

# Site-Specific 10-yr. Wind Pressure Report (V2.1 2016-01-04 Format)

## Site Information:

Name: T2111.101 Point Escuminac, NB  
 Latitude: 47° 4' 25" N  
 Longitude: 64° 47' 43" W  
 Tower Height (m): 76.2  
 Elevation MSL (m): 1

## Results:

**Note:** Following direction from the S37 Committee,  $Q_e$  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 S37-13		
$Q_{Min}$ (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):

$$Q_h = 0.12919 \{ [0.0000 e^{(-0.0000 z)} + 1.0000 \ln(z/0.0500) / \ln(z/0.0500)] 63.63 \}^2 (z/10)^{0.200}$$

## Profile Formula General Form:

$$Q_h = 0.12919 \{ [a_1 e^{(-a_2 z)} + a_3 \ln(z/z_h) / \ln(z/z_{01})] v_{01} \}^2 (z/10)^{0.200}$$

## Site Values of Coefficients:

$$a_1 = 0.0000, a_2 = 0.0000, a_3 = 1.0000, z_h = 0.0500, z_{01} = 0.0500, v_{01} = 63.63 \text{ mph}$$

## 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 S37-13.

**Wind Pressure Formula:** Formula for the design wind pressure as a function of height. (Ref.: S37-13, 5.3.1)

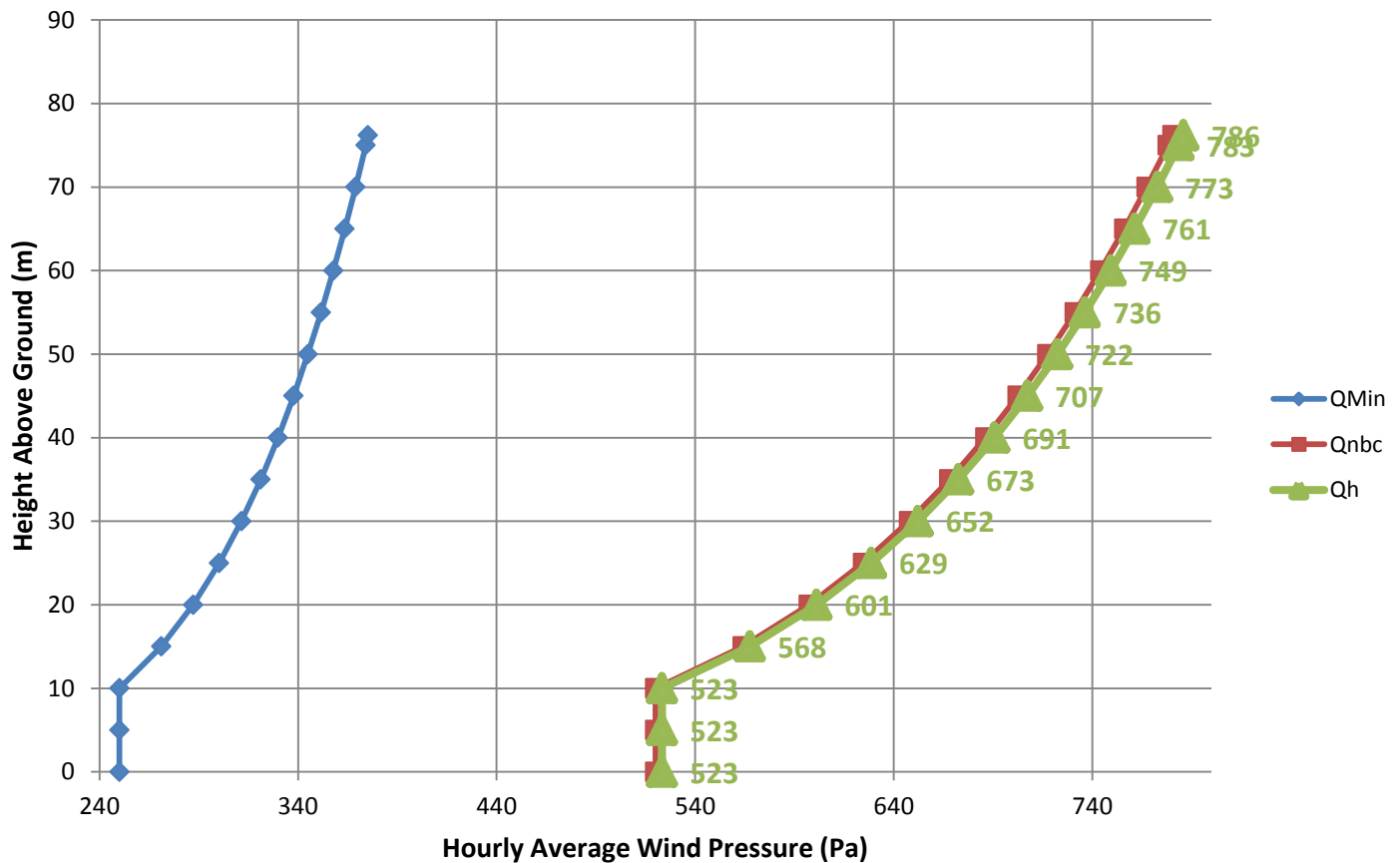
**Height (Z):** the vertical distance (m) above ground level at the base of the tower.

**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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10-yr. Wind Pressure Profile Graph for T2111.101 Point Escuminac, NB 76.2m Tower



Q<sub>nbc</sub> Profile: Regionally representative reference wind profiled with the  $z/10$  power law.

Q<sub>Min</sub> Profile: Minimum site-specific wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the  $z/10$  power law.

Q<sub>h</sub> Profile: The site-specific wind pressure profile directly from the Taylor and Lee (1984) simple guidelines.

#### Explanatory notes regarding the new report format and changes to calculation methods.

1. The most significant change from the previous versions of the reports is that the exponent used in the  $Q_h$  equation is no longer fixed at 0.2. The exponent now varies continuously from 0.2 for open terrain to 0.32 for closed terrain.
2. A new  $Q_{min}$  profile has been added to the graphs and it represents the minimum acceptable reference wind pressure profile. It starts with the minimum 10-metre reference wind pressure of 320 Pa for a 50-year return period as per section 5.4.1 of S37-13 and then uses the same  $z/10$  power law formulation as the  $Q_{NBC}$  profile to generate the curve. The corresponding 10-metre reference wind pressures for the 10-year and 30-year return periods are 250 Pa and 300 Pa respectively.
3.  $Q_h$  will always be plotted even when they are less than  $Q_{Min}$ . This will allow designers to see how  $Q_h$  varies over the height of the tower. Also, in rough terrain and for taller towers, the  $Q_h$  profile might cross the  $Q_{Min}$  profile.
4. The coefficients for the  $Q_h$  equation will now always be given regardless of the  $Q_{NBC}$  or  $Q_{Min}$  values.
5. The wind speeds will be given for each of the 4 equations ( $Q_h$ ,  $Q_{NBC}$ , or  $Q_{Min}$ ) too.

# Site-Specific 30-yr. Wind Pressure Report (V2.1 2016-01-04 Format)

## Site Information:

Name: T2111.101 Point Escuminac, NB  
 Latitude: 47° 4' 25" N  
 Longitude: 64° 47' 43" W  
 Tower Height (m): 76.2  
 Elevation MSL (m): 1

## Results:

**Note:** Following direction from the S37 Committee,  $Q_e$  can no longer be provided.

$Q_{nbc}$ (Pa): 630	$Q_{nbc} = 630(Z/10)^{0.2}$	$V_{nbc} = 69.83$ mph
Icing: As per CAN/CSA S37-13		
$Q_{Min}$ (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):

$$Q_h = 0.12919 \{ [0.0000 e^{(-0.0000 z)} + 1.0000 \ln(z/0.0500) / \ln(z/0.0500)] 69.64 \}^2 (z/10)^{0.200}$$

## Profile Formula General Form:

$$Q_h = 0.12919 \{ [a_1 e^{(-a_2 z)} + a_3 \ln(z/z_h) / \ln(z/z_{01})] v_{01} \}^2 (z/10)^{0.200}$$

## Site Values of Coefficients:

$$a_1 = 0.0000, a_2 = 0.0000, a_3 = 1.0000, z_h = 0.0500, z_{01} = 0.0500, v_{01} = 69.64 \text{ mph}$$

## 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 S37-13.

**Wind Pressure Formula:** Formula for the design wind pressure as a function of height. (Ref.: S37-13, 5.3.1)

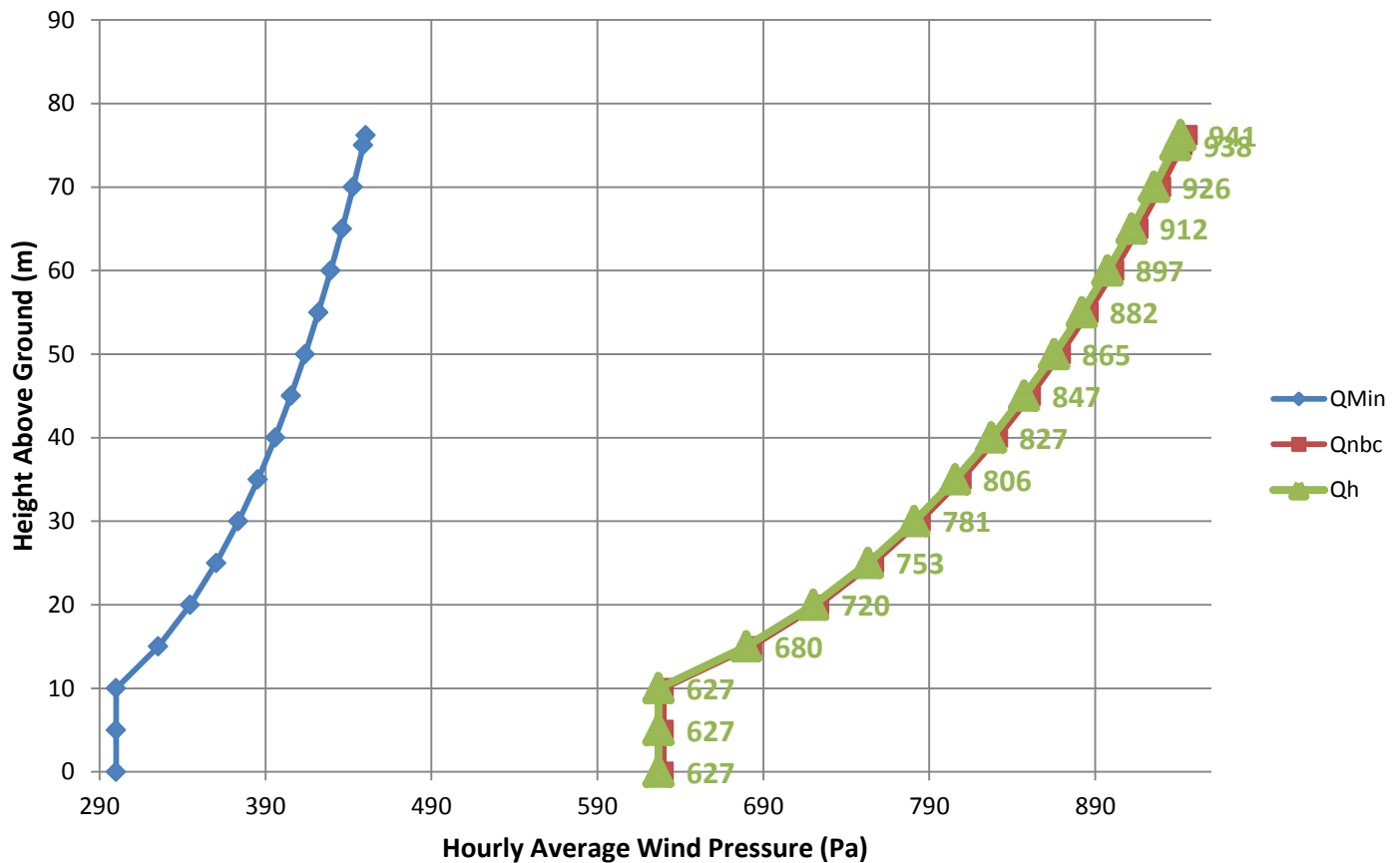
**Height (Z):** the vertical distance (m) above ground level at the base of the tower.

**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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## 30-yr. Wind Pressure Profile Graph for T2111.101 Point Escuminac, NB 76.2m Tower



Q<sub>nbc</sub> Profile: Regionally representative reference wind profiled with the  $z/10$  power law.

Q<sub>Min</sub> Profile: Minimum site-specific wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the  $z/10$  power law.

Q<sub>h</sub> Profile: The site-specific wind pressure profile directly from the Taylor and Lee (1984) simple guidelines.

#### Explanatory notes regarding the new report format and changes to calculation methods.

1. The most significant change from the previous versions of the reports is that the exponent used in the  $Q_h$  equation is no longer fixed at 0.2. The exponent now varies continuously from 0.2 for open terrain to 0.32 for closed terrain.
2. A new  $Q_{min}$  profile has been added to the graphs and it represents the minimum acceptable reference wind pressure profile. It starts with the minimum 10-metre reference wind pressure of 320 Pa for a 50-year return period as per section 5.4.1 of S37-13 and then uses the same  $z/10$  power law formulation as the  $Q_{NBC}$  profile to generate the curve. The corresponding 10-metre reference wind pressures for the 10-year and 30-year return periods are 250 Pa and 300 Pa respectively.
3.  $Q_h$  will always be plotted even when they are less than  $Q_{Min}$ . This will allow designers to see how  $Q_h$  varies over the height of the tower. Also, in rough terrain and for taller towers, the  $Q_h$  profile might cross the  $Q_{Min}$  profile.
4. The coefficients for the  $Q_h$  equation will now always be given regardless of the  $Q_{NBC}$  or  $Q_{Min}$  values.
5. The wind speeds will be given for each of the 4 equations ( $Q_h$ ,  $Q_{NBC}$ , or  $Q_{Min}$ ) too.

# Site-Specific 50-yr. Wind Pressure Report (V2.1 2016-01-04 Format)

## Site Information:

Name: T2111.101 Point Escuminac, NB  
 Latitude: 47° 4' 25" N  
 Longitude: 64° 47' 43" W  
 Tower Height (m): 76.2  
 Elevation MSL (m): 1

## Results:

**Note:** Following direction from the S37 Committee,  $Q_e$  can no longer be provided.

$Q_{nbc}$ (Pa): 680	$Q_{nbc} = 680(Z/10)^{0.2}$	$V_{nbc} = 72.55$ mph
Icing: As per CAN/CSA S37-13		
$Q_{Min}$ (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):

$$Q_h = 0.12919 \{ [0.0000 e^{(-0.0000 z)} + 1.0000 \ln(z/0.0500) / \ln(z/0.0500)] 72.39 \}^2 (z/10)^{0.200}$$

## Profile Formula General Form:

$$Q_h = 0.12919 \{ [a_1 e^{(-a_2 z)} + a_3 \ln(z/z_h) / \ln(z/z_{01})] v_{01} \}^2 (z/10)^{0.200}$$

## Site Values of Coefficients:

$$a_1 = 0.0000, a_2 = 0.0000, a_3 = 1.0000, z_h = 0.0500, z_{01} = 0.0500, v_{01} = 72.39 \text{ mph}$$

## 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 S37-13.

**Wind Pressure Formula:** Formula for the design wind pressure as a function of height. (Ref.: S37-13, 5.3.1)

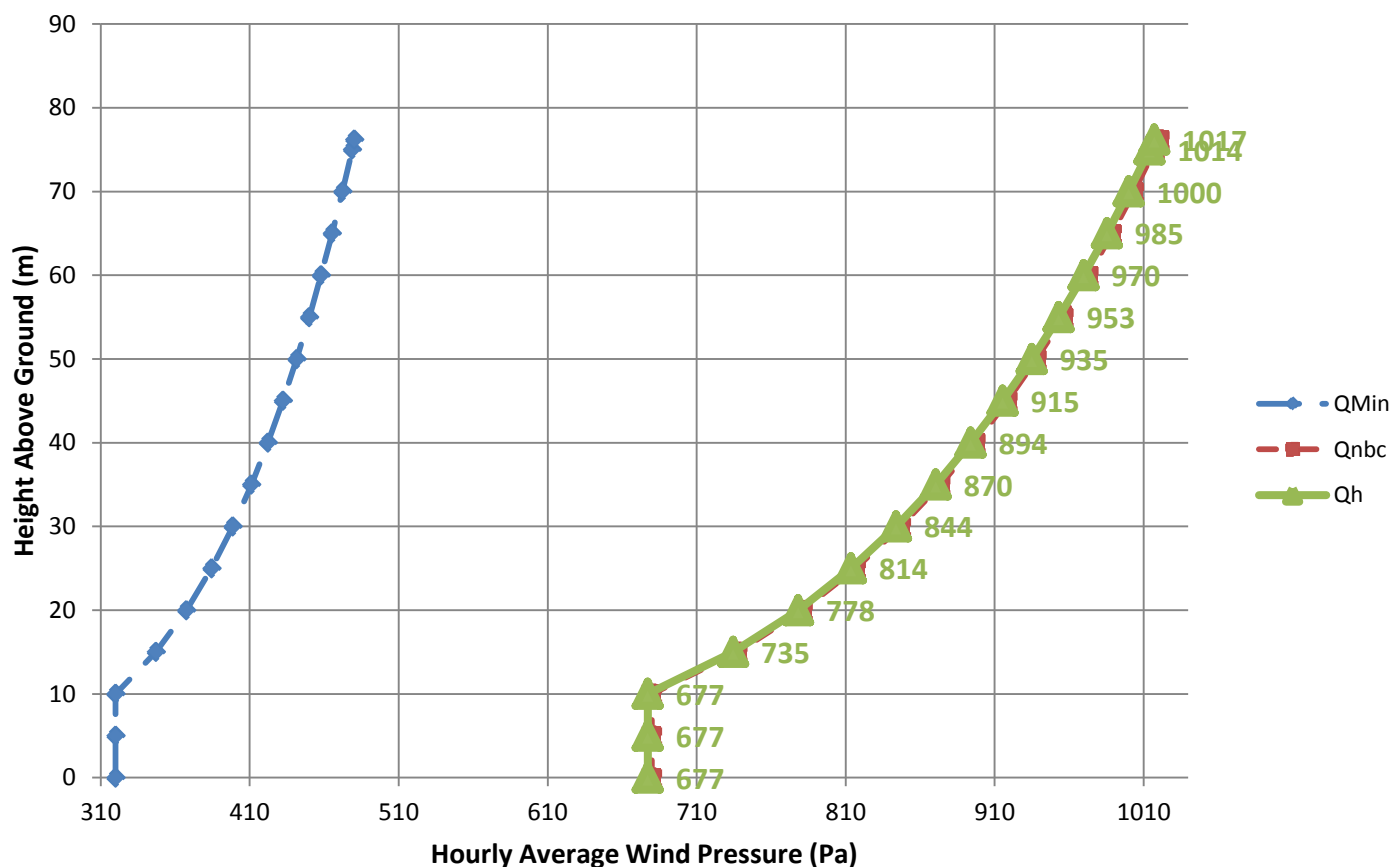
**Height (Z):** the vertical distance (m) above ground level at the base of the tower.

**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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50-yr. Wind Pressure Profile Graph for T2111.101 Point Escuminac, NB 76.2m Tower



$Q_{nbc}$  Profile: Regionally representative reference wind profiled with the  $z^{2/10}$  power law.

$Q_{Min}$  Profile: Minimum site-specific wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the  $z^{2/10}$  power law.

$Q_h$  Profile: The site-specific wind pressure profile directly from the Taylor and Lee (1984) simple guidelines.

#### Explanatory notes regarding the new report format and changes to calculation methods.

1. The most significant change from the previous versions of the reports is that the exponent used in the  $Q_h$  equation is no longer fixed at 0.2. The exponent now varies continuously from 0.2 for open terrain to 0.32 for closed terrain.
2. A new  $Q_{min}$  profile has been added to the graphs and it represents the minimum acceptable reference wind pressure profile. It starts with the minimum 10-metre reference wind pressure of 320 Pa for a 50-year return period as per section 5.4.1 of S37-13 and then uses the same  $z^{2/10}$  power law formulation as the  $Q_{NBC}$  profile to generate the curve. The corresponding 10-metre reference wind pressures for the 10-year and 30-year return periods are 250 Pa and 300 Pa respectively.
3.  $Q_h$  will always be plotted even when they are less than  $Q_{Min}$ . This will allow designers to see how  $Q_h$  varies over the height of the tower. Also, in rough terrain and for taller towers, the  $Q_h$  profile might cross the  $Q_{Min}$  profile.
4. The coefficients for the  $Q_h$  equation will now always be given regardless of the  $Q_{NBC}$  or  $Q_{Min}$  values.
5. The wind speeds will be given for each of the 4 equations ( $Q_h$ ,  $Q_{NBC}$ , or  $Q_{Min}$ ) too.

# Site-Specific 10-yr. Wind Pressure Report (V2.1 2016-01-04 Format)

## Site Information:

Name: T1109.102 Red Head, NB  
 Latitude: 45° 14' 1" N  
 Longitude: 65° 59' 5" W  
 Tower Height (m): 45.7  
 Elevation MSL (m): 146

## Results:

**Note:** Following direction from the S37 Committee,  $Q_e$  can no longer be provided.

$Q_{nbc}$ (Pa): 410	$Q_{nbc} = 410(Z/10)^{0.2}$	$V_{nbc} = 56.33$ mph
Icing: As per CAN/CSA S37-13		
$Q_{Min}$ (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):

$$Q_h = 0.12919 \{ [0.3379 e^{(-0.0092 z)} + 1.0000 \ln(z/0.5000) / \ln(z/0.5000)] 47.11 \}^2 (z/10)^{0.287}$$

## Profile Formula General Form:

$$Q_h = 0.12919 \{ [a_1 e^{(-a_2 z)} + a_3 \ln(z/z_h) / \ln(z/z_{01})] v_{01} \}^2 (z/10)^{0.287}$$

## Site Values of Coefficients:

$$a_1 = 0.3379, a_2 = 0.0092, a_3 = 1.0000, z_h = 0.5000, z_{01} = 0.5000, v_{01} = 47.11 \text{ mph}$$

## 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 S37-13.

**Wind Pressure Formula:** Formula for the design wind pressure as a function of height. (Ref.: S37-13, 5.3.1)

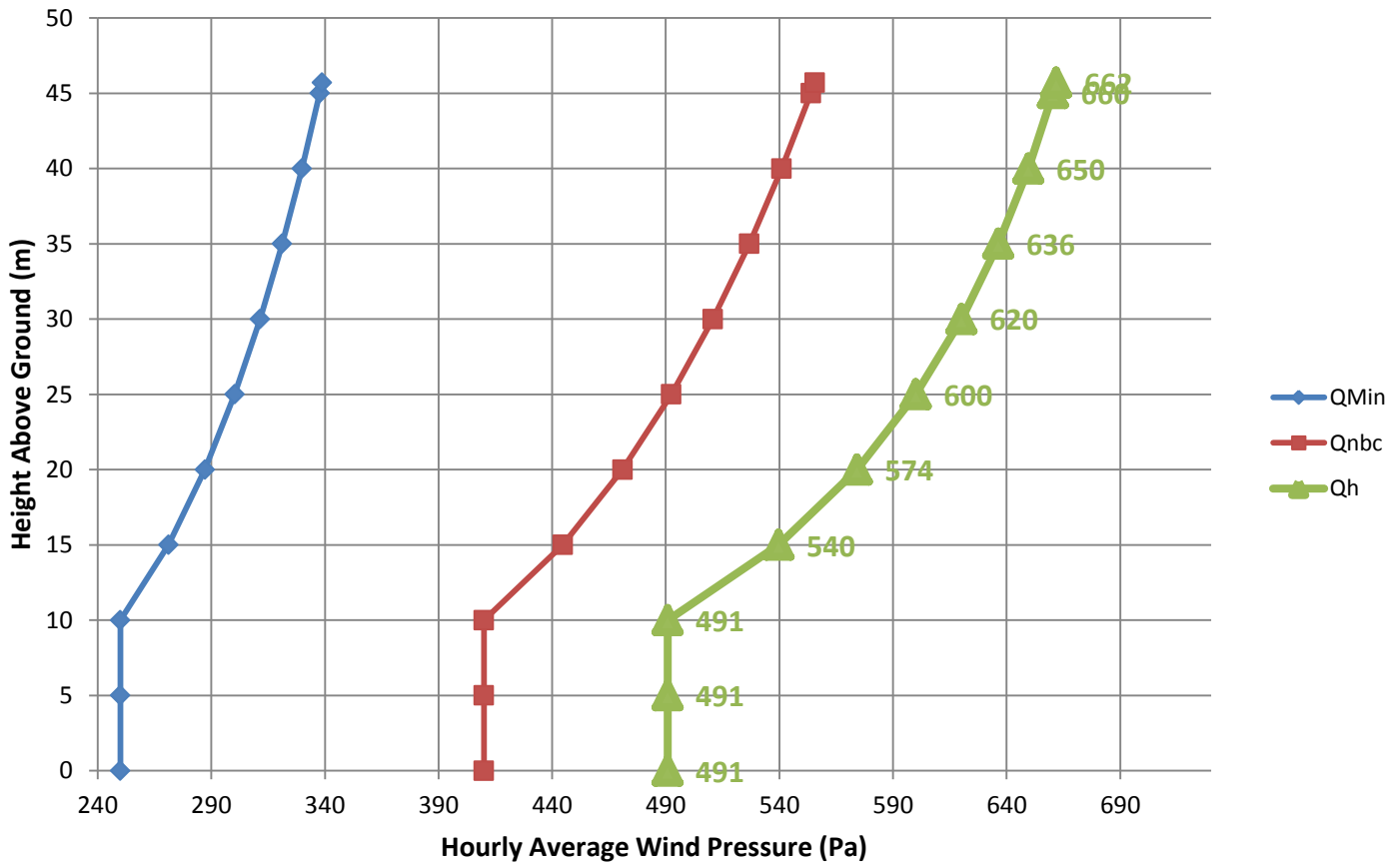
**Height (Z):** the vertical distance (m) above ground level at the base of the tower.

**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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10-yr. Wind Pressure Profile Graph for T1109.102 Red Head, NB 45.7m Tower



Q<sub>nbc</sub> Profile: Regionally representative reference wind profiled with the  $2/_{10}$  power law.

Q<sub>Min</sub> Profile: Minimum site-specific 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.

Q<sub>h</sub> Profile: The site-specific wind pressure profile directly from the Taylor and Lee (1984) simple guidelines.

#### Explanatory notes regarding the new report format and changes to calculation methods.

1. The most significant change from the previous versions of the reports is that the exponent used in the  $Q_h$  equation is no longer fixed at 0.2. The exponent now varies continuously from 0.2 for open terrain to 0.32 for closed terrain.
2. A new  $Q_{min}$  profile has been added to the graphs and it represents the minimum acceptable reference wind pressure profile. It starts with the minimum 10-metre reference wind pressure of 320 Pa for a 50-year return period as per section 5.4.1 of S37-13 and then uses the same  $2/_{10}$  power law formulation as the  $Q_{NBC}$  profile to generate the curve. The corresponding 10-metre reference wind pressures for the 10-year and 30-year return periods are 250 Pa and 300 Pa respectively.
3.  $Q_h$  will always be plotted even when they are less than  $Q_{Min}$ . This will allow designers to see how  $Q_h$  varies over the height of the tower. Also, in rough terrain and for taller towers, the  $Q_h$  profile might cross the  $Q_{Min}$  profile.
4. The coefficients for the  $Q_h$  equation will now always be given regardless of the  $Q_{NBC}$  or  $Q_{Min}$  values.
5. The wind speeds will be given for each of the 4 equations ( $Q_h$ ,  $Q_{NBC}$ , or  $Q_{Min}$ ) too.



# Site-Specific 30-yr. Wind Pressure Report (V2.1 2016-01-04 Format)

## Site Information:

Name: T1109.102 Red Head, NB  
 Latitude: 45° 14' 1" N  
 Longitude: 65° 59' 5" W  
 Tower Height (m): 45.7  
 Elevation MSL (m): 146

## Results:

**Note:** Following direction from the S37 Committee,  $Q_e$  can no longer be provided.

$Q_{nbc}$ (Pa): 490	$Q_{nbc} = 490(Z/10)^{0.2}$	$V_{nbc} = 61.59$ mph
Icing: As per CAN/CSA S37-13		
$Q_{Min}$ (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):

$$Q_h = 0.12919 \{ [0.3379 e^{(-0.0092 z)} + 1.0000 \ln(z/0.5000) / \ln(z/0.5000)] 51.56 \}^2 (z/10)^{0.287}$$

## Profile Formula General Form:

$$Q_h = 0.12919 \{ [a_1 e^{(-a_2 z)} + a_3 \ln(z/z_h) / \ln(z/z_{01})] v_{01} \}^2 (z/10)^{0.287}$$

## Site Values of Coefficients:

$$a_1 = 0.3379, a_2 = 0.0092, a_3 = 1.0000, z_h = 0.5000, z_{01} = 0.5000, v_{01} = 51.56 \text{ mph}$$

## 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 S37-13.

**Wind Pressure Formula:** Formula for the design wind pressure as a function of height. (Ref.: S37-13, 5.3.1)

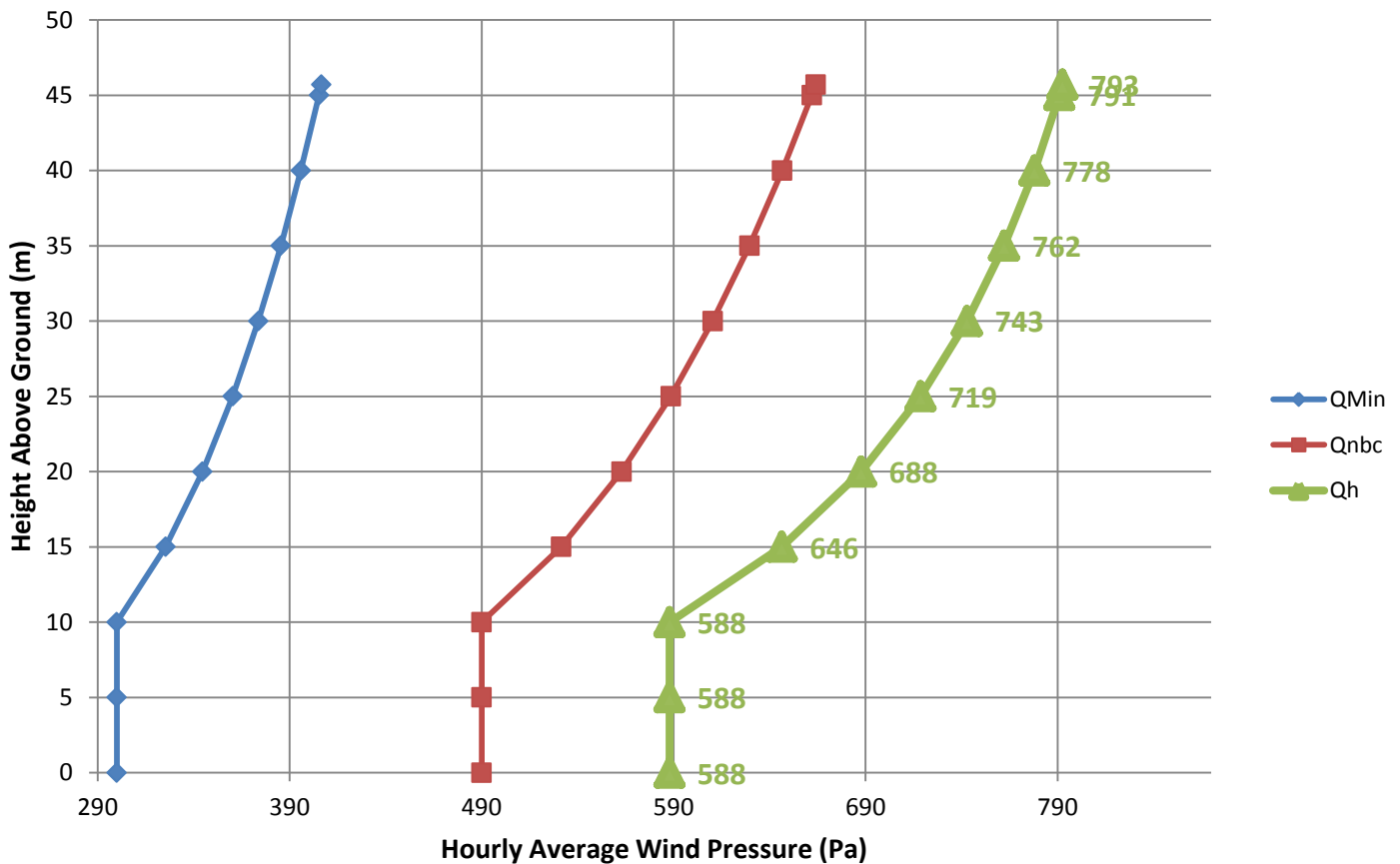
**Height (Z):** the vertical distance (m) above ground level at the base of the tower.

**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.

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30-yr. Wind Pressure Profile Graph for T1109.102 Red Head, NB 45.7m Tower



$Q_{nbc}$  Profile: Regionally representative reference wind profiled with the  $z/10$  power law.

$Q_{Min}$  Profile: Minimum site-specific wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the  $z/10$  power law.

$Q_h$  Profile: The site-specific wind pressure profile directly from the Taylor and Lee (1984) simple guidelines.

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2. A new  $Q_{min}$  profile has been added to the graphs and it represents the minimum acceptable reference wind pressure profile. It starts with the minimum 10-metre reference wind pressure of 320 Pa for a 50-year return period as per section 5.4.1 of S37-13 and then uses the same  $z/10$  power law formulation as the  $Q_{NBC}$  profile to generate the curve. The corresponding 10-metre reference wind pressures for the 10-year and 30-year return periods are 250 Pa and 300 Pa respectively.
3.  $Q_h$  will always be plotted even when they are less than  $Q_{Min}$ . This will allow designers to see how  $Q_h$  varies over the height of the tower. Also, in rough terrain and for taller towers, the  $Q_h$  profile might cross the  $Q_{Min}$  profile.
4. The coefficients for the  $Q_h$  equation will now always be given regardless of the  $Q_{NBC}$  or  $Q_{Min}$  values.
5. The wind speeds will be given for each of the 4 equations ( $Q_h$ ,  $Q_{NBC}$ , or  $Q_{Min}$ ) too.

# Site-Specific 50-yr. Wind Pressure Report (V2.1 2016-01-04 Format)

## Site Information:

Name: T1109.102 Red Head, NB  
 Latitude: 45° 14' 1" N  
 Longitude: 65° 59' 5" W  
 Tower Height (m): 45.7  
 Elevation MSL (m): 146

## Results:

**Note:** Following direction from the S37 Committee,  $Q_e$  can no longer be provided.

$Q_{nbc}$ (Pa): 530	$Q_{nbc} = 530(Z/10)^{0.2}$	$V_{nbc} = 64.05$ mph
Icing: As per CAN/CSA S37-13		
$Q_{Min}$ (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):

$$Q_h = 0.12919 \{ [0.3379 e^{(-0.0092 z)} + 1.0000 \ln(z/0.5000) / \ln(z/0.5000)] 53.59 \}^2 (z/10)^{0.287}$$

## Profile Formula General Form:

$$Q_h = 0.12919 \{ [a_1 e^{(-a_2 z)} + a_3 \ln(z/z_h) / \ln(z/z_{01})] v_{01} \}^2 (z/10)^{0.287}$$

## Site Values of Coefficients:

$$a_1 = 0.3379, a_2 = 0.0092, a_3 = 1.0000, z_h = 0.5000, z_{01} = 0.5000, v_{01} = 53.59 \text{ mph}$$

## 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 S37-13.

**Wind Pressure Formula:** Formula for the design wind pressure as a function of height. (Ref.: S37-13, 5.3.1)

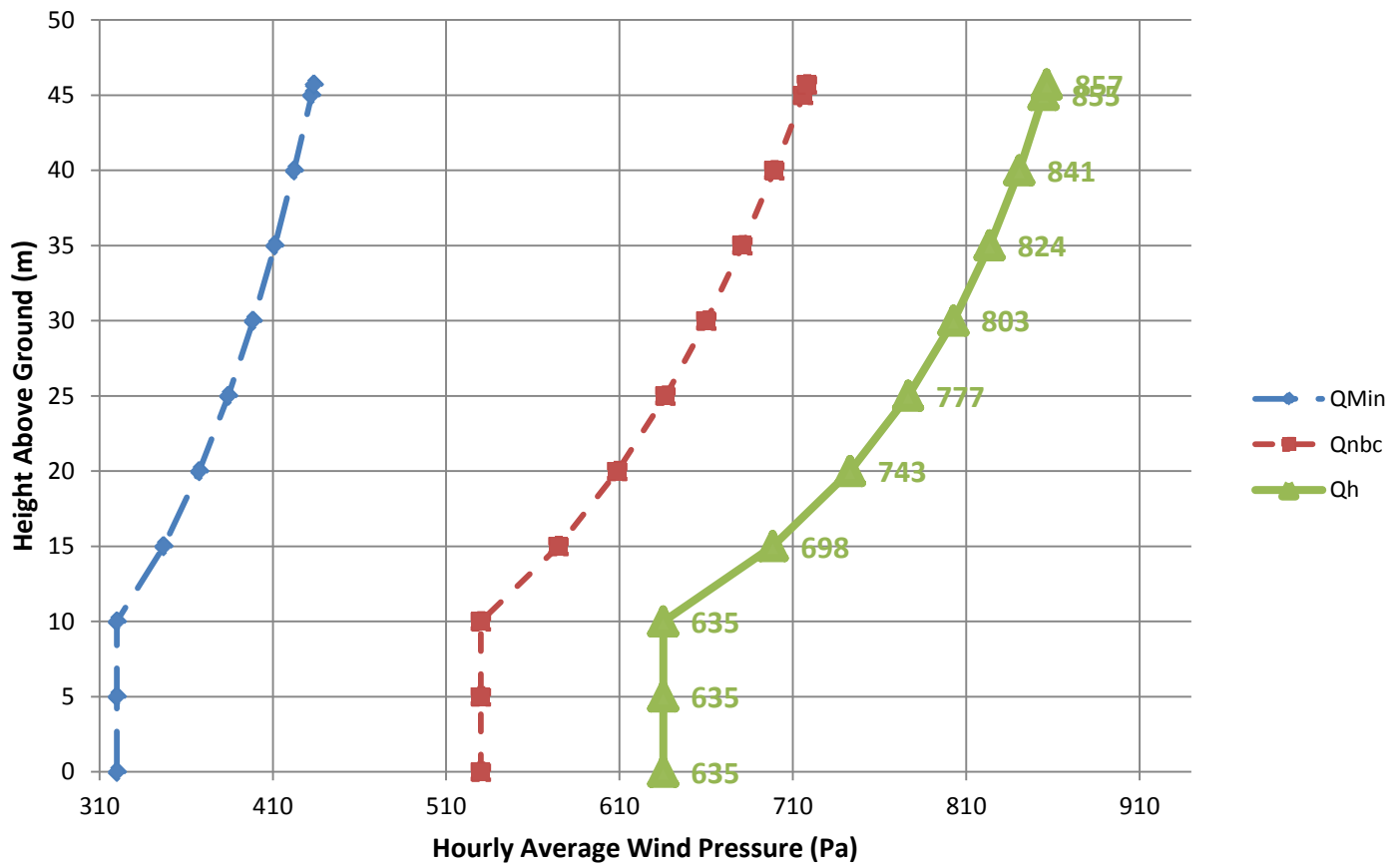
**Height (Z):** the vertical distance (m) above ground level at the base of the tower.

**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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50-yr. Wind Pressure Profile Graph for T1109.102 Red Head, NB 45.7m Tower



$Q_{nbc}$  Profile: Regionally representative reference wind profiled with the  $z^{2/10}$  power law.

$Q_{Min}$  Profile: Minimum site-specific wind pressure (320 Pa, 300 Pa, and 250 Pa for the 50-year, 30-year, and 10-year return periods respectively) profiled with the  $z^{2/10}$  power law.

$Q_h$  Profile: The site-specific wind pressure profile directly from the Taylor and Lee (1984) simple guidelines.

#### Explanatory notes regarding the new report format and changes to calculation methods.

1. The most significant change from the previous versions of the reports is that the exponent used in the  $Q_h$  equation is no longer fixed at 0.2. The exponent now varies continuously from 0.2 for open terrain to 0.32 for closed terrain.
2. A new  $Q_{min}$  profile has been added to the graphs and it represents the minimum acceptable reference wind pressure profile. It starts with the minimum 10-metre reference wind pressure of 320 Pa for a 50-year return period as per section 5.4.1 of S37-13 and then uses the same  $z^{2/10}$  power law formulation as the  $Q_{NBC}$  profile to generate the curve. The corresponding 10-metre reference wind pressures for the 10-year and 30-year return periods are 250 Pa and 300 Pa respectively.
3.  $Q_h$  will always be plotted even when they are less than  $Q_{Min}$ . This will allow designers to see how  $Q_h$  varies over the height of the tower. Also, in rough terrain and for taller towers, the  $Q_h$  profile might cross the  $Q_{Min}$  profile.
4. The coefficients for the  $Q_h$  equation will now always be given regardless of the  $Q_{NBC}$  or  $Q_{Min}$  values.
5. The wind speeds will be given for each of the 4 equations ( $Q_h$ ,  $Q_{NBC}$ , or  $Q_{Min}$ ) too.