

Method of Test for
**DETERMINING THE QUANTITY OF CLAM SHELL
IN CLAM AND REEF SHELL MIXTURES**
DOTD Designation: TR 110M/110-95

I. Scope

- A. This procedure is designed to determine the quantity of clam shell in mixtures of clam and reef shell (Figure 1).
- B. Reference Documents
 - 1. DOTD TR 108, Splitting and Quartering Samples.
 - 2. DOTD TR 109M, Determining the Amount of Foreign Matter in Clam Shell, Reef Shell and Mixtures of Clam and Reef Shell.
 - 3. AASHTO M 92, Wire Cloth Sieves for Testing Purposes.

II. Apparatus

- A. **Sieve** - 4.75 mm sieve conforming to the requirements of AASHTO M 92.
- B. **Pans, containers** - sufficient to hold the total sample and to contain the separated clam and reef shell components.
- C. **Balance or scale** - with a capacity of 12 000 g readable to 1 g.
- D. **Worksheet** - Aggregate Test Report, DOTD Form No. 03-22-0745 (Figures 2 & 3).

III. Sample Preparation

Use a representative sample of one sack of material. Obtain a representative test specimen of the shell mixture weighing approximately 5000 g. Prepare the sample in accordance with DOTD TR 109M.

IV. Procedure

- A. Separate the dry washed sample from DOTD TR 109M on the 4.75 mm sieve.
- B. Weigh the material retained on the 4.75 mm sieve and record on the worksheet as A.
- C. Separate the clam shell and reef shell particles in the material retained on the 4.75 mm sieve by hand.
- D. Weigh the clam shell to the nearest 1 g and record on the worksheet as B.

V. Calculations

Calculate the percentage of clam shell (C) using the following formula:

$$C = \frac{B}{A} \times 100$$



Clam Shell

Reef Shell

Figure 1

where:

A = wt. of material retained on the 4.75
mm sieve, g
B = wt. of clam shell removed, g
100 = constant

$$= 22.85$$

$$C = 23g$$

example:

A = 3260
B = 745

$$\frac{745}{3260} \times 100$$
$$= 0.2285 \times 100$$

VI. Report

Report the quantity of clam shell to the nearest percent.

VII. Normal Test Reporting Time

Normal test reporting time is 1 day.

MATT MENU SELECTION - 2

Louisiana Department of Transportation and Development
 AGGREGATE TEST REPORT

DOTD 03-22-0745
 Rev. 7/95

Project No. 999-99-9999 Material Code 413 Lab No. 22-999999
 Date Sampled 07-21-94 Submitted By 0071 Quantity 1.000
 Purpose Code 3 Source Code AH44 Spec Code 1 P.O. No. _____
 Date Tested 07-28-94 Ident EX-1 Plant Code _____ Frict. Rating _____ (1-4)
 Item No. 302 Date Rec'd (lab) 7/22/94 Sampled By: _____

Remarks 1 _____

Tested By H.C. Date 7/28/94 Checked By D.H. Date 7/28/94

DOTD TR 102, 112, 113 & 309					DOTD TR 428				
Unit <input type="checkbox"/> 1 = grams <input type="checkbox"/> 2 = pounds					Liquid Limit _____ Plastic Limit _____				
Sieve		Wt. Retained	% Retained	% Coarser	% Passing	No. of Blows	Wt Cup + Wet Soil, g	Wt Cup + Dry Soil, g	Wt Water
mm	In								
63	2 1/2								
50	2								
37.5	1 1/2								
31.5	1 1/4								
25.0	1								
19.0	3/4								
16.0	5/8								
12.5	1/2								
9.5	3/8								
4.75	No. 4								
Wt Mat. in Pan _____					Factor _____				
Acc. Total _____					Cup No. _____				
Initial Dry Total Wt _____ % Diff: _____					Wt Cup, g _____				
Unit <input type="checkbox"/> 1 = grams <input type="checkbox"/> 2 = pounds					Wt Dry Soil _____				
Sieve		Wt. Retained	% Retained	% Coarser	% Passing	% Moisture _____			
mm/mm	No.					Plasticity Index _____			
2.36	8					Absorption (T84 or T85) _____			
2.00	10					Spec Grav SSD (T84 or T85) _____			
1.18	16					Spec Grav APP (TR 300) _____			
600	30					Effective Spec Grav (TR 300) _____			
425	40					Opt Moist Content, % (TR 418) _____			
300	50					Maximum Density (TR 418) _____			
180	80					Lab Comp Method (TR 418) _____			
150	100					Cement, % (TR 432 or SPECIFIED) _____			
75	200					Lime, % (TR 416 or SPECIFIED) _____			
53	270					Other (Additive) Code _____ % _____			
Wt Mat. in Pan _____					Clay Lumps, % (TR 119) _____				
Decant Loss _____					Friable Particles, % (TR 119) _____				
Acc. Total _____					Clay Lumps & Friable Particles % (TR 119) _____				
Initial Dry Total Wt _____ % Diff: _____					Flat or Elongated Part, % (TR 119) _____				
Dry Wt After Washing _____					Coal & Lignite, % (TR 119) _____				
Remarks 2: _____					Glassy Particles, % (TR 119) _____				
_____					Iron Ore, % (TR 119) _____				
_____					Wood, % (TR 119) _____				
_____					Total (Clay Lumps, Fri. Part., Iron Ore, Coal & Lignite, Wood), % (TR 119) _____				
_____					Foreign Matter, % (TR 109) _____				
_____					Clam Shell, % (TR 110) <u>23</u>				
_____					Soundness, % Loss (T 104) _____				
_____					Abrasion, % Loss (T 98) _____				
_____					Colorimetric Test (1=Pass, 2=Fail) (T 21) _____				
_____					Asphalt Content, % (TR 307) _____				
_____					Retained Asphalt Coating, % (TR 317) _____				
_____					Percent Crushed (TR 306) _____				
_____					Retained Marshall Stability (TR 313) _____				
_____					Resistivity (TR 429) _____				
_____					pH (TR 430) _____				
_____					Organic Content, % (TR 413) _____				
_____					Sand Equivalent (TR 120) _____				
_____					Approved By: _____ Date: _____				

Aggregate Test Report (Front)
 Figure 2

APPARENT SPECIFIC GRAVITY (DOTD TR 300)		Date:
Tested By: _____		
Coarse Aggregate		
Wt in Air	a	
Wt in Water	b	
Difference	c	a - b
Apparent Specific Gravity	D	a/c
Fine Aggregate		
Flask No.		
Wt of Flask & Dry Sand	e	
Wt of Flask	b	
Wt of Dry Sand	d	a - b
Wt of Flask + Sand + Water	c	
Apparent Specific Gravity	E	d/(a+c - b)
Combined Coarse and Fine Aggregates		
% Passing 4.75mm (No. 4) Sieve	F	
Coarse Spec Grav Portion	G	(100 - F) D
Fine Spec Grav Portion	H	(F) E
Apparent Spec Grav	I	G + H

EFFECTIVE SPECIFIC GRAVITY (DOTD TR 300)		Date:
Tested By: _____		
Wt of Aggregate	A	
Wt of Mix	B	
% Asphalt in Mix	C	$\frac{B-A}{C} \times 100$
Wt of Jar + Water	D	
Wt of Jar + Water + Mix	E	
Spec Grav of Mix	F	$\frac{D-B}{E-F} - C$
% Aggregate in Mix	X	$100 - C$
Specific Gravity of Asphalt Cement	H	
Effective Specific Grav of Aggregate	G	$\frac{100 \times X}{F - H}$

SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE (AASHTO T85)		Date:
Tested By: _____		
Wt of Oven Dry Test Sample in Air, g	A	
Wt of Saturated Surf-Dry Test Sample in Air, g	B	
Wt of Saturated Test Sample in Water, g	C	
Bulk Spec Grav (Saturated Surf-Dry)		$\frac{B}{B-A} - C$
Absorption, %		$\frac{B-A}{A} \times 100$

PERCENT FOREIGN MATTER (DOTD TR 109)		Date:
Tested By: _____		
Wt of Material Removed by Hand	A	
Wt of Dried Portion	D	
Wt Total Sample	B	A + B
Wt of Portion After Wash, Dry	E	
Wt of Material Removed by Wash	C	D - E
Foreign Matter, %	F	$\frac{A+C}{B} \times 100$

PERCENT CLAM SHELL (DOTD TR 110)		Date:
Tested By: <u>K.B.</u>		
Wt Retained 4.75 mm (No. 4)	A	3260
Wt Clam Shell	B	745
Clam Shell, %	C	23.0%

Aggregate Test Report (Back)
 Figure 3