Method of Test For

DETERMINING TOTAL MOISTURE AND FREE MOISTURE IN AGGREGATE (COARSE AND FINE)

DOTD DESIGNATION: TR 106

I. Scope

A. This procedure is designed to determine the total moisture and free moisture contents of coarse and fine aggregates by drying the material with various heat sources.

B. For test procedure, refer to AASHTO T 255 with the following modifications

II. Reference Documents

A. AASHTO R 76 – Reducing Samples of Aggregate to Testing Size
B. AASHTO T 84 – Specific Gravity and Absorption of Fine Aggregate
C. AASHTO T 85 – Specific Gravity and Absorption of Coarse Aggregate
D. AASHTO T 255 – Total Evaporable Moisture Content of Aggregate by Drying

III. Apparatus

A. Use AASHTO T 255 Section 5-APPARATUS with the following modifications
   1. The use of a microwave is not permitted
   2. Blended Calcium Sulfate (BCS) and Reclaimed Asphalt Pavement (RAP) require the use of an oven
B. Aggregate Test Report

IV. Health Precautions

A. Proper equipment and precautions are to be used whenever hot materials or equipment must be handled. Use container holders or gloves while handling hot containers. Wear eye protection while stirring and weighing the heated material due to possible shattering of particles.

V. Sample

A. The entire sample may be used to determine moisture content. If a representative portion is used, obtain the representative sample in accordance with AASHTO R 76. The following minimum sizes will apply:
   1. Fine Aggregate – 500 g
   2. Coarse Aggregate – 10 lb.
   3. Lightweight Aggregate – 2000 g

VI. Procedure

A. Use AASHTO T 255 Section 7-PROCEDURE with the following modifications
   1. The use of a microwave is not permitted
   2. Blended Calcium Sulfate (BCS) and Reclaimed Asphalt Pavement (RAP) require the use of an approved thermostatically controlled, ventilated oven, capable of maintaining a temperature of 140°F, and 100°F. See Figure 1.

MATERIAL	TEMPERATURE
Reclaimed Asphaltic Concrete Pavement (RAP)	100°F
Blended Calcium Sulfate (BCS)	140°F

Figure 1

VII. Report

A. Report the total moisture content to the nearest 0.1%.
B. When the free moisture content of a sample is calculated, report the free moisture content to the nearest 0.1%

VIII. Normal Test Reporting Time

Normal test reporting time is 1 hour.

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
DOTD 03-22-4040
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PORTLAND CEMENT CONCRETE PLANT REPORT

Project No. 842-61-0097 Date 1-8-93 Lot No. 1 Mix Design No. 1

Plant ABC Ready Mix Location Baton Rouge

Concrete (Class/Type) Class A Min Cement Factor 6.0 Bags/Cu Yd Max Water-Cement Ratio 6.0 Gal/Bag

Total Cubic Yards Today _____ Scales Balanced: Time _____ AM/PM _____ AM/PM _____ AM/PM

Mix Proportions From Mix Design

Cement _____ lb Fly Ash _____ lb Fine Aggregate (SSD) _____ lb

Coarse Aggregate (SSD) _____ lb Water Reducer _____ oz Air Entrainment _____ oz

Moisture and Batch Weight Computations for One Cubic Yard

	Aggregate Tests	TEST 1		TEST 2	
	Time of Test	FINE	COARSE	FINE	COARSE
A	Tare weight, gm or lb	192.5	1.95		
B	Wet weight (A + sample), gm or lb	727.5	12.27		
C	Dry weight (A + sample), gm or lb	702.5	12.04		
D	Weight of water (B-C), gm or lb	25.0	0.23		
E	Dry weight of sample (C-A), gm or lb	510.0	10.09		
F	Percent total moisture (D/E), %	4.9	2.3		
G	Absorption factor %	0.3	0.8		
H	Percent free moisture (F-G), %	4.6	1.5		
I	Pounds of aggregate/cu yd (SSD) from mix design				
J	Corrected weight (1 + (H/100)) I, lb				
K	Free water (J-I), lb				
L	Free water (K/8.34), gal				

Allowable Water Calculations for One Cubic Yard

M	Total admixture (ounces from mix design/128), gal		
N	Total free water (L for fine and coarse agg. + M), gal		
O	Maximum allowable water (from mix design), gal		
P	Maximum allowable water to be added (O-N), gal		
Q	Minimum allowable water to be added (.75P), gal		

Total Batch Weight Calculations

R	Batch size, cu yd				
S	Cement (R x mix design weight), lb				
T	Fly Ash (R x mix design weight), lb				
U	Fine aggregate (R x J), lb				
V	Coarse aggregate (R x J), lb				
W	Maximum water to be added (R x P), gal				
X	Minimum water to be added (R x Q), gal				
Y	Water reducing admixture (R x mix design weight), oz				
Z	Air entraining admixture (R x mix design weight), oz				

Batch Water Adjustments For Ice

AA	Pounds of ice added per cu yd				
BB	Gallons of ice (AA x R/8.34 = gal per batch)				
CC	Adjusted maximum water to be added (W-BB), gal				
DD	Adjusted minimum water to be added (X-BB), gal				

Remarks _____

E. K. Hunt
Concrete Technician

J. J. Mitchell
Department's Certified Inspector

Figure 2
Portland Cement Concrete Plant Report
(Methods A and B)