Buffalo Completes Huge New Pumping Station

The large new pumping station of the City of Buffalo, which has been under way for several years at Porter Ave., is now practically complete and is in service. The Buffalo Common Council has adopted the name "Col. Francis G. Ward Pumping Station" for this plant in place of the old common and unofficial designation of Porter Ave. station. This has been done to honor the memory of Colonel Ward, whose recent death ended 20 years of conspicuous service as Chief of the Bureau of Water and as Commissioner of Public Works.

The Buffalo water-works were started in 1849 by a private company. The city purchased the plant in 1868 when the city had a population of 100,000 and a daily consumption of 4,000,000 gal. Then all water was pumped from the Niagara River by a 4,000,000-gal. Cornish bull engine (made in 1851 by I. P. Morris, of Philadelphia) and a 6,000,000-gal. beam engine (made by Shepard Iron Works, of Buffalo, in 1866). The supply was much contaminated with sewage. As the city grew, the pipes were extended, additional pumps were erected and haphazard additions were made to the station building to house them.

The first improvement under city administration was the construction of a new intake in the center of the Niagara River, placed there on the old theory that running water purified itself. In springtime the pumps were choked with slush ice. From the beginning of Colonel Ward's connection with the City Water Department, an intake in Emerald Channel and a duplicate pumping station at the foot of Porter Ave. were advocated. The plans were examined and recommended by experts several times, but nothing was done up to the time when he became Commissioner of Public Works. In 1907 a contract was let for the construction of a new intake tunnel and intake from Emerald Channel. While the new tunnel was being built, the foundations were laid for the new pumping station. In 1909 a contract was let for the superstructure, but the completion of the building was delayed because of an unfortunate accident by which the roof trusses fell.

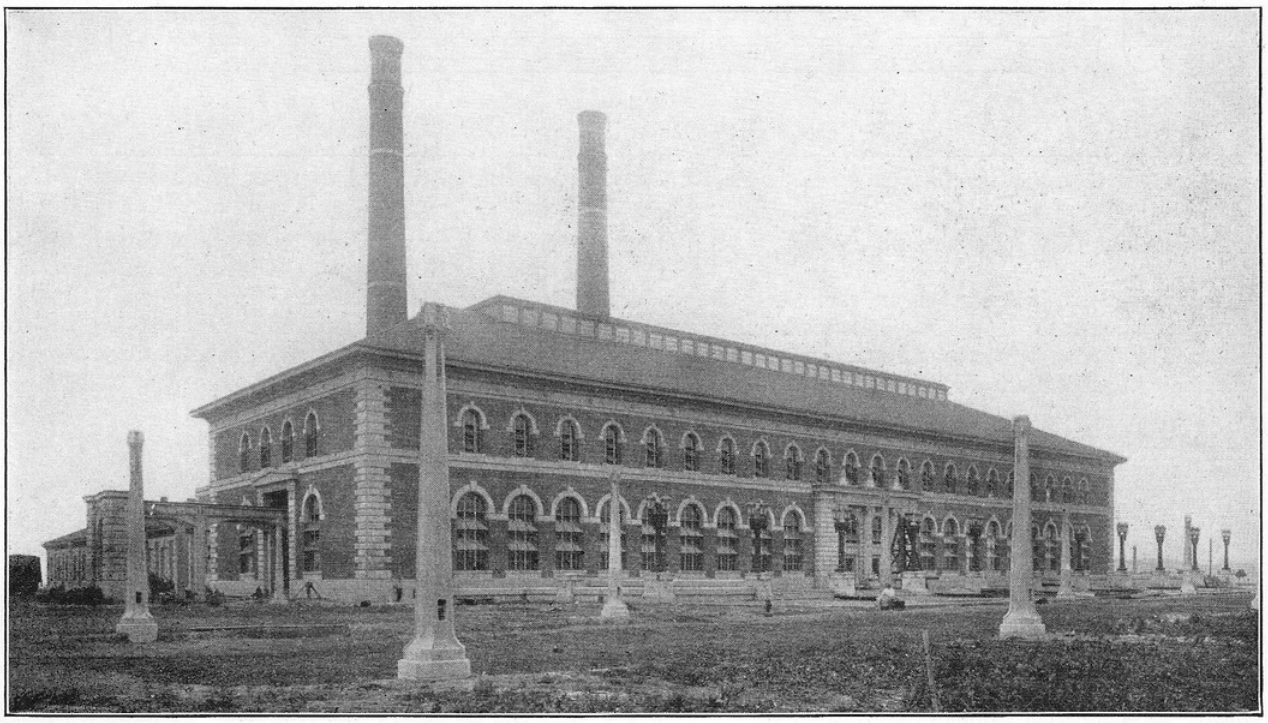

FIG. 1. THE COL. FRANCIS G. WARD PUMPING STATION, BUFFALO, N. Y.

General Design of Station

The building is of brick, with terra-cotta trimmings, a dressed-stone base and a concrete and tile roof. It is fireproof throughout. The general appearance is shown in Fig. 1 and the arrangement in Fig. 2. The engine room is 90 ft. wide by 364 ft. long and has foundations for eight 30,000,000-gal. triple-expansion steam pumps. Five of these have been installed. In back of the engine room, and at right angles to it, is a boiler room 100x200 ft., with a 45x100-ft. coal-storage space back of that. The boiler room has been designed for 16 boilers, in two rows of eight, and has two brick stacks 250 ft. high and 11 ft. in diameter at the top. Only one row of boilers has been installed. The rated capacity of each boiler is 750 hp.; each has 7,500 ft. of heating surface and is equipped with moving-grate stokers and superheaters. Coal is brought in from the New York Central tracks. A conveyor receives coal from the car and delivers it into the shed or the boiler bunkers. The same conveyor feeds from the storage shed into the bunkers. The coal tracks have a spur to the south end of the engine room, and the crane tracks for the engine room run out over it, so that the 30-ton crane can pick up a shipment and place it anywhere in the engine room.

A 40x235-ft. extension to the rear of the north end of the engine room contains the storeroom and the office of the plant engineer. A similar extension to the rear at the south end of the engine room contains the ma-

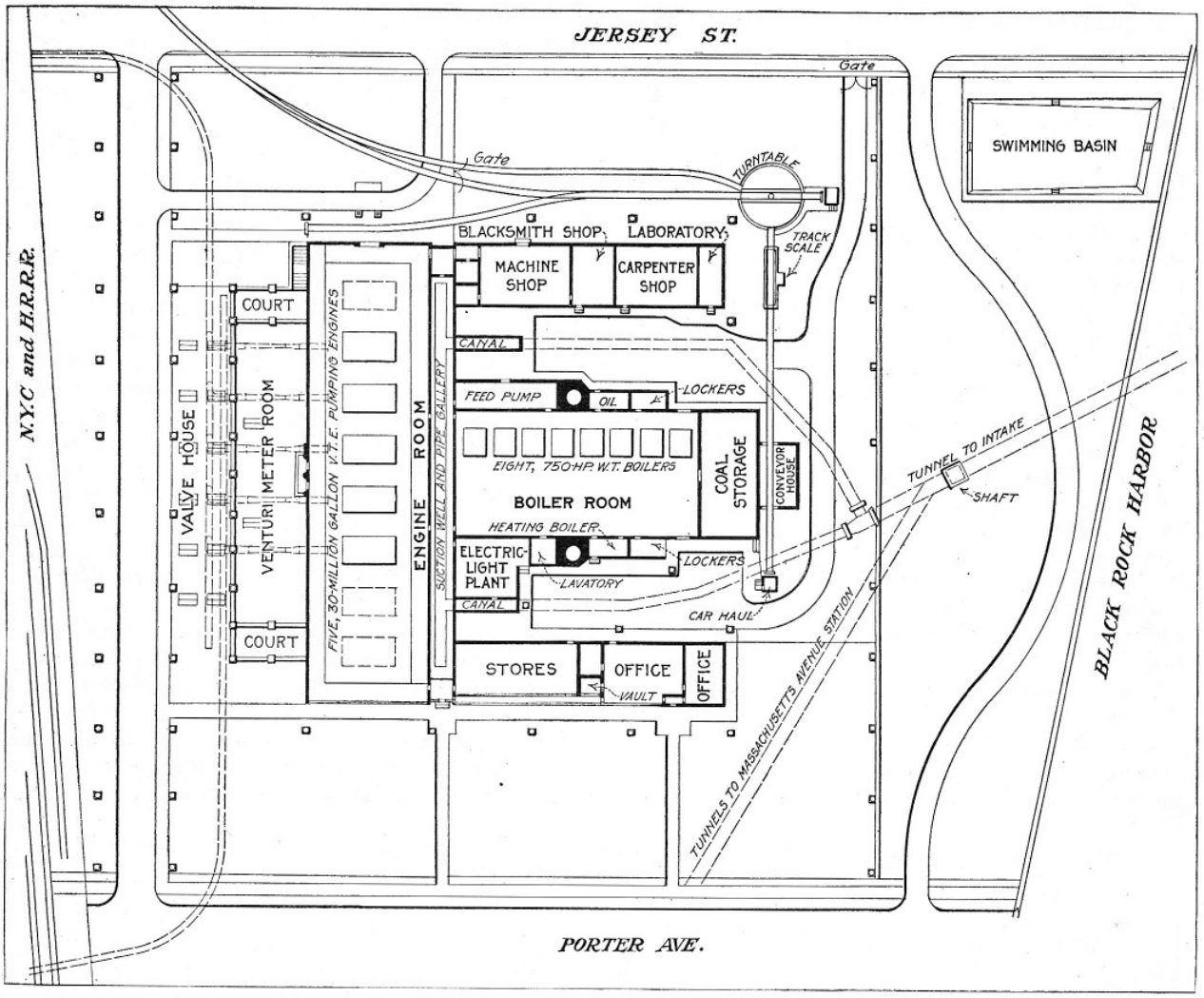

FIG. 2. GENERAL PLAN OF THE COL. FRANCIS G. WARD PUMPING STATION, PORTER AVE., BUFFALO

chine, blacksmith, carpenter and paint shops, and a small laboratory.

Adjoining the boiler room on the north side is a small electric plant for lighting the station and grounds, and for supplying power to the small pumps and other machinery. This plant will also furnish light and power for the department storehouse, a short distance off, and to the intake pier, on which some little apparatus is installed.

Wells; Venturi and Valve Rooms

Adjoining the boiler room on the south side is a hot-well to which the condensed steam returns from the engines. Alongside the well are two steam boiler-feed pumps with a feed-water heater and purifying system.

In the rear of the engine room is a covered suction well 20 ft. wide and 325 ft. long, with the water in it 20 ft. deep. It is supplied through two covered canals extending from the shore shaft of the new 12-ft. tunnel and so divided by gates that any part of the canals or pump-suction wells can be cut off for cleaning without interfering with the rest of the canals or wells.

One of the most interesting features of the entire station is the provision of venturi-meter and valve rooms in front of the engine room. The meter room is 55x235 ft. and is built below the ground grading line. In it are five 48-in. venturi meters—one in the discharge of each pump. In front of the meter room is the valve room, 45x300 ft., also built below the grade line. In this chamber, as shown in Fig. 4, the 48-in. discharge lines from the engines pass at right angles over two pairs

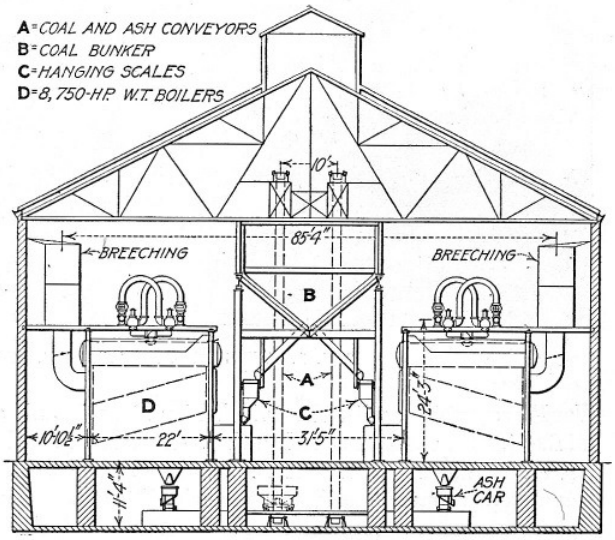

FIG. 3. SECTION THROUGH BOILER ROOM

of 60-in. cast-iron pipe lines extending into the city distribution system. One is on the high service and the other on the low. Each 48-in. pipe is connected to the four 60-in. pipes by 36-in. T's and a 36-in. hydraulically operated valve. A pump can be changed from one service to another, in less than 5 min., by opening and closing two 36-in. valves.

Improving the Old Station; Statistics

While the new station has been under way, the old Massachusetts Ave. station has been entirely rebuilt into a modern fireproof building. The old horizontal pumps have all been removed and four new 30,000,000-gal. vertical triple-expansion units have been erected in their places. Two of the old 30,000,000-gal. vertical triple-expansion pumps remain—overhauled and put in good condition.

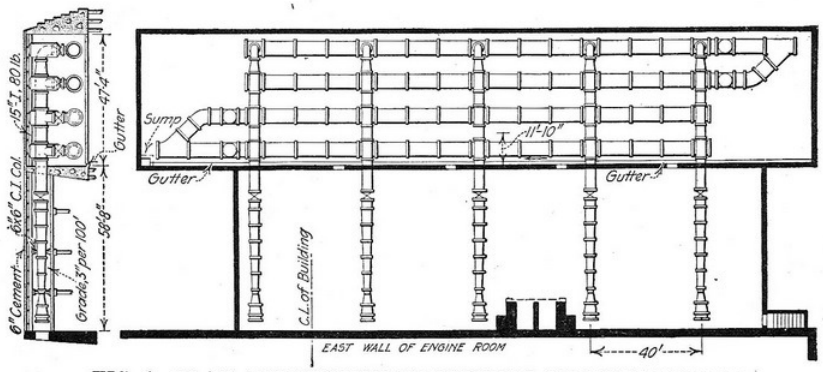

FIG. 4. PLAN AND SECTION OF VENTURI AND VALVE ROOM

The boiler rooms of the old station have also been rebuilt, furnished with new brick chimneys and equipped with sixteen 300-hp. horizontal tubular boilers each and four 600-hp. water-tube boilers.

The present population of Buffalo is 475,000. The total consumption for the year ending June 30, 1915, was 52,896 million gallons, of which 15,548 million passed through meters. The average daily consumption was 148.1 million gallons, giving 312 gal. per capita per day. The total cost of supplying water per million gallons, figured on the total maintenance item of the department (old station only), was $11.07. The total cost of supplying water, including the interest on bonds, was $19.53 per million gallons during the same fiscal year.

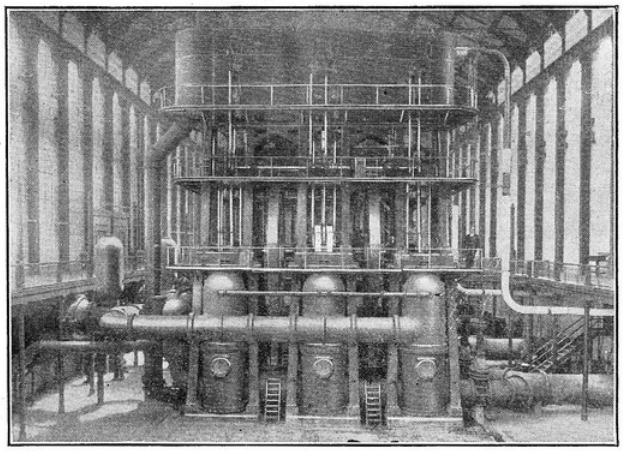

FIG. 5. HOLLY ENGINE NO. 1; COL. FRANCIS G. WARD PUMPING STATION, BUFFALO

Utility-Franchise Policy for a Model City Charter

The public-utility and franchise policy embodied in a model city charter should be so formulated as to conserve and further certain definite purposes, according to the principles adopted by the Municipal Program Committee of the National Municipal League (North American Building, Philadelphia), which is engaged in framing such a model city charter. These purposes may be outlined as follows:

1. To secure to the people of the city the best public-utility service that is practicable.

2. To secure and preserve to the city as a municipal corporation the fullest possible control of the streets and of their special uses.

3. To remove as far as practicable the obstacles in the way of the extension of the practice of municipal ownership and operation of public utilities, and to render practicable the success of such ownership and operation when undertaken.

4. To secure for the people of the city public-utility rates as low as practicable consistent with the realization of the three purposes above set forth. It should be no part of such policy to secure compensation for franchises or special revenues for general city purposes by an indirect tax upon the consumers of public-utility services.

In formulating a policy to carry out the four purposes above stated as desirable, the following principles should be recognized:

1. Each utility serving an urban community should be treated as far as practicable as a monopoly with the obligations of a monopoly; and its operation within the city should be based as far as practicable upon a single comprehensive ordinance or franchise grant uniform in its application to all parts of the city and to all extensions of plant and service as well as to the existing plant and service.

2. Every franchise should be revocable by the city upon just compensation being paid to its owners, when the city is prepared to undertake public ownership.

3. The control of the location and character of public-utility fixtures, the character and amount of service rendered and the rates charged therefor should be reserved by the city, subject to reasonable review by the courts or a state utilities commission where one exists.

4. Private investments in public utilities should be treated as investments in aid of public credit and subject to public control, and should be safeguarded in every possible way; and the rate of return allowed thereon should be reduced to the minimum return necessary in the case of safe investments with a fixed and substantially assured fair earning power.

5. The granting and enforcement of franchises and the regulation of utilities operating thereunder should be subject to adequate public scrutiny and discussion and should receive full consideration by an expert bureau of the city government established and maintained for that purpose, or in case the maintenance of such bureau is impracticable, by an officer or committee designated for the purpose.