

Part 1 GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 31 37 00 Rip-Rap
- .2 Section 31 32 19.01 Geotextiles

1.2 REFERENCES

- .1 Nova Scotia Transportation and Infrastructural Renewal (NSTIR) Standard Specification for Highway Construction and Maintenance (current edition).

1.3 DEFINITIONS

- .1 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .2 Unsuitable materials: any material to wet for current project work

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground or above ground utility locates, indicating: location plan of existing utilities as found in field and clearance record from utility authority.
- .2 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert excess or rejected unclassified material to a local facility or quarry with the approval of Departmental Representative.

1.6 EXISTING CONDITIONS

- .1 Buried services and existing features:
 - .1 Before commencing work verify location of any buried services or above ground on and adjacent to site.
 - .2 Prior to beginning excavation Work, notify Departmental Representative having established the location of any buried or above ground utilities.

- .3 Protect existing roadway structures and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
- .4 Where required for excavation, cut roots or branches with approval by Departmental Representative.

Part 2 EXECUTION

2.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

2.2 PREPARATION/PROTECTION

- .1 Protect existing features in accordance applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

2.3 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29 - Health and Safety Requirements.
- .2 Upon completion of construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore work area to equal to or better to the approval by Departmental Representative
- .3 Protect open excavations against flooding and damage due to surface run-off.
- .4 Dispose of water in a manner not detrimental to public, private property, or Department of Environment Regulations.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

EXCAVATING, TRENCHING AND BACKFILLING

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- .5 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials

2.4 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as indicated on drawings
- .2 Remove concrete, paving, walks and rubble and other obstructions encountered during excavation to approval of Department Representative
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 Dispose of surplus and unsuitable excavated material in approved location on site or off site.
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Install geotextiles in accordance with Section 31 32 19.01 - Geotextiles.

2.5 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris to approval of Departmental Representative.
- .2 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3 Clean and reinstate areas affected by Work as approved by Departmental Representative.

END OF SECTION

Part 1 GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 31 23 33.01 Excavating, Trenching and Backfilling
- .2 Section 31 37 00 Rip-Rap

1.2 MEASUREMENT AND PAYMENT

- .1 No measurement of geotextiles will be taken. Geotextiles shall be considered incidental to the work and placed as shown on Drawings.

1.3 REFERENCES

- .1 Nova Scotia Transportation and Infrastructural Renewal (NSTIR) Standard Specification for Highway Construction and Maintenance (current edition).
- .2 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.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 If requested by Department Representative submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and 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 To N.S.T.I.R. Division 6 Section 12 - Light Weight
- .2 Securing pins and washers: to CSA G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to ASTM A123/A123M.

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.
 - .2 Inform Departmental 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 Departmental Representative.

3.2 INSTALLATION

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing 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.

GEOTEXTILES

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- .5 Pin successive strips of geotextile as directed by manufacturer.
- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 After installation, cover with overlying layer within 4 hours of placement.
- .8 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
- .9 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling

3.3 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

Part 1 GENERAL**1.1 DESCRIPTION OF WORK**

- .1 The Work under this section include the supply of all material, transportation, labour, and equipment necessary to place rip rap and Armour Rock as shown on the drawings, complete in every respect .

1.2 RELATED REQUIREMENTS

- .1 Section 31 23 33.01 Excavating, Trenching and Backfilling.

1.3 REFERENCES

- .1 Nova Scotia Transportation and Infrastructural Renewal (NSTIR&PW) Standard Specification for Highway Construction and Maintenance (current edition).

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert excess left over aggregate materials from landfill to local quarry for reuse as approved by Departmental Representative.

Part 2 PRODUCTS**2.1 STONE**

- .1 Hard, dense with relative density not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:
 - .1 Armour rock as located on Drawings:
 - .1 Material to conform to N.S.T.I.R Div. 3 Section 8.
 - .2 Random rip-rap: as located on Drawings
 - .1 Material to conform to N.S.T.I.R Div. 3 Section 6

2.2 GEOTEXTILE FILTER

- .1 Geotextile: in accordance with Section 31 32 19.01 - Geotextiles.

Part 3 EXECUTION**3.1 PLACING**

- .1 Where rip-rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated. Trenching is **not** to be done in the brook.

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- .2 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.
- .3 Place geotextile on prepared surface in accordance with Section 31 32 19.01- Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.
- .4 Place rip-rap to thickness and details as indicated on Drawings.
- .5 Place stones in manner approved by Departmental Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.
- .6 Placement:
 - .1 Use larger stones for lower courses and as headers for subsequent courses.
 - .2 Stagger vertical joints and fill voids with rock spalls or cobbles.
 - .3 Finish surface evenly, free of large openings and neat in appearance.
 - .4 Material to be placed by excavator and not end dumped from a truck.
 - .5 Care is to be taken not to place rock in stream bed or else with prior approval from Department of Environment and Department Representative.

END OF SECTION