Soil sample

Discussion

$D_{10} = 0.078$mm $D_{30} = 0.125$mm $D_{60} = 0.55$mm $C_c = (D_{30})^2 / [D_{10} \times D_{60}] = 0.125^2 / [0.55 \times 0.078] = 0.36422$ & 1 $C_u = D_{60} / D_{10} = 0.55 / 0.078 = 7.0513$ & 6 If a soil is well-graded, it should satisfy 1 &C_c & 3 C_u & 4 (for gravels) C_u & 6 (for sand) Note that, from our result, C_c is much smaller than one. So by the constraints $1 < C_c$ & 3, we can conclude that the testing soil is not well-graded, but poorly graded. And the C_u obtained is 7.0513 > 6, which implies that the sample should be sand but not gravels.

As we see our sample contains 17.16% of gravel which satisfy the constraints of gravelly sand. So we may further conclude that the sample is poorly-graded gravelly sand. (3) For the engineering application of results, we may see that as sieve analysis test (dry sieve) results in gradation of sample in well-graded or poorly graded on the basis of their particle sizes and its size distribution, so the result can be an indicator of other engineering properties such as compressibility, shear strength, and hydraulic conductivity which is important in construction engineering and geotechnical engineering.

In an engineering design, the gradation of soil often controls the design and ground water drainage of the site. For example a poorly graded soil will have better drainage than a well graded soil because there are more void spaces in a poorly graded soil. And other example is a well graded soil is able to be compacted more than a poorly graded soil. Most types of projects may have gradation requirements that must be met before the soil to be used is accepted.

Conclusion

From the above result, the sample is classified as poorly-graded gravelly sand. The result is useful for the type of use of the site in further development. These poorly graded stone is good for drainage but not as a kind of foundation support. The importance of the gradation of soil is understood so that soil can be based in different use and will not induce unwanted accident in construction engineering or geotechnical engineering.