

## SUMMARY STATEMENT

1. My name is **Michael (Mike) Green**. I am an Engineering Meteorologist with Meteorology Solutions Ltd.
2. I have prepared evidence on behalf of **Christchurch City Council** to help understand wind effects as a result of higher density/taller buildings as enabled by the proposed development controls in Plan Change 14 to the Christchurch District Plan.
3. My evidence is based on experience of applying meteorology in urban and other complex environments, as well as utilising the results from a computational fluid dynamics (CFD) study that investigated the effects on wind from increasing building height in urban Christchurch<sup>1</sup>.
4. Christchurch is a relatively windy city and wind can negatively affect outdoor pedestrian comfort. Increasingly tall buildings can increase street level wind speeds, and so could potentially adversely affect the comfort, and safety, of pedestrians and people using public spaces. For this reason, wind impact assessments are required in many cities in the world; including for Auckland, Wellington, and Dunedin in New Zealand.
5. In urban environments, wind speeds vary a lot over short distances, and higher and larger buildings will enhance these spatial differences, and hence can negatively affect the surrounding pedestrian amenity. Wind impact assessments provide information to planners and developers about how spatial wind changes as a result of a new building. From my experience, it is easier for developers to understand, and mitigate, wind impacts within their own development at an early stage of a project, rather than after it is built.
6. The levels of tolerance to wind in urban environments, from both a safety and comfort perspective, are linked to how people use various locations. For example, in areas that people move through and do not linger, such as streets and open footpaths can tolerate higher wind speeds, while outdoor alleyways, café areas, and urban parks and other gathering areas, tolerate less wind.

---

<sup>1</sup> [Technical Advice for Wind for Christchurch City](#)

7. Based on my experience, and from the results from the Christchurch urban wind study, it is my opinion that wind impact assessments should be required for new buildings above 30 m in the CBD area, and for above 20 m for residential urban developments.
8. If a wind impact assessment shows that wind conditions at street level increases to exceed standards for comfort and/or safety as a result of a new building, then practical mitigation options can be evaluated to demonstrate a reduction of wind effects. Such mitigation can include the use of vegetation and other porous barriers, avoiding featureless large facades when they are exposed to stronger wind directions, use of canopies and balconies, and use of wind lobbies for exposed entrances.
9. In summary, new tall buildings could negatively affect the surrounding wind environment at street level in Christchurch city. A method has been proposed to assess if, and by how much, a new tall building would affect the wind around the new development. The method includes testing mitigation options should wind speeds exceed acceptable levels.

Date: 25 October 2023

Mike Green