

35,000 lb., and the ultimate strength of the joint varied from 25,000 to 75,00 lb.

Table I. gives the results of the tests.

Table I.—Tests of Bars.

Kind of bar.	Began slipping.	Broke at.
*1 ¼-in. round bar, plain.....	75,600 lb.
† " " " with mortar	40,500 lb.
1 ½-in. round bar plain	37,400 lb.
" " " with mortar	32,200 lb.	32,200 lb.
1-in. round bar, plain	35,000 lb.
" " " with mortar..	25,600 lb.	25,600 lb.
¾-in. round bar, plain	27,300 lb.	30,000 lb.
" " " with mortar..	26,400 lb.	26,400 lb.

*1-in. slip at 18,000 lb.

†Mortar broke at 29,000 lb.

Forms.—The forms for the side-walls were built up of 7/8-in. tongued and grooved flooring, with 2 by 6-in. vertical studs about 2 ft. from centre to centre. The studs on the opposite sides were fastened together with iron wire passing through the forms. These wires were approximately 2 ft. apart horizontally and 4 ft. vertically.

The concrete was placed in the forms with a tower and dump cars running on a circular track.

Arrangements for Washing Out.—The bottom of the tank slopes toward the centre from all sides, the 24-in. waste outlet being at the centre. The slope toward the centre could not readily be made more than 2 in 75, being limited by the depth of the sewer which was already built. In order to facilitate the removal of sediment, therefore, the bottom was laid out in a series of star-shaped mounds, as indicated in Fig. 3, each mound draining into a shallow gutter. Hose connections furnish water under pressure for cleaning out.

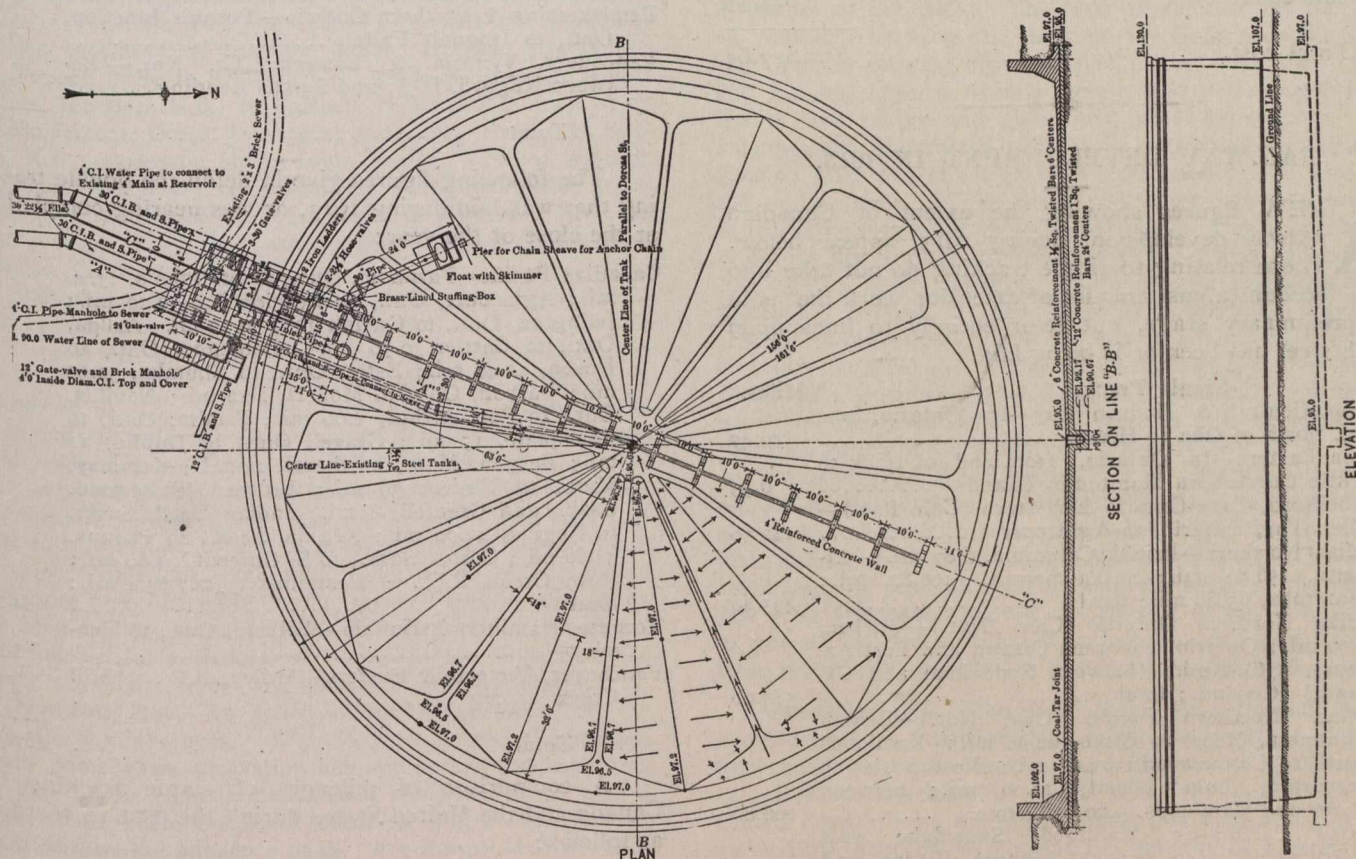


Fig. 3.—Foundation Plan of Settling Tank.

At the junction of the side-wall with the bottom, knee-bars are provided to reinforce this connection. These bars are 1 in. square and 12 in. from centre to centre.

Mixture.—The concrete in the walls and bottom is a mixture of 1 part cement, 1 ½ parts sand, and 3 parts limestone screenings run through a ¾-in. mesh screen, with the addition of 10 ½ lb. of Shamrock waterproofing to each barrel of cement. The composition of this waterproofing is approximately as follows:—

Silica	60.0 per cent.
Alumina	15.0 " "
Lime	6.5 " "
Oxide of iron	1.5 " "
Combined water	10.0 " "
Gelatinous material	7.0 " "

This material cost 73 ½ cents per bbl. of cement.

Bond in Concrete.—Special precaution was taken to obtain a good bond between the successive layers of concrete. The old surfaces were scrubbed with brushes and a stream of water. In addition, 6-in. strips of corrugated plates, about 1/16 in. thick, were placed vertically in the joints. In spite of these precautions, when the reservoir was filled, small leaks developed along most of the joints, and efflorescence was quite extensive. These leaks appear to be closing up gradually, and it is probable that in the course of time they will disappear entirely. The intention, however, is to empty the reservoir and treat the joints with some waterproofing compound.

After completion the outside of the wall was rubbed with carborundum blocks and brushed with cement mortar.

The reservoir was designed by the writer's company, and was built under contract by the Fruin-Colnon Con-