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BUILDING RESEARCH & TRAINING CENTRE

PRESSURE DISTRIBUTION THROUGH

DRY SAND

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The experimental procedure described herein, is based on the assumption that the stress increment due to surface loads is "propagated " through dry sand inside an area symmetrical about the load & bounded by a certain surface. This was shown experimentally w.r.t. the vertical stress increments by Koegler and Schildig, 1927, Hugi and Gerber, 1927, and others.

The present series of experiments were designed to measure both the horizontal & vertical stress increments τ & $\Delta\sigma_z$ produced by a surface line load at any point on a rigid horizontal base underlying a loosely packed layer of dry sand. n = 42 %) The load surcharge (12.6 kg/m') is applied on top of a wooden strip 2.5 cms in width. This loading setup will produce practically the same effect as for a line load but at depths 2 1/2 times the width of the strip (Steinbrenner 1936). The rigid base is a wooden rectangle 1 x 2 meters & is composed of two squares 1 x 1 ms. such that one square is completely fixed to the body of the apparatus while the second square is connected to the measuring devices have a vary limited freedom to move between the two glass walls bounding the apparatus fig. (1). If the load surcharge is placed directly above the line of separation (0) of the two parts of the base, (position O), the measured increment of vertical load (Y + V) will correspond to half the load surcharge. The corresponding vertical stress distribution $\Delta\sigma_{z_0}$ with a zero ordinate at e_0 & that for the horizontal shear stress τ is τ_0 which will have a zero ordinate at e_e and because of symmetry it will have another zero ordinate at O.

Shifting the load after emptying and newly filling apparatus to position (1) at a distance 1 to the right of O, the measured vertical increment will correspond to the area of the curve labelled $\Delta\sigma_{z_1}$, lying at the left of (0)