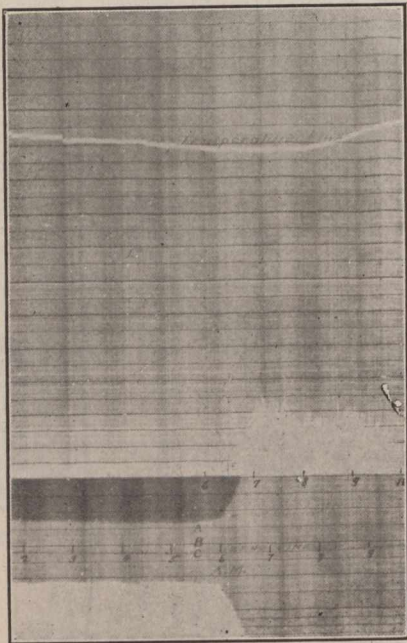


To determine the quantity of water being discharged, a traverse is first made of the pipe at the gauging point, and from this traverse the pipe coefficient (mean velocity divided by center velocity) is obtained. The orifices are then left at the center and the mean velocity at any rate of flow may always be found by multiplying the center velocity by this coefficient.

A preliminary test of the first district was made in August, 1911. There was then a steady flow between 1.30 a.m. and 5 a.m. at the rate of 395,000 gallons per 24 hours. The district was subdivided and it was found that this high night rate was quite evenly distributed over all the streets. The services were sounded with an aqua-phone and a large number of houses were found to have a continuous flow of water during the night. The mains were also carefully sounded and no evidence of leakage could be found. Inspection of the fixtures in the houses in this district showed a large number of leaks, but in several houses with a continuous night flow, the fixtures were found to be in good condition, thus showing wilful waste.



A Photo Record With Prism Attachment Recording Both Legs of U-Tube.

A district almost entirely residential was gauged, and the minimum night flow found to be 395,000 gallons per twenty-four hours, or about 77.75 per cent. of the mean flow.

A few services were found to be leaking between the curb cock and the main, and these were repaired. After these repairs had been made and the houses inspected, the night flow was again taken and showed a reduction of only 50,000 gallons per twenty-four hours.

As this district was still in a very unsatisfactory condition, the engineers took the streets with the heaviest night flow and shut off all the services; it was then found that the flow to these streets stopped. This showed that the waste was in the houses and that there was no leakage in the mains.

A leak of 170,000 gallons per twenty-four hours was found; this was caused by a break in a 1-inch service pipe, which singularly enough occurred just inside a sewer through which it passed.

The twenty-two districts gauged with the recording pitometer showed a total mean flow of 10,618,000 gallons per twenty-four hours, and a minimum night flow at the

rate of 7,185,000 gallons per twenty-four hours, or about 67½ per cent. of the mean flow.

In the districts subdivided, it was found that the high night flow is almost entirely caused by waste inside the houses. This is due to leaking fixtures, careless and wilful waste, and can only be controlled by the installation of meters.

The mains in these districts are remarkably free from leakage, as shown by our tests, for after closing all the curb cocks the flow practically stopped, thus proving the mains to be tight.

CONCRETE ROADWAYS.

Concrete roads have been the principal type of road built by Wayne County, Michigan, and concrete roads are the accepted standard of construction. The road commissioners state that their aim is to provide the county with durable, permanent roads. They believe that the concrete road that they devised and built has accomplished their purpose, and that that type of road is the coming roadway. It is a road that is low in ultimate cost, pleasing to the eye, smooth, dustless, and affords excellent traction for all types of vehicles. While their early efforts at concrete road building were somewhat experimental they have devised several means in their methods of construction which will add materially to the life of concrete roads. Among the more important improvements have been.

- (1) The increase of the amount of cement used in the mix, changing from 1-2-4 mix to 1-1½-3 mix;
- (2) More stringent specifications as to quality of stone and sand;
- (3) An increase in the depth of the work to not less than 7 inches;
- (4) A protecting plate at the expansion joint.

The Eureka road in Wayne County is a typical example of the type of roads built. Eureka road is one of the principal roads leading into Wyandotte. It is built of concrete of a 1-2-4 mix with 12 feet of metal, 23 feet over all at its narrowest point. It was built last fall, and additional mileage will be constructed at an early date.

The following is a statement of the expenditures on Eureka road, a stretch one mile in length, up to and including September 30, 1911:—

Roadway Proper.	Cost.
Teams	\$ 980.00
Other labor	3,364.15
Pebbles, tons 2,014	1,657.78
Sand, tons 700	684.94
Cement barrels 1,218	1,723.97
Coal, tons 60.75	189.45
Expansion joints	77.60
Lumber and engineers stakes	14.31
Water supply	110.14
Blue prints, advertising photos	11.47
Lubrication, waste, etc.	48.51
Liability insurance	49.41
Hardware and repairs	27.50
Express, messenger and auto	53.03
Miscellaneous	48.81
	\$9,041.07
Drainage.	
Open ditch	\$ 265.01
Tile drains	48.84
	313.85
Total cost of roadway proper with drainage....	\$9,354.92