

Use of Pond Ash, Soil and Polyethylene Fiber in Road Subgrade

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Abstract: Thermal power plants release waste materials as by Disposal of them is a major concern nowadays. It requires a large area products which are threat to environment. And also has many environmental issues. Major by products are Fly ash, Bottom ash and Pond ash. Fly ash is collected from the flue gases of the power plants by mechanical or electrostatic precipitator. Bottom ash is collected from the bottom of the boilers. Pond ash is derived from the mixture of both fly ash and bottom ash. The power plants produce very large of pond ash as compared to fly ash and bottom ash. So the goal is to utilize the pond ash in some other fields to minimize its potential hazard to the environment. As compared to the natural soil, the weight of pond ash is very less and it has self-draining capacity. It is necessary to know the strength characteristics of pond ash before its successful application in various fields. During the construction of embankments, abutments, earthen dams and other retaining structures a huge amount of soil is needed. Due to rapid industrialization and the scarcity of availability of natural soil the scientists thought to utilize the waste products of power plants as a replacement to the natural soil. This will solve the environmental issues due to the deposition of the by-products and also reduce the scarcity of natural soil. At present scenario the use of pond ash in India in other fields is negligible. Only about 35% of the pond ash is being used commercially. It shows that in order to preserve the valuable natural soil it is necessary to utilize the pond ash to the maximum extent. Recently Pond ash is being used as a filler material in low lying areas. This is also used for embankment construction in some areas. However, its use is limited due to lack of sufficient knowledge about its characteristics and some other physical properties. The strength of pond ash is less as compared to the conventional earth material because of less angle of friction and interlocking between the particles is less because of shape of pond ash particles is partially rounded and sub rounded. Use of reinforcing materials with the pond ash will enhance its geotechnical properties like in case of reinforced earth. For that, the knowledge about the strength characteristics of soil mass and the reinforcement is very much essential. Material used to make subgrade road are polythene fiber, pond ash and soil. Pond ash is the product of combination of Fly ash, Bottom ash and Coal which are by products of thermal power plants. Together these are mixed with water to form slurry. That slurry is pumped to the ash pond. In ash pond area, excess water is removed and the ash settles as residue. This residual deposit is called pond ash. And polythene fiber (cement fiber bag) is the Cement Bag Fiber is not a conventional type of fiber which could have been used as a reinforcing material. The Cement Bags are manufactured product of polyester. These are available everywhere, where there construction works are concerned. Test conducted like specific gravity determination, moisture content determination by oven drying method, sieve analysis, compaction test, determination of California bearing ratio. By using all the above mentioned material to find out the new way of constructing the subgrade of road.

Keywords: Polythene fiber (cement fiber bag), soil, pond ash.