

The Living Building Challenge:

Achieving Net Zero Energy and 50% less water consumption at
Camp Glenorchy

*What if every single act of design and construction made the
world a better place?*



Camp Glenorchy is part of The Headwaters



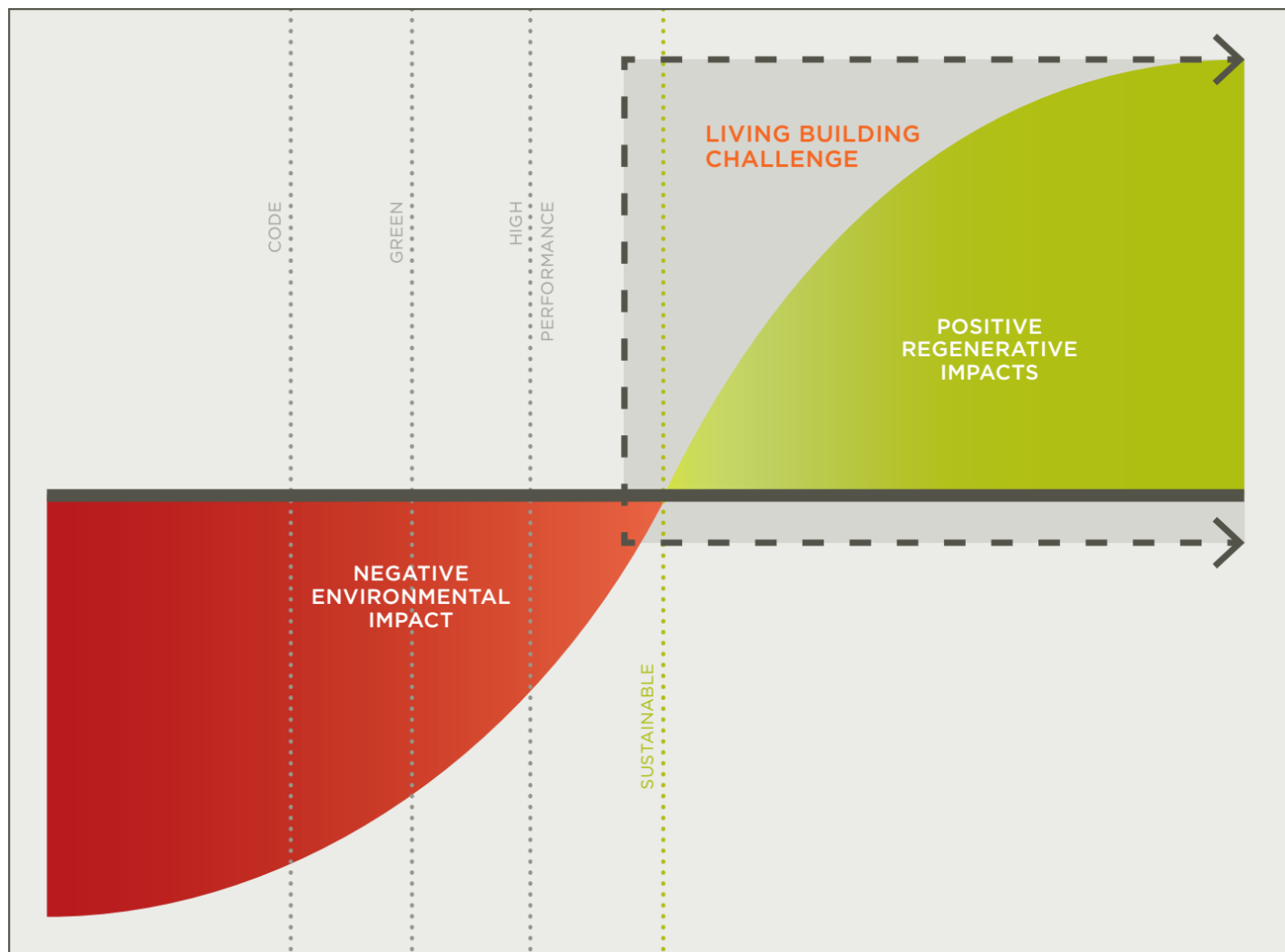
- A new concept in sustainable hospitality and retail in New Zealand
- Located at the head of the lake, heart of the mountains at the north end of Lake Wakatipu
- The Headwaters includes
 - Mrs Woolly's General Store (now open)
 - Mrs Woolly's Campground (glamping tents + unpowered tent and caravan sites)
 - Camp Glenorchy (opening January 2018)
- A "triple bottom line" commercial enterprise, with all profits benefiting the Glenorchy Community Trust to support a vibrant, regenerative future for people of the rural community of Glenorchy





**IT'S TIME TO
IMAGINE A
LIVING FUTURE
AND A WORLD OF
LIVING BUILDINGS**

The **Living Building Challenge** is a philosophy, certification, and advocacy tool for projects to move beyond merely being “less bad” and to becoming truly regenerative





Human health, comfort and happiness are deeply affected by many aspects of our environment, including the air we breathe, the surfaces we touch, the noises we hear, and the views we see.

Approaches we're using at Camp Glenorchy to create a place where all visitors feel comfortable, healthy and inspired:

1. Test Lab
2. Passive design
3. High-performing building envelope
4. Integrated design



Test Lab

The existing staff house on the Camp Glenorchy site has been turned into a 'Test Lab'.

A team worked throughout the winter of 2015 to test the systems that will be used to provide heating and hot water in our Camp Glenorchy guest cabins.

We are now testing how people interact with the systems, to find the right balance between automation and manual control so our guest cabins are easy to enjoy while using the least energy.



Passive Design

Buildings will harness the power of the sun and wind to provide healthy, comfortable spaces with minimal energy use for those staying with us.

The size, placement and layout of windows has been designed to capture energy and light from the sun, reducing the need for heating and lighting.

Opening windows by varying degrees will allow fresh air to circulate through the buildings and shading features will keep them cool on hot summer days. Acoustic insulation will reduce noise transfer both between rooms and between indoor and outdoor spaces.



High-performing building envelope

The building envelope separates the inside of a building from the outside environment. It is the physical layer containing the building's framing, insulation, interior lining and exterior cladding.

Our buildings will have a high level of air tightness and insulation to help keep them warm and dry in winter and cool in summer.

Insulation made from 80% recycled plastic bottles and the use of SIPs panels means our walls thermal performance will be 60% higher than the New Zealand Building Code requirement.





Integrated design

We believe that incorporating different points of view throughout the design process creates opportunities for even better outcomes.

Project team members from many different disciplines have been actively collaborating in the design of Camp Glenorchy to create buildings where the architecture, systems and the environment work together to improve comfort and achieve high levels of energy and water efficiency.



Our goal is to have a healthy interrelationship with nature, throughout both construction and operation.

A variety of elements will reduce effects on our local environment – including the air, waterways and soil.

We are exploring a number of design features to help us strengthen and highlight connections between Camp Glenorchy and its local natural and cultural surroundings

1. Glenorchy
2. Electric vehicles
3. Design for resilience
4. Landscaping



Glenorchy

Connection to the Glenorchy community and landscape is embedded in Camp Glenorchy's core.

Community input, interests and concerns have formed the foundation of our design thinking about Camp Glenorchy. A series of over 400 conversations with the community have helped us understand the needs of our neighbours, locals and visitors from around the world so that we can reflect their thoughtful input into the project.

Camp Glenorchy, the buildings have been designed to echo the regional architecture and rural character of historic buildings in the area.





Electric Vehicles

As part of Camp Glenorchy's commitment to support others who are seeking to minimise their impact on the environment, we will provide electric car charging stations on site.

Visitors will be able to charge electric cars using energy generated in our solar garden, turning their car's battery into storage for the sun's energy as an alternative to fossil-based fuels.

Our own site utility vehicles will be electric, and vehicles required for longer trips to and from Queenstown will be plug-in hybrids.

Designing for resiliency

Camp Glenorchy is designed to act as a Civil Defence resource for the community, providing a place of safety and security in case of emergency.

Its large shared facility building is designed to a high level of earthquake resistance.

If the main electricity grid is unable to provide power, the site will be able to supply enough energy to power emergency lighting and all refrigeration equipment for a week.



Landscaping

Camp Glenorchy's landscaping is being designed to reflect local geology, vegetation and culture.

Once construction is complete, the campsite landscape will be restored and regenerated with native tree species to support local species such as bees, birds and bats.

A guiding theme in the Camp Glenorchy planting design is 'if it's not native, it's edible'. The edible orchard will become a learning opportunity for visiting families, schools and groups to see first-hand the entire food cycle and begin to think about how they can replicate it in their own homes and communities.





Camp Glenorchy's water-saving strategies will help better manage the way water is used: our goal is to use 50% less water than similar facilities.

We will reduce wastewater levels as well by treating waste water on site and reusing it for irrigation.

Water supplies throughout the site will be separately metered to allow us to monitor our water use. It will be available to help illustrate how guest and operational choices impact water usage.



Rainwater

Rainwater will be collected from all roofs and 60,000 litres will be stored in underground tanks.

It will then be filtered and treated to drinking-water quality standards and be routed to sinks, handwashing basins and showers throughout the site.

Water from municipal supplies will only be used when the rainwater tanks are empty.





Water efficiency

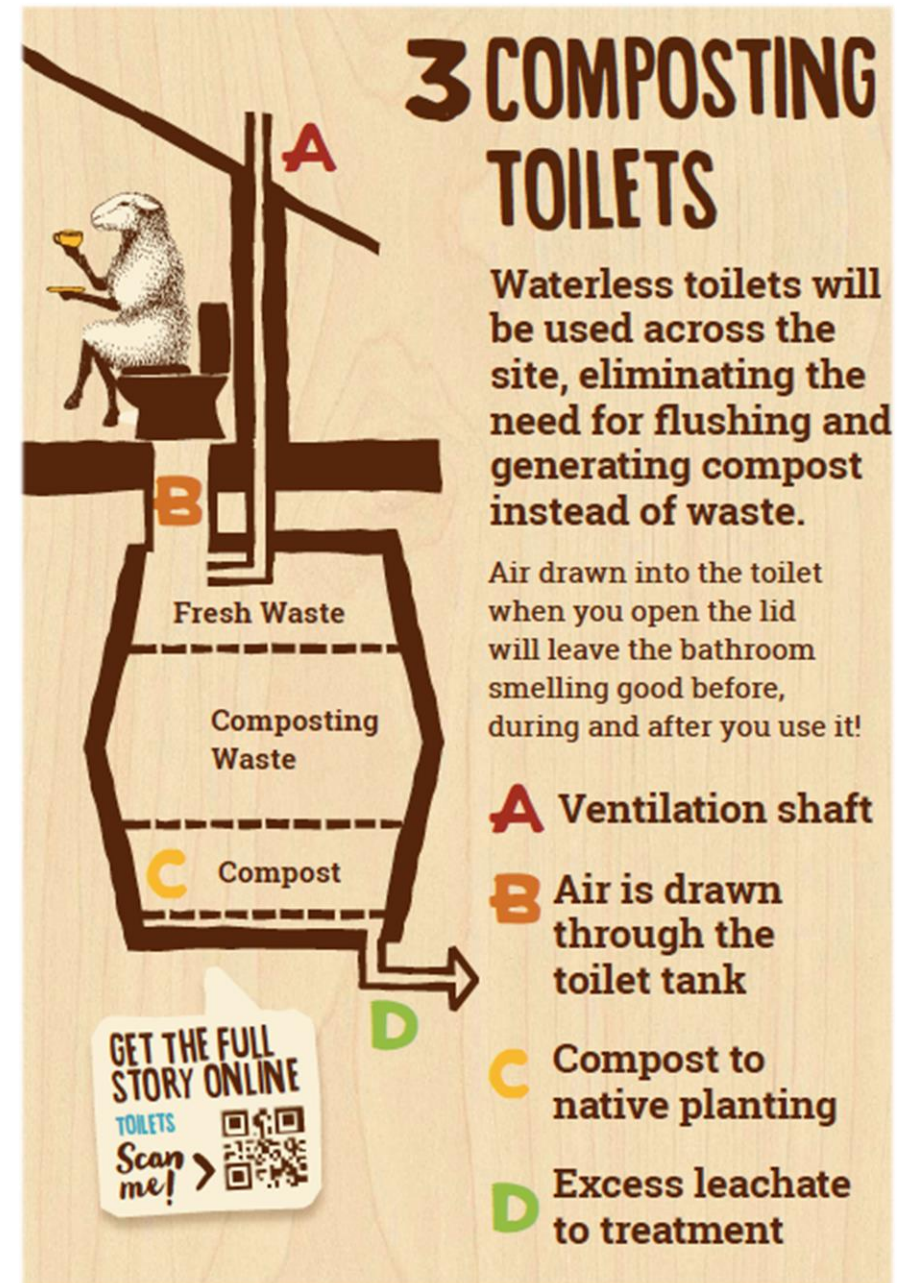
Low-flow fittings and water-efficient appliances will be installed throughout the site, minimising the water used by taps, showers, dishwashers and washing machines.

There will also be timed showers in the public bathrooms.

Native and drought-tolerant plants species will be used throughout the site landscaping to reduce water required for irrigation, a crucial factor in achieving our 50% water conservation target.

Composting toilets

Odour-free, waterless composting toilets will be installed in all new buildings to be used by both guests and staff. In addition to significantly reducing the need for flushing, this well-tested and proven design will generate nutrient-rich compost for our native plants.



Grey Water Wetlands

Wastewater from bathroom sinks, showers, and washing machines will be treated on-site using a constructed wetland system.

The wetlands harness the natural functions of certain types of plants and micro-organisms to treat wastewater without chemicals, removing sediment and pollutants.

Following treatment, water will be diverted to an underground storage tank for use in irrigating Camp Glenorchy's landscaping and orchards.





Blackwater

Blackwater* will be treated using an innovative aeration system to a level of purity that can be safely released into the ground.

We go one step further and blend it with the grey water for further treatment in the wetlands.

- * Wastewater from all sinks and dishwashers within the common building kitchens, and a small volume of liquid from the composting toilets



Net Zero Energy Building Certification means that, over the course of a year, Camp Glenorchy will generate as much power on-site via renewable sources as it uses.

Data collected by a site-wide monitoring system will be shared both on-site and online, allowing visitors and the general public to see how we're performing against our targets both at the moment and over time.

This data will also create an opportunity to engage with visitors and help them discover more about the energy choices they make and sustainable ways to conserve and



Energy Generation

A north facing “solar garden” of photovoltaic panels will generate the energy Camp Glenorchy needs to achieve Net Zero Energy while providing a model showing how solar power works for our visitors and guests.

The photovoltaic panels are mounted on frames made primarily of timber, and pathways will allow guests to walk around and between the panels.

Surplus energy generated by the solar garden during the day will be stored in batteries, allowing us to use it at night.



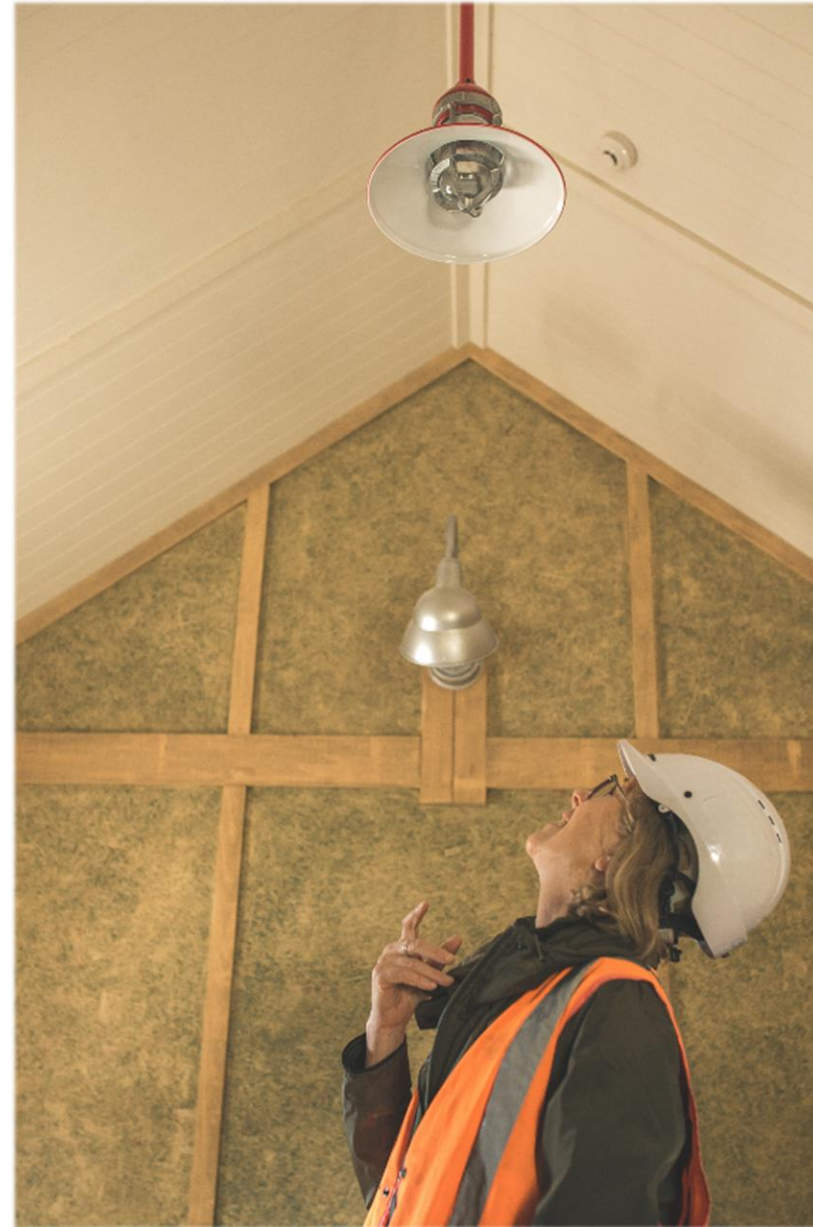
Smart lighting

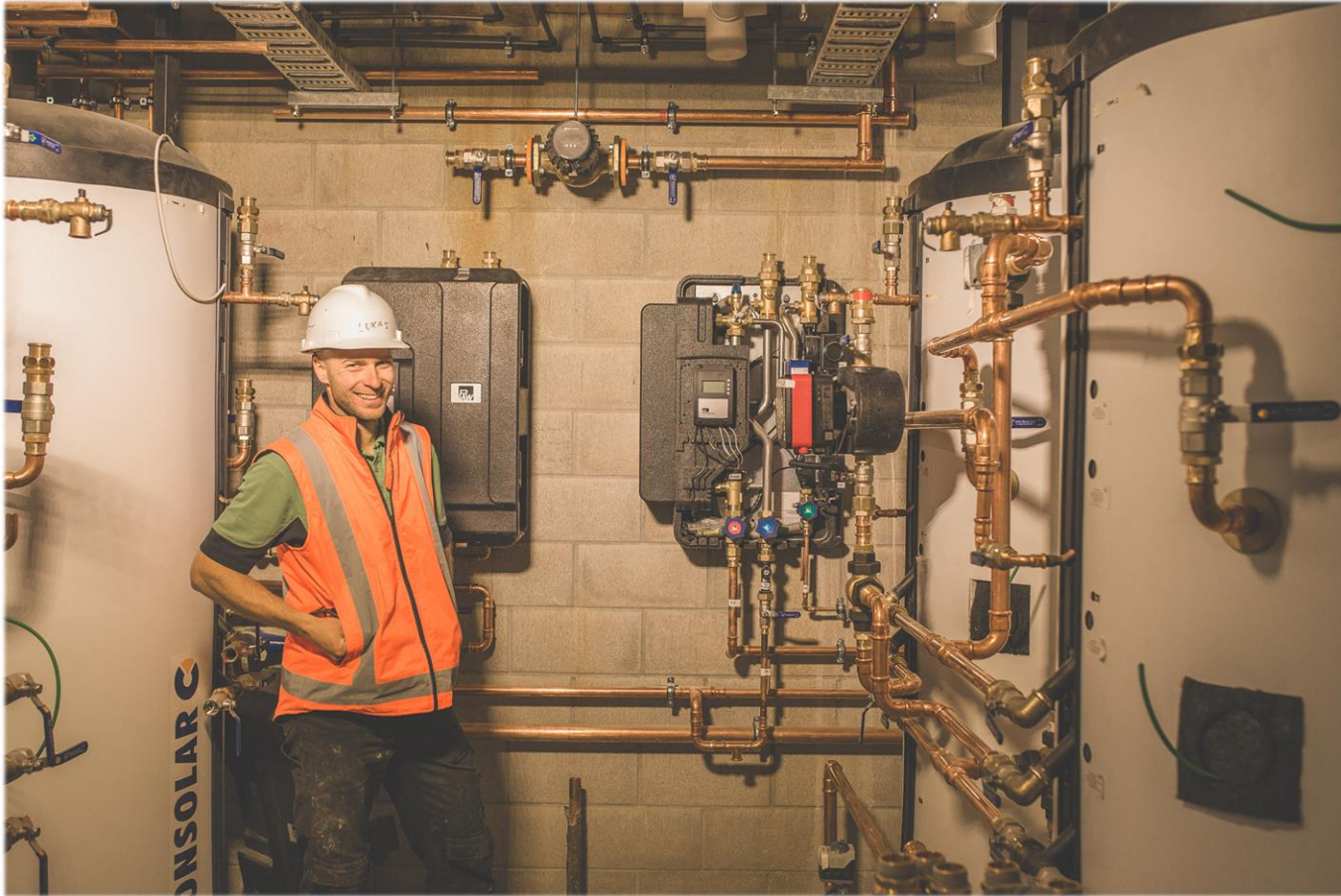
All light fixtures will use LED bulbs.

As well as being highly efficient when turned on, many of the lights within buildings will be set to automatically turn off when there is no one in the room.

LUX sensors measure the available ambient light within rooms and control the LED lights.

Exterior lighting will also be automated, providing safety and illumination for visitors while respecting Glenorchy's rural nightscape by avoiding unnecessary light pollution.





Heating

The windows, building envelope, and siting angles have been designed to take full advantage of the power of the sun.

Temperature sensors monitor room comfort, and turn heat up or down automatically.

Presence sensors determine whether a room is occupied, and turn lights, heating and power plugs on or off when no one is "home."

To supplement solar gain, underfloor heating will be provided by a system of highly-efficient ground-source heat pumps, solar hot water tubes, excess solar electricity and a "thermal store" which acts like a water battery.



Camp Glenorchy seeks to foster a healthy relationship with the entirety of its surrounding environment.

People – both locals and travelers – play key roles in this relationship and one of our core values is to create a respectful, welcoming and inclusive experience.

Buildings blend in with the local architecture and mountains, and create pedestrian-welcoming accessible walking.

Signage will offer interpretive and educational information.



Universal access to nature

Camp Glenorchy sits in one of the most stunning settings in the world.

Ringed by rugged mountains, turquoise blue Lake Wakatipu and the verdant forest and farmlands at what locals call the “head of the lake, the heart of the mountains.”

The Living Building Challenge advocates for universal access to sunlight, clean air, water and soil, all abundant in Glenorchy.

Our project has been designed from the start to take in natural light, protect the night sky, reuse water as a precious resource, and protect the soil beneath our feet.

We will use resources efficiently, respect and protect our neighbours’ access to sunlight and views, and plant native plants and trees that contribute to air quality while attracting native birds, bats and bees.





Economy and community

At the heart of the project's vision is environmental, community and financial sustainability.

Our goal is to create a positive impact on the local economy so that it can provide opportunities for people who live in Glenorchy.

All profits from the operation of Camp Glenorchy, Mrs. Woolly's General Store, and The Headwaters' offerings will go to the Glenorchy Community Trust.

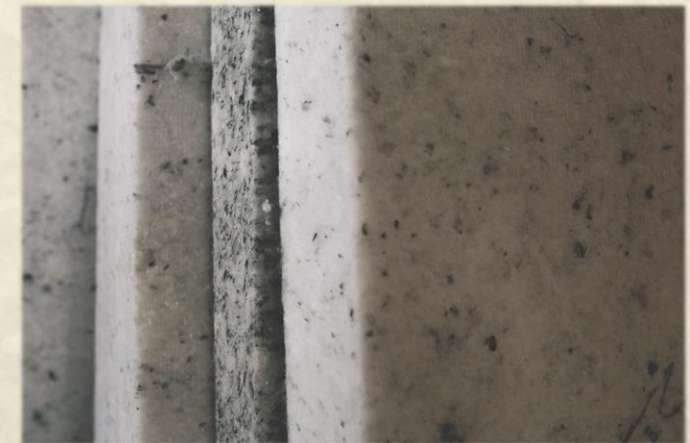
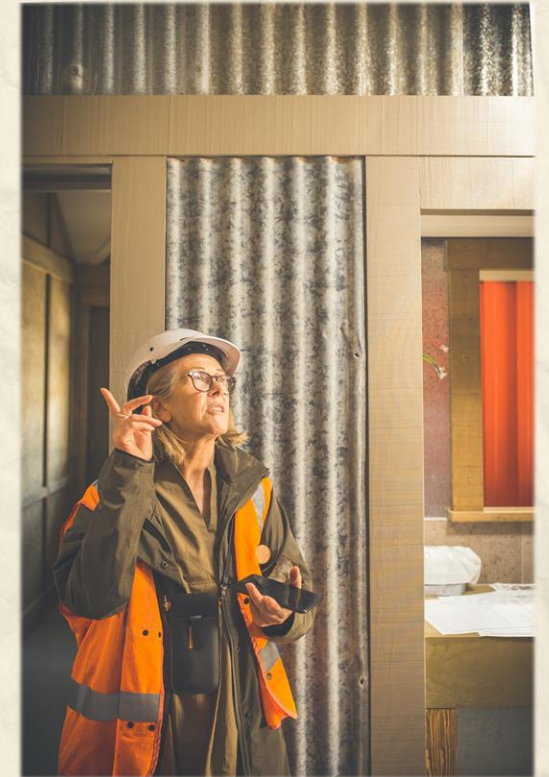
The Trust is led by the residents of Glenorchy, who will decide where funds will be invested for the good of the community as a whole.



The building industry is a significant user of chemicals and products considered “worst in class” due to their impact on human and environmental health.

We are committed to the health of not only our guests and staff but also the people involved in the building process and the community who live close to the site.

Our aim is to provide a safe and healthy environment by avoiding toxic substances and using natural building materials wherever possible.



Timber Lifecycle

Timber is one of the key materials in the construction of Camp Glenorchy.

Aware of the potential impact this could have on the environment, we are recording the source of all our timber sources and committed to using salvaged timber wherever possible.

We are recycling timber from existing buildings in a variety of ways, both onsite and off.





Construction waste

An Environmental Management Plan (EMP) is being followed during construction to limit health risks to workers and avoid potential pollution of surrounding areas.

Specific initiatives within the EMP include:

- Consideration of opportunities for off-site prefabrication of the building frameworks/panels to minimise noise and air pollution during construction.
- On-site separation of waste streams during construction to facilitate recycling of as many materials as possible, and measurement of quantities of waste diverted from landfills through recycling and reuse.

“Declare” products & certified materials

We are sourcing environmentally responsible building materials wherever possible, including timber sourced from Forest Stewardship Council (FSC)-certified mills and forests.

We also seek products certified under the Living Future Institute’s DECLARE program wherever feasible and available.

The Declare program advocates with manufacturers for transparency in manufacturing processes and the avoidance of potentially hazardous chemicals.



Declare. 





Beauty can be expressed in many forms and is a very personal personal experience.

Following the principles of the Living Building Challenge, Camp Glenorchy seeks to create a warm, welcoming place that inspires and uplifts the human spirit.

Throughout the site, visitors will discover creative touches from artists and craftspeople that will both educate and delight.





Influence & inspire

Like us, the Living Building Challenge recognises beauty as a key factor in preserving, conserving and serving the greater good.

At Camp Glenorchy, we believe education and discovery also play a key role in this process.

We will continue to actively develop the educational content on our website, and we will reach out via traditional and social media to share stories of what inspires us.

We hope to inspire others to pause, reflect, embrace and perhaps initiate positive change in their own lives and communities.

Interior design

Great attention to detail is being given to the interior design of buildings in Camp Glenorchy.

Rooms and common spaces will convey a sense of cosiness and homey-ness while using materials that are recycled, healthy and/or locally sourced and pleasant to see, touch and live with.



Artists & crafts

Local artists and craftspeople are working during the construction of Camp Glenorchy to incorporate beautiful and meaningful works of art throughout the site.

Local artist, Dan Kelly, has designed the campfire shelter that will be at the heart of the campground. The campfire shelter will become a gathering place for guests to share stories and experiences gathered during the day.

Our goal is to tap into artist's unique ability to help us celebrate the beautiful landscape around us and tell the story of the region.





Becoming a catalyst for positive change

At Camp Glenorchy we believe that creating nourishing experiences and long lasting memories will help spark a desire to make positive changes in their own lives, homes and communities once our guests return home.

We are building spaces that invite our guests to gather and interact with each other, nurturing the creation of communities that feel connected to Glenorchy and each other, spanning the globe.



For more information, we'd love to have you visit

www.CampGlenorchy.co.nz



Opening January 2018