DESIGN FOR
A GRAVITY WATER SUPPLY
FOR
ALBANY, NEW YORK

SUBMITTED TO

THE FACULTY OF RENSSELAER POLYTECHNIC INSTITUTE

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS

FOR THE DEGREE OF CIVIL ENGINEER

JUNE, 1925

TROY, NEW YORK

FOREWORD

The standards of modern public water supplies are being steadily raised as the community grows in size and resources. This is true concerning the sanitary conditions surrounding the water supply. The theory of bacteria origin of contagious disease has sufficiently been demonstrated during the past years to prove the danger and significance of water-borne bacteria. The prevalence of diseases transmitted by bacteria in the drinking water, however, can be controlled by improving the quality of water supply. It is true also that with the increase in size and luxury of American cities has come a demand that the water supply should satisfy higher aesthetic standards such as appearence, taste, temperature. The per capita consumption has also increased with the higher standard of living, with more water fixtures, more flowers and lawns; and for this purpose alone municipalities are introducing a check by the installment of water meters. Most American cities are constructed chiefly of wooden buildings so that the per capita fire loss is enormous. Chief reliance for fighting fires and preventing general conflagration is, therefore, thrown upon the water supply which must have an ample quantity and sufficient pressure for fire protection.

For satisfactory consideration of the above mentioned purposes as well as an insurance of a dependable and permanent supply, the water supply engineer is now seriously giving his first attention to the gravity supply, for, if proper storage is kept there could be no interruption of supply through the failure of pumps as is liable to occur in pumping

systems. The gravity supply is generally of high mountain source and is therefore aesthetically better than a river source. The gravity supply will generally, by the mere operation of gates to conduits, meet any emergency that is likely to occur in the district it supplies. These considerations and others contribute much to the reason why San Francisco goes 189 miles, up to the Sierra Nevada Mountains, and New York City 150 miles to the Catskill Mountains for their supplies by gravity.

The present supply for Albany, New York, is taken from the much polluted Hudson River. The system consists of a combined mechanical and slow sand filtration plant and a central pumping station. Although the filtration plant is one of the best in the country, yet in times when the Hudson is heavily polluted, filtration is very difficult. Numerous complaints have been made of the objectionable chlorine taste which is necessary present after purification. Furthermore, this problem is believed to give more complication when the new Hudson Valley Coke and Products Plant is completed in Troy, for it is not much of the household sewerage rather it is the industrial waste that is hard to purify. The present system is also not giving enough pressure in the higher sections of the city which is rapidly growing. The annual cost of the maintenance of the pumping station and and the filter is also enormous.

The Fox Creek and Bozen Kill project is designed with the purpose of correcting the old system and satisfying the

new demand of the city - that of replacing a gravity supply for the pumping supply, and that of using mountain water instead of river water. This project is based on sound engineering principles and will have a direct appeal to the average citizen in that the water comes from the Catskills; in that it is an entire gravity system; that filtration will be only incidental; and that water power can be used for municipal use or for sale.

The writer regrets that with the limited amount of time available he is unable to devote as much study as he likes to the construction features of the project. But it is believed that the contents of this report will bring out the salient points of the design.

ACKNOWLEDGEMENT

The writer wishes to acknowledge indebtedness to Professor Thomas R. Lawson, under whose guidance the study was made. Miss Harriet R. Peck, librarian of the Rensselear Polytechnic Institute, has helped to solve many bibliographical problems. However special thanks should be given to Mr. Gabriel R. Solomon, consulting engineer of Troy, for advices on the various subjects in the design and his special interest in making the presentation of the problem as practical and as complete as possible.