

REPORT OF SOIL INVESTGATION

**NEW INDUSTRIAL BUILDING
1340 HEINE COURT
BURLINGTON**

**CONTRACT NO.:8560
REPORT NO.: E15-02003
REPORT DATE: FEB 11, 2015**

**PREPARED FOR:
S.ACTON HOLDINGS INC
C/O TRUMBLY HAMPTON DESIGN BUILD INC
5845 SIXTH LINE RR #1
GUELPH, ERAMOSIA, ONTARIO**

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APPENDIX

Enclosure #1 : Sketch showing bore hole locations.

Enclosure #2 : Frontier locates

Enclosure #3 : Description of Soil in bore hole No.1

Enclosure #4 : Description of Soil in bore hole No.3

DATE : FEBRUARY 11, 2015
CLIENT : S. ACTON HOLDINGS INC
C/O TRUMBLEY HAMPTON DESIGN BUILD INC
5845 SIXTH LINE RR #1
GUELPH, ERAMOSA, ONTARIO
CONTRACT 8560: NEW INDUSTRIAL BUILDING
1340 HEINE COURT, BURLINGTON, ON
REPORT : E15-02003 SOILS INVESTIGATION

As authorized by Mr. R. Trumbley, we carried out a soils investigation on the above property to determine the soil conditions present and to determine design parameters for the project as outlined below. The conditions described are those encountered at the test locations.

DESCRIPTION OF SITE

The site is located on the west side of Heine Court St. in the City of Burlington. The site is level with a slight slope down to the east. There is a creek to the rear of the property.

At present, the site is unoccupied, but several small trees are present in the north east corner. A damaged sanitary manhole cover was noted approximately 15'-0" off the curb line.

No survey of the property was available at this time and measurements were taken from a fence line and the curb.

DESCRIPTION OF PROJECT

The building will be approximately 4000 sq.ft with a 1000 sq. ft office. The building will be a single storey (18'-0") high. There will be no basement or depressed loading docks.

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DETAILS OF WORK

The work was carried out on Feb 06, 2015 and consisted of three boreholes to depths of 5'-10". The borehole locations are shown on enclosure #1 prepared from a sketch provided by the client.

The boreholes were laid out by our representative to cover the building area. Locates were carried out by ONE Call and on the property by Frontier Locates [enclosure #2].

Elevations of the top of the boreholes were referenced to existing grade.

The investigation was carried out employing a drilling contractor under the full time supervision of a member of our geotechnical staff.

The holes were lowered employing a track mounted CME Model 75 drilling machine equipped with hollow stem augers and an automatic safety hammer.

Standard penetration tests were taken at shallow increments of depth using a 2" O.D. split spoon sampler. The sampler was driven 24" (except where extremely dense soils were encountered, in which case the driving was terminated at 50 blows per 6" or less) into the undisturbed soils employing a 140 lb weight falling freely 30".

The number of blows required to drive the sampler 6" into the soil is recorded under column "n" of the soil boring logs. The standard blow count 'N' is the summation of the centre two increments. The holes were sealed with bentonite in accordance with current M.O.E.E. requirements.

The unconfined compressive strength of the cohesive samples was determined employing a penetrometer. The values are approximate only but are a good indication on soils of low plasticity. The results are shown under column qu of the soil boring logs.

Continues.....

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Moisture contents were determined on typical samples. These results are shown under column M.C. of the soil boring logs.

For this project, the writer felt that refined soil testing in the laboratory was not necessary. The samples obtained during this investigation will be retained for 6 months unless otherwise requested.

No evidence of contaminants was observed during drilling and no samples were taken or submitted to an environmental laboratory for testing.

DESCRIPTION OF SOILS [enclosures 3 & 4]

Frost was present to approximately 2'-0".

In BH 1 there was 3'-0" of top soil fill. This soil was loose and with a high moisture content (27%).

Below the fill was a reddish brown silt trace of clay formed by weathering of the underlying bedrock. This material was compact and with a moisture content of 19%. This material extended to 5'-6".

The underlying bedrock (the Queenston shales) was encountered at 5'-6". The upper surface was weathered.

In BH 2 there was 3'-0" of reddish brown silts trace of clay fill with traces of organics. The blow counts (38) are not accurate due to frost.

Below the fill was a thin layer of reddish brown clayey silt. This soil was very stiff with a moisture content of 17%. The weathered shale bedrock was encountered at 5'-10".

In BH 3 the fill only extended to 1'-0" and consisted of a mixture of reddish brown silt and top soil. The very stiff reddish brown clayey silt was present to 3'-10". The weathered shale was penetrated to 5'-9".

Continues.....

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WATER LEVELS

No free water was encountered in the boreholes at the time of drilling. Given the nature of the soil, a true ground water table in the overburden is unlikely.

COMMENTS & CONCLUSIONS

FOOTINGS

We would recommend the footings be carried down to the weathered shales. The footings can be designed employing an allowable soil bearing pressure of 6000 psf (300 kPa) SLS basis / 9000 psf(UDL).

Since the upper surface of the shale is weathered, the exterior footings should be founded at least 4'-0" below final grade.

Given the very shallow depth of overburden it is possible that bedrock contours will be inconsistent but are unlikely to vary by more than 12".

Care should be taken in excavating not to over excavate as the shale is present in relatively thin layers and can be easily peeled off with even small machines.

With respect to settlement, the shales were formed due to the pressure of the last ice sheet which has been estimated as being in the order of 2km deep in this area. Settlement in the shales is obviously not a factor.

FLOORS

All fill should be stripped from the site.

The site has been worked and levelled. The depth of overburden is minimal and given its relatively high moisture content will likely have to be recompacted for support of floors when the frost leaves the ground.

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A moisture barrier of 6" of crushed stone (Gran A) compacted to 95% maximum standard Proctor density should be placed below the floor slab in the industrial area.

The details of floor design should be based on floor loading and equipment employed. We would recommend a minimum concrete strength of 30 MPa.

In the office area a 6" layer of 3/4" clear stone and a 5" thickness of 25MPa concrete should be provided.

ASPHALT PAVEMENT

The following asphalt pavements are recommended

Light Duty	Granular A-6"	Compacted to 95% MSPD
	HL 3 -3"	Compacted to 92% Marshel
Medium Duty	Granular B-6"	Compacted to 98%
	Granular A-4"	Compacted to 98%
	HL 3 -3"	Compacted to 95% Marshel
Heavy Duty	Granular B-12"	Compacted to 100%
	Granular A- 6"	Compacted to 100%
	HL 8 - 2"	Compacted to 95% Marshel
	HL 3 - 2"	Compacted to 95% Marshel

We recommend installing weeping tile behind curbs retaining landscaped areas. The tile should drain to the parking lot catch basin.

We also recommend a 10'-0" section of weeping tile be installed in the granular base to drain the soil around the catch basin.

Continues.....

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SEISMIC RESPONSE

Based on the blow counts ($\bar{N} > 50$) of the original soils, the site class is "C" for Seismic Response (Ontario Building Code table 4.1.8.4. A.

SRUCTURAL INSPECTIONS LIMITED

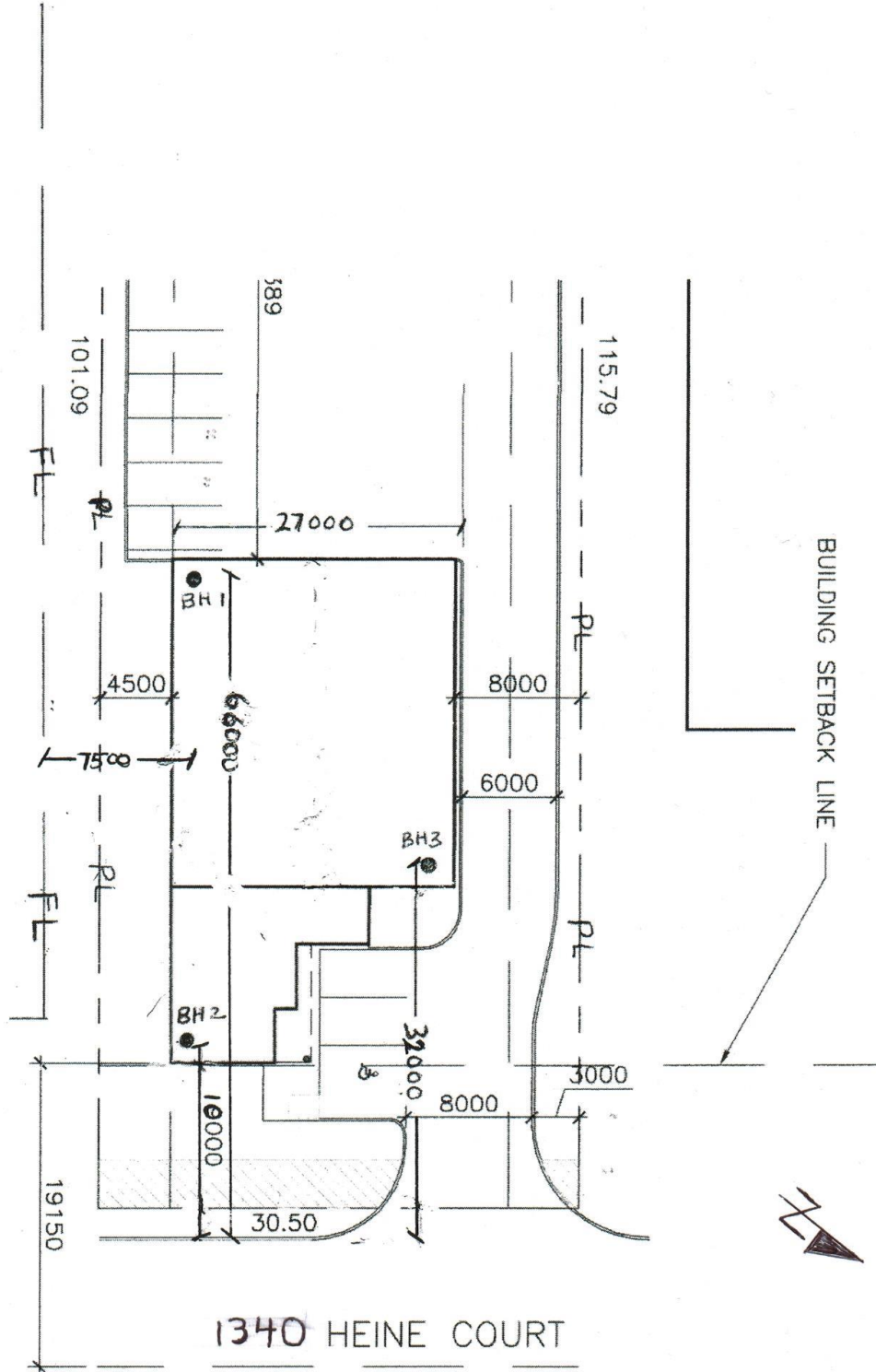
R.W. Featherstone

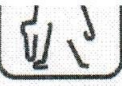
R.W. Featherstone, P.Eng.

President



Enclosure#1



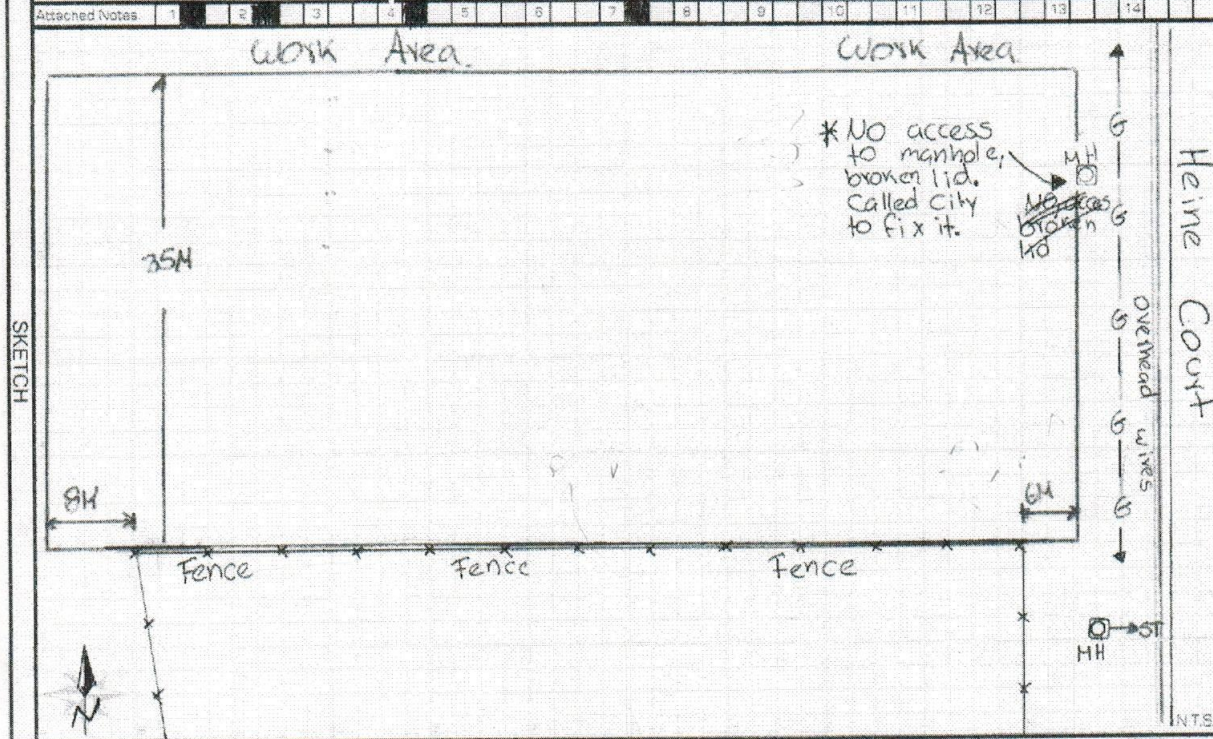


FRONTIER
UTILITY LOCATING SERVICES INC.

701 Trinity Road, Unit 6, Andover, MA 01810
www.frontierlocating.com
Phone: 905-548-7643
Fax: 905-548-7613

CLIENT	Company	Structural Inspection		Work Order	551840	
	Applicant	Steve Lockyer		Purchase Order		
	Address	547 Main Street East, 22		Project	Empty Lot	
	City	Milton	Postal Code	L9E 3T	Site Address	1340 Heine Ct
	Phone	905-693-1364	Cell	905-691-8560	City	Burlington
	Email / Fax	structuralinspections@bell.net.ca		Description	Work Area	

NOTE: NON-CONDUCTIVE LINES, INCLUDING, FOR EG., SOME SEWER AND WATER LINES, MAY NOT BE DETECTABLE



It is the applicant's ("the excavator's") responsibility to ensure that all utility owners are contacted prior to excavating in the vicinity of buried utility lines. Hand dig within one (1) meter of markings. Depths of utility lines vary, and must be determined by hand digging.

Public Locates	Called?	<input checked="" type="radio"/> Y	<input type="radio"/> N	Available?	<input checked="" type="radio"/> Y	<input type="radio"/> N	Reviewed?	<input checked="" type="radio"/> Y	<input type="radio"/> N	(Please circle)
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NOTICES
Locate expires 30 days from date of report. See expiry date below. Sketch depicts approximate locations only, and is a guide to markings in the field. If markings are not visible, a new locate is required. The applicant agrees and understands that the location and marking of underground utility services is for the convenience of the applicant only, and does not relieve the applicant or any other person or corporation from liability for damages or personal injury to any person, or for property damage caused to the service or to any other property by reason of the applicant or any other person having relied upon the location and marking of the service. Applicant signing has authority to do so. The applicant acknowledges receipt and understanding of the Standard Terms & Conditions of Locate. Faxed or emailed reports implies acknowledgment & agreement with these terms. Payment for this locate is due Net 30 Days.

APPROVAL	Approval (Office only)	BILLING	Equipment	Personnel	Print	Initial	N/E
	Approved by: (Print & sign) X		P&CLE 2.0 hrs	Tech 1: Juan A	2.0 hrs		<input type="checkbox"/>
SIGN	Date:	GPR _____ hrs	Tech 2: _____ hrs				<input type="checkbox"/>
	Locate Technician (Print & sign) X Juan Arroyave	Sonde _____ hrs	Tech 3: _____ hrs				<input type="checkbox"/>
	Client (Print & sign) X	Other _____ hrs	Mob: _____ hrs				<input type="checkbox"/>
		Date	Feb 5/15	Total Hours	3.0 hrs		
		Expires	March 5/15	Page	1 of 2		

White Copy- Frontier Yellow Copy- Client Pink Copy- Office

Enclosure #3

STRUCTURAL INSPECTIONS LIMITED

CONTRACT N° 8560 **PROJECT:**1340 HEINE COURT, BURLINGTON, ON
CLIENT: TRUMBLEY AND HAMPTON
DATE: 06-Feb-15

BORE HOLE NO. 1
ENCLOSURE 3

	n	N	R"	QU	MC	CONSIST.	DESCRIPTION	DEPTH (M)
—	7							—
—	6	11	18		26.9			—
—	5							—
—	5							—
2.5	4							—
—	8	21	24		19.1			—
—	13							—
—	22							—
5.0	42							—
—	50 for 5"	50	10		5.9			—
							3'0" (0.91m)	1.0
							REDDISH BROWN SILT WITH SOME CLAY	
							5'0" (1.52m)	
							5'11" (1.80m) WEATHERED SHALE	
							END OF BOREHOLE	

BORE HOLE NO. 2

DEPTH	n	N	R"	QU	MC	CONSIST.	DESCRIPTION	DEPTH
—	25							—
—	21	37	18		9.0			—
—	16							—
—	15							—
2.5	5							—
—	7	18	20		16.7			—
—	11							—
—	28							—
5.0	23							—
—	50 for 4"	50	6		6.4			—
							3'0" (0.91m)	1.0
							REDDISH BROWN SILT WITH SOME CLAY SOME ORGANICS AT 2'6"	
							5'6" (1.68m)	
							5'10" (1.78m) WEATHERED SHALE	
							END OF BOREHOLE	

- n = NO. OF BLOW / 6" (140 LB HAMMER)
- N = STANDARD BLOW COUNT
- QU = UNCONFINED COMPRESSIVE STRENGTH (kPa)
- MC = MOISTURE CONTENT
- R" = RECOVERY

Enclosure #4

STRUCTURAL INSPECTIONS LIMITED

CONTRACT N° 8560 PROJECT:1340 HEINE COURT, BURLINGTON, ON
 CLIENT: TRUMBLY AND HAMPTON
 DATE: 06-Feb-15

BORE HOLE NO. 3
 ENCLOSURE 4

	n	N	R"	QU	MC	CONSIST.	DESCRIPTION	DEPTH (M)
	8						REDDISH BROWN SILT TILL	
	4	9	18		16.8		1' (0.30m) WITH SOME ORGANICS	
	5							
	6							
2.5	4						REDDISH BROWN SILT WITH SOME CLAY	1.0
	15	33	20		20.5		3'10" (1.17m)	
	18							
	23						REDDISH BROWN WEATHERED SHALE WITH SOME GREY SHALE	
5.0	25							
	50 for 3"	50	9		10.1		5'9" (1.75m)	
END OF BOREHOLE								

- n = NO. OF BLOW / 6" (140 LB HAMMER)
- N = STANDARD BLOW COUNT
- QU = UNCONFINED COMPRESSIVE STRENGTH (kPa)
- MC = MOISTURE CONTENT
- R" = RECOVERY