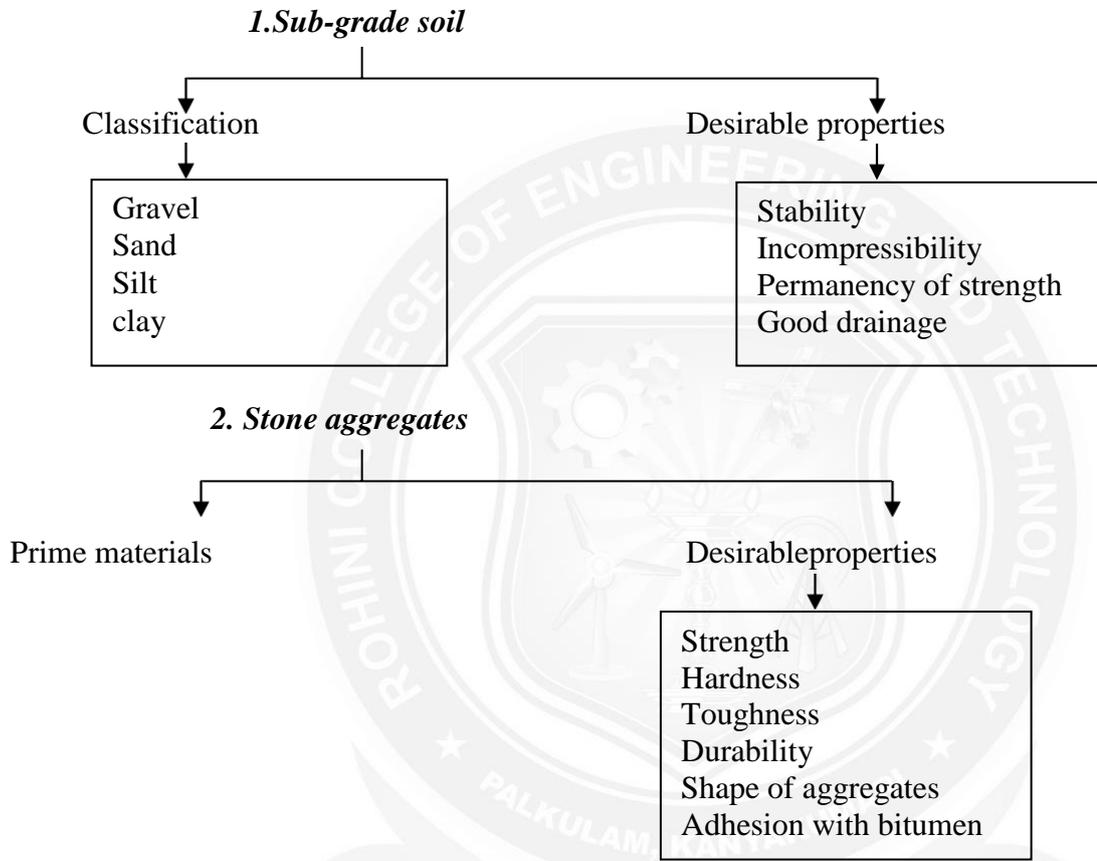


4.1 HIGHWAY CONSTRUCTION MATERIALS

Good quality construction material makes superior pavements. Thickness, performance and efficiency of pavements depend upon quality of highway materials. Highway materials include:

1. Sub-grade soil
2. Stone aggregates
3. Bituminous materials
4. Cement and cement concrete

Classification, Characteristics and Desirable Properties:



3. Types of bituminous material:

- ✓ Asphalt
- ✓ Bitumen
- ✓ Cutback bitumen
- ✓ Bitumen emulsion

Desirable Properties of Aggregates

1. Strength
2. Hardness
3. Toughness
4. Durability
5. Shape of aggregates
6. Adhesion with bitumen

1. Strength

- ✓ The aggregates to be used in road construction, particularly the aggregates used in the wearing course of the pavement should be sufficiently strong/ resistant to crushing to withstand the high stresses induced due to heavy traffic wheel loads.

2. Hardness

- ✓ The aggregates used in the surface course are subjected to constant rubbing or abrasion due to moving traffic.
- ✓ Abrasive action may be increased due to the presence of abrading material like sand between the tyre of vehicle and the aggregates exposed to the top surface.
- ✓ It should be hard enough to resist the wear due to abrasive action of traffic.

3. Toughness

- ✓ Aggregates in the pavement are also subjected to impact due to moving wheel loads.
- ✓ The magnitude of impact increase with roughness of road and speed of vehicle. Severe impact is common when heavily loaded steel tyre vehicles move on WBM.
- ✓ The resistance to impact or toughness is thus another desirable property of aggregates

4. Durability

- ✓ The aggregates are subjected to physical and chemical actions of rains and ground water, the impurities in them and that of atmosphere.
- ✓ The road stones used in the construction should be sound enough to withstand the weathering action. The property of aggregates to withstand the adverse actions of weather may be called soundness.

5. Shape of Aggregate

- ✓ Road aggregates may be rounded, angular, flaky or elongated.
- ✓ Flaky and elongated particles have less strength than rounded and cubical particles. Thus, too flaky and too much elongated particles should be avoided.

6. Adhesion with Bitumen

- ✓ The aggregates in bituminous pavements should have less affinity with water when compared with bitumen, otherwise the bituminous coating on the aggregates will be stripped off in presence of water.