

## RECOMMENDATIONS

### WATER SUPPLY.

#### *Records.*

1. That a Venturi meter be installed in the 18-inch, 30-inch and 40-inch supply pipes at Chateau d'Eau, in order to determine the city's consumption of water and that accurate records of the flow in the supply pipes be kept.

2. That an automatic water pressure recording gauge be installed in each fire station, and records from same filed for future reference.

3. That an up-to-date plan of the distribution system be maintained in each fire station; this plan to show sizes of all mains and locations of all hydrants.

#### *Supply Lines.*

4. That the reliability of supply be assured by making a comprehensive study of conditions pertaining to the installation of the 30-inch and 40-inch supply mains; this to include, particularly, an examination of the foundations on which the mains are laid, also the number and location of air valves and their condition as to reliability of operation.

In the event of it having been determined that an unsatisfactory condition of the foundations is responsible for the frequent breaks just north-west of the St. Charles River, I would suggest for consideration that the work of paralleling the unreliable portion and making provision for the ultimate extension of at least the 40-inch line be commenced and completed at the earliest possible date.

5. That the number of gate valves on the 40-inch pipe line be increased by placing one additional at Aqueduct Hill, also that cross connections with suitable valves be placed on the supply mains at intervals of about  $1\frac{1}{2}$  miles.

#### *Pumping Station.*

6. That the erection of a fireproof pumping station equipped with electrically driven centrifugal pumps to provide satisfactory pressures for effective direct hydrant streams at the higher levels of the city be included in studies of the water supply system.

#### *Consumption.*

7. That a leakage survey of the distribution system and a thorough inspection of plumbing fixtures be made immediately, and that every effort be made to reduce leakage and waste so that the consumption rate may be materially reduced.

8. That the city adopt the policy of metering all new services and ten per cent. annually of those now used, so that at the end of ten years all services will be metered.

#### *Mains.*

9. That the distribution system in the principal congested value and mercantile districts of "Lower Town" be strengthened by laying a 12-inch line along St. Peter and Du Fort Streets, connecting with the 12-inch on St. Andre and Little Champlain Streets, also by extending the 12-inch along St. Joseph Street to connect with the 12-inch on Boulevard Langelier.

10. That the reliability of the system be improved by testing all mains in the trench before back-filling to a hydrostatic pressure of 125 pounds.

11. That the following be adopted as the standard minimum size of mains used for hydrant supply:

(a) For residential districts 6 and 8-inch; the former to be used only where they complete a good gridiron, and the latter in locations where dead ends and an incomplete gridiron are likely to exist for some time, and in any case where blocks exceed 600 feet in length.

(b) For manufacturing and mercantile districts 8 and 12-inch, the former to be used only in sections where they complete the gridiron.

12. That 4-inch mains in the distribution system which furnish hydrant supply or form a part of the gridiron be replaced within 5 years.

13. That dead ends be eliminated wherever practicable and long, unsupported lines of pipe be cross-connected so that each of the hydrants about any block will furnish ample engine supply.

14. That an electrolytic survey be made and remedial measures in accordance with the best waterworks practice be adopted.

*Note.*—The Canadian Fire Underwriters' Association believes that it is essentially the business of each municipality to lay out its system of distributing mains, as it is best able to judge of present and future consumption in each district, and of other local conditions involving paving, topography, pressures, size and type of hydrants, etc.; but practical experience has shown that for good fire protection in districts such as are found in this city, a gridiron system of mains of the sizes recommended above is satisfactory only when cross-connected at all intersections, free from dead ends and with secondary cross-feeder mains at frequent intervals.

#### *Gate Valves.*

15. That additional gates be set so that no single case of accident, breakage or repairs to the pipe system in important mercantile and manufacturing districts will necessitate shutting from service a length of main greater than 500 feet, and in other districts lengths greater than 800 feet.

16. That all valves except those along service limits be kept open during the normal operation of the system.

17. That an inspection be made annually of all gate valves and that records be kept of operation and inspection.