A comparison was then made between walls with counterforts 16 feet and 20 feet apart, respectively, and the balance in favour of economy proved to be for the latter. It was therefore decided that the wall should be vertical, carried up to the level of the roadway, of a reinforced concrete type without a base plate, with counterforts at 20 feet centres, and with a belt of granite in its face where the wash of the sea was greatest.

The calculations for the strains and areas of steel and concrete were then commenced and the following assumptions made:—

That all steel used would have an elastic limit of 32,000 lbs per square inch.

That all rods should have a working stress of 12,000 lbs. per square inch and be capable of being cold bent, 180° flat on themselves.

These assumptions were subsequently required by specification.

Plate No. II gives the results of the calculations. The diagram on the left is for calculating the Earth Pressure or P. for earth horizontal with top of wall and is in accordance with Trantwine's formula, in which

$$P = \frac{\text{weight of a single cubic foot of backing} \times t^2}{2}$$

$$= \frac{100 \times t^2}{2} = 50t^2$$

and the figures thus obtained are those in Col. 1.

COLUMN 2. The figures are found simply by subtracting the loads in the previous column, one from the other.

COLUMN 3. Figures in Col. 2 multiplied by 20. 20 feet is the distance from centre to centre of counterforts.

COLUMN 4. Let W. equal total load uniformly distributed in lbs.
Let S. equal clear span of strip in inches.

Then Moment. in inch lbs. $= \frac{WS}{8}$

COLUMNS 5 AND 6.

Notation:—

h equals Height of Strip.
T " Theoretical thickness of wall to centre of gravity of steel.
p " Ratio of cross-section of steel to cross-section of wall to centre of gravity of steel.
K " Constant for a given steel and a given concrete.
C " Pressure per square inch in outside fibre of concrete in compression.
S " Tension per square inch in steel reinforcement.