

#65-F-214

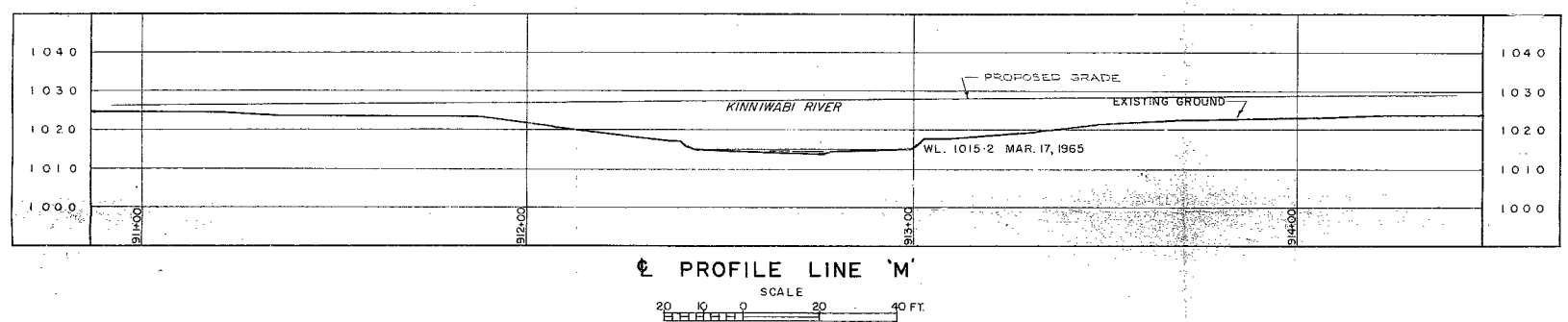
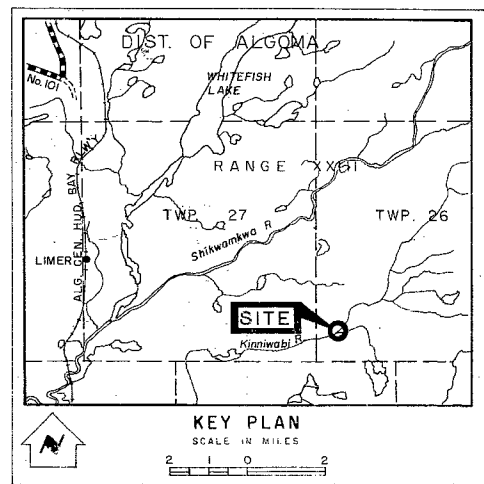
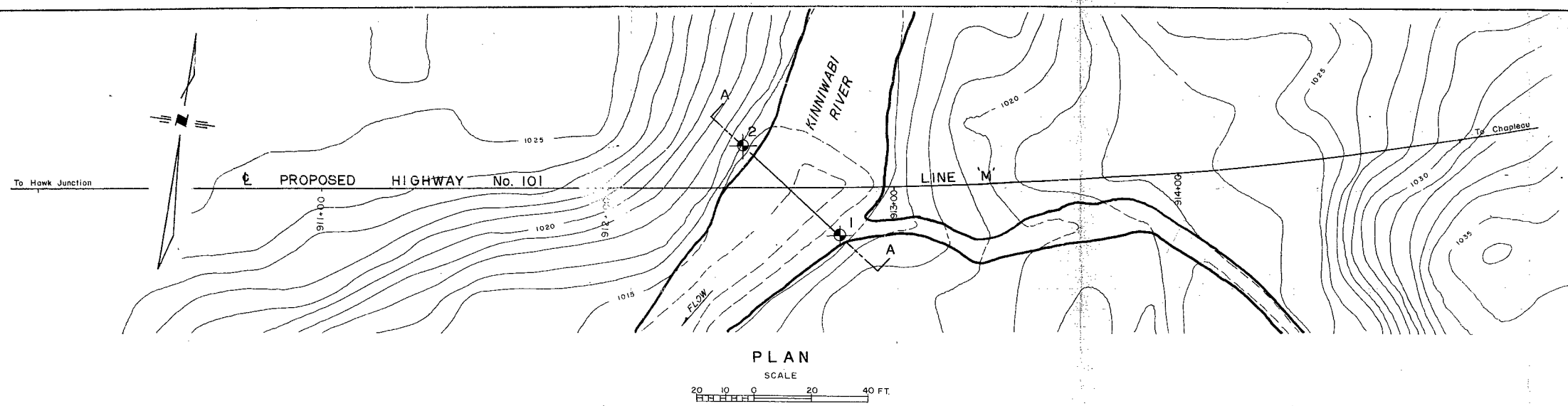
W.P. #82-62

Hwy. #101 E

KINNIWABI

RIVER WEST

CROSSING



LEGEND

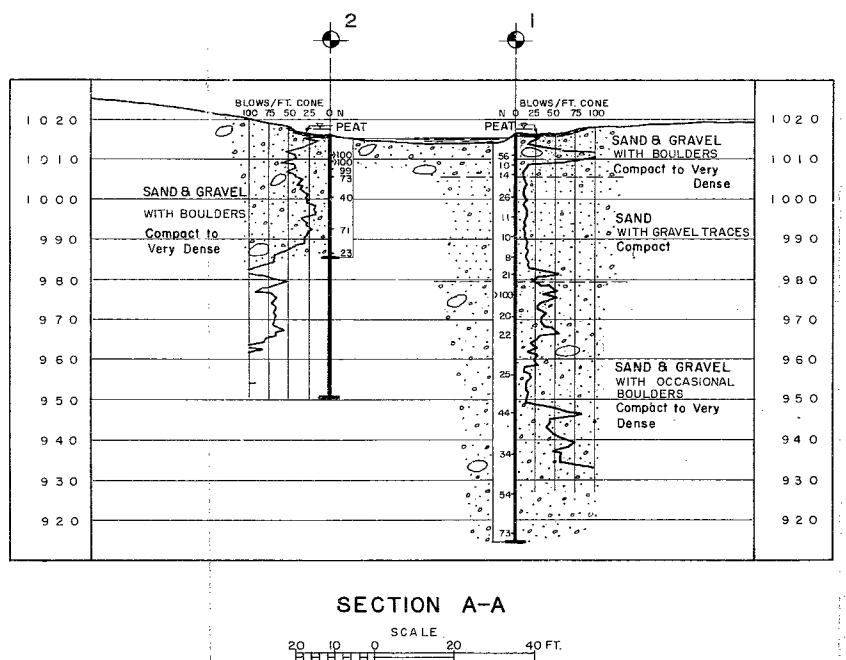
- Bore Hole
- ⊕ Cone Penetration Hole
- ⊕ Bore & Cone Penetration Hole
- ≡ Water Levels established at time of field investigation (MAR. 1965)
- ▽ Artesian Water Condition

NO.	ELEVATION	STATION	OFFSET
1	1016.6	912+81	17' RT.
2	1016.6	912+39	15' LT.

BM. ELEV. 1024.60
N.W. Top 0.4 Spr. Stump
81 Lt. Sta. 909.90

NOTE

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.



REVISIONS	
DATE	DESCRIPTION

GEOCON LTD
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION - FOUNDATION SECTION

KINNIWABI RIVER
WEST CROSSING

KING'S HIGHWAY NO. 101, LINE 'M' DIST. NO. 18
DISTRICT OF ALGOMA
TWP. No. 26 LOT RANGE XXIII

BORE HOLE LOCATIONS & SOIL STRATA

SUB'D. H.L.M.	CHECKED D.B.O.	W.P. NO. 82-62	DRAWING NO.
DRAWN A.E.L.	CHECKED D.B.O.	JOB NO.	T 7737-1
DATE MAR. 26, 1965	SITE NO.	BRIDGE DRAWING NO.	
APPROVED <i>[Signature]</i>	CDT. NO.		

PRINT RECORD		
NO.	FOR	DATE

GEOCON LTD

HEAD OFFICE

420 MICHEL JASMIN, DORVAL, QUEBEC
TELEPHONE 631-9827

DISTRICT OFFICES

14 HAAS ROAD
REXDALE, TORONTO, ONT.
TEL. 244-6476

1425 WEST PENDER ST.
VANCOUVER 5, B.C.
TEL. MU. 1-8926

Rexdale, Ontario,
April 19th, 1965.

Department of Highways, Ontario,
Materials and Testing Division,
Downsview, Ontario.

Attention: Mr. A. G. Stermac, P. Eng.,
Principal Foundation Engineer.

Re: Soil Conditions and Foundations
Proposed Kinniwabi River Crossing
Station 913, Township 26,
District 18, Ontario.

Dear Sirs:

This letter accompanies our detailed report covering the above investigation.

We find that the site is covered by a thin surficial layer of peat which is underlain directly by a deep deposit of compact to very dense sand and gravel with boulders. The relative density of the granular deposit was observed to be extremely erratic but generally in the compact range. The actual soil conditions encountered at the site are discussed in detail in the report.

The site is considered suitable for the use of spread footing foundations founded at elevation 1009 as presently proposed, and provided suitable scour preventative measures are taken as discussed. A net allowable bearing value of 2.0 tons per square foot may be used in design of spread footings for the proposed bridge, in conjunction with other soil mechanics design criteria as discussed herein.

Department of Highways, Ontario,
Materials and Testing Division,
April 19th, 1965,
Page 2.

We believe that this report contains all the information required from this investigation. If there are any questions regarding any aspect of this report or if we can be of assistance otherwise on this project, please do not hesitate to call us.

Yours very truly,

GEOCON LTD

M. A. J. Matich per Dhe.

MAJM/reb
Enc.

M. A. J. Matich, P. Eng.,
President.

T7737
REPORT
TO
DEPARTMENT OF HIGHWAYS, ONTARIO
ON
SOIL CONDITIONS AND FOUNDATIONS
PROPOSED KINNIWABI RIVER CROSSING
STATION 913, TOWNSHIP 26
DISTRICT 18 ONTARIO

Distribution:

- 11 copies - Department of Highways, Ontario,
Downsview, Ontario
- 3 copies - Geocon Ltd,
Rexdale, Ontario.

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DRAWING - at rear of report

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INTRODUCTION

Geocon Ltd has been retained by the Department of Highways, Ontario by letter dated March 8th, 1965, Work Permit 82-62 to carry out a foundation investigation for the proposed crossing at the Kinniwabi River approximately 12 direct miles south-east of Hawk Junction, Ontario. The crossing will form part of Highway 101 within Township 26, District 18. The purpose of the investigation was to determine the soil conditions at the site of the proposed crossing as required for the design of the proposed structure. Preliminary information was made available as the work progressed.

SUMMARIZED SOIL CONDITIONS

The site is overlain by a deep deposit of granular material. A stratum of sand and gravel with boulders was encountered to the maximum depth of penetration of the boreholes of 102 feet. In general, the distribution of boulders was higher near the surface of the deposit. The relative density of the deposit was found to range from compact to very dense. The erratic relative density encountered during this investigation has been observed during previous work in the general area and as such it is believed that the relative density is generally compact.

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At the time of the investigation the water level in the river was at elevation 1015.2. Slight artesian pressure equivalent to elevation 1017.5 was encountered within the overburden.

DISCUSSION

General

It is understood that it is proposed to construct a simply supported single span reinforced concrete bridge over the Kinniwabi River. The bridge will be located on Line M, at about chainage 912+60. Information taken from the Department of Highways, Ontario, Bridge Division, Drawing No. D-5389-1, indicates that the bridge will have a 30 degree skew and longitudinal span length and width of 51 and 36 feet, respectively. As presently proposed, footings will be founded at elevation 1009.0.

Foundations

The soil conditions at the site consist of a deep deposit of sand, gravel with boulders, with the content of boulders higher near the surface of the deposit than elsewhere. The relative density of the deposit as indicated by the results of the standard penetration tests is variable, ranging from compact to very dense.

Foundations (continued)

Based on the observed relative density of the sand and gravel stratum, it is considered that the proposed bridge may be carried on spread footings within this stratum. The foundation elevation, however, will depend on whether or not protection is provided against possible undermining by scour. One possibility would be to provide suitable rip-rap cover on the banks and river bed adjacent to each abutment. If this is done, the abutment footings may be carried at elevation 1009, as proposed.

As discussed in detail in Appendix I, the relative density of the sand and gravel as indicated by the results of the standard penetration tests, is extremely erratic. Further, the presence of slight artesian pressure and the coarse gravel sizes within the overburden complicates the estimate of relative density based on "N" values alone. The dynamic penetration tests indicate that the relative density is in the compact range. Previous work in the general area and observation of the behaviour of buildings founded on spread footings within the "ablation" till indicates two significant factors. Firstly, a similar pattern of "N" values and relatively low resistance to the dynamic penetration tests at depth within the till stratum after initial high resistances is common. Secondly, it is known from our experience that heavy industrial structures founded on spread footings

Foundations (continued)

within a geologically similar deposit locally have performed satisfactorily. It is considered therefore, that an allowable bearing value of 2.0 tons per square foot may be used in the design of spread footings for the abutments and for the retaining walls for the proposed bridge. With precautions during construction as discussed below, the total settlements of the abutments, and relative differential settlement, should be less than 1 inch and 1/2 inch, respectively. This order of settlement should be tolerable for the type of structure proposed. Further, the settlements will, for practical purposes take place concurrently with application of load and will therefore be largely completed at the end of construction.

Considering the size of the structure and other factors involved, the method of rip-rap cover as a means for scour protection is probably the most economical solution. The alternative to using rip-rap protection, however, would be to found the abutments below the possible depth of scour. The latter is dependent on a number of factors including the hydraulics of the river channel, the maximum variation in water level and the nature of the material in the stream bed. In view of these considerations it is not possible to determine the depth of scour on the basis of information, obtained during this investigation. However, published data (Terzaghi and

Foundations (continued)

Peck, "Soil Mechanics in Engineering Practice") indicates that the depth of scour below the low water channel may be of the order of four times the greatest known rise in river level. Therefore, if no suitable rip-rap protection is provided to the abutments, it should be assumed that scouring to at least the depth indicated may occur. Depending on the anticipated depth of scour, the abutments might be founded on footings or suitable bearing piles extended below the possible scour zone, or the foundation might be protected against undermining by a steel sheet pile surround. A variety of pile types would be suitable for use as bearing piles. The presence of boulders would have to be contended with for any type of driven pile.

The above discusses soil mechanics factors pertinent to a choice of foundation type. The final choice of foundation type, however, is also dependent on considerations of economics which are beyond the scope of this report.

Approach Embankments

It is understood that the grade of the approach embankments will be about 8 feet above existing ground level. Further, that the embankments will be constructed of suitable granular fill with side slopes of 1 vertical to 2 horizontal, with a rock fill toe.

Approach Embankments (continued)

If spread footings are used and adequate rip-rap protection provided, as discussed above, the overall stability of either approach embankment should be adequate. It is recommended that the surficial peat be stripped from beneath the embankment and abutment locations.

It is recommended that the backfill to the abutments and retaining walls consist of well compacted free draining non-frost susceptible granular material. It is further recommended that adequate provision be made for drainage of the backfill behind the abutments and retaining walls. With backfill as above, a coefficient of lateral earth pressure of 0.4 is recommended for the case of spread footings on sand and gravel. The abutment should have a factor of safety of at least 1.5 against lateral sliding.

Construction of the east approach will cover the drainage course shown on the attached drawing. Measures should be taken to provide alternative drainage, to prevent erosion of the toe of the embankment particularly during Spring run-off when the present stream probably discharges a significant amount of water.

Construction

With foundations at elevation 1009, construction would involve excavation into the pervious sand and gravel stratum for a distance of at least 6 feet below observed river level. Some means

Construction (continued)

will therefore be required to control water inflow. For this purpose, a gravity well point system could be used or alternatively the excavation could be sheeted and dewatered by pumping from filter equipped sumps maintained below excavation level. Installation of well points would probably require the use of a hole puncher to contend with the boulders in the stratum, and also the construction of a low berm on the river side of the excavation. Installation of sheeting would also have to contend with the presence of boulders, and the locally dense nature of the stratum. Sheeting if used, should be carried below excavation level a distance at least equal to the maximum head differential likely to be encountered during construction. The base of excavation should be well compacted prior to footing construction.

CONCLUSIONS AND RECOMMENDATIONS

- 1) The overburden consists of a thin surficial layer of peat which is underlain directly by a deep deposit of compact to very dense sand and gravel with boulders. In general, the distribution of the boulders was high near the surface of the deposit.

- 2) At the time of the investigation the water level in the river was at elevation 1015.2. Slight artesian pressure equivalent to elevation 1017.5 was encountered within the overburden.
- 3) The site is suitable for the use of spread footing foundations founded at elevation 1009 as presently proposed, with suitable precautions to prevent scour as discussed. A net allowable bearing value of 2 tons per square foot may be used in the design of the spread footings as discussed in the report.
- 4) Excavation will be required for a depth of at least 6 feet below observed river level, and suitable measures to control the inflow of water will be required. Several possible means of effecting this are discussed herein.

PERSONNEL

The investigation was carried out under the supervision of Mr. H. L. MacPhie. This report was written by Mr. D. B. Oates and reviewed by Mr. M. A. J. Matich, P. Eng.

DBO/reb

D. B. Oates
D. B. Oates, P. Eng.,
District Soils Engineer.



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APPENDIX I

PROCEDURE

SITE AND GEOLOGY

SOIL CONDITIONS

WATER CONDITIONS

OFFICE REPORTS ON SOIL EXPLORATION

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PROCEDURE

The field work for this investigation was carried out between March 1st and March 18th, 1965. As discussed later the site is located about 12 direct miles south-east of Hawk Junction in Township 26, District 18, Ontario. Access to the site was by winter road. Mobilization of the drilling equipment to the site was carried out using a bulldozer for the last 6 miles into the site. Similarly, because of the poor condition of the winter road it was necessary to use a four-wheel drive truck for transportation of field personnel. Two boreholes with adjacent dynamic penetration tests were put down using a standard skid mounted machine drill rig. The depths of the boreholes were 31 feet and 102 feet. The depths of the respective dynamic penetration tests were 89 and 66 feet.

Sampling of the overburden was carried out at 5 foot intervals using a 2-inch split spoon sampler with a foot valve to assist recovery. Where samples were not recovered by this method, slotted tube samples were obtained. Because of the presence of boulders some blacting was necessary.

A complete log of each borehole and penetration test is given on the Office Reports on Soil Exploration in this Appendix. The location of the boreholes together with the inferred soil stratigraphy is shown on Drawing No. T7737-1 located in the pocket at the rear of this report.

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The results of the laboratory testing are shown on the Figure in Appendix II. All samples remaining after testing will be stored until April 1st, 1966 at which time you will be contacted for instructions regarding their disposal.

All elevations given herein are referred to Geodetic datum. The bench mark used has an elevation of 1024.60 and is a nail and washer in the top of an 0.4 foot diameter spruce stump, 81 feet left of station 909+90.

SITE AND GEOLOGY

The site is located about 12 direct miles south-east of Hawk Junction, Ontario. Access to the site is by winter road. Visual inspection of the area indicates that the site is located within a valley between high bedrock outcrops.

At the time of the investigation the river level was at elevation 1015.2. Information taken from the Department of Highways, Ontario Drawing No. E-2830-1 indicates that the high water level in the river is at about elevation 1018.

From available geological information and previous work in the general area, it is known that the overburden consists

of a sand and gravel deposit of varying thickness overlying bedrock of Precambrian origin. It is also known that the main sand and gravel deposit is overlain in some areas by silts and other sand and gravel deposits. The main sand and gravel deposit which overlies bedrock is believed to be a modified glacial till, known as an "ablation till". This was formed when large quantities of melt water flushed out most of the fine fractions of normal glacial till.

SOIL CONDITIONS

The principal soil conditions encountered in the boreholes are as follows:

Peat

Ground surface at the borehole locations is covered by a thin layer of peat which had a thickness at borehole locations of about 6 inches. General inspection of the area revealed the presence of a large number of boulders within the peat. Boulders also covered the surface at the river bottom.

Compact to Very Dense Grey-Brown Sand,
Gravel with Boulders

Underlying the peat at both borehole locations is a stratum of grey-brown sand and gravel. Penetration of the boreholes required the use of blasting techniques due to the occasional presence of boulders. The distribution of boulders was generally higher near

Compact to Very Dense Grey-Brown Sand,
Gravel with Boulders (continued)

the surface of the stratum. The depth of this stratum ranged from 31 to 102 feet which coincided with the depth of the boreholes.

Similarly, both dynamic penetration tests were terminated within this stratum. Between depths of 11 and 37 feet below ground level at the location of borehole 1, the overburden has been described as a grey-brown sand with gravel traces. This layer is believed to be of the same geological origin as the material which both overlies and underlies it and as such has not been described separately herein.

Mechanical analyses tests were carried out on 5 samples from this stratum and the results plotted on Figure 1 of Appendix II. The grading of samples tested ranged from 34 to 68 percent gravel sizes, 24 to 58 percent sand sizes, and 8 to 11 percent silt sizes. The samples were recovered by 2 inch nominal size sampler and therefore the curves do not reflect the content of grain sizes larger than about 1-1/2 inches. Within the layer described as sand with gravel traces, the silt fraction, based on visual examination of the samples recovered, was absent.

Standard penetration tests carried out in this stratum gave "N" values ranging from 8 to greater than 100 blows per foot

SOIL CONDITIONS (continued)

V

Compact to Very Dense Grey-Brown Sand, Gravel with Boulders (continued)

indicating a compact to very dense relative density. The high blow counts were probably affected by the coarse gravel sizes present within the stratum. Examination of the results of the dynamic penetration tests indicate that the relative density of this stratum is probably compact. The erratic pattern of "N" values encountered at this site has been observed in previous work in the general area.

WATER CONDITIONS

The river level at the time of the investigation was at elevation 1015.2. Slight artesian pressure corresponding to about elevation 1017.5 was encountered in both boreholes, at a depth of about 30 feet below ground level.

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EXPLANATION OF THE FORM "OFFICE REPORT ON SOIL EXPLORATION"

The object of this form is to enable a comprehensive study of the soil to be made by combining on one sheet all of the information obtained from the boring. An explanation of the various columns of the report follows.

ELEVATION AND DEPTH

This column gives the elevation and depth of boundaries between the various soil strata. The elevation is referred to the datum shown in the general heading.

WATER CONDITIONS

In this column the water level in the casing at the time of boring or the water table in the ground, determined by a series of observations in a piezometer or standpipe, is indicated to scale by a horizontal line with the symbol W.L. or W.T. above the line. A notation of any complicated groundwater conditions will be made in this column.

DESCRIPTION

A description of the soil, using standard terminology, is contained in this column. The consistency of cohesive soils and the relative density of non-cohesive soils are described by the following terms:

<u>Consistency</u>	<u>U-Strength</u> <u>Tons/sq. ft.</u>	<u>Relative Density</u>	<u>Standard Penetration</u> <u>Resistance. Blows/ft.</u>
Very soft	0.03 to 0.25	Very loose	0 to 4
Soft	0.25 to 0.5	Loose	4 to 10
Firm	0.5 to 1.0	Compact	10 to 30
Stiff	1.0 to 2.0	Dense	30 to 50
Very stiff	2.0 to 4.0	Very dense	over 50
Hard	over 4.0		

STRATIGRAPHIC PLOT

The stratigraphic plot follows the standard symbols of the National Research Council, Canada.

ELEVATION SCALE

The information in all columns is plotted to a true elevation scale which is shown in this column.

GRAPHS

The main body of the report forms a graph which is used to plot to correct elevation the important soil properties which are obtained through field and laboratory tests. The scales and symbols for the plotting are shown at the head of the column.

OTHER TESTS

In this column are shown, by symbol, the other field or laboratory tests which have been performed on the soil and for which the results have not been plotted on the above graph.

SAMPLES

The first three columns describe the condition, type and number of each sample obtained from the boring. The location and extent of each sample is plotted to scale.

In the last column is shown the penetration resistance in blows of 4200 inch-pounds required to drive one foot of the sampler into the ground. When a 2 inch Drive Sampler is used the result obtained is termed the "Standard Penetration Resistance".

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OFFICE REPORT ON SOIL EXPLORATION

CONTRACT T7737 BORING # 1 DATUM GEODETS CASING BX
 BORING DATE MAR 10 - 1965 REPORT DATE MAR 22, 1965 COMPILED BY AEL CHECKED BY 330
 SAMPLER HAMMER WT. 140 LBS. DROP 30 INCHES (PENETRATION RESISTANCES CONVERTED TO BLOWS OF 4200 IN - LBS. ENERGY)

SAMPLE CONDITION



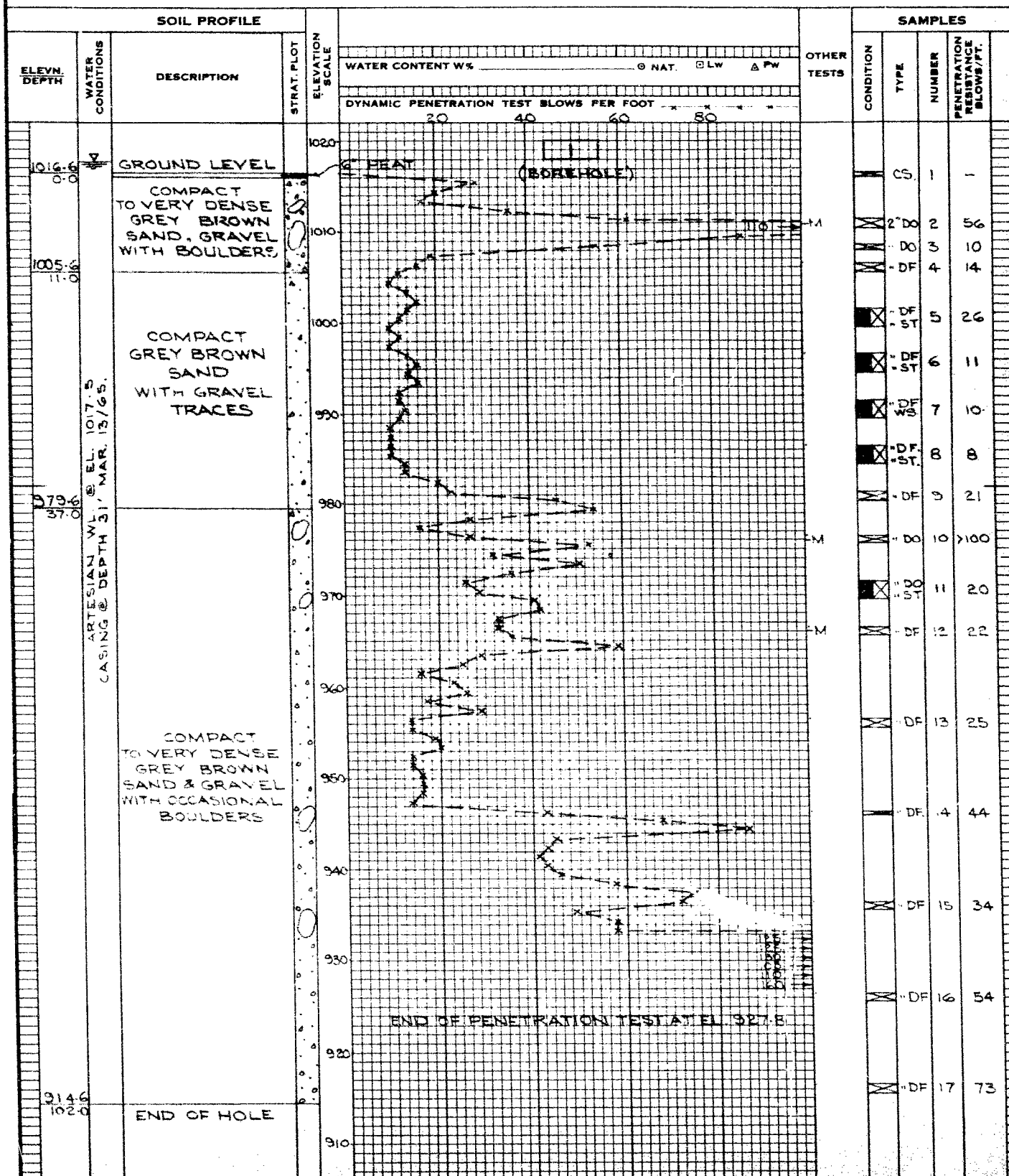
A.S. - AUGER SAMPLE
 S.T. - SLITTED TUBE
 W.S. - WASHED SAMPLE
 D.O. - DRIVE-OPEN
 D.F. - DRIVE-FOOT VALVE
 C.S. - CHUNK SAMPLE

SAMPLE TYPES

F.S. - FOIL SAMPLE
 S.O. - SLEEVE-OPEN
 S.F. - SLEEVE-FOOT VALVE
 T.O. - THIN WALLED OPEN
 R.C. - ROCK CORE

ABBREVIATIONS

V - IN-SITU VANE TEST
 M - MECHANICAL ANALYSIS
 U - UNCONFINED COMPRESSION
 QC - TRIAXIAL CONSOLIDATED UNDRAINED
 Q - TRIAXIAL UNDRAINED
 S - TRIAXIAL DRAINED
 7 - WET UNIT WEIGHT
 K - PERMEABILITY
 C - CONSOLIDATION
 WL - WATER LEVEL IN CASING
 WT - WATER TABLE IN SOIL



GEOCON

OFFICE REPORT ON SOIL EXPLORATION

CONTRACT T7737 BORING # 2 DATUM GEODETIC CASING BK
 BORING DATE MAR 16-17/65 REPORT DATE MAR 23, 1965 COMPILED BY AEL CHECKED BY D.B.O
 SAMPLER HAMMER WT. 140 LBS. DROP 30 INCHES (PENETRATION RESISTANCES CONVERTED TO BLOWS OF 4200 IN - LBS. ENERGY)

SAMPLE CONDITION



DISTURBED
FAIR
GOOD
LOST

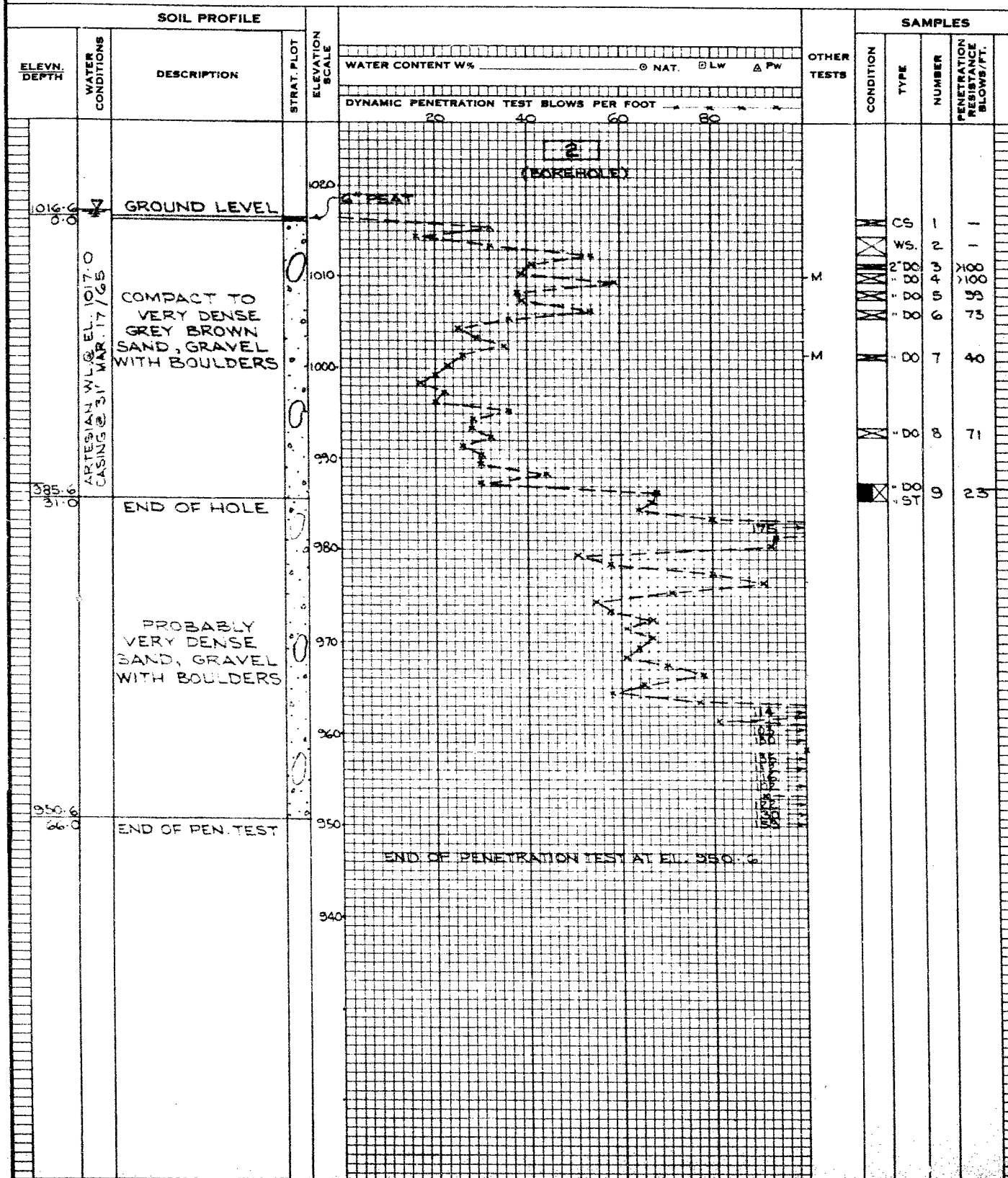
SAMPLE TYPES

A.S. - AUGER SAMPLE
S.T. - SLOTTED TUBE
W.S. - WASHED SAMPLE
D.O. - DRIVE-OPEN
D.F. - DRIVE-FOOT VALVE
C.S. - CHUNK SAMPLE

F.S. - FOIL SAMPLE
S.O. - SLEEVE-OPEN
S.F. - SLEEVE-FOOT VALVE
T.O. - THIN WALLED OPEN
R.C. - ROCK CORE

ABBREVIATIONS

V - IN-SITU VANE TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
QC - TRIAXIAL CONSOLIDATED UNDRAINED
Q - TRIAXIAL UNDRAINED
S - TRIAXIAL DRAINED
γ - WET UNIT WEIGHT
K - PERMEABILITY
C - CONSOLIDATION
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL



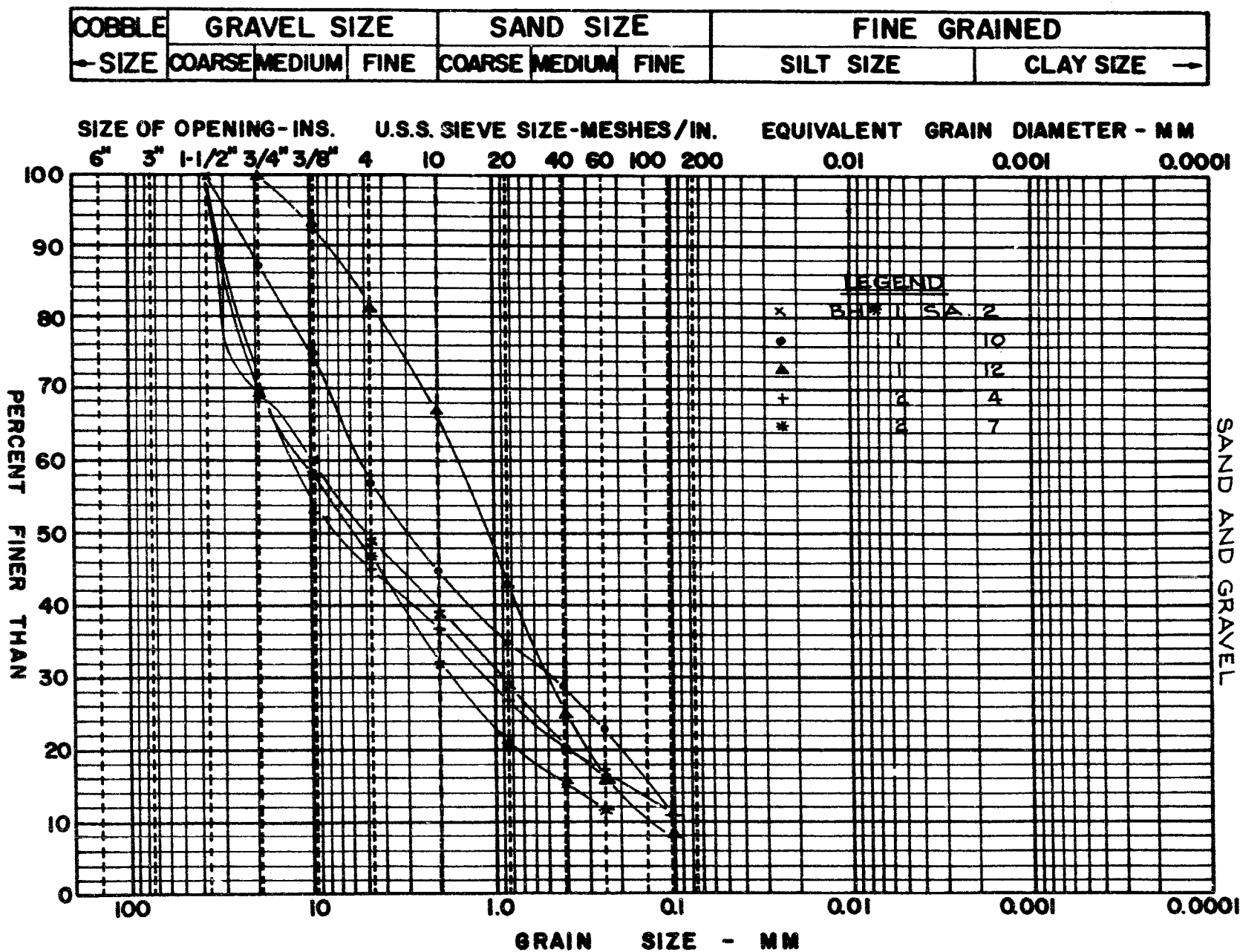
APPENDIX II

FIGURES - LABORATORY TESTING

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GRAIN SIZE DISTRIBUTION

APPENDIX II
FIGURE 1
PROJECT T 7737



M.I.T. GRAIN SIZE SCALE

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

Foundation Section,
Materials and Testing Div.,
Room 107, Lab. Bldg.

Attention: Mr. S. McCombie

June 9, 1965

Kinniwabi River (Centre Crossing) W.P. 83-62.
Kinniwabi River (West Crossing) W.P. 82-62.

We have reviewed the subsoil conditions for the above-mentioned proposed structures following a verbal request by Mr. J. McAllister for recommendations relating to piled foundations, and submit the following comments:

Based on the information contained in the Soil Report by Geocon, Ltd., it is our opinion that the most suitable type of pile which could definitely penetrate the upper layer of boulders which exists at both sites, would be a Franki type displacement caisson.

We have been in touch with Franki of Canada, Ltd., and enclose for your information, a copy of their estimate for supplying and installing 8 piles at each abutment location having a design capacity of 40 - 50 tons per pile.

If you have any further queries regarding this matter, please contact this Office.

KGS/MdeF
Encl.

cc: Foundations Office
Gen. Files

K. G. Selby
K. G. Selby,
SENIOR FOUNDATION ENGINEER
For:
K. Y. Lo,
SUPERVISING FOUNDATION ENGINEER

12.2.8.11

FRANKI

CANADA LIMITED



214 MERTON STREET,

TORONTO,

TELEX NO.
02-2159
CABLEGRAMS
"FRANKIPILE"
TELEPHONE:
HU. 1-6426

May 27, 1965

Department of Highways, Ontario
Materials and Testing Division
Downsview, Ontario

Attention: Mr. K. Selby, P.Eng.

Dear Sir:

Re: Piling
Proposed Kinniwabi River Crossings
(W.P. 82-62 & W.P. 83-62)

We have examined soil reports T7737 & T7738 prepared by Geocon Ltd., and have examined the soil samples.

As requested, we have carried out a study into the feasibility of installing Franki caisson piles at these two sites.

Although the soil in which the piles would be founded at the W.P.83-62 site contains some silt, we do not anticipate any difficulty making piles of the capacities envisaged.

For budget purposes, we estimate the total cost of installing 16 piles at each of these sites to be in the order of \$11,000.00. Should the bridges be built at separate times involving additional mobilization, we estimate the cost to be in the order of \$7,500.00 for each bridge. These prices do not include the cost of supplying the pile shells, or the cost of any load test, if required.

cont'd.....

Our price is based on the following:

WP 83-62

- 1) Loading on each abutment - $18.9 \text{ K/lin.ft.} \times 34' = 640 \text{ Kips}$
- 2) Assuming minimum number of 8 piles required because of structural considerations: load per pile = 80 Kips.
- 3) Working elevation approximately at existing ground elevation approximately at cut-off elevation for piles at elevation 1030
- 4) Founding elevation for piles at approximate elevation 1010
- 5) Shafts to consist of 12 3/4" O.D. pipe @ 0.203 wall thickness.

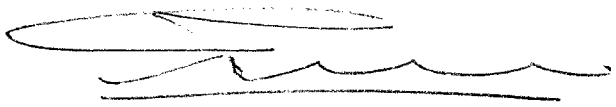
WP 82-62

- 1) Loading on each abutment = $22.4 \text{ K/lin. ft.} \times 34' = 763 \text{ Kips}$
- 2) Assuming a minimum of 8 piles: load per pile = 95.5 Kips
- 3) Working elevation approximately at existing ground elevation approximately at cut-off elevation for piles at elevation 1015
- 4) Founding elevation for the piles at approximate elevation 995
- 5) Shafts as for WP 83-62

We trust this letter contains the information you require at this time. Should you require further information, we would be pleased if you would call us.

Yours very truly,
FRANKI CANADA LIMITED

AM/eh


A. Prior, P.Eng.
Chief Engineer

X-5065

Mr. A. H. Toys,
Bridge Engineer,
Bridge Division.

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attention: Mr. J. McSpackie

April 27, 1965

FOUNDATION INVESTIGATION REPORT BY:
Geoccon, Limited, Consulting Engineers, Toronto.
Proposed Kinniwabi River Bridge (West Crossing),
District of Algoma, Twp. 26, Ontario, Hwy. 101.
W.F. 82-62 -- District 18

We have reviewed the attached report prepared by the
Consultant, Geoccon, Ltd. and herewith submit our comments for
your consideration:

The factual information seems to be adequate and well
presented. We are in agreement with the findings and recom-
mendations contained in the report, except for the recommendation
regarding the dewatering for construction purposes. It appears
to us that well points cannot be considered because of the presence
of boulders. Interlocking steel sheet piling should only be
resorted to if necessary from the scour protection point of view.
Otherwise, we feel that excavating under water and pouring of
tremie seal should be adopted. In this way, the presence of
boulders will have no detrimental and harmful effect on the
construction.

We feel that the contained results are adequate for your
further design work. However, should you wish to discuss any
additional questions, please feel free to contact our office.

AGJ/def
1000.

cc: Messrs. A. H. Toys (2)
R. A. Gregaskes
H. D. Schiller
R. MacArthur
C. A. Ward
A. B. Saint
F. Le Visser
J. Watt

A. G. Starzak
A. G. Starzak,
PRINCIPAL FOUNDATION ENGINEER

Foundations Office
Gen. Files

Hwy. 401 & Leslie St.,
Downsview, Ontario.

March 8, 1965

Materials and Testing Division

Gescon, Limited,
14 Main Road,
Bendale, Ontario.

Attention: Mr. A. Gates

cc: ✓ E.F. 32-62, Hwy. 101, Mississauga River, West Crossing,
E.F. 33-62, Hwy. 101, Mississauga River, Centre Crossing,
E.F. 34-62, Hwy. 101, Mississauga River, East Crossing.
--- District #13, Sault Ste. Marie, Ont. ---

Dear Sir:

Please consider this your authority to carry out foundation investigations at the above sites. Plans and profiles were provided to your representative on March 1, 1965.

It is understood that a qualified soils engineer will be in charge of the field work at all times.

Eleven copies of the completed foundation report, with one additional copy of each subsoil profile, should be submitted to the Foundation Section prior to May 1, 1965. Previous requirements as to preliminary borehole information and laboratory testing program, should be followed.

Because the drawings accompanying the foundation reports, showing the location of borings, the inferred subsoil conditions, etc., are to become contract drawings, you are requested to prepare them in accordance with the P.E.C. standards. To enable you to do this, we are supplying you with sample drawings with all the necessary explanations, together with linen sheets for your drawings. You are also requested to provide the P.E.C. with Craneflex copies of the drawings.

cont'd. /2 ...

Geccon, Limited
Attn: Mr. D. Bates

- 2 -

March 8, 1965

Charges for the work performed will be in accordance with your Schedule of Rates, dated March 4, 1960, and invoices to be addressed to the attention of the undersigned.

We are attaching Purchase orders J 34776, J 34777, and J 34778, covering the purchase of any new material required for these projects, in order that you may use these as a basis for exemption from the Federal Tax for such purchases. The Exemption Certificate is printed thereon.

Yours very truly,



HRG/HRGF
Attach.

A. Rutka,
MATERIALS & TESTING ENGINEER

cc: Messrs. S. McCombie
P. De Visser
E. Hearthur
A. A. Ward
E. R. Saint
R. Konings
W. D. Smith (2)
Foundations Office
Gen. Files (2)

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

FROM: Bridge Division,
Downsview, Ontario.

DATE: March 1, 1965.

OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 82-62 Kinniwabi R. West Crossing,
W.P. 83-62 Kinniwabi R. Centre Crossing,
W.P. 84-62 Kinniwabi R. East Crossing,
Hwy #101, District # 18.

This will confirm our verbal request for foundation investigations at the above crossings.

You have recieved two prints of the following drawings:-

W.P. 82-62	E.- 2840 - 1
	D - 5389 - 1
W.P. 83-62	E - 2839 - 1
	D - 5388 - 1
W.P. 84-62	E - 2838 - 1
	D - 5377 - 1

and one print of study plan F- 3561.

We would be pleased if you would let us have any information on the sites as soon as it becomes available, in order to confer the proposed designs.

J.C. McAllister

JCM/ag
c.c. W.D. Smith
R. Fitzgibbon

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

LETTERS OF AUTHORITY, PLEASE.

JOBS GIVEN TO GEOLOGISTS WHO ARE
IN THE AREA. MARCH 1st. 1965

ABS