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63-F-3

CULVERT OVER

BLACK

CREEK.

Mr. A. M. Toye,
Bridge Engineer,
Bridge Division.

Attn: Mr. K. L. Kleinstelber,
Municipal Bridge Liaison
Engr.

Mr. A. G. Stermac,
Principal Foundation Engr.,
Foundation Section,
Materials & Research Division.
January 14, 1963.

Site Visit by K. G. Selby, to Municipal Contract -
Twp. of Bleheim Culvert over Black Creek, Lot 13,
Con. VIII, IX, County of Oxford. -- W.J. 63-F-3.

A request was made to the Foundation Section by Mr. K. L. Kleinstelber, to visit the above-mentioned site on January 8, 1963, where the contractor was experiencing some difficulties in carrying out the excavation for the culvert footings.

The proposed structure is an 18' span, 60' long, rigid frame concrete culvert, founded on timber piles. At the time of the visit, the piles had been driven and excavation was in progress for the footings. The total depth to the bottom of footings was about 10' below ground level. Over about 25% of the excavation, the full depth had been reached, whilst the remainder varied in depth from about 5 to 8 feet. The whole excavation was encased in thin, wooden sheeting driven to about 4' below the footing level. Some bracing was provided between the piles and between the piles and the sheeting.

At two locations adjacent to piles, a rapid flow of water was coming through the bottom of the excavation. This water was creating very unstable conditions in the area affected.

Subsoil at the site was observed to consist of about 4' of muck underlain by about 14' of very soft organic clay or organic silt (sometimes called marl), followed by dense sand and gravel. The organic deposit, in its undisturbed state, is somewhat impermeable, but can change its strength properties rapidly in the presence of disturbances, such as pile driving.

The following observations were made by the writer:

- (1) The protection provided for the excavation sides, was inadequate.
- (2) The dewatering scheme (consisting of a shallow, unprotected sump pumped out by a single pump), was inadequate.

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Bridge Engr.
Attn: Mr. K.L. Kleinsteinber.

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- (3) Because of the points mentioned in (1) and (2), earth movements had taken place, resulting in the two rows of piles being deflected in towards the centre for distances up to about 12" at the top. It was not possible to assess the amount of permanent damage to the latter.

The following advice was given to the contractor after bringing to his attention, the above-mentioned observations:

(1) Steps should be taken to improve the stability of the excavation sides, by providing adequately braced sheeting and trimming the excavation sides to provide more favourable slopes.

(2) Additional sumps should be constructed and properly boxed in, at the locations where the water flow was coming out of the ground surface.

In addition to the above, a discussion took place at the site between the writer and Mr. Hoyt of Ure & Smith, Consulting Engineers. As a result of this, it was agreed, subject to certain changes in the contract price, to alleviate the construction situation somewhat, by raising the elevation of the footings slightly, providing 6" working slabs and permitting the footings to be poured in two stages.

We would like to point out at this time, that the description of the upper 18' of subsoil was given on Drawing #1 - (Ref. B-362-A), as soft clay and silt. Such a material would have different properties from the material which we have classified as organic clay or organic silt.

KGS/MdeF
Encl.

cc: Foundations Office ✓
Gen. Files.

K. G. Selby
K. G. Selby,
SENIOR FOUNDATION ENGR.
For:

A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

P.S. -- Enclosed, we are returning
your file No. 11171.