
Appendix A-3

Geotextile Application Guide

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STANDARD AND SPECIFICATIONS FOR GEOTEXTILE

Definition: Woven or non-woven fabric consisting of long chain polymeric filaments or yarns of polypropylene, polyethylene, polyester, polyamide, or polyvinylidene chloride. The geotextile shall be inert to commonly encountered chemicals and hydrocarbons, and be mildew and rot resistant.

Purpose: To function as a barrier to sediment while allowing water to flow through when used as silt fence, inlet protection, or in a dewatering practice. To provide a stabilized base for stone and riprap applications when used as an underlay.

Conditions Where Practice Applies

Standard, reinforced and super silt fence, storm drain inlet protection, culvert inlet protection, geotextile dewatering bag, pumping pit, dewatering device, dewatering basin, lined channel, subsurface drain, riprap and gabion mattress chutes, riprap outlet protection, riprap stilling basin, stabilized construction entrance, temporary crossing, stream diversion. Refer to **Figure A-3a, Geotextile Selection Table** for choosing the appropriate type of geotextile for a given situation.

Design Criteria

For the purposes of this Handbook, geotextiles have been classified into different categories, or "Types", dependent upon the geotextile application. There are two general types of geotextiles under this classification, the "Type GS" and the "Type GD". Type GS geotextiles are used to separate and/or support layers of different media, such as stone and earth. They tend to have high tensile strength and low permeability. Type GD geotextiles are used in applications that depend on the passage of water through the fabric, thus they can generally be considered "drainage type" geotextiles. This class is further broken down into subclasses depending on the permeability and strength requirements for the given application. See **Figure A-3b, Geotextile Properties Table** for the minimum acceptable property values for the various geotextile types and applications. The minimum acceptable values have been established using the ASTM Test Methods listed below:

Property	Test Method
Grab Tensile Strength	ASTM D 4632
Grab Tensile Elongation	ASTM D 4632
Trapezoidal Tear Strength	ASTM D 4533
Mullen Burst Strength	ASTM D 3786
Puncture Strength	ASTM D 4833
Apparent Opening Size	ASTM D 4751
Ultraviolet Stability (% Strength Retained)	ASTM D 4355
Flow-thru Rate	ASTM D 4491

The designer shall specify on the plan the “Type” of geotextile for the application, such as “Type GD-II geotextile” for use in a pumping pit. In addition, a specific product, “or approved equivalent” shall be included on the plan. To further this example, on the pumping pit detail, a note would be included that says, “Use Type GD-II geotextile, Mirafi FW402 or approved equivalent”. If the contractor wishes to substitute products, he/she should refer to **Figure A-3b, Geotextile Properties Table** for the minimum acceptable values for Type GD-II geotextile in selecting an alternate product. **All substitutions must have prior approval from the appropriate plan approval agency.**

Considerations

The information in this geotextile reference section is generally intended for use with respect to the standard erosion and sediment controls presented in this Handbook. Geotextile products may also be used in stormwater management facilities, such as infiltration trenches and bioretention facilities. The designer shall determine the appropriate geotextile to be used in stormwater management applications, and specify on the plan a manufacturer’s product, “or approved equal”, to be used for that application. The example products cited in this appendix do not represent a complete list of all products, and listing of a product is not an endorsement of its use. It is the responsibility of the designer to specify a product that meets all of the site criteria. If, during construction, the contractor wishes to substitute a product, it must be with the concurrence of the designer and plan approval agency.

Geotextile Selection Table		
Type	Application	Example Products
GS-I	Separation / Stabilization / Underlayment for: Dewatering Basin - Type 2 Gabion Chute Lined Channel Riprap Chute Riprap Outlet Protection Riprap Stilling Basin Stabilized Construction Entrance Stream Diversion Temporary Crossing	US Fabrics US315 ADS 315W Amoco ProPex 2006
GD-I	Culvert Inlet Protection Reinforced Silt Fence Silt Fence Super Silt Fence	Mirafi 500X Geotex 2005T Amoco ProPex 2130
GD-II	Dewatering Basin - Type 1 Dewatering Device Inlet Protection - Type 1 Pumping Pit	Thrace-LINQ GTF 400EO Skaps M404 WinFAB 2197
GD-III	Inlet Protection - Type 2	Silt Sack High Flow Dandy Bag II Ultra-Drain Grate Guard
GD-IV	Geotextile Dewatering Bag	Dirtbag 53/55 Dandy Dewatering Bag TerraTex N08/N10

Figure A-3a Geotextile selection table

Geotextile Properties Table					
Type	GS-I	GD-I	GD-II	GD-III	GD-IV
Minimum Grab Tensile Strength (ASTM D-4632)	300 lbs	100 lbs	200 lbs	265 lbs	200 lbs
Maximum Grab Tensile Elongation (ASTM D-4632)	15%	20%	40%	40%	50%
Minimum Trapezoidal Tear Strength (ASTM D-4533)	100 lbs	50 lbs	50 lbs	50 lbs	80 lbs
Minimum Mullen Burst Strength (ASTM D-3786)	N/A	N/A	N/A	N/A	350 psi
Minimum Puncture Strength (ASTM D-4833)	150 lbs	60 lbs	45 lbs	100 lbs	130 lbs
Apparent Opening Size (ASTM D-4751)	40-80 US Sieve	30-80 US Sieve	30-80 US Sieve	20-40 US Sieve	40-80 US Sieve
Minimum UV Resistance after 500 hours (ASTM D-4355)	70%	70%	70%	70%	70%
Flow-thru Rate (ASTM D-4491)	6 gpm/ft ² maximum	10 gpm/ft ² maximum	110 gpm/ft ² minimum	110 gpm/ft ² minimum	70 gpm/ft ² minimum

Figure A-3b Geotextile properties table

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