

9 June 2021

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HND TS Limited
C/ Berry Simons

Attention: Mr Andrew Braggins

Dear Andrew

North Shore No 1, Takapuna Auckland Environmental Wind - Fast Track Letter

1 Introduction

SLR Consulting NZ Ltd (**SLR**) has been commissioned to undertake an assessment of environmental wind impacts associated with the proposed development known as North Shore No 1 in Takapuna, Auckland. As part of this work, during the resource consent application phase, SLR's role is to evaluate compliance against the Auckland Unitary Plan (**AUP**) requirements and relevant rules and, if necessary, to identify appropriate additional wind mitigation measures to result in a comfortable and safe wind environment within and around the proposed development.

2 Experience and Qualifications

The Environmental Wind Study will be overseen and managed by SLR's Dr Peter Georgiou. Peter is a Wind Engineering specialist with over 40 years of experience in the field.

Peter's initial experience was with the twelve years he spent in Canada at the University of Western Ontario's Boundary Layer Wind Tunnel Facility (**BLWTL**) where he was engaged in research as well as consulting on a wide range of North American, European, Middle East and Southeast Asian projects.

At BLWTL, Peter was involved in investigations associated with major windstorm events in the North American and Southeast Asian regions. Peter determined the design wind loads for the then new Caribbean Uniform Building Code, assisted in developing the then new ISO Wind Loading Code and was an expert witness for the U.S. Government in the area of hurricane hazards.

In subsequent stints at the University of Sydney and now at SLR, Peter has led and carried out hundreds of wind studies involving buildings, towers, stadiums and bridges throughout New Zealand, Australia, Southeast Asia, North America, Europe and the Middle East. Peter has appeared as an expert witness in a number of high-profile wind-related matters and continues his interest in the wind risk associated with extreme windstorm events and the impact of climate change on the wind environment.

3 AUP Requirements

The site is subject to the wind related requirements set out in the AUP. The AUP's wind speed criteria relate to the usage of the site (i.e., business, residential, etc) and cover both Comfort (walking, strolling, standing, sitting, etc) and Safety.

SLR's wind study will also assess the proposed development according to the so-called Lawson Criteria – criteria that have been accepted internationally for over two decades in the assessment of environmental winds.

Finally, in the assessment of wind conditions within and around the site and their significance, wind speeds in the "Future" condition (i.e., with the proposed development) will be compared to the existing "Base line" condition relevant to the AUP's criteria regarding existing wind speeds.

4 High Level Review

Wind Characteristics

Auckland's wind climate is categorised by the following:

- Airflow over Auckland is predominantly from the southwest. This is particularly so in winter and spring. Spring is generally the windiest season throughout the region.
- In summer and autumn, the proportion of winds from the north-east increases, as the high-pressure belt moves further south compared to winter and spring. Summer and autumn are the seasons when the greatest numbers of light wind days in the region are recorded.
- Sea breezes add to the proportion of easterlies in eastern coastal areas, such as the subject site, in summer and early autumn.

Wind Impact

The proposed development will influence local wind speeds, both in terms of potential localised wind speed-up (e.g., windflow accelerating around building edges) and potential sheltering (e.g., the proposed development shielding residences and other buildings downstream of prevailing strong wind directions).

These will be assessed quantitatively by SLR via detailed 3D CFD (Computational Fluid Dynamics) Modelling for a full range of prevailing wind directions. The influence of surrounding buildings and the local topography will be taken into account as well as the statistical characteristics of the local wind climate (needed for comparison against the nominated wind acceptability criteria).

Mitigation Options Assessed

Based on SLR's previous experience, windbreak options will be assessed at areas deemed to be exposed to adverse wind conditions (depending upon intended usage: e.g., walkway area, seating area, etc).

Windbreak options to mitigate effects include:

Landscaping both within and around the site (note: significant landscaping is already planned). Internal landscaping would cover both public access ground level areas, elevated terraces, as well as private gardens.

- Awnings or canopies around the perimeters of the development's various buildings – aimed at ameliorating potential downwash winds.
- Alternative and practical horizontal windbreaks such as pergolas, umbrellas, etc, for localised areas.
- Internal space wind amelioration (if relevant) via air-locks, entry set-backs, revolving doors, etc, to mitigate potential wind channelling throughout internal spaces.
- Windbreaks to mitigate pressure differences across zones prone to channelling effects, e.g., the development's Through Site Link.
- Windbreaks such as moveable porous or louvred screens to maintain comfortable conditions at elevated corner balconies exposed to prevailing wind directions.

It should be noted that the above mitigation strategies are routinely applied to major building developments and their efficacy has been demonstrated both via Wind Tunnel Testing and 3D CFD Modelling as well as post-construction site user experience surveys and on-site wind monitoring.

SLR trust the above serves to provide the information required at this stage; however, should you have any further queries please do not hesitate to contact the undersigned

Yours sincerely



DR PETER GEORGIU
Technical Director

Checked/ Authorised by: NA