

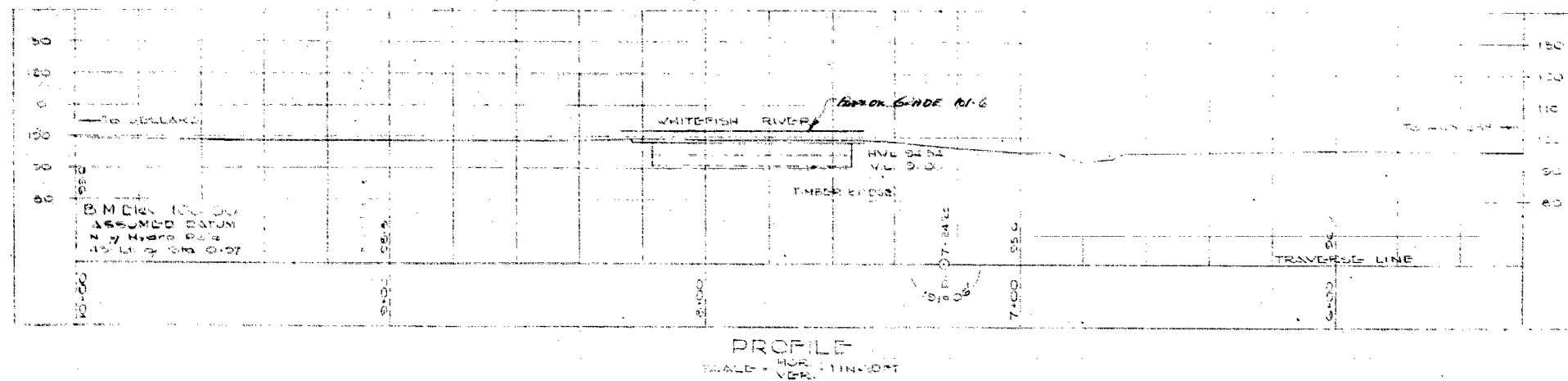
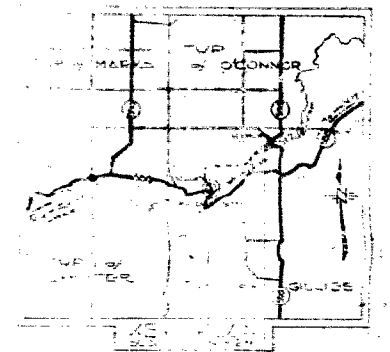
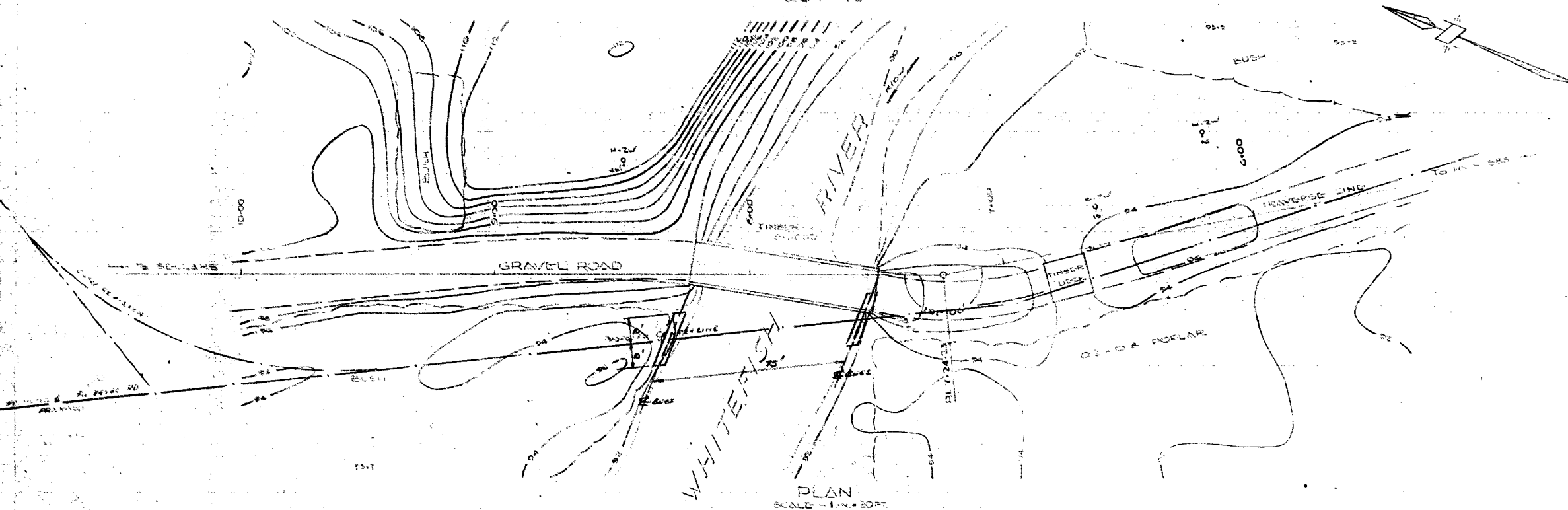
63-F-5

W.P. # 701-64

WHITEFISH R.

SELLARS RD.

DISTRICT OF THUNDER BAY
TOWNSHIP OF GILLIES
CON. V
LOT 10



DEPARTMENT OF HIGHWAYS - ONTARIO	
PLANNING SECTION	
DISTRICT NO. 19	
BRIDGE CROSSING	
WHITEFISH RIVER	
AND	
SHELLARS ROAD	
CON. V	
TOWNSHIP OF GILLIES DISTRICT OF THUNDER BAY	
BRIDGE SITE	
DESIGNED BY J. J. J. J. J.	APPROVED J. J. J. J. J.
DRAWN BY DRAFTERMAN - D. J. J. J.	DATE OF SURVEY - AUG 1962
CHECKED BY J. J. J. J. J.	DATE OF PLAN - SEPT 1962
SUPERVISOR	PLAN

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

Attn: Mr. K. L. Kleinsteinber,
Mun. Bridge Liaison Engr.

Mr. A. G. Stermac,
Principal Foundation Engr.,
Foundation Section,
Materials & Research Division.
February 20, 1963

W.J. 63-F-5

- D.H.O. FOUNDATION INVESTIGATION -

Whitefish River and Sellars Road Crossing,
Township of Gillies, Lot 10, Concession V,
District of Thunder Bay - District No. 19.

We have reviewed the Foundation Report prepared by the D.H.O. Regional Soils Branch, Fort William, for the above-mentioned proposed structure, and submit the following comments:

1) In the Foundation Report, it is recommended that the footings be located at elev. 84.0±; however, this depth should be governed by hydrological requirements.

2) Excavations for the footings may be carried out in a fine-grained subsoil which is likely to become 'quick' when subjected to unbalanced hydrostatic head - i.e., below elev. 83.0. If this is the case, a dewatering scheme must therefore, be chosen which will prevent this from happening. It is suggested that interlocking sheet piling be driven to a depth below the footing base equal to the height of water table above it. The sheeting will also serve for scour protection provided it is left in place.

If we can be of further assistance in the foundation design of this structure, please contact our Office.

MD/MdeF
Attach.

cc: Messrs. A. M. Toye (3)
J. P. Howard
R. E. Dawson
F. Norman
A. Watt

Foundations Office ✓
Gen. Files.

M. Devata
M. Devata,
SENIOR FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

To: Mr. A. Stermac
Principal Foundations Engineer
Downsview

FROM: Mr. R. Morgenroth
Project Soils Engineer
Materials and Research

DATE: January 31st, 1963

OUR FILE REF.

IN REPLY TO

SUBJECT:

DHO FOUNDATION INVESTIGATION

WHITEFISH RIVER AND SELLARS ROAD CROSSING
TOWNSHIP OF GILLIES, LOT 10, CONCESSION V
DISTRICT OF THUNDER BAY - DISTRICT # 19

At the request of the Bridge Planning Unit and yourself, a foundation investigation was carried out by the Regional Soils Branch in Fort William during the first part of January, 1963.

Description of Site

The proposed bridge site is located in a broad flood plain of the Whitefish River. The immediate area is lightly wooded, chiefly by poplar. Access will be easy from either side of the river via very short bush roads which lead off from the existing road. These bush roads are located on the new right-of-way.

The Whitefish River in this area is located in a possible glacial trough. The trough was filled, at least in part, by glacial drift and outwash material, the greater portion of which has since been eroded away by earlier stages of the Whitefish River. The glacial drift deposit reaches depths of 100 feet. At the site, remnants of a 10 to 20 feet thick surface clay layer exists over sand and gravel. Short distances on either side of the river, bedrock outcrops and the drift becomes shallow and gravelly.

Field Work

The field work was carried out between January 7th and January 22nd, 1963, using a skid-mounted drillrig. Three bore holes were drilled to a depth of about 30 feet. Samples were taken at irregular intervals because of the presence of gravel. Conventional wash boring procedures were not employed in these borings because of the gravel strata and cobbles. The results of the bore hole logs are summarized in Appendix I.

A dynamic cone penetration test was done with each bore hole. Not one of these tests exceeded a depth of 20 feet.

The locations of the bore holes are shown on the site plan, Appendix II. Ground elevations and datum references are also indicated. The site plan was drawn from the Planning and Design Branch's Bridge Site Plan dated September, 1962.

Cont'd..

Subsoil Conditions

There were, essentially, two types of material encountered at the site.

1. The upper stratum was a coarse gravel varying in depth from 7 to 11 feet. No samples were taken in this material but the reaction of the machine while drilling and the blocking of the casing while drilling indicated a gravel. Pieces of rock were often recovered after drilling out a "blocked" casing.
2. The second stratum encountered was a dark grey sand varying from a fine sand to a fine silty sand. Some cobbles were encountered in this material particularly in Bore Hole No. 3.

The relative density of this material was medium dense to dense in the upper portions of the stratum and becoming dense to very dense at depths greater than 15 feet. The penetration resistance varied from 25 to 65 blows per foot.

Water Conditions

The water level in each bore hole remained constant at river level. The water in the casing froze shortly after work stopped. However, this is not believed to have affected the water level.

The Whitefish River at the site is normally 2 to 3 feet deep and flows fairly swiftly. The river appears to rise about 3 feet during the spring. No observations have been made about scour conditions but 3 feet seems to be a reasonable estimate.

Local residents have observed the river to flood 4 feet above normal due to the river freezing solid and the water building pressure and breaking through at some weak point in the ice.

Recommendations

1. It is recommended that this structure be founded on spread footings, founded 5 feet below ground level which will be at about elevation 84 feet (using the elevations on the enclosed site plan). Using an 'N' value of 30, a safe bearing capacity of 3 tons per square foot may be used. This will permit a maximum settlement of 1 inch. Since the subsoils are sand, the settlement will occur almost immediately once the load is applied.

Sheet piling will be required to maintain an open excavation, particularly on the river side of the excavation. The sheet piling should be driven to a depth of 15 to 20 feet. The sheet

Cont'd...

piling will provide additional safeguards against scour.

2. Dewatering: Because of the pervious subsoil, dewatering is likely to be difficult. In addition to the sheet piling it is recommended that cofferdams be built round the excavation. This will reduce the danger of creating a quick condition in the bottom of the excavation. It will likely be necessary to use bagged material to build the cofferdams since the current is fairly swift.
3. The approach fills should be protected by riprap to prevent any erosion of the slopes where they may come in contact with the river.

R. Morgenroth

R. MORGENROTH
Project Soils Engineer

For

F. NORMAN
REGIONAL SOILS ENGINEER

RMPdc

c.c. Mr. G. Wrong

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

WHITEFISH RIVER AND SELLARS ROAD CROSSING


W.P. _____ BORE HOLE NO. _____ 1 _____

JOB _____ STATION _____

DATUM 9LQ COMPILED BY R.M.

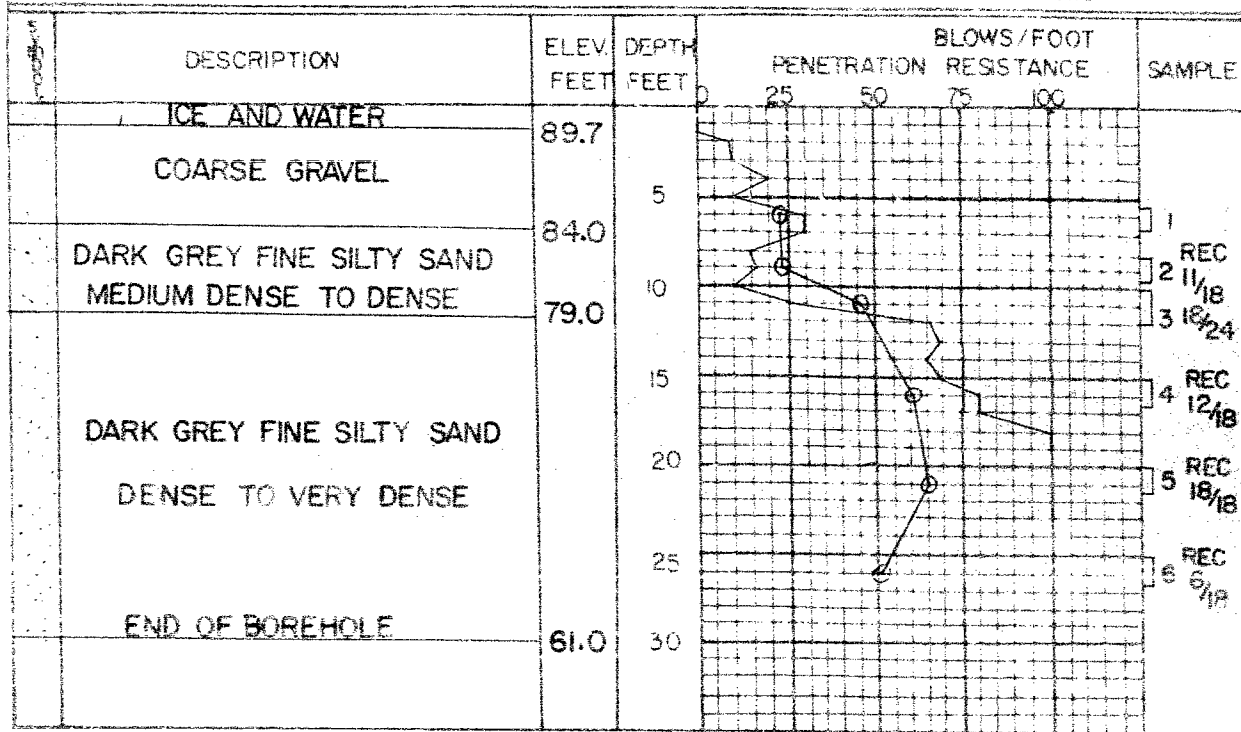
BORING DATE JAN. 7/63 CHECKED BY R.M.

LEGEND

2" Dia. Split Tube 

2" Split Tube 

2" Dia. Cone 



DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

WHITEFISH RIVER AND SELLARS ROAD CROSSING

W.P. _____ BORE HOLE NO. 2

JOB _____ STATION _____

DATUM 9LQ COMPILED BY R.M.

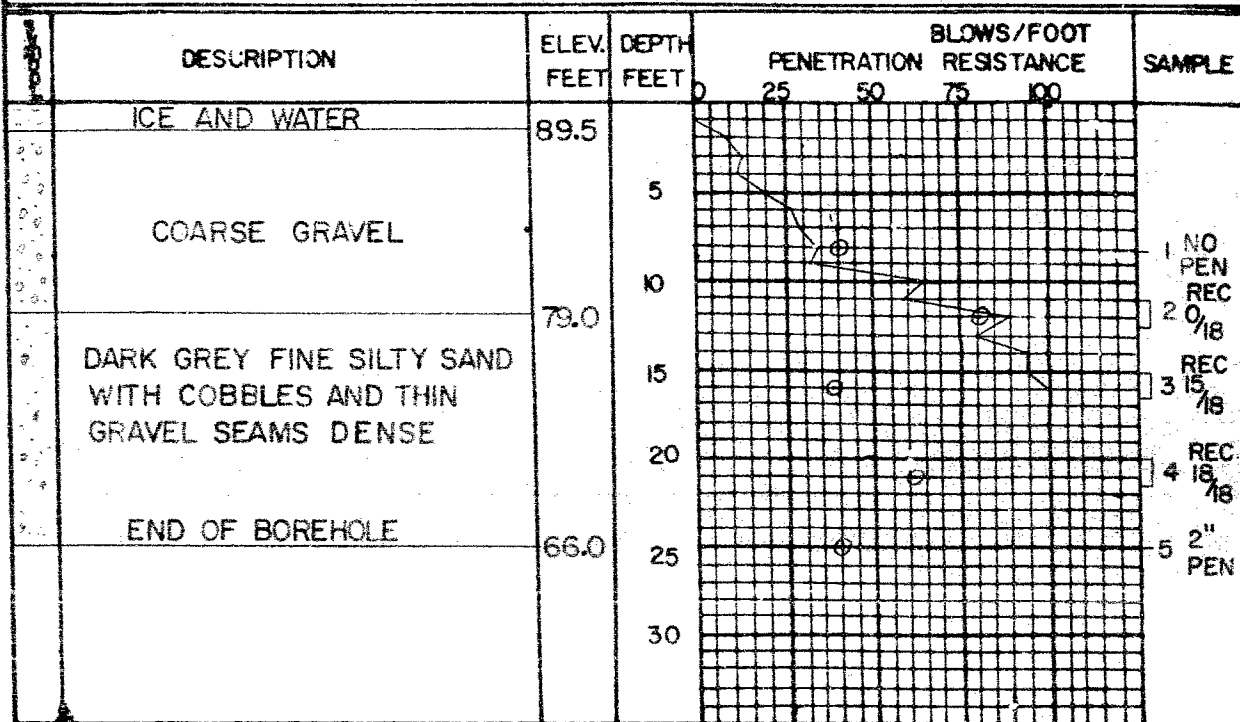
BORING DATE JAN. 9/63 CHECKED BY R.M.

LEGEND

2" Dia. Split Tube 

2" Split Tube 

2" Dia. Cone 



DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION
 WHITEFISH RIVER AND SELLARS ROAD CROSSING

W.P. _____ BORE HOLE NO. 3 _____

JOB _____ STATION _____

DATUM 91.0 COMPILED BY R.M. _____

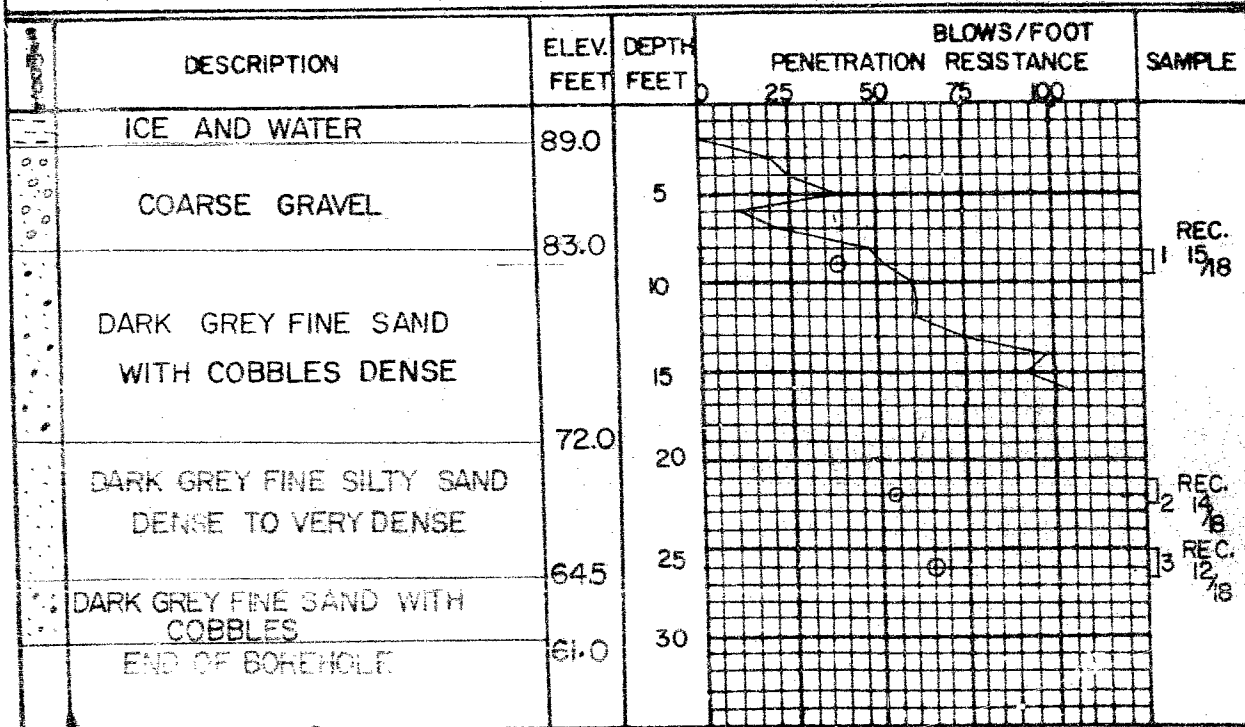
BORING DATE JAN. 11/63 CHECKED BY R.M. _____

LEGEND

2" Dia. Split Tube 

2" Split Tube 

2" Dia. Cone 



APPENDIX I.

March 13/63.

- i) A safe design load of 20-25 tons/pile may be used for timber piles driven to Elev 79.0 (i.e. 10 ft below natural ground)
- ii) Steel Tube piles (12 3/4" OD x 0.25) driven to practical refusal can provide a safe design load of 50 tons/pile. It is estimated that the piles meet refusal @ Elev 70.0 \pm (that is 20' below natural ground)

The above information given to Jack Reid on 12th March/63 in per his request to A. G. Stenmar.

M. Devata

March 13th/63

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. Stermac,
Principal Foundation Engineer,
Room 107 Lab. Bldg.,
Downsview, Ontario.

From: J. C. McAllister

DATE: December 21, 1962.

OUR FILE REF.

IN REPLY TO

SUBJECT: Sellars Br. over Whitefish River
Lot 10 Con. V Twp. of Gilles
District of Thunder Bay

Attached is a cost estimate for a foundation investigation which Mr. F. Norman supplied at the Bridge Planning Engineers request and with your consent.

The superstructure has been designed and a foundation report is necessary to design the abutments.

Attached are two prints of the site plan showing the location of the proposed abutments. We would be pleased if you could have this work done as soon as possible.

I understand that this township road will have a development road designation and the cost of investigation will be recoverable from Municipal Roads Branch.

J. C. McAllister

JCMcA:go
c.c. T. Kovich

J. C. McAllister,
for S. McCombie,
Bridge Planning Engineer.

F. NORMAN WILL UNDERTAKE THE INVESTIGATION
A COPY OF SITE PLAN WAS FORWARDED TO FT. WILLIAM
ON DEC. 26, 1962 WITH A COPY OF THIS LETTER

AS STERMAC

DEC. 26, 1962

MEMORANDUM

To: Mr. S. McCombie
Bridge Planning Engineer
Bridge Planning Unit
Downsview

From: Mr. F. Norman
Regional Soils Engineer
Materials and Research
Fort William

Date: November 13th, 1962

Our File Ref.

IN REPLY TO

SUBJECT: Proposed Structure at Whitefish River on Hwy. 588
Lot 10 Concession V, Township of Gillies
District of Thunder Bay

At your request, I have prepared an estimate of the cost of a foundation investigation at the above proposed structure site.

Our preliminary site investigation shows alluvial sands and gravels to an undetermined depth within the immediate vicinity of the river.

The natural subsoil in this area outside the zone affected by the river is a gravelly fine sand.

If the drilling work can be undertaken in the winter months, a raft for floating the drill will not be required since the ice will offer enough support.

Because of this, it has been necessary to draw up two estimates, one for a winter operation and one for a summer operation.

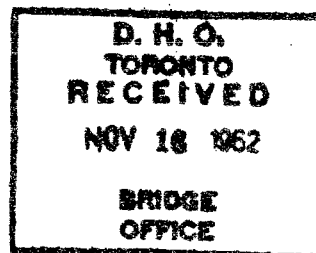
Attached is our estimate sheet delineating the individual charges, based on the most recent schedule of charges available to us.

FM;dc
Attach.

cc. Mr. G. Wrong
Mr. T. Stermac
Mr. T. J. Kovich



F. NORMAN
REGIONAL SOILS ENGINEER



ESTIMATE OF COST OF FOUNDATION INVESTIGATION
PROPOSED STRUCTURE AT WHITEFISH RIVER & HWY. 588
LOT 10 CONCESSION V TOWNSHIP OF GILLIES

DISTRICT OF THUNDER BAY

ITEM	UNIT COST	SUMMER OPERATION UNITS	TOTAL COST SUMMER OPERATION	WINTER OPERATION UNITS	TOTAL COST WINTER OPERATION
Supply & Operate drill	\$ 11.50 per/hr.	24 hrs.	\$ 276.00	24 hrs.	\$ 276.00
Mobilize drill.	\$.50 per/mi.	90 mi.	\$ 45.00	90 mi.	\$ 45.00
Supply & Operate raft	\$ 12.00 per/day	3 days	\$ 36.00	-	-
Mobilize raft	\$.50 per/mi.	90 mi.	\$ 45.00	-	-
Assembly of raft	\$ 7.50 per hr.	2 hrs.	\$ 15.00	-	-
Engineering supervision	\$ 4.50 per hr.	24 hrs.	\$ 108.00	24 hrs.	\$ 108.00
Office Engineering	\$ 4.50 per hr.	8 hrs.	\$ 36.00	8 hrs.	\$ 36.00
Mileage (Engineer)	\$.10 per mi.	300 mi.	\$ 30.00	300 mi.	\$ 30.00
Laboratory Testing	\$ 5.00 per sample	4 samples	\$ 20.00	4 samples	\$ 20.00
Typing of report	\$ 7.00 per report	1 report	\$ 7.00	1 report	\$ 7.00
TOTALS			\$ 618.00		\$ 522.00

TOTAL ESTIMATE FOR WINTER DRILLING \$ 522.00

TOTAL ESTIMATE FOR SUMMER DRILLING \$ 618.00