

CONT. 73-97

THAMES RIVER

4 HWY. 2

40P2-25



MEMORANDUM

TO: Mr. A. P. Watt, (2)  
Regional Bridge Planning Engineer,  
Southwestern Region,  
London, Ontario.

FROM: Foundations Office,  
Design Services Branch,  
Central Bldg., Downsview.

ATTENTION:

DATE: November 29, 1971.

OUR FILE REF.

IN REPLY TO

DEC 2 1971

SUBJECT:

40 P 2 - 25  
SPRING 74

FOUNDATION INVESTIGATION REPORT  
For

Proposed Crossing at  
Thames River and Hwy. 2  
Town of Thamesford, Co. of Oxford  
District No. 2 (London)  
W.O. 71-11099 - W.P. 36-68-03

CONT. 73-97

Attached, we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the above structure site.

We believe that the factual data and recommendations contained therein, will prove adequate for your design requirements. Should additional information be required, please do not hesitate to contact our Office.

*Alf W. Mac*

A. C. Stermac,  
PRINCIPAL FOUNDATION ENGINEER.

AGS/ac  
Attach.

cc: Messrs. D. W. Farren 3/4/72  
B. R. Davis 3/4/72  
A. Rutka 3/4/72  
W. A. Zonnenberg  
L. E. Walker  
B. J. Giroux 3/4/72  
J. R. Roy  
G. A. Wrong 3/4/72  
E. A. Singh 3/4/72

Foundations Office  
Documents

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FOUNDATION INVESTIGATION REPORT  
For  
Proposed Crossing at  
Thames River and Hwy. 2  
Town of Thamesford, Co. of Oxford  
District No. 2 (London)  
W.O. 71-11099 - W.P. 36-68-03

1. INTRODUCTION:

A request for a foundation investigation at the crossing of Thames River and Hwy. #2, was received from Mr. A. P. Watt, Regional Bridge Planning Engineer, in a memo dated August 3, 1971.

A field investigation was subsequently carried out by the Foundation Office to determine the subsoil conditions existing at the site. This report contains the results of this investigation and our recommendations pertaining to the design of the proposed structure foundations and approach embankments.

2. DESCRIPTION OF SITE:

The site of the proposed crossing is located in the Town of Thamesford, just east of the junction of Hwy. #2 and 19.

The surrounding area is gently sloping. There are some trees around the existing bridge and an industrial building at the north-east corner of the bridge. There is a Conservation Authority dam about 800-1000 ft. north of the site. At this location the river flows in a north to south direction.

At the south-east corner of the existing structure, the Water Surveys of Canada have installed gauges and instruments to measure the water levels and river discharge.

Physiographically, the site is located in the region referred to as the Oxford Till Plain.

### 3. FIELD AND LABORATORY INVESTIGATION PROCEDURES:

A total of two sampled boreholes and two dynamic cone penetration tests was carried out during the course of the field work. Boring was achieved by means of a conventional diamond drilling equipment adapted for soil sampling purposes. During the field work, disturbed samples were obtained by means of a standard split-spoon sampler; the energy used in driving it, conformed to the requirements of the Standard Penetration Test.

Dynamic cone penetration tests were carried out adjacent to each borehole. Driving energy used to advance the cone was 350 ft.-lbs. per blow.

All boreholes were surveyed in the field by personnel from London Region Engineering Survey Section. The locations and elevations of the borings are shown on Drawing No. 71-11099A, which accompanies this report.

All samples were visually examined and classified at the site as well as in the laboratory. Following this inspection, laboratory tests were carried out on selected samples to determine the following physical properties:

Moisture Content

Grain-Size Distribution

The results of the field and laboratory tests are summarized on the Record of Borehole sheets contained in the Appendix to the report.

### 4. SUBSOIL CONDITIONS:

Subsoil conditions in both boreholes were generally similar. Subsoil at the site consists of a granular or non-cohesive type of deposit. The composition of the material varies from sandy silt to silty sand with some gravel and traces of clay. Many boulders were encountered while advancing the boreholes, indicating the presence of frequent boulders up to 2 ft. in size.

The grain-size analyses indicate the following ranges of distribution, and are plotted on Fig. 1.

Gravel	9 - 61%
Sand	14 - 55%
Silt and Clay	25 - 57%

Standard penetration tests indicate a very dense relative density.

The existing fill contains numerous boulders. The river bed is also covered with numerous boulders.

5. GROUNDWATER CONDITIONS:

River water level at the time of the investigation was at elevation 898.6 ft. Groundwater level in the boreholes was found to be at the same level as the river.

According to the Water Surveys of Canada, the high water level of elevation 906.2 ft. was recorded on February 2, 1968, and the discharge measured was 6880 c.f.s.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to replace the existing structure with a new bridge. The bridge may consist of either one (84 ft.) or three (35'-50'-35') spans. The existing bridge is a 75' single span, concrete and steel structure. It is reported that the structure is founded on spread footings placed at elevation 897.0 ft. In general, the condition of the structure is poor.

The present grade which will remain unchanged is at elevation 919 ft. resulting in a maximum height of embankment of 24 ft.

The subsoil is competent to support spread footing type foundations. An allowable net bearing capacity of 3 TSF may be used for design purposes for footings placed at or below elevation 896.0 ft. However, the exact depth of foundation will depend upon hydrological considerations.

As an alternative in the case of a three span structure, the abutments may be constructed within the approaches, and be supported on steel H piles driven to elevation 885 $\pm$ . Maximum allowable pile loads may be assumed in this case. However, it should be ensured that the portion of fill within the approaches through which piles have to be driven should not contain grain sizes larger than 3 inches.

It should be assumed that immediate differential settlements of 1 inch maximum will occur between pier and abutment whatever the method of support.

Because of the granular nature of the subsoil, it is susceptible to 'boiling' under an unbalanced hydrostatic head; therefore, a suitable dewatering scheme will be required to pour concrete in the dry, for footings placed below the ground or river water level. It should be noted that driving of sheet piles to suitable depths will be extremely difficult because of presence of boulders.

7. MISCELLANEOUS:

The field investigation was carried out during the period of October 18-26, 1971, under the supervision of Mr. A. Prakash, Project Foundation Engineer, who also prepared this report.

Equipment was owned and operated by P.V.K. and Sons Ltd.

This report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

*A. Prakash*

A. Prakash, P. Eng.

*K. G. Selby*

K. G. Selby, P. Eng.

AP/ao

November 26, 1971.





APPENDIX I



FOUNDATION SECTION

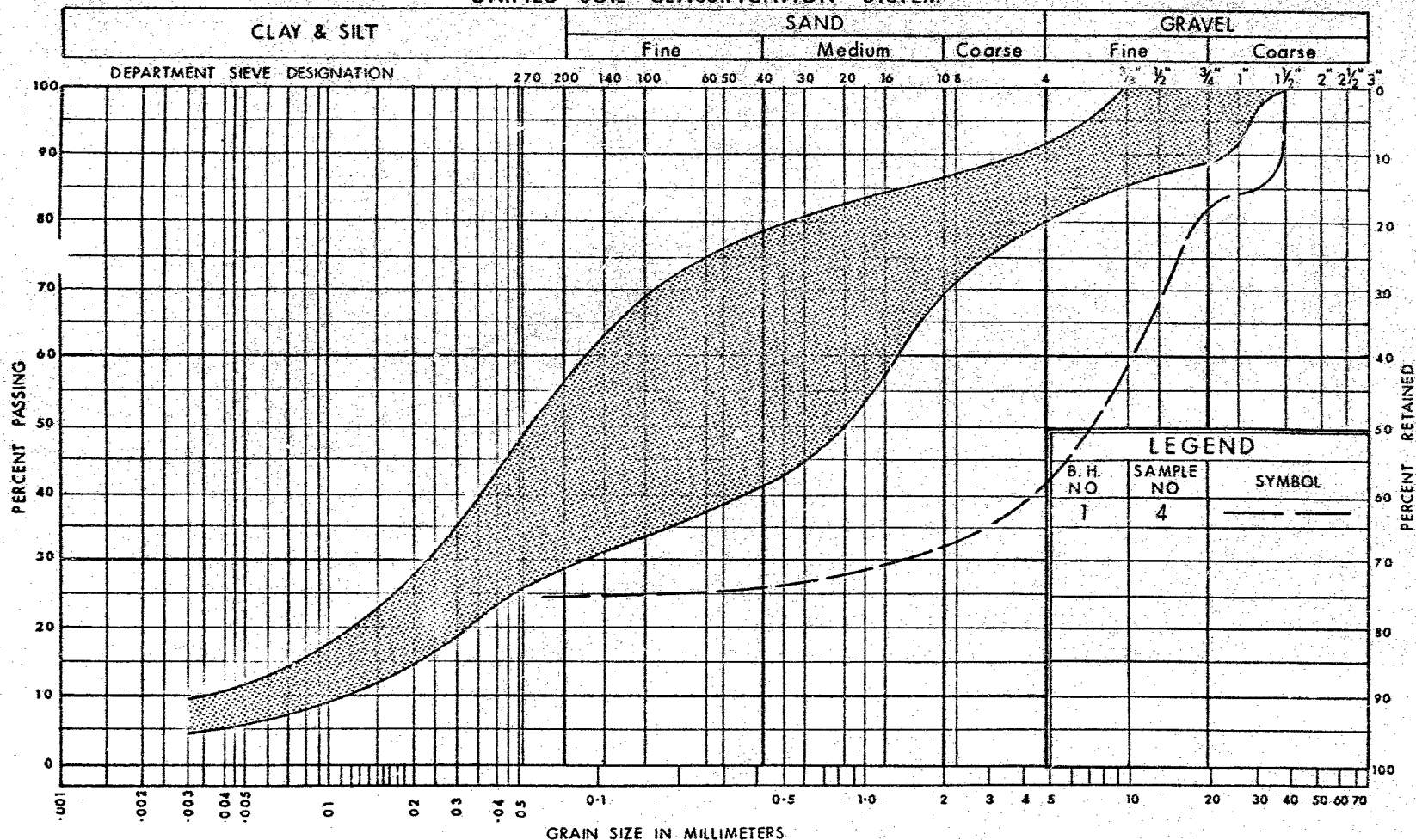
ORIGINATED BY AF

COMPILED BY F2

CHECKED BY

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE	LIQUID LIMIT ——— $w_L$		BULK DENSITY	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS / FOOT	BLOWS / FOOT	PLASTIC LIMIT ——— $w_p$			WATER CONTENT ——— $w$
							20 40 60 80 100				
						SHEAR STRENGTH P.S.F.	WATER CONTENT %				
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE	$w_p$ ——— $w$ ——— $w_L$				
							10 20 30				
901.8	Ground Level										
0.0	Sandy silt to silty sand, some gravel, traces of clay.  Very Dense	○	1	SS	100	4"					598.6 ▽ 2 31 51 6  9 43 42 6
		○	2	SS	10	10"					
		○	3	SS	10	11"					
		○	4	SS	100	6"					
		○	5	SS	100	5"					
		○	6	SS	100	3"					
		○	7	SS	100						
875.3	Frequent Boulders	○	8	SS	110						
26.5	End of Borehole										
						870					

# UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT  
OF  
TRANSPORTATION AND COMMUNICATIONS



DESIGN SERVICES  
BRANCH

GRAIN SIZE DISTRIBUTION  
SANDY SILT TO SILTY SAND  
SOME GRAVEL TRACES OF CLAY

W.P. No. 36-68-03

JOB No. 71-11099

FIG. NO. 1

## SUMMARY OF PILE DRIVING RECORDS

W.O. 71-11099 W.P. 36-68-03 CONT. 73-97 DIST. 2

SITE CROSSING @ THAMES RIVER AND Hwy # 2

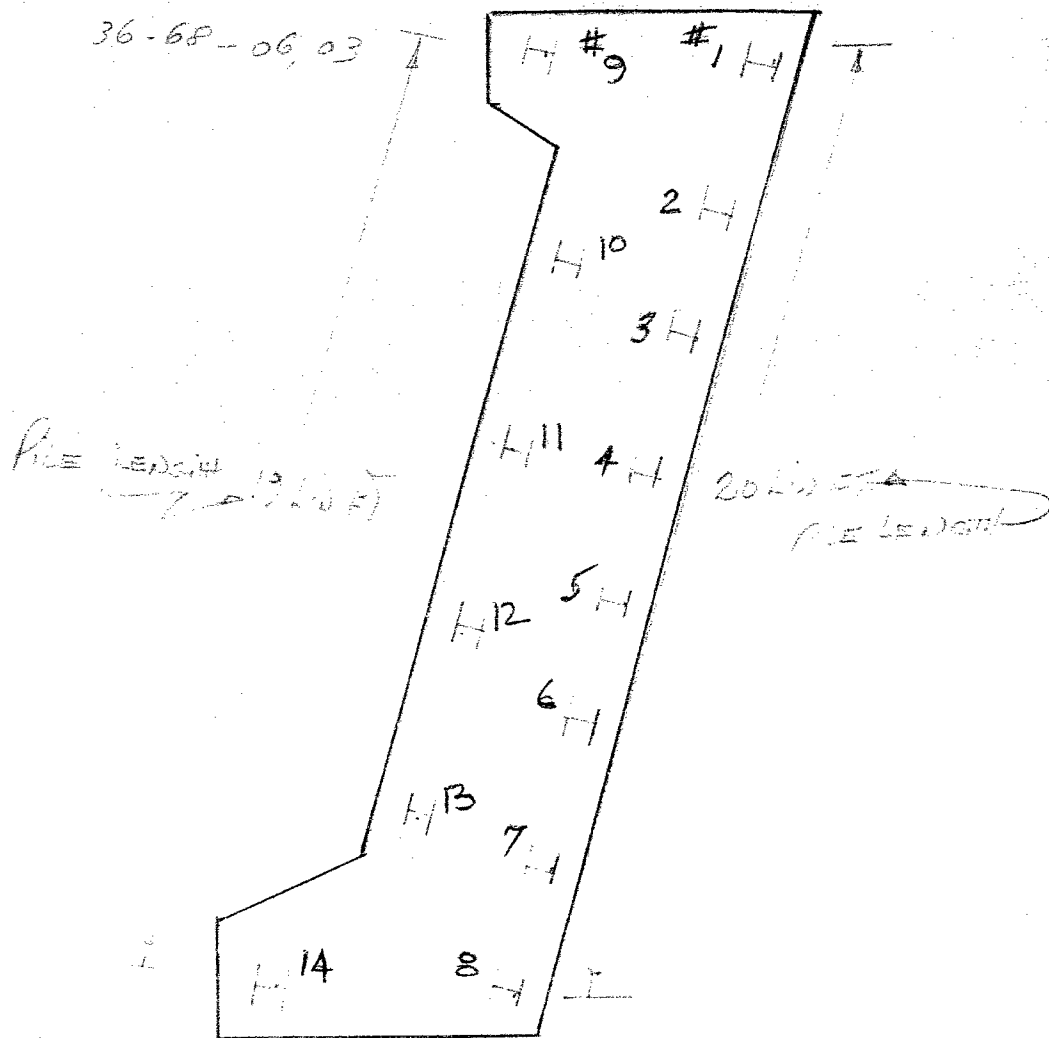
DATE DRIVEN Nov. 12 - Nov. 16/73 WEIGHT OF ANVIL

HAMMER TYPE B-225 WEIGHT 1.425 ENERGY 25000 FT/lb

[illegible]

WEST ABUTMENT.

Cont. 73-97



NOTE ALL PILES DRIVEN TO GRADE.

## BRIDGE CONSTRUCTION — PILE DRIVING RECORD

DISTRICT NO. 2 CONTRACT NO. 73-97 STRUCTURE MID. THAMES RIVER BR. @ Hwy #2  
 CONTRACTOR Looby Const Co. DESIGN LOAD OF PILE 95 TONS  
 HAMMER DETAILS: TYPE \_\_\_\_\_ WEIGHT \_\_\_\_\_ HEIGHT OF FALL OR ENERGY \_\_\_\_\_  
 TYPE OF ANVIL OR CAP \_\_\_\_\_ WEIGHT OF ANVIL OR CAP \_\_\_\_\_

## PILE DETAILS

PILE NO. 5 LOCATION Nest Abut. Battered. 1135 DATE DRIVEN Nov. 13/73

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.
20	1	1	26	26	51		76				
	2	3	27	27	52		77				
	3	10	28	28	53		78				
	4	15	29	29	54		79				
	5	20	30	30	55		80				
	6	17	31	31	56		81				
	7	29	32	32	57		82				
	8	35	33	33	58		83				
	9	44	34	34	59		84				
	10	51	35	35	60		85				
	11	48	36	36	61		86				
	12	54	37	37	62		87				
	13	58	38	38	63		88				
	14	52	39	39	64		89				
	15	56	40	40	65		90				
	16	53	41	41	66		91				
	17	70	42	42	67		92				
	18	96	43	43	68		93				
	19		44	44	69		94				
	20		45	45	70		95				
	21		46	46	71		96				
	22		47	47	72		97				
	23		48	48	73		98				
	24		49	49	74		99				
	25		50	50	75		100				

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	6	6	6	7	8	8
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE	20'			FINAL CUT OFF ELEVATION		
				GRADE 902.25		

REPORT TO BE SENT TO: — PRINCIPAL FOUNDATION ENGINEER  
 MATERIALS & RESEARCH DIVISION  
 DEPARTMENT OF HIGHWAYS  
 PARLIAMENT BUILDINGS  
 TORONTO, ONTARIO

SIGNED H. H. Helmer  
 NAME (PRINT) H. H. HELMER  
 DATE Nov 13/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

135  
 902.25  
 19.7  
 882.85  
 TID

# BRIDGE CONSTRUCTION - PILE DRIVING RECORD

## Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12 $\frac{1}{2}$ " O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12 $\frac{1}{2}$ " x  $\frac{1}{2}$ " steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.



# BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 2 CONTRACT NO. 73-97 STRUCTURE MID. THAMES R.R. BR. @ Hwy #2  
 CONTRACTOR \_\_\_\_\_ DESIGN LOAD OF PILE \_\_\_\_\_  
 HAMMER DETAILS: TYPE \_\_\_\_\_ WEIGHT \_\_\_\_\_ HEIGHT OF FALL OR ENERGY \_\_\_\_\_  
 TYPE OF ANVIL OR CAP \_\_\_\_\_ WEIGHT OF ANVIL OR CAP \_\_\_\_\_

## PILE DETAILS

PILE NO. 14 LOCATION WEST ABUTMENT (VERTICAL) DATE DRIVEN \_\_\_\_\_

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.
19	1		26	1		51			76		
	2		27	2		52			77		
	3		28	3		53			78		
	4		29	4		54			79		
	5		30	5		55			80		
	6		31	6		56			81		
	7		32	7		57			82		
	8		33	8		58			83		
	9	33	34	9		59			84		
	10	35	35	10		60			85		
	11	39	36	11		61			86		
	12	47	37	12		62			87		
	13	50	38	13		63			88		
	14	55	39	14		64			89		
	15	55	40	15		65			90		
	16	64	41	16		66			91		
	17	76	42	17		67			92		
	18	88	43	18		68			93		
	19		44	19		69			94		
	20		45	20		70			95		
	21		46	21		71			96		
	22		47	22		72			97		
	23		48	23		73			98		
	24		49	24		74			99		
	25		50	25		75			100		

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	6.0	6.0	6.5	7.0	7.0	7.3
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE	19			FINAL CUT OFF ELEVATION GRADE 902.25		

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER  
 MATERIALS & RESEARCH DIVISION  
 DEPARTMENT OF HIGHWAYS  
 PARLIAMENT BUILDINGS  
 TORONTO, ONTARIO

SIGNED H. Helmer  
 NAME (PRINT) H. L. HELMER  
 DATE Nov. 19/73  
 ATTACH SKETCH OF PILE NUMBERING SYSTEM

TIP

902.25  
19.0  
883.25

# BRIDGE CONSTRUCTION - PILE DRIVING RECORD

## Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12 $\frac{1}{2}$ " O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12 $\frac{1}{2}$ " x  $\frac{1}{2}$ " steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

## BRIDGE CONSTRUCTION — PILE DRIVING RECORD

DISTRICT NO. 2 CONTRACT NO. 73-97 STRUCTURE MID. THAMES RIV. BR. @ HWY # 2  
 CONTRACTOR Looby & Sons Ltd. DESIGN LOAD OF PILE 95 Ton  
 HAMMER DETAILS: TYPE WESCAM WEIGHT \_\_\_\_\_ HEIGHT OF FALL OR ENERGY \_\_\_\_\_  
 TYPE OF ANVIL OR CAP \_\_\_\_\_ WEIGHT OF ANVIL OR CAP \_\_\_\_\_  
 PILE DETAILS \_\_\_\_\_

PILE NO. 1 LOCATION NEXT ABUTMENT (VERTICAL) DATE DRIVEN Nov. 16/73

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.
2.0	1		26	51			76				
	2		27	52			77				
	3		28	53			78				
	4		29	54			79				
	5		30	55			80				
	6		31	56			81				
	7		32	57			82				
	8	29	33	58			83				
	9	33	34	59			84				
	10	32	35	60			85				
	11	33	36	61			86				
	12	44	37	62			87				
	13	47	38	63			88				
	14	51	39	64			89				
	15	56	40	65			90				
	16	69	41	66			91				
	17	87	42	67			92				
	18	93	43	68			93				
	19		44	69			94				
	20		45	70			95				
	21		46	71			96				
	22		47	72			97				
	23		48	73			98				
	24		49	74			99				
	25		50	75			100				

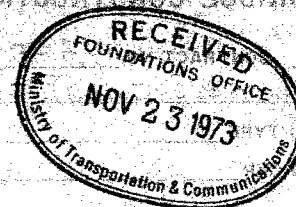
DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	6.0	6.0	6.5	6.5	7.0	7.5
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE <u>20'</u>	FINAL CUT OFF ELEVATION <u>GRADE 902.25</u>					

REPORT TO BE SENT TO: — PRINCIPAL FOUNDATION ENGINEER  
 MATERIALS & RESEARCH DIVISION  
 DEPARTMENT OF HIGHWAYS  
 PARLIAMENT BUILDINGS  
 TORONTO, ONTARIO

SIGNED W. L. Helmer  
 NAME (PRINT) W. L. HELMER  
 DATE Nov. 19/73  
 ATTACH SKETCH OF PILE NUMBERING SYSTEM

902.25  
 20.0  
 88 2.25

# BRIDGE CONSTRUCTION - PILE DRIVING RECORD



## Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12 $\frac{1}{2}$ " O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12 $\frac{1}{2}$ " x  $\frac{1}{2}$ " steel plate shoe.

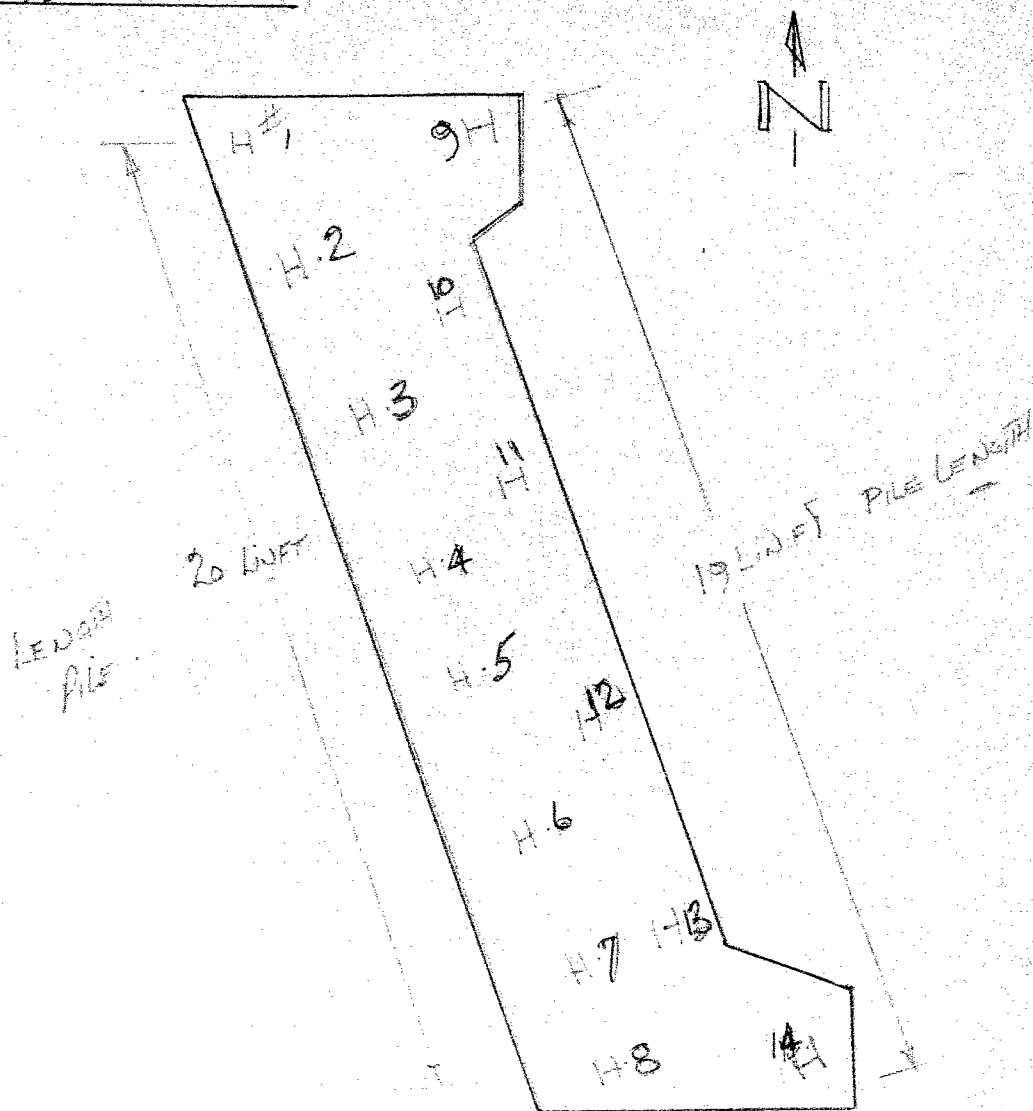
Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

# EAST ABUTMENT



NOTE - ALL PILES DRIVEN TO GRADE

OVER

Form OB-ML-286  
300 Pads — 81-4636DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION  
FOUNDATION SECTION

## BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 2 CONTRACT NO. 73-97 STRUCTURE MIDDLE THAMES RIVER OHW #2  
 CONTRACTOR Looby Const. Co. DESIGN LOAD OF PILE 95 TONS  
 HAMMER DETAILS: TYPE B 225 WEIGHT \_\_\_\_\_ HEIGHT OF FALL OR ENERGY \_\_\_\_\_  
 TYPE OF ANVIL OR CAP \_\_\_\_\_ WEIGHT OF ANVIL OR CAP \_\_\_\_\_  
 PILE DETAILS 'H' 14# PER LWT. 12" x 11" x 12' DRIVE JHES.  
 PILE NO. 14 LOCATION EAST ABUTMENT VERTICAL DATE DRIVEN Nov 12/73

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.
19	1		26			51			76		
2	1		27			52			77		
3			28			53			78		
4	2		29			54			79		
5	3		30			55			80		
6	4		31			56			81		
7	5		32			57			82		
8	6		33			58			83		
9	7		34			59			84		
10	8		35			60			85		
11	9		36			61			86		
12	10		37			62			87		
13	11		38			63			88		
14	12		39			64			89		
15	13		40			65			90		
16	14		41			66			91		
17	15		42			67			92		
18	16		43			68			93		
19	17		44			69			94		
20	18		45			70			95		
21	19		46			71			96		
22	20		47			72			97		
23	21		48			73			98		
24	22		49			74			99		
25	23		50			75			100		

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	3	3	3.5	3.5	3.5	3.75
MEASURED REBOUND IN INCHES		3/16	3/16	3/16	3/16	3/16
FINAL LENGTH OF PILE	19		FINAL CUT OFF ELEVATION			
			902.25			

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER  
 MATERIALS & RESEARCH DIVISION  
 DEPARTMENT OF HIGHWAYS  
 PARLIAMENT BUILDINGS  
 TORONTO, ONTARIO

SIGNED H.L. Helmer  
 NAME (PRINT) H.L. HELMER  
 DATE Nov 12/73  
 ATTACH SKETCH OF PILE NUMBERING SYSTEM

902.25  
 19.0  
 883.25

TIP

# BRIDGE CONSTRUCTION - PILE DRIVING RECORD

## Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12 $\frac{1}{2}$ " O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12 $\frac{1}{2}$ " x  $\frac{1}{2}$ " steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

Form OB-M1-285  
300 Pads — 61-1686DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION  
FOUNDATION SECTION

## BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 2 CONTRACT NO. 73-97 STRUCTURE MID THAMES RIVER BR @ Hwy # 2  
 CONTRACTOR Looby Const. Co. DESIGN LOAD OF PILE \_\_\_\_\_  
 HAMMER DETAILS: TYPE \_\_\_\_\_ WEIGHT \_\_\_\_\_ HEIGHT OF FALL OR ENERGY \_\_\_\_\_  
 TYPE OF ANVIL OR CAP \_\_\_\_\_ WEIGHT OF ANVIL OR CAP \_\_\_\_\_

## PILE DETAILS

PILE NO. 5 LOCATION EAST ABUTMENT, BAYVIEW 135 DATE DRIVEN Nov. 13/73

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.
20	1	26		26			51			76	
	2	27		27			52			77	
	3	28		28			53			78	
	4	29		29			54			79	
	5	30		30			55			80	
	6	31		31			56			81	
	7	32		32			57			82	
	8	33		33			58			83	
	9	34		34			59			84	
	10	35		35			60			85	
	11	36		36			61			86	
	12	37		37			62			87	
	13	38		38			63			88	
	14	39		39			64			89	
	15	40		40			65			90	
	16	41		41			66			91	
	17	42		42			67			92	
	18	43		43			68			93	
	19	44		44			69			94	
	20	45		45			70			95	
	21	46		46			71			96	
	22	47		47			72			97	
	23	48		48			73			98	
	24	49		49			74			99	
	25	50		50			75			100	

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	3.5	3.5	3.5	4	4	4.5
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE	20					
FINAL CUT OFF ELEVATION	GRADE 902.25					

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER  
 MATERIALS & RESEARCH DIVISION  
 DEPARTMENT OF HIGHWAYS  
 PARLIAMENT BUILDINGS  
 TORONTO, ONTARIO

SIGNED H.L. Melher  
 NAME (PRINT) H.L. MELHER  
 DATE Nov. 13/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

902.25

19.4

882.85



DATE	LOCATION	TYPE OF BLANK OR CASE	WEIGHT OF BLANK OR CASE	HAMMER DETAIL TYPE	CONTRACTOR	DISTRICT NO.	CONTRACT NO.	STRUCTURE
DATE OF TEST	LOCATION	TYPE OF BLANK OR CASE	WEIGHT OF BLANK OR CASE	HAMMER DETAIL TYPE	CONTRACTOR	DISTRICT NO.	CONTRACT NO.	STRUCTURE
			WEIGHT OF FALL OR ENERGY					
			REGION LOAD OF PILE					

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

MEETINGS ON 10/20/2001 3:19 PM TO 10/20/2001 4:04 PM

OVER

Form OB-ML-285  
300 Pads — 61-4636DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION  
FOUNDATION SECTION

## BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 2 CONTRACT NO. 73-97 STRUCTURE MID. THAMES R. BR @ Hwy #2

CONTRACTOR

DESIGN LOAD OF PILE \_\_\_\_\_

HAMMER DETAILS: TYPE \_\_\_\_\_

WEIGHT \_\_\_\_\_ HEIGHT OF FALL OR ENERGY \_\_\_\_\_

TYPE OF ANVIL OR CAP \_\_\_\_\_

WEIGHT OF ANVIL OR CAP \_\_\_\_\_

PILE DETAILS

PILE NO. 10 LOCATION ERSI ABUTMENT BOTTLER 1.8 DATE DRIVEN Nov. 12/73

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.
19	1		26	51			76				
	2		27	52			77				
	3		28	53			78				
	4		29	54			79				
	5		30	55			80				
	6		31	56			81				
	7		32	57			82				
	8		33	58			83				
	9		34	59			84				
	10		35	60			85				
	11		36	61			86				
	12		37	62			87				
	13		38	63			88				
	14	34	39	64			89				
	15	37	40	65			90				
	16	44	41	66			91				
	17	51	42	67			92				
	18	52	43	68			93				
	19		44	69			94				
	20		45	70			95				
	21		46	71			96				
	22		47	72			97				
	23		48	73			98				
	24		49	74			99				
	25		50	75			100				

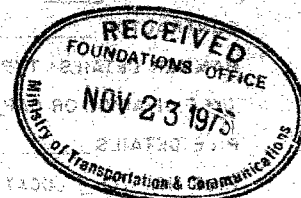
DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	3	3	3	3.5	4.0	4.0
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE	19'			FINAL CUT OFF ELEVATION		

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER  
MATERIALS & RESEARCH DIVISION  
DEPARTMENT OF HIGHWAYS  
PARLIAMENT BUILDINGS  
TORONTO, ONTARIOSIGNED H. L. Helmer  
NAME (PRINT) H. L. HELMER  
DATE Nov 19/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

902.25  
18.8  
883.45

# BRIDGE CONSTRUCTION - PILE DRIVING RECORD



## Notes:

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

File Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12 $\frac{1}{2}$ " O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12 $\frac{1}{2}$ " x  $\frac{1}{2}$ " steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 4092-25

DIST. 2 REGION Southwestern

W.P. No. 36-68-03

CONT. No. 73-97

W. O. No. 71-F-99

STR. SITE No. 23-137

HWY. No. 2

LOCATION THAMES RIVER & Hwy. 2,  
Oxford Co.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. \_\_\_\_\_

REMARKS: To be added to existing microfiche.

FIELD RECONNAISSANCE REPORT  
REQUIRED BY FOUNDATION SECTION  
FOR

FF-69  
SEPT. 1968

W.P. NO. 36-68-03 HIGHWAY NO. 2 DISTRICT 2 SITE PLAN NO. E-5303-1 PROFILE NO. C-91-3  
RIVER CROSSING ☒ GRADE SEPERATION ☐ R.R.X. ☐ OTHER (SPECIFY) \_\_\_\_\_  
ALTERNATE SCHEME (IF ANY) \_\_\_\_\_

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☐ ROLLING ☐ VALLEY ☒ GULLIED ☐ FLAT ☐  
VEGETATION: TREES ☒ BRUSH ☐ GRASS ☒ SWAMP ☐ FARM CROPS ☐ CLEARED ☐  
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☐  
ROCK OUTCROP (SPECIFY LOCATIONS) boulders in riverbed

UNDERGROUND UTILITIES: UTILITY COMPANY \_\_\_\_\_ TELEPHONE NO. FOR DEFINITE LOCATION \_\_\_\_\_

1 Bell Canada only in approaches, overhead at bridge.

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

5 \_\_\_\_\_

EXISTING STRUCTURE(S): \_\_\_\_\_ bottom of footing \_\_\_\_\_

FOUNDATIONS: SPREAD FOUNDATIONS ☒ SIZE 8'-9" x 51'-0" ELEVATION(S) 897.0  
PILES ☐ TYPE \_\_\_\_\_ LENGTH(S) \_\_\_\_\_  
DESIGN LOAD \_\_\_\_\_ T.S.F. \_\_\_\_\_ TONS/PILE \_\_\_\_\_  
CONDITION OF STRUCTURE Poor

APPROACHES: CUT ☐ FILL ☒ SIDE SLOPES \_\_\_\_\_  
BERMS YES ☐ NO ☒

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF  
EXISTING APPROACHES & STRUCTURE, ETC.) \_\_\_\_\_

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☒ NO ☐ IF NO,  
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☒ IF NO,  
PROPERTY OWNER(S): \_\_\_\_\_

NAME

ADDRESS

TELEPHONE NO.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

WHO WILL OBTAIN NECESSARY PERMISSION? Foundation Section

HAS SITE BEEN SURVEYED & STAKED? YES ☒ NO ☐ IF YES, DATE OF MOST RECENT SURVEY June, 1971

WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☐ NO ☒ No stakes

IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING:

WILL A RAFT BE NECESSARY? YES ☒ NO ☐ IF YES, GIVE MAX. DEPTH OF WATER 4 - 5 FT

CURRENT: SWIFT ☐ MODERATE ☐ SLOW ☒

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) Site

ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES:

ALTERNATE SCHEME: YES ☐ NO ☐ IF YES, SPECIFY \_\_\_\_\_

HYDROLOGIC REASONS: YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) \_\_\_\_\_

REMARKS

NEAREST AVAILABLE ACCOMODATION: Thamesford - Balmoral Hotel

OTHER COMMENTS: \_\_\_\_\_

DATE 16-7-71 PLANNING TECHNICIAN

REGIONAL BRIDGE LOCATION ENGINEER

MEMORANDUM

To: Mr. A. G. Stermac,  
Principal Foundation Engineer,  
Bridge Office,  
DOWNSVIEW, Ontario.

From: Bridge Planning,  
Southwestern Region,  
London, Ontario.

ATTENTION:

DATE: August 3, 1971.

OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 36-68-03, Bridge Site 23-137  
Thames River Bridge at Thamesford  
Hwy. 2  
District 2, London

Would you kindly arrange to have a foundation investigation conducted at the above location.

I have enclosed two copies of the bridge site plan E-5303-1 with the probable footing locations for a one span structure marked in red, and for a three span structure marked in blue.

I have also enclosed a field reconnaissance report for the above site for your use.

*S. Jants*

SJ/fs  
Encls.

S. Jants,  
Bridge Planning Technician

For: A. P. Watt,  
Regional Bridge Planning Engineer,  
Southwestern Region.

cc: Mr. S. McCombie  
Mr. A. Crowley

DRAWINGS RECEIVED AUG 11, 1971

COMPLETION DATE

OCT 13, 1971.

XXXXXXXXXXXXXXXXXXXXXXX

MEMORANDUM

TO: Mr. A. P. Watt, Regional Bridge Planning Engineer, Southwestern Region, London, Ontario.	FROM: Foundations Office, Design Services Branch, Central Bldg., Downsview.
ATTENTION:	DATE: October 28, 1971.
OUR FILE REF.	IN REPLY TO

---

SUBJECT: Hwy. #2 and Thames River, Thamesford,  
District #2, London, W.O. 71-11099,  
N.P. 36-68-03.

We have recently completed the foundation investigation field work for the above-mentioned project. In view of the urgency of the work, we have summarized our findings as follows in order that design work might proceed without delay.

Subsoil:

Subsoil at the site consists of a granular or non-cohesive type of deposit. The composition of the material varies from sandy silt to medium to coarse sand with some gravel. Many boulders were encountered while advancing the boreholes, indicating the presence of frequent boulders up to 2 ft. in size. The existing fill also contains numerous boulders. The N values indicate a very dense relative density.

River water level at the time of the investigation was at elevation 898.0 ft. Groundwater level in the boreholes was found to be at the same level as the river.

Recommendation:

It is proposed to replace the existing structure with a new bridge. The bridge may consist of either one or three spans. The subsoil is competent to support spread footing type foundations. An allowable net bearing capacity of 3 TSF may be used for design purposes for footings placed at or below elevation 896.0 ft. However, the exact depth of foundation will depend upon hydrological considerations. As an alternative in the case of a three span structure, the abutments may be constructed within the approaches, and be supported on steel H piles driven to elevation 385±. Maximum allowable pile loads may be assumed in this case. It should be assumed that immediate differential settlements of 1 inch maximum will occur between pier and abutment whatever the method of support.

Mr. A. P. Watt

- 2 -

October 28, 1971.

A suitable dewatering scheme will be required to pour concrete in the dry, for footings placed below the ground or river water level.

Our complete report will be forwarded to you in the near future. If any questions arise relating to the foregoing, please contact this Office.

*K. G. Selby*

KGS/ao

cc: J. L. Keen  
W. A. Zonnenberg

K. G. Selby,  
SUPERVISING FOUNDATION ENGINEER.

Foundations Files ✓  
Documents



MEMORANDUM

TO:

FROM: Foundations Office  
Design Services Branch  
Central Bldg., Downsview

ATTENTION:

DATE: December 9, 1971

OUR FILE REF.

IN REPLY TO

---

SUBJECT: Foundation Investigation Report for  
Proposed Crossing at Thames River and  
Hwy. 2 - Town of Thamesford - Co. of Oxford  
District No. 2 (London)  
W.O. 71-11099 - W. P. 36-68-03

Would you please return the above report to this  
office so that a small change may be made.

KGS:mt

K. G. Selby  
Supervising Foundation Engineer

DEC 10 AM 10:12

*corrected & sent all.  
out Dec. 16/71*

DOWN LOND 3 DEC 9/71 4:20 PM

A G STERMAC PRINCIPAL FOUNDATION ENGR

ATTENTION: K SELBY

RE: FOUNDATION REPORT THAMES RIVER BRIDGE AT THAMESFORD

W.O. 71-11099, W.P. 36-68-03

FOR YOUR INFORMATION REFERENCE TO YOUR REPORT PAGE NO. 2 INTRODUCTION  
REQUEST FOR INVESTIGATION DISCUSSES AT ST. THOMAS EXPRESSWAY AND BURWELL  
ROAD.

J G FORSTER SENIOR SOILS ENGR MATERIALS AND TESTING

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Department of Highways Ontario  
Copy for the information of

A. Stermac

A.P. Watt,  
Reg. Bridge Planning Engineer,  
London Region.

Structural Office,  
West Bldg., Downsview.

March 30, 1972.

Re: Thames River Bridge at Thamesford,  
W.P. 36-68-03, Site 23-137,  
Hwy. No. 2, District #2.

71-11-099

Attached herewith are prints of the Preliminary Bridge  
Plan Drawing D-23-137-P1 for the above mentioned structure.

The estimated cost of the proposed structure is  
\$141,000.00, which includes tender, materials, engineering and  
sundry construction.

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

C.S. Grebski,  
Structural Design Engineer.

CSG:sr  
Attach.

c.c. A. McKim  
B. Davis  
A. Stermac (2)  
J. Anderson  
A. Crowley

No comments

K.L. Guly

FOUNDATIONS OFFICE

REVIEW OF DESIGN DRAWINGS:

W.P. .... 36-68-03....  
W.O. .... 71-11092.....

Foundation Report By: ..... A. Prakash.....  
Review of Design Drawings By: ..... A. Prakash.....  
Design Drawing No.'s: ..... 23-137-P1.....

1. Does footing design comply with our report or subsequent memos? yes
2. If answer to 1. is No, is present design acceptable? N.A.  
~~yes~~
3. Has sufficient field work been done? yes
4. Are estimated pile lengths shown on Drawings correct? If not, make a new list. N.A.
5. If excavation of unsuitable soil is recommended, is this shown on Drawings? N.A.
6. Are approaches designed in accordance with our report? Check slopes and berm lengths. yes
7. Do you anticipate any construction problems? i.e., lewetering, stability of temporary slopes or excavations. No
8. Summarize your comments; on separate sheet if necessary.

Drawings Received ... April 19 ..... 1972..  
Reviewed ... April 21 ..... 1972..

Signed ..... A. Prakash.....

40P0-25  
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. A. Stermac  
Principal Foundation Engineer  
Room 107, Central Building

✓  
FROM: C.S. Grebski  
Structural Design Engineer  
Structural Office - West Bldg.

ATTENTION:

DATE: July 19, 1972

OUR FILE REF.

IN REPLY TO

SUBJECT:

Thames River Bridge at Thamesford  
W.P. 36-68-03 Site 23-137  
Hwy. No. 2 District 2

71-11099

We are submitting the final bridge drawings attached herewith which show the foundation design for this structure.

Kindly give us your comments at your earliest convenience.

CSG/hvh  
Encls.

*C.S. Grebski*  
C.S. Grebski  
Structural Design Engineer

cc Foundation Office

No comments

K. G. Gully  
July 27 1972

CONT 73-97

FOUNDATIONS OFFICE

REVIEW OF DESIGN DRAWINGS:

W.P. .... 36-68-03  
W.O. .... 71-11099  
Foundation Report By: ..... A. PRAKASH  
Review of Design Drawings By: ..... A. K. B.  
Design Drawing No.'s: ..... 25-137-1 ..... 23-137-3

1. Does footing design comply with our report or subsequent memos? *yes*
2. If answer to 1. is No, is present design acceptable? *-*
3. Has sufficient field work been done? *yes*
4. Are estimated pile lengths shown on Drawings correct? If not, make a new list. *yes*
5. If excavation of unsuitable soil is recommended, is this shown on Drawings? *-*
6. Are approaches designed in accordance with our report? Check slopes and berm lengths. *NA.*
7. Do you anticipate any construction problems? *No*  
i.e., dewatering, stability of temporary slopes or excavations.
8. Summarize your comments; on separate sheet if necessary. *-*

*No comments*

Drawings Received ..... 19.....  
Reviewed ..... 24 July ..... 19.72..

Signed ..... *A. K. B.* .....

*Copy to B.O.  
5 Dec. 72  
dk.*