FACULTY OF ENGINEERIN & TECHNOLOGY

TOPIC : AGGREGATES-CLASSIFICATION (L-5)

Today , it will be discussed :

Classification of Aggregates based on following criteria

- **Grain Size**
- **Density / Weight**
- **Geographical origin**
- **Shape**

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Classification of aggregates based on Grain Size :
There are two overriding categories based on size:
Fine Aggregates : The size of fine aggregates is defined as 4.75mm or smaller. That is, aggregates which can be passed through a number 4 sieve, with a mesh size of 4.75mm. Fine aggregates include things such as sand, silt and clay. Crushed stone and crushed gravel might also fall under this category. Typically, fine aggregates are used to improve workability of a concrete mix.

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Classification of aggregates based on Density / Weight :

Different density aggregates will have much different applications. Lightweight and ultra lightweight aggregates are more porous than their heavier counterparts, so they can be put to great use in green roof construction, e.g.They are also used in mixes for concrete blocks and pavements, as well as insulation and fireproofing.

High density aggregates are used to form heavy weight concrete. They are used for when high strength, durable concrete structures are required – building foundations or pipe work ballasting.

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Classification of aggregates based on Geographical Origin:

Natural – Aggregates taken from natural sources, such as riverbeds, quarries and mines. Sand, gravel, stone and rock are the most common, and these can be fine or coarse.

Processed–or 'artificial aggregates', or 'by-product' aggregates, they are commonly taken from industrial or engineering waste, then treated to form aggregates for high quality concrete. Common processed aggregates include industrial slag, as well as burnt clay. Processed aggregates are used for both lightweight and high-density concrete mixes.

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Classification of aggregates based on Shapes :

Rounded – Natural aggregates smoothed by weathering, erosion and attrition. Rocks, stone, sand and gravel found in riverbeds are your most common rounded aggregates. Rounded aggregates are the main factor behind workability.

Irregular – These are also shaped by attrition, but are not fully rounded. These consist of small stones and gravel, and offer reduced workability to rounded aggregates.

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Angular – Used for higher strength concrete, angular aggregates come in the form of crushed rock and stone. Workability is low, but this can be offset by filling voids with rounded or smaller aggregates.

Flaky – Defined as aggregates that are thin in comparison to length and width. Increases surface area in a concrete mix.

Elongated – Also adds more surface area to a mix – meaning more cement paste is needed. Elongated aggregates are longer than they are thick or wide.

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The main objective of **Flakiness and Elongation Index of Coarse Aggregates** tests is to determine the relative amounts of flaky and elongated particles which when present in large quantity may result in more voids in the concrete, thus requiring a large amount of sand, cement, and water for particular workability. These particles tend to be oriented on one plane which affects the durability. Generally, elongated or flaky particles above 10 to 15% are not desirable. The test does not apply to sizes smaller than 6.3 mm.

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Flaky and Elongated – A mix of the previous two – and the least efficient form of aggregate with regards to workability

Please also go through
https://youtu.be/Yopxh_n3UXI

https://youtu.be/XlofFBVkAbE

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THANK YOU