

Institute of Canada as such be requested to vote upon it? But even assuming that the Act applies only to engineers in private practice, surely we may ask whether this is the full fruition of the legislative hopes that have been raised in the Institute meetings, and is this the only outcome of all the proposals and questionnaires that have been laid before us? Are the rest of us to shift for ourselves? Meetings have been suggested and have actually been held in certain branches for the promotion of the interests of professional technical employees or employed engineers. These gentlemen constitute a numerous section of the Institute membership, but within the Institute form probably an uninfluential group; however, it is the group that most assuredly and most urgently needs recognition and consideration. The bait of "legislation" has been hung out for such engineers to bite at and their votes have apparently been obtained in favor of some degree of legal action, but what are they going to gain? By the present bill—Nothing! From the present activities of the Institute branches—also nothing! (seemingly). What is to be the solution? It would appear from the general trend of opinions expressed that some solution is desired. Have we, therefore, an official precedent or example set for us in this protective measure for engineers in private practice? Must we also seek an "Association of Employed Engineers," separate and distinct from the Engineering Institute of Canada to attend to this feature of our joint welfare? Such a scheme has been suggested, and in other countries such associations are being shaped. Should the association, if formed, seek government recognition and have its members rated as professional men? These are some of the questions that should attract the attention of the corporate members of the Institute, and it is seriously hoped that some means may be found, apart from a pure union, by which the general interests of the professional employees may be advanced. In the meantime *READ THE PROPOSED ACT AGAIN* and ask for a meeting of your branch *BEFORE THE BALLOT IS CALLED*.

P. L. PRATLEY.

Westmount, Que., May 13th, 1919.

CORRECTION

IN the placing of Figure 1 on page 449 of last week's issue of *The Canadian Engineer* the cut was inadvertently reversed. Those who are interested in "The Bulk

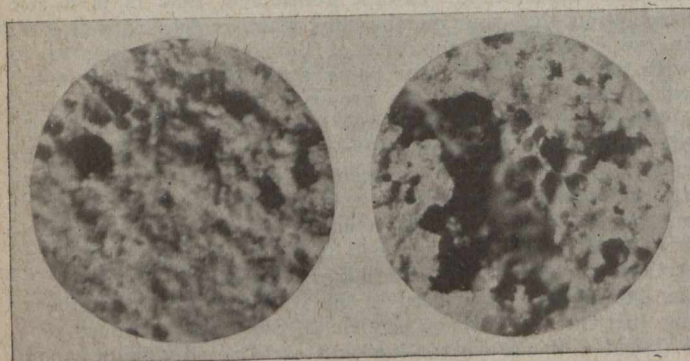


FIG. 1.—TEXTURE OF CEMENT MATRIX IN CONCRETE OF DIFFERENT CONSISTENCY (x 60)

ing Effect of Moisture in Sands" will please note the change in the accompanying corrected reproduction of Fig. 1.

It is rumored, although unconfirmed, that the steel contracts for the proposed bridge over the Niagara River, near Bridgeburg, have been let. The construction of this bridge, if proceeded with, will take five years to complete.

HOT MIX ASPHALT PAVEMENTS*

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THE very desirable quality of flexibility possessed by bituminous pavements makes it necessary to provide a stable foundation. If the foundation is unstable and sinks after the pavement has been put down, the pavement will gradually sink with the foundation, thus forming a depression in which water will collect and eventually destroy it. The wheels of vehicles passing over such depressions will drop into them, the force of the blow depending upon the weight of the load and its speed, and this will further exaggerate the depression by forcing up a portion of the pavement immediately in front of it. It will also set up a vibration in the springs of the vehicle which will cause successive blows to be dealt to the pavement until the spring vibration returns to the normal. This action, especially in commercial vehicles where the springs are short and stiff, results sooner or latter in wave formation which is unpleasant to ride over and which, when it once sets in to any considerable extent, rapidly increases until it becomes necessary to resurface the street or road. The same effect will be produced on a rigid foundation when the bituminous pavement is lacking in stability, due to a poorly graded mineral aggregate, too soft or too much bituminous cement, or a combination of these.

Drainage

The character of the foundation required will depend upon the traffic, climate, character of subsoil and drainage conditions. The heavier the traffic the stronger must the foundation be. In cold climates where the ground freezes to considerable depth in winter, the spring thaws produce a very unstable condition of the subsoil and in such cases the foundation must be stronger than is required in climates where there is little or no frost. A well drained sandy soil is much less affected by these temperature changes than is a heavy clayey soil. In all foundations, drainage is by far the most important single consideration. With adequate drainage, a much thinner foundation can be laid than where it is absent or imperfect and the cost of proper drainage is often far less than the added cost of an adequate foundation on imperfectly drained ground.

A number of different types of foundations have been successfully employed, such as old Macadam or Telford; broken stone rolled dry or cemented together with some form of bituminous cement; old cobblestone, Belgian block or granite set pavements, old brick or asphalt block pavements; bituminous concrete; natural cement and Portland cement concrete.

Where the traffic is light, as on country roads which are not main arteries from or between large cities and in some residential streets, old Macadam or Telford roads have proved to be suitable foundations for bituminous surface mixtures. In the opinion of the writer, Telford is preferable to Macadam owing to the fact that the larger stones composing its base have a partial slab effect and therefore resist more strongly any pressure tending to displace them or to force them into the subsoil. In some cases, notably the Thames embankment in London, a macadam foundation covered with an asphalt pavement has successfully carried very heavy traffic, but the layer of stone has been built up during many years and is very thick and the drainage is nearly perfect. Under very severe conditions the use of Macadam or Telford as a foundation for bituminous pavements is to be deprecated and more failures than successes have resulted from it.

Existing Pavements Utilized

Many roads are classified as Macadam which contain no base course of large stone and are in reality old dirt roads which have never been properly drained and on which fine stone has been dumped and consolidated by traffic. Before using any Macadam road as a foundation, its history,

*Abstracts from paper read before the Sixth Canadian Good Roads Congress, May 21st, 1919.