

McROSTIE SETO GENEST

& ASSOCIATES LTD. - CONSULTING ENGINEERS - 393 BELL ST., OTTAWA, ONTARIO
& ASSOCIÉS LTÉE - INGÉNIEURS CONSEILS - 393, RUE BELL - TEL. 232-5334

May 3, 1965.

Mr. K. Y. Lo, P. Eng.,
Foundation Section,
Materials & Testing Division,
Department of Highways of Ontario,
DOWNSVIEW, Ontario.

Dear Sir:

This will record our telephone conversation with you on April 28 regarding our subsurface investigation report No. SF-854 for the proposed new bridge near Ste.-Anne de Prescott.

In section 2.2.1 of the report we suggested that an embankment material possessing stress-strain characteristics similar to the underlying deposit be used in order that the shear strength of the east embankment material could be developed to resist failure. Thus it was felt that a clay embankment should be considered. However, in the last paragraph of this section it was pointed out that a granular fill would need to be placed at the contact area between the clay embankment fill and the abutment; this of course, to avoid the larger pressures on the abutment associated with a clay backfill.

In section 2.2.2 of the report we suggested that only the upper 6 feet or so of overburden encountered at borehole No. 1 location be removed by displacement. It was felt that this layer possesses a sufficiently low shear strength that it might be displaced. After a discussion with the Consultants it was agreed that an attempt be made to remove the softer material in this fashion.

In section 2.1.1 of the report we recommended a Franki type pile foundation for the support of the structure. On this basis, the boreholes were not all taken down to bedrock since a Franki type pile could be made to bear on or near the surface of the dense till layer encountered between elevations 135 and 125 in all three boreholes.

Yours very truly,



G. L. Genest
McROSTIE SETO GENEST &
ASSOCIATES LTD.

McROSTIE SETO GENEST

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1. TERMS OF REFERENCE

We were instructed by C. C. Parker and Associates Ltd. to carry out a foundation investigation for a proposed new bridge crossing the Rigaud River in the Township of East Hawkesbury for the Counties of Prescott and Russell. The new structure is to have three spans of continuous reinforced concrete or of simple beams, with an approach embankment up to 24 feet high. A diversion of the river is being proposed. Our report is to include recommendations on the structure and embankment foundations.

2. CONCLUSIONS AND RECOMMENDATIONS

2.1 Structure Foundations

2.1.1 Foundation Type

The most likely economical and feasible type of foundation for the proposed bridge at this site, is driven cast in place expanded base caisson similar to Franki, Parco or Petrifond piles. It is our opinion that the expanded bases could be formed in the dense tills above the rock, reducing the length of pile that would be required with other types of end bearing piles. Of course, any alternate type of end bearing piles such as steel

H piles, concrete filled shell piles, driven precast Herkules piles, and large diameter augered Western Caissons should be considered if they prove to be economical. However, since H piles or tube piles could likely penetrate to considerable depths, it is doubtful that they would be more economical. Also, the difficulties of driving and augering through dense till should be recognized.

Footings are not recommended due to the variable nature of the soils at footing level, the difficulty in maintaining the density of the tills below water level, and the low strength of the clays encountered.

2.1.2 Construction Precautions

Construction inspection of pile driving operations should be considered. Uncased caissons would require inspection of the driving method, the final resistance, the quality and quantity of concrete used in caisson shaft, and the cut-off elevation amongst other items. An allowance provided to cover the cost of a pile load test on any pile which inspectors might feel was substandard is a useful addition to construction control of any piling contract.

Variations between boreholes could be expected at this site because of the irregular subsoil encountered. If

significant variations are discovered at the time of construction they should be reported to the supervising authority for appropriate action. Finally variations in depth to the dense till stratum can be expected and contract payment procedures should make clear which party is to bear the cost of these variations.

2.2 Embankment Foundations

2.2.1 East Abutment (Closed-end Structure)

The stability analysis was made considering a failure slip longitudinal to the proposed 25 foot high embankment at the east abutment. Borehole No. 3 revealed the presence of a clay stratum at that location. The results of the analysis showed that the shear strength of the embankment material must be developed in order to obtain a suitable factor of safety against instability of the embankment foundation at that location. For this reason the embankment material, within the zone of possible longitudinal failure near the east abutment, must possess stress-strain characteristics similar to the underlying natural clay stratum. We recommend therefore that the embankment material should be compacted clay which has some remolded strength, for a distance of 75 feet from the east abutment. Such a clay can be found in the upper desiccated, layer, usually about 10 feet thick and commonly referred to as the clay crust,

in the Leda clay deposits in this area. Borrow areas could be investigated to determine the suitability of the upper clay stratum.

The clay fill would exert pressures on the new bridge abutment; we recommend that granular fill be placed at the contact area between the clay embankment fill and abutment.

2.2.2 West Abutment (Closed-end Structure)

Borehole No. 1 revealed the presence of a soft clayey deposit at the location of the west abutment. Presumably this soft deposit extends to the west of borehole No. 1. A stability analysis carried out at the west abutment considering a failure slip longitudinal to the proposed 25 foot high embankment showed instability of the embankment foundation. Hence, we recommend that the soft clayey deposit, about 6 feet thick at borehole No. 1, be removed by displacement. This could likely be achieved by placing a granular fill at the proposed embankment location progressing easterly so that the weight of the embankment would cause successive shear failure in the existing soft embankment foundation materials. These failures would occur in front of the embankment and the granular fill would thus displace and replace the existing soft clayey deposit. Should it be necessary for contract estimating purposes to

predetermine the length of embankment under which the soft soils should be displaced, the westerly extent of the soft clayey layer beneath the proposed embankment could be determined by a few additional boreholes.

Other alternatives such as excavation and replacement of existing soils, or additional spans to minimize extent of embankment were discussed with you by telephone, however it was concluded that the foregoing " pre load " procedure would be more economical with observation and maintenance program carried out by the County's forces as required.

3. SITE INVESTIGATION

3.1 Field Work

The drilling and sampling work was carried out by our own drill rig under the supervision of a Soils Engineer.

Sampling in the cohesive soils was by 2 inch thin wall Shelby tube sampler with small scale penetrometer tests made on the end of the tube as they were taken out. In situ vane tests were made between the tube sampling.

Sampling in the non cohesive soils was by 2 inch split barrel sampler with standard penetration tests carried out simultaneously. Where casing refusal was encountered, the material was diamond core drilled to confirm the existence of bedrock. During the diamond drilling operations a careful watch was made for any loss of drill water or drops of drill rods since these helped indicate the soundness of the rock. All soil and rock samples were field identified, logged and then sent to our laboratory for further study.

3.2 Laboratory Testing

Moisture content and classification tests were made on all samples, and laboratory penetrometer tests made on every 6 inch of cohesive sample. These tests helped to confirm the field identification of the soils, their strength properties and their probable behaviour during construction.

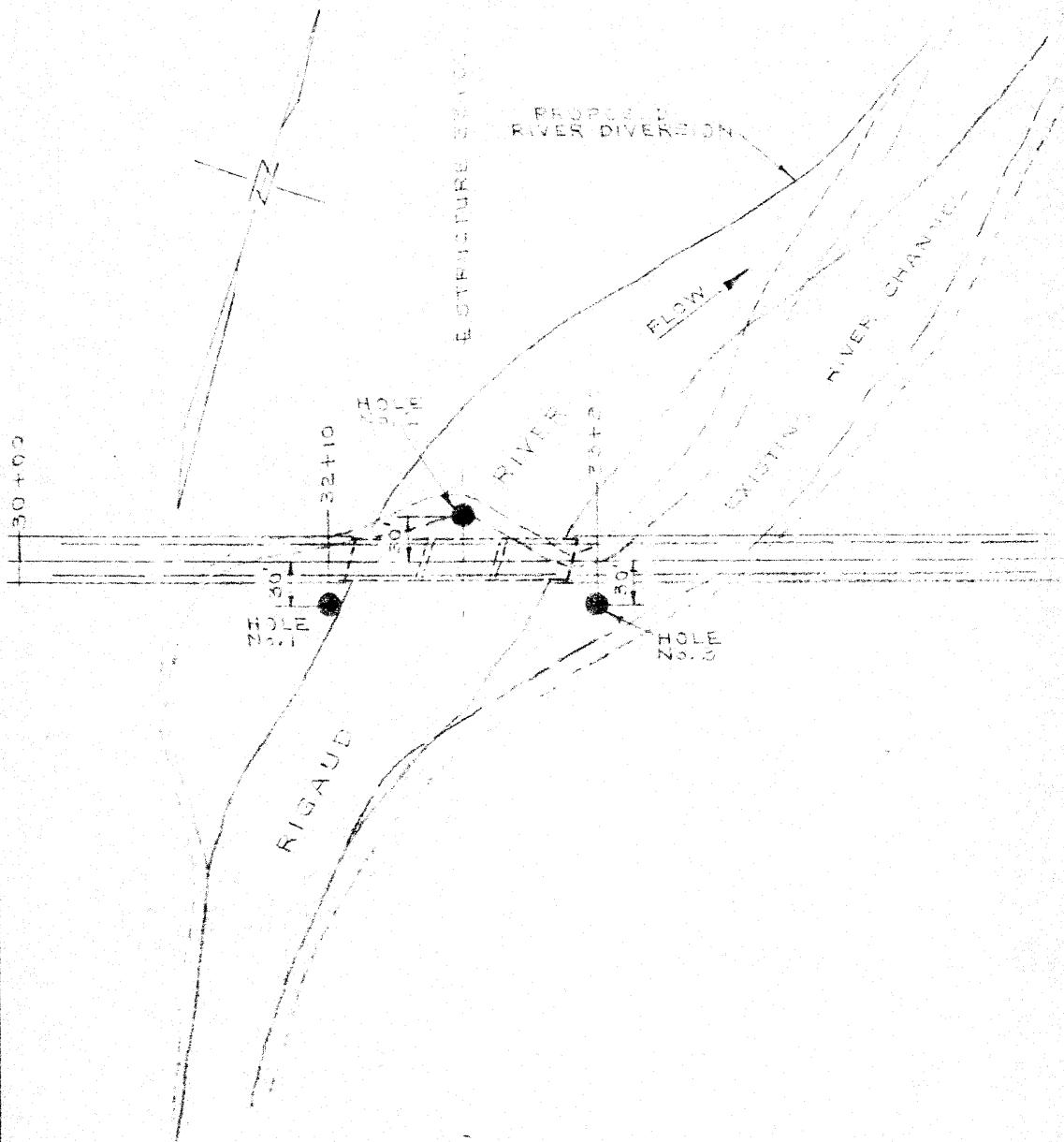
3.3 Observations

The soils encountered are described in detail on the attached soil profile summary sheets but in general are as follows:

West Abutment Area - Fill or river deposit about 6 feet thick, underlain by medium soft clay about 1.5 feet thick, underlain by loose till about 2.5 feet thick, underlain by medium dense to dense till.

Pier Area - Stiff clay about 7.5 feet thick, underlain by medium soft clay about 10 feet thick, underlain by loose to medium dense till about 10 feet thick, underlain by dense till.

East Abutment Area - About 1 foot of river deposit, underlain by stiff clay about 7.5 feet thick, underlain by loose to medium dense till about 8 feet thick, underlain by dense till about 10 feet thick, underlain by weathered or fractured rock.



McROSTIE SETO GENEST

& ASSOCIATES LTD. - CONSULTING ENGINEERS

& ASSOCIÉS LTÉE - INGÉNIEURS CONSEILS

BORÉHOLE LOCATIONS - POSITIONS DES FORAGES

EAST HAWKESEURY TOWNSHIP

SCALE
ÉCHELLE 1" = 100'

PLATE
PLAQUE 1

DEFECTS IN NEGATIVE DUE TO
CONDITION OF ORIGINAL DOCUMENT

McROSTIE & ASSOCIATES LTD.
CONSULTING ENGINEERS
OTTAWA CANADA

SOIL PROFILE AND SUMMARY OF FIELD AND LABORATORY TESTS

ELEVATION OF GROUND SURFACE (ZERO DEPTH) (FEET)		DATE WHEN MADE	HOLE NO.
REMARKS: (ELEVATION OF SURFACE OF WATER, LOCATION OF SURFACE OF WATER, LOCATION OF SURFACE OF WATER, LOCATION OF SURFACE OF WATER)			

[illegible]

SOIL PROFILE AND SUMMARY OF FIELD AND LABORATORY TESTS

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 11
REMARKS

DATE _____ HOLE NO _____

[illegible]

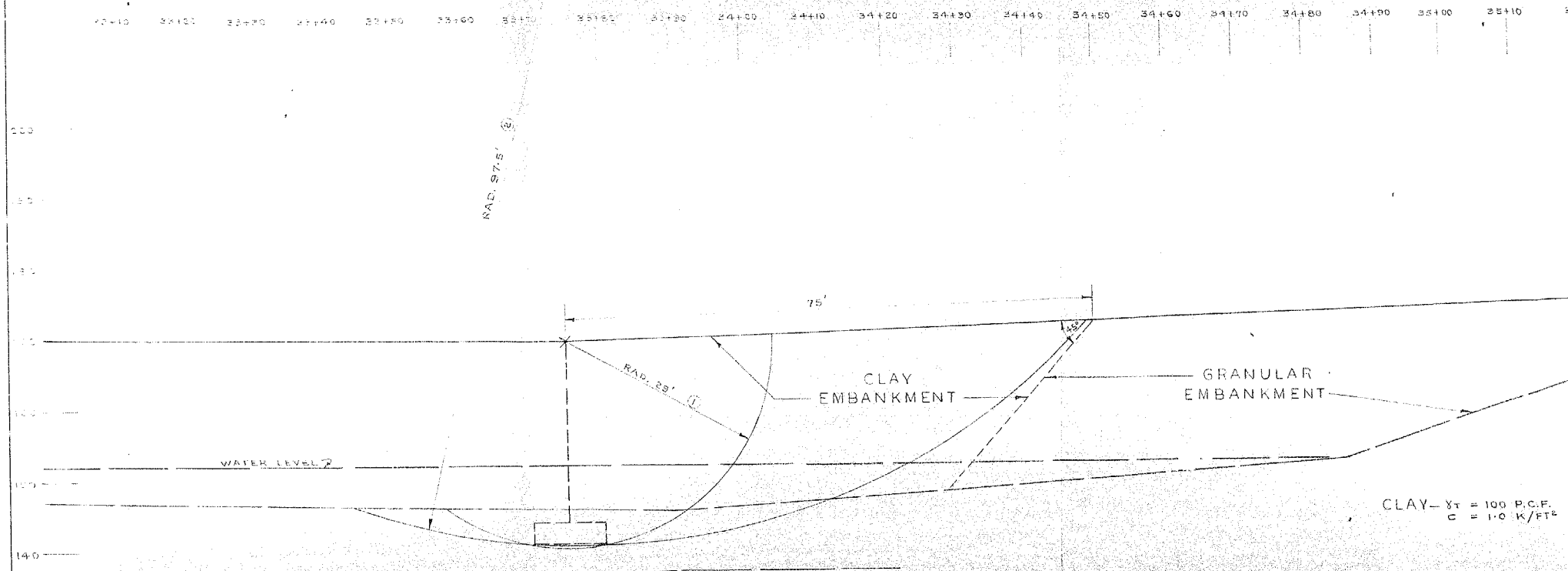
McROSTIE & ASSOCIATES LTD.
CONSULTING ENGINEERS
OTTAWA CANADA

SOIL BORING AND TESTING
OF FIELD AND LABORATORY TESTS

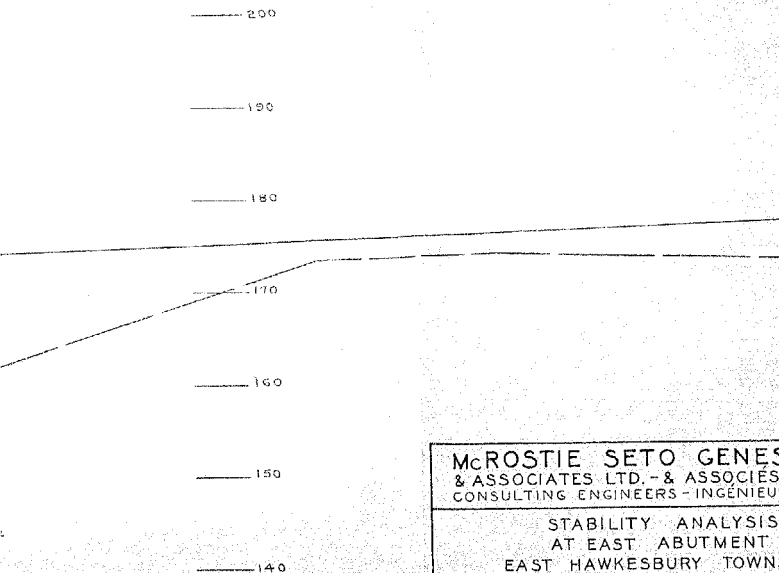
ELEVATION OF GROUND SURFACE (ZERO DEPTH) 100.00 DATE 1982.03.11 HOLE NO. 3
REMARKS 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

HOLE NO.	DATE	DEPTH (FEET)	ELEVATION	DESCRIPTION OF SOIL	STANDARD PENETRATION BLOW COUNT	SAMPLING METHOD	PROBING OR VANE TEST					
							15 BARREL			NO. GALLONS		
							INCH DEPTH	INCH DEPTH	INCH DEPTH	INCH DEPTH	INCH DEPTH	INCH DEPTH
ALLOWS PER FOOT OR IN KIPS PER FT.							0	1	2	3	4	5
WATER CONTENT												
VANE TEST												
REMOULDED UNDISTURBED												

CIRCLE No.	EMBANKMENT			SUBSOIL		F.S.
	γ_T	ϕ	C	γ_T	C	
(1)	P.C.F.	DEGREE	P.S.F.	P.C.F.	P.S.F.	
①	100	0	0	100	1000	1.2
②	100	0	200	100	1000	1.6
③	120	0	0	100	1000	1.7



25+20 25+30 35+40 35+50

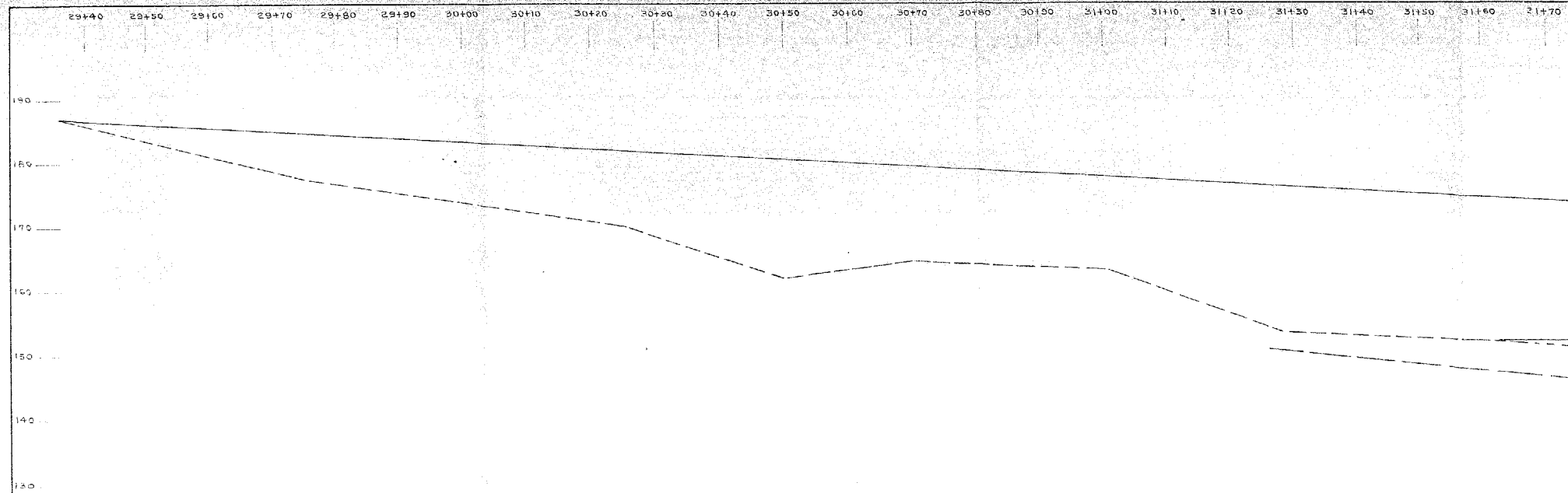


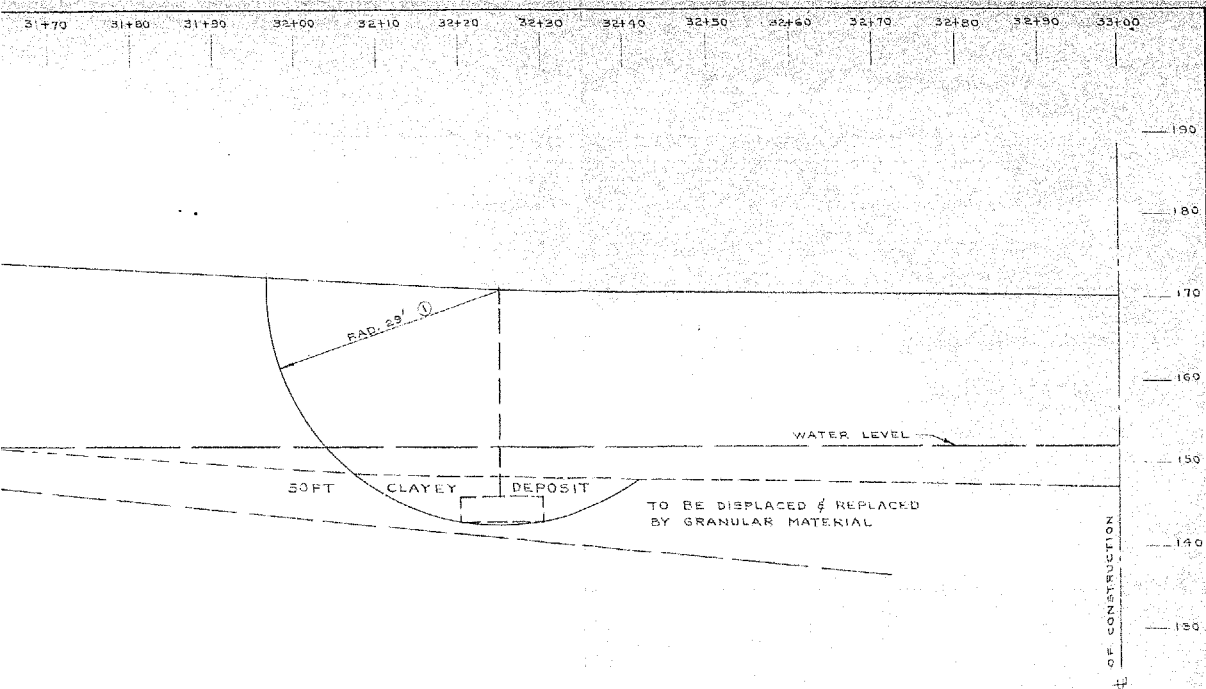
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CONSULTING ENGINEERS - INGÉNIEURS CONSEILS

STABILITY ANALYSIS
AT EAST ABUTMENT
EAST HAWKESBURY TOWNSHIP

SCALE:
ECHELLE: 1" = 10'

PLATE: 5
PLAQUE:





CIRCLE No.	EMBANKMENT			SUBSOIL		F.S.
	γ_T	ϕ	C	γ_1	C	
①	P.C.F. 120	DEGREE 0	P.S.F. 0	P.C.F. 100	P.S.F. 700	.8

McROSTIE SETO GENEST
& ASSOCIATES LTD. & ASSOCIÉS LTÉE
CONSULTING ENGINEERS - INGÉNIEURS CONSEILS

STABILITY ANALYSIS
AT WEST ABUTMENT
EAST HAWKESBURY TOWNSHIP

SCALE:
ECHELLE: 1" = 10'

PLATE:
PLAQUE: 6

cc: Foundations Office (RM: 110)
Mr. G.C.E. Burkhardt, P.Eng.,
Municipal Bridge Checking Engr.,
Bridge Division.

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

May 5, 1965

Your Memo -- April 20/65

United Counties of Prescott and Russell,
Bridge over the Rigaud River,
Township of East Hawkesbury,
Lots 10/11, Con. VI/VII,
Structure Site No. 27-158,
Your File No. BA 2034

The above report by the Soils Consultant, McRostie, Seto Genert and Associates Ltd., has been reviewed and subsequently discussed with the Consultant. The following comments are submitted for your consideration:

1. Piled Foundation: Steel H-piles driven to bedrock or practical refusal, should be considered if found to be more economical than Franki or similar type of piles. Unfortunately, the length of H-pile cannot be estimated accurately as bedrock was not proven in B.H. 1 and 2, but should be of the order of 30 ft. according to B.H. 3.
2. The soft material at the west approach embankment should be removed. If displacement method is used, sufficient time should be allowed to elapse before paving so that the trapped material may consolidate.
3. In no case should clay backfill be used behind the abutment. The standard D.H.O. requirements for back-filling should be adhered to.

We believe that the foregoing comments will prove adequate for your requirements; however, should additional information be required, please contact our Office.

KYL/MdeF


K. Y. Lo,
SUPERVISING FOUNDATION ENGR.

cc: Foundations Office ✓
Gen. Files

MEMORANDUM

To: A. Stermac, P.Eng.,
Principal Foundation Eng.
Materials & Research Section,
Room 107, Lab. Bldg.

FROM: Bridge Division,
Downsview, Ontario

DATE: April 20, 1965

OUR FILE REF.


IN REPLY TO

SUBJECT: United Counties of Prescott and Russell,
Bridge over the Rigaud River,
Township of East Hawkesbury,
Lots 10/11, Con. VI/VII,
Structure Site No. 27-158,
Our File No. BA 2034

Attached please find one (1) copy of the Foundation Report by McRostie, Seto Genert and Associates Limited, and one (1) copy of the Preliminary Plans.

We would appreciate it very much if we could have your comments at your earliest convenience, especially in respect of embankment stabilities.

GCEB/m


G.C.E. Burkhardt, P.Eng.,
Municipal Bridge Checking Engineer

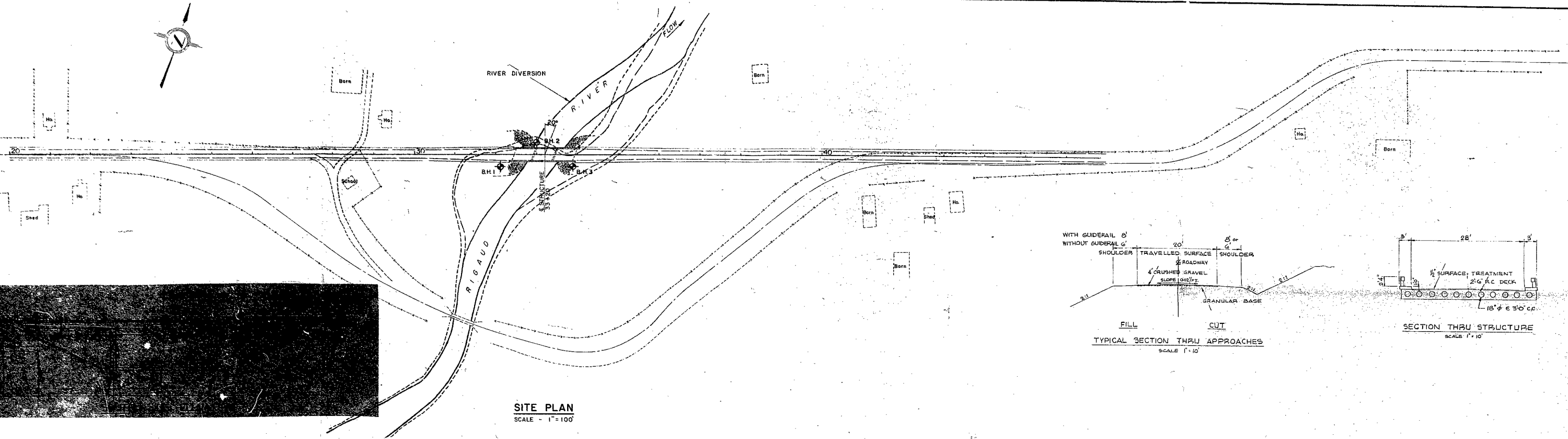
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BRIDGE

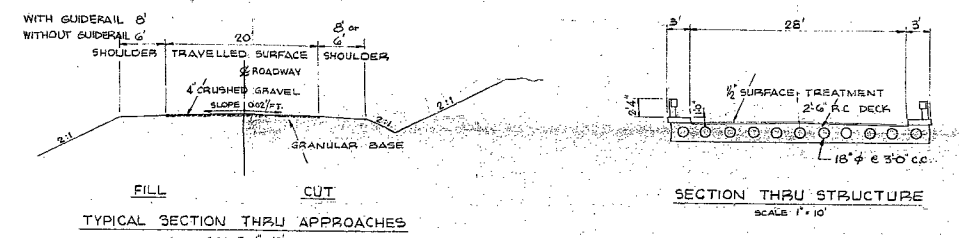
RIGAUD RIVER

LOTS 10/11 , CON. VI /VII

EAST HAWKESBURY TWP.

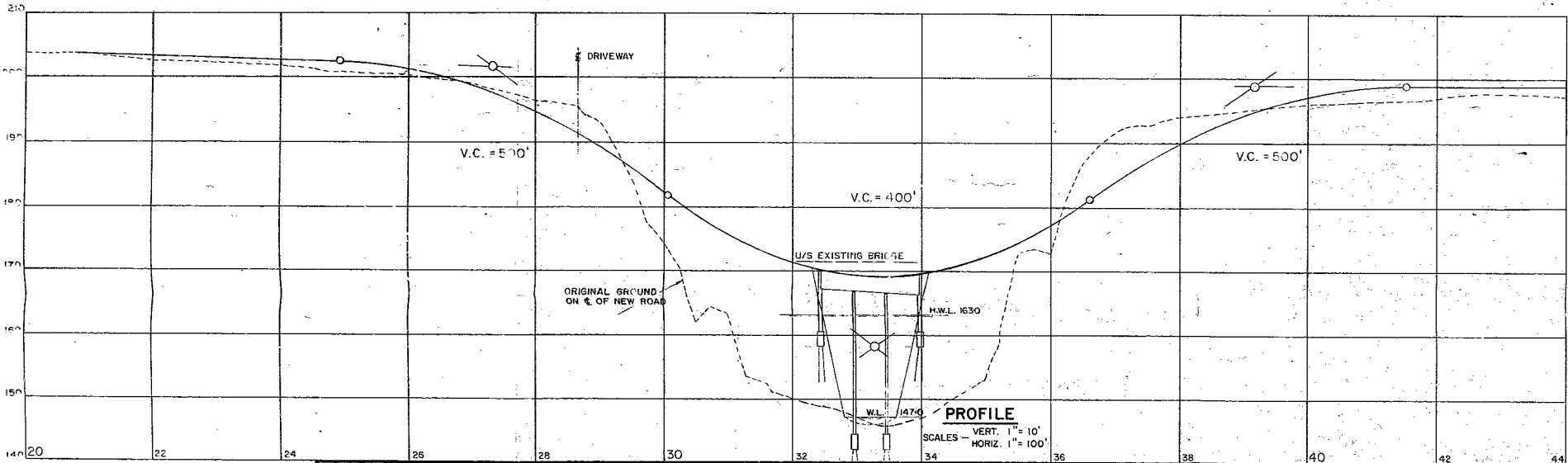


SITE PLAN
SCALE - 1"=100'

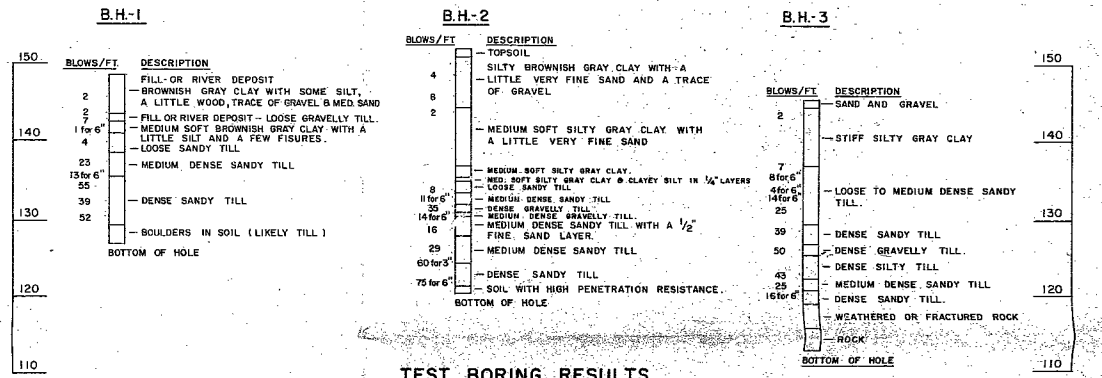


TYPICAL SECTION THRU APPROACHES
SCALE 1"=10'

SECTION THRU STRUCTURE
SCALE 1"=10'



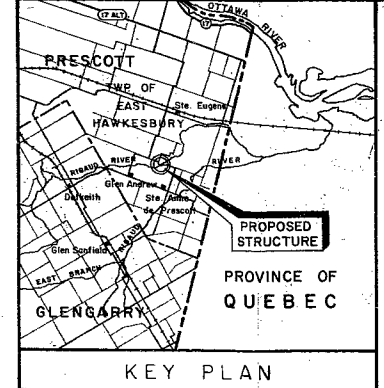
PROFILE
VERT. 1"=10'
HORIZ. 1"=100'



TEST BORING RESULTS

Test Borings are by McROSTIE SETO GENEST & Associates Ltd.
Ottawa, Ontario, Jan. 23 & 25, 1965
Test Borings are for general information only, and are not guaranteed
by the county.

MAR 12 1965



KEY PLAN

FOLLOW SEPARATE INSTRUCTIONS FOR PREPARATION OF BRIDGE SITE PLAN, WHEN MAKING BRIDGE SURVEY.

DATA

SPECIAL FEATURES: WATERFALLS, DAMS, EXCEPTIONAL FLOODS, ICE, DRIFTWOOD, SLIDING BANKS ETC.
NONE

2. (A) UPSTREAM & DOWNSTREAM BRIDGES (GIVE LOCATION, LENGTH, HEIGHT ABOVE N.H.W.L., NET CROSS-SECTIONAL AREA AT HIGH WATER & ESTIMATED AGE) UPSTREAM: LOTS 14 & 15 CONCESSION VII, 93' CLEAR SPAN PONY TRUSS, BUILT 1922, NET AREA 1350 SQ. FT., 4.5' ABOVE H.W.L.
DOWNSTREAM: LOT 11 CONCESSION X, 115' CLEAR SPAN PONY TRUSS, 30° SKEW, BUILT 1959, NET AREA 1590 SQ. FT.
(B) REASONS WHY THESE BRIDGES ARE, OR ARE NOT, FAIR INDICATIONS OF SIZE OF PROPOSED BRIDGE
THESE BRIDGES ARE A FAIR INDICATION OF SIZE OF PROPOSED BRIDGE

3. REASONS FOR CHANGES IN HEIGHT OR LENGTH FROM THAT OF OLD BRIDGE
BRIDGE RELOCATED TO WIDER PORTION OF RIVER, ICE BUMPS ABUTMENT OF EXISTING BRIDGE, OPENING IS TOO SMALL.

DATA (CONT'D.)

4. IS DITCH, STREAM, OR RIVER GRADIENT LIABLE TO BE LOWERED? NO

5. NAVIGATION CLEARANCES REQUIRED, IF ANY? NOT APPLICABLE

6. RAILWAY CLEARANCE REQUIRED, IF ANY? N.A.

7. IF STRUCTURE IS OVER OR UNDER A RAILWAY, HAS APPROVAL BEEN OBTAINED
(A) FROM RAILWAY CO. N.A.
(B) FROM BOARD OF TRANSPORT COMMISSIONERS? N.A.

8. HAS APPROVAL BEEN OBTAINED UNDER NAVIGABLE WATERS PROTECTION ACT? N.A.

9. IS A TEMPORARY DETOUR REQUIRED? EXISTING BRIDGE USED.
WHO WILL BUILD IT? N.A.
WHO WILL MAINTAIN IT? N.A.

10. INFORMATION AND EVIDENCE OF EXTREME FLOODING WAS OBTAINED FROM LOCAL RESIDENTS AND REFLECTS HIGHEST WATER ELEVATION IN THE AREA OF THIS CONSTRUCTION TO BE 163.11 AND THE LOWEST WATER ELEVATION TO BE 146.8 ft.

11. ROAD DESIGN INFORMATION
ESTIMATED A.D.T. 130 (YEAR 1964) DESIGN CLASS O-200
DESIGN SPEED 40 M.P.H.
STOPPING SIGHT DISTANCE 275

STRUCTURE DATA

1. NET SPAN LENGTH AND TYPE OF BRIDGE 3 SPAN, CONTINUOUS REINFORCED CONCRETE SPANS 37'-50" x 37'-50"

2. ROADWAY WIDTH ON BRIDGE 28 ft.

3. NUMBER & WIDTH OF SIDEWALKS 2-2' ESCAPE CURBS

4. SKEW ANGLE 20°

5. TOTAL LENGTH & TYPE OF PILING FRANKI PILES

6. APPROX. VOLUME OF CONCRETE CU. YDS.

7. APPROX. WEIGHT OF STEEL TONS

8. APPROX. WEIGHT OF REINFORCEMENT TONS

9. APPROX. VOLUME OF APPROACH FILL CU. YDS.

10. DRAINAGE AREA 92 SQ. MILES

FIELD INVESTIGATION MADE DECEMBER 1964

BY A.J. LYNCH & D.C. CRAMM
SURVEY ENGINEER

C.C. PARKER & ASSOCIATES LTD.
CONSULTING ENGINEERS
HAMILTON ONTARIO

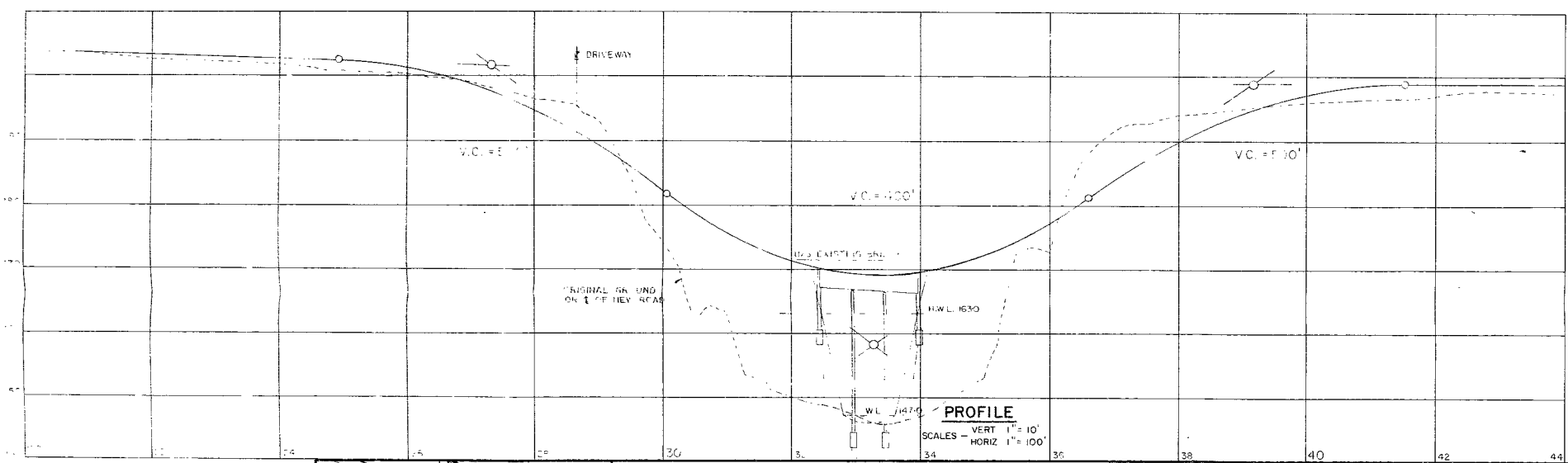
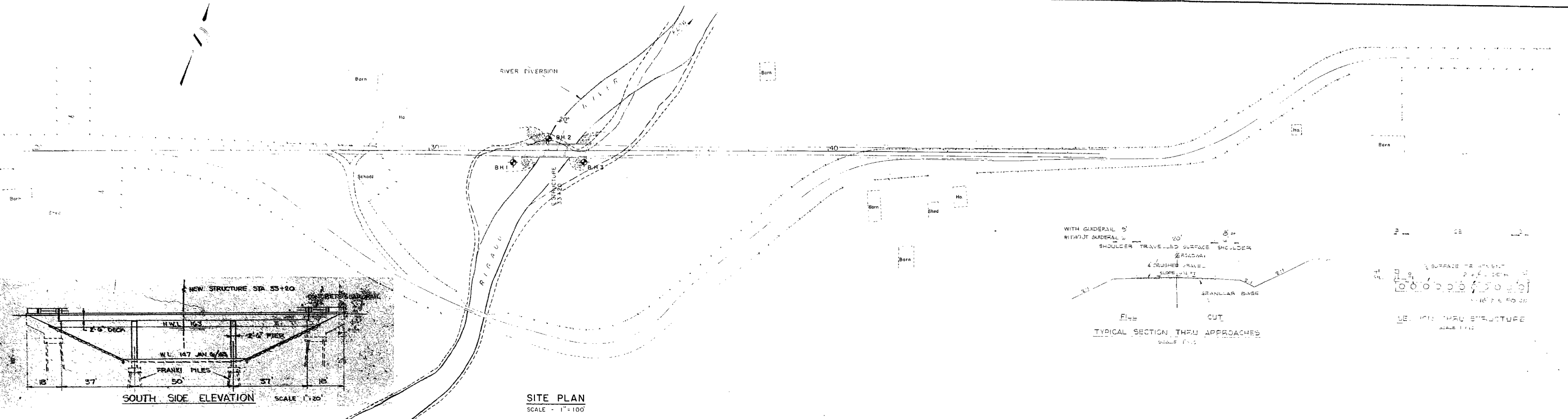
BRIDGE OVER RIGAUD RIVER

OWNER UNITED COUNTIES OF
CO. PRESCOTT AND RUSSELL MUNICIPAL DIST. NO. 9
TWP. EAST HAWKESBURY ROAD NO. 14
LOT 10 & 11 CON. VI & VII

SITE PLAN AND PROFILE

FEB/65
DATE
D.C. CRAMM
DESIGN ENGINEER

LOADING BRIDGE
H20-S16 NO. NO. 1

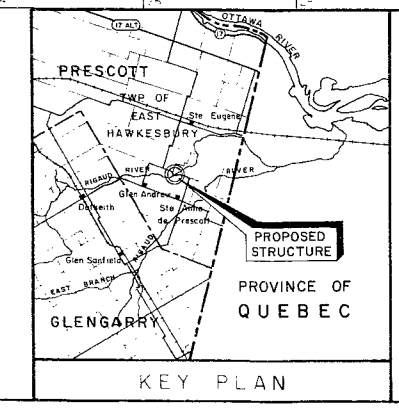


B.H.-1		B.H.-2		B.H.-3	
BLOWS/FT	DESCRIPTION	BLOWS/FT	DESCRIPTION	BLOWS/FT	DESCRIPTION
2	FILL OR RIVER DEPOSIT	4	TOPSOIL	2	SAND AND GRAVEL
2	BROWNISH GRAY CLAY WITH SOME SILT, A LITTLE WOOD, TRACE OF GRAVEL & MED SAND	8	SILTY BROWNISH GRAY CLAY WITH A LITTLE VERY FINE SAND AND A TRACE OF GRAVEL	7	STIFF SILTY GRAY CLAY
1 for 6"	FILL OR RIVER DEPOSIT - LOOSE GRAVELLY TILL	2	MEDIUM SOFT SILTY GRAY CLAY WITH A LITTLE VERY FINE SAND	8 for 6"	LOOSE TO MEDIUM DENSE SANDY TILL
13 for 6"	MEDIUM SOFT BROWNISH GRAY CLAY WITH A LITTLE SILT AND A FEW FIGURES	11 for 6"	MEDIUM SOFT SILTY GRAY CLAY	14 for 6"	TILL
55	LOOSE SANDY TILL	35	MEDIUM DENSE SANDY TILL	25	DENSE SANDY TILL
39	MEDIUM DENSE SANDY TILL	14 for 6"	MEDIUM DENSE SANDY TILL WITH A 1/2" FINE SAND LAYER	39	DENSE GRAVELLY TILL
52	DENSE SANDY TILL	18	MEDIUM DENSE SANDY TILL	50	DENSE SILTY TILL
	BOULDERS IN SOIL (LIKELY TILL)	20	DENSE SANDY TILL	43	MEDIUM DENSE SANDY TILL
	BOTTOM OF HOLE	75 for 6"	DENSE SANDY TILL	25	DENSE SANDY TILL
			SOIL WITH HIGH PENETRATION RESISTANCE	16 for 6"	WEATHERED OR FRACTURED ROCK
			BOTTOM OF HOLE		ROCK

TEST BORING RESULTS

Test Borings are by McROSTIE SETO GENEST & Associates Ltd. Ottawa, Ontario. Jan. 23 & 25, 1965

Test Borings are for general information only, and are not guaranteed by the county.



<p>FOLLOW SEPARATE INSTRUCTIONS FOR PREPARATION OF BRIDGE SITE PLAN WHEN MAKING BRIDGE SURVEY</p> <p>DATA</p> <p>SPECIAL FEATURES: WATERFALLS, DAMS, EXCEPTIONAL FLOODS, ICE, DRIFTWOOD, SLIDING BANKS ETC. NONE</p> <p>(A) UPSTREAM & DOWNSTREAM BRIDGES (GIVE LOCATION, LENGTH, HEIGHT ABOVE N.H.W.L., NET CROSS-SECTIONAL AREA AT HIGH WATER & ESTIMATED AGE) UPSTREAM: LOTS 14 & 15 CONCESSION VII L. 93' CLEAR SPAN PONY TRUSS, BUILT 1922 NET AREA 1350 SQ. FT. 4' 9" ABOVE H.W.L. DOWNSTREAM: LOT 1 CONCESSION X, 119' CLEAR SPAN PONY TRUSS, 30° SKEW, BUILT 1959, NET AREA 1590 SQ. FT.</p> <p>(B) REASONS WHY THESE BRIDGES ARE, OR ARE NOT, FAIR INDICATIONS OF SIZE OF PROPOSED BRIDGE THESE BRIDGES ARE A FAIR INDICATION OF SIZE OF PROPOSED BRIDGE</p> <p>REASONS FOR CHANGES IN HEIGHT OR LENGTH FROM THAT OF OLD BRIDGE BRIDGE RELOCATED TO WIDER PORTION OF RIVER ICE BUMPS ABUTMENT OF EXISTING BRIDGE, OPENING IS TOO SMALL</p>	<p>DATA (CONT'D)</p> <p>4 IS DITCH, STREAM, OR RIVER GRADIENT LIABLE TO BE LOWERED NO</p> <p>5 NAVIGATION CLEARANCES REQUIRED, IF ANY NOT APPLICABLE</p> <p>6 RAILWAY CLEARANCE REQUIRED, IF ANY N.A.</p> <p>7 IF STRUCTURE IS OVER OR UNDER A RAILWAY, HAS APPROVAL BEEN OBTAINED (A) FROM RAILWAY CO. N.A. (B) FROM BOARD OF TRANSPORT COMMISSIONERS N.A.</p> <p>8 HAS APPROVAL BEEN OBTAINED UNDER NAVIGABLE WATERS PROTECTION ACT? N.A.</p> <p>9 IS A TEMPORARY DETOUR REQUIRED? EXISTING BRIDGE USED WHO WILL BUILD IT? N.A. WHO WILL MAINTAIN IT? N.A.</p> <p>10 INFORMATION AND EVIDENCE OF EXTREME FLOODING WAS OBTAINED FROM LOCAL RESIDENTS AND REFLECTS HIGHEST WATER ELEVATION IN THE AREA OF THIS CONSTRUCTION TO BE 168.11 AND THE LOWEST WATER ELEVATION TO BE 146.811.</p> <p>11 ROAD DESIGN INFORMATION ESTIMATED ADT 130 (YEAR 1964) DESIGN CLASS D-200 DESIGN SPEED 40 MPH STOPPING SIGHT DISTANCE 275'</p>	<p>STRUCTURE DATA</p> <p>1 NET SPAN LENGTH AND TYPE OF BRIDGE 3 SPAN, CONTINUOUS, REINFORCED CONCRETE SPANS 37, 50, 37</p> <p>2 ROADWAY WIDTH ON BRIDGE 28 ft.</p> <p>3 NUMBER & WIDTH OF SIDEWALKS 2-2' ESCAPE CURBS</p> <p>4 SKEW ANGLE 20°</p> <p>5 TOTAL LENGTH & TYPE OF PILING FRANKI PILES</p> <p>6 APPROX VOLUME OF CONCRETE CU. YDS</p> <p>7 APPROX WEIGHT OF STR. STEEL TONS</p> <p>8 APPROX WEIGHT OF REINFORCEMENT TONS</p> <p>9 APPROX VOLUME OF APPROACH FILL CU. YDS</p> <p>10 DRAINAGE AREA 92 SQ. MILES</p> <p>FIELD INVESTIGATION MADE DECEMBER 1964</p> <p>BY A.J. LYNCH & D.C. GRAMM SURVEY ENGINEER</p>	<p>C.C. PARKER & ASSOCIATES LTD. CONSULTING ENGINEERS HAMILTON ONTARIO</p> <p>BRIDGE OVER RIGAUD RIVER</p> <p>OWNER UNITED COUNTIES OF PRESCOTT AND RUSSELL MUNICIPAL DIST. NO. 9 CO. PRESCOTT ROAD NO. 14 TWP. EAST HAWKESBURY LOT 10 & 11 CON. VI & VII</p> <p>SITE PLAN AND PROFILE</p> <p>DATE FEB 1965 BRIDGE NAME LOADING H20-S16 NO. 1 BRIDGE NO. 1 DWG. NO. 1</p>
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