

CONCRETE BRIDGE FAILURE

During the summer of 1909, there was erected on Concession B, Township Etobicoke, York County, Ontario, a concrete bridge. The reproduced photo gives some idea of the style of the structure.

The span was ten feet, making the opening through the bridge for the water ten by six. From the bed of the stream to the top of the concrete guard the height was about twenty-six feet so that when the roadway was filled in there was about thirteen feet of earth over the floor.

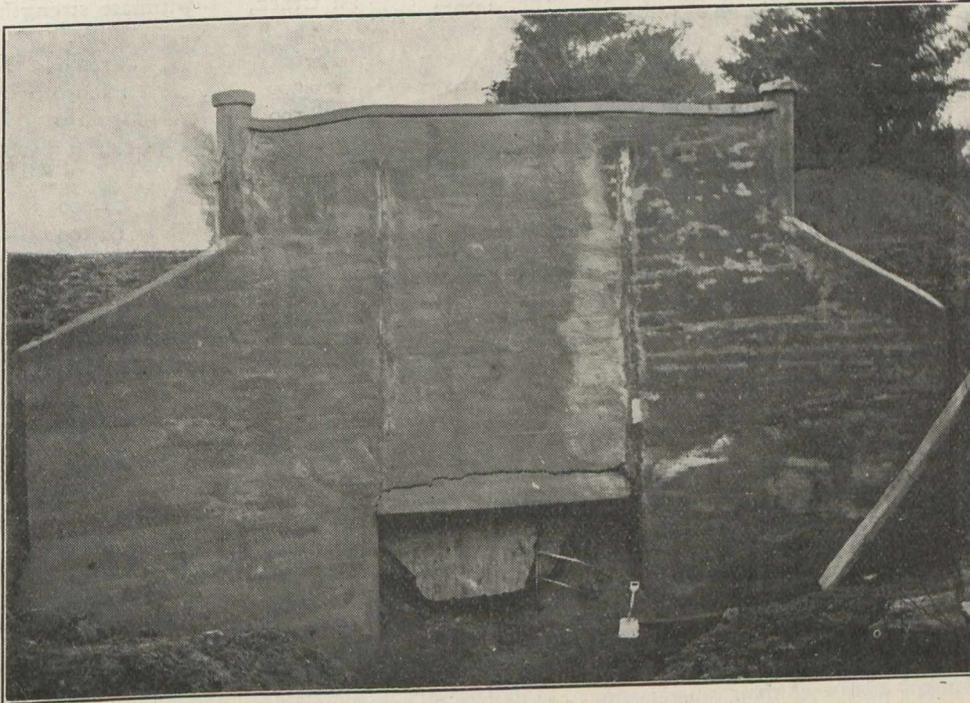
The reinforcement consisted of three-quarter inch plain rods placed two foot centres in the walls and twelve-inch centres in the floor.

After the bridge had been completed nearly two months and the thirteen foot fill over the floor completed the centres were struck and almost immediately the floor fell.

The accompanying photo gives a good idea of the break. The floor fell in, the horizontal crack in the face of the wall shows the depth of floor.

On examination the concrete appeared good being of correct proportion and had set well. The weakness appeared to be in the design.

A calculation made from measurements taken after the failure shows a stress of at least 41,500 pounds per sq. in.



Cheeney Creek Bridge after failure

on the steel in the floor slab and a stress of 1,100 pounds per sq. in. in the concrete.

This certainly looks like a case where the design has been at fault.

Municipalities are slow in learning that they must employ competent engineers in connection with engineering work, and contractors familiar with such work are learning to leave work alone unless it has been designed by engineers known to be experienced.

Peat fuel for locomotives has been unsuccessfully experimented with by engineers of the Swedish federal railways. The fuel has proven too soft to form a proper fuel bed when fired alone. A type of firebox may be designed which will be more successful. If such a successful design should be evolved it is reported that the railways would place several peat-burning locomotives in regular service.

CONTROL OF WORKMANSHIP ON ASPHALT PAVEMENTS.*

By L. Kirschbraum, Municipal Asphalt Laboratory, Chicago,

Undoubtedly there have been more failures on account of improper mixing and handling of good materials than in the use of inferior ones. To secure good results depends not only on laboratory inspection, but also upon trained inspectors at the asphalt plant when the mixtures are prepared and at the street where the materials are being laid.

Upon the establishment of an asphalt plant inspection bureau for the City of Chicago by the late Andrew Rosewater, M. Am. Soc. C.E., general instructions were issued to plant inspectors which read as follows:

Inspectors at asphalt plants are hereby instructed to take note daily of the materials used in the proportioning of paving mixtures, both as to their physical nature and the quantities, by measurements and weight.

It is desirable for the preparation and maintenance of proper records in connection with work, under contract with the city, to note the name and brand of each kind of material used, and in compounding mixtures to see them measured and weighed and observe, whatever proportions are

used in the various mixtures, whether a uniformity is maintained, and if no uniformity or system is observed, to embrace such facts in the reports.

Contractors are expected to afford all necessary conveniences for such inspections. If obstacles are placed in the way of securing desired information, or facilities are denied by any contractor, the inspector must note same in his daily report, with the alleged reasons.

Samples of asphaltic cement used shall be sent daily to the laboratory for testing purposes, also the street surface mixtures. Separate samples of other materials called for by the chemist shall be taken for examination and test to the laboratory. Anything relating to materials received at the plant, or to operations in their mixture and handling, shall be noted on the daily reports sent to the laboratory.

* From a paper in the Michigan Technic.