

LECTURE 16

Effect of Addition of Admixtures-

1. Stabilizing agents are the admixtures added to soil.
2. The effect of adding these admixtures is to stabilize the soil.
3. In many cases they accelerate the process of densification.

Effect of compaction on soil properties-

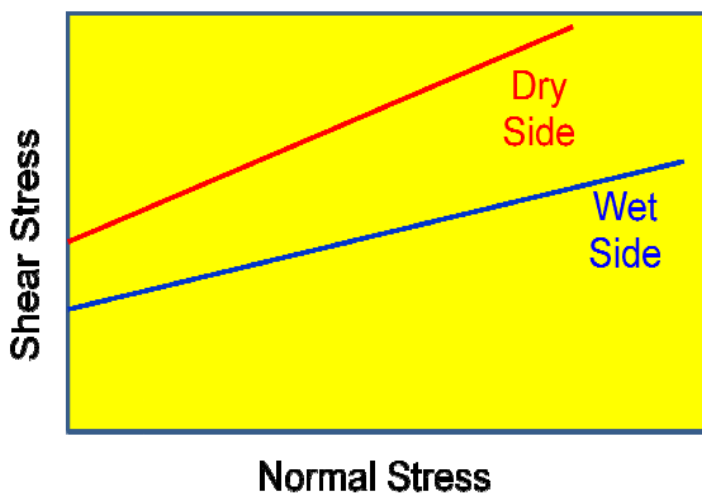
1. Density
2. Shear strength
3. Permeability
4. Bearing Capacity
5. Settlement
6. Soil Structure
7. Pore Pressure
8. Stress Strain characteristics
9. Swelling & Shrinkage

Influence on Density:

Effect of compaction is to reduce the voids by expelling out air. This results in increasing the dry density of soil mass.

Influence on Shear strength:

Increase the number of contacts resulting in increased shear strength, especially in granular soils. In clays, shear strength depends on dry density, moulding water content, soil structure, method of compaction, strain drainage condition etc. Shear strength of cohesive soils compacted dry of optimum (flocculated structure) will be higher than those compacted wet of optimum (dispersed structure).



Effect of compaction on permeability

1. Increased dry density, reduces the void space, thereby reducing permeability.
2. At same density, soil compacted dry of optimum is more permeable.
3. At same void ratio, soil with bigger particle size is more permeable.
4. Increased compactive effort reduces permeability.

Effect on Bearing Capacity

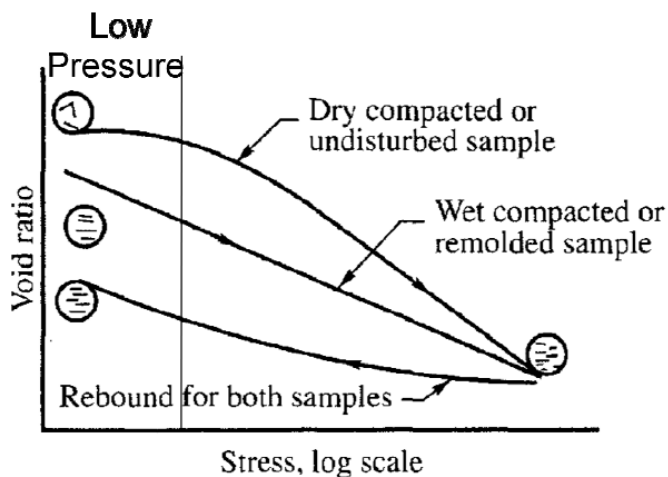
1. Increase in compaction increases the density and number of contacts between soil particles.
2. This results in increased
3. Hence bearing capacity increases which is a function of density and

Effect on Settlement

1. Compaction increases density and decreases void ratio.
2. This results in reduced settlement.
3. Both elastic settlement and consolidation settlement are reduced.
4. Soil compacted dry of optimum experiences greater compression than that compacted wet of optimum.

Effect on Compressibility

Optimum shows more compressibility than that on dry side. But at higher pressure, behavior is similar.



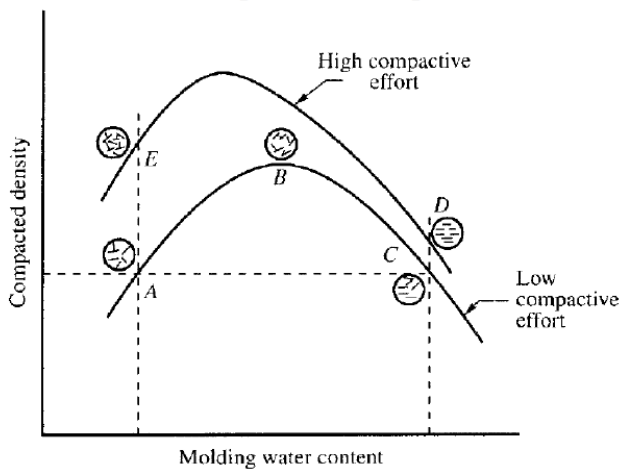
Effect on Soil Structure

In fine grained soil

1. On dry side of optimum, the structure is flocculated. The particles repel and density is less.
2. Addition of water increases lubrication and transforms the structure into dispersed structure

In coarse grained soil, single grained structure is maintained

In composite soil, behaviour depends on composition.



Effect on Pore Pressure

1. Clayey soil compacted dry of optimum develops less pore water pressure than that compacted wet of optimum at the same density at low strains.
2. However, at higher strains the effect is the same in both the cases.

Effect on Stress Strain Characteristics:

The strength and modulus of elasticity of soil on the dry side of optimum will always be better than on the wet side for the same density. Soil compacted dry of optimum shows brittle failure and that compacted on wet side experiences increased strain.

