FINAL REPORT



200 WELLS STREET

SOUTH MELBOURNE

PEDESTRIAN WIND STUDY RWDI # 2102852 April 22, 2021

SUBMITTED TO

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PORT PHILLIP PLANNING DEPARTMENT Date Received: 13/5/2021



EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the Proposed Development at 200 Wells Street, South Melbourne. The pedestrian level wind microclimate assessment has been conducted for the existing Site as well as with the inclusion of the Proposed Development (Existing and Proposed configurations respectively), to understand the effect of the Proposed Development on the wind conditions in the local surrounding area. The expected wind conditions are based on combining the measured results from a boundary-layer wind tunnel test with historical meteorological records for the area. Winds are predominantly from the north, with occasional winds from the south and southwest throughout the year. The results of the assessment were compared against the Melbourne Pedestrian Wind Criteria (C270). The following is a summary of the expected wind conditions based on the outcomes of the assessment:

- Wind conditions at the existing site at grade level were comfortable for pedestrian use at the majority of measurement locations, however the safety criterion was exceeded at four locations on the east side of Wells Street near the intersection of Park Street.
- The inclusion of the Proposed Development was found to result in a minimal impact to the surrounding wind conditions. One fewer location was found to exceed the safety criterion with the inclusion of the Proposed Development. Wind speeds at main entrances of the Proposed Development would be suitable for the intended usage throughout the year. Locations away from corners are appropriate for entrances for retail tenancies.
- The wind conditions at the Level 5 terrace, on the roof, and on balconies were found to be comfortable for the intended use throughout the year with no safety exceedance.



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1 INTRODUCTION

RWDI Australia Pty Ltd (RWDI) was retained to conduct a pedestrian wind assessment for the Proposed Development at 200 Wells Street, South Melbourne. This report presents the project objectives, discusses the results from RWDI's wind tunnel assessment and, where necessary, provides conceptual wind control measures.

1.1 Proposed Development Description

The Proposed Development (shown in Image 1) is located at the intersection of Park Street and Wells Street, within the Domain Precinct close to Melbourne's Botanical Gardens. The existing site comprises of an old warehouse building converted into offices. The property has three street frontages lining Park Street, Wells Street and Little Bank Street. The proposed mixed-use development comprises 17 storeys of approximately 61 m overall height, including ground floor retail/food & beverage, four levels of commercial tenancy with the remaining levels residential apartments. Outdoor amenity spaces on the development include terraces at podium level (Level 5) and private balconies.



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

1.2 Objectives

The objective of the study was to assess the effect of the Proposed Development on wind speeds in pedestrian areas and provide recommendations for minimising adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the Proposed Development 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 walkways and footpaths around the Proposed Development, entrances and amenity spaces.



2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

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

- A Existing: Existing Site with existing surroundings (Image 2A), and
- B Proposed: Proposed Development with existing surroundings (Image 2B).

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 360 m radius of the 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 57 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 1.5 m above the concerned levels in pedestrian accessible areas throughout the Site. Wind speeds were measured for 36 directions at 10-degree increments. 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.



Image 2A: Wind Tunnel Study Model - Existing Configuration

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Image 2B: Wind Tunnel Study Model – Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Melbourne Airport between 1998 and 2018, inclusive, were analyzed on an annual basis. Image 3 graphically depicts the annual directional distribution of wind frequencies and speeds.

Winds from the north are predominant with occasional winds from the southerly and southwesterly directions throughout the year, as indicated by the wind rose below. Strong winds of a mean speed greater than 10 m/s measured at the airport (at an anemometer height of 10 m) occur for 10.7% of the time on an annual basis.

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

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Image 3: Directional Distribution of Winds Approaching Melbourne Airport From 1998 to 2018

2.3 Melbourne Pedestrian Wind Criteria (C270)

The Melbourne pedestrian wind criteria (C270) were used as the basis of assessing pedestrian wind comfort in the current study. The comfort and safety conditions for this criterion are based on mean wind speeds (or gust-equivalent mean wind speed) and 3 second gust speeds, respectively. An annual exceedance of 20% of the time is considered for the mean wind speeds, while an annual exceedance of 0.1% of the time (approximately nine hours per year) is used for the gust speeds. Only gust speeds need to be considered in the wind safety criterion, these are rare events which deserve special attention in city planning and building design due to their potential safety impact on pedestrians.

It should be noted that the wind comfort criteria represent an average wind tolerance and can be subjective in a way that regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can affect a person's perception of the wind climate. Therefore, comparisons of wind speeds for different Site and surrounding configurations are the most objective way of assessing the local pedestrian wind conditions.

Table 1 below summarizes the Melbourne pedestrian wind criteria (C270):

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Image 1: Wind Comfort Criteria (Melbourne Planning Scheme C270)

Comfort Category	Mean Wind Speed (m/s) 20% exceedance threshold
Comfortable for Sitting	<u><</u> 3
Comfortable for Standing	3 - 4
Comfortable for Walking	4 - 5
Uncomfortable	> 5
Safety Criterion	3-Second Gust Speed (m/s) 0.1% exceedance threshold
Exceeded	> 20



3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on Site plans in Figures 1A through 2B located in the "Figures" section of this report. These conditions and the associated wind speeds are also presented in Table 1, located in the "Tables" section of this report. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

In our discussion of the anticipated wind conditions, reference will be made to the following generalised wind flow patterns. If these buildings/wind combinations occur for prevailing winds, there is a greater potential for increased windiness in pedestrian areas:

- Buildings tend to intercept the stronger winds at higher elevation and redirect them to the ground level (Downwashing flows, Image 4a).
- When winds approach a tall façade and are deflected down, a localised increase in the wind activity or corner acceleration can be expected around the exposed building corners at pedestrian level (Image 4b).



Image 4: General wind patterns – (a) downwashing, (b) corner accelerations

Dense landscaping tends to reduce wind speeds downwind of their location to a large extent and may be used upwind of areas where reduced wind activity is desired. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

3.1 Wind Comfort - Grade Level (Sensor locations 1 – 37, 58 and 59)

Wind conditions comfortable for walking are appropriate for footpaths, walkways and service lanes 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 likely to linger. Wind speeds comfortable for sitting are preferred for areas intended for passive activities.



3.1.1 Existing Configuration

The wind speeds around the site are comfortable for sitting or standing use at the majority of sensor locations. Wind speeds suitable for walking use occur at a localised off-site area between the Royal Domain Corporate Centre and Royal Domain tower (sensor locations 22 and 23 as shown in Figure 1A) due to downwashed winds interacting with the existing built forms. Walking condition would be suitable as pedestrian access would be limited and less likely to remain in one area for prolonged period.

The wind speed assessed at grade level were found to exceed the safety criterion at four off-Site sensor locations (sensor locations 18 -20 and 23 as in Figure 2A) on the eastern side of the intersection of Wells Street and Park Street.

3.1.2 Proposed Configuration

With the completion of the proposed development, wind speeds would be similar to the Existing configuration on-Site and off-site, and would be comfortable for sitting and standing use at majority of the locations. Localised walking conditions found between the Royal Domain corporate Centre and Royal Domain tower (sensor locations 22 and 23 as shown in Figure 1B) are consistent with the existing condition. A marginal increase in wind speed was found on the north side of Park Street (sensor location 19) which is appropriate for this footpath location without active street frontage.

Wind speeds at main entrances to the Proposed Development (sensor locations 3 and 8) would be suitable for the intended pedestrian use with conditions comfortable for sitting throughout the year. Locations away from corners are appropriate for entrances for retail tenancies.

The addition of the Proposed Development would reduce the number of locations where the safety criterion was exceeded from four locations in the existing configuration (sensor locations 18, 19, 20, and 23) to three locations (sensor locations 18, 19 and 23), highlighting that these exceedance *a* are driven by wind flow driven by the existing built form.

3.2 Wind Comfort - Above Grade Level (Locations 38 - 57)

It is generally desirable for wind conditions at amenity spaces intended for passive activities to be suitable for sitting or standing use more than 80% of the time during appropriate weather conditions. The Proposed Development has amenity spaces at multiple levels:

- Level 5 terrace (sensor location 38 to 46);
- Balcony location at Level 7 (sensor location 47 to 50);
- Balcony location at Level 16 (sensor location 51 to 52); and,
- Roof (sensor location 53 to 57).

The wind conditions on all amenity space at Level 5 and roof were found to be comfortable with sitting and standing wind conditions, which is appropriate for the intended use. The assessment of wind conditions on the balconies is based on wind speed measurements on representative balcony locations on study model. The wind conditions on the balconies would be suitable for sitting at all locations throughout the year.

Wind speeds assessed above grade level were found to meet the wind safety criterion for at all sensor locations.



4 APPLICABILITY OF RESULTS

The drawings and information received through 26 March 2021 listed below were for the development at 200 Wells Street and were used to construct the scale model. The wind conditions presented in this report pertain to the Proposed Development as detailed in the architectural massing design drawings listed in the table below. RWDI has reviewed updated Town Planning submission drawings dated 22 April 2021 provided by Pomroy Pacific. These drawings are consistent in massing and in our opinion the minor changes are not expected to materially affect the wind speed predictions at grade. Minor changes have been made to the plan form at Level 5, and locations of balconies on Levels 6 to 15; these are expected to result in negligible changes to the wind speeds predicted herein.

Should there be any design changes that deviate from the drawings dated 22 April 2021, the wind condition predictions presented may change. Therefore, if further 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)
TP01.00_Location Plan_CAD	AutoCAD	17/03/2021
TP02.00_Ground Plan_CAD	AutoCAD	26/03/2021
TP02.01_Level 01 (Podium)_CAD	AutoCAD	26/03/2021
TP02.02_Level 02 (Typical Levels 02-04)_CAD	AutoCAD	26/03/2021
TP02.05_Level 05 (Terrace)_CAD	AutoCAD	26/03/2021
TP02.06_Level 06 (Amenities)_CAD	AutoCAD	26/03/2021
TP02.07_Level 07 (Typical Levels 07-15)_CAD	AutoCAD	26/03/2021
TP02.16_Level 16 (Typical Levels 16-17)_CAD	AutoCAD	26/03/2021
TP02.18_Level 18 (Roof Plant)_CAD	AutoCAD	26/03/2021
TP02.19_Roof Level_CAD	AutoCAD	26/03/2021
TP02.B01_Basement Level B01_CAD	AutoCAD	26/03/2021
TP02.B02_Basement Level B02_CAD	AutoCAD	26/03/2021
TP02.B03_Basement Typical Levels B03-B04_CAD	AutoCAD	26/03/2021
TP02.B05_Basement Level B05_CAD	AutoCAD	26/03/2021
TP09.00_East Elevation_CAD	AutoCAD	26/03/2021
TP09.01_North & South Elevations_CAD	AutoCAD	26/03/2021
TP09.02_West Elevation_CAD	AutoCAD	26/03/2021
TP10.00_Section AA_CAD	AutoCAD	26/03/2021
TP10.01_Section BB_CAD	AutoCAD	26/03/2021

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BANK STREET







BANK STREET









				Wind	Comfort		Wind Safety		
Location	Season	Configuration	Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating	
1	Summer	Existing	3.0	-	Sitting	12.1	-	Pass	
		Proposed	3.1		Standing	13.6	12%	Pass	
	Winter	Existing	2.9	-	Sitting	12.3	-	Pass	
		Proposed	3.4	17%	Standing	14.1	15%	Pass	
	Annual	Existing	2.8	-	Sitting	11.9	-	Pass	
		Proposed	3.1	11%	Standing	13.6	14%	Pass	
2	Summer	Existing	2.8	-	Sitting	13.6	-	Pass	
		Proposed	2.6		Sitting	12.8		Pass	
	Winter	Existing	2.9	-	Sitting	13.8	-	Pass	
		Proposed	2.8		Sitting	12.9		Pass	
	Annual	Existing	2.6	-	Sitting	13.4	-	Pass	
		Proposed	2.6		Sitting	12.4		Pass	
3	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	1.9	-30%	Sitting	9.8	-12%	Pass	
	Winter	Existing	-	-	N/A	-	-	-	
		Proposed	2.1	-22%	Sitting	10.1	-11%	Pass	
	Annual	Existing	· · ·	-	N/A	-	-	-	
		Proposed	1.9	-27%	Sitting	9.8	-11%	Pass	
4	Summer	Existing	3.1	-	Standing	16.5	-	Pass	
		Proposed	2.9		Sitting	12.7	-23%	Pass	
	Winter	Existing	3.4	-	Standing	16.4	-	Pass	
		Proposed	2.9	-15%	Sitting	12.6	-23%	Pass	
	Annual	Existing	3.1	-	Standing	16.1	-	Pass	
		Proposed	2.8	-10%	Sitting	12.3	-24%	Pass	
5	Summer	Existing	3.3	-	Standing	17.7	-	Pass	
		Proposed	3.2		Standing	12.4	-30%	Pass	
	Winter	Existing	3.6	-	Standing	18.3	-	Pass	
		Proposed	3.1	-14%	Standing	13.1	-28%	Pass	
	Annual	Existing	3.3	-	Standing	17.7	-	Pass	
		Proposed	3.0		Sitting	12.6	-29%	Pass	
6	Summer	Existing	3.5	-	Standing	18.2	-	Pass	
		Proposed	3.7		Standing	13.9	-24%	Pass	
	Winter	Existing	4.1	-	Walking	19.7	-	Pass	
		Proposed	3.5	-15%	Standing	14.9	-24%	Pass	
	Annual	Existing	3.7	-	Standing	18.6	-	Pass	
		Proposed	3.4		Standing	14.4	-23%	Pass	
7	Summer	Existing	3.1	-	Standing	13.1	-	Pass	
		Proposed	2.9		Sitting	10.7	-18%	Pass	

			Wind Comfort		Wind Safety			
Location	Season	Configuration	Speed	% Change	Rating	Speed	% Change	Rating
			(111/5)	change		(111/3)	change	
	Winter	Existing	3.2	-	Standing	14.4	-	Pass
		Proposed	2.6	-19%	Sitting	10.7	-26%	Pass
	Annual	Existing	3.0	-	Sitting	13.8	-	Pass
		Proposed	2.6	-13%	Sitting	10.6	-23%	Pass
8	Summer	Existing	2.9	-	Sitting	11.5	-	Pass
		Proposed	2.1	-28%	Sitting	8.2	-29%	Pass
	Winter	Existing	2.9	-	Sitting	11.9	-	Pass
		Proposed	1.8	-38%	Sitting	7.8	-34%	Pass
	Annual	Existing	2.8	-	Sitting	11.6	-	Pass
	, initiaal	Proposed	1.8	-36%	Sitting	7.8	-33%	Pass
9	Summer	Existing	3.3	-	Standing	12.6	-	Pass
		Proposed	3.0		Sitting	12.1		Pass
	Winter	Existing	2.9	-	Sitting	12.2	-	Pass
		Proposed	2.8		Sitting	11.8		Pass
	Annual	Existing	2.9	-	Sitting	12.2	-	Pass
		Proposed	2.8		Sitting	11.7		Pass
10	Summer	Existing	3.4		Standing	13.5		Pass
	Summer	Proposed	3.3		Standing	12.7		Pass
	M/ Sectors	Eviation -	2.0		Cittin	107		Dana
	winter	Existing	2.8	-	Sitting	12.7	-	Pass
		Toposed	2.5		Sitting	12.2		1 435
	Annual	Existing	2.9	-	Sitting	12.8	-	Pass
		Proposed	2.9		Sitting	12.3		Pass
11	Summer	Existing	3.6	-	Standing	14.5	-	Pass
		Proposed	3.1	-14%	Standing	14.1		Pass
	Winter	Existing	3.3	-	Standing	14.5	-	Pass
		Proposed	2.9	-12%	Sitting	14.2		Pass
								_
	Annual	Existing	3.3	- 1 706	Standing	14.1	-	Pass
		Floposed	2.9	-1270	Sitting	15.0		r d 5 5
12	Summer	Existing	3.3	-	Standing	14.8	-	Pass
		Proposed	3.0		Sitting	14.2		Pass
	Winter	Existing	3.1	-	Standing	14.7	-	Pass
		Proposed	3.0		Sitting	14.3		Pass
	Annual	Existing	3.0		Sitting	14.4		Pass
	, annuur	Proposed	2.9		Sitting	13.8		Pass
	-							
13	Summer	Existing	3.2	-	Standing	13.5	-	Pass
		rioposeu	5.0		Sitting	12.0		1 922
	Winter	Existing	3.0	-	Sitting	13.4	-	Pass

			Wind Comfort		Wind Safety			
Location	Season	Configuration	Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
		Proposed	3.0	0	Sitting	12.9		Pass
		- · .·	2.0		C'111	42.2		P.
	Annual	Existing	2.9	-	Sitting	13.2	-	Pass
		Toposed	2.5		Sitting	12.7		1 435
14	Summer	Existing	2.6	-	Sitting	11.5	-	Pass
		Proposed	2.9	12%	Sitting	12.4		Pass
	Winter	Existing	2.7	-	Sitting	12.3	-	Pass
		Proposed	2.9		Sitting	13.1		Pass
	Annual	Fxisting	25	-	Sitting	11.8	-	Pass
	, initiali	Proposed	2.8	12%	Sitting	12.6		Pass
15	Summer	Existing	2.5	-	Sitting	11.9	-	Pass
		rioposed	2.4		Sitting	12.2		1 033
	Winter	Existing	2.9	-	Sitting	13.1	-	Pass
		Proposed	2.8		Sitting	13.9		Pass
	Annual	Existing	2.6	-	Sitting	12.6	-	Pass
		Proposed	2.5		Sitting	12.9		Pass
16	Summor	Evicting	2.5		Standing	10 1		Pacc
10	Summer	Proposed	3.4	-	Standing	18.1	-	Pass
					U			
	Winter	Existing	4.4	-	Walking	20.4	-	Exceeded
		Proposed	4.3		vvaiking	20.4		Exceeded
	Annual	Existing	3.8	-	Standing	19.4	-	Pass
		Proposed	3.7		Standing	19.4		Pass
17	Summer	Existing	3.3	-	Standing	15.1	-	Pass
		Proposed	3.4		Standing	14.8		Pass
	Winter	Evicting	26		Standing	16.2		Dace
	winter	Proposed	3.5	-	Standing	15.8	-	Pass
	Annual	Existing	3.3	-	Standing	15.6	-	Pass
		Proposed	3.3		Standing	15.2		Pass
18	Summer	Existing	3.8	-	Standing	19.1	-	Pass
		Proposed	3.8		Standing	18.9		Pass
	Winter	Existing	4.7	-	Walking	21.5	-	Exceeded
		Proposed	4.6		Walking	21.5		Exceeded
		- · .·	4.0			20.6		
	Annual	Existing Proposed	4.0 4.0	-	Standing	20.6	-	Exceeded
19	Summer	Existing	3.6	-	Standing	19.9	-	Pass
		Proposed	4.0	11%	Standing	19.0		Pass
	Winter	Existing	4.7	-	Walking	22.3	-	Exceeded
		Proposed	4.5		Walking	21.4		Exceeded

LocationSeasonConfigurationSpeed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Speed (m/s)% (hange (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)Rating (m/s)Speed (m/s)% (m/s)% (m/s)% (m/s)Speed (m/s) <th></th> <th></th> <th></th> <th></th> <th>Wind</th> <th>Comfort</th> <th></th> <th colspan="3">Wind Safety</th>					Wind	Comfort		Wind Safety		
AnnualExisting Proposed4.0 4.1-Standing Walking21.4 20.5-Exceeded20SummerExisting Proposed3.5-Standing21.6 19.5-ExceededWinterExisting Proposed3.6-12% 3.6Standing21.5 20.0-ExceededAnnualExisting Proposed3.4-11% 3.4Standing20.7 12%-Exceeded21SummerExisting Proposed3.4-11% 3.4Standing17.9 17.4-Pass21SummerExisting Proposed3.5-Standing 3.417.4-Pass21SummerExisting Proposed3.5-Standing 3.517.3-Pass22SummerExisting Proposed3.5-Standing 3.517.3-Pass22SummerExisting Proposed4.2-Walking Walking17.3-Pass23SummerExisting Proposed4.1-Walking Walking19.5-Pass23SummerExisting Proposed4.5-Walking Walking19.5-Pass24SummerExisting Proposed3.3-Walking19.5-Pass25SummerExisting Proposed4.1-Walking19.5-Pass24SummerExisting Proposed5.0-<	Location	Season	Configuration	Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating	
20SummerExisting Proposed3.7 3.7-Standing Standing20.5Exceeded20SummerExisting Proposed3.7 3.6-Standing10.5-ExceededWinterExisting Proposed3.6-1.2% 3.6Standing20.0-ExceededAnnualExisting Proposed3.8 3.4-Standing10.7 19.3-Exceeded21SummerExisting Proposed3.2 3.4-Standing17.4 		Annual	Existing	4.0	-	Standing	21.4	-	Exceeded	
20 Summer Existing Proposed 3.7 - Standing Standing 21.0 - Exceeded Winter Existing Proposed 3.4 - Walking 3.4 21.5 - Exceeded Annual Existing Proposed 3.8 - Standing 3.4 20.7 - Exceeded Annual Existing Proposed 3.8 - Standing 3.4 11% Standing Standing 17.9 - Pass 21 Summer Existing Proposed 3.2 - Standing 17.8 - Pass Winter Existing Proposed 3.5 - Standing 17.8 - Pass Annual Existing Proposed 3.5 - Standing 17.3 - Pass 22 Summer Existing Proposed 4.2 - Walking 17.3 - Pass 23 Summer Existing Proposed 4.4 - Walking 19.5 - Pass 24 Summer Existing Proposed 4.1 - Walking 19.5 - Pass <th></th> <td></td> <td>Proposed</td> <td>4.1</td> <td></td> <td>Walking</td> <td>20.5</td> <td></td> <td>Exceeded</td>			Proposed	4.1		Walking	20.5		Exceeded	
Proposed3.5Stanting19.5PassWinterExisting Proposed3.6-12%Stanting Stanting21.5-Exceeded ExceededAnnualExisting Proposed3.4-Stanting Stanting20.7-Exceeded21SummerExisting Proposed3.2-Stanting Stanting17.9-Pass21SummerExisting Proposed3.5-Stanting Stanting17.4-PassWinterExisting Proposed3.5-Stanting Stanting17.8-PassAnnualExisting Proposed3.5-Stanting Stanting17.3-Pass22SummerExisting Proposed4.2-Walking Walking17.3-Pass22SummerExisting Proposed4.4-Walking Walking19.2-Pass23SummerExisting Proposed4.4-Walking Walking19.2-Pass24SummerExisting Proposed4.4-Walking Walking19.0-Pass24SummerExisting Proposed5.0-Walking Walking19.0-Pass25SummerExisting Proposed5.0-Walking Walking21.9-Exceeded24SummerExisting Proposed3.1-Stanting Malking13.4-Pass </th <th>20</th> <td>Summer</td> <td>Existing</td> <td>3.7</td> <td>-</td> <td>Standing</td> <td>21.0</td> <td>-</td> <td>Exceeded</td>	20	Summer	Existing	3.7	-	Standing	21.0	-	Exceeded	
WinterExisting Proposed4.1 3.672% -72% standingStanding 20.021.5 exceededExceeded exceededAnnualExisting Proposed3.411% Standing20.7 19.3Exceeded Pros21SummerExisting Proposed3.2 3.5Standing Standing17.9 17.4Prass21SummerExisting Proposed3.5 3.5Standing Standing17.8 17.8Prass22SummerExisting Proposed3.5 3.5Standing Standing17.3 17.3Pass22SummerExisting Proposed4.2 4.7Walking Walking17.3 19.5Pass23SummerExisting Proposed4.4 4.7Walking Walking19.5 19.5.Pass23SummerExisting Proposed4.4 4.4Walking Walking19.0 19.5.Pass24SummerExisting Proposed5.0 4.1Walking Walking19.0 19.5.Pass24SummerExisting Proposed5.0 4.3Standing Walking13.4 19.5Exceeded25SummerExisting Proposed3.1 4.3Standing13.4 14.3Pass25SummerExisting Proposed3.1 4.3Standing13.4 14.3 </th <th></th> <td></td> <td>Proposed</td> <td>3.5</td> <td></td> <td>Standing</td> <td>19.5</td> <td></td> <td>Pass</td>			Proposed	3.5		Standing	19.5		Pass	
Proposed3.61.2%Standing20.0ExceededAnnualExisting3.8-Standing20.7-Exceeded21SummerExisting3.2-Standing17.4-PassWinterExisting3.5-Standing17.4-PassAnnualExisting3.5-Standing17.4-PassAnnualExisting3.5-Standing17.3-Pass22SummerExisting3.5-Standing17.3-Pass23SummerExisting4.2-Walking17.3-PassWinterExisting4.4-Walking17.3-PassWinterExisting4.4-Walking19.5-Pass23SummerExisting4.1-Walking19.5-Pass23SummerExisting4.1-Walking19.5-Pass24SummerExisting5.0-Walking19.5-Pass25SummerExisting3.1-Walking13.3-Pass24SummerExisting3.1-Standing13.4-Pass25SummerExisting3.1-Standing13.4-Pass24SummerExisting3.1-Standing13.4-		Winter	Existing	4.1	-	Walking	21.5	-	Exceeded	
AnnualExisting Proposed3.8 3.4 			Proposed	3.6	-12%	Standing	20.0		Exceeded	
21SummerProposed3.4-11%Standing19.3Pass21SummerExisting Proposed3.2-Standing17.4-PassWinterExisting Proposed3.5-Standing18.3-PassAnnualExisting Proposed3.5-Standing17.4-Pass22SummerExisting Proposed3.5-Standing17.3-Pass22SummerExisting Proposed4.2-Walking17.3-Pass23SummerExisting Proposed4.4-Walking19.5-Pass24SummerExisting Proposed4.4-Walking18.0-Pass23SummerExisting Proposed4.4-Walking19.5-Pass24SummerExisting Proposed5.0-Walking19.5-ExceededAnnualExisting Proposed5.0-Walking21.5-ExceededAnnualExisting Proposed3.3-Standing13.4-Pass24SummerExisting Proposed3.2-Standing13.4-Pass25SummerExisting Proposed3.2-Standing13.4-Pass24SummerExisting Proposed3.3-Standing13.4-Pass		Annual	Existing	3.8	-	Standing	20.7	-	Exceeded	
21 Summer Existing Proposed 3.2 - Standing 3.3 17.9 - Pass Pass Winter Existing Proposed 3.5 - Standing 3.5 17.4 - Pass Pass Annual Existing Proposed 3.5 - Standing 3.5 17.8 - Pass Pass 22 Summer Existing Proposed 3.5 - Standing 3.5 17.3 - Pass Pass 22 Summer Existing Proposed 4.2 - Walking 17.3 - Pass Pass Winter Existing Proposed 4.4 - Walking 19.5 - Pass Pass Annual Existing Proposed 4.1 - Walking 19.2 Pass Pass 23 Summer Existing Proposed 5.0 - Walking 19.5 - Pass Pass 24 Summer Existing Proposed 5.0 - Walking 21.9 - Exceeded 24 Summer Existing Proposed 3.2 - Standing 13.4 - <t< th=""><th></th><td></td><td>Proposed</td><td>3.4</td><td>-11%</td><td>Standing</td><td>19.3</td><td></td><td>Pass</td></t<>			Proposed	3.4	-11%	Standing	19.3		Pass	
Proposed3.922%Standing17.4PassWinterExisting Proposed3.5-Standing Standing17.8-PassAnnualExisting Proposed3.5-Standing Standing17.6-Pass22SummerExisting Proposed4.8-Walking Walking17.3-Pass23SummerExisting Proposed4.4-Walking Walking17.3-Pass44-Walking19.5-Pass-Pass47.7-Walking19.2-Pass4.4-Walking18.3-PassAnnualExisting Proposed4.4-Walking18.0-AnnualExisting Proposed4.4-Walking19.0-Pass23SummerExisting Proposed5.0-Walking21.5-ExceededAnnualExisting Proposed4.3-Walking20.9-Exceeded4SummerExisting Proposed3.3-Standing13.4-Pass24SummerExisting Proposed3.1-Standing13.6-Pass25SummerExisting Proposed3.1-Standing13.6-Pass25SummerExisting Proposed2.4-Stitting 3.111.8-Pass <t< th=""><th>21</th><td>Summer</td><td>Existing</td><td>3.2</td><td>-</td><td>Standing</td><td>17.9</td><td>-</td><td>Pass</td></t<>	21	Summer	Existing	3.2	-	Standing	17.9	-	Pass	
WinterExisting Proposed3.5 3.5- Standing18.3 17.8- PassAnnualExisting Proposed3.2 3.5- Standing17.6 17.3- Pass22SummerExisting Proposed4.2 4.8- 14%Walking17.3 17.3- Pass24SummerExisting 			Proposed	3.9	22%	Standing	17.4		Pass	
Proposed3.5Standing17.8PassAnnualExisting Proposed3.2- StandingStanding Standing17.6- PassPass22SummerExisting Proposed4.2- 4.8Walking17.3- PassPass24SummerExisting Proposed4.4- 4.7Walking19.5- PassPass23SummerExisting Proposed4.4- 4.4Walking18.0- Pass23SummerExisting Proposed4.4- 4.1Walking19.5- Pass24SummerExisting Proposed5.0- 4.1Walking19.5- Pass25SummerExisting Proposed4.5- 4.3Walking20.3- Exceeded24SummerExisting Proposed3.2- 5.0Standing13.4- Pass24SummerExisting Proposed3.1- 5.0Standing13.4- Pass24SummerExisting Proposed3.1- 5.0Standing13.4- Pass25SummerExisting Proposed3.1- 5.11Standing13.6- Pass25SummerExisting Proposed2.8- 5.11Sitting 5.11%11.8- Pass26SummerExisting Proposed2.4- 5.11Standing11.4- Pass26Summer <th></th> <td>Winter</td> <td>Existing</td> <td>3.5</td> <td>-</td> <td>Standing</td> <td>18.3</td> <td>-</td> <td>Pass</td>		Winter	Existing	3.5	-	Standing	18.3	-	Pass	
AnnualExisting Proposed3.2 3.5- Standing17.6 (17.3)- PassPass22SummerExisting Proposed4.2 4.8- (14%) Walking17.3 (17.3)- PassPass23SummerExisting Proposed4.4 (4.7)- Walking19.5 (19.2)- PassPass23SummerExisting Proposed4.1 (4.4)- Walking18.3 (18.3)- PassPass23SummerExisting Proposed4.4 (4.1)- Walking19.0 (19.5)- PassPass24SummerExisting Proposed5.0 (4.1)- Walking21.5 (21.9)- Exceeded24SummerExisting Proposed3.2 (4.3)- Walking20.3 (20.3)- Exceeded24SummerExisting Proposed3.2 (3.3)- (3.8)13.4 (19%)- Pass24SummerExisting Proposed3.1 (3.1)- (3.8)13.6 (14.0)- Pass25SummerExisting Proposed3.1 (3.1)- (3.3)Standing (14.0)11.4 (20.3)- (20.3)25SummerExisting Proposed2.3 (3.1)- (11%)Standing (11.4)11.4 (20.3)- (20.3)26SummerExisting Proposed2.4 (3.3)- (51.1)Standing (14.0)11.4 (20.3)- (20.3)26SummerExisting Proposed2.3 <b< th=""><th></th><td></td><td>Proposed</td><td>3.5</td><td></td><td>Standing</td><td>17.8</td><td></td><td>Pass</td></b<>			Proposed	3.5		Standing	17.8		Pass	
22SummerExisting Proposed4.2 4.8·Walking17.3 17.3Pass22SummerExisting Proposed4.4 4.8·Walking17.3 17.3·PassWinterExisting Proposed4.4 4.7·Walking19.5 19.2·PassAnnualExisting Proposed4.1 4.4·Walking18.3 19.2·Pass23SummerExisting Proposed4.4 4.1·Walking19.0 19.5·Pass23SummerExisting Proposed5.0 5.0·Walking19.5 19.5·PassWinterExisting Proposed5.0 4.3·Walking21.5 21.9·ExceededAnnualExisting Proposed3.8 3.819% 19%Standing13.4 14.3·Pass24SummerExisting Proposed3.3 3.310% 3.3Standing13.4 14.0·Pass24SummerExisting Proposed3.1 3.3·Standing13.4 14.0·Pass25SummerExisting Proposed2.8 3.1·Sitting 3.311.4 11%·Pass25SummerExisting Proposed2.3 2.4·Sitting 3.111.4 11%·Pass26AnnualExisting Proposed2.3 2.4·Sitting 3.111.4 1.8·Pass26<		Annual	Existing	3.2	-	Standing	17.6	-	Pass	
22SummerExisting Proposed4.2 4.8·Walking17.3 17.3·Pass PassWinterExisting Proposed4.4 4.7·Walking19.5 19.2·Pass PassAnnualExisting Proposed4.1 4.4·Walking18.3 18.0·Pass23SummerExisting Proposed4.4 4.4·Walking19.0 19.5·Pass23SummerExisting Proposed4.4 4.1·Walking19.0 19.5·PassWinterExisting Proposed5.0 4.1·Walking19.0 19.5·PassWinterExisting Proposed5.0 4.3·Walking20.3 20.9·ExceededAnnualExisting Proposed3.2 3.8·Standing13.4 14.3·Pass24SummerExisting Proposed3.1 3.3·Standing13.6 14.0·PassWinterExisting Proposed3.0 3.3·Sitting 3.313.3 10%·Pass25SummerExisting Proposed2.3 3.1·Sitting 3.111.4 11%·Pass26SummerExisting Proposed2.3 3.1·Sitting 3.111.4 1.1%·Pass26SummerExisting Proposed2.3 3.1·Sitting 3.111.4 1.1%·Pass27Sum			Proposed	3.5		Standing	17.3		Pass	
WinterProposed4.814%Walking17.3PassWinterExisting Proposed4.4-Walking19.5-PassAnnualExisting Proposed4.1-Walking18.3-Pass23SummerExisting Proposed4.4-Walking19.0-PassWinterExisting Proposed4.4-Walking19.0-PassWinterExisting Proposed5.0-Walking19.5-PassWinterExisting Proposed5.0-Walking21.5-ExceededAnnualExisting Proposed3.2-Standing13.4-PassWinterExisting Proposed3.2-Standing13.4-PassWinterExisting Proposed3.1-Standing13.6-PassWinterExisting Proposed3.1-Standing13.6-PassAnnualExisting Proposed3.310%Standing13.3-PassAnnualExisting Proposed3.111%Standing13.3-Pass25SummerExisting Proposed2.3-Sitting11.4-PassMinterExisting Proposed2.3-Sitting11.4-PassAnnualExisting Proposed2.4-Sitting11.4 <td< th=""><th>22</th><td>Summer</td><td>Existing</td><td>4.2</td><td>-</td><td>Walking</td><td>17.3</td><td>-</td><td>Pass</td></td<>	22	Summer	Existing	4.2	-	Walking	17.3	-	Pass	
WinterExisting Proposed4.4 4.7· Walking19.5 19.2· PassPass PassAnnualExisting Proposed4.1 4.4· Walking18.3 18.0· PassPass23SummerExisting Proposed4.4 4.1· Walking19.0 19.5· Pass23SummerExisting Proposed4.4 4.1· Walking19.0 19.5· Pass24SummerExisting Proposed5.0 4.3· Walking20.3 20.9· Exceeded24SummerExisting Proposed3.2 3.8· 19% Standing13.4 14.3· Pass24SummerExisting Proposed3.1 3.1 3.3· Standing13.6 14.0· Pass25SummerExisting Proposed2.8 3.1 11%· Standing11.8 1.2 1.3· Pass25SummerExisting Proposed2.3 2.5· Sitting 2.4 2.5Sitting 11.4 1.4· Pass26NumerExisting Proposed2.3 2.5· Sitting11.4 11.4· Pass26NumerExisting Proposed2.3 2.5· Sitting11.4 2.4· Pass27NumerExisting Proposed2.4 2.5· Sitting11.4 2.4· Pass27NumerExisting Proposed2.4 2.5· Sitting11.4 2.4· Pass			Proposed	4.8	14%	Walking	17.3		Pass	
AnnualProposed4.7Walking19.2PassAnnualExisting Proposed4.1-Walking18.3-Pass23SummerExisting Proposed4.4-Walking19.0-Pass24SummerExisting Proposed5.0-Walking21.5-ExceededAnnualExisting Proposed5.0-Walking20.3-ExceededAnnualExisting Proposed3.2-Standing13.4-Pass24SummerExisting Proposed3.1-Standing13.4-PassWinterExisting Proposed3.1-Standing13.6-PassWinterExisting Proposed3.30-Sitting Standing13.3-Pass25SummerExisting Proposed2.3-Sitting Standing11.8-Pass25SummerExisting Proposed2.3-Sitting Standing11.4-Pass26MunerExisting Proposed2.3-Sitting Standing11.4-Pass26AnnualExisting Proposed2.4-Sitting Standing11.4-Pass27SummerExisting Proposed2.4-Sitting Standing11.4-Pass27SummerExisting Proposed2.4-Sitting		Winter	Existing	4.4	-	Walking	19.5	-	Pass	
AnnualExisting Proposed4.1 4.4- WalkingWalking18.3 18.0- Pass23SummerExisting Proposed4.4 4.1- Walking19.0 19.5- Pass23SummerExisting Proposed5.0 5.0- Walking19.0 19.5- PassWinterExisting Proposed5.0 5.0- Walking21.5 21.9- ExceededAnnualExisting Proposed4.5 4.3- Walking20.3 20.9- Exceeded24SummerExisting Proposed3.2 3.8- 19%Standing13.4 14.3- Pass24SummerExisting Proposed3.1 3.1- Standing13.6 14.0- Pass25SummerExisting Proposed2.3 3.1- Sitting 3.1- Sitting11.8 1.2- Pass25SummerExisting Proposed2.3 3.1- Sitting11.4 1.1- Pass26SummerExisting Proposed2.3 3.3- Sitting11.4 1.8- Pass25SummerExisting Proposed2.3 3.1- Sitting11.4 1.1- Pass26AnnualExisting Proposed2.3 3.1- Sitting11.4 1.1- Pass26SummerExisting Proposed2.3 3.1- Sitting11.4 1.18- Pass27SummerExisting Proposed2.4 3.5			Proposed	4.7		Walking	19.2		Pass	
23SummerExisting Proposed4.4Walking18.0Pass23SummerExisting Proposed4.1Walking19.0-PassWinterExisting Proposed5.0-Walking19.5-PassWinterExisting Proposed5.0-Walking21.5-ExceededAnnualExisting Proposed4.5-Walking20.3-Exceeded24SummerExisting Proposed3.2-Standing13.4-PassWinterExisting Proposed3.1-Standing13.6-PassWinterExisting Proposed3.1-Standing13.6-PassWinterExisting Proposed3.1-Standing13.3-Pass25SummerExisting Proposed2.3-Sitting 3.111.8-PassWinterExisting Proposed2.3-Sitting 3.111.8-Pass26SummerExisting Proposed2.3-Sitting 3.111.4-Pass27SummerExisting Proposed2.3-Sitting 3.111.4-Pass27SummerExisting Proposed2.3-Sitting 3.111.4-Pass28SummerExisting Proposed2.4-Sitting11.4-Pass		Annual	Existing	4.1	-	Walking	18.3	-	Pass	
23SummerExisting Proposed4.4 4.1Walking19.0 WalkingPass PassWinterExisting Proposed5.0 5.0- Walking21.5 21.9- ExceededAnnualExisting Proposed4.5 4.3- Walking20.3 20.9- Exceeded24SummerExisting Proposed3.2 3.8- 19%Standing13.4 14.3- PassWinterExisting Proposed3.1 3.3- Standing13.6 14.0- PassWinterExisting Proposed3.0 3.3- Standing13.6 14.0- PassWinterExisting Proposed3.0 3.3- Standing13.3 13.9- Pass25SummerExisting Proposed2.8 3.1- Sitting 3.1 11%Standing11.4 1.2 PassWinterExisting Proposed2.3 3.1- Sitting11.4 1.1 Pass- Pass25SummerExisting Proposed2.3 3.1- Sitting11.4 1.1 Pass- PassWinterExisting Proposed2.4 2.5- Sitting11.4 1.1 Pass- Pass41Existing Proposed2.4 2.5- Sitting11.4 1.1 Pass- Pass25SummerExisting Proposed2.4 2.5- Sitting11.4 1.1 Pass- Pass40Existing Proposed2.4 2.5- Sitting11.4 1.1 2.5			Proposed	4.4		Walking	18.0		Pass	
WinterProposed4.1Walking19.5PassWinterExisting Proposed5.0-Walking21.5 21.9-ExceededAnnualExisting Proposed4.5 4.3-Walking20.3 20.9-Exceeded24SummerExisting Proposed3.2 3.8-Standing13.4 14.3-PassWinterExisting Proposed3.1 3.3-Standing13.6 14.0-PassWinterExisting Proposed3.0 3.3-Standing13.6 14.0-PassAnnualExisting Proposed3.0 3.1-Standing13.3 13.9-Pass25SummerExisting Proposed2.8 3.1-Sitting 3.111.4 111%-PassWinterExisting Proposed2.3 3.1-Sitting 3.111.4 11.8-Pass25SummerExisting Proposed2.3 3.1-Sitting 3.111.4 11.8-Pass4nnualExisting Proposed2.4 2.5-Sitting Sitting11.4 1.8-Pass	23	Summer	Existing	4.4	-	Walking	19.0	-	Pass	
WinterExisting Proposed5.0 5.0- WalkingWalking21.5 21.9- ExceededAnnualExisting Proposed4.5 4.3- Walking20.3 20.9- Exceeded24SummerExisting Proposed3.2 3.8- 19%Standing13.4 14.3- PassWinterExisting Proposed3.1 3.3- Standing13.6 14.0- PassWinterExisting Proposed3.1 3.3- Standing13.6 14.0- PassAnnualExisting Proposed3.0 3.3- Sitting13.3 1.4- Pass25SummerExisting Proposed2.3 3.1- Sitting11.8 11.8- PassWinterExisting Proposed2.3 3.1- Sitting11.4 Standing- Pass25SummerExisting Proposed2.3 2.4- Sitting11.4 Standing- PassMinterExisting Proposed2.3 3.1- Sitting11.4 1.18- PassAnnualExisting Proposed2.4 2.5- Sitting11.4 1.18- Pass			Proposed	4.1		Walking	19.5		Pass	
Proposed5.0Walking21.9ExceededAnnualExisting Proposed4.5 4.3-Walking20.3 20.9-Exceeded24SummerExisting Proposed3.2 3.8-Standing Standing13.4 14.3-PassWinterExisting Proposed3.1 3.3-Standing Standing13.6 14.0-PassMinterExisting Proposed3.0 3.3-Standing Standing13.6 14.0-PassAnnualExisting Proposed3.0 3.3-Sitting Standing13.3 13.9-Pass25SummerExisting Proposed2.3 2.4-Sitting Standing11.4 1.18-PassWinterExisting Proposed2.3 2.4-Sitting Sitting11.4 1.18-PassAnnualExisting Proposed2.4 2.5-Sitting Sitting11.4 1.18-Pass		Winter	Existing	5.0	-	Walking	21.5	-	Exceeded	
AnnualExisting Proposed4.5 4.3Walking20.3 20.9Exceeded24SummerExisting Proposed3.2 3.8- StandingStanding13.4 14.3- PassWinterExisting Proposed3.1 3.3- StandingStanding13.6 14.0- PassWinterExisting Proposed3.1 3.3- StandingStanding13.6 14.0- PassAnnualExisting Proposed3.0 3.3- StandingSitting 13.3- Pass25SummerExisting Proposed2.8 3.1- StandingSitting 12.3- Pass25SummerExisting Proposed2.3 2.4- Sitting11.4 Standing- PassWinterExisting Proposed2.3 2.4- Sitting11.4 Standing- PassMulterExisting Proposed2.4 2.5- Sitting11.4 1.18- Pass			Proposed	5.0		Walking	21.9		Exceeded	
24SummerExisting Proposed3.2 3.8- 19%Standing13.4 14.3- PassPassWinterExisting Proposed3.1 3.3- StandingStanding13.6 14.0- PassWinterExisting Proposed3.1 3.3- StandingStanding13.6 14.0- PassAnnualExisting Proposed3.0 3.3- StandingStanding13.3 14.0- Pass25SummerExisting Proposed2.8 3.1- 11%Standing11.8 12.3- Pass25SummerExisting Proposed2.3 2.4- Sitting11.4 Standing- PassWinterExisting Proposed2.3 2.4- Sitting11.4 1.18- PassAnnualExisting Proposed2.4 2.5- Sitting11.4 1.18- Pass		Annual	Existing	4.5	-	Walking	20.3	-	Exceeded	
24SummerExisting Proposed3.2 3.8- 19%Standing13.4 14.3- PassWinterExisting Proposed3.1 3.3- StandingStanding13.6 14.0- PassAnnualExisting Proposed3.0 3.3- Sitting 3.3Sitting Standing13.3 14.0- Pass25SummerExisting Proposed2.8 3.1- 11%Sitting Standing11.8 12.3- Pass25SummerExisting Proposed2.3 2.4- Sitting11.4 Standing- PassWinterExisting Proposed2.3 2.4- Sitting11.4 Standing- PassMinterExisting Proposed2.4 2.5- Sitting11.4 11.8- Pass			Proposed	4.3		Walking	20.9		Exceeded	
Proposed3.819%Standing14.3PassWinterExisting Proposed3.1 3.3-Standing13.6 14.0-PassAnnualExisting Proposed3.0 3.3-Sitting Standing13.3 13.9-Pass25SummerExisting Proposed2.8 3.1-Sitting 11%11.8 Standing-PassWinterExisting Proposed2.3 2.4-Sitting Sitting11.4 11.8-PassWinterExisting Proposed2.4 2.5-Sitting Sitting11.4 11.8-PassAnnualExisting Proposed2.4 2.5-Sitting Sitting11.4 11.8-Pass	24	Summer	Existing	3.2	-	Standing	13.4	-	Pass	
WinterExisting Proposed3.1 3.3- StandingStanding13.6 14.0- PassAnnualExisting Proposed3.0 3.3- 10%Sitting Standing13.3 13.9- Pass25SummerExisting Proposed2.8 3.1- 11%Sitting Standing11.8 12.3- Pass26SummerExisting Proposed2.8 3.1- 11%Sitting Standing11.8 12.3- Pass26SummerExisting Proposed2.3 2.4- Sitting11.4 Standing- Pass27MinterExisting Proposed2.3 2.4- Sitting11.4 Standing- Pass27MinterExisting Proposed2.4 2.5- Sitting11.4 Standing- Pass			Proposed	3.8	19%	Standing	14.3		Pass	
Proposed3.3Standing14.0PassAnnualExisting Proposed3.0 3.3- 10%Sitting Standing13.3 1.3.9- Pass25SummerExisting Proposed2.8 3.1- 11%Sitting Standing11.8 12.3- Pass26WinterExisting Proposed2.3 2.4- SittingSitting Sitting11.4 1.8- Pass27MinterExisting Proposed2.3 2.4- SittingSitting Sitting11.4 1.8- PassAnnualExisting Proposed2.4 2.5- SittingSitting Sitting11.4 1.8- Pass		Winter	Existing	3.1	-	Standing	13.6	-	Pass	
AnnualExisting Proposed3.0 3.3- 10%Stiting Standing13.3 13.9- PassPass25SummerExisting Proposed2.8 3.1- 11%Stiting Standing11.8 12.3- PassWinterExisting Proposed2.3 2.4- SittingSitting Sitting11.4 11.8- PassMunualExisting Proposed2.4 2.5- SittingSitting Sitting11.4 11.8- Pass			Proposed	3.3		Standing	14.0		Pass	
25 SummerExisting Proposed2.8 3.1- 11%Standing11.8 Standing- PassPass 25 SummerExisting Proposed2.8 3.1- 11%Stitling Standing11.8 12.3- PassWinterExisting Proposed2.3 2.4- SittingStitling Sitting11.4 11.8- PassAnnualExisting Proposed2.4 2.5- SittingSitting Sitting11.4 11.8- Pass		Annual	Existing	3.0	-	Sitting	13.3	-	Pass	
25SummerExisting Proposed2.8 3.1-Sitting Standing11.8 12.3-Pass PassWinterExisting Proposed2.3 2.4-Sitting Sitting11.4 11.8-Pass PassAnnualExisting Proposed2.4 2.5-Sitting Sitting11.4 11.8-Pass Pass			Proposed	3.3	10%	Standing	13.9		Pass	
Proposed3.111%Standing12.3PassWinterExisting Proposed2.3 2.4-Sitting11.4 11.8-PassAnnualExisting Proposed2.4 2.5-Sitting11.4 11.8-Pass	25	Summer	Existing	2.8	-	Sitting	11.8	-	Pass	
WinterExisting Proposed2.3 2.4-Sitting11.4 1.8-PassAnnualExisting Proposed2.4 2.5-Sitting11.4 1.8-PassAnnualExisting Proposed2.4 2.5-Sitting11.4 1.8-Pass			Proposed	3.1	11%	Standing	12.3		Pass	
Proposed2.4Sitting11.8PassAnnualExisting2.4-Sitting11.4-PassProposed2.5Sitting11.8Pass		Winter	Existing	2.3	-	Sitting	11.4	-	Pass	
AnnualExisting2.4-Sitting11.4-PassProposed2.5Sitting11.8Pass			Proposed	2.4		Sitting	11.8		Pass	
Proposed 2.5 Sitting 11.8 Pass		Annual	Existing	2.4	-	Sitting	11.4	-	Pass	
			Proposed	2.5		Sitting	11.8		Pass	

				Wind	Comfort	Wind Safety			
Location	Season	Configuration	Speed	%	Pating	Speed	%	Pating	
			(m/s)	Change	Kating	(m/s)	Change	Kating	
26		F : /:	27		<u> </u>	16.0			
26	Summer	Existing	3./	- -11%	Standing	16.0	-	Pass	
		Toposed	5.5	1170	Standing	13.5		1 435	
	Winter	Existing	3.8	-	Standing	17.5	-	Pass	
		Proposed	3.5		Standing	17.0		Pass	
	Annual	Existing	35	-	Standing	16.8	_	Pass	
	Annual	Proposed	3.2		Standing	16.1		Pass	
27	Summer	Existing	3.5	-	Standing	16.5	-	Pass	
		Proposed	3.4		Standing	16.1		Pass	
	Winter	Existing	3.8	-	Standing	18.3	-	Pass	
		Proposed	3.7		Standing	18.1		Pass	
		E 1 ()	25			47.6			
	Annual	Existing	3.5	-	Standing	17.6	-	Pass	
		Toposed	5.5		Standing	17.1		1 435	
28	Summer	Existing	3.2	-	Standing	14.7	-	Pass	
		Proposed	3.3		Standing	14.1		Pass	
	Winter	Fristing	35	-	Standing	16.6	-	Pass	
	Winter	Proposed	3.4		Standing	15.8		Pass	
					-				
	Annual	Existing	3.2	-	Standing	15.9	-	Pass	
		Proposed	3.2		Standing	15.1		Pass	
29	Summer	Existing	3.3	-	Standing	15.0	-	Pass	
		Proposed	3.5		Standing	15.3		Pass	
	Minter	Evicting	2.4		Ctanding	15.0		Dass	
	winter	Proposed	3.4	-	Standing	15.6	-	Pass	
			5.1		5.0.101.16				
	Annual	Existing	3.2	-	Standing	15.0	-	Pass	
		Proposed	3.3		Standing	15.1		Pass	
30	Summer	Existing	2.1	-	Sitting	9.9	-	Pass	
		Proposed	2.0		Sitting	10.1		Pass	
	Winter	Existing	2.2	-	Sitting	9.8 10 F	-	Pass	
		Proposed	2.2		Situng	10.5		Pass	
	Annual	Existing	2.0	-	Sitting	9.7	-	Pass	
		Proposed	2.0		Sitting	10.2		Pass	
21	Summor	Evicting	26		Sitting	10.9		Dace	
31	Summer	Proposed	3.2	- 23%	Standing	13.6	- 26%	Pass	
						. 510			
	Winter	Existing	2.6	-	Sitting	12.1	-	Pass	
		Proposed	2.9	12%	Sitting	13.3	10%	Pass	
	Annual	Existing	2.4	-	Sitting	11.6	-	Pass	
		Proposed	2.9	21%	Sitting	13.2	14%	Pass	
					6 111				
32	Summer	Existing	2.6	-	Sitting	9.9	-	Pass	

			Wind Comfort			Wind Safety		
Location	Season	Configuration	Speed	%	Pating	Speed	%	Pating
			(m/s)	Change	Katilig	(m/s)	Change	Rating
		Proposed	3.2	23%	Standing	12.5	26%	Pass
	Winter	Existing	24	_	Sitting	10.6	_	Pass
	Winter	Proposed	2.4	- 17%	Sitting	12.3	- 16%	Pass
			210		0.000.00	. 210	1070	
	Annual	Existing	2.4	-	Sitting	10.2	-	Pass
		Proposed	2.8	17%	Sitting	12.3	21%	Pass
33	Summer	Existing	3.3	-	Standing	10.9	-	Pass
		Proposed	3.6		Standing	14.4	32%	Pass
	Winter	Existing	2.7	-	Sitting	10.9	-	Pass
		Proposed	3.1	15%	Standing	13.8	27%	Pass
	Annual	Existing	2.8	-	Sitting	10.8	-	Pass
		Proposed	3.2	14%	Standing	13.8	28%	Pass
34	Summer	Existing	-	- 27%	N/A Standing	-	-	- Pass
		rioposed	5.0	2770	Standing	14.0		1 035
	Winter	Existing	· · ·	-	N/A	· · ·	-	-
		Proposed	3.0	15%	Sitting	13.7		Pass
	Appual	Evicting			NI/A			
	Annual	Proposed	3.2	- 23%	Standing	- 13.9	-	- Pass
35	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.2	-56%	Sitting	4.8	-55%	Pass
	Winter	Existing		-	N/A	·	-	-
		Proposed	1.3	-54%	Sitting	5.2	-56%	Pass
	Annual	Existing	-	- E 404	N/A Sitting	-	- E C 04	- Dace
		Froposed	1.2	-5470	Sitting	5.0	-30%	rass
36	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.8	47%	Sitting	11.3	23%	Pass
	Winter	Existing		_	NI/A	L .	_	_
	Winter	Proposed	2.6	37%	Sitting	11.3	20%	Pass
					0			
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	2.6	44%	Sitting	11.1	21%	Pass
37	Summer	Existing		-	N/A		-	-
		Proposed	2.6		Sitting	16.9	-12%	Pass
	Winter	Existing	-	-	N/A Sitting	-	-	- Dace
		rioposeu	2.9		Situng	17.3	-13%	r d22
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	2.6		Sitting	16.6	-13%	Pass
20	Cummor	Eviating			N1/A			
38	Summer	Proposed	2.6	- 62%	Sitting	- 11.9	- 95%	- Pass
		. oposed	2.0	0270		11.5	5570	

			Wind Comfort			Wind Safety			
Location	Season	Configuration	Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating	
	Winter	Existing	-	-	N/A	-	-	-	
		Proposed	3.0	87%	Sitting	12.8	97%	Pass	
	Annual	Existing	-	-	N/A	-	-	-	
		Proposed	2.7	80%	Sitting	12.2	94%	Pass	
39	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	2.0	18%	Sitting	9.2	48%	Pass	
	Winter	Existing	· · ·	-	N/A		-	-	
		Proposed	2.2	38%	Sitting	9.6	41%	Pass	
	Annual	Existing	· · ·	-	N/A	· ·	-	-	
		Proposed	2.0	25%	Sitting	9.3	43%	Pass	
40	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	2.8	56%	Sitting	11.3	71%	Pass	
	Winter	Existing	· ·	-	N/A	· · ·	-	-	
		Proposed	2.2	47%	Sitting	11.1	68%	Pass	
	Annual	Existing	· · ·	-	N/A	· · ·	-	-	
		Proposed	2.3	44%	Sitting	11.0	69%	Pass	
41	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	2.7	35%	Sitting	11.1	41%	Pass	
	Winter	Existing	-	-	N/A	-	-	-	
		Proposed	2.1	31%	Sitting	11.5	49%	Pass	
	Annual	Existing	-	-	N/A	-	-	-	
		Proposed	2.3	35%	Sitting	11.1	44%	Pass	
42	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	2.2	38%	Sitting	9.1	49%	Pass	
	Winter	Existing	· ·	-	N/A	· ·	-	-	
		Proposed	1.8	29%	Sitting	7.9	27%	Pass	
	Annual	Existing	· ·	-	N/A	· ·	-	-	
		Proposed	1.9	36%	Sitting	8.4	38%	Pass	
43	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	3.5	119%	Standing	12.2	94%	Pass	
	Winter	Existing	· ·	-	N/A	· ·	-	-	
		Proposed	2.8	100%	Sitting	11.9	89%	Pass	
	Annual	Existing	-	-	N/A	-	-	-	
		Proposed	2.9	93%	Sitting	11.9	92%	Pass	
44	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	1.6	-24%	Sitting	8.1		Pass	
	Winter	Existing	-	-	N/A	-	-	-	
		Proposed	1.7		Sitting	9.3	19%	Pass	

			Wind Comfort		Wind Safety			
Location	Season	Configuration	Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Annual	Existing Proposed	- 1.6	- -11%	N/A Sitting	- 8.7	- 10%	- Pass
45	Summer	Existing Proposed	- 1.9	- 19%	N/A Sitting	- 10.1	- 74%	- Pass
	Winter	Existing Proposed	- 2.1	- 50%	N/A Sitting	- 11.1	- 88%	- Pass
	Annual	Existing Proposed	- 1.9	- 36%	N/A Sitting	- 10.7	- 84%	- Pass
46	Summer	Existing Proposed	- 2.5	-	N/A Sitting	- 15.6	- 71%	- Pass
	Winter	Existing Proposed	- 3.4	- 89%	N/A Standing	- 16.6	- 91%	- Pass
	Annual	Existing Proposed	- 2.9	- 53%	N/A Sitting	- 16.0	- 82%	- Pass
47	Summer	Existing Proposed	- 2.1	- 24%	N/A Sitting	- 14.5	- 127%	- Pass
	Winter	Existing Proposed	- 3.4	- 143%	N/A Standing	- 15.5	- 154%	- Pass
	Annual	Existing Proposed	- 2.9	- 107%	N/A Sitting	- 14.9	- 144%	- Pass
48	Summer	Existing Proposed	- 1.4	- -26%	N/A Sitting	- 6.9	-	- Pass
	Winter	Existing Proposed	- 1.6	-	N/A Sitting	- 7.5	-	- Pass
	Annual	Existing Proposed	- 1.4	- -18%	N/A Sitting	- 7.3	-	- Pass
49	Summer	Existing Proposed	- 1.2	- -43%	N/A Sitting	- 5.4	- -33%	- Pass
	Winter	Existing Proposed	- 1.3	- -28%	N/A Sitting	- 6.0	- -23%	- Pass
	Annual	Existing Proposed	- 1.2	- -33%	N/A Sitting	- 5.7	- -27%	- Pass
50	Summer	Existing Proposed	- 3.3	- 57%	N/A Standing	- 14.8	- 92%	- Pass
	Winter	Existing Proposed	- 2.2	- 22%	N/A Sitting	- 13.6	- 79%	- Pass
	Annual	Existing		-	N/A		-	-

			Wind Comfort		Wind Safety			
Location	Season	Configuration	Speed	%	Dating	Speed	%	Deting
			(m/s)	Change	Rating	(m/s)	Change	Rating
		Proposed	2.4	33%	Sitting	14.3	91%	Pass
51	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.6	14%	Sitting	7.1	16%	Pass
	Winter	Existing		-	N/A	· .	-	-
		Proposed	1.9	27%	Sitting	7.8	15%	Pass
	Annual	Existing		-	N/A		-	-
		Proposed	1.6	14%	Sitting	7.4	14%	Pass
52	Summer	Existing		-	N/A	· ·	-	-
		Proposed	1.4	-36%	Sitting	5.4	-35%	Pass
	Winter	Existing		-	N/A		-	-
		Proposed	1.2	-37%	Sitting	5.3	-35%	Pass
	Annual	Existing		-	N/A	· ·	-	_
		Proposed	1.3	-32%	Sitting	5.2	-36%	Pass
53	Summer	Existing	-	-	N/A	-	-	_
55	Summer	Proposed	3.7	37%	Standing	14.2	48%	Pass
	Winter	Existing		-	N/A		-	-
		Proposed	3.4	36%	Standing	14.8	47%	Pass
	Annual	Existing	· .	-	N/A	· ·	-	-
		Proposed	3.4	42%	Standing	14.2	45%	Pass
54	Summer	Existing		-	N/A	· ·	-	-
		Proposed	3.5	52%	Standing	14.4	67%	Pass
	Winter	Existing		-	N/A	· ·	-	-
		Proposed	3.4	48%	Standing	14.7	55%	Pass
	Annual	Existing	· .	-	N/A	· ·	-	-
		Proposed	3.3	50%	Standing	14.3	57%	Pass
55	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.5	59%	Standing	13.4	68%	Pass
	Winter	Existing	-	-	N/A	· ·	-	-
		Proposed	3.3	57%	Standing	14.1	64%	Pass
	Annual	Existing		-	N/A	· .	-	-
		Proposed	3.3	57%	Standing	13.6	64%	Pass
56	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.9	77%	Standing	15.4	86%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.9	95%	Standing	15.8	93%	Pass
	Annual	Existing	-	-	N/A		-	-
		Proposed	3.8	90%	Standing	15.4	90%	Pass

			Wind Comfort			Wind Safety		
Location	Season	Configuration	Speed	%		Speed	%	
			(m/s)	Change	Rating	(m/s)	Change	Rating
57	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.8	137%	Standing	14.3	134%	Pass
	Alists .	Eviation -			N1/A			
	winter	Existing	-	-	N/A Standing	-	-	-
		Proposed	3.5	169%	Standing	13.9	136%	Pass
	Annual	Existing		-	N/A	-	-	-
		Proposed	3.4	143%	Standing	13.9	136%	Pass
58	Summer	Existing	3.3	-	Standing	14.2	-	Pass
		Proposed	2.9	-12%	Sitting	13.2		Pass
	Winter	Existing	3 1	-	Standing	13.7	-	Pass
	Winter	Proposed	2.8	-10%	Sitting	12.9		Pass
		Toposed	2.0	1070	Sitting	12.5		1 433
	Annual	Existing	3.0	-	Sitting	13.6	-	Pass
		Proposed	2.7	-10%	Sitting	12.8		Pass
	6					12.0		
59	Summer	Existing	3.4	-	Standing	13.8	-	Pass
		Proposed	3.0	-12%	Sitting	12.9		Pass
	Winter	Existing	3.2	-	Standing	13.8	-	Pass
		Proposed	2.9		Sitting	12.8		Pass
					U			
	Annual	Existing	3.1	-	Standing	13.4	-	Pass
		Proposed	2.8	-10%	Sitting	12.6		Pass
Seasons	Months	Hours		Wind Comfort (m/s)		Wind Safety (m/s)		

Seasons	Months	Hours	Wind Comfort (m/s)		Wind Safety (m/s)		
Summer	November - April	6:00 - 23:00	≤ 3	Sitting	≤ 20	Pass	
Winter	May - October	6:00 - 23:00	≤ 4	Standing	> 20	Exceeded	
Annual	January - December	0:00 - 23:00	≤ 5 > 5	Walking Uncomfortable			
Configurations							
Existing	Existing site and surroundings						

Proposed Project with existing surroundings