# OKLAHOMA DEPARTMENT OF TRANSPORTATION SPECIAL PROVISIONS FOR STONE FOR RIPRAP, FILTER BLANKET AND GABIONS

These Special Provisions amend and where in conflict, supersede applicable sections of the <u>1999 Standard</u> <u>Specifications for Highway Construction, English and Metric</u>. Units of measurement are provided in the subsections in both English and Metric equivalents. The units for this project will be those specified in the project plans.

(Replace with the following:)

# SECTION 713 STONE FOR RIPRAP, FILTER BLANKET AND GABIONS

## 713.01. MATERIAL COVERED.

This Section covers stone for plain riprap, laid up riprap, grouted riprap, special plain riprap, filter blanket, gabions and rock filter dam.

## 713.02. RIPRAP STONE.

(a) Materials. Stone for riprap shall be hard, sound, durable and meet the requirements below. Determine the bulk specific gravity and absorption in accordance with ASTM D 6473. The minium bulk specific gravity shall be 2.25 and the maximum absorption shall be 6 percent. Loss of soundness (by freeze and thaw test) after 20 cycles shall not exceed 15 percent when tested in accordance with the U. S. Army Corps of Engineers test method CRD-C 144. Neither the width or thickness of any piece of riprap shall be less than <sup>1</sup>/<sub>3</sub> of its length. The size of stone for the various kinds of riprap shall be as follows:

Riprap Thickness, inches (mm)	Maximum, pounds (kg)	Average Size, pounds (kg)	Not more than 20% Shall Have a Mass Less Than, lb (kg)
12 (300)	150 (70)	30-50 (13-23)	20 (9)
18 (450)	300 (150)	70-125 (30-60)	30 (14)
24 (600)	1000 (450)	225-400 (100-180)	40 (18)
30 (750)	1000 (450)	225-400 (100-180)	40 (18)
36 (900)	2000 (900)	450-800 (200-360)	80 (36)

1. Stone for Plain Riprap (Type I).

When placed on the embankment, the smaller stones shall be well distributed throughout the mass.

Percent	Volume, Cubic Feet (Cubic Meter)	
40-60	5-12 (0.142-0.340)	
20-30	2-5 (0.057-0.142)	
10-20	0.25-2 (0.007-0.057)	
5-15	may be less than 0.25 (0.007)	

# 2. Stone for Special Plain Riprap (Type II).

3. Stone for Laid up or Grouted Riprap (Type III or IV).

Riprap Thickness, inches (mm)	Size Range, pounds (kg)	At least 60% Shall Have a Mass More Than, lb (kg)
12 (300)	50-250 (23-113)	100 (45)
18 (450)	50-250 (23-113)	150 (68)

Slabs or slivers will be rejected. Spalls shall be well graded of a suitable size for the work.

#### (b) Acceptance.

The contractor shall furnish riprap stone from an approved Erosion Control Stone Source. The Engineer or an assigned representative will be required to perform a visual acceptance at the project. Submit a riprap sample to the Materials Engineer if the 'Erosion Control Stone Source' list on the Materials Division's website displays *QM Sample Required* under *Approval Status*.

## 713.03. FILTER BLANKET MATERIAL.

(a) Materials. Material for a filter blanket shall consist of sand, gravel, crushed stone, or other approved materials that have been processed, blended, or naturally combined. It shall be reasonably free from lumps or balls of clay, organic matter, objectionable coatings, or other foreign materials, and shall be durable and sound. Filter blanket material shall not contain flat and/or elongated particles in an amount exceeding 20 percent when tested in accordance with ASTM D 4791. The backing material in place shall be reasonably well graded within the following limits:

Single Course Backing (Filter Blanket)			
Sieve Size	Percent Passing		
4 inch (100mm)	100		
2 inch (50mm)	60-90		
1 inch (25mm)	40-70		
3∕8 inch (9.5mm)	15-40		
No. 4 (4.75mm)	0-15		

Two Course Backing (Filter Blanket)			
	Percent Passing		
<u>Sieve Size</u>	Lower Course	<u>Upper Course</u>	
6 inch (150mm)	_	100	
4 inch (100mm)	-	90-100	
2 inch (50mm)	-	65-85	
1 inch (25mm)	-	40-70	
3/8 inch (9.5mm)	100	15-35	
No. 4 (4.75mm)	95-100	0-10	
No. 8 (2.36mm)	80-90	-	
No. 16 (1.18mm)	55-75	-	
No. 30 (600µm)	30-60	-	
No. 50 (300µm)	12-30	-	
No. 100 (150µm)	0-10	-	

(b) Acceptance. The contractor shall furnish a Type A certification in accordance with Subsection 106.04, from an approved Coarse Aggregate source or Erosion Control Stone Source for single course filter blanket or the upper course of a two course filter blanket. The lower course of a two course filter blanket shall be from an approved Coarse or Fine Aggregate Source and shall be furnished with a Type A certification. The certification(s) shall be prepared by a person certified in the appropriate area by the Oklahoma Highway Construction Materials Technician Certification Board. The Engineer or an assigned representative will be required to perform a visual acceptance at the project.

# 713.04. GABIONS, REVETMENT MATTRESSES AND ROCK FILTER DAMS.

(a) Materials. Stone fill for gabions, revetment mattresses and rock filter dams shall consist of hard, dense, sound, durable, rough-fractured stone as nearly cubical as practicable. Loss of soundness (by freeze and thaw test) after 20 cycles shall not exceed 15 percent when tested in accordance with the U. S. Army Corps of Engineers test method CRD-C 144. The stone shall have a minimum bulk specific gravity of 2.5 in accordance with ASTM D 6473 and meet the following dimensional requirements:

Structure Type	Minimum Dimension	Maximum Dimension
Gabions / Rock Filter Dam	4 inch (100mm)	8 inch (200mm) <sup>a</sup>
Revetment Mattresses	3 inch (75mm)	5 inch (125mm) <sup>b</sup>

- <sup>a</sup> When the gabion height exceeds 18 inches (450mm), 5% of the stone may have a maximum dimension of 10 inches (250mm)
- <sup>b</sup> For 12 inch (300mm) revetment mattresses, the stone may have a maximum dimension of 6 inches (150mm).
- (b) Acceptance. The contractor shall furnish stone for gabions, revetment mattresses and rock filter dams from an approved Erosion Control Stone Source that can provide the required specific gravity. The Engineer or an assigned representative will be required to perform a visual acceptance at the project. Submit a stone sample to the Materials Engineer prior to use for testing.