

# memorandum



To: D. Lai, P. Eng.  
Head, Design Review  
Approvals Section  
Structural Office

Date: 95 07 20

From: Pavements and Foundations Section  
Room 315, Central Building

Subject: Hwy 11, Vernon Lake Narrows Bridge NBL  
W.P. 74-70-03, Cont. No. 77-130, Site No. 42-18  
District 52, Huntsville

We refer to your request on 95 07 13 for a review of the pile capacities for the existing bridge at the above-noted site location. We understand that some rehabilitation works will be required for this structure and will consequently result in an increase in loading to the bridge foundation.

Based on the contract drawings that you sent us, the piers are supported on groups of steel caisson tubes. Each caisson tube consists of a steel liner driven into the non-cohesive soil stratum at a designated depth. The design requires the soil inside the tube be removed, three H-piles driven through the tube to bedrock, and the tube filled with concrete.

In general, for piles driven to bedrock, the stability of a pile group is governed by that of the individual pile. There is no risk of a block failure unless the piles are resting on a steeply sloping rock formation and sliding on a weak clay-filled bedding plane adversely oriented in the direction of loading. No reduction in pile capacity due to group effects is considered necessary.

We have reviewed the subsurface conditions and recommendations given in the original foundation report for this structure. Based on our review, we recommend the following capacities for a 'steel caisson tube' with three 310X110 or 310X79 H-piles for design review purposes, in accordance with the O.H.B.D.C.:

	HP310X79 (Pier 1-3, 5 and 6)	HP310X110 (Pier # 4)
Factored Axial Capacity at U.L.S.	3450 kN	4800 kN
Axial Capacity at S.L.S.	2670 kN	3450 kN

We believe the above is sufficient for your present purposes. Should you require further information, please contact us. As requested, the drawings are returned with this memorandum.

A handwritten signature in black ink, appearing to be 'D. Kwok', written over the printed name.

D. Kwok, P. Eng.  
Project Foundation Engineer  
for  
T. Kim, P. Eng.  
Senior Foundation Engineer

From: David Lai  
To: Dundas  
Date: 7/13/95 5:31pm  
Subject: VERNON LAKE NARROWS BRIDGE NBL SITE NO. 42-18

TAI KIM;

WE ARE CURRENTLY EVALUATING THIS BRIDGE FOR SOME INCREASE IN LOADING. PLEASE ADVISE US THE CAPACITY OF THE ORIGINAL PILES. THE DRAWINGS SHOW THE H-PILES WERE DRIVEN IN GROUP OF 3 INSIDE A CASING AT VERY CLOSE SPACING WHICH MAY NECESSITATE A REDUCTION FACTOR.

A COPY OF THE GENERAL ARRANGEMENT DRAWING AND THE FOUNDATION DRAWING WOULD BE SENT TO YOU ASAP.

DAVID LAI



*Daniel K.*

*Would you review this file and  
see me next week.*

*Thanks,*

*July 14, 1995*

*Tai*