STUDY ON USE OF FLYASH AND POULTRY NETTING COATED WITH BITUMEN TO STABLISE THE

SUBGRADE BENEATH A ROADWAY

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Abstract:

The characteristics of the soil sub grade which serves has the foundation have a significant for the entire payment impact on the design of a flexible pavement as a result, the performance and design analysis of pavement construction must be done with great care. Because the shrink swell soils are high in silt and clay content the soil sub grade must be stabilized compacted before laying a flexible pavement Subgrade soil can be replaced with other materials to stabilize this types of soils, The current utilization rate of fly ash, which is an industrial waste, is around 58%fly ash can be properly utilized by replacing it in the sub grade with bitumen coated poultry netting in various percentage and layers of poultry netting placement. Therefore, flyash is added as a partial substitute for the purpose of stabilization and An addition of bitumen coated poultry netting is inserted at 4 distinct layers in the subgrade, where it has found to be stabilized with the ideal moisture content and maximum dry density when compared to the soil that hasn't been treated the prepared subgrade is seen to have high CBR value.

Keywords: Subgrade, Flyash, Stabilization ,Shrink Swell soils, Poultry netting, CBR Value.

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I. Introduction

Many highway agencies private organization and researchers are doing extensive Studies on waste materials and research projects concerning the feasibility and Environmental suitability. Shrink swell soils which are considered as problematic Soils have worldwide distribution and hence, their proper identification and characterization becomes an absolute necessity in the perspective of the present day geotechnical engineering practice due to the change in the climatic conditions there exists a great change in behaviour of soil shrink swell soils are composed mainly by kaolinite, montmorillonite, and illite group minerals (puppala et al 2002) their Physical characteristics mostly include low bearing capacity, high settlements, low shear strength, high water absorbability(Kemp errand gebreselassic 2006).The plastic waste coated aggregate is mixed with hot bitumen for 15 sacs and the Resulting mix transported for road construction central mixing plants helps to have better control Of temperatures and better of their material thus helping to have uniform coating and heated bitumen is also sprayed. The initiative aims to establish environment friendly Plastic waste disposal solutions. In this process it seeks to ban the use of plastic bags and plastic products, and reduce plastic littering across the state. Because of its swelling nature with respect to moisture content the settlements increasing with loads which in current great damage to flexible pavements. Poultry netting in plastering uses to prevent cracks. It expands

in heat and contract on cooling the gap between RCC structures and walls joint fill with fixing poultry netting before plastering. Poultry netting, is a mesh of wire commonly used to fence in fowl, such as Chickens, in a run and loop, it is made of thin, flexible galvanized steel wire with hexagonal gaps, poultry netting has the same function has reinforcement does in concrete. It strength the plaster against forces, mainly to avoid the crack formed due to insufficient gaps filling between pavements layers gaps so in order to increase the bearing capacity of the soil at the site either by partial replacement of subgrade (or) Complete replacement of soil, As the complete replacement is not a useful idea so partial replacement of fly ash along with the placement of bitumen coated poultry netting is observed to be more effective at lesser cost

MATERIALS USED:

Fly ash is used as subbase materials collected from thermal power station the engineering properties of fly ash

Poultry netting

In fig (a) poultry netting is flexible in structure this makes it ideal for using in curves and all kinds of plastering this available in rolls of bundles; it is available different materials like MS and galvanized iron. The mesh size also varies and it is available in different wire diameters. The poultry netting obtained from the dealer with coated bitumen which is heated at about 150centigrade temperature and two coats are applied on the entire poultry netting for stiffness purpose the properties of Poultry netting mass (210/Gms/$m^{2)}$, tensile strength (8KN/m), and also soil sample for this study gathered 1m depth from ground surface this soil through 4.75mm sieve and soil used for investigation and soil passed through 4.25 microns sieve is used for calculation for liquid limit and plastic limit the properties of sand 16.2% silt 20.3% Clay 63.5% SP 2.71% this were properties of unmodified soil were has the fly ash is **an** industrial by product obtained burning coal which is serving as the main sources of thermal energy the chemical properties of fly Al2O3(16.2), SiO2(61.11), FeO3(6.3).

Plastic waste:

Plastic waste also known as plastic pollution; is defined as the buildup plastic objects (such as plastic bottles and other items) the plastic waste such carry bags, cups, disposables, etc. are bags cups, disposables, etc. are shredding machine and then sprayed in different over the hot

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aggregates. Shredding is the process of cutting the plastic into small sizes between 2.36mm to 4.75mm with help of the plastic shredding machine viz. agglomerate and scrap grinder.

EXPERIMENTAL METHODS:

In the present study compaction tests are carried for different percentages of fly ash replacements to determine the maximum dry density and optimum moisture content. The suitable fly ash content having maximum dry density is considered for further investigation. The CBR tests carried by the procedure according to IS code. The bitumen coated chicken mesh is placed at different layers in the specimen

TABLE:1 OMC and MDD of soil with variation in flyash content and CBR values same

S. No.	LAYERS	OMC(%)	MDD
1	Unmodified soil	19.2	1.41
2	Flyash+soil 5%	21.1	1.31
3	Flyash+soil 10%	27.1	1.41
4	Flyash+soil 15%	24.1	1.49
5	Flyash+soil 20%	24.1	1.38

TABLE:2 CBR values of soaked and unsoaked samples with different soils conditions

S. No.	LAYERS	CBR VALUE	
		UNSOAKED	SOAKED
1	Unmodified soil	5.1	3.2
2	Modified soil	5.5	4.01
3	First layer	5.9	4.1
4	Second layer	5.7	4.4
5	Third layer	5.3	4.38
6	Fourth layer	5.2	3.8
7	1&3 layers	5.5	4.12
8	2&4 layers	5.7	4.12
9	1,2,3,4 layers	6.1	4.78

II. Conclusion

This is study compaction test are carried for different percentages of fly ash replacement to determine the maximum dry density and optimum moisture content the suitable fly ash content having maximum density is considered further investigation the CBR test are carried by the procedure according to IS code the bitumen coated poultry netting is placed at different layers in specimen the CBR mould diameter 150mm and the height of 128mm is marked into 4 layers and the poultry netting is placed in all layers .individually and then at 1,3,&2,4 positions and then in all layers and their CBR values are noticed in both soaked and unsoaked test the long term of materials used in the flexible pavements laid over shrink swell soil /sand subgrade could further elucidated by extensive field studies though the techniques tried are found to be effective on an off lane test track study has seen in this work the pavement performance over cyclic netting and drying may be for their investigated with an on lane test track under actual traffic operation

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