Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Bid Receiving
PWGSC
33 City Centre Drive
Suite 480C
Mississauga
Ontario
L5B 2N5
Bid Fax: (905) 615-2095

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
Ontario Region
33 City Centre Drive
Suite 480
Mississauga
Ontario
L5B 2N5

Title - Sujet Weather Radar Network Modernization	
Solicitation No. - N° de l'invitation K3D33-141144/A	**Amendment No. - N° modif.** 007
Client Reference No. - N° de référence du client K3D33-141144	**Date** 2015-03-13
GETS Reference No. - N° de référence de SEAG PW-$TOR-018-6639	
File No. - N° de dossier TOR-4-37044 (018)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2015-03-16**	**Time Zone** **Fuseau horaire** Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Pan, Long	**Buyer Id - Id de l'acheteur** tor018
Telephone No. - N° de téléphone (905) 615-2076 ( )	**FAX No. - N° de FAX** (905) 615-2023
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
Vendor/Firm Name and Address **Raison sociale et adresse du fournisseur/de l'entrepreneur** **Telephone No. - N° de téléphone** **Facsimile No. - N° de télécopieur**	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature**	**Date**

Canada

Amendment No.07 to Letter of Interest

Amendment No.07 is raised to include the following information:

1. Notice to Suppliers; and
2. To include the missing attachment in Amendment No.06: Annex G – Geotechnical and Climatology Examples.

Notice to Suppliers

The letter of Interest (LOI) will expire on March 16, 2015. Canada does not contemplate extending the LOI any further.

Annex G – Geotechnical and Climatology Example

Terraprobe
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing

September 1, 1998

Our ref: 983105
Stoney Creek Office

Public Works and Government Services Canada
Western Region
1100 - 9700 Jasper Ave.
EDMONTON, Alberta
T5J 4E2

Attention: Mr. R. S. Dagg,
Senior Property Agent
Real Estate Advisory Services

RE: GEOTECHNICAL INVESTIGATION
ENVIRONMENT CANADA STATION
EXETER, ONTARIO

Dear Sir:

This report presents the results of a geotechnical investigation carried out at the above site. The location of the site is shown on the Key Plan, Figure 1.

A request for proposal and the terms of reference for the assignment were outlined in a memorandum from Public Works and Government Services Canada (PWGSC) dated August 18, 1998. A proposal and cost estimate for carrying out the specified program of investigation were detailed in our letter of August 19, 1998. Formal authorization to proceed with the investigation was provided by way of Consultant Agreement No. 6300353 dated September 10, 1998.

The purpose of the work was to investigate and report on the subsurface soil and groundwater conditions in two, ten metre deep boreholes. Based on the results of the boreholes, a discussion was to be provided addressing the geotechnical engineering aspects to be considered in the design of foundations for the proposed Doppler Weather Radar Tower.

Terraprobe

Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing

GEOTECHNICAL INVESTIGATION
ENVIRONMENT CANADA STATION
EXETER, ONTARIO

PREPARED FOR: **Public Works and Government Services Canada**
Western Region
1100 - 9700 Jasper Ave.,
EDMONTON, Alberta
T5J 4E2

DISTRIBUTION:

3 copies	Public Works and Government Services Canada	Our Ref. 983105
1 copy	**Terraprobe Limited**	October 20, 1998

Terraprobe Limited

12 Bram Court, Unit 18
Brampton, Ontario L6W 3V1
(905) 796-2650 Fax 796-2250

220 Bayview Drive, Unit 25
Barrie, Ontario L4N 7T3
(705) 739-8355 Fax 739-8369

1012 Kelly Lake Road, Unit 1
Sudbury, Ontario P3E 5P4
(705) 670-0460 Fax 670-0558

903 Barton Street, Unit 22
Stoney Creek, Ontario L8E 5P5
(905) 643-7560 Fax 643-7559
1-800-465-2066

www.terraprobe.on.ca

It should be noted that this report addresses only the geotechnical aspects of the subsurface conditions at the site. The presence of subsurface contamination resulting from previous activities or uses of the site, or from off-site sources are outside the scope of this report and have not been investigated. No analyses with respect to soil or groundwater quality have been carried out as part of this investigation.

1. PROCEDURE

The field work for this investigation was carried out on September 18, 1998, at which time two boreholes, numbered 1 and 2 were drilled at the locations shown on Location Plan, Figure 2. The boreholes were drilled using a truck mounted drill rig supplied and operated by a specialist drilling contractor. The boreholes were advanced using hollow stem continuous flight augers. Standard penetration testing and sampling was carried out at regular intervals of depth using conventional 50mm outside diameter spoon sampling equipment. After the drilling, sampling, and logging was completed, the boreholes were backfilled with drill cuttings.

The field work was continuously supervised by an experienced technician from our office who also; located the boreholes, logged the boreholes, determined ground surface elevations at the borehole locations and cared for the samples recovered. The soil samples recovered in the course of the field work were taken to our Stoney Creek office for further examination, water content determinations, and selective classification testing. In addition two soil samples were submitted to Philip Services laboratories for analysis of soil pH and water soluble sulphate, to assess the potential for sulphate attack on the subsurface concrete.

The ground surface elevations at the borehole locations have been determined relative to a site bench mark provided by PWGSC. The bench mark is described as being on the top of a square iron bar located at the northeast corner of the corner of the subject property. The elevation of this point is understood to be 200.00m, referred to local datum.

2. SUBSURFACE CONDITIONS

2.1 General

The subsurface soil and groundwater conditions encountered in the boreholes are presented on the attached Log of Borehole sheets. The stratigraphic boundaries indicated on the logs of boreholes typically represent a transition from one soil type to another and should not be interpreted to represent exact planes of geological change. The subsurface conditions are confirmed at the borehole locations only, and will vary between and beyond the borehole locations. The following discussion has been simplified in terms of the major soil strata for the purposes of geotechnical design.

The boreholes encountered surface fill underlain by as stratum of stiff to hard silty clay till. Both boreholes were terminated in strata of inter-layered silty clay and silt.

Fill

A surface layer of sand and gravel fill was penetrated in both boreholes. The sand and gravel fill was in a loose to compact state of packing with N values, as determined in the standard penetration testing, of 9 and 13 blows per 0.3m. The sand and gravel fill was fully penetrated at depths of about 0.5 to 1m below the existing ground surface. The sand and gravel fill in borehole 2 was underlain by a layer of clayey silt fill. A single N value of 6 blows per 0.3m was determined in the clayey silt fill. The sample of clayey silt fill recovered from the standard penetration testing had an in-situ water content of about 28 percent.

Silty Clay Till

Both boreholes encountered an extensive deposit of silty clay till. N values of 12 to 36 blows per 0.3m were measured in the silty clay till, inferring a stiff to hard consistency. The natural water content of the silty clay till ranged from about 11 to 19 percent. The silty clay till had liquid and plastic limits of 31 and 16 percent respectively, based on a single Atterberg Limit determination. A grain size distribution curve for a sample of silty clay till is shown on Figure 3. Based on observations of auger resistance, cobbles and possibly boulders were encountered within the till deposit.

The results of analyses of two samples of the silty clay till for pH and water soluble sulphate are detailed in the enclosed Appendix A. A soil pH in the range of about 8.2 to 8.3 and a water soluble sulphate content of about 0.002 percent have been indicated for the two samples of silty clay till tested.

Silt and Silty Clay

The boreholes were terminated in strata of inter-layered silt and silty clay. The N values of 18 and 60 blows per 0.3m were measured in the inter-layered silt and silty clay. The natural water content of the inter-layered silt and silty clay was about 21 percent.

Groundwater Conditions

Borehole 1 was dry upon completion to elevation 191.4m or to a depth of about 9.6m. The water level in the completed borehole 2 was at depth of about 9.5m or at about elevation 191.8m. These conditions should not be interpreted as stabilized groundwater conditions. The groundwater levels will also vary due to seasonal effects and precipitation conditions.

3. DISCUSSION

3.1 General

This section of the report provides our interpretation of the factual data obtained during this investigation and is intended for design purposes only. Comments made with respect to the construction aspects are only provided in as much as they may impact on design considerations. Contractors bidding on or undertaking these works should review the factual information, satisfy themselves as to the adequacy of the information, and make their own interpretation of the data as it affects their construction techniques, equipment selection, scheduling, and the like.

3.2 Foundations

It is understood that the usual design for the Doppler Weather Radar Tower foundations consists of a series of drilled caissons. It is understood that the caissons are intended to support the foundation loads and to provide resistance to uplift forces. Based on the results of the boreholes, this type of

foundation system is considered feasible for the site.

The axial load bearing capacity of a caisson socketed at least one diameter into the very stiff to hard silty clay till may be computed using the end bearing area and an allowable bearing pressure of 300 kPa. Uplift forces on the caissons will be resisted by the skin friction between the shaft surface and the surrounding silty clay till. For design purposes, the uplift capacity of an individual caisson may be calculated assuming a skin friction of 80kPa for the portion of the shaft within the silty clay till and below the depth of frost penetration which can be taken as 1.2m.

The caissons should have a minimum diameter of 750mm and should be provided with temporary steel liners suitable to carry out "down the hole " inspection of the bearing stratum and removal of softened or disturbed soil and any accumulated water from the bearing surface prior to pouring concrete. Plastic concrete should be placed within the liner, and the liner withdrawn in such a manner that a sufficient head of concrete is maintained to minimize groundwater seepage and soil ingress into the drilled hole. The concrete should be placed immediately after inspection and removal of any softened or disturbed material and any accumulated water.

The results of analyses carried out on two samples of the silty clay till have indicated that the subsurface environment is not particularly aggressive to Portland cement concrete with respect to sulphate attack. On this basis, Type 10 cement would be considered acceptable for underground concrete at the site. Criteria for the design of concrete mixes for various classes of exposure are provided in CSA standard A23.1-94, Table 10 and section 15.5.

4. CLOSURE

It is recommended that the geotechnical engineering aspects of the foundation design be reviewed by the geotechnical engineer at the final design stage. The adequacy of the bearing strata should be confirmed by this office during construction.

We trust that this report is satisfactory for your present requirements. If there is any point which requires further clarification please contact the undersigned. Thank you for retaining **Terraprobe** for this assignment.

Yours Truly,

Terraprobe Limited

REGISTERED PROFESSIONAL ENGINEER
J. G. MUCKLE
PROVINCE OF ONTARIO

J. G. Muckle, P.Eng., Associate

ABBREVIATIONS TERMINOLOGY, AND GENERAL INFORMATION

Sampling Method	Penetration Resistance
SS - split spoon ST - shelby tube AS - auger sample RC - rock core	Standard Penetration Resistance ('N' values) is defined as the number of blows by a hammer of 63.5kg. mass (140 lbs.) falling freely for a distance of 0.76m (30 inches) required to advance a standard 50mm (2 inch) diameter split spoon sampler for a distance of 0.3m (12 inches). Dynamic Cone Penetration Resistance is defined as the number of blows By a hammer of 63.5 kg. mass (140 lbs.) falling freely for a distance of 0.76m (30 inches) required to advance a conical steel point of 50mm diameter and with 60 degree sides on 'A' size drill rods for a distance of 0.3m (12 inches).

Soil Description

Cohesionless Soils

Relative Density	'N' Value
very loose	< 4
loose	4 - 10
compact	10 - 30
dense	30 - 50
very dense	> 50

Cohesive Soils

Consistency	Undrained Shear Strength (kPa)	'N'
very soft	< 12	< 2
soft	12 - 15	2 - 4
firm	25 - 50	4 - 8
stiff	50 - 100	8 - 15
very stiff	100 - 200	15 - 30
hard	> 200	> 30

Soil Composition

	% By Weight
'trace' (eg. trace silt)	< 10
'some' (eg. some gravel)	10-20
'adjective' (eg. sandy)	20-35
'and' (e.g. sand and gravel)	35-50

General Information

The recommendations provided in this report are based on the factual information obtained from the boreholes and on the general information provided for the proposed project.
Site investigations by means of boreholes and/or test pit identifies subsurface conditions at the location and time of sampling only. Ground conditions at locations away from the boreholes and test pits may vary.
Recommendations are made by interpretation of this factual data for specific conditions such as size, configuration and location of the proposed project. Changes in project conditions should be reviewed by the Geotechnical consultant as they may affect the recommendations provided.
In order to identify possible changes in ground conditions between the sample locations and their effect on the project, it is recommended that site inspections be carried out during construction by qualified Geotechnical personnel.

Terraprobe

LOG OF BOREHOLE 1

PROJECT No: 983105
CLIENT: Public Works & Government Services Canda
LOCATION: See Figure 2

BORING DATE: September 18, 1998
ELEVATION DATUM: Assumed 200.00m
SAMPLER HAMMER, 63.5kg; DROP, 760mm

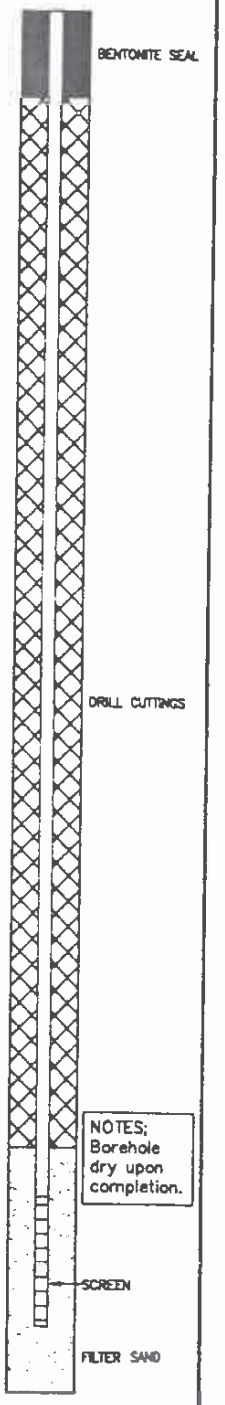
BORING METHOD: 60mm Inside Diameter - Hollow Stem Auger

DEPTH SCALE IN METRES	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	"N" VALUE
0	GROUND SURFACE		201.04 / 0.00			
	Compact, brown, SAND & GRAVEL (FILL)			1	SS	13
1	Stiff, dark brown, SILTY CLAY; trace topsoil.		200.04 / 1.00	2	SS	14
			199.54 / 1.50	3	SS	23
2				4	SS	21
3				5	SS	29
4						
	Stiff to hard, brown, SILTY CLAY; trace sand, trace to some gravel. (TILL)			6	SS	20
5						
6	80mm thick gravel layer at about elevation 194.90m.			7	SS	12
7						
8				8	SS	34
			192.44 / 8.60			
9	Very stiff, brown, interlayered SILTY CLAY and SILT.			9	SS	18
	END OF BOREHOLE		191.44 / 9.60			

PENETRATION RESISTANCE PLOT
SHEAR STRENGTH kPa
20 40 60 80

WATER CONTENT (%)
10 20 30

INSTALLATION INFORMATION



983105-1.dwg

SHEET 1 OF 1

Terraprobe

LOG OF BOREHOLE 2

PROJECT No: 983105
CLIENT: Public Works & Government Services Canda
LOCATION: See Figure 2

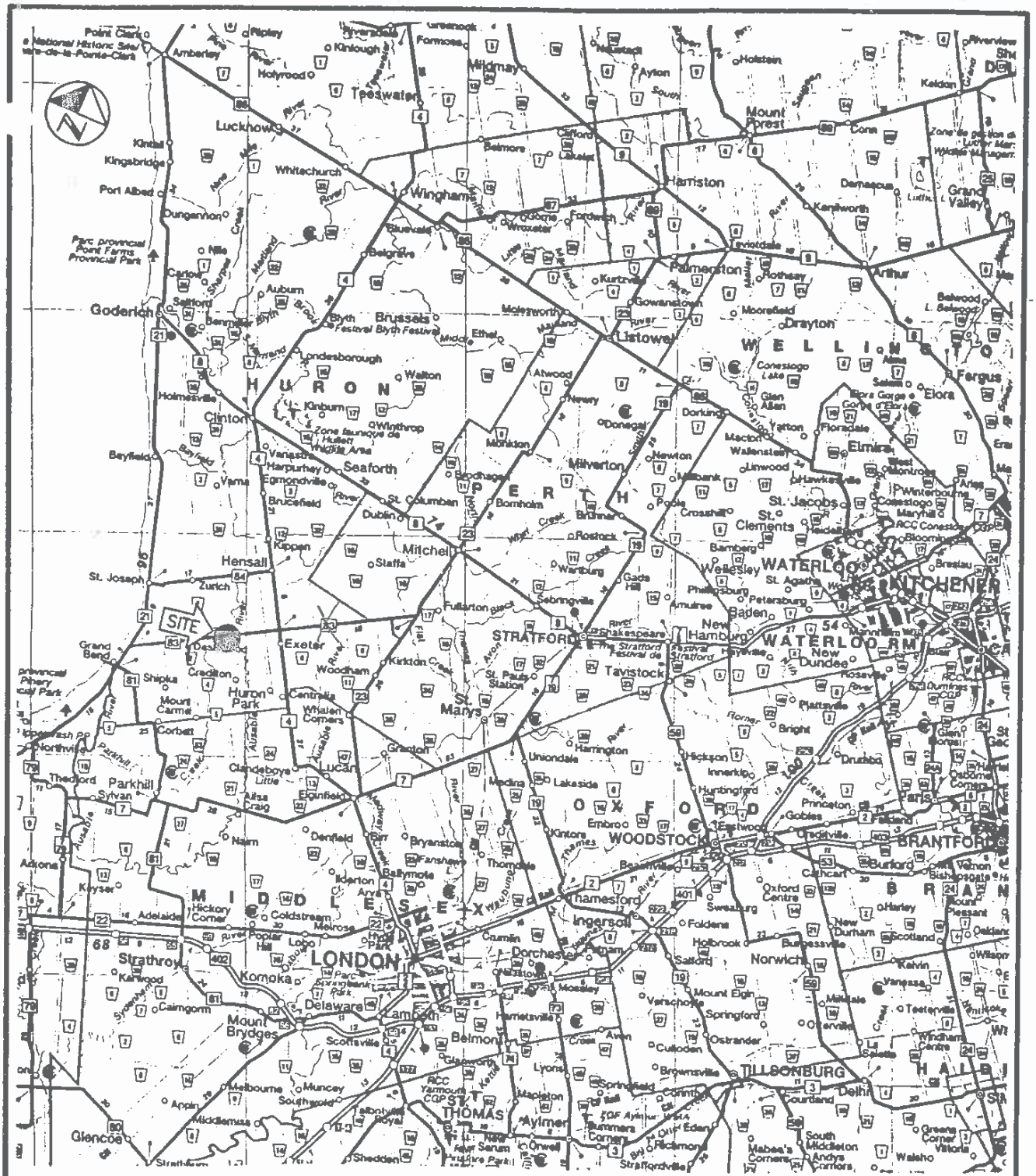
BORING DATE: September 18, 1998
ELEVATION DATUM: Assumed 200.00m
SAMPLER HAMMER, 63.5kg; DROP, 760mm

BORING METHOD	DEPTH SCALE IN METRES	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	"N" VALUE	PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30)	INSTALLATION INFORMATION
60mm Inside Diameter - Hollow Stem Auger	0	GROUND SURFACE		201.00						
		Loose, brown, SAND & GRAVEL (FILL)		0.00	1	SS	9			
				200.45						
		Firm, brown, CLAYEY SILT; trace topsoil, trace gravel. (FILL)		0.55	2	SS	6			
	1			199.85						
				1.15	3	SS	21			
	2				4	SS	36			
	3				5	SS	26			
	4				6	SS	20			
		Very stiff to hard, brown, SILTY CLAY; trace sand, occasional gravel, cobbles. (TILL)			7	SS	18			
	5									
	6				8	SS	21			
	7									
	8				9	SS	22			
				192.40						
		Hard, brown, Interlayered SILTY CLAY and SILT.		8.60	10	SS	60			
	9			191.40						
		END OF BOREHOLE		9.60						

NOTES:
Water level in open borehole at elevation 191.76m after drilling.

SHEET 1 OF 1

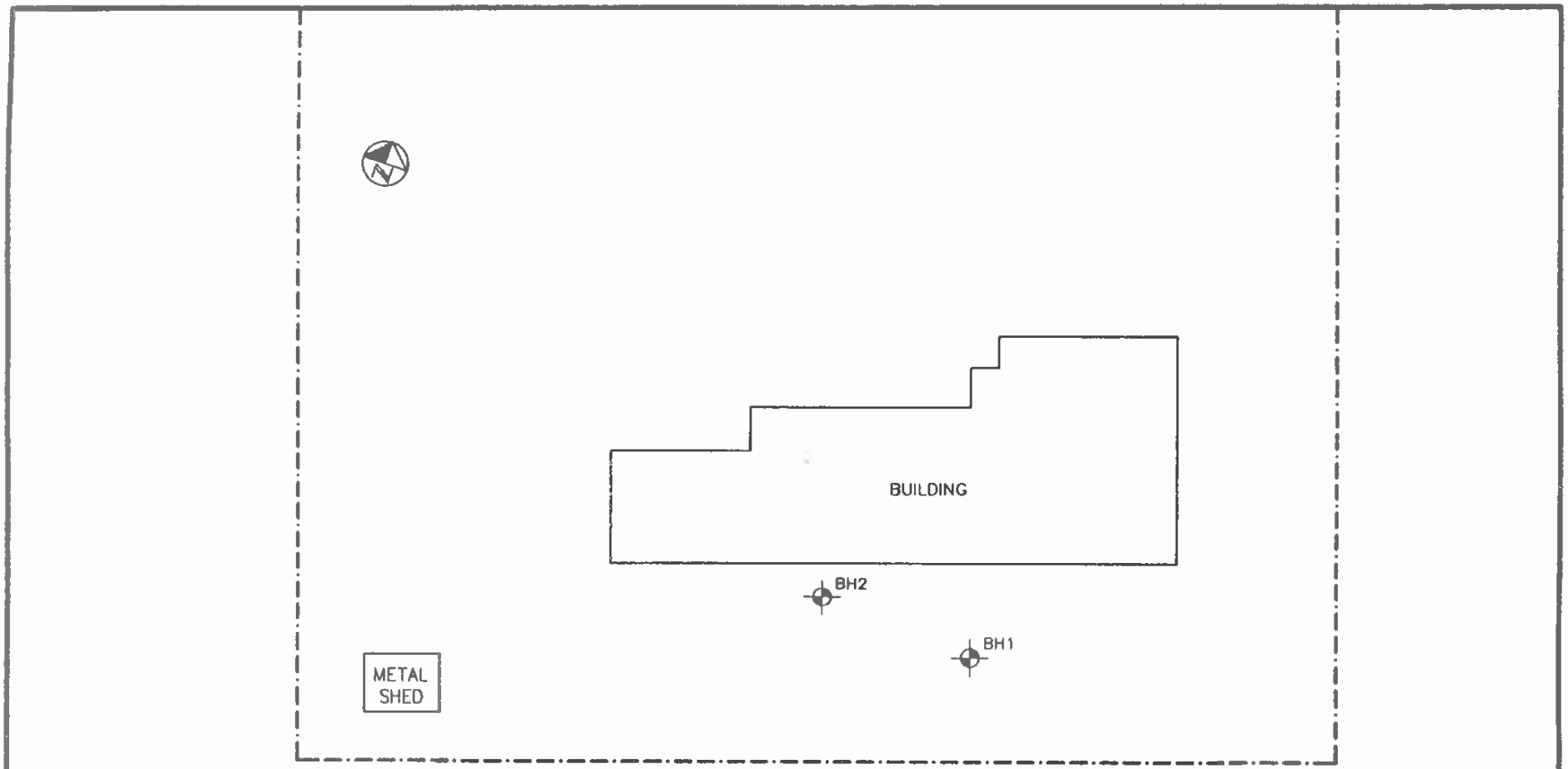
983105-2.dwg



KEY PLAN
EXETER, ONTARIO

Terraprobe

Job no.: 983105	FIGURE 1
Scale: N.T.S.	
Date: Ocober, 1998	



LEGEND:
BH1 location of borehole
property line

NOTES:
all locations and scales are approximate.

LOCATION PLAN
EXETER, ONTARIO

Terraprobe

Job no.: 983105	FIGURE 2
Scale: N.T.S.	
Date: October; 1998	

Marble Mountain, NL 35m Tower

Site Specific 10-yr. Hourly Wind Pressure Documentation Sheet

Site Information:

Name: Marble Mountain, NL
Latitude: 48° 55' 49" N
Longitude: 57° 50' 3" W
Tower Height (m): 35
Elevation MSL (m): 540

UTM Coordinates:

Zone: 21
Easting (m): 438902
Northing (m): 5420040

Results:

Q_e (Pa): 460
Uncertainty of Q_e: [20%, -25%]
Q_{nbc} (Pa): 430
Icing: As per CAN/CSA S37-13
Return Period: **10**

Wind Pressure Formula (for z in metres and result in Pa):

$$Q_h = 0.12919 \{[1 + 0.2389\, e^{(-0.0126\, z)}]\, 50.01\}^2 \; (z/10)^{0.2}$$

Profile Formula General Form:

$$Q_h = 0.12919 \{[a_1\, e^{(-a2\, z)} + a_3\, \ln(z/z_h) / \ln(z/z_{01})]\, v_{01}\}^2 \; (z/10)^{0.2}$$

Site Values of Coefficients:

$$a_1 = 0.2389,\; a_2 = 0.0126,\; a_3 = 1.0000,\; z_h = 0.3500,\; z_{01} = 0.3500,\; v_{01} = 50.01 \text{ mph}$$

Definitions

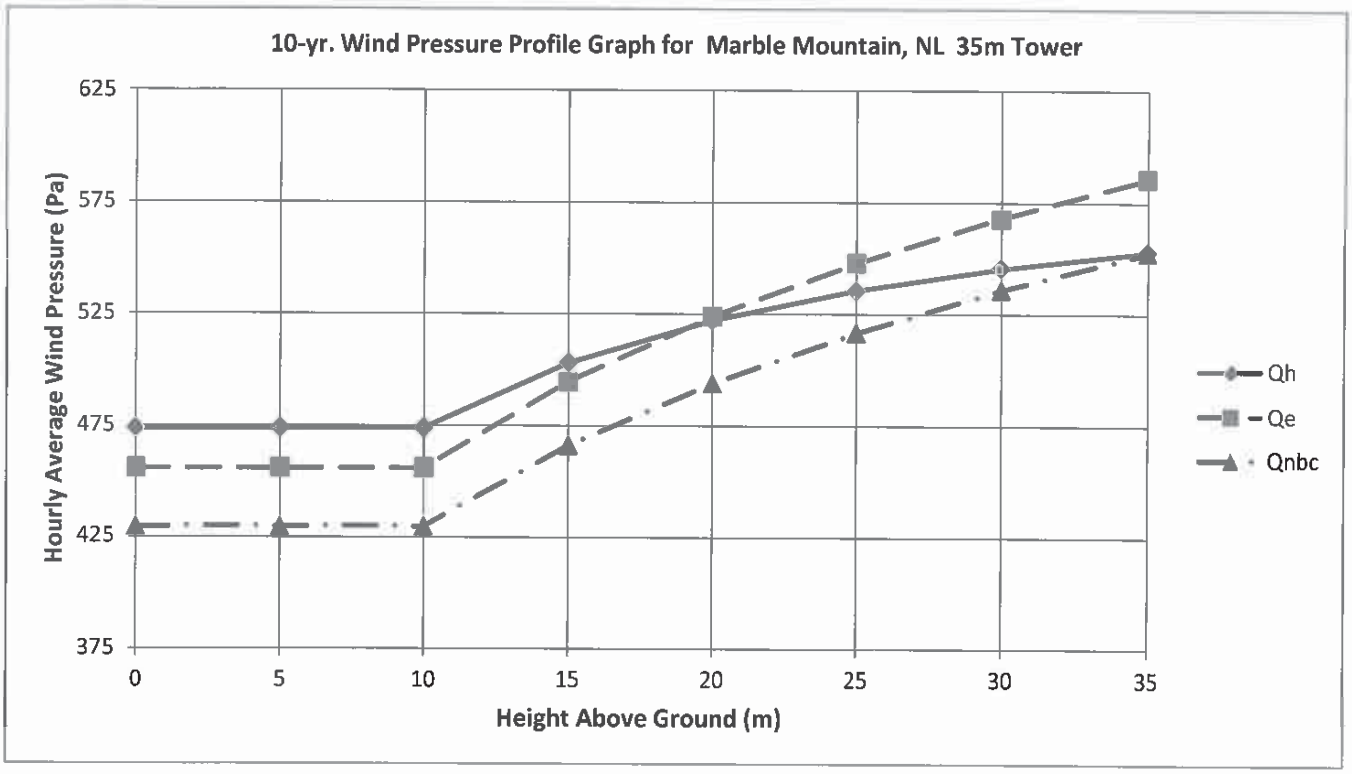
Tower Height: Height of the tower from ground level at the base of the tower to the top of the structure.
Q_e: "Site Specific Equivalent Wind Pressure at 10 m" => the wind pressure which, when using the 2/10 power law yields the same average wind pressure over the height of the tower as the Wind Pressure Profile Formula.
Q_{nbc}: Regionally representative reference wind pressure at 10 m in the format of the National Building Code of Canada. As per the November 17, 1988 meeting of the CSA Antenna Tower Technical Committee, the Q_{nbc} value profiled with the 2/10 power law should comprise the minimum hourly average wind pressure at : all heights above ground.
Wind Pressure Profile Formula: Formula for the design wind pressure as a function of height.
Height: the vertical distance (m) above ground level at the base of the tower.

Notes:

n.b. No wind pressure value less than 90% of the value at 10 m should be used for heights less than 10 m a.g.l.

These wind pressures were evaluated using a version of the methods described by Taylor and Lee (1984) "Simple Guidelines for Estimating Wind Speed Variations Due to Small Scale Topographic Features", Climatological Bulletin 18 2, using the Boyd (1969) analysis of thirty year return period wind speeds (which is also used for the National Building Code of Canada), modified by a technique described by Wieringa (1980) "Representativeness of Wind Observations at Airports" Bulletin of the American Meteorological Society, 61 9, as input data. The uncertainty in NBCC regionally representative reference wind pressures is about [+15%,-15%].

Marble Mountain, NL 35m Tower



Qe profile = Qe (the site-specific equivalent reference wind pressure) with the 2/10 power law profile.

Qh = site specific wind pressure directly from Taylor and Lee (1984) simple guidelines.

Qnbc profile = regionally representative wind pressure in the National Building Code format with the 2/10 power law profile

November 24, 2014

Marble Mountain, NL 35m Tower

Site Specific 30-yr. Hourly Wind Pressure Documentation Sheet

Site Information:

Name: Marble Mountain, NL
Latitude: 48° 55' 49" N
Longitude: 57° 50' 3" W
Tower Height (m): 35
Elevation MSL (m): 540

UTM Coordinates:

Zone: 21
Easting (m): 438902
Northing (m): 5420040

Results:

Q_e (Pa): 550
Uncertainty of Q_e: [20%, -25%]
Q_{nbc} (Pa): 510
Icing: As per CAN/CSA S37-13
Return Period: **30**

Wind Pressure Formula (for z in metres and result in Pa):

$$Q_h = 0.12919 \{[1 + 0.2389\, e^{(-0.0126\, z)}]\, 54.74\}^2 \; (z/10)^{0.2}$$

Profile Formula General Form:

$$Q_h = 0.12919 \{[a_1\, e^{(-a2\, z)} + a_3\, \ln(z/z_h) / \ln(z/z_{01})]\, v_{01}\}^2 \; (z/10)^{0.2}$$

Site Values of Coefficients:

$$a_1 = 0.2389,\; a_2 = 0.0126,\; a_3 = 1.0000,\; z_h = 0.3500,\; z_{01} = 0.3500,\; v_{01} = 54.74 \text{ mph}$$

Definitions

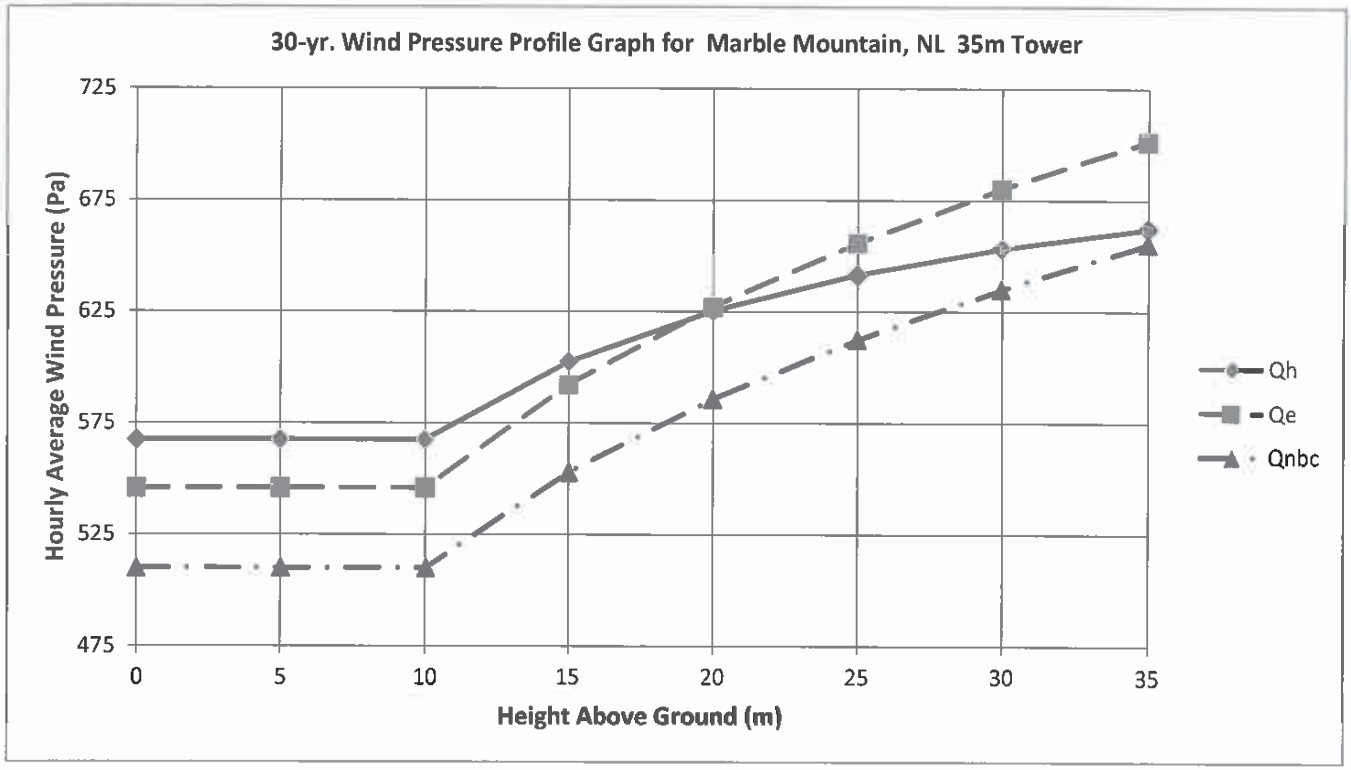
Tower Height: Height of the tower from ground level at the base of the tower to the top of the structure.
Q_e: "Site Specific Equivalent Wind Pressure at 10 m" => the wind pressure which, when using the 2/10 power law yields the same average wind pressure over the height of the tower as the Wind Pressure Profile Formula.
Q_{nbc}: Regionally representative reference wind pressure at 10 m in the format of the National Building Code of Canada. As per the November 17, 1988 meeting of the CSA Antenna Tower Technical Committee, the Q_{nbc} value profiled with the 2/10 power law should comprise the minimum hourly average wind pressure at all heights above ground.
Wind Pressure Profile Formula: Formula for the design wind pressure as a function of height.
Height: the vertical distance (m) above ground level at the base of the tower.

Notes:

n.b. No wind pressure value less than 90% of the value at 10 m should be used for heights less than 10 m a.g.l.

These wind pressures were evaluated using a version of the methods described by Taylor and Lee (1984) "Simple Guidelines for Estimating Wind Speed Variations Due to Small Scale Topographic Features", Climatological Bulletin 18 2, using the Boyd (1969) analysis of thirty year return period wind speeds (which is also used for the National Building Code of Canada), modified by a technique described by Wieringa (1980) "Representativeness of Wind Observations at Airports" Bulletin of the American Meteorological Society, 61 9, as input data. The uncertainty in NBCC regionally representative reference wind pressures is about [+15%,-15%].

Marble Mountain, NL 35m Tower



Qe profile = Qe (the site-specific equivalent reference wind pressure) with the 2/10 power law profile.

Qh = site specific wind pressure directly from Taylor and Lee (1984) simple guidelines.

Qnbc profile = regionally representative wind pressure in the National Building Code format with the 2/10 power law profile

November 24, 2014

Marble Mountain, NL 35m Tower

Site Specific 50-yr. Hourly Wind Pressure Documentation Sheet

Site Information:

Name: Marble Mountain, NL
Latitude: 48° 55' 49" N
Longitude: 57° 50' 3" W
Tower Height (m): 35
Elevation MSL (m): 540

UTM Coordinates:

Zone: 21
Easting (m): 438902
Northing (m): 5420040

Results:

Q_e (Pa): 590
Uncertainty of Q_e: [20%, -25%]
Q_{nbc} (Pa): 550
Icing: As per CAN/CSA S37-13
Return Period: **50**

Wind Pressure Formula (for z in metres and result in Pa):

$$Q_h = 0.12919 \{[1 + 0.2389\, e^{(-0.0126\, z)}]\, 56.90\}^2 \; (z/10)^{0.2}$$

Profile Formula General Form:

$$Q_h = 0.12919 \{[a_1\, e^{(-a2\, z)} + a_3\, \ln(z/z_h) / \ln(z/z_{01})]\, v_{01}\}^2 \; (z/10)^{0.2}$$

Site Values of Coefficients:

$$a_1 = 0.2389,\; a_2 = 0.0126,\; a_3 = 1.0000,\; z_h = 0.3500,\; z_{01} = 0.3500,\; v_{01} = 56.90 \text{ mph}$$

Definitions

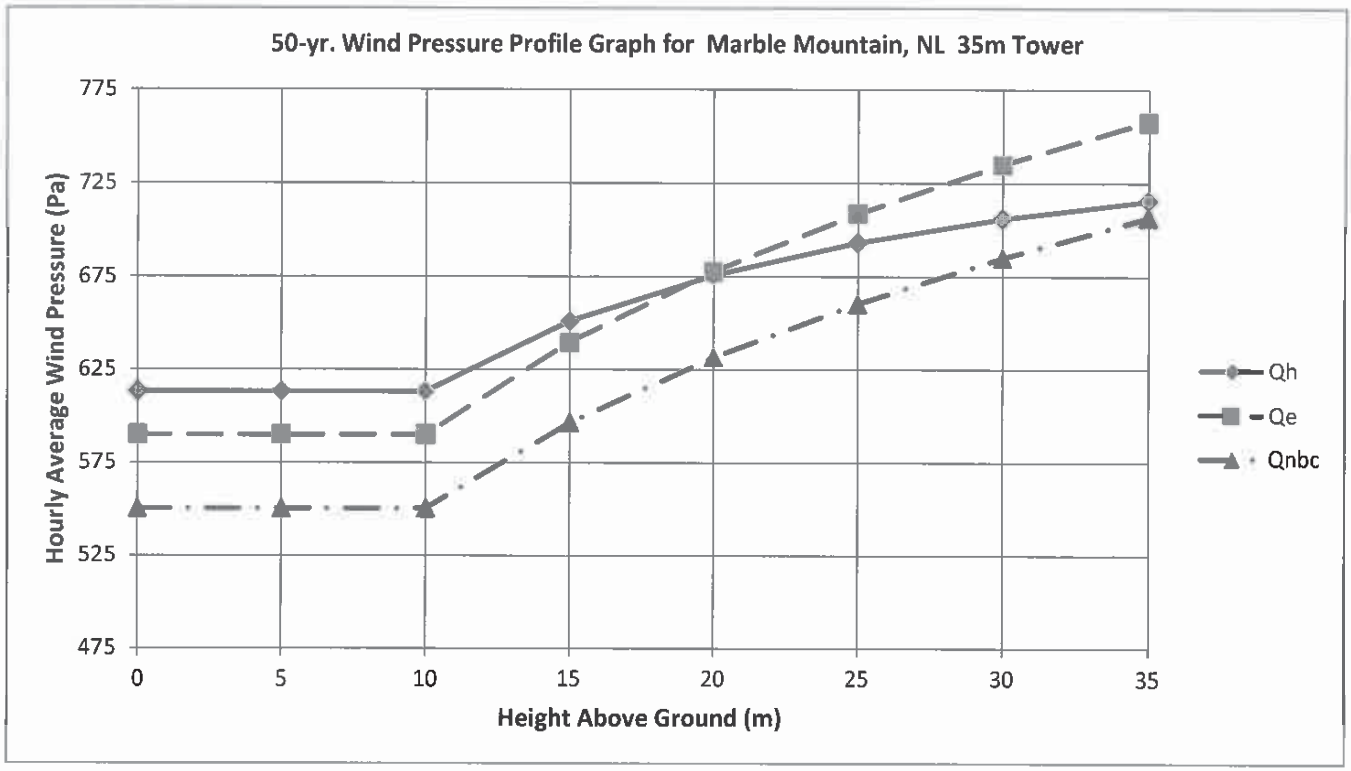
Tower Height: Height of the tower from ground level at the base of the tower to the top of the structure.
Q_e: "Site Specific Equivalent Wind Pressure at 10 m" => the wind pressure which, when using the 2/10 power law yields the same average wind pressure over the height of the tower as the Wind Pressure Profile Formula.
Q_{nbc}: Regionally representative reference wind pressure at 10 m in the format of the National Building Code of Canada. As per the November 17, 1988 meeting of the CSA Antenna Tower Technical Committee, the Q_{nbc} value profiled with the 2/10 power law should comprise the minimum hourly average wind pressure at all heights above ground.
Wind Pressure Profile Formula: Formula for the design wind pressure as a function of height.
Height: the vertical distance (m) above ground level at the base of the tower.

Notes:

n.b. No wind pressure value less than 90% of the value at 10 m should be used for heights less than 10 m a.g.l.

These wind pressures were evaluated using a version of the methods described by Taylor and Lee (1984) "Simple Guidelines for Estimating Wind Speed Variations Due to Small Scale Topographic Features", Climatological Bulletin 18 2, using the Boyd (1969) analysis of thirty year return period wind speeds (which is also used for the National Building Code of Canada), modified by a technique described by Wieringa (1980) "Representativeness of Wind Observations at Airports" Bulletin of the American Meteorological Society, 61 9, as input data. The uncertainty in NBCC regionally representative reference wind pressures is about [+15%,-15%].

Marble Mountain, NL 35m Tower



Qe profile = Qe (the site-specific equivalent reference wind pressure) with the 2/10 power law profile.

Qh = site specific wind pressure directly from Taylor and Lee (1984) simple guidelines.

Qnbc profile = regionally representative wind pressure in the National Building Code format with the 2/10 power law profile

November 24, 2014