

DISCUSSION

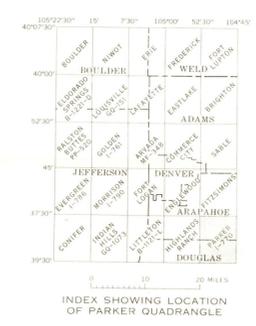
The various geologic units, except artificial fill, are grouped on this map solely on the basis of their relative swelling-pressure potential. Pressure limits that define each category are modifications of standard limits used in evaluation of expansive soils (Lambe, 1960, p. 28). Geologic samples were gathered for testing from rather widely spaced locations. Test results from the samples showed that the limits of swelling pressures of individual geologic units overlap Lambe's category limits. Most, but not all the materials in a map category will fall within the stated limits. Categories are based upon results of tests by Philip S. Powers, U.S. Geological Survey; on unpublished test data obtained from soils engineers; and on field evaluation of engineering characteristics during detailed geologic mapping of the quadrangle (Maberry and Lindvall, 1972).

This map is intended for use as a guide to land users; it is obvious that the map data cannot and should not supplant detailed field and laboratory investigations of swelling pressures at specific sites. Such investigations are required in the design of engineered structures.

Most of the geologic materials at or near the ground surface in the Parker quadrangle contain varying amounts of clay. Certain types of clay have the property of swelling or expanding as they absorb water and contracting as they give up water. This swelling and shrinking may be so slight as to be unnoticeable or it may have severe consequences, depending mostly on the amounts and types of clay minerals present and the amount of water involved. Swelling of clay-bearing materials may be enough to displace buildings, crack concrete foundations or roads, or otherwise disturb the works of man. The Denver Formation, for example, is particularly troublesome in the Denver metropolitan area because of its extremely high swelling pressures. Several buildings and other man-made structures sited on clayey rocks of the Denver Formation have been severely damaged by rupture due to swelling clays. The red band of extremely high swelling-pressure potential in the southwestern part of the map represents the Denver Formation.

REFERENCES CITED

- Lambe, T. W., 1960, The character and identification of expansive soils: Washington, Federal Housing Admin. Tech. Studies Report FHA-701, 51 p.
- Maberry, J. O., and Lindvall, R. M., 1972, Geologic map of the Parker quadrangle, Arapahoe and Douglas Counties, Colorado: U.S. Geol. Survey Misc. Geol. Inv., Map 1-770-A.



MAP SHOWING RELATIVE SWELLING-PRESSURE POTENTIAL OF GEOLOGIC MATERIALS IN THE PARKER QUADRANGLE, ARAPAHOE AND DOUGLAS COUNTIES, COLORADO

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