

## NEW JERSEY REGULATIONS FOR THE DESIGN OF SEWERAGE SYSTEMS AND DISPOSAL WORKS.

**A**T a recent meeting of the Board of Health of the State of New Jersey, a set of rules and regulations governing the submission of designs for water-works or sewage works were adopted. These rules have been under consideration for about a year, and the necessity for them has increased daily. Plans are submitted at the present time in all sizes up to 6 feet by 10 feet, and on all kinds of paper from the wrapping kind up to tracing cloth. It is also an unfortunate circumstance that some few engineers who have worked along other lines will accept work designing municipal sewage disposal or water purification plants apparently without investigating the underlying principles as thoroughly as is desirable. It then becomes necessary for the authorities to gather detailed data regarding the project, which very often cannot be done as efficiently as would be best because of the small number of engineers which may be employed with the present annual appropriation.

The present rules are therefore intended to prevent loss of time incident to the collection of fundamental data, upon which the design is based, and also to make the plans and reports more uniform in character. Before taking final action they were submitted to several of the leading sanitary engineers, with the request that comments and criticisms be made, so that no unjust provisions should be included which would cause unnecessary hardship or expense upon the part of the engineers. Many helpful suggestions were made by these engineers.

The following is extracted from the adopted rules and regulations:—

### Sewerage Systems and Sewage Disposal Works.—

The plans for a complete sewerage and sewage disposal system shall include the following:

A general map of the municipality or sewerage district.

Profiles of all sewers proposed.

Details of construction of manholes, flush tanks, and special structures pertaining to the sewers.

General and detailed plans for disposal works.

A comprehensive report upon the proposed system by the designing or consulting engineer. This report to be typewritten upon letter-size paper, and the sheets firmly bound together.

A preliminary report, containing data and information sufficient for the complete understanding of the project may be submitted to the State Board of Health for their consideration, prior to the submission of detailed plans.

**Map or General Plan.**—The general plan referred to shall be drawn to a scale not greater than 100 nor less than 300 feet to 1 inch, and shall show the entire area of the municipality or district. If the municipality is greater than two miles in length the map may be divided into sections, conforming in size to those mentioned under "Drainage." The sheets shall be bound together and a small index map supplied, showing by number the area covered by the various sheets. A general plan shall accompany each application, in the case of a new sewer system or any extension or modification of any existing sewer system unless such general plan has already been submitted.

The map shall show all existing or proposed streets, the surface elevations at all street intersections, and contour lines at intervals of not more than 10 feet.

If it is intended to defer the construction of sewers in some of the streets, the plan shall show that sewerage facilities are provided for all such sections of the municipality or sewerage district. The plans shall also clearly show the location of all existing sewers, either "separate" or "combined," the location of the disposal works, and the location of existing and proposed sewer outlets or overflows. The true or magnetic meridian, the town or borough lines, title, date, scale, direction of flow and average water elevation of the stream shall also be clearly shown. The elevation of the highest known freshets at the outlets and site of the disposal plant shall be given. Any area from which sewage is to be pumped shall be shown by light shading, coloring or other distinctive marks.

Letters and figures shall be clearly and distinctly made. Sewers to be built at present shall be shown by solid lines, and sewers to be constructed later shall be shown by a line of dashes, as ----- Existing sanitary sewers shall be shown by the following symbol, ....., and combined sewers by a dot and dash, —.—.—. All topographical symbols used are to be the same as those of the United States Geological Survey.

Elevations of the surface of the streets should be placed outside the street lines in the upper right angle, or opposite their respective positions in the street. The elevations of sewer inverts should be shown at street intersections, ends of line, and wherever a change of grade occurs. The elevations of the sewer shall be written close to the point to which they refer, parallel with the sewer line and between the street lines. The elevations of surface shall be shown to the nearest 1/10 foot; those of the sewer invert to the nearest 1/100 foot. The sizes and gradients of all proposed and existing sewers shall be marked along the line of the sewer.

All sewer appurtenances and unusual features, such as manholes, lampholes, flush tanks, siphons, pumps, etc., shall be designated on the plans by suitable symbols and referenced by a legend near the title.

Profiles of all sewers over 8 inches in diameter and of all 8-inch sewers, where gradients less than that given below are used, shall accompany the application. Profiles of all sewers must be approved before they are constructed.

Profiles of sewer lines shall be prepared and drawn to such a scale as to clearly show the structural features of the sewer. For ordinary use, the following scales are suggested: Vertically, 10 feet to 1 inch; horizontally, 100 feet to 1 inch. Both scales must be clearly shown upon each sheet. Upon these profiles shall be shown all manholes, flush tanks, lampholes, siphons, and stream crossings, with elevations of stream bed and normal water. Figures showing the sizes and gradients of sewers, surface elevations, sewer inverts, etc., should be shown with the same frequency as required for the map.

**Grades, Etc.**—The following gradients for sewers flowing half full are suggested as minimum grades for ordinary use, as with careful construction a theoretical velocity of approximately two feet per second can be obtained:—