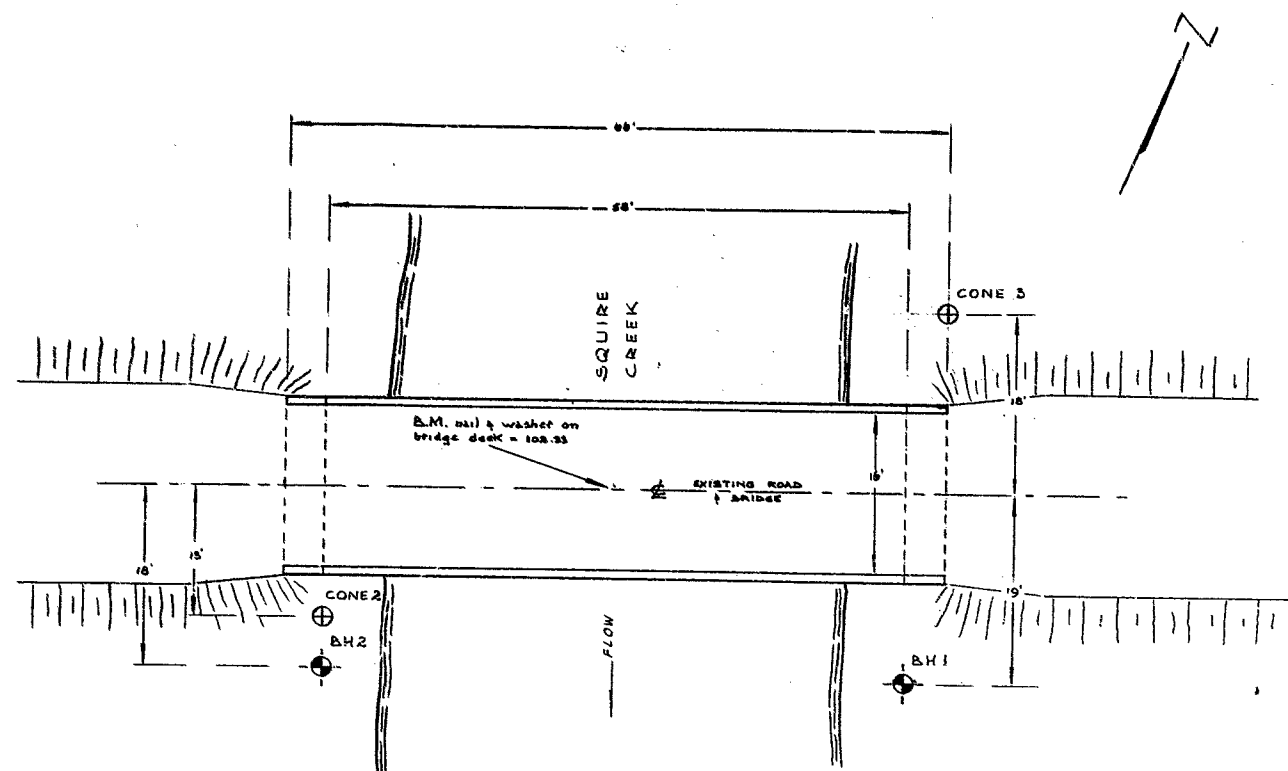
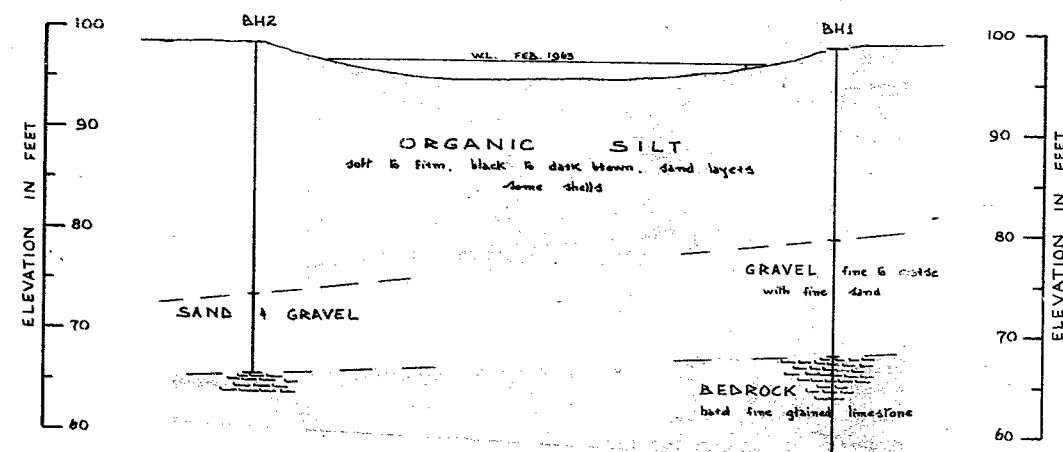


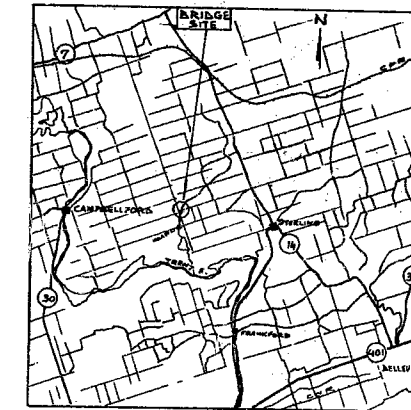
63-F-229M  
GUERNSEY BRIDGE  
OVER SQUIRE CREEK  
LOT 24, CON. 4  
RAWDON  
NEAR HOARD STATION



BOREHOLE LOCATION PLAN  
SCALE 1" = 10'



ESTIMATED SUBSOIL STRATIGRAPHY  
SCALE: VERT & HOR 1" = 10'



SITE PLAN  
SCALE 1" = 6 miles

W. A. TROW & ASSOCIATES LTD.		
FOUNDATION INVESTIGATION		
COUNTY BRIDGE REPLACEMENT		
OVER SQUIRE CREEK		
CONCESSION 4, LOT 24		
TOWNSHIP OF RAWDON		
PROJECT NO 1054	FEBRUARY 1963	DRAWING NO 1

MEMORANDUM

To: Mr. A. Stermac,  
Principal Foundation Eng.,  
Lab. Bldg.

FROM: G. C. E. Burkhardt

DATE: June 26, 1963.

OUR FILE REF.

IN REPLY TO


SUBJECT: County of Hastings,  
Guernsey Bridge over Squire Creek,  
Township of Rawdon,  
Lot 24, Con. IV,  
Structure Site No. 15-93,  
Our File No. 1663

Attached please find one copy of the Foundation Report, by William A. Trow & Associates Ltd., for your comments.

The proposed bridge is a 50 foot single span simply supported structure with concrete abutments. The bottom of the footings will be at EL. 91.0. The structure will be founded on Class B Timber Piles, driven to EL. 65.0ft.

We hope to approve the plans no later than July 12th, 1963, and we would appreciate it very much, if we could have your comments prior to this date.

GCEB/ah

  
G. C. E. Burkhardt,  
for K. L. Kleinsteinber,  
Municipal Bridge Liaison Engineer.

*In comment*

*By phone June 27, 1963*

*A. Stermac*

**BA 113**

**WILLIAM A. TROW AND ASSOCIATES LTD.**

SITE INVESTIGATIONS  
LABORATORY TESTING  
SOIL MECHANICS CONSULTATION

W. A. TROW, M.A.Sc., M.E.I.C., P.ENG.

1850 JANE ST.,  
WESTON, ONT.  
CH. 1-4644

Project: J1054

March 11, 1963

Mr. G.L. Totten, P.Eng.,  
Consulting Engineer,  
41 King Street East,  
Cobourg, Ontario

Re: Foundation Conditions  
Proposed Bridge Replacement Over Squire Creek  
Near Hoard Station, Ontario

Dear Sirs:

In conformance with verbal arrangements with Mr. Langlois and yourself during February, we have made an investigation of subsoil conditions at this creek crossing, which is located on the country road between Concessions III and IV, Lot 24, in Horden Township.

It is understood that the bridge replacement will incorporate an increase in width downstream toward the south and that the road and bridge grade will remain essentially unchanged. The foundation problems involved in this construction, therefore, will be concerned almost entirely with the type and bearing level of the abutment supports.

Since only one means of permanent support appears feasible at this site, and since there will be no particular foundation difficulties if the road grade is unchanged, we shall take the liberty to be brief in our submission to you. Our comments and recommendations are outlined under the sections that follow.

SITE

The site of this creek crossing lies in a flat stretch of land which, - according to geological records, - lies in a small embayment of Glacial Lake Iroquois projecting into the drumlinized land to the north. Glacial drumlin hills pointing in a south westerly direction rise from this flat land and from the more rolling terrain farther to the north. About 500 feet to the west of this bridge the flood plain of the creek is terminated by a ridge of land about 30 feet high. This, probably, is a drumlin formation partially submerged by the alluvial deposits of Lake Iroquois and Squire Creek.

The creek meanders in a north - south direction at this crossing and the flow is sluggish. It is reported that the spring floods never reach closer than about 2 feet from the bridge deck. However, since the level of the road surface to the west is at least 2 feet lower than the bridge deck, it is probable that the flood waters follow this route. At the time of the investigation the water level or ice surface was about 5½ feet below the deck, - the water was about 1 to 2 feet deep and the creek bed was very soft.

Photographs of the bridge and the surrounding land are included with this report. The bridge is a steel truss structure supported on simple timber cribs.

SUBSOIL

The subsoil at this site consists of soft to firm compressible organic clayey silt with sand layers and numerous shells. This material changes at depths of 19 to 25 feet to medium dense sand and gravel and at approximately 31 feet to hard limestone

bedrock. The shear strength of the organic silt, according to field vane tests, ranges approximately from 700 paf down to 250 paf, which values are too low to support any load of consequence.

The descriptions of the soil at each test location are presented in the borehole logs and in the stratigraphical profile of Log. 1.

#### FOUNDATIONS

As inferred in the foregoing section, the upper organic silt deposit is too weak and compressible to support any concentrated bridge loading. Even if the existing timber crib arrangement were to be utilized as a short term construction measure, the proposed widening of the bridge would involve an extension of the crib over organic soil that has not experienced any surcharging effect. Differential settlement, therefore could be expected.

Consequently, the new structure must be supported on piles, which probably will penetrate through the sand and gravel stratum to bedrock. Timber piles should be quite acceptable for this purpose. The permissible loading on timber piles will equal their safe structural capacity when considered as short columns. Some batter piles may be required to accommodate traffic forces.

Scouring of the creek bed does not seem to be significant at the existing crossing, although snow and ice cover precluded precise observations on the extent of erosion of the banks. If the grade of the roadway is increased, however, so that an overflow over the west end is prevented, this situation could change. Consequently, it may be desirable to install light sheet piling along the exposed faces of the abutments to protect the tops of the piles and the

adjacent edges of the roadway fill. The decision on this matter would require some study of the anticipated hydraulic conditions which is beyond the scope of this report.

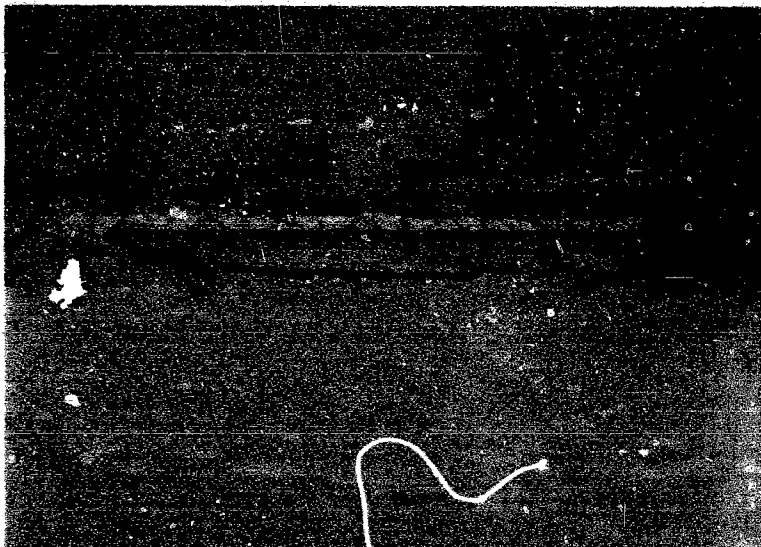
If you have any comments regarding the foregoing information, or if any other queries come to mind after you have reviewed this report, we shall be pleased to discuss them with you.

Yours very truly,



WAT/go  
Encls.

*WAT*  
William A. Trow, P.Eng.

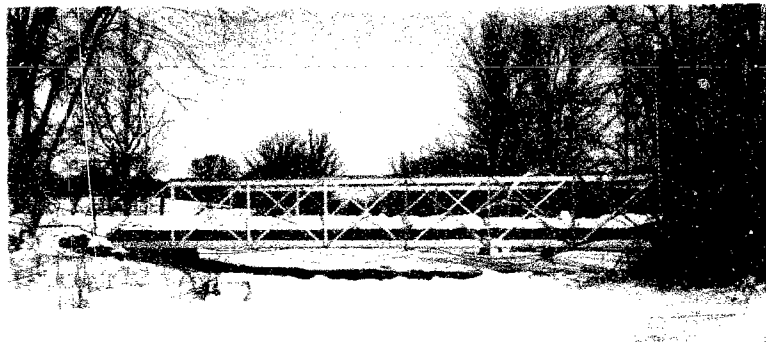


Bristing Bridge - From the South



View From Bridge Deck Looking West





BRIDGE OVER LAKE AT TROW'S



WALKWAY THROUGH PARK AT TROW'S



from the seat



SUPER IMPROVED MOVEMENT MAY  
APPEAR AS MULTIFIELD ON FILM.

# WILLIAM A. TROW & ASSOCIATES LTD.

SITE INVESTIGATIONS · SOIL MECHANICS CONSULTATION

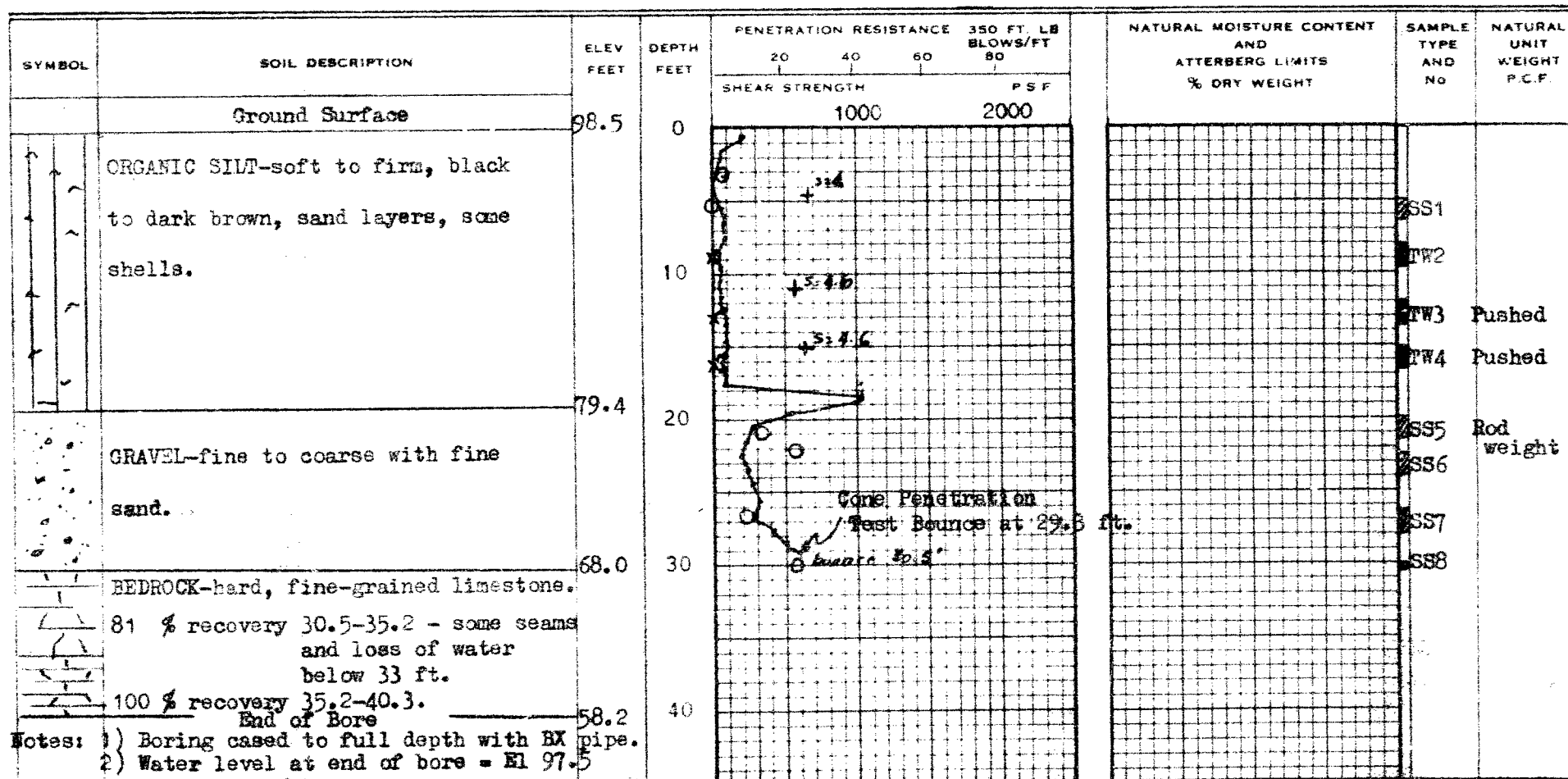
## LEGEND

DRAWING NO. 2  
PROJECT NO. J1054

BOREHOLE NO. 1  
PROJECT County Bridge Replacement over Squire Creek  
LOCATION Concession 4, Lot 24, Rawdon Twp.  
HOLE LOCATION See Dwg. 1.  
HOLE ELEVATION 98.5 ft.  
DATUM See Dwg. 1.

PENETRATION RESISTANCE  
2" O.D. SPLIT TUBE —○—○—○—  
2" I.D. SHELBY TUBE \*—\*—\*—\*—\*—  
2" DIA. CONE ————  
SHEAR STRENGTH  
UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE ⊕  
UNCONFINED COMPRESSION ⊗  
VANE TEST AND SENSITIVITY (S) +<sup>s</sup>

NATURAL MOISTURE CONTENT AND LIQUIDITY INDEX X<sup>LI</sup>  
ATTERBERG LIMITS  
LIQUID LIMIT —○—  
PLASTIC LIMIT —+—  
SAMPLE TYPE  
2" O.D. SPLIT TUBE ————  
2" I.D. SHELBY TUBE ————  
3" O.D. SHELBY TUBE ————



# WILLIAM A. TROW & ASSOCIATES LTD.








SITE INVESTIGATIONS SOIL MECHANICS CONSULTATION

## LEGEND

DRAWING NO. 3  
PROJECT NO. J1054

BOREHOLE NO. 2  
PROJECT County Bridge Replacement over Squire Creek  
LOCATION Concession 4, Lot 24, Rawdon Twp.  
HOLE LOCATION See Dwg. 1.  
HOLE ELEVATION 98.5 ft.  
DATUM See Dwg. 1.

### PENETRATION RESISTANCE

2" O.D. SPLIT TUBE   
2" I.D. SHELBY TUBE   
2" DIA CONE   
SHEAR STRENGTH   
UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE   
UNCONFINED COMPRESSION   
VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE CONTENT AND LIQUIDITY INDEX



 LI

ATTERBERG LIMITS

LIQUID LIMIT 

PLASTIC LIMIT 

SAMPLE TYPE

2" O.D. SPLIT TUBE   
2" I.D. SHELBY TUBE   
3" O.D. SHELBY TUBE 