

M.12.01

Table of Gradation, Fine Aggregate for Mortar
Square Mesh Sieves Grading

	A	B
	Percent Passing by weight	
Pass $\frac{3}{8}$ "	100	
Pass #4	95-100	
Pass #8	80-100	100
Pass #16	50-85	
Pass #30	25-60	
Pass #50	10-30	10-40
Pass #100	2-10	0-10

**SECTION M.12
BEARING AREAS**

RIPRAP

- SLOPE PAVING & SLOPE PROTECTION**
- WATERPROOFING AND DAMPPROOFING**
- STONE AND GRANITE SLOPE CURBING**
- CALCIUM CHLORIDE FOR DUST CONTROL**

WOOD

M.12.01—Bearing Areas: Materials for this work shall conform to the following requirements:

1—Vacant

2—Prefabricated Pads: Prefabricated pads shall consist of cotton duck impregnated with rubber and shall be a single sheet of $\frac{1}{8}$ -inch minimum thickness with a tolerance of plus 15 percent or minus 5 percent, composed of 8-ounce duck and high quality natural rubber constructed in five or more plies. The breakdown stress for compression perpendicular to the plane of lamination shall be not less than 11,000 pounds per square inch.

M.12.02—Riprap: Materials for this item shall consist of sound, tough, durable and angular rock, free from decomposed stones or other defects impairing its durability. The size of a stone as hereinafter specified shall be its least dimension. Broken concrete or rounded stones are not acceptable. The type of material to be used shall be as noted on the

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1. Standard Riprap: This material shall conform to the following requirements:

- (A) Not more than 15 percent of the riprap shall be scattered spalls and stones less than 6 inches in size.
- (b) No stone shall be larger than 30 inches in size, and at least 75 percent of the mass shall be stones at least 15 inches in size.

2. Intermediate Riprap: This material shall conform to the following gradation:

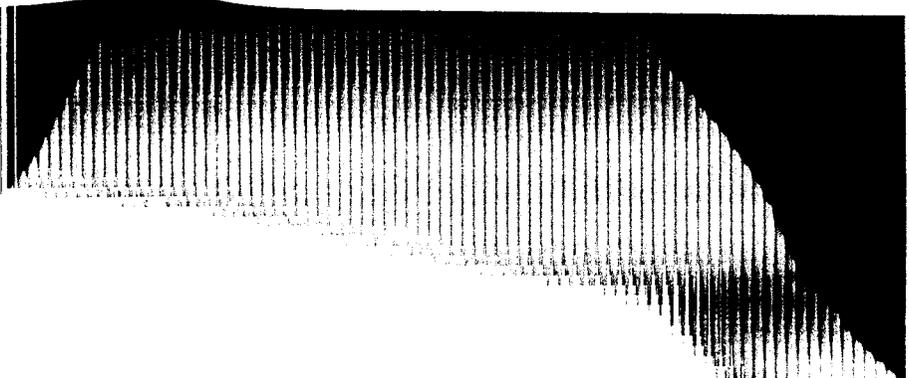
Stone Size	% of the mass
18" or over	0
10" to 18"	30-50
6" to 10"	30-50
4" to 6"	20-30
2" to 4"	10-20
less than 2"	0-10

3. Modified Riprap: This material shall conform to the following gradation:

Stone Size	% of the mass
10" or over	0
6" to 10"	20-50
4" to 6"	30-60
2" to 4"	30-40
1" to 2"	10-20
less than 1"	0-10

4—Special Riprap: This material shall conform to the gradation of Article M.01.01 for two inch stone.

M.12.03—Slope Paving: The stone for this work shall consist of sound, tough, durable rock, free from decomposed stone or other defects impairing its durability. Each piece shall have an area on its exposed surface of not less than 2 square feet and a thickness not less than 9 inches, except that stone for the two bottom rows shall be of such size that they can be embedded at least 2 feet into the ground; and they shall have a thickness of not less than 12 inches.



**DIVISION III
MATERIALS SECTION**

SECTION M.01

GRADATION OF AGGREGATE

M.01.01—Gradation table for sizes of crushed or broken stone, crushed and uncrushed gravel and reclaimed miscellaneous aggregate.

PERCENT PASSING BY WEIGHT

NAME

Square Mesh Sieves	No. 3	No. 4	No. 6	No. 67	No. 8	Screenings	Dust
2 1/4" (63 mm)	100						
2" (50 mm)	90-100	100					
1 1/4" (37.5 mm)	35-70	90-100					
1" (25 mm)	0-15	20-55	100	100			
3/4" (19 mm)		0-10	90-100	90-100			
1/2" (12.5 mm)	0-5		20-55		100		
3/8" (9.5 mm)		0-5	0-15	20-55	85-100	100	
No. 4 (4.75 mm)			0-5	0-10	10-30		100
No. 8 (2.36 mm)				0-5	0-10	60-100	40-100
No. 16 (1.18 mm)					0-5		

Reclaimed miscellaneous aggregate shall only be used where authorized in the specifications.

M.02.06—Gradation, Plasticity, Resistance to Abrasion and Soundness Requirements:

1—Gradation:

Square Mesh Sieves	Grading		
	A	B	C
	Percent passing by weight		
Pass 5"	100		
Pass 3½"	100	90-100	
Pass 1½"	55-100	55-95	100
Pass ¾"			45-80
Pass ¼"	25-60	25-60	25-60
Pass #10	15-45	15-45	15-45
Pass #40	5-25	5-25	5-25
Pass #100	0-10	0-10	0-10
Pass #200	0-5	0-5	0-5

The grading percentages specified in the above table shall apply to the material after it has been delivered to the construction site as well as when tested at the pit or other source of supply.

When the fraction of the dry sample passing the No. 100 mesh sieve is greater than eight percent by weight, the sample will be washed as indicated. The amount obtained from washing shall be added to that obtained by dry sieving; and the total amount passing each sieve shall meet the above gradation.

2—Plasticity:

(a) When the fraction of the dry sample passing the No. 100 mesh sieve is four percent or less by weight, no plastic limit test will be made.

(b) When the fraction of the dry sample passing the No. 100 mesh sieve is greater than four percent and not greater than eight percent by weight, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T90.

(c) When the fraction of the dry sample passing the No. 100 mesh sieve is greater than eight percent by weight, the sample will be washed; and the additional material passing the No. 100 mesh sieve shall be determined by AASHTO Method T-146, except that the No. 100 mesh sieve will be substituted for the No. 40 mesh sieve where the latter is specified in AASHTO Method T-146. The combined materials that passed the No. 100 mesh sieve shall not have suffi-

M.02.07

cient plasticity to permit the performing of the plastic limit test using AASHTO Method T90.

3—**Test for Resistance to Abrasion.** Gravel materials shall show a loss on abrasion of not more than fifty percent using AASHTO Method T96.

4—**Soundness:** When tested with magnesium sulfate solution for soundness using AASHTO Method T 104, coarse aggregate shall not have a loss of more than 15 percent at the end of five cycles.

M.02.07—Free-Draining Materials: Free-draining material shall consist of sand, gravel, rock fragments, quarry run stone, broken stone, reclaimed miscellaneous aggregate containing no more than 15 percent by weight of bituminous concrete or mixtures thereof. This material, or the material from any one source of a mixture, shall not have more than 70 percent, by weight, passing the No. 40 mesh sieve and not more than 10 percent, by weight, passing the No. 200 mesh sieve.

SECTION M.03

PORTLAND CEMENT CONCRETE

M.03.01—General Composition of Concrete Mixes:

Portland cement concrete shall consist of an intimate mixture of portland cement, other approved cementitious material (when used), fine aggregate, coarse aggregate, water, and admixtures, if ordered or permitted by the Engineer, proportioned in accordance with the following requirements:

TYPE	28-day Minimum Compressive Strength	Water/Cement; or Water/Cement plus other approved Cementitious Material (by weight) Maximum	Minimum Cementitious Material Required lbs/cubic yard (kg/cu. meter)
Pavement	3500 psi (27.5 MPa)	0.49	611 (277)
Class "A"	3000 psi (25 MPa)	0.53	611 (277)
Class "C"	3000 psi (25 MPa)	0.53	658 (299)
Class "F"	4000 psi (30 MPa)	0.44	658 (299)
Slope Paving	2000 psi (15 MPa)	0.69	451 (205)