.00	3.56	0.78	0.50	6.28		0	1.68	0.68	2.72	17.45				
6.00	7.00		1.00	1.00			0.50	1.57	1.00	30	1.70	0.70	3.07	2.78				
15D =	7.50	6.00	6.00	6.00			0.50			0	1.80	0.80	4.80	20.23	19.73	39.96	15.98	7.55

3 Pile dia (m) = 0.6

0.00	2.00			2.00	Ignored						0.0							
2.00	6.00			4.00	3.56	0.78	0.60	7.54		0	1.68	0.68	2.72	20.94				
6.00	7.00		1.00	1.00			0.60	1.88	1.00	30	1.70	0.70	3.07	3.34				
15D =	9.00	6.00	6.00	6.00			0.60			0	1.80	0.80	4.80	24.28	28.66	52.94	21.18	9.48