ATTACHMENT 3

Wind Analysis Study by Donald Ballanti dated March 22, 2019

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Mark Stefan
AG-CCRP Public Market, L. P.
170 Grant Avenue, Sixth Floor
San Francisco, CA 94108

Subject: Wind and Comfort Evaluation for the Emeryville Public Market Parcel B Project

Dear Mr. Stefan:

This letter-report summarizes my findings and recommendations concerning microclimate and wind conditions of the proposed Emeryville Public Market Parcel B Project. I have based this report on my analysis of the climate of the area, a site visit and a review of project plans and elevations. My purpose is to provide an evaluation of outdoor comfort conditions within the proposed facility, identify potential problems and, where possible, provide recommendations for improving on-site comfort conditions.

Existing Conditions

The closest source of long-term wind data to the project site is the former Alameda Naval Air Station, located about 5 miles southwest of the project site. Data from this site show that westerly winds are the most frequent and strongest winds during all seasons.[1] This is the primary wind direction during the spring and summer months when sea breezes predominate. A secondary maxima in wind direction frequency is evident for southeasterly winds, which is the wind direction associated with winter storms. While the average wind speed for southeasterly winds is not the highest of all wind directions, this is the likely wind direction of peak winds measured over the year. Calm winds occur about 10% of the time. The annual average wind speed at Alameda Naval Air Station is 8.6 miles per hour and annual average wind speed at the project site would be somewhat less than this.

[1]Wind direction refers to the direction from which the wind is moving. Thus, a westerly or west wind moves from west to east.

Wind conditions partly determine pedestrian comfort and safety on sidewalks and in other public areas. Large buildings can redirect wind flows around and down to street The project site is occupied by a mixture of open areas and buildings up to eight stories in level, resulting in increased wind speed and turbulence at street level. The generally breezy character of Emeryville results from its flat, open land and exposure to persistent wind off of the San Francisco Bay.

The Emeryville Public Market development site is occupied by a mixture of open areas and buildings up to eight stories in height. Further west, a mixture of buildings from one to 30 stories in height offer some shelter from prevailing westerly winds off San Francisco Bay. Parcel B is located at the east edge of the Emeryville Public Market site and is partially sheltered from prevailing winds by the 2-story Public Market building, the 8-story Marketplace Tower and similar-sized buildings on Parcel C and D.

Building Aerodynamics

The construction of a building results in severe distortions of the wind field. The building acts as an obstacle to wind flow. The deceleration of wind on the upwind side of the structure creates an area of increased atmospheric pressure, while an area of decreased atmospheric pressure develops on the downwind side. Accelerated winds generally occur on the upwind face of the building, particularly near the upwind corners and along the building sides. The downwind side has generally light, although variable, winds.

The strength of ground-level wind accelerations near buildings is controlled by exposure, massing and orientation or the structure. Exposure is a measure of the extent that the building extends above surrounding structures into the wind stream. A building that is surrounded by taller structures is not likely to cause adverse wind accelerations at ground level, while even a small building can cause wind problems if it is freestanding and exposed.

Massing is important in determining wind impact because it controls how much wind is intercepted by the structure and whether building-generated wind accelerations occur above-ground or at ground level. In general, slab-shaped buildings have the greatest potential for wind problems. Buildings that have an unusual shape or utilize set-backs have a lesser effect. A general rule is that the less continuous a building's faces are (vertically or horizontally), the lesser the probable wind impact at ground level.

Orientation determines how much wind is intercepted by the structure, a factor that directly determines wind acceleration. In general, buildings that are oriented with their wide axis across the prevailing wind direction will have a greater impact on ground-level

winds than a building oriented with its long axis along the prevailing wind direction.

Evaluation of Project

The Parcel B site is bounded by the relocated Shellmound Street to the west and north; the UPRR train tracks to the east, and Parcel A to the south. The Parcel B development project proposes an new 8-story mixed-use building with an entry lobby, bike parking, retail and servicing areas at ground floor, 3-4 levels of structured parking for building users/Public Market district patrons and research lab space at the top 3 floors. The project site includes landscape and utilities improvements, and small landscaped open space areas at the north and south ends of the site. An access way at the south end of the site provides vehicle entry/exiting for both Parcel B and Parcel A.

The west side of the building is proposed to include public art mounted on the facade of the parking floors. The artwork could be two or three-dimensional, potentially illuminated and made of LEDs, metal mesh, aluminum, Kevlar, or fiber resin.

The proposed building would be partially sheltered from prevailing winds. The northern half of the building would be sheltered by the Marketplace Tower just across Shellmound Street. during west winds. The site is currently fairly exposed to southeast winds, but this exposure would be greatly reduced when the proposed building on the adjacent Parcel A is constructed.

The orientation of the proposed building reflects the shape of the parcel, with the long axis of the building aligned north/south. This would maximize interception of winds from the west, while minimizing the interception of winds from the southeast direction.

The massing of the building would have a profound effect on how the building changes the wind. Although the building has a rectangular footprint and would be considered slab-shaped, the lower half of the structure would be naturally-ventilated parking garage space, which makes all building faces discontinuous with respect to wind. Because the parking levels connect the upwind and downwind sides of the building, regardless of wind direction, the type of pressure differences between the up-wind and down-wind sides of the building that typically drive wind accelerations near the base of a building cannot occur, since the pressure difference would be relieved by air flowing through the garage floors. The proposed public art display on the west side of the building would allow air to flow through the garage floors and would have no effect on wind around the building.

In summary, the proposed Parcel B building is somewhat exposed to prevailing wind directions and is aligned across the important west wind direction. However, the

presence of naturally-ventilated parking garage space in the bottom half of the structure means that any upwind and downwind pressure differences generated at the top floors of the building would result in airflow through the parking garage floors and not wind accelerations at ground level. Based on the exposure, massing and orientation of the proposed building it would not have the potential to adversely affect ground-level winds near its base, at proposed landscaped open spaces areas at the north and south ends of the site, within adjacent Parcel A to the south, or at properties east of the site on the far side of the UPRR train tracks. Since the project does not have the potential to adversely affect wind, wind tunnel or computerized computational fluid dynamics testing would not be recommended for this project.

I hope that you find this report helpful. Please call if you have questions or would like more information.

Sincerely,

Donald Ballanti
Certified Consulting Meteorologist