Appendix C

SITE SPECIFIC WIND LOADING

Site-Specific 10-yr. Wind Pressure Report (V2.2 2019-04-22)

Site Information:

Name: Telegraph Cove, BC
Latitude: 50° 31' 41.9" N
Longitude: 126° 47' 22.3" W
Tower Height (m): 37
Elevation MSL (m): 710

Results:

Note: Following direction from the S37 Committee, Qe can no longer be provided.

Q_{nbc} (Pa):	400	$Q_{nbc} = 400(Z/10)^{0.2}$	V_{nbc} = 55.64 mph
Icing:	As per CAN/CSA S37-18		
Q_{Min} (Pa)	250	$Q_{Min} = 250(Z/10)^{0.2}$	V_{Min} = 43.99 mph

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

$$Q_h = 0.12919 \{[0.1918\, e^{(-0.0011\, z)} + 1.0000\, \ln(z/0.8000) / \ln(z/0.8000)]\, 43.61\}^2\, (z/10)^{0.319}$$

Profile Formula General Form:

$$Q_h = 0.12919 \{[a_1\, e^{(-a2\, z)} + a_3\, \ln(z/z_h) / \ln(z/z_{01})]\, v_{01}\}^2\, (z/10)^{0.319}$$

Site Values of Coefficients:

$$a_1 = 0.1918,\ a_2 = 0.0011,\ a_3 = 1.0000,\ z_h = 0.8000,\ z_{01} = 0.8000,\ v_{01} = 43.61 \text{ mph}$$

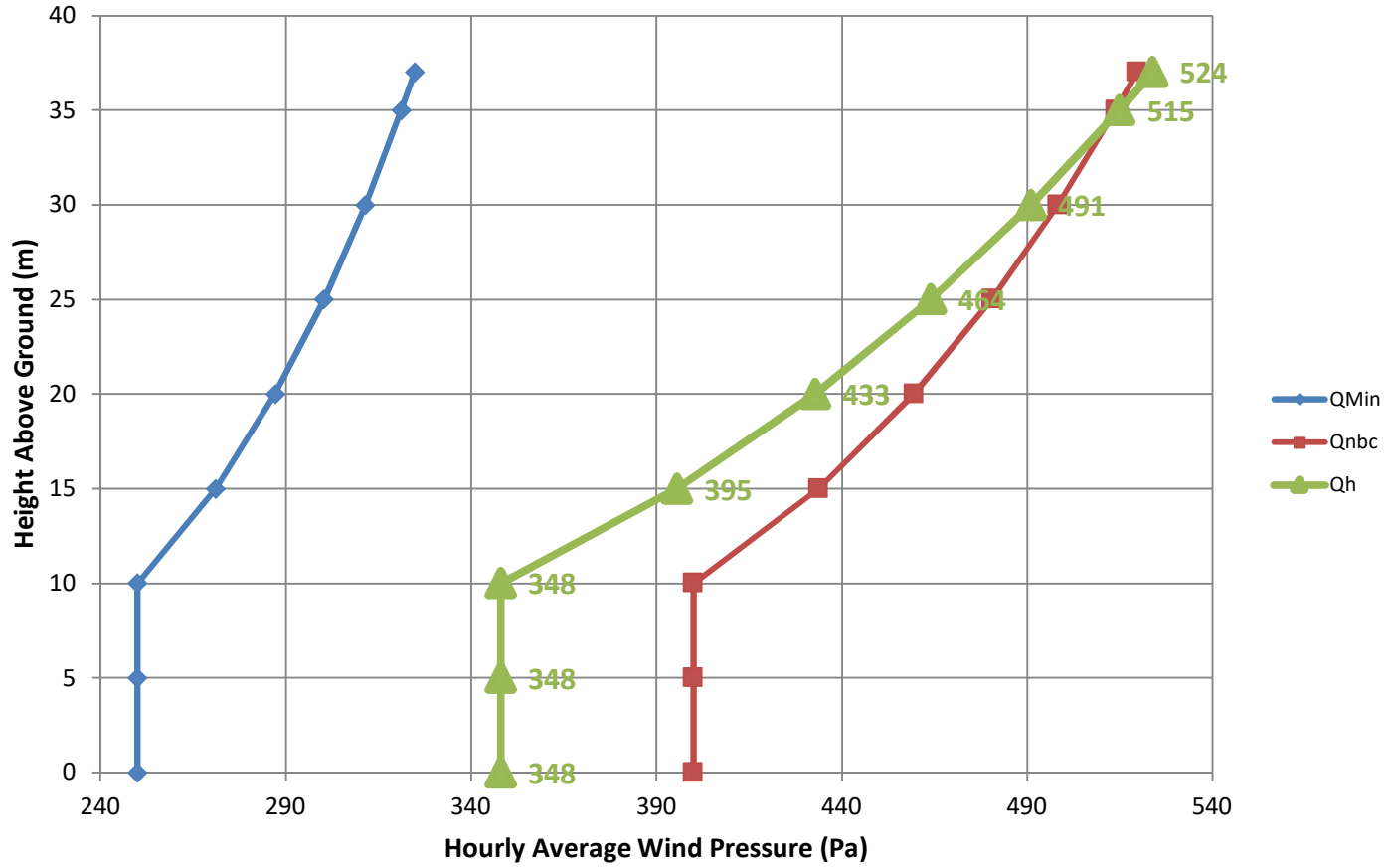
Definitions

Tower Height: Height of the tower from ground level at the base of the tower to the top of the structure.
Q_{nbc}: Regionally representative reference wind pressure at 10 m in the format of the National Building Code of Canada and the Q_{nbc} value is profiled with the $^2/_{10}$ power law.
Q_{Min}: Minimum reference wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the $^2/_{10}$ power law as per Section 5.4.1 of S37-18.

Wind Pressure Formula: Formula for the design wind pressure as a function of height. (Ref.: S37-18, 5.3.1)
Height (Z): the vertical distance (m) above ground level at the base of the tower.

Note: 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%].



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Telegraph Cove, BC 37m Tower

Site-Specific 30-yr. Wind Pressure Report (V2.2 2019-04-22)

Site Information:

Name: Telegraph Cove, BC
Latitude: 50° 31' 41.9" N
Longitude: 126° 47' 22.3" W
Tower Height (m): 37
Elevation MSL (m): 710

Results:

Note: Following direction from the S37 Committee, Qe can no longer be provided.

Q_{nbc} (Pa):	480	$Q_{nbc} = 480(Z/10)^{0.2}$	V_{nbc} = 60.95 mph
Icing:	As per CAN/CSA S37-18		
Q_{Min} (Pa)	300	$Q_{Min} = 300(Z/10)^{0.2}$	V_{Min} = 48.19 mph

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

$$Q_h = 0.12919 \{[0.1918\, e^{(-0.0011\, z)} + 1.0000\, \ln(z/0.8000) / \ln(z/0.8000)]\, 47.73\}^2\, (z/10)^{0.319}$$

Profile Formula General Form:

$$Q_h = 0.12919 \{[a_1\, e^{(-a2\, z)} + a_3\, \ln(z/z_h) / \ln(z/z_{01})]\, v_{01}\}^2\, (z/10)^{0.319}$$

Site Values of Coefficients:

$$a_1 = 0.1918,\ a_2 = 0.0011,\ a_3 = 1.0000,\ z_h = 0.8000,\ z_{01} = 0.8000,\ v_{01} = 47.73 \text{ mph}$$

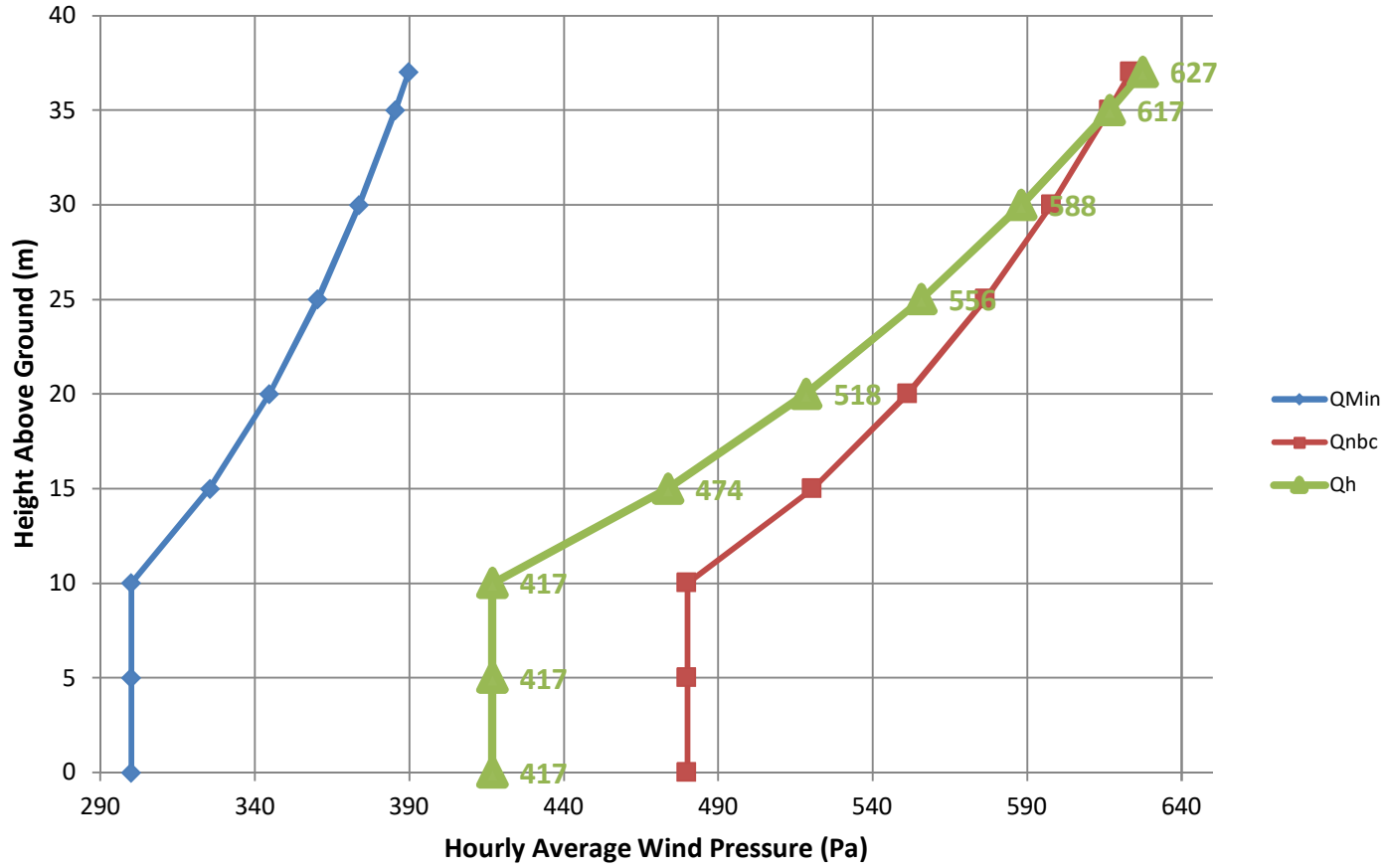
Definitions

Tower Height: Height of the tower from ground level at the base of the tower to the top of the structure.
Q_{nbc}: Regionally representative reference wind pressure at 10 m in the format of the National Building Code of Canada and the Q_{nbc} value is profiled with the $^2/_{10}$ power law.
Q_{Min}: Minimum reference wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the $^2/_{10}$ power law as per Section 5.4.1 of S37-18.

Wind Pressure Formula: Formula for the design wind pressure as a function of height. (Ref.: S37-18, 5.3.1)
Height (Z): the vertical distance (m) above ground level at the base of the tower.

Note: 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%].



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Telegraph Cove, BC 37m Tower

Site-Specific 50-yr. Wind Pressure Report (V2.2 2019-04-22)

Site Information:

Name: Telegraph Cove, BC
Latitude: 50° 31' 41.9" N
Longitude: 126° 47' 22.3" W
Tower Height (m): 37
Elevation MSL (m): 710

Results:

Note: Following direction from the S37 Committee, Qe can no longer be provided.

Q_{nbc} (Pa):	520	$Q_{nbc} = 520(Z/10)^{0.2}$	V_{nbc} = 63.44 mph
Icing:	As per CAN/CSA S37-18		
Q_{Min} (Pa)	320	$Q_{Min} = 320(Z/10)^{0.2}$	V_{Min} = 49.77 mph

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

$$Q_h = 0.12919 \{[0.1918\, e^{(-0.0011\, z)} + 1.0000\, \ln(z/0.8000) / \ln(z/0.8000)]\, 49.62\}^2\, (z/10)^{0.319}$$

Profile Formula General Form:

$$Q_h = 0.12919 \{[a_1\, e^{(-a2\, z)} + a_3\, \ln(z/z_h) / \ln(z/z_{01})]\, v_{01}\}^2\, (z/10)^{0.319}$$

Site Values of Coefficients:

$$a_1 = 0.1918,\ a_2 = 0.0011,\ a_3 = 1.0000,\ z_h = 0.8000,\ z_{01} = 0.8000,\ v_{01} = 49.62 \text{ mph}$$

Definitions

Tower Height: Height of the tower from ground level at the base of the tower to the top of the structure.
Q_{nbc}: Regionally representative reference wind pressure at 10 m in the format of the National Building Code of Canada and the Q_{nbc} value is profiled with the $^2/_{10}$ power law.
Q_{Min}: Minimum reference wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the $^2/_{10}$ power law as per Section 5.4.1 of S37-18.

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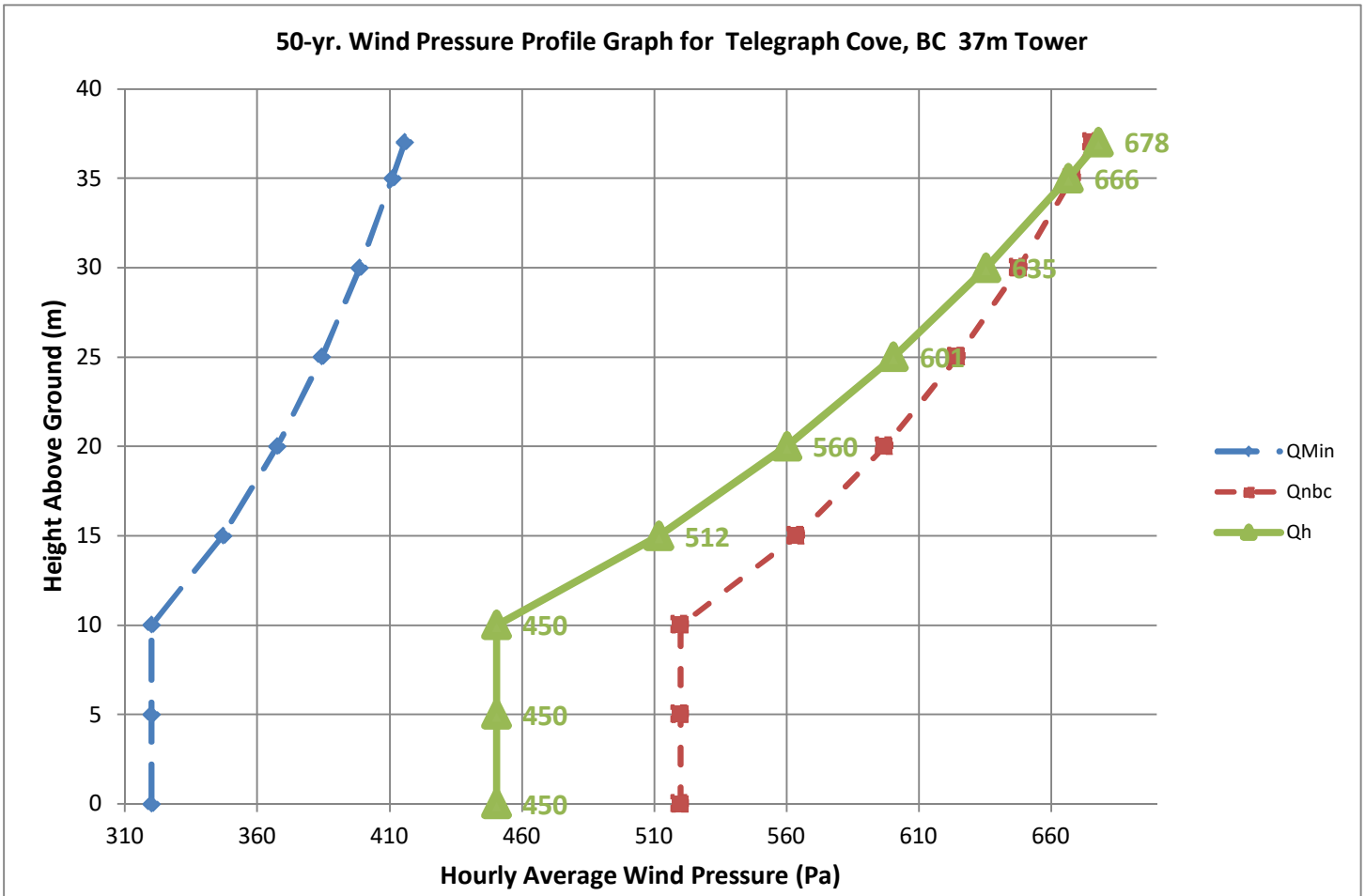

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