

# Construction Specification 795—Geotextile

## 1. Scope

This work consists of furnishing all material, equipment, and labor necessary for the installation of geotextiles.

## 2. General requirements

Fibers (threads and yarns) used in the manufacture of geotextile shall consist of synthetic polymers. They shall be formed into a stable network of filaments or yarns retaining dimensional stability relative to each other. The geotextile shall be free of defects and conform to the physical requirements in Tables 1 or 2, whichever is applicable. Unless otherwise specified, the class and type of geotextile shall be shown on the drawings and shall meet the requirements for materials that follow.

## 3. Classification

**Woven**—Fabrics formed by the uniform and regular interweaving of the threads or yarns in two directions. Woven fabrics shall be manufactured from monofilament yarn formed into a uniform pattern with distinct and measurable openings, retaining their position relative to each other. The edges of fabric shall be selvaged or otherwise finished to prevent the outer yarn from unraveling.

**Nonwoven**—Fabrics formed by a random placement of threads in a mat and bonded by heat-bonding, resin-bonding, or needle punching. Nonwoven fabrics shall be manufactured from individual fibers formed into a random pattern with distinct, but variable small openings, retaining their position relative to each other when bonded by needle punching, heat, or resin bonding.

## 4. Certification and Test Data

The geotextile shall meet the specified requirements (Table 1 or 2) for the product style shown on the label. The manufacturer or distributor shall submit to the NRCS representative the technical data specification sheet containing the Minimum Average Roll Values (MARV). The product properties (MARV) will be acceptable documentation that the product style meets the specified requirements. Typical test data from the identified production run of the product for each of the specified tests must be submitted to the NRCS representative if requested.

## 5. Shipping and storage

The geotextile shall be shipped/transported in rolls wrapped with a protective covering to keep out dust, dirt, debris, and ultraviolet light. The cover shall be maintained undisturbed to the maximum extent possible before placement. Each roll of geotextile shall be labeled or tagged to clearly identify the brand, class, and the individual production. Prior to use, the geotextile shall be stored in a clean, dry place, out of direct sunlight, not subject to extremes of either hot or cold, and with the manufacturer's protective cover in place.

## 6. Surface preparation

The surface on which the geotextile is to be placed shall be graded to the neat lines and grades as shown on the drawings. It shall be reasonably smooth and free of loose rock and clods, holes, depressions, and projections. The surface preparation will be inspected and approved by the NRCS inspector prior to placing the geotextile.

## **7. Placement**

The geotextile shall be placed on the approved prepared surface at the locations and in accordance with the details shown on the drawings. It shall be unrolled along the placement area and loosely laid, without stretching, in such a manner that it conforms to the surface irregularities when stone or other material is placed on or against it. The geotextile may be folded and overlapped to permit proper placement in designated area(s).

The geotextile shall be temporarily secured during placement of overlying material to prevent slippage, folding, wrinkling, or other displacement of the geotextile without causing punctures, tears, or other openings to be formed in the geotextile.

The geotextile shall be joined by overlapping a minimum of 18 inches and secured against the underlying foundation material. Securing pins, approved and provided by the geotextile manufacturer, shall be placed along the edge of the panel or roll material to adequately hold it in place during installation. Securing pins shall be placed along a line about 2 inches in from the edge of the placed geotextile at intervals not to exceed 12 feet unless otherwise specified. Additional pins shall be installed as necessary and where appropriate to prevent any undue slippage or movement of the geotextile. The use of securing pins will be held to the minimum necessary.

The geotextile shall not be placed until it can be anchored and protected with the specified covering within 48 hours or protected from exposure to ultraviolet light. In no case shall material be dropped on uncovered geotextile from a height of more than 3 feet. Should the geotextile be torn or punctured, the repair shall consist of a patch of the same type of geotextile being used and overlaying the existing geotextile. The patch shall extend a minimum of 2 feet from the edge of any damaged area.

For road stabilization, geotextile shall be unrolled in a direction parallel to the roadway centerline in a loose manner permitting conformation to the surface irregularities.

## 8. Tables 1 and 2

**Table 1 Requirements for woven geotextiles**

Property	Test method	Class I	Class II & III	Class IV
Tensile strength (pounds) <sup>1/</sup>	ASTM D 4632 grab test	200 minimum in any principal direction	120 minimum in any principal direction	180 minimum in any principal direction
Elongation at failure (percent) <sup>1/</sup>	ASTM D 4632 grab test	<50	<50	<50
Puncture (pounds) <sup>1/</sup>	ASTM D 4833	90 minimum	60 minimum	60 minimum
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTM D 4751	As specified, but no smaller than 0.212 mm (#70) <sup>2/</sup>	As specified, but no smaller than 0.212 mm (#70) <sup>2/</sup>	As specified, but no smaller than 0.212 mm (#70) <sup>2/</sup>
Percent open area (percent)	CWO-02215-86	4.0 minimum	4.0 minimum	1.0 minimum
Permittivity sec <sup>-1</sup>	ASTM D 4491	0.10 minimum	0.10 minimum	0.10 minimum

Note: CWO is a USACE reference

**Table 2 Requirements for nonwoven geotextiles**

Property	Test method	Class I	Class II	Class III	Class IV <sup>3/</sup>
Tensile strength (lb) <sup>1/</sup>	ASTM D 4632 grab test	180 minimum	120 minimum	90 minimum	115 minimum
Elongation at failure (%) <sup>1/</sup>	ASTM D 4632	≥ 50	≥ 50	≥ 50	≥ 50
Puncture (pounds)	ASTM D 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTM D 4751	As specified max. #40 <sup>2/</sup>			
Permittivity sec <sup>-1</sup>	ASTM D 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 minimum

1/ Minimum average roll value (weakest principal direction).

2/ U.S. standard sieve size.

3/ Heat-bonded or resin-bonded geotextile may be used for classes III and IV. They are particularly well-suited to class IV. Needle-punched geotextiles are required for all other classes.