

W. G. Kirchoffer, "Novel Sewerage and Sewage Treatment Plant at Mt. Horeb, Wis.,"
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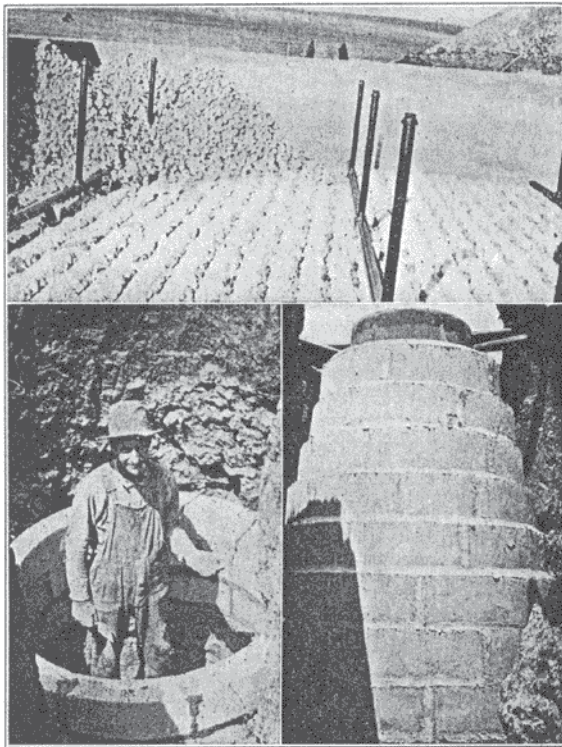
MUNICIPAL AND COUNTY ENGINEERING

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Novel Sewerage System and Sewage Treatment Plant
at Mt. Horeb, Wis.

By W. G. Kirchoffer, Sanitary and Hydraulic Engineer, Madison, Wis.

Mt. Horeb, Wis., claims the distinction of being the first village in Wisconsin to have its entire sewerage system constructed of cement concrete. The sewer pipe was manufactured by the Waupaca Sand and Gravel Company, Waupaca, Wis., and was composed entirely of cement and sand. The specifications followed for its manufacture were almost identical with those prepared by the engineering department of Kansas City, Mo.



VIEWS OF SEWERAGE WORKS AT MT. HOREB, WIS.
Top: Sprinkling Filter Under Construction. Bottom:
Sewer Manhole of Cement Blocks Under Construction and
Completed.

Some of the advantages considered in selecting this pipe were a more perfect joint, a smooth and uniform interior surface which would cause the least deposit, and about 14 per cent. greater carrying capacity than vitrified pipe.

Some of the disadvantages of the use of this pipe, as discovered during construction, are its weight as a drawback in handling, slightly larger and deeper trenches, greater porosity and difficulty in cutting to an exact line or shape at terminal points or in manholes. However, on the whole, we considered the advantages were greater than the disadvantages.

The manholes were all built of cement blocks, cast in an arc of a circle. These blocks, from the contractor's standpoint, at least, were an improvement over brick, considering cost and

ease of building the manholes. They should also prove to be will prove whether they will disintegrate faster than brick.

The sewage disposal plant was constructed entirely of concrete. It consists of a settling tank, a sludge digestion chamber, a siphon chamber, a sludge drying bed and a sprinkling filter. The plant was designed for a population of 800, with a daily average consumption of 100 gals. per capita. The settling tank has a capacity of a 2½-hour flow, assuming the entire flow to take place in 18 hours. The sprinkling filters have an area of 1,936 sq. ft. and a depth of 6 ft. The sprinkling nozzles are of the square Taylor type, spaced 11 ft. c.c. and operate under a maximum head of 6 ft. The contents of the siphon chamber are such as to cause the siphons to discharge at 20-minute intervals. The daily rate is 1,800,000 gals. per acre.

During the first winter of operation the volume of sewage was so small that all of the nozzles except one row were shut off and this row was housed in with rough lumber and buried with straw and manure. The plant is so located that it has no stream or open water into which the effluent can be discharged. The Galena limestone appears close to the surface at this point, and as it is extremely full of crevices the effluent was disposed of by constructing an underground pipe gallery (similar to galleries for the collection of water in water-bearing materials) on two sides of the filter into which the effluent discharges.

The plant has operated fairly satisfactorily, considering the care which it has received, which has been almost nothing, although the authorities promised the engineer they would care for it faithfully. On account of an excess of untreated creamery water being discharged into this plant, the underground filter has had to be extended, and from a recent date the plant will receive regular attention of a caretaker. The creamery waste will be treated in a specially designed tank before discharging into the sewerage system.

Mt. Horeb is located on a high ridge (known in the early history of Wisconsin as the military ridge), and drains into four dry valleys. This plant is the first one of four to be built and provides sewerage for the business section of the village. Other plants, slightly smaller, will have to be built in the other valley as occasion demands. These plants have not as yet been designed, but when they are needed they will be designed to fit the needs at that time and in accordance with the best prevailing practice, and particularly as may be indicated by the experience with this plant.

The sewers consist of 482 ft. of 6-in., 3,781 ft. of 8-in., 2,750.2 ft. of 10-in., 1,372.7 ft. of 12-in. concrete pipe, and cost \$7,732.10. The sewage disposal plant, exclusive of rock excavation, cost \$5,320.

Mr. C. H. Phillips, Waupaca, Wis., was contractor, and Ray A. Phelps, resident engineer, under the direction of W. G. Kirchoffer, who prepared the plans and had general supervision of the work.