Memorandum

To	Stephen Davis
Copy	
From	Nick Locke and Neil Jamieson
Office	Petone
Date	26 May 2022
File/Ref	5-29Q19.00
Subject	Lower Hutt District Plan Wind Rules

This memorandum provides a review of wind controls in the Lower Hutt District Plan and compares these with proposed wind controls in the draft Wellington City District Plan. Issues associated with implementing wind controls in Lower Hutt and Wellington are discussed.

Planning controls for wind effects in Lower Hutt (see Attachment 1)

Attachment 1 provides extracts from the Lower Hutt district plan that have specific mention of wind. While other parts of the plan may also be able to be related to wind effects (for example, general polices and rules for safety and amenity of public spaces), only parts of the district plan with specific reference to wind are analysed below.

Zones

The district plan includes planning controls for wind effects of development in the following zones:

- 4A 5.2 Scheduled Site - 32A Hathaway Avenue Boulcott - Housing for the Elderly
- 5A Central Commercial Activity Area
- 5B Petone Commercial Activity Area
- 9A Community Health Activity Area

Zones 5A and 5B have the most comprehensive wind controls that include policies, standards, reporting requirements and design guidance. Zone 4A only includes wind effects in the matters of discretion for discretionary restricted activities. Zone 9A only includes wind effects in policies for the area.

Only zones 5A and 5B are analysed below, as the planning controls for wind in zones 4A and 9A are undefined in terms of the wind criteria that must be achieved and the information requirements for an application.

Triggers

Wind effects must be considered in the Central Commercial and Petone Commercial areas when a building is constructed or altered, and is over 12 metres in height, and where any part of the building fronts a street, pedestrian mall, pedestrian walkway, or other public space. This is a relatively simple trigger to interpret and is similar to Wellington City's trigger for wind,

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which uses a height threshold of 18.6m in the Central Area and uses the height limit (ie between 9m and 12m) in the Centres areas. Under the proposed Wellington district plan, the height thresholds will be 20m in the City Centre zone and 12m in the Suburban Centres zones.

Wind standards

The wind standards for assessing wind effects in the Central Commercial and Petone Commercial areas are identical, except that the Petone Commercial area does not include Comfort criteria (refer district plan 5A 2.2.2(c) and 5B 2.2.2.2(b)). The five criteria that comprise the wind standards relate to the following ideas; 1) safety of pedestrians, 2) the wind effects of a development at specific locations, 3) the net wind effects of a developments throughout the surrounding area, 4) pedestrian comfort., and 5) reporting requirements.

The technical criteria within the wind standards are essentially the same as those currently used in the Wellington City District Plan. However, detailed assessment and reporting requirements in the Wellington City wind standards, which accurately define the criteria, are not included in the Lower Hutt wind standard. This means that reporting and compliance could vary depending on the interpretation applied by the wind specialist undertaking a wind assessment.

Report requirements

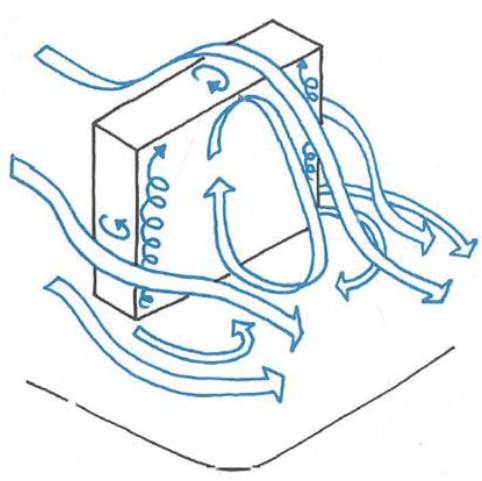
The reporting requirements for the Central Commercial and Petone Commercial areas are identical and are set out in Appendix Central Commercial 6 and Appendix Petone Commercial 4 respectively. The information requirements are qualitative and broadly describe issues that the assessment should address. These information requirements differ from those for the Wellington City central area but are similar to the type of assessment/reporting required for the "Centres" zones of Wellington City.

Design guidance

Both the Central Commercial Area and the Petone Commercial Area have design guidance that relates specifically to wind effects of buildings (refer Appendix Central Commercial 8 Part A 2.10 and Appendix Petone Commercial 2 2.10 respectively).

The guidance in each appendix is different, but each identifies useful design features that generally help mitigate adverse wind effects. However, the guidance is not complete and therefore does not cover all the common problems that occur in city/street environments. Reference to the Wind Chapter Best Practice Guidance in the draft Wellington District Plan would provide designers and planners additional detail on designing for wind.

A correction should be made to a diagram in the guidance for the Petone area, which states, "Projecting roofline reduces wind flow down face of building" - this note should be deleted from the diagram. In reality, a projecting roofline will tend to deflect more (not less) wind down the windward face of a building. The diagram to the right (from the Best Practice Guide in the draft Wellington District Plan) illustrates how wind near the top of a building typically flows up and over the building. This upwash at the top windward edge of the building will be 'blocked' by a projecting roofline.



Application of the Lower Hutt wind rules

Application of the wind rules in Lower Hutt has been relatively limited over the past 20 to 25 years. This has been primarily due to the relatively low number of developments that have triggered the requirement because of their height or location. However, WSP has been involved in a significant number of wind tunnel studies and desktop wind assessments in central Lower Hutt and in Petone. These have included the developments at Queensgate, as well as the

Summerset Retirement Village in Boulcott and the Sebell Suites development at the south end of High Street, among others.

WSP's experience in providing wind engineering services for these developments would suggest that:

(1) Clarifying, or clearly defining in the District Plan, the decision-making process as to when and whether a desktop wind assessment or a wind tunnel study is required, would be helpful for developers.

(2) Upskilling/educating planners within Lower Hutt Council would be helpful, as would identifying sources of independent advice on pedestrian wind issues. WSP has previously presented to Wellington City Council planners on wind effects for pedestrians. Wellington City Councill also retain the services of an independent Wind Consultant, Dr Michael Donn, from Victoria University.

(3) Boundaries with residential areas and areas with significant numbers of permanent residents warrant consideration with respect to wind effects, in terms of the District Plan. Apart from Lower Hutt Council planner's consideration of the potential wind effects of new buildings, resource consent and Environment Court hearings have shown that these areas raise the most concern and result in the most submissions from the public.

Wind effects and risks of increasing building height

The proposed increase in height limits within the Central Commercial area (unlimited building height) and the Petone Commercial area (six storey height limit) have potential to increase adverse wind conditions in pedestrian areas, particularly unsafe wind conditions, as higher buildings generally correspond to greater wind effects at ground level.

A fundamental effect of increasing the heights of new buildings in areas with predominantly low building heights is that the new buildings are generally exposed to the stronger winds that blow at higher levels, which in turn generate downwash wind flows that produce localised windy areas near the base of the new building. At such locations, relatively low buildings, 4-6 stories in height, can produce dangerous wind speeds. As the height of buildings exposed to wind increase, the likelihood of dangerous wind speeds also increases.

The trigger heights of wind standards in other cities provides some indication of when it is sensible to manage the wind effects of new buildings. However, it is important to compare wind rules for cities with a similar wind climate and with similar heights of existing buildings, as both the prevailing winds and the general exposure of new buildings to those winds will have a significant bearing on trigger thresholds. For comparison. in Wellington City the trigger height for assessing wind effects varies from 12 metres in the outer suburbs (where building heights are generally low) to 18.6 metres in the CBD (where building heights are generally higher).

The change in height limits is therefore likely to put more pressure on consent planners to ensure the wind effects are managed appropriately. The existing height threshold for triggering a wind assessment is relatively low, and therefore should ensure that development that could have adverse wind effects are assessed. The effectiveness of the existing wind rules is therefore dependant on how accurately the wind effects are reported and the extent to which good wind design is incorporated into development proposals. The qualitative reporting requirements means that significant judgement is required to establish a sensible balance between wind design and other design/development constraints.

Options for wind triggers

Changing the criteria that triggers the wind standards is unlikely to improve the effectiveness of the current wind standards. This is primarily due to the low height threshold that is currently used – a lower height than 12 metres would require more buildings to be assessed, but these lower buildings would be unlikely to cause problematic wind conditions. The real challenge

will be to ensure that the taller and bulkier building developments comply effectively with the current wind standards.

Changes to the operation, or implementation, of the current wind rules would be the best way to maintain or improve the planning outcomes for wind. Using peer review to check the consistency and accuracy of wind assessments is used widely in other cities. The use of wind tunnel testing is also used widely to accurately quantify the wind effects of proposed developments. Improving the quality of information that is used in the planning process and the judgement that is applied thereafter, are the best ways to maintain or improve wind conditions with higher building development.

Costs of assessing wind effects

The costs for applicants associated with the wind rules has the following components

Specialist wind assessment –	A qualitative assessment (ie expert opinion / desktop study) would generally take one or two days to prepare, depending on the scale and complexity of the building/s, and would cost approximately $2,000 to $5,000
	A quantitative wind study involves wind tunnel testing a physical scale model of the development and measuring wind speeds with and without the proposed building. These investigations generally take a few weeks to complete and cost around $20,000 to $35,000, depending on the size and complexity of the development and surrounding area.
Redesign	Costs associated with delays and fees for redesigning buildings that do not comply with wind standards are difficult to predict as these costs are highly dependent on the specific development and on the effort that is put into the original design to minimise wind effects.
Peer review	Peer reviews of wind assessments (qualitative or quantitative), often initiated by Councils, are likely to have similar or lower costs than a qualitative assessment. The quality of the information received by the reviewer will determine the time and costs of a review.
Resource consent process	The delays and processing costs associated with the wind controls can be significant if wind effects are particularly severe or if the application is of a poor quality. These costs are highly specific to projects.
Hearings	Costs associated with Resource Consent and Environment Court hearings are difficult to predict, as these costs are highly dependent on the specific development and on the degree of public submissions in opposition.

Draft Wellington wind controls

The draft wind controls for Wellington City (i.e objectives, policies, rules, standards and guidance) set out to maintain the scope and stringency of the existing wind controls but simplify their use and reformat the wind controls into the new structure of the district plan.

The trigger height for the City Centre zone is increased slightly from 18.6 metres to 20 metres, while the Local Centres zone remains at 12 metres. Additional criteria for the scale and height of additions or alterations have been included that allow small additions or alterations to tall buildings (higher than 20m / 12m) to avoid being assessed.

The wind standard has been simplified by removing the cumulative effect criterion for stronger winds. This reduces the amount of information required but should not affect the quality of the assessment.

The guidance has been updated and expanded to provide some rules of thumb for wind effects of buildings. It is hoped these rules of thumb will improve the accuracy and consistency of qualitative wind assessments.

Issues and opportunities

A major factor in the success of any set of wind rules is their implementation. The ease by which designers and developers can understand the rules, as well as the ease of interpretation and enforcement by consent planners, has a large bearing on their effectiveness.

Simplicity and clarity are the ultimate tests for the wind controls. In this regard the Lower Hutt wind controls are relatively simple and therefore should be simple and relatively low cost to implement. However, the wind controls are open to wide interpretation and so are likely to produce widely varying outcomes, depending on the parties involved.

The best opportunities for improving the wind controls in a full plan review would be to clarify, or clearly define, some of the technical standards. The application of the wind controls to other areas in Lower Hutt where building heights are expected to increase significantly, or where particularly good wind conditions are desired, would also make sense.

Attachment 1

"Wind" extracts from the Lower Hutt District Plan

City of Lower Hutt District Plan » Chapter 4 Residential » 4A General Residential Activity Area » 4A 5 Precincts and Scheduled Sites » 4A 5.2 Scheduled Site - 32A Hathaway Avenue Boulcott - Housing for the Elderly » 4A 5.2.2 Rules

4A 5.2.2 Rules

Rule 4A 5.2.2.1 Activities

(a)	Housing for the Elderly including the construction or alteration of buildings is a restricted discretionary activity if: (i) a building setback of no less than 5m from all Residential Activity Area boundaries including that of Boulcott School is provided; and (ii) the Development Standards relating to Site Coverage, Recession Planes, Yards, Permeable Surface and not those Development Standards relating to Building Height are complied with, provided that: 1. the length of the northern boundary of the site shall be exempt from the recession plane permitted activity conditions. **Discretion is restricted to:** **…** (iv) Urban Design Effects, Architectural Treatment, Effects on Amenity and Character Values and Wind Effects 1. The extent to which the proposal would adversely affect the amenity and character values of the surrounding residential and recreational area, including: i. The effects of buildings and structures on neighbouring and surrounding residential and recreational sites, Boulcott School and Boulcott Kindergarten, and, in particular, the location, design, appearance, bulk, spacing and articulation of buildings; and ii. Whether the proposal would cause significant loss of sunlight, daylight or privacy on adjoining residential properties and Boulcott School. iii. The degree to which the proposal meets the Medium Density Design Guide. 2. The degree to which policies 4A 5.2.1.1 and 4A 5.2.1.2 are met. 3. Consideration shall include onsite amenity, including the management of onsite Wind effects. **…**
(b)	Housing for the Elderly on the site that does not comply with the above restricted discretionary standards is a discretionary activity
Links to: Policies 4A 5.2.1.1, 4A 5.2.1.2	

City of Lower Hutt District Plan » Chapter 5 Commercial » 5A Central Commercial Activity Area » 5A 1 Issues, Objectives and Policies » 5A 1.2 Site Development Issues

5A 1.2 Site Development Issues

…

5A 1.2.2 Relationship of Buildings to Streets and Open Spaces

Issue

The relationship of buildings to streets and open spaces (including parks and reserves) affects the quality of these public places and their amenity for people using them.

Objective

To ensure development maintains and enhances the amenity and safety of the Central Commercial Activity Area, in particular, maximising pedestrian comfort and safety.

Policy

…

(e) Encourage buildings to be well designed to manage the adverse effects on amenity values, including visual, wind and glare.

Explanation and Reasons

Maintaining and enhancing the amenity values in the Central Commercial Activity Area will make the area more attractive and enjoyable for people. The relationship of buildings to the public environment, such as streets and open spaces, makes an important contribution to the amenity and safety within the central area. One important interface is the ground level relationship between buildings and the streetscape. Requiring display windows and buildings to be located on the front boundary of identified key roads maintains and enhances the quality of the streetscape for pedestrians. In addition, requiring shelter for pedestrians along the identified key roads provides protection from adverse climatic conditions and provides a more comfortable environment.

One of the valued qualities of the Lower Hutt City central area is the access of sunlight to public spaces, including streets and open spaces. However, it is recognised that protecting sunlight access to all areas of public space in the central area would conflict with some other objectives for the Central Commercial Activity Area. Therefore, specific locations have been identified based on highly used areas within the central area to protect for sunlight access to provide an attractive environment to visitors and residents in the central area.

The design of buildings influences the amenity values of the central area, as well as recognising the elements and form of heritage buildings. The District Plan encourages high quality urban design through guidance and advocacy from an early stage in the building design process.

The existing wind speeds at ground level within the Central Commercial Activity Area are variable, with some areas experiencing high and dangerous conditions. In addition, in some locations within the Central Commercial Activity, such as areas of open space and outdoor street activity, calmer wind conditions are desirable to provide a more attractive environment. The wind conditions contribute to the overall amenity in the central area, with buildings having a direct relationship with the resultant wind conditions. Accordingly, the District Plan manages new buildings and larger additions to existing buildings over 12 metres in height in specific locations to ensure the wind conditions are not worsened.

5A 2.2 Restricted Discretionary Activities

…

(b) The construction, alteration of, and addition to buildings and structures over 12 metres in height (except for those works permitted under Rules 5A 2.1(b) and (c)) and where any part of the building or structure fronts a street, pedestrian mall, pedestrian walkway, or other public space identified in Appendix Central Commercial 5 – Wind Protection.

…

5A 2.2.1 Matters in which Council has Restricted its Discretion

…

(b) The construction, alteration of, and addition to buildings and structures over 12 metres in height (except for those works permitted under Rules 5A 2.1(b) and (c)) and where any part of the building or structure fronts a street, pedestrian mall, pedestrian walkway, or other public space identified in Appendix Central Commercial 5 – Wind Protection.

(i) The effects of Wind on public space and adjoining areas.

5A 2.2.2 Standards and Terms

…

(c) The construction, alteration of, and addition to buildings and structures over 12 metres in height (except for those works permitted under Rules 5A 2.1(b) and (c)) and where any part of the building or structure fronts a street, pedestrian mall, pedestrian walkway, or other public space identified in Appendix Central Commercial 5 – Wind Protection shall comply with the following standards:

(i) Wind Protection:

All buildings and structures over 12 metres in height and where any part of the building or structure fronts a street, pedestrian mall, pedestrian walkway, or other public space identified in Appendix Central Commercial 5 – Wind Protection shall be designed to comply with the following conditions:

(a) Safety: The safety criteria shall apply to all public space. The maximum gust speed shall not exceed 20 m/s. If the speed exceeds 20 m/s with the proposed development, it must be reduced to 20 m/s or below.

(b) Cumulative Effect: The cumulative criteria shall apply to all public space. Any proposed development shall comply with the requirements for both of the following Wind strengths, at each measurement location.

Wind strength	**Change in annual hours of occurrence with the development at all measurement points**	**Requirements on developer**
Strong (mean hourly Wind speed = 3.5 m/s)	If hours that 3.5m/s is equalled or exceeded increase by more than 170 hr/yr (i.e. 2 % of the year)	Reduce change in hours to a maximum of 170 hours.
Moderate (mean hourly Wind speed = 2.5 m/s)	If hours that 2.5m/s is equalled or exceeded increase by more than 170 hr/yr (i.e. 2 % of the year)	Reduce change in hours to a maximum of 170 hours.

(c) While hours exceeded at some locations in the Cumulative Effect Criteria may increase or decrease, the overall impact of a building on the Wind conditions must be neutral or beneficial.

(d) Comfort: The comfort criteria only applies to the public spaces listed in Rule 5A 2.1.1(c).

Comfort Wind strength	**Annual hours of occurrence with the development**	**Requirements on developer**
Mean hourly Wind speed = 2.5 m/s	If hours that 2.5 m/s is equalled or exceeded increase above1700 hours	If existing building exceeds 1700 hours, then reduce number of hours for proposed building to existing levels If existing building is below 1700 hours then reduce number of hours for proposed building to below 1700 hours.

(e) To show that a development complies with these standards a Wind report must be supplied that meet the requirements outlined in Appendix Central Commercial 6 – Wind Report.

City of Lower Hutt District Plan » Chapter 5 Commercial » 5A Central Commercial Activity Area » 5A Appendices » Appendix Central Commercial 6 - Wind Report

Appendix Central Commercial 6 - Wind Report

Buildings above 12 metres require a Wind assessment report to identify and describe measures for addressing the potential adverse of Wind on public space, including streets.

Typically headings for a Wind assessment report would be:

- Existing Wind conditions/environment
- Existing built context and environment in terms of height and bulk of surrounding buildings
- Location of the site relative to public spaces
- Proposed building height and form
- Design features proposed to manage Wind effects

City of Lower Hutt District Plan » Chapter 5 Commercial » 5A Central Commercial Activity Area » 5A Appendices » Appendix Central Commercial 8 - Central Commercial Activity Area Design Guide » Part A Assessment Guidelines

Appendix Central Commercial 8 – Central Commercial Activity Area Design Guide

Part A Assessment Guidelines

2. Design

…

2.10 Managing wind

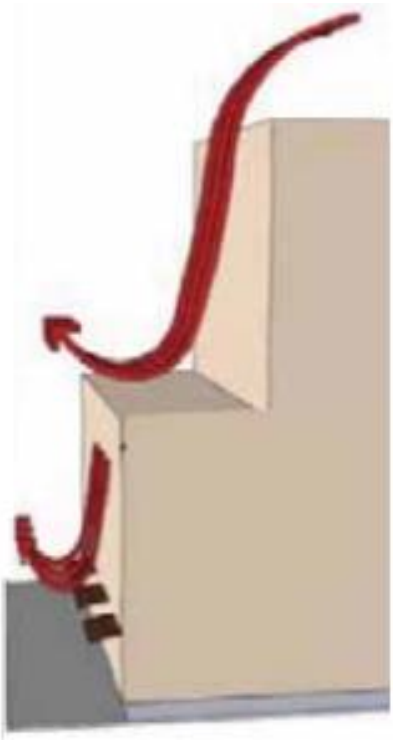
The objective of this guideline is to help to minimise the adverse effects of wind to create a more sheltered, safe and comfortable city centre. It is intended to manage wind effects on the Central Area streets and public places where good street frontages are sought.

The orientation, massing and form of buildings in a city can greatly influence wind conditions. Some of the negative effects of building design on wind flow are:

- Streets that present significant variation of building heights (a taller building adjacent to a shorter one) can exacerbate adverse wind conditions;
- Taller buildings can create increased wind speeds down towards the ground level (downwash effect);
- Horizontally elongated plain façades (a building that is short but long) can have a detrimental impact on pedestrian discomfort caused by increased wind speeds (“row” effect); and
- Alteration or demolition of buildings can change wind flow pattern and speed at ground level and affect neighbouring buildings by funneling wind in.

Assessment Guidelines

1. New buildings should be designed with reference to the existing wind patterns of the site and not increase the wind speed at ground level at key street locations (refer to Chapter 5A 2, Rules);
2. Projecting and recessive elements (such as balconies, verandahs, set backs) should be used to reduce the adverse effects of wind at street level.



Upper floor building setback and verandah or awnings on ground floor to reduce wind-flow speed

Verandah and transitional volume minimise the adverse effect of increased wind flow

Appendix Central Commercial 8 - Central Commercial Activity Area Design Guide

Part B Encouraged Guidelines

3. Amenity

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3.3 Creating Positive Parks

The provision of a range of types of park spaces will become important once the strategy to intensify and mix the uses within the Lower Hutt Central Area takes place. Current demands for local parks provision to the people working in the area will increase with the successful development of residential units and additional retail and commercial activities in the next 20 years.
Higher residential densities mean smaller private outdoor spaces for the residents of the Central Area, which results in an increased demand for park provision from both the public and the private sector.
The objective of this guideline is to assist the delivery of high quality parks within the Central Area in association with private development. It is recognised that Hutt City Council will also have a role in provision of park space within the Central Area as public space.
A high quality and usable open space is safe, active, convenient, well maintained, pleasant, connected and appropriate to its context.
An unsuccessful park is the one that disregards the existing network of open space and the connections to the pedestrian and cycle routes, as well as wind and solar aspect and size, location and activity pertinent to the site and its surroundings. An unsafe park is one that does not consider the uses and interface of the buildings fronting it and creates hidden, inconvenient, unattractive, poorly maintained and unlit spaces.
The design of parks should be integrated with the urban and building design process.

3.4 Greening the Central Area

“Greening the Central Area” guidelines address how development can create a greener environment for the Lower Hutt Central Area. The emphasis will be on initiatives to provide spaces, such as rooftop gardens and green walls.
The objective of this guideline is to promote aesthetic improvements to the urban environment as well as to assist in increasing biodiversity, reducing the heat island effect, purifying indoor and outdoor air quality, and reducing water usage by the adoption of efficient water management systems.

A. Rooftop Gardens

Rooftop gardens (intensive green roofs) are typically areas on the top of a building or terraces within that can include paving and usually grass, trees and shrubs. They provide useable outdoor areas, have good insulation capabilities and can assist with stormwater management.

B. Green Roofs

Green roofs (extensive green roofs) consist of a vegetated roof area not designed as useable amenity spaces. They assist in increasing biodiversity, insulation capabilities and reducing water usage by the adoption of efficient water management system.

C. Vertical Green Treatments

Green walls, green indoor or outdoor atriums and landscaped balconies are all part of the vertical green spaces initiative. They are methods for aesthetically restoring urban environments (visual relief for blank walls and tall buildings) and control noise pollution (soundproof capabilities).

Encouraged Guidelines

1. Greening by roof gardens and vertical green treatment is encouraged. The spaces created can be publicly accessible (part of the park network), semi-public (for residents of a building) or not for use (design feature). If green roofs, roof gardens and vertical green treatments are to be used they should consider:
   - waterproofing, drainage systems and appropriate structure strength to support any additional weight loadings;
   - the plant species that are resistant to severe environments (wind and drastic changes in temperature), require low maintenance and low water use;
   - soil mix and depth. Light-weight soil mix is recommended;
   - maintenance procedures and access;
   - the opportunity to use collected rainwater for irrigation;
   - plant types that maximise solar access in winter and control solar infiltration in summer.

5B 1.2 Site Development Issues

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5B 1.2.3 Area 2 - Character and Building Form and Quality within Area 2 - Petone Mixed Use

Issue

The Area 2 - Petone Mixed Use area provides for a range of complementary activities to support the needs of residents and workers. In order for the area to attract and support the mixture of activities, any buildings, structures and associated areas need to be functional, attractive and contribute to the quality of the environment. The building and open spaces also need to recognise their context and effects on their surroundings, such as the foreshore, historic heritage areas, main entrance and gateway routes, and residential areas.

Objective

To ensure that the form and quality of buildings, structures, open space and development overall within the Petone Mixed Use Area maintain and enhance the character, amenity values and quality of the environment, whilst recognising and protecting the values and features of adjoining areas.

Policy

a) Provide for alterations and minor additions to existing buildings, subject to minimum standards, and encourage a high quality urban and built form design for these building modifications.

b) Manage new buildings and developments and larger additions to existing buildings to be well designed and to contribute to the creation of an integrated, safe and attractive mixed use environment with a high standard of streetscape and amenity.

c) For Jackson Street, require buildings to provide and maintain an active, transparent and continual frontage, as well as shelter, to provide a pedestrian focused environment along this main gateway route.

d) Manage the height and location of buildings to respond to their context and locality, with lower building heights for the areas:
   - Adjoining and close to Residential Activity Areas to minimise effects on the amenity values, including shading, over dominance and privacy; and
   - Along the Jackson Street front road boundary with taller buildings setback from the street, thereby creating a streetscape with lower level buildings and protecting sunlight to public spaces within the street

e) Manage the height, location and design of buildings and development on The Esplanade to create a landscaped street frontage and protection of sunlight access to the beach to avoid overshadowing.

f) Encourage all new buildings to provide appropriate levels of natural light to occupied spaces within the building.

g) Require a minimum level of amenity for future occupiers of residential buildings through the use of a permitted activity standard regarding outdoor space. In addition to encouraging good quality and amenity by guiding their design to ensure current and future occupants have useable internal space, ongoing access to daylight, and an external aspect.

h) Manage new buildings to be designed to manage adverse effects on amenity value, including visual, wind and glare.

i) Restrict the height of buildings and structures at the interface with adjoining residential areas to minimise effects on the amenity values, including shading, over dominance and privacy.

j) Ensure that new buildings higher than 12 metres are designed to avoid, remedy or mitigate any wind problems that they create (including cumulative effects with other buildings) and where existing wind conditions are dangerous, ensure new development improves the wind environment as far as reasonably practical.

k) Encourage buildings to be designed and located in a manner that enhances the safety, convenience, accessibility and amenity of pedestrian spaces and linkages within the Petone Mixed Use Area.

Explanation and Reasons

The Area 2 - Petone Mixed Use area consists of a range of complementary activities. In order to provide a quality environment that is attractive, functional and contributes to the quality of the environment, buildings and structures need to be well designed and integrated into the area.

It is recognised there are a variety of existing building forms and styles which have various functions and uses, and are of a mixed quality. The District Plan seeks to ensure the design of new buildings and developments positively contribute to the area's environment by adopting best practice urban design outcomes. Through the development and use of design guidance, the Council will guide and assess the appropriateness of the urban design outcomes resulting from development in the area.

The existing wind speeds at ground level within the Petone Mixed Use Area are variable, with some areas experiencing high and dangerous conditions. In addition, in some locations within this area, such as areas of open space and outdoor street activity, calmer wind conditions are desirable to provide a more attractive environment. The wind conditions contribute to the overall amenity in this mixed use environment, with buildings having a direct relationship with the resultant wind conditions. Accordingly, the District Plan manages new buildings and larger additions to existing buildings over 12 metres in height to ensure the wind conditions are not worsened.

City of Lower Hutt District Plan » Chapter 5 Commercial » 5B Petone Commercial Activity Area » 5B 2 Rules » 5B 2.2 Area 2 - Petone Mixed Use - Area generally bounded by Hutt Road, Petone Avenue, Campbell Terrace, Victoria Street, Sydney Street and The Esplanade » 5B 2.2.2 Restricted Discretionary Activities » 5B 2.2.2.1 Matters in which Council has Restricted its Discretion

5B 2.2.2.1 Matters in which Council has Restricted its Discretion

…

(b) The construction, alteration of, addition to buildings and structures over 12 metres in height

The effects of wind on public space and adjoining areas.

5B 2.2.2.2 Restricted Discretionary Activity – Conditions

…

(b) The construction, alteration of, addition, and repair of buildings and structures over 12 metres in height.

(i) Wind Protection:

All buildings and structures over 12 metres in height and where any part of the building or structure fronts a street, pedestrian mall, pedestrian walkway, shall be designed to comply with the following conditions:

(a) Safety: The safety criteria shall apply to all public space. The maximum gust speed shall not exceed 20 m/s. If the speed exceeds 20 m/s with the proposed development, it must be reduced to 20 m/s or below.

(b) Cumulative Effect: The cumulative criteria shall apply to all public space. Any proposed development shall comply with the requirements for both of the following Wind strengths, at each measurement location.

Wind strength	**Change in annual hours of occurrence with the development at all measurement points**	**Requirements on developer**
Strong (mean hourly Wind speed = 3.5 m/s)	If hours that 3.5m/s is equalled or exceeded increase by more than 170 hr/yr (i.e. 2 % of the year)	Reduce change in hours to a maximum of 170 hours.
Moderate (mean hourly Wind speed = 2.5 m/s)	If hours that 2.5m/s is equalled or exceeded increase by more than 170 hr/yr (i.e. 2 % of the year)	Reduce change in hours to a maximum of 170 hours.

(c) While hours exceeded at some locations in the Cumulative Effect Criteria may increase or decrease, the overall impact of a building on the Wind conditions must be neutral or beneficial.

(d) To show that a development complies with these standards a Wind report must be supplied that meet the requirements outlined in Appendix Petone Commercial 4 – Wind Report.

2. Design Guidelines

…

2.10 Wind

Design Objective

Development does not increase wind intensity in streets and public places.

Buildings which are designed to minimise wind effects and create sheltered, safe and comfortable outdoor areas, can provide a more attractive residential and commercial

mixed use environment. This is particularly important in coastal locations, such as Petone.

[Refer also to District Plan Objective 5B 1.2.3 and relevant associated policies]

Guidelines

1. Buildings should be designed with reference to the existing wind patterns of the site and not increase wind speed at ground level;
2. Projecting and recessive elements (such as balconies, verandahs, set-backs) should be used to reduce the adverse effects of wind at street level; and
3. Consideration should be given to providing sheltered open spaces which respond to the predominant wind directions.

Windy streets are uncomfortable and can be dangerous in high wind speeds. This discourages their use as public spaces.

Windy streets are uncomfortable and can be dangerous in high wind speeds. This discourages their use as public spaces.

5B Appendices

Appendix Petone Commercial 4

Wind Report

Buildings above 12 metres require a Wind assessment report to identify and describe measures for addressing the potential adverse of Wind on public space, including streets.

Typically headings for a Wind assessment report would be:

- Existing Wind conditions/environment.
- Existing built context and environment in terms of height and bulk of surrounding buildings.
- Location of the site relative to public spaces.
- Proposed building height and form.
- Design features proposed to manage Wind effects.

9A 1.2 Site Development Issues

9A 1.2.1 Height, Scale and Location of Building and Structures

Issue

The site on which the Hutt Hospital is located is used intensively, and the scale of buildings is different in character to those in surrounding areas. Future development on the site must be managed to ensure buildings and structures do not affect adversely the amenity values of the surrounding area.

Objective

To ensure that all structures and buildings are designed and maintained to ensure the amenity values of surrounding residential and recreation activity areas, and the streetscape are maintained and enhanced.

Policy

1. To ensure a progressive reduction in height of buildings the closer they are located to a site boundary, maintaining adequate daylight and sunlight for adjoining properties.
2. To require minimum setback requirements from all boundaries to maintain and enhance amenity values of surrounding the activity areas and the streetscape.
3. To ensure that new buildings are of a height, shape and form that adverse effects of wind are managed and mitigated.
4. To ensure that new buildings and structures are of a height, scale and design that adverse effects upon visual amenity values are avoided, remedied or mitigated.

Explanation and Reasons

All new buildings and structures on the site have the potential to affect adversely the amenity values of adjoining sites and the surrounding area if their height, location, intensity and scale is not managed.

Building form, height and location can also affect wind flow patterns which can have adverse effects on pedestrians. Such adverse effects need to be mitigated or avoided.

The Plan will manage the adverse effects of buildings and structures through the use of rules.

The amenity values of adjoining sites will be maintained by restricting the height of buildings in close proximity to residential boundaries.

The visual amenity values of the site when viewed from High Street will also be maintained, by restricting development between the existing buildings and the road frontage.