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August 21, 2014

Trans World Assurance Company
C/0 Julia M. Baigent
Jewel Property Advisors, LLC
60 Buck Court
Woodside, CA 94062

Subject: Wind Impact Analysis of the Proposed Central Park South Project, San Mateo

Dear Ms. Baigent:

This letter-report summarizes my findings concerning potential wind impacts of the proposed Central Park South project in downtown San Mateo. I have based this analysis on a review of project plans and sections, a site visit, and my knowledge of building aerodynamics gained from nearly 40 years of wind tunnel studies and analysis of building-generated wind problems.

The focus of this analysis is the potential for adverse wind impacts on the Central Park picnic area which is located directly northwest of the project site. Outdoor dining is a wind-sensitive activity so increased wind is a concern as it could adversely affect usability of the picnic area.

The following analysis examines wind qualitatively. The proposed project is examined to determine where the most important factors that determine wind effects combine to accelerate winds that can adversely affect users of the picnic area.

PROJECT DESCRIPTION

The project site is a generally flat, rectangular parcel that abuts the southeast side of Central Park occupying the east corner of the intersection of El Camino Real and 9th Avenue. The project site is currently occupied by four 1-2 story buildings. The project would redevelop the entire project site as a combination of office and residential uses. A four-story office building and surface parking would occupy the southwest portion of the

site adjacent the El Camino Real/9th Avenue intersection. Parking would also be provided in the basement. Further to the northeast along 9th Avenue a four-story 60-unit apartment building with basement parking would be constructed. Access to the apartment building basement garage would be off 9th Avenue.

EXISTING CONDITIONS

San Mateo is located on the eastern side of the San Francisco peninsula. The peninsula region extends from northwest of San Jose to the Golden Gate. The Santa Cruz Mountains run up the center of the peninsula, with elevations exceeding 2000 feet at the southern end, decreasing to 500 feet in South San Francisco.

Two important gaps in the Santa Cruz Mountains occur on the peninsula. The larger of the two is the San Bruno Gap, extending from Fort Funston on the ocean to the San Francisco Airport. The other gap is the Crystal Springs Gap, between Half Moon Bay and San Carlos. As the sea breeze strengthens on summer afternoons, the gap permits maritime air to pass across the mountains, and its cooling effect is commonly seen from San Mateo to Redwood City.

Annual and seasonal wind roses are attached. A wind rose is a graphical display of the frequency of wind direction and speed as measured at the San Mateo Wastewater Treatment Plant, which is located about 1.5 miles northeast of the project site. The wind roses are based on 5 years of data for the hours of 11 am to 5 pm, which would be the likely times of maximum use of the picnic areas in Central Park. The data files used were prepared by the Bay Area Air Quality Management District. For each wind direction, the frequency of the wind coming from that direction is plotted from the center (the longer the radiating bar, the more frequent the wind blows from that direction).[1] The various colors of the radiating bar provide the frequency of wind speed classes.

On an annual basis, winds at San Mateo are most frequent and strongest from the north to southwest quadrants,which reflects the alignment of the Santa Cruz Mountains and the location of the Crystal Springs Gap. The strongest winds almost all have a westerly component.

Spring is the windiest season in San Mateo, with an average speed of 8.62 knots between 11 am and 4 pm. The dominant wind directions are northwest through west, both in frequency and in average speed.

The summer months show a wind pattern similar to the annual pattern, but the maxima in

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

frequency and strength shifts further to the northwest.

Fall has lighter average winds and the predominate wind direction is from the north. Winds with an easterly component are more common, but frequencies and average speeds are low.

Winter has the lightest average winds, although the highest winds of the year often occur during winter during storms. North is the predominant wind direction, although generally light. Highest winds generally are from the west through southeast quadrants, reflecting pre- and post-frontal winds generated by storms approaching from the west.

When evaluating wind impacts in San Mateo, winds from the north through southwest quadrants will be of greatest concern because of their frequency and average strength. Although some strong winds can occur from the south direction in winter, these winds are highly correlated with rainy weather when outdoor use of the picnic area is unlikely. Winds from the easterly directions are generally not a concern, being neither frequent nor strong.

IMPACTS

Generalized Effects of Buildings

The construction of a building or buildings results in distortions 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 structures. It important to note that except very close to the building, wind effects are felt downwind of the structure, and do not propagate very far in the upwind direction.

The strength of ground-level wind accelerations near buildings is controlled by exposure, massing and orientation. 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 the adjacent picnic area within Central Park.

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.

Project Impact Analysis

Exposure

The Central Park South site is moderately exposed to winds from the prevailing wind directions. For north through northwest winds the site receives little shelter from structures, but Central Park contains numerous very tall, mature trees that offer significant shelter from wind even in the absence of structures. For all other directions the site is sheltered by 1-3 story structures.

Massing

The proposed office building has relatively uniform building faces and a rectangular footprint. The proposed apartment building has a much more complex design. Although the office design contains no building face setbacks, the northwest (Central Park) and southeast (9th Avenue) faces are discontinuous. The most continuous building face of the apartment building is on the southwest side, which faces the office structure.

Orientation

The office building has a rectangular footprint and has its long axis aligned southeast to northwest. This alignment would tend to maximize amount of wind intercepted by the building when the wind is from the southwest and northeast wind directions.

The apartment building would be "T-shaped", with the two axes along a southeast-northwest and southwest-northeast alignment. This alignment would tend to intercept the most wind from southwest, southeast, northeast and northwest directions.

Probable Project Wind Impacts

As described earlier winds from the north through southwest quadrants will be of greatest

concern in San Mateo during the day because of their frequency and average strength. The following discussion describes probable wind impacts for these critical wind directions.

For north winds, the project site is fairly exposed because Central Park is directly upwind of the project site. However, the massing and orientation of the office building and apartment building are such that neither structure presents a large or continuous building face oriented into the approaching wind. Any wind accelerations created by the new buildings would be weak and entirely contained within the project site. No change in wind speeds would be expected within the Central Park picnic areas.

For northwest winds, the site is fairly exposed as Central Park is directly upwind of the project site. The office building is aligned with its narrow end toward the wind, which means that wind accelerations would be weak, and because the building is setback almost 50 feet from the Central Park property line any wind accelerations would be entirely contained within the project site. The apartment building would have a discontinuous building face intercepting northwest winds so any wind accelerations created by the apartment building would be weak and entirely contained within the project site. No change in wind speeds would be expected within the Central Park picnic areas.

For west winds, the site is fairly exposed as Central Park and El Camino Real are directly upwind of the project site with 1-4 story structures further upwind. However, the massing and orientation of the office building and apartment building is such that neither structure contain large or continuous building faces oriented into the approaching wind. Also, the apartment building would be partially sheltered by the office building. Therefore, any wind accelerations created by the new buildings would be weak and entirely contained within the project site. No change in wind speeds would be expected within the Central Park picnic areas.

For southwest west winds, the site is fairly exposed as El Camino Real is directly upwind of the project site with 1-4 story structures further upwind. The office building has its wide axis oriented across winds from this direction, which would tend to maximize the strength of wind accelerations, which would be expected near the upwind corners of the structure. However, because the building is setback almost 50 feet from the Central Park property line, any wind accelerations generated by the office building would be entirely contained within the project site. No change in wind speeds for the southwesterly direction from the office building would be expected within the Central Park picnic areas.

The apartment building would have a large, continuous building face oriented into a southwest wind, so it would be expected to result in wind accelerations near the upwind corners (See Figure 1). However, the presence of the office building would shelter much of this building face from a southwest wind, so the accelerations would be expected to be weak. The setback from the western corner of the apartment building and the Central Park property line is on the order of 20 feet. It is possible that during southwest winds, a small

portion of the picnic area would experience accelerated winds due to the construction of the apartment building. The magnitude of the increase is expected to be minor because the southwest building face which generates the wind acceleration is largely sheltered by the new office building. Also, the area between the west corner of the apartment building and Central Park will be landscaped with trees, shrubs and vines. Once established, this low-level landscaping, together with the existing dense elevated canopy of trees that exist along the Central Park boundary would act as a shelterbelt that would eliminate the predicted minor wind accelerations within the small portion of the picnic area that would be affected.

Summary of Impacts

Critical wind directions between 11 am and 5 pm in San Mateo have been identified as the northerly through southwesterly directions. The potential for wind accelerations caused by the project affecting the adjacent Central Park picnic area was examined by considering the exposure, massing and orientation of the new buildings for winds from the northerly through southwesterly directions. No potential for accelerated winds reaching the picnic area was found except for southwest winds. Winds from the southwest quadrant are expected about 12 percent of the time on an annual basis between 11 am and 5 pm in San Mateo. Seasonally, the frequency of winds from the southwest quadrant ranges from 7 percent of the time in winter to 17% of the time in spring. The apartment building would have the potential for generating minor wind accelerations (on the order of 10-20%) over a small portion of the picnic area when the wind is from the southwest.

In conclusion, with the proposed project landscaping, the building massing and orientation, and the existing trees at the perimeter of Central Park, the wind environment at the picnic area adjacent the proposed project would be essentially unchanged with construction of the project.

Sincerely,

Donald Ballanti

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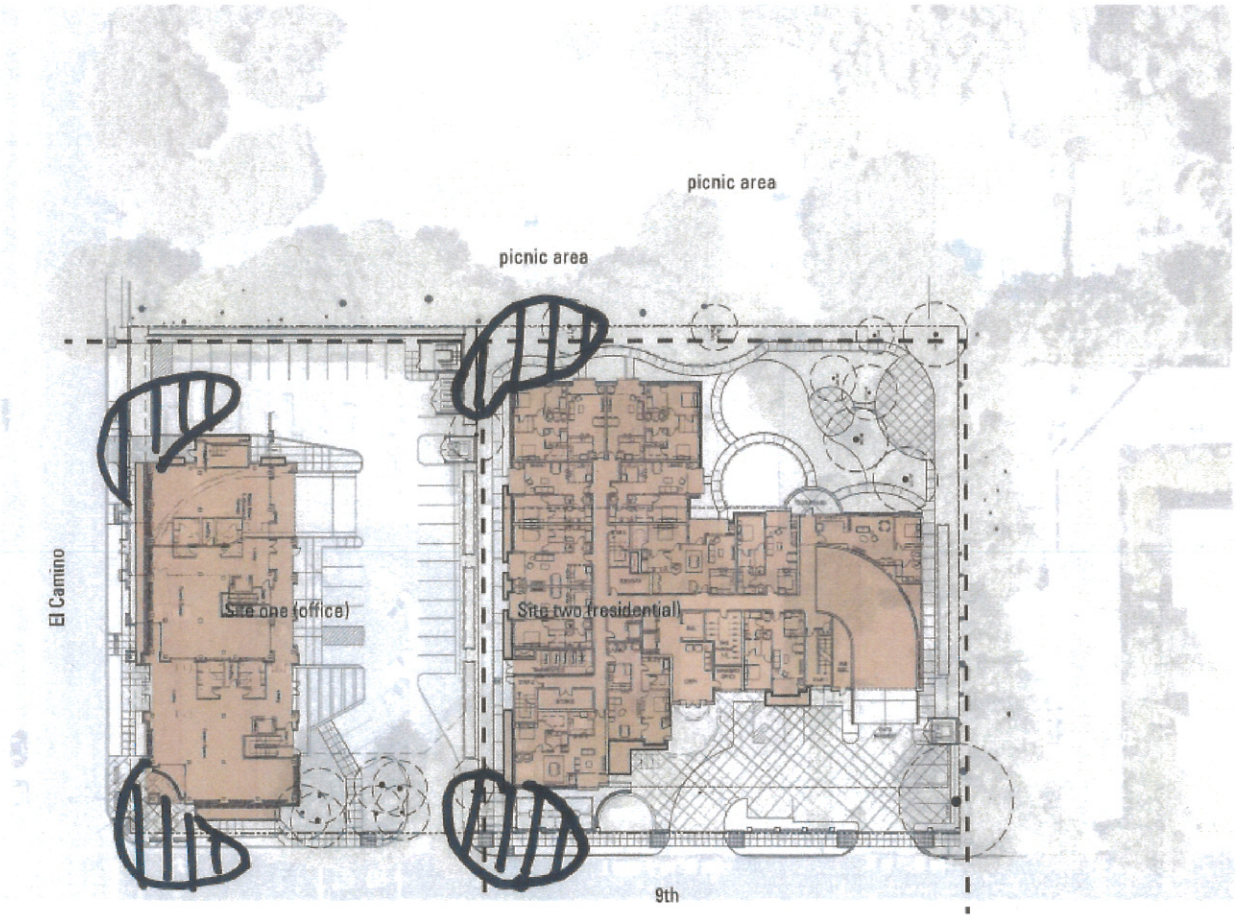
Consulting Meteorologist

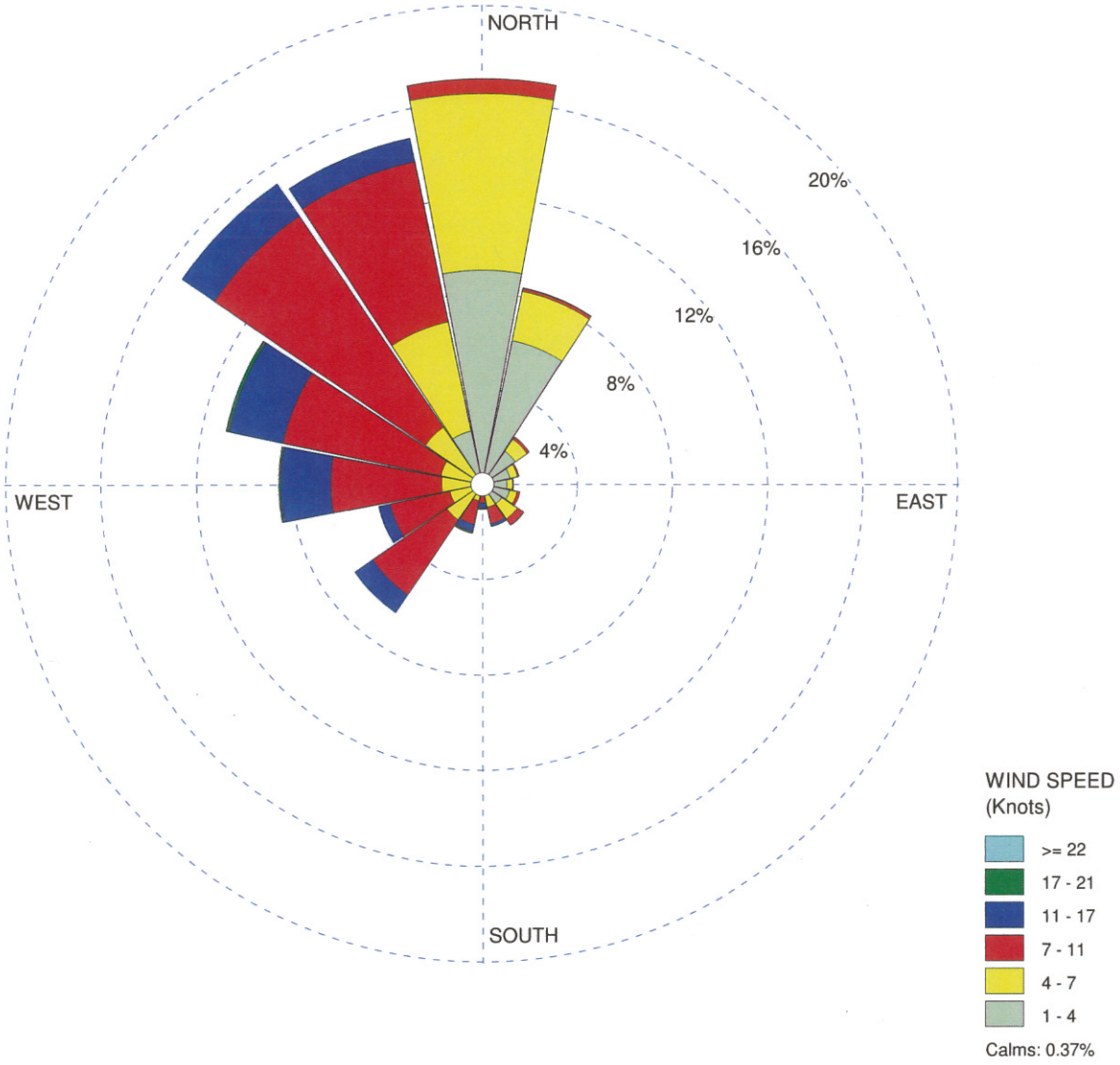
Figure 1: Expected Location of Wind Accelerations for Southwest Winds



WIND ROSE PLOT: San Jose

San Mateo STP
Annual 11 am to 5 pm

DISPLAY:
Wind Speed
Direction (blowing from)

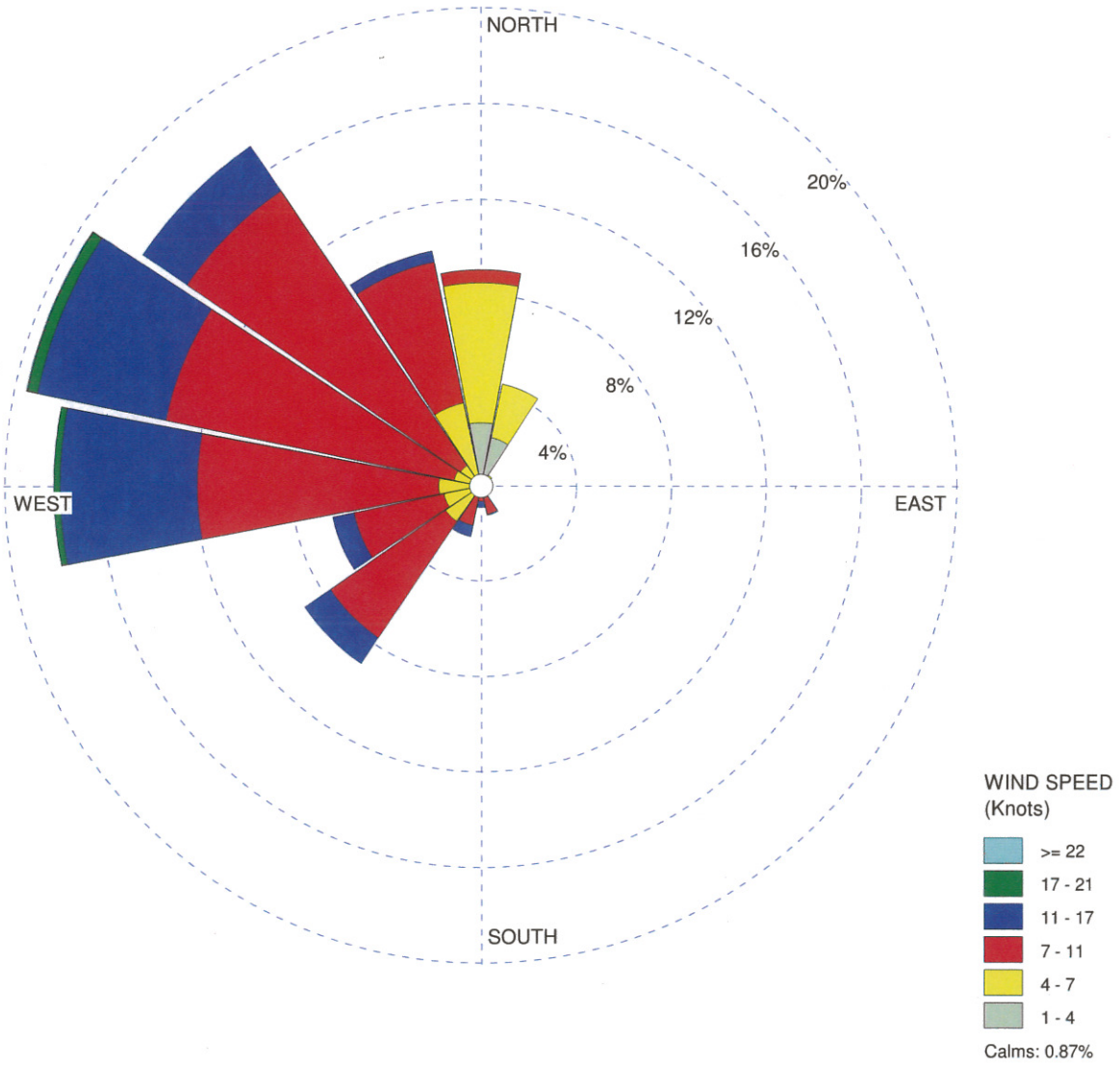


COMMENTS:	DATA PERIOD: **Start Date: 1/1/1999 - 11:00** **End Date: 12/31/2005 - 16:00**	COMPANY NAME: **Donald Ballanti, CCM**	
		MODELER:	
	CALM WINDS: **0.37%**	TOTAL COUNT: **10956 hrs.**	
	AVG. WIND SPEED: **6.84 Knots**	DATE: **8/8/2014**	PROJECT NO.:

WIND ROSE PLOT: San Jose

San Mateo STP
Spring 11 am to 5 pm

DISPLAY:
Wind Speed
Direction (blowing from)

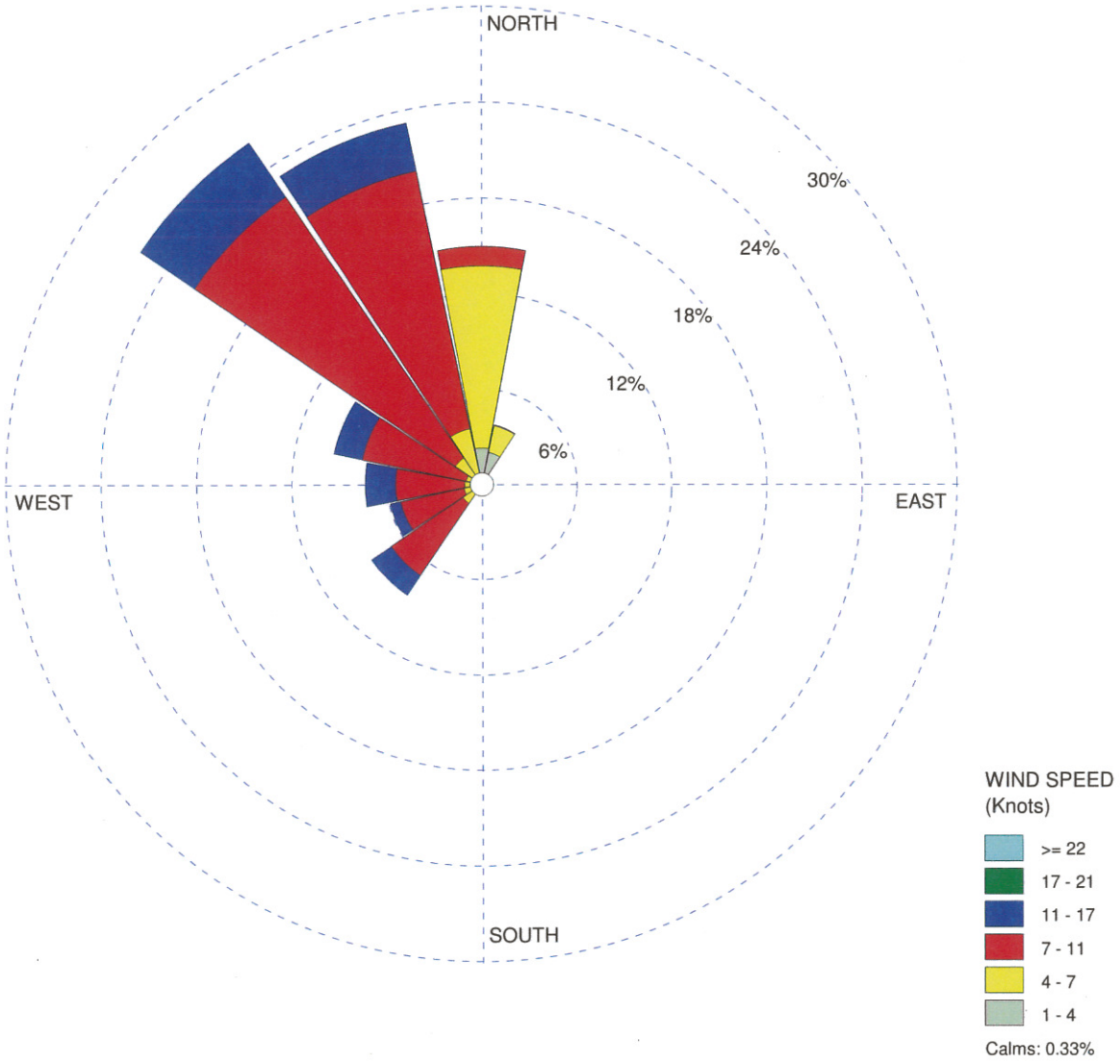


COMMENTS:	DATA PERIOD: **Start Date: 3/22/1999 - 11:00** **End Date: 6/21/2005 - 16:00**	COMPANY NAME: **Donald Ballanti, CCM**	
		MODELER:	
	CALM WINDS: **0.87%**	TOTAL COUNT: **2760 hrs.**	
	AVG. WIND SPEED: **8.62 Knots**	DATE: **8/8/2014**	PROJECT NO.:

WIND ROSE PLOT: San Jose

San Mateo STP
Summer 11 am to 5 pm

DISPLAY:
Wind Speed
Direction (blowing from)

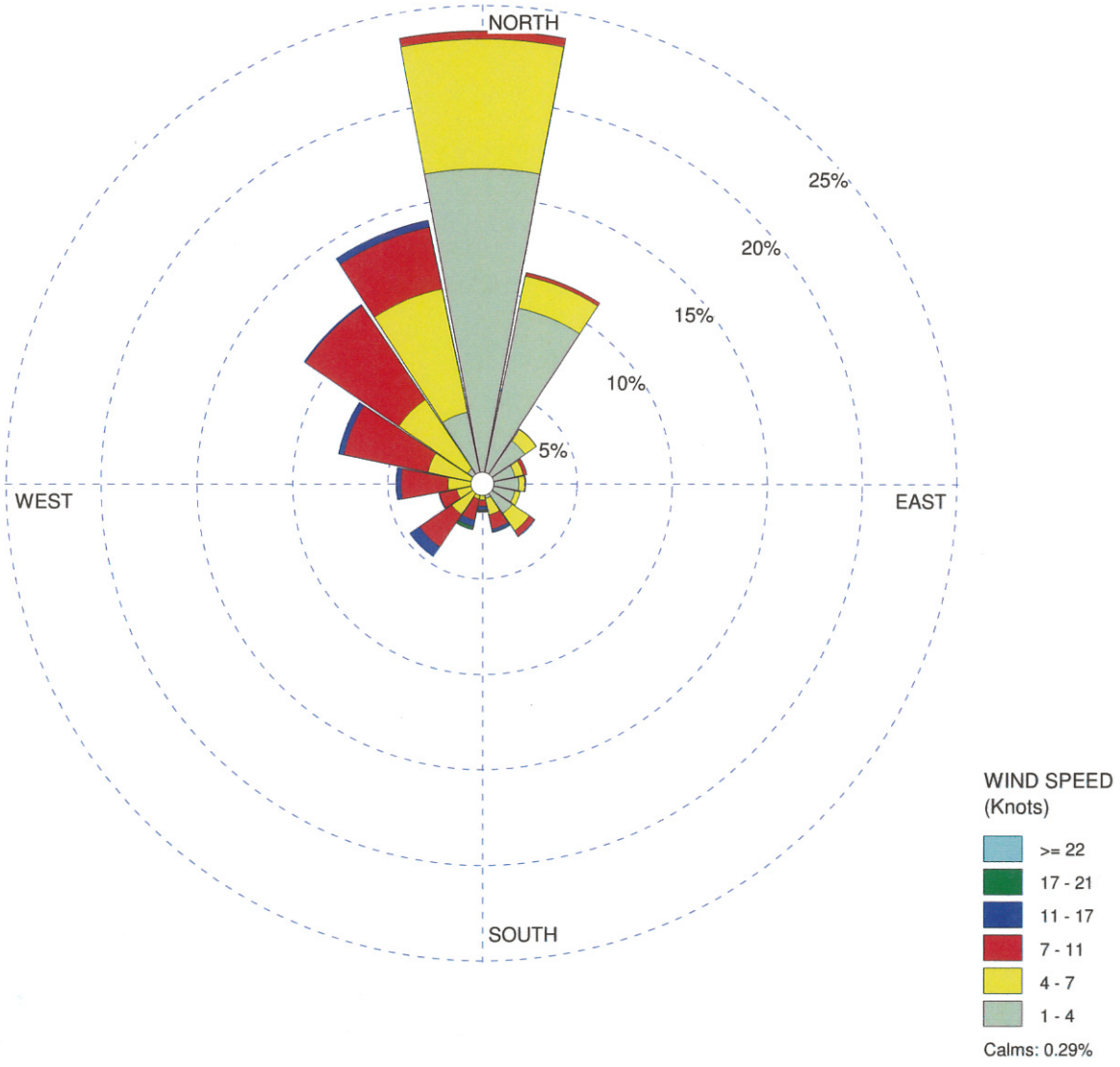


COMMENTS:	DATA PERIOD: **Start Date: 6/22/1999 - 11:00** **End Date: 9/21/2005 - 16:00**	COMPANY NAME: **Donald Ballanti, CCM**	
		MODELER:	
	CALM WINDS: **0.33%**	TOTAL COUNT: **2760 hrs.**	
	AVG. WIND SPEED: **8.36 Knots**	DATE: **8/8/2014**	PROJECT NO.:

WIND ROSE PLOT: San Jose

San Mateo STP
Fall 11 am to 5 pm

DISPLAY:
Wind Speed
Direction (blowing from)

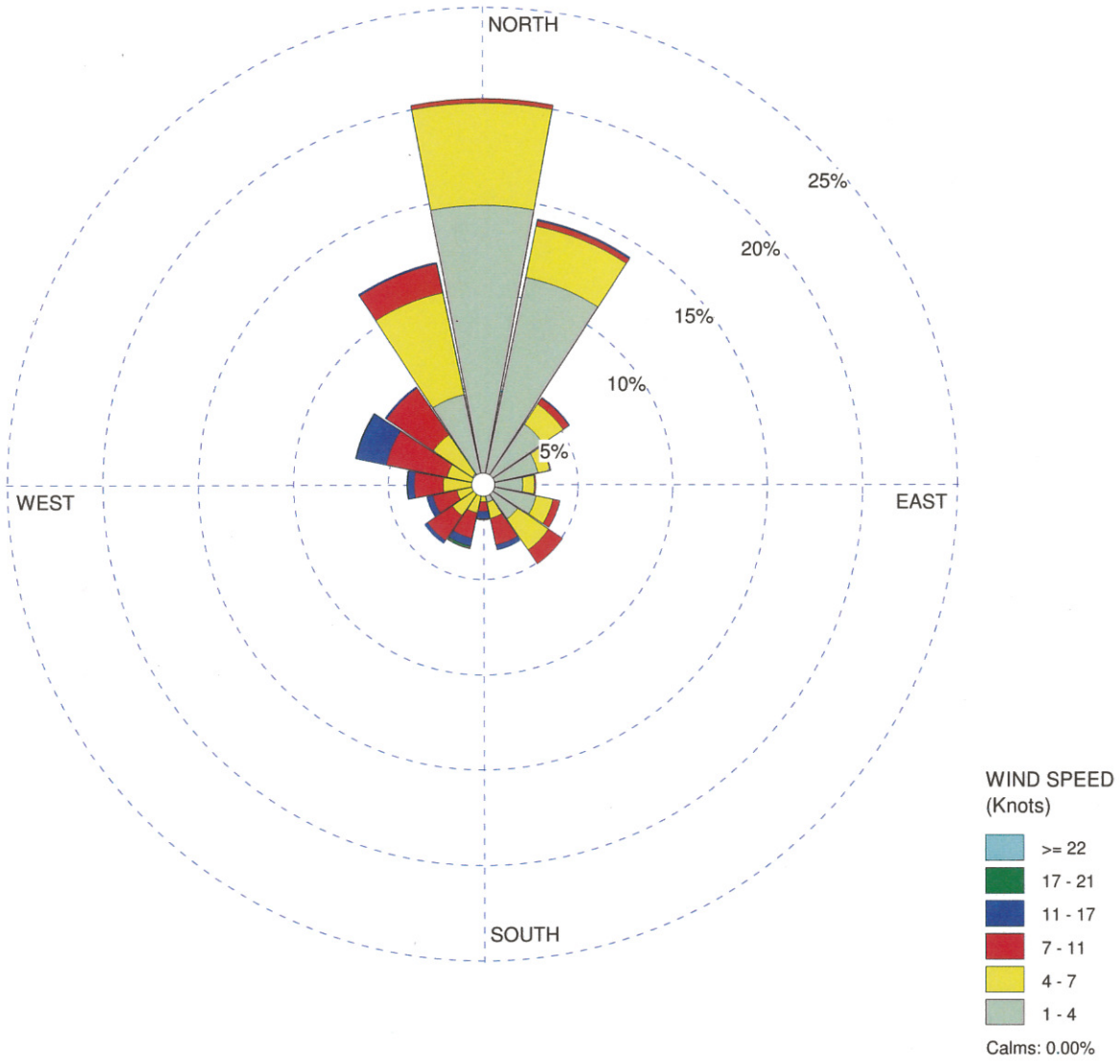


COMMENTS:	DATA PERIOD: **Start Date: 9/21/1999 - 11:00** **End Date: 12/22/2005 - 16:00**	COMPANY NAME: **Donald Ballanti, CCM**	
		MODELER:	
	CALM WINDS: **0.29%**	TOTAL COUNT: **2790 hrs.**	
	AVG. WIND SPEED: **5.24 Knots**	DATE: **8/8/2014**	PROJECT NO.:

WIND ROSE PLOT: San Jose

San Mateo STP
Winter 11 am to 5 pm

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 1/1/1999 - 11:00** **End Date: 12/31/2005 - 16:00**	COMPANY NAME: **Donald Ballanti, CCM**	
		MODELER:	
	CALM WINDS: **0.00%**	TOTAL COUNT: **2736 hrs.**	
	AVG. WIND SPEED: **5.05 Knots**	DATE: **8/8/2014**	PROJECT NO.: