

# Wynyard Central Sustainability Standards



Sustainability Standards for eight development parcels in Wynyard Central.  
To be read in conjunction with the Wynyard Central Design Guidelines.

**Waterfront  
Auckland** 

*An Auckland Council Organisation*

Issued for EOI stage 2. 31 July 2013

## WYNYARD CENTRAL SUSTAINABILITY STANDARDS

Waterfront Auckland is committed to achieving a high level of sustainability in the redevelopment of the Waterfront and has produced a Sustainable Development Framework. The Waterfront Plan sets out the goal of a blue-green waterfront, 'a resilient place where integrated systems and innovative approaches are taken to enhance the marine and natural ecosystems, conserve natural resources, minimise environmental impacts, reduce waste, build sustainably and respond to climate change.' Other Waterfront Plan goals set out social, economic and cultural aspirations as part of a comprehensive approach to sustainability. Wynyard Central is expected to be an exemplar of sustainable waterfront revitalisation.

Waterfront Auckland has undertaken significant research and analysis to determine the development expectations in Wynyard Central and the sustainability standards have had wide peer review. Precinct modelling and analysis has identified the following priorities:

- High performance buildings
- Energy efficiency
- Water efficiency and rain water re-use
- Renewable energy – solar photovoltaics (PV) for energy and solar hot water
- Sustainable transport modes

These standards describe the **environmental sustainability requirements** for the development of Wynyard Central and any development proposals will be required to meet or better these standards. Guidance for achieving the high quality design and architectural outcomes expected by Waterfront Auckland are outlined in the Wynyard Central Design Guidelines.

It is a requirement that all commercial and mixed use development over 2000m<sup>2</sup> will be Green Star accredited through the New Zealand Green Building Council. [www.nzgbc.co.nz](http://www.nzgbc.co.nz)

All residential units are required to be certified with a Homestar rating of at least 7 through the New Zealand Green Building Council and BRANZ. [www.homestar.org.nz](http://www.homestar.org.nz).

While there is a 5 Green Star minimum, a design for 6 Green Star is required as part of the design process where opportunities to go beyond 5 star performance will be identified and will increase knowledge of the design options and marginal costs. This is provided for in the Development Agreement.

Where it can be demonstrated that the performance standards can be exceeded and there is a desire to showcase innovative sustainability strategies, Waterfront Auckland may agree to an alternative verification method (instead of Green Star or Homestar) for quality assurance.

In addition to the Green Star and Homestar certification requirements, there are specific standards that relate to Waterfront Auckland's priority areas identified above.

Waterfront Auckland seeks assurance of the ongoing performance of buildings in the precinct. Monitoring of building performance and sharing of data with Waterfront Auckland is therefore a requirement. As part of Waterfront Auckland's commitment to sustainability and for educational purposes, Waterfront Auckland may report the performance of Wynyard Central and individual building performance on the Waterfront Auckland website.

Implementation of these standards is expected to contribute to a 45% reduction in greenhouse gas emissions across Wynyard Quarter compared to a Business as Usual redevelopment.

Waterfront Auckland's overarching Sustainable Development Framework 2013 sets out the vision, objectives and commitments to the sustainable revitalisation of the waterfront. It includes broad development expectations, an implementation strategy (including actions Waterfront Auckland will take to advance sustainability and the tools that will be used) as well as sustainability targets. An ability to demonstrate alignment with Waterfront Auckland's sustainability approach in development proposals is required.

The specific standards are set out in the following table.

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
<b>Natural Hazards</b>	Minimising risk	All developments are designed and built to reduce risk from natural hazards. Design responses could include higher floor levels and low impact design for flood events and safe egress/access out of the area in the event of a natural hazard.	Designs of buildings, public realm and infrastructure will demonstrate that risk from natural hazards has been considered. Design responses to minimise risk could include higher ground floor levels and low impact design approaches for flood events and safe egress/access out of the area in the event of a natural hazard.	No specific target
	Ensuring resilience	<p>Placement of critical infrastructure in areas susceptible to flooding is avoided.</p> <p>Stormwater systems are designed to accommodate the effects of extreme weather and flooding events.</p> <p>Businesses at the waterfront have continuity plans in place to deal with disturbances from natural hazard events.</p>	<p>Placement of critical infrastructure in areas susceptible to flooding is avoided.</p> <p>Stormwater systems are designed to accommodate the effects of extreme weather and flooding events.</p>	No specific target
<b>Climate Change - mitigation</b>	Greenhouse gas emissions	All developments will be low carbon. This will primarily be achieved through being energy efficient, incorporating renewable energy, promoting sustainable transport modes, minimising waste to landfill and selection and source of building materials.	<p>No specific standard.</p> <p>Energy efficiency, renewable energy, transport and waste standards will all contribute to reduction of greenhouse gas emissions.</p>	45% reduction in CO <sub>2</sub> emissions over BAU by 2030.
	Precinct passive design	Designs of new developments will maximise microclimate, solar access, natural ventilation and natural light to minimise the need for heating, cooling and artificial lighting.	<p>All glazing to be double glazing as a minimum with performance characteristics to meet Green Star and Homestar requirements and energy targets (with the exception of some character buildings).</p> <p>Appropriate sun control and design for passive solar gain in winter. Minimise overshadowing and southerly aspect. Shallow floorplates to maximise cross ventilation and light.</p> <p>Mixed mode ventilation to offices and other non-residential uses.</p> <p>Residential floorplates will combine a mix of deeper double aspect apartments and smaller single aspect apartments. Deep floorplates with long stretches of double-loaded corridors with single aspect apartments will be avoided.</p>	No specific target

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
			<p>Residential units to be designed to minimise the need for heating and cooling, with the expectation that apartments be designed to not require heating and be naturally ventilated.</p> <p>If heating is to be installed in residential units, this must be high efficiency. If heat pumps are provided they must have a minimum 5 star rating.</p>	
	Precinct renewable energy generation	<p>Building design optimises the roof space available for solar and makes this space available for installation of solar panels to maximise the provision of on-site renewable energy.</p> <p>Waterfront Auckland and a third party solar provider or consortium to work with development partners to facilitate the delivery of a precinct-wide solar system.</p>	<p>All developments (unless otherwise agreed with Waterfront Auckland) to be designed to accommodate solar photovoltaics (PV). Residential developments to incorporate a combination of solar PV and solar hot water heating panels. Alternatively heat pump hot water systems can be used.</p> <p>Waterfront Auckland recognises the challenges and opportunities that exist in developing a precinct-wide system and anticipates working with a third party to deliver the system. This will help to minimise impacts on development partners but will require cooperation between parties. Developers will liaise with Waterfront Auckland's chosen solar partner/s through the building design process to ensure solar is integral to the design. Developers/building owners will then grant access rights to roofspace for solar installation to be carried out by Waterfront Auckland's chosen solar partner/s.</p> <p>New developments to incorporate a roof design that optimises solar energy generation. This will mean giving consideration to roof slope, orientation and solar access and avoiding locating plant or venting equipment on roofspace if possible. If this is not possible, the space taken up by this equipment should be minimised, with a minimum of 70% of roofspace on each building left clear for the installation of solar.</p> <p>Roofs will be designed to be PV ready. This will include the following: roof cladding and structure designed to allow a solar framing system to be fitted at a later date (without voiding the roof warranty); ensuring adequate structural support for the increased loading of a future solar panel system (both live and dead loads).</p> <p>New developments will also need to incorporate the following: provision of an accessible pathway/route from the PV array to the main switchboard for cabling and conduit; safe access to the roof for installation and maintenance; provision of adequate shaded and ventilated space for inverter equipment to</p>	<p>Initial – onsite sources 5%  10 yr target – onsite sources 10%  30 yr target – onsite sources 30%</p>

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
			<p>be mounted (preferably not at roof level but close); availability of access to inverter equipment for servicing and/or to shut down the solar system; provision of dedicated risers to street or basement level; and connection to the grid or the development's main switchboard.</p> <p>For solar water heating, provision of a route from the roof to hot water cylinder and a socket outlet for future installation of a solar water heating controller.</p>	
<b>Climate Change - adaptation</b>	Designing for future climate - flooding/sea level rise/storm surge/extreme weather events	<p>Developments will adopt resilient design principles and be adaptable to predicted climate effects including more severe and frequent weather events and predicted sea level rise and associated potential rise in water table. This will involve consideration of risk and resilience to both flooding and drought.</p> <p>Design of residential and non-residential buildings will ensure the comfort of occupants in a future climate that may be warmer.</p> <p>Developments will adopt a Low Impact Urban Design and Development (LIUDD) approach.</p> <p>Designs for the public realm incorporate shade, shelter and green space.</p> <p>Stormwater systems designed to accommodate extreme weather and flooding events.</p>	<p>Buildings designed to be wet-proof and incorporate resilient design principles to ensure adaptability to changes in future climate and aid recovery from any flooding at ground or basement levels.</p> <p>Consideration will be given to: location of critical infrastructure, plant and equipment to avoid potential damage from flooding in extreme weather events; provision of emergency power and the ability to use the solar photovoltaic system in the event of a prolonged mains power failure; provision of fillable emergency water storage and pumping equipment in conjunction with rainwater harvesting system; allowance for manual control of the interior environment in prolonged power outages in an extreme weather event; protectable entry points to buildings and basement either by temporary sandbagging or by a designed solution (e.g. ability to fit storm boards); provision of waterproofed basement pumping stations for potential pump out of basements after an extreme weather event; consideration of more extreme wind and rain loading effects than current code requirements; buildings on external sites exposed to the coast to incorporate appropriate protection from storm surges.</p> <p>Developments will adopt a Low Impact Urban Design and Development (LIUDD) approach.</p> <p>Stormwater infrastructure to be sized to accommodate extreme weather and flooding events.</p> <p>Landscaping designed to be resilient to cope with potential flooding events as well as drought conditions.</p>	No specific target

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
<b>Resource Efficiency</b>	Energy efficiency	All developments will have a high level of energy efficiency and have energy efficient lighting and appliances.	<p>Energy efficiency targets:<sup>1</sup>  Office - 80 kWh/m<sup>2</sup>/year  Residential - 40 kWh/m<sup>2</sup>/year</p> <p>All glazing to be double glazing as a minimum with performance characteristics to meet Green Star and Homestar requirements and energy targets (with the exception of some character buildings).</p> <p>All lighting is LED or technology of equivalent or better performance.</p> <p>Residential - Score minimum of 11.5 in Homestar EHC 6 thermal calculator.</p> <p>Developers to provide a full appliance package of the highest energy and water star ratings available, for all residential units.</p> <p>Retail and other ground floor uses are required to use energy efficient lighting and appliances.</p>	Office - 80 kWh/m <sup>2</sup> /year Residential - 40 kWh/m <sup>2</sup> /year Public spaces - 40% reduction in energy use against baseline.
	Building design, performance and lifetime use	<p>All buildings will be low carbon, energy and water efficient and designed to meet set performance standards.</p> <p>Office buildings will be of a minimum standard of a 5 star Green Star built rating. Tenants will match the base building rating with a minimum 5 star interiors fit-out rating. Residential developments will achieve a minimum 7 star Homestar rating.</p> <p>Energy and water use will be monitored to ensure that they perform as designed and to allow tuning of building systems to improve performance.</p> <p>Data collected will inform targeting of reductions and awareness and behaviour</p>	<p>Minimum 5 star Green Star built rating for office buildings over 2000m<sup>2</sup>. Other non-residential buildings and offices of less than 2000m<sup>2</sup> will be designed to an equivalent standard of performance; obtaining a rating will be optional.</p> <p>Requirement to maximise Green Star credits in the following areas: energy, transport, water.</p> <p>The hotel is expected to achieve an equivalent performance to 5 Green Star minimum. Green Star certification may be required using a custom Green Star rating tool.</p> <p>Residential buildings to achieve a minimum 7 star Homestar rating. The developer shall carry out the full range of Homestar stages including initial appraisal design rating and certified ratings for each apartment.</p> <p>Requirement for building owners/operators to undertake a high level of building commissioning, tuning and continuous commissioning/maintenance to ensure on-going sustainable performance over the development's lifetime.</p>	<p>100% of office buildings &gt;2000m<sup>2</sup> will be a minimum 5 star Green Star rating.</p> <p>All residential buildings to have a minimum of a 7 star Homestar rating.</p> <p>10% of office buildings in the Wynyard Quarter to have a 6 star Green Star rating.</p>

<sup>1</sup> Refer target assumptions in appendix.

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
		<p>change campaigns.</p> <p>Tools such as NABERS NZ may be used to monitor ongoing performance.</p>	<p>A post occupancy energy and water use report shall be provided for commercial buildings at the end of the 12 months fine tuning period comparing real building energy and water use performance with predicted.</p> <p>Requirement for smart metering for all units and individual tenancies, on-going building performance monitoring and to share data collected with Waterfront Auckland. Building performance data may be publicly reported by Waterfront Auckland. Where another measurement system is not identified the NABERS NZ tool should be used to measure and report on energy performance.</p>	<p>A living building in the Wynyard Quarter  <a href="http://living-future.org/lbc">http://living-future.org/lbc</a></p>
	Water efficiency	<p>Water efficient fixtures and appliances to be used in all new buildings and refurbishments.</p> <p>Rainwater collection and reuse for toilet flushing, laundry and irrigation for all new buildings (and in refurbishments where practical).</p> <p>Landscaping to be low-water demand or to use drip irrigation systems.</p>	<p>Developments to be designed to achieve the following water consumption targets:<sup>2</sup></p> <p>Office - 0.35kL/m<sup>2</sup>/yr  Residential - 120 litres/person/day</p> <p>Residential requirements:  Fixtures and appliance rating minimums:  3-star WELS showerhead  4-star WELS toilet and tapware  5-star WELS dishwasher and washing machine</p> <p>Non-residential requirements:  Waterless or very low water use urinals and water monitoring and leak detection.  Fixtures and appliance rating minimums:  3-star WELS showerhead  4-star WELS toilet and tapware  5-star WELS dishwasher and washing machine</p>	<p>Office - 0.35kL/m<sup>2</sup>/yr  Residential - 120 litres/person/day</p>

<sup>2</sup> Refer target assumptions in appendix.

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
	Waste management	<p>Waste to landfill will be minimised.</p> <p>Developments will maximise the recycling and reuse of construction and demolition waste.</p> <p>Developments will make provision for the on-site storage of clean recyclables and non-landfill disposal of organic kitchen waste.</p>	<p>90% of construction waste for new build projects to be reused or recycled. 80% of demolition waste to be reused or recycled (excluding any contaminated land or hazardous material).</p> <p>Waste Management Plan to be used in accordance with REBRI guidance.</p> <p>Provision to be made for on-site storage and collection of organic kitchen waste and recyclables.</p> <p>If available, organic waste to be disposed of in a precinct-wide waste management system. In advance of this, organic waste to be disposed of to an on-site waste management system or sent to an off-site non-landfill disposal system.</p>	<p>90% of construction waste for new build projects to be reused or recycled. 80% of demolition waste to be reused or recycled (excluding any contaminated land or hazardous material).</p> <p>Waste to landfill: Commercial – 30 kg/person/year Residential – 50 kg/person/year</p> <p>Longer term target, zero waste.</p>
	Building materials	<p>Developments will take opportunities to showcase sustainable NZ building products and systems, e.g. Laminated timber products, locally sourced materials and demonstrate support for environmentally friendly materials, equipment and environmental labelling schemes (e.g. ECNZ, FSC, Energy Star, MEPS etc)</p> <p>Materials used will be durable and suitable for the marine environment of the site.</p>	<p>Materials used will be durable and suitable for the marine environment of the site.</p> <p>Support will be demonstrated for environmentally friendly materials, equipment and environmental labelling schemes (e.g. ECNZ, FSC, Energy Star, MEPS etc)</p>	No specific target



Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
<b>Environmental Quality</b>	Water quality - Precinct stormwater treatment	<p>Exemplary level of stormwater treatment.</p> <p>Developments will take available initiatives to improve harbour water quality.</p> <p>Gross pollutant capture should be provided for all drainage.</p>	<p>Developments will adopt a Low Impact Urban Design and Development (LIUDD) approach.</p> <p>The Wynyard Quarter has a substantial network of existing and planned rain gardens. All stormwater in the central precinct to be treated prior to disposal. Treatment can be via on-site treatment or connected to an existing rain garden if there is capacity. All stormwater from laneways and vehicular access-ways to be captured and treated to remove a minimum of 80% of total suspended solids and utilising a treatment technology that maximises removal of dissolved metals e.g. copper and zinc.</p>	<p>80% of total suspended solids removed from stormwater precinct-wide.</p> <p>Water quality at city centre waterfront improves.</p>
	Air quality	Local air quality impacts will be minimised through a high use of sustainable transport modes and the use of the Best Practicable Option in dealing with any discharges to air.	<p>No specific standard.</p> <p>Achieving the transport modal split will help to minimise transport emissions.</p>	Air quality in city centre improves (AC target)
	Contaminated land	Best Practicable Option to be used in dealing with contaminated land, to be assessed on a site-by-site basis. Impact on the environment is minimised and there is no danger to, or harm to human health.	No specific standards as appropriate remediation will depend on site-specific issues and the type of development proposed. Remediation to be agreed with Waterfront Auckland on a site-by-site basis.	No specific target

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
	Biodiversity and ecology	<p>Developments to support biodiversity through landscaping and compliment existing and planned areas such as Jellicoe Street and Daldy Street linear park.</p> <p>Ecological corridors will link Victoria Park to the Headland Park and waterfront.</p> <p>Opportunities for open space, shade, community gardens and food growing spaces in residential developments to be considered.</p> <p>Support for use of threatened native plant species and species that provide a year-round food source for native birds such as Tui.</p>	<p>No specific standard.</p> <p>Where landscaping is undertaken, it is expected that this will support the promotion of biodiversity and ecological values as identified in Waterfront Auckland guidance.</p> <p>Residential developments should incorporate spaces such as balconies, terraces and courtyards that could be used for planting and food growing.</p>	10 Ha of public open space in the Wynyard Quarter
<b>Transport and connectivity</b>	Public transport	Developments will be designed to facilitate and support a high use of public transport.	Requirement for all businesses and body corporates to undertake travel planning and join the Travel Management Association.	70% of trips to and from the area by walking, cycling and public transport as a percentage of total peak hour trips
	Walking and cycling	All developments will provide appropriate cycling and pedestrian infrastructure and amenities, e.g. showers, lockers, secure bike parking and electric bike charging points.	<p>All developments will provide appropriate cycling and pedestrian infrastructure and amenities including showers, lockers, secure bike parking and electric bike charging points.</p> <p>Office: Secure bike storage for a minimum of 10% of building staff and visitors to Green Star standards.</p> <p>Residential: Secure internal storage for bikes at a minimum ratio of 1 per studio, 1 or 2 bed apartment. 2 per 3 or more bedroom apartment. Visitor bike parking at a ratio of 1 per 15 apartments.</p>	70% of trips to and from the area by walking, cycling and public transport as a percentage of total peak hour trips

Issue	Element	Waterfront Auckland's Expectation	Central Precinct Performance Standard	SDF Precinct-wide Target
			<p>Developments to make provision for electric bike charging points. Number and location to be agreed on a site-by-site basis.</p> <p>Cycle parking provision for other non-residential uses to be agreed on a site-by-site basis.</p>	
	Parking provision	<p>Onsite parking provision to be below District Plan maximums where possible.</p> <p>Car parking facilities will make some provision for car share, car pool and electric vehicles.</p> <p>Car parking facilities will utilise innovative approaches to maximise efficiency such as the use of car stacking machinery.</p>	<p>Parking spaces to be de-linked from the apartments so that they are marketed and sold separately (at full market value). The intention being to incentivise purchasers of apartments to limit the number of car parks that they purchase.</p> <p>Maximum average ratio of one car space per 80m<sup>2</sup> of residential floor area (calculated as GFA excluding servicing and common areas within buildings).</p> <p>Developments to consider making provision for electric car charging points. Number and location to be agreed on a site-by-site basis.</p>	50% of new developments provide less than the permitted parking rate.
	Shared transport	<p>Developments will facilitate and support shared transport options including car pool and car share schemes.</p> <p>Car share schemes and car pooling by commuters will make a significant contribution to achieving the modal share target and reducing congestion and parking supply issues.</p>	<p>Requirement to set aside a proportion of car parking spaces for car share and/or car pool users for residential and non-residential developments. Number and location of parking spaces to be agreed on a site-by-site basis.</p>	10% of Wynyard Quarter residents and 25% of businesses to utilise car share vehicles.

**Wynyard Quarter Central Precinct - Commercial Energy Use Target Assumptions and Verification.**

The commercial energy target of 80kWh/m<sup>2</sup>/yr is based on the following assumptions in the following table which shall be used for energy modelling and performance auditing purposes and may differ from Green Star.

A minimum 5 star certified Green Star Office Built rating is required for the base building provisions of all commercial buildings. Developers shall also encourage/require major tenants to match this base building rating with a minimum 5 star Interiors fit-out rating.

It is recognized that these assumptions may vary depending on real use of the building however they set the standard for normalization and benchmarking.

Buildings shall be modelled at the design stage with these criteria as an off-axis scenario as part of the modelling required for Green Star accreditation both with and without an allowance for tenant fit out of an additional 15kWh/m<sup>2</sup>/yr. A post occupancy energy use report shall be provided at the end of the 12 months fine tuning period comparing real building energy performance with modelled. Any differences between the real and modelled building performance, including any normalisation shall be clearly identified. Developers shall use best endeavours to remedy any non-compliance and optimise building performance. Once the building is optimised a NABERSNZ base building rating shall be obtained for the Building and disclosed as a minimum to Waterfront Auckland. Ideally the rating would be publicly disclosed and maintained on an annual basis for each building (base building only).

Target is for Developer’s base building and excludes specialist tenant fit-out loads including main kitchens, large conference/training rooms, server rooms, call centres etc. These loads and energy consumptions shall be separately identified for each principal tenant to permit normalisation.

HVAC	Assumes highly energy efficient HVAC system with mixed mode operation, heat pump heating/cooling and high performance façade.	
Assumed internal temperatures	20-24°C in mixed mechanical mode 18-25°C in mixed natural mode. During plant operational periods 07-00 to 18-00 hrs. Off at weekends.	
General Occupancy Load	8W/m <sup>2</sup> average	
General Small Power Load	12W/m <sup>2</sup> average	
Lift	Feature stair to minimise inter-floor lift use. Consider regenerative braking.	
General Lighting Load	8W/m <sup>2</sup> average	Assumes LED lighting, 320lux average and 400lux maximum maintained illuminance, local occupancy control and daylighting control at perimeter and for any atria.

Occupancy, Small Power and Lighting Schedules - As NZS 4243:1996 Table A2

Climate	TMY 2 / NIWA average year weather file for Auckland
---------	---

The area to be used for target is the Net Lettable Area (NLA) as defined by the Property Council of New Zealand Rules of Measurement 2006.

Energy Modelling to be carried out using ASHRAE 140 tested energy modelling software

**Wynyard Quarter Central Precinct - Commercial Water Use Target Assumptions and Verification.**

The overall commercial water use target of 0.35kilolitres/m<sup>2</sup>/yr is based on the following assumptions.

A post occupancy water use report shall be provided at the end of the 12 months fine tuning period comparing real building water use performance with predicted. Any differences between the real and predicted building performance, including any normalisation shall be clearly identified.

Developers shall use best endeavours to remedy any non-compliance and optimise building performance.

Fixtures	Central gas hot water system with solar boost. Low water use fixtures including the following WELS ratings. 3 star showers, 4 star toilets and tapware, 5 star washing machine and dishwasher.
Rainwater harvesting % of non –potable water supplied from tank and mains	Approximately 50% tank and 50% mains. To be optimised for each commercial block with varying roof size, tank size and number of occupants.
Occupancy	1 person per 15m <sup>2</sup>
Outdoor Water Use	Common commercial area non-potable water use shall be minimized by adopting waterwise landscaping principles to reduce the need for irrigation to just that required to establish new plantings. These principles include: <ul style="list-style-type: none"> <li>▪ Avoiding large unshaded and unsheltered grassed areas</li> <li>▪ Use of effective mulching</li> <li>▪ Selection of smaller low water use planting</li> <li>▪ Soil improvement by adding organic matter</li> <li>▪ Reduced grass cutting in Summer</li> <li>▪ Weed control</li> <li>▪ Where irrigation is absolutely required, use of a low water-use drop irrigation system</li> </ul>
Rainfall Data	10 year annual rainfall data file for Auckland
Rainwater harvesting and re-use modelling shall be carried out using rainfall collection, storage and reuse model based on 10 year annual rainfall data file for Auckland	
The area to be used for target is the Net Lettable Area (NLA) as defined by the Property Council of New Zealand Rules of Measurement 2006.	

**Wynyard Quarter Central Precinct - Residential Energy Use Target Assumptions and Verification.**

The overall residential energy target of 40kWh/m<sup>2</sup>/yr is based on the following assumptions.

Homestar thermal (only) energy modelling shall be based on the assumptions in the Homestar Technical Manual when using an advanced hourly thermal simulation package rather than the simple ALF calculator.

Given the number of apartments and building owners a post occupancy energy use report for each apartment is not practical. The developer shall as a result carry out the full range of Homestar stages including initial appraisal design rating and certified ratings for each apartment. Certification shall form part of the handover documentation to the apartment owners.

HVAC	Assumes predominantly naturally ventilated apartments with high performance façade/roof and floor with minimal requirement for heating. Where provided heat pumps to have a minimum 5.0 star rating	
Assumed Internal Temperatures for modelling	Living area mean temperature between 5-11pm for a winter month (June to August) to be at least 18°C and the bedroom mean temperature from 11pm-7am to be at least 16°C.	
Hot water	Central gas hot water system with solar boost. Low water use fixtures including the following WELS ratings. 3 star showers, 4 star taps, 5 star washing machine and dishwasher.	
General Occupancy Load	Based on the number of beds and/or 3W/m <sup>2</sup> average	
General Small Power Load	7.5W/m <sup>2</sup> average. Energy Star whiteware including 3.5 star fridge freezer, dishwasher and 4 star dryer.	
General Lighting Load	2.5W/m <sup>2</sup> average.	Assumes LED Lighting.
Occupancy, Small Power and Lighting Schedules - As NZS 4243:1996 Table A2		
Climate	TMY 2 / NIWA average year weather file for Auckland	
The area to be used for target is the Net Lettable Area (NLA) as defined by the Property Council of New Zealand Rules of Measurement 2006.		
Energy Modelling to be carried out using ASHRAE 140 tested energy modelling software.		

**Wynyard Quarter Central Precinct - Residential Water Use Target Assumptions and Verification.**

The overall residential water use target of 120litres/person/day averaged over a year is based on the following assumptions.

Given the number of apartments and building owners a post occupancy water use report for each apartment is not practical. The developer shall as a result carry out the full range of Homestar stages including initial appraisal design rating and certified ratings for each apartment. Certification shall form part of the handover documentation to the apartment owners.

Fixtures	Central gas hot water system with solar boost. Low water use fixtures including the following WELS ratings. 3 star showers, 4 star toilets and tapware, 5 star washing machine and dishwasher.
Rainwater harvesting % of non –potable water supplied from tank and mains	Approximately 30% tank and 70% mains. To be optimised for each apartment block with varying roof size, tank size and number of occupants. Modelling to be submitted to NZGBC to support performance based approach to WAT-1 points rather than prescriptive requirement of 500L per bed.
Occupancy for Apartment	Based on the number of beds
Outdoor Water Use	Common residential area non-potable water use shall be minimized by adopting water-wise landscaping principles to reduce the need for irrigation to just that required to establish new plantings. These principles include: <ul style="list-style-type: none"> <li>▪ Avoiding large unshaded and unsheltered grassed areas</li> <li>▪ Use of effective mulching</li> <li>▪ Selection of smaller low water use planting</li> <li>▪ Soil improvement by adding organic matter</li> <li>▪ Reduced grass cutting in Summer</li> <li>▪ Weed control</li> <li>▪ Where irrigation is absolutely required, use of a low water-use drop irrigation system</li> </ul>
Rainfall Data	10 year annual rainfall data file for Auckland
Rainwater harvesting and re-use modelling shall be carried out using rainfall collection, storage and reuse model based on 10 year annual rainfall data file for Auckland	