Village of Skaneateles

Original plans for sewers and sewage disposal (1903)

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proved by the State Board of Health for several new sewers and for changes in others previously approved, and these appear in the twenty-first annual report.

On December 9, 1903, the State Commissioner of Health approved a plan for an extension of the system to McClellan street. This plan comprises:

A map and profile of the street sewer, forming Plate XLV of this report.

SKANEATELES

Original plans for sewers and sewage disposal

On July 3, 1903, the State Commissioner of Health approved plans for a system of sewers and sewage disposal for the village of Skaneateles which comprise:

A contoured sewer map of the village, forming Plate XLVI of this report.

Four sheets of sewer profiles, on file but not published in this report.

A sheet of sewer details, forming Plate XLVII of this report.

Two drawings of the sewage disposal system, forming Plates XLVIII and XLIX of this report.

A report by the designing engineer of the street sewer system, dated February 14, 1903, hereto appended.

A report from the designing engineer of the sewage disposal plant, hereto appended.

Specifications for the street sewer system, on file but not published in this report.

Specifications for the sewage disposal system, on file but not published in this report.

SKANEATELES, N. Y., *February* 14, 1903

To the Honorable the President and Board of Trustees of the Village of Skaneateles, N. Y.:

Gentlemen—I have the honor to submit herewith a complete design for a system of sewers for the village of Skaneateles. The design includes: (a) A topographical map of the entire village, with 10-foot contours, on which is shown every sewer, manhole, flush tank, lamphole, etc., with the size, rate of grade and direction of flow of each sewer, and the elevation of the sewer invert at each junction, and wherever a change in the rate of grade occurs. The map also shows the location and elevation of all cellars whose depth or distance from the street is such as to make them of especial importance in determining the depth of the sewer.

(b) Four sheets of profiles, showing the profile of the surface of the ground along the line of each sewer, and the relative location of the sewer invert, with elevations, rates of grade and sizes of sewers, and location of all structures.

(c) One sheet of detail plans for manholes, flush tanks and other structures.

(d) Contractor's specifications for the construction of the system.

(e) Engineer's report. together with a duplicate or copy of each of the above, for filing with the State Board of Health.

The elevations on these plans are referred to a datum plane which is 800 feet above tidewater. The initial bench-mark used in the survey being a copper bolt, set in the west wing-wall of the State dam by the United States Geological Survey, and marked "867 ft. U. S. G. S." The elevation of this bench was taken as 67 feet. All distances are given in feet and decimals of a foot.

The design is for a system of house sewers only (sometimes called a separate system) no provision being made for taking care of storm-water, though a certain amount of ground-water, such as collects in cellars, may be admitted without overtaxing the capacity of the sewers. It contemplates the concentration of the sewage from the entire village at the intersection of West Eliza-

beth and Griffin streets, whence it is to be conveyed through a 15-inch outfall sewer, across lands of Thomas Spearing, to a point on the bank of Skaneateles creek, into which the crude sewage may be discharged directly, or where, if deemed necessary, it may be subjected to bacterial treatment in a septic tank, the effluent from the same being discharged into the creek. The sewage from the portion of the village lying east of the creek is to be carried across the same, under Elizabeth street bridge, in a cast-iron pipe, properly trussed, and supported by the abutments of the bridge.

EAST STREET

No provision has been made in this design for any sewer in the extreme northerly portion of East street, from the summit of the hill to the corporation line—a distance of about 500 feet. The drainage from this portion of the street could be carried to the northerly limits of the village, and thence across private property to the Syracuse street sewer, and discharged into the same. But it seems probable that by the time there is any demand for sewerage in this sparsely settled region new streets will have been opened, connecting East and Syracuse streets, through one of which this sewage could be carried. I have therefore deemed it unwise to plan a sewer through private property at this time for the accommodation of such a limited territory, where there will probably be no demand for a sewer for many years to come.

EAST LAKE STREET

The sewage from the greater portion of East Lake street will have to be carried to the southerly limits of the village, as the grade of the street falls sharply in that direction. From this point it will be brought back across private property and discharged into the East Genesee street sewer at Leitch avenue. The approximate location and grade of this sewer are shown upon the plans. There are but few houses on this portion of East Lake street at present, and there may not be any demand for a sewer there for some time to come. I would recommend, however, that the lower portion of the return sewer be built at once

to a point on the property of Mr. Frederick Roosevelt, at which the sewage from his house (which now goes to or towards the lake) can be intercepted, as the sewer in East Genesee street will not be deep enough to properly serve this house. The residence of Miss Fitch will also be better served by this sewer than by the one in the street.

WEST LAKE STREET

At the southerly end of West Lake street a similar problem presents itself, but one not so easily solved. From the main entrance of Mr. Samuel Roosevelt's place to the south corporation line the grade of this street falls 18 feet. To bring the sewage back against the grade would involve a cut of about 26 feet at the summit of the hill. Furthermore, a high ridge extending along the east side of the street, between it and the lower land sloping toward the lake, makes it even more difficult to bring the sewage back by gravity through private property, as in the case of East Lake street above cited. To accomplish this without very deep cutting it would be necessary to carry the return sewer some distance south of the corporation limits and cross the ridge at a point south of the residence of Mr. Beebe. This would involve considerably more expense than the construction of a sewer against the grade in the street itself. I have planned, therefore, for the installation, at the southerly end of West Lake street, of a sewage lift or pump to raise the sewage from this portion of the street to the top of the ridge, at a point on the lands of Mr. Fitzgerald, just south of the corporation line. Thence it will be brought back by gravity through a 6-inch sewer, across private property (as shown on the map) and discharged into the West Lake street sewer, near the residence of Mr. Thomas Prentiss. This sewer will give better service to the clubhouse known as "Mingo Lodge", and to the residences of Mr. Roosevelt and Mr. Hanna than that in the street, and it will directly intercept the drainage from these places as now disposed. I would therefore recommend that this return sewer be carried far enough for that purpose at once. The one in the street and the lift need

not be put in until the west side of the street (now unoccupied) is built up sufficiently to create a demand for it.

In general, the sewers have been planned to be about eight feet below the present surface of the streets in order to give good drainage to all cellars. But in some places a greater depth has been found to be necessary, either for this purpose or in order to obtain the required fall for the sewer. Also it will be seen that there are low points in Griffin street and West Elizabeth street, where the depth of the sewer will be only about 3 to 3½ feet. A greater depth could not be obtained without bringing the sewage to the outlet at too low a grade to be discharged into the creek by gravity. At both of these points, however, the surface grade of the streets should unquestionably be raised, as a glance at the profile will show. and I recommend that this be planned for when the sewers are built.

At another low point, in West Lake street, the sewer will be a little less than 5 feet deep, and cannot be placed low enough to drain the cellars of Mr. Holben and Mr. Allen, at the least rate of grade which should be given to a house connection. It is, nevertheless, deep enough to receive the *sewage* from these houses, and the cellars are already provided with adequate relief from ground-water by an existing drain to the lake.

The estimated quantity of sewage for which the system is designed is nearly 955,000 gallons per day from the entire village. This allows for 150 gallons per capita, from a population of 6366, or a family of four persons to each 50-foot lot, on all streets now existing or proposed. The census returns for the past thirty years give the population of the village as follows:

1870	1409
1880	1669
1890	1559
1900	1495

It will be seen from this that Skaneateles can hardly be classed as a growing village. And I am unable to see any cause

which might have a tendency to make it one in the future, unless it be an increasing popularity as a summer resort. I therefore consider the above estimate sufficient to obviate any possibility of the capacity of the system proving inadequate during the life of the sewers, especially as none of them is planned to run more than two-thirds full. A smaller estimate, on the other hand, would make very little difference in the design, as most of the sewers are only 6 inches and 8 inches, the minimum sizes permissible in any case.

DISPOSAL

The question of ultimate disposal of the sewage has been given considerable study. The Skaneateles creek, which is the natural drainage outlet of the village, can in no sense be classed as a potable stream. The existence upon its banks of many paper, woolen, and other mills, all discharging their refuse into its waters, effectually precludes any such classification. It remains then to determine whether the discharge of this sewage into the creek would be likely to create a nuisance.

For the past eight years the city of Syracuse has taken careful gaugings of the flow of the creek, at a weir especially constructed for this purpose at Willow Glen, about a mile below the village. These measurements show the ordinary minimum flow to be about forty million (40,000,000) gallons per day, and the absolute minimum (except during rare periods of short duration, when some special circumstances necessitated a temporary closing of the gates in the dam) to be about 10,000,000 gallons per day. The maximum flow is over one hundred million (100,000,000) gallons, and it is usually near this figure during the greater part of the year, when the Erie canal is in operation, the creek being used as a feeder for the canal.

At 150 gallons per capita the present population of the village would yield less than 250,000 gallons per day. A flow of 40,000,000 gallons (which I believe can be safely counted upon, except during unusual periods of drought) would give this quantity of sewage a dilution of 160 volumes, and even during dry seasons a dilution of at least 40 volumes could be expected. This would

appear to be sufficient to prevent a nuisance, since in the case of the River Exe, "It was found, in 1895, that the addition of sewage to 40 times its volume of water made no serious alteration in the chemical or physical quality of the stream" (A. P. Folwell on Sewerage). It is regarded as safer, however, to consider the number of individuals contributing the sewage rather than its volume, as the proportion of water contained varies considerably. In this connection various authorities place the minimum amount of dilution necessary to prevent the creation of a nuisance at from 1500 to 3500 gallons per capita per day. Taking the larger figure, and assuming the present population of the village to be 1600, we would require a flow in the creek of only five million six hundred thousand (5,600,000) gallons per day, if every house were connected with the sewers, while the minimum dry weather flow is nearly twice that amount.

I feel justified, therefore, in recommending that for the present the sewage be discharged directly into the creek. If, however, this method of disposal should be found objectionable, either now or in the future, a septic tank should be constructed and the sewage be purified therein before allowing it to enter the stream.

A convenient site for the septic tank would be on the premises of Mr. H. C. DeWitt, immediately adjacent to the outlet shown on the map. The invert in the last manhole should be constructed with a turn to the west, to facilitate this change, should it become necessary.

No attempt has been made to plan the details of the lift which is proposed for the southerly end of West Lake street, as decided improvements in such devices may be made before its installation becomes necessary. As conditions are at present it would probably be most advantageous to employ what is known as the "Adams Sewage Lift", which could be operated by pressure from the village water system. The consumption of water would be equal to the quantity of sewage to be raised, which would be quite small, being contributed by such a limited territory. Or, a small pump might be employed, driven by an

electric motor, the power being furnished from the municipal electric lighting plant. A motor of one-half horsepower would probably be sufficient, and the expense of operation would be trifling. The objection to this plan lies in the fact that the village dynamos are run only 10½ to 14 hours out of each 24. A storage basin would consequently be required, in which the sewage could accumulate when the pump was not working. This would not only add to the expense of construction, but might prove objectionable if located too near a dwelling.

As stated above, this plan makes no provision for taking care of storm-water. To do so much larger sewers would be required, and the expense of construction would be proportionately greater. The present method of caring for storm-water, while manifestly inadequate, still serves the purpose fairly well, except during very heavy storms. The water must then remain in the street gutters until these small drains are able to carry it off. One of these drains, however, to which my attention has been especially called, appears to be particularly unequal to the duty which is laid upon it. I refer to the one which crosses private property between State and Jordan streets and discharges just above the dam. It is either too small, or has become badly clogged, as the water in it backs up every spring and floods the cellars which are connected with it. I have measured its watershed and its fall, and find that a 24-inch pipe, laid to a true grade along this line, or near it, would give all the service required of the present drain. I therefore recommend that attention be given to this matter when the sewer system is being constructed, as the work could be included in the sewer contract at a comparatively trifling increase in the cost of the same.

None of the existing drains above referred to (though dignified by some with the title of sewers) has been constructed in such a manner as to warrant its being included in the design herewith submitted.

Very respectfully,

FREDERICK M. THOMAS

Designing Engineer

SKANEATELES SEWAGE DISPOSAL PLANT—GENERAL DESCRIPTION OF PLANT

The work required will comprise the following items:

1. The proposed plant will comprise a septic tank built underground with concrete walls and roof of the capacity sufficient to detain the sewage estimated to be furnished by the village for a period of about ten hours. The tank will be provided with a grit chamber through which the sewage will pass before entering the septic tank proper, which chamber is intended to detain the mineral matter only. There will also be an affluent chamber and a valve chamber, with piping and fittings so arranged as to shut off the sewage from entering the septic tank proper and divert it directly into the stream whenever it becomes necessary to pump out the septic tank. The piping system will also include piping and fittings by which either of the three minor chambers and the large septic tank can be pumped out by means of a small centrifugal pump driven by a gasoline engine placed in the gate-house over the gate chamber.

It is intended that the affluent from the septic tank shall pass directly into the stream for the present; and it is believed that this degree of purification will be adequate for a long time if not permanently. Should further purification, however, be required in future, the septic treatment would still be the necessary preliminary to such further purification.

The action of the septic tank being to liquify the organic solids of sewage, there will result as the products of the action of the tank three distinct materials; first, a small amount of gas, chiefly marsh gas, which will be distributed through the ventilating system and which will be almost entirely odorless; second, a large amount of liquid affluent not thoroughly purified but sufficiently reduced in chemical character to warrant its discharge into the outlet with safety; third, a small amount of mineral residue precipitated to the bottom of the tank. This latter portion, comprising a very small proportion of the total sewage treated, will require removal about once a year, and it

is proposed to accomplish this by pumping it into the sludge bed to be located north of the septic tank, from which bed the liquid matter may filter through coarse screening material into the outlet. The remaining mineral matter when dry will resemble a rich soil and can be removed wherever required without objection whatever.

SCHEDULE OF WORK CALLED FOR

The work required will comprise the following items:

First, the septic tank proper with its inlet and outlet chambers and valve chamber and with all piping, fittings and accessories, including centrifugal pump and gasoline engine. The piping will include the length of iron inlet pipe through the wall and the iron outlet pipe extending from the affluent chamber to the outlet at the bank of the stream. The piping will also include the wrought-iron pipe extending from the centrifugal pump to the sludge bed with its fittings; second, the building over the inlet, outlet and valve chambers complete as shown on drawing No. 2 and in these specifications; third, the sludge bed shown on drawing No. 1 and described in these specifications.

Specifications on file in State Department of Health but omitted from this annual report.

WEEDSPORT

Original plans for sewers and sewage disposal

Original plans for a system of sewers and sewage disposal for the village of Weedsport were approved by the State Commissioner of Health on September 29, 1903, and comprise the following:

A contoured sewer map of the village, forming Plate L of this report.

A sheet of sewer profiles, forming Plate LI of this report.