

DENSITY AND MOISTURE CONTENT

DOTD Form 03-22-0750

MATT MENU SELECTION - 07

Louisiana Department of Transportation and Development
DENSITY & MOISTURE CONTENT WORK SHEET

DOTD 03-22-0750
Metric/English
Rev. 12/98

Metric/English (M or E) M (Entry Field Located on Menu)

Project No. 222-22-2222 Date Tested 12-02-98 Material Code 501
 Submitted By 0071 Purpose Code 3 Spec. Code 1
 Test Method N N = Nuclear S = Sand Cone Item Number 203(05)
 Station Tested 9 + 184 Section & Test No. 22-001

Location: 1.2 m LT. Lift No: 1 Depth of Test: _____

OM: Optimum % Moisture Content of Total Material (TR 415 or TR 418)	OM	<u>12.5</u>
%FM: Field % Moisture Content at Compaction (TR 403) (See back for calculations)	%FM	<u>14.0</u>
P ₁ : % Pulverization 19mm (3/4" SIEVE) (TR 431) (See back for calculations)	P ₁	[] [] []
P ₂ : % Pulverization 4.75mm (NO.4 SIEVE) (TR 431) (See back for calculations)	P ₂	[] [] []

(TR 415) Cross Reference Test No.	Sta. No.:	Max. Dry Density Method <u>2</u> <small>(1 = TR 415 A 2 = TR 415 B 3 = TR 418)</small>
a: Total Wet Mass (Wt.) of Sample		
b: Mass (Wt.) of +4.75 (+4) Material		
c: % By Mass (Wt.) of 4.75 (+4) Retained (100 b/a)		
d: Mass (Wt.) of Mold & Soil		
e: Mass (Wt.) of Mold		
f: Mass (Wt.) of Compacted Soil (d - e)		
g: Wet Density (f / 0.944) or (f / 2.832) or (f / 2.124) (f x 30) or (f x 10) or (f / 0.075)		
h: Mass (Wt.) of Wet Soil		
i: Mass (Wt.) of Dry Soil		
j: Mass (Wt.) of Water (h - i)		
k: % Moisture Content (100 j/i) (TR 403)		
l: Dry Density 100g / (100 + k)		

om (from Family of Curves): 12.7 pr (from Family of Curves): 1722 FAMILY OF CURVES ZONE NUMBER D

SAND METHOD (TR 401)	NUCLEAR METHOD (TR 401)			
	Nuclear Device Number <u>1100</u>	Test 1	Test 2	Test 3
SA: Mass (Wt.) of Sand in Mold	Insp. (Nuclear Badge No.) <u>1234</u>			
SB: Vol. of Mold	DS: Density Standard Count	<u>2769</u>	<u>2769</u>	<u>2769</u>
SC: Unit Mass (Wt.) of Sand (SA/SB)	DC: Density Test Count	<u>606</u>	<u>606</u>	<u>632</u>
SD: Orig. Mass (Wt.) of Sand	DR: Density Count Ratio (DC / DS)			
SE: Final Mass (Wt.) of Sand	WD: Wet Density	<u>1884</u>	<u>1884</u>	<u>1866</u>
SF: Mass (Wt.) of Sand in Cone (SD-SE)	MS: Moisture Standard Count	<u>740</u>	<u>740</u>	<u>740</u>
SG: Orig. Mass (Wt.) of Sand	MC: Moisture Test Count	<u>198</u>	<u>196</u>	<u>191</u>
SH: Final Mass (Wt.) of Sand	MR: Moisture Count Ratio (MC / MS)			
SI: Mass (Wt.) of Sand in Cone & Hole (SG-SH)	M: Moisture by Mass (Wt.)	<u>14.6</u>	<u>14.5</u>	<u>14.0</u>
SJ: Mass (Wt.) of Sand in Hole (SI-SF)	MP: Moisture by Percent - TR 401 <input type="checkbox"/> / TR 403 <input type="checkbox"/>			
SV: Vol. of Hole (SJ/SC)	NDD: Dry Density (WD - M) or $\frac{100 \times WD}{100 + MP}$	<u>1644</u>	<u>1645</u>	<u>1637</u>
SW: Dry Mass (Wt.) of Material	%NPR: % Density (NDD / PR) x 100	<u>95.5</u>	<u>95.5</u>	<u>95.1</u>
SDD: Dry Density (SW / SV)	ADD: Average Dry Density (NDD) or (NDD/3)		<u>1642</u>	
PR: Maximum Dry Dens. (TR 415 / TR 418)	PR: Maximum Dry Density (TR 415/TR 418)		<u>1722</u>	
%PR: % Density (Sand) (SDD / PR) x 100	%PR: % Dens.(Nuclear) (% NPR) or (% NPR/3)		<u>95.4</u>	

Remarks: _____

Insp/ Tech Signature (Signature)

The Density and Moisture Content Worksheet is completed by the inspector/technician. Refer to Sample Identification (03-22-0800) for recording general sample information.

The District Laboratory Technician is responsible for Independent Assurance sampling and testing in accordance with DOTD S 701.

Metric / English M *M = Metric*
 E *E = English*

This entry is located on the MATT Menu and is a required entry. Please note that results must be entered in the proper format based on the reporting unit selected.

Test Method N *(N or S)*

Required entry, alphabetic.

N = Nuclear
S = Sand Cone

Sta. Tested 9 + 1 8 4

Required entry. Can be entered in any of the following formats. Blanks are permitted and leading zeros may be omitted:

Metric: 999+999 99+999 9+999

English: 9999+99 999+99 99+99 9+99

Sec. & Test No.
 2 2 - 0 0 1

Required entry, alphanumeric. The first four characters represent the Section No., followed by a hyphen, the last four character represent the Test No.

Embankment:

If density test results meet specification requirements, the results are to be recorded with the last character of Section & Test No. blank.

If

density test results do not meet specification requirements, the failing results are to be recorded with the last character of the Section & Test No. being blank to represent the first failing test location. The second (and subsequent) density test results are to be entered with an alpha entry in the last character of Section & Test No. whether failing or passing results are obtained for that location.

Base

Course: Stabilized, Treated and Non-Stabilized

The density test results are to be entered with the last character of Section & Test No. blank.

Location: <u>1.2 m LT.</u>		Lift No: <u>1</u>	Depth of Test: _____
OM:	Optimum % Moisture Content of Total Material (TR 415 or TR 418)	OM	<u>121.5</u>
%FM:	Field % Moisture Content at Compaction (TR 403) (See back for calculations)	%FM	<u>114.0</u>
P ₁ :	% Pulverization 19mm (3/4" SIEVE) (TR 431) (See back for calculations)	P ₁	<u> </u>
P ₂ :	% Pulverization 4.75mm (NO.4 SIEVE) (TR 431) (See back for calculations)	P ₂	<u> </u>
(TR 415) Cross Reference Test No.	Sta. No.:	Max. Dry Density Method <u>1</u> (1 = TR 415 A 2 = TR 415 B 3 = TR 418)	
a:	Total Wet Mass (Wt.) of Sample		
b:	Mass (Wt.) of +4.75 (+4) Material		
c:	% By Mass (Wt.) of 4.75 (+4) Retained (100 b/a)		
d:	Mass (Wt.) of Mold & Soil		
e:	Mass (Wt.) of Mold		
f:	Mass (Wt.) of Compacted Soil (d - e)		
g:	Wet Density (f / 0.944) or (f / 2.832) or (f / 2.124) (f x 30) or (f x 10) or (f / 0.075)		
h:	Mass (Wt.) of Wet Soil		
i:	Mass (Wt.) of Dry Soil		
j:	Mass (Wt.) of Water (h - i)		
k:	% Moisture Content (100 j/i) (TR 403)		
l:	Dry Density 100g / (100 + k)		
om (from Family of Curves): <u>12.7</u> or (from Family of Curves): <u>1722</u> FAMILY OF CURVES ZONE NUMBER <u>D</u>			

Include Location, Lift No. and Depth of Test in space provided.

Record Optimum % Moisture Content (DOTD TR 415 or DOTD TR 418), Field % Moisture Content at Compaction (DOTD TR 403) and % Pulverization 19mm/4.75mm (DOTD TR 431). These fields are numeric and blanks are permitted. Pulverization results cannot exceed 100.

Family of Curves Zone Number - Two character alphanumeric field. Must be 'A - L' or '01 - 41' or blank.

Note:

The utilization of the Family of Curves (Metric or English version) requires moisture vs wet density results to fall within target zones.

Record non-computer results in accordance with DOTD TR 415.

SAND METHOD (TR 401)		NUCLEAR METHOD (TR 401)			
SA: Mass (Wt.) of Sand in Mold		Nuclear Device Number <u>110101</u> Insp. (Nuclear Badge No.) <u>112134</u>	Test 1	Test 2	Test 3
SB: Vol. of Mold		DS: Density Standard Count	<u>2769</u>	<u>2769</u>	<u>2769</u>
SC: Unit Mass (Wt.) of Sand (SA/SB)		DC: Density Test Count	<u>606</u>	<u>606</u>	<u>632</u>
SD: Orig. Mass (Wt.) of Sand		DR: Density Count Ratio (DC / DS)			
SE: Final Mass (Wt.) of Sand		WD: Wet Density	<u>1884</u>	<u>1884</u>	<u>1866</u>
SF: Mass (Wt.) of Sand in Cone (SD-SE)		MS: Moisture Standard Count	<u>740</u>	<u>740</u>	<u>740</u>
SG: Orig. Mass (Wt.) of Sand		MC: Moisture Test Count	<u>198</u>	<u>196</u>	<u>191</u>
SH: Final Mass (Wt.) of Sand		MR: Moisture Count Ratio (MC / MS)			
SI: Mass (Wt.) of Sand in Cone & Hole (SG-SH)		M: Moisture by Mass (Wt.)	<u>14.6</u>	<u>14.5</u>	<u>14.0</u>
SJ: Mass (Wt.) of Sand in Hole (SI-SF)		MP: Moisture by Percent - TR 401 <input type="checkbox"/> / TR 403 <input type="checkbox"/>			
SV: Vol. of Hole (SJ/SC)		NDD: Dry Density (WD - M) or $\frac{100 \times WD}{100 + MP}$	<u>1644</u>	<u>1645</u>	<u>1637</u>
SW: Dry Mass (Wt.) of Material		%NPR: % Density (NDD / PR) x 100	<u>95.5</u>	<u>95.5</u>	<u>95.1</u>
SDD: Dry Density (SW / SV)		ADD: Average Dry Density (NDD) or (NDD/3)	<u>1642</u>		
PR: Maximum Dry Dens. (TR 415 / TR 418)		PR: Maximum Dry Density (TR 415/TR 418)	<u>1722</u>		
%PR: % Density (Sand) (SDD / PR) x 100		%PR: % Dens.(Nuclear) (% NPR) or (% NPR/3)	<u>95.4</u>		

Nuclear Device No. Required entry if Test Method entry is 'N'. Three character numeric field. Must be blank if Test Method entry is 'S'.

Nuclear Film Badge No. Required entry if Test Method entry is 'N'. Four character numeric field. Must be blank if Test Method entry is 'S'.

Test Fields	Metric	English
Dry Density	9999 kg/cu m	999.9 lb/cu ft
Max. Dry Density	9999 kg/cu m	999.9 lb/cu ft

Record the test value in the appropriate space provided depending on the test method being used in accordance with DOTD TR 401. Computer entry fields are numeric, blanks are permitted and leading zeros may be omitted.

	Signature of inspector/technician performing the density tests.
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