

**IA Checklist  
T-180  
MOISTURE-DENSITY RELATIONS OF SOILS USING A 4.54-KG  
(10-LB) RAMMER AND A 457-MM (18-IN.) DROP**

Procedure		P	F	NA
1	Sieve an adequate quantity of the representative pulverized soil over the 19.0-mm (3/4) or No.4 sieve. Discard the coarse material, if any, retained on the 19.0-mm (3/4) sieve. The discarded coarse material may be utilized in T 224. Thoroughly mix selected representative sample with sufficient water to dampen it to approximately four percentage points below optimum moisture content.			
2	Form a specimen by compacting the prepared soil in the 152.40-mm (6-in) mold (with collar attached) in five approximately equal layers to give a total compacted depth of about 125mm (5-in). Compact each layer by 56 uniformly distributed blows from the rammer dropping free from a height of 457mm (18-in). During compaction the mold shall rest firmly on a dense, rigid, and stable foundation or base. This base shall remain stationary during the compaction process with a mass not less than 90kg (200-lbs)			
3	Following compaction, remove the extension collar, carefully trim compacted soil even with the top of the mold by means of the straight edge, and determine the mass of the mold and moist soil in Kg to the nearest 1 g, or determine the mass in lbs. to the nearest 0.005 lbs.			
4	Remove the material from the mold and slice vertically thru the center. Take a representative sample of the material from one of the cut faces and weight immediately.			
5	Thoroughly break up the remainder of the test specimen and return it to the test sample, add the next increment of water (1% to 2%), mix thoroughly, and repeat the compaction process at the new water content. Continue this series of determinations until there is either a decrease or no change in the wet mass of compacted soil.			
6	Calculate the wet unit mass (Wet Density), water content, and dry unit mass (Dry Density). Determine the moisture content in accordance with T 265 and record the results.			
7	Use water content and dry unit mass (dry density) data to plot the moisture-density relationship and define the optimum moisture content and maximum dry density from the peak of the compaction curve.			
8	If the compaction test sample contains oversized particles and the test sample is used for field density control, corrections must be made according to T 224 (correction for coarse particles in the soil compaction test) to properly compare the field density with the laboratory compacted (Reference) test sample. If no minimum percentage of coarse particles is specified, corrections shall be applied to compaction test samples with more than 5% (by weight) of oversize particles.			

**Remarks:**