3.2 DIAPHRAGM WALL

Diaphragm wall are structure elements, which are constructed underground to prevent the seepage into the excavated area

Various methods adopted to construct a diaphragm wall

Slurry trench technique

1. Soil mixing method
2. RC continuous diaphragm wall
3. Precast diaphragm wall
4. Glass diaphragm walls

Slurry trench technique

The technique involves excavating a narrow trench that is kept full of an engineered fluid or slurry

The slurry exerts hydraulic pressure against the trench walls and acts as shoring to prevent collapse

Slurry trench excavations can be performed in all types of soil even below ground water table

Soil mixing method

This is the method used to make continuous walls by churning up piled soil using an auger, pouring in cement milk and marking soil mortar columns in the ground using the soil as aggregate

This is an in situ mixing and churning method

In the method after completing excavation of the groove wall using an excavator, soil cement is produced by mixing and churning excavated soil

The excavated soil is classified and graded with cement milk after being put through a termite

Then the soil cement is poured into the groove wall, after which the steel material is built as the core material

RC continuous diaphragm wall

This method of building a very long continuous diaphragm wall

Excavate a given groove between the surface and underground using a stabilizing liquid

Insert a given steel bar pour in concrete, thereby building a reinforced concrete wall underground.

Precast diaphragm wall

With this method, a continuous trench or longer panels are excavated under self- hardening cement- bentonite (CB) slurry.

The precast concrete wall sections are lifted and positioned by a crane The CB slurry sets to form the final composite wall

The trench is excavated under bentonite slurry, which is then displaced with CB slurry.

Glass diaphragm walls

For contained enclosure, a diaphragm wall system consisting of special glass panels with a sealing made out of glass are used.

The panels are 50cm wide and up to 15cm long

Common uses of diaphragm wall walls

- To provide structural support for the construction
- To provide retaining wall
- To provide deep diaphragms

Applications of diaphragm wall

As permanent and temporary foundation wall foundation walls for deep foundation for deep basements

In earth retention schemes for highway and tunnel

projects As permanent walls for deep shafts for tunnel

access

As permanent cut - off walls through the core of earth dams

In congested areas for retention systems and permanent foundation walls Deep groundwater barriers through and under dams