

Equipment Checklist

FM 1-T180: Moisture-Density Relations of Soils Using a 4.54Kg or 10lb Rammer and a 457mm or 18in Drop

		P	F	N/A
Jaw Crusher				
1.	Electric power mechanical crusher			
2.	Minimum plate dimensions 2.25 x 3.5 inches (57 x 90 mm)			
3.	Maximum opening size 0.75 inches (19 mm), under tolerance 0.125 inches (3.175 mm)			
Molds (for Proctor only)				
4.	Height 4.584 ± 0.018 inches (116.40 ± 0.50 mm) or 6 ± 0.026 inch (152.40 ± 0.70 mm)			
5.	Diameter 4.000 ± 0.016 inches (101.60 ± 0.40 mm) or 6.000 ± 0.026 inch (152.40 ± 0.70 mm)			
6.	Volume 0.0333 ± 0.005 ft ³ (0.000943 ± 0.000014 m ³) (for 4" diameter mold) or 0.0750 ± 0.0009 ft ³ (0.002124 ± 0.000025 m ³) (for 6" diameter mold)			
7.	Alternative Mold Assembly conforms to Note 2 requirements (if used)			
Molds (for LBR only)				
8.	Height 6.000 ± 0.026 inches (152.40 ± 0.70 mm)			
9.	Diameter 6.000 ± 0.026 inch (152.40 ± 0.70 mm)			
10.	Volume 0.0982 ± 0.001 ft ³ (0.00278 ± 0.001 m ³)			
11.	Calculated sample volume 0.0750 ft ³ ± 1.2% (0.002124 m ³ ± 1.2%)			
12.	Base plate has 28 open holes 0.06 ± 0.03 inches (1.6 ± 0.8 mm) in diameter			
13.	Alternative Mold Assembly conforms to section 7.1.5 (if used)			
Molds (All Molds)				
14.	Base plate plane to 0.005 inches (0.13 mm)			
15.	Detachable collar approximately 2.375 inches (60 mm) in height			
Spacer Disc (if LBR Mold is Used)				
16.	Diameter 5.938 ± 0.031 inch (150.8 ± 0.8 mm)			
17.	Height 1.410 ± 0.026 inch (35.80 ± 0.70 mm) or 2.41 ± 0.02 inch (61.20 ± 0.51 mm CBR)			
18.	Surface plane to 0.005 inches (0.13 mm)			
Manual Rammer				
19.	Diameter of 2.000 ± 0.01 inches (50.80 ± 0.25 mm) or In service not less 1.985 inches (50.42mm)			
20.	Weight 10.00 ± 0.02 pounds (4.536 ± 0.009 kg)			
21.	Drop height 18.00 ± 0.06 inch (457.0 ± 2.0 mm)			
22.	Unrestricted drop			
23.	4 vent holes at each end no smaller than 0.375 inch (9.5 mm)			
Mechanical Rammer				
24.	Drop height 18.00 ± 0.06 inch (457.0 ± 2.0 mm)			
25.	Weight 10.00 ± 0.02 pounds (4.536 ± 0.009 kg)			
26.	Drop adjusts to elevation of soil			
27.	Uniformly distributes drops to the soil surface			
28.	Circular face diameter 2.000 ± 0.01 inches (50.80 ± 0.25 mm) or In service not less 1.985 inches (50.42mm)			
29.	Mech. rammer calibrated once a year, after any repair, or when results are questionable by ASTM D2168			
Sector Faced Rammer (required for mechanical compaction of LBR)				
30.	Average Side Length 2.90 ± 0.02 inches (73.70 ± 0.51 mm)			
31.	Sector Face Area 3.14 ± 0.03 inches ² (2025.80 ± 19.2 mm ²) for new rammers			
32.	In Service Minimum Area of 3.09 inches ² (1996.6 mm ²) for used rammers			
33.	Flat contact face with wear tolerance 0.01 inch (0.25 mm)			
Balances				
34.	Conforming to M 231			
35.	Class G 5, readability of 1.0 g, capacity reasonable for mass			
36.	Class G 2, readability of 0.1 g, capacity reasonable for mass			

Drying Ovens				
37.	Air drying oven not to exceed 140°F (60°C) (Optional)			
38.	Moisture drying oven capable of maintaining 230 ± 9° F (110 ± 5° C)			
Straightedge				
39.	Made of steel			
40.	At least 10.0 inches (25.0 cm) long - one beveled edge			
41.	One beveled edge and one longitudinal surface plane 0.1% of length within the portion used for trimming			
Sieves				
42.	Conform to M 92			
43.	2.0 inch (50 mm), ¾ inch (19 mm), No. 4 (4.75 mm) required			
Mixing Tools				
44.	Pans and or Spoons			
Containers (for each moisture content)				
45.	Resistant to corrosion and not subject to change in mass or disintegration			

Remarks:

Date: _____ Technician: _____ IA Observer: _____

Technician's E-mail Address: _____

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