
# MIT VOLPE REDEVELOPMENT PLAN

## Special Permit Volume 3

Planning Board Number - PB368

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City of Cambridge

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# A.
# PLANNING BOARD CRITERIA FOR TIS

# Planning Board Special Permit Criteria

## Criterion A – Project Vehicle Trip Generation

Table A presents the Project vehicle trip generation criterion. Project vehicle trip generation is based on ITE trip rates, adjusted for local mode split and vehicle occupancy rates as discussed previously.

**Table A-1 CRITERION – Project Vehicle Trip Generation**

| Period | Criteria (trips) | Build | Exceeds Criterion? |
|---|---|---|---|
| Weekday Daily | 2,000 | 6,553 | Yes |
| Weekday AM Peak Hour | 240 | 757 | Yes |
| Weekday PM Peak Hour | 240 | 852 | Yes |

The Project is expected to exceed the Planning Board Criteria for daily, morning peak, and evening peak Project vehicle trip generation under the Build program.

## Criterion B – Vehicle LOS

The criteria for a Project's impact to traffic operations at signalized intersections are summarized in Table B-1 below. These criteria are evaluated for each signalized study-area intersection and presented in Table B-2.

**Table B-1 CRITERION - Vehicular Level of Service**

| Existing | With Project |
|---|---|
| VLOS A | VLOS C |
| VLOS B, C | VLOS D |
| VLOS D | VLOS D or 7% roadway volume increase |
| VLOS E | 7% roadway volume increase |
| VLOS F | 5% roadway volume increase |

**Table B-2 CRITERION – Vehicular LOS**

| | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | **Baseline Condition** | **Build Condition** | **Traffic Increase** | **Exceeds Criterion?** | **Baseline Condition** | **Build Condition** | **Traffic Increase** | **Exceeds Criterion?** |
| O'Brien Highway/ Third Street | B | B | 14% | No | B | C | 15% | No |
| O'Brien Highway/ Cambridge Street/ East Street | D | D | 8% | Yes | F | F | 5% | No |
| O'Brien Highway/Land Boulevard | C | C | 20% | No | B | C | 20% | No |
| Cambridge Street/ Third Street | D | F | 15% | Yes | D | E | 19% | Yes |
| Cambridge Street/ First Street | C | D | 11% | No | C | D | 12% | No |
| First Street/ Thorndike Street | C | C | 9% | No | ]D | E | 12% | Yes |
| First Street/ Charles Street | D | D | 3% | No | D | D | 5% | No |
| Third Street/ Spring Street | C | C | 1% | No | C | C | 2% | No |
| Third Street/ Charles Street | C | D | 5% | No | C | C | 6% | No |
| Galileo Galilei Way/ Binney Street/Fulkerson Street | D | D | 7% | No | D | D | 9% | Yes |
| Binney Street/ 5th Street | E | E | 13% | Yes | D | D | 11% | Yes |
| Binney Street/ Third Street | D | D | 29% | Yes | C | D | 30% | No |
| Binney Street/ Second Street | B | E | 32% | Yes | F | F | 30% | Yes |
| Binney Street/ First Street | D | F | 30% | Yes | E | F | 19% | Yes |
| Binney Street/ Land Boulevard | F | F | 53% | Yes | F | F | 45% | Yes |
| Hampshire Street/ Cardinal Medeiros Avenue/ Portland Street | D | D | 15% | Yes | F | F | 21% | Yes |

| | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | **Baseline Condition** | **Build Condition** | **Traffic Increase** | **Exceeds Criterion?** | **Baseline Condition** | **Build Condition** | **Traffic Increase** | **Exceeds Criterion?** |
| Broadway/ Portland Street | F | F | 18% | Yes | E | F | 18% | Yes |
| Broadway/ Hampshire Street | D | D | 16% | Yes | E | F | 13% | Yes |
| Broadway/ Galileo Galilei Way | D | E | 17% | Yes | F | F | 18% | Yes |
| Broadway/ Ames Street | A | A | 2% | No | A | B | 10% | No |
| Broadway/ Green Garage | E | F | 11% | Yes | C | C | 8% | No |
| Broadway/ Main Street/ Third Street | B | B | 5% | No | E | F | 5% | No |
| Third Street/ Potter Street/ Kendall Street | B | C | 5% | No | B | C | 3% | No |
| Third Street/ Munroe Street/ Linskey Way | E | E | 3% | No | F | F | 4% | No |
| Main Street/ Albany Street | F | F | 4% | No | E | E | 5% | No |
| Main Street/ Galileo Galilei Way/ Vassar Street | B | B | 14% | No | B | C | 15% | No |
| Main Street/ Ames Street | D | D | 8% | Yes | F | F | 5% | No |
| Main Street/ Kendall Station Crosswalk | C | C | 20% | No | B | C | 20% | No |
| Main Street/ Longfellow Bridge | D | F | 15% | Yes | D | E | 19% | Yes |
| Memorial Drive/ Ames Street | C | D | 11% | No | C | D | 12% | No |
| Memorial Drive/ Wadsworth Street | C | C | 9% | No | D | E | 12% | Yes |
| Memorial Drive/ Western Avenue | D | D | 3% | No | D | D | 5% | No |
| Memorial Drive/ Cambridge Street/ River Street | C | C | 1% | No | C | C | 2% | No |

# Criterion C – Traffic on Residential Streets

This criterion considers the magnitude of Project vehicle trip generation during any peak hour that may reasonably be expected to arrive and/or depart by traveling on a residential street. The criteria, based on a Project-induced traffic volume increase on any two-block residential street segment in the study area, are summarized in Table C-1.

**Table C-1 CRITERION – Traffic on Residential Streets**

| Parameter 1: Amount of Residential[1] | Parameter 2: Current Peak Hour Street Volume (two-way vehicles) | | |
|---|---|---|---|
| | < 150 VPH | 150-400 VPH | > 400 VPH |
| 1/2 or more | 20 VPH[2] | 30 VPH[2] | 40 VPH[2] |
| >1/3 but <1/2 | 30 VPH[2] | 45 VPH[2] | 60 VPH[2] |
| 1/3 or less | No Max. | No Max. | No Max |

1 - Amount of residential for a two-block segment as determined by first floor frontage
2 - Additional Project vehicle trip generation in vehicles per lane, both directions
VPH - Vehicles per hour

6 of the 80 roadway segments in the study area identified as street segments which have more than 1/3 of residential frontage and are therefore evaluated against the traffic volume criteria. The results are presented in Table C-2.

**Table C-2 Criteria C – Traffic on Residential Streets**

| | | | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| Roadway | Reviewed Segment | Amount of Residential | Baseline | Project Trips | Exceeds Criteria? | Baseline | Project Trips | Exceeds Criteria? |
| O'Brien Highway | Cambridge Street to Land Boulevard | 1/2 or more | 2,095 | 44 | Yes | 1,919 | 50 | Yes |
| Cambridge Street | Second Street to First Street | 1/2 or more | 651 | 0 | No | 632 | 0 | No |
| Spring Street | Sciarappa Street to Third Street | 1/2 or more | 160 | 0 | No | 155 | 0 | No |
| | Third Street to Lopez Avenue | 1/2 or more | 102 | 0 | No | 171 | 0 | No |
| Charles Street | Sciarappa Street to Third Street | 1/2 or more | 131 | 0 | No | 207 | 0 | No |
| Binney Street | 5th Street to Third Street | >1/3 but <1/2 | 953 | 120 | Yes | 1,049 | 195 | Yes |
| Munroe Street | 5th Street to Third Street | 1/2 or more | 74 | 1 | No | 42 | 15 | No |

| | | | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| **Roadway** | **Reviewed Segment** | **Amount of Residential** | **Baseline** | **Project Trips** | **Exceeds Criteria?** | **Baseline** | **Project Trips** | **Exceeds Criteria?** |
| Potter Street | 5th Street to Third Street | 1/2 or more | 118 | 201 | Yes | 85 | 316 | Yes |
| 5th Street | Rogers Street to Binney Street | 1/2 or more | 122 | 0 | No | 146 | 0 | No |
| Third Street | O'Brien Highway to Cambridge Street | >1/3 but <1/2 | 711 | 99 | Yes | 790 | 112 | Yes |
| | Cambridge Street to Spring Street | >1/3 but <1/2 | 642 | 99 | Yes | 479 | 112 | Yes |
| | Spring Street to Charles Street | 1/2 or more | 611 | 99 | Yes | 459 | 112 | Yes |
| | Charles Street to Binney Street | >1/3 but <1/2 | 552 | 99 | Yes | 650 | 112 | Yes |

# Criterion D – Lane Queue

The criteria for a project's impact to queues at signalized intersections are summarized in Table D-1 below. These criteria are evaluated for each lane group at study-area signalized intersections and presented in Table D-2.

**Table D-1 CRITERION – Vehicular Queues at Signalized Intersections**

| Existing | With Project |
|---|---|
| Under 15 vehicles | Under 15 vehicles, or 15+ vehicles with an increase of 6 vehicles |
| 15 or more vehicles | Increase of 6 vehicles |

**Table D-2 Criteria D – Lane Queue (for signalized intersections)**

| Intersection | Lane | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Baseline | 2019 Build Mitigated | Exceeds Criterion? | Baseline | 2019 Build Mitigated | Exceeds Criterion? |
| O'Brien Highway at Third Street | O'Brien EB Left/Thru | 7 | 16 | Yes | 3 | 3 | No |
| | O'Brien EB Right | 6 | 17 | Yes | 3 | 3 | No |
| | O'Brien WB Thru/Right | 1 | 1 | No | 4 | 4 | No |
| | Third NB Left/Thru/Right | 2 | 2 | No | 11 | 11 | No |
| O'Brien Highway at North First Street | O'Brien EB Thru | 10 | 9 | No | 5 | 11 | No |
| | O'Brien EB Right | 4 | 4 | No | 1 | 2 | No |
| | O'Brien WB Thru | 3 | 3 | No | 7 | 6 | No |
| | O'Brien WB Right | 0 | 0 | No | 0 | 0 | No |
| | N. First NB Left | 1 | 1 | No | 3 | 3 | No |
| | N. First NB Thru/Right | 1 | 1 | No | 1 | 1 | No |
| | N. First SB Left/Thru | 1 | 1 | No | 1 | 4 | No |
| | N. First SB Right | 0 | 1 | No | 1 | 1 | No |
| O'Brien Highway at Cambridge Street | O'Brien EB Thru | 3 | 3 | No | 5 | 6 | No |
| | O'Brien WB Left/Thru | 5 | 5 | No | 5 | 5 | No |
| | Cambridge NB Right | 6 | 6 | No | 6 | 6 | No |
| | East SB Left/Thru/Right | 1 | 1 | No | 1 | 1 | No |
| O'Brien Highway at Land Boulevard | O'Brien EB Left | 5 | 3 | No | 18 | 21 | No |
| | O'Brien EB Thru | 21 | 18 | No | 12 | 27 | Yes |

| Intersection | Lane | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Baseline | 2019 Build Mitigated | Exceeds Criterion? | Baseline | 2019 Build Mitigated | Exceeds Criterion? |
| | O'Brien EB Right | 12 | 8 | No | 0 | 8 | No |
| | O'Brien WB Left | 36 | 37 | No | 7 | 6 | No |
| | O'Brien WB Thru | 59 | 64 | No | 7 | 6 | No |
| | O'Brien WB Right | 3 | 3 | No | 6 | 4 | No |
| | Land NB Left | 2 | 2 | No | 4 | 7 | No |
| | Land NB Thru | 6 | 6 | No | 7 | 7 | No |
| | Land NB Right | 22 | 23 | No | 6 | 6 | No |
| | Land SB Left/Thru/Right | 41 | 45 | No | 29 | 31 | No |
| Cambridge Street at Third Street | Cambridge EB Left/Thru/Right | 29 | 31 | No | 37 | 2 | No |
| | Cambridge WB Left/Thru/Right | 15 | 16 | No | 11 | 20 | No |
| | Third NB Left/Thru/Right | 5 | 6 | No | 11 | 10 | No |
| | Third SB Left | 2 | 2 | No | 1 | 20 | Yes |
| | Third SB Thru/Right | 12 | 15 | No | 6 | 1 | No |
| Cambridge Street at First Street | Cambridge EB Left | 5 | 4 | No | 7 | 8 | No |
| | Cambridge EB Thru/Right | 25 | 23 | No | 27 | 27 | No |
| | Cambridge WB Left | 2 | 2 | No | 3 | 3 | No |
| | Cambridge WB Thru/Right | 2 | 2 | No | 3 | 2 | No |
| | First NB Left/Thru | 3 | 3 | No | 18 | 18 | No |
| | First NB Right | 3 | 3 | No | 8 | 8 | No |
| | N. First SB Left/Thru | 1 | 1 | No | 0 | 0 | No |
| | N. First SB Right | 3 | 3 | No | 1 | 1 | No |
| First Street at Thorndike Street | Thorndike EB Left/Thru/Right | 2 | 2 | No | 7 | 7 | No |
| | First NB Thru | 1 | 1 | No | 17 | 15 | No |
| | First SB Thru | 2 | 2 | No | 2 | 3 | No |
| First Street at Charles Street | Charles EB Left/Thru/Right | 2 | 2 | No | 3 | 3 | No |
| | Cambridgeside WB Left/Thru/Right | 2 | 2 | No | 5 | 5 | No |
| | First NB Thru/Right | 2 | 2 | No | 14 | 14 | No |
| | First SB Left/Thru | 2 | 3 | No | 6 | 8 | No |

| Intersection | Lane | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Baseline | 2019 Build Mitigated | Exceeds Criterion? | Baseline | 2019 Build Mitigated | Exceeds Criterion? |
| Third Street at Charles Street | Charles EB Left/Thru/Right | 2 | 2 | No | 2 | 2 | No |
| | Charles WB Left/Thru/Right | 1 | 1 | No | 2 | 1 | No |
| | Third NB Left/Thru/Right | 1 | 1 | No | 4 | 7 | No |
| | Third SB Left/Thru/Right | 4 | 8 | No | 4 | 5 | No |
| Galileo Galilei Way/Binney Street at Fulkerson | Galileo EB Thru | 7 | 7 | No | 10 | 10 | No |
| | Galileo WB Thru | 8 | 11 | No | 4 | 5 | No |
| | Galilei WB Right | 4 | 4 | No | 3 | 3 | No |
| | Fulkerson SB Right/Hard Right | 5 | 7 | No | 4 | 5 | No |
| | Binney SEB Hard Right/Left | 3 | 3 | No | 5 | 5 | No |
| | Binney SEB Right | 3 | 7 | No | 46 | 42 | No |
| Binney Street at Third Street | Binney EB Left | 2 | 2 | No | 5 | 7 | No |
| | Binney EB Thru | 6 | 5 | No | 7 | 12 | No |
| | Binney EB Right | 2 | 2 | No | 3 | 4 | No |
| | Binney WB Left | 5 | 9 | No | 2 | 2 | No |
| | Binney WB Thru/Right | 5 | 14 | No | 3 | 3 | No |
| | Third NB Left/Thru | 6 | 7 | No | 6 | 7 | No |
| | Third NB Right | 4 | 3 | No | 4 | 4 | No |
| | Third SB Left/Thru/Right | 12 | 20 | Yes | 10 | 16 | No |
| Binney Street at Second Street | Binney EB Left | 1 | 1 | No | 3 | 3 | No |
| | Binney EB Thru/Right | 7 | 6 | No | 7 | 8 | No |
| | Binney WB Left | 2 | 2 | No | 0 | 0 | No |
| | Binney WB Thru/Right | 4 | 7 | No | 4 | 4 | No |
| | Second NB Left/Thru/Right | 2 | 3 | No | 8 | 8 | No |
| | Second SB Left/Thru/Right | 4 | 6 | No | 4 | 4 | No |
| Binney Street at First Street | Binney EB Left | 1 | 1 | No | 6 | 5 | No |
| | Binney EB Thru/Right | 3 | 3 | No | 4 | 4 | No |
| | Binney WB Left/Thru/Right | 5 | 5 | No | 6 | 6 | No |
| | First NB Left/Thru/Right | 1 | 1 | No | 1 | 1 | No |

| Intersection | Lane | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Baseline | 2019 Build Mitigated | Exceeds Criterion? | Baseline | 2019 Build Mitigated | Exceeds Criterion? |
| | First SB Left/Thru | 3 | 3 | No | 5 | 5 | No |
| | First SB Right | 2 | 4 | No | 2 | 2 | No |
| Binney Street at Land Boulevard | Binney EB Left | 3 | 3 | No | 2 | 2 | No |
| | Land NB Left | 12 | 12 | No | 10 | 9 | No |
| | Land NB Thru | 13 | 14 | No | 6 | 3 | No |
| | Land SB Thru | 6 | 6 | No | 8 | 8 | No |
| | Land SB Right | 6 | 8 | No | 3 | 3 | No |
| Hampshire Street at Portland Street/Cardinal Medeiros Avenue | Hampshire EB Left/Thru/Right | 8 | 17 | Yes | 6 | 5 | No |
| | Hampshire WB Left/Thru/Right | 4 | 3 | No | 6 | 7 | No |
| | Portland NB Left | 1 | 1 | No | 1 | 2 | No |
| | Portland NB Thru/Right | 3 | 2 | No | 3 | 3 | No |
| | Cardinal SB Left | 1 | 2 | No | 0 | 0 | No |
| | Cardinal SB Thru/Right | 5 | 7 | No | 2 | 2 | No |
| Broadway at Portland Street | Broadway EB Left/Thru/Right | 46 | 48 | No | 6 | 2 | No |
| | Broadway WB Left/Thru/Right | 5 | 5 | No | 4 | 12 | No |
| | Portland NB Left | 1 | 1 | No | 2 | 4 | No |
| | Portland NB Thru/Right | 5 | 13 | No | 8 | 2 | No |
| | Portland SB Left | 1 | 2 | No | 0 | 9 | No |
| | Portland SB Thru/Right | 4 | 4 | No | 2 | 0 | No |
| Broadway at Hampshire Street/Technology Square | Broadway EB Left/Thru/Right | 6 | 6 | No | 3 | 3 | No |
| | Broadway WB Left | 2 | 2 | No | 0 | 0 | No |
| | Broadway WB Thru | 2 | 2 | No | 5 | 7 | No |
| | Broadway WB Right | 1 | 1 | No | 2 | 3 | No |
| | Technology NB Left | 1 | 1 | No | 7 | 7 | No |
| | Technology NB Thru/Right | 1 | 2 | No | 18 | 24 | No |
| | Hampshire SB Left | 3 | 3 | No | 2 | 2 | No |
| | Hampshire SB Thru/Right | 7 | 8 | No | 2 | 3 | No |
| | Broadway EB Left | 4 | 3 | No | 3 | 3 | No |

| Intersection | Lane | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Baseline | 2019 Build Mitigated | Exceeds Criterion? | Baseline | 2019 Build Mitigated | Exceeds Criterion? |
| Broadway at Galileo Galilei Way | Broadway EB Thru | 4 | 10 | No | 5 | 8 | No |
| | Broadway EB Right | 1 | 1 | No | 1 | 1 | No |
| | Broadway WB Left | 1 | 1 | No | 2 | 3 | No |
| | Broadway WB Thru | 4 | 4 | No | 3 | 4 | No |
| | Broadway WB Right | 2 | 2 | No | 1 | 1 | No |
| | Galileo NB Left | 1 | 2 | No | 3 | 3 | No |
| | Galileo NB Thru/Right | 3 | 10 | No | 6 | 7 | No |
| | Galileo SB Left | 2 | 4 | No | 2 | 1 | No |
| | Galileo SB Thru | 7 | 10 | No | 6 | 12 | No |
| | Galileo SB Right | 8 | 7 | No | 5 | 10 | No |
| Broadway at Ames Street | Broadway EB Thru | 9 | 15 | No | 5 | 9 | No |
| | Broadway EB Right | 4 | 3 | No | 2 | 2 | No |
| | Broadway WB Left | 4 | 4 | No | 3 | 6 | No |
| | Broadway WB Thru | 5 | 5 | No | 5 | 7 | No |
| | Ames NB Left | 1 | 9 | No | 2 | 2 | No |
| | Ames NB Right | 3 | 4 | No | 3 | 3 | No |
| Broadway/Main Street at Third Street | Broadway EB Left | 3 | 10 | No | 5 | 9 | No |
| | Broadway EB Thru/Right | 2 | 6 | No | 3 | 5 | No |
| | Main WB Thru | 7 | 22 | Yes | 6 | 9 | No |
| | Main WB Right | 4 | 10 | No | 3 | 5 | No |
| | Third SB Left/Thru | 5 | 3 | No | 4 | 4 | No |
| | Third SB Right | 3 | 0 | No | 0 | 0 | No |
| Main Street at Galileo Galilei Way/Vassar Street | Main EB Left | 2 | 5 | No | 7 | 8 | No |
| | Main EB Thru/Right | 4 | 8 | No | 14 | 17 | No |
| | Main WB Left | 2 | 2 | No | 3 | 3 | No |
| | Main WB Thru/Right | 4 | 6 | No | 7 | 10 | No |
| | Vassar NB Thru | 4 | 10 | No | 8 | 11 | No |
| | Vassar NB Right | 2 | 3 | No | 3 | 4 | No |
| | Galileo SB Left | 1 | 1 | No | 2 | 2 | No |
| | Galileo SB Thru | 5 | 5 | No | 4 | 5 | No |

| Intersection | Lane | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Baseline | 2019 Build Mitigated | Exceeds Criterion? | Baseline | 2019 Build Mitigated | Exceeds Criterion? |
| | Galileo SB Right | 5 | 4 | No | 4 | 4 | No |
| Main Street at Ames Street | Main EB Left/Thru/Right | 4 | 6 | No | 15 | 16 | No |
| | Main WB Left/Thru/Right | 2 | 3 | No | 4 | 5 | No |
| | Ames NB Left/Thru/Right | 9 | 18 | Yes | 18 | 37 | No |
| | Ames SB Left/Thru | 1 | 2 | No | 3 | 6 | Yes |
| | Ames SB Right | 2 | 2 | No | 3 | 4 | No |
| Memorial Drive at Ames Street | Memorial WB Left/Thru/Right | 3 | 4 | No | 13 | 17 | No |
| | Ames SB Thru/Right | 3 | 3 | No | 5 | 6 | No |
| | Memorial EB Thru | 48 | 48 | No | 13 | 17 | No |
| Memorial Drive at Wadsworth Street | Memorial WB Thru/Right | 6 | 6 | No | 6 | 9 | No |
| | Memorial EB U-turn | 3 | 3 | No | 3 | 3 | No |
| | Memorial EB Left | 15 | 16 | No | 4 | 5 | No |
| | Wadsworth SB Thru/Right | 0 | 0 | No | 0 | 1 | No |
| Memorial Drive at Western Avenue | Western WB Left/Thru/Right | 25 | 23 | No | 72 | 71 | No |
| | Memorial NB Left | 8 | 8 | No | 15 | 30 | Yes |
| | Memorial NB Thru | 8 | 8 | No | 16 | 30 | Yes |
| | Memorial SB Thru/Right | 22 | 27 | No | 12 | 11 | No |
| Memorial Dr at River St | River EB Left/Thru | 9 | 9 | No | 7 | 8 | No |
| | River EB Right | 15 | 15 | No | 11 | 11 | No |
| | Memorial NB Thru/Right | 8 | 9 | No | 11 | 19 | Yes |
| | Memorial SB Left/Thru | 10 | 11 | No | 6 | 6 | No |

# Criterion E – Pedestrian and Bicycle Facilities

## Criteria 1: Pedestrian Delay

Pedestrian delay is a measure of the pedestrian crossing delay on a crosswalk during the peak hour as determined by the pedestrian level of service analysis in the HCM 2000.

Table E-1 presents the indicators for this criterion. Tables E-2 present the evaluation of PLOS criteria for each crosswalk at study area intersections under existing and full build conditions.

**Table E-1 CRITERION – PLOS Indicators**

| Existing | With Project |
|---|---|
| PLOS A | PLOS A |
| PLOS B | PLOS B |
| PLOS C | PLOS C |
| PLOS D | PLOS D or increase of 3 seconds |
| PLOS E, F | PLOS D |

**Table E-2 CRITERION– Pedestrian Delay**

| | | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| **Intersection** | **Crosswalk** | **Existing** | **Build** | **Exceeds Criterion?** | **Existing** | **Build** | **Exceeds Criterion?** |
| O'Brien Highway at Third St | East | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| O'Brien Highway at Cambridge St | North | D | D | No | D | D | No |
| | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| O'Brien Highway at Land Blvd | West | E | E | Yes | E | E | Yes |
| | North | E | E | Yes | E | E | Yes |
| | South | E | E | Yes | E | E | Yes |
| Cambridge St at Third St | East | B | B | No | B | B | No |
| | West | B | B | No | B | B | No |
| | North | B | B | No | B | B | No |
| | South | B | B | No | B | B | No |
| Cambridge St at First St | East | C | C | No | C | C | No |

| Intersection | Crosswalk | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Existing | Build | Exceeds Criterion? | Existing | Build | Exceeds Criterion? |
| | West | C | C | No | C | C | No |
| | South | C | C | No | C | C | No |
| First St at Thorndike St | West | C | C | No | C | C | No |
| | North | C | C | No | C | C | No |
| | South | C | C | No | C | C | No |
| First St at Charles St | East | C | C | No | C | C | No |
| | West | C | C | No | C | C | No |
| | North | C | C | No | C | C | No |
| | South | C | C | No | C | C | No |
| Third St at Spring St | East | A | A | No | A | A | No |
| | West | A | A | No | A | A | No |
| | North | D | E | Yes | C | C | No |
| | South | C | D | Yes | B | C | Yes |
| Third St at Charles St | East | C | C | No | C | C | No |
| | West | C | C | No | C | C | No |
| | North | C | C | No | C | C | No |
| | South | C | C | No | C | C | No |
| Binney St/Galileo Galilei Way at Fulkerson St | East | D | D | No | D | D | No |
| | Northwest | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| Binney St at 5th Street | East | F | F | Yes | F | F | Yes |
| | West | F | F | Yes | F | F | Yes |
| | North | A | A | No | A | A | No |
| Binney St at Third St | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| Binney St at Second St | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |

| Intersection | Crosswalk | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Existing | Build | Exceeds Criterion? | Existing | Build | Exceeds Criterion? |
| | North | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| Binney St at First St | East | E | E | Yes | E | E | Yes |
| | West | E | E | Yes | E | E | Yes |
| | North | E | E | Yes | E | E | Yes |
| | South | E | E | Yes | E | E | Yes |
| Binney St at Land Blvd | West | E | E | Yes | E | E | Yes |
| | North | E | E | Yes | E | E | Yes |
| | South | E | E | Yes | E | E | Yes |
| Hampshire St at Portland St/Cardinal Medeiros Ave | East | C | C | No | C | C | No |
| | West | C | C | No | C | C | No |
| | North | B | B | No | B | B | No |
| | South | B | B | No | B | B | No |
| Broadway at Portland St | East | C | C | No | C | C | No |
| | West | C | C | No | C | C | No |
| | North | B | B | No | B | B | No |
| | South | B | B | No | B | B | No |
| Broadway at Hampshire St | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| | North | C | C | No | D | D | No |
| | South | C | C | No | D | D | No |
| Broadway at Galileo Galilei Way | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| Broadway at Green Garage | East | F | F | Yes | F | F | Yes |
| | West | F | F | Yes | F | F | Yes |
| | South | B | B | No | C | C | No |
| Broadway at Ames St | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |

| Intersection | Crosswalk | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Existing | Build | Exceeds Criterion? | Existing | Build | Exceeds Criterion? |
| | South | D | D | No | D | D | No |
| Broadway at Main St and Third St | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| Third St at Potter St and Kendall St | East | A | A | No | A | A | No |
| | West | A | D | Yes | A | D | Yes |
| | North | E | F | Yes | F | F | Yes |
| | South | F | F | Yes | F | F | Yes |
| Third St at Munroe St and Linskey Way | East | A | A | No | A | A | No |
| | West | A | A | No | A | A | No |
| | North | F | F | Yes | F | F | Yes |
| | South | E | F | Yes | E | F | Yes |
| Main St at Albany St | East | F | F | Yes | F | F | Yes |
| | West | F | F | Yes | F | F | Yes |
| | South | C | C | No | B | B | No |
| Galileo Galilei Way at Main St | East | D | D | No | D | D | No |
| | West | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| Main St at Ames St | East | C | C | No | C | C | No |
| | West | C | C | No | C | C | No |
| | North | D | D | No | D | D | No |
| | South | D | D | No | D | D | No |
| Main St at Kendall Station Crossing | East | C | C | No | D | E | Yes |
| | West | C | C | No | D | E | Yes |
| Memorial Dr at Longfellow Bridge | North | D | D | No | C | C | No |
| | South | B | B | No | D | D | No |
| | Southwest | A | A | No | A | A | No |
| Memorial Dr at Ames St | East | D | D | No | D | D | No |

| Intersection | Crosswalk | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Existing | Build | Exceeds Criterion? | Existing | Build | Exceeds Criterion? |
| | West | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| Memorial Dr at Wadsworth St | East | D | D | No | D | D | No |
| | North | D | D | No | D | D | No |
| Memorial Dr at Western Ave | East | E | E | Yes | E | E | Yes |
| | West | E | E | Yes | E | E | Yes |
| | North | E | E | Yes | E | E | Yes |
| Memorial Dr at Cambridge St/River St | East | E | E | Yes | E | E | Yes |
| | West | E | E | Yes | E | E | Yes |
| | North | E | E | Yes | E | E | Yes |
| | South | E | E | Yes | E | E | Yes |

## Criteria 2 & 3: Safe Pedestrian and Bicycle Facilities

Safe pedestrian and bicycle facilities are off-road or non-street bicycle lanes and sidewalks that are along a publicly accessible street.

Table F-1 presents the indicators for this criterion. The evaluation of sidewalks or walkways and bicycle facilities are displayed.

**Table F-1 Criteria F – Pedestrian and Bicycle Facilities**

| Adjacent Street | Link (between) | Sidewalk or Walkway Present | Exceeds Criteria? | Bicycle Facilities or Right of Ways Present | Exceeds Criteria? |
|---|---|---|---|---|---|
| Binney Street | 6th Street and 5th Street | Yes | No | Yes | No |
| | 5th Street and Third Street | Yes | No | Yes | No |
| Third Street | Binney Street and Munroe Street / Linskey Way | Yes | No | Yes | No |
| | Munroe Street / Linskey Way and Athenaeum Street | Yes | No | Yes | No |
| | Athenaeum Street and Potter Street / Kendall Street | Yes | No | Yes | No |
| | Potter Street / Kendall Street and Broad Canal Way | Yes | No | Yes | No |

| | | | | | |
|---|---|---|---|---|---|
| | Broad Canal Way and Broadway / Main Street | Yes | No | Yes | No |
| Broadway | Third Street / Main Street and Green Garage Exit | Yes | No | Yes | No |
| | Green Garage Exit and Ames Street | Yes | No | Yes | No |
| Munroe Street | Third Street and 5th Street | Yes | No | No | No |
| 5th Street | Munroe Street and Potter Street | Yes | No | No | No |
| Potter Street | 5th Street and Third Street | Yes | No | No | No |

# B.
# PEDESTRIAN WIND STUDY

# REPORT

# VOLPE

CAMBRIDGE, MA

PEDESTRIAN WIND STUDY
RWDI # 1903749
January 7, 2021

## SUBMITTED TO

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# EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed Volpe development in Cambridge, MA (Image 1). The potential wind conditions have been assessed based on wind-tunnel testing of the project under the No Build and Build configurations (Images 2A and 2B), and the local wind records (Image 3) and compared to the Mean Speed and Effective Gust criteria adopted by the Boston Planning and Development Agency (BPDA). The results of the assessment are shown on site plans in Figures 1A through 2B, and the associated wind speeds are listed in Tables 1 and 2. The key findings are summarized as follows:

**Effective Gust**

- The effective gust criterion is met at all but one location to the west of Fifth Street for the No Build configuration. The effective gust speed exceedance at this location is expected to be eliminated for Build configuration.

**Mean Speed**

- In the No Build configuration with existing landscaping, mean speeds on and around the project site are generally expected to be comfortable for the intended use on an annual basis.

- For Build configuration with existing and proposed landscaping, wind conditions at grade level on and around the project site are generally predicted to be similar or slightly lower than the existing wind conditions.

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# LIST OF FIGURES



# LIST OF TABLES

# 1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed Volpe development in Cambridge, MA. This report presents the project objectives, background and approach, and discusses of the results from RWDI's assessment and provides conceptual wind control measures, where necessary.

## 1.1 Project Description

The project (site shown in Image 1) is bound by Binney Street and Broadway Street to the north and south and by a pedestrian walkway and Third Street to the west and east, respectively. The development consists of 8 building and a low-rise community center.

## 1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations for minimizing adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to appropriate criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including building entrances and public sidewalks.


PROJECT SITE
BINNEY STREET
BROADWAY STREET
3RD STREET
N

**Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)**

# 2 BACKGROUND AND APPROACH

## 2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed project, a 1:300 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

A – No Build: Existing site with existing surroundings (Image 2A), and,

B – Build: Proposed project with existing surroundings, existing deciduous landscaping and proposed deciduous and marcescent landscaping that retain foliage throughout the year (Image 2B)

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 1200 ft radius of the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 153 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 5 ft above local grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 directions in a 10-degree increment. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site, and reviewed by the design team.

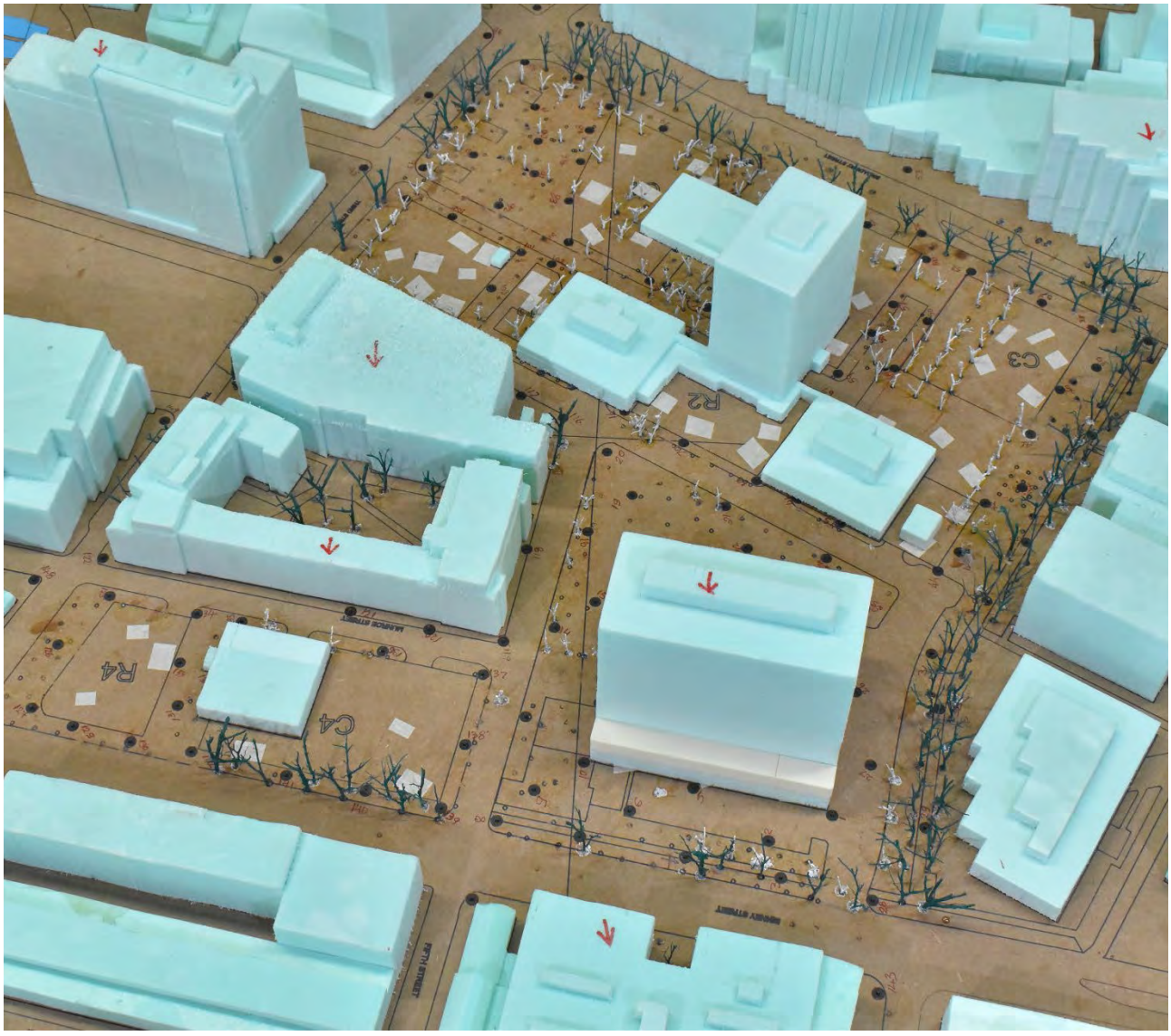
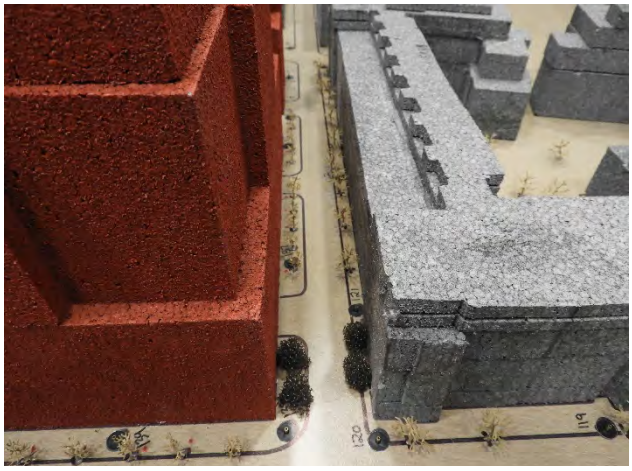



**Image 2A: Wind Tunnel Study Model – No Build Configuration**

**Image 2B: Wind Tunnel Study Model – Build Configuration**



## 2.2 Meteorological Data

The results were then combined with long-term meteorological data, recorded during the years 1995 through 2018 at Boston's Logan International Airport to predict full scale wind conditions. The analysis was performed separately for the entire year and for each of the four seasons. Images 3 and 4 present "wind roses", summarizing the annual and seasonal wind climates in the Boston area respectively, based on the data from Logan Airport.

On an annual basis, 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, west and northeast are the dominant wind directions.

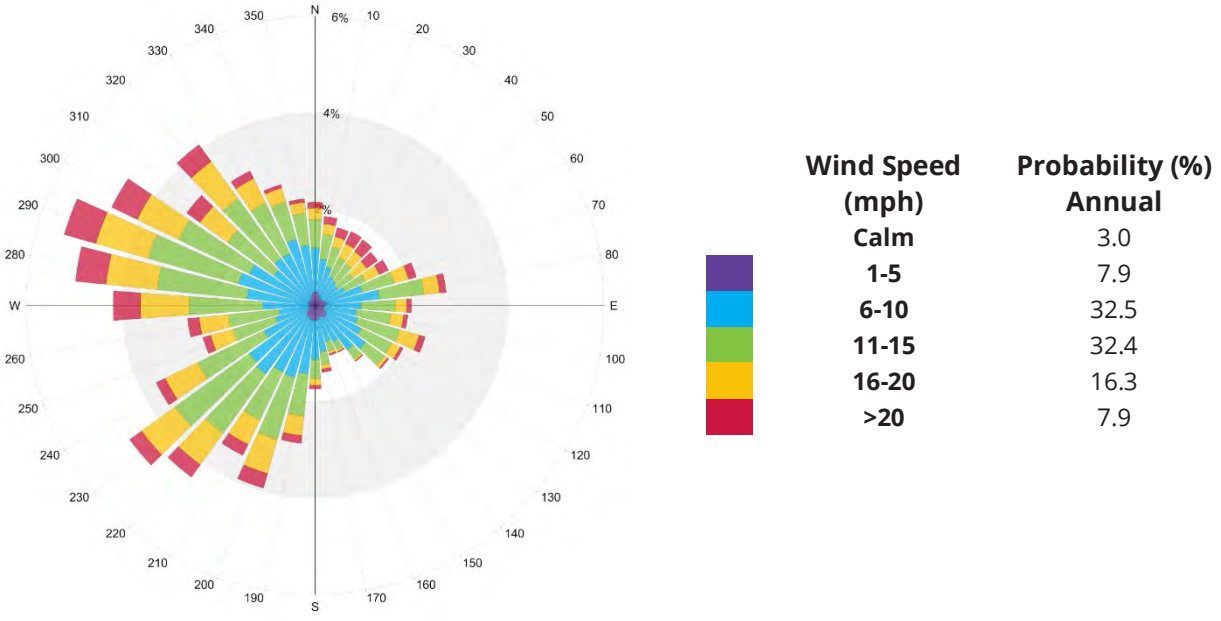
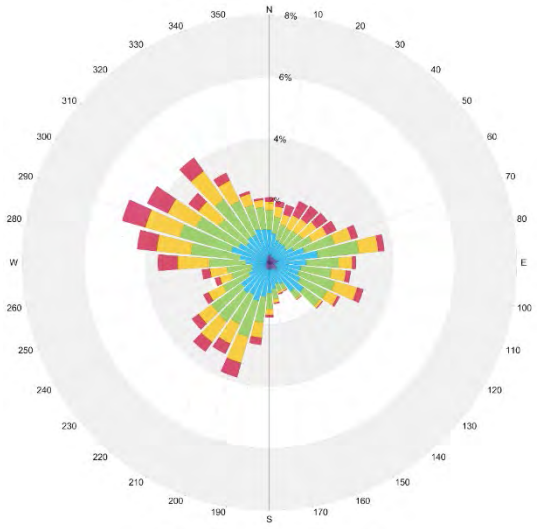
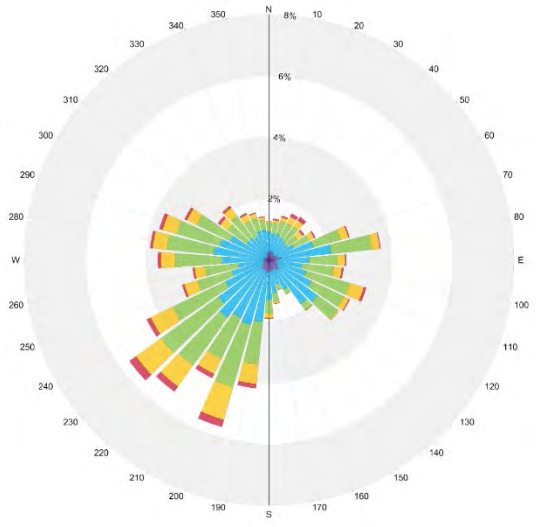



**Image 3: Annual Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 through 2018**

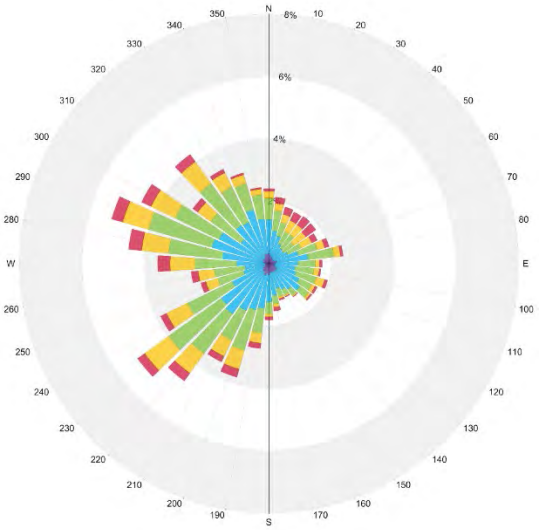
The first wind rose in Image 4, for example, summarizes the spring (March, April, and May) wind data which, in general, indicate prevailing winds occurring from the northwest to south-southwest and northeast to east-southeast directions and strong winds (red bands) primarily occurring from the west-northwest, northwest, south-southwest, west and northeast directions.



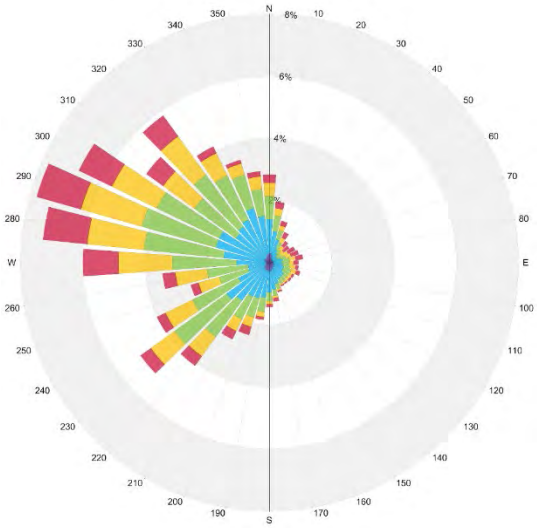
**Spring (March – May)**



**Summer (June – August)**



**Fall (September – November)**



**Winter (December – February)**

| Wind Speed (mph) | Probability (%) Spring | Summer | Fall | Winter |
|---|---|---|---|---|
| **Calm** | 2.8 | 3.0 | 3.4 | 2.6 |
| **1-5** | 6.8 | 9.4 | 8.7 | 6.5 |
| **6-10** | 28.9 | 38.8 | 34.6 | 27.9 |
| **11-15** | 32.3 | 34.4 | 32.0 | 30.9 |
| **16-20** | 19.2 | 11.8 | 14.5 | 19.7 |
| **>20** | 10.1 | 2.6 | 6.8 | 12.4 |

**Image 3: Seasonal Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 through 2018**

## 2.3 BPDA Wind Criteria

The Boston Planning and Development Agency (BPDA) has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BPDA 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 1% of the time.

The second set of criteria used by the BPDA to determine the acceptability of specific locations is based on the work of Melbourne. 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.

| **Wind Acceptability** | Effective Gust Speed (mph) |
|---|---|
| **Acceptable** | ≤ 31 |
| **Unacceptable** | > 31 |
| **Comfort Category** | Mean Wind Speed (mph) |
| **Comfortable for Sitting** | < 12 |
| **Comfortable for Standing** | ≤ 15 |
| **Comfortable for Walking** | ≤ 19 |
| **Uncomfortable for Walking** | > 19 |
| **Dangerous** | > 27 |

**Effective gust and mean wind speeds are based on a 1% exceedance or 99 percentile wind speeds.

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.

The wind climate found in a typical downtown location in Cambridge is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BPDA 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.

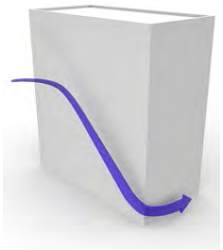
This study involved state-of-the-art measurement and analysis techniques to predict wind conditions. Nevertheless, some uncertainty remains in predicting wind comfort, and this must be kept in mind. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual 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 procedure. The wind speeds reported are for the frequency of occurrence stated (1% of the time). Higher wind speeds will occur but on a less frequent basis.

## 2.4 Generalized Wind Flows

In our discussion of wind conditions, reference may be made to the following generalized wind flows (Image 4):

***DOWNWASHING***

Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. This is often the main cause for wind accelerations around large buildings at the pedestrian level.



***CORNER ACCELERATION***

When winds approach at an oblique angle to a tall façade and are deflected down, a localized increase in the wind activity or corner acceleration can be expected around the exposed building corners at pedestrian level.

**Image 5: Generalized Wind Flows**

If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity. Design details such as; setting back a tall tower from the edges of a podium, deep canopies close to ground level, wind screens, tall trees with dense landscaping, etc. (Image 5) can help reduce wind speeds. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

***Podium/tower setback, canopy, landscaping and wind screens (left to right)***

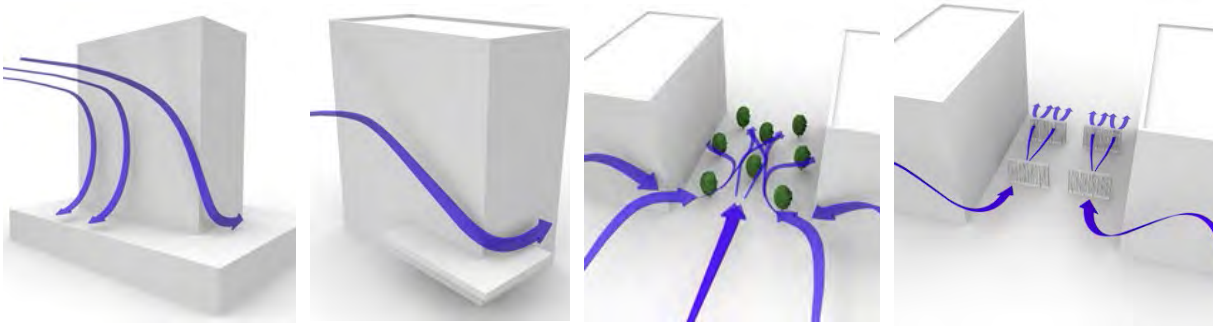


**Image 6: Common Wind Control Measures**

# 3 RESULTS AND DISCUSSION

The predicted wind conditions in terms of mean and effective gust speeds pertaining to the tested configurations are graphically depicted on site plans in Figures 1A through 2B located in the "Figures" section of this report. These conditions and the associated wind speeds are presented in Tables 1 and 2, located in the "Tables" section of this report. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested. Typically, the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds.

The following is a detailed discussion of the suitability of the predicted wind comfort conditions for the anticipated pedestrian use of each area of interest. Wind conditions comfortable for walking are appropriate for sidewalks and walkways as pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing are preferred at main entrances where pedestrians are apt to linger.

## 3.1 No Build Configuration

The mean speed winds for the existing site and adjacent sidewalks are generally expected to be comfortable for sitting or standing (Figure 1A). Wind speeds are expected to be higher to the northwest of the project site, around the existing building to the west of Fifth Street, with conditions comfortable for walking. Mean wind speeds at the southwest corner of an existing building to the west of Fifth Street are expected to be dangerous during the winter (Location 25 in Table 2).

The effective gust criterion is expected to be met for all locations tested with the exception of the southwest corner of an existing building to the west of Fifth Street on an annual basis (Location 25 in Figure 2A).

## 3.2 Build Configuration

With the addition of the proposed project with existing and proposed landscaping on-site, similar or slightly lower mean speeds are anticipated (Figure 1B). No dangerous wind speeds are detected at any location on an annual basis (Figure 1B) however, winds rated dangerous are predicted at the southwest corner of building C4 during the winter (Location 38 in Table 2). Wind speeds rated uncomfortable for walking are expected at a few building corners. Wind speeds at most building entrances are expected to be comfortable sitting or standing on an annual basis, which is suitable for the intended use. Wind speeds at one entrance location of Building R4 is expected to be comfortable for walking on an annual basis, which is considered higher than desired for the intended use (Location 130 in Figure 1B).

Wind speeds at all locations are predicted to meet the effective gust criterion on an annual basis with the addition of the proposed project (Figure 2B). winds at a few building corners are predicted to exceed the effective gust criterion during the winter and spring (Locations 25, 38 and 137 in Table 2). High wind activity at the building corners is mainly caused by northwesterly winds. Additional marcescent landscaping can be considered to the northwest of this corner. In addition, modified building massing (i.e. chamfering, re-entrant corners) vertical features in the form of porous wind screen, architectural feature/ signage or canopies wrapping around the corners can be considered at this corner for reduced wind speeds. Examples of these are shown in Images 6 and 7.

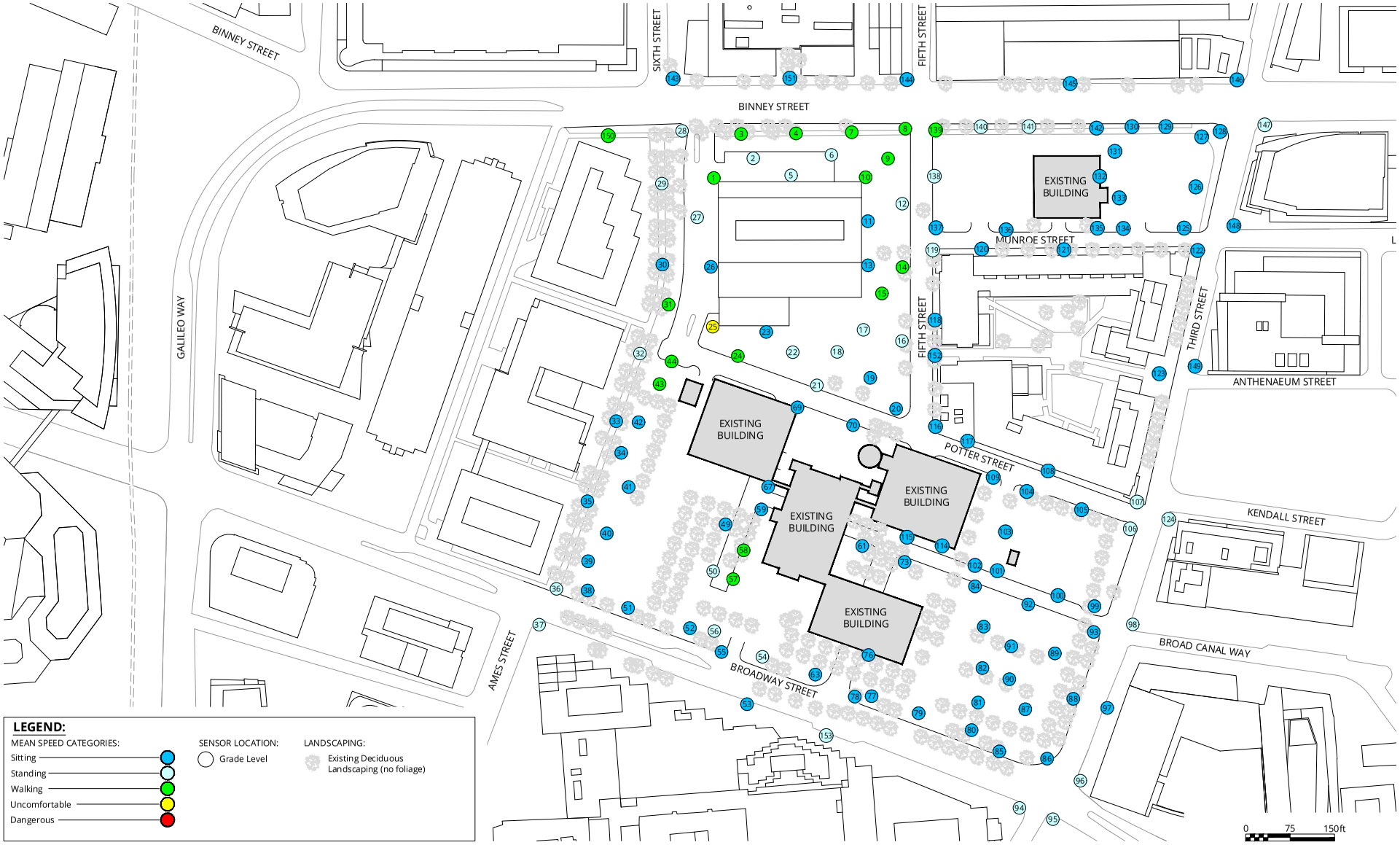

**Image 7: Examples of Wind Control Measures at Building Corners**

# 4 APPLICABILITY OF RESULTS

The wind conditions presented in this report pertain to the model of Volpe constructed using the drawings and information listed below. Should there be any design changes that deviate from this list of drawings, the wind condition predictions 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.

| File Name | File Type | Date Received (dd/mm/yyyy) |
|---|---|---|
| 20_0810 Volpe - Build Configuration.3dm | Rhinoceros | 11/11/2020 |
| 20_0902 Volpe - Build Configuration Opt2.3dm | Rhinoceros | 11/11/2020 |
| 20_0811 Volpe - Build Configuration revised R2R3.3dm | Rhinoceros | 11/11/2020 |

# FIGURES



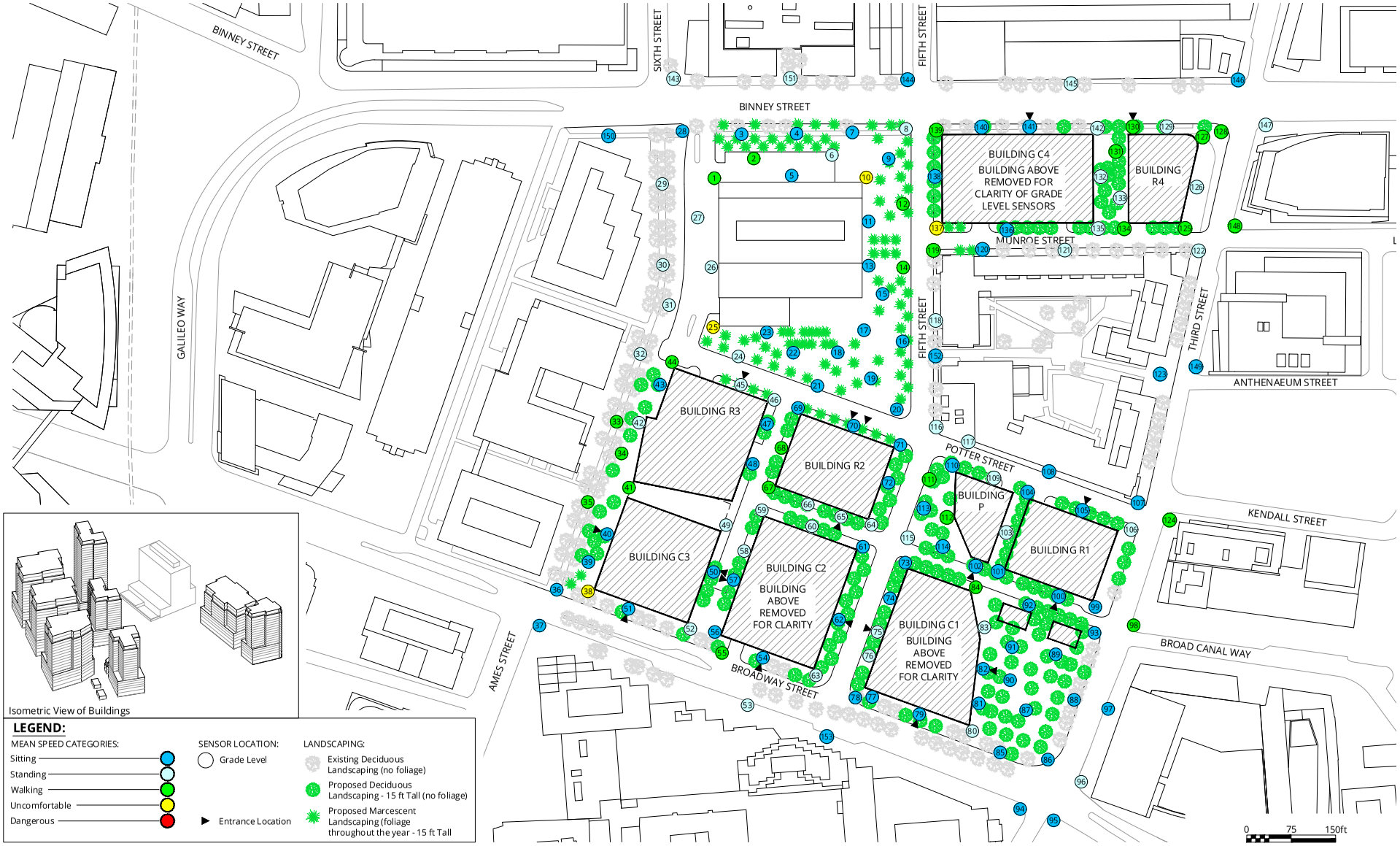

**Pedestrian Wind Conditions - Mean Speed**
No Build
Annual (January to December, 0:00 to 23:00)

Volpe - Cambridge, MA

True North

Project #1903749

| | |
|---|---|
| Drawn by: GRE | Figure: 1A |
| Approx. Scale: | 1"=150' |
| Date Revised: | Dec. 23, 2020 |




Isometric View of Buildings

**LEGEND:**

MEAN SPEED CATEGORIES:
- Sitting
- Standing
- Walking
- Uncomfortable
- Dangerous

SENSOR LOCATION:
- Grade Level
- Entrance Location

LANDSCAPING:
- Existing Deciduous Landscaping (no foliage)
- Proposed Deciduous Landscaping - 15 ft Tall (no foliage)
- Proposed Marcescent Landscaping (foliage throughout the year - 15 ft Tall

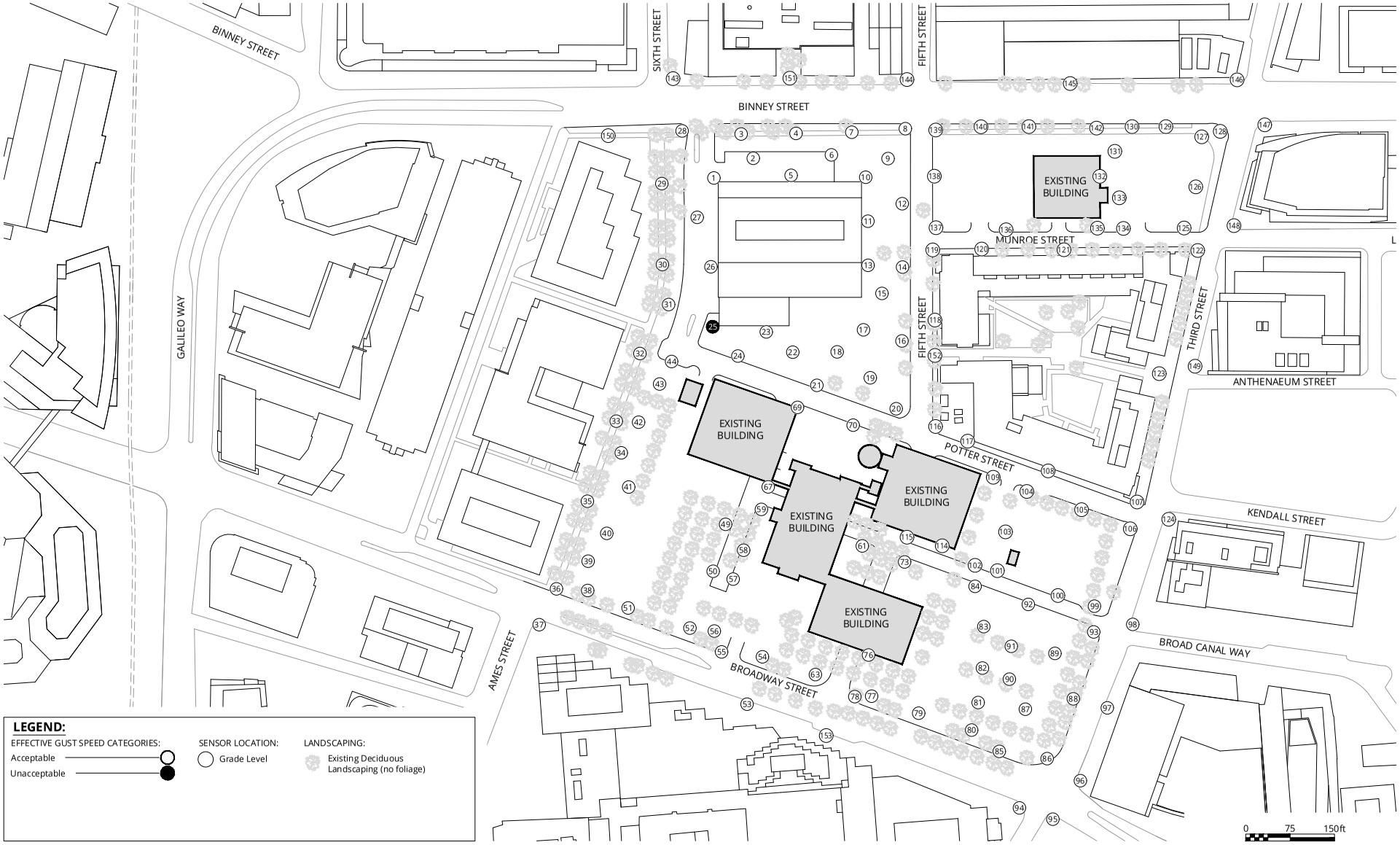
**Pedestrian Wind Conditions - Mean Speed**
Build
Annual (January to December, 0:00 to 23:00)

Volpe - Cambridge, MA

True North

Project #1903749

| | |
|---|---|
| Drawn by: GRE | Figure: 1B |
| Approx. Scale: | 1"=150' |
| Date Revised: | Nov. 10, 2020 |



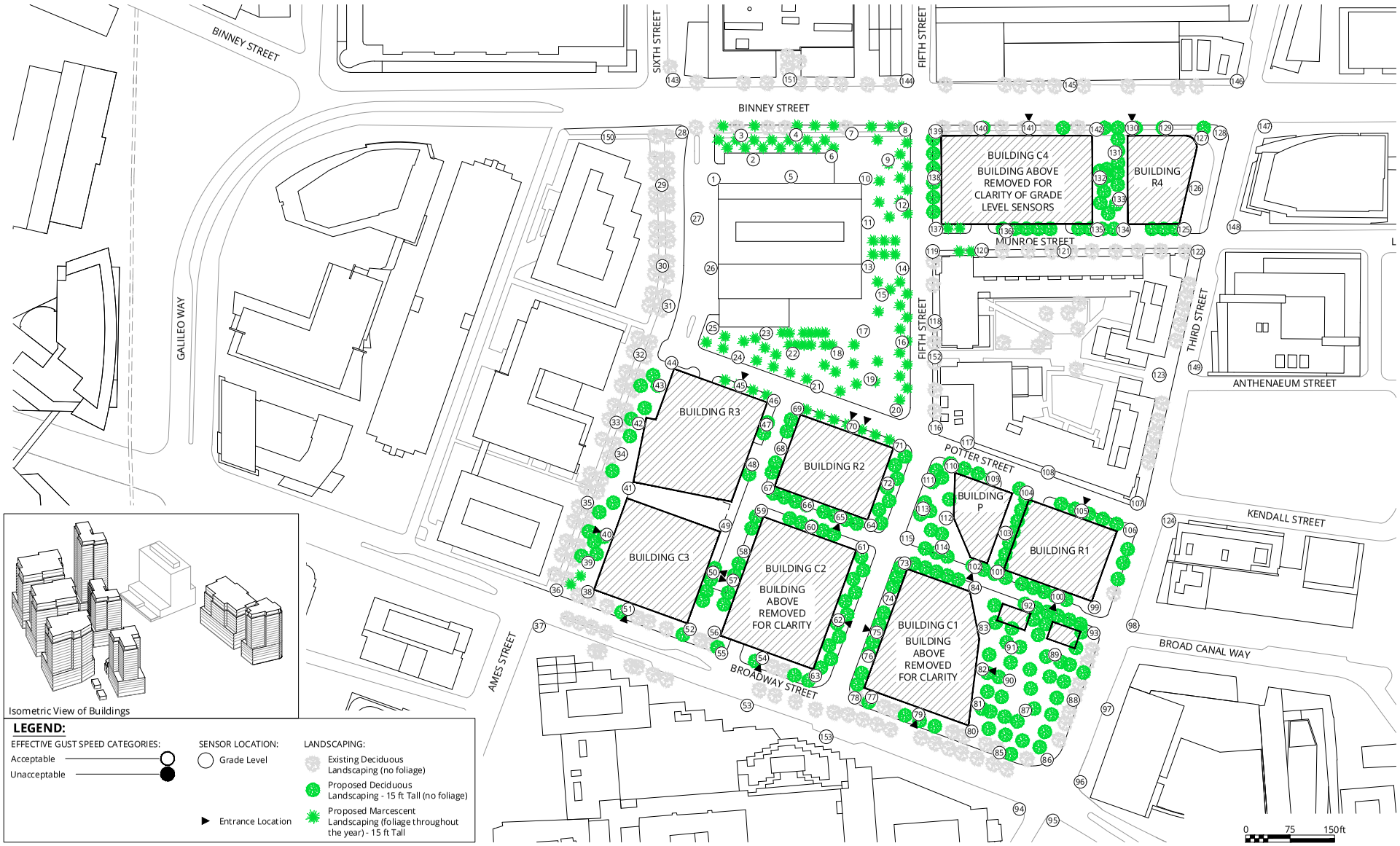

**Pedestrian Wind Conditions - Effective Gust Speed**
No Build
Annual (January to December, 0:00 to 23:00)

Volpe - Cambridge, MA

True North

Project #1903749

| | |
|---|---|
| Drawn by: GRE | Figure: 2A |
| Approx. Scale: | 1"=150' |
| Date Revised: | Dec. 23, 2020 |






Isometric View of Buildings

**LEGEND:**

EFFECTIVE GUST SPEED CATEGORIES:
- Acceptable
- Unacceptable

SENSOR LOCATION:
- Grade Level
- Entrance Location

LANDSCAPING:
- Existing Deciduous Landscaping (no foliage)
- Proposed Deciduous Landscaping - 15 ft Tall (no foliage)
- Proposed Marcescent Landscaping (foliage throughout the year) - 15 ft Tall

**Pedestrian Wind Conditions - Effective Gust Speed**
Build
Annual (January to December, 0:00 to 23:00)

Volpe - Cambridge, MA

True North

Project #1903749

| | |
|---|---|
| Drawn by: GRE | Figure: 2B |
| Approx. Scale: | 1"=150' |
| Date Revised: | Nov. 10, 2020 |

# TABLES

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **1** | A | Annual | 18 | | Walking | 26 | | Acceptable |
| | B | Annual | 18 | | Walking | 27 | | Acceptable |
| **2** | A | Annual | 13 | | Standing | 19 | | Acceptable |
| | B | Annual | 16 | 23% | Walking | 24 | 26% | Acceptable |
| **3** | A | Annual | 17 | | Walking | 24 | | Acceptable |
| | B | Annual | 11 | -35% | Sitting | 17 | | Acceptable |
| **4** | A | Annual | 16 | | Walking | 23 | | Acceptable |
| | B | Annual | 10 | -38% | Sitting | 16 | | Acceptable |
| **5** | A | Annual | 14 | | Standing | 20 | | Acceptable |
| | B | Annual | 10 | -29% | Sitting | 17 | | Acceptable |
| **6** | A | Annual | 15 | | Standing | 21 | | Acceptable |
| | B | Annual | 14 | | Standing | 21 | | Acceptable |
| **7** | A | Annual | 18 | | Walking | 25 | | Acceptable |
| | B | Annual | 10 | -44% | Sitting | 17 | | Acceptable |
| **8** | A | Annual | 18 | | Walking | 26 | | Acceptable |
| | B | Annual | 15 | -17% | Standing | 22 | | Acceptable |
| **9** | A | Annual | 19 | | Walking | 27 | | Acceptable |
| | B | Annual | 12 | -37% | Sitting | 19 | | Acceptable |
| **10** | A | Annual | 18 | | Walking | 26 | | Acceptable |
| | B | Annual | 20 | 11% | Uncomfortable | 26 | | Acceptable |
| **11** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 12 | 20% | Sitting | 19 | 19% | Acceptable |
| **12** | A | Annual | 13 | | Standing | 21 | | Acceptable |
| | B | Annual | 18 | 38% | Walking | 25 | 19% | Acceptable |
| **13** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 12 | 20% | Sitting | 19 | 19% | Acceptable |
| **14** | A | Annual | 16 | | Walking | 23 | | Acceptable |
| | B | Annual | 19 | 19% | Walking | 26 | 13% | Acceptable |
| **15** | A | Annual | 16 | | Walking | 23 | | Acceptable |
| | B | Annual | 8 | -50% | Sitting | 13 | | Acceptable |
| **16** | A | Annual | 13 | | Standing | 20 | | Acceptable |
| | B | Annual | 9 | -31% | Sitting | 16 | | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **17** | A | Annual | 15 | | Standing | 23 | | Acceptable |
| | B | Annual | 10 | -33% | Sitting | 17 | | Acceptable |
| **18** | A | Annual | 15 | | Standing | 23 | | Acceptable |
| | B | Annual | 9 | -40% | Sitting | 15 | | Acceptable |
| **19** | A | Annual | 12 | | Sitting | 20 | | Acceptable |
| | B | Annual | 8 | -33% | Sitting | 14 | | Acceptable |
| **20** | A | Annual | 9 | | Sitting | 16 | | Acceptable |
| | B | Annual | 12 | 33% | Sitting | 17 | | Acceptable |
| **21** | A | Annual | 15 | | Standing | 23 | | Acceptable |
| | B | Annual | 12 | -20% | Sitting | 18 | | Acceptable |
| **22** | A | Annual | 15 | | Standing | 24 | | Acceptable |
| | B | Annual | 8 | -47% | Sitting | 14 | | Acceptable |
| **23** | A | Annual | 12 | | Sitting | 21 | | Acceptable |
| | B | Annual | 8 | -33% | Sitting | 14 | | Acceptable |
| **24** | A | Annual | 19 | | Walking | 26 | | Acceptable |
| | B | Annual | 14 | -26% | Standing | 21 | | Acceptable |
| **25** | A | Annual | 25 | | Uncomfortable | 34 | | Unacceptable |
| | B | Annual | 20 | -20% | Uncomfortable | 29 | | Acceptable |
| **26** | A | Annual | 10 | | Sitting | 17 | | Acceptable |
| | B | Annual | 15 | 50% | Standing | 23 | 35% | Acceptable |
| **27** | A | Annual | 15 | | Standing | 22 | | Acceptable |
| | B | Annual | 14 | | Standing | 23 | | Acceptable |
| **28** | A | Annual | 14 | | Standing | 21 | | Acceptable |
| | B | Annual | 12 | -14% | Sitting | 20 | | Acceptable |
| **29** | A | Annual | 14 | | Standing | 20 | | Acceptable |
| | B | Annual | 15 | | Standing | 23 | 15% | Acceptable |
| **30** | A | Annual | 12 | | Sitting | 21 | | Acceptable |
| | B | Annual | 13 | | Standing | 20 | | Acceptable |
| **31** | A | Annual | 19 | | Walking | 27 | | Acceptable |
| | B | Annual | 15 | -21% | Standing | 23 | | Acceptable |
| **32** | A | Annual | 14 | | Standing | 20 | | Acceptable |
| | B | Annual | 15 | | Standing | 22 | 10% | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **33** | A | Annual | 12 | | Sitting | 15 | | Acceptable |
| | B | Annual | 18 | 50% | Walking | 26 | 73% | Acceptable |
| **34** | A | Annual | 8 | | Sitting | 13 | | Acceptable |
| | B | Annual | 16 | 100% | Walking | 24 | 85% | Acceptable |
| **35** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 18 | 80% | Walking | 26 | 63% | Acceptable |
| **36** | A | Annual | 14 | | Standing | 20 | | Acceptable |
| | B | Annual | 12 | -14% | Sitting | 18 | | Acceptable |
| **37** | A | Annual | 13 | | Standing | 19 | | Acceptable |
| | B | Annual | 12 | | Sitting | 19 | | Acceptable |
| **38** | A | Annual | 11 | | Sitting | 17 | | Acceptable |
| | B | Annual | 26 | 136% | Uncomfortable | 31 | 82% | Acceptable |
| **39** | A | Annual | 12 | | Sitting | 17 | | Acceptable |
| | B | Annual | 12 | | Sitting | 18 | | Acceptable |
| **40** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 12 | 50% | Sitting | 17 | 21% | Acceptable |
| **41** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 16 | 78% | Walking | 23 | 64% | Acceptable |
| **42** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 15 | 50% | Standing | 23 | 44% | Acceptable |
| **43** | A | Annual | 16 | | Walking | 22 | | Acceptable |
| | B | Annual | 11 | -31% | Sitting | 18 | | Acceptable |
| **44** | A | Annual | 16 | | Walking | 24 | | Acceptable |
| | B | Annual | 19 | 19% | Walking | 27 | 13% | Acceptable |
| **45** | A | Annual | - | | - | - | | - |
| | B | Annual | 15 | - | Standing | 20 | - | Acceptable |
| **46** | A | Annual | - | | - | - | | - |
| | B | Annual | 15 | - | Standing | 21 | - | Acceptable |
| **47** | A | Annual | - | | - | - | | - |
| | B | Annual | 11 | - | Sitting | 16 | - | Acceptable |
| **48** | A | Annual | - | | - | - | | - |
| | B | Annual | 12 | - | Sitting | 17 | - | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **49** | A | Annual | 12 | | Sitting | 18 | | Acceptable |
| | B | Annual | 14 | 17% | Standing | 20 | 11% | Acceptable |
| **50** | A | Annual | 13 | | Standing | 21 | | Acceptable |
| | B | Annual | 8 | -38% | Sitting | 13 | | Acceptable |
| **51** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 9 | | Sitting | 15 | | Acceptable |
| **52** | A | Annual | 10 | | Sitting | 17 | | Acceptable |
| | B | Annual | 13 | 30% | Standing | 19 | 12% | Acceptable |
| **53** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 14 | 56% | Standing | 21 | 50% | Acceptable |
| **54** | A | Annual | 14 | | Standing | 22 | | Acceptable |
| | B | Annual | 9 | -36% | Sitting | 15 | | Acceptable |
| **55** | A | Annual | 11 | | Sitting | 18 | | Acceptable |
| | B | Annual | 17 | 55% | Walking | 24 | 33% | Acceptable |
| **56** | A | Annual | 14 | | Standing | 21 | | Acceptable |
| | B | Annual | 10 | -29% | Sitting | 16 | | Acceptable |
| **57** | A | Annual | 16 | | Walking | 24 | | Acceptable |
| | B | Annual | 11 | -31% | Sitting | 16 | | Acceptable |
| **58** | A | Annual | 16 | | Walking | 23 | | Acceptable |
| | B | Annual | 15 | | Standing | 20 | | Acceptable |
| **59** | A | Annual | 9 | | Sitting | 15 | | Acceptable |
| | B | Annual | 13 | 44% | Standing | 19 | 27% | Acceptable |
| **60** | A | Annual | - | | - | - | | - |
| | B | Annual | 14 | - | Standing | 22 | - | Acceptable |
| **61** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 10 | 11% | Sitting | 16 | 14% | Acceptable |
| **62** | A | Annual | - | | - | - | | - |
| | B | Annual | 10 | - | Sitting | 15 | - | Acceptable |
| **63** | A | Annual | 12 | | Sitting | 19 | | Acceptable |
| | B | Annual | 15 | 25% | Standing | 21 | 11% | Acceptable |
| **64** | A | Annual | - | | - | - | | - |
| | B | Annual | 15 | - | Standing | 21 | - | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **65** | A | Annual | - | | - | - | | - |
| | B | Annual | 13 | - | Standing | 19 | - | Acceptable |
| **66** | A | Annual | - | | - | - | | - |
| | B | Annual | 15 | - | Standing | 21 | - | Acceptable |
| **67** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 17 | 113% | Walking | 23 | 64% | Acceptable |
| **68** | A | Annual | - | | - | - | | - |
| | B | Annual | 19 | - | Walking | 27 | - | Acceptable |
| **69** | A | Annual | 9 | | Sitting | 15 | | Acceptable |
| | B | Annual | 12 | 33% | Sitting | 18 | 20% | Acceptable |
| **70** | A | Annual | 11 | | Sitting | 19 | | Acceptable |
| | B | Annual | 7 | -36% | Sitting | 11 | | Acceptable |
| **71** | A | Annual | - | | - | - | | - |
| | B | Annual | 11 | - | Sitting | 16 | - | Acceptable |
| **72** | A | Annual | - | | - | - | | - |
| | B | Annual | 7 | - | Sitting | 12 | - | Acceptable |
| **73** | A | Annual | 7 | | Sitting | 12 | | Acceptable |
| | B | Annual | 12 | 71% | Sitting | 17 | 42% | Acceptable |
| **74** | A | Annual | - | | - | - | | - |
| | B | Annual | 9 | - | Sitting | 14 | - | Acceptable |
| **75** | A | Annual | - | | - | - | | - |
| | B | Annual | 13 | - | Standing | 19 | - | Acceptable |
| **76** | A | Annual | 6 | | Sitting | 11 | | Acceptable |
| | B | Annual | 14 | 133% | Standing | 20 | 82% | Acceptable |
| **77** | A | Annual | 11 | | Sitting | 17 | | Acceptable |
| | B | Annual | 10 | | Sitting | 15 | | Acceptable |
| **78** | A | Annual | 11 | | Sitting | 17 | | Acceptable |
| | B | Annual | 10 | | Sitting | 16 | | Acceptable |
| **79** | A | Annual | 9 | | Sitting | 16 | | Acceptable |
| | B | Annual | 11 | 22% | Sitting | 16 | | Acceptable |
| **80** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 15 | 88% | Standing | 21 | 50% | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **81** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 7 | -22% | Sitting | 12 | | Acceptable |
| **82** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 8 | -11% | Sitting | 13 | | Acceptable |
| **83** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 13 | 63% | Standing | 18 | 29% | Acceptable |
| **84** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 16 | 100% | Walking | 22 | 57% | Acceptable |
| **85** | A | Annual | 11 | | Sitting | 18 | | Acceptable |
| | B | Annual | 10 | | Sitting | 15 | | Acceptable |
| **86** | A | Annual | 12 | | Sitting | 20 | | Acceptable |
| | B | Annual | 12 | | Sitting | 19 | | Acceptable |
| **87** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 12 | 50% | Sitting | 18 | 29% | Acceptable |
| **88** | A | Annual | 11 | | Sitting | 18 | | Acceptable |
| | B | Annual | 12 | | Sitting | 18 | | Acceptable |
| **89** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 8 | -11% | Sitting | 13 | | Acceptable |
| **90** | A | Annual | 9 | | Sitting | 15 | | Acceptable |
| | B | Annual | 8 | -11% | Sitting | 15 | | Acceptable |
| **91** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 8 | -11% | Sitting | 13 | | Acceptable |
| **92** | A | Annual | 11 | | Sitting | 16 | | Acceptable |
| | B | Annual | 12 | | Sitting | 18 | 13% | Acceptable |
| **93** | A | Annual | 11 | | Sitting | 17 | | Acceptable |
| | B | Annual | 12 | | Sitting | 18 | | Acceptable |
| **94** | A | Annual | 16 | | Walking | 24 | | Acceptable |
| | B | Annual | 12 | -25% | Sitting | 18 | | Acceptable |
| **95** | A | Annual | 15 | | Standing | 23 | | Acceptable |
| | B | Annual | 10 | -33% | Sitting | 17 | | Acceptable |
| **96** | A | Annual | 13 | | Standing | 21 | | Acceptable |
| | B | Annual | 14 | | Standing | 20 | | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **97** | A | Annual | 8 | | Sitting | 13 | | Acceptable |
| | B | Annual | 12 | 50% | Sitting | 19 | 46% | Acceptable |
| **98** | A | Annual | 15 | | Standing | 23 | | Acceptable |
| | B | Annual | 16 | | Walking | 23 | | Acceptable |
| **99** | A | Annual | 10 | | Sitting | 17 | | Acceptable |
| | B | Annual | 12 | 20% | Sitting | 18 | | Acceptable |
| **100** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 10 | 25% | Sitting | 16 | 14% | Acceptable |
| **101** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 12 | 50% | Sitting | 17 | 21% | Acceptable |
| **102** | A | Annual | 10 | | Sitting | 15 | | Acceptable |
| | B | Annual | 10 | | Sitting | 14 | | Acceptable |
| **103** | A | Annual | 8 | | Sitting | 12 | | Acceptable |
| | B | Annual | 14 | 75% | Standing | 19 | 58% | Acceptable |
| **104** | A | Annual | 8 | | Sitting | 13 | | Acceptable |
| | B | Annual | 11 | 38% | Sitting | 17 | 31% | Acceptable |
| **105** | A | Annual | 8 | | Sitting | 14 | | Acceptable |
| | B | Annual | 9 | 13% | Sitting | 16 | 14% | Acceptable |
| **106** | A | Annual | 14 | | Standing | 23 | | Acceptable |
| | B | Annual | 15 | | Standing | 20 | | Acceptable |
| **107** | A | Annual | 13 | | Standing | 21 | | Acceptable |
| | B | Annual | 12 | | Sitting | 18 | | Acceptable |
| **108** | A | Annual | 7 | | Sitting | 11 | | Acceptable |
| | B | Annual | 9 | 29% | Sitting | 14 | 27% | Acceptable |
| **109** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 13 | 30% | Standing | 19 | 19% | Acceptable |
| **110** | A | Annual | - | | - | - | | - |
| | B | Annual | 12 | - | Sitting | 18 | - | Acceptable |
| **111** | A | Annual | - | | - | - | | - |
| | B | Annual | 18 | - | Walking | 24 | - | Acceptable |
| **112** | A | Annual | - | | - | - | | - |
| | B | Annual | 18 | - | Walking | 27 | - | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **113** | A | Annual | - | | - | - | | - |
| | B | Annual | 12 | - | Sitting | 18 | - | Acceptable |
| **114** | A | Annual | 7 | | Sitting | 12 | | Acceptable |
| | B | Annual | 12 | 71% | Sitting | 19 | 58% | Acceptable |
| **115** | A | Annual | 7 | | Sitting | 13 | | Acceptable |
| | B | Annual | 15 | 114% | Standing | 22 | 69% | Acceptable |
| **116** | A | Annual | 12 | | Sitting | 17 | | Acceptable |
| | B | Annual | 13 | | Standing | 19 | 12% | Acceptable |
| **117** | A | Annual | 9 | | Sitting | 15 | | Acceptable |
| | B | Annual | 14 | 56% | Standing | 20 | 33% | Acceptable |
| **118** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 14 | 40% | Standing | 20 | 25% | Acceptable |
| **119** | A | Annual | 14 | | Standing | 22 | | Acceptable |
| | B | Annual | 18 | 29% | Walking | 25 | 14% | Acceptable |
| **120** | A | Annual | 9 | | Sitting | 16 | | Acceptable |
| | B | Annual | 26 | 189% | Uncomfortable | 34 | 113% | Unacceptable |
| **121** | A | Annual | 11 | | Sitting | 18 | | Acceptable |
| | B | Annual | 15 | 36% | Standing | 21 | 17% | Acceptable |
| **122** | A | Annual | 11 | | Sitting | 16 | | Acceptable |
| | B | Annual | 14 | 27% | Standing | 20 | 25% | Acceptable |
| **123** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 9 | -10% | Sitting | 14 | | Acceptable |
| **124** | A | Annual | 15 | | Standing | 23 | | Acceptable |
| | B | Annual | 16 | | Walking | 23 | | Acceptable |
| **125** | A | Annual | 10 | | Sitting | 17 | | Acceptable |
| | B | Annual | 19 | 90% | Walking | 26 | 53% | Acceptable |
| **126** | A | Annual | 8 | | Sitting | 15 | | Acceptable |
| | B | Annual | 13 | 63% | Standing | 20 | 33% | Acceptable |
| **127** | A | Annual | 8 | | Sitting | 13 | | Acceptable |
| | B | Annual | 19 | 138% | Walking | 28 | 115% | Acceptable |
| **128** | A | Annual | 8 | | Sitting | 15 | | Acceptable |
| | B | Annual | 16 | 100% | Walking | 22 | 47% | Acceptable |

**Table 1: Mean Speed and Effective Gust Categories - Annual**

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **129** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 14 | 56% | Standing | 20 | 43% | Acceptable |
| **130** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 16 | 78% | Walking | 22 | 57% | Acceptable |
| **131** | A | Annual | 8 | | Sitting | 12 | | Acceptable |
| | B | Annual | 16 | 100% | Walking | 22 | 83% | Acceptable |
| **132** | A | Annual | - | | - | - | | - |
| | B | Annual | 15 | - | Standing | 21 | - | Acceptable |
| **133** | A | Annual | 9 | | Sitting | 13 | | Acceptable |
| | B | Annual | 15 | 67% | Standing | 21 | 62% | Acceptable |
| **134** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 18 | 80% | Walking | 26 | 63% | Acceptable |
| **135** | A | Annual | 11 | | Sitting | 16 | | Acceptable |
| | B | Annual | 15 | 36% | Standing | 22 | 38% | Acceptable |
| **136** | A | Annual | 12 | | Sitting | 19 | | Acceptable |
| | B | Annual | 10 | -17% | Sitting | 16 | | Acceptable |
| **137** | A | Annual | 12 | | Sitting | 20 | | Acceptable |
| | B | Annual | 22 | 83% | Uncomfortable | 29 | 45% | Acceptable |
| **138** | A | Annual | 13 | | Standing | 19 | | Acceptable |
| | B | Annual | 7 | -46% | Sitting | 12 | | Acceptable |
| **139** | A | Annual | 16 | | Walking | 23 | | Acceptable |
| | B | Annual | 17 | | Walking | 25 | | Acceptable |
| **140** | A | Annual | 14 | | Standing | 19 | | Acceptable |
| | B | Annual | 9 | -36% | Sitting | 15 | | Acceptable |
| **141** | A | Annual | 15 | | Standing | 21 | | Acceptable |
| | B | Annual | 10 | -33% | Sitting | 15 | | Acceptable |
| **142** | A | Annual | 9 | | Sitting | 15 | | Acceptable |
| | B | Annual | 14 | 56% | Standing | 21 | 40% | Acceptable |
| **143** | A | Annual | 11 | | Sitting | 16 | | Acceptable |
| | B | Annual | 13 | 18% | Standing | 20 | 25% | Acceptable |
| **144** | A | Annual | 9 | | Sitting | 14 | | Acceptable |
| | B | Annual | 12 | 33% | Sitting | 17 | 21% | Acceptable |

## Table 1: Mean Speed and Effective Gust Categories - Annual

| Location | Configuration | Season | Mean Wind Speed | | | Effective Gust Wind Speed | | |
|---|---|---|---|---|---|---|---|---|
| | | | Speed (mph) | % Change | Rating | Speed (mph) | % Change | Rating |
| **145** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 14 | 40% | Standing | 19 | 19% | Acceptable |
| **146** | A | Annual | 12 | | Sitting | 19 | | Acceptable |
| | B | Annual | 7 | -42% | Sitting | 12 | | Acceptable |
| **147** | A | Annual | 13 | | Standing | 20 | | Acceptable |
| | B | Annual | 13 | | Standing | 19 | | Acceptable |
| **148** | A | Annual | 9 | | Sitting | 15 | | Acceptable |
| | B | Annual | 16 | 78% | Walking | 23 | 53% | Acceptable |
| **149** | A | Annual | 11 | | Sitting | 16 | | Acceptable |
| | B | Annual | 11 | | Sitting | 16 | | Acceptable |
| **150** | A | Annual | 17 | | Walking | 24 | | Acceptable |
| | B | Annual | 11 | -35% | Sitting | 17 | | Acceptable |
| **151** | A | Annual | 11 | | Sitting | 16 | | Acceptable |
| | B | Annual | 15 | 36% | Standing | 20 | 25% | Acceptable |
| **152** | A | Annual | 10 | | Sitting | 16 | | Acceptable |
| | B | Annual | 10 | | Sitting | 16 | | Acceptable |
| **153** | A | Annual | 16 | | Walking | 24 | | Acceptable |
| | B | Annual | 11 | -31% | Sitting | 16 | | Acceptable |

| Configurations | | Mean Wind Criteria Speed (mph) | | Effective Gust Criteria (mph) | |
|---|---|---|---|---|---|
| **No Build** | Existing Site and surroundings | ≤ 12 | Comfortable for Sitting | ≤ 31 | Acceptable |
| | | 13 - 15 | Comfortable for Standing | > 31 | Unacceptable |
| **Build** | proposed project with existing surroundir | 16 - 19 | Comfortable for Walking | | |
| | | 20 - 27 | Uncomfortable for Walking | | |
| | | > 27 | Dangerous Conditions | | |

***Notes***

*1) Wind Speeds are for a 1% probability of exceedance*

*2) % Change is based on comparison with Configuration A*

*3) % changes less than 10% are excluded*

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **1** | A | 20 | 14 | 18 | 19 | 28 | 20 | 26 | 27 |
| | B | 19 | 15 | 18 | 19 | 28 | 21 | 26 | 29 |
| **2** | A | 13 | 10 | 12 | 14 | 20 | 15 | 19 | 21 |
| | B | 16 | 13 | 15 | 18 | 25 | 19 | 23 | 27 |
| **3** | A | 17 | 13 | 16 | 18 | 25 | 19 | 23 | 26 |
| | B | 11 | 8 | 10 | 12 | 18 | 13 | 17 | 19 |
| **4** | A | 16 | 12 | 15 | 17 | 23 | 18 | 22 | 24 |
| | B | 11 | 8 | 10 | 11 | 17 | 13 | 16 | 18 |
| **5** | A | 14 | 11 | 13 | 15 | 21 | 16 | 19 | 22 |
| | B | 11 | 8 | 10 | 11 | 18 | 13 | 16 | 18 |
| **6** | A | 15 | 11 | 14 | 16 | 21 | 16 | 20 | 23 |
| | B | 15 | 11 | 14 | 15 | 22 | 17 | 20 | 23 |
| **7** | A | 19 | 14 | 18 | 20 | 26 | 20 | 25 | 28 |
| | B | 11 | 8 | 10 | 11 | 18 | 13 | 16 | 18 |
| **8** | A | 19 | 15 | 18 | 20 | 26 | 20 | 25 | 28 |
| | B | 15 | 11 | 14 | 16 | 23 | 17 | 21 | 23 |
| **9** | A | 20 | 15 | 18 | 21 | 27 | 21 | 25 | 29 |
| | B | 13 | 9 | 12 | 13 | 20 | 15 | 18 | 20 |
| **10** | A | 18 | 14 | 17 | 20 | 27 | 20 | 26 | 29 |
| | B | 20 | 16 | 19 | 21 | 27 | 21 | 26 | 28 |
| **11** | A | 10 | 7 | 10 | 11 | 16 | 12 | 16 | 17 |
| | B | 14 | 9 | 13 | 12 | 22 | 15 | 20 | 20 |
| **12** | A | 14 | 12 | 13 | 14 | 22 | 18 | 21 | 23 |
| | B | 18 | 14 | 17 | 20 | 26 | 20 | 24 | 28 |
| **13** | A | 11 | 8 | 10 | 11 | 17 | 12 | 16 | 17 |
| | B | 14 | 10 | 13 | 12 | 21 | 15 | 19 | 19 |
| **14** | A | 16 | 13 | 15 | 17 | 24 | 18 | 23 | 25 |
| | B | 19 | 15 | 17 | 21 | 27 | 20 | 24 | 28 |
| **15** | A | 17 | 13 | 16 | 17 | 24 | 19 | 23 | 25 |
| | B | 8 | 6 | 8 | 9 | 13 | 10 | 12 | 14 |
| **16** | A | 14 | 10 | 13 | 14 | 21 | 16 | 20 | 22 |
| | B | 9 | 7 | 9 | 10 | 16 | 13 | 15 | 18 |
| **17** | A | 16 | 12 | 15 | 16 | 24 | 18 | 22 | 24 |
| | B | 12 | 9 | 10 | 10 | 18 | 14 | 17 | 17 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **18** | A | 16 | 12 | 15 | 17 | 24 | 18 | 22 | 25 |
| | B | 9 | 7 | 9 | 9 | 15 | 12 | 14 | 15 |
| **19** | A | 12 | 9 | 11 | 13 | 21 | 15 | 19 | 21 |
| | B | 9 | 7 | 8 | 9 | 15 | 11 | 14 | 15 |
| **20** | A | 10 | 7 | 9 | 10 | 17 | 13 | 16 | 18 |
| | B | 12 | 9 | 12 | 13 | 18 | 14 | 17 | 19 |
| **21** | A | 16 | 12 | 15 | 17 | 23 | 18 | 22 | 25 |
| | B | 12 | 10 | 12 | 13 | 18 | 15 | 18 | 19 |
| **22** | A | 16 | 12 | 15 | 17 | 25 | 19 | 23 | 27 |
| | B | 9 | 7 | 8 | 9 | 15 | 11 | 14 | 15 |
| **23** | A | 12 | 9 | 11 | 14 | 21 | 16 | 19 | 23 |
| | B | 9 | 6 | 8 | 9 | 15 | 11 | 14 | 15 |
| **24** | A | 19 | 15 | 18 | 21 | 27 | 20 | 25 | 28 |
| | B | 14 | 11 | 13 | 15 | 22 | 16 | 21 | 23 |
| **25** | A | 26 | 20 | 24 | 28 | 35 | 27 | 32 | 38 |
| | B | 21 | 16 | 19 | 23 | 30 | 23 | 27 | 32 |
| **26** | A | 11 | 8 | 10 | 11 | 18 | 13 | 16 | 18 |
| | B | 15 | 12 | 14 | 17 | 23 | 18 | 22 | 25 |
| **27** | A | 16 | 12 | 15 | 16 | 23 | 17 | 22 | 24 |
| | B | 14 | 11 | 14 | 15 | 23 | 18 | 22 | 25 |
| **28** | A | 15 | 10 | 14 | 15 | 23 | 16 | 21 | 23 |
| | B | 12 | 9 | 11 | 13 | 20 | 16 | 19 | 21 |
| **29** | A | 15 | 11 | 14 | 15 | 20 | 15 | 19 | 21 |
| | B | 16 | 11 | 14 | 15 | 24 | 17 | 22 | 24 |
| **30** | A | 13 | 9 | 12 | 14 | 21 | 16 | 20 | 23 |
| | B | 13 | 10 | 12 | 14 | 21 | 16 | 19 | 22 |
| **31** | A | 19 | 15 | 18 | 21 | 27 | 21 | 25 | 30 |
| | B | 15 | 11 | 14 | 16 | 24 | 18 | 22 | 26 |
| **32** | A | 14 | 11 | 13 | 15 | 20 | 16 | 19 | 21 |
| | B | 15 | 12 | 14 | 17 | 23 | 17 | 21 | 24 |
| **33** | A | 12 | 9 | 12 | 13 | 16 | 12 | 15 | 17 |
| | B | 19 | 14 | 17 | 20 | 27 | 21 | 25 | 29 |
| **34** | A | 8 | 6 | 8 | 9 | 13 | 10 | 13 | 14 |
| | B | 17 | 13 | 16 | 18 | 25 | 19 | 23 | 27 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **35** | A | 10 | 8 | 10 | 11 | 16 | 13 | 16 | 17 |
| | B | 18 | 14 | 17 | 19 | 26 | 20 | 25 | 28 |
| **36** | A | 15 | 13 | 14 | 14 | 21 | 18 | 20 | 21 |
| | B | 12 | 9 | 11 | 13 | 18 | 14 | 17 | 19 |
| **37** | A | 14 | 11 | 13 | 13 | 20 | 15 | 19 | 20 |
| | B | 13 | 10 | 12 | 13 | 20 | 16 | 19 | 20 |
| **38** | A | 12 | 10 | 11 | 12 | 17 | 14 | 17 | 18 |
| | B | 26 | 21 | 25 | 28 | 33 | 26 | 31 | 35 |
| **39** | A | 13 | 12 | 12 | 11 | 19 | 17 | 17 | 17 |
| | B | 13 | 10 | 12 | 14 | 18 | 14 | 17 | 19 |
| **40** | A | 9 | 7 | 8 | 9 | 14 | 12 | 14 | 15 |
| | B | 12 | 9 | 11 | 13 | 18 | 14 | 17 | 19 |
| **41** | A | 9 | 7 | 9 | 10 | 14 | 11 | 13 | 15 |
| | B | 17 | 13 | 16 | 18 | 23 | 18 | 21 | 25 |
| **42** | A | 10 | 8 | 9 | 11 | 16 | 12 | 15 | 17 |
| | B | 15 | 12 | 14 | 17 | 23 | 18 | 22 | 25 |
| **43** | A | 16 | 12 | 15 | 17 | 22 | 17 | 21 | 24 |
| | B | 12 | 9 | 11 | 11 | 19 | 14 | 17 | 19 |
| **44** | A | 17 | 13 | 15 | 18 | 24 | 19 | 22 | 26 |
| | B | 19 | 14 | 18 | 21 | 28 | 20 | 26 | 29 |
| **45** | A | - | - | - | - | - | - | - | - |
| | B | 15 | 12 | 14 | 16 | 21 | 16 | 19 | 22 |
| **46** | A | - | - | - | - | - | - | - | - |
| | B | 15 | 13 | 15 | 16 | 21 | 18 | 20 | 22 |
| **47** | A | - | - | - | - | - | - | - | - |
| | B | 11 | 10 | 11 | 12 | 17 | 14 | 16 | 18 |
| **48** | A | - | - | - | - | - | - | - | - |
| | B | 12 | 10 | 11 | 12 | 18 | 14 | 17 | 18 |
| **49** | A | 12 | 10 | 11 | 13 | 18 | 15 | 17 | 20 |
| | B | 15 | 11 | 14 | 15 | 21 | 16 | 20 | 22 |
| **50** | A | 14 | 11 | 13 | 15 | 21 | 16 | 20 | 22 |
| | B | 9 | 7 | 8 | 9 | 14 | 11 | 13 | 14 |
| **51** | A | 9 | 7 | 9 | 10 | 15 | 11 | 14 | 16 |
| | B | 10 | 8 | 9 | 10 | 16 | 13 | 15 | 16 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **52** | A | 11 | 8 | 10 | 11 | 17 | 13 | 16 | 18 |
| | B | 13 | 10 | 12 | 14 | 19 | 15 | 18 | 21 |
| **53** | A | 9 | 7 | 9 | 9 | 15 | 11 | 14 | 14 |
| | B | 15 | 11 | 14 | 15 | 22 | 17 | 20 | 23 |
| **54** | A | 14 | 11 | 13 | 15 | 23 | 18 | 21 | 24 |
| | B | 9 | 7 | 9 | 10 | 15 | 12 | 14 | 16 |
| **55** | A | 11 | 8 | 10 | 11 | 19 | 14 | 18 | 19 |
| | B | 17 | 13 | 16 | 18 | 24 | 19 | 23 | 26 |
| **56** | A | 14 | 11 | 13 | 15 | 22 | 17 | 20 | 23 |
| | B | 10 | 9 | 10 | 10 | 16 | 14 | 15 | 16 |
| **57** | A | 17 | 13 | 16 | 18 | 25 | 20 | 23 | 26 |
| | B | 11 | 8 | 10 | 12 | 16 | 12 | 15 | 17 |
| **58** | A | 16 | 13 | 15 | 17 | 24 | 19 | 22 | 25 |
| | B | 15 | 12 | 14 | 16 | 21 | 16 | 20 | 22 |
| **59** | A | 9 | 7 | 8 | 10 | 15 | 12 | 14 | 16 |
| | B | 14 | 11 | 13 | 14 | 19 | 16 | 18 | 20 |
| **60** | A | - | - | - | - | - | - | - | - |
| | B | 14 | 12 | 14 | 16 | 22 | 19 | 22 | 24 |
| **61** | A | 9 | 7 | 8 | 9 | 14 | 12 | 14 | 15 |
| | B | 10 | 8 | 10 | 11 | 16 | 13 | 16 | 17 |
| **62** | A | - | - | - | - | - | - | - | - |
| | B | 11 | 9 | 10 | 11 | 16 | 12 | 14 | 16 |
| **63** | A | 13 | 10 | 12 | 13 | 20 | 15 | 18 | 20 |
| | B | 15 | 13 | 15 | 16 | 21 | 18 | 20 | 22 |
| **64** | A | - | - | - | - | - | - | - | - |
| | B | 15 | 14 | 15 | 16 | 21 | 19 | 20 | 22 |
| **65** | A | - | - | - | - | - | - | - | - |
| | B | 13 | 12 | 13 | 14 | 19 | 17 | 19 | 20 |
| **66** | A | - | - | - | - | - | - | - | - |
| | B | 15 | 14 | 15 | 17 | 21 | 19 | 21 | 23 |
| **67** | A | 8 | 6 | 7 | 8 | 14 | 11 | 13 | 15 |
| | B | 17 | 13 | 16 | 18 | 24 | 19 | 23 | 25 |
| **68** | A | - | - | - | - | - | - | - | - |
| | B | 20 | 16 | 19 | 21 | 28 | 22 | 26 | 29 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **69** | A | 9 | 7 | 9 | 9 | 17 | 12 | 15 | 16 |
| | B | 12 | 10 | 12 | 13 | 18 | 15 | 18 | 19 |
| **70** | A | 12 | 9 | 11 | 12 | 20 | 15 | 18 | 21 |
| | B | 7 | 6 | 7 | 8 | 11 | 9 | 11 | 12 |
| **71** | A | - | - | - | - | - | - | - | - |
| | B | 12 | 9 | 11 | 12 | 16 | 13 | 16 | 17 |
| **72** | A | - | - | - | - | - | - | - | - |
| | B | 7 | 6 | 7 | 7 | 12 | 10 | 12 | 13 |
| **73** | A | 7 | 6 | 7 | 7 | 12 | 10 | 11 | 12 |
| | B | 12 | 10 | 11 | 13 | 17 | 14 | 16 | 18 |
| **74** | A | - | - | - | - | - | - | - | - |
| | B | 9 | 7 | 9 | 10 | 15 | 12 | 14 | 15 |
| **75** | A | - | - | - | - | - | - | - | - |
| | B | 13 | 11 | 13 | 14 | 20 | 16 | 19 | 21 |
| **76** | A | 7 | 6 | 6 | 7 | 11 | 10 | 11 | 12 |
| | B | 14 | 11 | 13 | 15 | 20 | 16 | 19 | 21 |
| **77** | A | 11 | 9 | 11 | 12 | 18 | 14 | 17 | 18 |
| | B | 10 | 8 | 10 | 10 | 15 | 13 | 15 | 16 |
| **78** | A | 12 | 9 | 11 | 11 | 19 | 14 | 17 | 18 |
| | B | 11 | 9 | 10 | 11 | 17 | 14 | 16 | 17 |
| **79** | A | 10 | 7 | 9 | 10 | 17 | 13 | 16 | 17 |
| | B | 11 | 9 | 10 | 12 | 16 | 13 | 16 | 17 |
| **80** | A | 9 | 7 | 8 | 9 | 15 | 11 | 14 | 14 |
| | B | 15 | 13 | 14 | 16 | 21 | 18 | 20 | 22 |
| **81** | A | 10 | 8 | 9 | 10 | 15 | 11 | 14 | 15 |
| | B | 7 | 6 | 6 | 7 | 13 | 11 | 11 | 13 |
| **82** | A | 9 | 7 | 8 | 9 | 14 | 11 | 14 | 15 |
| | B | 8 | 8 | 8 | 9 | 13 | 12 | 13 | 14 |
| **83** | A | 9 | 7 | 8 | 9 | 14 | 12 | 14 | 15 |
| | B | 13 | 10 | 12 | 14 | 18 | 14 | 17 | 19 |
| **84** | A | 9 | 7 | 8 | 9 | 14 | 12 | 14 | 14 |
| | B | 16 | 13 | 15 | 17 | 22 | 18 | 21 | 24 |
| **85** | A | 12 | 9 | 12 | 12 | 19 | 14 | 18 | 18 |
| | B | 10 | 9 | 10 | 11 | 15 | 13 | 15 | 16 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **86** | A | 12 | 9 | 12 | 13 | 20 | 15 | 19 | 22 |
| | B | 12 | 11 | 12 | 12 | 19 | 17 | 19 | 20 |
| **87** | A | 8 | 6 | 8 | 9 | 15 | 11 | 14 | 15 |
| | B | 12 | 10 | 11 | 12 | 18 | 17 | 18 | 20 |
| **88** | A | 11 | 9 | 10 | 12 | 19 | 14 | 17 | 20 |
| | B | 13 | 10 | 12 | 13 | 19 | 15 | 17 | 19 |
| **89** | A | 9 | 7 | 9 | 10 | 15 | 11 | 14 | 15 |
| | B | 8 | 7 | 8 | 9 | 13 | 11 | 13 | 14 |
| **90** | A | 10 | 8 | 9 | 10 | 16 | 12 | 14 | 16 |
| | B | 9 | 8 | 8 | 9 | 15 | 13 | 15 | 16 |
| **91** | A | 10 | 8 | 9 | 10 | 15 | 12 | 14 | 15 |
| | B | 8 | 7 | 8 | 8 | 14 | 12 | 13 | 14 |
| **92** | A | 11 | 9 | 11 | 11 | 16 | 13 | 16 | 17 |
| | B | 13 | 10 | 12 | 14 | 19 | 15 | 18 | 20 |
| **93** | A | 12 | 9 | 11 | 12 | 18 | 14 | 17 | 18 |
| | B | 13 | 10 | 12 | 13 | 19 | 15 | 18 | 19 |
| **94** | A | 17 | 13 | 16 | 17 | 25 | 20 | 24 | 25 |
| | B | 12 | 10 | 12 | 13 | 18 | 16 | 18 | 19 |
| **95** | A | 16 | 13 | 15 | 17 | 24 | 20 | 23 | 25 |
| | B | 10 | 9 | 10 | 11 | 17 | 15 | 17 | 18 |
| **96** | A | 13 | 10 | 12 | 14 | 21 | 16 | 20 | 23 |
| | B | 15 | 12 | 14 | 14 | 21 | 18 | 21 | 21 |
| **97** | A | 8 | 6 | 8 | 8 | 13 | 10 | 12 | 14 |
| | B | 12 | 10 | 12 | 13 | 19 | 15 | 18 | 20 |
| **98** | A | 16 | 13 | 15 | 17 | 24 | 19 | 23 | 25 |
| | B | 16 | 13 | 16 | 17 | 24 | 19 | 23 | 25 |
| **99** | A | 11 | 9 | 11 | 11 | 18 | 15 | 17 | 18 |
| | B | 13 | 10 | 12 | 13 | 19 | 15 | 18 | 19 |
| **100** | A | 9 | 7 | 8 | 9 | 15 | 12 | 14 | 15 |
| | B | 10 | 9 | 10 | 11 | 16 | 14 | 16 | 17 |
| **101** | A | 8 | 7 | 8 | 9 | 14 | 12 | 14 | 15 |
| | B | 13 | 11 | 12 | 13 | 18 | 14 | 17 | 18 |
| **102** | A | 10 | 9 | 10 | 11 | 15 | 13 | 15 | 16 |
| | B | 10 | 8 | 10 | 10 | 15 | 12 | 14 | 15 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **103** | A | 8 | 7 | 8 | 8 | 13 | 10 | 12 | 13 |
| | B | 15 | 13 | 14 | 14 | 21 | 17 | 20 | 20 |
| **104** | A | 8 | 7 | 8 | 8 | 13 | 12 | 13 | 14 |
| | B | 12 | 9 | 11 | 12 | 18 | 13 | 17 | 18 |
| **105** | A | 9 | 7 | 8 | 8 | 15 | 11 | 14 | 15 |
| | B | 10 | 7 | 9 | 10 | 17 | 12 | 16 | 16 |
| **106** | A | 15 | 11 | 14 | 15 | 24 | 18 | 22 | 25 |
| | B | 16 | 12 | 15 | 16 | 22 | 16 | 21 | 22 |
| **107** | A | 14 | 10 | 13 | 15 | 21 | 16 | 20 | 23 |
| | B | 13 | 10 | 12 | 13 | 20 | 15 | 19 | 19 |
| **108** | A | 7 | 6 | 7 | 7 | 11 | 10 | 11 | 12 |
| | B | 9 | 7 | 9 | 9 | 15 | 11 | 14 | 15 |
| **109** | A | 10 | 8 | 9 | 11 | 16 | 12 | 15 | 17 |
| | B | 13 | 10 | 13 | 14 | 19 | 15 | 18 | 21 |
| **110** | A | - | - | - | - | - | - | - | - |
| | B | 12 | 10 | 12 | 12 | 18 | 15 | 17 | 19 |
| **111** | A | - | - | - | - | - | - | - | - |
| | B | 18 | 14 | 17 | 19 | 25 | 19 | 23 | 26 |
| **112** | A | - | - | - | - | - | - | - | - |
| | B | 19 | 15 | 18 | 20 | 28 | 21 | 26 | 29 |
| **113** | A | - | - | - | - | - | - | - | - |
| | B | 12 | 10 | 11 | 13 | 19 | 15 | 18 | 20 |
| **114** | A | 7 | 6 | 7 | 8 | 12 | 11 | 12 | 13 |
| | B | 12 | 10 | 12 | 13 | 19 | 16 | 19 | 20 |
| **115** | A | 8 | 6 | 7 | 8 | 13 | 10 | 12 | 13 |
| | B | 15 | 14 | 15 | 16 | 22 | 19 | 21 | 23 |
| **116** | A | 12 | 9 | 11 | 13 | 17 | 13 | 16 | 19 |
| | B | 14 | 11 | 13 | 14 | 20 | 15 | 18 | 21 |
| **117** | A | 10 | 7 | 9 | 10 | 15 | 12 | 15 | 17 |
| | B | 14 | 11 | 13 | 15 | 20 | 16 | 19 | 21 |
| **118** | A | 10 | 7 | 9 | 11 | 16 | 13 | 15 | 17 |
| | B | 14 | 11 | 13 | 15 | 21 | 16 | 19 | 22 |
| **119** | A | 14 | 11 | 13 | 14 | 23 | 18 | 21 | 23 |
| | B | 18 | 14 | 17 | 20 | 25 | 20 | 24 | 28 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **120** | A | 10 | 7 | 9 | 10 | 17 | 13 | 16 | 18 |
| | B | 27 | 20 | 25 | 29 | 34 | 26 | 32 | 37 |
| **121** | A | 11 | 9 | 10 | 12 | 19 | 14 | 17 | 19 |
| | B | 15 | 11 | 14 | 16 | 22 | 16 | 20 | 23 |
| **122** | A | 11 | 8 | 10 | 11 | 17 | 13 | 16 | 18 |
| | B | 14 | 11 | 13 | 15 | 21 | 16 | 19 | 22 |
| **123** | A | 10 | 8 | 10 | 11 | 16 | 12 | 15 | 17 |
| | B | 9 | 7 | 9 | 10 | 14 | 11 | 13 | 15 |
| **124** | A | 16 | 11 | 15 | 16 | 25 | 17 | 23 | 24 |
| | B | 18 | 13 | 16 | 17 | 25 | 18 | 23 | 24 |
| **125** | A | 11 | 8 | 10 | 11 | 18 | 13 | 16 | 18 |
| | B | 20 | 16 | 18 | 21 | 27 | 21 | 25 | 28 |
| **126** | A | 9 | 7 | 8 | 9 | 15 | 12 | 14 | 16 |
| | B | 14 | 10 | 13 | 14 | 21 | 16 | 20 | 21 |
| **127** | A | 9 | 6 | 8 | 9 | 14 | 11 | 13 | 14 |
| | B | 20 | 15 | 19 | 21 | 30 | 22 | 28 | 30 |
| **128** | A | 9 | 7 | 8 | 9 | 15 | 12 | 14 | 16 |
| | B | 16 | 13 | 16 | 17 | 23 | 18 | 22 | 24 |
| **129** | A | 10 | 7 | 9 | 10 | 15 | 11 | 14 | 15 |
| | B | 14 | 11 | 13 | 15 | 20 | 16 | 19 | 21 |
| **130** | A | 9 | 7 | 8 | 9 | 15 | 11 | 14 | 15 |
| | B | 18 | 13 | 16 | 17 | 24 | 17 | 22 | 24 |
| **131** | A | 9 | 7 | 8 | 9 | 13 | 10 | 12 | 13 |
| | B | 17 | 13 | 16 | 17 | 24 | 18 | 22 | 24 |
| **132** | A | - | - | - | - | - | - | - | - |
| | B | 16 | 12 | 14 | 16 | 22 | 17 | 20 | 22 |
| **133** | A | 9 | 7 | 8 | 9 | 14 | 10 | 13 | 14 |
| | B | 16 | 12 | 15 | 16 | 22 | 17 | 21 | 23 |
| **134** | A | 11 | 8 | 10 | 11 | 17 | 13 | 16 | 18 |
| | B | 19 | 15 | 18 | 20 | 26 | 20 | 25 | 28 |
| **135** | A | 11 | 8 | 10 | 11 | 17 | 13 | 16 | 18 |
| | B | 15 | 12 | 14 | 16 | 22 | 17 | 21 | 24 |
| **136** | A | 12 | 9 | 11 | 12 | 20 | 15 | 18 | 20 |
| | B | 11 | 8 | 10 | 12 | 17 | 13 | 15 | 18 |

**Table 2: Mean Speed and Effective Gust Categories - Seasonal**

| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| **137** | A | 13 | 11 | 12 | 13 | 21 | 17 | 20 | 21 |
| | B | 23 | 17 | 21 | 25 | 30 | 23 | 27 | 32 |
| **138** | A | 14 | 11 | 13 | 14 | 20 | 17 | 19 | 21 |
| | B | 7 | 5 | 7 | 7 | 12 | 10 | 11 | 12 |
| **139** | A | 17 | 13 | 15 | 18 | 23 | 18 | 22 | 25 |
| | B | 19 | 13 | 18 | 18 | 27 | 19 | 24 | 26 |
| **140** | A | 15 | 11 | 14 | 16 | 20 | 15 | 18 | 21 |
| | B | 10 | 7 | 9 | 10 | 16 | 11 | 14 | 16 |
| **141** | A | 16 | 12 | 14 | 17 | 22 | 17 | 20 | 23 |
| | B | 10 | 8 | 9 | 11 | 16 | 12 | 15 | 17 |
| **142** | A | 10 | 7 | 9 | 11 | 16 | 12 | 15 | 17 |
| | B | 15 | 12 | 14 | 16 | 21 | 16 | 20 | 22 |
| **143** | A | 12 | 10 | 11 | 12 | 17 | 14 | 16 | 17 |
| | B | 13 | 10 | 13 | 14 | 20 | 16 | 20 | 22 |
| **144** | A | 9 | 7 | 9 | 10 | 15 | 11 | 14 | 16 |
| | B | 12 | 9 | 11 | 13 | 18 | 13 | 17 | 18 |
| **145** | A | 11 | 8 | 10 | 11 | 17 | 13 | 15 | 18 |
| | B | 14 | 11 | 13 | 15 | 20 | 15 | 18 | 21 |
| **146** | A | 13 | 10 | 12 | 13 | 19 | 15 | 18 | 21 |
| | B | 8 | 6 | 7 | 8 | 13 | 10 | 13 | 13 |
| **147** | A | 13 | 10 | 12 | 14 | 21 | 16 | 20 | 23 |
| | B | 15 | 10 | 13 | 14 | 21 | 15 | 19 | 20 |
| **148** | A | 9 | 7 | 9 | 10 | 15 | 12 | 14 | 16 |
| | B | 16 | 13 | 16 | 17 | 24 | 19 | 23 | 25 |
| **149** | A | 11 | 8 | 10 | 12 | 17 | 13 | 16 | 18 |
| | B | 12 | 10 | 11 | 11 | 17 | 14 | 16 | 17 |
| **150** | A | 12 | 8 | 11 | 11 | 19 | 13 | 17 | 18 |
| | B | 12 | 8 | 11 | 11 | 19 | 13 | 17 | 18 |
| **151** | A | 15 | 12 | 14 | 16 | 20 | 17 | 19 | 22 |
| | B | 15 | 12 | 14 | 16 | 20 | 17 | 19 | 22 |
| **152** | A | 11 | 8 | 10 | 11 | 16 | 13 | 15 | 17 |
| | B | 11 | 8 | 10 | 11 | 16 | 13 | 15 | 17 |
| **153** | A | 11 | 9 | 10 | 12 | 16 | 12 | 15 | 17 |
| | B | 11 | 9 | 10 | 12 | 16 | 12 | 15 | 17 |

## Table 2: Mean Speed and Effective Gust Categories - Seasonal

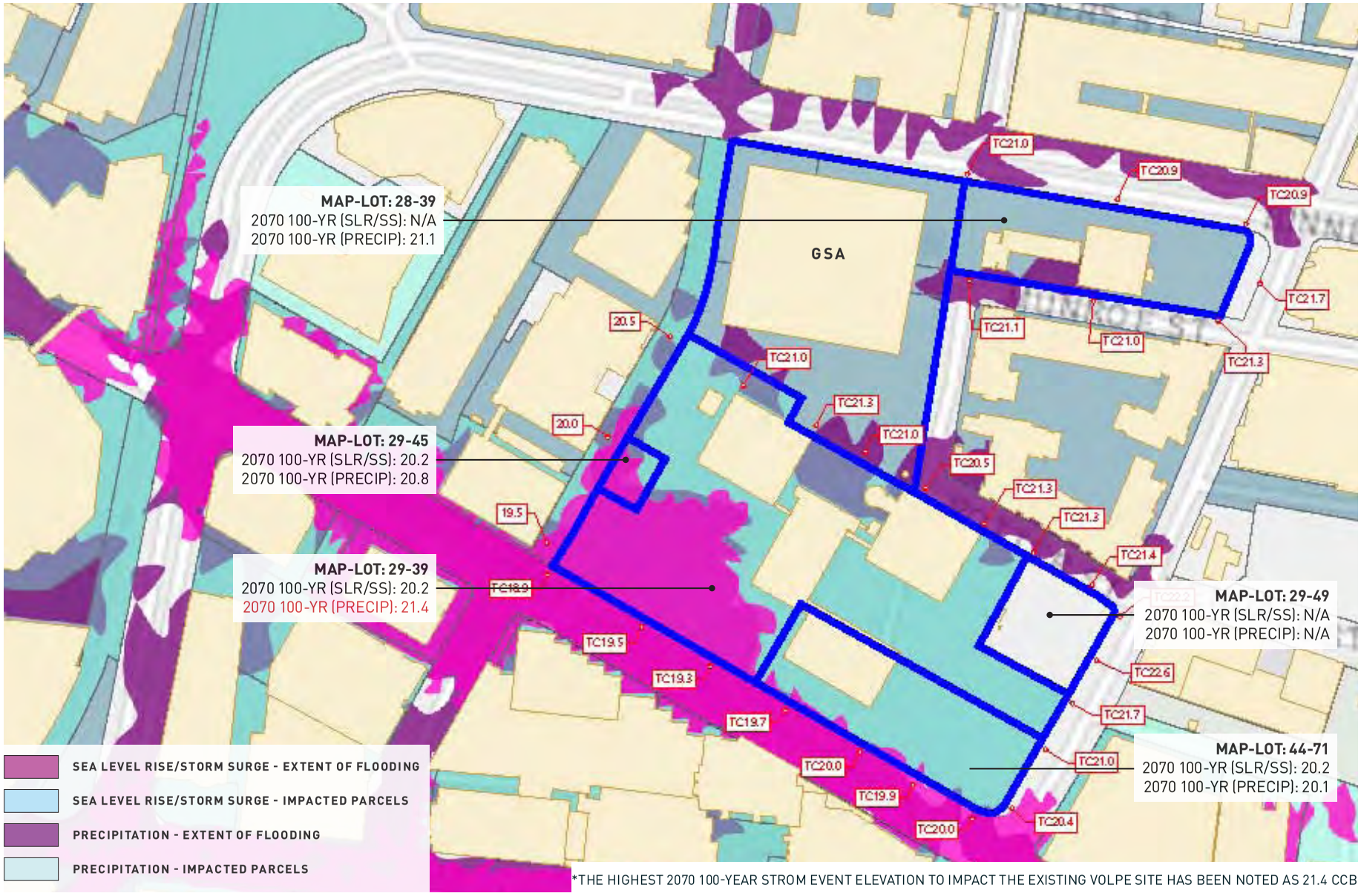
| Location | Configuration | Mean Wind Speed (mph) | | | | Effective Gust Wind Speed (mph) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |

| Seasons | Months | Mean Wind Criteria Speed (mph) | | Effective Gust Criteria (mph) | |
|---|---|---|---|---|---|
| Spring | March - May | ≤ 12 | Comfortable for Sitting | ≤ 31 | Acceptable |
| Summer | June - August | 13 - 15 | Comfortable for Standing | > 31 | Unacceptable |
| Fall | September - November | 16 - 19 | Comfortable for Walking | | |
| Winter | December - February | 20 - 27 | Uncomfortable for Walking | | |
| Annual | January - December | > 27 | Dangerous Conditions | | |

| Configurations | |
|---|---|
| **No Build** | Existing site and surroundings |
| **Build** | Proposed project with existing surroundings |

# C.
# 2070 FLOOD ELEVATIONS


Existing Volpe Site - 2070 10-Year Flood




*THE HIGHEST 2070 100-YEAR STROM EVENT ELEVATION TO IMPACT THE EXISTING VOLPE SITE HAS BEEN NOTED AS 21.4 CCB

Existing Volpe Site - 2070 100-Year Flood

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