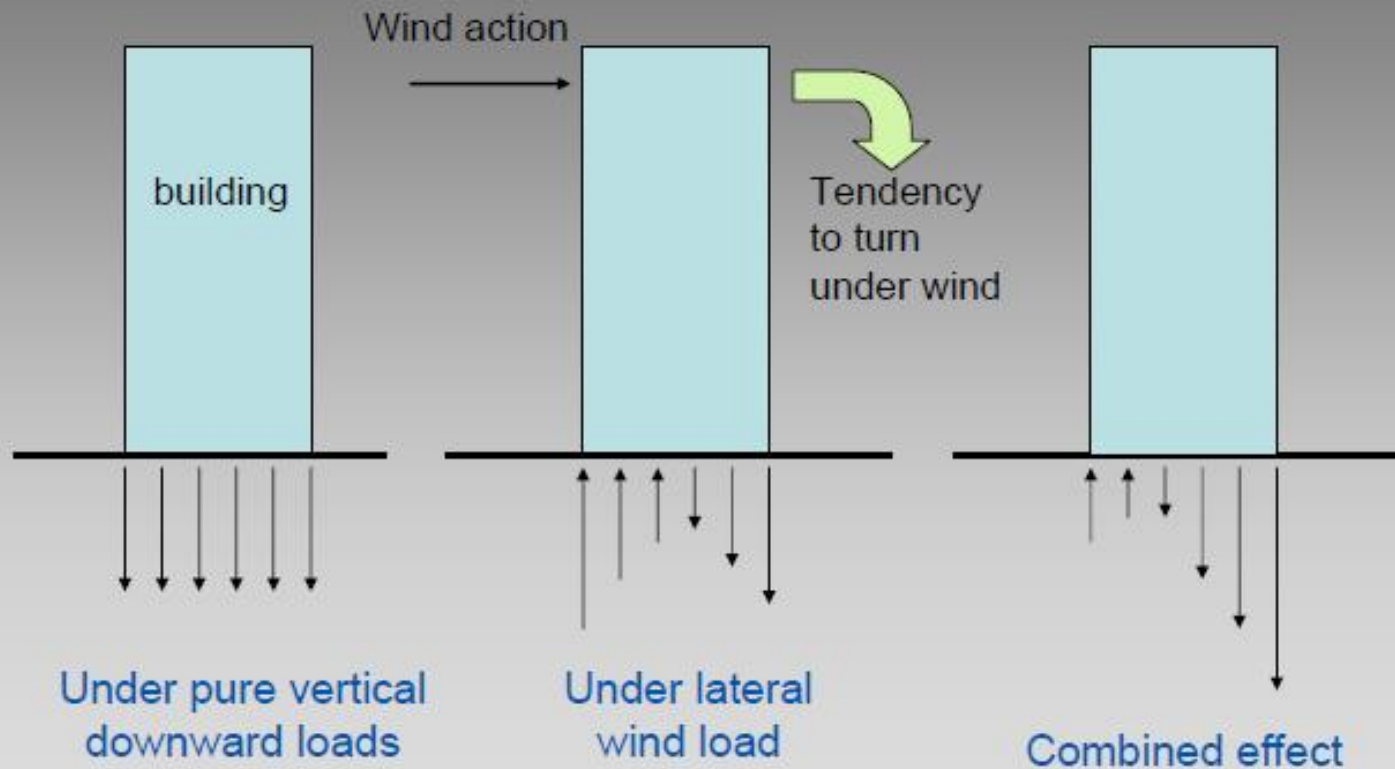


Foundation

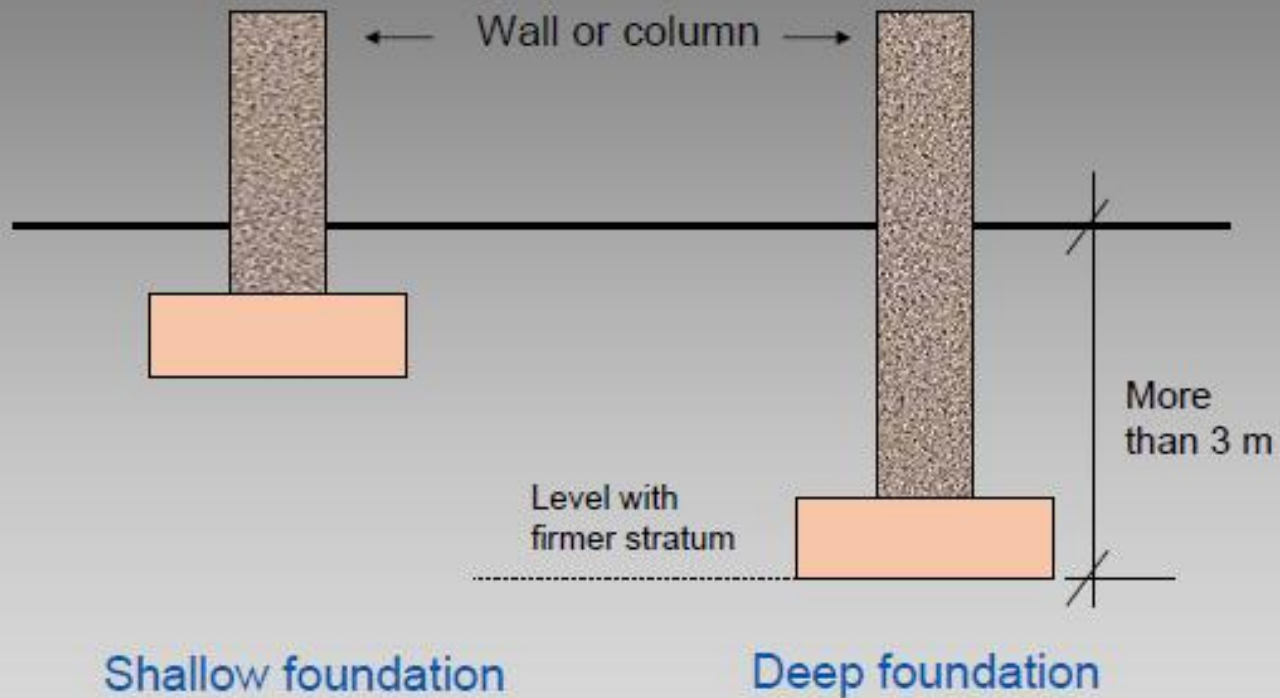
Forces acting onto Foundation

↓ Downward load

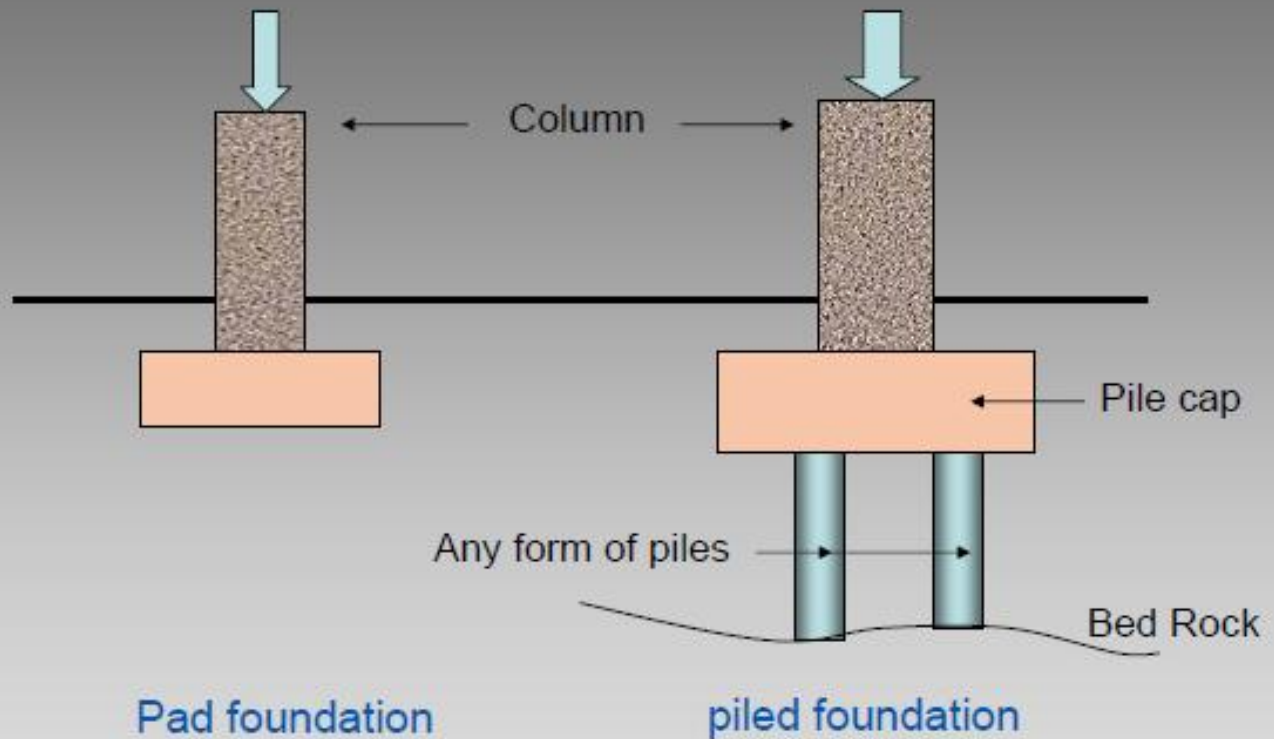
↑ Uplifting action



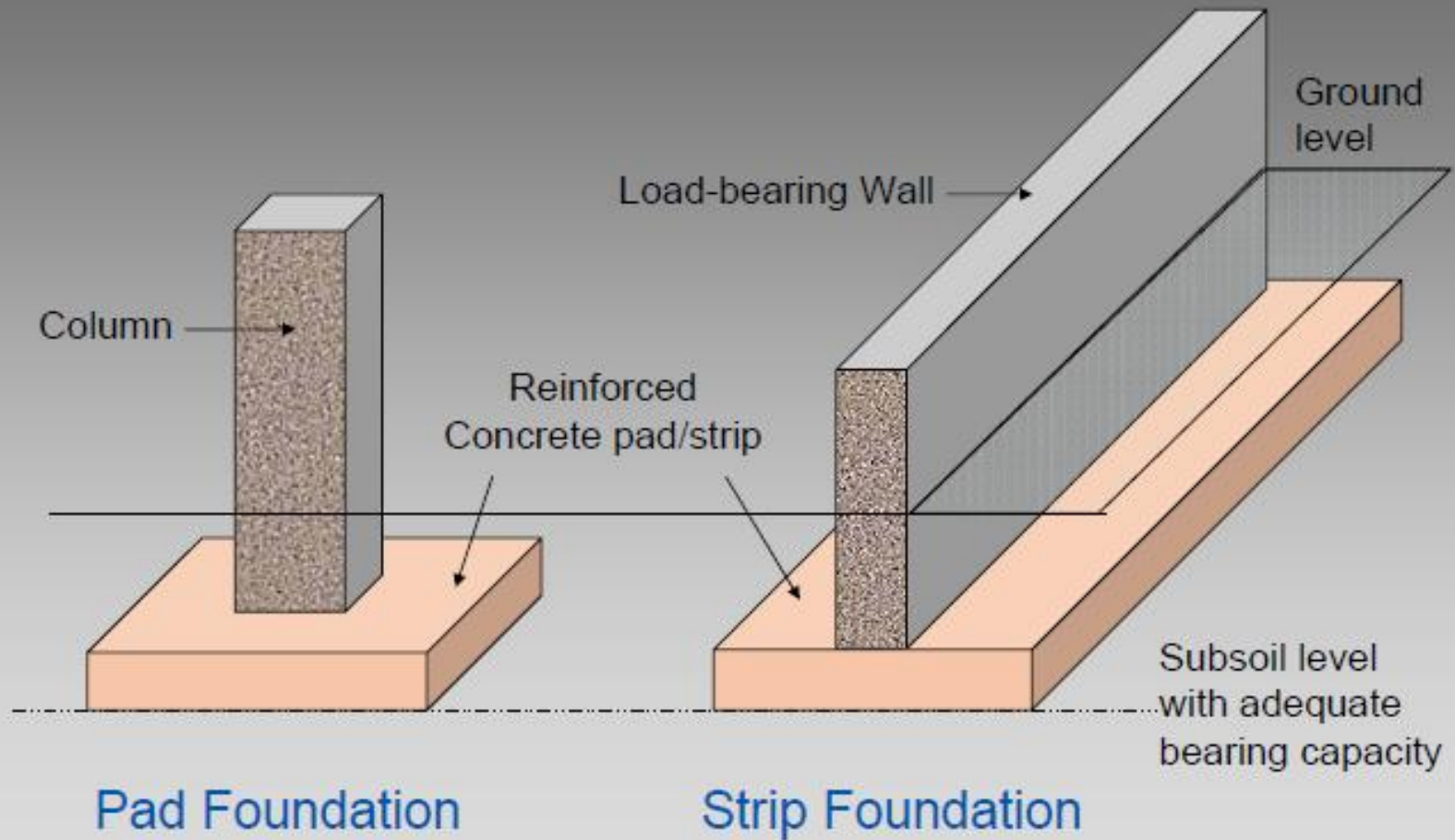
Examples of Shallow Foundation



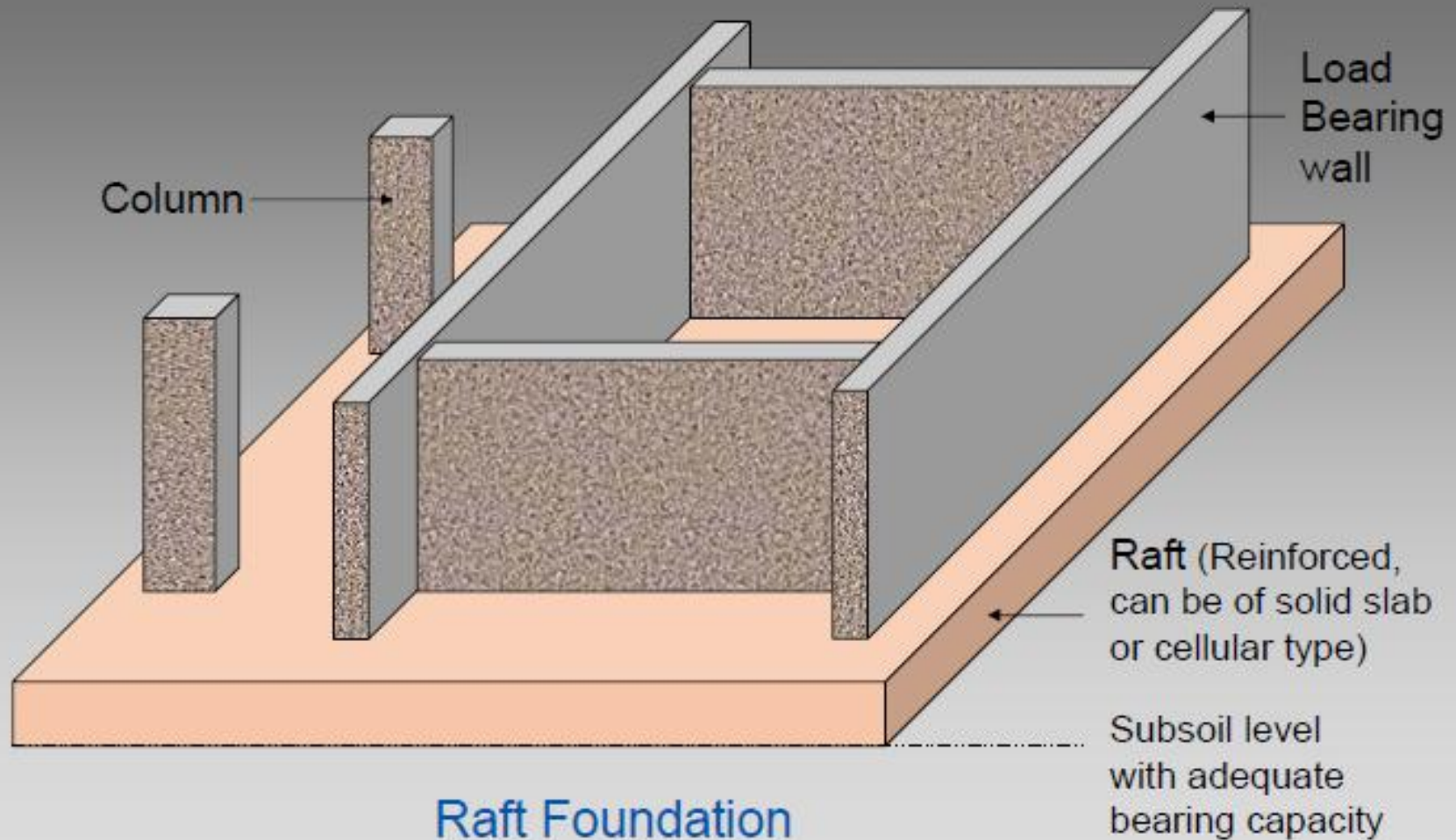
Shallow and Piled Foundation



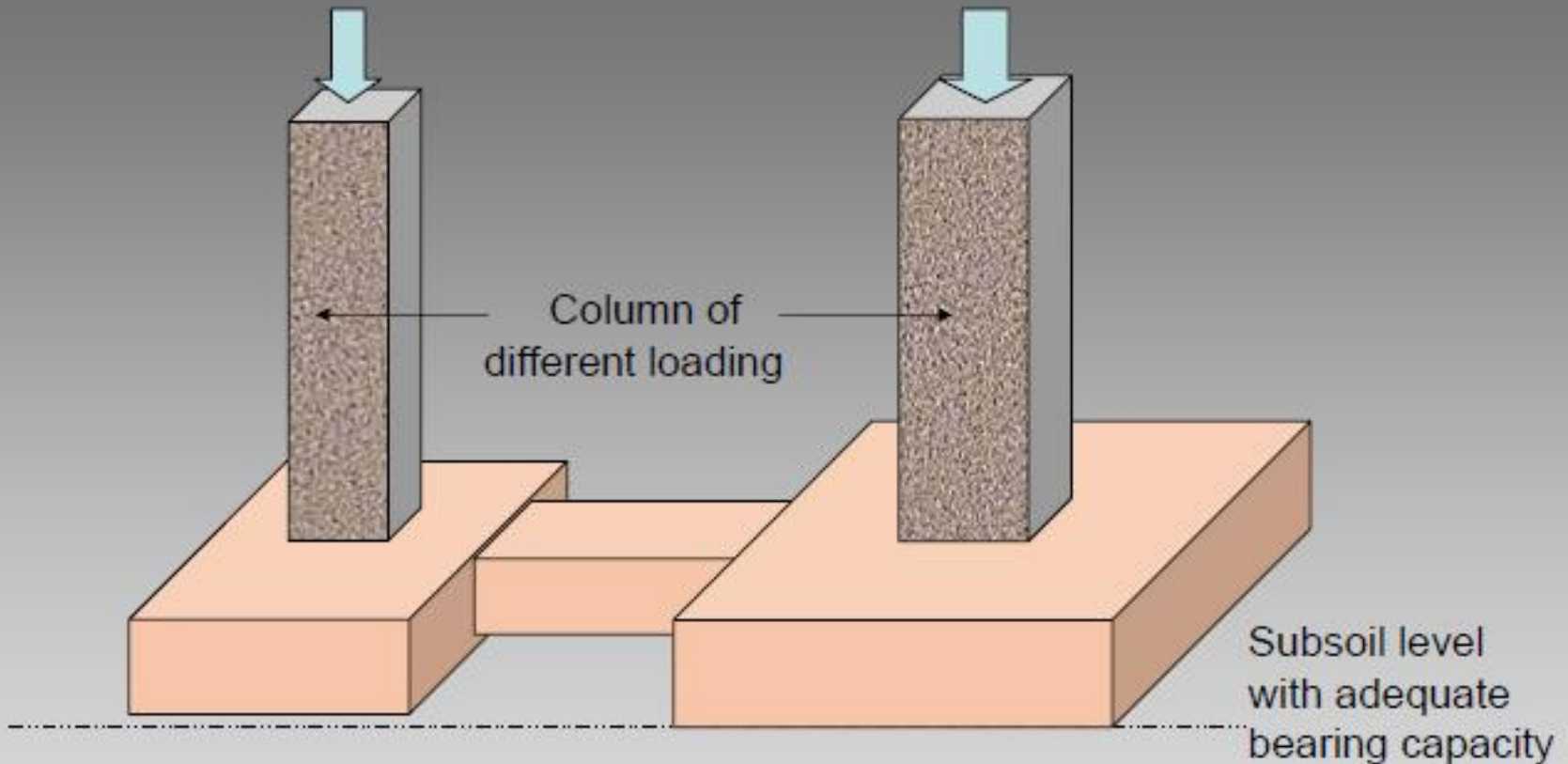
Types of Shallow Foundation



Types of Shallow Foundation

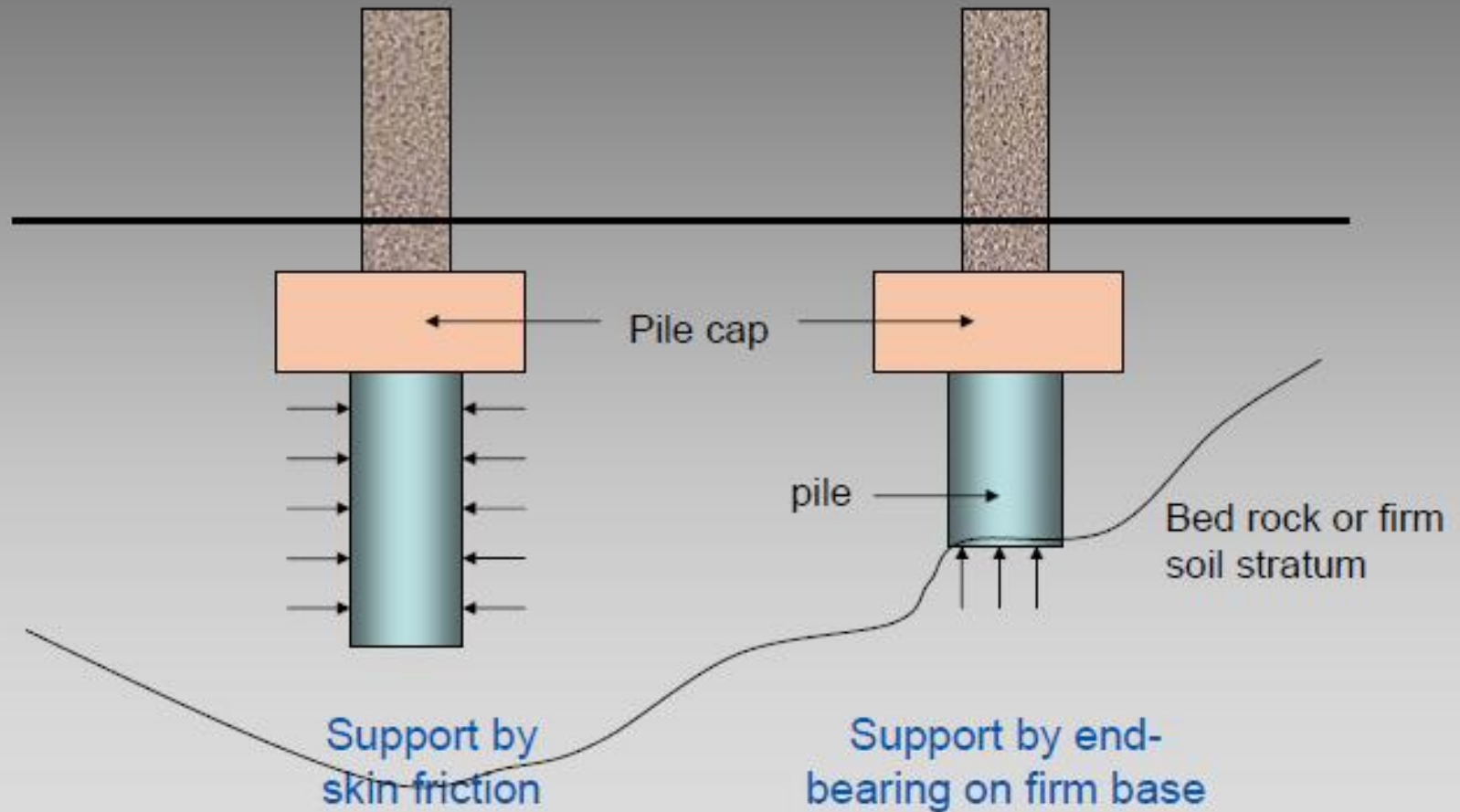


Balanced base Foundation

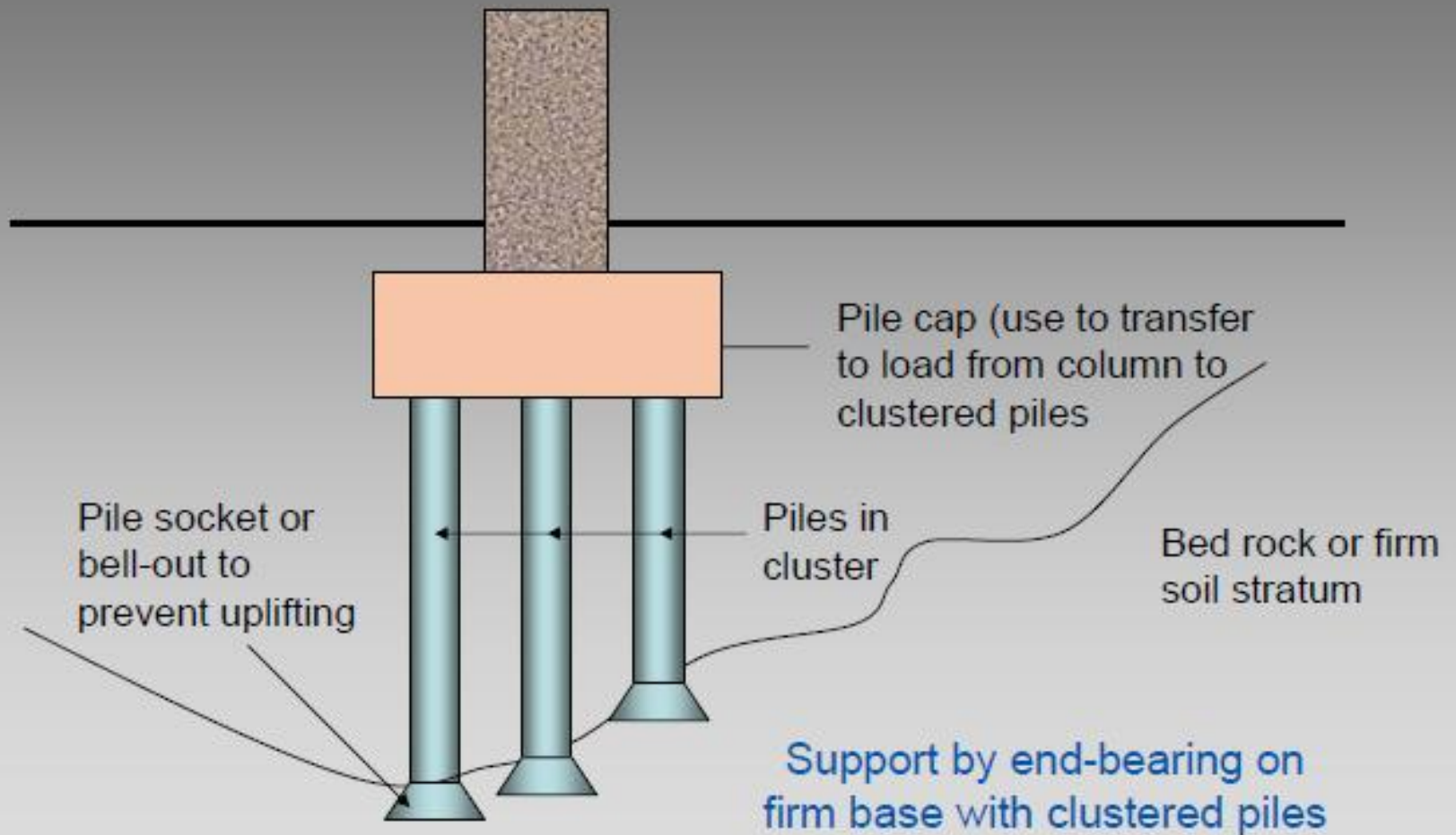


Pad Foundation with tie-beam balancing the tilting effect due to different in turning moment

Loading Supports to Pile



Loading Supports to Pile



Piles formed by manual methods (e.g. Hand-Dug Caisson)



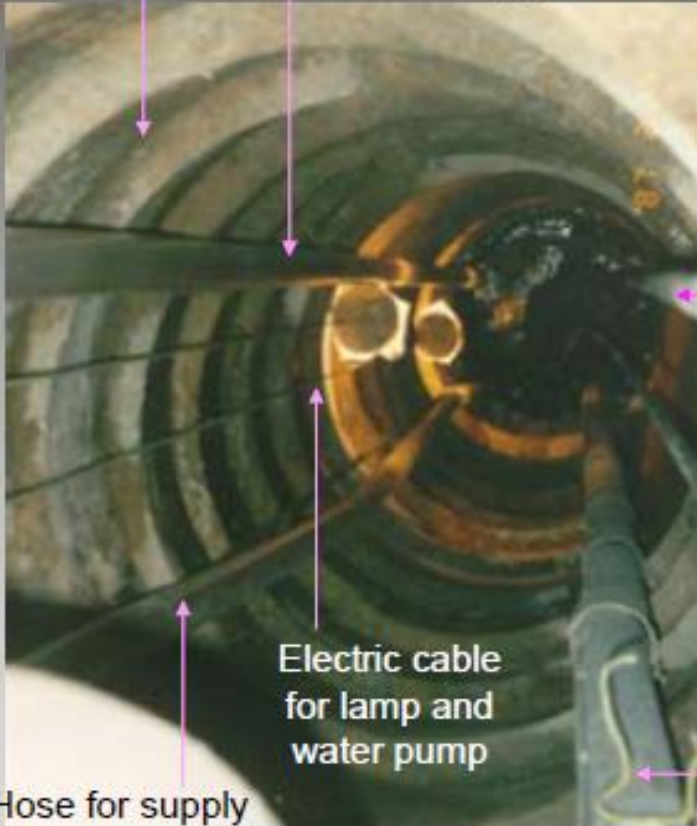
Worker working inside the caisson shaft and to excavate using simple powered tools.



Hand-dug
caisson working
in sloped site

Concrete ring to protect side of caisson from collapsing

Plastic hose for supply of fresh air



Electric cable for lamp and water pump

Hose for supply of compress air for power tools



Hose for pumping up of ground water

Tremie pipe for concreting

Working inside a caisson

Construction of Pile cap



Forming a pile cap for a clustered H-pile



Foundation using Mini-pile or Pipe Pile



Anchor plate at the pile head to connect the pile rigidly into the reinforced pile cap



Forming a pile cap with mini-piles

Piles formed by mechanical methods (e.g. bored piles of various kinds)



Small dia. pile formed
using boring rig and drill



Medium dia. pile formed
using bucket barrel



Large dia. Pile formed by
reverse circulation drill

Piles formed by percussion methods



H-pile driven using gravity drop hammer



Precast circular-section pile driven by diesel hammer

Foundation using steel H-pile



Inserting H-pile
after pre-boring

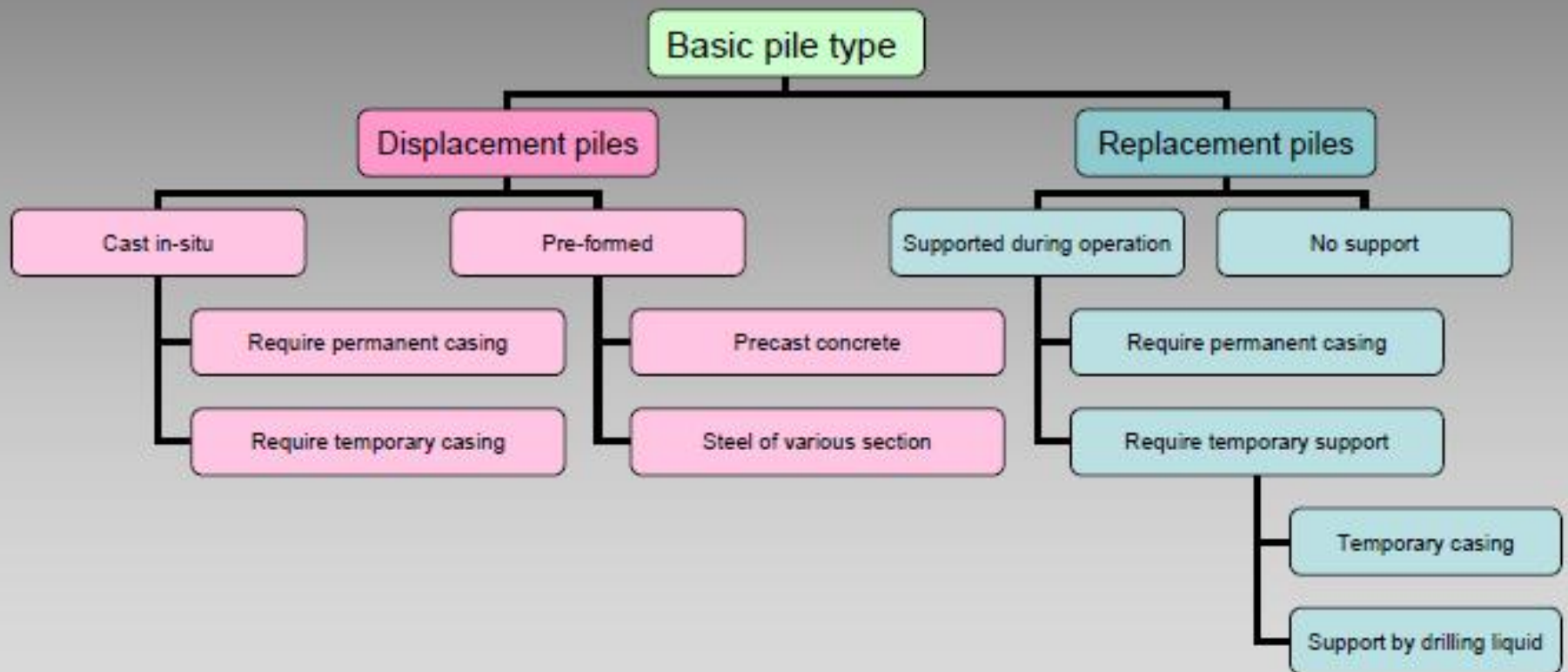


Hydraulic hammer
for driving pile

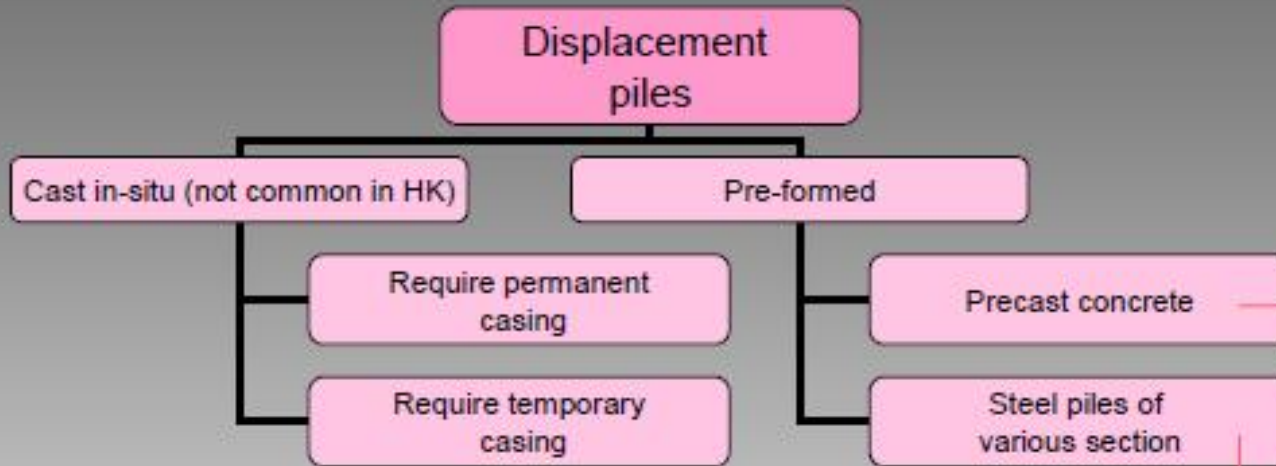


Site welding to connect
H-piles (12m per pile)

Types of pile according to their operation



Operation of displacement pile



Operation of Replacement piles

Replacement piles

Supported during operation

No support
(seldom use due to high risk of
Soil collapse during forming)

Require permanent casing
(seldom use due to cost of the casing)

Require temporary support

Temporary casing

Support by drilling liquid





Steel casing

Helix auger



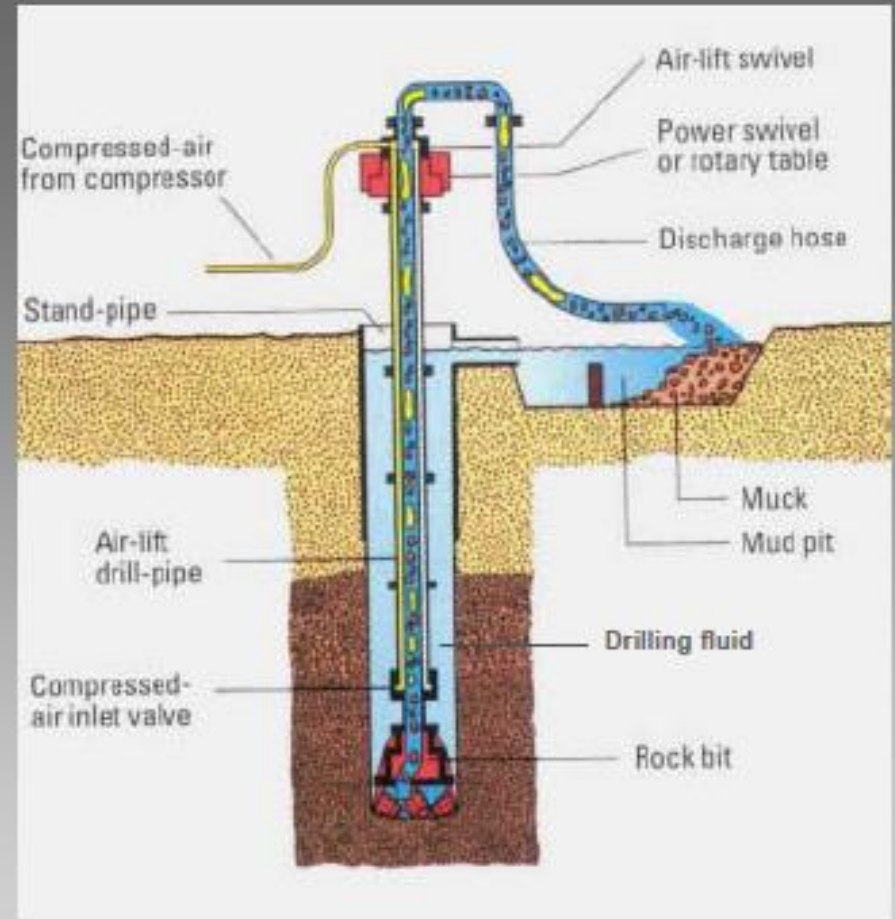
Various forms of drilling rig for pile
max up to 900mm dia.

Steel casing as temporary support during the boring process



purpose of the casing serves also as:

- drilling rod
- Soil protection
- Carrier tube to take the mud out from the bore hole using drilling fluid (bentonite)



Using of drilling fluid to remove mud from bore hole



A section of flight auger



Using of Continuous Flight Auger to form a bore hole

Flight Auger Machine for larger diameter pile (up to 1.2m)

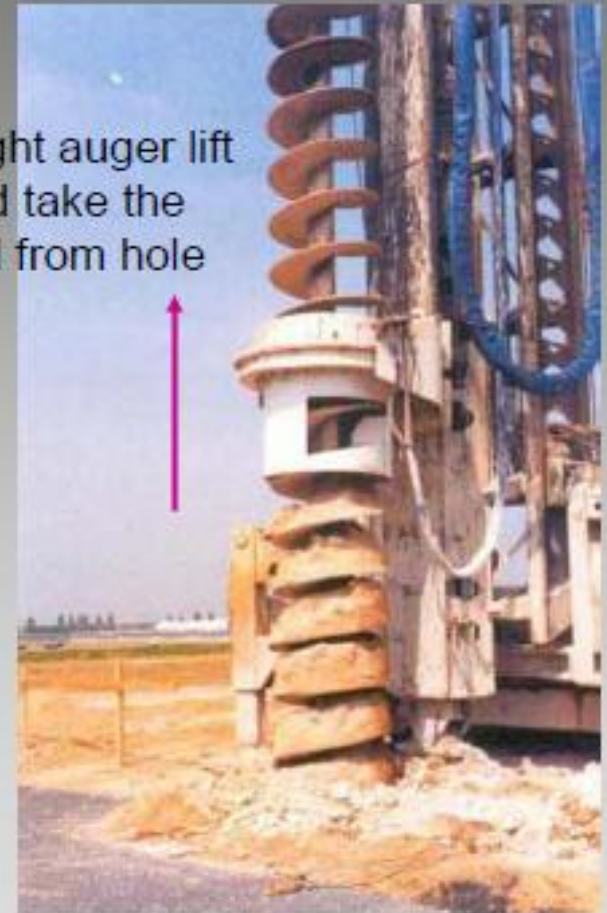


Soil taken out from the bore hole by the flight auger

Flight auger rotates rapidly and the soil spin-off from the flight



Flight auger lift and take the soil from hole



Drilling rig to form a bore hole using bucket barrel



Bucket barrel of various sizes

Drilling rig to form a bore hole using bucket barrel



Bucket barrel taking soil from the borehole

Foundation using bored piles (formed by chisel and grab and support with casing)



Various
forms of grab

Placing reinforcement and concreting to bored pile



Reinforcement in the form of a steel cage for insertion into the bored hole before concreting

Placing reinforcement and concreting to bored pile



Concrete skip

Tremie pipe



Kentledge set-up for loading test –
purpose: to provide reaction against jacking





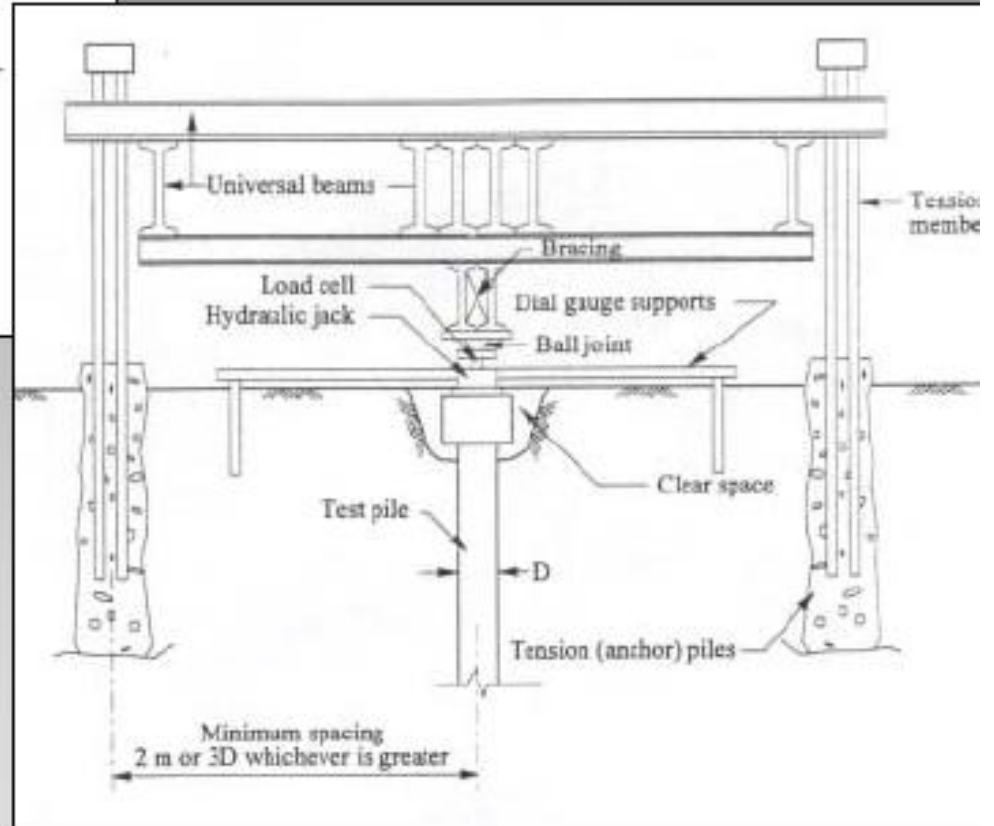
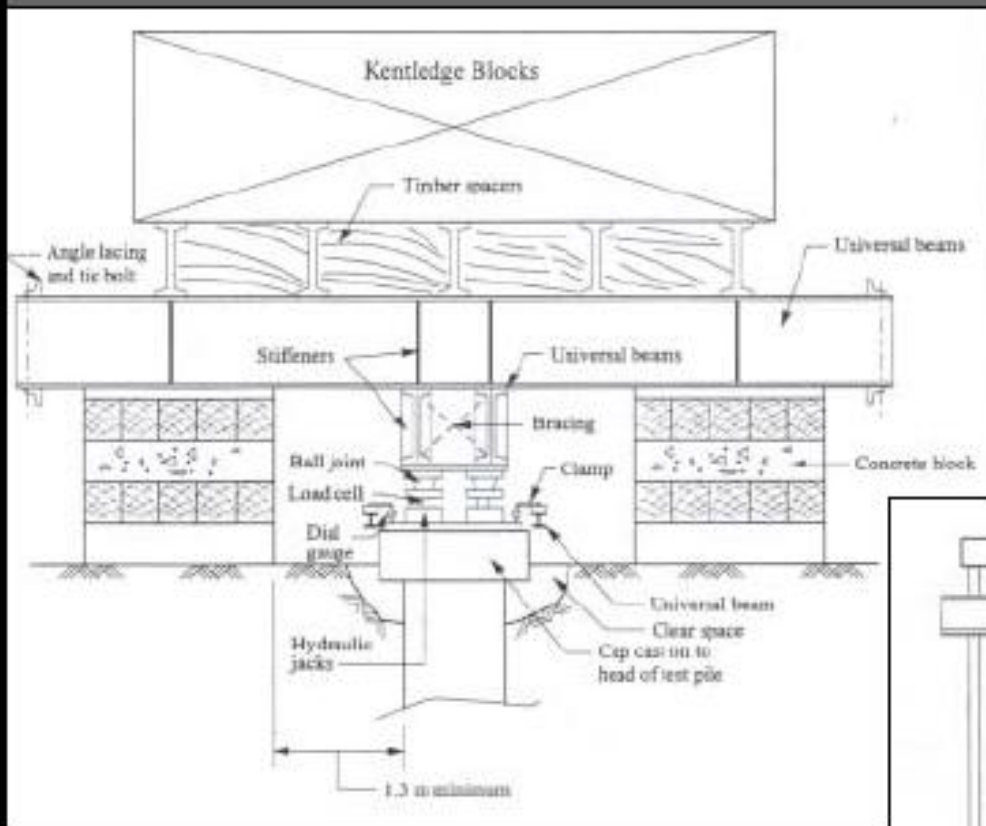
Anchor pile to
restraint the loading
during jacking

Reaction beam

Reference frame

Loading test using anchor
pile arrangement





Set-up of Kentledge and Anchor Pile for Loading Test

Hydraulic jack

Pile under test

Deflectometer (for measuring settlement)



Kentledge above

Reference frame



Jacking and measuring the settlement

Other uses of piles



Bored piles as
excavation
support



Other uses of piles

Driving steel tube (reinforced and grouted afterward) as piers for support deck structure



Loading test and kentledge set-up





Thanks for your kind
attention