

804.2 Materials

804.2.01 Abrasives

A. Requirements

1. Types

- a. Make the abrasives of low dusting mineral with a minimum of 10 percent by weight G-80 steel grit added, and blended homogeneously throughout the abrasive.
- b. Use a mineral abrasive listed on QPL 68.
- c. If you propose to use an alternative abrasive mixture, submit it to the Office of Materials and Research for approval before use.

2. Detrimental Substances

Use abrasives that contain less than 100 ppm of any corrosive compound such as sulfate, chloride, or any EPA characteristic compound such as lead, chromium, or arsenic that can be detected by the EPA Toxicity Characteristic Leaching Procedure (TCLP).

3. Grades

Ensure that the mineral abrasive used to blend with steel grit meets the grade for the sizes in the following table (Size A fits coal and copper slag; Size B fits staurolite abrasive)

Fractional Percent by Weight Retained on Each Sieve, by Sieve Size								
Size	No. 16 (1.18 mm)	No. 20 (850 µm)	No. 30 (600 µm)	No. 40 (425 µm)	No. 50 (300 µm)	No. 60 (250 µm)	No. 100 (150 µm)	PAN
A	0-10	5-35	25-50	20-45	5-35	0-10		0-10
B	0-2	0-2	0-2	0-5	5-25	5-25	30-60	0-20

4. Packaging

- a. Furnish abrasives for blasting in moisture-proof and mildew-resistant bags.
- b. Plainly show the size designation, requisition number, and purchase order number on the bags or on tags firmly affixed to each bag.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will take representative samples of the material sent to the Department, and test as follows:

Test	Method
Aggregate gradation	AASHTO T 27
Toxicity Characteristic Leaching Procedure (TCLP)	TCLP-EPA SWD 846-1311

D. Materials Warranty

General Provisions 101 through 150.

Section 805—Rip Rap and Curbing Stone

805.1 General Description

This section includes the requirements for rip rap and curbing stone. Construction and material will be covered under the Special Provisions.

805.1.01 Related References**A. Standard Specifications**

General Provisions 101 through 150.

B. Referenced Documents

AASHTO T 96

AASHTO T 104

ASTM C 295

GDT 64

805.2 Materials**805.2.01 Rip Rap****A. Requirements**

1. Aggregate Quality

All rip rap stone shall be made of sound, durable rock pieces that meet these requirements:

Aggregate Quality	Maximum Percent
Abrasion loss "B" grading	65
Soundness loss	15
Flat and slabby pieces (length five times more than the average thickness)	5
Weathered and/or decomposed pieces and shale	5

2. Gradation for Stone-Dumped rip rap Type 1 and Type 3:

Severe Drainage Conditions or Moderate Wave Action (Type 1)*		
Size By Volume	Approx. Weight	Percent Smaller Than
4.2 ft ³ (0.12 m ³)	700 lbs (320 kg)	100%
1.8 ft ³ (0.05 m ³)	300 lbs (135 kg)	50% - 90%
0.8 ft ³ (0.02 m ³)	125 lbs (55 kg)	20% - 65%
*Between 0% and 15% of the Type 1 rip rap shall pass a 4 in (100 mm) square opening sieve.		

General Use Normal Drainage Conditions (Type 3)*		
Size By Volume	Approx. Weight	Percent Smaller Than
1.0 ft ³ (0.03 m ³)	165 lbs (75 kg)	100%
0.1 ft ³ (0.003 m ³)	15 lbs (7 kg)	10% - 65%
*Between 0% and 15% of the Type 3 rip rap shall pass a 2 in (50 mm) square opening sieve.		

3. Stone for Plain Rip Rap

The stones shall be clean and free of rock dust and fines.

a. Process the stone so that the largest pieces have a volume of 2 ft³ (0.06 m³) or less.

b. Ten percent or less of the total rip rap weight can consist of spalls that pass a 5 in (125 mm) sieve.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Percent wear	AASHTO T 96
Petrographic analysis	ASTM C 295
Soundness (magnesium sulfate)	AASHTO T 104

D. Materials Warranty

General Provisions 101 through 150.

805.2.02 Curbing Stone**A. Requirements**

1. Type 1:

Provide Type 1 curb that meets these requirements:

- a. Curb thickness and height as shown on the Plans
- b. Cut in lengths of not less than 5 ft (1.5 m) nor more than 10 ft (3 m)
- c. Tops dressed to an even, smooth surface for the full length
- d. Have straight, even edges
- e. Top sloped ¼ in (6 mm) from back to front
- f. Have squared ends to permit joints to be constructed not more than ½ in (13 mm) wide for the full depth of the curb.
- g. Backface hand dressed at least 4 in (100 mm) below that part of the back that will be exposed
- h. Front face hand dressed to a depth of 1 in (25 mm) below the indicated elevation of the base course, pavement or gutter
- i. Have ends of circular curb sections cut along radial lines to permit joints to be constructed not more than ½ in (13 mm) wide
- j. Circular curb conforms accurately to the required radius
- k. Dressed surfaces do not contain projections or depressions more than 3/8 in (10 mm) from the plane surface of the curb

2. Type 2:

Provide Type 2 curb that meets these requirements:

- a. Dimensions shall be 5 in (125 mm) thick, 17 in (425 mm) deep, and 5 ft (1.5 m) long, unless otherwise specified.
- b. Front face to have a top margin draught with a smooth face 10 in (250 mm) deep
- c. Have a smooth face (Note: A quarry face may be considered a smooth face if free from holes and all bumps exceeding allowed tolerances are pointed level)
- d. Tops of curbs present even, smooth faces for the full length
- e. Have squared joints that when abutted with adjacent sections, present no crack or joint exceeding ½ in (13 mm) in width
- f. Have ends of circular curb sections cut along radial lines to permit joints to be constructed not more than ½ in (13 mm) wide
- g. Circular curb conforms accurately to the required radius

- h. The allowable tolerances for Type 2 Curb dimensions are as follows:

Measurement Item	Dimension & Tolerance
Thickness	5 ¼ in (131 mm) +/- ¼ in (6mm)
Depth	17 in (425 mm) +/- 1 in (25 mm)
Top Surface	¼ in (6 mm) in 5 ft (1.5 m)
Side Surface	½ in (13 mm) in 5 ft (1.5 m)

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test for Percent Wear according to AASHTO T 96

D. Materials Warranty

General Provisions 101 through 150.

Section 806—Aggregate for Drainage

806.1 General Description

This section includes the requirements for aggregate used for drainage.

806.1.01 Related References

A. Standard Specifications

Section 800 – Coarse Aggregate

B. Referenced Documents

AASHTO T 11

AASHTO T 27

GDT 4

806.2 Materials

806.2.01 Coarse Aggregate for Underdrains

A. Requirements

Use Class A or B coarse aggregate graded for size No. 89 in Table 800.1

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test the aggregate as follows:

Test	Method
Sieve analysis	AASHTO T 27

D. Materials Warranty

General Provisions 101 through 150.