REPORT ON

CONTRACT 501/84-53

CORE SAMPLINE & ANALYSIS

C.N. EAST YARDS

WINNIPEG, MANITOBA

NTL FILE GO21

Prepared for
PARKS CANADA
PRAIRIE REGION
WINNIPEG, MANITOBA
FILE No. C4870-102-4-4



Prepared by
THE NATIONAL TESTING LABORATORIES LIMITED
WINNIPEG, MANITOBA

August 27, 1984

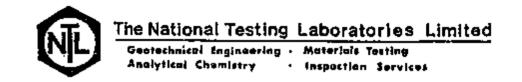


TABLE OF CONTENTS

			Page
AB	STRACT		_
1.0	INTRODUCTION		1
2.0	SITE		1
3.0	FIELD PROGRAM		1
4.0	LABORATORY WORK		3
5.0	RESULTS		4-9
5.1	Search of Existing Soils Data		4
5.2	Field Program	·	5
5.2a	Site Observations		5
5.2b	Test Drilling Results .		6
6.0	DISCUSSION AND RECOMMENDATIONS		9–12
6.1	Background		9
6.2	Areas of Potential Historic Values		9
6,3	Potential Problems		10
6,4	Further Work	•	10
6.4a	Old Forts		10
6.45	Visitor Reception Centre		11
Bot	rehole Location Plan		Plate 1
Bor	rehole Logs	Plates	2 to 25



ABSTRACT

This report is presented as a preliminary assessment of in situ historic resources and in general terms the gross subsoil conditions as they relate to the proposed Visitor Reception Centre and the feasibility of an extensive archaeological investigation of the history of the Red River west bank located east of the CN East Yards between the Assimiboine River and Water Street in Winnipeg.

Discussed in the report are the overburden and general soil characteristics which are determined on the basis of 24 boreholes and the search of existing soils data in the area.

Conclusions are drawn with regards to areas of potential historic values and excavation problems which might be encountered in the subsequent archaeological investigations.

Recommendations are offered for further studies in order to obtain specific soils data for the siting and conceptual design of the Visitor Reception Centre.



1.0 INTRODUCTION

As authorized by Miss Olga Bailey, Contracts Clerk, Prairie Region of Parks Canada, The National Testing Laboratories Ltd. (NTL) conducted a core sampling and analysis of the Red River West bank near the CN East Yards in Winnipeg.

The primary objective of the work was, on the basis of 24 testholes, to define the gross stratigraphy of areas of potential interest to Parks Canada such that the archaeologists could assess the appropriate methods and locations for subsequent archaeological investigations. The work involved in this report represents the first phase of the physical investigation of the site history.

The detailed terms of reference for the work can be found on Alternative II of NTL proposal dated June 27, 1984 and copy of Acceptance of Tender, Contract 501/84-53 by Parks Canada.

2.0 SITE

The site is located immediately east of the easterly limit of the CN East Yards, along the west bank of the Red River from the mouth of the Assiniboine River northward to Water Street in the City of Winnipeg.

3.0 FIELD PROGRAM

The field drilling program was conducted in 2 stages over the period between July 25, 1984 and August 3, 1984. Prior to undertaking the Stage I field exploration, 2 site meetings were held on July 12 and 23, 1984 between Parks Canada field personnel and the writer for locating the 3 deep boreholes and essociated shallow borings. Utility clearances were obtained from all governing authorities including CNR.

The Stage I program was performed between July 25 & 27, 1984 and consisted of 15 boreholes (i.e. TH I-15) put down at locations designated by Parks Canada personnel. On completion of the Stage I program, a meeting was held on July 31, 1984 between Mr. Peter Priess and other Archaeologists of Parks Canada and the writer, for the purpose of discussing the findings of the Stage I program and finalizing the drilling locations of the Stage II program. In this meeting, 9 additional boreholes were proposed and drilled on August 3, 1984. The borehole locations are shown on the site plan, plate 1 appended.

With the exception of TH 4, 5, 13 to 15 which were drilled below the top of the bank and on the flood plains using hand augering methods, all boreholes were drilled on and above the top of bank using either a 200mm or 400mm diameter truck-mounted power auger which is owned and operated by Subterranean (Winnipeg) 1td. Except TH 18 where auger refusal was caused by an unknown object in the fill at the 1.37m depth, all boreholes were drilled through the existing fill and terminated in the underlying non-cultural native soils, at depths of 2.5 to 7.2m from grade. The following field logging, sampling and testing procedures were adopted:

3.1 The soil profile encountered at each borehole was visually classified to its <u>full</u> depth.

- 3.2 Disturbed soil samples were obtained at close intervals or at depths of change in material types.
- 3.3 All samples were visually examined in the field and returned to our soil mechanics laboratory for further evaluation and reclassification.
- 3.4 Ground water conditions and stability of the borehole walls were observed during drilling and on completion of the drilling.

The foregoing sampling procedures were altered somewhat from those which were described in our proposal of June 27, 1984. The alterations were considered necessary due to the variability in composition and stony nature of the overburden encountered. The alterations did not jeopardize the purpose of the field investigation and were agreed to by Mr. Peter Priess of Parks Canada.

The entire test drilling and sampling operations were closely monitored by the writer and Parks Canada Archaeologists.

The findings of the Stage II program were verbally communicated to Mr. Peter Priess on the afternoon of August 3, 1984.

Layout of the 24 boreholes was done by our survey crew. Borehole surface elevations were determined from a site contour map supplied by Parks Canada.

4.0 LABORATORY WORK

The principle aim of the laboratory work was directed toward confirmation of the logs of the boreholes. This was carried out by detailed visual examination of the recovered samples. Particle size, shape, color, composition, consistency and/or relative density were used in this confirmation.



Laboratory classification tests on the soil samples were not conducted as such tests were of little value considering the purpose of this study.

The soil samples, each identified by a tag and wrapped with a plastic bag, are stored in 4 cardboard boxes in our laboratory. These samples are ready for immediate delivery to Parks Canada, if needed.

5.0 RESULTS

5.1 Search of Existing Soils Date

To verify the potential existence of relevant testhole logs and obtain a general appreciation of the gross subsoil stratigraphy of the area, inquiries were made with the City of Winnipeg, CNR, University of Manitoba and several local contractors and consulting engineering firms. In addition, search of pertinent literature in the form of soils maps and reports was undertaken in our library and others.

The results of this search showed that there were no specific testhole data in the immediate area of the site. However, regional soils information to the north, south and west of the site shows that the subsoil stratigraphy may consist of varying surface deposits (i.e. cinder, random fill etc.) underlain by glacial Lake Agassiz deposits of silts/sands and silty clays overlying either water bearing sand and gravel or glacial till, followed by Paleozoic carbonate limestone bedrock of the Red River Formation (Lower Fort Garry member).

It should be noted that the areas along the Red River West bank and north of the mouth of the Assimiboine River were previously used as a <u>weste disposal site</u> which historically was known as the "Red - Assimiboine River Junction dump site." The boundary, shape, size, depth and type of refuse involved are not known.

Testholes previously put down on the Red River west banks, along the CNR tracks and near the Norwood bridge to the south of the site showed that the soil profile generally consisted of random fill or cinders up to about 3m over approximately 7m of silty clay over 4.3m of fine sand and gravel over limestone bedrock. Glacial till was apparently absent in the area.

On the basis of personal communications with local foundation contractors, we understand that within the area previously owned by Genstar to the north, the subsoils generally consist of random fill over silt and silty clay over a thick bed of water bearing sand or a thin layer of glacial till over bedrock. Buildings and other structures in the area were mostly supported on driven piles. The depth to the sand and gravel or glacial till could range between 12.5 and 15.2m from grade. Limestone bedrock might be located within 15.5 to 18.3m of the ground surface.

5.2 Field Program

5.2a Site Observations

The slope faces of the Red River banks within the areas investigated were generally covered with trees, bush and localized random fill. There were signs of bank instability in the form of upper and lower slope movements, particularly near TH 11 where nearly vertical old scarps were noted. Toe erosion was evident at the river's edge. The river bank movements appeared to be of a rotational nature, extending retrogressively from the river's edge towards the top of bank.

At the time of the field investigation, no <u>fresh</u> slope slippage was apparent. However, the trunks of many trees in the area tended to bow downhill indicating the occurrence of "creep movements".

Random fill materials such as building debris, scrap metals, etc, had been end dumped on top or below the crest of the riverbanks. Such fill materials were seen on the river banks between the mouth of the Assimiboine River and TH 1, 4 & 6 to the north.

5.2b Test Drilling Results

The gross subsoil stratigraphy encountered at each of the 24 boreholes can be found on the attached borehole logs, Plates 2 to 25 inclusive. The soil sequence above the top of bank "usually included varying fill materials over natural alluvial deposits of sand and clayey silts. Below the top of bank at TH 4, 5, 13, 14 & 15, native non-cultural stratified deposits of silts, topsoil, sand and clay were encountered and extended to the depths explored.

It should be noted that there was evidence of fill between the top of bank and TH 4, 5, 13 to 15. However, the number of boreholes authorized in this study was such that it was not possible to occurately determine the latural extent of the cultural fill deposits which extended below the top of the river banks.

The thickness of the fill materials ranged between 0.3m (TH 8) and 5.5m (TH I). Generally, the fill consisted of relatively clean surficial sand and gravel fill over either random fill (i.e. a mixture of topsoil, brick, wood, metal, glass, broken bottle, tile, concrete, cobble, ash-like material, organics,

rag, plastic bag, sand, gravel, clay and silt) or railway-related fill (i.e. black or red cinder, coal etc.). The thickness and nature of the fill materials encountered in 19 of the 24 borings are summarized below:

		F111
<u>Borehole</u>	Thickness (m)	Nature
1	5.50	random .
2	2.40	railway related
3	1.10	railway related
6	2.00	random
7	0.60	railway related
8	0.30	railway related
9	0.80	railway related
10	1-45	railway related
11	4.00	reilway related
12	1.35	railway related
16	2.45	random (see note a)
17	1.85	random (see note b)
18	at least 1.37	random (see note c)
19	1.85	random (see note d)
20	2.00	railway related
21	2.75	sand, gravel, shale, silt
22	1.50	random (see note e)
23	1.00	random
24	1.25	random (see note f)

Notes

(e) At TH 16 (Plate 17), chinking-like deposits and some charcoal which could be related to previously burned log structures were encountered.

- (b) At TH 17 (Plate 18), 3 attempts had to be made before the fill thickness could be verified by augering. A railway track was encountered at the 150mm depth in the 1st attempt. Auger refusal was experienced at 0.3m on an unknown object in the 2nd attempt.
- (c) At TH 18 (Plate 19), drilling were attempted at 2 alternate locations. At both locations, the base of the fill could not be reached. Auger refused on an unknown object at 1.37m from grade. Artifact like deposits were recovered and picked up by a Parks Canada field representative.
- (d) TH 19 was relocated approximately 3m east of original location, due to the possible existence of a waterline running in the north-south direction.
- (e) At TH 22 (Plate 23), a 125mm thick layer of rotten log which could be related to an old log structure was encountered at about 2.25m from grade.
- (f) At TH 24 (Plate 25), an abundance of fish bones, some shells, charcoal and chinking-like deposits were encountered between depths of 0.7 and 1.3m from grade.

The alluvial deposits (i.e. sand, silty clay, clayey silt) which were located below the fill were relatively weak, stratified and with varying relative densities and/or consistencies. The sand and the clayey silt/silty clay were usually loose and soft respectively. These deposits tended to increase their moisture contents from moist to wet near the depths of 3 to 4m from grade.

Caving was noted at the 2.9m depth at TH 21, at the 1.37m depth at TH 23 and at depths of 1.68 to 2.22m at TH 24.

Slight seepage was experienced at TH 21, at about 3.35m from grade.

6.0 DISCUSSION AND RECOMMENDATIONS

6.1 Background

In discussion with Parks Canada Archaeologists, we were advised that there were two old Forts (i.e. Gibralter I & II) located within the limits of our studied area. These Forts were log-type structures which were burned down at least 3000 years ago. There was also an immigration shed situated in the area. We understand that the main objective of the subsequent archaeological investigation is to determine the locations of these two Forts.

6.2 Areas of Potential Historic Values

On the basis of our field observation and exploration, it is postulated that the general areas of TH 16, 17, 18, 22, and 24 may represent areas of potential interest to Parks Canada. Among these boreholes, materials of potential historic values had been identified at TH 16, 22 and 24, at least on a limited basis.

In our view, the in-situ historic resources in the area would be best determined using trenching methods. These trenches should be initially dug through the noted boreholes, in the direction approximately perpendicular to the river banks and be supplemented with lateral trenches running parallel to the top of the river banks.



6.3 Potential Problems

Potential problems which we could foresee, would include stability of the trench walls and possible existence of unknown buried utilities and <u>methane</u> gas from the random fill. Although domestic garbage of any significance was not encountered in our boreholes, the occurrence of such and the associated methane gas should not be entirely ruled out. For safety reasons, the trenches should be provided with adequate excavation slopes (say 2H to 1V or flatter). Device for detecting methane or other toxic gases should be utilized frequently in the trenches.

Dewatering may be required if the trenches are extended significantly into the alluvial deposits or if the trenches are made in the <u>wetter</u> periods of the year.

Precautions should be exercised for trenching work near TH 16 and in the areas located east and south of the existing CNR Building and Structures shop where waterlines and other buried utilities may be encountered. Based on a copy of an old drawing received from CNR, there is a waterline running from the southeast corner of the said CNR shop towards a shed near the top of the river bank. Backfill of any waterline could be water-charged and when intercepted, a sudden inflow of water into the trenches may occur.

6.4 Further Work

6.4a Old Forts

In the event that the trenching operation fails to locate the old Forts, considerations may be given to drilling additional boreholes in the areas of potential interest to

Parks Canada. The drilling of boreholes would be superior to trenching, considering the expedition and minimum disturbance of existing surface features.

Due to the river bank instability and the existence of extensive end dumped fill discussed earlier, it is logical to assume that the top of the river bank at the site 3000 years ago would be different from what is seen today. For this reason, it is recommended that an airphoto study of the area be undertaken. This study would involve in the comparison of old air photos against the present ones such that the change in topography, surface features, shoreline and top of bank could be defined. If the original top of bank can be well defined, it would be of considerable assistance in search of the old Forts and in locating additional boreholes.

6.4b Visitor Reception Centre

We understand that preliminary design of the Vistor Reception Centre is currently underway by Parks Canada. We also understand that this Centre may be located in the areas previously owned by Genstar, where little borehole information is available.

Because of the history of the site, the bank instability and extensive random fill encountered in our present study, it would be advisable to put down some boreholes, on a preliminary basis, between our studied area and Water Street to the north.

This preliminary soils investigation would identify the general subsurface conditions, areas of potential difficulty and possible foundation alternatives and as such, it would provide valuable guidance to the design team in the site

selection and conceptual design of the Visitor Reception Centre. In this regard, we are prepared to undertake the work under similar terms and conditions of our current contract 501/84-53.

Respectfully submitted,

THE NATIONAL TESTING LABORATORIES LIMITED

per: Walter Kwan, M. Eng., P. Eng.

Manager, Geotechnical Division

WK:dm

FOR MAP SEE! 21K-87-101-62

***************************************		1965 <u>- 1955 (Ja</u> ri					BOREHO)L	E L	OG	
The Nat	tional Te	esting Lab	oratori	e s	Ltd.	PROJECT	ON BAST	r y/	ARDS		
90cO/Dem	WK	CKD	WK		Date of Investi	igation July 25,	1984 JOB NO.	G	021	1	TH 1
				Ĺ		SOIL DESCRIPTIO	N			MPLE	DRILL TYPE
		- 13 - 13 -	DEP1H J	ğ	DATUM			휟		14.4	400mm auger
	W= () ITER CONTEN		(m)	355	SURFACE ELE	evation 230,2m		CONDITION	ያሳላፒ	PENETRATION PENETRATION	OTHER TESTS
		-	0		FILL						-
- - - - - - - - - - - - - - - - - - -	<u> </u>		-	1	- sand	& gravel	·				_
- 	<u> </u>		-1 - '		FILL					i	
		· · · · · · · · · · · · · · · · · · ·	_	N	-topsoi	l, sand, grave	:1	H			
	┢╍═╏╌╃╌╵╏╌┤		_2	J	- brick	s, cobbles					
┡ ╾┾╌┼╾┤╌╇╴	┋ ╾┨╶┼╌╊┄┥	╸┢┪╸ ┠╶╅	. ľ	Ŋ	- broke	n bottles, gla	155	1			_
			· [nic tile, concr					_
			-3	YL.	FILL -	clay & silt, s	oft				_
┍┋┪╸┩╸┩	▎ ▘ ▍ ┊┤╌╏	╶┋ ╌╃╌╂╼╂╼╂	-		FILL						_
			. \	1		moist to wet	İ	ŀ			
		-	_4	М	- ash l	ike deposits			j		<u> </u>
-	 ├─├┈┃╼┃╼┪	┼ ┧┼ ┼	_ · ,].	- light	grey					_
	-4-1	-4-4-1-4-1	·	X]	- some	clay & silt grey at 4.lm					, -
			· -5	+	- uai k	Stey at 411m					
~ !	╺ ┨ ┊ ╌┡╼┦		·	1	FILL -	sand & gravel			ŀ		_
<u> </u>	··· ·		. ľ	╨		dark grey to b	lack		- 1		
┢╤╈╍╟╌┡╴╽╌┋		╌╂╅ ┋ ╋╾┫	_6	1	CLAY						i
		- 1-1-1-1	<u> </u>	_ _	- firm,	brown, silty		-			
		··· 	زا :	%	SAND &	CLAY		- 1	Į		
	+++		-7 🖇					- 1	j	- 1	
			-′ <u>⊬</u>		- wet,	firm to soft		-			
1-+ 1		·	.					ļ		ŀ	4
			_8		End Hol	e at 7.2m	r L	- 1	- 1		
┣╌┨╌┝╌┋┄╏╶┢	- • •	•++-	-						Į		
									[7
	_[]		·	1			1				7
	╅╅┾╂	╁┼╂╁╂	·				l				4
			.				l	-]	4
		 	. [İ			l	į			
	 		. 1				I	f			
				1			1			ŀ	
	1111	 					į			1	7
	- [<u> </u>	·				}	ļ		i	
	- - - -	+++++	.	-			{		Ì		
	· * * * * * * * *			1			{		- [Į	긔
	- 		.	Į			ĺ		- (ŀ	4
		╅╂╇╇┋		-			!		ŧ		<u> </u>
							ŀ	ļ	j		
	╌┧╌╏╌┇	▗ ▗ ▗ 	·				ļ		1		PLATE 2
ليلنيل				ــاـــ		·	, <u></u>				<u>1</u>

_						_		REH) <u>L</u> [<u>E</u> L	OG	
The Nati	ional Testli	ng Lab	orato	riet	itd.	PROJECT	Ī	CN EAS	ST	YARD	S	
gged/Dwn,	WĶ	CKD	WK		Date of Invest	ilgation Jul	y 25, 1984	JOB NO.	G	021		TH 2
				Ţ			SCRIPTION				MPLE	
			DEPTH		DATUM				ŢŌ		POETFATOR PESSTANCE	400mm auger
	W - O WI - TER CONTENT %	Δ	(>	SCIL SYMBOL	SURFACE EL	EVATION	230.1m		CONDITION	ž.	E	OTHER TESTS
			<u>(n)</u>	36	7 FILL -	sand &	gravel	—— <u> </u>	g	۴.	1 12 12	
				X		cinder,		18.33.471. 3 .6			}	
<u> </u>	<u>- </u>	 	_	П								
<u> </u>		<u> </u>	— 1	M	<u>FILL</u>]
1.				[]	— cinde	er			İΙ			!
 			_		- red						ļ	ľ
╇╼╇╾╄╾┿╌╿ ┼╌╿╴┝╺╏			_ 2	14	- some	black c	oal lumps					
╽╴┨╸╏ ╺┠╺┥	╼┾┥╌╄╍╆╶╁╶	╎ ╏┤┪		<u>, , , , , , , , , , , , , , , , , , , </u>								
 				2,346.3	SAND			i				
 			- 3	30	- fine,	, silty n to tan						
<u> - - - - </u>			_									
┡ ╶╂╌┤ <mark>╽</mark> ╏	<u> </u>	┠ ┄┃ ╍╏ ┈┨	_ 4		<u>SILT</u>							
			_ "	1		to firm ey, s a nd						
			-	Ш	- strat	tified	,	į		j		
┊╸┩╸ ┪╌┤	- 		- - 5	!		sandy at	3.4m			i		
^९ ╍╁╼╁┄╂╾┝			-	ᄤ			 					
╒ ╫╌╂╌╇			- i		End Hol	le at 5.	2m		1			
	<u>- </u>		- 6		_,					ļ		
├ ┼┤╽╽	• • • • • • • • • •	├ ╸ ┞╸┿╺ ┨		'					- 1			
			-	.					- [- 1		
			- 7						ļ	ı		
┠┋ ┾╋┪	- 		-	:					- 1			
▎ ┤┤╃┿	┸┋┼┼┼┤	 	-	.				ļ	ŀ			
		411	- 1					,	-			
			.	1				{		ľ		
 				ŀ					ĺ	Ī		
		+							-	1		
		$\Box\Box$.						ł			
╶ ╅╶╅╺╉╶╋			· [ŀ			
	╶ ┼┼┼┼		.								•	
		\blacksquare	-								1	
▎ 		##	. [Ī			
	╌╁╌╅╼┞═╉╼┦		. 1									
	╼╆╌╿╌┞╼╂═								ŀ			
			-						.]			
<u> </u>	┸		٠									
╀╌╁╌╂╾╂╾┞	<u> </u>		-									
├ ├ ┼		++-	-									
	┈╸ ╶ ┼┼┼┼	+	.						Į	ļ		
┠═┋═┋ ═┩╶╂	╶┨ ╫┩═╇╌╂┤		j								_	PLATE 3

The National Testing Laboratories Ltd. PROJECT

BOREHOLE LOG

CN EAST YARDS

					CN EAS	1 1	AKDŞ		
ogged/Dwn.	WK	CKD	WK	_	Dare of Investigation July 25, 1984 JOB NO.	G	021	\Box	TH 3
` I			l	İ	SOIL DESCRIPTION			MPLE	DRILL TYPE
	1 r <u>1 </u>		OEPTH	<u> </u>	DATUM	8		P W	200mm auger
	W- () WI-	Δ		35 35 38	SURFACE ELEVATION 230.0m	NOITIGNO	Ę	PENETRATION PERSTANCE	OTHER TESTS
	T T T		(m) O	30		_	=	- <u>8 8</u>	<u> </u>
			_ `		FILL - sand & gravel, rootlets r	1	i	ļ	-
┡ ╃╌╁╌┪┄┠╾├╺	╺┾╶┦┈╿╶┼┤	╽╴╁╌┨╴╏		X	<u>FILL</u> ,				<u> </u>
		-	· ;	,	- cinder		ļ	İ	_
	┫		-	V	- black	i	ĺ		-
┣═┋═ ┾┄ ╡ ╌╂╼ ╡ ═	- ├ ┈┤╶ ┤╶├┈┤╴┤	╌┼╌╂╌┫	-	1	- DIACK]
			- ı				Ι,		_
			_ `	Ш		ł			
╞╌╂╌ ╂╌╀╶ ┋ ╌╋╌	-}- ┽┈ ┇╸ ┧┈╂┈┤	┵	i	(III	<u>silt</u>	[;			
	 		-	$\ \ $	- soft to firm]		'	
	 		-					[I	-
┠╼╁╌╉═╂╾┊╶╏ ╌	╂╇╀┼┼┦	++1	- {	쎄	- clayey				
	<u> </u>		- 2	$\ \ $	- tan to brown	l	·		
<u> </u>	<u> </u>	<u>++-</u>	,		- some sand		l	' !	
 	1111			Ш	- wet at 3.4m			i	
		-11	.	Ш					
ቖ•፟፟፟፟፟፟፟ ፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟	 	111	·Ì	们			- !		_
	┥┿╅		.	Ш			- 1	- 1	_
		\Box	_ 3	Ш		ĮĮ	i		_
		<u> </u>	.	Ш					_
₽----------	╿ ╌┝╸╏╌╸╸╸┪╼╃╴	· ┃][[- 1		-
	╿ ╌┠╌┠ ╌	-		Т			\neg		
			'		End Hole at 3.4m		·	ľ	_
<u> </u>	 	·· 	·]			' 1	į		_
] 	╏╏╏	╌┠╼╂╼╂	4		1		ŀ		_
			.	1	i	Į	1		_
	<u> </u>		.	j				1	~
<u> </u>	┠╸┠┈ ┠╌┨╼ ╏╸ ┼		.	i				- 1	-
			·]	- [-	-
	! 	###	1	ſ				j	-
┠╶╂╼┞┈┤╶┨ ╍ ╂ ━	Ĭ ╍╂╍╂╍┼╸┼╸╂	┿┿╃					- 1		-
		+++		ļ				1	-
			į.	- }					-
╏═╏═╏═┋	╏╺ ╁╌╁╶╂ ┈ ┫╴╬╴	╂	1	- }			1		-
		\Box						1	-
		 			,				_
		777					ĺ		-
<u> </u>		 	•			1		- 1	
┣ ╅╌┇╌╏╴╏╴┦╶┤		╈╋	İ	1	ì	ţ			
		++-		1	Į.	}	}	- 1	
	▎ ▎	###		1	[l	ĺ	1	PLATE 4
		111		Ļ	<u></u>	1			

					BORE	łÖL	EL	OG	
The Natio	onal Testin	g Lab	orato	rie	CN E	ST Y	ARDS		
agged/Dwn.	VIK	CKD	WK		Date of Investigation July 25, 1984 JOB N	10. GO	21		TH 4
`1		· · · ·	<u> </u>	Τ	SOIL DESCRIPTION			MPLE	DRILL TYPE
	1-7:1-7-1	 _	DEPTH	۱ ٍ	DATUM .	10%	ľ	30	50mm hand aweer
	w- O w-	Δ]	SCIL	SURFACE ELEVATION 226.7m	CONDITION	¥ .	PENETHANTON RESISTANCE	OTHER TESTS
Jan Tana	R CONTENT %		(w)	18 <u>6</u>		- 8	<u> </u>	8.8	
			٥	Ш	SILT - brown, some clay	-		1	l .
	<u> </u>	<u> </u>	Ł	۳	CLAY - firm, brown	-	ĺ		
		<u> </u>		$ \rangle$	- silt inclusions at 0.6m				
 - - - - -	4- 4- 4- 4- 4			ľ	50mm thicklayer of clay				!
┣ ╶ ╅┄┞┄ ┊╾ ┊╺╏╸			_		glass & wood, black			f	-
	┆┆╏╏		<u></u> 1	뭾	SILT	j	j		-
┣┋	┞ ┋	┈┠╍┿ ╌	-	JV.	- clayey)	į		-
			-		12mm thick ash like layer				-
┝ ╺ ╺ ╺ ╺ 	 - 		ļ.		- sandy, stratified				ļ .
╺ ┤╍╉╌╉╴┞╶┧╴	┨╺╇╸┝═┡═ ┼═			31	- oxidized stains		l ,		
╍╁┄╿╌┦╶╏╶┠╌	╂┾╁┟┟	┉┤╼╄╌╏		Ж	- gypsum inclusions				_
	1		— 2		50 4153 1311 3				_
<u> </u>			-	ווין	- 50mm thick ash like layer				-
╼┼╼╀╌╁╼╉╾	┦╸ ┼╸ ┤╸ ┼╸┼╸┤		_	l il	<u>SILT</u>				-
╺ ┈ ┤ ╶┤ ╶ ┤╌┤╌┤	╀┼┼┼	╌┼╾╂╼┨	-		- brown to tan				-
┍╇╇	1-1-1-1-1		_		- soft to firm				_
- - - - - - - - - - 	 - -+- -+- 		— з		~ clayey				-
╼┾╼┩ ┄ ┆╶╂ <u>╶╂</u> ╌	┨╶┧═ ┩╌╂╶╬╼┨			1		 			
	╂┄┟╌╁╌┨				End Hole at 3.1m				
			<u>-</u>						_
			-						-
┊╿╢╃┪			_		•	[]			-
			_			_ i			-
		-1	-			- i I			-
			_			11		:	
-}- - - -									
4-4-4-4-			-			-			
-++			-	l			ı		
<u></u>			-						
+++++	 		-						
- 	, 	777	-						
	<u> </u>		_						
- 	 		_						
	╂╌┼┄┼╌╂═╂╌┤	$+$ \mp \mp				'			
	╀┼┼		_	Ιİ					
			-						•
			-						_
		- - -	-						PLATE 5
			L	<u> </u>					* **** **

			BOREHOLE LOG	
The National Testin	ng Laboratories	PROJECT	CN EAST YARDS	
aged/Dwn. WK	скв МК	Date of Investigation July 25.	1984 JOB NO. G021	TH 5
		SOIL DESCRIPTIO	N SOIL SAMPLE	DRILL TYPE
	т рерти ∫ д	CATUM	COLUMN TO SERVICE STATE OF THE	Som hand auser
Wp - □ W - ○ Ws - WATER CONTENT %		SURFACE ELEVATION 226.5m	TYPE TYPE TYPE TYPE	OTHER TESTS
	38 (m) 0 -			
┞╅┦┧┠┦┧╽╏	 	SILT	i	ļ -
		~ tan, moist		l -
		- clayey		} -
		TOPSOIL		<u> </u>
	1 1	- black, organic		
		<u>silt</u>	·	
┡┵┼╀┢╺╏╍╃╌┼┤╏╌╏╌╏		- clayey, sandy	 	
		- organic inclusions	<u> </u>]
		- firm to soft	1	i _
	 	Tore clay		1
		- stratified		1 -
 				i -
		CARD have a 41 hr		j -
~ [+++++++++		SAND - brown, silty - some rootlets		-
<u> </u>		SILT - clayey, soft	 	
	3	End Hole at 2.74m]	J -
		ENG HOTE SC 5.44m		-
	 			-
	· 			
<u> </u>]
	<u>.+++</u>		<u> </u>] _
	<u>+ </u>]
]
				_
	 			I
] 7
	 - 			1 -
		į] -
	┤ ┋] -
	 			-
<u> </u>	 		.] -
[™] ┸	** **			-
				<u> </u>
1	 			! -
	<u> </u>			
				PLATE 6

The Manager Waste			.1-	BOREHO	<u>)L</u>	E L	<u>QG</u>	
The National Testir	ag Labo	oratç	r196	CN EAST	YA	RDS		
respect/Dwn. WK	CKD	WK		Detect Investigation July 25, 1984 JOB NO.	GO	21		TH 6
				SOIL DESCRIPTION	sc	IL SA	MPLE	7
		DEPTH	 මූ	DATUM	텵		24	400mm auger
Wp−□ W−○ WI− WATER CONTENT %	^	(m)	뛶	SURFACE ELEVATION 230.8m	MOITION	¥	PERSTANTED PERSTANCE	OTHER TESTS
		0	8163		╁╩		8.8	<u> </u>
┡┋┪┈┠┞┋┋ ┋┼┼╬╸	╏╸╿╸ ┠╸		W	FILL	ĺ.			
			M	- sand, gravel		}		
	┞╫╬┪		$ \mathbf{y} $	- some topsoil	П]
│	<u> </u>				П			•
┝╺┡┈╬┄┣╺ ┠ <u>╏</u> ┩╸╪╌╡╴┤╌	 	_ 1			†			ľ
			N	FILL				
┝ ╶┧╌ ╅┈┠╌╃╌┫╌┠ ╶╂═╿═╄ ╶	┢╌╂╼├╌┠		M	- ash like deposit				
				- light grey to black, bricks	Ш			ļ
		' I	X	- some hard mortar lumps	Ш			
		·	}	- organics	Ш	ŀ		
		- 2	111	SILT - firm	1 1			
				- clayey, rootlets				j
			1111	- sandy, tan to brown]			
			37	SAND	$ \ $			
				- eilty, brown	il			
╼╣╌╂╌┃ ╴┡╾╟┄┃╍╟╶┋╶╉ ╾	- - - 	- 3	\$ T	- moist	$ \ $			
	++-	- 3			Π			
				End Hole at 3m	$ \ $			
		i			ļļ			
		i			į {			
	╌┼╌╂╌				[}			
			İ		ŀΙ			
			li					
						}		
<u>╺╀┸┞╶╆╼╃╾╂╶┼</u> ╶┟╌╂╼╂╌						}		
								
			!				•	
▕▗ ╏ ╏ ╏┩ ╸╏						1		
				·				
┈┠╍╂┈┠╼╊╼╂═╃╍╀╌┞╌						1		
			(
					} }			
	▎	.			1		'	PLATE 7

BOREHOLE LOG The National Testing Laboratories Ltd. **PROJECT** CN EAST YARDS Date of Investigation July 25, 1984 JOS NO. ogged/Dwn. CKD WK WK G021 TH 7 SOIL DESCRIPTION SOIL SAMPLE DRILL TYPE 200mm auger DATUM DEPTH Wp -- □ W -- ○ W -- △ OTHER TESTS SURFACE ELEVATION 230.5m WATER CONTENT % (a)FILL - sand, gravel FILL - cinder, black SAND - brown, moist - fine to medium 1 SILT - firm to soft - some organic - oxidized stains - clayey, sandy - stratified - wet & soft at 4.12m - 3 grey, wet sandy silt End Hole at 4,12m PLATE 8

" - '	· ·			DREHO	LE L	.OG	
The National Tes	ing Laborate	orles Ltd	, PROJECT	CN EAST	YARDS	}	
ogged/Dwn. WK	CKD 1/7K	Date of	rwestlestion July 25, 198	4 JOB NO. (3021	A 2451 F	TH 8
WP- W- O W	_		SOIL DESCRIPTION CE ELEVATION 230.7m		SOIL S	PERSTANTON THE PERSON	ORILL TYPE 200mm auger OTHER TESTS
	2	SILT - sar - sar - sar - sir -	m, clayey dy, stratified				PLATE 9

	Г			_						_									BO	REH	ΟL	EL	OG	
	Π	10	Ne	ati:	OI	8	Ţ	es	tir	ıg	Li	be	erc	to	rie:	Ltd.	PROJE	CT		CN EAS	T Y	ARDS	i	
-	999	ed/[m			W	ĸ	_	_	C	ĸο	·	WK			Date of Invest	igetion	Julv 25.	1984	JOB NO.	GO	121		TH 9
` i								_				Т						DESCRIPTA			\$0)łL SA	MFLE	
ļ	_	₽	_	_	<u>-t</u> -		<u>-</u>	·	+	_	ļ	╡	DÉP	Тн	ي ا	DATUM					ğ		8 8	200mm auger
ŀ		Wp					O NTE			Δ	•	1	/-		SCIL	BURFACE EL	EVATION	230.50	3		CONDITION	E E	PENTRATE	OTKER TESTS
ŀ	7		Í	Ī	Ī	Ţ	Ţ	Ϊ	Ī		П	⇉	\ <u>'</u>		9.70	FILL	•	 —		·- ·-	۱ ۵	 - -	* 2	
ŀ	+	Н		-	1	+	+	t	╁	L	Н	+	•		<u>\</u>	- sand.	grave	1			}	}		-
}	+	╂┤	+	\pm	+	+		-	\vdash	 	H	╁	•		עו	<u>FILL</u>						Ì		1 -
Ţ]- -		7	7	Ŧ	-	1	Ţ.			7			ľ^	- cinder	r							[-
ŀ	╁	╽		<u> </u>	#	<u>†</u>	1	亡	上		Ц	뉰.			$\underline{\lambda}$	- black						l .		} <u> </u>
E	十	H		+	-	╬	+	╂-	╀	Н	Н	{			111	e i i m							ĺ] =
F		H	4	7.	Ŧ	+	F	₹-	-	П	H		- 1			SILT	_				1	'] -
Ŀ	+			#	1	1	1			Ħ	口	⇉	•		⊮	~ firm	to sof	t] -
F	+	╁╅	+	+	+	╀	+	÷	Н	Н	dash	-				- claye	y, san	dy					l	[-
-	‡	1-4	4	7	#	+	 -	†**	Д	П	耳	‡				- strat:	ified							
Ł	<u> </u>	Ш			1	<u> </u>	Ŀ	上	<u></u>		1	ユ		i		~ tan to						l		_
F	┽.		1	1	ı	1:	-	ļ -	ŀ		+	4	_			1	DI Guil							-
þ	- -	! [7	+	+	1	1.	<u>.</u>	ţ.		#	⇉	2			- moist					Ιi			i -
Ŀ	\pm	┢┪		1	+	+	╁		Н		-				∦						İΙ			
-	Ţ]	- +	4	-	-	╀	H			\Box	7									Н	ļ		_
, L	士	<u> </u>	1		<u>·</u>	ŀ	1	1_			⇉	ユ			111									
(-	ŀ	}	1	-	1	⊢	Н		\dashv	\dashv		ĺ	H I						1			-
ļ			7	1	1	1.	۲	١	П		7	寸			-111						ļ	- 1		
Ŀ		╌		+	+	1	+	 		-	+	_	- 3	·	-1!!						Ш	ı		_
F		П	- -	7		-	-		H	4	7	7		Į	-:-						Ц			_
Ė	+		1	1-		<u>†-</u>	1-	上	ᆸ	_	#	ユ		ļ										' '
⊢	+	-	4	\pm	╁-	+-	╁	╂	Н			\pm				End Hold	e at 3	. 2m			İÌ			
			. [.			1-	Ţ-	-	Ц	\dashv	\dashv	丁		- {										_
Ŀ	+			†	1.	1	<u> </u>		Ц	╛	⇉	士		ļ							!			_
- 1	+	┝┽	╬	╬	+	ļ-	╫	┞	╢	}	+	╁	-]							ŀΪ			· –
Ļ	11		#	‡	1	1	1			\Box	#	4			į							ļ		-
Ŀ	± 1	┢╈	\pm	1	<u>†</u> .	-			H		士	1			ļ							1	į	
F	\Box	H	4	+	1	╀┈	ļ			\dashv	+	-[1									-
		口	1	1	1	1	1	Ħ	口	コ	ユ	#			ı								ļ	
H	╁┤	\dashv	+	+	╁	+	1	Н	⊢┤	\dashv	-	+			- 1]
F	Ħ	ightharpoons	#	1	-	F	F	H	H	7	7	7									[-
E	1-1		+	#	1	L	L.		Ħ	⇉	⇉	ユ		-							1			1
Ę	+	$\vdash \downarrow$	+	+-	+-	┝	\vdash	Н	Н	\dashv	+	\dashv		1										
ļ	\Box	口	7	1	Ţ	Γ	Г	П	П	耳	4	Ŧ		- {	ſ						[-
┢	╅╌┨	⊣	+	+	╬	+	\vdash	H	┠╾┾	-+	_	十			j								•	ן י
F	\exists	-Ŧ	7	-	-	-	-	F	H	\dashv	Ţ	7									.			
	士		1	Τ	#	1	-		Ħ	#	士	#												
` r	╁┤	├-	-}-	+	十	-	\vdash		H	_	_	\pm			-									4
ļ			_	-	Ţ	F	Γ		П	-4	\dashv	T												<u></u>
H	± 1	Lt	_	†	+	İ			H		_	士											ļ	│
F	H	H		+	+	+	ļ-	\vdash	Н	\dashv	+	+		ĺ	Į									PLATE 10
Ľ	Щ		ユ	1	1	Ι					J	I,			1	_								1101210 10

The National Testing Laboratories Ltd. PROJECT

BOREHOLE LOG

CN EAST YARDS

40	وحببار									
(Logged/Dwn.	WK	CKD	WK		Date of Investigation July 25, 1984 JOB NO.	G	021		TH 10
						SOIL DESCRIPTION	SÇ	IL ŞA	MPLE	ORILL TYPE
	 <u> </u>	 		DEPTH	ᅵᇽ	DATUM	CONCITION		TERETHATION	200am auger
		w- O w-	Δ	ОЕРТН	= 5	SURFACE ELEVATION 230.1m] <u>Ş</u>	TYPE		OTHER TESTS
	WANT TO THE PROPERTY OF THE PR	EA CONTENT %			86		8	<u> </u>	P.F.	
	┠┋╏┩╍╃═╅	╺╂╶╂╌┞╌╁┈┨	┝╾┞╼╄╼	0	⁄ע	FILL	i		1	
				-	r١	FILL - sand, gravel, clay			ļ	-
	┣ ╊ ┪	- 	++-	-	\searrow	- copscii, bricks,				
			_{	- i	\sim	- broken rock				
		<u> </u>		<u>.</u>		<u>FILL</u>	1			
	┣╼╁╌┼╌┟╼┦╶	╺┋╍┨╴┠╌╂╴╂┈┫	╍┝═╂	_ 1	X	- sand			}	<u> </u>
					']	- brown to red		Ì		
		 	╌┨╌┼╌┫	- ¦	X	- some cinder				_
			- 	- [1	'	· -
		 		_ [Ш	SILT				
ļ	┝ ╾╋╺╟╶ <mark>╟</mark> ╶╂╌╋╌	┩╊ ╟╬╀╢	<u> </u>	_	剻	- clayey, sandy		ł		_
		1+++		·	粌	- stratified				
			1	- 2	ii [i	- oxidized stains		ſ	i	_
	╒┋	┋┋ ╌┨╶╏╌╉	+++++++++++++++++++++++++++++++++++++++	- !	ШII	- sand layers at 2m		ı		<u>-</u> -
			111	- 1	II.II	- clay pockets at 2.6m - soft to firm	ľ			<u>.</u>
إسير	、 - ┣─┃┄┟┄┨┄╏╌	·┨╴┞ <mark>╶┠╾┩═</mark> ┡	<u> </u>		杊	Sole to III	1			-
١,		╀╌╁╴╽╶┟╌╂╌╁		ſ	╢╢				Ì	-
- 1				٠ 1	ΙΙ				ŀ	
- 1	╅╅	╁╂╂╂╂	+++	— 3 F	Ӵ		-			نـ
		1	111	. 1	- 1			- 1		ゴ
	- - - - - - - - - - 	┦┈┊╶├╼┟╸╬			1	End Hole at 3m		- 1	i	
-	╼╁╼┩╌┠╺┋╍╂╼	╃╼┼╌╁╼╞╼┺╼╁	$\overline{+}$		- 1				ĺ	寸
ļ	<u> </u>	1. 1. 1. 1. 1. 1.		·	- 1		- {		ŀ	
ŀ	╅╅┪	┆ ┆╏╂╉╋	+ + +	. 1	- 1		- (. !	
Ţ			. 	. }	- 1	į	1			4
		·]·-} - ·	111	.	J			- }		
ŀ		╂╌┨╴├┈┼ ┈╏╶ ┼	+H $'$	- 1	1			i	ı	4
ļ			\Box	'					Į	す
<u> </u>	-┨═ ┧╌┦╼ ╽╶╏ ╌	╽╶╽╼ ┟╾┠╌┠╌┞╌	<u></u>	·			[J	
-	 		+							ㅋ
t	 	<u> </u>	###	Ĺ				- 1		ュ
ł	-{-}-}-	┠┋┋	++-{					ſ	- 1	+
ļ			\Box	·	- 1			Í		구
ŀ	╍╂┈┞┈┞╌╂╌┼╌	 	 	·]			- 1	- 1	_
ļ			111.	.					ŀ	~ન
t				. [-					ュ
(mg	╺╁╌╠╾╃┈╄╄╼	 	++-				.		- [
\ 			 							7
ł	┋	┞╶├ ╶ ┊ ╶┼╼╂╾╉╾		· [Ì		ĺ		- 1	ゴ
ţ	1111		 	. [- 1	-
ŀ	- - - - - - - - - - 	┣┍┋					-		 	
F		┠╺┞ ╍╂╸┞╺╂ ╺ ╂	++	[PLATE 11

							BORE	HOI	LE	L	OG	
The No	tional	Testin	g L	abo	orato	ries	PROJECT CN I	east 1	YAR	DS		
.ogged/Dwn.	WK		CKE) W	K	_		NO. {			MPLE	TH 11
	1					ı	SOIL DESCRIPTION					200mm auger
w _n _ [<u></u>	0 w-		Ħ	DEPTH	<u> </u>	DATUM		NGITRONO	}	echoringe Restauce	OTHER TESTS
	ATER CO	_	_		(<u>m)</u>	38	SURFACE ELEVATION 230.7m		刨	Ě	11	Olher lesis
-1	1		\Box	Н	Ö							
- 					•	l	FILL		1		•	
		· ∤ ∤ ∳-	+	H	•	X	- sand, gravel	-	1	1		
	7-7		_	- -		l	- silt, bricks					
		<u> </u>		17		l	- trace of organics		1			
╌ ┝╺ ┝╍╋┈╂	+ +			11		l×	titud vi viganico					
	╺┪╼╋╶╅	╺╊╌┿╼┞╌┨	+	Н	– 1	ľ		- 1.	ŀ			
4.44	 	4-4-4-1	丰	口	•			{				
<u> </u>	111	╌╂╌┋╌╂╌		ᅡ	•	\vdash		{				
 	++1	╂┩	1	H	•	ĺ	<u>FILL</u>	j				
	-	44-1-1		П			- cinder					
<u></u>	++1	 		口	_, 2	X	- red	{		-		
╼╆╌┼╌┦╌┦	- + - + - 1	<u> </u>	-	Н						ļ		
		11.1.		H	-		- some sand & gravel			Ì		
	++++			⇉	•]	- wet at 3m		1			
╺ ╫┋┼	╅╂╇	╂┼┼		╁		lv	- saturated at 3.7m		-	1		
	-1-1-1		-	П.		r			1			
<u> </u>		1. 1.		咠	— з	l						
╼┼╸┟╸┠┈┞	╅╅╏	1]-		╁┪		l						:
	T	1.4		H		k,						
	+++	-			•	ĮΧ						
╌┼╶╏╼┋╸┩	╃┹╁	+++		┧		l			1			
-+		$+\Pi$		П	-	l						
-	111	1 -1 -1 -1		Ħ.	4	<u>Ļ</u> .,						
╼╈╂┈┤┞	-+	1-4-+		ᅼ			SAND - brown					
4-1-1-1	-∏-ī	[H		20	- fine to mediam	- +	+	 -		
	- -	1-1-1-1		口	•		End Hole on soft clayey silt					
╅╂┼╂	+ + +	1-1-1-1	<u> </u>	⇈	•		at 4.3m			[
 	1	+		1	-		GC 77 JUL					
	 	 	#	Ħ	– 5							
<u> </u>	-	11.4								Į	ı	
		++	+	Н	_					1	 - 	
			ļ.,	П	-			ļ		į		j
	-+	1 1		ㅂ	-					Ì]
		+ + + +	-	∤ −╂	-				. }			
	 			Ħ		1						
	+++	11-1-	世	H		1						
		╅╅	-	\vdash	_							
	11	1.1	—	Ħ	_			ļ			 	<u></u>
╼╊╌╁╌╡╼┩	╉┪╁	++-		Ħ	-				}			PLATE 12

BOREHOLE LOG The National Testing Laboratories Ltd. PROJECT CN EAST YARDS .000cd/@wn, Date of Investigation July 25, 1984 CKĐ JOB NO. WK WK G021 TH 12 SOIL DESCRIPTION SOIL SAMPLE DRILL TYPE 200mm auger DATUM DEPTH Wp-□ W- O WI- △ ĭYP£ OTHER TESTS SURFACE ELEVATION 230,9m WATER CONTENT % (m) 0 FILL - sand, gravel organics - 1 FILL - cinder - black, 50mm thick red layer at lm, some coal SILT - firm to soft 2 clayey, sandy stratified . 3 End Hole at 3.6m PLATE 13

					BOREHO)L	E L	OG	
The Nat	lional Testin	g Lab	orato	ried	Ltd. PROJECT CN EAS	ΓY	ARDS		
.ogged/Dwn.	WK	CKD	WK	_	Data of Investigation July 27, 1984 JOB NO.	GC	021		TH 13
			i —		SOIL DESCRIPTION	sc	IL SA	MPLE	DRILL TYPE
,			ОЕРТН	ಕ	DATUM	Ē		F #	50mm bend maser
	W~ () WI ATER CONTENT %	Δ	(m)	SCIL	SURFACE ELEVATION 226.7m	NOTEGRACE	£	MARTHATICS PESSON MARK	OTHER TESTS
			0	2	TOPSOIL - organic	† ''	-		
			 			1 ,	 		-
			}		SILT	Н			_
			}	ľ	- clayey, sandy	Ш			
			ŀ		- stratified	Ш]
			- 1	<u> </u>	- tan to dark brown	Ш			
	 		-	i :	- moist, soft				_
- - - - - - - - - - 	 - - - - - 					[,	<u> </u>
	+ - - - - - - 		L	И	rootlets at 1.52m	Ш			_
	 - - - - - - - - - - - -	╌ ╽┉┣╌	ŕ	j.	·				
	<u>╟╶╋╸╃╸┠┈╎╴╂╴</u> ╅	··	2	\ \ \	· sandy at 1.83m]			_
		<u> </u>				1			_
						İΙ			
				lil.					-
			-						
	<u> </u>		-						
			- 3	┝╌╏	···	-			-
	╏╶╏╼╏╼╏╼╏ ╾╏		~	╽╽	End Hole at 3m		- 1	1	
			-	$ \ $			ĺ	i	_
			-						
		$\exists \Box$	-					ł	-
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			- ;			1			_
			-	{					
	 	###	_	{					_
┣┷┷┫╾╏╴╅╌			_	1	:				_
		+	_						
	╒╫┼┠┪┩	+							<u>-</u>
									<u>-</u>
		\mp	-				j		-
			•	ļ					7
		4.1.	-		:				_
	┊╸ ╏┈╎┈╂╌┊┄┝╸┪		-		j		}		_
	 		-				}		-
	╺ ╋╫╂		-				}		-
	┡ 	+-	-				ļ		-
		1	-				ļ		PLATE 14
		-		Ļį					1 LATE 14

						BOREHO)L	ΕL	OG	
The National Testing	g Lab	orato	rie	Ltd.	PROJECT	CN EAST			•	· · · · · · · · · · · · · · · · · · ·
SEGOO/Dwn. WK	CKD	٧ĸ		Date of Invest	igation July 27	1984 JOB NO.	GC)21		TH 14
		-	Γ		SOIL DESCRIPTION	ON	SC	IIL SA	MPLE	
		DEPTH	1 5	DATUM			Š		E S	50mm hand sugge
WP- W- O WI-	Δ	(-)	SCIL	SURFACE EL	EVATION 226.0m		ношажа	¥.	PENETRATION RESISTANCE	OTHER TESTS
		(<u>m</u>)	<u>89</u>		- organic		8	, F.	_X. K	
┡ ╏╇╇ ┼╫╃╇			l		- organic		ŀ			-
		-	lii l	SILT]
		_		- soft	to firm y, stratified					
P → · · · · · · · · · · · · · · · · · ·	·	_		soft	black clay					<u>.</u>
<u> </u>		— 1	- 			.				<u> </u>
	· - -	_		\ SAND -	75mm_thick_					
┡	+ -			SILT						! -
	-	- !		-soft	•			i	i	ļ -
		-	\mathbb{H}	- claye	y, sandy					-
	1-1-1	•		- strat	•	·				l -
	1	-2	jiH		ic inclusions			1		~_
	 	-		or Ban	10 111010115			- 1		-
┣┍┢╒ ╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇╒╇		-					-			_
┍ ╃╫┼┼┼┼┼	-	- [Ш					ļ		_
`_ 	- <u> </u>	-	111							
		-з Н	111				4	\dashv		<u>. </u>
<u> </u>			Į			ł				<u>-</u>
		.	- 1	End Hole	e at 3m		-			<u>-</u>
<u> </u>	+-						ł			_
	\overline{H}						ļ		i	_
	\Box	.]				!				-
	###	·]					ĺ			-
		٠				į				_
		٠	ı			ŀ		i		
	╅╼╪╼╊	·	- 1							_
	$\overline{\Box}$.	- 1			ļ				_
	 	. }	- 1			}				_
	\Box	.				Ì				
	##					İ				_
<u> </u>	##	.				!		}		<u>-</u>
		.				į		}		<u>-</u>
						[1			_
\		·]				1			ŀ	=
		·	ĺ							•
		.								7
┣┼┺┤╴┆╏╼╊╀┤┊╂┞ ╸	╉╼╊╌╊	.	Ì			i				PLATE 15

	_							OREHO	<u>)L</u>	<u>t</u> L	<u>OG</u>	
The Natio	onal Testin	g Lab	orator	le:	Ltd.	PROJE						,
_								CN EAST	YA	RDS		
⊃ggsd/Dwn,	WK	CKO	WK		Date of Investig	etion	July 27, 19	34 JOB NO.		021		TH 15
		•					DESCRIPTION	<u> </u>			MPLE	
 .			DEPTH	_	DATUM							550mm band gy
	w- 0 w-	Δ	DEFIR	SCIL	C116C4CF C1 E1	/ATION	226.Om		CONDITION	سِ ا	PENETRATOR PESSETANCE	OTHER TESTS
WAT.	ER CONTENT N	 -	(m)	36	SUMPACE ELE	VALION	420.0W		8	3dAL	49	-
╺ ╁╸╅╴╂╍┾╸╪	┩╡ ╸ ╿ ╶┊╴	╌╂╌╂╌	0	¥	<u>SILT – o</u>	rgani	c				}	
	· ┟·┢╺╂╺┞╺┫╌		·	$\ \ _{L^{2}}$	CTIT					Į		
	 	· 	-		SILT	٠.			1	ĺ		
╍╋╍┨╌┋╌╄╾┿	╺╁╍┞╴╂╌┞╌┠╼┇		- [- soft t							ļ
╃╇┾┽╅	╶╏┊┋		- :	Ш	- clayey	, san	dy				i	1
╡╸ ┧═┢╼╫╼╏	1-1-1-1-1		_ 1	$\ \ $	- strati	fied			[]			
 	-1 -1-+-+-	<u> </u>	_	$\ \ $								1
┿┢┪┨╪	╅╴┇╌╊╼┇╼┣╸╏			11	orga	nic i	nclusions a	t 1.3m				1
1 1 1	·┣·┊ ╸┣╺┊╾┡╸ ·┪╴┆╴┩╺╽╴╖╟╺	. - -	- i									•
┩╸ ┪╌╏┄╏═┩╸			- `	11	sand							
╅┾┼╂	╀┼╬╁╁╁	╅	-		- dark b	rown	to black]
 	 		_ 2 }									!
	· <u>+-</u> [- <u>+-</u> [- <u>-</u>]-	-	_						li			•
1-1-1-1	4-111-4-7	\Box		Ш								•
			- ļ	1								
` 	╂╂┿╀╇	╅	.	-								
 - - - - - -	 	<u>-1</u>	- !		End Hole	at 2	. 5m				'	
<u> </u>	<u> </u>	- 	- з İ							ļ		
	<u>1 </u>	-+-	. ~									ŀ
11-	+		ł	-								
	┆┈╄╌╄╸╋╸		• [
┨═╏═	┫═┊ ╺┾╼ ╏╸╏ ╺┫	╌┼╌┼	.	- [;				
 		777	-	-				ļ	·	Ī		
†- - - -		++-	. !	i				·				
╅╌┠╴┠╴╃╼┠╌	<u></u> │ • ┡┈┤╌┋╌┣┉╇╴			-						į		
 	4		_	ł						- 1		
 	 	╧	٠							1		
┼┼┼┼	┞╏ ┼┼	╶ ┤ ╎ ┍╋	.									
, , , , , , , , , , , , , , , , , , , 		47	.							- 1		
╊╼╽═┼ <u>╒</u> ╂┄╅╌	┆ ╏┪┪┪	111	.						ĺ			
┞ ┩╍┿╌╋┿╾	┨╏	╌┼╌┤╾┥	, ,					[ĺ			
		111	-					İ	í			
		1.11	. [1			
├ ┼┼	╈╂╂╂	╁┼┼	.						- 1			
 	 	 	.						١, ١			
ぺ <u>-</u> ╆╌╂╌	╏┈ ┨┄╊╼╂═┢═┪	 - -	. 1									
4111			•						ŀ			
	 	 	•							i		
╂╂╂	╿╸	- [-]	· [
·┌┈┑╼┊═┿ ╌┠╌		1	_ [- [- 1	- 1		

					·	OREHO	<u>)L</u>	<u>E L</u>	<u>og</u>	
The Nat	ional Test	ling Lab	orato	ries	Ltd. PROJECT	CN EAST	, A.	RDS		
.00ged/Dwn,	GL/WK	CKD	WK	, , , ,	Date of Investigation Aug 3/84	JOB NO.)21		TH 16
			ŀ	l	SOIL DESCRIPTION				MPLE	1
- - 			ОЕРТН	=	DATUM		Ē			400mm Auger
	W - Q - W TER CONTENT &		(m)	SCIL SYMBOL	SURFACE ELEVATION 231.0m		COMPUTION	ž.	PERCHANTER PESSET ANCE	OTHER TESTS
 			0	X	FILL					
<u>╺</u> ┾╶┼╌á╴┟┄		┝╸╽╶┤╌┤╴	l	┝÷	sand & gravel		1			
·+ [· []	<u> </u>		ſ		-\ FILL - wood layer					
	[Ţ :	X	rever				}	1
 	<u> </u>		†	ĺ	 0.3m thick fine to m	au tha				
	<u> </u>		 1		brown sand	-41 dia]			
			 	X	wood layer			[]
 		┝╸╽╼╍┩╌╼┞╸╴	Ĺ						-	!
 - - -			l :		- clay, silty				ŀ	}
 			[i		- cinder, metal pieces					
╂═╂┈┼╾			†	 	- wire, glass					
 			[2	l i	- some chinking-like dep	osits				
 		-1-+-	L	X						
╆╌╄╌┤╴┦╶	<u> </u>			ſŊ	- some charcoal					
			Γ Ι	111.	<u>- some ash like deposits</u>	<u></u>		ļ ,		
 	├─ ┤ ─ ┊╶┦╍╂╼┽	-	├] [SAND & SILT					
╎ ┤ ┤ ┤	 		<u> </u>	1 1						
			L 3	训	- brown	į				
 		· - - -	_	捌	→ moist				:	
		-1-1-		╢∦	- compact					
		1.1.1.1		·[]]-[- fine to medium					
┠═ ╁╌╂╌	┊┋ ┪┨ ╌┼╌┤	+++	- i	胐				Ì		•
┞ ╟┼┼	╼		├	╬┤						1
<u> </u>		<u> </u>	_ 4	ŀ	End Hole at 3.75m		ļ			
	-	┄╎┈├╼╂╌┨			MIG HOTE BC 21/7h		•			
			-	}			- {	J		
	╶╏╌ ┼┼┼		<u> </u>	ŀ				•		
		\Box	-	-				1		
┼ ╶╂╌┼╾╉┈	▕▕ ▗		L l	Į						
 				- 1						
			-	}						
	┷┼┼┼┼┼	+++	<u> </u>	- 1				J		
		\Box	.	-						
	<u>- </u>		<u> </u>	•				ŀ		•
 		-						ļ		
	<u>, , , , , , , , , , , , , , , , , , , </u>		·	[,	۱ ۰			
 	┝╂╃┼	┽┼┼┤	-	- 1			ſ	1		
		- 	_							
┠┋ ┼┼┤	·- - - -	<u> </u>	L l	}		ì	!			
		- - - - - - - - - - 	T			ì	Î			
ــــــــــــــــــــــــــــــــــــــ	╘ ╼╇╶╇╼╇	╍╄╌╂╌┥	- 1				⊢ 1			PLATE 17

The National Testing Laboratories Ltd. PROJECT

BOREHOLE LOG

CN EAST YARDS

	,			EAST				
Nged/Dwn. GL/WK	CKD WK	- , -		B NO.				TH 17
}		-	SOIL DESCRIPTION			IL SA	MPLE	1
wp - [] w - () wr -	i inter	ᄱᅵᇴ	DATUM		ള			400mm Auger
WATER CONTENT %	<u>(n</u>)) H JOS	SURFACE ELEVATION 231.0m		ношако	TYPE	PERMITON MANAGE	OTHER YESTS
	1	× × ×	FILL - sand, gravel - cinder, glass - brick, silt - concrete pieces - clay - 25mm thick ash-like layer 1.52m - wood SILT - soft to firm, clayey End Hole at 2.13m NOTES 1) This test hole was drill 0.3m west of original location where a railway track was encountered at 150mm from grade. 2) Prior to drilling at the final location, a 2nd attempt was made 0.6m east of original locatio In this case, auger refu on unknown object at 0.3	ed n.				PLATE 18

					REHC	<u>)L</u>	E L	OG	
The National	Testing Lal	ocrato	rle		N B400	***	nna.		
					N EAST	YA.	RDS		
299ed/Dwm. CL/WK	CKD	WK	_	Date of Investigation Aug. 3/84	JOB NO.	G	021		TH 18
1		-		SOIL DESCRIPTION	· · · · · · · · · · · · ·		IL SA	MPLE	1
Wp - □ W - ○	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	CEPTH	ặ	DATUM		Ē		2 2	400mm Auger
WATER CONT		(m)	SCIL	SURFACE ELEVATION 230.7m	·	СОМВІТЮН	TYPE	PENETRATION PERSTANCE	OTHER TESTS
		0	***	FILL		۳		- A - A	
┋		+ .	l,	- sand & gravel				[
		} :	<u>n</u>	- wet lime at 1.2m					-
┡┯┽┼	╌┼╌┥╃┨╬╵	1	IJ						-
		+	X	- plastic bag,] .
	<u> </u>	<u> </u>		- broken bottle				ļ	! .
	+- + 	1	X	- wood, metal pieces					_
┢╄╂╅╬╋┡┤┤	┅╌╁╌┞╌	1							
		T							_
1-1-1-1-1-1		Ţ		Auger refusal at 1.37m on unknown object					,
		†							·
	· ┿ ╸╇╸╇╸┠╸╇╸ · · · · · · · · · · · · · · · · · · ·	2	ļ	NOTES					-
		f		I) Artifact like materials	į			·	
┣┥╃┩ ┋╅╀┼┤	┤╌╁┤╌┞╌	 		picked up by Parks Canad	da [
	11212	1	ĺ	on site representative.					
<u> </u>	·	1	į	2) One additional hole dril	lled	-			-
	·····	L 3		0.6m east of TH 18; aug	er				
	<u>╶</u> ┞╏╫╂╬	L	}	refusal again at 1.37m	ſ		}		_
┡╊╟╂┼╽╢╁┨	│ 	f. I			i		Ì		_
	1	ΓI							_
	-	[- 1			•
					!	- 1			-
		F 4	-		ţ	- 1			-
		- I			- 1	ı	1		-
	┊	- 1					- 1		•
		- 1			-		- 1		-
		<u> </u>	-						
			- !					į	-
┡┋┋	 	[-	
		·	ĺ						
			-						
		<u> </u>							-
		<u> </u>	- {			$\cdot $			•
┡ ╬		-			Į		ł		-
╻┇╸ ┇┋		<u> </u>			- 1		j		-
	· - - - - - - - - - - - - -	ļ l			i		Ì		-
	┿ ╅╫╂	L l				Ì	1		
F	-┟ <u>╁╁</u> ╄╋╸	<u> </u>			1				PLATE 19

BOREHOLE LOG The National Testing Laboratories Ltd. PROJECT CN EAST YARDS .ogged/Dwn. CKD Date of Investigation JOB NO. GL/WK WΚ Aug 3/84 G021 TH 19 SOIL DESCRIPTION SQIL SAMPLE . DRILL TYPE 400mm Auger DATUM (a) (a) DEPTH W- □ W- ○ W- △ TYPE OTHER TESTS SURFACE ELEVATION 231.2m WATER CONTENT % FILL - sand & gravel FILL -- cinder - coal - broken glass 1 - piece of oxidized copper some silt - wood pieces - 2 SILT - sandy - firm SAND, brown End Hole at 2.6m 3 PLATE 20

																BOREH	<u>)L</u>	<u>E L</u>	<u>.0G</u>	
	T	he	N	rtk	'n	a۱	Te	86	tin	g	_at	orato	rle	B Ltd.	PROJECT					
	٠.															CN BAST	r y,	ARDS		
١,	999	ed/(Own	. G	L/	WK.				Ç	(D	WK		Dete of Invo	tigation Aug 3/84	JOB NO.	G(021		TH 20
į														<u> </u>	SOIL DESCRIPTION	N			AMPLE	DRILL TYPE
	-	±	-	7	<u>+</u>	Τ,	!	<u> </u>		⇉	1	ОЕРТН	وَ	DATUM			ĮĒ		Q B	400mm Auger
		Wp		J Vate						Δ		(m)	137	SURFACE E	LEVATION 230.7m		NOTEGNOC	Ĕ	PERESTANTON PERESTANCE	OTHER TESTS
- (Ţ	T		4	Ţ.	I	I	Į.		\Box	<u> </u>	0	<u> </u>	<u>FILL</u>			۲,		 ~~	
ł	. L	Ł			\pm	+	╁.	╂.	H	+	+	╁	X	band -	& gravel		l	ĺ		! -
-	-	F	Н	Ŧ	Ŧ	T	Ι-	Ι_	П	\mp	7	}	┝	<u>90</u> 00	cohble to 100mm	Ø	ļ			
ŀ	7	+-		+	7	╀	-	1	-	- ‡	<u> </u>	-	ì	<u>FILL</u>			1	(ĺ] -
ļ	‡	1 1		_	‡	·+··-	Ë			-+	- † -	1	\triangleright	1	thick sand laye	er at O Am		[
ţ	#	Ħ		- -	<u> </u>	1	<u> </u>	<u> </u> -	┇		+-	_1	[]	l				İ		l <u>-</u>
ł	<u>.</u>	丗		+	╆	上	上		団		1	1	K.	Ļ	cinder at 1.5m	1	l		ļ]
ŀ	+	╂┨		+	- -	-	H			-{	-	{	X	- sand	& silt		l	ļ	ĺ	i -
ŀ	-			+	+						-	Ī								-
ţ	#	1-1		1.	1	 					_	r	١,					Ì	ļ	
ŀ		H	_	+	†	 		Н	1	1	1	†	r						i	_
╁	╁	Н	\dashv	+	╀	╂-	-	Н	+	+	╫	-2	37	CANID	1		} ;	Į		
F	+	H	7	7	F	F			7	Ŧ	Ŧ	<u></u>	Hi		brown. moist	.	1	ĺ		· -
ŀ	1	П	7	#	1		_			7	1	-	Ш	SILT						_
^	4	-	1	Ľ	1				-‡	<u></u>	+	L	Ш	- firm	to soft			į		
` r	╬	┢╂		-	}-	-	Li		+	+	+			- claye	:y					<u>-</u>
F	-		_[.	7	ļ-				7		\Box	Γ,	Щ				┝┥			
þ	丰	Ħ		+	1				_	+	Ħ	-3	1	End Ho3	ie at 2.74m		ΙI		:	
ŀ	+	Н	-	+	 			\dashv	+	1	╁╌	-								
F		┰	-	+	F	Η		\dashv	+	+	+	-	Ш							
þ	#	1-1	7	+	1	H		耳	#	‡	\Box	_								i -
t			<u>- </u>	\pm	+	ᆸ	ᆸ		#	\pm			ļ							
ŀ	╫	₽₹	-			-	- 		╅	+-	Н	_ 4					<u> </u>			
F	Ŧ			-	٠				7	+	-	_ ¬								` `
E	+	Ħ	_	‡	ţ.			_	#	#	Ħ	+						,		
ŀ	+-	┢┪		+	\vdash			Ⅎ	#	±	∄	-								_ =
F	+	H		F	F	П	-	\dashv	+	+	H	L					.	1		. ⊢
þ	+-	H	1	丰	Ľ			コ	#	‡	Ħ	Ļ								·
Ŀ	+	Н	1	士	Ė	H		⇉	₫,	1	<u> </u>	! -						Ì	' <u> </u>	
F	+	┝┥	+	╫	╀	╌┨	╌╢	╌╂	+	+	± 1									
F	-	Π	7	Ŧ	ļ.		コ	7	4	7	П	•					ŀ			-
t	+-	口	寸	丰	t		⇉	コ	#	丰	⇉	_	ļ ļ				Į			
ŀ	╅╼	H	┿	┿	十	H	┪	┪	+	+	H	-	! {				ł			
1	-	H	+	F	F	П	\dashv		-	Ŧ	H	<u>-</u>					.			
(_	Ħ	#	+	F	-: ‡	#	ヸ	۲.,	#	\Box	_								
ŀ	+-		士.	1	E	H		⇉	#	#	\Box	_	}							│
F	+	┢┤		+	\vdash		\dashv	+	1	+	+-	_								
F	Ŧ		7		F	П	\neg	\neg		Ŧ	+		[i
þ	#		#	1	1	Ħ	4	7	+	#	H	-								PLATE 21

					REHC	<u>)L</u>	<u>E L</u>	<u>og</u>	
The National Testi	ng Lab	orato	riea	B Ltd. PROJECT	CN EAST	YA	RDS		
.ogged/Dwm. GL/WK	CKD	WK .	_	Caro of Investigation Aug. 3/84.	JOB NO.				TH 21
		!	l	SOIL DESCRIPTION		şç	IL SA	MPLE	DRILL TYPE
		CEPTH	ಕ	DATUM		ENDITION		HENRITANDER PERSTANDER	400mm Auger
Wp - [] W - () Wi - WATER CONTENT %	Δ	_{/-} \	SCIL SYMBOL	SURFACE ELEVATION 229.7m		춡	147E		OTHER TESTS
11111111111	111		30	· ·		₽.	 F -	K.F	
		0		<u>FILL</u>					
╍┋╌╏╌┤╌┋╸╂┈┝╶┞	·}·- <u> </u> ·-}	[V	- aand & gravel		1			1
- ┩╍┞╸╏╶┠╸ ╏╸╏	4	[n						l
<u> </u>	1-1-1-	Ţ							ŀ
	 	-	X						
┤╏╏╏╏	╀╌╏╶┞╼	 1	rì						ŀ
		}							
		L	M	FILL]
╸ ╂╌┠╌╂┈ ╂╶┾╌ ╇╴┠╌┨╼╂╌┠╸	 	L	\Box	- broken shale		ll		l 	}
	1 1-1	Γ	i	<u>FILL</u>			1		
1-	 	<u> </u>		- silt					•
╀╌╀╌╀╌╂╌╏╶┞╌┼	╂╌┦ <u>╶</u> ╅┈	_ 2	X	- wet					
} } • • • • • • • • • • • • • • • • • •	┝ ╼┥╌╪╾┆	-							
		L	IJ	- soft, tan	i	li			
	1.		M				ł		
┩ ┈┨╶┟┋┨╞═╉╸	╏ ╶┤ ╌ ┣		Щ	0.00			i		
 	$\prod \prod$	Γ ͺ	W	SAND caving at 2.9m	Į				
	<u> </u>	_ 3	M	- brown		1			
╏╎╏ ┼╋┼╋┼╌╎╌┼ ╏╏	┝╌╏╌┞╌┦	-	K	- grey at 3m, seepage at 3	35m	-			
		-		- Kiej at bai seepage at s		ì			
		-		SILT			ļ		
· - - - - - - - - - 	 - - - 	_	堋	- clayey			į		
╍┠╍╉ ╸┥┈┃╌┼╶ ┊ ╴┃╴╏╴ ┋╶╏ ╴	┠╼╂╼┼	4	i	- soft					
		_ ,	Ш	- dark grey		ĺ			
 		-	411	- dark grey		ľ			
┊ ╌╂╌┼╌┠╌┢╾╏╶┠┄╂╸╂ ╸ ┞		- [┆╣╽						
	┝┼┼┤	- i					\dashv		
		-		End Hole at 4.57m	ļ	1			
		_			ì	-			
╎╏╇╇╂╋╬╬		_		NOTE	.				
				Test hole caved in to 3.35	.				
		-		from grade on completion.	_	ļ			
╂╃ ┼ ╏╂╂╂╂		~		-	ţ	Ī			
 	H	- !							
		_							
▗ ▎ ┡		_				-			
╶ ╇╤╀┞ ┪ ╇╋┉╋┉╋┉		_							
		- :	ιI			- 1	ļ		PLATE 22

i						BOREH	<u> </u>	<u>E</u> L	<u>OG</u>	
The Nat	llonal Testir	ng Lab	orato	ie	B Ltd. PROJECT	CN EAS	T Y	ARDS		
Oggeti/Dwn,	GŁ/WK	CKD	WK		Data of Investigation Aug. 3/84	JOB NO.	G	721		TH 22
				Ţ	SOIL DESCRIPTION				MPLE	DRILL TYPE
	,_t_t_		DEPTH	١.,	DATUM	-	Ž.		ğ y	400mm Auge
	W- O WI-	Δ	DEPAH	SYMBOL	SURFACE ELEVATION 230.7m		MOLLIGNOS	سِ ا	PERSTANCE.	OTHER TESTS
WA	TER CONTENT %		(M)	28	SURFACE ECEVATION 230.70		8	7. 2.	14	
╃╂╄╋╸	╉╼╅╌┋╌┊	╏ ╌╊╍┼╌	0		FILL		ı]	1
 	 	╁═┼╌╁╾╴	┝	レ			ı		i	
	 		Ļ	n	- wood, concrete		ı	ļ	l	
 					- sand, gravel					
╅╴┞╴┤╌┤╾	╂╌┞╶┼╌╁╌╂	┪╌┃═┋╼┋		X	- blue ceramic tile, ra	eg .	1			
1	1 1 - 1 - 1 - 1		Γ.	۱)	- some silt					1
			_1	l						}
╅╃┪╂	 	 	-	\vdash			┨		ļ	ŀ
<u> </u>			L	X	FILL - sandy silt, soft	:			ĺ	
<u>-}- - </u>	╅┅╂┊┄┦╌┤┄┦╌	<u> </u>	Ĺĺ	··· }	- trace of broken rock		۱ ا	[
 		1-1-		÷,	SAND]			j
1-1-1			-	1	- fine to medium				Į	1
┦╼┤┤ ╏	┋╊╅╂╁╂┆	 	_2		- silty, compact					Į
╪┼┼	┋╌╂╶╂╼╂╼╂╼	╟┼┼┤	<u></u>	ΙŢ						ļ .
		- -	_	*	125mm thick layer o	of				İ
				:.	rotten log			İ		
<u> </u>	<u> </u>		-				i			
┼┼┤╀	╅╸┨ ╴ ┋ ╴ ┋ ╴┩╸ ┇╸ ┥		-							
Ĭ Ţ╃┩╌┼╌	┇╺┋╒┋	├ ╎ ┼┼┦	⊸ 3	```]			
 	╏ ╏╬╅┻┩		_	311	SILT - soft - clayey	Г	Н			
} -{{∤	<u> </u>	<u></u> ∐-∤-∤			Y CLAYEY			į		
			-		End Hole at 3.05m					
┠ ╾┡╌╅╌		 	-				Ιļ		i	
┨ ╌╂╾╁╍┫╾╵	┝╍ ╅╍╉╼╉╼╉╍╇╍┦	┝┋┋	-				!			
 			_4				,			
<u> </u>		··· :	_							
	 	│ │ ┼ ┦ ┩								
			-				{			
 	├─├ ─ ┞ ╌╂╌╂┈╂┈┨	┝┤┿┪	-				1			•
			.				[]			
			_				1			
 	┠ ═╏┋ ┋	┝╌┧╼╉╼╏					Ιİ			
			-							
┞╶╏┈ ┼╌╂╼ [┋]		▎	-					1		
			-				ነ ነ		, '	
╅╅┼╇			_					;		
	├ ┊ ┼┼┼┼┼	- 								
 			•							
╂╌╂╌╄╌	┡═┋┋ ═╂╴┠╶╂┉┥		-							
		- + -	- 1				Ιİ		'	
╁┼╏┼	<u>- </u>		_		·			ļ		 _
	↓	├ ╶ ┣ ━╃╾╏		- '			┧			PLATE 23

1			٠. ٠.	_		В	OREHO)L	E L	OG	
	The Nati	lonal Testin	g Lab	orato	rie:	B Ltd. PROJECT	CN EAST	YA	RDS		-
~	-gged/Dwn.	GL/WK	CKD	WK		Date of Investigation Aug 3/84	JOB NO.	GO	21		TH 29
Ī					Τ	SOIL DESCRIPTION		SC		MPLE	- ORILL TYPE
ŀ				DEPTH	절	DATUM		ğ		100	400mm Auger
1		W - O WI -	Δ		SYNE	SURFACE ELEVATION 230.7m		NOTTION	14 PE	ACHERICAN HOLLOWINGS	OTHER TESTS
F				0	X	FILL - sand & gravel					-
E				[H	- concrete pieces]
F	┪╌┼╏╶┼┪	_			X	<u>FILL</u>]
-	-	╽╏╅╏╾┡┪			l,	- silt					;
F				_ 1	X	- some clay					7
F	 - - -			_ ·	\prod	SILT					7
F	1					caving at 1.37m					
þ	╅		· • • • • • • • • • • • • • • • • • • •	-					i	1	7
þ	.4. .1. .4.			-		- sandy					_
ļ	 			<u>.</u>		- brown		ł			-
ŀ				_ 2		- soft to firm					_
£									J	i	-
ŀ	╃╃┼┼	╃┋ ╂╅╂		-				ļ	ŀ	į	-
_	`! 			-				}		.	
F	1-1-1-1			-				1			
F	 	··· - - · · · • • • • • • • • • • • • • •		 3						i	
F		- 	##	- .	Ш			_			
L	 	-+ 		-		End Hole at 3.2m		ŀ			
E	1-1-	╺┥ ╸┞╌┞╴╂ <u>╸</u> ╂╶╂ ╶ ╡ ╏┆┞╏═╂╺┩		<u> </u>		Mid Role at 3.2m		- 1		l	
F	4-1	• - • 		_				-			<u>-</u>
Ŀ	 	╌┞╾┤╾╂╌╄╼╄╼╂	+	_ 4				-1	- 1		-
F	┼╌╂╌╞╌╉╺┡	<u> </u>	+	_			j		ļ		_
F	 	<u> </u>	+						1		_
F	ŢŢ ŢŢŢ		-1-1-1	-						- 1	7
F	<u> </u>		\bot	•]	_
E	┞╌╏┈┇╌╏╶┇	-1-1-1-1-1	###	-						ł	-
t	1 			-							-
┝	 		-{··}· }	-	[]	-
F	 		+ -	-				-			-
F				~							_
Ļ		▕ 	\dashv	-							-
	` <u></u>	· ╅┼╂╬╬	 	-							_
ŀ		·┞ ┼┼┼┼	 	_						ŀ	_
F		▗ ╊ ┋ ╃┋		~						1	
-	╺╞╸ ╂╍╉╴╏	<u>╌┡╺╇╍┿╴╂╌┨</u>	<u>-+</u>	_			Į		ţ	l	· · · · · · · · · · · · · · · · · · ·
F							1				PLATE 24

	_	, , , , ,				DREH)L	E L	<u>QG</u>	
The Nati	onal Testin	g Lab	orato	ri e :	Ltd. PROJECT	CN BAST	· v	(DDC		
, i						,		ikus		
reged/Dwn. (L/WK	CKD	WK	_	Date of Investigation Aug 3/84	JOB NO.)21		TH 24
				ı	SOIL DESCRIPTION				MPLE	1
	+ + - + -		DEPTH	ĺđ	DATUM		[[2 2	400cm Auge
	W - O WI - ER CONTENT %	Δ	(m)	SCIL	SURFACE ELEVATION 230.8m		MOITIGNOO	Ĕ	PERTANDA	८४भस्त्र ग्रह्मा
			0	27.55			1-2	┝┈┺╌	- E N	
		- 1 7	1	×	FILL				ł	•
 - -	<u>·</u>	-	1	Ι,	 gravelly sand 				ļ	
╃┄╏┊╌┟╌╊	<u> </u>	1	Ĺ	X	- some concrete & cobble				ļ	ľ
4 1		- - -	Ŧ	\vdash	FILL - sandy		1			
╃╸╏╶╽ ┿╌╌┟┈╈╼┼╏	1-1-4-1-1-1		t .	$ \mathbf{x} $	- wood, cinder, silt)			
┆┈┆╸┆╺ ┣ ╋╍╁╾┼╍┼╶╏		##	1	C	abundance of fish bone	28				
	- - - - - - - - - - - - - - - - - - -		┢	Ž	~ shells, charcoal, chinking-l	ike deposit	19			
	- ┼╁╌┞═╁╌╏	+	-		SAND					
 	-] .	ÌÌÌÌ			t			
<u>† </u>	· <u> </u>	1-1-	1		caving between 1,68 &	2.22mm	li			
 	· † - - +	ļ. [_2		SILT	!				
		1-1-			- soft to firm					
		1.4								
	▝ ┋	- -	 		- tan					
┦╶┧╴┤╸ ╁╍╉╵	╺╎╍╋┈╉╍┠ ╶╂╺ ╽		┞.	Ш	- sandy					
			- -							
<u>- -+ • + </u>	1-1-1	<u> </u>	-3							
├ ─┼╴┼╶├╶┽╴	╶╏├┈┥╶╁┄╂┈╂		_					- 1		
		. - -	ΓΙ	Ш						
							. [
╏╸╏╸┆ ╶┢╼ ┡			┝╶┤				ļļ			
┞┼╏ ┼	┩┋╏╏	╅	- 1			1				
	41114		_4	Ш		i	· i	İ		
 		. = 	_	Ш						
┝╼ ╁╌╅╌╉╌┦╴	╂╌╎╌┦┄┼╌┝╌╏		_	-111		-	_			
		1		}	End Hole at 4.27m					
			-	}	mie nose de Trefu		}			
			-		uarra.					
	╂┼┼╂┄╂╌╊┯	+	-		NOTE				ļ	
		\blacksquare	-		Hole caved to 3.35m from g	rade on				
 - - - - 	* 		_		completion	i]	
┞╶╏┄ ┢╌ ┝╸	┋	1	_				- }	ļ	;	
	 	+		ļ				ĺ		
	┊ ╫╫╫	11	- i				-		;	
	1-		-						1	
	+	++-	-				1			
┃ ┃ ┃ ┃			-							
<u> </u>	· <u>····································</u>		_				ļ		•	
┠╸┠ ╍ ┩╼ ╂╼	╌┧╼╊╼╬╌┟╌╋╌┨									PLATE 25