



**Note: The PROV published in November 2018 replaces OPSS 511 COMMON, November 2013 with no technical content changes.**

## **CONSTRUCTION SPECIFICATION FOR RIP-RAP, ROCK PROTECTION, AND GRANULAR SHEETING**

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#### **511.01 SCOPE**

This specification covers the requirements for the installation of rip-rap, rock protection, granular sheeting, and geotextile.

#### **511.02 REFERENCES**

This specification refers to the following standards, specifications, or publications:

##### **Ontario Provincial Standard Specifications, Material**

OPSS 1004	Aggregates - Miscellaneous
OPSS 1860	Geotextiles

**511.05 MATERIALS**

**511.05.01 Rip-Rap, Rock Protection, and Granular Sheeting**

Rip-rap shall be according to OPSS 1004 and as specified in the Contract Documents.

Rock protection and granular sheeting shall be according to OPSS 1004.

**511.05.02 Geotextile**

Geotextile shall be nonwoven, Class II according to OPSS 1860, with an FOS of 75-150 µm, unless otherwise specified in the Contract Documents.

**511.07 CONSTRUCTION**

**511.07.01 Excavation**

Prior to placing any material, the area shall be excavated or filled or both to the lines and dimensions specified in the Contract Documents and fine graded to a uniform even surface.

**511.07.02 Placing Material**

**511.07.02.01 General**

Material shall be placed to the lines and dimensions specified in the Contract Documents.

When rip-rap or rock protection is being placed on slopes, the rock shall commence at the toe of the slope and progress up the slope.

When geotextile is specified in the Contract Documents, rip-rap, rock protection, and granular sheeting shall be placed in a manner so as not to damage the geotextile.

**511.07.02.02 Rip-Rap**

Rip-rap shall be placed in a set and stable manner, flat on the slope with the largest dimension parallel to the slope contours. The larger pieces of rip-rap shall be placed in the bottom courses. The rip-rap shall be laid closely so that a reasonable semblance of courses is achieved. Smaller pieces of rip-rap shall be used to fill the voids.

**511.07.02.03 Rock Protection**

Rock protection shall be placed in a random, but stable manner.

**511.07.02.04 Granular Sheeting**

Granular sheeting operations shall follow earth excavation operations as closely as practical and possible.

Compaction of granular sheeting material is not required.

**511.07.02.05 Geotextile**

Geotextile shall be free of folds, tears, and punctures and as specified in the Contract Documents. The geotextile shall be joined so that the material overlaps a minimum of 500 mm and shall be pinned together. Alternatively, the geotextile shall be joined to conform to the seam requirements of OPSS 1860.

Geotextiles shall be fixed to prevent movement during installation. Geotextile shall be wrapped down into the ground a minimum 300 mm at termination points.

**511.07.03 Management of Excess Material**

Management of excess material shall be according to the Contract Documents.

**511.09 MEASUREMENT FOR PAYMENT**

**511.09.01 Actual Measurement**

**511.09.01.01 Rip-Rap**

Measurement of rip-rap shall be by area in square metres following the contour of the ground.

**511.09.01.02 Rock Protection**

Measurement of rock protection shall be by volume in cubic metres. The volume is a product of the area of the rock protection measured following the contour of the ground by its depth.

Truck box measurement shall be used when it is not possible to take an in place measurement.

**511.09.01.03 Granular Sheeting**

Measurement of granular sheeting shall be by area in square metres following the contour of the ground.

**511.09.01.04 Geotextile**

Measurement of geotextile shall be by area in square metres following the contour of the ground, without any allowance made for overlaps.

**511.09.02 Plan Quantity Measurement**

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clauses under Actual Measurement.

**511.10 BASIS OF PAYMENT**

**511.10.01 Rip-Rap - Item  
Rock Protection - Item  
Granular Sheeting - Item  
Geotextile - Item**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work.

When there is not a separate tender item for geotextile, payment for the geotextile shall be included in the tender item for rip-rap, rock protection, or granular sheeting, as appropriate.