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STUDY ON EFFECT OF BURNT BRICK DUST ON ENGINEERING PROPERTIES ON EXPANSIVE SOIL

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ABSTRACT

The goal of this venture is to stabilize the Black Cotton soil (BC Soil) as it is being the poorest soil among all soils and furthermore it is an expansive soil. An experiment investigation is carried out to study the effect of brick powder a on engineering properties of the black cotton soils. The black cotton soil is known as expansive soil which begin swelling when it interacts with moisture. Because of this property of soil the quality and different properties of soil are extremely poor. To enhance its properties it is fundamental to settle the soil by various stabilizers. It gives different kind of soil properties result with various type of stabilizers. Soil Stabilization is a procedure to treat a soil to keep up, change or enhance the execution of soil. In this examination, burnt brick dust is added to expansive soil is assessed for the enhancing designing properties of black cotton soil. The assessment includes the assurance of the swelling potential, direct shrinkage, atterberg's limits, California bearing ratio and compaction trial of black cotton soil in its normal state and in addition when blended burnt brick dust (from 10 to 50%). The practices have been performed on extents 10%,20%,30%, 40%, and 50% with black cotton soil. The examination result demonstrates extensive lessening in swelling of black cotton soil .With expanding measure of stabilizer swelling diminishes. Most extreme decrement in swelling has been noted in half of substitution of soil by brick dust. Additionally by expanding settling content direct shrinkage lessens. Greatest decrement in shrinkage has been noted in half substitution of soil by stabilizer. Maximum dry density of soil is improving and optimum moisture content is decreasing with increasing stabilizing content. For increasing content of stabilizing agent brick dust atterberg's limit values are also decreasing.

I. INTRODUCTION

The Engineering Properties of soil are relied upon the many focuses like minerals, water table, soil water and so forth which differ according to zone to region. Because of which we can't get necessary properties appropriate to our requirements of development. To determine this issue we have method called stabilization which intends to stable or to alter or to enhance the soil properties in positive way. So we can have a development works which satisfy our necessities and objective of construction. Black cotton soil on account of their shading and their reasonableness for developing cotton. They contain 'montmorillonite' earth mineral which has high extensive qualities. BC soils have low shrinkage point of confinement and high ideal moisture content. It is very delicate

to dampness changes, compressible subgrade material. Issues related with asphalt development turn out to be more basic when the subgrade comprises of expansive soils. In India, broad soils cover about 0.8x106 Km2 regions, roughly one fifth of its surface zone. Henceforth the subgrade and its unwanted qualities can be altered utilizing an appropriate stabilization method. Stabilization includes the techniques utilized for altering the properties of a soil to enhance its designing execution. In the development of street and landing strip keeps, the primary target of stabilization is to build the quality or soundness of soil and to decrease the development cost by making best utilization of the locally accessible materials. From the current investigations it is watched that, strong waste materials, for example, Brick powder are utilized for this planned reason. Transfer of these waste materials is basic as these are causing risky impacts on the condition. This may observed to be a practical treatment strategy for soils as these materials are accessible locally furthermore, such arrangement will discovered useful for the creating nations like India where economy is the prime worry for receiving any new strategy or procedure.

II. MATERIALS

2.1 Material Used: Black Cotton Soil , Brick Dust.

2.1.1 Properties of black cotton soil:

It has swell-shrinkage properties it is an extremely hazardous soil for thought of its utilization as a development material in construction. Its various properties when it is untreated are:

Moisture content	26.04
Liquid limit	55%
Plasticity index	38.08%
Linear shrinkage	35.01%
Specific Gravity	2.26
pH	7.2
Colour	Greyish black

2.1.2 Brick Dust:

Brick dust is a waste item acquired from distinctive block ovens and tile processing plants. There are various block furnace which have become over the decades in an impromptu path in various parts of the nation. Huge amounts of waste items like brick dust or broken pieces or chips of blocks (brickbat) come out from these ovens and industrial facilities. Up until now, such materials have been utilized only to fill low lying zones or are dumped as waste material. Masonry waste mainly consists of cement mortar and burnt brick. But for the experimental purpose only bricks are considered excluding the cement mortar.

III. TEST INCLUDED

3.1 Atterbeg's limit:

Liquid limit of black cotton reduces efficiently with increasing percentage of brick dust from 10 to 50 % liquid limit descends to almost 29%.

Plastic limit of black cotton soil decreases as the amount of brick dust increases, it reduces to almost 11from 17%.

Plasticity index reduces with increasing percentage of brick dust it almost lessen up to 17 % to 26%.

3.2. Linear shrinkage:

Linear shrinkage values for mix proportions of soil & brick dust decreases with adding more percentage of brick dust . it got reduces from 23.7 to 7.3%. The reading shows that with increasing brick dust content the linear shrinkage is reducing. For 30%, 40% & 50 % it reduces 60.33 %, 67.08 % & 69.19 % respectively than the black cotton soil.

3.3. Modified Proctor Test:

The results in the modified proctor test shows that the with increasing quantity of brick dust by percentage weight of black cotton soil dry density increases and optimum moisture content decreases. There is a decrement of 18.8 to 11.1% in moisture content and increment 1.7 to 1.9 % in dry density.

3.4. Free Swell Index :

The swelling index is decreasing with increasing the burnt brick dust percentage which shows reduction in swell index with increment in brick dust content.

3.5.CBR Test:

The CBR value of soil increases with the increment of brick powder. The CBR values increases up to 8%. Black cotton soil after stabilization the required CBR estimation of 8% as per IRC: 37-2012 is accomplished by balancing out with substitution of BC soil by 50% of brick dust.

IV. CONCLUSION

From the above outcomes it is reasoned that the effect of brick dust on black cotton soil is sure. By supplanting soil by half of its dry weight by black cotton soil it gives most extreme change in the designing properties of black cotton soil. So utilization of brick dust is ideal for adjustment since it gives positive comes about as stabilizer and furthermore it is a waste utilization. The Increase in MDD and lessening in OMC is more with increment in the extent of brick dust in the soils. The consequences of the investigation demonstrate that Brick Powder are reasonable for improving properties of the soils. From the above discussion it can be concluded that the Brick dust can effectively utilized with Black Cotton soil in improving the soil engineering values. From the above discourse it can be inferred that the Brick dust can adequately used with Black Cotton soil in enhancing the soil properties. The brick dust can effectively utilized with Black Cotton soil in improving the soil CBR values. The utilization of Brick Powder brought about usage of devastation squanders and observed to be prudent for local area. This will brings about the usage of rejected black cotton soil in development. From the outcomes, it is presumed that effect of Brick Powder is positive and can be essentially used as a stabilization material.

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