POSSIBLE EXPLANATIONS FOR "EXTENT" FOR EXPANSIVE SOILS

Simple Correlations Between Soil Plasticity and Expansion Potential

Soil Expansion Potential (ASTM D-4829)

This test was developed in Orange County, California in the mid-1960s and introduced in the 1973 Uniform Building Code as UBC Test Standard 29-2. It was re-designated as UBC Test Standard 18-1 in the 1994 code. This standard was adopted by ASTM in 1988. Soil material is disaggregated and passed through the #4 sieve and then brought to approximately the optimum moisture content (as determined by ASTM D-1557). The optimum moisture content equates to approximately 80 to 85% of saturation. After setting for 6 to 30 hours, the moisture-conditioned soil is compacted into a 4-in diameter mold. The moisture content is then adjusted, if necessary, to bring the sample to 50% saturation. A 144 psf surcharge is applied and the sample is wetted and monitored for 24 hours, measuring the volumetric swell. The Expansion Index is calculated as follows:

$EI = 100 \times \Delta h \times F$

Where Δh = percent swell and F = fraction passing No. 4 sieve

Section 1803.2 of the 1994 Uniform Building Code directs expansive soil tendency be graded by this method. The UBC mandates that "special [foundation] design consideration" be employed if the Expansion Index is 20, or greater (UBC Table 18-1-B). UBC Table 18-1-C may be applied to gain a "weighted index", allowing for a lessening of expansion with increasing depth (confinement).

EI Expansion Potential

0 to 20 Very Low
21 to 50 Low
51 to 90 Medium
91 to 130 High
>130 Very High

According to ASTM, "The expansion index has been determined to have a greater range and better sensitivity of expansion potential than other indices" (such as Atterberg limits).

Plan Review Evaluation for Element 6B- Extent- Expansive Soils

The following "ratings" can be accepted examples expected for "extent" when a risk is identified **as Expansive Soils**

A "weighted index", allowing for a lessening of expansion with increasing depth (confinement).

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