Variability of Soil Physical and Hydraulic Properties in a Meso-scale Test Bed. (S01-gribb165850-Poster)

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Abstract:

The variability of soil properties in a 2m x 1.3m x 2m constructed deposit is discussed. Specimens were collected along the centerline of the deposit at three locations at 10- to 20-cm depth intervals. The saturated hydraulic conductivity, bulk density, and particle size distribution of specimens were measured in the laboratory. In addition, three specimens at each location were subject to microscopic evaluation. Thin sections were prepared, and a scanning electron microscope and image analysis were used to quantify the area, perimeter, diameter, roughness, and shape of soil pores and particles. Particle size distributions were very similar at all locations and depths, but bulk densities varied +/- 0.2g/cm3. Increases in bulk density caused decreases in saturated hydraulic conductivity in most instances. Changes in bulk density were related to the microstructure of the specimens. We observed a decrease in pore circularity and an increase in pore roughness when bulk density increased. Correlation coefficients between saturated hydraulic conductivity and pore circularity and pore roughness were above 0.7, indicating the influence of pore space geometry and tortuosity on permeability.

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