

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 31 22 13 – Rough Grading
- .2 Section 31 23 33.01 – Trenching and Backfilling
- .3 Section 31 37 00 – Rip-Rap
- .4 Section 32 11 23 – Roadway Grading
- .5 Section 31 42 13 – Pipe Culverts

**1.2 MEASUREMENT AND PAYMENT**

- .1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams and overlaps.

**1.3 REFERENCES**

- .1 ASTM International
  - .1 ASTM A123/A123M-[09], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM D4491-[99a(2009)], Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - .3 ASTM D4595-[09], Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  - .4 ASTM D4716-[08], Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
  - .5 ASTM D4751-[04], Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum [2007]).
  - .2 LEED Canada-CI Version 1.0-[2007], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
  - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
    - .1 No.2-[M85], Methods of Testing Geosynthetics - Mass per Unit Area.

- .2 No.3-[M85], Methods of Testing Geosynthetics - Thickness of Geotextiles.
- .3 No.6.1-[93], Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
- .4 No.7.3-[92], Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
- .5 No. 10-[94], Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .4 CSA International
  - .1 CSA G40.20/G40.21-[04(R2009)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .5 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 1860-[November 2010], Material Specification for Geotextiles.

#### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Test and Evaluation Reports:
  - .1 Submit copies of mill test data and certificate at least 2 weeks prior to start of Work.
- .4 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements
- .2 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect geotextiles from direct sunlight and UV rays.
  - .3 Replace defective or damaged materials with new.

**Part 2 Products**

**2.1 MATERIAL**

- .1 Geotextile: woven synthetic fibre fabric, supplied in rolls.
  - .1 Woven Material shall be used for road construction, in accordance with Section
- .2 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.
  - .1 Non-woven material shall be used in the sub-base of ditches
- .3 Physical properties: Woven Material
  - .1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 135-270 g/m<sup>2</sup>.
  - .2 Tensile strength and elongation (in any principal direction): to ASTM D4595.
    - .1 Tensile strength: minimum 900 N, wet condition.
    - .2 Elongation at break: 5-20%.
    - .3 Seam strength: 350-900 N
- .4 Physical properties: Non-Woven Material
  - .1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 150-450 g/m<sup>2</sup>.
  - .2 Tensile strength and elongation (in any principal direction): to ASTM D4595.
    - .1 Tensile strength: minimum 400 N wet condition.
    - .2 Elongation at break: 40-100%.
    - .3 Seam strength: 180 N
- .5 Securing pins and washers: to CSA G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m<sup>2</sup> to ASTM A123/A123M.
- .6 Factory seams: sewn in accordance with manufacturer's recommendations.
- .7 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Owner's Representative
  - .2 Inform Owner's Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Owner's Representative

### **3.2 INSTALLATION**

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with pins and washers
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .5 Join successive strips of geotextile by Pins
- .6 Pin successive strips of geotextile at 2000 mm
- .7 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .8 After installation, cover with overlying layer within 4 hours of placement.
- .9 Replace damaged or deteriorated geotextile to approval of Owner's Representative
- .10 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling, 31 24 13 - Roadway Embankments, 33 46 16 - Subdrainage Piping, 35 31 19 - Revetments.
- .11 No Payment for this item. To be included in payment item for Roadway construction, ditching and culvert installation

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.4 PROTECTION**

- .1 Vehicular traffic not permitted directly on geotextile.

**END OF SECTION**