WIND - Wind

Buildings and structures alter the patterns and speeds of wind around them, and this can result in uncomfortable or even hazardous conditions for people in public spaces. The windy climate of Lower Hutt means that new buildings need to be designed and managed to reduce the impacts of wind on public space.

It is most effective to consider wind in the design of new buildings early in the process, as issues such as building bulk, shape, and site layout can have an impact. Even relatively low buildings (four storeys) can have notable wind effects if they are significantly different to their surrounding buildings.

The rules in this chapter apply to building activity in the following zones:

a. All Residential zones
b. All Commercial and Mixed Use zones
c. All Industrial zones
d. Sport and Recreation Zone
e. Open Space Zone
f. Hospital Zone
g. Tertiary Education Zone
h. Marae Zone
i. Quarry Zone
j. Seaview Marina Zone

In these areas, an assessment of the likely effects of buildings over a specified height is required to ensure that the comfort and safety of pedestrians in public spaces is effectively managed. These rules apply in conjunction with the rules in activity area chapters and with other general rules.

Objectives

WIND-O1	Wind in urban environments
Buildings and structures in urban environments are managed so that within public spaces: 1. Wind conditions remain safe, and where possible, existing unsafe wind conditions are improved, 2. Wind conditions are comfortable in high-use public spaces, including pedestrian spaces and open space areas, and 3. The pedestrian wind environment is protected from gradual degradation over time.	

Policies

WIND-P1	Early consideration in wind design
Encourage consideration of wind during the early stages of building design to achieve high quality design for wind that minimises the adverse impact on public spaces, with wind mitigation measures contained on site.	
WIND-P2	**Managing effects**
Require that larger buildings, including significant alterations and additions, are designed to manage adverse wind effects, by meeting specified performance standards.	
WIND-P3	**Retaining existing wind mitigation measures**
Ensure that where wind effects have been managed through wind mitigation measures, that those mitigation measures are retained and maintained.	

Rules

Note:
This chapter applies to all new buildings and structures, and demolition, alteration and additions to existing buildings and structures including any existing wind mitigation measures, within the identified zones.

WIND-R1	Demolition, alteration, and additions to existing buildings and structures
General Rural Zone **Rural Lifestyle**	1. **Activity status:** Permitted

Zone **Natural Open Space Zone**	
Residential Zones **Commercial and Mixed Use Zones** **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	2. **Activity status:** Permitted Where: a. Demolition and alterations do not include the removal of existing off-site wind mitigation measures required by a resource consent, and b. Additions or alterations either: i. Do not increase the height of the building or structure by more than 8m when measured from the existing highest point of the building or structure, or ii. Do not result in the building or structure exceeding a height threshold specified in Table 1: Height thresholds for wind assessment when measured from ground level.
Residential Zones **Commercial and Mixed Use Zones** **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	3. **Activity status:** Controlled Where: a. Compliance is not achieved with WIND-R1.2b, and b. Compliance is achieved with: i. WIND-S1: Safety, ii. WIND-S2: Deterioration of wind environment, and iii. WIND-S3: Comfort. **Matters of control are limited to:** 1. The provision of a wind assessment prepared by a suitably qualified and experienced person, and in accordance with the s88 requirements detailed for this rule. 2. The implementation of the building design and any wind mitigation measures identified in the wind assessment. **Notification:** Public and limited notification are precluded for applications under this rule. **Information requirements:** Applications made under this rule require a wind assessment report to identify and describe measures for addressing the potential adverse effects of wind on public space including streets and open space areas. The report should be either quantitative or qualitative, as described below. A quantitative wind assessment shall be used for alterations and additions to existing buildings and structures that both increase their height by over 8m over their existing height and result in a total height over 22m when measured from ground level. A qualitative wind assessment should be used for applications that do not meet the thresholds which necessitate a quantitative wind assessment. The contents of quantitative and qualitative wind assessments are described in Appendix WIND-APP1.
Residential Zones **Commercial and**	4. **Activity status:** Restricted discretionary Where:

Mixed Use Zones **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	a. Compliance is not achieved with WIND-R1.2a, or b. Compliance is not achieved with: i. WIND-R1.2b, and ii. WIND-R1.3b. **Matters of discretion are restricted to:** 1. The degree to which deterioration of wind conditions resulting from the proposed development will adversely affect safety and comfort for persons in public spaces. 2. Positive effects where the proposed development contributes to an improvement of existing unsafe wind conditions in public spaces. 3. The overall effect of the proposed development on public spaces in the local wind environment, including cumulative effects. 4. The effect of the proposed development on the effectiveness of existing wind mitigation measures. 5. The ongoing protection and operation of wind mitigation measures that are required to meet the performance standards in this chapter. **Information requirements:** Applications made under this rule require a wind assessment report to identify and describe measures for addressing the potential adverse effects of wind on public space including streets and open space areas. The report should be either quantitative or qualitative, as described below. A quantitative wind assessment shall be used for alterations and additions to existing buildings and structures that both increase their height by over 8m over their existing height and result in a total height over 22m when measured from ground level. A qualitative wind assessment should be used for applications that do not meet the thresholds which necessitate a quantitative wind assessment. The contents of quantitative and qualitative wind assessments are described in Appendix WIND-APP1.
WIND-R2	**New buildings and structures**
General Rural Zone **Rural Lifestyle Zone** **Natural Open Space Zone**	1. **Activity status:** Permitted
Residential Zones **Commercial and Mixed Use Zones** **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	2. **Activity status:** Permitted Where: a. The building or structure does not exceed a height threshold specified in Table 1: Height thresholds for wind assessment, when measured from ground level.
Residential Zones **Commercial and**	3. **Activity Status:** Controlled Where:

Mixed Use Zones **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	a. Compliance is not achieved with WIND-R2.2, and b. Compliance is achieved with: i. WIND-S1: Safety, ii. WIND-S2: Deterioration of wind environment, and iii. WIND-S3: Comfort. **Matters of control are limited to:** 1. The provision of a wind assessment prepared by a suitably qualified and experienced person, and in accordance with the s88 requirements detailed for this rule. 2. The implementation of the building design and any wind mitigation measures identified in the wind assessment. **Notification:** Public and limited notification are precluded for applications under this rule. **Information requirements:** Applications made under this rule require a wind assessment report to identify and describe measures for addressing the potential adverse effects of wind on public space including streets and open space areas. The report should be either quantitative or qualitative, as described below. A quantitative wind assessment shall be used for new buildings and structures over 22m in height when measured from ground level. A qualitative wind assessment should be used for applications that do not meet the thresholds which necessitate a quantitative wind assessment. The contents of quantitative and qualitative wind assessments are described in Appendix WIND-APP1.
Residential Zones **Commercial and Mixed Use Zones** **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	4. **Activity status:** Restricted discretionary Where: a. Compliance is not achieved with WIND-R2.2, and b. Compliance is not achieved with WIND-R2.3b. **Matters of discretion are restricted to:** 1. The degree to which deterioration of wind conditions resulting from the proposed development will adversely affect safety and comfort for persons in public spaces. 2. Positive effects where the proposed development contributes to an improvement of existing unsafe wind conditions in public spaces. 3. The overall effect of the proposed development on public spaces in the local wind environment, including cumulative effects. 4. The effect of the proposed development on the effectiveness of existing wind mitigation measures. 5. The ongoing protection and operation of wind mitigation measures that are required to meet the performance standards in this chapter. **Information requirements:** Applications made under this rule require a wind assessment report to identify and describe measures for addressing the potential adverse effects of wind on public space including streets and open space areas. The report should be either quantitative or qualitative, as described below. A quantitative wind assessment shall be used for new buildings and structures over 22m in height when measured from ground level. A qualitative wind assessment should be used for applications that do not meet the thresholds which necessitate a quantitative wind assessment. The contents of quantitative and qualitative wind assessments are described in Appendix WIND-APP1.

Standards

WIND-S1	Safety
Residential Zones **Commercial and Mixed Use Zones** **Industrial Zones** **Sport and Active Recreation Zone**	1. The annual maximum 3-second gust speed shall not exceed 20 m/s in any public space.

Open Space Zone **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	
WIND-S2	**Deterioration of wind environment**
Residential Zones **Commercial and Mixed Use Zones** **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**	1. At all locations within public spaces, a proposed building must not increase the number of hours that the mean hourly wind speed equals or exceeds 2.5 m/s by more than 480 hours per year compared to the existing wind environment. 2. The overall impact of a proposed building, considering all locations within public spaces and their associated uses, on the annual change in the number of hours that the mean hourly wind speed equals or exceeds 2.5 m/s must be unchanged or reduced.
WIND-S3	**Comfort**
City Centre Zone **Metropolitan Centre Zone** **Local Centre Zone**	1. This standard applies to sites abutting one or more of: a. Active Street Frontage Overlay A, b. Active Street Frontage Overlay B, c. Open Space Zone, and d. Sport and Active Recreation Zone 2. When measured from any ground level public space within 50m of a site boundary: a. The existing wind conditions equals or exceeds 2.5 m/s for more than 1,700 hours each year: i. The development must maintain or improve the existing wind conditions. b. The existing wind conditions equals or exceeds 2.5 m/s for no more than 1,700 hours each year: i. The development must not result in this threshold being exceeded.

Table 1: Height thresholds for wind assessment

Zone	Height Thresholds	
City Centre Zone **Metropolitan Centre Zone**	1. Where the site has frontage to the Active Street Frontage Overlay A	
	2. Where the site abuts any site within an Open Space and Recreation Zone	12m

	3. Where the site is within the Jackson Street Heritage Precinct or Jackson Street Character Transition Precinct	
	4. Where clause 1, 2 or 3 of this table does not apply	22m
Residential Zones **Local Centre Zone** **Neighbourhood Centre Zone** **Mixed Use Zone** **Industrial Zones** **Sport and Active Recreation Zone** **Open Space Zone** **Hospital Zone** **Tertiary Education Zone** **Marae Zone** **Quarry Zone** **Seaview Marina Zone**		12m

Appendix WIND-APP1 - Wind reports

Quantitative Wind Assessment

A quantitative assessment is based on the results of wind tunnel testing, or a suitable equivalent (for example, computational fluid dynamics software calibrated against measured data). It should quantify the extent and magnitude of the effect of the building on the surrounding pedestrian level wind environment by measuring and comparing the wind conditions of the existing site with those of the proposed building.

The assessment should document to what degree the building complies with the standards WIND-S1: Safety, WIND-S2: Deterioration of wind environment, and WIND-S3: Comfort. It should also cover the topics of a qualitative wind assessment.

Qualitative Wind Assessment

A qualitative assessment is not based on the results of a wind tunnel test or computer modelling, and relies on the professional knowledge of a suitably qualified and experienced person, and any available evidence of local wind conditions.

The assessment must include the following:

a. A description of existing wind conditions, including sources and limitations of information used. Results from any previous relevant quantitative assessment should be used when available.
b. A description of the interaction of existing buildings with the wind that leads to the existing wind conditions.
c. A review of the proposed development and its appropriateness for the wind environment in which it sits.
d. Location of the proposed development relative to important nearby public spaces.
e. A description of the influence of the proposed development on the surrounding pedestrian level wind environment.
f. To what degree existing wind conditions may deteriorate with the proposed development.
g. A description of proposed wind mitigation measures.
h. The likelihood that the development will meet, or to what degree it will not meet, the standards WIND-S1: Safety, WIND-S2: Deterioration of wind environment, and WIND-S3: Comfort.
i. The rationale behind the design of the building and any proposed wind mitigation measures that support it being the

best practical way to achieve the standards WIND-S1: Safety, WIND-S2: Deterioration of wind environment, and WIND-S3: Comfort.