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SVNIT

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To, Mr. Vikas Sharma
D & V Solution, Gurgaon, Haryana

UCS and Triaxial Test Report

Specimen Preparation and Testing:

Specimens are prepared from the mix of Black Cotton soil (20% by volume) + River sand (80% by volume) + Cement (4% by weight of total soil) + stab. ANT (0.0071% by weight of total soil). The required amounts of raw materials were mixed thoroughly in dry state. Then, water with required quantity of stab. ANT corresponding to OMC was added to give proper consistency to the mixture for easy moulding. Cylindrical samples were compacted in three layers by a static press to achieve dry unit weight equal to the MDD of the mix obtained from compaction test as per Russian Standard No. 60929601.001-2010. The values of OMC and MDD were found to be 14.8% and 2.15 g/cc, respectively. Immediately after preparation, the samples were sealed in airtight polythene bags and kept at a temperature of 27 ± 2^0 C for curing as per IS: 4332 (Part V)-2006. After curing the specimens were air dried for two days at room temperature; and then unconfined compressive strength (UCS) and triaxial tests on these cured samples was performed using a conventional compression testing machine at a constant strain rate of 0.6 mm/min. The tests were carried out in four different series.

Series 1: 38 mm diameter and 76 mm high specimen, 21 days curing and 2 days air drying.

Series 2: 38 mm diameter and 76 mm high specimen, 14 days curing and 2 days air drying, then 7 days submerged in water. Moisture content of the soaked specimen was found to be 16.8%, i.e., moisture content increased by 2% due to soaking.

Series 3: 50 mm diameter and 100 mm high specimen, 21 days curing and 2 days air drying.

Series 4: 38 mm diameter and 76 mm high specimen, 21 days curing and 2 days air drying. Deviator stress at failure (σ_d) was determined for various cell pressures (σ_3) from Unconsolidated Undrained (UU) triaxial test. From the stress-strain curves, the elastic secant modulus (E) was determined corresponding to peak stress.

Table 1 UCS and Triaxial Test results

Specimen No.	Series 1	Series 2	Series 3	Series 4: UU Triaxial test					
				σ_3 = 40 kPa		σ_3 = 80 kPa		σ_3 = 120 kPa	
	UCS_{dry} (kPa)	UCS_{wet} (kPa)	UCS_{dry} (kPa)	σ_d (kPa)	E (MPa)	σ_d (kPa)	E (MPa)	σ_d (kPa)	E (MPa)
1	4024	1548	3096	3797	96.2	4728	119.8	5562	137.7
2	2687	1668	2934	3083	90.1	4392	115.6	5750	145.7
3	4466	1878	--	3665	130.2	4150	98.0	--	--
4	3577	--	--	--	--	--	--	--	--
Average value	3688.5	1698	3015	3515	105.5	4423	111.1	5656	141.7

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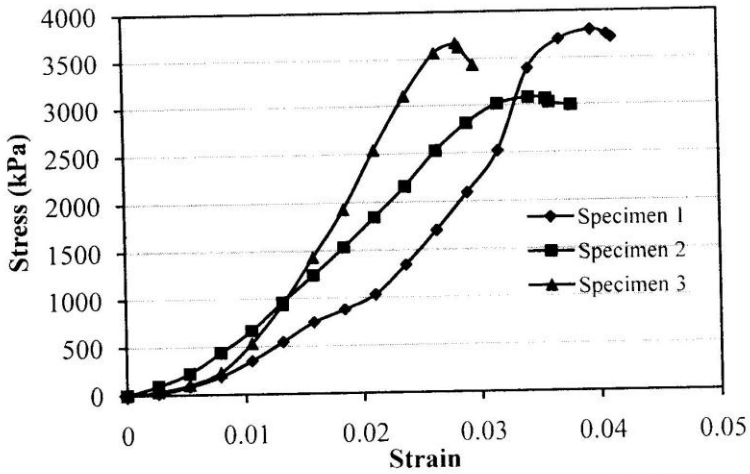

Fig. 1 Stress (σ_d) - strain curves for cell pressure of 40 kPa

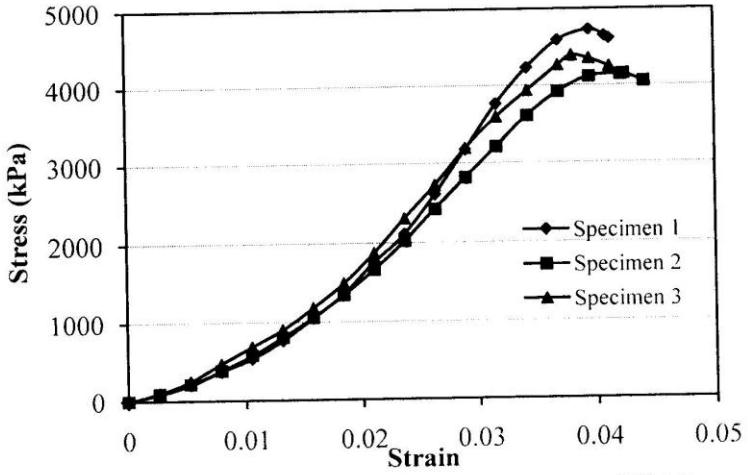

Fig. 2 Stress (σ_d) - strain curves for cell pressure of 80 kPa

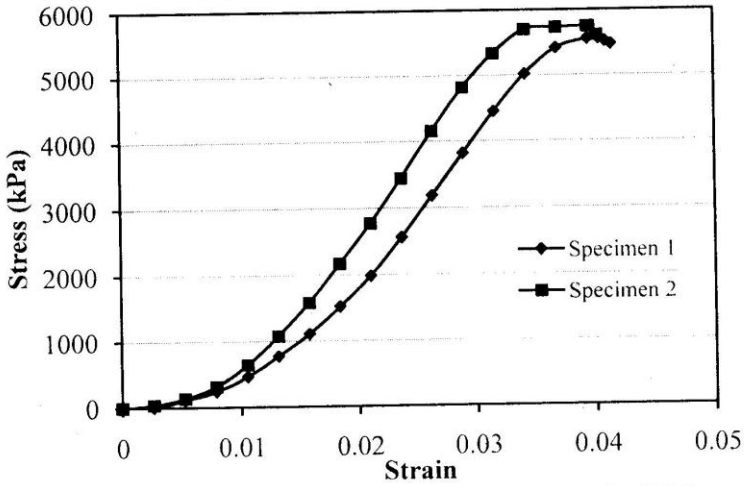

Fig. 3 Stress (σ_d) - strain curves for cell pressure of 120 kPa

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