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Research Paper :

Use of geotexitles for different purposes

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ABSTRACT

Though Geotextile is not a new name or concept in engineering field but still it requires more acceptability in different fields of construction civil and agricultural engineering. Having more than one engineering function, geotextile is of a great importance. It is used as separator, rein forcing material, filters, proper drainage device, moisture barrier etc. It is not less than boon for Civil Engineering and Agricultural Engineering. It is extensively used in construction of pavements, dams, retaining wall, soil stabilization etc. Results show that as a separator it maintains identity and strength of dissimilar materials. Having characteristics of good tensile strength it is proved that by using geotextiles strength of soil can be increased, shown by triaxial test. Geotextiles fulfills the purpose of filtration and retention because of its wooven pattern. Results show that it also serves the purpose of drainage and moisture barriers.

Key words : Geotextile, Polyster, Nylon, Polypropylenes, Polyethylene, PVC, Separation, Reinforcement, Filtration, Drainage, Moisture barrier

During some last year the name of Geotexiles has become very popular in different sectors of engineering. Basically geotextiles is like a textile with little difference. It is of synthetic fibers such as polyster, nylon, polypropylene, polyethylene, PVC and composite of these, hence biodegradation doesn't take place in it. These fibres are woven, matted or knitted in such a manner that the product fabric becomes porous. The beauty of geotextiles is that they are porous to water flow across their manufactured plane and also within plane, but with a wide variation. The geotextiles always performs at least one or more than one among its functions like separation, Reinforcement, filtration and drainage.

METHODOLOGY

- Separation
- Reinforcement
- Filtration
- Drainage
- Moisture barrier (When Impregnated)

All the following mechanism were observed and verified at Departemnt of Civil Engineering, College of Agricultural Engineering and Technology, Etawah (U.P.)

Separation:

The geotextile (a flexible synthetic layer) is introduced between two dissimilar materials such that the identity or integrity and functioning of both materials can remain intact or be improved.

Two systems or mechanisms can be seen when stones are placed on soil. First the particles of soil attempt to enter the voids of stones, hence drainage capability gets disturbed. The second is that the stones attempt to punch into the soil, hence strength of stones get ruin. By placing geotextile the above situations may be avoided. It may be understood in the following manner (Fig. 1)

– Soil Fines pumping into stone voids and its prevention using geotextiles;

– Mechanism of stone intrusion into soil sub grade and its prevention using geotextiles.

Reinforcement:

Geotextile has a very good property of tensile strength. Geotextile is a boon for soil which is weak in tension and rich in compression. Geotextiles serve not only as separators but also increase the bearing capacity of the soil to take heavier loads.

Improvement in strength can be evaluated in a number of ways, but the triaxial tests illustrate the beneficial effects of the geotexile when properly placed. Fig. 2 shows two sets of triaxial tests on dense sand samples at confining pressures for different soils and geotextiles configuration.

Curves 1 shows onle sand curves 2 have goetexile on the top and bottom of the soil and do not show improved strength. Curves 3 shows improved strength when fabric is placed at middle also. Curves 4 show the mush improved strength because of geotextiles at right zones, as in figure.