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## **Enhancing the Index and Engineering Properties of Virgin Soil by the Addition of Saw Dust-A Review**

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### **Abstract**

Soil that contains a lot of clay and mud is a major burden on the engineer. These resources show significant changes in the visible areas with changes in water, solid, dry clay, for example, may be suitable as the base of heavy loads as long as it is dry, but may not be stable when wet and most of the time the soil shrinks when dry and expands in moisture, which can adversely affect the structures on which it is based or built of them. Even when the water content does not change, the properties of the ideal soil can vary greatly between them the nature of the soil and its condition after disturbance. Clay is often weak and there is not enough stability in large loading. In this case, it is necessary to stabilize or stabilize the soil. Stabilization in the broadest sense incorporates the various techniques used to repair soil structures to improve its engineering performance. Stabilization uses a variety of engineering functions, the most common application being the construction of roads and airports, where the main purpose is to increase the stability or strength of the ground as well reduce construction costs by making better use of locally available materials. Stability is the process of basically altering the chemical properties of soft soils by adding stability or binding, either in water or in dry. conditions to increase the strength and firmness of the weak soil at the beginning. Soil adjustment is a procedure of modifying or improving the geotechnical properties of soil, collects it fit for development purposes. Adjustment builds the heap bearing limit of the dirt while diminishes the compressibility and penetrability of soil. For planning purposes, new methods have been shaped to fix the geotechnical properties of the insecure soil. Soil adjustment, Removal of the undesirable materials and variable the ground water conditions are the for the most part three techniques managing updating of soil.

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### **Introduction**

Soil that contains a lot of clay and mud is a major burden on the engineer. These resources show significant changes in the visible areas with changes in water, solid, dry clay, for example, may be suitable as the base of heavy loads as long as it is dry, but may not be stable when wet and most of the time the soil shrinks when dry and expands in moisture, which can adversely affect the structures on which it is based or built of them. Even when the water content does not change, the properties of the ideal soil can vary greatly between them the nature of the soil and its condition after disturbance. Clay is often weak and there is not enough stability in large loading. In this case, it is necessary to stabilize or stabilize the soil. Stabilization in the broadest sense incorporates the various techniques used to repair soil structures to improve its engineering performance. Stabilization uses a variety of engineering functions, the most common application being the construction of roads and airports, where the main purpose is to increase the stability or strength of the ground as well reduce construction costs by making better use of locally available materials. Stability is the process of basically altering the chemical properties of soft soils by adding stability or binding, either in water or in dry. conditions to increase the strength and firmness of the weak soil at the beginning. Geotechnical engineers design foundations and other structures in the soil after an investigation of the type of soil, its features and its size. If the soil is good for shallow depth, shallow foundation such as footing and rafters are usually plentiful saving. However, if the subsoil is not good but there is a strong stratum present at great depth, then a deeper foundation is needed such as piles, springs and caissons. Deep foundations are very expensive and costly it only works when the supporting structure is heavy and large. Sometimes soil conditions get worse even at great depth and does not work to build a deep foundation. In such cases different types of soil development (stabilization) strategies are accepted. The aim is to improve the features in the area and make the soil capable of carrying load and increasing shear strength, reducing soil compression, so that the carrying capacity of the soil increases and reduces the settlement of structures built on it. Sometimes, the goal is to be reduces soil penetration.

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### **Literature Review**

Misra (1993) found that the essential components in sawdust cannot be calcium, potassium, and magnesium, even though Sulphur, phosphorus, and manganese are found in about 1% and iron, aluminum, copper, zinc, sodium, silicon., and boron is opened by common sense numbers.

Elinwooden ash 2006 and those of solid objects. The study has also solved the general scope of molecular dispersion in addition, physical, compound, design, and mechanical properties of sawmill.

Elinwooden ash 2008: Reported as, wood ash (WA) by 10% instead the level of the binding fabric in fixing the mud mixture works on it the self-assembly method also results in gaining higher power than normal traditional blend without adding fabric instead of regular Portland cement (OPC). Because of

the wood ash (WA) as a material and does not take part of any pleasant reaction to the hydration system delays energy gain length compared to a mixture made of standard Portland cement (OPC). Previously a for a long time very low energy properties are found in wood ash (WA) compounds such as additional fabric, but with long-lasting blends made of wood (WA) as an additive the best-known shows comparable characters because the compounds are prepared without any to add additional minerals. In the long run combos are made in different high classes up to 20% of the same popular electricity prices

Chowdhury and Maniar (2014): Contains information that the soil saw was purchased from wood finishing machines. Accommodation arrangements are important, integrated and mineralogical Wood ash (WA) is supplied and broken. Power limits i.e... Its stressful quality, elasticity and flexibility of flexible cement mortar (WA) concrete is tested. As a result, it was noted that wood waste was wood ash (WA) should be mixed with concrete without compromising solid quality properties. In addition, the use of another measurable concept of help vector Gadget Vitiator (SVM) machine, standard power parameters with wood ash (WA) develops a suitable model.

Raheem: Examined the impact of releasing years on the oppressive forces of the earth access to information (SDA) concrete. From the results, it is shown that it is stressful the increase in quality is largely due to the release of age and decreased progressively ground access information (SDA). The effects also showed that solid ground information (SDA) strength gains little by little in the beginning to restore years. This is in line with early detection of solid content pozzolanic objects gradually gained strength at the beginning of the release period (74 and 102] in recent years, pozzolanic work had begun and improved ground compression strength access to information (SDA) concrete.

Okeyinka and Oladejo: Announced the dynamic force of solid 3D shape decreases with the development of the content of wood waste. Calcium carbonates (CaCO<sub>3</sub>) as an admixture compound basically increases the compressive strength wood waste cement and concrete for all levels of options. The pressure force of wood cement debris concrete made (CaCO<sub>3</sub>) admixture will grow with years of release and the greatest strength occurs in 10% of the wood waste content, followed by 20% content of wood waste.

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## Conclusions

After going through various researches, following points were noted to be taken care of

1. Feasibility of Saw Dust as a Soil modifier in subgrade pavement.
2. Limited work has been carried out on the use of application of Saw Dust as a modifying agent.
3. Comparison of various soil samples with respect of percentages of Saw Dust to find out the strength and stability parameters.
4. Comparison of various engineering properties of virgin soil and soil mixed with polyurethane discrete fiber.

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## REFERENCES

1. Improvement of Mechanical Properties by Waste Sawdust Ash Addition into Soil by Shaheer Khan volume 20 2015 EJGE and Haziq Khan.
2. Influence addition of Fine Sawdust on the Physical Properties of Expansive soils in the Middle Nile Delta, Egypt by A. A. Abd El Halim and A. A. El Baroudy, *Journal of Social Science and Plant Nutrition*, 2014, 14 (2), 483-490.
3. Stability of Red Clay and Laterite Soil with Sawdust as an Amendment by Arun Kumar. K, Padmanbhan Narayan and N. Chiranthana, *International Journal of Combined Research and Development*, eISSN:2321-225X; pISSN:2321-2241 Volume: 2; Issue: 2; February-2014.
4. Studies on Soil Stabilization by using Bagasse Ash by Prakash Chavan and Dr. M. S. Nagakumar, *International Journal of Scientific Research Engineering & Technology (IJSRET)* ISSN: 2278-0882, ICRTIET-2014 Conference Proceeding, 30-31 August, 2014.
5. Potential Utilization of Solid Waste (Bagasse Ash) by V. S. Aigbodion, S. B. Hassan, T. Ause and G. B. Nyior, *Journal of Minerals & Materials Characterization & Engineering*, Vol. 9, No. 1, pp. 67-77, 2010.
6. Analysis of Strength Characteristics of Black cotton Soil Using Bagasse Ash and Additives as Stabilizer by Kiran R. G and Kiran. L *International Journal of Engineering Research & Technology (IJERT)*, Vol. 2 Issue 7, July – 2013.
7. Sachin N. Bhavsar, Hiral B. Joshi, Priyanka K. Shroff, Patel Ankit J, "Impact of Marble Powder on engineering properties of black cotton soil" in "International Journal for Scientific Research and Development", Vol.2, Issue 02, 2014.
8. Parte Shyam Singh, Yadav R.K., "Effect of Marble dust on Index Properties of black cotton soil" in "International Journal of Engineering Research & Science & Technology": 2319-5991, Vol.3, No.3, August 2014.
9. Nidhi Gautam, Dr. J K Sharma, Dr. N P Kaushik, "Stabilization of Expansive soil using Marble dust and coir fibre" in "Indian Geotechnical Conference" Indian Institute of Science, Bengaluru, 13-15 December, 2018.