SECTION V

EARTH PRESSURE; STABILITY AND DISPLACEMENTS OF RETAINING CONSTRUCTIONS

SUB-SECTION V a

EARTH PRESSURE AGAINST RIGID VERTICAL WALLS

V a 6 EXPERIMENTAL STUDY OF THE PRESSURE EXERTED BY A PULVERULENT MASS AGAINST A RETENTION WALL

(Scale Model Tests)

J. GRADOR

SYNOPSIS OF THE FRENCH REPORT

The Paper is a report of a series of research experiments on soil pressure against a retention wall.

The tests were made on a very small scale model:

The height and width of the wall were respectively 50 and 80 cm. (19 1/2 and 31 inches).

The object of our research was to measure the distribution of the fill pressure against the whole height of the retention wall.

The paper describes in detail the test devices which made these pressure measurements possible; they are an application of Mr. Coyne's general method for acoustic measurement of deformations. As for the test results, they confirm and clarify the non hydraulic nature of the active pressure of soils which has already been brought out by other experimental methods.

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SUB-SECTION V b

EARTH PRESSURE AGAINST FLEXIBLE VERTICAL WALLS

V b 8 A REPORT OF FIELD AND LABORATORY TESTS ON THE STABILITY OF POSTS AGAINST LATERAL LOADS

WALTER L. SHILTS
LEROY D. GRAVES
GEORGE G. DRISCOLL
University of Notre Dame

SUMMARY

This report describes full scale field tests conducted for the Outdoor Advertising Association of America on the stability against lateral loads of the posts of their cantilever type advertising structures. In addition, it describes small scale laboratory tests conducted by the authors to check and complement the field tests. Field posts were tested in a granular soil and a silt-clay. Laboratory posts were tested in a clean fine sand. Field loads were applied to individual posts in increments to as much as 3000 pounds by use of a chain hoist and a dynamometer. Laboratory loads were applied by a cable, pulley, and weights. Deflections were measured with dial gauges and scales. The results are presented as plotted curves of the post deflection under load. Discussion of the results leads to the following conclusions:

1) The relation between the "average soil pressure" caused by a lateral load and the resulting post movement in a granular soil at the ground level is described by the equation:

$$\frac{Q_1}{A_1} = p_p \log (1 + 2 \Delta \tan \phi)$$

$\frac{Q_1}{A_1}$ is the "average soil pressure"

p_p is Rankine's passive pressure

Δ is the post movement

ϕ is the angle of interval friction of the soil