

1.0 GENERAL

1.1 GENERAL

- .1 This section has been revised from the Alberta Transportation Civil Works Master Specifications template.

1.2 REFERENCES

Provide geosynthetics in accordance with the following standards except where specified otherwise:

- .1 American Society for Testing and Materials (ASTM)
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| .1 | ASTM D3786 | Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method. |
| .2 | ASTM D4491 | Standard Test Method for Water Permeability of Geotextiles by Permittivity. |
| .3 | ASTM D4533 | Standard Test Method for Trapezoidal Tearing Strength of Geotextiles. |
| .4 | ASTM D4632 | Standard Test Method for Grab Breaking Load and Elongation of Geotextiles. |
| .5 | ASTM D4751 | Standard Test Method for Determining Apparent Opening Size of a Geotextile. |
| .6 | ASTM D4833 | Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products. |
| .7 | ASTM D5261 | Standard Test Method for Measuring Mass per Unit Area of Geotextiles |
| .8 | ASTM D5262 | Standard Test Method For Determining The Unconfined Tension Creep And Creep Rupture Behavior Of Planar Geosynthetics Used For Reinforcement Purposes |
| .9 | ASTM D6637 | Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method |
| .10 | ASTM D6992 | Standard Test Method for Accelerated Tensile Creep and Creep-Rupture of Geosynthetic Materials Based on Time-Temperature Superposition Using the Stepped Isothermal Method |

1.3 SUBMITTALS

Provide the following submittals:

- .1 The manufacturer’s product technical specification certifying that the geosynthetics being supplied meets the specified requirements prior to delivery to the Site.

1.4 DELIVERY, STORAGE, AND HANDLINGS

- .1 Inspect each shipment of material and timely replace any damaged materials.
- .2 Keep geosynthetics wrapped in their original packaging until immediately prior to installation. Protect geosynthetics from direct sunlight, excessive heat, dirt, and rodents while in transit and storage.

2.0 PRODUCTS

2.1 MATERIALS

Provide materials in accordance with the following:

- .1 Geotextile: Non-woven, needle punched, composed of a minimum 85% polypropylene or polyester polymers, formulated to resist deterioration by ultraviolet exposure and free of manufacturing defects, cuts, tears, or any other physical damage, that meets or exceeds the following physical properties:

- .1 Geotex 1701 or Approved Equivalent (for riprap installation areas)

	Property	Requirement	Test Method
1.	CBR Puncture	5338 N	ASTM D6241
2.	Grab Strength	1890 N	ASTM D4632
3.	Grab Tensile Elongation	50%	ASTM D4632
4.	Trapezoidal Tear Strength	689 N	ASTM D4533
5.	Apparent Opening Size	150 µm	ASTM D4751
6.	Permittivity	0.7 sec ⁻¹	ASTM D4491
7.	Flow Rate	2037 L/min/m ²	ASTM D4491

- .2 Geotex 801 or Approved Equivalent (for retaining wall drainage gravel)

	Property	Requirement	Test Method
1.	CBR Puncture	2335 N	ASTM D6241
2.	Grab Strength	912 N	ASTM D4632
3.	Grab Tensile Elongation	50%	ASTM D4632
4.	Trapezoidal Tear Strength	356 N	ASTM D4533
5.	Apparent Opening Size	180 µm	ASTM D4751
6.	Permittivity	1.5 sec ⁻¹	ASTM D4491
7.	Flow Rate	4482 L/min/m ²	ASTM D4491

- .2 Geogrid: Refer to SweetTech Engineering Consultants' Issued for Tender (IFT) "Downtown Dike Redi Rock Retaining Walls Design" drawing package for detailed specifications regarding geogrid material requirements.
- .3 Root Barrier Fabric: Polyester fibers spunbonded into a swirling web pattern, with exceptional ultraviolet stability and water and air permeability. Root barrier fabric is to meet or exceed the physical properties of the following product:
 - .1 Landmaster Polyspun 300 or Approved Equivalent

3.0 EXECUTION

3.1 PREPARATION

- .1 Excavate and prepare the subgrade to the lines, grades, slopes, and elevations specified in the Contract Documents. Remove rock fragments or other objects having sharp projections.
- .2 Remove snow, ice, organics, loose, or other deleterious materials from the subgrade.
- .3 Do not place geosynthetics until the prepared subgrade surfaces have been inspected by the Owner or Engineer of Record. Rectify any defects as required by the Owner or Engineer of Record.

3.2 INSTALLATION

- .1 Geotextile:
 - .1 Install geotextile at the locations, to the lines, grades, slopes, and elevations specified in the Contract Documents.
 - .2 Place geotextile in a smooth, wrinkle-free, and slack condition to conform to the contour of the subgrade without becoming taut when covered with the specified material. Where required to conform to the subgrade, provide folds in the geotextile. Orient folds in the downslope and downstream direction.
 - .3 Place the geotextile with the longitudinal seam parallel to the longitudinal direction.
 - .4 At field seams, including patches or repair areas, provide a minimum overlap of 500 mm or as required by the manufacturer, whichever is greater.
 - .5 Temporarily anchor the geotextile with sandbags or weights placed at the outer edges, along seams, and at other intermediate points as required to prevent displacement.
 - .6 When placing geotextile in the wet, anchor the geotextile with stakes placed at the outer edges along seams to prevent displacement.
 - .7 Construct field seams such that the upper upslope sheet of the geotextile overlaps the downslope sheet, and the downstream end of the sheet overlays the upstream end of the adjacent sheet. Install geotextile from the bottom of the slope working upslope and from the downstream extent working upstream.
 - .8 Trim excess geotextile at the outer edges to the specified lines.

- .9 Protect the geotextile from damage. Repair or replace geotextile damaged during installation or construction of subsequent Work.
 - .10 Do not allow any equipment to operate directly on the geotextile or the overlying material.
 - .11 Cover the geotextile the same day of installation with the specified material. During placement of the specified material, limit the height from which the material is placed to 300 mm or lower, as required to avoid damaging or displacing the geotextile.
 - .12 Where drainage gravels are installed (at retaining wall locations), geotextile is to be installed to separate the drainage gravel from adjacent fine-grained soils. The geotextile is intended to prevent the drainage gravel from becoming contaminated with fines. Provide minimum 500 mm overlap at field seams where required.
- .2 Geogrid:
- .1 Refer to SweetTech Engineering Consultants' Issued for Tender (IFT) "Downtown Dike Redi Rock Retaining Walls Design" drawing package for detailed specifications regarding geogrid material requirements.
- .3 Root Barrier Fabric:
- .1 Refer to Geotextile installation specifications outlined in clause 3.2.1 of this Section.
 - .2 Horizontal root barriers are required under the full length and width of specified pathways identified in the Contract Documents.

END OF SECTION