

## Suitability Number of Coarse-Grained Soils and Relationships among Fineness Modulus, Density and Strength Parameters

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**Abstract :** Suitability number (SN) is perhaps one of the most important parameters of coarse-grained soil in assessing its appropriateness to use as a backfill in retaining structures, sand compaction pile, Vibro compaction, and other similar foundation and ground improvement works. Though determined in an empirical manner, it is imperative to study SN to understand its relation with other aggregate properties like fineness modulus (FM), and strength and density properties of sandy soil. The present paper reports the findings of the study on the examination of the properties of sandy soil, as mentioned. Random numbers were generated to obtain the percent fineness on various sieve sizes, and fineness modulus and suitability numbers were predicted. Sand samples were collected from the field, and test samples were prepared to determine maximum density, minimum density and shear strength parameter  $\phi$  against particular fineness modulus and corresponding suitability number. Five samples of SN value of excellent (0-10) and three samples of SN value fair (20-30) were taken and relevant tests were done. The data obtained from the laboratory tests were statistically analyzed. Results show that with the increase of SN, the value of FM decreases. Within the SN value rated as excellent (0-10), there is a decreasing trend of  $\phi$  for a higher value of SN. It is found that SN is dependent on various combinations of grain size properties like D10, D30, and D20, D50. Strong linear relationships were obtained between SN and FM ( $R^2=.0.93$ ) and between SN value and  $\phi$  ( $R^2=.94$ ). Correlation equations are proposed to define relationships among SN,  $\phi$ , and FM.

**Keywords :** density, fineness modulus, shear strength parameter, suitability number

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