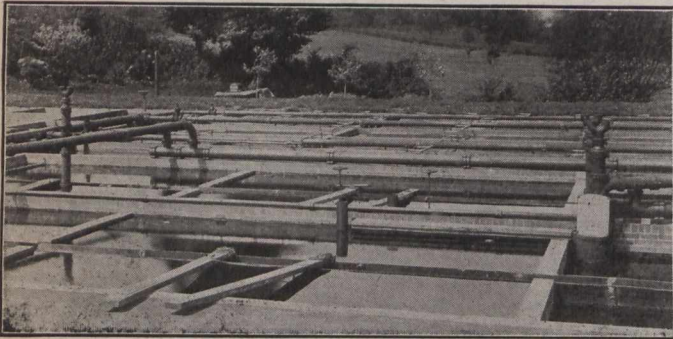


## ACTIVATED SLUDGE DEVELOPMENTS

**T**HE Manchester (England) Corporation have approved of a scheme for converting part of one of their large settlement tanks at Davyhulme, Manchester's main sewage outfall works, into an activated sludge tank capable of treating a million Imperial gallons per day of strong sewage.

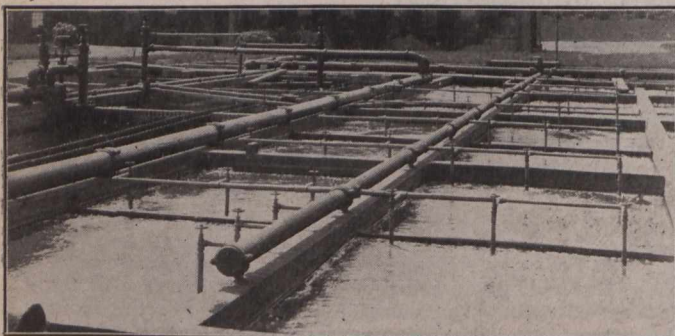
The activated sludge plant at the Withington outfall, which was designed to treat 250,000 gallons of sewage per day, was first put into operation last September, and the new features introduced, including the Clifford settling tank inlet apparatus, have so far exceeded expectations



View Across Activated Sludge Plant; Settlement Tanks in Foreground

that the volume treated had reached 400,000 gallons per day early in January and is still being increased. Both the Davyhulme and the Withington works are in charge of E. Ardern, M.Sc., who has been so intimately linked with the development of the activated sludge process from its early stages. Both the Davyhulme and the Withington installations are fitted with Jones and Atwood equipment.

The Worcester (England) Corporation have applied to the minister of munitions for a permit to extend their sewage works for the purpose of putting into operation an option given them by Jones & Atwood, Limited, when the original contract for activated sludge plant was signed to extend their plant to treat 3,000,000 gallons per day.



Aeration Tank in Use at Worcester, England

The first trial plant for dealing with 750,000 gallons per day has now been in operation since April, 1916, and Mr. Caink, the city engineer of Worcester, wrote a letter to the Royal Sanitary Institute meeting held January 12th, 1918, to the effect that "The installation of the process at Worcester has in every respect fulfilled my expectations."

## UNIFORM ROAD ACCOUNTING\*

By Edward N. Hines

Chairman, Board of County Road Commissioners, Wayne County, Michigan.

**I**N advancing a plan of obtaining costs on highway construction and maintenance, there are certain features which must be noted as essential in order to arrive at dependable costs.

First in importance is the adoption and use of a satisfactory means of controlling the items of labor and materials as they enter into the construction of the road.

Second in order is the division of the work into such groups as will agree most naturally with the character of operations performed, and at the same time readily admit of a classification which will apply to road work in general.

Finally, it is necessary to provide means for checking the results on the various operations during the progress of the work—in other words, to obtain cost figures on the different portions of the work in time to cut off waste and speed up efforts where necessary on the balance of the work still remaining.

As a means of controlling the labor item, the first detail to be considered is the use of the workman's time card. The timekeeper on the job is made responsible for the issuing of one of these cards every payroll period for each man on the payroll. He must record thereon daily the nature of the labor performed and the number of hours in each case, and at the end of the weekly period summarize in the proper space the total hours spent by the man on each class of work. After being approved by the foremen, all the cards thus made up are sent into the main office where the rates are verified, the extensions proven and the amounts due each man entered on the payroll distribution sheet. From this payroll sheet the total labor is distributed to the construction cost ledger and maintenance and indirect expense accounts.

In controlling the stock used in connection with road construction, provision is made for charging each item of material as it is used. All material which on its receipt is used directly on the road without any attempt at storage is charged directly from the voucher record through the distribution ledger to the road in question. To take care of materials, supplies and repair parts which are carried in stock, a series of stores accounts are set up. These stores accounts cover separately the different types of materials used in road construction and are made up as follows: Tiling, brick, cement, pebbles, sand, limestone, granite, trap rock, tarvia, gravel, road oil, armor plate, expansion felt, spiling lumber, coal and general stores. As a means of controlling the issuing of stock from these stores, a suitable form of stores requisition is used. This requisition is issued in triplicate, one copy being retained by the foreman having authority for its issuance; the second copy is kept by the storekeeper having charge of the stores, while the third copy is sent to the main office. This third or office copy is authority for charging the material in question to the proper account through the transfer journal. The operation of such a plan of stores control naturally requires the supervision of this stock by a competent storekeeper with adequate space and suitable conditions for proper storage.

\*Abstracted from paper presented at the fourth annual short course in highway engineering at the University of Michigan, February 25-March 1, 1918.