

MR. A. RUTKA, P.ENG.  
CHIEF MATERIALS AND TESTING ENGINEER  
DEPARTMENT OF HIGHWAYS OF ONTARIO  
McDONALD CARTIER FREEWAY AND KEELE STREET  
DOWNSVIEW, ONTARIO

FOUNDATION INVESTIGATION  
W.P. 80-85  
C.P.R. OVERHEAD  
HIGHWAY NO. 17  
DEUX RIVIERES, ONTARIO

Project: J3371

January, 1967

William Trow Associates Limited

Project: J3371

Soil Mechanics  
Consultants  
W. A. Trow  
MSc. MEIC. P. Eng.  
K. Peaker  
PhD. MEIC. P. Eng.  
D. H. Shields  
PhD. MEIC. P. Eng.



Associates Ltd.

Mr. A. Rutka, P.Eng.,  
Chief Materials and Testing Engineer,  
Department of Highways of Ontario,  
McDonald Cartier Freeway and Keele Street,  
Downsview, Ontario.

January 24, 1967

Attention: A. Stermac, P.Eng.

Foundation Investigation  
W.P. 80-65  
C.P.R. Overhead  
Highway No. 17  
Deux Rivieres, Ontario

Dear Sirs:

In accordance with your authorization of December 7, 1966,  
we have completed a foundation investigation at the above noted  
site. The field work was carried out during the period of December 20,  
1966 to January 6, 1967. Our finding and recommendations are  
summarized in the following paragraphs.

- 1) The subsoil at this site consists of extensive sand deposits  
overlain near the surface by a layer of sandy silt. Bedrock was not  
encountered at this site although one boring was taken to a depth of  
70 feet. The groundwater level was found at approximately El 524 feet;  
however, this is water perched above the sandy silt and the true water  
table in the lower sand is at El 507 feet.



2) The bridge may be founded on piles, either end-bearing piles driven to refusal or shorter expanded base type concrete piles, or on spread footings designed to a safe net bearing pressure of 2 tns/ft<sup>2</sup>. The choice will depend on economic and design considerations. No constructional problems are envisaged at this site.

PROJECT:

It is proposed to replace the existing multi-span bridge with a three span structure at the same location. The new bridge may incorporate piers built on a skew and crib walls will be required on the northwest and southeast corners of the structure. These factors were taken into consideration during the investigation.

SITE:

The bridge site is situated on a spur on the lower slopes of hills which rise to the west. This overhead carries Hwy. 17 across a single C.P.R. track running east to west. The existing structure of concrete piers and steel beams is reported to be founded on piles.



### FIELD WORK AND SUBSOIL STRATIGRAPHY:

The field work at this site consisted of 4 borings and 3 additional dynamic cone penetration tests located as shown on the site plan drawing. All holes were advanced cased using washboring techniques and in borehole 2, diamond drilling was required below 34 feet depth. Bedrock was not encountered on this site where the lowest elevation attained in a boring was 456 feet, some 70 feet below track level.

The subsoil encountered is shown in detail on the borehole logs Dwg. 1 to 7 and in summary form on the site plan drawing. Extensive deposits of sand are overlain near the surface by a sandy silt stratum. At the surface shallow deposits of medium sand, possibly fill, cover the sandy silt. The lower sand deposits are compact to dense down to about El 490 feet below which the relative density of the soil increases greatly. Gravel layers and boulders are found below this level.

The water level in the completed boreholes was at approximate El 524 feet - some 2 feet below track level. During the drilling of Borehole 2, a stabilized water level was observed in the borehole casing at El 507 feet, 19 feet below ground level. This indicates that the measured water level at El 324 feet is water perched above the sandy silt rather than the true water table. No artesian conditions were encountered.



#### FOUNDATIONS:

Several alternatives are available for foundation design at this site.

1) The bridge may be supported on a foundation of end-bearing piles driven to refusal in the very dense sand deposits at approximate El 490 feet. Refusal is defined according to the pile capacity when designed structurally as a short column. For example, refusal of a 40 to 50 ton pile is defined as 8 blows/inch of a Delmag D-12 hammer, or equivalent, developing an energy of at least 22,000 foot pounds.

2) An alternative, of shorter, expanded base type piles, i.e., Franki or Compacto, may be adopted provided the base of the pile is formed below the silty deposits. These deposits extend down to approximate El 510 feet in the region of Boreholes 2 and 3 and may extend slightly deeper in the areas of Borehole 1 and 4.

3) The bridge may be based on footings placed in original ground at relatively shallow depth and spread footings can be designed to a safe net bearing pressure of 2 tons per square foot. The footing must be placed below fill or possible fill and must be at least 6 feet below the surface for frost protection requirements. Approximate footing elevations in the regions of boreholes 1 to 4 are

52, 519, 519 and 531 feet respectively. The required excavation in the area of boreholes 2 and 3 is below the present perched water level by some 5 feet, but this perched water can be drained away by perimeter ditches. No problems are envisaged if the excavation is shored or alternatively if the slopes are cut back to at least 45 degrees.

It is recommended that the same foundation considerations be applied to the crib walls because the subsoil density profile is fairly uniform over the site.

#### EARTH PRESSURES:

The crib walls (and the abutments and wing walls if the approach fill does not spill through the abutments) must be designed to withstand the lateral earth pressure exerted by the retained soil. The earth pressure that will act on the walls can be estimated using a value of earth pressure coefficient equal to 0.35 for a rigid, unyielding structure or 0.25 if some inward yield is permissible. The earth pressure,  $p$ , on the walls at any depth,  $h$ , can be estimated from the expression:

$$p = K \left[ \gamma (h - h_1) + \gamma_s h_1 + q \right]$$

where:  $K = 0.35$ , the recommended earth pressure coefficient assuming the walls to be rigid, or 0.25 assuming a slight inward movement is possible and permissible.

$\gamma = 130$  pcf, the estimated unit weight of the retained soil

$\gamma_s = 65$  pcf, the estimated submerged weight of the retained soil.

$h_1$  = height of the water table above the point being considered.

$q$  = surcharge, if any, acting at the top of the wall.



This calculation assumes that drainage facilities will be provided behind the wall so that the water table remains more or less constant and the same level in front and back of the wall.

The stability of the crib walls (and the abutments and wing walls if the fill does not spill through the abutments) must be checked for horizontal sliding along the base if spread footings are used. The frictional force developed along the base can be calculated using a friction coefficient of 0.7 (concrete sliding on granular soil). If the resisting force is less than 2 times the estimated sliding force, the footing base can be extended under the fill to increase the weight of backfill carried by it. In this manner, the resistance to sliding can be increased.

If any queries arise from the contents of this report please do not hesitate to call us.

Yours very truly,

D.Y. Larmour, M.Sc.

D.H. Shields, P.Eng.

DYL/gh

Encls.

Dist: - Department of Highways (12)

BOREHOLE NO. 1  
 PROJECT D.H.O. Bridge: C.W.R. Overhead, WP 80-65  
 LOCATION Hwy. 17, Deux Rivières  
 HOLE LOCATION 16 feet left of Sta. 317 + 13  
 HOLE ELEVATION 533.0 feet  
 DATUM See Site Plan Dwg.

## 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  $(S_u + S)$ 

## NATURAL MOISTURE CONTENT

AND LIQUIDITY INDEX

## ATTERBERG LIMITS

LIQUID LIMIT

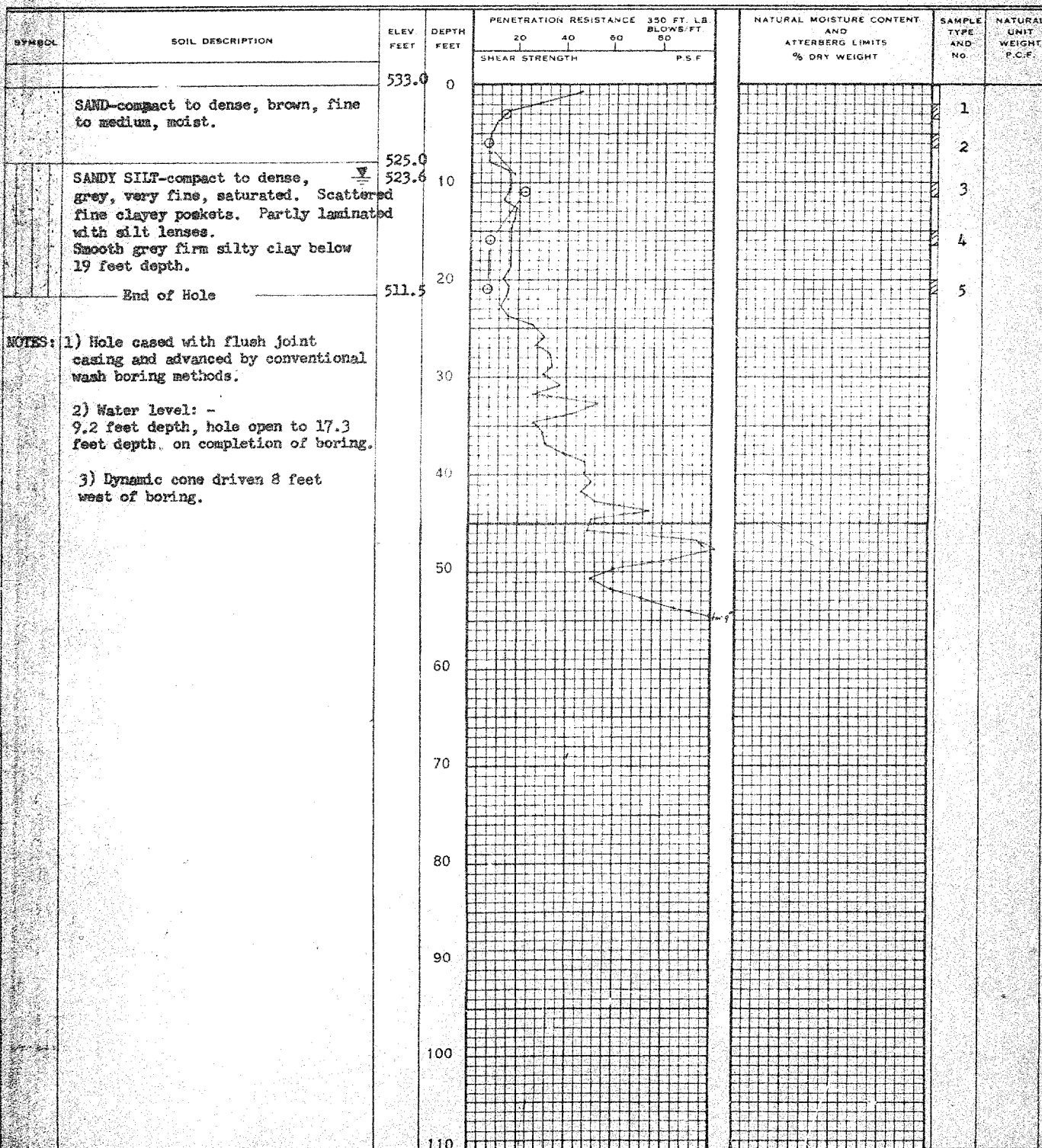
PLASTIC LIMIT

## SAMPLE TYPE

2" O.D. SPLIT TUBE







2" I.D. SHELBY TUBE







3" O.D. SHELBY TUBE

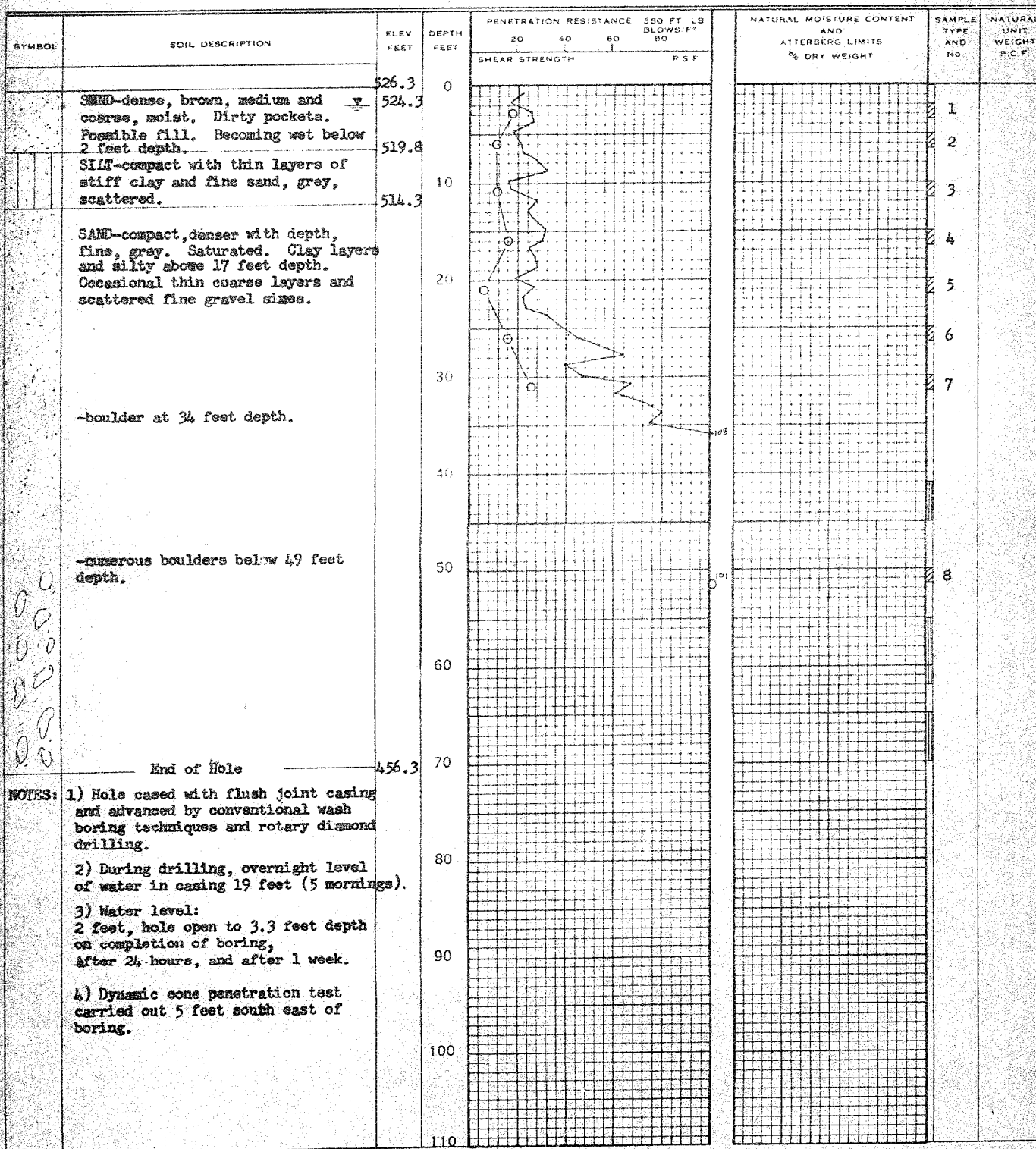




BOREHOLE No. 2  
PROJECT D.H.O. Bridge: C.P.R. Overhead, W.P. 80-65  
LOCATION Hwy. 17, Deux Rivières  
HOLE LOCATION 16 feet right of Sta. 315 + 57  
HOLE ELEVATION 526.3 feet  
DATUM See Site Plan Dwg.

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   $\frac{1}{2}$

NATURAL MOISTURE CONTENT AND LIQUIDITY INDEX   
ATTERBERG LIMITS  
LIQUID LIMIT   
PLASTIC LIMIT   
SAMPLE TYPE  
2" O.D. SPLIT TUBE   
2" I.D. SHELBY TUBE   
3" O.D. SHELBY TUBE 



BOREHOLE NO. 3  
 PROJECT D.H.O. Bridge: C.P.R. Overhead, W.P. 80-65  
 LOCATION  Hwy. 17, Deux Rivières.  
 HOLE LOCATION 3 feet right of Sta. 315 + 72  
 HOLE ELEVATION 525.6 feet  
 DATUM See Site Plan Dwg.

## 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

NATURAL MOISTURE CONTENT AND LIQUIDITY INDEX

## ATTERBERG LIMITS

LIQUID LIMIT

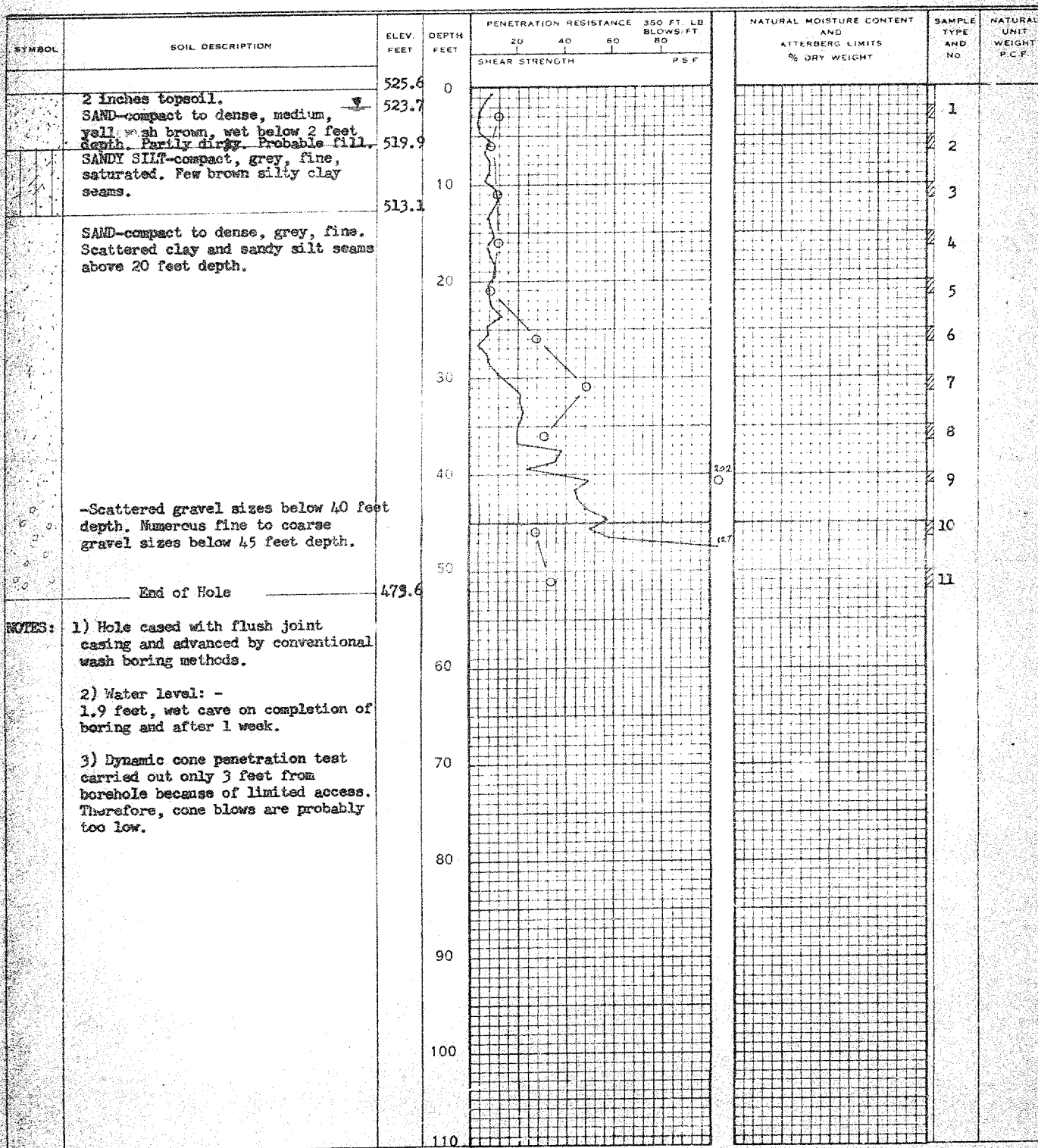
PLASTIC LIMIT

## SAMPLE TYPE

2" O.D. SPLIT TUBE

2" I.D. SHELBY TUBE

3" O.D. SHELBY TUBE



WILLIAM TROW ASSOCIATES LTD.

SITE INVESTIGATIONS · SOIL MECHANICS CONSULTATION

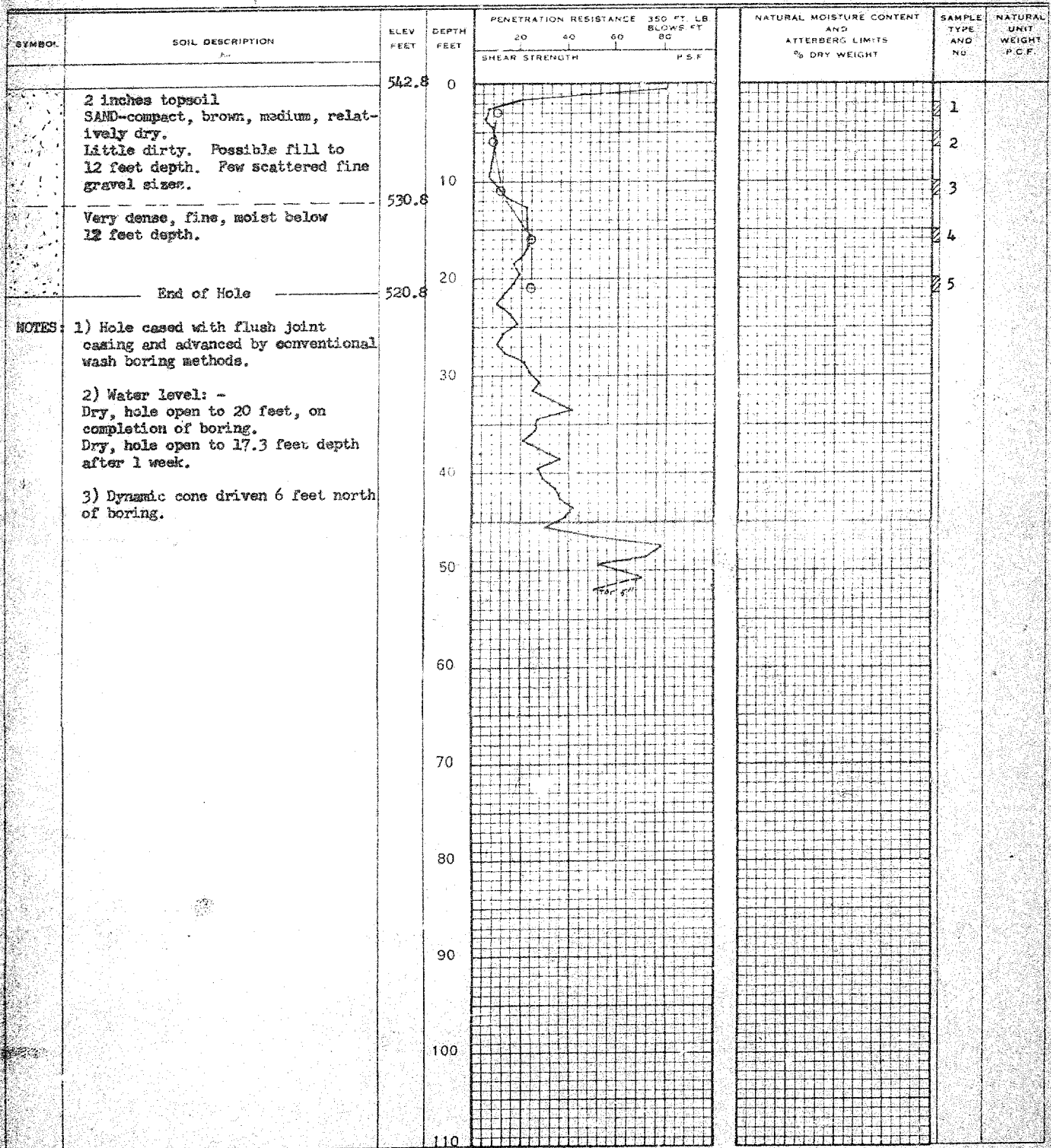
LEGEND

DRAWING No. 4  
PROJECT No. J3371

BOREHOLE No. 4  
PROJECT D.H.O. Bridge: Overhead, W.P. 80-65  
LOCATION Hwy. 17, Deux Rivières.  
HOLE LOCATION 26 feet right of Sta. 315 + 01  
HOLE ELEVATION 542.8 feet  
DATUM See Site Plan Dwg.



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 15:1

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







BOREHOLE NO. 5: S.E. Crib Wall  
 PROJECT D.H.O. Bridge: C.P.R. Overhead : W.P. 80-65  
 LOCATION Hwy. 17, Deux Rivières  
 HOLE LOCATION 42 feet right of Sta. 317 + 14.  
 HOLE ELEVATION 526.2  
 DATUM See Site Plan Dwg.



## PENETRATION RESISTANCE

2" O.D. SPLIT TUBE 2" I.D. SHELBY TUBE 2" DIA. CONE 



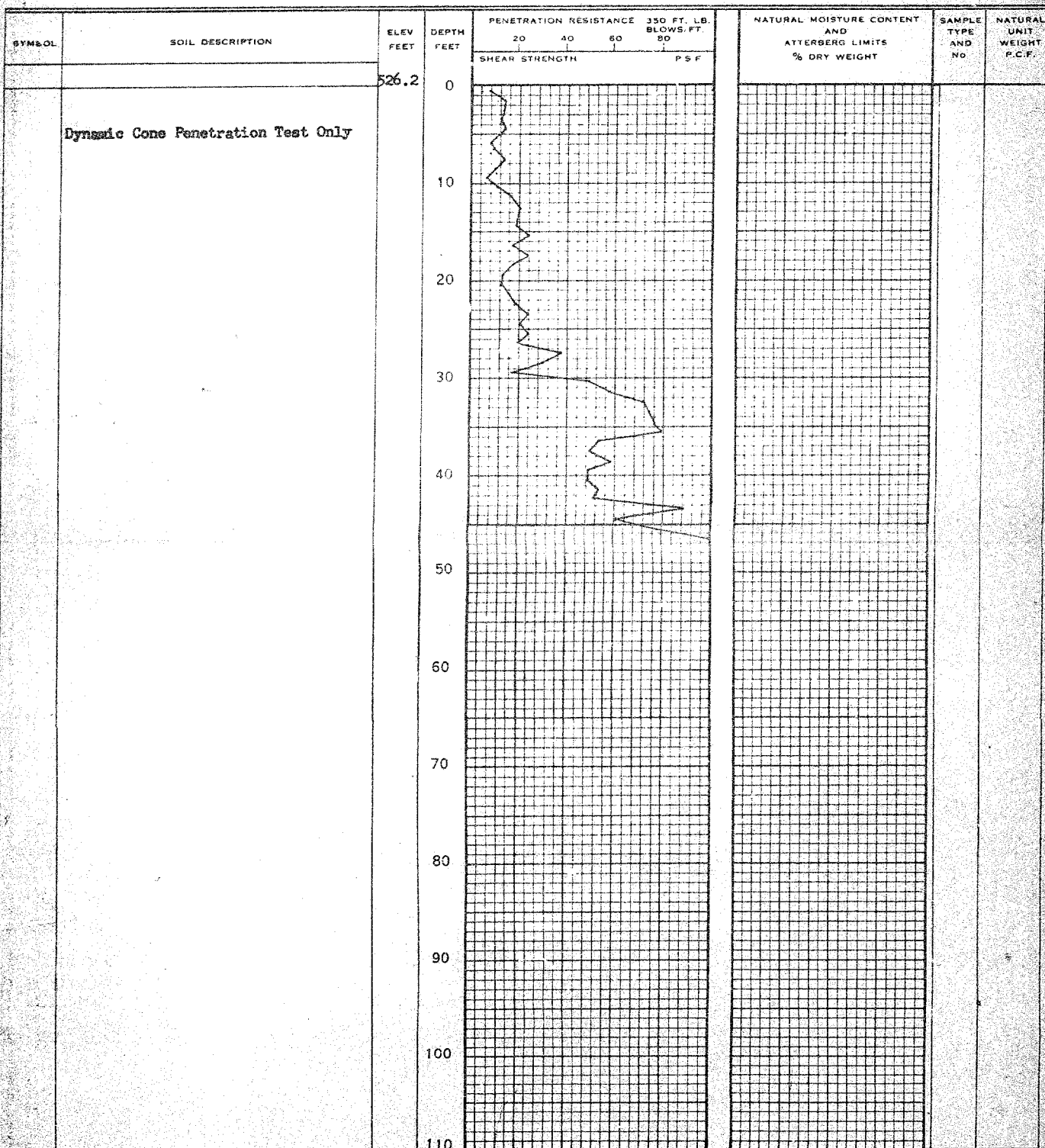

## SHEAR STRENGTH

UNDRAINED TRIAXIAL AT OVERBURDEN PRESSURE UNCONFINED COMPRESSION VANE TEST AND SENSITIVITY (S) NATURAL MOISTURE CONTENT  
AND LIQUIDITY INDEXLI  
X

## ATTERBERG LIMITS

LIQUID LIMIT PLASTIC LIMIT 

## SAMPLE TYPE

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



# WILLIAM TROW ASSOCIATES LTD.




SITE INVESTIGATIONS SOIL MECHANICS CONSULTATION

DRAWING NO 6  
PROJECT No J337R




## LEGEND

BOREHOLE NO 6: N.E. Skow Pier  
PROJECT D.H.O. Bridge: C.P.R. Overhead: W.P. 80-65  
LOCATION Hwy. 17, Deux Rivieres  
HOLE LOCATION 10 feet left of Sta. 316 + 25  
HOLE ELEVATION 525.7 feet  
DATUM See Site Plan Dwg.

### PENETRATION RESISTANCE

3" 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

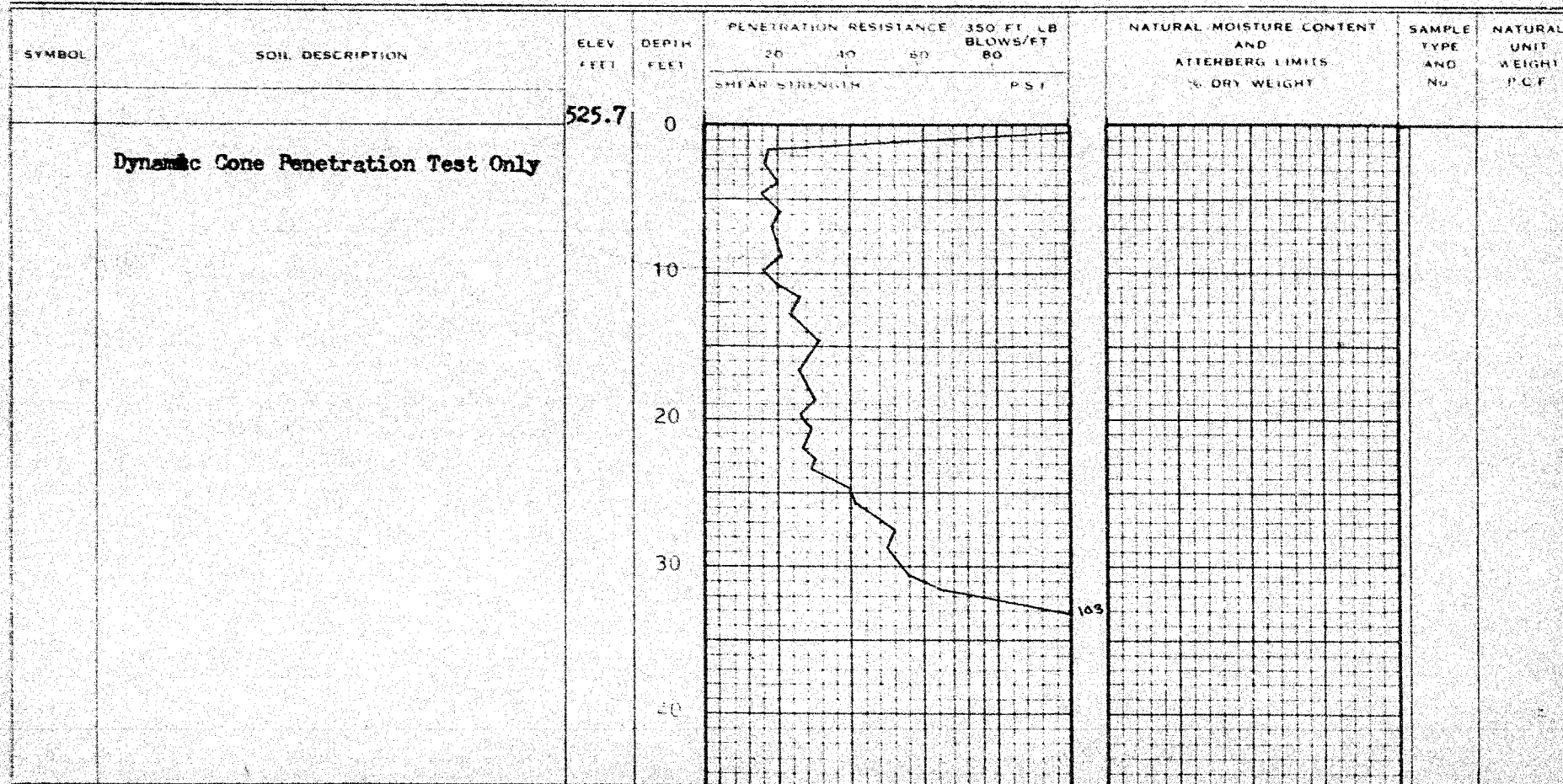
### ATTERBERG LIMITS

LIQUID LIMIT 

PLASTIC LIMIT 

### SAMPLE TYPE

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






# WILLIAM TROW ASSOCIATES LTD.

SITE INVESTIGATIONS SOIL MECHANICS CONSULTATION




DRAWING NO. 7  
PROJECT NO. J3371

## LEGEND

### 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  
X

### ATTERBERG LIMITS

LIQUID LIMIT



PLASTIC LIMIT



### SAMPLE TYPE

2" O.D. SPLIT TUBE



2" I.D. SHELBY TUBE



3" O.D. SHELBY TUBE



BOREHOLE NO. 7: N.W. Grib Wall

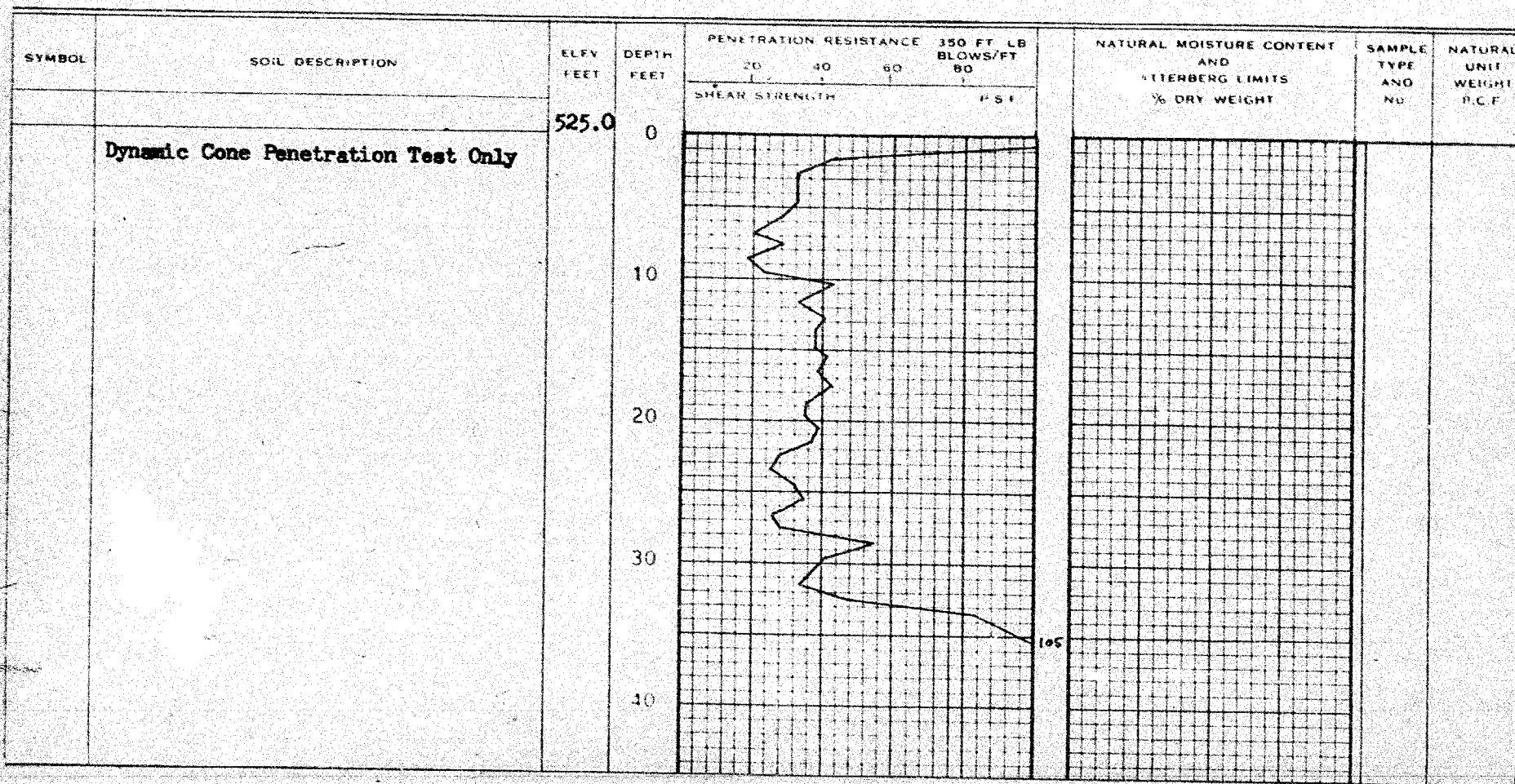
PROJECT D.H.O. Bridge: C.P.R. Overhead: W.P. 80-65

LOCATION Hwy. 17, Deux Rivieres,

HOLE LOCATION 65 feet left of Sta. 315 + 07.

HOLE ELEVATION 525.0 feet

DATUM See Site Plan Dwg.



Mr. C. S. Grebski,  
Bridge Design Engineer,  
Bridge Division,  
Admin. Bldg.

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

August 3, 1967

C.P.R. Overhead at Deux Rivières  
W.P. 80-65, Site No. 29-1 --  
Hwy. 17, District No. 13 (North Bay)

With reference to your memo of July 31, 1967,  
regarding the above structure, we have reviewed the Preliminary  
Plan D-6167-P1, and have no comments to make. The designer has  
followed the recommendations contained in the foundation investi-  
gation report and those brought up in subsequent discussions and  
subsequently confirmed in memorandum form.

AGS/WdeF

*A. G. Sternac*  
A. G. Sternac  
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. S. McCombie  
J. B. Curtis

Foundations Files ✓  
Gen. Files

Copy for the information of  
Mr. A. Stermac,  
Principal Foundation Engineer

Mr. J.B. Curtis,  
Regional Bridge Location Engineer,  
North Bay Regional Office,  
North Bay, Ontario

Bridge Division,  
Downsview, Ontario

July 31, 1967

C.P.R. Overhead at Deux Rivieres  
W.P. 80-65, Site No. 29-1  
Highway 17, District No. 13

Attached herewith are prints of the revised Preliminary Bridge  
Plan Drawing D-6167-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$150,000.  
This cost includes tender, materials, engineering and sundry  
construction.

Any comments or revisions you may have should be submitted  
within three weeks.

CSG:rd

C.S. Grebski,  
Bridge Design Engineer

Attach.

c.c. R. Forrest  
E. Cross  
A. Stermac  
S. McCombie



Mr. C. S. Grebski,  
Bridge Design Engineer,  
Bridge Division, Admin. Bldg.

Attention: Mr. P. O. Low

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

July 24, 1967

-- C.F.R. Overhead at Deux Rivières --  
W.P. 80-65, Site No. 29-1  
Highway 17, District No. 13 (North Bay)

This is to confirm our telephone conversation of  
this date.

We have reviewed your Preliminary Plan D-6167-F1,  
and submit the following comments:

It is believed that, instead of using 12 BP at 53  
steel H-piles, the use of tubular piles would be more  
economical due to the existing soil conditions. It is assumed  
that 12-3/4"  $\phi$  steel tube piles driven to approximate elevation  
475.0 ft., will carry safe loads of 70 ton/pile. The working  
load on the piles, however, should be checked by the use of  
the Hilay formula during pile driving.

AKB/MdeF

*A. G. Stermac*  
A. G. Stermac  
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. S. McCombie  
J. B. Curtis

Foundations Files /  
Gen. Files

Calculate bearing capacity of 12" steel piles.

tip cl. 490 ft.

Regular Leg

$$Q_{ult} = 4 N A_p + \frac{\bar{N} A_s}{50} \text{ (TON)}$$

N at tip = 30 Blows/ft

$\bar{N}$  around perimeter = 17 --

the embedded length = 30 ft tip cl. 490 ft.

$$Q = 4 \times 30 \times 1 + \frac{17 \times (50 \times 1 \times 3.14)}{50}$$

$$Q = 120 + \frac{160\pi}{50} = 120 + 32 = 152$$

$$\underline{\underline{Q_s = \frac{150}{3} = 50 \text{ T/pile}}}$$

Take tip cl. @ 475 ft, embedded length 45 ft.

$$Q = 120 + \frac{17 \times (45 \times 3.14)}{50} = 120 + \frac{2300}{50} = 120 + 46 =$$

$$Q_s = \frac{166}{3} = 55 \text{ T/pile}$$

but N at tip around cl 475 may be increased to

say 50 Blows/ft  $4 \times 50 = 200$

$$Q_s = \frac{200 + 46}{3} = \frac{246}{3} = 80 \text{ T/pile}$$

use 70 T pile @ cl. 475 ft

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac,  
Principal Foundation Engineer  
Mr. J.B. Curtis,  
Reg. Bridge Location Engineer,  
North Bay Regional Office

Bridge Division,  
Downsview, Ontario

July 13, 1967

C.P.R. Overhead at Deux Rivieres  
W.P. 80-65, Site No. 29-1  
Highway 17, District No. 13

Attached herewith are prints of the Preliminary Bridge  
Plan Drawing D-6167-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$150,000.  
This cost includes tender, materials, engineering and sundry  
construction, but does not include the cost of removal of the  
existing bridge.

Any comments or revisions you may have should be submitted  
within three weeks.

CSG:rd

C.S. Grebaki,  
Bridge Design Engineer

Attach.

c.c. S. McCombie  
A. Stermac  
R. Forrest  
E. Cross

Mr. C. Grebski  
Bridge Design Engineer

Attn: Mr. M. Stoyanoff  
Bridge Control Engineer

Foundation Section  
Material & Testing Div.  
Room 107, Lab. Building

February 9, 1967

Foundation Investigation Report

W.P. 80-65

C.P.R. Overhead, Hwy. 17

Deux Riviers, Ontario, Dist.#13

Attached please find the letter from Franki Canada Limited regarding the use of their type of pile at this location.

The letter is self explanatory and we believe that it contains enough information for you to make the necessary cost comparisons.

Should you have some querries please feel free to contact this office.

AGS:mt  
Att, 3 &

*A. G. Stermac*  
A. G. Stermac  
Principal Foundation Engineer

cc: Foundation Files  
General Files



# FRANKI

CANADA LIMITED

25 OVERLEA BLVD. - BLDG. No. 3

\*\*\*\*\*

TELEX NO.  
02-2159  
CABLEGRAMS  
"FRANKIPILE"  
TELEPHONE:  
\*\*\*\*\*  
421-7710

Our Ref: Box 190  
X.1167

TORONTO, 17, ONT.

February 8, 1967

Department of Highways, Ontario,  
Materials & Testing Division,  
Room 107, Lab Bldg.,  
Hwy 401 & Leslie,  
Downsview, Ontario

ATTENTION: Mr. A. Stermac, P.Eng.

Dear Sirs:

Re: Deux Rivières Bridge,  
Hwy. 17

We have examined the soil conditions as reported by W. A. Trow Associates from a viewpoint of employing Franki displacement caisson piles as the foundation for the proposed bridge.

Assuming that high capacity piles could be employed, we have selected a 24 inch diameter pile which would have a capacity of up to 175 tons.

Not knowing the loads that will have to be transferred through piers and abutments, we have selected an arbitrary number of piles in order to arrive at a budget price for this type of foundation.

Our budget price to install all equipment is of the order of \$3,500.00.

Our budget price to install 30 piles, founded at about elevation 505 and about 30 feet long is of the order of \$9,500.00. Small variations from the number of piles selected would be of the order of \$250.00 per pile for additional piles and about \$100.00 per pile for less piles.

Reinforcement will probably be required to accommodate bending moments in the foundation. The maximum reinforcing that can normally be used in this type of pile is of the order of 7 #6 bars and this would result in an additional cost of about \$70.00 per pile.

When more concrete information on the bridge design becomes available, we shall be pleased to discuss the matter further with you and review our estimates.

Yours very truly,  
FRANKI CANADA LIMITED

A handwritten signature in dark ink, appearing to be 'A. Prior', written over a horizontal line.

A. Prior, P.Eng.  
Chief Engineer

AP/eh

Mr. B. E. Davis,  
Bridge Engineer,  
Bridge Division.

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

Attention: Mr. S. McCombie

February 1, 1967 **FEB 1 1967**

FOUNDATION INVESTIGATION REPORT FOR D.R.O.  
BY: William Trow Associates Limited --  
Proposed Crossing - C.P. Railway, Hwy. 17,  
K.F. 80-65 -- District 13 (North Bay).

Attached, please find the foundation investigation report for the above mentioned crossing, prepared and submitted by the Consultant, William A. Trow Associates Ltd.

We have reviewed the report and believe that the factual information is adequate and well presented.

Regarding the recommendations, we feel that either H or tube piles, if used, could penetrate beyond elevation 490 before reaching practical refusal. However, this could happen, but does not necessarily have to. We are only bringing this to your attention at this stage in order to avoid complications at a later stage. The subsoil being basically granular, the capacity of the piles could be satisfactorily established by the use of the Hiley formula.

The Consultant recommends, as an alternative, Franki or Composite type piles.

According to our information, piles driven to approx. elevation 510.0, could have a safe bearing capacity of up to 175 tons. It is our opinion that these piles should be given serious consideration. We are in the process of acquiring approximate costs of these piles for this particular job. We will forward them to Mr. S. Stoyanoff as soon as possible, hoping that it will make his cost comparison easier.

Should you have any additional points that you would like to discuss, please feel free to contact this Office.

AGB/AGSF

Attach.

cc: Messrs. B. E. Davis (2)  
H. A. Fregaskes  
D. W. Farren  
H. McArthur  
G. E. French  
J. B. Curtis  
E. E. Saint  
B. A. Singh  
Foundations File  
Gen. Files

*Althman*  
A. G. Storaas  
PRINCIPAL FOUNDATION ENGINEER



Eng. 401 & Route 94.,  
Brampton, Ontario.

December 7, 1966

**Materials and Testing Division**

William A. Trow Associates Ltd.,  
96 Milvan Drive,  
Weston, Ontario.

Attention: Mr. W. A. Trow

Re: Letter of Authority -- Foundation Investigations  
Donn Riviere Creek, Eng. 17 -- U.P. 104-63  
S.P.S. Overhead at Donn Riviere -- U.P. 88-63 ✓  
Amendo Creek Bridge, Eng. 17 -- U.P. 111-63  
District No. 13 (North Bay)

Dear Sir:

Please consider this your authority to carry out foundation investigations at the above mentioned sites.

Drawings and plans showing the crossing locations and proposed footing layout, have been given to your representative on December 2, 1966.

You are requested to proceed with the investigations as soon as possible and submit the separate final reports by not later than February 1, 1967.

Eleven (11) copies of each report will be required for our distribution.

At the Amendo Creek Bridge site you are also requested to put down a number of shallow borings in order to establish whether bedrock is to be found above the proposed stream diversion bed. A plan with the stream diversion profile was given to your representative.

The proposed S.P.S. Overhead structure may incorporate piers built on a pier. You are, therefore, requested to establish the subsoil conditions for this alternative, also. The locations of two borings for this purpose are shown on the plan E-4420-1.

Grid calls will be required on the N.E. and S.E. corners of this structure, and these areas should also be included in your investigation.



December 7, 1966

Although unlikely, there is still a possibility that a barrel arch type of structure could be used for the Bay 17 crossing of the Deux Riviere Creek (S.P. 143-63). You are, therefore, requested to also investigate the subsoil conditions to a distance approximately 70 ft. from the highway centre-line downstream as well as upstream, where the barrel arch footings could presumably end.

Should you have any questions while working in the field, please contact the Foundation Section, Moncton, or better - Mr. J. B. Curtis, Regional Bridge Location Engineer, North Bay, 121 Main Street East, P.O. Box 535, North Bay, Ontario - Telephone No. 472-7900 (Area Code 705).

According to our information, accommodation is available in the town of Deux Riviere which is very close to all three sites.

In accordance with our terms of reference, you are to have a qualified Soils Engineer in charge of the field work at all times. Any deviation from this arrangement has to be approved by the Department. Previous requirements as to preliminary borehole information and laboratory testing program, should be followed.

Since the drawings accompanying the foundation reports, showing the location of borings, the inferred subsoil conditions, etc., are to become contract drawings, you are required to prepare them in accordance with the B.M.S. Standards. To enable you to do this, we are supplying you with a sample drawing with all the necessary explanations, together with linen sheets for your drawings. You are also requested to provide us with Crumflex copies of the drawings.

Charges for the work performed will be in accordance with your Schedule of Rates, dated January 1, 1966, and invoices to be addressed to the attention of the undersigned.

We are attaching the following Purchase Orders:

L-00012 - S.P. 143-63 - Deux Riviere Creek, Bay. 17.  
L-00013 - S.P. 80-65 - S.P.A. O'head at Deux Riviere,  
L-00014 - S.P. 331-65 - Ausente Creek Bridge, Bay. 17.

covering the purchase of any new material required for this work, 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.

WAT/hac/f  
Attach.

cc: Messrs. E. McCombie  
H. McArthur  
G. E. French  
J. B. Curtis  
L. E. Saint  
Mrs. I. Steinberg  
E. Kenings  
E. Bayraktar (2)

Yours very truly,

*A. R. R. R.*

A. R. R. R.

RAILROAD & TUNNEL ENGINEER  
DEFECTS IN NEGATIVE DUE TO  
CONDITION OF ORIGINAL DOCUMENT

A. Crowley  
Foundations Office  
Gen. Files (2)

#66-F-243C

W.P. #80-65

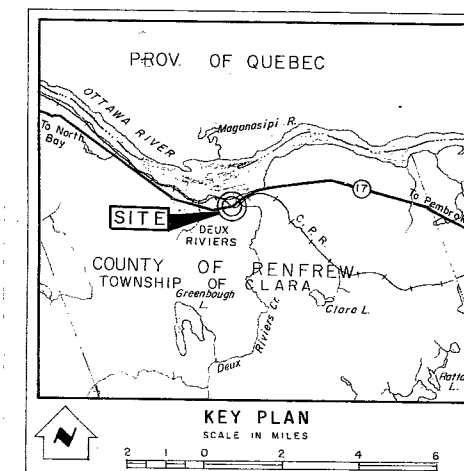
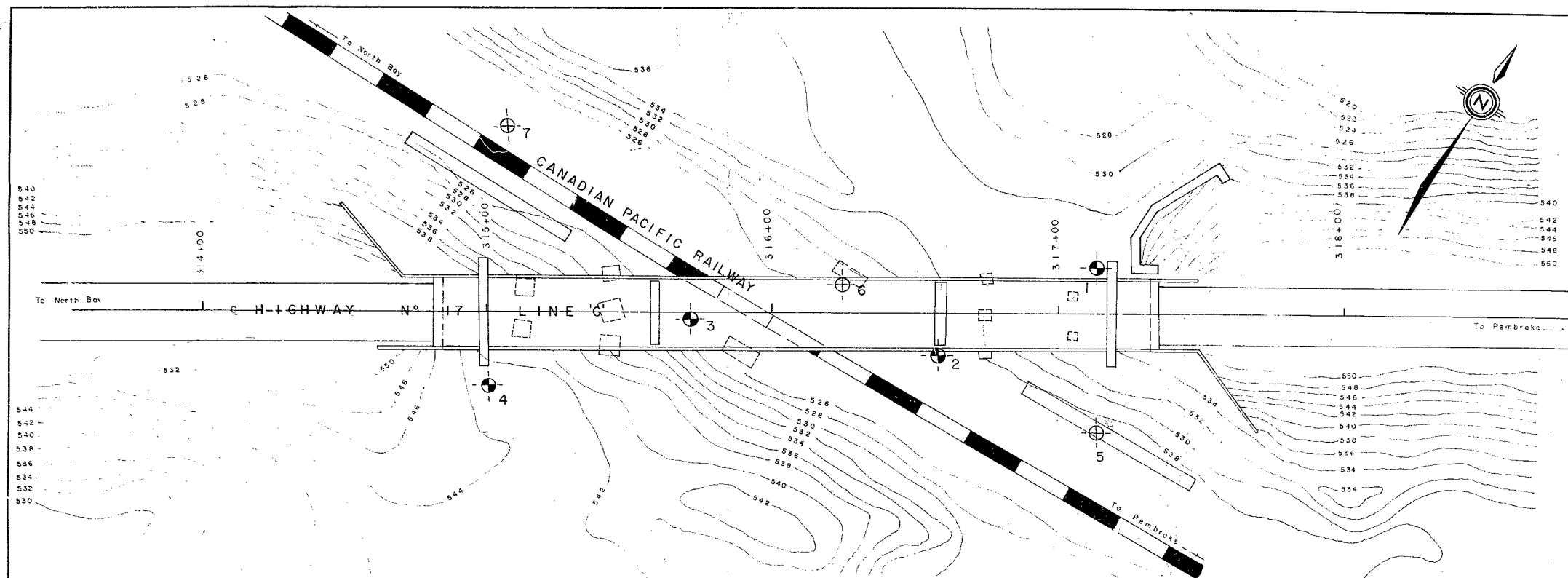
HWY #17





C.P.R.

OVERHEAD

DEUX

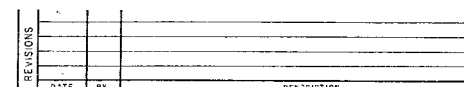
RIVIERES



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation.		

- NOTE -

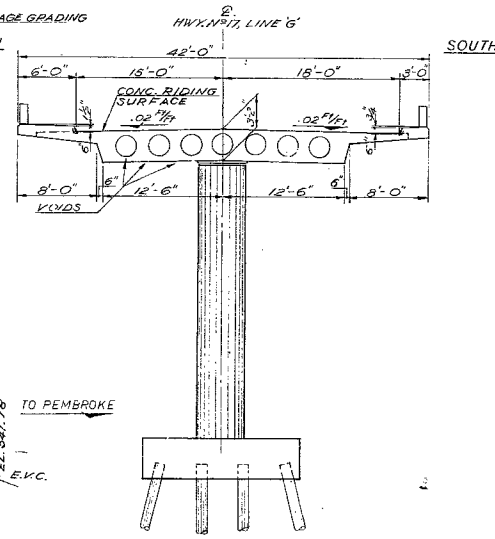
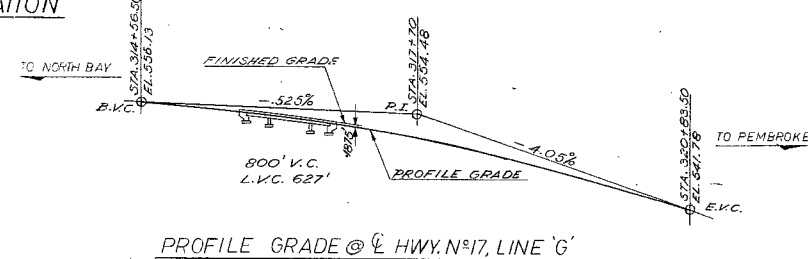
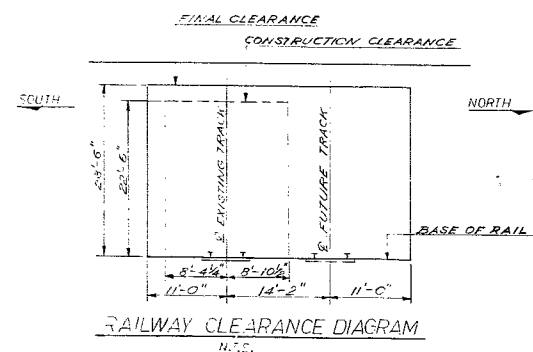
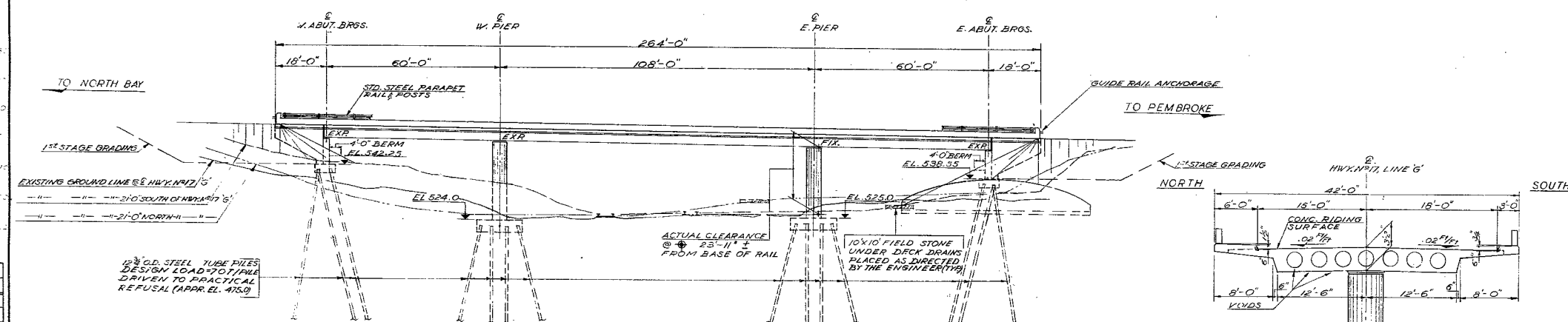
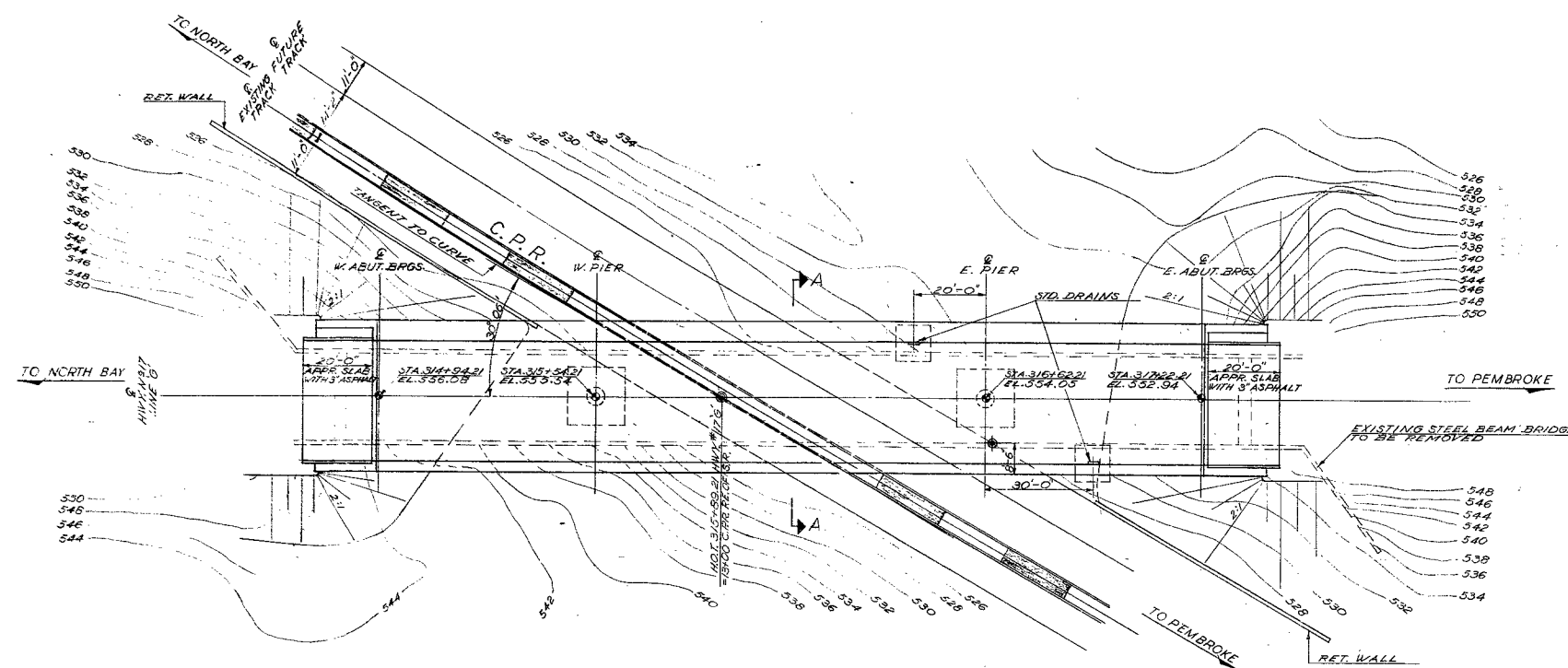
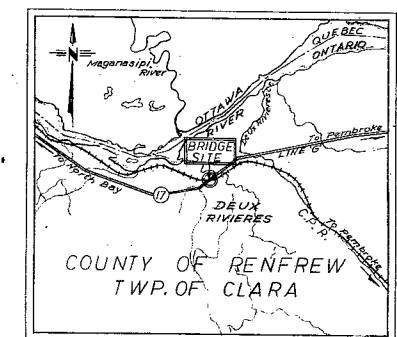
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.



WILLIAM. TROW ASSOCIATES LIMITED

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING DIVISION - FOUNDATION SECTION

PROPOSED CROSSING
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[illegible]

REVISIONS			
	7-25-67	P.O.L.	PROFILE GRADE OF HWY. NR. 17 LINE 6' AS SUPPLIED FOR DESIGN TO BE MAINTAINED.
	DATE	BY	DESCRIPTION

<div style="text-align: center;"> <b>DEPARTMENT OF HIGHWAYS ONTARIO</b>  <b>BRIDGE DIVISION</b> </div>			
<div style="text-align: center; font-size: 1.5em;"> <u>C.P.R. OVERHEAD AT</u>  <u>DEUX RIVIERES</u> </div>			
KING'S HIGHWAY No.17 CO. RENFREW TWP. CLARA		DIST. No. 13  LOT 19 CON. 'B'	
<div style="font-size: 1.2em;"> <u>PRELIMINARY PLAN</u> </div>			
APPROVED _____ <div style="text-align: center; font-size: 0.8em;">BRIDGE ENGINEER</div>		SITE No. 29-1 W.P. No. 80-65	
DESIGN P.O.L. CHECK DRAWING P.S.CH. CHECK P.O.L. DATE 10/15/77 LOADING 1650-54	CONTRACT No. _____ DRAWING No. D-6167-P1		