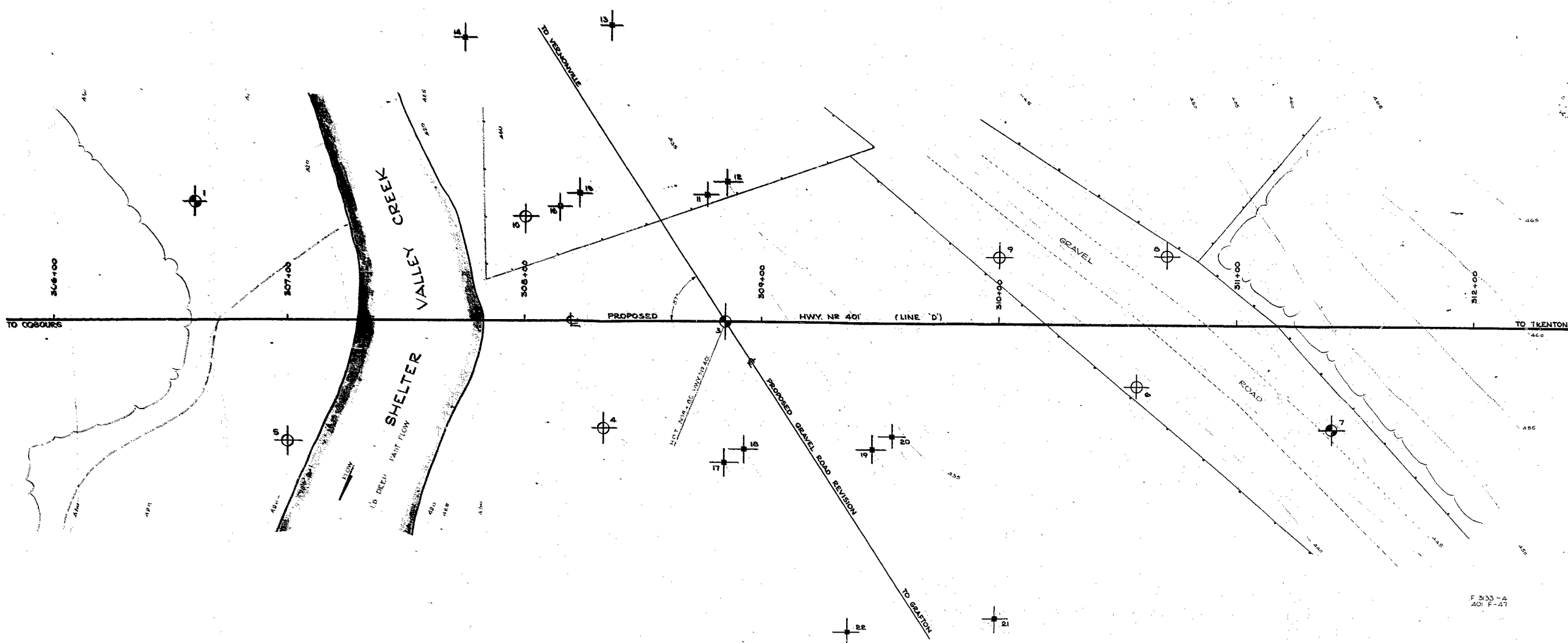
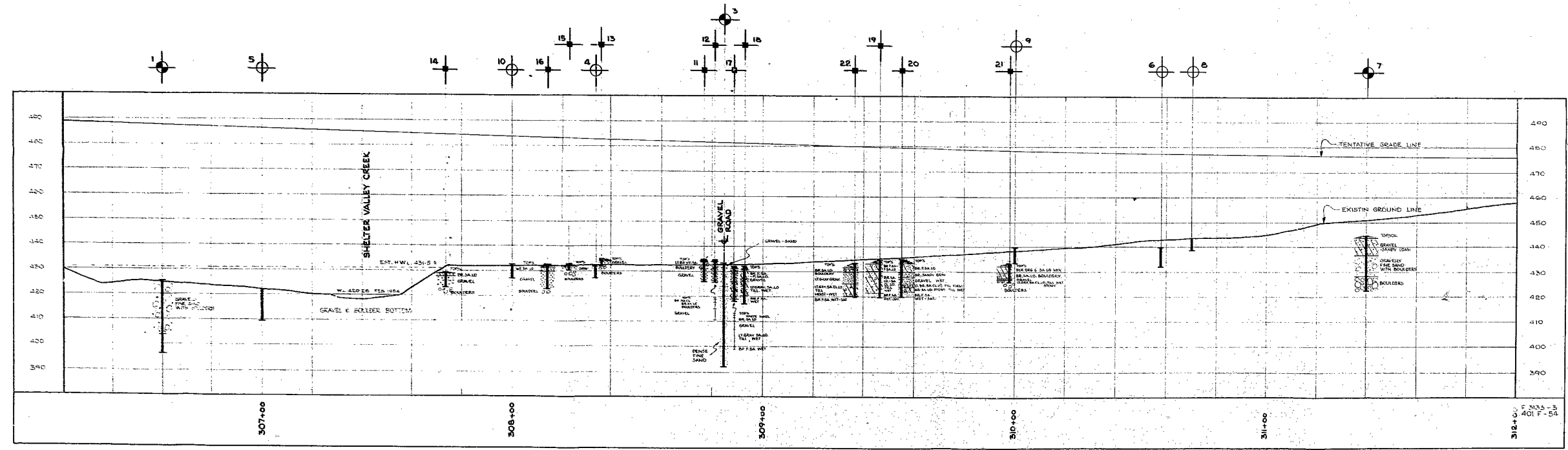


57-F-28
W.P.# 56-57
Hwy.# 401
CROSSING
GRAVEL RD.
SHELTER VALLEY
2 MILES N.E. OF
GRAFTON

EDITED
FOR MICROFILMING
BY *MB* DATE *1/11/22*



PLAN



PROFILE

LEGEND			
AUGER HOLE			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			

HOE NO.	ELEVATION	STATION	DISTANCE FROM C.
1	475.65'	306+60'	50' LT
3	435.45'	308+85'	0'
4	431.4'	308+34'	45' RT
5	422.5'	307+00'	51' RT
6	440.1'	310+58'	26' RT
7	444.8'	311+40'	44' RT
8	443.55'	310+70'	29' LT
9	439.8'	310+00'	28' LT
10	432.6'	308+00'	44' LT
11	435.45' (ELEV. APPROX. ONLY)	307+77'	54' LT
12	435.4'	306+88'	59' LT
13	425.4'	305+26'	125' LT
14	429.4'	307+74'	180' LT
15	435.5'	308+25'	54' LT
16	435.4'	308+14'	46' LT
17	432.4'	308+85'	59' RT
18	432.4'	308+95'	54' RT
19	435.4'	309+46'	53' RT
20	435.4'	309+25'	158' RT
21	435.4'	309+99'	41'
22	435.4'	309+11'	27'

— 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

**SHELTER VALLEY ROAD
PROPOSED CROSSING
2 MILES N.E. OF GRAFTON**
SHOWING POSITION & ELEVATION OF HOLES

HWY. NO. 401 (LINE 'D')
CO. NORTHUMBERLAND
TWP. HALDIMAND

WP. 56-57
LOT. 14

DIV. NO. 7
CON. I

SCALE
1 IN. = 20 FT.

SUBMITTED BY

DATE
MAY 27, 1958

DRAWN BY
R.E.F.

APPROVED BY

DRAWING NO.
F-57-28A

Mr. A. Toye,

May 28/58

Bridge Engineer

Re: Subsoil investigation

Materials & Research Section

at Shelter Valley
Road.

Attention: Mr. G. B. Webster
Culvert Design Engineer

Following the proposed gravel road reconstruction along the new highway 401 at Shelter Valley, new subsoil investigations were carried out by means of flite auger. The subsoil was investigated at the probable corner points of the proposed footings as indicated by your office.

In the attached drawing no. F-57-28A it will be seen that the subsoil represents alluvial deposit made up of almost entirely granular material. At some spots, especially at the southern side of the centre line, the sand was loamy and wet. Normally, the subsoil would be expected to behave like granular material in which case the settlement due to loading will be quick and uniform. Under these circumstances the subsoil could be considered competent to carry loads of 4 - 5 t.s.f. It will be convenient to place the footings anywhere below elevation 425 ft.

F. C. Brownridge,
Materials & Research Engr.

Per:

VA/rf
Encl.

V. Korla.

cc: Mr. H. McMillan.
Mr. H.D. Duff.
Soils.
File.

C.C. FOUNDATION SECTION.

Mr. A. Towe.

November 13th, 1957.

Bridge Engineer.

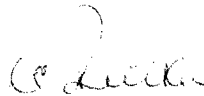
Materials & Research Section.

Re: Foundation Report - Highway No. 401
& Shelter Valley County Road.
W. 56-57. W.J.F.-57-28.

We are forwarding herewith two copies of the above mentioned Foundation Report. We are advised that this structure will be of the arched culvert type and the sub-soil, being primarily a dense granular soil, can support a spread footing foundation.

F. C. BROWNBRIDGE.
Materials & Research Engineer.

per:



A. RUTKA.
Principal Soils Engineer.

c.c. Mr. A. Towe.
Mr. H. Tregaskes.
Mr. D.G. Ramsay.
Mr. H.D. Duff.
Foundation Section.
File.

Foundation Report
on
New Bridge at Highway 401
Crossing gravel road at Shelter Valley,
about 2 miles North East of Grafton.

Plan No: F-3133-4

Station: 310 /65

DISTRIBUTION

Mr. A. Toye
Bridge Engineer (2)
Mr. H. Tregaskes
Construction Engineer (1)
Mr. D. G. Ramsay
Design Engineer (1)
Mr. W. D. Duff,
Dist. Eng. PORT HOPE (1)
Foundation Section (1)
File (1)

A.P. 56-57

A.D. F-57-28.

Introduction: A subsoil investigation was carried out to determine the bearing values of layers for supporting the foundations of the proposed structure.

The location is where the new highway No. 401 crosses the gravel road at Shelter Valley, about 2 miles North East of Crafton, Haldimand Township. (Station 310+65, Profile No. F-3133-4).

The job started on August 6, 1957, and was completed on August 15, 1957.

Procedure: The subsoil investigations were carried out by means of a skid mounted coredrill machine. In the course of investigations one borehole with dynamic cone penetration and three separate cone penetration tests were made.

The location of the boreholes is shown on drawing F-57-28A, and their elevations on log sheets under Appendix I.

Subsoil Findings and Analysis:

The physiography is influenced by old Lake Iroquois. The topography is characterized by large drumlins, some with steep slopes, cut by deep stream valleys and beaches.

The terrain is spillway deposit, filled with sand and gravel and boulders. Investigations all across the valley revealed the same subsoil stratigraphy (the data of this report and that of F-57-27 are combined.) In addition to the boreholes made in connection with job F-57-27, one borehole (No. 7) and one dynamic cone penetration (No. 8) was made on

the eastern side of the existing gravel road, and two dynamic cone penetration tests were made on the western side. In the borehole the casing was lowered from elevation 439 ft. down to elevation 429 ft. by BX casing shoe. From elevation 429 ft. down to elevation 423 ft. the layer was drilled by means of core bit and the samples extracted showed the presence of large boulders in this layer.

Under the topsoil down to elevation 436.5 ft. the layer is gravelly, sandy, loam. Below this down to elevation 429 ft. it is gravel and fine sand with boulders. Below this down to the end of the borehole 423 ft. the layer is dense boulders. The very dense and bouldery nature of the subsoil was confirmed during attempts for standard penetration and dynamic cone penetration tests.

CONCLUSIONS AND RECOMMENDATIONS:

From the above discussion it will follow that:

1. The terrain is spillway deposit. The subsoil is one layer of gravelly sand with large boulders down to elevation 423 ft. (end of the borehole).
2. The subsoil stratigraphy is favourable for spread footing type foundations. These footings could be placed anywhere below elevation 436.5 ft. and the layer can provide a bearing value of 2.5-3 T.s.f. to support the foundations of the proposed structure.
3. The approach fills to the structure do not present any stability problem.

V. Korlu,
Foundation Engineer.

APPENDIX I.

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

DRILL RIG 54-1 OPERATION PENETRATION JOB F-57-28 WP 56-57 BORING 6 STA. 310+58 (26' RT.)
 CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT SEPT 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 12 INCHES COMPILED BY H.S CHECKED BY A.L DATE BORING 2 AUG. 1957

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
 Q_c - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT

SAMPLE TYPES

CS - CHUNK SS - SLEEVE SAMPLE
 DO - DRIVE OPEN PS - PISTON SAMPLE
 DF - DRIVE FOOT VALVE WS - WASHED SAMPLE
 TO - THIN WALLED OPEN RC - ROCK CORE

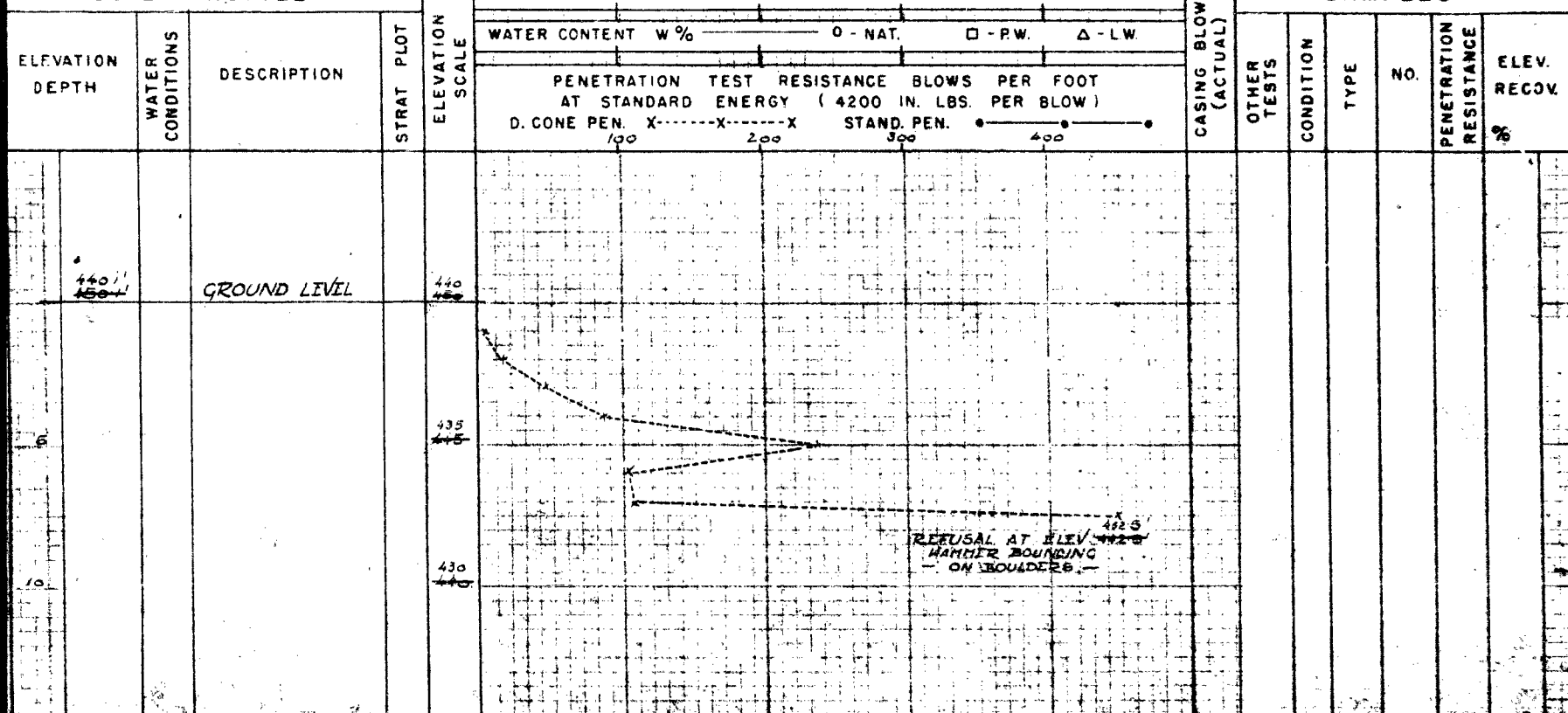
SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE

SAMPLES



DRILL RIG 54-1 OPERATION BORE & PINET N JOB F-57-28 W.P. 56-57 BORING 7 STA. 3H+40 (44' RT)
CASING BX (standard samplers to fit unless noted) DATUM GEODITIC DATE REPORT JEPT 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 7 AUG 1957

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
Q _c - 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

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW) D. CONE PEN. X-----X STAND. PEN.	CASING BLOW (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE %	ELEV. RECOV.
444.8 439.8 +5.0 7.0'		GROUND LEVEL TOPSOIL										
436.5 446.8 -10.3 8.0'		GRAVEL - SANDY LOAM		440' 450		12		X	VS	1		439.8' 440.8
428.8 438.8 -10.0 16.0'		GRAVELLY FINE SAND WITH BOULDERS		435' 445	DRILLED	13			SF	2	> 100	434.5' 444.8
422.8 432.8 -10.0 22.0'		BOULDERS		430' 440		27			SF	3		429.8' 439.8
		END OF BOREHOLE		425' 435	REFUSAL AT ELEV. 429' HAMMER BOUNCING ON BOULDERS	99						422.8' 432.8
				420' 430		186						
						776						

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

DRILL RIG 54-1 OPERATION PENETRATION JOB F 57-28 W.P. 56-57 BORING 8 STA. 310 +70 (29' LT.)
CASING Bx (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT 5 SEP 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 1/2 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 12 AUG 1957

ABBREVIATIONS

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

SAMPLE TYPES

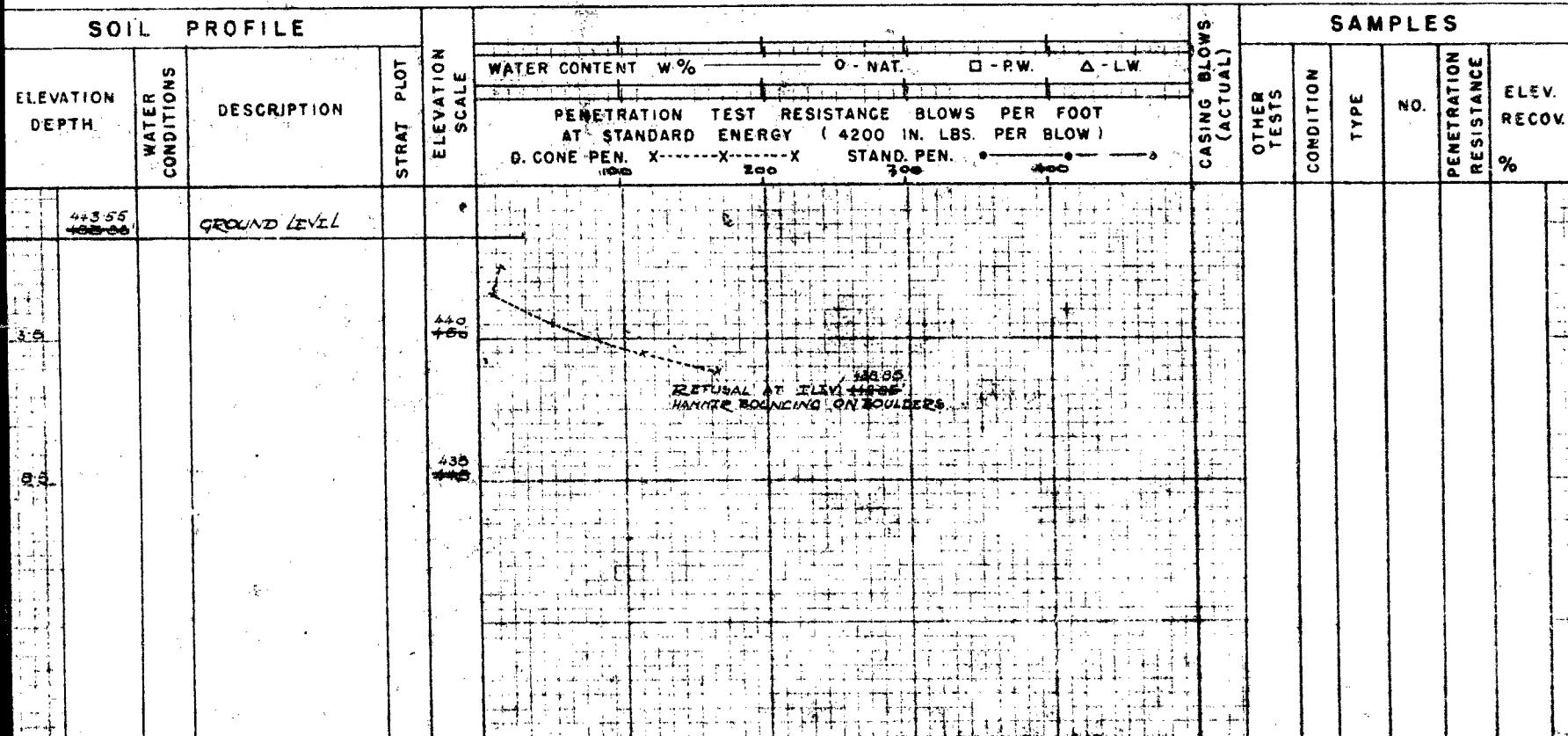
C.S. - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN
S.S. - SLEEVE SAMPLE
P.S. - PISTON SAMPLE
W.S. - WASHED SAMPLE
R.C. - ROCK CORE

SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE



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

DRILL RIG 54-1 OPERATION PENETRATION JOB F-57-28 WP. 56-57 BORING 2 STA. 312+00 (29+47)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT SEPT. 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 1/4 INCHES COMPILED BY HS CHECKED BY AL DATE BORING 12 AUG 1957

- ABBREVIATIONS
- V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_c - TRIAXIAL CONSOLIDATED QUICK

Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL


K - PERMIABILITY
C - CONSOLIDATION
CA - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN

S.S. - SLEEVE SAMPLE
PS - PISTON SAMPLE
WS - WASHED SAMPLE
R.C. - ROCK CORE

SAMPLE CONDITION



DISTURBED
FAIR
GOOD
LOST

SOIL PROFILE

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W %	0 - NAT.	□ - P.W.	△ - L.W.	PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)	D. CONE PEN. X-----X-----X	STAND. PEN. ●-----●-----●	CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECORD
429.3 428.8		GROUND LEVEL																
430 440																		
430 440																		

REFUSAL AT ELEV. 433.5
HAMMER BOUNCING ON BOULDERS

DA - MAY 21/58

T HOLE # 11

0 - 15"
15" - 48"
48" - 9'

TOP'S
LT BR V.F. SA Bouldery
GRAY.

T HOLE # 12

0 - 8"
8" - 27"
27" - 60"
60" - 9'

TOP'S L.
BR SA CL Lo
BR SA Lo Bouldery.
GRAY.

T HOLE # 13

0 - 7"
7" - 33"
33" -

TOP'S L.
GRAY.
BOULDERS N.F.F.

T HOLE # 14

0 - 7"
7" - 20"
20" - 72"
72" +

TOP'S L.
BR SA Lo
GRAY.
N.F.F. BOULDERS.

T HOLE # 15

0 - 16"
16" - 30"
30" +

TOP'S L.
GRAY.
N.F.F. BOULDERS.

T HOLE # 16

0 - 12"
12" - 34"
34" - 10'

TOP'S L.
BR SA Lo
GRAY

T HOLE # 17

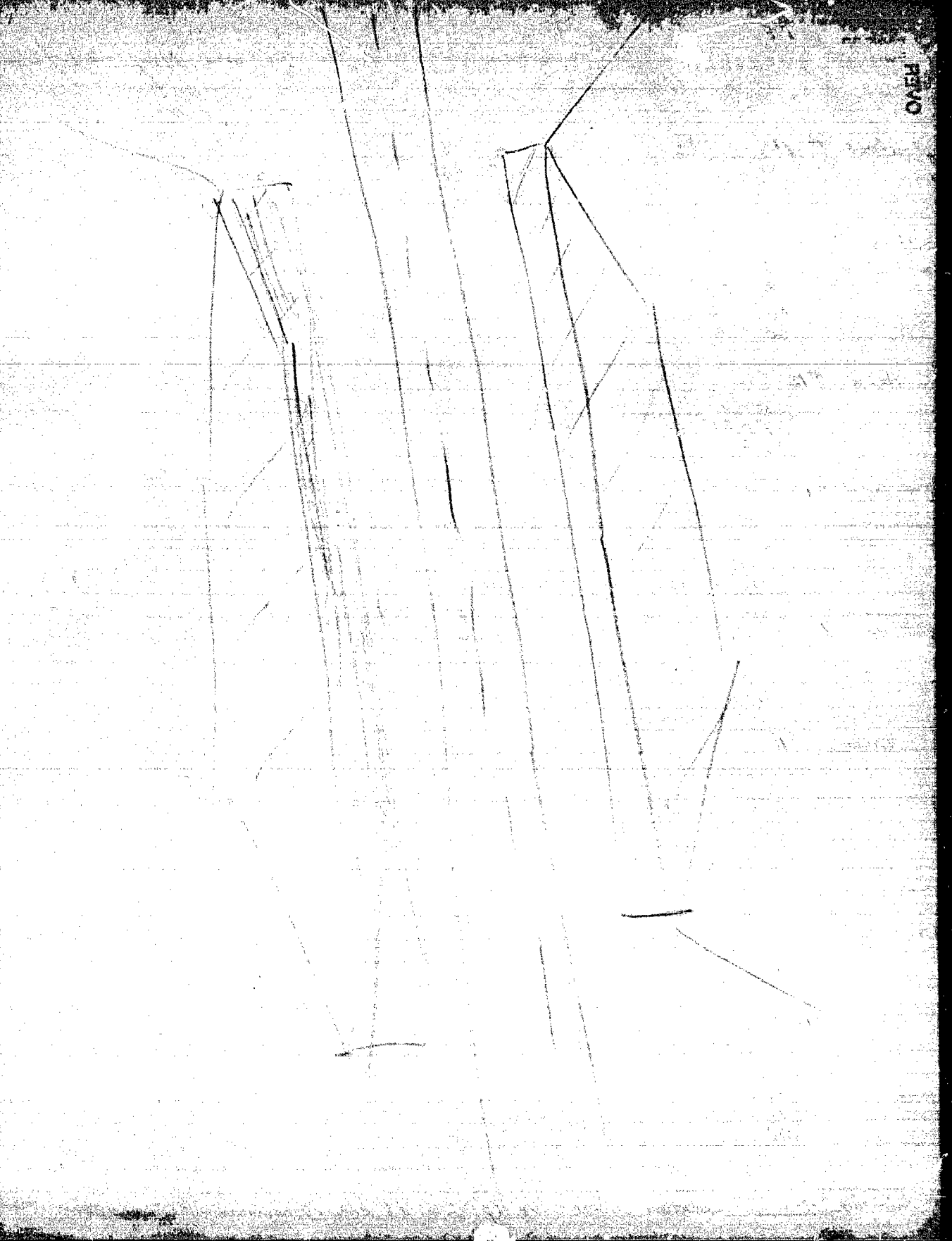
0 - 12"
12" - 30"
30" - 35"
35" - 38"
38" - 12'
12' - 15'

TOP'S L.
N.F.F. M.B.
BR SA Lo
GRAY.
A GRAY SA Lo TH. WET.
BR F. SA WET.

T HOLE # 18

0 - 20"
20" - 60"
60" - 72"
72" - 112"
112" - 15'

TOP'S L.
BR FSA - FSA Lo
GRAY.
LT GRAY SA Lo TH. WET.
BR F. SA WET.



DATE MAY 21/58

OT. HOLE # 19

0 - 19"
19' - 9 1/2'
9 1/2' - 13'
13' - 15'

TOPS'L

BR F SA - F SA LO

BR SA LO - SA CL LO TILL WET

BR F SA WET - SAT.

L. HOLE # 20

0 - 20"
20' - 60"
60' - 7'
7' - 9 1/2'
9 1/2' - 11'
11' - 13'
13' - 15'

TOPS'L

BR F SA LO

BR SANDY GRAY

GRAY WET

LT BR SA CL LO TILL (FIRM)

BR SA LO STONY TILL WET

BR F SA WET - SAT.

T. HOLE # 21

0 - 20"
20' - 48"
48' - 72"
72' - 78"
78' - 90"
90' -

TOPS'L

BR DRY + SA LO MIX.

BR SA LO BOULDER

GRAY

LT GRAY SA CL LO TILL WET STONY

NFP BOULDER 3 ATTACH.

RT. HOLE # 22

0 - 20"
20' - 72"
72' - 96"
96' - 13'
13' - 13 1/4'

TOPS'L

BR SA LO BOULDER

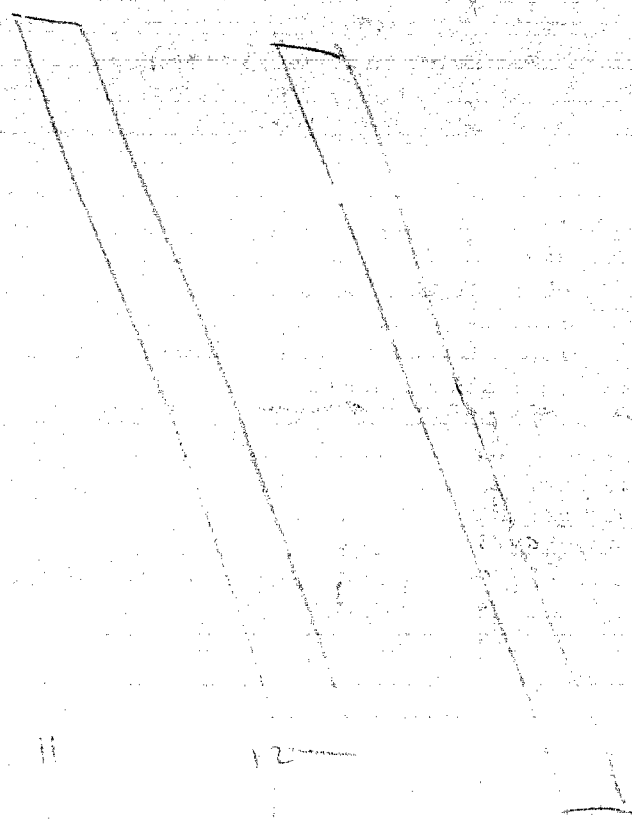
LT GRAY GRAY

LT GRAY SA CL LO TILL MOIST - WET (WET @ 12')

BR F SA WET - SAT.

NFP HOLE STONING

0151



11

12