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CONSULTING ENGINEERS

#14
Spare

GEOTECHNICAL STUDY
RIDEAU CANAL
JONES FALLS, ONTARIO

PREPARED FOR

PARKS CANADA

PROJECT NO.: O-6941

FEBRUARY 1985.

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TABLE OF CONTENTS

APPENDIX

DRAWINGS

SUMMARY

The monoliths, at the lower locks (40 to 42), are made up of sandstone and granite blocks cemented with mortar. The quality of the stone varies significantly throughout the monoliths. It is considered to be in poor to fair condition.

The monoliths are resting on granitic bedrock of poor quality for the uppermost 0.5 m thick layer. The bedrock is, generally, more competent below the upper weathered layer.

Next to the log sill, the bottom of the lock is composed of a layer of concrete over sandstone and granite blocks of, generally, poor to fair condition. The blocks are founded on a granitic bedrock of fair to excellent quality.

Clayey silt fill was found underlying the stone masonry at the stair locations.

The recommended safe-net-bearing value for the weathered bedrock is 1000 kPa.

The recommended safe-net-bearing value for competent bedrock is 2000 kPa.

The clean clayey silt fill is considered to be acceptable as a foundation material, if the restoration does not impose additional pressure on the fill.

The foundation factor, F, for earthquake considerations is equal to 1.0 for foundations on bedrock.

The excavation side slope in the fill or natural ground should be cut-back at 45 degrees above a height of 1.2 m in order to comply with the Occupational Health and Safety Act.

The earth pressure on shoring is assumed to have a trapezoidal distribution, as given on p. 7.

The earth pressure on retaining walls is assumed to have a trapezoidal distribution with an earth pressure coefficient equal to 0.33.

The above points are discussed in detail in the following report.

1. SITE AND PROJECT DESCRIPTION

All components of the Jones Falls locks, located 40 km north of Kingston, Ontario, have experienced significant deterioration. The locks are used to commute between Sand Lake and Whitefish Lake. Parks Canada will be reconstructing and restoring the locks.

The locks are, primarily, divided into two sections. A first set of three locks,numbers 40 to 42,is used to travel from Whitefish Lake to the Turning Basin, while north of the Basin, lock 39 serves as an access from the Turning Basin to Sand Lake.

Physiographically, the Jones Falls area is characterized by shallow till overburden and outcropping rock ridges. The Pre-Cambrian rock in the study area is of the Grenville Formation consisting of granite-gneiss.

A geotechnical study has been undertaken to determine the bearing capacity and conditions beneath the monoliths in locks 40 to 42 and beneath the upper stop log sill in lock 39.

2. FIELD WORK AND SUBSOIL

The field work, consisting of 12 vertical boreholes and 2 horizontal boreholes, was carried out during the period of November 19, 1984, to January 11, 1985, using CME 55 drilling equipment and a portable diamond drill.

Core samples of the bedrock were taken in all vertical boreholes, except at boreholes numbers 11 to 14, inclusive, which were put down through the stone stairs on the north side of lock numbers 40 and 41. It was decided to replace the two proposed test pits along the stairs by boreholes 11 to 14 to avoid excessive damage to the property. Upon completion of the boreholes, they were filled with cement grout.

The logs of boreholes 1 through 8 with A and B, show that the monoliths, at the lower locks (40 to 42), are made up of sandstone and granite blocks cemented with mortar. A concrete layer of variable thickness was found covering the surface of the monoliths at all borehole locations. While the quality of the stone varies significantly throughout the monoliths, it is considered to be in poor to fair condition.

The monoliths are resting on granitic bedrock, which is of poor quality for the uppermost 0.5 m thick layer. The bedrock is, generally, more competent below the upper weathered layer.

The information obtained from borehole numbers 9 and 10 shows that, next to the log sill, the bottom of the lock is composed of a 75 mm to 125 mm thick layer of concrete over sandstone and granite blocks of, generally, poor to fair condition. The blocks are founded on a granitic bedrock of fair to excellent quality.

Boreholes numbers 11 to 14, inclusive, which were taken through the stone stairs, show that the stairs are made up of sandstone blocks in poor

to fair condition. The stone masonry rests on clean clayey silt fill, with frequent gravel sizes. The clayey silt fill was found overlying silty sand fill at borehole 12.

The composition of the monoliths and the bottom of the lock 39 as well as the subsoil encountered, is described in detail on the borehole logs given in Appendix 'B' of this report. The borehole locations are provided on the site plan, Dwgs. 1 and 2.

3. FOUNDATIONS

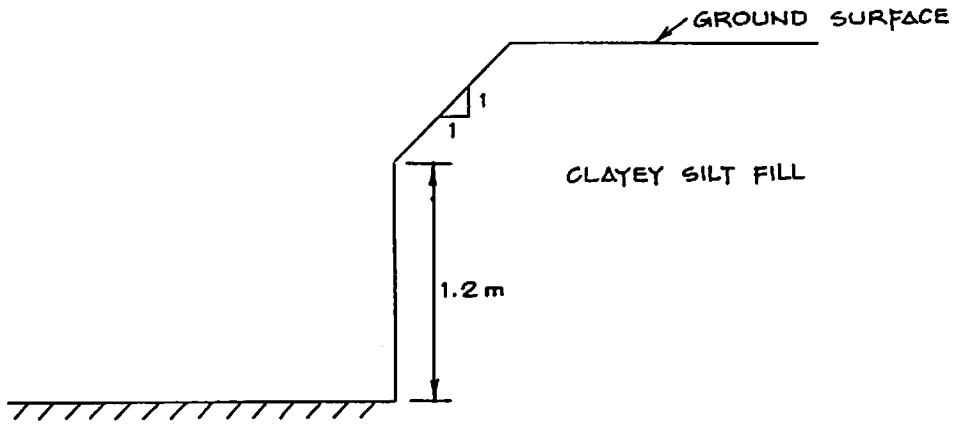
The two pairs of monoliths and the upper lock sill are founded on granitic bedrock. The surface of the bedrock is, generally, in very poor condition, a recommended safe-net-bearing value for the surface bedrock is 1000 kPa. A greater value could be obtained if the very poor quality bedrock is subexcavated. A recommended safe-net-bearing value for competent bedrock is 2000 kPa, or greater.

The monolith stairs are founded on clean clayey silt fill with frequent gravel sizes. The fill has been consolidating over the years under the structural loading and water percolation. If the restoration of the monoliths does not impose additional pressure on the fill, it is considered to be acceptable as a foundation material. Any foundation soil, which is disturbed during restoration, should be subexcavated and replaced with "engineered" fill.

The foundation factor, F, required to satisfy the conditions outlined in the Ontario Building Code for earthquake considerations, is 1.0 for foundations on bedrock.

4. EXCAVATIONS AND GROUNDWATER

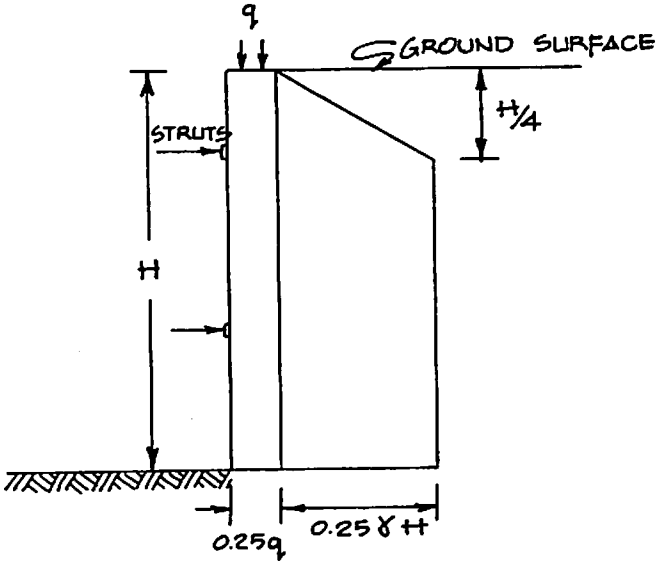
The excavation side slopes in the fill or natural ground should be cut-back at 45 degrees above a height of 1.2 m in order to comply with the Occupational Health and Safety Act. A sketch showing the recommended side slope configuration is given below.



SKETCH OF UNBRACED EXCAVATION

If shoring is to be used as an alternative means for excavation, the earth pressure can be assumed to have a trapezoidal distribution.

A sketch of the recommended pressure distribution is provided below:



SKETCH OF EARTH PRESSURE ON SHORING

where

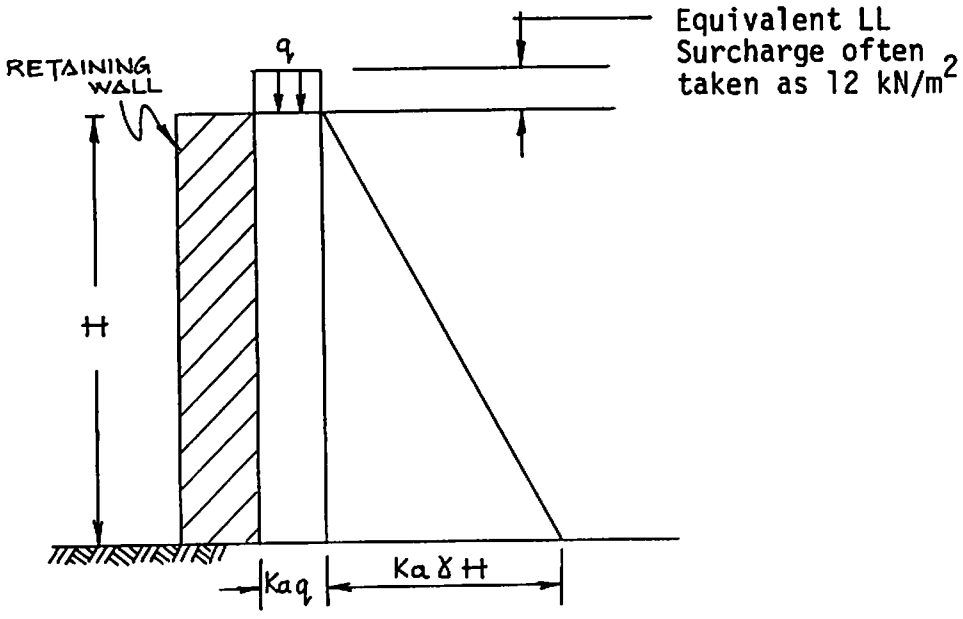
q = any surcharge loading acting on the surface adjacent to the shoring.

γ = 20 kN/m^3

5. EARTH PRESSURE ON RETAINING WALLS

The earth pressure acting on retaining walls can be assumed to have a triangular distribution.

A sketch of the recommended pressure distribution is shown below:



assume γ = 20 kN/m^3

Ka = 0.33

SKETCH OF EARTH PRESSURE ON RETAINING WALLS

In the above configuration, there has been no allowance made for hydrostatic build-up against the wall. Therefore, if there is no provision made for drainage of the backfill material, it will be necessary to design the structure for the increased loading due to hydrostatic pressure.

FONDEX LIMITED

Glenn Collins, M.Sc.

Henry R. Krzywicki, P.Eng.

APPENDIX

APPENDIX 'A'

EXPLANATORY NOTES
ON THE
RECORDS OF BOREHOLES

EXPLANATORY NOTES

ON THE

RECORDS OF BOREHOLES

The purpose of borehole records is to assemble on a single sheet all of the field and laboratory data obtained during the investigation regarding the soil, bedrock, and groundwater conditions at the location of the borehole.

SOIL PROFILE

Elevation: This column gives the elevations of boundaries between various geological strata. The elevation refers to the datum shown in the heading of the borehole record. The corresponding depths below the ground surface are also shown.

Description: Each geological stratum is described, using standard terminology, from examination and analyses of samples.

The relative density of granular soils is defined on the basis of the Standard Penetration Test. The consistency of cohesive soils is referred to in terms of either shear strength or unconfined compressive strength. The proportion of each constituent part as

defined by the grain size is denoted by the following terms.

Relative Density (granular soils)	Standard Penetration Test Value "N"
Very loose	0 to 4
Loose	4 to 10
Compact or Medium	10 to 30
Dense	30 to 50
Very dense	over 50

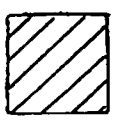
Consistency (cohesive soils)	Undrained Shear Strength (c) (KN/m^2)
Very soft	under 10
Soft	10 to 25
Medium or firm	25 to 50
Stiff	50 to 100
Very stiff	100 to 200
Hard	over 200

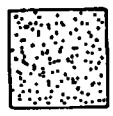
Plasticity of Cohesive Soils	Liquid Limit
Low	under 30%
Medium	30 to 50%
High	over 50%

Descriptive Terms	Range of proportion
"Trace"	1 to 10 %
"Some"	10 to 20 %
Adjective (c.g. sandy, silty)	20 to 35 %
"and" (c.g. sand and gravel)	35 to 50 %

STRATIGRAPHIC PLOT

The following stratigraphical symbols are used to denote main soils types:

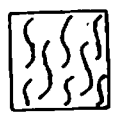

Clay


Sand


Cobbles and/or boulders


Silt


Gravel


Organic soil

GROUNDWATER CONDITIONS

The groundwater level as observed in the borehole is shown by the symbol ▼

SAMPLES

Number: Each sample taken from the borehole is numbered as shown in this column; the exact location and the length of each sample are also shown.

Type: The symbols shown are referred to the following sample types:

AS: auger sample
SS: split spoon sample
ST: Shelby tube sample
WS: washed sample
RC: core sample

(N) Standard Penetration Resistance: The number of blows required to advance a Standard Split Barrel sampler 0.3 m into the subsoil, driven by means of a hammer, having 63.5 kg (± 0.5 kg) mass, falling freely a distance 0.76 m (± 0.02 m)

Recovery: Rock core recoveries are given in percentages.

DYNAMIC PENETRATION RESISTANCE

The number of blows required to advance a 51 mm diameter 60^{o} steel cone fitted to the end of 45 mm OD drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

STRENGTH

Results of field or laboratory strength tests on cohesive soils are shown graphically in the "Shear Strength" column using the indicated symbols.

CONSISTENCY

Results of moisture content, liquid limit, and plastic limit tests as determined in the laboratory are shown under "Consistency".

A P P E N D I X "B"

BOREHOLE LOGS

0-6941

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BOREHOLE NUMBER A

PROJECT Geotechnical Study - Jones Falls
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 29/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR •, LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
106.47	HORIZONTAL BOREHOLE							
0.0	SANDSTONE - WHITE, COARSE GRAINED, WITH MORTAR & INCLUDING SOME BOULDERS OF GNEISS		1	RC	81	100		
			2	RC	100	100		
1.0			3	RC	100	100		
	- GREY / BLACK, FINE GRAINED		4	RC	28	86		
	- GOOD TO EXCELLENT CONDITION FROM 0 to 1.1 m.		5	RC	47	74		
2.0			6	RC	70	80		
	- GOOD CONDITION FROM 1.1m. to 2.7m		7	RC	0	100		
	- PREDOMINANTLY RED SANDSTONE BY 2.5m.							
3.0	- EXCELLENT CONDITION BY 2.7m.		8	RC	93	95		
4.1	SILTY CLAY STIFF, GREY.		9	RC		7		
5.3	END OF BOREHOLE							

NOTES

1) WATER SEEPING FROM BOREHOLE AT 125 ml/min. AFTER 2 DAYS.

2) NO LOSS OF DRILL WATER DURING DRILLING.

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BOREHOLE NUMBER B

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 24/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
102.33	HORIZONTAL BOREHOLE							
0.0	CONCRETE OCCASIONAL LARGE AGGREGATE AND COBBLES IN MORTAR TO 0.7m.		1	RC	90	100		
1.0	SANDSTONE - WHITE, COARSE GRAINED WITH GNEISS - GREY/BLACK, FINE GRAINED, IN MORTAR		2	RC	76	100		
2.0	- OCCASIONAL RED SANDSTONE BOULDERS - GOOD TO EXCELLENT CONDITION TO 2.1m							
3.0	MORTAR - PREDOMINANTLY MORTAR BY 2.1 m.		3	RC	6	6		
4.1								
4.2	SANDY SILT COMPACT, BROWN END OF BOREHOLE							

NOTES
1) NO LOSS OF DRILL WATER DURING DRILLING.

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BOREHOLE NUMBER 1

PROJECT Jones Falls Geotechnical Study

LOCATION Rideau Canal, Jones Falls, Ontario

DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 28,29,31/8

REPORT DATE Feb 18/85

DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth 111.54	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
0.0	200 mm CONCRETE CAP		1	RC	19	62		
	SANDSTONE							
	RED, COARSE GRAINED, WITH MORTAR, POOR CONDITION		2	RC	0	23		
1.0			3	RC	40	60		
2.0	-LOST DRILLING WATER AT 2.0 m. DEPTH		4	RC	100	100		
			5	RC	52	66		
	-GOOD CONDITION BETWEEN 2m AND 5m DEPTH.		6	RC	85	100		
3.0			7	RC	68	74		
4.0			8	RC	86	100		
			9	RC	50	81		
5.0	-OCCASIONAL GNEISS AND QUARTZITE BOULDERS BY 5m DEPTH.		10	RC	0	65		
6.0			11	RC	42	57		
104.54			12	RC	25	75		
7.0	CONTINUED							

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BOREHOLE NUMBER 1 (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 28,29,31/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQU'D LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
104.54	CONTINUED							
7.0	SANDSTONE RED, COARSE GRAINED, FREQUENT QUARTZITE AND OCCASIONAL GNEISS BOULDERS		13	RC	26	59		
8.0	- FAIR CONDITION - SEVERAL VOIDS NOTED BETWEEN 9 AND 10.0 m DEPTH.		14	RC	23	35		
9.0			15	RC	60	100		
101.44								
10.1	QUARTZITE BEDROCK WHITE, WEATHERED AT UPPER LEVELS, BECOMING SOUND BY 11.7 m. DEPTH.		16	RC	29	45		
11.0			17	RC	78	77		
			18	RC	78	77		
			19	RC	0	82		
12.0			20	RC	56	100		
99.44								
12.1	END OF BOREHOLE							
	NOTES 1) LOSS OF DRILL WATER UPON PENETRATION OF CONCRETE CAP.							

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BOREHOLE NUMBER 2

PROJECT Jones Falls Geotechnical Study

LOCATION Rideau Canal, Jones Falls, Ontario

DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 24,26,28/84

REPORT DATE Feb 18/85

DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY	SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	
111.57								
0.0	380 mm CONCRETE CAP		1	RC	94	94		
	SANDSTONE							
	WHITE AND RED, COARSE GRAINED, IN MORTAR, EXCELLENT CONDITION		2	RC	93	100		
1.0								
	– GOOD CONDITION BETWEEN 1.2 m & 5.0 m DEPTH.		3	RC	85	94		
2.0								
			4	RC	56	80		
3.0	– FREQUENT GNEISS BOULDERS BY 3.3 m DEPTH		5	RC	57	86		
			6	RC	65	90		
4.0			7	RC	73	100		
			8	RC	77	100		
5.0	– FAIR TO GOOD CONDITION BELOW 5.0 m DEPTH.		9	RC	28	56		
6.0			10	RC	53	89		
			11	RC	92	92		
104.57			12	RC	62	87		
7.0	CONTINUED							

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BOREHOLE NUMBER 2 (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 24,26,28/8
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY	SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	
104.57								
7.0	SANDSTONE WHITE AND RED, COARSE GRAINED, FREQUENT GNEISS BOULDERS, IN MORTAR		13	RC	35	94		
			14	RC	30	61		
8.0	– FREQUENT QUARTZITE BOULDERS BY 7.4 m. DEPTH.		15	RC	93	100		
			16	RC	0	100		
			17	RC	0	87		
			18	RC	50	90		
9.0			19	RC	44	100		
			20	RC	19	35		
10.0			21	RC	56	100		
11.0			22	RC	25	55		
99.77								
11.8	GRANITE GNEISS BEDROCK GREY / BLACK, FAIR TO GOOD CONDITION		23	RC	42	75		
			24	RC	76	100		
	– SOME DRILLING WATER LOST IN BEDROCK		25	RC	30	38		
98.06								
13.51	END OF BOREHOLE							
	NOTES 1) NO DRILLING WATER LOSS IN MASONRY. SOME WATER LOSS NOTED IN BEDROCK.							

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BOREHOLE NUMBER 3

PROJECT Jones Falls Geotechnical Study

LOCATION Rideau Canal, Jones Falls, Ontario

DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 19-20/84

REPORT DATE Feb 18/85

DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR •, LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
111.56								
0.0	75 mm CONCRETE CAP		1	RC		20		
	SANDSTONE		2	SS	18 FOR 75 mm			
	RED, COARSE GRAINED, IN MORTAR, FAIR CONDITION.							
1.0	LOSS OF DRILL WATER UPON PENETRATING CAP.		3	RC	68	8		
	VOIDS NOTED TO 0.6m DEPTH							
2.0	POOR CORE RECOVERY AT UPPER LEVELS.		4	RC	48	63		
3.0								
107.88								
3.68	SILTY CLAY FILL		5	RC	22	39		
4.0	FIRM, GREY, FREQUENT SAND POCKETS AND GRAVEL SIZES, WET.		6	SS	12		REMOULDED	
106.86								
4.7	SILTY CLAY							
5.0	HARD TO VERY STIFF, GREY, WET.		7	ST	P		IN-SITU	
105.76								
5.8	END OF BOREHOLE							
	NOTES							
	1) CASING SIZED AT 5.8m DEPTH. DRILL BIT AND CASING BROKEN OFF AT LOWER LEVELS. HOLE ABANDONED.							

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BOREHOLE NUMBER 3B

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 22,23/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
111.56								
0.0	100mm CONCRETE CAP							
111.06	SAND FILL: LOOSE, BROWN,							
0.5	OCCASIONAL GRAVEL SIZES AND WOOD PIECES, MOIST.		1	RC	0	33		
1.0	SANDSTONE RED, COARSE GRAINED IN MORTAR POOR CONDITION							
2.0	OCCASIONAL QUARTZITE BOULDERS BY 1.5m. DEPTH.		2	RC	21	35		
3.0	FAIR TO GOOD CONDITION BY 3m. DEPTH 75mm VOID AT 3.86 m. DEPTH.		3	RC	75	91		
4.0								
5.0			4	RC	39	53		
6.0			5	RC	61			
104.56								
7.0	CONTINUED							

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 3B (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 22,23/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY	SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	
104.56	CONTINUED							
7.0	SANDSTONE RED, COARSE GRAINED, IN MORTAR. - POOR TO FAIR CONDITION BY 7.5m DEPTH.		5	RC	61	94		
8.0			6	RC	16	59		
9.0	- SANDSTONE BECOMING WHITE BY 9m. DEPTH.		7	RC	40	92		
10.0			8	RC	11	46		
100.8								
10.76	QUARTZITE BEDROCK GREY, WEATHERED AT UPPER LEVELS, BECOMING SOUND BY 11.3m DEPTH.		9	RC	0	53		
11.0			10	RC	58	100		
12.0			11	RC	82	95		
99.06								
12.5	END OF BOREHOLE							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 4

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 21/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY	SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	
111.56								
0.0	585 mm CONCRETE CAP							
	SANDSTONE							
	RED AND WHITE, FREQUENT GNEISS BOULDERS, IN MORTAR		1	RC	68	100		
1.0	– GOOD CONDITION		2	RC	50	100		
2.0			3	RC	37	85		
3.0			4	RC	35	72		
4.0								
5.0	– OCCASIONAL QUARTZITE BOULDERS BY 5.8m DEPTH.		5	RC	67	86		
6.0			6	RC	40	79		
104.56								
7.0	CONTINUED							

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 4 (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 21/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY	SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	
104.56								
7.0	SANDSTONE RED AND WHITE, COARSE GRAINED, FREQUENT GNEISS BOULDERS, IN MORTAR		6	RC	40	79		
8.0			7	RC	19	31		
102.67								
8.89	CULVERT							
10.0								
101.06								
10.5	SANDSTONE RED AND WHITE, COARSE GRAINED.		8	SS				
11.0			9	RC	0	54		
100.26								
11.3	QUARTZITE BEDROCK GREY, WEATHERED AT UPPER LEVELS							
12.0			10	RC	32	64		
98.56								
13.0	END OF BOREHOLE							

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 5

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 21,22/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR * , LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
107.43								
0.0	75mm CONCRETE CAP		1	RC	0	50		
	SANDSTONE RED, COARSE GRAINED, IN MORTAR. HIGHLY WEATHERED TO 0.6m DEPTH.		2	RC	0	50		
			3	RC	91	100		
1.0	GOOD CONDITION BELOW 0.6m DEPTH		4	RC	39	61		
2.0			5	RC	0	100		
3.0			6	RC	83	98		
4.0								
	– FREQUENT GNEISS AND QUARTZITE BOULDERS BY 5.4m DEPTH.		7	RC	40	80		
5.0			8	RC	25	69		
6.0			9	RC	50	93		
	– OCCASIONAL VOIDS NOTED BY 7m. DEPTH		10	RC	43	61		
100.43								
7.0	CONTINUED							

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 5 (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 21,22/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR •, LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
100.43								
7.0	SANDSTONE RED, COARSE GRAINED, WITH GNEISS BOULDERS, IN MORTAR		11	RC	88	100		
8.0								
	CLAY HARD, GREY, FRIABLE, CALCIFIED, DRY		12	RC	56	84		
9.0								
	GNEISS & SANDSTONE IN MORTAR		13	RC	79	89		
10.0	GRANITE GNEISS BEDROCK BLACK, WEATHERED WITH OCCASIONAL CLAY SEAMS.		14	RC	67	78		
			15	RC	50	63		
			16	RC	0	100		
11.0								
96.2			17	RC	80	100		
11.28	END OF BOREHOLE							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 6

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 18-21/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) — LIQUID LIMIT (W) — PLASTIC LIMIT (Wp) — %
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
107.43								
0.0	200mm CONCRETE CAP		1	RC	62	100		
			2	RC	100	100		
	SANDSTONE		3	RC	0	100		
	RED AND WHITE, COARSE GRAINED, IN MORTAR.		4	RC	69	100		
			5	RC	100	100		
1.0			6	RC	67			
			7	RC	64	100		
	- GENERALLY EXCELLENT CONDITION		8	RC	0	100		
			9	RC	91	100		
2.0	- 15 mm. VOID AT 1.0 m DEPTH.		10	RC	61	92		
			11	RC	100	100		
	- GOOD CONDITION BY 2.2 m DEPTH.		12	RC	78	100		
			13	RC	78	78		
3.0			14	RC	45	100		
			15	RC	86	100		
			16	RC	70	100		
4.0			17	RC	62	87		
			18	RC	57	100		
			19	RC	50	100		
			20	RC	81	90		
5.0			21	RC	70	90		
			22	RC	89	100		
			23	RC	100	100		
6.0			24	RC	80	90		
			25	RC		100		
			26	RC		100		
			27	RC	71	86		
			28	RC	87	100		
			29	RC	0	100		
100.43			30	RC	0	100		
7.0	CONTINUED							

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FOUNDATION ENGINEERS

0-6941

BOREHOLE NUMBER 6 (cont)

PROJECT Jones Falls Geotechnical Study

LOCATION Rideau Canal, Jones Falls, Ontario

DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 18-21/84

REPORT DATE Feb 18/85

DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
100.43								
7.0	SANDSTONE RED AND WHITE, COARSE GRAINED, IN MORTAR GOOD CONDITION OCCASIONAL QUARTZITE & GNEISS BOULDERS BY 8.1m DEPTH		31	RC	100	100		
			32	RC	0	75		
			33	RC	80	100		
			34	RC	81	86		
			35	RC	0	75		
8.0			36	RC	0	46		
			37	RC	0	64		
9.0			38	RC	68	81		
10.0			39	RC	51	72		
11.0			40	RC	64	79		
95.65								
11.78	GRANITE GNEISS BEDROCK BLACK / GREY, FINE GRAINED, FAIR CONDITION		41	RC	68	82		
12.0								
13.0			42	RC	42	83		
93.79								
13.64	END OF BOREHOLE							
	NOTES 1) LOSS OF DRILL WATER IN BEDROCK AT UPPER LEVELS. FULL RETURN AT 13.5m DEPTH.							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 7

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 23,26/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth 107.42	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
0.0 107.12	25mm CONCRETE CAP		1	RC	0	66		
0.3	SAND FILL FREQUENT COBBLES, POSSIBLE WEATHERED CONCRETE							
1.0	SANDSTONE RED, COARSE GRAINED, IN MORTAR		2	RC	0	53		
2.0	GENERALLY POOR CONDITION, OCCASIONAL QUARTZITE BOULDERS AT UPPER LEVELS.		3	RC	73	94		
3.0	GOOD CONDITION BY 2.5 m. DEPTH. OCCASIONAL QUARTZITE BOULDERS BY 3.3 m DEPTH.							
4.0	50 mm VOIDS NOTED AT 4.3 m. AND 4.7 m. DEPTH.		4	RC	22	45		
5.0	OCCASIONAL GRANITE BOULDERS BY 5.1 m DEPTH		5	RC	33	60		
6.0								
	GNEISS & QUARTZITE BEDROCK		6	RC	0	41		
7.0	GREY/BLACK, INTERBEDDED, WEATHERED AT UPPER LEVELS CONTINUED							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 7 (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 23,26/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
100.42	CONTINUED							
7.0	GNEISS & QUARTZITE BEDROCK		6	RC	0	41		
	GREY / BLACK, INTERBEDED, BECOMING SOUND BY 7.2 m DEPTH		7	RC	80	97		
99.32								
8.1	END OF BOREHOLE							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 8

PROJECT Jones Falls Geotechnical Study

LOCATION Rideau Canal, Jones Falls, Ontario

DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 27/84

REPORT DATE Feb 18/85

DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth 107.42	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
0.0	CONCRETE SANDSTONE COBBLES IN MORTAR		1	RC	0	35		
1.0	– THE MORTAR IS MORE PREDOMINANT THAN THE SANDSTONE AGGREGATE.		2	RC	54	100		
2.0								
104.92								
2.5	SANDSTONE WHITE, COARSE GRAINED, IN MORTAR		3	RC	48	90		
3.0	– MORTAR IS IN POOR CONDITION							
4.0	– PREDOMINANTLY RED SANDSTONE IN FAIR CONDITION BY 5m. DEPTH.		4	RC	47	79		
5.0			5	RC	21	50		
6.0			6	RC	17	61		
100.42								
7.0	CONTINUED							

0-6941

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BOREHOLE NUMBER 8 (cont)

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE CME 55

DRILLING DATE Nov 27/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY	SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	
100.42	CONTINUED							
7.0	SANDSTONE RED, COARSE GRAINED WITH FREQUENT GNEISS AND QUARTZITE BOULDERS, IN MORTAR		6	RC	17	61		
8.0	– POOR TO FAIR CONDITION		7	RC	24	54		
9.0			8	RC	0	35		
10.0			9	RC	24	51		
11.0								
95.72								
11.7	QUARTZITE BEDROCK GREY, SOUND GNEISS INTRUSION BY 13.1m DEPTH.		10	RC	65	97		
94.13								
13.28	END OF BOREHOLE							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 9

PROJECT Jones Falls Geotechnical Study

LOCATION Rideau Canal, Jones Falls, Ontario

DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 5,7/84

REPORT DATE Feb 18/85

DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR * LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	% RQD	% RECOVERY		
113.73								
0.0	125mm. CONCRETE CAP GNEISS GREY/BLACK, IN MORTAR POOR CONDITION		1	RC	21	27		
1.0	ABOUT 50% MORTAR							
111.93			2	RC	41	95		
1.8	SANDSTONE RED, COARSE GRAINED, IN MORTAR, FAIR TO GOOD CONDITION		3	RC	33	67		
110.76			4	RC	66	83		
	GNEISS GREY/BLACK, WITH MORTAR, OCCASIONAL RED SANDSTONE AND QUARTZITE BOULDERS POOR TO VERY POOR QUALITY.		5	RC	36	57		
109.33			6	RC	0	73		
4.4	GRANITE GNEISS BEDROCK GREY/BLACK, FINE GRAINED, SOUND		7	RC	71	100		
			8	RC	100	100		
107.68			9	RC	59	100		
6.05	END OF BOREHOLE NOTES 1/ OCCASIONAL LOSS OF DRILL WATER IN MASONRY.							

0-6941

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BOREHOLE NUMBER 10

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 7,10/84
REPORT DATE Feb 18/85
DRAWN BY GC

Elev. / Depth	DESCRIPTION	STRATIGRAPHY	SAMPLES: NUMBER	TYPE	RQD %	RECOVERY %
113.73						
0.0	CONCRETE: WITH GNEISS AND QUARTZITE COBBLES, GREY, GENERALLY EXCELLENT CONDITION		1	RC	75	83
			2	RC	100	100
			3	RC		100
			4	RC	0	100
			5	RC		100
			6	RC		100
			7	RC	90	100
			8	RC		100
			9	RC	23	41
1.0 / 112.41						
1.32	SANDSTONE RED, COARSE GRAINED, FREQUENT GNEISS AND QUARTZITE BOULDERS		10	RC	24	52
			11	RC	0	32
2.0			12	RC		100
	– GENERALLY POOR CONDITION		13	RC	0	27
	– OCC. LOSSES OF WASH WATER FROM TOP TO BOTTOM OF HOLE		14	RC	0	75
			15	RC	0	50
3.0			16	RC	0	100
110.33	– BECOMING IN FAIR CONDITION BY 3.0m DEPTH		17	RC	54	92
3.4	GRANITE GNEISS BEDROCK		18	RC	58	78
	GREY/BLACK OCC. QUARTZITE INTRUSIONS SOME HIGHLY FRACTURED ZONES, BUT GENERALLY SOUND.		19	RC	83	100
			20	RC	0	91
108.8			21	RC	57	86
4.93	END OF BOREHOLE					
	NOTES 1) OCCASIONAL LOSS OF DRILL WATER IN MASONRY					

DYNAMIC PENETRATION RESISTANCE BLOWS/FT.
0 20 40 60 80

SHEAR STRENGTH k.s.f.
FIELD VANE SHEAR •
LAB VANE SHEAR X

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
%

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 11

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 10/11/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR * , LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	% RECOVERY		
107.6	STAIRS LOCK #41							
0.0	SANDSTONE WHITE, COARSE GRAINED, POOR CONDITION – VOIDS BETWEEN 0.6m AND 0.8m DEPTH		1	RC	RQD 25%	42		
1.0 105.98	– RED SANDSTONE BY 1.5 m DEPTH							
1.62	CLAYEY SILT FILL LOOSE, BROWN, OXYDIZED, FREQUENT GRAVEL SIZES, OCCASIONAL SAND POCKETS, VERY MOIST.		2	RC		100		
2.0			3	SS	7			
			4	SS	6			
3.0 103.79			5	SS	8			
3.81	END OF BOREHOLE							

0-6941

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FOUNDATION ENGINEERS

BOREHOLE NUMBER 12

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 10,11/84
REPORT DATE Feb 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR • ; LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) ; LIQUID LIMIT (W) ; PLASTIC LIMIT (Wp) ; %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	% RECOVERY		
107.69	STAIRS LOCK # 41							
0.0	SANDSTONE RED AND WHITE, COARSE GRAINED, IN MORTAR FAIR TO GOOD CONDITION		1	RC	RQD 88	100		
			2	RC	RQD 50	55		
1.0			3	RC	RQD 86	100		
105.91								
1.78	CLAYEY SILT FILL							
2.0	COMPACT, BROWN, OXYDIZED, FREQUENT GRAVEL SIZES		4	SS	20			
	– INCREASING CONTENT OF SAND WITH DEPTH		5	SS	13			
104.49								
3.2	SILTY SAND FILL COMPACT COARSE TO MEDIUM, FREQUENT GRAVEL SIZES		6	SS	22			
103.88								
3.81	END OF BOREHOLE							
	NOTES 1) TEMPORARY LOSS OF DRILL WATER AT 1.2 m DEPTH							

0-6941

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BOREHOLE NUMBER 13

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

DRILLING DATE Dec 9/84
REPORT DATE Feb 18/95
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 SHEAR STRENGTH FIELD VANE SHEAR • LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W) PLASTIC LIMIT (Wp) %
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	% RECOVERY		
103.1	STAIRS LOCK #42							
0.0	SANDSTONE WHITE, COARSE GRAINED, OCCASIONAL GNEISS BOULDERS, IN MORTAR.		1	RC		100		
			2	RC	0	100		
			3	RC	RQD 57	57		
			4	RC	0	36		
1.0	– POOR TO FAIR CONDITION – RED SANDSTONE BELOW 1.0m DEPTH		5	RC	RQD 38	46		
2.0								
100.79								
2.31	CLAYEY SILT FILL COMPACT, BROWN, FREQUENT SAND AND GRAVEL SIZES.		6	RC				
			7	SS	23			
3.0			8	SS	15			
99.14								
3.96	END OF BOREHOLE							

0-6941

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BOREHOLE NUMBER 14

PROJECT Jones Falls Geotechnical Study
LOCATION Rideau Canal, Jones Falls, Ontario
DATUM Geodetic BOREHOLE TYPE Portable Diamond Drill

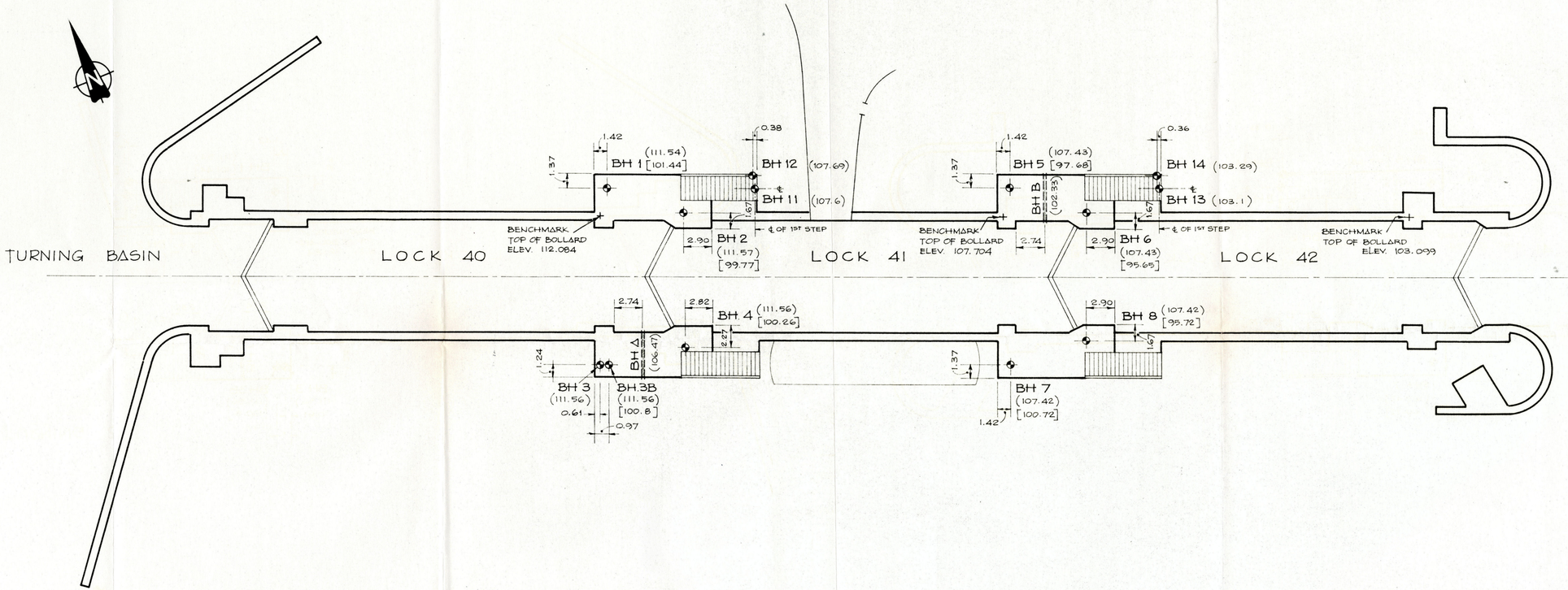
DRILLING DATE Dec 9,10/84
REPORT DATE Feb. 18/85
DRAWN BY GC

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH: FIELD VANE SHEAR •, LAB VANE SHEAR X	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	% RECOVERY		
103.29	STAIRS LOCK #42							
0.0	SANDSTONE RED AND WHITE, COARSE GRAINED, IN MORTAR, GOOD CONDITION		1	RC	RQD 73	84		
1.0	ONLY FAIR CONDITION BY 0.94m. DEPTH.		2	RC	RQD 55	80		
101.34	EXCELLENT CONDITION BY 1.45m DEPTH.		3	RC	RQD 100	100		
1.95	CLAYEY SILT FILL LOOSE, BROWN, OXYDIZED, FREQUENT SAND AND GRAVEL SIZES		4	RC				
			5	SS	7			
3.0			6	SS	6			
99.25			7	SS	9			
4.04	END OF BOREHOLE							

NOTES

1) LOSS OF DRILL WATER AT 0.7m DEPTH.

DRAWINGS



LEGEND

- BH 5 – VERTICAL BOREHOLE
- BH A – HORIZONTAL BOREHOLE
- (107.43) – SURFACE ELEVATION
- [97.68] – BEDROCK ELEVATION

JONES FALLS GEOTECHNICAL STUDY RIDEAU CANAL JONES FALLS, ONTARIO.

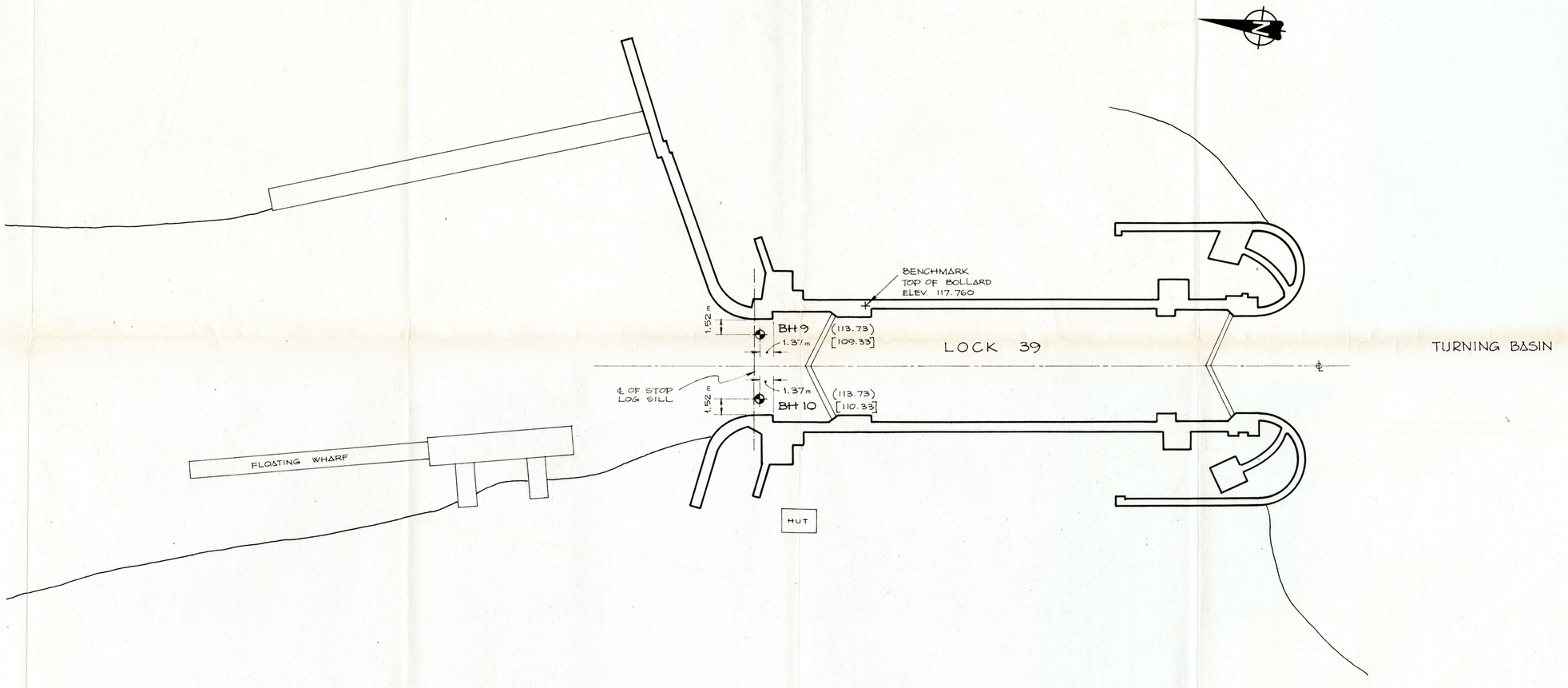
LOCATION OF BOREHOLES

DRAWN BY: G.V.
CHECKED BY: G.C.

DRAWING No: O-6941-S-1 of 2

FONDEX LTD.

SCALE: 1:240 METRIC
DATE: FEBRUARY 1985



LEGEND

- BH 9 — VERTICAL BOREHOLE
- (113.73) — SURFACE ELEVATION
- [109.33] — BEDROCK ELEVATION

JONES FALLS
GEOTECHNICAL STUDY
RIDEAU CANAL
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LOCATION OF BOREHOLES

DRAWN BY: G.V.
CHECKED BY: G.C.

DRAWING No: O-6941-S-2 of 2

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SCALE: 1:240 METRIC
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