Research Title: Effect of Sand Collected From Different Riverbed on The Properties of Sand-Cement Block

ABSTRACT: Usually sand is used as fine aggregate in preparation of cement concrete. About 700 rivers including tributaries flow through the country constituting a waterway of total length around 24,140 km (15,000 miles). Huge quantity of sand is deposited on the rivers bed which is collected from the river bed to use as fine aggregate for engineering constructions all over the Bangladesh. But all the sands are not good enough to use as fine aggregate for cement concrete. This project work was limited to twenty sand samples from seven large rivers, the Padma, the Jamuna, the Matamuhuri, the Muhuri, the Sumeshori, the Shitalakshya, and the Modhumoti to find out which river sand is the most suitable.

To complete this project work, the sand samples were collected from the selected rivers and the following properties were investigated in the laboratory, fineness modulus by sieve analysis, unit weight, specific gravity, percentage of voids, slit content, water absorption, salinity, pH, TDS and conductivity by traditional procedure, grain sizes (D10, D30, D60), and co-efficient of uniformity (Cu), co-efficient of curvature (Cc) from the gradation curve of fine aggregate. About 80 sand cement block specimens were prepared for compressive strength, water absorption and density test with collected sand samples as fine aggregate with a mix ratio 1:4 and water-cement ratio 0.4.

1.1 Objective of the Study

- To know the quality of different sand at different riverbed place in Bangladesh
- Study the physical & chemical properties of different riverbed.
- Investigate the pH and salinity of water contained sand and find the causes.
- Study the mechanical properties of compacts according to ASTM standers and the block factories will be able to make good quality blocks with the ideas from our research

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1. Site Selection Area

Fig: 1.1 Matamuhuri river, Kakara, Cox's Bazar

Fig: 1.2 Matamuhuri river, Eidgah, Cox's Bazar

Fig: 1.3 Matamuhuri river, Khotakhali, Cox's Bazar

Fig: 1.4 Muhuri river, Posuram, Feni

Fig:1.5 Feni river, Shovupur, Feni

Fig:1.6 Jamuna river, Voapur, Tangail

Fig: 1.7 Kaliganga river, Torabridge, Manikganj

Fig: 1.8 Shitalakshya river, Kaliganj, Gazipur

Fig: 1.9 Buriganga, Kholamora, Keraniganj

Fig:1.10 Sitholokkha river, Narayanganj

Fig:1.11 Padma River, Muktarpur,Munshiganj.

Fig: 1.12 Durgapur, Someshwari river, Netrokona

2. Sampling directly from trucks

Fig:2.1

Fig: 2.2

Fig: 2.3

Fig: 2.4

Fig: 2.5

Fig: 2.6

Figure: 2 Sampling directly from trucks

3. Sand Sampling at HBRI

Fig: 3.1 Matamuhuri river sand-1, Cox's Bazar

Fig: 3.2 Matamuhuri river sand-2, Cox's Bazar

Fig: 3.3 Matamuhuri river sand-3, Cox’s Bazar

Fig: 3.4 Feni river sand, Shovupur, Feni

Fig: 3.5 Muhuri river sand, Posuram, Feni

Fig: 3.6 Someshwari river sand, Netrokon

Fig: 3.7 Padma river sand-1, Pakshi, Pabna

Fig: 3.8 Buriganga river sand, keraniganj

Fig: 3.9 Padma river sand-2, Monshigonj

Fig: 3.10 Kaligonga river, Manikgonj

Fig: 3.11 Shitalakshya river sand, Gazipur

Fig: 3.12 Jamuna river, Vuapur, Tangail

Figure: 3.5 Sample collected from different riverbed

4. Casting solid block specimens

a) Block machine

b) Mixing ingredients

c) Block Processing

Figure: 4.1 Casting solid block specimens

5. Curing of specimens

a) kept at ambient temperature b) Water curing of Building blocks c) Blocks after immersion in water

Figure : 5.1 Curing process of building blocks

6. Preparing the test specimens

a) Block specimen under test b) Failure observations of specimen

Figure: 6.1 Test specimens