3.4 WIND

Introduction

This section describes wind conditions in the Project area and at the Project site. This section provides a general discussion of the relationship between building design and wind effects and evaluates the potential for the West Campus to result in adverse wind conditions in public areas. The analysis presented below is based on the Wind Impact Evaluation for the Menlo Park Facebook Campus Project prepared by Donald Ballanti.[1] The Wind Impact Evaluation is included in Appendix 3.4 of this document. No comments were received in response to the Notice of Preparation (NOP) (Appendix 1) or public scoping meetings with regard to potential wind impacts from implementation of the Project.

The change in the Conditional Development Permit (CDP) for the East Campus would not result in wind impacts. Therefore, Project impacts at the East Campus are not discussed further in this section.

Applicable Plans and Regulations

There are no applicable federal, State, or local regulations associated with the effect of development on wind conditions.

Existing Conditions

Wind Setting

Wind is an important factor in determining pedestrian comfort and safety. The Bay Area is noted for its cool, windy climate that, combined with frequent stratus clouds, can make outdoor space uncomfortably cool. The usability of outdoor space, parks, and even the success of retail space is partially determined by wind conditions. In the Bay Area, average wind speeds are greatest in the summer and least in the fall.[2] Winds also exhibit a diurnal variation with the strongest winds occurring in the afternoon and lightest winds occurring in the early morning.

Building Aerodynamics

The construction of a building can result in severe distortion of the wind field because 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. The downwind side has generally light, variable winds. Where two buildings are close together, the areas of accelerated wind may overlap within the gap between the two

[1] Donald Ballanti, Certified Consulting Meteorologist, *Wind Impact Evaluation for the Menlo Park Facebook Campus Project*, August 26, 2011.

[2] Donald Ballanti, Certified Consulting Meteorologist, *Wind Impact Evaluation for the Menlo Park Facebook Campus Project*, August 26, 2011.

structures. The strength of ground-level wind accelerations near buildings is controlled by exposure, massing, and orientation of the structure.

Exposure is a measure of the extent that the building extends above surrounding structures or terrain into the wind stream. A building that is surrounded by taller structures or sheltered by terrain is not likely to cause adverse wind accelerations at ground level, while even a comparatively small building could cause wind effects 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 acceleration effects. Buildings that have an unusual shape, rounded faces, or utilize set-backs have a lesser wind effect. A general rule is that the more complex the building is geometrically, the lesser the probable wind impact at ground level.

Building orientation determines how much wind is intercepted by the structure, a factor that directly determines wind acceleration. In general, buildings that are oriented with the wide axis across the prevailing wind direction will have a greater impact on ground-level winds than a building oriented with the long axis along the prevailing wind direction.

Existing Conditions at the Project Site

The closest wind monitoring station to the Project site is at the Palo Alto Airport approximately 2.25 miles to the south. The Palo Alto Airport has an exposure to winds off San Francisco Bay (Bay) similar to that of the Project site. As there are no intervening terrain features, winds measured at the Palo Alto Airport are considered representative of conditions at the Project site. Figure 3.4-1 shows a wind rose for the Palo Alto Airport, based on data from all times of day and all months of the year. As shown in Figure 3.4-1, the prevailing winds at the Palo Alto Airport, and similarly at the Project site, are northwest to north winds. Under existing conditions, neither the East Campus nor the West Campus has protection from these prevailing winds due to a lack of intervening terrain, buildings, and vegetation.

The existing, built features at the East Campus include nine buildings clustered near the center of the site with pedestrian and outdoor spaces running roughly southwest to northeast between the structures. The five wind-exposed structures on the northwest side of the pedestrian/outdoor corridor create four gaps between buildings that are aligned along northwest to north-northwest directions. All four of these gaps have two-story porous wind fences to control adverse wind conditions within the central pedestrian/outdoor corridor.

Existing development at the West Campus includes two vacant office buildings totaling 127,246 square feet (sf) with a maximum height of 35.4 feet. In addition, the western portion of the site includes a surface parking lot with 347 parking stalls, landscape features, a basketball court, and a guard house. The eastern portion of the site does not include structures and mainly consists of previously developed land with minimal vegetation. However, a dense landscape buffer of mature vegetation surrounds the perimeter of the West Campus.

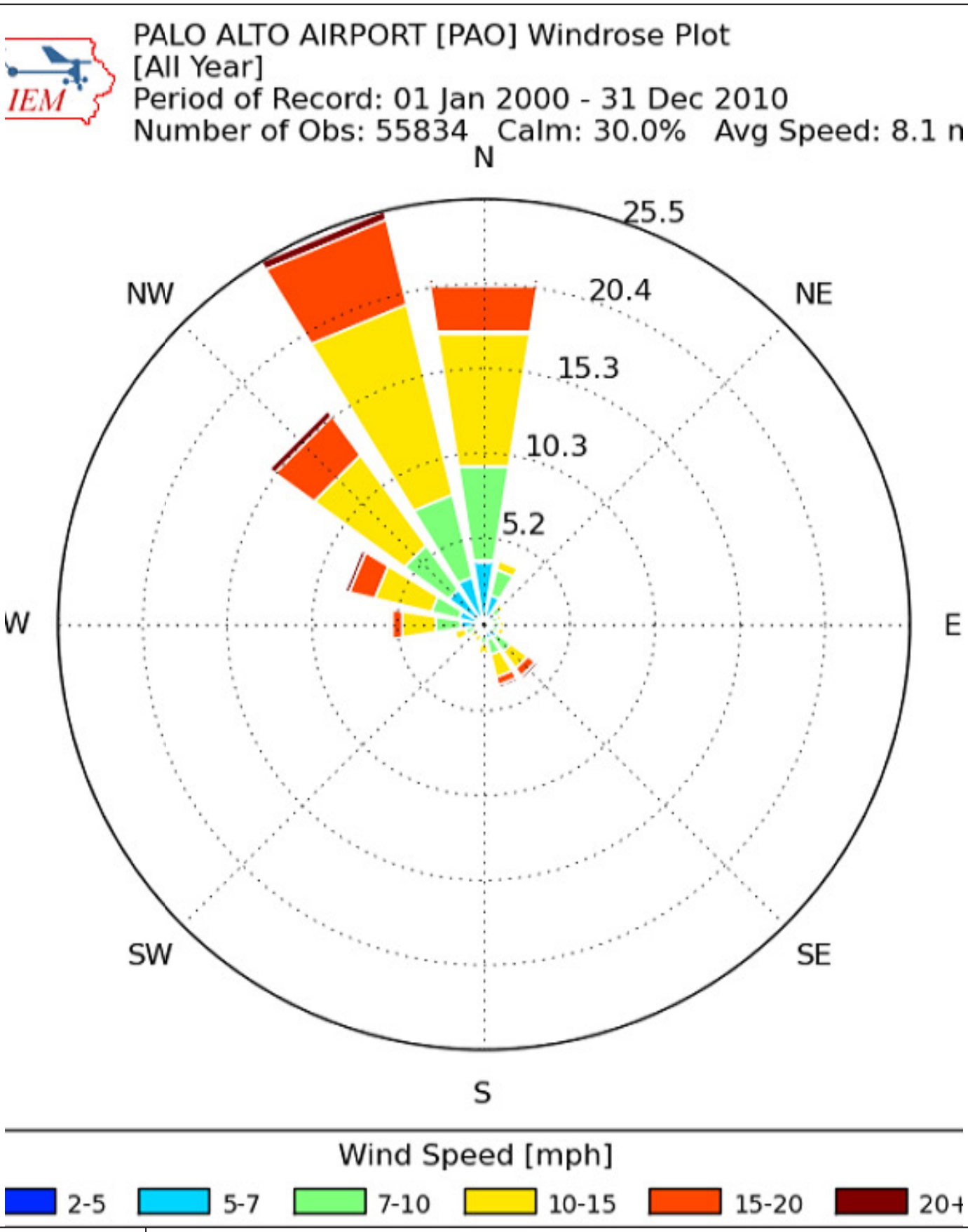

FIGURE 3.4-1
Palo Alto Airport Wind Rose

***Source*:** Don Ballanti, 2011.

Pedestrian and bicycle trails are located in the vicinity of the Project site. As shown in Figure 2-4 (Project Description), a Bay Conservation and Development Commission (BCDC) Public Shore Trail borders the East Campus and runs along the perimeter of the site. In addition, west of Willow Road, the Bay Trail travels along the northern side of Bayfront Expressway. East of Willow Road, the Bay Trail continues along the southern side of Bayfront Expressway. There are no other public access areas in the immediate vicinity of the Project site.

Impacts and Mitigation Measures

Standards of Significance

CEQA does not list any specific criterion for the evaluation of wind effects associated with a project. Some larger cities in the Bay Area (City of San Francisco and City of Oakland) have established both standards and criteria for the evaluation of wind impacts, these standards are applicable in zoning districts where high rise structures are permitted. CEQA significance levels in San Francisco and Oakland are based on pedestrian hazard.

The City of Menlo Park has not established any CEQA significance thresholds for wind. For this analysis, the Project is considered to have a potentially significant impact if the Project would:

- Alter wind patterns in a manner that adversely affects the comfort of a public area.

Methodology

The potential for accelerated winds was evaluated based on a review of site exposure, building heights, and building orientations to identify locations where exposure, massing, or orientation to the prevailing winds would suggest that increased winds would affect pedestrian spaces.

WD-1 ***Wind Impacts.*** *Implementation of the Project at the West Campus would not change the existing wind conditions at the Project site in a manner that would adversely affect the comfort of a public area, resulting in less-than-significant impacts. (LTS)*

The West Campus has little shelter from northwest to north prevailing winds. It is likely that areas within the West Campus would experience accelerated winds due to the increased height, bulk, and alignment of the proposed buildings. Although there would be common outdoor areas for employees, there would be no areas on the West Campus open to the public.

Wind effects from development at the West Campus would not extend into surrounding neighborhoods to the south or create an uncomfortable or hazardous environment along the Bay Trail along Bayfront Expressway. Because development of the West Campus would not result in adverse wind effects on public areas, this impact is considered ***less than significant***.

Cumulative Impacts

In general, the effect of land development on wind conditions is site-specific and does not alter regional wind patterns. Therefore, the geographic context considered in evaluating the cumulative effect of the Project, in combination with other reasonable foreseeable development on wind conditions is the Project site and immediately adjacent areas.

C-WD-1 ***Cumulative Wind Impacts.*** *The Project, in combination with other foreseeable development in the Project area, would have a less-than-significant impact on cumulative wind conditions in public areas. (LTS)*

Tier 1 and Tier 2

Of the cumulative projects considered for this analysis, the cumulative Tier 1 projects closest to the Project site include an office/retail development at 1283 Willow Road, Menlo Gateway, and a 21-unit residential development at 297 Terminal Avenue. The Tier 2 projects are not located close enough to the Project site to cumulatively affect wind conditions, with the exception of a potential rail station as part of the Dumbarton Rail Corridor Project. With the exception of Menlo Gateway approximately 1.5 miles from the Project site, none of these projects would include high-rise buildings and, thus, would not likely result in significant wind-related impacts. Therefore, these cumulative development projects would not be expected to substantially alter wind conditions adjacent to public areas, such as parks, trails, or sidewalks. Although Menlo Gateway includes multi-story buildings that could alter local wind conditions, Bayfront Park (the closest public designated area) to the north is approximately 2,500 feet from Menlo Gateway and would not be substantially affected by local wind impacts. Therefore, there would be no significant cumulative problem with respect to wind.

Wind effects from development at the West Campus would not extend into surrounding neighborhoods to the south, or create an uncomfortable or hazardous environment along the Bay Trail to the north of Bayfront Expressway. Therefore, the Project, together with the identified cumulative projects, would not result in wind conditions in the vicinity of the Project site that would impact the comfort of public areas. The Project's cumulative impact would be ***less than significant***.

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