1. Atterberg Limits Documentation of Calculations

The Atterberg limits calculations used in the program follow the standards outlined in ASTM D 2487, AASHTO M 145 (ASTM D 3282) and Australian Standard AS 1726.

1.1 Moisture Content

Moisture content is calculated with the following formula:

$$MC = 100\% * \frac{W_{wt} - W_{dt}}{W_{dt} - W_t}$$
(1.1)

Where:

MC = the moisture content

 W_{wt} = the weight of the moisture specimen with tare

 W_{dt} = the weight of the dried specimen with tare

 W_t = the weight of the container

1.2 Liquid Limit Calculations

1.2.1 Multi-Point Method

The multi-point liquid limit is defined as the moisture value corresponding to the intersection of a regression line of blow counts and moisture values with a vertical line extending from 25 blows.

1.2.2 1-Point Calculation Method

When using the single point method, the following equation is used to determine the liquid limit:

$$LL = MC * \left(\frac{N}{25}\right)^{0.121} \tag{1.2}$$

Where:

LL = the soil's liquid limit

N = the number of blows until the soil groove closed

MC = the soil's water content

1.3 Plastic Limit

The plastic limit is the average of the moisture contents for all of the entered plastic limit test points.

1.4 Plasticity Index

The plasticity index is the value obtained by subtracting the plastic limit from the liquid limit. If the liquid limit is **NV** or the plastic limit is **NP**, the plasticity index is defined to be **NP**.

⇒ The liquid and plastic limit values are rounded to the number of decimals selected from the **Atterberg Limits Calculated Results** panel on the programâĂŹs Settings dialog before calculating the plasticity index. So, for example, if the selection is to round Atterberg values to 0 decimal places, the plasticity index calculated for LL = **34.66** and PL = **1.42** would be **34** (not **33**).

1.5 Liquidity Index

The liquidity index is calculated as:

$$LI = \frac{NM - PL}{PI} \tag{1.3}$$

Where:

NM = the soil's natural moisture content, in percent

PL = the calculated plastic limit

PI = the calculated plasticity index