

When should I Pave a Gravel Road?

Separation or Stabilization: The geotextile is used to permanently separate two distinct layers of soil in a roadway. The classic example is where a road is to be built across a poorly drained, fine-grained soil (clay or silt) and a geotextile is laid down prior to placing gravel. This keeps the soft, underlying soil from working its way up into the expensive gravel and it keeps the gravel from punching down into the soft soil. The full gravel thickness remains intact and provides full support for many years.

Typically, woven and nonwoven geotextiles are used in this application. If a woven product is used, it should be at least 4 oz./sq. yd. and could be a "slit-tape" or "monofilament" type for routine, non-critical situations. If a nonwoven product is used, it should be at least 8 oz./sq. yd. for survivability during construction.

Drainage: The geotextile acts as a filter through which water passes while it restricts fine-grained soil from entering into coarse-grained soil (sand or gravel). An example is in an underdrain where gravel-filled trenches lined with a geotextile fabric are constructed along the edges of roads. The fabric allows water to drain into the trench, while it permanently separates the different soil materials. The gravel remains clean and cannot "plug up" with fine material. Not only can it be used in roadways, but also under parking lots, walls, athletic fields, lawns, tennis courts, and other areas.

Normally, nonwoven fabrics are used because of their small pore size (opening size) and high flow capacity. They should be at least 4 oz./sq. yd. If installation stresses are more severe such as where sharp angular aggregate is in contact with the fabric, or a heavy degree of compaction is required, then a heavier nonwoven with a minimum of 8 oz./sq. yd. should be used. Woven fabrics can be used but they should be of the "monofilament" variety. "Slit-tape" wovens should NOT be used for drainage applications because of their poor capacity to pass water.

Erosion Control: A layer of heavy stones or broken rocks (riprap) is commonly used to provide erosion protection for stream banks, culverts, ditches, stream channels, shorelines, and bridge structures. A geotextile placed between the rock layer and the underlying soil surface provides anchorage of the underlying soil and protects it from erosion and wave attack.

Two key properties are important for proper erosion control. It must have sufficient capacity to pass water, especially if water is coming from behind the fabric. Second, the geotextile must be able to retain the finer soil particles under the fabric. Typical geotextiles used for erosion control are medium weight (8 oz./sq. yd.) nonwoven fabrics or "monofilament" woven fabrics. In some instances where the riprap is rounded or the fabric is protected by a thin sand cushion before the riprap is placed, a lighter weight fabric (4 oz./sq. yd.) could be used, if care is exercised during riprap placement.

Reinforcement: In some areas, construction is proposed in "soft" areas where the foundation soils are too weak to support a road or structure. Without sufficient reinforcement, the foundation cannot "hold up" the structure and it fails at considerable expense. When this condition exists, usually a soils engineer is needed to design the facility and the underlying geotextile and/or geogrid.