

Construction of Bore Piles

- Introduction and Design Concept
- Piling Equipments
- Piling Procedure
- Preparing Bentonite
- Installation of Reinforcement
- Concreting
- Pile Tests
- Discussions

- Foundation
 - Transfers load to the underlying ground.
 - Typical Strength of Columns / Substructures
M20
 - Typical Bearing capacity shallow depth 100 kpa
- Foundation types :

Shallow	- Spread (open)
	- Raft
Deep	- Pile
	- Well
	- Diaphragm walls

- Advantages of Piles

- 1 at a time i.e. risk is lessened
- No tilt
- Load test
- Borelog can be verified, length can be changed
- Cost is less
- If problem always discard the one.

- Piling Materials

1. Concrete
2. Admixture
3. Reinforcement Cage
4. Drilling Mud in case of bore pile

Load Bearing Capacity of Piles

- $Q_f = Q_{\text{shaft}} + Q_{\text{base}}$

- $Q_a = (Q_{\text{shaft}} + Q_{\text{base}})/\text{FOS}$

- In clays and cohesive soil:

$$Q_f = (\alpha C_u)A_s + (N_c)C_u A_b$$

C_u = unconfined compressive strength = $6 \times N$

N = standard penetration test no.

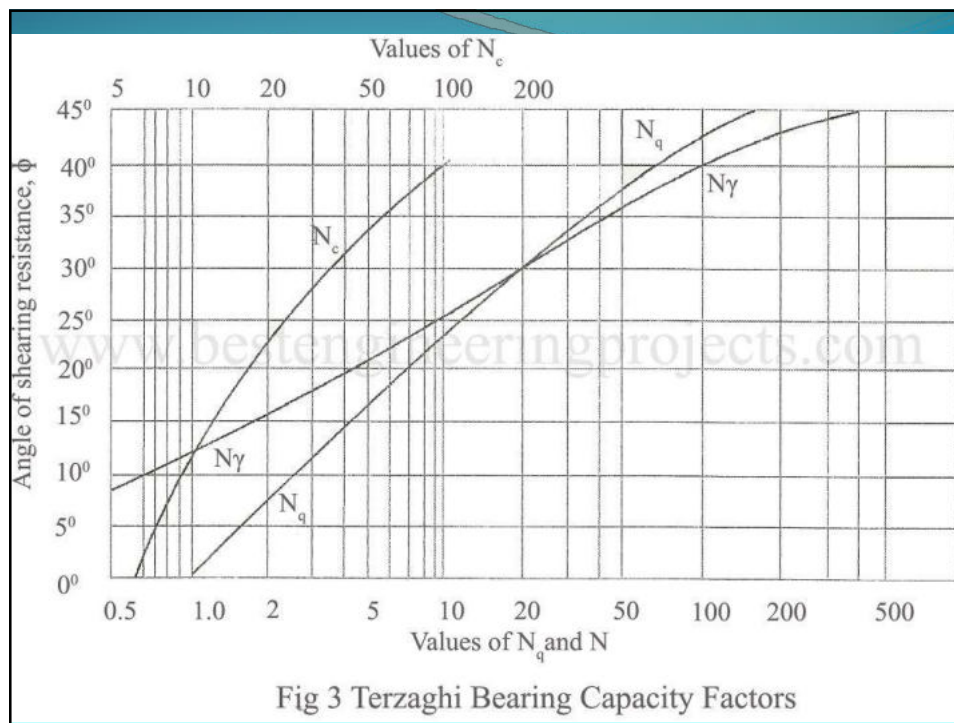
α = adhesion factor = 0.3 to 0.5

N_c = bearing capacity factor

FOS = 2.5

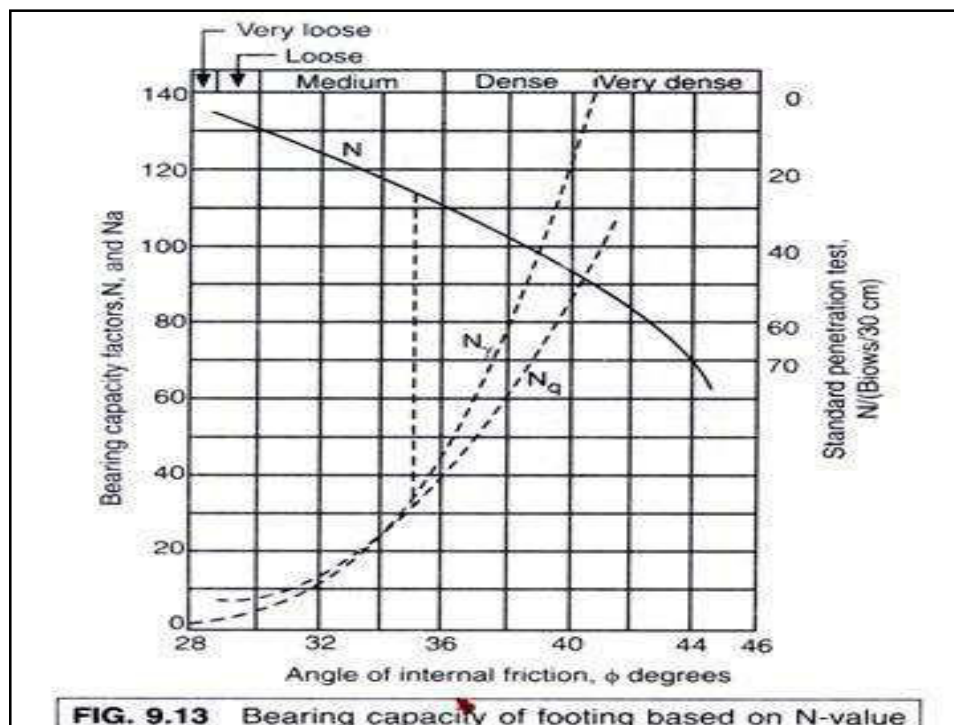
Load Bearing Capacity of Piles

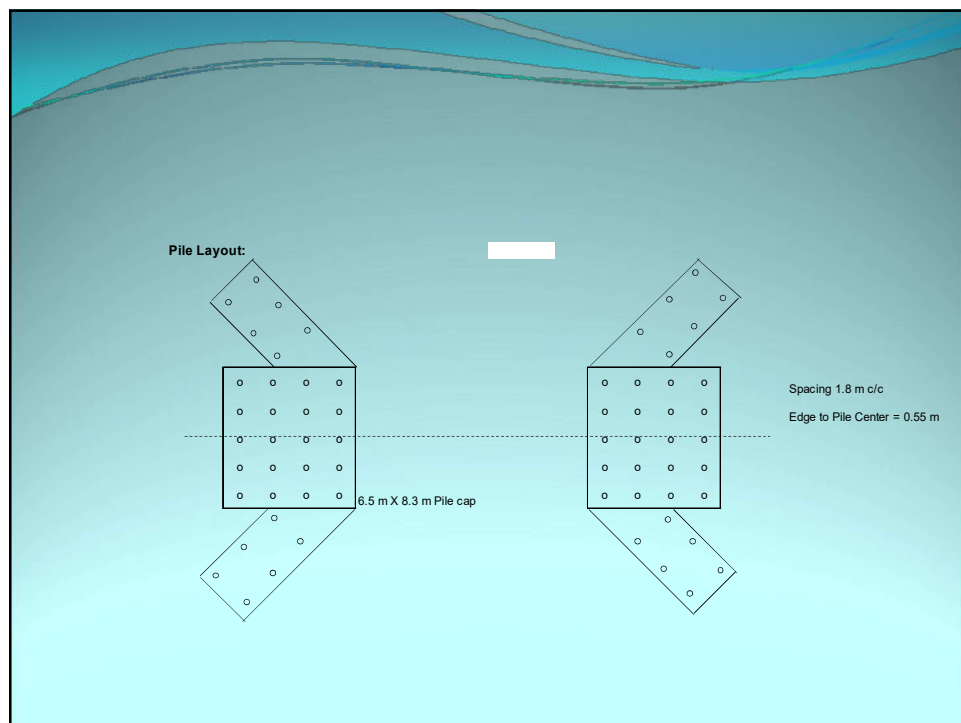
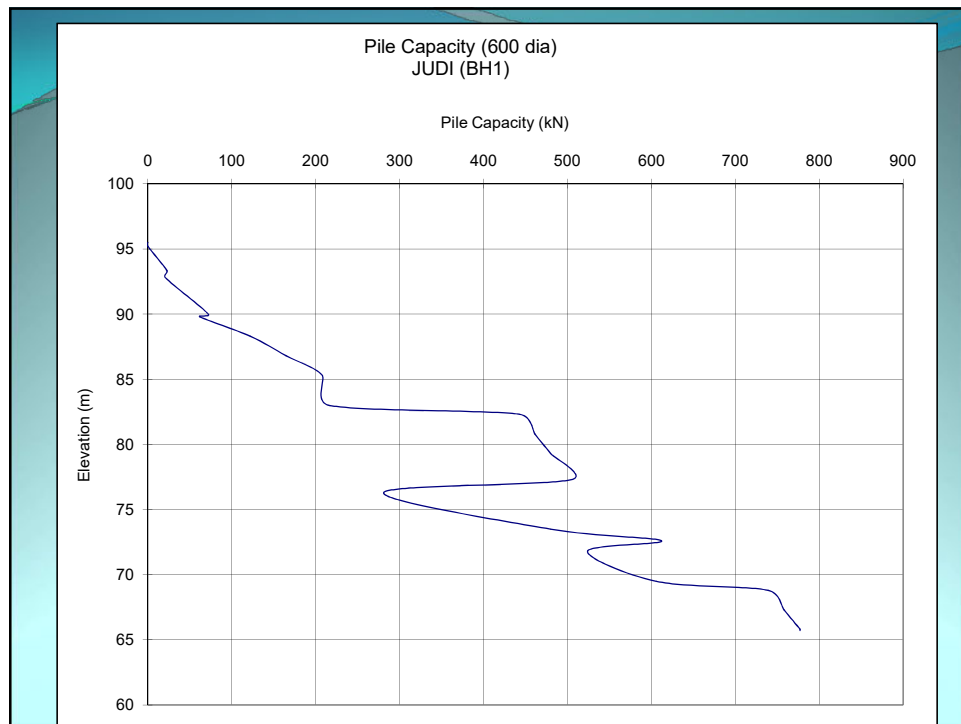
- $Q_f = Q_{\text{shaft}} + Q_{\text{base}}$
- $Q_a = (Q_{\text{shaft}} + Q_{\text{base}})/\text{FOS}$
- In sand and granular soil
- $Q_f = (k p'_{\text{ave}})A_s + (N_q) p' A_b$
- p' = effective overburden pressure
- $\text{FOS} = 2.5$
- $k = 0.5$
- N_c, N_q are bearing capacity factors



BEARING CAPACITY FACTORS OF TERZAGHI

ϕ°	N_c	N_q	N_γ
0	5.7	1.0	0.0
5	7.3	1.6	0.14
10	9.6	2.7	1.2
15	12.9	4.4	1.8
20	17.7	7.4	5.0
25	25.1	12.7	9.7
30	37.2	22.5	19.7
35	57.8	41.4	42.4
40	95.7	81.3	100.4
45	172.3	173.3	360.0
50	347.5	415.1	1072.8

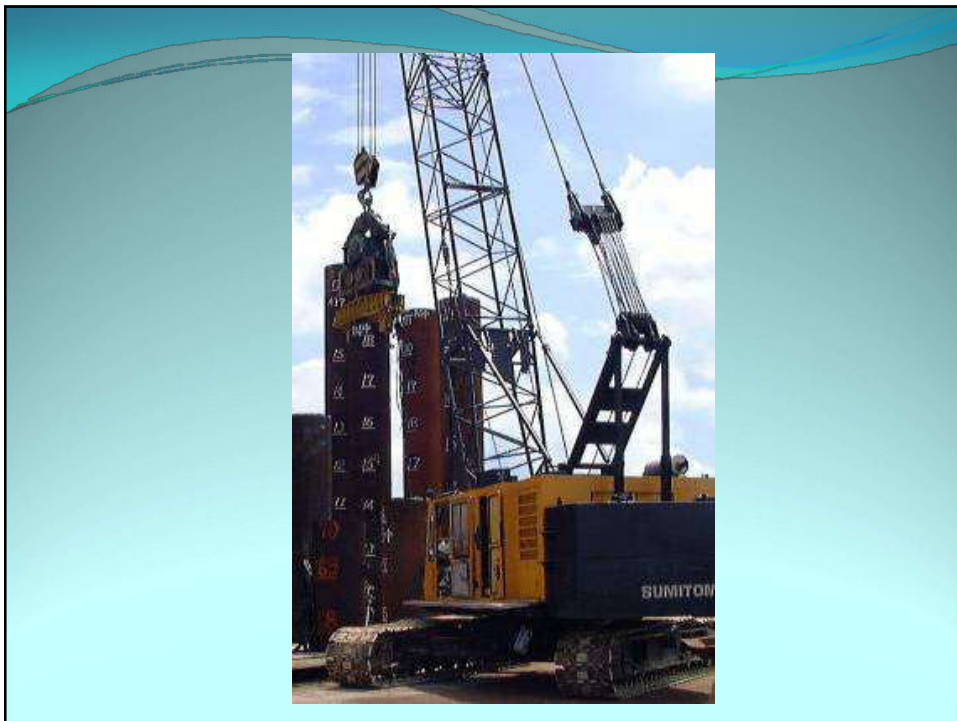




Pile Driving Machines: Conventional and obsolete

Pile Boring Machines : Auger drilling
 Bucket drilling
 Percussion (Chisel) by wash boring

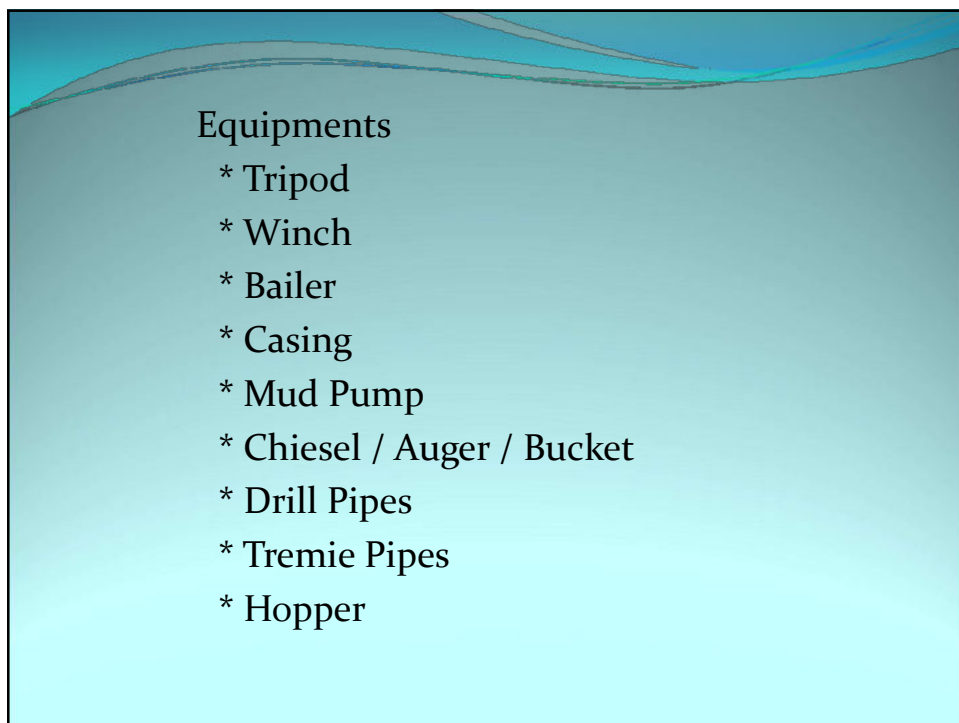














Winch Machine



Chisel







Tremie Pipes



Hopper



Mud Pump



Bentonite Tank
(collection+supply)



