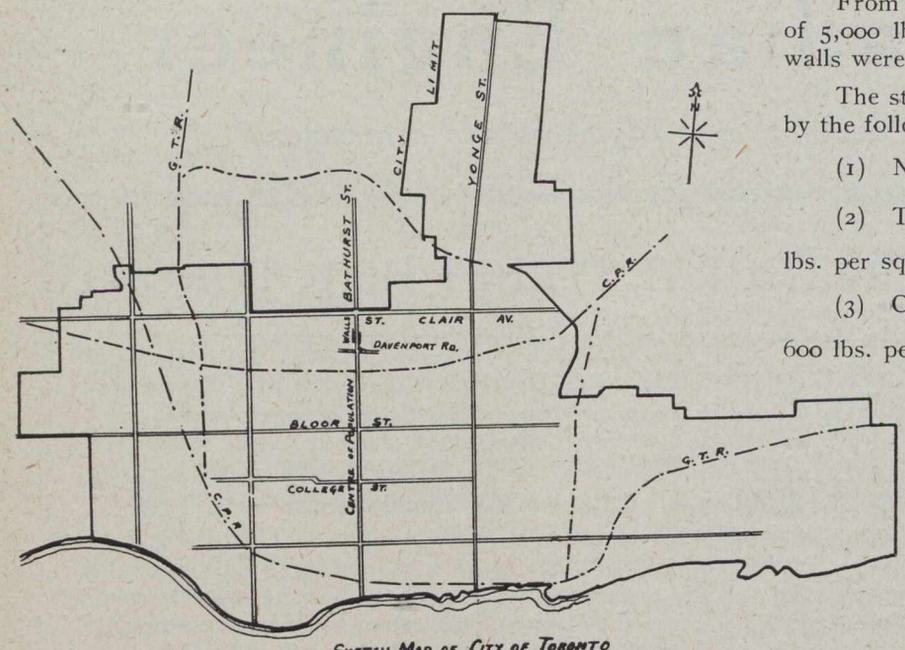
Reinforced concrete walls were designed for the east side and plain gravity walls for the west. A more satisfactory treatment of the west side would have been by terracing, plans for which were prepared by the city but failed to receive the sanction of the property owners interested.



SKETCH MAP OF CITY OF TORONTO SHOWING LOCATION OF WALLS AND CENTRE OF POPULATION.

Fig. 1.—Map of City of Toronto.

From tests on the site an allowable bearing pressure of 5,000 lbs. per square foot was decided upon and the walls were designed to fulfil this requirement.

The stresses in the steel and concrete were calculated by the following formulæ:—

(1) Neutral axis $= [\sqrt{(r^2m^2 + 2rm)} - rm]\, d.$

(2) Tension in steel $= \dfrac{B}{r\,b\,d^2\,(1 - \frac{1}{3}\,k)} = 16{,}000$ lbs. per sq. in.

(3) Compression in concrete $= \dfrac{2\,B}{k\,b\,d^2\,(1 - \frac{1}{3}\,k)} =$ 600 lbs. per sq. in.

Where

b = breadth of the beam in inches.
d = effective depth of the beam in inches.
n = distance of the neutral axis from the compressed edge of the beam in inches.
$k = \dfrac{n}{d}$.
$A_c = bd$ square inches.
A_t = area of tensile reinforcement in square inches.
$r = \dfrac{A_t}{bd}$.
E_s = elastic modulus for steel in tension.
E_c = elastic modulus for concrete in compression.
$m = \dfrac{E_s}{E_c} = 15.$
B = bending moment in inch-pounds.

The notation being that approved by the Concrete Institute (England).

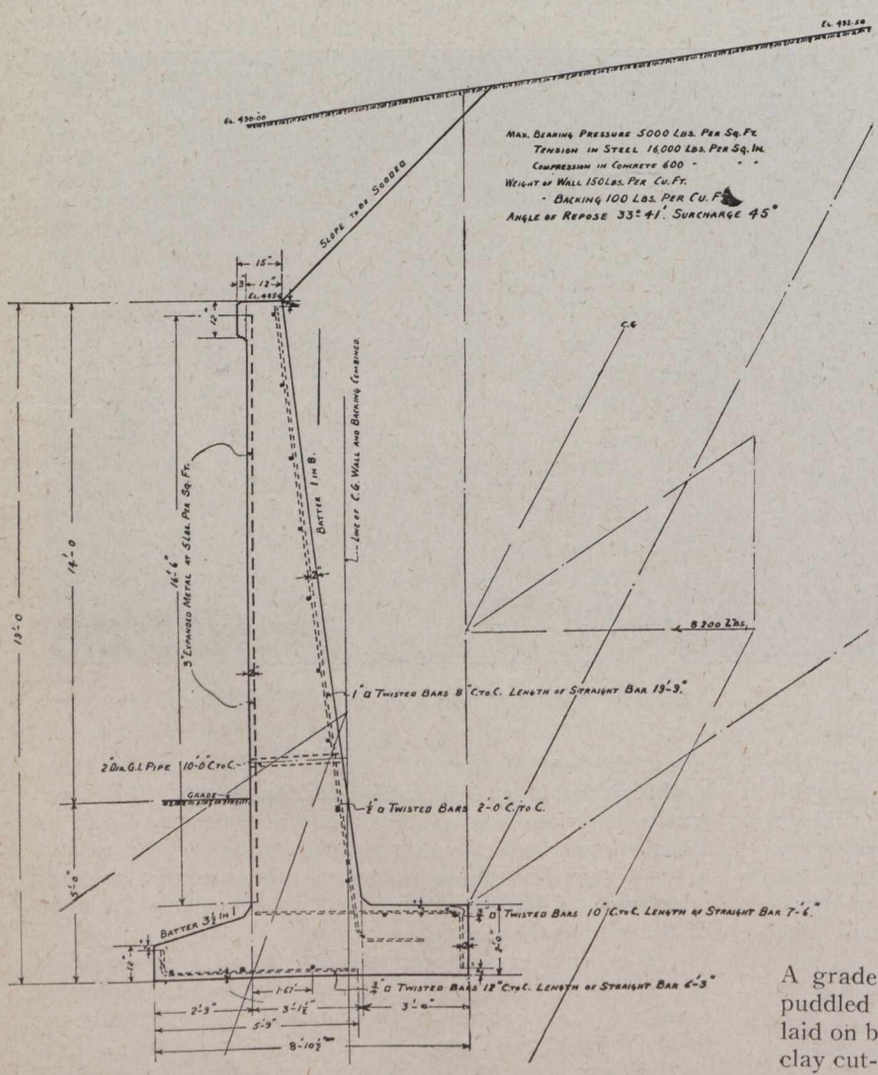


Fig. 2.—Detail of Reinforced Concrete Section of Wall.

A detail of the wall at its highest part is shown in Fig. 2. The longitudinal reinforcing is ½-inch square twisted bars spaced 2 ft. 0 in. centre to centre. The face of the wall has 3-inch expanded metal @ 5 lbs. per square foot, which gives practically the same area as ½-inch bars would have done, and is, in the writer's opinion, a far more satisfactory distribution of the steel for that part of the wall.

The trunk is reinforced with 1-inch square twisted bars at 8 ins. centre to centre, the heel has ¾-inch square twisted bars at 10 ins. centre to centre, and the toe has ¾-inch square twisted bars at 12 ins. centre to centre. The concrete used was a 1:2:4 mix, fairly wet, the aggregate being ¾-inch limestone with a specific gravity of 3.07.

The mixers were placed so as to allow the concrete to gravitate to the forms.

The construction offered no special features excepting in the vicinity of station 3 + 50 (Fig. 3), where a water-bearing stratum was struck, necessitating the use of a certain amount of timber sheet piling and special drainage, a general idea of which is given in Figs. 3 and 4. A grade was formed on the heel of the walls with well-puddled clay and three 3-inch diameter tile drains were laid on boards resting on the clay. At intervals a puddled clay cut-off wall was inserted in the line of tiles to prevent scouring action.