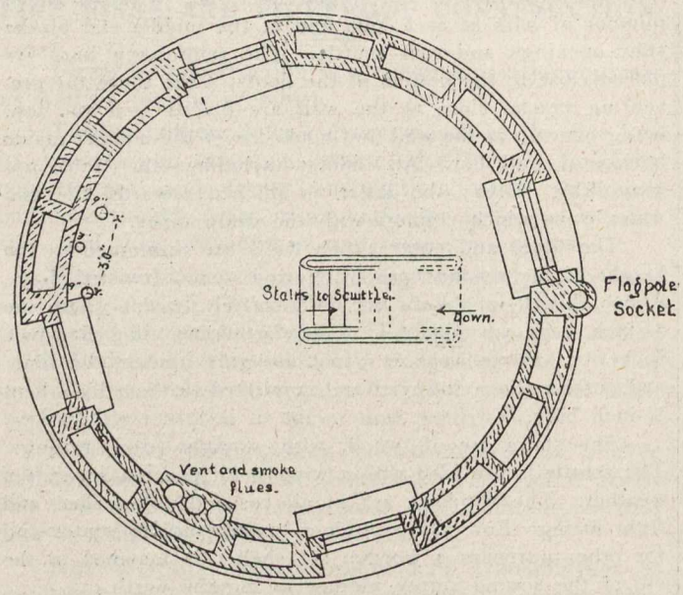
installed so as to make no serious break in the continuous yearly records, and such instruments as could be set up in the adjoining library building were made use of during the process of reconstruction. On the first floor in addition to three standard mercury barometers, are self-recording daily, weekly and monthly barometers, as well as a self-recording wind velocity meter and a self-recording wind direction meter. The two latter are connected to the anemometer and weather vane by metal rods passing through iron pipes extending through the floors and roof. The rooms on the second floor are to be equipped with steel cases for the keeping of observation records, while the third



Section through Third Floor.

floor is to be devoted to cloud observations and astronomical work. On the roof are the continuous sunshine recorder, wind vane, anemometer and flag-pole, the latter for the display of weather signals.

From an architectural point of view the new tower closely approximates the style of its predecessor. The smooth, clean-cut concrete work, with picked finish, brings out the simple but effective design—decidedly appropriate in a structure of this kind—in a much more striking manner than was possible with the old observatory.

Altogether, the observing tower is one of extreme durability, calculated to withstand the severe climatic changes which it is sure to experience. The concrete contractors and engineers are to be congratulated on a most excellent piece of concrete construction.

SPECIFICATIONS FOR CONCRETE PIPE.

The use of reinforced concrete pipe for drains, sewers and culverts is increasing. Many methods of reinforcement have been suggested. The specifications given here require a certain patented reinforcement, but outside of the clauses referring to the patented devices the specifications are general and well prepared.

Pipe.—The pipe shall be constructed of concrete reinforced with longitudinal bars and circular bands. It shall be made in sections of definite lengths, with the longitudinal reinforcement so disposed as to provide for the inter-locking of one section with another, and so formed that when these are locked together and cemented they shall form a continuous line of pipe. It shall be of the thickness shown in the attached tables.

Concrete.—The concrete used in the construction of the pipe shall consist of either of the following mixtures: A—1 part of Portland cement, 2½ parts of clean, sharp sand, 5 parts of crushed stone or clean, coarse gravel, not more than one inch in diameter. B—1 part of Portland cement, 5 parts of sandy gravel as taken from the pit.

The amount of cement in the mixture may be increased if the engineer shall so order in writing, in which case payment shall be made for the actual cost of the cement added. Crusher run stone or crushed slag below one inch in diameter may be used with the written consent of the engineer.

Mixing.—The concrete shall be mixed in batches large enough to make at least one complete section of pipe. When mixed by hand, it shall be done on a tight mixing board, made for that purpose. The sand shall first be spread in a thin layer on the board, and the cement spread over this and the whole turned until of a uniform color. The stone, which shall have been previously wet, shall then be added, together with the required amount of water and the whole turned until all of the particles are coated with cement and the mixture is of uniform consistency. All mixing machines shall meet the approval of the engineer. If a continuous mixer is used it shall mix the materials to a uniform color before the water is added, and shall mix the wet mixture until all the particles are thoroughly coated with cement and it is uniformly wet. It shall also feed the ingredients in their proper proportions at all times. At least once every twenty minutes the mixer shall be stopped and the platform upon which the concrete is being fed shall be entirely cleared, so that no concrete shall remain thereon long enough to attain its initial set.

Placing.—The concrete shall be placed in the forms and thoroughly tamped in layers not exceeding three inches in thickness as quickly as possible after being mixed. In no case shall concrete be used which has begun to set. The finished pipe shall be kept moist for a period of at least six days.

Forms.—The forms shall consist of cast-iron bottom rings and steel plates rolled to a true circle for the size for which they are intended. They shall be rigidly held in position so that they cannot be distorted while the concrete is being placed in them.

Cement.—All cement used shall be of some well known and reputable brand of Portland cement. It shall be properly stored in a dry, well-ventilated place, and properly protected from the weather. There shall not be more than one day's supply of cement out on the work at any time. Cement that has become lumpy in the packages shall not be used. All cement shall fulfil the requirements of the specifications contained in the Professional Papers of the Corps of Engineers U.S.A., No. 28.

Reinforcement.—The reinforcement shall be of steel in the shape of flat bars and bands. Test specimens shall develop a tensile strength of from 66,000 to 70,000 pounds per square inch, an elastic limit of 50 per cent. of this and an elongation of 22 per cent. The reinforcements shall be of the sizes and shall be placed in the pipe as shown on the attached sheet of details. It shall be held rigidly so that it shall be uniform in all sections. The longitudinal bars shall have hooked ends at either extremity for the interlocking of adjacent sections. The circular bands shall have loops punched in them at equal distances apart, through which the longitudinal bars shall pass.

Laying.—The sections shall be laid with the spigot ends towards the outlet and one of the longitudinal rods at the top of the pipe. After the section is laid, a joint shield made for that purpose shall be slipped around the pipe with about half its width projecting beyond the end of the pipe. The next section shall then be fitted to the one already laid, care being taken to have the projecting hooks of the longitudinal rods close to the corresponding hooks of the section already in place. A tie-band shall then be slipped through these hooks, locking the sections together. The joint shield shall be drawn up snugly around the pipe and the joint flushed with water. A thin mortar shall be poured in the joint and the shield left in place until the mortar has set. Care shall be taken to completely fill the joints with the mortar. All joints shall be water-tight.

Building activity in Winnipeg was greater in September as the figures for the month show. There were 202 permits issued covering 236 buildings to cost $477,400.