

SECTION C: MIT Kendall Square Wind Study



MIT Kendall Square Initiative
Cambridge, MA

Draft Report

Pedestrian Wind Comfort Study
RWDI # 1502103

November 4, 2015

SUBMITTED TO

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MIT Kendall Square Initiative - Cambridge, MA
Pedestrian Wind Study
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1. INTRODUCTION

A pedestrian wind comfort study was conducted on the proposed MIT Kendall Square Initiative Project located in Cambridge, Massachusetts. The project will be a Mixed Use Project for MIT as part of the East Campus Development at Kendall Square. The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas throughout and around the study site and provide recommendations for minimizing adverse effects.

The study involved wind simulations on a 1:300 scale model of the proposed building and surroundings. These simulations were then conducted in RWDI's boundary-layer wind tunnel at Guelph, Ontario, for the purpose of quantifying local wind speed conditions and comparing to appropriate criteria for gauging wind comfort in pedestrian areas. A list of the drawings used for the construction of the model can be found in Appendix A. The criteria recommended by the Boston Redevelopment Authority (BRA) were used in this study. The present report describes the methods and presents the results of the wind tunnel simulations.

2. OVERVIEW

Major buildings, especially those that protrude above their surroundings, often cause increased local wind speeds at the pedestrian level. Typically, wind speeds increase with elevation above the ground surface, and taller buildings intercept these faster winds and deflect them down to the pedestrian level. The funneling of wind through gaps between buildings and the acceleration of wind around corners of buildings may also cause increases in wind speed. Conversely, if a building is surrounded by others of equivalent height, it may be protected from the prevailing upper-level winds, resulting in no significant changes to the local pedestrian-level wind environment. The most effective way to assess potential pedestrian-level wind impacts around a proposed new building is to conduct scale model tests in a wind tunnel.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.



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3. METHODOLOGY

Information concerning the site and surroundings was derived from: site photographs, information on surrounding buildings and terrain, site plans and elevations of the proposed development provided by the design team. The following configurations were simulated:

No Build:	Includes all existing site and surrounding buildings;
Full Build with Mitigation:	Includes the proposed MIT Kendall Square Initiative Project with landscape mitigation controls, all future developments and all existing surroundings.

As shown in Figures 1a and 1b, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1,200 ft radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modelled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 170 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of 5 feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. The results were then combined with long-term meteorological data, recorded during the years 1983 to 2013 at the Boston Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for the 4 seasons as well as for the entire year.

Figures 2a, 2b and 2c present "wind roses", summarizing the seasonal and annual wind climates in the area respectively, based on the data from Boston Logan International Airport. The upper left wind roses in Figure 2a, for example summarize the spring (March, April, and May) wind data. In general, the prevailing winds at this time of year are from the northwest to south-southwest and northeast to east-southeast. In the case of strong winds, however, the most common wind direction is west-northwest, northwest, south-southwest and west.

On an annual basis (Figure 2c) the most common wind directions are those between north-northwest and south-southwest. Winds from the east-northeast to the east-southeast are also relatively common. In the case of strong winds, west-northwest, northwest and west are the dominant wind directions.

This study involved state-of-the-art measurement and analysis techniques to predict wind conditions at the study site. Nevertheless, some uncertainty remains in predicting wind comfort, and this must be kept in mind. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this report represent an average for the total population. Also, unforeseen changes in the project area, such as the construction or removal of buildings, can affect the conditions experienced at the site. Finally, the prediction of wind speeds is necessarily a statistical



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procedure. The wind speeds reported are for the frequency of occurrence stated (one percent of the time). Higher wind speeds will occur but on a less frequent basis.

4. PEDESTRIAN WIND COMFORT CRITERIA

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of the time. The second set of criteria used by the BRA to determine the acceptability of specific locations is based on the work of Melbourne¹. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the 1-hour mean wind speed exceeded 1% of the time (i.e., the 99-percentile mean wind speed). They are as follows:

BRA Mean Wind Criteria*

Dangerous	> 27 mph
Uncomfortable for Walking	> 19 and ≤ 27 mph
Comfortable for Walking	> 15 and ≤ 19 mph
Comfortable for Standing	> 12 and ≤ 15 mph
Comfortable for Sitting	< 12 mph

* Applicable to the hourly mean wind speed exceeded one percent of the time.

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BRA effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

¹ Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions", Journal of Industrial Aerodynamics, 3 (1978) 241 - 249.



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5. TEST RESULTS

Table 1 presents the mean and effective gust wind speeds for each season as well as annually. Figures 3 – 4 graphically depict the wind conditions at each wind measurement location based on the seasonal and annual mean and effective gust speeds, respectively. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested, except where noted below in the text.

5.1 No Build Configuration

A wind comfort categorization of walking is considered appropriate for sidewalks. Lower wind speeds conducive to standing are preferred at building entrances. On an annual basis (Figure 3a) conditions comfortable for walking or better are predicted around the study site. However, a few locations where uncomfortable conditions are predicted occur to the north of the study site along Third Street, Broad Canal Way and along Main Street.

The effective gust criterion shown in Figure 4a was met for the majority of sensor locations around the existing site with the exception of Locations 13, 30, 42, 53, 146 and 166 which were expected to exceed the effective gust criterion on an annual basis.

5.2 Full Build with Mitigation Configuration

5.2.1 Building Entrances and Sidewalks

The proposed buildings are expected to provide sheltering from the dominant winds and therefore will generally improve the wind conditions on site. In addition, the conditions benefit significantly with the addition of the proposed landscaping at grade level for the summer seasons. Entrance way locations show mean speed conditions of standing and sitting (Figure 3b) with a few exceptions at Locations 82 - 84 and 124 – 136 between Sites 4 and 5 on an annual basis. This high pedestrian area shows a mix of mean speed wind conditions of uncomfortable and walking. The wind conditions in this area can be improved through the use of mitigation measures, such as vertical wind screens (8 to 10 ft tall and 70-80% solid) positioned perpendicular to the building or scattered throughout the courtyard. Alternatively, recessing entrance ways in this area can also help to protect from strong approaching winds. Examples of wind screens and recessed entrances are shown in Image 1 below. In the area between site 4 and 5 the design of the T-Station is still developing. Therefore opportunities will be available to implement mitigation strategies in this area as the design develops.



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Image 1 – Examples of Wind Screens and Recessed Entrance

Alternatively, modifying the current landscaping plan to include deciduous trees that retain their foliage in winter would likely improve conditions, particularly during the winter. As evaluated, the MIT Site includes expansive landscaping; however, additional mitigation measures could include such features as tall planters with trees that retain their leaves throughout winter. Examples of tall planters can be seen in Image 2 below.



Image 2 – Examples of Tall Planters



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The effective gust criterion is met for the majority of sensor locations around the proposed site, with the exception of Locations 124 and 133 which are expected to exceed the effective gust criterion on an annual basis (Figure 12b). It is recommended these locations be mitigated according to recommendations presented above in Images 1 and 2.

5.2.2 Off-site Walkways and Courtyards

On an annual basis, mean speed conditions are expected to be comfortable for walking or better. Exceptions are at locations north of Site 1. Wind conditions in this area are consistent to those observed in the No Build configuration.

The effective gust criterion was met for the majority of off-site locations around the proposed sites on an annual basis; with the exception of Locations 42 and 53 (see Figure 4b). These locations are predicted to exceed the effective gust criterion, and are consistent to those observed in the No Build configuration.

5.2.3 Above Grade Pedestrian Amenity Spaces

The podium space of the proposed Building 4 Tower is a pedestrian accessible area where wind conditions comfortable for sitting and standing are generally preferred, particularly during the summer. Mean speed conditions (Figure 3b) are expected to be generally comfortable for standing and sitting with some areas rated for walking conditions (locations 152, 154, 156, 159) or uncomfortable (location 157). Several locations on other podium spaces are expected to be exposed to greater wind activity where walking or uncomfortable conditions exist. The exception is the podium spaces on building 5 where standing or better conditions are expected. If desired, conditions can be improved with the use of mitigation measures, including features such as tall porous parapets (8-10 ft tall and 70-80% solid) around the perimeter of select terraces. Alternatively, tall planters around the perimeter and wind screens could help improve comfort conditions (see examples in Image 3).



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Image 3 – Examples of Tall Parapets, Wind Screens and Planters

Pedestrian use of the above grade amenity spaces is not expected during the winter months, however, the mitigation measures recommended to improve the conditions during the summer months will also help to reduce the wind speeds during the winter.

The effective gust criterion shown in Figure 4b was met for most above grade amenity sensor locations, with the exception of Locations 72, 157, and 161. These areas are expected to exceed the effective gust criterion, on an annual basis. It is recommended that wind conditions be improved through mitigation measures, using such features as those presented above in Images 3.



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6. RECOMMENDATIONS

Based on the above discussion on wind conditions, the following conclusions/recommendations can be made:

- In selected areas, the development provides an overall sheltering effect to the wind and improves the existing conditions.
- Recommend the design team consider recessing entrance ways or using vertical wind screens to provide localized wind protection. Recessing entrance ways with problematic wind speed conditions can help to protect from strong approaching winds.
- Tall porous parapets (8-10 ft tall and 70-80% solid) or tall planters and wind screens added around select areas of the podium terraces.

7. APPLICABILITY OF RESULTS

The results presented in this report pertain to the model of the MIT Kendall Square Initiative development constructed using the architectural design drawings listed in Appendix A. Should there be any design changes that deviate from this list of drawings, the results presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

8. REFERENCES

- 1) ASCE Task Committee on Outdoor Human Comfort (2004). *Outdoor Human Comfort and Its Assessment*, 68 pages, American Society of Civil Engineers, Reston, Virginia, USA.
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- 7) Lawson, T.V. (1973). "Wind Environment of Buildings: A Logical Approach to the Establishment of Criteria", *Report No. TVL 7321*, Department of Aeronautic Engineering, University of Bristol, Bristol, England.
- 8) Durgin, F. H. (1997). "Pedestrian Level Wind Criteria Using the Equivalent average", *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 66, pp. 215-226.

TABLES



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
1	A	Spring	15		Standing	21		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	10	-33%	Sitting	15	-29%	Acceptable
		Summer	9	-31%	Sitting	13	-24%	Acceptable
		Fall	10	-23%	Sitting	14	-30%	Acceptable
		Winter	11	-27%	Sitting	20		Acceptable
		Annual	10	-29%	Sitting	16	-23%	Acceptable
2	A	Spring	16		Walking	24		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	6	-63%	Sitting	11	-54%	Acceptable
		Summer	5	-64%	Sitting	8	-60%	Acceptable
		Fall	6	-63%	Sitting	10	-57%	Acceptable
		Winter	10	-41%	Sitting	16	-33%	Acceptable
		Annual	7	-58%	Sitting	11	-51%	Acceptable
3	A	Spring	18		Walking	27		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	18		Walking	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	9	-50%	Sitting	14	-48%	Acceptable
		Summer	8	-50%	Sitting	13	-46%	Acceptable
		Fall	8	-53%	Sitting	13	-50%	Acceptable
		Winter	13	-28%	Standing	21	-25%	Acceptable
		Annual	10	-47%	Sitting	15	-41%	Acceptable
4	A	Spring	20		Uncomfortable	29		Acceptable
		Summer	15		Standing	23		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	15	-25%	Standing	23	-21%	Acceptable
		Summer	13	-13%	Standing	20	-13%	Acceptable
		Fall	14	-22%	Standing	22	-19%	Acceptable
		Winter	15	-25%	Standing	23	-23%	Acceptable
		Annual	14	-25%	Standing	22	-21%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Full Build with Mitigation

Mean Wind Speed Criteria

Comfortable for Sitting: ≤ 12 mph
Comfortable for Standing: > 12 and ≤ 15 mph
Comfortable for Walking: > 15 and ≤ 19 mph
Uncomfortable for Walking: > 19 and ≤ 27 mph
Dangerous Conditions: > 27 mph

Effective Gust Criteria

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
5	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15	15%	Standing	22		Acceptable
		Winter	17	31%	Walking	25	19%	Acceptable
		Annual	15	15%	Standing	22	11%	Acceptable
6	A	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	23	64%	Uncomfortable	30	43%	Acceptable
		Summer	17	55%	Walking	23	28%	Acceptable
		Fall	20	54%	Uncomfortable	27	35%	Acceptable
		Winter	22	57%	Uncomfortable	30	36%	Acceptable
		Annual	21	58%	Uncomfortable	28	38%	Acceptable
7	A	Spring	17		Walking	24		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	24	41%	Uncomfortable	32	33%	Unacceptable
		Summer	18	20%	Walking	24	14%	Acceptable
		Fall	21	31%	Uncomfortable	29	26%	Acceptable
		Winter	23	44%	Uncomfortable	31	29%	Acceptable
		Annual	22	34%	Uncomfortable	29	26%	Acceptable
8	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	19		Walking	26		Acceptable
	B	Spring	16	-20%	Walking	22	-19%	Acceptable
		Summer	14	-18%	Standing	19	-17%	Acceptable
		Fall	15	-17%	Standing	21	-19%	Acceptable
		Winter	12	-37%	Sitting	20	-26%	Acceptable
		Annual	14	-25%	Standing	21	-21%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Full Build with Mitigation

Mean Wind Speed Criteria

Comfortable for Sitting: ≤ 12 mph
Comfortable for Standing: > 12 and ≤ 15 mph
Comfortable for Walking: > 15 and ≤ 19 mph
Uncomfortable for Walking: > 19 and ≤ 27 mph
Dangerous Conditions: > 27 mph

Effective Gust Criteria

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
9	A	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	13	-24%	Standing	20	-20%	Acceptable
		Summer	10	-29%	Sitting	16	-20%	Acceptable
		Fall	12	-20%	Sitting	19	-17%	Acceptable
		Winter	14	-13%	Standing	21	-16%	Acceptable
		Annual	12	-23%	Standing	19	-21%	Acceptable
10	A	Spring	15		Standing	24		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	15		Standing	25		Acceptable
		Annual	14		Standing	23		Acceptable
	B	Spring	23	53%	Uncomfortable	33	38%	Unacceptable
		Summer	18	50%	Walking	24	20%	Acceptable
		Fall	19	36%	Walking	28	22%	Acceptable
		Winter	22	47%	Uncomfortable	31	24%	Acceptable
		Annual	21	46%	Uncomfortable	29	26%	Acceptable
11	A	Spring	18		Walking	28		Acceptable
		Summer	15		Standing	23		Acceptable
		Fall	17		Walking	27		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	18		Walking	28		Acceptable
	B	Spring	11	-39%	Sitting	18	-36%	Acceptable
		Summer	9	-40%	Sitting	14	-39%	Acceptable
		Fall	11	-35%	Sitting	17	-37%	Acceptable
		Winter	15	-25%	Standing	24	-20%	Acceptable
		Annual	12	-36%	Sitting	18	-35%	Acceptable
12	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	17		Walking	27		Acceptable
	B	Spring	15	-17%	Standing	24	-11%	Acceptable
		Summer	12	-14%	Sitting	19		Acceptable
		Fall	14	-18%	Standing	23	-12%	Acceptable
		Winter	16	-16%	Walking	25	-14%	Acceptable
		Annual	14	-16%	Standing	23	-16%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
13	A	Spring	25		Uncomfortable	36		Unacceptable
		Summer	19		Walking	28		Acceptable
		Fall	24		Uncomfortable	35		Unacceptable
		Winter	27		Uncomfortable	39		Unacceptable
		Annual	25		Uncomfortable	36		Unacceptable
	B	Spring	18	-28%	Walking	27	-25%	Acceptable
		Summer	14	-26%	Standing	21	-25%	Acceptable
		Fall	17	-29%	Walking	25	-29%	Acceptable
		Winter	18	-33%	Walking	25	-36%	Acceptable
		Annual	17	-33%	Walking	25	-32%	Acceptable
	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	17	-19%	Walking	24	-17%	Acceptable
		Summer	13	-24%	Standing	18	-25%	Acceptable
		Fall	16	-24%	Walking	22	-24%	Acceptable
		Winter	16	-27%	Walking	23	-26%	Acceptable
		Annual	16	-26%	Walking	22	-25%	Acceptable
15	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	23		Uncomfortable	33		Unacceptable
		Annual	21		Uncomfortable	30		Acceptable
	B	Spring	17	-19%	Walking	24	-20%	Acceptable
		Summer	14	-18%	Standing	19	-21%	Acceptable
		Fall	16	-24%	Walking	22	-24%	Acceptable
		Winter	25		Uncomfortable	36		Unacceptable
		Annual	18	-14%	Walking	25	-16%	Acceptable
	A	Spring	13		Standing	22		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	14		Standing	24		Acceptable
		Annual	13		Standing	22		Acceptable
	B	Spring	9	-31%	Sitting	15	-32%	Acceptable
		Summer	7	-42%	Sitting	11	-42%	Acceptable
		Fall	8	-38%	Sitting	14	-36%	Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	10	-27%	Sitting	16	-28%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
17	A	Spring	11		Sitting	18		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	8	-27%	Sitting	14	-22%	Acceptable
		Summer	6	-25%	Sitting	10	-29%	Acceptable
		Fall	8	-20%	Sitting	13	-19%	Acceptable
		Winter	8	-20%	Sitting	14	-18%	Acceptable
		Annual	8	-25%	Sitting	13	-20%	Acceptable
18	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	10	-17%	Sitting	16	-16%	Acceptable
		Summer	8	-20%	Sitting	13	-19%	Acceptable
		Fall	10		Sitting	15	-17%	Acceptable
		Winter	11		Sitting	18	-10%	Acceptable
		Annual	10	-19%	Sitting	16	-18%	Acceptable
19	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	23		Uncomfortable	32		Unacceptable
		Annual	21		Uncomfortable	30		Acceptable
	B	Spring	20		Uncomfortable	28		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	24		Uncomfortable	33		Unacceptable
		Annual	20		Uncomfortable	28		Acceptable
20	A	Spring	19		Walking	29		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	18		Walking	28		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	18		Walking	28		Acceptable
	B	Spring	17	-11%	Walking	26	-10%	Acceptable
		Summer	13	-19%	Standing	20	-17%	Acceptable
		Fall	16	-11%	Walking	25	-11%	Acceptable
		Winter	18		Walking	29		Acceptable
		Annual	16	-11%	Walking	25	-11%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
21	A	Spring	18		Walking	28		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	13	-28%	Standing	21	-25%	Acceptable
		Summer	10	-38%	Sitting	17	-29%	Acceptable
		Fall	13	-24%	Standing	20	-23%	Acceptable
		Winter	14	-18%	Standing	22	-15%	Acceptable
		Annual	13	-26%	Standing	20	-23%	Acceptable
22	A	Spring	16		Walking	26		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	15		Standing	25		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	15		Standing	25		Acceptable
	B	Spring	14	-13%	Standing	22	-15%	Acceptable
		Summer	11	-21%	Sitting	17	-23%	Acceptable
		Fall	12	-20%	Sitting	20	-20%	Acceptable
		Winter	15	-12%	Standing	23	-15%	Acceptable
		Annual	13	-13%	Standing	21	-18%	Acceptable
23	A	Spring	16		Walking	26		Acceptable
		Summer	13		Standing	22		Acceptable
		Fall	15		Standing	25		Acceptable
		Winter	16		Walking	28		Acceptable
		Annual	15		Standing	26		Acceptable
	B	Spring	14	-13%	Standing	24		Acceptable
		Summer	11	-15%	Sitting	19	-14%	Acceptable
		Fall	13	-13%	Standing	23		Acceptable
		Winter	15		Standing	27		Acceptable
		Annual	13	-12%	Standing	23	-11%	Acceptable
24	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	11	-27%	Sitting	18	-25%	Acceptable
		Summer	9	-31%	Sitting	15	-29%	Acceptable
		Fall	11	-15%	Sitting	18	-18%	Acceptable
		Winter	12	-14%	Sitting	19	-14%	Acceptable
		Annual	11	-23%	Sitting	18	-20%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Full Build with Mitigation

Mean Wind Speed Criteria

Comfortable for Sitting: ≤ 12 mph
Comfortable for Standing: > 12 and ≤ 15 mph
Comfortable for Walking: > 15 and ≤ 19 mph
Uncomfortable for Walking: > 19 and ≤ 27 mph
Dangerous Conditions: > 27 mph

Effective Gust Criteria

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
25	A	Spring	18		Walking	29		Acceptable
		Summer	15		Standing	24		Acceptable
		Fall	17		Walking	28		Acceptable
		Winter	18		Walking	30		Acceptable
		Annual	17		Walking	28		Acceptable
	B	Spring	15	-17%	Standing	26	-10%	Acceptable
		Summer	12	-20%	Sitting	20	-17%	Acceptable
		Fall	15	-12%	Standing	25	-11%	Acceptable
		Winter	16	-11%	Walking	27	-10%	Acceptable
		Annual	15	-15%	Standing	25	-13%	Acceptable
26	A	Spring	14		Standing	24		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	14		Standing	24		Acceptable
		Annual	14		Standing	23		Acceptable
	B	Spring	11	-21%	Sitting	19	-21%	Acceptable
		Summer	9	-25%	Sitting	15	-25%	Acceptable
		Fall	10	-29%	Sitting	18	-22%	Acceptable
		Winter	12	-14%	Sitting	20	-17%	Acceptable
		Annual	11	-25%	Sitting	18	-22%	Acceptable
27	A	Spring	21		Uncomfortable	32		Unacceptable
		Summer	16		Walking	25		Acceptable
		Fall	20		Uncomfortable	30		Acceptable
		Winter	22		Uncomfortable	34		Unacceptable
		Annual	20		Uncomfortable	31		Acceptable
	B	Spring	21		Uncomfortable	31		Acceptable
		Summer	16		Walking	25		Acceptable
		Fall	19		Walking	30		Acceptable
		Winter	21		Uncomfortable	33		Unacceptable
		Annual	19		Uncomfortable	30		Acceptable
28	A	Spring	21		Uncomfortable	31		Acceptable
		Summer	17		Walking	25		Acceptable
		Fall	21		Uncomfortable	30		Acceptable
		Winter	23		Uncomfortable	33		Unacceptable
		Annual	21		Uncomfortable	31		Acceptable
	B	Spring	21		Uncomfortable	30		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	20		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	33		Unacceptable
		Annual	20		Uncomfortable	29		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
29	A	Spring	14		Standing	23		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	23		Acceptable
	B	Spring	12	-14%	Sitting	21		Acceptable
		Summer	9	-25%	Sitting	16	-20%	Acceptable
		Fall	12	-14%	Sitting	19	-14%	Acceptable
		Winter	13	-13%	Standing	21	-13%	Acceptable
		Annual	12	-18%	Sitting	19	-16%	Acceptable
30	A	Spring	23		Uncomfortable	33		Unacceptable
		Summer	18		Walking	26		Acceptable
		Fall	21		Uncomfortable	31		Acceptable
		Winter	24		Uncomfortable	35		Unacceptable
		Annual	22		Uncomfortable	32		Unacceptable
	B	Spring	21		Uncomfortable	30		Acceptable
		Summer	16	-11%	Walking	23	-12%	Acceptable
		Fall	20		Uncomfortable	29		Acceptable
		Winter	23		Uncomfortable	34		Unacceptable
		Annual	20		Uncomfortable	29		Acceptable
31	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	4	-73%	Sitting	6	-73%	Acceptable
		Summer	3	-75%	Sitting	5	-72%	Acceptable
		Fall	4	-71%	Sitting	5	-76%	Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	7	-52%	Sitting	10	-56%	Acceptable
32	A	Spring	16		Walking	26		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	24		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
33	A	Spring	21		Uncomfortable	32		Unacceptable
		Summer	19		Walking	28		Acceptable
		Fall	19		Walking	29		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	20		Uncomfortable	30		Acceptable
	B	Spring	13	-38%	Standing	22	-31%	Acceptable
		Summer	12	-37%	Sitting	19	-32%	Acceptable
		Fall	13	-32%	Standing	22	-24%	Acceptable
		Winter	14	-26%	Standing	23	-21%	Acceptable
		Annual	13	-35%	Standing	22	-28%	Acceptable
34	A	Spring	16		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	12	-14%	Sitting	18	-14%	Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	15		Walking	22		Acceptable
35	A	Spring	21		Uncomfortable	31		Acceptable
		Summer	17		Walking	26		Acceptable
		Fall	20		Uncomfortable	30		Acceptable
		Winter	21		Uncomfortable	32		Unacceptable
		Annual	20		Uncomfortable	30		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	21		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
36	A	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	25		Acceptable
		Fall	19		Walking	29		Acceptable
		Winter	21		Uncomfortable	32		Unacceptable
		Annual	20		Uncomfortable	30		Acceptable
	B	Spring	21		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	32		Unacceptable
		Annual	20		Uncomfortable	29		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
37	A	Spring	16		Walking	24		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	15		Standing	24		Acceptable
		Summer	12	-14%	Sitting	19		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	14	-11%	Standing	23		Acceptable
	A	Spring	19		Walking	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	18		Walking	25		Acceptable
39	A	Spring	22		Uncomfortable	30		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	13		Standing	22		Acceptable
		Annual	12		Standing	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
41	A	Spring	14		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	20	43%	Uncomfortable	27	42%	Acceptable
		Summer	15	50%	Standing	20	33%	Acceptable
		Fall	18	50%	Walking	24	41%	Acceptable
		Winter	13	0%	Standing	18		Acceptable
		Annual	17	38%	Walking	22	24%	Acceptable
42	A	Spring	22		Uncomfortable	32		Unacceptable
		Summer	18		Walking	26		Acceptable
		Fall	21		Uncomfortable	31		Acceptable
		Winter	24		Uncomfortable	35		Unacceptable
		Annual	22		Uncomfortable	32		Unacceptable
	B	Spring	22		Uncomfortable	33		Unacceptable
		Summer	18		Walking	27		Acceptable
		Fall	21		Uncomfortable	31		Acceptable
		Winter	24		Uncomfortable	35		Unacceptable
		Annual	21		Uncomfortable	32		Unacceptable
43	A	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
	B	Spring	16	-11%	Walking	24		Acceptable
		Summer	13	-13%	Standing	19		Acceptable
		Fall	15	-12%	Standing	23		Acceptable
		Winter	17	-11%	Walking	24	-11%	Acceptable
		Annual	15		Walking	23		Acceptable
44	A	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
	B	Spring	14	-13%	Standing	20	-13%	Acceptable
		Summer	12	-14%	Sitting	16	-16%	Acceptable
		Fall	13	-13%	Standing	19	-14%	Acceptable
		Winter	14	-18%	Standing	21	-13%	Acceptable
		Annual	13	-17%	Standing	19	-14%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
45	A	Spring	17		Walking	26		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	16		Walking	25		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24	-11%	Acceptable
		Annual	16		Walking	24		Acceptable
46	A	Spring	23		Uncomfortable	31		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	32		Unacceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	21		Uncomfortable	30		Acceptable
		Summer	15	-12%	Standing	22		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	20	-13%	Uncomfortable	29		Acceptable
		Annual	19	-11%	Walking	27		Acceptable
47	A	Spring	17		Walking	26		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	15	-12%	Standing	23	-12%	Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
48	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	18	-14%	Walking	27		Acceptable
		Summer	13	-13%	Standing	21		Acceptable
		Fall	16	-16%	Walking	25		Acceptable
		Winter	17	-19%	Walking	25	-17%	Acceptable
		Annual	16	-16%	Walking	25	-13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
49	A	Spring	20		Uncomfortable	29		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	15	-25%	Standing	23	-21%	Acceptable
		Summer	12	-14%	Sitting	18		Acceptable
		Fall	14	-22%	Standing	23	-12%	Acceptable
		Winter	15	-21%	Standing	24	-14%	Acceptable
		Annual	14	-22%	Standing	22	-15%	Acceptable
	A	Spring	18		Walking	28		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	20	11%	Uncomfortable	30		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	18		Walking	29	12%	Acceptable
		Annual	18		Walking	28		Acceptable
51	A	Spring	20		Uncomfortable	29		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	23	15%	Uncomfortable	31		Acceptable
		Summer	20	18%	Uncomfortable	27	13%	Acceptable
		Fall	22	16%	Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	22	14%	Uncomfortable	29		Acceptable
	A	Spring	21		Uncomfortable	27		Acceptable
		Summer	16		Walking	21		Acceptable
		Fall	18		Walking	24		Acceptable
		Winter	21		Uncomfortable	27		Acceptable
		Annual	19		Walking	25		Acceptable
	B	Spring	17	-19%	Walking	24	-11%	Acceptable
		Summer	14	-13%	Standing	18	-14%	Acceptable
		Fall	15	-17%	Standing	21	-13%	Acceptable
		Winter	19		Walking	25		Acceptable
		Annual	16	-14%	Walking	22	-12%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
53	A	Spring	29		Dangerous	39		Unacceptable
		Summer	21		Uncomfortable	28		Acceptable
		Fall	26		Uncomfortable	35		Unacceptable
		Winter	28		Dangerous	37		Unacceptable
		Annual	27		Uncomfortable	35		Unacceptable
	B	Spring	29		Dangerous	38		Unacceptable
		Summer	22		Uncomfortable	30		Acceptable
		Fall	26		Uncomfortable	35		Unacceptable
		Winter	27		Uncomfortable	37		Unacceptable
		Annual	26		Uncomfortable	35		Unacceptable
54	A	Spring	19		Walking	28		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	17	-11%	Walking	25	-11%	Acceptable
		Summer	12	-14%	Sitting	18		Acceptable
		Fall	15	-12%	Standing	23	-12%	Acceptable
		Winter	15	-17%	Standing	23	-12%	Acceptable
		Annual	15	-18%	Standing	22	-14%	Acceptable
55	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	18	29%	Walking	27	17%	Acceptable
		Annual	14		Standing	22		Acceptable
56	A	Spring	17		Walking	26		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	16		Walking	27		Acceptable
		Annual	16		Walking	25		Acceptable
	B	Spring	21	24%	Uncomfortable	30	15%	Acceptable
		Summer	18	29%	Walking	26	24%	Acceptable
		Fall	19	19%	Walking	27		Acceptable
		Winter	20	25%	Uncomfortable	30	11%	Acceptable
		Annual	20	22%	Uncomfortable	28	13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
57	A	Spring	17		Walking	26		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	15	-12%	Standing	23	-12%	Acceptable
		Summer	12	-14%	Sitting	18	-18%	Acceptable
		Fall	15	-12%	Standing	22	-12%	Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	16		Walking	23	-12%	Acceptable
	A	Spring	21		Uncomfortable	31		Acceptable
		Summer	17		Walking	25		Acceptable
		Fall	21		Uncomfortable	30		Acceptable
		Winter	23		Uncomfortable	33		Unacceptable
		Annual	21		Uncomfortable	31		Acceptable
	B	Spring	16	-24%	Walking	24	-23%	Acceptable
		Summer	14	-18%	Standing	21	-16%	Acceptable
		Fall	15	-29%	Standing	22	-27%	Acceptable
		Winter	14	-39%	Standing	23	-30%	Acceptable
		Annual	15	-30%	Standing	23	-27%	Acceptable
59	A	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	25		Acceptable
	B	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	17		Walking	25		Acceptable
	A	Spring	20		Uncomfortable	28		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	19		Walking	26		Acceptable
	B	Spring	14	-30%	Standing	23	-18%	Acceptable
		Summer	12	-20%	Sitting	19	-14%	Acceptable
		Fall	14	-22%	Standing	22	-15%	Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	15	-20%	Walking	24	-10%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
61	A	Spring	20		Uncomfortable	29		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	13	-35%	Standing	21	-28%	Acceptable
		Summer	11	-31%	Sitting	17	-26%	Acceptable
		Fall	13	-28%	Standing	20	-26%	Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	14	-26%	Standing	22	-23%	Acceptable
62	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	15		Standing	24		Acceptable
	B	Spring	13	-19%	Standing	22	-12%	Acceptable
		Summer	10	-23%	Sitting	17	-15%	Acceptable
		Fall	13	-13%	Standing	21		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	13	-13%	Standing	21	-11%	Acceptable
63	A	Spring	22		Uncomfortable	31		Acceptable
		Summer	17		Walking	25		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	23		Uncomfortable	33		Unacceptable
		Annual	21		Uncomfortable	30		Acceptable
	B	Spring	19	-14%	Walking	28		Acceptable
		Summer	15	-12%	Standing	22	-12%	Acceptable
		Fall	18	-14%	Walking	27		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	19	-12%	Walking	27		Acceptable
64	A	Spring	22		Uncomfortable	33		Unacceptable
		Summer	18		Walking	27		Acceptable
		Fall	21		Uncomfortable	31		Acceptable
		Winter	22		Uncomfortable	33		Unacceptable
		Annual	21		Uncomfortable	31		Acceptable
	B	Spring	17	-23%	Walking	26	-21%	Acceptable
		Summer	14	-22%	Standing	21	-22%	Acceptable
		Fall	16	-24%	Walking	25	-19%	Acceptable
		Winter	20		Uncomfortable	31		Acceptable
		Annual	17	-20%	Walking	26	-17%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
65	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	18		Walking	25		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	16	-24%	Walking	25	-17%	Acceptable
		Summer	14	-22%	Standing	22	-12%	Acceptable
		Fall	15	-25%	Standing	24	-14%	Acceptable
		Winter	16	-24%	Walking	25	-14%	Acceptable
		Annual	15	-24%	Walking	24	-14%	Acceptable
66	A	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	16	-16%	Walking	24	-14%	Acceptable
		Summer	12	-20%	Sitting	18	-14%	Acceptable
		Fall	14	-22%	Standing	22	-15%	Acceptable
		Winter	17	-11%	Walking	26		Acceptable
		Annual	15	-18%	Standing	23	-13%	Acceptable
67	A	Spring	11		Sitting	18		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	19		Acceptable
		Annual	10		Sitting	18		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16	-11%	Acceptable
68	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	13	18%	Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Full Build with Mitigation

Mean Wind Speed Criteria

Comfortable for Sitting: ≤ 12 mph
Comfortable for Standing: > 12 and ≤ 15 mph
Comfortable for Walking: > 15 and ≤ 19 mph
Uncomfortable for Walking: > 19 and ≤ 27 mph
Dangerous Conditions: > 27 mph

Effective Gust Criteria

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
69	A	DATA NOT AVAILABLE						
	B	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	18		Walking	26		Acceptable
70		DATA NOT AVAILABLE						
	B	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	17		Walking	25		Acceptable
71		DATA NOT AVAILABLE						
	B	Spring	19		Walking	27		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
72		DATA NOT AVAILABLE						
	B	Spring	25		Uncomfortable	34		Unacceptable
		Summer	19		Walking	26		Acceptable
		Fall	23		Uncomfortable	31		Acceptable
		Winter	25		Uncomfortable	35		Unacceptable
		Annual	23		Uncomfortable	32		Unacceptable
73		DATA NOT AVAILABLE						
	B	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
74		DATA NOT AVAILABLE						
	B	Spring	23		Uncomfortable	32		Unacceptable
		Summer	19		Walking	27		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	25		Uncomfortable	33		Unacceptable
		Annual	22		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
75	DATA NOT AVAILABLE							
	B	Spring	20		Uncomfortable	29		Acceptable
		Summer	16		Walking	25		Acceptable
		Fall	18		Walking	28		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
76	DATA NOT AVAILABLE							
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	17		Walking	26		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	19		Walking	29		Acceptable
77	A	Spring	11		Sitting	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	21		Acceptable
		Annual	11		Sitting	20		Acceptable
	B	Spring	9	-18%	Sitting	14	-30%	Acceptable
		Summer	7	-30%	Sitting	13	-19%	Acceptable
		Fall	8	-27%	Sitting	14	-26%	Acceptable
		Winter	9	-25%	Sitting	15	-29%	Acceptable
		Annual	8	-25%	Sitting	14	-30%	Acceptable
78	A	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	21		Acceptable
		Annual	11		Sitting	20		Acceptable
	B	Spring	17	42%	Walking	25	25%	Acceptable
		Summer	14	56%	Standing	21	31%	Acceptable
		Fall	16	45%	Walking	24	26%	Acceptable
		Winter	21	75%	Uncomfortable	32	52%	Unacceptable
		Annual	17	55%	Walking	26	28%	Acceptable
79	A	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	7	-42%	Sitting	12	-40%	Acceptable
		Summer	6	-40%	Sitting	10	-38%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
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Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
80	A	Fall	7	-42%	Sitting	11	-42%	Acceptable
		Winter	8	-38%	Sitting	12	-43%	Acceptable
		Annual	7	-42%	Sitting	11	-44%	Acceptable
		Spring	13		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
	B	Fall	13		Standing	21		Acceptable
		Winter	14		Standing	24		Acceptable
		Annual	13		Standing	22		Acceptable
		Spring	8	-38%	Sitting	13	-41%	Acceptable
		Summer	7	-36%	Sitting	12	-33%	Acceptable
		Fall	8	-38%	Sitting	13	-38%	Acceptable
		Winter	10	-29%	Sitting	16	-33%	Acceptable
		Annual	8	-37%	Sitting	14	-39%	Acceptable
	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	15	-17%	Standing	24	-11%	Acceptable
		Summer	12	-14%	Sitting	19	-14%	Acceptable
		Fall	14	-18%	Standing	22	-15%	Acceptable
		Winter	18		Walking	28		Acceptable
		Annual	15	-13%	Standing	23	-11%	Acceptable
82	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	17		Walking	27		Acceptable
	B	Spring	15	-17%	Standing	23	-15%	Acceptable
		Summer	13		Standing	18	-18%	Acceptable
		Fall	15	-12%	Standing	22	-15%	Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	16		Walking	23	-15%	Acceptable
	A	Spring	16		Walking	26		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	16		Walking	25		Acceptable
83	B	Spring	22	38%	Uncomfortable	30	15%	Acceptable
		Summer	20	54%	Uncomfortable	26	24%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
84		Fall	21	31%	Uncomfortable	29	21%	Acceptable
		Winter	28	65%	Dangerous	37	37%	Unacceptable
		Annual	23	42%	Uncomfortable	31	22%	Acceptable
	A	Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	21		Acceptable
		Annual	11		Sitting	19		Acceptable
	B	Spring	15	36%	Standing	25	32%	Acceptable
		Summer	13	44%	Standing	22	38%	Acceptable
		Fall	14	27%	Standing	24	33%	Acceptable
		Winter	20	67%	Uncomfortable	30	43%	Acceptable
		Annual	16	41%	Walking	25	33%	Acceptable
85	A	Spring	14		Standing	25		Acceptable
		Summer	11		Sitting	19		Acceptable
		Fall	13		Standing	23		Acceptable
		Winter	14		Standing	24		Acceptable
		Annual	13		Standing	23		Acceptable
	B	Spring	14		Standing	22	-12%	Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	16	14%	Walking	25		Acceptable
		Annual	14		Standing	22		Acceptable
86	A	Spring	15		Standing	26		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	17		Walking	28		Acceptable
		Annual	15		Standing	26		Acceptable
	B	Spring	13	-13%	Standing	20	-23%	Acceptable
		Summer	11		Sitting	16	-20%	Acceptable
		Fall	13	-13%	Standing	20	-17%	Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	13	-12%	Standing	21	-21%	Acceptable
87	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	19		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	14		Standing	24		Acceptable
		Annual	13		Standing	22		Acceptable
	B	Spring	14		Standing	20	-13%	Acceptable
		Summer	12		Sitting	17	-11%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
88	A	Fall	13	29%	Standing	20	13%	Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	14		Standing	21		Acceptable
		Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	20	25%	Uncomfortable	28	22%	Acceptable
		Summer	17	42%	Walking	23	28%	Acceptable
		Fall	18	29%	Walking	26	18%	Acceptable
		Winter	23	53%	Uncomfortable	33	43%	Unacceptable
		Annual	20	39%	Uncomfortable	28	25%	Acceptable
	A	Spring	9		Sitting	15		Acceptable
		Summer	7		Sitting	12		Acceptable
		Fall	8		Sitting	14		Acceptable
		Winter	9		Sitting	16		Acceptable
		Annual	8		Sitting	15		Acceptable
	B	Spring	11	22%	Sitting	16	19%	Acceptable
		Summer	9	29%	Sitting	13		Acceptable
		Fall	9	13%	Sitting	14		Acceptable
		Winter	11	22%	Sitting	19		Acceptable
		Annual	10	25%	Sitting	16		Acceptable
90	A	Spring	9		Sitting	15		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	15		Acceptable
	B	Spring	8	-11%	Sitting	12	-20%	Acceptable
		Summer	6	-25%	Sitting	10	-23%	Acceptable
		Fall	7	-22%	Sitting	11	-27%	Acceptable
		Winter	13	30%	Standing	20	25%	Acceptable
		Annual	9	-6%	Sitting	13	-12%	Acceptable
	A	Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	10		Sitting	18		Acceptable
		Winter	11		Sitting	19		Acceptable
		Annual	10		Sitting	18		Acceptable
91	B	Spring	10	-11%	Sitting	17	-11%	Acceptable
		Summer	8		Sitting	14	-13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
92	A	Fall	10		Sitting	15	-17%	Acceptable
		Winter	14	27%	Standing	21	11%	Acceptable
		Annual	11		Sitting	17		Acceptable
		Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
	B	Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	19		Acceptable
		Spring	21	91%	Uncomfortable	28	47%	Acceptable
		Summer	18	100%	Walking	23	44%	Acceptable
		Fall	19	73%	Walking	26	44%	Acceptable
		Winter	31	158%	Dangerous	40	100%	Unacceptable
		Annual	22	102%	Uncomfortable	29	54%	Acceptable
	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	19		Acceptable
	B	Spring	15	25%	Standing	23	21%	Acceptable
		Summer	12	20%	Sitting	19	19%	Acceptable
		Fall	14	27%	Standing	22	16%	Acceptable
		Winter	16	33%	Walking	25	25%	Acceptable
		Annual	14	30%	Standing	22	17%	Acceptable
94	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	19		Acceptable
	B	Spring	17	42%	Walking	23	21%	Acceptable
		Summer	15	50%	Standing	20	25%	Acceptable
		Fall	16	45%	Walking	22	16%	Acceptable
		Winter	28	133%	Dangerous	36	80%	Unacceptable
		Annual	19	73%	Walking	25	33%	Acceptable
	A	Spring	9		Sitting	15		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	8		Sitting	15		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	8		Sitting	15		Acceptable
95	B	Spring	7	-22%	Sitting	11	-27%	Acceptable
		Summer	6	-25%	Sitting	9	-31%	Acceptable

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2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
96	A	Fall	6	-25%	Sitting	10	-33%	Acceptable
		Winter	24	167%	Uncomfortable	33	120%	Unacceptable
		Annual	11	34%	Sitting	16		Acceptable
		Spring	22		Uncomfortable	31		Acceptable
		Summer	18		Walking	25		Acceptable
	B	Fall	20		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	32		Unacceptable
		Annual	21		Uncomfortable	29		Acceptable
		Spring	14	-36%	Standing	23	-26%	Acceptable
		Summer	12	-33%	Sitting	19	-24%	Acceptable
		Fall	14	-30%	Standing	21	-28%	Acceptable
		Winter	18	-18%	Walking	29		Acceptable
		Annual	15	-31%	Standing	23	-21%	Acceptable
	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	15		Standing	25		Acceptable
		Annual	14		Standing	23		Acceptable
	B	Spring	13	-13%	Standing	20	-17%	Acceptable
		Summer	12		Sitting	18	-10%	Acceptable
		Fall	13		Standing	19	-14%	Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	13		Standing	20	-13%	Acceptable
98	A	Spring	20		Uncomfortable	28		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	8	-60%	Sitting	12	-57%	Acceptable
		Summer	6	-60%	Sitting	10	-55%	Acceptable
		Fall	7	-59%	Sitting	12	-52%	Acceptable
		Winter	13	-35%	Standing	21	-25%	Acceptable
		Annual	9	-53%	Sitting	14	-47%	Acceptable
	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	7	-50%	Sitting	11	-52%	Acceptable
		Summer	6	-45%	Sitting	9	-50%	Acceptable
99	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	7	-50%	Sitting	11	-52%	Acceptable
		Summer	6	-45%	Sitting	9	-50%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
100	A	Fall	6	-54%	Sitting	10	-55%	Acceptable
		Winter	12	-14%	Sitting	19	-17%	Acceptable
		Annual	8	-45%	Sitting	12	-44%	Acceptable
		Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	12		Sitting	20		Acceptable
	B	Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
		Spring	14		Standing	22		Acceptable
		Summer	13	30%	Standing	19	12%	Acceptable
		Fall	14	17%	Standing	21		Acceptable
		Winter	18	29%	Walking	26	18%	Acceptable
101	A	Annual	15	13%	Standing	22		Acceptable
		Spring	14		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	15	7%	Standing	23		Acceptable
		Summer	14	17%	Standing	20	11%	Acceptable
		Fall	15	15%	Standing	22		Acceptable
		Winter	19	27%	Walking	27	13%	Acceptable
		Annual	16	13%	Walking	23		Acceptable
102	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	17	13%	Walking	25		Acceptable
		Annual	14		Standing	21		Acceptable
103	A	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	11	-15%	Sitting	19		Acceptable
		Summer	10		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
104	A	Fall	11	-15%	Sitting	18	-14%	Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	12	-10%	Sitting	20		Acceptable
		Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
	B	Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
		Spring	11	-21%	Sitting	18	-14%	Acceptable
		Summer	9	-25%	Sitting	14	-22%	Acceptable
		Fall	10	-23%	Sitting	17	-15%	Acceptable
		Winter	15		Standing	23		Acceptable
	A	Annual	11	-13%	Sitting	18	-14%	Acceptable
		Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	12	-20%	Sitting	19	-17%	Acceptable
		Summer	11		Sitting	16	-11%	Acceptable
		Fall	12		Sitting	18	-14%	Acceptable
		Winter	13	-13%	Standing	21		Acceptable
		Annual	12	-14%	Sitting	19	-16%	Acceptable
106	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	16	14%	Walking	22		Acceptable
		Summer	14	27%	Standing	20	11%	Acceptable
		Fall	15	15%	Standing	21		Acceptable
		Winter	18	29%	Walking	26	13%	Acceptable
		Annual	16	21%	Walking	22		Acceptable
107	A	Spring	18		Walking	28		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	16		Walking	26		Acceptable
		Winter	17		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	21	17%	Uncomfortable	28		Acceptable
		Summer	19	36%	Walking	25	14%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
108	A	Fall	21	31%	Uncomfortable	27		Acceptable
		Winter	27	59%	Uncomfortable	36	29%	Unacceptable
		Annual	22	29%	Uncomfortable	29	12%	Acceptable
		Spring	18		Walking	27		Acceptable
		Summer	15		Standing	23		Acceptable
		Fall	18		Walking	26		Acceptable
	B	Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
		Spring	10	-44%	Sitting	17	-37%	Acceptable
		Summer	9	-40%	Sitting	14	-39%	Acceptable
		Fall	10	-44%	Sitting	16	-38%	Acceptable
		Winter	17	-15%	Walking	27		Acceptable
		Annual	12	-36%	Sitting	19	-31%	Acceptable
	A	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	19		Walking	27		Acceptable
		Spring	15	-21%	Standing	22	-21%	Acceptable
109	B	Summer	12	-20%	Sitting	18	-18%	Acceptable
		Fall	14	-22%	Standing	22	-19%	Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	15	-20%	Walking	23	-16%	Acceptable
	A	Spring	22		Uncomfortable	32		Unacceptable
		Summer	17		Walking	25		Acceptable
		Fall	21		Uncomfortable	30		Acceptable
		Winter	23		Uncomfortable	34		Unacceptable
		Annual	21		Uncomfortable	31		Acceptable
		Spring	12	-45%	Sitting	20	-38%	Acceptable
	B	Summer	9	-47%	Sitting	15	-40%	Acceptable
		Fall	11	-48%	Sitting	18	-40%	Acceptable
		Winter	11	-52%	Sitting	19	-44%	Acceptable
		Annual	11	-49%	Sitting	18	-42%	Acceptable
	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	17		Walking	27		Acceptable
		Winter	19		Walking	30		Acceptable
		Annual	17		Walking	27		Acceptable
		Spring	14	-22%	Standing	21	-22%	Acceptable
111	B	Summer	11	-21%	Sitting	17	-23%	Acceptable

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2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
112	A	Fall	13	-24%	Standing	20	-26%	Acceptable
		Winter	16	-16%	Walking	24	-20%	Acceptable
		Annual	14	-21%	Standing	21	-24%	Acceptable
		Spring	20		Uncomfortable	28		Acceptable
		Summer	16		Walking	22		Acceptable
	B	Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
		Spring	21		Uncomfortable	28		Acceptable
		Summer	18	13%	Walking	25	14%	Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	24	14%	Uncomfortable	32		Unacceptable
		Annual	21		Uncomfortable	28		Acceptable
	A	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	12	-29%	Sitting	18	-28%	Acceptable
		Summer	10	-23%	Sitting	16	-16%	Acceptable
		Fall	11	-27%	Sitting	17	-26%	Acceptable
		Winter	13	-24%	Standing	21	-13%	Acceptable
		Annual	12	-28%	Sitting	18	-22%	Acceptable
114	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	13		Standing	22		Acceptable
	B	Spring	12	-14%	Sitting	19	-14%	Acceptable
		Summer	10		Sitting	15	-17%	Acceptable
		Fall	11	-15%	Sitting	18	-14%	Acceptable
		Winter	18	20%	Walking	27	17%	Acceptable
		Annual	13		Standing	20		Acceptable
115	A	Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	21		Acceptable
		Annual	11		Sitting	19		Acceptable
	B	Spring	12		Sitting	21	11%	Acceptable
		Summer	10	11%	Sitting	16		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
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Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
116	A	Fall	12		Sitting	20		Acceptable
		Winter	16	33%	Walking	26	24%	Acceptable
		Annual	13	14%	Standing	21		Acceptable
		Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
	B	Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
		Spring	11	-15%	Sitting	15	-25%	Acceptable
		Summer	9		Sitting	13	-19%	Acceptable
	A	Fall	10	-17%	Sitting	14	-26%	Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11	-13%	Sitting	15	-20%	Acceptable
		Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
	B	Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
117	A	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	9	-31%	Sitting	15	-29%	Acceptable
		Summer	7	-36%	Sitting	12	-29%	Acceptable
		Fall	8	-33%	Sitting	14	-26%	Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	10	-21%	Sitting	16	-20%	Acceptable
	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	9	-18%	Sitting	15	-12%	Acceptable
		Summer	7	-22%	Sitting	12	-20%	Acceptable
		Fall	8	-20%	Sitting	14	-18%	Acceptable
		Winter	14	27%	Standing	23	28%	Acceptable
		Annual	10		Sitting	16		Acceptable
118	A	Spring	12		Sitting	21		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	12		Sitting	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	11		Sitting	18	-14%	Acceptable
		Summer	9		Sitting	14	-18%	Acceptable
119	A	Spring	12		Sitting	21		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	12		Sitting	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	11		Sitting	18	-14%	Acceptable
		Summer	9		Sitting	14	-18%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
120	A	Fall	10	-17%	Sitting	16	-16%	Acceptable
		Winter	17	42%	Walking	27	29%	Acceptable
		Annual	12		Sitting	19		Acceptable
		Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
	B	Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	19		Acceptable
		Annual	10		Sitting	17		Acceptable
		Spring	15	36%	Standing	24	33%	Acceptable
		Summer	12	33%	Sitting	18	29%	Acceptable
		Fall	14	40%	Standing	22	29%	Acceptable
		Winter	19	73%	Walking	29	53%	Acceptable
		Annual	15	50%	Standing	23	37%	Acceptable
	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	18		Acceptable
121	B	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	17	42%	Walking	27	35%	Acceptable
		Annual	12		Sitting	20		Acceptable
	A	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	14	17%	Standing	23	15%	Acceptable
		Summer	11		Sitting	18	13%	Acceptable
		Fall	13		Standing	22	16%	Acceptable
		Winter	16	23%	Walking	26	24%	Acceptable
		Annual	14	13%	Standing	22	11%	Acceptable
122	A	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	14	17%	Standing	23	15%	Acceptable
		Summer	11		Sitting	18	13%	Acceptable
		Fall	13		Standing	22	16%	Acceptable
		Winter	16	23%	Walking	26	24%	Acceptable
		Annual	14	13%	Standing	22	11%	Acceptable
123	A	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	14	17%	Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
124	A	Fall	13	18%	Standing	20		Acceptable
		Winter	14	17%	Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
		Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
	B	Fall	16		Walking	24		Acceptable
		Winter	18		Walking	28		Acceptable
		Annual	17		Walking	25		Acceptable
		Spring	23	35%	Uncomfortable	33	32%	Unacceptable
		Summer	19	36%	Walking	27	29%	Acceptable
		Fall	22	38%	Uncomfortable	32	33%	Unacceptable
		Winter	26	44%	Uncomfortable	37	32%	Unacceptable
		Annual	23	32%	Uncomfortable	32	29%	Unacceptable
125	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	13	-19%	Standing	20	-20%	Acceptable
		Summer	11	-15%	Sitting	17	-15%	Acceptable
		Fall	12	-25%	Sitting	19	-21%	Acceptable
		Winter	14	-18%	Standing	21	-19%	Acceptable
		Annual	13	-22%	Standing	19	-20%	Acceptable
126	A	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	10		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	21	110%	Uncomfortable	30	76%	Acceptable
		Summer	18	125%	Walking	25	79%	Acceptable
		Fall	20	100%	Uncomfortable	29	81%	Acceptable
		Winter	23	130%	Uncomfortable	33	83%	Unacceptable
		Annual	21	105%	Uncomfortable	29	83%	Acceptable
127	A	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	17	21%	Walking	25	19%	Acceptable
		Summer	14	27%	Standing	21	17%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
128		Fall	16	23%	Walking	24	20%	Acceptable
		Winter	18	29%	Walking	27	23%	Acceptable
		Annual	16	25%	Walking	24	15%	Acceptable
	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	20	33%	Uncomfortable	29	21%	Acceptable
		Summer	17	31%	Walking	24	26%	Acceptable
		Fall	19	36%	Walking	28	22%	Acceptable
		Winter	26	63%	Uncomfortable	36	44%	Unacceptable
		Annual	21	37%	Uncomfortable	29	27%	Acceptable
	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	12		Sitting	21		Acceptable
	B	Spring	17	31%	Walking	25	19%	Acceptable
		Summer	14	40%	Standing	20	18%	Acceptable
		Fall	16	33%	Walking	24	20%	Acceptable
		Winter	21	50%	Uncomfortable	30	30%	Acceptable
		Annual	17	42%	Walking	25	18%	Acceptable
130	A	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	13		Standing	22		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	15	25%	Standing	24	20%	Acceptable
		Summer	12	33%	Sitting	19	19%	Acceptable
		Fall	15	36%	Standing	23	21%	Acceptable
		Winter	19	46%	Walking	27	23%	Acceptable
		Annual	15	27%	Walking	23	16%	Acceptable
131	A	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	21	75%	Uncomfortable	30	58%	Acceptable
		Summer	17	89%	Walking	24	50%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
132	A	Fall	21	91%	Uncomfortable	29	61%	Acceptable
		Winter	26	100%	Uncomfortable	36	71%	Unacceptable
		Annual	21	77%	Uncomfortable	30	57%	Acceptable
		Spring	13		Standing	22		Acceptable
		Summer	12		Sitting	19		Acceptable
	B	Fall	12		Sitting	20		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	13		Standing	21		Acceptable
		Spring	18	38%	Walking	25	14%	Acceptable
		Summer	14	17%	Standing	20		Acceptable
		Fall	17	42%	Walking	24	20%	Acceptable
		Winter	20	54%	Uncomfortable	28	33%	Acceptable
		Annual	17	33%	Walking	24	15%	Acceptable
	A	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	20		Acceptable
133	B	Spring	26	100%	Uncomfortable	35	67%	Unacceptable
		Summer	22	100%	Uncomfortable	29	71%	Acceptable
		Fall	25	108%	Uncomfortable	34	79%	Unacceptable
		Winter	26	100%	Uncomfortable	36	80%	Unacceptable
		Annual	25	106%	Uncomfortable	34	68%	Unacceptable
	A	Spring	11		Sitting	18		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	18	13%	Acceptable
		Winter	16	45%	Walking	26	53%	Acceptable
		Annual	12	20%	Sitting	20	15%	Acceptable
134	A	Spring	14		Standing	23		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	13		Standing	20	-13%	Acceptable
		Summer	11	-15%	Sitting	16	-20%	Acceptable
	A	Spring	14		Standing	23		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
135	B	Spring	13		Standing	20	-13%	Acceptable
		Summer	11	-15%	Sitting	16	-20%	Acceptable
	A	Spring	14		Standing	23		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	13		Standing	20	-13%	Acceptable
		Summer	11	-15%	Sitting	16	-20%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
136	A	Fall	12	-14%	Sitting	20		Acceptable
		Winter	17	21%	Walking	26	18%	Acceptable
		Annual	13		Standing	21		Acceptable
		Spring	12		Sitting	20		Acceptable
		Summer	11		Sitting	18		Acceptable
	B	Fall	12		Sitting	19		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	19		Acceptable
		Spring	23	92%	Uncomfortable	31	55%	Acceptable
		Summer	20	82%	Uncomfortable	26	44%	Acceptable
		Fall	22	83%	Uncomfortable	30	58%	Acceptable
		Winter	24	100%	Uncomfortable	33	65%	Unacceptable
		Annual	22	85%	Uncomfortable	30	58%	Acceptable
	A	Spring	22		Uncomfortable	33		Unacceptable
		Summer	19		Walking	29		Acceptable
		Fall	21		Uncomfortable	31		Acceptable
		Winter	22		Uncomfortable	33		Unacceptable
		Annual	21		Uncomfortable	31		Acceptable
	B	Spring	16	-27%	Walking	23	-30%	Acceptable
		Summer	13	-32%	Standing	19	-34%	Acceptable
		Fall	15	-29%	Standing	22	-29%	Acceptable
		Winter	19	-14%	Walking	27	-18%	Acceptable
		Annual	16	-25%	Walking	23	-27%	Acceptable
138	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	19		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	10		Sitting	16	-11%	Acceptable
		Summer	8	-11%	Sitting	14		Acceptable
		Fall	9		Sitting	16		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	10		Sitting	16		Acceptable
139	A	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	16	33%	Walking	23	21%	Acceptable
		Summer	13	44%	Standing	18	13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
140		Fall	15	36%	Standing	21	17%	Acceptable
		Winter	18	50%	Walking	27	35%	Acceptable
		Annual	16	41%	Walking	22	24%	Acceptable
	A	Spring	17		Walking	25		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	19	12%	Walking	26		Acceptable
		Summer	17	13%	Walking	23		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	20	11%	Uncomfortable	27		Acceptable
		Annual	19		Walking	25		Acceptable
	A	Spring	21		Uncomfortable	31		Acceptable
		Summer	19		Walking	27		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	29		Acceptable
	B	Spring	22		Uncomfortable	31		Acceptable
		Summer	17	-11%	Walking	25		Acceptable
		Fall	21	11%	Uncomfortable	30		Acceptable
		Winter	20		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	29		Acceptable
142	A	Spring	20		Uncomfortable	30		Acceptable
		Summer	18		Walking	26		Acceptable
		Fall	18		Walking	28		Acceptable
		Winter	18		Walking	28		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	15	-25%	Standing	21	-30%	Acceptable
		Summer	13	-28%	Standing	18	-31%	Acceptable
		Fall	13	-28%	Standing	20	-29%	Acceptable
		Winter	15	-17%	Standing	23	-18%	Acceptable
		Annual	14	-26%	Standing	21	-27%	Acceptable
	A	Spring	20		Uncomfortable	30		Acceptable
		Summer	17		Walking	26		Acceptable
		Fall	18		Walking	29		Acceptable
		Winter	19		Walking	30		Acceptable
		Annual	19		Walking	29		Acceptable
	B	Spring	8	-60%	Sitting	12	-60%	Acceptable
		Summer	7	-59%	Sitting	10	-62%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
144	A	Fall	7	-61%	Sitting	12	-59%	Acceptable
		Winter	11	-42%	Sitting	19	-37%	Acceptable
		Annual	8	-57%	Sitting	13	-54%	Acceptable
		Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
	B	Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
		Spring	16	33%	Walking	24	26%	Acceptable
		Summer	12	33%	Sitting	19	27%	Acceptable
		Fall	15	25%	Standing	23	28%	Acceptable
		Winter	16	14%	Walking	25	25%	Acceptable
		Annual	15	23%	Standing	23	20%	Acceptable
	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	12	-20%	Sitting	18	-25%	Acceptable
		Summer	10	-23%	Sitting	15	-29%	Acceptable
		Fall	12	-14%	Sitting	18	-18%	Acceptable
		Winter	13		Standing	20	-9%	Acceptable
		Annual	12	-16%	Sitting	18	-19%	Acceptable
146	A	Spring	25		Uncomfortable	34		Unacceptable
		Summer	21		Uncomfortable	28		Acceptable
		Fall	24		Uncomfortable	33		Unacceptable
		Winter	28		Dangerous	38		Unacceptable
		Annual	25		Uncomfortable	35		Unacceptable
	B	Spring	21	-16%	Uncomfortable	30	-12%	Acceptable
		Summer	18	-14%	Walking	25	-11%	Acceptable
		Fall	21	-13%	Uncomfortable	30		Acceptable
		Winter	23	-18%	Uncomfortable	33	-13%	Unacceptable
		Annual	21	-17%	Uncomfortable	30	-16%	Acceptable
	A	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	23		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17		Walking	26		Acceptable
147	B	Spring	15	-17%	Standing	24	-11%	Acceptable
		Summer	13	-13%	Standing	20	-13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Fall	15	-12%	Standing	23	-12%	Acceptable
		Winter	16	-11%	Walking	25		Acceptable
		Annual	15	-13%	Standing	23	-12%	Acceptable
148	DATA NOT AVAILABLE							
	B	Spring	11		Sitting	18		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	11		Sitting	18		Acceptable
149	DATA NOT AVAILABLE							
	B	Spring	11		Sitting	18		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	11		Sitting	18		Acceptable
150	DATA NOT AVAILABLE							
	B	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
151	DATA NOT AVAILABLE							
	B	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	11		Sitting	18		Acceptable
152	DATA NOT AVAILABLE							
	B	Spring	15		Standing	23		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	15		Walking	23		Acceptable
153	DATA NOT AVAILABLE							
	6	Acceptable			Annual		4	Sitting
	B	Spring	10		Sitting	15		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Summer	8		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	12		Sitting	18		Acceptable
154		DATA NOT AVAILABLE						
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	26		Acceptable
155		DATA NOT AVAILABLE						
	B	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
156		DATA NOT AVAILABLE						
	B	Spring	19		Walking	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	23		Uncomfortable	32		Unacceptable
		Annual	19		Walking	27		Acceptable
157		DATA NOT AVAILABLE						
	B	Spring	27		Uncomfortable	37		Unacceptable
		Summer	25		Uncomfortable	33		Unacceptable
		Fall	27		Uncomfortable	36		Unacceptable
		Winter	29		Dangerous	39		Unacceptable
		Annual	27		Uncomfortable	36		Unacceptable
158		DATA NOT AVAILABLE						
	B	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	22		Acceptable
159		DATA NOT AVAILABLE						
	B	Spring	19		Walking	29		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Full Build with Mitigation

Mean Wind Speed Criteria

Comfortable for Sitting: ≤ 12 mph
Comfortable for Standing: > 12 and ≤ 15 mph
Comfortable for Walking: > 15 and ≤ 19 mph
Uncomfortable for Walking: > 19 and ≤ 27 mph
Dangerous Conditions: > 27 mph

Effective Gust Criteria

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Summer	17		Walking	26		Acceptable
		Fall	18		Walking	28		Acceptable
		Winter	20		Uncomfortable	31		Acceptable
		Annual	19		Walking	29		Acceptable
160		DATA NOT AVAILABLE						
	B	Spring	10		Sitting	16		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
161		DATA NOT AVAILABLE						
	B	Spring	24		Uncomfortable	32		Unacceptable
		Summer	22		Uncomfortable	28		Acceptable
		Fall	24		Uncomfortable	31		Acceptable
		Winter	27		Uncomfortable	35		Unacceptable
		Annual	24		Uncomfortable	32		Unacceptable
162		DATA NOT AVAILABLE						
	B	Spring	11		Sitting	20		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	12		Sitting	23		Acceptable
		Annual	11		Sitting	20		Acceptable
163		DATA NOT AVAILABLE						
	B	Spring	13		Standing	22		Acceptable
		Summer	10		Sitting	18		Acceptable
		Fall	12		Sitting	21		Acceptable
		Winter	15		Standing	26		Acceptable
		Annual	13		Standing	22		Acceptable
164	A	Spring	17		Walking	27		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	16		Walking	26		Acceptable
	B	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	15		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
165	A	Spring	19		Walking	27		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
	B	Spring	19		Walking	26		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	A	Spring	25		Uncomfortable	34		Unacceptable
		Summer	21		Uncomfortable	28		Acceptable
		Fall	24		Uncomfortable	32		Unacceptable
		Winter	25		Uncomfortable	35		Unacceptable
		Annual	24		Uncomfortable	33		Unacceptable
	B	Spring	22	-12%	Uncomfortable	31		Acceptable
		Summer	17	-19%	Walking	24	-14%	Acceptable
		Fall	20	-17%	Uncomfortable	29		Acceptable
		Winter	22	-12%	Uncomfortable	31	-11%	Acceptable
		Annual	20	-16%	Uncomfortable	29	-13%	Acceptable
167	A	DATA NOT AVAILABLE						
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	17		Walking	27		Acceptable
		Fall	20		Uncomfortable	30		Acceptable
		Winter	22		Uncomfortable	33		Unacceptable
		Annual	20		Uncomfortable	30		Acceptable
168	A	DATA NOT AVAILABLE						
	B	Spring	19		Walking	27		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
169	A	DATA NOT AVAILABLE						
	B	Spring	18		Walking	27		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	16		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph	
	Uncomfortable for Walking:	> 19 and ≤ 27 mph	
	Dangerous Conditions:	> 27 mph	



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Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
170	A	DATA NOT AVAILABLE						
	B	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>	<u>Mean Wind Speed Criteria</u>	<u>Effective Gust Criteria</u>
A – No Build	Comfortable for Sitting: ≤ 12 mph	Acceptable: ≤ 31 mph
B – Full Build with Mitigation	Comfortable for Standing: > 12 and ≤ 15 mph	Unacceptable: > 31 mph
	Comfortable for Walking: > 15 and ≤ 19 mph	
	Uncomfortable for Walking: > 19 and ≤ 27 mph	
	Dangerous Conditions: > 27 mph	

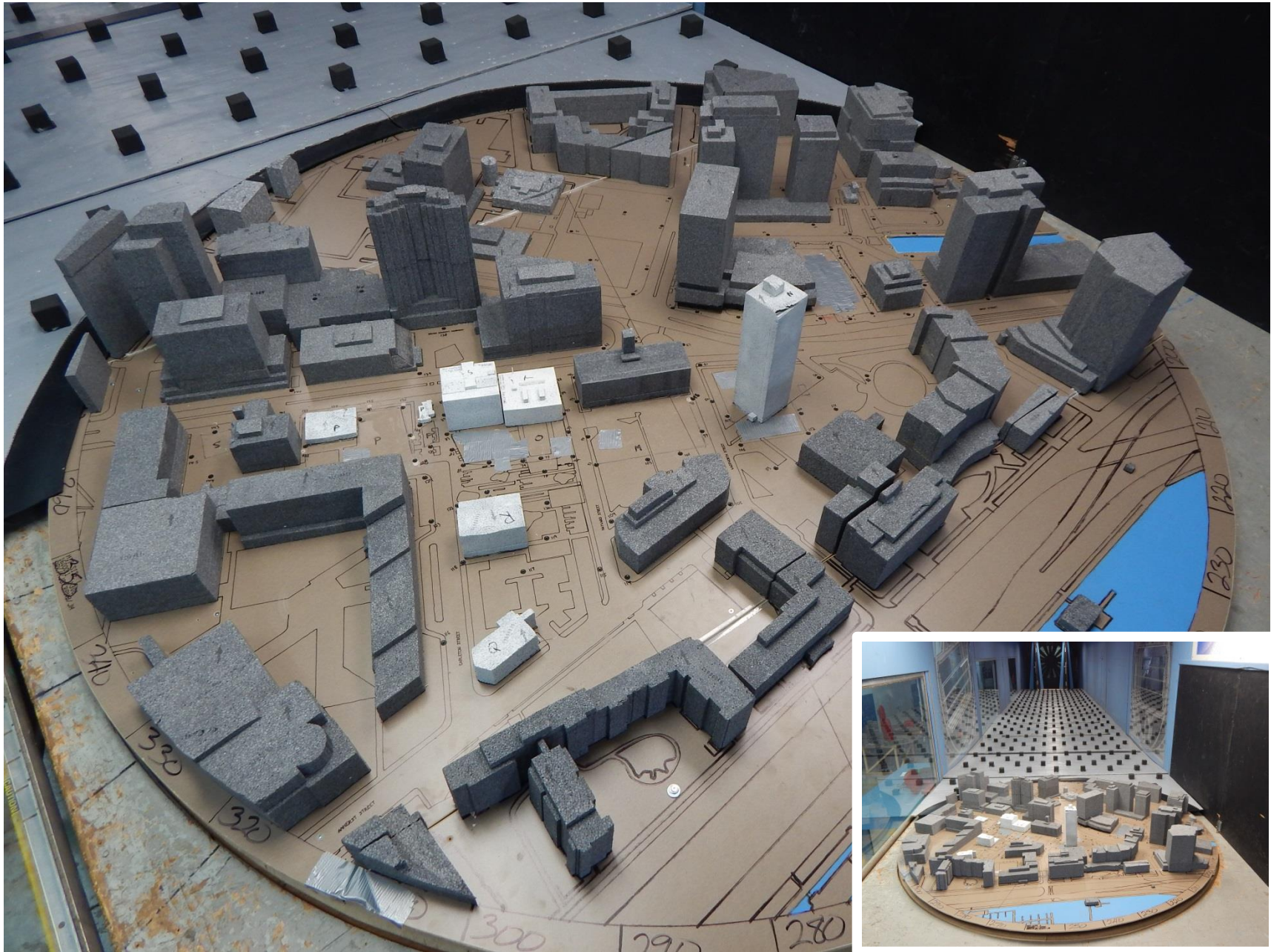
TABLE 2A: TOTAL MEAN SPEED EXCEEDANCES (DANGEROUS)

		SEASON				
CONFIGURATION	NAME	Spring	Summer	Fall	Winter	Annual
A - No Build	Grade Level	1	0	0	2	0
	Podium Level	0	0	0	0	0
B - Full Build with Mitigation	Grade Level	1	0	0	3	0
	Podium Level	0	0	0	1	0

TABLE 2B: TOTAL EFFECTIVE GUST SPEED EXCEEDANCES

		SEASON				
CONFIGURATION	NAME	Spring	Summer	Fall	Winter	Annual
A - No Build	Grade Level	10	0	3	18	5
	Podium Level	1	0	1	1	1
B - Full Build with Mitigation	Grade Level	4	0	3	23	4
	Podium Level	4	1	1	6	3

FIGURES



Wind Tunnel Study Model No Build

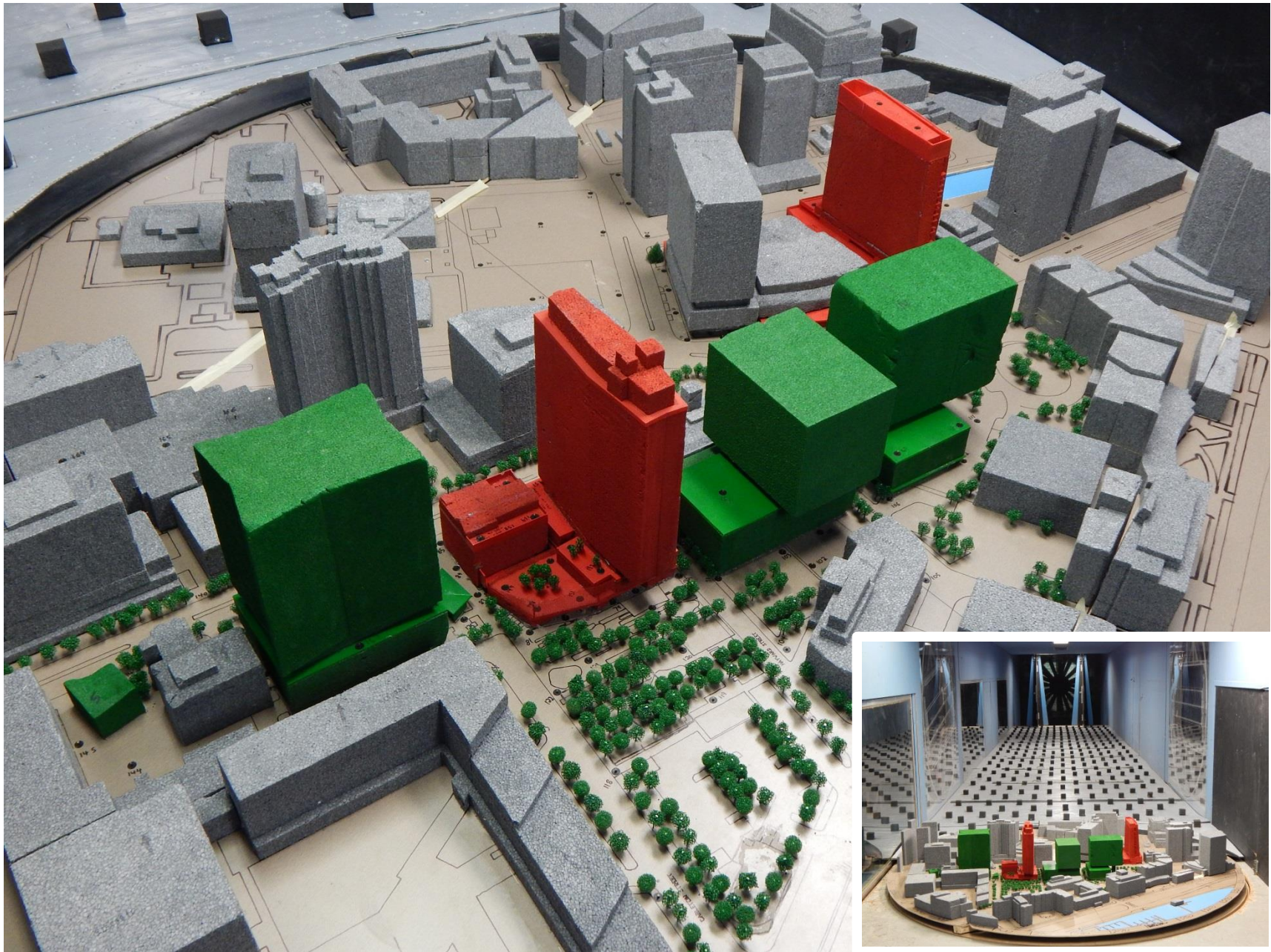
MIT Kendall Square Initiative – Cambridge, MA

Figure No. 1a

Date: November 4, 2015



Project #1502103



Wind Tunnel Study Model

Full Build with Mitigation

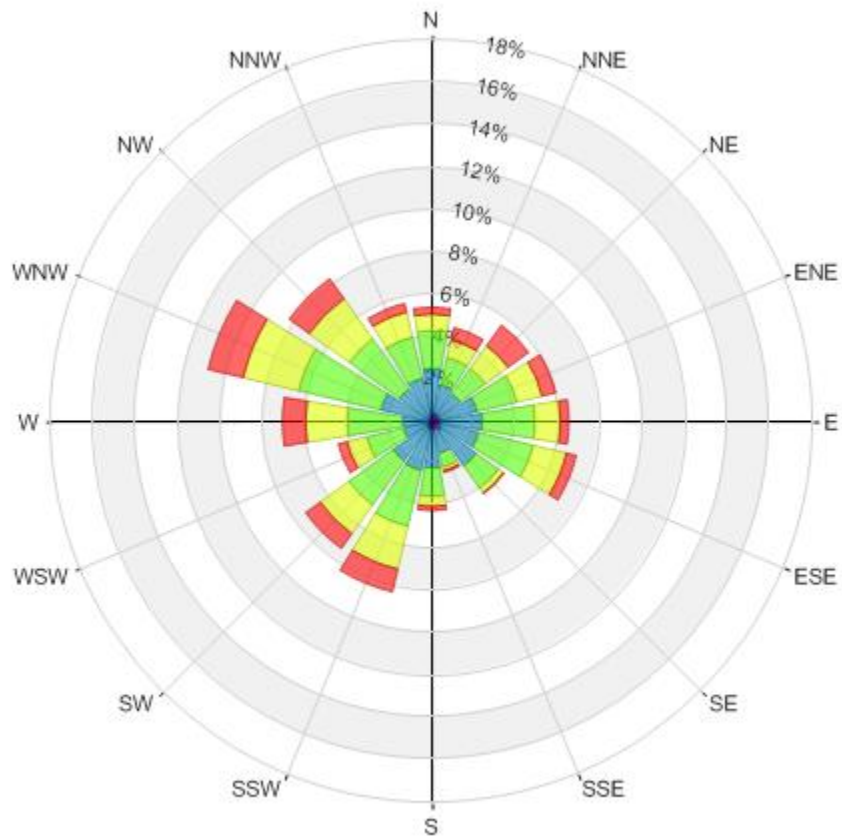
MIT Kendall Square Initiative – Cambridge, MA

Figure No. 1b

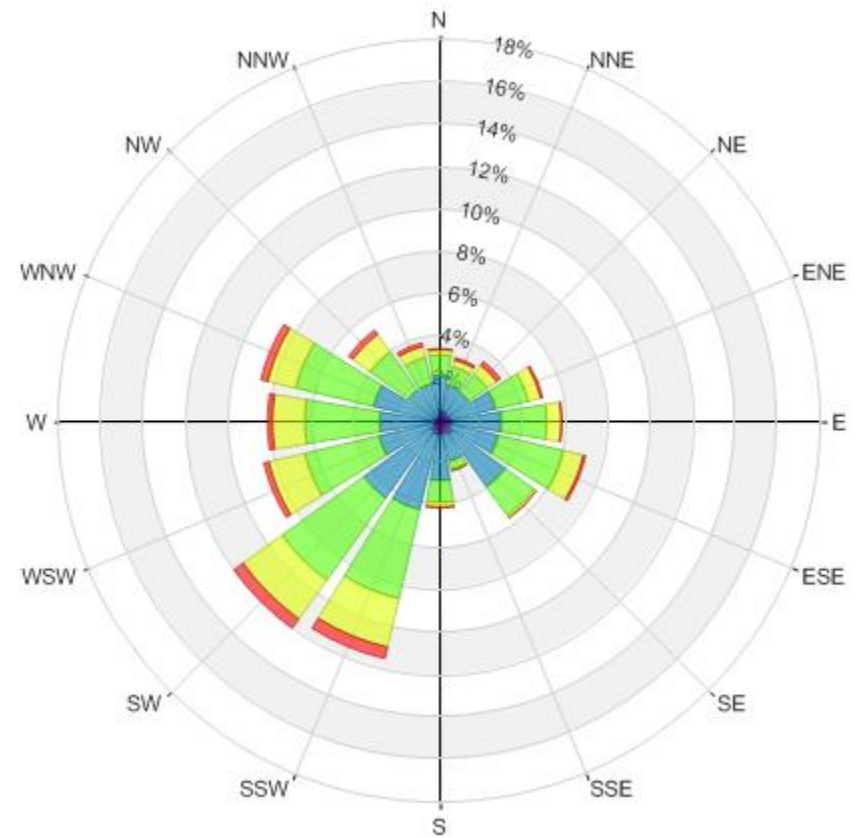
Project #1502103

Date: November 4, 2015





Spring
(March - May)



Summer
(June - August)

	Wind Speed (mph)	Probability (%)	
		Spring	Summer
	Calm	2.0	2.1
	1-5	5.5	7.4
	6-10	27.5	36.6
	11-15	33.5	36.4
	16-20	20.7	14.6
	>20	10.8	3.0

Directional Distribution (%) of Winds (Blowing From) **Boston Logan International Airport (1983 - 2013)**

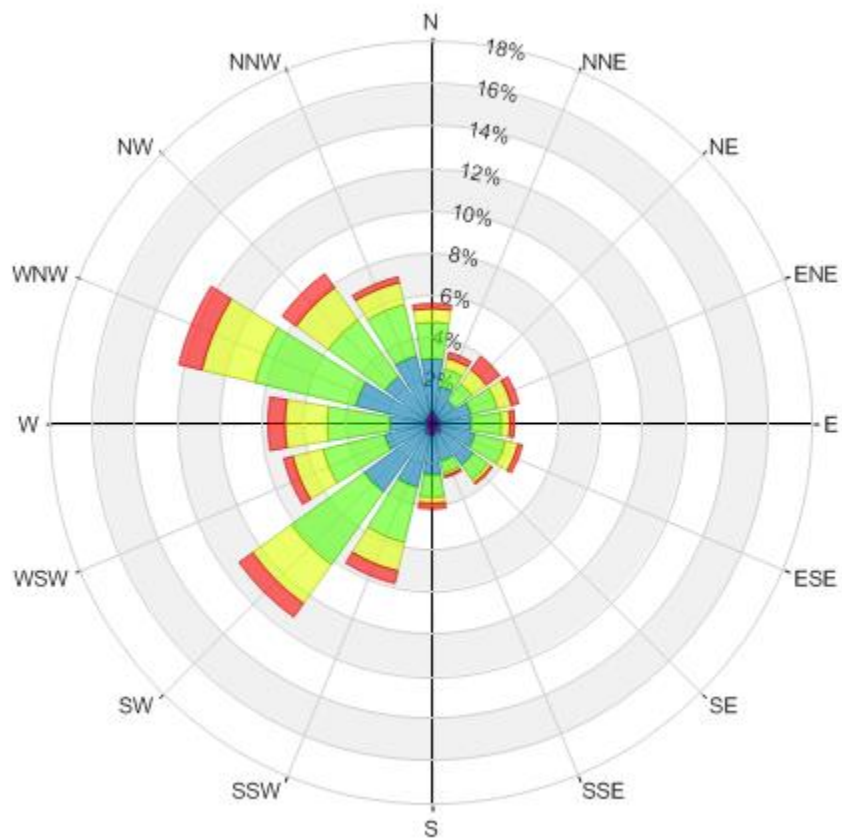
MIT Kendall Square Initiative – Cambridge, MA

Project #1502103

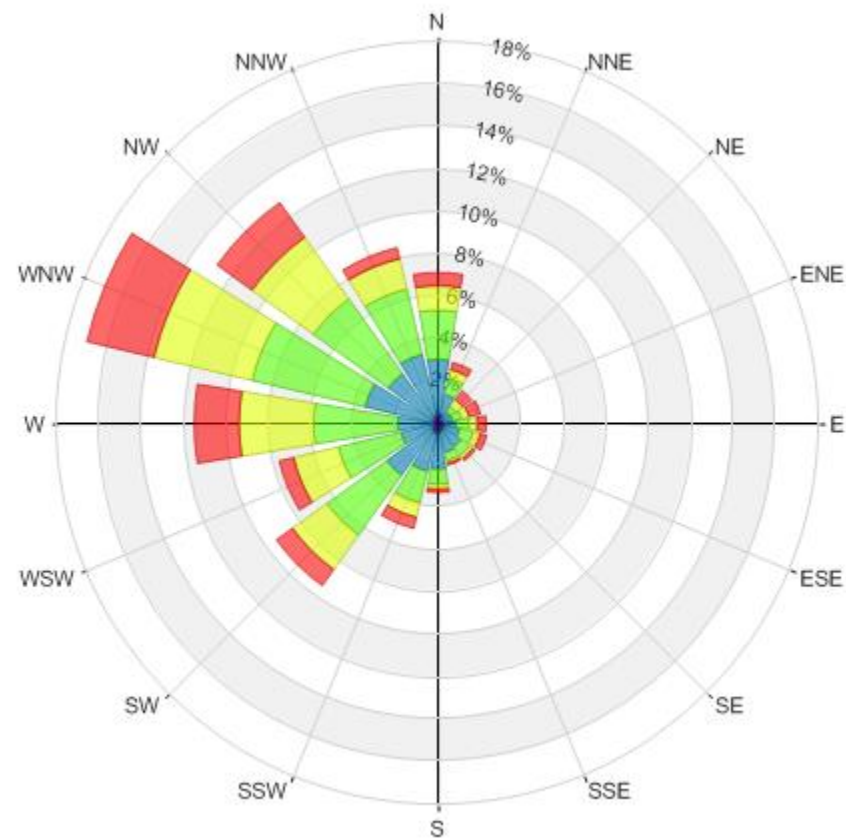
Figure No. 2a

Date: November 04, 2015





Fall
(September - November)



Winter
(December - February)

	Wind Speed (mph)	Probability (%)	
		Fall	Winter
	Calm	2.3	1.8
	1-5	6.9	5.3
	6-10	32.7	26.1
	11-15	33.9	31.8
	16-20	16.8	21.8
	>20	7.3	13.2

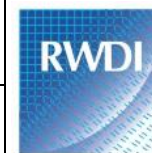
Directional Distribution (%) of Winds (Blowing From) **Boston Logan International Airport (1983 - 2013)**

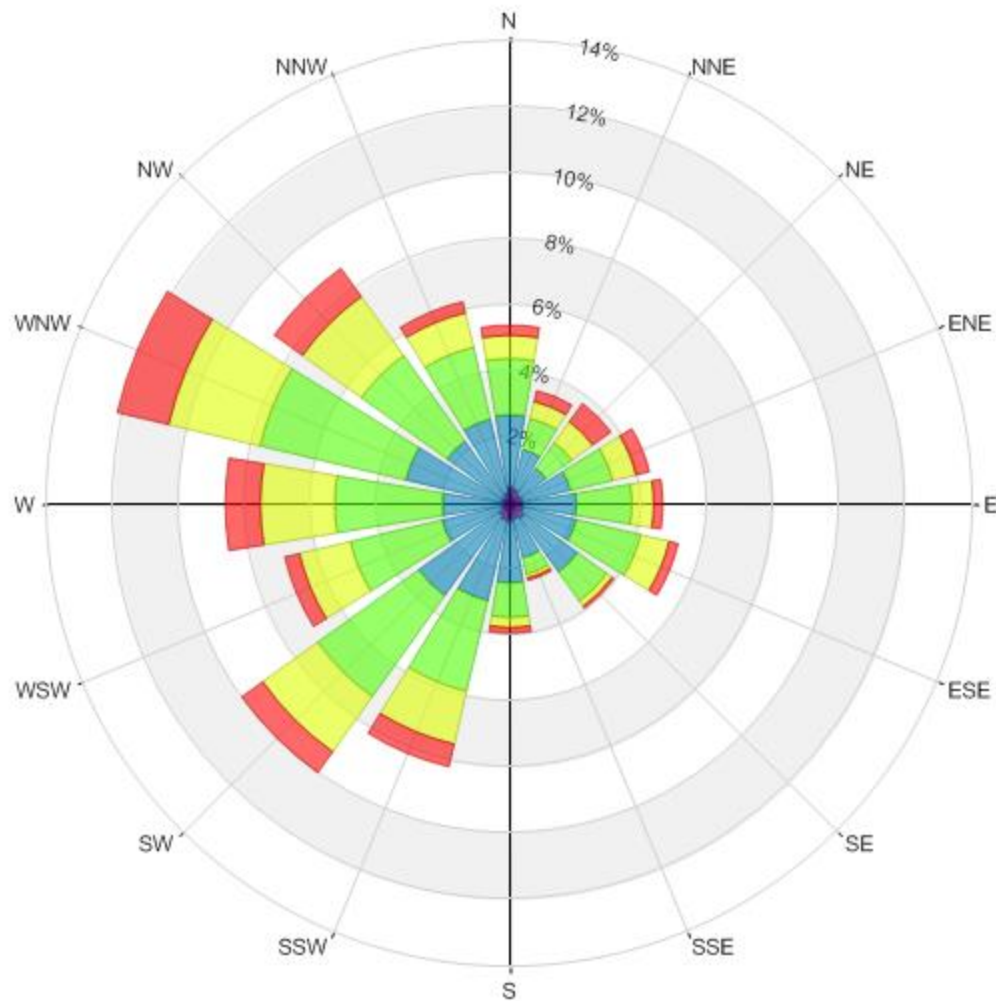
MIT Kendall Square Initiative – Cambridge, MA

Project #1502103

Figure No. 2b

Date: November 04, 2015





Annual Winds

**Wind Speed
(mph)**

Calm	2.0
1-5	6.3
6-10	30.8
11-15	33.9
16-20	18.5
>20	8.6

Probability (%)

**Directional Distribution (%) of Winds (Blowing From)
Boston Logan International Airport (1983 - 2013)**

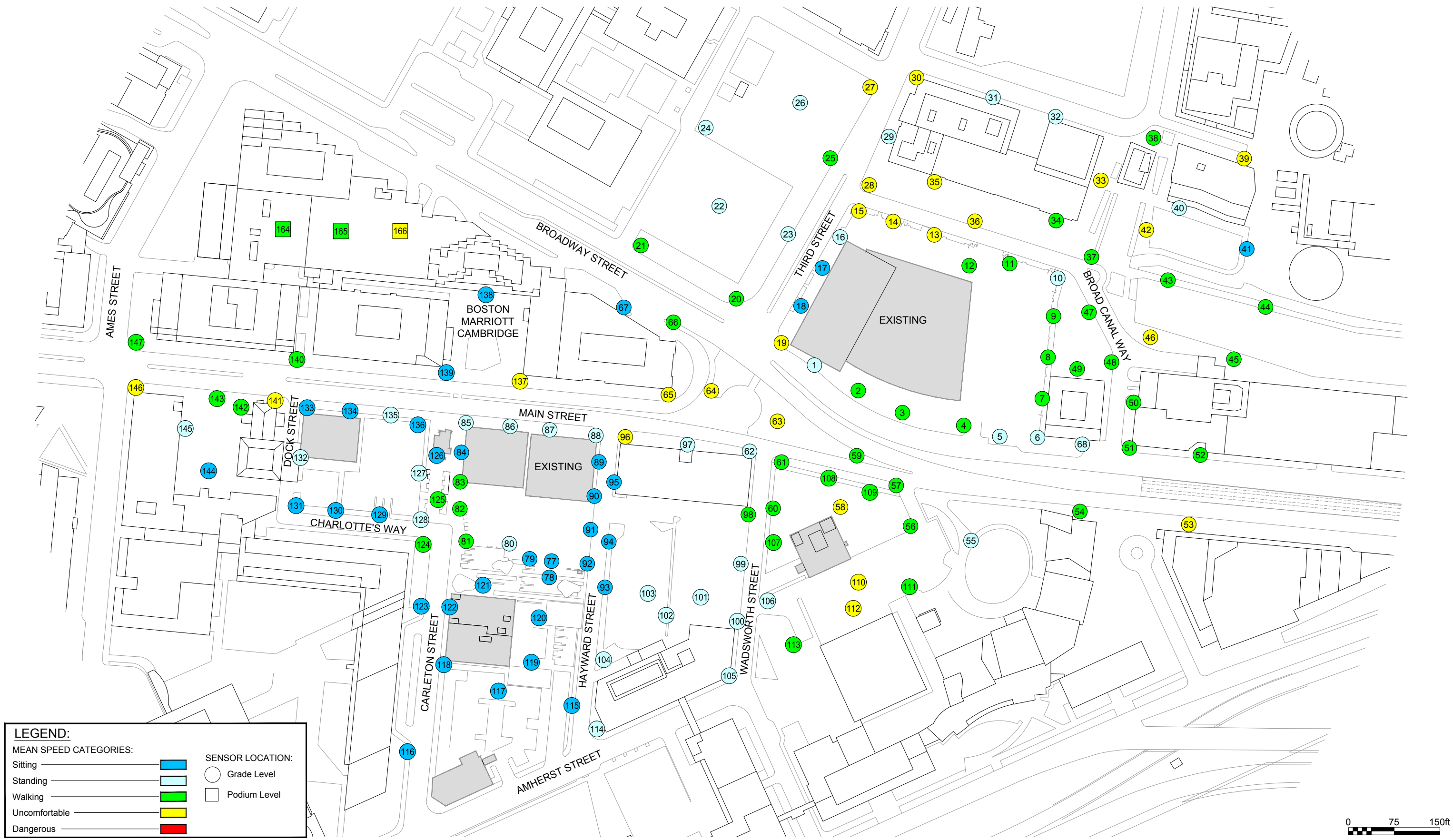
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Project #1502103

Figure No. 2c

Date: November 04, 2015





Pedestrian Wind Conditions - Mean Speed - No Build
Annual (January to December, 6:00 to 23:00)

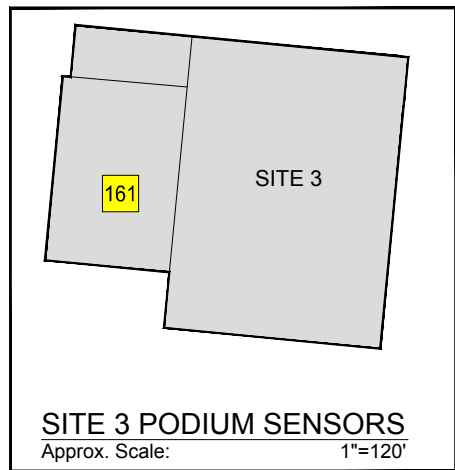
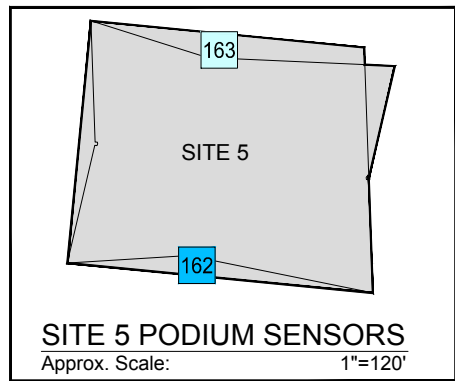
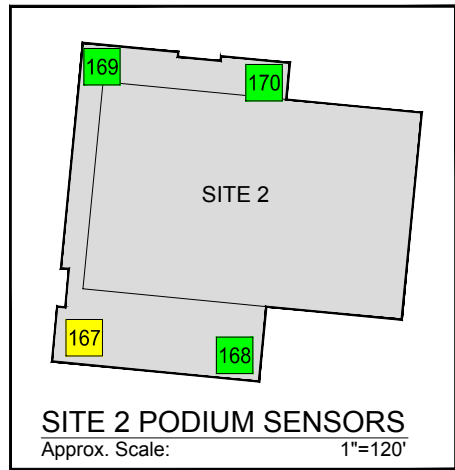
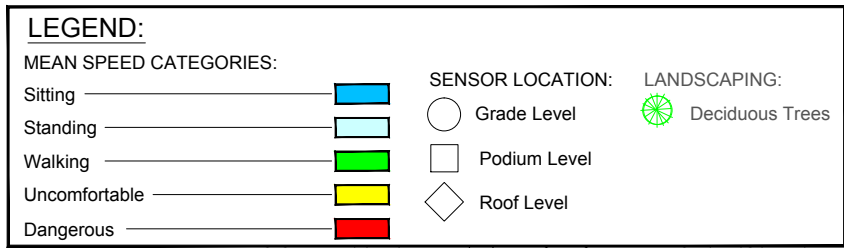
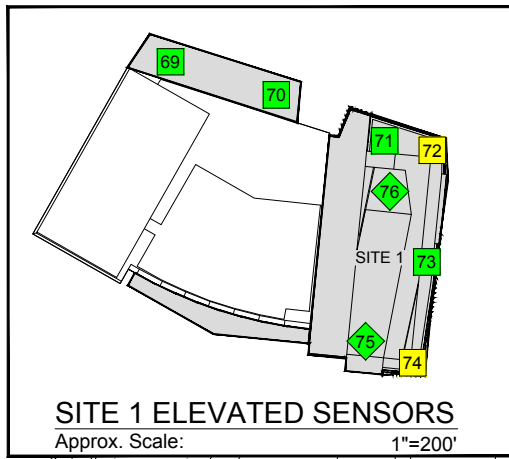
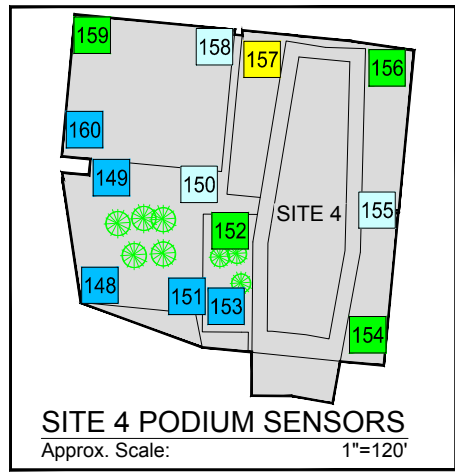
MIT Kendall Square Initiative - Cambridge, MA



Drawn by:	EM	Figure:	3a
Approx. Scale:	1"=150'		
Date Revised:	Nov. 4, 2015		

Project #1502103





Pedestrian Wind Conditions - Mean Speed - Full Build + Mitigation
Annual (January to December, 6:00 to 23:00)

MIT Kendall Square Initiative - Cambridge, MA



Drawn by: EM	Figure: 3b
Approx. Scale: 1"=150'	
Date Revised: Nov. 4, 2015	



Project #1502103



LEGEND:

EFFECTIVE GUST CATEGORIES:
Acceptable
Unacceptable

SENSOR LOCATION:
Grade Level
Podium Level

Pedestrian Wind Conditions - Effective Gust - No Build
Annual (January to December, 0:00 to 23:00)

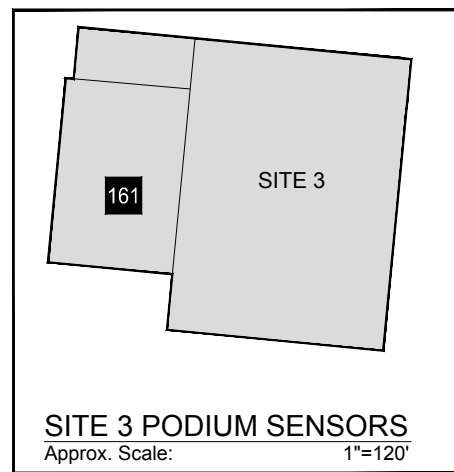
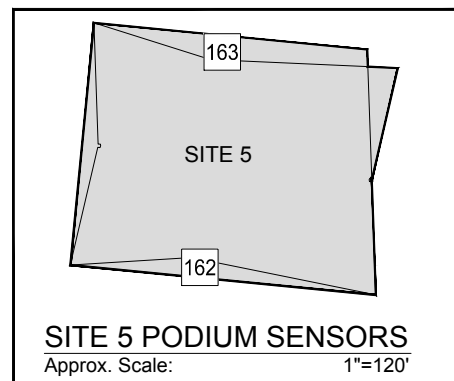
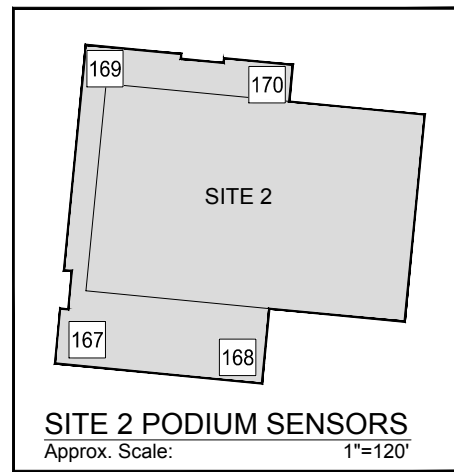
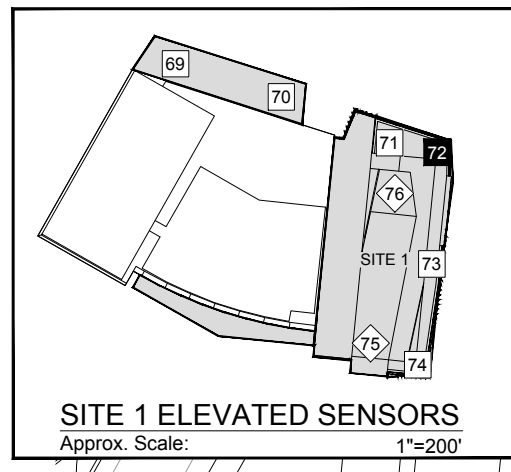
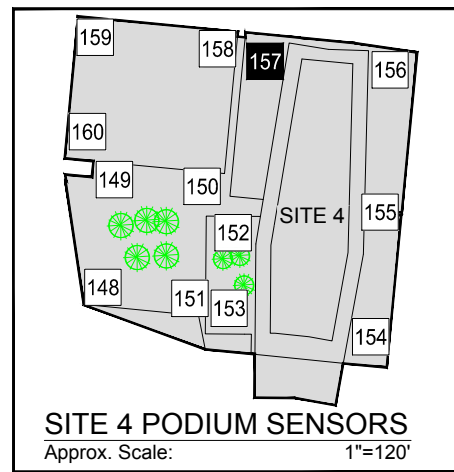
MIT Kendall Square Initiative - Cambridge, MA



Drawn by:	EM	Figure:	4a
Approx. Scale:	1"=150'		
Date Revised:	Nov. 4, 2015		

Project #1502103





APPENDIX A



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APPENDIX A: DRAWING LIST FOR MODEL CONSTRUCTION

The drawings and information listed below were received from Perkins+Will and were used to construct the scale model of the proposed MIT Kendall Square Initiative. Should there be any design changes that deviate from this list of drawings, the results may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
20150901_SITE 4_WIND STUDY MODEL.3dm	3D Model	09/03/15