

B.A. 455



ONTARIO

DEPARTMENT OF HIGHWAYS

Charlottenburg 28987
H & Access to make
another soil report

Memo to.....Mr. A. Toye,

Date.....August 31st, 1955.

Bridge Engineer.

Subject Re: Foundation Report

From.....Highways Laboratory.

Hwy. #401 & Summerstown Sta. Rd.

Charlottenburg Twp. #1 Sta. 270+ 45
Site Plan - E.2896-1

Attached herewith is the Bridge foundation report for the above structure. This structure is not proposed for construction in the near future to our knowledge.

You will note that a pile foundation is recommended and that the maximum fill which the subsoil can support is 27 feet. Fortunately the maximum proposed fill adjacent to the structure is 27 feet also, but this fill depth increased to 29 feet at a point approximately 200 feet south of the structure. It is believe that the very small factor of safety in the design will accommodate the additional 2 feet of fill and that no special design fill section will be necessary. In any case, the fill greater than 27 feet is located a sufficient distance from the structure to have no harmful effects upon the structure if a slight slip failure should occur during construction.

F.C. Brownridge,
Materials and Research Engineer.

Per:

(A. Rutka)

AR:df

Attch:

B.A. 455

A REPORT ON THE FOUNDATION
INVESTIGATION AT THE INTERSECTION
SUMMERSTOWN STATION ROAD AND
HWY. # 401 STATION 270^A5

Site Plan E - 2896-1

Profile Plan..... F - 3158-2

Copies to -

Mr. A. Toye, Bridge Engineer (2)
Mr. H. Tregaskes, Const. Engineer (1)
Mr. J. Wilkes, Division Engineer, Ottawa, (1)
Mr. G.N. Farantatos (1)
File

Project 55-F-14

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Introduction

A soils investigation has been completed at the intersection of Summerstown Station Road and Hwy. 401, near Summerstown.

The soil conditions have been explored in order to recommend the most suitable foundation for the proposed Hwy. 401 overpass, and examine the stability of the approach fills.

Procedure

Four borings each with a dynamic cone test were put down between June 9th and June 17th at the positions shown on the attached plan No. 55-F-144. All the relevant information concerning the soils encountered, penetration resistance, locations and levels etc. appears in appendix I under logs of each hole.

Soil Conditions

A bed of soft clay between ten and fifteen feet in thickness overlays a sand which is inclined to be stony at the lower levels. Varying in depth from twelve to eighteen feet the till rests on limestone bedrock.

Water Conditions

Ground water was found in each borehole producing a free surface just below the ground level.

Tests and Calculations

The clay samples obtained have been tested to find their unconfined compression strengths. All of these were low varying from 375 to 625 lbs. per square foot.

The stability of the approach fills was analyzed for base failure using tested values of shear strength, and side slopes of one to two. The results showed that the substrata was adequate to carry up to twenty seven feet of fill but no more. Using an approximate method it was further calculated that the ground will settle about nine inches under the fill.

The sandy till layer was found to be very firm having a penetration resistance of 30 blows per foot at an elevation of 150.00. Due to its depth below ground level a pile foundation will be required to effect bearings on this layer.

Recommendation

It is therefore recommended that cast in place piles (Franki, Raymond, Tuba, etc.) be employed to transmit the bearing load to the sandy till layer. These should be between fifteen and twenty feet in length.

Piles of this type, twenty inches diameter, are capable of sustaining loads of 100 tons. This figure can be adopted as a design load and confirmed by a load test carried out in accordance with the National Building code of Canada, appendix 4.2C.

Conclusion

This bridge requires a pile foundation.

The most preferable type is a cast in place pile, designed for an ultimate load of 100 tons and having a length between fifteen and twenty feet.

A load test should be carried out in accordance with the National Building code of Canada to establish the safe load of a finished pile.

A fill of twenty-seven feet will be stable.

GNF:HR

(G. N. Farantatos)
Foundation Engineer.

APPENDIX I

55-F-14
Hwy. # 401 E.
SUMMERSTOWN
STATION RD.

EDITED
FOR MICROFILMING
BY *KT* DATE *2.7.90*

MATERIALS LABORATORY-DEPARTMENT OF HIGHWAYS - ONTARIO
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG. *LOKIZ DRILL #1*
CASING. *BX*. (STANDARD SAMPLERS TO FIT UNLESS NOTED)
SAMPLER HAMMER WT. *250* # DROP - INCHES

JOB 65-F-14 SUMNERSTOWN BORING NO. 1
DATUM STA 270 +20 AT 55' AT 84°43' DATE REPORT
COMPILED BY G.H. CHECKED BY BORING DATE JUNE 11TH 1968

SAMPLE CONDITION

SAMPLE TYPES

ABBREVIATIONS

V-INSITU VANE SHEAR TEST γ - UNIT WEIGHT
 U-MECHANICAL ANALYSIS K - PERMEABILITY
 U-UNCONFINED COMPRESSION C - CONSOLIDATION
 Qc- TRIAXIAL CONSOLIDATED QUICK CA - CASING
 Q - TRIAXIAL QUICK WL - WATER LEVEL IN CASING
 S - TRIAXIAL SLOW WT - WATER TABLE IN SOIL

54-90

MATERIALS LABORATORY-DEPARTMENT OF HIGHWAYS - OITARIO
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG CORE DRILL #4
CASING 3X (STANDARD SAMPLERS TO FIT UNLESS NOTED)
SAMPLER HAMMER WT 250 # DROP _____ INCHES

JOB 55-F-14 SUMMERSTOWN BORING NO. 2
 DATUM STA 272+20 AT 55° AT 92° 11' DATE REPORT _____
 COMPILED BY MM CHECKED BY _____ BORING DATE JUNE 15TH TO 16TH 1955

SAMPLE CONDITION

SAMPLE TYPES

ABBREVIATIONS

C.S - CHUNK
 DO - DRIVE OPEN
 D.F - DRIVE FOOT VALVE
 TO - THIN WALLED OPEN
 WS - WASHED SAMPLE
 RC - ROCK CORE
 V - INSITU VANE SHEAR TEST
 M - MECHANICAL ANALYSIS
 U - UNCONFINED COMPRESSION
 Qc - TRIAXIAL CONSOLIDATED QUICK
 Q - TRIAXIAL QUICK
 S - TRIAXIAL SLOW
 Y - UNIT WEIGHT
 K - PERMEABILITY
 C - CONSOLIDATION
 CA - CASING
 WL - WATER LEVEL IN CASING
 WT - WATER TABLE IN SOIL

SOIL PROFILE

SHEAR STRENGTH

WATER CONTENT

SAMPLES

ELEV. DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT. PLOT	ELEVATION SCALE	PENETRATION TEST RESISTANCE BLOWS PER FOOT			OTHER TESTS	CONDITION	TYPE	NR	PENETRATION RESISTANCE	ELEV. RECOV.	
					50	100	150							
167.3				0	STD EN = 1200 lb/in							167.3		
166.3 1.0	V	WL. JUNE 15TH		3	X CONE PENETRATION TEST O STD PENETRATION TEST							NO OF BLOWS AT STD EN 1200 lb/in	167.3	
		GRAY CLAY		6					X	T.O. 2"	1	7-2"	167.3 17	
				9						T.O. 2"	2	PAUSED	159.3 100	
				12						T.O. 2"	3	PAUSED	157.3 100	
52.8 12.5				15					X	T.O. 2"	4	Ad FOR 12"	154.3 50	
		FINE SANDY TILL (STONY)		18					X	D.O.	5	Ad FOR 12"	151.3 45	
				21									145.3	
				24						R.C. AX			SMALL RECOVERY OF ROCK CLAY IN THIS SECTION	143.3
				27						D.O.	6	16'-0"	0 (VERY SAND)	137.3
37.3 30.0		ROCK HARD LIMESTONE		30					X	R.C. AX	7		2'-0" OF BROKEN ROCK CORE RECOVERED	137.3
34.3 33.0				33	END OF BOREHOLE AT 33.0 FT EI 134.3									

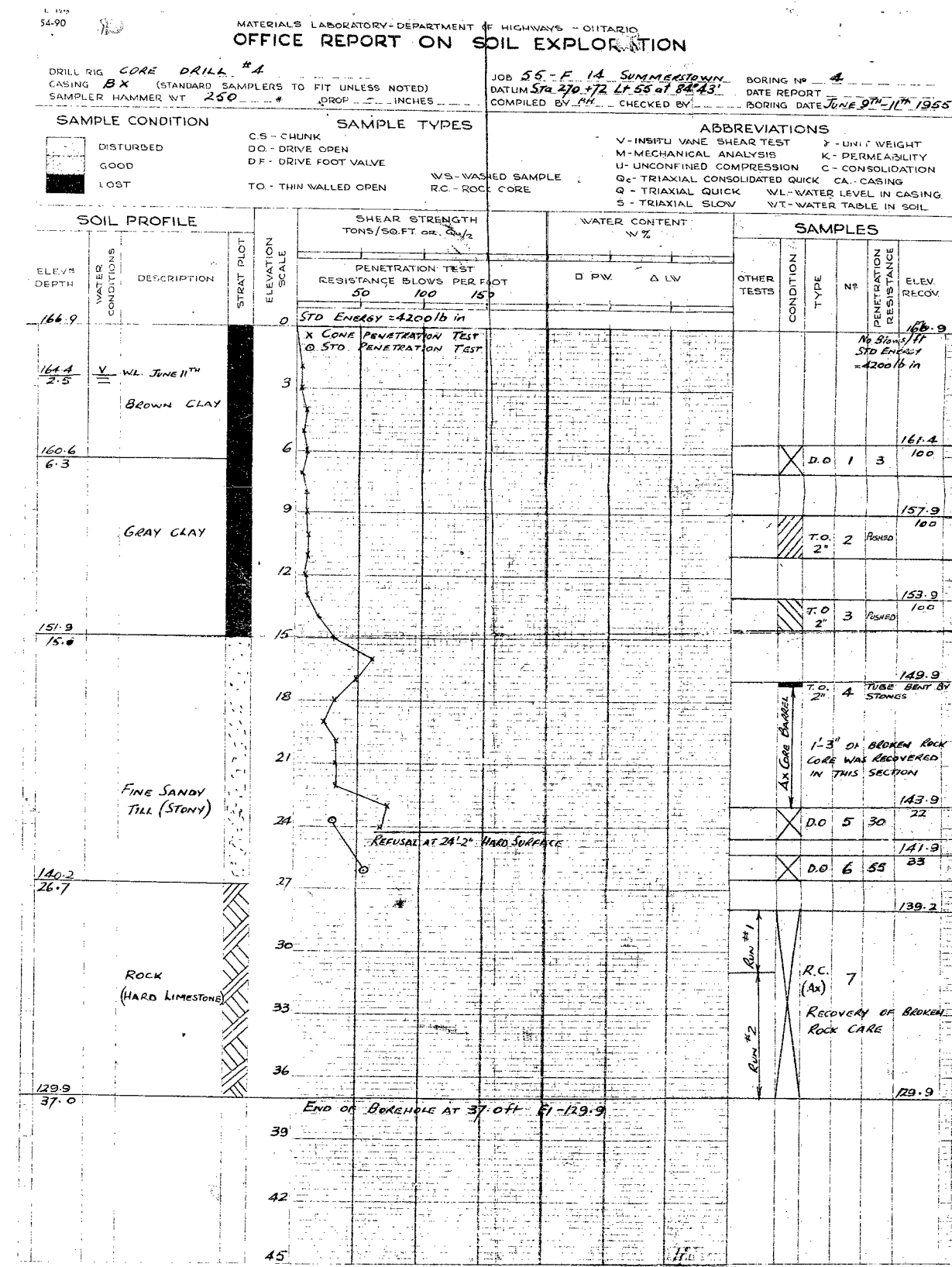
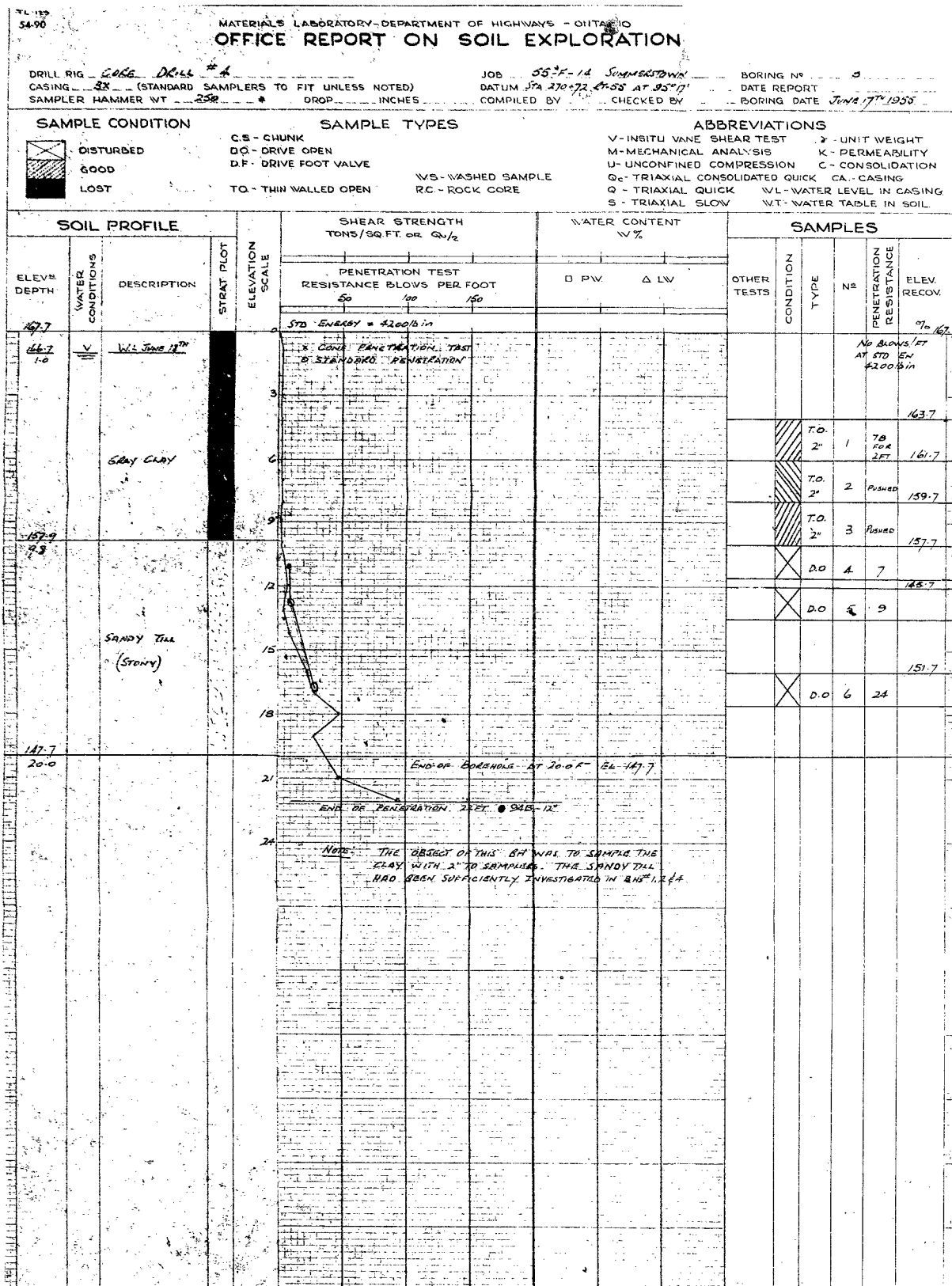
SOIL PROFILE

SHEAR STRENGTH

WATER CONTENT

1. T-WATER TABLE

[illegible]



SOME DEFECTS IN NEGATIVE DUE

TO CONDITION OF ORIGINAL DOCUMENTS

