Procedure Checklist
FM 1-T099: The Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in) Drop

		P	F	N/A
Sample Preparations				
1.	Representative sample selected to provide approximately 30 lb after sieving.			
2.	If sample is too wet, is it dried until friable under a trowel at 60°C (140ºF) max?			
3.	For Coarse materials, particles larger than 3/4 inch crushed (Skip to step 6 if no coarse material)			
4.	Entire sample passed through mechanical crusher without separating materials one time			
5.	Pieces not reduced by mechanical crushing discarded			
6.	Material passed No. 4 sieve			
7.	Percent retained and passed No. 4 sieve recorded and materials kept separate			
8.	Representative sample with mass approximately 11 lb prepared from portions of plus and minus No. 4			
9.	Water added to specimen in increasing amounts so that the moisture contents vary by approx 1% moisture.			
10.	Moisture contents should start approximately 3 to 8% below optimum and end 1-2% past optimum. (Start 3% below and end 1% past for non-cohesive well drained soils)			
11.	Each specimen thoroughly mixed.			
12.	Allowed to stand prior to compaction: A-3 = No requirement A-2-4 (non-plastic) = 3 hr. A-1, A-2-4 (plastic), A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 = 12 hr.			
Compation Procedure				
13.	Sample mixed immediately prior to compaction			
14.	Note 6 applied to all soil types except A-3 and Non-Plastic A-2-4 unless noted otherwise			
15.	Compacted in 3 layers 1.8 ± 0.5 inches in height.			
16.	Each layer receives 25 or 56 uniformly distributed blows.			
17.	During compaction does mold rest on a uniform rigid foundation.			
18.	When using a manual rammer, is care taken to avoid rebound of the rammer from the top end of the guide-sleeve.			
19.	Mold selected and extension collar attached.			
20.	Guide-sleeve held steady and within 5° of vertical.			
21.	Blows applied at a uniform rate.			
22.	Is surface of specimen completely covered.			
23.	Extension collar removed.			
24.	Soil carefully trimmed even with top of mold.			
25.	Holes patched with smaller sized materials.			
26.	Trimmed with the straight edge.			
27.	Weighed to the nearest 1g or 0.005 lbs.			
28.	Mass of specimen (minus the mold) divided by mold volume.			
29.	Recorded as wet density (w_1) in lbs/ft³.			
30.	Material removed from mold.			
31.	Representative moisture content sample taken from cut face after specimen is sliced vertically, or sample taken from mixing bowl prior to compaction.			
32.	Moisture contents determined in accordance with T 265			
33.	Steps 9 through 27 repeated for each specimen prepared.			
Calculations				

34.	Moisture content = [(A - B)/(B - C)] x100 ____. To the nearest 0.1 % ____. Dry unit mass = W_1/(w + 100) x 100 ____. To the nearest 0.1 lbs/ft³ ____. where; w = Percent moisture A = Mass of wet soil + tare B = Mass of dry soil + tare C = Mass of tare W_1 = Wet unit mass			
Moisture – Density Relationship				
35.	Unit weight plotted as ordinates (vertical).			
36.	Moisture content plotted as abscissas (horizontal).			
37.	Points plotted in 30-31 connected with a smooth line.			
38.	Moisture content corresponding to the peak of the curve equals the "optimum moisture-content".			
39.	The oven dry density of the soil at the optimum moisture content equals the "maximum density".			
Report				
40.	Report includes: Corrected optimum moisture content to the nearest. 0.1%.			
41.	Corrected maximum dry density, to the nearest 0.1 lbs/ft³.			

Remarks: Comparison Criteria: Max. Density within 4.5 PCF of the IA Result
% Optimum Moisture within 15% of the average

Date:_____ Technician:_____ IA Observer:_____

Technician's E-mail Address: _____

Employer's/ Supervisor's E-mail Address: _____