

**DRAFT TEXT FOR SUSTAINABLE BUILDING GUIDELINES  
(Version 1: September 2007)**

**Section 1: Sustainable Building Guidelines: An Introduction**

Wellington City Council is committed to sustainability, environmental wellbeing, and reducing the city's contribution to climate change. It is working to achieve this in its own operations and to encourage this in the community.

Buildings can have a big impact on the natural environment. The Council has developed these Sustainable Building Guidelines to assist homeowners, tenants, developers, builders and others in making Wellington's buildings more sustainable.

These Guidelines are largely based on a range of valuable resources that have recently been developed in New Zealand, such as the Smarter Homes website ([www.smarterhomes.org.nz](http://www.smarterhomes.org.nz)) and other useful links. The Guidelines draw from this material to explain why sustainable buildings make sense, and what the options are.

We've supplemented this with some Wellington-focused information you might be interested in, such as:

- Wellington-based case studies for sustainable homes and office buildings
- Unique features of Wellington that might affect your choice of sustainable options
- The Council's processes you should know about, and how we can help you with your plans
- Links to other Wellington City Council information on sustainability and environmental well-being

Every building is different, so not all the techniques and features described in these Guidelines are appropriate in every case. Some times there are competing priorities (cost, durability, appearance, etc.), and tradeoffs must be made based on the specific building and the people involved. We provide links to more detailed resources where you can find more information on what might work best for you.

Because most types of building work require a building consent, and some projects require resource consent as well, be sure to contact the Council before beginning work to find out what is required. [and see the section on the right "Working With the Council" for more information].

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## **Section 2: Sustainable Homes**

### **2.1 Why a sustainable home?**

Our homes can have a significant impact on the natural environment. A typical New Zealand home consumes a large portion of valuable resources and is a major contributor to our overall greenhouse gas emissions. Homes account for 13% of New Zealand's total energy consumption and close to 30% of the nation's electricity usage each year. Our gardens are often a source of non-native, invasive species which replace our unique New Zealand fauna and flora.

At the same time, the means and technology are widely available to reduce homes' impact on the surrounding environment. So when renovating an existing home or building a new one, by making the choice to build sustainably you will not only improve your quality of life, but that of future generations also.

**Find out more on: <http://www.smarterhomes.org.nz/why-smarter-homes/what-can-smart-homes-do-for-the-environment/>**

A sustainable home can be thought of as a smart home. It has less impact on the environment, but not at a cost to the occupiers. Quite the opposite – a smart sustainable home offers a range of benefits.

- **Comfort** – A sustainable home is designed to fit your needs perfectly and adapt to your requirements as you move through different life stages.
- **Health** – Many New Zealanders suffer from asthma, headaches, eczema and sneezing fits, which are associated with moulds and other toxins found in most households. Otago University's School of Medicine conducted research that shows that damp homes are among main factors responsible for respiratory problems such as asthma, colds and 'flu. According to the Energy Efficiency and Conservation Authority, about 45% of our homes are too damp. Smart purchases and maintenance ensure that the air in your home is free of toxins, particulates and excessive moisture, protecting your family from respiratory diseases.
- **Warmth** – The Building Research Association of New Zealand has discovered that around 30 percent of our homes are colder than the minimum temperatures recommended by the World Health Organisation: 16°C in bedrooms and 18°C in living areas. A sustainable home harnesses the energy of the sun, capturing the heat to ensure healthy and comfortable temperatures inside the building. A fully insulated house uses only half the amount of energy for heating compared to an uninsulated house. An Otago School of Medicine study found that householders who installed insulation in their home took fewer sick days and visited their doctor less than householders who didn't.
- **Cost** – Insulation, smart heating options, and energy and water efficient appliances are some of the features which can make homes cheaper to run. The payback period for investing in insulation could be as little as one year for a simple hot water cylinder wrap or three years for ceiling insulation. Not only do these measures reduce costs, but greening your home appears to be a wise investment. A survey

conducted by allrealestate.co.nz suggests that one in ten people are prepared to pay up to 25 percent more for a sustainable home. And banks are starting to offer “green mortgages,” providing customers with a package of discounts on eco-friendly home products because they predict that eco-friendly homes retain their value better over time.

**Find out more at the Smarter Homes website: <http://www.smarterhomes.org.nz/why-smarter-homes/why-choose-a-smart-home/>**

## **2.2 What are your options for a sustainable home?**

There is a vast range of things that can be done to make your home more sustainable and to reap the benefits of living smarter. Some can be done right away and are free; others will take longer and require more investment. Many make sense for retrofits as well as for new builds. Some ideas on what you can do include:

- Insulate your walls, ceiling and under your floor to make heating easier and to save on energy costs. Consider double-glazing your windows.
- Utilise the sun's energy – it's free! Orientate your new home for maximum solar impact, install a solar water heater, and consider passive heating options. Talk to your architect for further ideas.
- Choose appliances with high energy efficiency ratings. Swap your regular light bulbs for eco bulbs. When designing your home, allow for maximum natural light penetration to reduce the need for artificial light.
- Choose building materials that do not use or emit toxic chemicals. Look for the Environmental Choice tick of approval. Consider materials sourced locally, to reduce the environmental impacts of transporting them.
- If you can, install a tank for rainwater collection and choose water efficient appliances. Install low-flow fixtures in your bathroom.
- Minimise waste and recycle where possible, especially during the demolition and construction phase.
- Use renewable electricity sources where possible, either by generating it on-site (for example, small-scale wind turbines or micro-hydro) or by choosing a power company that generates from renewable sources.
- Build with comfort in mind, particularly if this is the house you plan to grow old in. Access will become key both indoors and out.
- Choose native and local plant-life for your gardens and landscaping.

Each home is different. Visit the Smarter Homes website ([www.smarterhomes.org.nz](http://www.smarterhomes.org.nz)) to learn about other options and to find more detail on the ideas above. You can use the Homesmarts tool at Smarter Homes to identify the key problems in your home and what technologies and actions will work best for you.

### **2.3 Case studies: sustainable homes**

Here are a few examples of homes in Wellington that have incorporated sustainable features. For more examples, see the Case Studies section of the Smarter Homes website: <http://www.smarterhomes.org.nz/help/case-studies/>

#### **Solar Home**

**Location: Wilton**

**Key features: thermal mass, orientation, passive heating, automatic temperature control**

The home of Wellington architect, Richard Wright, has been designed taking into account “natural conditioning” – the combination of solar heating and natural ventilation. To allow for maximum solar penetration the house is aligned to face north and west, and has been designed to be one room wide throughout.

Air heated by the sun is transferred from the ceiling through a ducting system to a basement rock bin containing 12 tonnes of recycled concrete kerbing, where the heat is stored for use when the temperature drops. Enough heat can be stored to supply the house for a week of sunless days. The system can be reversed in summer to provide the house with cool air.

A pre-programmed thermostat system monitors the internal temperature of the house and opens windows automatically when triggered. Exposed thermal mass floor slabs absorb and release heat in the sunroom and gallery. An internal balustrade uses solar heat to warm water, with the hope that this system can be developed to replace gas water heating altogether.

These features were custom-built into the Wrights’ home, but the principles can also be incorporated into existing homes. For around the price of a good quality home appliance, a natural conditioning system could be installed. For a large house energy savings could be as great as \$1,000 per year.

See [http://www.aonui.co.nz/sustain/ESD\\_projects/solarhome\\_esd.html](http://www.aonui.co.nz/sustain/ESD_projects/solarhome_esd.html) for more details.

#### **Pugh House**

**Location: Northland**

**Key features: onduline cladding, double glazing, passive solar heating**

The Pugh House in Northland incorporates a number of sustainable design features.

Onduline cladding was used for the exterior of the house. This type of cladding is produced from waste paper that is coloured with natural pigment resin then soaked with bitumen under high pressure. It is low maintenance, it offers a high degree of thermal insulation, and it does not rot, rust or become brittle.

Also contributing to the home's insulation is the use of low-emissivity double glazing. Low-E glass has a special coating on one side, which faces into the cavity between the two panes. The coating allows short wavelength solar energy in, but then reflects longer wavelength heat from inside the house back in. This type of double-glazing helps conserve as much energy as normal triple glazing, but does not have the increase in weight that you would get with triple glazing. It also helps reduce condensation considerably. Exposed concrete used for the flooring also helps passive solar heating of the home.

New Zealand plantation-grown macrocarpa was used extensively in the Pugh House. This wood has the benefit of not requiring toxic treatment. Salvaged swamp totara was used for the upper floor of the home.

Contact information: [www.mellingmorse.co.nz](http://www.mellingmorse.co.nz)

### **Renovating for Sustainability**

**Location: Kilbirnie**

**Key features: insulation, central heating, air lock**

Vicki's three bedroom villa in Kilbirnie is a lot warmer these days than when it was built back in 1901. Like many Wellington homes it is situated against a hill, meaning it gets the morning sun but then loses it early, especially in winter.

The house was very drafty and the living areas are not carpeted, so the first step they took was to have under-floor insulation installed. Other means to stop the drafts were also used – curtains were hung on all the windows and draft-stop sausages were used for the doors. Vicki made these herself and filled them with small stones and untreated wood shavings, which were obtained for free from a timber yard. They also confirmed that their ceiling insulation was up to Building Code standards, to see if any improvements could be made in that area.

A central heating system using a gas boiler radiator was installed, to replace the use of electric oil heaters.

The next work done was to enclose the front porch area, thereby creating an air lock between the house and the outside. Insulation was also built into the walls between the porch and the front bedroom. They now find it easier to heat the front bedroom, which has a window opening out into the now enclosed porch.

Plans for the future include laying black polythene down on the ground under the house to stop moisture evaporating from the soil and coming up through the floor. They are also considering getting secondary double-glazing. This costs less than replacement wooden frames and is less likely to diminish the older home's character than aluminium frames.

## **2.4 Resources for Sustainable Homes**

Sustainable homes are very quickly becoming mainstream and there is now a wide range of resources and programmes that you can take advantage of to make sure that you don't get left behind. Visit the websites below to get an idea of what is out there.

### **Information and Advice:**

Smarter Homes: [www.smarterhomes.org.nz](http://www.smarterhomes.org.nz)

For reliable and independent information how to design, build and renovate 'smarter' – more sustainable - homes. It has a Homesmarts tool allowing you to evaluate the current performance of your home, and to get tips on what improvements will best suit your circumstances and your budget.

Level: [www.level.org.nz](http://www.level.org.nz)

For information about sustainable building tailored specifically to the construction industry.

BRANZ Sustainable Construction:

[www.branz.co.nz/main.php?page=Sustainable%20Construction](http://www.branz.co.nz/main.php?page=Sustainable%20Construction)

For details of work undertaken by the Building Research Association of New Zealand in the area of sustainability in the construction industry, including the "Easy Guide to Eco-Building" and a description of the "Green Home Scheme."

Sustainable Living: [www.sustainableliving.org.nz](http://www.sustainableliving.org.nz)

For useful information on organic gardening, composting, responsible shopping and other sustainable living issues.

Beacon Pathway: [www.beaconpathway.co.nz](http://www.beaconpathway.co.nz)

For details of research being carried out to help New Zealanders find affordable and attractive ways to make our homes more sustainable.

Environmental Choice NZ: <http://www.enviro-choice.org.nz/>

For details of this environmental labelling programme and a list of licensed products.

EnergyWise: [www.energywise.org.nz](http://www.energywise.org.nz)

For tips on how to be energy wise, including a calculator to work out your energy savings, and easy tips on how to save energy and keep warm.

### **Training courses and events:**

Wellington High School Community Education: [www.cecwellington.ac.nz/course/home](http://www.cecwellington.ac.nz/course/home)

Wellington High School's Community Education Centre offers the Sustainable Households learning programme, which aims to help people learn how to make changes in their own homes to lessen impacts on the planet, improve health and to save money.

Building Biology and Ecology Institute: [www.ecoprojects.co.nz](http://www.ecoprojects.co.nz)

The Building Biology and Ecology Institute offers courses and workshops for people interested in building their own Eco Home and for builders wanting to focus on healthy and ecologically sound building practices. Students can study towards the Certificate in Ecological Building and Design by correspondence or, for those people who are not interested in getting a qualification, the course materials are offered in a DIY format for people to work through in their own time.

Victoria University's Sustainable Architecture course:

[www.vuw.ac.nz/architecture/courses/ARCH-222.aspx](http://www.vuw.ac.nz/architecture/courses/ARCH-222.aspx)

Victoria University's degree paper Sustainable Architecture gives an introduction to the ideas, issues and concepts of sustainable architecture. As part of the course work, students complete projects looking at ways to make new materials from waste, particularly construction and demolition waste. The course is available for second year Architecture and Design students.

**Grants:**

EnergyWise Home Grants: [www.eeca.govt.nz/residential/energywise-home-grants](http://www.eeca.govt.nz/residential/energywise-home-grants)

The EnergyWise grants scheme provides funding, with a focus on low-income households, for insulation and energy efficiency measures in houses built before 1978 (when home insulation became mandatory). Twelve thousand homes a year are benefiting from the scheme.

SolarSmarter: [www.solarsmarter.org.nz](http://www.solarsmarter.org.nz)

The Government has launched a website and cash grant scheme to encourage householders to install solar water heating systems and to ensure high industry standards are achieved. A \$500 grant is available, to cover part of the installation costs by approved suppliers.

## **Section 3. Sustainable Commercial Buildings**

### **3.1 Why a sustainable office?**

Improving the sustainability of commercial buildings makes good business sense, both for the landlord and the tenant. Sustainable buildings are more economic to run. They reduce waste and are much more efficient in their use of key resources such as land, energy, water and materials. They also tend to be healthier and more comfortable. Improved levels of natural light, cleaner air and a higher degree of personal control lead to increased productivity. Sustainable buildings are also adaptable and durable enough to meet the requirements for flexibility and needs of future generations of building occupiers.

- Energy costs for sustainable commercial buildings are on average 35–50% of those for similar conventional buildings.
- A survey conducted on buildings in New Zealand showed that sustainable buildings generally scored in the top 5% for user satisfaction and potential productivity benefits.
- The difference in the initial capital cost of sustainable buildings compared to conventional good quality buildings varies quite widely (from 15% less to 11.5% more), with sustainable features initially costing an average of 2–6% more.
- Offices labelled ‘green’ can increase publicity and attractiveness to potential customers, employees and investors. A high “Green Star” rating from the New Zealand Green Building Council ([www.nzgbc.org.nz](http://www.nzgbc.org.nz)), for example, can be a valuable marketing tool.

Find out more about the benefits of sustainable office buildings at:

(<http://www.mfe.govt.nz/publications/sus-dev/value-case-sustainable-building-feb06/value-case-sustainable-building-feb06.pdf>)

### **3.2 What are the options for sustainable commercial buildings?**

The range of sustainable strategies being adopted for commercial buildings is growing and has moved from conscious attempts to save energy to increasingly holistic approaches, which address not just energy but a wider range of environmental issues including water use, materials selection and waste management. Examples of sustainable options in the office include:

- Green roofs – consider planting grasses and shrubs on your roof. The plants will reduce your building’s greenhouse gas emissions by absorbing carbon dioxide, reduce and treat stormwater runoff, and provide an excellent amenity for the occupiers.
- Rain water – collect rain water from your roof to use in the toilets, minimising mains water use, reducing flood risk, and saving on energy costs required to pump the water up your building.
- Passive heating and cooling – insulate and use materials with good thermal mass properties to ensure that heating and cooling is achieved with minimal energy expenditure.
- Lighting – ensure maximum use of day light, use energy-efficient light bulbs, and consider installing sensors so that lights are only as bright as needed, and only on when required.
- Electronic technology -- controls for heating/cooling result in significant savings. User interfaces such as screens showing occupants how much energy the building is using can increase occupants’ awareness and influence positive behaviour.
- Tuning – ensure that the building systems work efficiently and no water or energy is wasted needlessly.
- Construction waste -- put in place an environmental management system to reduce, reuse and recycle as much waste as possible, and to control stormwater and sediment runoff.

For large scale developments engaging with the design team and telling them what you want early in the design process is vital. Quite often it is the first ten minutes of the first meeting that most decisions are made about a project. Sustainability has to be stressed in this time.

### **3.3 Case Studies: Commercial Buildings**

Here are a couple examples of new sustainable commercial buildings in Wellington. For more examples in New Zealand and elsewhere, check the “Resources” section of the New Zealand Green Building Council website ([www.nzgbc.org.nz](http://www.nzgbc.org.nz)).

#### **Conservation House – Te Whare Atawhai**

**Location: Manners Street**

**Key features: sustainable materials, chilled beam system, green roof, rain water collection, eco-lighting**

The Department of Conservation’s new head office on Manners Street was designed with long term sustainability in mind. Located in the old Mid City movie theatre complex, the building was designed to reduce impacts on the environment, both during the construction phase and on an ongoing basis.

Wood used for internal doors, framework and panelling was sourced from sustainable plantation timber. Carpet tiles were chosen for flooring as less water and energy is used in their production than conventional carpet, and less waste is produced as worn tiles can be replaced individually.

The building uses an active chilled-beam system for temperature control. Warm air rises and passes around water-carrying coils in the ceiling beams. The cool air descends into the room and is replaced by rising warm air, creating an airflow cycle. In winter heated water runs around the coils, so the surrounding air is warmed. Waste heat in the building is captured by heat pumps and used to heat water.

A large atrium running through the building encourages airflow and allows natural light in, reducing the need for artificial lights. A rooftop café with a native garden gives staff an outdoor area without leaving the building. A wind turbine has recently been installed on the roof to provide power to the café area. Eco bulbs and sensors have been used throughout the building, allowing it to use 40% less power than conventional office buildings.

A rainwater collection system is used for toilets, gardening and cleaning and has resulted in a 60% reduction in use of mains water. Motion sensors in the tapware and low-flow fittings installed in the bathrooms further reduce water use.

Behavioural influences have also been incorporated in the building design. The stairwell has been placed in a central area to encourage the use of stairs instead of lifts. A large bike rack is provided and the building is adjacent to a bus stop. To reduce waste to landfill, individual rubbish bins were replaced by recycling stations and organic waste collection bins.

Contact information: Conservation House, 18-32 Manners St, Wellington, Ph (04) 471 0726, [www.doc.govt.nz](http://www.doc.govt.nz).

See <http://www.doc.govt.nz/templates/MultiPageDocumentTOC.aspx?id=43014> for more details.

### **Meridian Energy**

**Location: Kumutoto development, Wellington waterfront**

**Key features: construction and demolition waste minimisation, REBRI, green office, rain water collection**

Right from the word “go”, the new six storey head office for Meridian Energy took into account ecologically sustainable design, in line with their commitment to carbon neutrality, reducing their environmental footprint, and encouraging partners and suppliers to operate sustainably.

The comprehensive design specification set out what Meridian wanted to achieve, and covered all aspects from the proximity of the site to public transport and use of environmentally healthy materials, through to the installation of monitoring equipment so energy use can be tracked and efficiencies gained.

In New Zealand, construction and demolition waste accounts for 40% of waste sent to landfill. A major aim of this development was to reduce this source of waste. A waste specialist, sponsored by Ministry for the Environment, worked with the contractors to help implement the REBRI (Resource Efficiency in the Building and Related Industries) guidelines. A Waste Minimisation Plan was written, which included actions such as keeping a waste register, putting in place a recycling programme, and staff awareness and training. Implementation of this plan has resulted in 64% of waste being recycled.

Features were incorporated to ensure that the office is a pleasant and productive place for staff to work. Maximum natural light and views for the majority of staff were specified, along with maintaining indoor comfort through draft minimisation and automatic temperature controls that staff can manually override if required.

The office has been designed to use 60% less energy and 70% less water than comparable office buildings. These savings are achieved through a number of features, including a rainwater collection system, water efficient sanitary equipment, use of solar water heating and mixed mode ventilation.

The aim is for the building to be the first new office building in New Zealand to achieve the Green Building Council’s five-star rating. Completion is due in late 2007.

Contact information: Meridian Energy, Kumutoto Site 7, North Queens Wharf, Wellington.  
Ph 0800 496 496

[www.meridianenergy.co.nz](http://www.meridianenergy.co.nz)

See [www.meridianenergy.co.nz/AboutUs/NewWellingtonoffice/](http://www.meridianenergy.co.nz/AboutUs/NewWellingtonoffice/) for more details.

### **3.4 Resources for sustainable commercial buildings**

Improvements in sustainability can be made across the whole scope of building and running commercial buildings, right from building design through to purchasing office supplies. Go to these websites for details of initiatives being taken or for general information in the area of commercial buildings:

New Zealand Green Building Council: [www.nzgbc.org.nz](http://www.nzgbc.org.nz)

Learn about a new rating tool for commercial buildings recently developed by the NZGBC. The tool, called Green Star NZ, gives a rating based on eight environmental performance areas, and can be applied during the different stages of a building's development – design, build and performance.

Building Code Review: [www.dbh.govt.nz/bcl-building-code-review](http://www.dbh.govt.nz/bcl-building-code-review)

For more information on the review of the Building Code being undertaken by the Department of Building and Housing.

BRANZ Sustainable Construction:

[www.branz.co.nz/main.php?page=Sustainable%20Construction](http://www.branz.co.nz/main.php?page=Sustainable%20Construction)

For details of work undertaken by the Building Research Association of New Zealand in the area of sustainability in the construction industry, including the “Easy Guide to Eco-Building” and a description of the “Green Home Scheme.”

Sustainable Business Network: [www.sustainable.org.nz](http://www.sustainable.org.nz)

The Sustainable Business Network offers information for businesses interested in sustainable development, including tips on how to make your vehicle fleet “green,” updates on government sustainability policies, and tips on how to make your office operations more sustainable.

Reducing Building Material Wastes: [www.rebri.org.nz](http://www.rebri.org.nz)

For guidelines on waste minimisation projects in design, construction and demolition of buildings.

EECA Crown Loan Scheme: [www.eeca.govt.nz/government/crown-loans](http://www.eeca.govt.nz/government/crown-loans)

EECA's Crown Loan Scheme offers full or partial funding to government agencies, including schools, polytechnics and universities, for projects aimed at improving the energy efficiency of buildings and facilities.

## **Section 4: Wellington-specific considerations**

### **Wind:**

We all know that Wellington is a windy city. Yearly average wind speeds are 5.8 m/s at Kelburn and 7.5 m/s at the Airport, and most days there are gusts that far exceed those average speeds. The strongest winds are usually felt in late spring. The most common wind directions are northerly (most frequently between October and January) and southerly (most frequently between May and August). The speed of Wellington's predominant northwesterly flow is expected to increase over time as a result of climate change.

In terms of sustainability, one of the opportunities of high wind speeds is the potential for renewable energy generation by wind turbines, for direct use in homes and businesses and potentially for contribution to the wider grid. Wellington is particularly well-suited for wind energy because the average monthly wind speed does not alter much throughout the year. Topography is an issue though; a site may be too sheltered from the wind to operate a turbine effectively, or the wind may be funnelled by external features so that the speeds are too high and would damage a turbine. Detailed wind and load analysis should take place by a suitable professional before decisions are made on wind turbine location. There are also potential environmental effects on neighbouring properties due to visual impact and noise, so it is important to meet the requirements of the Council's District Plan [[www.wellington.govt.nz/plans/district/districtplan.html](http://www.wellington.govt.nz/plans/district/districtplan.html)].

A less favourable effect of high wind speed is that it causes heat loss from a building, so a site should be chosen to protect the dwelling from wind. In general the southerly winds which blow through Wellington are colder than their northerly counterparts. Local characteristics like neighbouring buildings or certain landscape combinations may funnel or accelerate wind speed in a section's direction.

Wind protection can be provided by the unique topography of the area, a tree shelter belt, or a combination of both. On a flat site, shelter can be provided by using either neighbouring buildings or rows of trees/shrubs.

When considering shelter from winds, however, care should be taken to ensure that solar access to the house is not blocked. Tradeoffs may need to be made here, depending on your priorities.

If a shelter belt is required, an effort should be made to locate a section with an existing shelter belt, or existing trees somewhere on the site that can be moved to provide protection. If new planting is needed, native trees and shrubs should be used since the high winds in Wellington can "burn" and kill some plant life.

Specific Engineering Design solutions might be required due to high wind loads at a site. The Council can provide more information on specific sites.

**Topography:**

Wellington's hilly topography presents challenges and opportunities for sustainable buildings.

The hills can affect solar access. On the one hand, north-facing slopes can provide good solar access for natural light and passive solar heating, as well as potential solar water heating. On the other hand, south-facing slopes can make it challenging to harness the sun's energy.

As mentioned above, Wellington's hills can offer opportunities to shelter buildings from high winds and the resulting heat loss, but this may need to be balanced with a desire for solar access and views.

One of the sustainability challenges of steep slopes is the potential for erosion, particularly during rain events. In addition to damaging the landscape from which soil and vegetation is removed, the sediment can choke watercourses and reduce the healthiness of aquatic life.

**Temperature:**

Wellington has a relatively mild climate. Because the average Wellington house typically suffers less than 5 days per year with uncomfortably hot temperatures, overheating is generally not a problem, and this is not expected to be greatly affected by climate change in this century. As a result, tinted windows are not generally required in Wellington, though homes with large westerly facing windows may require tinting to reduce overheating in the summer months.

While winters are relatively mild, they can still produce some cold days and nights, so double glazing is ideal, with low-e surfaces and argon filling where possible. The Building Code's new requirements for thermal efficiency will make double glazing almost mandatory in the Wellington region (part of Climate Zone 2) from 30 June 2008. The Standards NZ handbook 4244 shows how R-values beyond the existing and planned Building Code minimums can be achieved for various building components in Climate Zone 2.

Wellington's winter temperatures mean that hot water cylinders should definitely be wrapped in insulation. Pipework should also be insulated and reduced in length where possible.

**Corrosion from sea water:**

Quite often people view sea spray corrosion as a problem associated with living next to the beach. However, even in the relative shelter of Wellington's harbour, any home near the water must be protected against highly corrosive sea water. NZS 3604 (the New Zealand standard for the design and construction of timber-framed buildings) defines a sea spray zone as any area "within 500m of the sea including harbours, or 100m from tidal estuaries and sheltered inlets." This definition incorporates a large portion of Wellington.

NZS 3604 specifies stainless steel fixings, ties, nails and fastenings for any construction within 500m of the sea. Those areas of Wellington not within 500m of the sea are still classified as being in exposure zone 1 and again require stainless steel for the majority of fixings used in construction.

Wellington's frequent rain cannot be relied upon to remove all corrosive build-up from your home. Care must be taken to ensure sheltered areas such as under verandas and eaves are cleaned regularly to prevent the build-up of corrosive agents like salt water residue.

**Soil and drainage:**

Wellington has a mixture of thin weathered rock and clay-based soils over underlying greywacke on steep slopes that do not retain water. As a result, opportunities for natural stormwater treatment or retention occur infrequently. The Council's Drainage Officer can provide more guidance on specific situations.

**Planting:**

See the Wellington Regional Native Plant Guide for tips on helping our native ecosystems survive and flourish, while beautifying your garden or rural property.  
[[www.bethedifference.gw.govt.nz/section1658.cfm?](http://www.bethedifference.gw.govt.nz/section1658.cfm?)]

**Rainfall:**

Wellington receives an average of 1200 - 1400 mm of rain per year, similar to the national average. Most rain occurs during the winter months, but heavy rainfall episodes can occur at any time. As a result of climate change, Wellington is expected to become even wetter over time.

From a water supply perspective, this rainfall is helpful; it means that droughts are unlikely. However, it is still costly to treat and distribute drinking water, so rainwater harvesting for non-potable uses like watering gardens or flushing toilets can provide economic benefit, as well as the environmental benefit of reducing the impact of rain events on the stormwater system.

Flooding can also be an issue in Wellington. Though not directly related to building design, it is a sustainability issue worth considering. Current flood hazard areas can be found on the Council's District Plan maps  
[[www.wellington.govt.nz/plans/district/volume3/vol3.html](http://www.wellington.govt.nz/plans/district/volume3/vol3.html)].

In combination with steep slopes, Wellington's high rainfall can be a recipe for erosion. To minimise erosion, any earthworks should take place during the summer months. A good local resource is Greater Wellington's guide to erosion and sediment control on small sites.  
[[www.gw.govt.nz/council-publications/pdfs/Small\\_sites\\_guide.PDF](http://www.gw.govt.nz/council-publications/pdfs/Small_sites_guide.PDF)]

**Other hazards**

In addition to the potential hazards of erosion, slips and flooding mentioned above, Wellington's location on a fault line means that there is significant risk of potential

earthquake damage. The Council's District Plan maps (see link above) show hazard areas for potential earthquakes as well as flooding.

**Public transport:**

Choosing a building site that is close to a public transport route, walkways or cycleways can decrease the need for private motor vehicle use, reducing greenhouse gas emissions. For information on the Wellington area's public transport network, visit the Metlink site. [[www.metlink.org.nz](http://www.metlink.org.nz)] To find out more about Council's walkways, see [[www.wellington.govt.nz/services/walkways](http://www.wellington.govt.nz/services/walkways)].

## **Section 5: Working with the Council**

Most types of building work require a building consent to ensure compliance with the Building Act 2004, and with the New Zealand Building Code. The council, through its building services team, is responsible for administering this process. For information on the building consent process and other building services the Council offers, go to [[www.wellington.govt.nz/services/buildserv/index.html](http://www.wellington.govt.nz/services/buildserv/index.html)]. The brochure “A General Guide to the Building Consent Process” can be found at [[www.wellington.govt.nz/services/buildserv/pdfs/buildconguide.pdf](http://www.wellington.govt.nz/services/buildserv/pdfs/buildconguide.pdf)].

In addition to a building consent, a resource consent is required if your proposal does not comply with the rules of the District Plan. Information on the resource consent process can be found at [<http://www.wellington.govt.nz/services/reconsent/index.html>]. That page summarises the District Plan rules for inner residential and outer residential areas. For more detail or information on non-residential areas, the provisions of the District Plan can be found at [[www.wellington.govt.nz/plans/district/districtplan.html](http://www.wellington.govt.nz/plans/district/districtplan.html)]. The Council’s guide “Understanding Wellington City’s District Plan” can be downloaded at [[www.wellington.govt.nz/plans/district/understandplan/pdfs/understanding.pdf](http://www.wellington.govt.nz/plans/district/understandplan/pdfs/understanding.pdf)].

The Council has proposed changes to the District Plan to encourage the use of renewable energy sources [[www.wellington.govt.nz/plans/district/planchanges/planchange32.html](http://www.wellington.govt.nz/plans/district/planchanges/planchange32.html)] and to encourage sustainability and energy efficiency in the Central Area [<http://www.wellington.govt.nz/plans/district/planchanges/planchange48.html>]. The potential for additional regulatory and financial incentives for sustainable buildings is being explored.

The Council can offer other forms of assistance and advice beyond its regulatory services. For example, the Council’s Southern Landfill is able to compost untreated timber and some gib boards, so it is worth contacting the Council during the demolition and fitout stages to discuss sustainable disposal options.

## Section 6: Buildings in Context: Sustainable Development

Sustainable buildings are an important component of a wider sustainable built and natural environment. Where a building is located, and how it relates to its surroundings, is as important as how it is constructed. Many of these decisions are made at the subdivision or neighbourhood level, where lots are designed and transport networks planned, or at a wider scale when decisions are made about where and how the city will grow.

The Council's urban development activities

[[www.wellington.govt.nz/services/urban/index.html](http://www.wellington.govt.nz/services/urban/index.html)] are therefore a key part of the context for sustainable buildings. The Urban Development Strategy

[[www.wellington.govt.nz/plans/strategies/pdfs/urbandev.pdf](http://www.wellington.govt.nz/plans/strategies/pdfs/urbandev.pdf)] plans for compact growth around public transport nodes and corridors, and the Northern Growth Management Plan

[[www.wellington.govt.nz/projects/new/northerngrowth/ngrowthmanagement.html](http://www.wellington.govt.nz/projects/new/northerngrowth/ngrowthmanagement.html)] outlines principles for growth in greenfield areas on the city's northern edge. The Council's Transport Strategy [[www.wellington.govt.nz/plans/strategies/pdfs/transport.pdf](http://www.wellington.govt.nz/plans/strategies/pdfs/transport.pdf)] supports compact growth, public transport, travel demand management, and other sustainability features of the built environment.

At the subdivision level, the Council's District Plan includes a Subdivision Design Guide [[www.wellington.govt.nz/plans/district/volume2/pdfs/v2subdivision.pdf](http://www.wellington.govt.nz/plans/district/volume2/pdfs/v2subdivision.pdf)], which contains sustainability principles and techniques. It is currently being revised as part of Plan Change 46 [[www.wellington.govt.nz/plans/district/planchanges/planchange46.html](http://www.wellington.govt.nz/plans/district/planchanges/planchange46.html)] to further strengthen the sustainability components.

The Council's Code of Practice for Land Development

[[www.wellington.govt.nz/services/urban/codeofpractice/code.html](http://www.wellington.govt.nz/services/urban/codeofpractice/code.html)] also guides development, with a focus on minimum standards for the design and construction of infrastructure (i.e. earthworks, roading, water and drainage).

Another useful guide to sustainable subdivision is Standards NZ's NZ44: 2001 "Subdivision for People and the Environment"

[[www.qualityplanning.org.nz/pubs/subdivision-people-environment.pdf](http://www.qualityplanning.org.nz/pubs/subdivision-people-environment.pdf)].

The Council's Environmental Strategy focuses on the city's natural environment, as well as energy and waste, and provides context for a variety of Council's environmental goals and programs. See [[www.wellington.govt.nz/services/environment/index.html](http://www.wellington.govt.nz/services/environment/index.html)] for more information.

[Other potential links:

composting ([www.wellington.govt.nz/services/rubbrecyc/composting.html](http://www.wellington.govt.nz/services/rubbrecyc/composting.html))

recycling ([www.wellington.govt.nz/services/rubbrecyc/recycling/recycling.html](http://www.wellington.govt.nz/services/rubbrecyc/recycling/recycling.html))

Kai-to-Compost ([www.wellington.govt.nz/services/rubbrecyc/kaitocompost.html](http://www.wellington.govt.nz/services/rubbrecyc/kaitocompost.html))]