



Land Development News

Technical Memorandum

Subject: Clarification of the Definition of Expansive Soil **Date:** July 7, 2009 **No.:** 09-11

Summary: This policy seeks to clarify the definition of Expansive Soil as used in determining the suitability of soils for building pads and foundation backfill.

Effective Date: Immediately.

Background: Expansive Soil is defined by Section 1802.3.2 of the International Building Code and Section R403.1.8 of the International Residential Code as follows:

“Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:

- 1. Plasticity Index (PI) of 15 or greater, determined in accordance with ASTM D 4318.*
- 2. More than 10 percent of the soil particles pass a No. 200 sieve (75 μ m), determined in accordance with ASTM D 422.*
- 3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422.*
- 4. Expansion Index greater than 20, determined in accordance with ASTM D 4829.”*

The test methods prescribed for determining plasticity index and expansion index are performed only on that portion of a soil sample that passes the No. 40 sieve or the No. 4 sieve, respectively. Therefore, the relative contribution of this portion of the soil sample to the properties of the sample as a whole must be considered when using these tests to evaluate the overall properties of the soil. This document clarifies how such overall soil properties may be determined.

Policy: If the PI of the soil is 20 or less (e.g. $PI \leq 20$) and the Liquid Limit (LL) is 45 or less (e.g. $LL \leq 45$), the Plasticity Index Corrected (PI_{cor}) or the Expansion Index Corrected (EI_{cor}) may be substituted in the provisions defining Expansive Soil. PI_{cor} and EI_{cor} are defined as:

$$PI_{cor} = \frac{PI \times (\% \text{ Passing No. 40 Sieve})}{100} \quad \text{and} \quad EI_{cor} = \frac{EI \times (\% \text{ Passing No. 4 Sieve})}{100}$$

If you have any questions, please contact a Geotechnical Engineer with the Stormwater and Geotechnical Section, Environmental and Site Review Division, at **703-324-1720, TTY 711**.

Sincerely,

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Building Official

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