



**CITY OF
SWIFT CURRENT**
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**SECTION 03070
RIP - RAP**

DECEMBER 2015



CONSTRUCTION SPECIFICATIONS

SECTION: 03070 RIP - RAP

1	GENERAL	2
1.1	DEFINITIONS	2
1.2	RELATED SECTIONS	2
1.3	DEFINITIONS	2
1.4	APPROVAL	2
1.5	INSPECTION AND TESTING	3
1.6	JOB CONDITIONS	3
2	PRODUCTS	3
2.1	GENERAL	3
3	EXECUTION	4
3.1	PREPARATION	4
3.2	INSTALLATION	4
4	MEASUREMENT AND PAYMENT	4
4.1	MEASUREMENT	4
4.2	PAYMENT	4

1 GENERAL

1.1 DEFINITIONS

- 1.1.1 Work of this section consists of supplying, hauling, and placing of rip-rap as specified and as shown on drawings.

1.2 RELATED SECTIONS

- 02010 Site Preparation and Grading
- 02015 Sub – Grade Preparation
- 03001 Aggregates General
- 03005 Granular Base Course
- 03010 Granular Sub – Base
- 03060 Geotextile and Rolled Erosion Control Devices
- 04000 Asphalt Pavement Crack Routing and Sealing
- 04001 Asphalt Pavement Crack Sealing
- 04015 Asphalt Concrete
- 04025 Prime, Tack and Fog Coats
- 04070 Asphalt Concrete Pavement Milling
- 06010 Concrete Side walk, Curb and Gutter Construction
- 07000 Pavement Markings
- 10000 Flexible Guide Posts and Delineators
- 12000 Regulatory Roadway Signs

1.3 DEFINITIONS

- 1.3.1 **Rip-rap:** is a protective covering consisting of hand-laid or randomly deposited rock, sacked concrete or sacked cement stabilized material which is placed on exposed surfaces for protection against erosion and wave action.

1.4 APPROVAL

- 1.4.1 The Contractor shall have the rip-rap material approved by the City in writing prior to delivery to the site. The approval of rock samples from a particular source or quarry site shall not necessarily be construed as approval of all material from that location.
- 1.4.2 Delivery and handling of rip-rap shall be subject to the City's approval and shall be as such as to minimize segregation and breakage and damage.
- 1.4.3 Material which has deteriorated or does not meet specified requirements shall be removed from site.

1.5 INSPECTION AND TESTING

- 1.5.1 Sampling and testing of materials shall be completed as required by the City for the quality of rip-rap.
- 1.5.2 Rip-rap shall not be placed until the foundation to receive it has been approved by the City.

1.6 JOB CONDITIONS

- 1.6.1 Placement operations shall be suspended whenever climatic conditions, as determined by the City, are unsatisfactory for placing rip-rap fill to requirements of this Specification.
- 1.6.2 Materials shall not be permitted to slide or roll down slopes.
- 1.6.3 When placing rip-rap do not disturb satisfactorily placed material or structures already in place.
- 1.6.4 Material shall be delivered to site in a manner to minimize stockpiling and in any event obtain approval from company to stockpile.

2 PRODUCTS

2.1 GENERAL

- 2.1.1 The rock supplied shall be hard, durable and angular in shape, resistant to weathering and water action, free of overburden, spoil, shale seams and organic material. No sandstone will be permitted. The minimum dimension of any single rock shall be not less than one third of its maximum dimension. The minimum acceptable unit weight of the rock is 2.5 t/m³. The rock rip-rap shall be free from seams, cracks, or other structural defects to meet the following specified size distribution.

		Class 1	Class 1m
Nominal Mass	Kg	40	7
Nominal Diameter	or mm	300	175
None heavier than:	Kg	130	40
	or mm	450	300
No less than 20% or more than 50% heavier than:	Kg	70	10
	or mm	350	200
No less than 50% or more than 80% heavier than:	Kg	40	7
	or mm	300	175
100% heavier than:	Kg	10	3
	or mm	200	125

Percentages are by mass. Sizes are equivalent spherical diameters, and are for guidance only.

3 EXECUTION

3.1 PREPARATION

3.1.1 Prepare surfaces to receive rip-rap to lines and grades as shown on the drawings.

3.2 INSTALLATION

3.2.1 The rock rip-rap shall be placed on a non-woven geotextile filter fabric unless otherwise noted on the drawings or in the specifications.

3.2.2 The hand laid rock rip-rap erosion protection shall be placed in the areas indicated on the drawings or as designated by the City.

3.2.3 Rip-rap shall be placed by suitable mechanical equipment so that no intermixing of foundation material and rip-rap is allowed to occur during placing and that minimum breakage of rock fragments will occur and that the mass is stable.

3.2.4 Rip-rap need not be compacted but shall be dumped and graded off to same regular surface and in such manner that larger rock fragments are uniformly disturbed and smaller rock fragments fill voids between larger pieces.

3.2.5 Hand placing will be required only to extend to secure results specified above in the areas where mechanical equipment cannot operate adequately.

3.2.6 Rip-rap shall not be placed against structures until permission is obtained from the City.

3.2.7 The rip-rap stones shall be placed on the surface to be covered as shown by the plans or as directed by the City, on slopes not exceeding 1½H:1V starting with the larger stones on the bottom row. Rip-rap shall be placed on the prepared surface such that the weight of the stone is carried by the sub-grade and not by the underlying stones. Rip-rap shall be placed proceeding upward from the bottom. Voids between rip-rap shall be filled with broken rock fragments.

3.2.8 Care shall be taken not to puncture the geotextile filter fabric when placing the rip-rap. Any damaged filter fabric shall be repaired or replaced as requested by the City.

4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

4.1.1 Measurement shall be based on the volume of Rip-rap used as determined by truck load quantities, or length, width and depth measurements in the field as approved by the engineer.

4.2 PAYMENT

4.2.1 Payment shall be based on the measurement multiplied by the unit rate specified in the unit price schedule of the contract.

END OF SECTION