

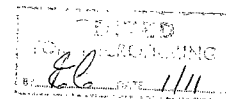
#58-F-17

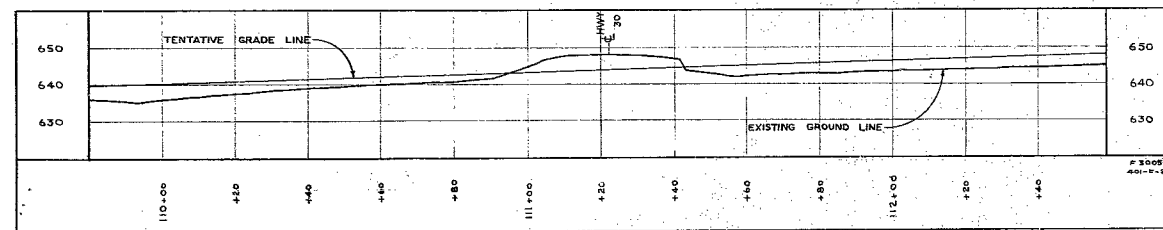
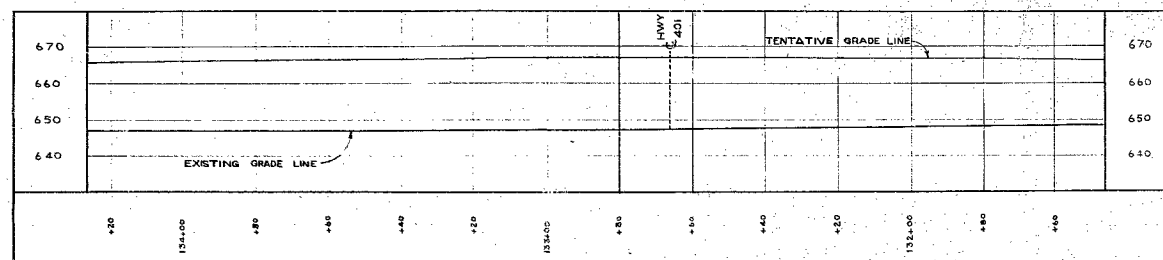
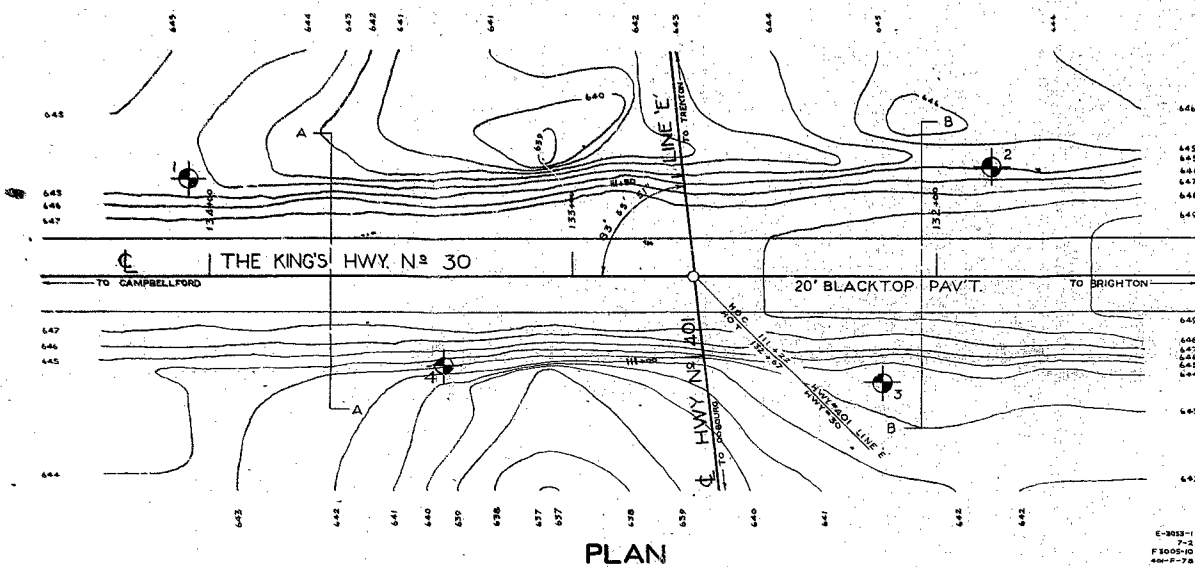
W.P. #59-58

HWY #401 & #30

CROSSING, 2 MI.

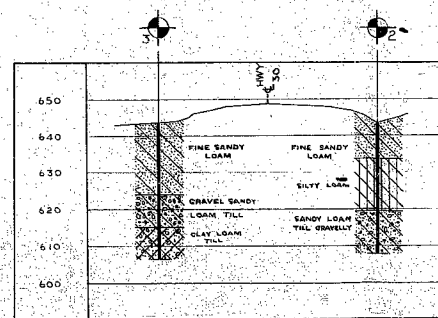
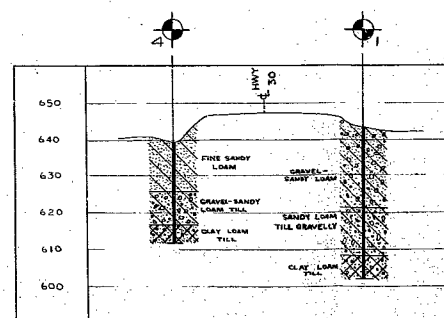
N. OF BRIGHTON





LEGEND			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
HOLE NO.	ELEVATION	STATION	DISTANCE FROM HWY. N° 30
1	643.5'	134+06	27' RT.
2	643.5'	137+85	30' RT.
3	643.1'	132+15	30' LT.
4	639.8'	133+35	25' LT.

— 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.



DEPARTMENT OF HIGHWAYS — ONTARIO.
MATERIALS & RESEARCH SECTION DOWNSVIEW.

HWY. 30 PROPOSED CROSSING 2 MILES N. OF BRIGHTON

SHOWING POSITION & ELEVATION OF HOLES.

HWY No. 401 (LINE 'E')	W.P. 59-58.	DIV. No. 7.
CO. NORTHUMBERLAND		
TWP. BRIGHTON	LOT. 4.	CON IV.
SCALE 1 IN = 20 FT.	SUBMITTED BY	DATE 2 SEPT. 1958.
DRAWN BY D. N.	APPROVED BY	DRAWING No. F-58-17A

FOUNDATION SECTION

Mr. A. Toye,

Bridge Engineer.

Materials Research Section.

September 15, 1958

Re: Foundation Report May. 4th, and

May. 30 crossing 2 miles north of

Brighton, Twp. of Brighton.

W.F. 59-58 W.D. F-58-17.

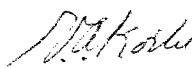
Attached please find two copies of the above mentioned report.

For using spread footing type foundations with a bearing capacity of 2 T.S.F. or more the elevation 625 ft. or below (in borch la No. 2) appears convenient. Due to the depth of excavations this may not seem an economical proposition.

The use of end bearing piles for support of foundations at this site has much to commend it. It will be safe to assume that the piles driven into the subsoil will meet refusal at about elevation 610 ft.

A. Gutka
Acting Materials & Research Engineer

Per:



V. Korin

VK/hk

C.C. Mr. A. Toye

" H. Pregaskes

" C.C. Massey

" A.D. Bu f

" A. Salt

Dr. E. Sarow

Foundation Section

8/15

FOUNDATION REPORT

on

New Underpass Bridge at Hwy. 401
and Hwy. 10 crossing, 2 miles North of Brighton,
Township of Brighton.

Plan No. F-3005-10
Station: 111+20

DISTRIBUTION:

Mr. A. Toye Bridge Engineer.	(2)
Mr. H. Fregashies Construction Engineer	(1)
Mr. D.G. Ramsay Design Engineer	(1)
Mr. H.B. Duff Dist. Eng. Port Hope.	(1)
Mr. H. Batt Water Resources Commission.	(1)
Mr. P. Karow Department of Mines.	(1)
Foundation Section.	(1)
FILE	(1)

W.P. 59-58
U.S. F-58-17

INTRODUCTION

A subsoll investigation was carried out to determine the bearing values of layers for supporting the foundations of the proposed bridge.

The location is about 2 miles north of Brighton where Hwy. No. 401 intersects Hwy. No. 30, Lot 4, (Con. IV), Township of Brighton (Station 111+20, Profile No. F-3005-S).

The work started on May 22, 1958 and was completed on June 6, 1958.

DESCRIPTION OF SITE AND FIELD WORK

The location of the site is within the shoreline of late Iroquois Lake. The physiography is rolling drumlins covered with farmlands.

The explorations were carried out by means of skid mounted core drill machine. In the course of investigations four boreholes were made. Adjacent to boreholes 2" diameter cone penetration tests were also recorded. The RE casings by wash and drive method were lowered down until the hard clay loam till layer was detected, and stopped.

The location of the boreholes is shown on drawing No. F-58-17A and their elevations on log sheets under Appendix I.

FIELD AND LABORATORY FINDINGS

The explorations at the site revealed the following subsoll stratigraphy: Under the topsoil the layer is fine sandy loam down to elevation 625 ft. in boreholes No. 3 & 4 (west side of Hwy. 30 center line), and elevation 620 ft. in boreholes No. 1 & 2 (East side of Hwy. 30 center line). In borehole No. 1 the loam contains about 25% gravel while in borehole No. 2 the loam contains high percentage of silt. Underlying this layer is a stiff gravel - sandy loam till layer extending down to elevation 616 ft. in boreholes No. 3 & 4 and elevation 608 ft. in boreholes No. 1 & 2. This layer is underlain by a hard clay loam till layer in which the boreholes were stopped.

From the laboratory tests the top fine sandy loam is loose outwash deposit. It is non-plastic and has an average moisture content of 18%. The standard penetration tests in the field registered average blows per foot of 21, 19, 19, 12 in boreholes No. 1, 2, 3, 4 respectively.

The underlying gravel - sandy loam till layer is non-plastic and has an average natural moisture content of 9%. The field standard penetration tests registered average blows per foot of 70, 87, 76, 32 in boreholes No. 1, 2, 3, 4 respectively.

The clay loam till layer underlying the sandy loam till layer is made up of about 30-40% clay and silt and sand with pebbles. It is in a very hard state. The standard penetration tests registered more than 100 blows per foot.

SUPPORT OF FOUNDATIONS

At this intersection the new Highway No. 401 is underpassing the existing highway No. 30. The new grade line for Hwy. 401 is only few feet below the existing Hwy. 30 elevation.

Spread footing type foundations will be considered. In order to find 2 T.s.f. or more bearing value in the subsoil it will be necessary to place the footings at about elevation 625 ft. and may be still lower in borehole No. 2. It is believed that placing the footing at such a depth might not be an economical proposition.

The use of end bearing piles for supporting the foundations of the new structure at this site has much to commend it. The end bearing piles driven into the subsoil will meet refusal at about elevation 610 ft. This depth of refusal may somewhat vary due to the inconsistencies in the subsoil stratigraphy.

CONCLUSIONS AND RECOMMENDATIONS

From the above discussion it will follow that:

1. The subsoil is firm silty sand loam overlying very dense sandy loam till changing to very hard clay loam till.
2. If spread footing type foundations are contemplated it will be necessary to place the footings not higher than elevation 625 ft. in order to obtain 2 T.s.f. or more bearing value. This depth may not seem an economical proposition.
3. The use of end bearing piles for support of the foundations at this site has much to commend it. Judging from the subsoil stratigraphy the elevation of refusal for the piles may somewhat vary. However, it will be safe to assume that the piles when driven will meet refusal at about elevation 610 ft.
4. The approach fills to the new structure do not present any stability problems.

V. Koria

Foundation Engineer.

APPENDIX I

DEPARTMENT OF HIGHWAYS - ONTARIO
 MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-6 OPERATION BORE & PENETN JOB F-58-17 WP 59-58 BORING 1 STA. 134+06(27' RT)
 CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG. 1958
 SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY AL CHECKED BY DATE BORING MAY 23, 1958

ABBREVIATIONS

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

SAMPLE TYPES

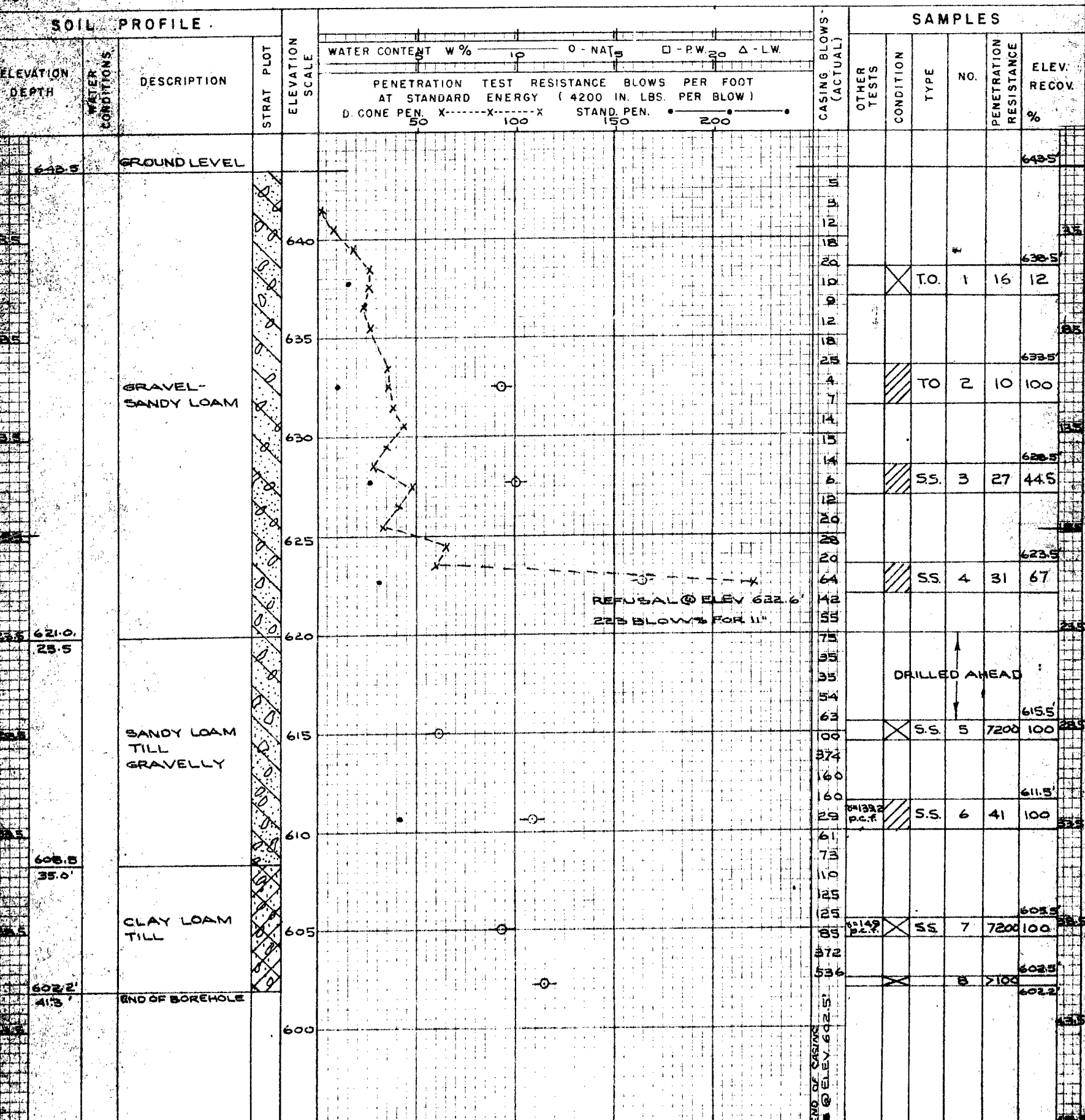
C.S. - CHUNK S.S. - SLEEVE SAMPLE
 D.O. - DRIVE OPEN P.S. - PISTON SAMPLE
 D.F. - DRIVE FOOT VALVE W.S. - WASHED SAMPLE
 T.O. - THIN WALLED OPEN R.C. - ROCK CORE

SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE



DRILL RIG 54-6 OPERATION BORE & PENETN JOB F-58-17 WP 59-58 BORING 2 STA. 131+85 (30' R)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1958
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY AL CHECKED BY DATE BORING MAY 28, 1958

SAMPLE CONDITION

- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE						SAMPLES						
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE		CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV.
643.5		GROUND LEVEL										643.5
638.5		FINE SANDY LOAM		640		5						638.5
633.5'				635		10						633.5
633.5'		SILTY LOAM		630		15						633.5
628.5				625		20						628.5
619.5'		SANDY LOAM TILL GRAVELLY		620		25						619.5
607.9		END OF BOREHOLE		615		30						607.9

DRILL RIG 54-6 OPERATION BORE & PENETIN JOB F-58-17 WP 59-58 BORING 3 STA 132+15(30'LT)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1958
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY A.L. CHECKED BY _____ DATE BORING JUNE 2, 1958

SAMPLE TYPES

SAMPLE CONDITION

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

C.S. - CHUNK	S.S. - SLEEVE SAMPLE
D.O. - DRIVE OPEN	P.S. - PISTON SAMPLE
D.F. - DRIVE FOOT VALVE	W.S. - WASHED SAMPLE
T.O. - THIN WALLED OPEN	R.C. - ROCK CORE



- DISTURBED
- FAIR
- GOOD
- LOST

SAMPLES

[illegible]

DRILL RIG 54-6 OPERATION BORE & PENET'N. JOB F-58-17 WP. 59-58 BORING 4 STA. 133+35(25' LT.)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1958
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY AL CHECKED BY DATE BORING JUNE 4, 1958

SAMPLE TYPES

SAMPLE CONDITION

T.O. - THIN WALLED OPEN

 γ - UNIT W

R.C. - ROCK CORE



- DISTURBED
- FAIR
- GOOD
- LOST

SAMPLES

[illegible]