Colorado Procedures – Laboratory 3102

Standard Method of Test for

Determination of Resistance Value at Equilibrium

(This procedure is used in conjunction with AASHTO T 190.)

1. SCOPE

1.1   This procedure will be used to determine the R-value of a material by the Hveem Stabilometer at 300 psi exudation pressure, and to evaluate stability.

1.2   Determine the R-value by Hveem Stabilometer according to AASHTO T 190-02, Sections 4, Preparation of Soil Specimens, and CP-L 3101, Subsection 2.1.1.

2.   CALCULATION: R-VALUE BY STABILOMETER AND EXUDATION PRESSURE

2.1   Determine the R-value by the stabilometer and exudation pressure method by plotting the R-values of the three specimens against their respective exudation pressures.

2.2   Draw a smooth curve through the plotted points. The R-value by stabilometer is the point at which the curve crosses the 300 psi exudation pressure. The R-value will be reported for undesignated borrow material which is determined to be "unstable".

3. CALCULATION: EVALUATION OF STABILITY

3.1   Calculate and plot moisture content at respective exudation pressures, as determined above.

3.2   Compare moisture at 300 psi exudation moisture to optimum moisture (AASHTO T 99 or T 180).

3.3   Determine the decrease of R-value from 400 psi to 300 psi exudation pressure.

3.4   Compare moisture at 300 psi exudation moisture to optimum moisture (AASHTO T 99 or T 180).

3.4   Material will be considered "unstable" if optimum moisture is greater than 300 psi exudation moisture and the decrease in R-value from 400 psi to 300 psi exudation pressure is 10 or greater.

4. CALCULATION OF EXUDATION MOISTURE

4.1   Calculate the water Added percent to the nearest 0.01 percent for each specimen using the following formula:

$$M_2 = W(100+M_1)/W_1$$

Where:

M_2 = Water added, in percent
W = Water added, in grams (total)
M_1 = Hygroscopic moisture*, in percent
W_1 = Original specimen batch mass, in grams

* : Definition in Appendix B

4.2   Calculate the exudation moisture in percent for each specimen using the following formula:

$$M = M_1 + M_2$$

Where:

M = Exudation moisture, in percent
M_1 = Hygroscopic moisture, in percent
M_2 = Water added, in percent

Example

$$W_1 = 1100$$

W	$=$	65	70	76

$$M_1 = 4.52$$

M_2	$=$	6.18	6.65	7.22

$$M = M_1 + M_2$$

$$M = 4.52 + 6.18 = 10.70\%$$
$$M = 4.52 + 6.65 = 11.17\%$$
$$M = 4.52 + 7.22 = 11.74\%$$

5. REPORT

5.1   Use CDOT Form #323 and Form #1003 for reporting / recording information for this CP-L. The statement 'This material meets the criteria as "unstable" as defined in Subsection 3.4 of CP-L 3102.' will be written in the comments section on Form #323.