

GEOTEXTILE USE IN ROAD CONSTRUCTION

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Abstract: *Our project aimed to use geotextiles in road construction. First, we will determine the advantages of using geotextiles, which are permeable fabrics that, when combined with soil, can separate, filter, reinforce, protect, or drain. For decades, geotextiles have been successfully utilized in road construction.*

They satisfy practically all traditional capability like detachment, insurance, filtration, Waste, fixing, and support. In late time the extent of use has been broadened essentially by the development of street asphalt. Geosynthetic reinforcements have been shown in the field to improve pavement performance by reducing road surface deflection and preventing cracking, rutting, and potholes.

Jute created bounteously in India and may utilized in usefully and richly with extraordinary adequacy for adjustment of endlessly soil adjustment for week sub level . However there has been very restricted yet effective development of streets

Keywords: Geotextile, Filtration, Reinforce, Protect, Separate etc.

I. Introduction -

Geosynthetics are adaptable and practical materials that have altered ground change and customization methods in the field of structural designing. They have become essential in almost every city world wide's geotechnical, environmental, coastal, and hydraulic engineering projects due to their proven track record. Geosynthetics are a wide range of materials made from polymers, which are common plastics. Due to their unique properties—high tensile strength, durability, flexibility, and resistance to harsh environmental conditions—these materials are utilized in a wide range of civil engineering applications. Geotextile, which is a permeable fabric made of polymers like polyester or polypropylene, is one of the most common types of geosynthetics. When applied to soil, geotextiles are used to separate, filter, reinforce, protect, or drain it. They are a subcategory of geosynthetics. They were initially made of regular strands, textures, or vegetation blended in with soil to work on the nature of streets based on temperamental soil. In fact, geotextiles have been used to stabilize roads since the time of the Pharaohs.

Geotextiles are now used extensively in a wide range of civil engineering tasks,

including the construction of roads, erosion control, filtration, drainage, and soil reinforcement. They have demonstrated their ability to stop soil erosion, give slopes and embankments structural stability, and keep pollutants out of the environment

In conclusion, the adaptability, usefulness, and cost-effectiveness of geosynthetics, including geotextiles, have made them an integral part of modern civil engineering projects. They have changed ground alteration and customization strategies and are fundamental for guaranteeing the wellbeing, toughness, and supportability of foundation projects around the world

II. Overview of the Project

A polymeric (natural or synthetic) planar material that is used in contact with soil, rock, or any other geotechnical material for filtration, drainage, separation, reinforcement, protection, sealing, and packing.

III. Advantages And Disadvantages of Geotextile

- They are easier to handle and lay out on the jobsite because they weigh less.
- Transport and Labour costs are less in genuine terms
- Weaved geotextiles have a high tear strength.

IV. Types Of Geotextiles

Geotextile are made up of polyester or polypropylene. They are divided into three categories

- Woven fabric geotextile
- Non- woven geotextile
- Knitted geotextile

“ Experimental Studies on viability of Using Geosynthetics on fibre in Concrete”

From the literature review, it is clear that there has been a growing push to find cheaper alternatives to steel reinforcement in recent years. Several different options have been investigated globally. Numerous viable alternatives are discovered, as are numerous methods for replacing steel and adding tensile durability to concrete. In various areas of construction, the methods that have been found to be feasible and cost-effective are also tested. One such alternative strategy is adding natural or synthetic fibers to the concrete to

provide secondary support. Several fibers are also being tested on concrete floors; some of them succeeded in strengthening and preserving the concrete, but many are still in the research stage. Bounteous materials were presented as extra materials cement, for example, polypropylene, glass filaments, FRP, coir and so on. This paper describes an effort to incorporate geosynthetics, a material that can be used in concrete like soil fibers. This paper describes the investigation that was conducted to investigate the stability of using geosynthetics as fibers in concrete. Geosynthetics are used extensively as soil reinforcement, separators, drainage, filters, and in a variety of infrastructure projects worldwide.

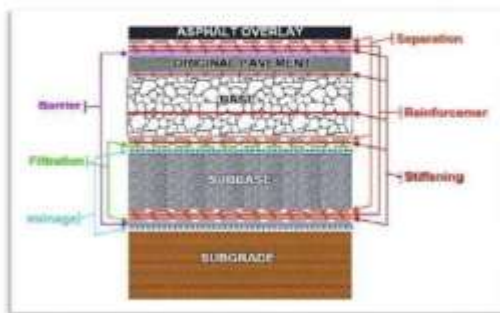
“ Application of Geo synthetics in the construction of roads & railways”

Geosynthetic plastics, such as geogrids and geotextiles, are sometimes used to reinforce roads in order to improve their performance. Geogrids comprise of polymers framed into generally inflexible

V. Methodology

Geotextile is a permeable synthetic textile material utilized to enhance soil characteristics. It can separate, filter, strengthen, protect, and drain

when used with soils. For a wide range of civil projects, including roads, harbors, landfills, drainage structures, and others, geotextiles are excellent materials. The use of geotextiles in road construction is primarily their mechanical functions. They allow water to flow through without significantly eroding soil particles. They are used for filtration on their own, separating smaller particles from larger ones to stop erosion and strengthening weak soils to make them more able to bear weight.



VI. Various modes water penetrates into pavement

- Subsurface water from the pavement's sides
- Subsoil water from below through capillary action
- Water intercepted as a result of drainage flooding to excess
- Ground water from hindered springs and restricted springs.
- Percolation through poor pavement surface and cracks.
- Water from the pavement's side into

the subsoil

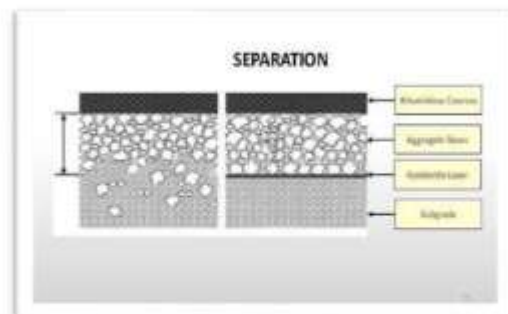
VII. Engineering Characteristics and functions

Significant designing properties of geotextiles are rigidity, burst and cut strength modulus of flexibility, penetrability. Distribution of pores, ultraviolet resistance to abrasion, and stability against hostile environments. Geotextiles are primarily used for reinforcement, filtration, drainage, and control separation. Highways, rail roads, reinforced earth embankments and walls, drainage control dams, stabilization of soil and rock slopes, and erosion control are just a few examples.

VIII. Mechanism of Geotextile

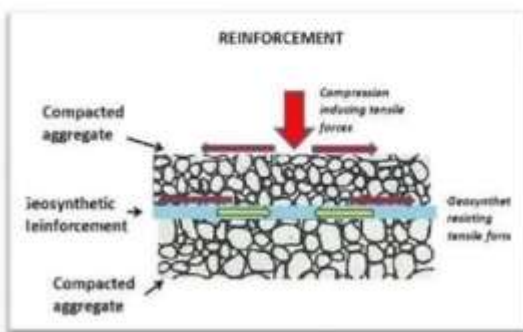
- Separation
- Reinforcement
- Drainage

➤ **Separation:** Geotextile material act as separator between subgrade and subbase layer of soil, as we can in the figure it's show that with or without geotextile material performance of road, without geotextile the sub base or the aggregate layer is deepen down in to soil and cause problem, to overcome such conditions geotextile acts as a separator.

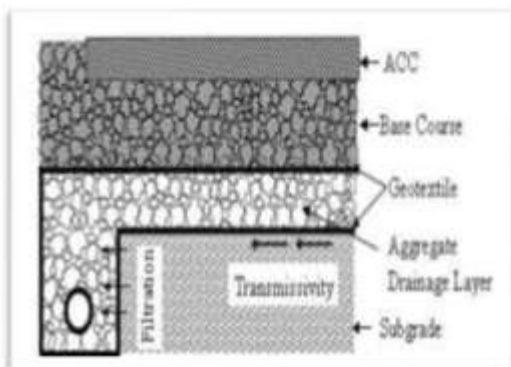


Reinforcement: It's protected the subbase or base Corse part Prevent

migration of small gravel and sand aggregate, because strong fabric membrane prevents from damage mostly used in road construction. Because of compression tensile forces induced and the aggregate get separated from their location causes to pavement fail in structures. AS we see in picture how load acts by use of geotextile material prevents from de location of subbase part of road structure.



➤ **Drainage:** Accumulation of water on road causes problems such as soften the ground, road surface breaks up and maintenance of road get increased. Drainage helps to pass accumulated water so that we can avoid problems like soil erosion in hilly areas it reduces the risk factor of soil slippage. The below picture show how use geotextile material helps to runoff of percolated water from road surface and helps to allow water to pass out, and increase life of road as well main maintenance cost.



IX. Conclusion

The construction of highways relies heavily on the geotextiles. They are successfully utilized in essentially all realities of new development. It effectively reduces the cost of maintenance and significantly extends the pavement's service life. Due to its high resistance to deformation, it provides structural strength and significantly separates the subbase from the subsoil.

Additionally, it thins the subbase granular course. It would be helpful on the off chance that geotextiles were utilized in expressway development as its application will decrease starting development costs and cut down regular fix and support work of street.

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