

# COMPACTION TEST

## Equipment:

- Cylindrical mold with an inside diameter of 150 mm and a height of 22.90 cm
- Steel plate, 5 mm thick, diameter 148 mm (plus magnet for removal from mold)
- Proctor hammer: 4.5 kg drop weight, 450 mm drop height
- 3 small pales (5 Quart)
- Hand trowel
- Folding meter stick
- Ruler or paint stick
- Digital scale with at least 30 lb capacity, and 2 g readability



**Procedure:**

- Take 3 samples of the finished product (5 Quarts each)

For each sample take the following steps:

- Fill sample gently into the mold going over the top
- Scrape off surplus material with the ruler
- Measure weight of the sample including the weight of the mold in grams and subtract weight of mold
- Place steel disc on top of sample
- Use proctor hammer to compact sample with 3 strikes
- Remove steel plate (with magnet)
- Measure average distance between surface of compacted media and the rim of the mold in centimeter
- Empty mold



## Calculations:

Density ( $D_{\text{loose}}$ ) of sample before compaction:

$$D_{\text{loose}} = \frac{m_{\text{loose}}}{V} \text{ (g/cm}^3\text{)}$$

$m_{\text{loose}}$  = mass (weight) of samples in g

$V$  = volume of mold in  $\text{cm}^3$

Density ( $D_{\text{comp}}$ ) compressed with 3 strikes of proctor hammer:

$$D_{\text{comp}} = D_{\text{loose}} \times \text{CF (\%)}$$

$$\text{CF} = \frac{100}{100 - C}$$

CF = compensation factor

C = compaction (loss of volume) in %

To convert test result from  $\text{g/cm}^3$  to  $\text{lb/ft}^3$  by multiplying by 62.43.

Express test results as the mean from the three replications.

