Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Log of Geotech Borehole: BH3A

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: January 5 - 6, 2007

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
Gray boulders	-7.81					
SPT: 6 / 50 for 0.10 m (Refusal) No Sample Recovery	-8.06	SS	4	50	0	
Redish brown sandstone boulders	-9.33					
SPT: 50 for 0.03 m (Refusal) No Sample Recovery SS5, "N" Value = 50, Recovery = 0%		SS	5	50	0	
Redish brown broken rock	-10.9					
SPT: 2 / 11 / 4 / 3 No Sample Recovery	-11.5	SS	6	15	0	
Redish brown broken rock and boulders						

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Drilling Method: NW/NQ Casing/Coring — Driller: NES Ltd. — Datum: Geodetic — Sheet: 2 of 3

Log of Geotech Borehole: BH3A

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: January 5 - 6, 2007

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
Redish brown broken rock and boulders	-16.4					
Bedrock: Light red sandstone with quartz veins		RC	---		100	68
		RC	---		100	17
		RC	---		100	35
	-19.6	RC	---		100	83
End of Borehole						

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Log of Geotech Borehole: BH4

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: November 21, 2006

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
Ground Surface	2.4					
Fill and Boulders Gray boulders	0.42					
SPT: 11 / 25 / 12 / 5 Gravel	-0.19	SS	1	37	6	
Gray boulders and broken rock Block of concrete at the bottom	-1.15					
SPT: 3 / 5 / 3 / 3 Gravel	-1.76	SS	2	8	8	
Fill materials and boulder at the top followed by broken red sandstone	-2.63					
SPT: 5 / 5 / 14 / 50 for 0.13 m (Refusal) No Sample Recovery	-3.21	SS	3	19	0	
Broken red sandstone	-4.2					
SPT: 6 / 6 / 9 / 6 Sand and gravel	-4.81	SS	4	15	8	
Broken red sandstone	-5.7	SS	5	50		

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Log of Geotech Borehole: BH4

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: November 21, 2006

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
		SS	5	50	0	
SPT: 50 for 0.03 m (Refusal) No Sample Recovery SS5: "N" Value = 50, Recovery = 0%						
Broken red sandstone Cobble size rock fragments	-7.24					
SPT: 7 / 15 / 42 / 50 for 0.03 m (Refusal) CFEM: Sandy Gravel, trace Silt and/or Clay	-7.73	SS	6	57	31	
Broken red sandstone at the top followed by red and gray broken rock	-8.56					
Bedrock: Light gray sandstone		RC	---		100	95
SPT: 50 for 0.00 m (Refusal) No Sample Recovery SS7, "N" Value = 50, Recovery = 0%		SS	7	50	0	
Bedrock: Light gray sandstone		RC	---		98	67
	-11.5	RC	---		100	59
End of Borehole						

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Drilling Method: NW/NQ Casing/Coring — Driller: NES Ltd. — Datum: Geodetic — Sheet: 2 of 2

PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
This Permit Allows
AFN ENGINEERING INC.
To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by APEGNL F0292 which is valid for the year 2019

STAMP
REGISTERED PROFESSIONAL ENGINEER
NEIL C. HUNT
SIGNATURE
1/7/19
DATE
NEWFOUNDLAND & LABRADOR

Log of Geotech Borehole: BH5

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: November 30, 2006

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
0 m LNT	0					

Fracflow Consultants Inc., 154 Major's Path, St. John's, NL A1A 5A1, Phone: (709) 739-7270, Fax: (709) 753-5101
Drilling Method: NW/NQ Casing/Coring — Driller: NES Ltd. — Datum: 0 m LNT — Sheet: 1 of 3

Log of Geotech Borehole: BH5

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: November 30, 2006

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
Harbour Bottom (12.70 m)	-12.7					
Spoon sank 0.60 m	-13.3	SS	1	50	0	
SPT: 50 for 0.00 m (Refusal) No Sample Recovery SS1, "N" Value = 50, Recovery = 0%						
Gray sandstone boulders	-14.6	SS	2	50	0	
SPT: 50 for 0.00 m (Refusal) No Sample Recovery SS2, "N" Value = 50, Recovery = 0%						
Large boulders	-15.8					
Spoon Sank 0.36 m						

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Drilling Method: NW/NQ Casing/Coring — Driller: NES Ltd. — Datum: 0 m LNT — Sheet: 2 of 3

Log of Geotech Borehole: BH5

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: November 30, 2006

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
SPT: 2 / 2 / 21 / 50 for 0.13 m (Refusal) CFEM: Gravelly Sand, some Silt and/or Clay	-16.8	SS	3	23	78	
No core recovery	-17.3	SS	4	50	0	
SPT: 50 for 0.03 m (Refusal) No Sample Recoery SS4, "N" Value = 50, Recovery = 0%						
Rock fragments	-18.7					
SPT: 12 / 50 for 0.13 m (Refusal) CFEM: Sand, trace Silt and/or Clay	-19	SS	5	50	64	
Rock fragments						
Drilled ahead without casing. Did not encounter bedrock. Hole could not be advanced	-19.6					
End of Borehole						

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Drilling Method: NW/NQ Casing/Coring — Driller: NES Ltd. — Datum: 0 m LNT — Sheet: 3 of 3

Log of Geotech Borehole: BH6

Project: Marine Geotechnical Investigation
Location: St. John's, NL
Client: Public Works Government Services Canada — Project No: 390
Drilling Supervisor: David Howlett — Date: November 24, 2006

Geologic Description	Elevation (m)	Sample Type	Sample No.	"N" Value	Recovery (%)	RQD (%)
0 m LNT	0					

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Drilling Method: NW/NQ Casing/Coring — Driller: NES Ltd. — Datum: 0 m LNT — Sheet: 1 of 3

revisions		date
E	ISSUED FOR TENDER	1/7/19
D	RE-ISSUED FOR 99% REVIEW	12/19/18
C	ISSUED FOR 99% REVIEW	11/6/18
B	ISSUED FOR 66% REVIEW	10/19/18
A	ISSUED FOR REVIEW	8/17/18

project / projet
HARBOUR DEVELOPMENT PROSSER ROCK, NL

drawing / dessin
BOREHOLE LOGS

designed / conçu: N.H. — date: JANUARY 7, 2019
drawn / dessiné: P.H. — date: JANUARY 7, 2019
approved / approuvé: N.H. — date: JANUARY 7, 2019
Tender / Soumission — PWGSC Project Manager / Administrateur de projets TPSGC
project number / no. du projet: R.100138.001
drawing no. / no. du dessin: C20

E-DRM/GDD-E: 552877

PWGSC B1 (2004)