

**ITEM P-152LM SUBGRADE
(FOR MEDIUM STRENGTH SUBGRADE)**

152LM-3.4 ACCEPTANCE TESTING FOR CBR. Each layer of the subgrade will be accepted when the measured CBR meets the requirements defined in Section 152LM-3.4.

Acceptance measurements will be made on each lot of completed subgrade. Each lift of subgrade, including the bottom layer, for the required length of medium strength subgrade shown on the plans, shall be divided into two (2) lots, representing material placed on the north and south sides of the test pavement centerline. Each lot area will be divided into two (2) equal areas, or sublots (See figure 1). A random location will be located in one sublot within the vehicle wheel path in accordance with procedures described in ASTM D 3665.

A corresponding location shall be established in the adjacent lot at the same station and corresponding offset. The Engineer reserves the right to perform additional CBR tests at random locations outside the vehicle wheel path to verify material quality in those areas and include these additional tests in the lot samples for acceptance evaluation.

Three (3) CBR penetrations will be made within one foot of each other at each random location in each sublot. The average of the three penetrations will be considered as an individual CBR test for that sublot provided the range in the three penetrations is less than, or equal to, 1.5. Should the range exceed 1.5, an additional penetration(s) shall be performed adjacent to the first three to test for local variability. ASTM E-178 shall be consulted to establish whether any one or more of the set of penetrations is an outlier at a significance level of 5 percent, to determine if any value(s) should be discarded when performing the acceptance computations. The average of the penetrations (or those remaining after the E-178 test for outliers), shall be averaged to establish the individual CBR test for that sublot location.

The lot shall be considered acceptable when (See Table 1):

- a. The range between the high and low CBR tests within a particular lot is less than or equal to 2.0 for the lot.
- b. The range between the high and low CBR for two contiguous side by side (i.e., north and south) sublots is 1.0.
- c. The difference in the average CBRs (i.e., the average CBR for the two sublots representing the particular lot) for contiguous north – south lots is equal to, or less than, 2.0.
- d. The average of the two lots is equal to, or less than, 2.5. For a nominal target CBR of 7, the average of the two lots material is between 5.5 and 8.0 (1.5 below target to 1.0 above target).

North			
Lot 1 (CBR is average of sublots 1A & 1B)			
Transition 4	Sublot 1A (MRC)	Transition 5	Sublot 1B (MRG)
	Sublot 2A (MRC)		Sublot 2B (MRG)
Lot 2 (CBR is average of sublots 2A & 2B)			

Figure 1. CBR test configuration for each lift

Table 1. Allowable CBR ranges

Lot 1 (CBR for Lot 1 (CBR-1) is average of Sublot 1A & 1B) Difference between high and low CBRs of 1A and 1B cannot exceed 2.0	
Sublot 1A- CBR = X	Sublot 1B- CBR = $X_1 = X \pm 2$
2A- CBR = $X \pm 1$	Sublot 2B- CBR = $X_1 \pm 1$ and CBR = $X \pm 2$
Lot 2 (CBR for Lot 2 (CBR-2) is average of Sublot 2A & Lot 2B) Difference between high and low CBRs of 2A and 2B cannot exceed 2.0	
The average of CBR-1 and CBR-2 must be from Target CBR – 1.5 to Target CBR + 1.0	

Table 1 assumes subplot 1A is the starting point. “X” is the value obtained from the average of 3 CBR penetrations. “X” (as the starting point) should be as close to the Target CBR as possible.

Subgrade material not meeting the CBR acceptance criteria shall be reported to the engineer as soon as practicable to determine a corrective course of action. In most cases, the material will pulverized, reworked by wetting or drying, and recompacted until the CBR acceptance criteria is satisfied.