

	- Removable Tape	Meters
619.2105	Construction Zone Pavement Marking Letters	
	- Removable Tape	Each
619.2106	Construction Zone Pavement Marking Symbols	
	- Removable Tape	Each
619.2107	Construction Zone Pavement Marking Stripes	
	Simulated by Raised Markers	Meters
619.2108	Construction Zone Pavement Marking Stripes	
	- Supplemented by Raised Markers	Meters
619.22	Temporary Rumble Strips	Meter

* Refer to the Standard Contract Pay Item Catalog for full Item Number and full description.

SECTION 620 - BANK AND CHANNEL PROTECTION (NYS DOT SPECIF)

620-1 DESCRIPTION. This work shall consist of furnishing all plant, labor, equipment, and materials to place a protective covering of erosion-resistant material on embankment slopes, streambanks, at culvert inlets or outlets on bottoms and side slopes of channels, at structure foundations, and at other locations shown on the plans or as directed by the Engineer. The work shall be done in accordance with these specifications and in conformity with the lines, grades, thicknesses, and typical sections shown on the plans or established by the Engineer.

620-1.01 Stone Filling. Stone filling shall consist of well graded stone placed as protective material on stream-banks, in channels and elsewhere, as required.

620-1.02 Dry Rip-Rap. Dry rip-rap shall consist of stone fitted and placed on streambanks or in channels in order to provide protection against erosion.

620-1.03 Grouted Rip-Rap. Grouted rip-rap shall consist of stone similar to dry rip-rap but with all spaces between the stones filled with cement grout.

620-1.04 Bedding Material. Bedding material shall consist of granular material placed in a layer, where required, on the ground surface prior to placing stone filling or rip-rap. The purpose of the bedding material is to prevent underlying finer materials from passing into and through the stone filling or rip-rap.

620-1.05 Concrete Block Paving. Concrete block paving shall consist of concrete blocks placed on embankment slopes under structures as protection against erosion.

620-1.06 Gabions. Gabions shall consist of open wire mesh baskets, filled with stones.

620-2 MATERIALS

620-2.01 Soundness Approval. The soundness of all material used for stone filling or rip-rap shall be approved on the basis of a geologic evaluation in accordance with the control procedure in effect on the date of advertisement for bids. Prior to the evaluation, the Contractor shall stockpile the material. Where the State elects to conduct soundness tests, stone filling or rip-rap will be rejected if it exceeds 10% loss, by weight, after 10 cycles of the magnesium sulfate soundness test.

620-2.02 Stone Filling. The gradation of materials furnished for use as stone filling shall be as specified in Figure 620-1, and will be accepted or rejected based on a visual examination of the material by the Engineer.

Figure 620-2 is incorporated to assist the Engineer and the Contractor to evaluate the gradation of materials considered for use as Stone Filling and Rip-Rap.

620-2.03 Dry Rip-Rap. In addition to meeting the requirements set forth in §620-2.01, dry rip-rap shall consist of stones shaped as nearly as practicable in the form of right rectangular prisms. At least fifty

percent, by weight, of the stones shall weigh in excess of 150 kg each, and the remainder of the stones shall weigh from 50 to 150 kg each. One dimension of each of the stones furnished shall be at least equal to the thickness of the rip-rap as shown on the plans.

The gradation of materials furnished for use as dry rip-rap will be accepted or rejected based on a visual examination of the material by the Engineer.

620-2.04 Grouted Rip-Rap. The requirements for the stone used for grouted rip-rap shall be the same as stated in §620-2.03.

The grout shall consist of one part cement conforming to the requirements for Portland Cement Type 2, §701-01 and three parts fine aggregate, conforming to the requirements for Concrete Sand in §703-07.

620-2.05 Bedding Material. Bedding material shall be composed of crushed stone, crushed air-cooled blast furnace slag, or gravel, free of soft, nondurable particles, organic material, and thin or elongated particles. Bedding material shall be stockpiled.

Bedding material shall meet the following gradation requirements:

Sieve Designation	Percent by Weight Passing
100 mm	100
25.0 mm	15 to 60
6.3 mm	0 to 25
425 µm	0 to 10

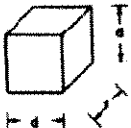



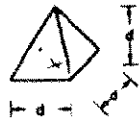
The procedure for acceptance or rejection of these materials shall be as described in the appropriate Soil Control Procedure (SCP) Manual.

FIGURE 620-1 STONE FILLING GRADATION REQUIREMENTS

Stone Filling Item	See Notes	Stone Size ¹	Percent of Total by Weight
Fine	2, 3, 4	Smaller than 200 mm	90 - 100
		Larger than 75 mm	50 - 100
		Smaller than 2.0 mm	0 - 10
Light	2, 3, 4	Lighter than 50 kg	90 - 100
		Larger than 150 mm	50 - 100
		Smaller than 12 mm	0 - 10
Medium	2, 4	Heavier than 50 kg	50 - 100
		Smaller than 150 mm	0 - 10
Heavy	2, 4, 5	Heavier than 300 kg	50 - 100
		Smaller than 150 mm	0 - 10

NOTES:

1. Stone sizes, other than weights, refer to the average of the maximum and minimum dimensions of a stone particle as estimated by the engineer.
2. Materials shall contain less than 20 percent of stones with a ratio of maximum to minimum dimension greater than three.
3. Air-cooled blast furnace slag, cobbles or gravel having at least one fractured face per particle are acceptable substitutes for stone under these items, provided that the soundness and gradation requirements are met.
4. Materials shall contain a sufficient amount of stones smaller than the average stone size to fill in the spaces between the larger stones.
5. Heavier gradings of this item may be required on some projects, in which case the requirements will be stated on the plans or in the proposal.

Specified Masses and Sizes	APPROXIMATE SHAPE				
					
300 kg ^{6/100}	d = 475 mm	d = 600 mm	d = 400 mm	d = 600 mm	d = 700 mm
150 kg ^{3/30}	d = 400 mm	d = 475 mm	d = 300 mm	d = 475 mm	d = 550 mm
75 kg ^{1/2}	d = 300 mm	d = 400 mm	d = 240 mm	d = 400 mm	d = 440 mm
50 kg ^{1/10}	d = 260 mm	d = 340 mm	d = 200 mm	d = 340 mm	d = 400 mm
200 mm	23 kg ⁶	11 kg ^{2A}	45 kg ¹⁰⁰	11 kg ^{1A}	7 kg ⁵
150 mm	9 kg ²⁰	5 kg ¹¹	18 kg ⁴⁰	5 kg ¹¹	3 kg ¹

620-2.06 Concrete Block Paving. The concrete block shall comply with the requirements for Concrete Block (Slope Paving), §704-04. The block shall have the following nominal dimensions:

Length:	400 to 500 mm
Thickness:	150 mm (solid)
Width:	200 mm

The standard dimensions of the block shall be the specified nominal dimension minus 10 mm. The maximum permissible variation in dimensions of individual units from standard dimensions shall be not more than 3 mm. The size of block used shall be consistent throughout any continuously paved area, and only one nominal length shall be used in any contract. All units shall be sound and free from cracks or other defects that would interfere with the proper placing of the blocks or impair the strength, permanence and appearance of the construction.

Cushion sand for concrete block paving shall conform to the requirements for cushion sand set forth in §703-06. Grout, where used, shall consist of one part Portland Cement Type 2, conforming to the requirements of §701-01, and two parts Mortar Sand, conforming to the requirements of §703-03.

620-2.07 Gabions. The materials used in this work shall conform to the requirements of the following subsection of Section 700 - Materials.

Gabions 712-15

620-3 CONSTRUCTION DETAILS

620-3.01 General. The ground surface on which bank or channel protection is to be placed shall be free of brush, trees, stumps, and other objectionable material and shall be dressed to a smooth surface. All soft or spongy material shall be removed to the depth shown on the plans or as directed by the Engineer and replaced with approved material. Filled areas shall be compacted in accordance with applicable provisions of §203-3.12, Compaction. Protection for structure foundations shall be provided as early as the foundation construction permits. The type of protection shall be placed in accordance with these specifications and the contract documents.

620-3.02 Stone Filling. Stone filling shall be placed in a manner that will produce a reasonable well-graded mass of stone with smaller stone fragments filling the space between the larger ones, so as to result in the minimum practicable percentage of voids. The final section of stone filling shall be in conformance with the lines, grades, and thicknesses shown on the plans. Stone filling used for bank or channel protection shall be placed to its full course thickness in one operation, unless otherwise directed by the Engineer or specified in the special provisions, and in such a manner that the underlying material will not be displaced or worked into the layer of stone filling. Placement of stone upon finished bedding material, when used, shall be carefully controlled to avoid disruption and damage to the layer of bedding

material. The stone shall be so placed and distributed that there will be no pockets of uniform size material.

The desired distribution of the various sizes of stone throughout the mass shall be obtained by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during final placing; or by other methods of placement which will produce the specified results. Rearranging of individual stones by mechanical equipment or by hand will be required to the extent necessary to secure the specified results. When stone filling is dumped under water, methods shall be used that will minimize segregation.

620-3.03 Dry Rip-Rap. The stones shall be placed so that the dimension approximately equal to the layer thickness is perpendicular to the slope surface and that the weight of the stone is carried by the underlying material and not by the adjacent stones. On slopes, the largest stones shall be placed at the bottom of the slope. The dry rip-rap shall be properly aligned and placed so as to minimize void spaces between the adjacent stones. The spaces between the stones shall be filled with spalls of suitable size.

620-3.04 Grouted Rip-Rap. The procedure of placing the stones shall be the same as described in §620-3.03, Dry Rip-Rap, except that the space between stones shall be filled with grout rather than spalls. Material upon which the grouted rip-rap is laid shall not be allowed to occupy the space between the stones.

When the stones are in place, the spaces between them shall be completely filled with grout and the surface of the stones cleaned to remove accumulation of grout. Rip-rap shall not be grouted in freezing weather. The grouted rip-rap shall be kept moist for seven days after grouting. A suitable curing compound may be employed, if approved by the Engineer.

The Engineer may direct that occasional spaces be left ungrouted for relief of hydrostatic pressure. The ungrouted spaces shall be chinked with spalls of suitable size.

620-3.05 Bedding Material. Where called for on the plans or directed by the Engineer, stone filling and dry rip-rap shall be placed on bedding material. The bedding material shall be placed on the prepared area to the full specified thickness of each layer in one operation, using methods which will not cause segregation of particle sizes. Contamination of bedding material by natural soils or other materials shall be prevented at all times. Bedding material that becomes contaminated shall be removed and replaced with uncontaminated bedding material at no expense to the State.

620-3.06 Concrete Block Paving. Blocks shall be laid on a 75 mm bed of cushion sand in running bond with the long dimension transverse to the slope and all joints tight. Blocks shall be thoroughly rammed in place to provide a uniformly even surface and solid bedding under each block.

In the areas where grouting is called for, the concrete block shall be laid in running bond with the length parallel to the slope and with 6 mm joints. Following the laying of blocks, in the area to be grouted, sufficient mortar sand shall be spread over the surface and swept into the joints to fill the latter to 100 mm from the surface. The block shall be wetted to the satisfaction of the Engineer before any grout is placed. The joints shall be filled with grout from the bottom flush with the top of the block.

After grouting has been completed and the grout has sufficiently hardened, the blocks shall be wetted, covered and cured with curing covers for the first seven days after grouting. Grout shall not be poured during freezing water.

620-3.07 Gabions. Each gabion unit shall be assembled by binding together all vertical edges with wire ties on approximately 150 mm spacing or by a continuous piece of connecting wire stitched around the vertical edges with a coil about every 100 mm. Empty gabion units shall be set to line and grade as shown on the plans. For structural integrity wire ties or connecting wire shall be used to join the gabions together along the perimeter of all contact surfaces according to the manufacturer's instructions. Internal tie wires shall be uniformly spaced and securely fastened in each outside cell of the structure in accordance with the manufacturer's instructions or where ordered by the Engineer. When gabions are being placed as slope protection the cross-connecting wire may be deleted if order by the Engineer.

A standard fence stretcher, chain fall, or iron rod may be used to stretch the wire baskets and hold alignment.

§620

The gabions shall be filled with stone carefully placed by hand or machine to assure alignment and avoid bulges with a minimum of voids. After a gabion has been filled, the lid shall be bent over until it meets the side and edges. The lid shall then be secured to the sides, ends, and diaphragms with the wire ties or connective wire in the same manner described above for assembling.

620-4 METHOD OF MEASUREMENT

620-4.01 Stone Filling, Dry Rip-Rap, Gabions, Grouted Rip-Rap and Bedding Material. The quantity to be paid for under each of these items shall be the number of cubic meters computed from the payment lines shown on the plans, or as directed by the Engineer.

620-4.02 Concrete Block Paving. The quantity to be paid for under this item shall be the number of square meters computed from the payment liens shown on the plans, or as directed by the Engineer.

620-5 BASIS OF PAYMENT

620-5.01 Stone Filling, Dry Rip-Rap, Gabions, Grouted Rip-Rap and Bedding Material. The unite price bid per cubic meter for each of these items shall include the costs of furnishing all materials, labor and equipment necessary to satisfactorily complete the work, except that any necessary excavation will be paid for under its appropriate pay item.

620-5.02 Concrete Block Paving. The unit price bid per square meter for this item shall include the costs of furnishing all materials, labor and equipment necessary to satisfactorily complete the work, except that any necessary excavation will be paid for under its appropriate pay item.

Payment will be made under:

Item No.	Item	Pay Unit
620.02	Stone Filling (Fine)	Cubic Meter
620.03	Stone Filling (Light)	Cubic Meter
620.04	Stone Filling (Medium)	Cubic Meter
620.05	Stone Filling (Heavy)	Cubic Meter
620.06	Dry Rip-Rap	Cubic Meter
620.07	Grouted Rip-Rap	Cubic Meter
620.08	Bedding Material	Cubic Meter
620.09	Concrete Block Paving	Square Meter
620.10	Galvanized Gabions	Cubic Meter
620.11	P.V.C. Coated Galvanized Gabions	Cubic Meter

SECTIONS 621 AND 622 (VACANT)

SECTION 623 - SCREENED GRAVEL, CRUSHED GRAVEL, CRUSHED STONE, CRUSHED SLAG

623-1 DESCRIPTION. This work shall consist of furnishing and placing, as shown on the plans or directed by the Engineer, screened gravel, crushed gravel, crushed stone, or crushed slag.

623-2 MATERIALS. The materials shall meet the requirements of §703-02, Coarse Aggregates, unless otherwise indicated, and shall be furnished in the sizes or combination of sizes indicated on the plans or ordered by the Engineer.

623-3 CONSTRUCTION DETAILS. Screened gravel, crushed gravel, crushed stone or crushed slag shall be placed on the plans or as directed by the Engineer.

623-4 METHOD OF MEASUREMENT