Exhibit F

RWDI Response Letter and Pedestrian Wind Study

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June 7, 2019

Mark Stefan

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Re: Emeryville Public Market – Parcel B
RWDI Project 1902969

Dear Owners,

As per your request, this memo discusses the findings of the CPP qualitative report (Supplemental Consulting Report, Revision 1, CPP Project 13419, May 29, 2019), reviewing RWDI's quantitative wind tunnel results (Pedestrian Wind Study RWDI # 1902969, May 13, 2019).

First, RWDI's approach includes wind speed measurements around the project site for three different site and surrounding configurations, allowing the comparison between the wind conditions before and after the addition of project as well as in the future buildings. These measurements are then combined with local wind data to accurately predict the occurrence frequencies of different wind speeds. On the other hand, although desktop reviews are helpful in initial assessments of the impact of new developments on the wind environment, they are qualitative in nature and cannot provide accurate wind speeds and frequencies.

Since the City of Emeryville does not have a wind significance threshold, due to the proximity of the Emeryville and Oakland, the City of Oakland's requirements were used for the wind tunnel study carried out by RWDI. The City of Oakland considers a significant wind impact to occur if a project were to "create winds exceeding 36 mph for more than one hour during daylight hours of the year", these are referred to as Hazard exceedances. It is noted that the Marketplace EIR included the following significance threshold: If the exposure, orientation and massing of a proposed structure can be expected to substantially increase ground-level winds in pedestrian corridors or public spaces near the project site. Since the ambient wind (undisturbed by buildings) in Emeryville seldom exceeds 36 mph, a project must substantially increase winds for this threshold to be exceeded.

With respect to Comfort Criteria, only a few locations were considered in CPP's review without considering the existing wind conditions or the future wind conditions at all pedestrian areas around the development, therefore we don't believe the report to give the full picture.

When compared to the existing conditions, the addition of the study building reduces winds across the site (Table 2, Pedestrian Wind Study RWDI # 1902969, May 13, 2019). On average, without the study building in place, the average wind speed for the comfort criteria is 12 mph for an average of 15% of the time with a total of 24 of the 45 tested locations exceeding the 11 mph comfort criteria. Once the study building is in place, the average wind speed for the comfort criteria is reduced to 11 mph for an average of 12% of the time with the total number of exceedances reducing to 15 of the 45 tested locations.

For arguments sake, to focus on just the area that CPP focuses on in their report, the area between Parcels A and B (this area includes locations 5-8 and 15, Figure 2b of the RWDI report, Image 1 below) the average wind speed without the study building in place is 14.6 mph (Image 2 below). With the addition of the study building the average wind speed in this area is reduced to 14.0 mph. The difference is marginal but does show a decrease in wind speeds, once the study building is in place.

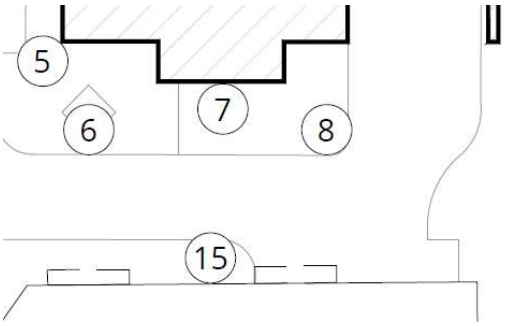

Image 1: Placement of listed sensors between Parcels A and B

Of more importance than the comfort conditions are the Hazard conditions, which show the same trend when the conditions for the site with the study building in place is compared to the conditions for the existing site. Across the entire site, the average wind speed that is exceeded for 1 hr/year on the existing site is 28 mph. this speed decreases to 26 mph with the study building in place. The total number of locations that exceeds the hazard criterion is also reduced from 1 to 0 with the addition of the study building (Table 1 of the RWDI report).

In the same area (Image 1) as discussed previously (Locations 1-8 and 15, Table 1 of the RWDI report, Image 3 below), there are no exceedances in any of these locations with or without the study building, and the average wind speed that is exceeded for 1 hr/year is decreased from 31.0 mph in the existing condition to 30.4 mph once the study building is in place.

Location	Existing			Existing + Project			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
5	15	30	e	12	16	-3	e
6	16	34	e	14	24	-2	e
7	15	30	e	14	26	-1	e
8	14	24	e	15	31	1	e
15	13	19	e	15	27	2	e

Image 2: Extract of Table 2 – Comfort Conditions - from RWDI report showing wind speeds at the areas between Parcels A and B

Location	Existing			Existing + Project			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
5	31	0		26	0	0	
6	33	0		30	0	0	
7	32	0		31	0	0	
8	31	0		33	0	0	
15	28	0		33	0	0	

Image 3: Extract of Table 1 – Hazard Conditions - from RWDI report showing wind speeds at the areas between Parcels A and B

In our wind tunnel test, we modeled the Final Development Plan (FDP) with an open parking structure, according to the drawings and information received on March 22, 2019. As indicated in the report and

the memo, the addition of the building to the site does not negatively affect the wind conditions around the site, and it actually improves the conditions by eliminating the hazard exceedance at location 44. With regard to comfort, it also does not worsen the conditions as detailed in the memo.

Please note that the open structure is a positive design feature in moderating the accelerated winds, but the extent of its effectiveness can only be evaluated by testing both closed and open versions and comparing the results.

Closing

In conclusion, to review the full site, or just the area between Parcels A and B, wind conditions are improved with the addition of the study building when compared to the conditions on the site as it exists today. Accordingly, the project does not increase winds and is considered to have a less than significant impact.

We trust this memo satisfies your current needs. If you have additional questions, please do not hesitate to contact us.

Yours truly,

Raisa Lalui, M.Eng
Project Manager

APPENDIX A

REPORT

EMERYVILLE PUBLIC MARKET – PARCEL B

EMERYVILLE, CA

PEDESTRIAN WIND STUDY
RWDI # 1902969
May 14, 2019

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed Emeryville Public Market - Parcel B development in Emeryville, CA (Image 1). Based on our wind tunnel testing of the proposed development under the Existing, Existing + Project and Project + Cumulative configurations (Images 2A through 2C), and the local wind records (Image 3), the potential wind hazard and comfort conditions are predicted as shown on site plans in Figures 1A through 2C, while the associated wind speeds are listed in Tables 1 and 2. These results can be summarized as follows:

Wind Hazard Conditions:

- For the existing configuration (without the project), wind speeds at all locations are anticipated to comply with the wind hazard criterion except for a location on the east side of the railroad tracks near the pedestrian bridge tower.

- With the addition of the proposed building to the site (existing + project configuration), and the future buildings (5850 Shellmound Way and Parcel F) to the southwest of the project (project + cumulative configuration), wind speeds at all locations are expected to meet the wind hazard criterion including the location on the east side of the railroad tracks near the pedestrian bridge tower.

Wind Comfort Conditions:

- Wind speeds at 24 locations in the existing configuration (without the project) are expected to exceed the comfort criterion. Most of these locations are to the west of the project site and around the building east of Overland Avenue.

- For the existing + project configuration and the project + cumulative configuration, wind conditions are expected to be moderated and the numbers of locations where wind speeds exceed the comfort criterion are predicted to be 15 and 18, respectively.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed Emeryville Public Market – Parcel B development in Emeryville, CA. This report presents the project objectives, background, RWDI's approach and a discussion of the results.

1.1 Project Description

The project (site shown in Image 1) is located on the east side of Shellmound Street between 63th Street to the north and Powell Street to the south. The proposed development consists of an 8-story, approximately 113 ft tall, building with retail stores on grade level, parking spaces on Levels 2 through 5 and research laboratories on Levels 6 through 8.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local wind 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 adjacent/nearby public sidewalks and walkways.

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 - Existing:	Existing site with existing surroundings (Image 2A)
B – Existing + Project:	Proposed project with existing surroundings (Image 2B)
C – Project + Cumulative:	Proposed project with future surroundings (Image 2C)

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 45 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 the site and reviewed by the project team.

Image 2A: Wind Tunnel Study Model – Existing Configuration

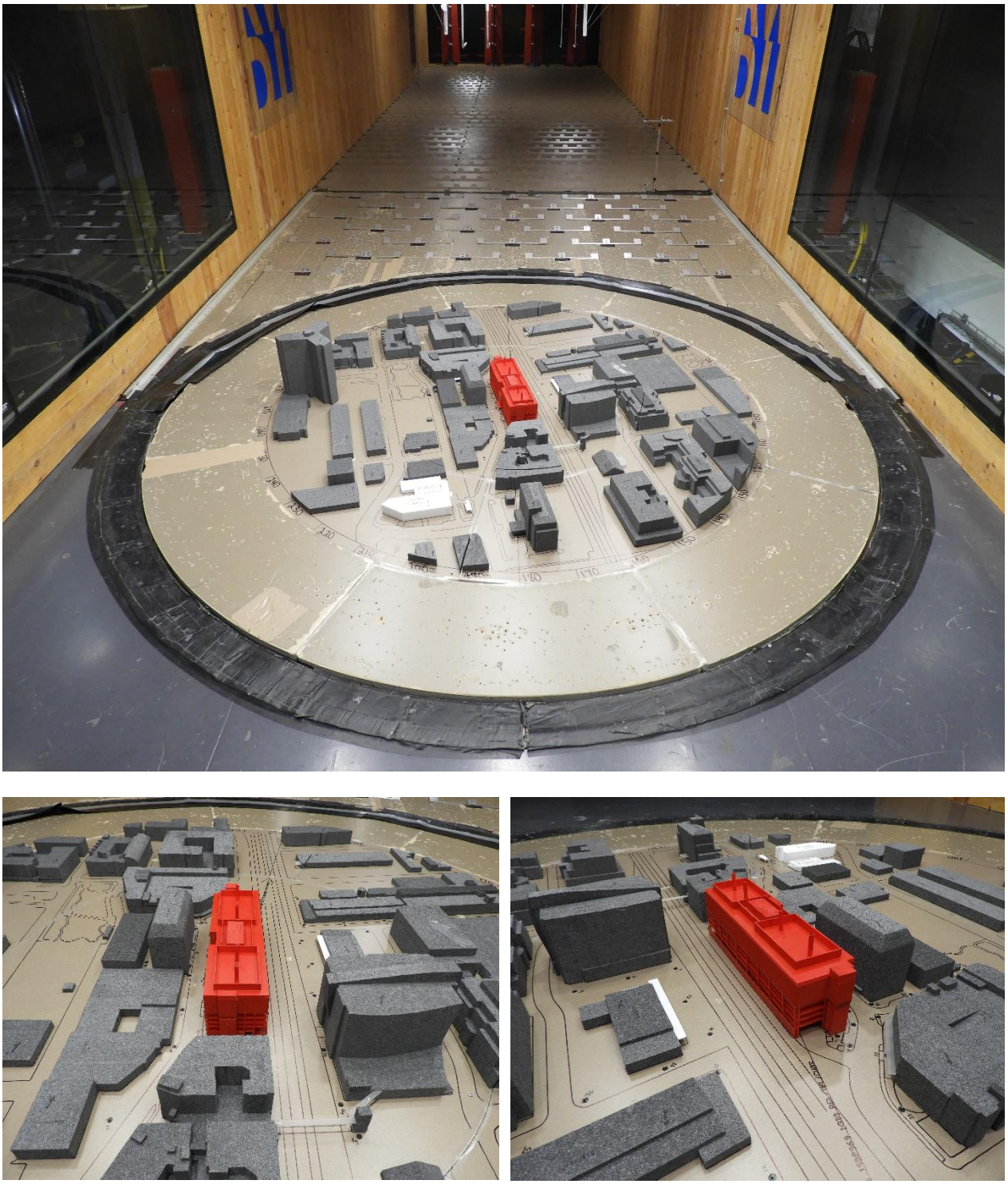


Image 2B: Wind Tunnel Study Model – Existing + Project Configuration

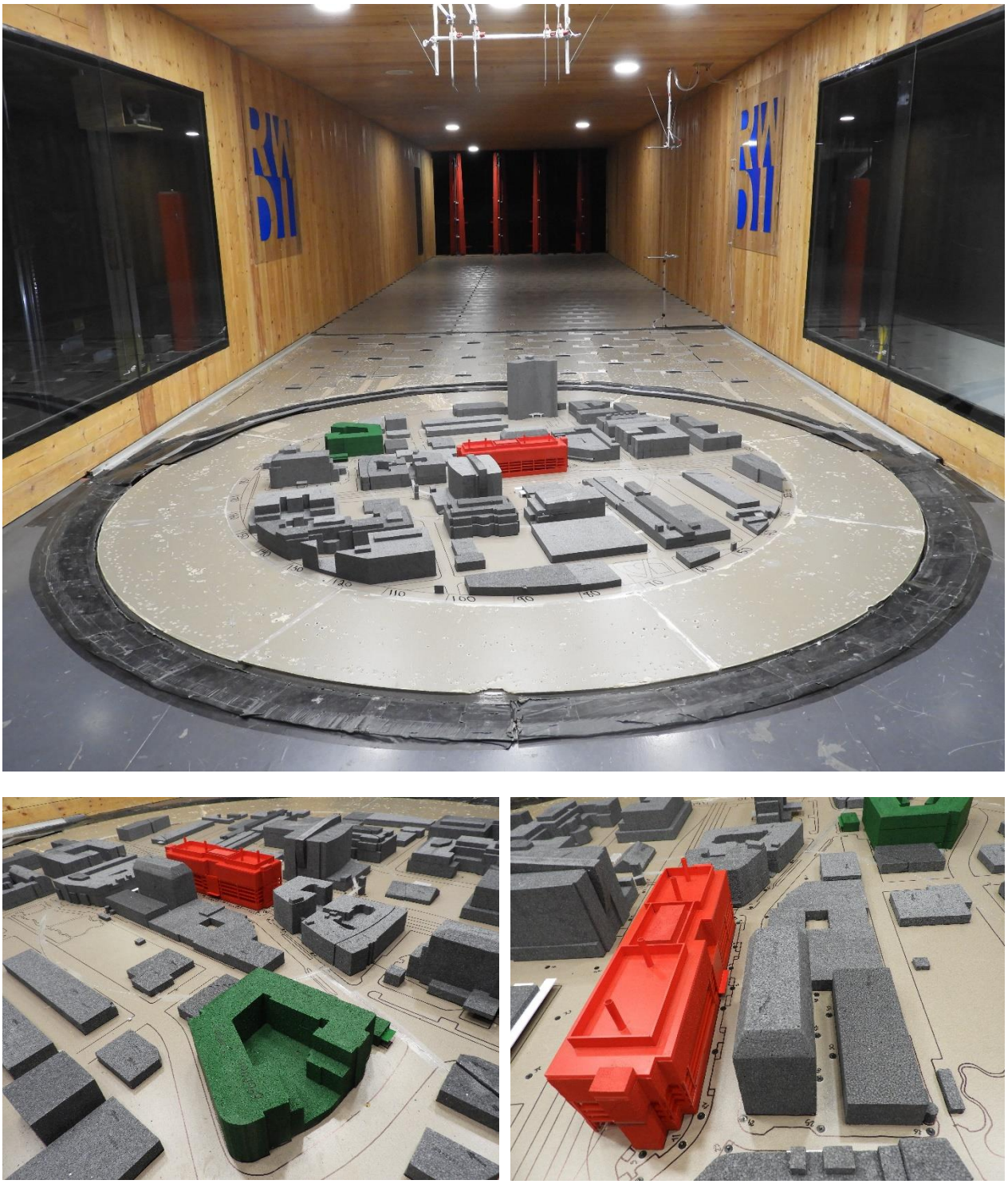


Image 2C: Wind Tunnel Study Model – Project + Cumulative Configuration

2.2 Meteorological Data

Wind statistics recorded at Metropolitan Oakland International Airport between 1987 and 2017, inclusive, were analyzed for annual wind conditions. Image 3 graphically depicts the directional distribution of the annual wind frequencies and speeds. Winds are frequent from the northwest through west-southwest directions throughout the year, as indicated by the annual wind rose. Strong winds of a mean speed greater than 15 mph measured at the airport (at an anemometer height of 30 feet) occur 11.5% of the time annually.

Wind statistics were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the appropriate criteria for pedestrian comfort and safety.

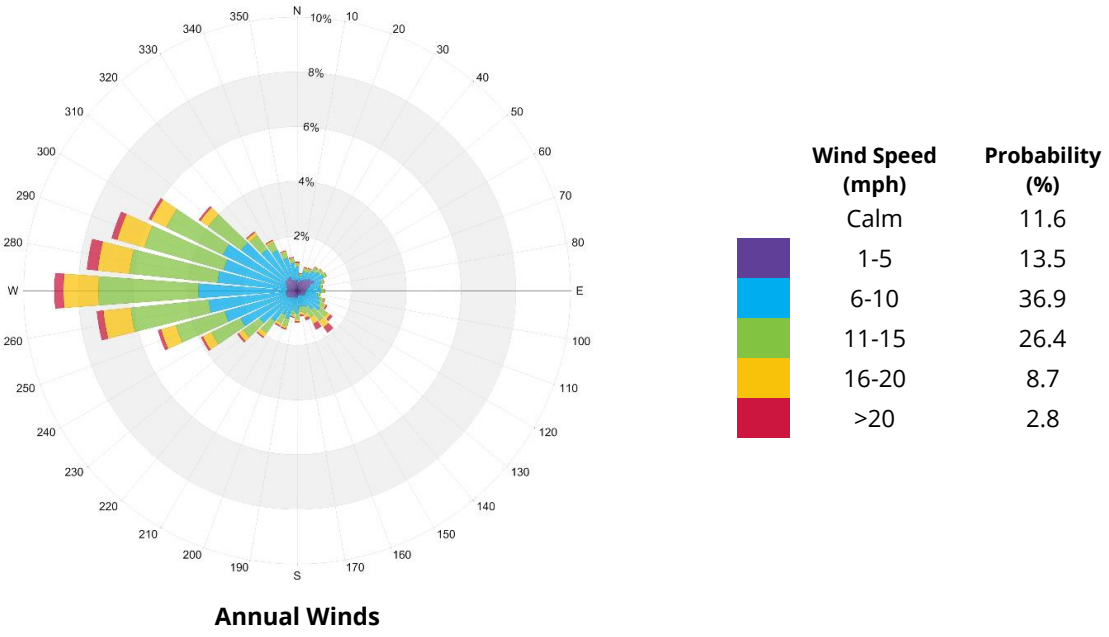


Image 3: Directional Distribution of Winds Approaching Metropolitan Oakland International Airport from 1987 to 2017

2.3 Planning Code Requirements

Since the City of Emeryville does not have a wind significance threshold, the City of Oakland's requirements were considered. In Oakland, a wind analysis needs to be done if the height of the project is 100 feet or greater (measured to the roof) and one of the following conditions exists:

- The project is located adjacent to a substantial water body (i.e. Oakland Estuary, Lake Merritt or San Francisco Bay).
- The project is in downtown.

Since the proposed project (approximately 113 feet tall) exceeds the 100 feet height and is adjacent to San Francisco Bay, it is subject to the thresholds of significance.

For the purposes of this study, the City of Oakland considers a significant wind impact to occur if a project were to "create winds exceeding 36 mph for more than one hour during daylight hours of the year". The Planning Code defines these wind speeds in terms of equivalent wind speeds (the average wind speeds (mean velocity) adjusted to include the level of gustiness and turbulence). Equivalent wind speeds were calculated according to the specifications in the City of Oakland Significant Wind Impact Criterion, whereby the mean hourly wind speed is increased when the turbulence intensity is greater than 15% according to the following formula:

$$\boldsymbol{EWS = V_m \times (2 \times TI + 0.7)}$$

where $\boldsymbol{EWS}$ = equivalent wind speed

$\boldsymbol{V_m}$ = mean pedestrian-level wind speed

$\boldsymbol{TI}$ = turbulence intensity

Pedestrian Comfort

Although not applicable towards Significant Wind Impacts as defined by the City of Oakland, wind comfort speeds have been calculated for informational purposes. The comfort criteria are that wind speeds do not exceed 11 mph for more than 10% of the time during the year, when calculated for daylight hours, in substantial pedestrian use areas. A lower wind speed threshold of 7 mph may be considered for public seating areas where calmer wind conditions are ideal.

3 RESULTS AND DISCUSSION

This section presents the wind tunnel test results analyzed in terms of the equivalent wind speeds (EWS) as defined in the previous section. Within the text of this report, the equivalent wind speeds are simply referred to as wind speeds.

The wind hazard conditions for the configurations tested are graphically depicted on site plans in Figures 1A through 1C located in the "Figures" section of this report. Table 1, located in the "Tables" section, numerically presents these results and lists the predicted wind speed to be exceeded one hour per year. The predicted number of hours per year that the wind hazard criterion (one minute wind speed of 36 mph) is exceeded is also provided. A letter "e" in the last column of each configuration indicates the wind hazard exceedance.

The wind comfort results for the configurations tested are graphically depicted on site plans in Figures 2A through 2C, where locations have been color-coded according to the criteria of the 7 mph and 11 mph comfort categories explained in the Planning Code Requirements. This data is numerically presented in Table 2. For all the measurement points, the equivalent wind speeds exceeded 10% of time are listed (please note that wind speeds will be below these values for 90% of the time). Each location is marked as a comfort exceedance if the 11 mph threshold is exceeded. A letter "e" in the last column of each configuration indicates a wind comfort exceedance.

The following is a detailed discussion of the suitability of the predicted wind conditions for each area of interest.

3.1 Existing Configuration

For the existing configuration, the 1-hour per year wind hazard criterion is expected to be met at all test locations. Exception is Location 44 on the east side of the railroad tracks near the pedestrian bridge tower (Figure 1A). For all locations tested, the average wind speed which is exceeded for 1 hour per year is 28 mph (Table 1).

For all the 45 test locations, the average wind speed for 90% of the time is below 12 mph (Table 2). Wind speeds at 24 test locations exceed the Planning Code's pedestrian comfort criterion of 11 mph (see Figure 2A). On average, winds exceed the comfort criterion 15% of the time when all test locations are considered.

3.2 Existing + Project Configuration

With the addition of the proposed development, wind speeds are expected to meet the hazard criterion at all test locations. The hazard exceedance at Location 44 in the existing configuration would be eliminated after the addition of the project (Figure 1B). For all locations tested, the average wind speed exceeded for 1 hour per year is 26 mph, which is 2 mph lower than the existing configuration (Table 1).

For all the 45 test locations, the average wind speed for 90% of the time is below 11 mph (Table 2). Wind speeds at 15 test locations exceed the Planning Code's pedestrian comfort criterion of 11 mph (see Figure 2B). On average, winds exceed the comfort criterion 12% of the time when all test locations are considered. These results, in general, indicate the positive effect of the project on the wind conditions around the site.

3.3 Project + Cumulative Configuration

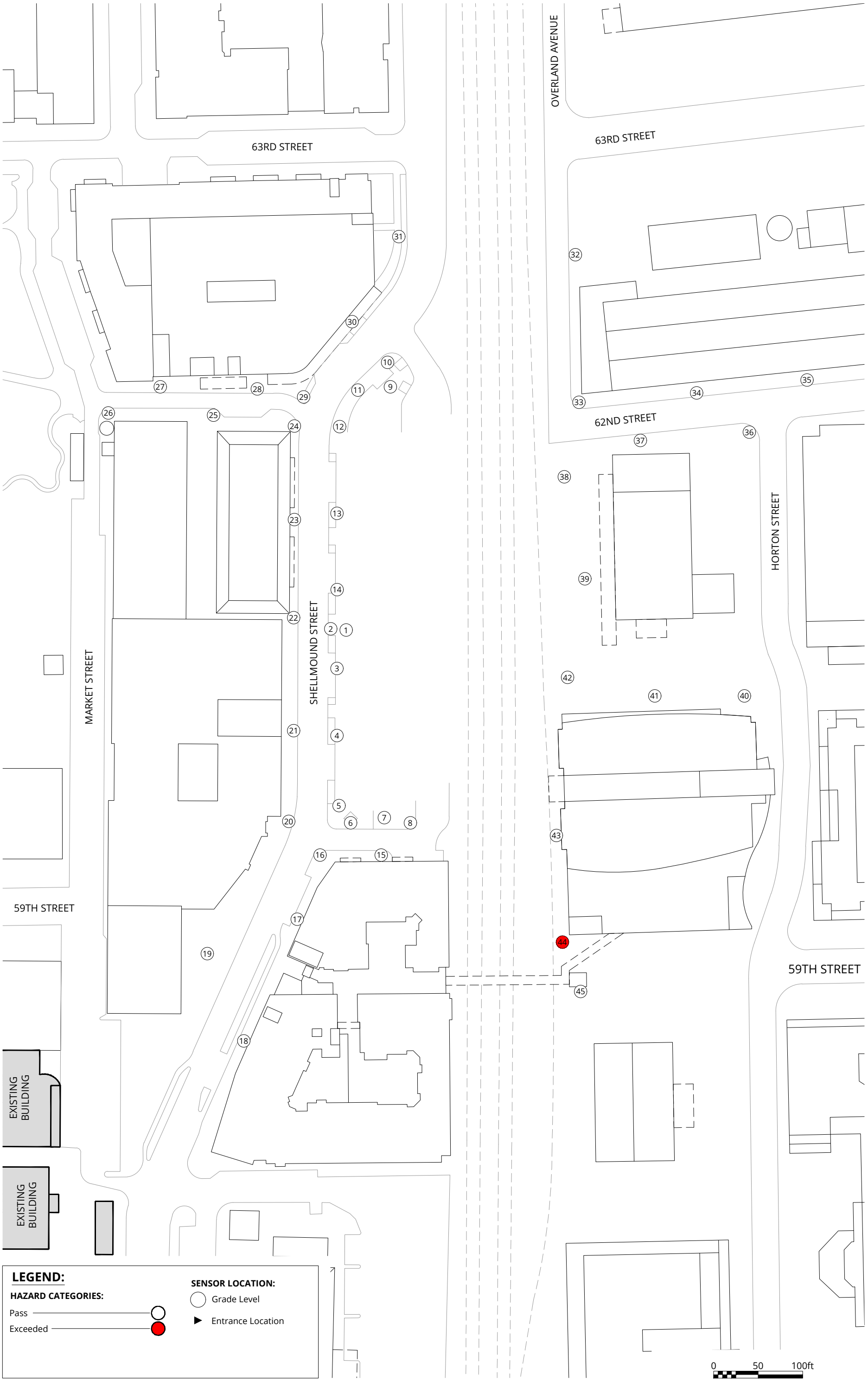
The addition of the approved cumulative developments (5850 Shellmound Way and Parcel F) in the surrounding area would provide wind speeds similar to those for the existing + project configuration. The wind hazard criterion is met at all locations (Figure 1C) and the average wind speed exceeded for 1 hour per year is 26 mph (Table 1). Wind speeds at 18 test locations exceed the Planning Code's pedestrian comfort criterion of 11 mph (see Figure 2C). The average 90% wind speed for the 45 test locations is below 11 mph (Table 2) and winds exceed the comfort criterion 13% of the time (Table 2).

4 APPLICABILITY OF RESULTS

The drawings and information listed below were received from Hart Howerton and were used to construct the scale model of the proposed Emeryville Public Market – Parcel B development. The wind conditions presented in this report pertain to the proposed project as detailed in the architectural design drawings listed in the table below. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may be affected. Therefore, for any changes in the design, it is recommended that RWDI be contacted and requested to review their potential impact on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
13-013_Emeryville_FDP_20190215	SketchUp	22/03/2019

FIGURES



Pedestrian Wind Hazard Conditions
Existing
Annual

Emeryville Public Market - Parcel B - Emeryville, CA

True North

Project #1902969

Drawn by:	GRE	Figure:	1A
Approx. Scale:	1"=100'		
Date Revised:	May 9, 2019		

AR2465

63RD STREET

OVERLAND AVENUE

63RD STREET

62ND STREET

HORTON STREET

MARKET STREET

SHELLMOUND STREET

59TH STREET

59TH STREET

BUILDING ABOVE REMOVED FOR CLARITY OF GRADE LEVEL SENSORS

EXISTING BUILDING

EXISTING BUILDING

LEGEND:

HAZARD CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

Entrance Location

0 50 100ft

Pedestrian Wind Hazard Conditions

Existing + Project

Annual

Emeryville Public Market - Parcel B - Emeryville, CA

True North

Project #1902969

Drawn by:	GRE	Figure:	1B
Approx. Scale:	1"=100'		
Date Revised:	May 9, 2019		

AR2466

63RD STREET

OVERLAND AVENUE

63RD STREET

62ND STREET

HORTON STREET

BUILDING ABOVE REMOVED FOR CLARITY OF GRADE LEVEL SENSORS

SHELLMOUND STREET

MARKET STREET

59TH STREET

59TH STREET

FUTURE BUILDING

FUTURE BUILDING

LEGEND:

HAZARD CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

Entrance Location

0 50 100ft

Pedestrian Wind Hazard Conditions
Project + Cumulative
Annual

Emeryville Public Market - Parcel B - Emeryville, CA

True North

Project #1902969

Drawn by:	GRE	Figure:	1C
Approx. Scale:	1"=100'		
Date Revised:	May 9, 2019		

AR2467

63RD STREET

OVERLAND AVENUE

63RD STREET

62ND STREET

HORTON STREET

SHELLMOUND STREET

MARKET STREET

59TH STREET

59TH STREET

EXISTING BUILDING

EXISTING BUILDING

LEGEND:

COMFORT CATEGORIES:

1 - 7 mph

8 - 11 mph

> 11 mph

SENSOR LOCATION:

Grade Level

Entrance Location

0 50 100ft

Pedestrian Wind Comfort Conditions
Existing
Annual

Emeryville Public Market - Parcel B - Emeryville, CA

True North

Project #1902969

Drawn by:	GRE	Figure:	2A
Approx. Scale:	1"=100'		
Date Revised:	May 9, 2019		

AR2468

63RD STREET

OVERLAND AVENUE

63RD STREET

62ND STREET

HORTON STREET

SHELLMOUND STREET

MARKET STREET

59TH STREET

59TH STREET

BUILDING ABOVE REMOVED FOR CLARITY OF GRADE LEVEL SENSORS

EXISTING BUILDING

EXISTING BUILDING

LEGEND:

COMFORT CATEGORIES:

1 - 7 mph

8 - 11 mph

> 11 mph

SENSOR LOCATION:

Grade Level

Entrance Location

0 50 100ft

Pedestrian Wind Comfort Conditions
Existing + Project
Annual

Emeryville Public Market - Parcel B - Emeryville, CA

True North

Project #1902969

Drawn by:	GRE	Figure:	2B
Approx. Scale:	1"=100'		
Date Revised:	May 9, 2019		

AR2469

63RD STREET

OVERLAND AVENUE

63RD STREET

62ND STREET

HORTON STREET

BUILDING ABOVE REMOVED FOR CLARITY OF GRADE LEVEL SENSORS

SHELLMOUND STREET

MARKET STREET

59TH STREET

59TH STREET

FUTURE BUILDING

FUTURE BUILDING

LEGEND:

COMFORT CATEGORIES:

1 - 7 mph

8 - 11 mph

> 11 mph

SENSOR LOCATION:

Grade Level

Entrance Location

0 50 100ft

Pedestrian Wind Comfort Conditions

Project + Cumulative

Annual

Emeryville Public Market - Parcel B - Emeryville, CA

True North

Project #1902969

Drawn by:	GRE	Figure:	2C
Approx. Scale:	1"=100'		
Date Revised:	May 9, 2019		

AR2470

TABLES

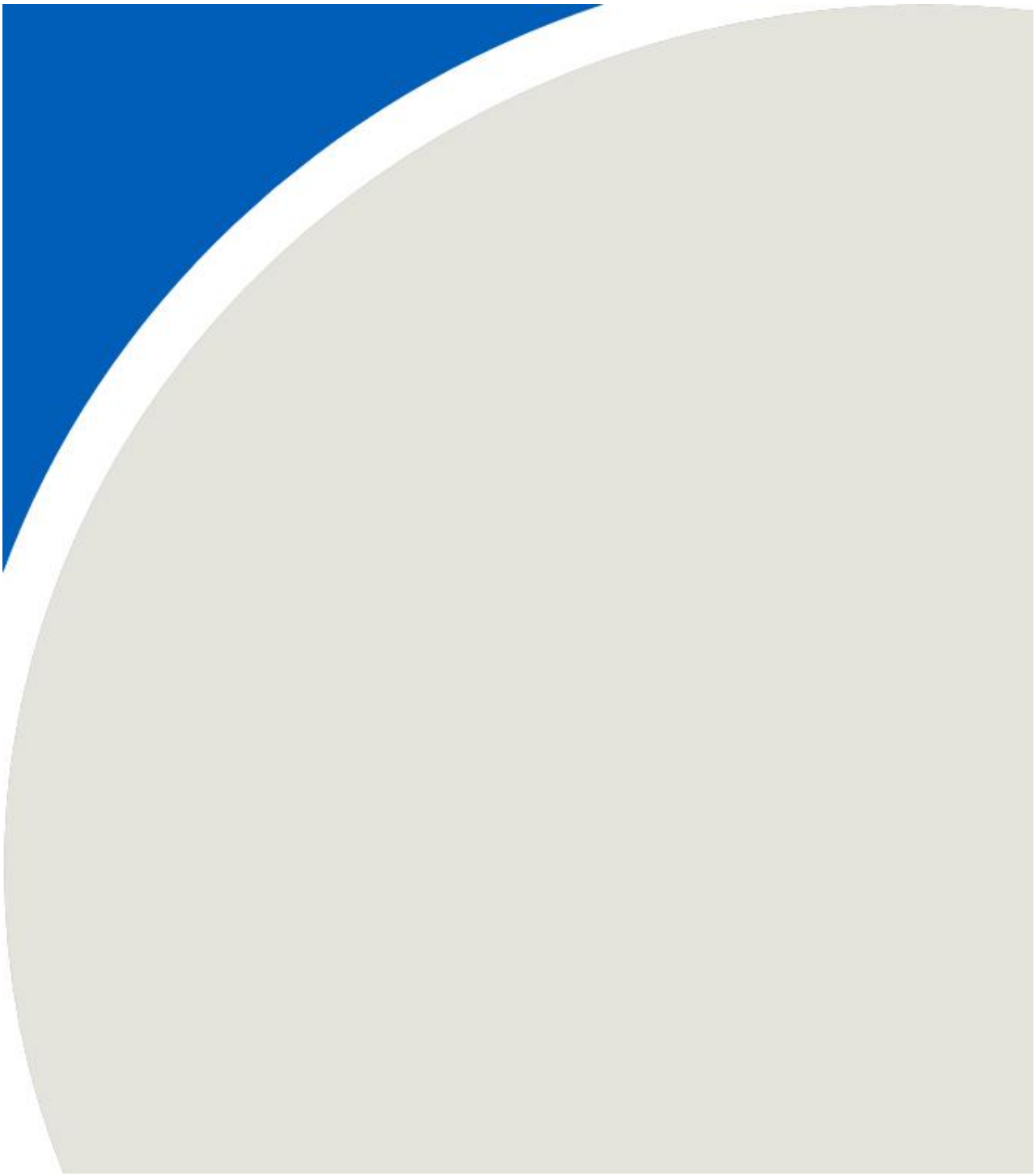


Table 1: Wind Hazard Conditions

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
1	28	0		25	0	0		25	0	0	
2	30	0		25	0	0		25	0	0	
3	27	0		23	0	0		22	0	0	
4	25	0		19	0	0		21	0	0	
5	31	0		26	0	0		27	0	0	
6	33	0		30	0	0		30	0	0	
7	32	0		31	0	0		31	0	0	
8	31	0		33	0	0		32	0	0	
9	24	0		20	0	0		21	0	0	
10	24	0		28	0	0		28	0	0	
11	27	0		32	0	0		32	0	0	
12	29	0		32	0	0		32	0	0	
13	30	0		29	0	0		29	0	0	
14	35	0		33	0	0		33	0	0	
15	28	0		33	0	0		33	0	0	
16	34	0		30	0	0		30	0	0	
17	24	0		21	0	0		21	0	0	
18	24	0		22	0	0		25	0	0	
19	25	0		24	0	0		27	0	0	
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22	27	0		27	0	0		27	0	0	
23	23	0		26	0	0		25	0	0	
24	29	0		24	0	0		24	0	0	
25	34	0		33	0	0		33	0	0	
26	25	0		25	0	0		25	0	0	
27	28	0		28	0	0		28	0	0	
28	25	0		24	0	0		25	0	0	
29	34	0		29	0	0		30	0	0	
30	24	0		27	0	0		27	0	0	
31	25	0		24	0	0		24	0	0	
32	25	0		22	0	0		22	0	0	
33	22	0		27	0	0		26	0	0	
34	24	0		20	0	0		19	0	0	
35	21	0		21	0	0		22	0	0	
36	28	0		26	0	0		28	0	0	

Table 1: Wind Hazard Conditions

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
37	21	0		22	0	0		22	0	0	
38	25	0		27	0	0		26	0	0	
39	24	0		25	0	0		24	0	0	
40	32	0		27	0	0		27	0	0	
41	32	0		27	0	0		27	0	0	
42	31	0		28	0	0		29	0	0	
43	30	0		28	0	0		28	0	0	
44	40	3	e	28	0	-3		28	0	-3	
45	19	0		17	0	0		17	0	0	

SUMMARY	Average (mph)	Total Hours	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total
	28	**3**	**1 ---- 45**	**26**	**0**	**-3**	**0 ---- 45**	**26**	**0**	**-3**	**0 ---- 45**

Table 2: Wind Comfort Conditions

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
1	13	19	e	11	10	-2		11	10	-2	
2	13	18	e	10	6	-3		10	6	-3	
3	12	15	e	11	10	-1		10	6	-2	
4	12	14	e	9	4	-3		10	5	-2	
5	15	30	e	12	16	-3	e	13	19	-2	e
6	16	34	e	14	24	-2	e	14	27	-2	e
7	15	30	e	14	26	-1	e	15	26	0	e
8	14	24	e	15	31	1	e	15	31	1	e
9	10	7		8	3	-2		8	3	-2	
10	10	6		13	18	3	e	13	18	3	e
11	12	12	e	13	22	1	e	14	23	2	e
12	12	12	e	14	25	2	e	14	25	2	e
13	10	7		14	22	4	e	14	25	4	e
14	12	14	e	14	21	2	e	14	21	2	e
15	13	19	e	15	27	2	e	15	28	2	e
16	16	34	e	15	29	-1	e	14	27	-2	e
17	10	7		9	5	-1		9	4	-1	
18	11	10		10	7	-1		12	13	1	e
19	12	14	e	11	10	-1		12	16	0	e
20	12	17	e	10	6	-2		10	7	-2	
21	12	16	e	9	3	-3		9	3	-3	
22	10	6		11	10	1		11	10	1	
23	8	2		11	10	3		11	10	3	
24	10	7		11	10	1		11	10	1	
25	15	26	e	14	24	-1	e	15	26	0	e
26	10	5		9	5	-1		10	5	0	
27	12	12	e	11	10	-1		12	13	0	e
28	11	10		11	10	0		11	10	0	
29	15	23	e	13	17	-2	e	13	19	-2	e
30	9	5		13	17	4	e	13	18	4	e
31	9	5		11	10	2		11	10	2	
32	10	7		9	3	-1		9	3	-1	
33	11	10		11	10	0		11	10	0	
34	9	3		7	1	-2		7	1	-2	
35	10	7		9	4	-1		9	4	-1	
36	11	10		10	5	-1		10	5	-1	

Table 2: Wind Comfort Conditions

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
37	8	2		9	3	1		9	4	1	
38	11	10		11	10	0		11	10	0	
39	11	10		10	7	-1		10	7	-1	
40	15	26	e	11	10	-4		11	10	-4	
41	15	26	e	11	10	-4		11	10	-4	
42	15	27	e	11	10	-4		11	10	-4	
43	14	22	e	9	5	-5		9	5	-5	
44	18	39	e	14	22	-4	e	13	21	-5	e
45	8	1		7	1	-1		7	1	-1	

SUMMARY	Average (mph)	Average (%)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total
	12	**15**	**24 ---- 45**	**11**	**12**	**-1**	**15 ---- 45**	**11**	**13**	**-1**	**18 ---- 45**

APPENDIX A - DESCRIBES SCOPE OF WORK

PEDESTRIAN LEVEL WINDS

Pedestrian level wind services evaluate wind speeds and frequencies and how they impact the comfort and safety of people in outdoor spaces.

WIND TUNNEL TESTING

A scale replica of the redevelopment site and surroundings will be tested in a wind tunnel to simulate the winds approaching and interacting with the project site. This is the most advanced and accurate means of predicting wind speeds around buildings and structures.

Wind Climate Analysis

As required by the City of Emeryville, data describing the speed, direction and frequency of occurrence of wind gathered at Metropolitan Oakland International Airport between 1982 and 2012 will be used for this study.

Proximity Model

A proximity model of the existing buildings and relevant surroundings within an approximate 1600 foot radius of the center of the development site will be constructed at an approximate scale (i.e., 1:400 scale). The buildings immediately surrounding the study site will be modeled in more detail than buildings beyond this radius. The model will incorporate relevant topographic changes as applicable. Surroundings beyond the limits of the proximity model will be appropriately simulated by spires and roughness blocks situated on the wind tunnel floor upwind of the study model. This will provide an accurate representation of the wind speed and turbulence profiles of wind approaching the study model.

Scale Model Construction

A scale replica of the redevelopment site will be constructed. The scale will be selected so that it is appropriate for the size of the project, to capture the relevant architectural details and surroundings. A series of wind speed sensors that measure both mean and gusts will be installed on the model to measure wind conditions at key pedestrian areas. The sensors are meant to represent an average person's height, and we will work with the design team to locate sensors in all areas of interest. *The proposed test locations will be provided to the project team and City for review and comment prior to the testing.*

Wind Tunnel Testing

A boundary-layer wind tunnel will be used to simulate the natural wind speed and turbulence levels at the site. The wind tunnel is equipped with spires and dynamic roughness that will be used to simulate the approaching wind speed and turbulence profiles. *The context of the surrounding buildings to include during the Cumulative test configuration (as described below) and the need for testing this configuration will be confirmed with the project team and the City in advance of testing*.

PEDESTRIAN LEVEL WINDS

Pedestrian level wind services evaluate wind speeds and frequencies and how they impact the comfort and safety of people in outdoor spaces.

Two development configurations of the study site and surroundings will be tested:

- **Existing:** the existing surroundings, with any buildings currently on site, without the proposed development.
- **Existing plus Project:** the proposed development along with existing surroundings.

Optional, if required:

- **Existing plus Project plus Cumulative:** the proposed development, along with existing surrounding structures and surrounding future buildings.

Analysis

The data collected from the wind tunnel will be analyzed together with the the area's long-term meteorological statistics to predict how often selected wind speed ranges will occur at each location. Results will first be reviewed against the pedestrian wind comfort and safety criteria determined appropriate with the city. Results will be presented in a diagrammatic form, relating each measurement location with its resulting comfort/safety rating.

In the event that undesirable conditions are predicted, we will use our experience and judgment to suggest wind control strategies in an effort to improve conditions. If conditions are particularly severe in critical areas, we may recommend or the City may require additional testing to develop specific solutions and satisfy planning code requirements additional scope would be provided to accommodate this effort if required.

LEGEND:

COMFORT CATEGORIES:

1 - 7 mph

8 - 11 mph

> 11 mph