

Marrick & Co. One Planet Action Plan

December 2017



Image: Hospital lane and the common as part of the public landscape (Artist impression only)

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1. Message from the Team

“The collaborative way in which both council and Mirvac have approached this project is a game-changer for future development,” Mirvac’s general manager of residential development NSW and major projects Toby Long said.

“The needs and wants of the community have been put first and foremost in the design and provision of both public and private amenity. This project reinforces Mirvac’s purpose to reimagine urban life.”

Mr Long said Marrickville was the ideal location to apply its urban life, place-making philosophy in line with the One Planet Living ten principles.

“The mandatory application of BASIX across all residential development has been important in lifting the standard of the built form,” said Mr Long. “However, urban life is about much more than water and energy consumption; it is about people. Marrick & Co will be an exemplar of the way in which we can design happy, healthy and connected cities.”

It is no accident that Marrick & Co incorporates many of the elements that are prized in the inner-west. The residential design team, Kim Bazeley from Mirvac Design and, Tim Greer and Ksenia Totoeva from Tonkin Zulaikha Greer Architects all live in the inner-west and have stamped it with many of the fine details that they love about their home locale.

“Marrickville is this wonderful, eccentric place where residents feel a deep sense of belonging and commitment to their local community,” says Mr Greer. “That was a feeling that we wanted to expand upon and continue at Marrick & Co.

“To achieve this we had to turn traditional apartment design inside out, creating buildings that were outward looking rather than inward. This is an important distinction that allows the new and existing communities to connect and interact.”

The Common is the unifying point where the public and private domain overlap, providing a tree-lined open space that incorporates a lawn for recreation, picnics and play.

“Being at the centre of the site means that the buildings around the perimeter open on to a beautiful landscaped space which is not only about enjoyment but also has a role to play in the collection of rainwater as part of the water filtration for the site,” says Mr Greer.

Ms Bazeley says that regard for neighbours was an important consideration in the form of the buildings, with two storey terrace homes at ground level capped by green planter boxes, a further six storeys of apartments set back from the street and the top levels recessed further.

“The site has many layers to it and can be approached from a number of different streets which achieves the permeability so critical in well-connected communities,” says Ms Bazeley. “You can walk through many different landscaped areas, past cottage gardens and The Common across a shared pedestrian laneway and then into the landscaped spaces around the buildings.”

2. Message from HIP V. HYPE Sustainability - the projects One Planet Integrator

HIP V. HYPE Sustainability believes that sustainability is inherent to good design. It’s not just an option, a differentiator or a marketing tool. At a global scale it is also, by definition, non-negotiable. We have embraced the One Planet Living ten principles as a highly engaging and accessible framework for identifying, contextualising, analysing and communicating the design, technology and behavioural actions that can put this philosophy into action.

Mirvac engaged HIP V. HYPE Sustainability as its Sustainability Integrator to drive the implementation of the One Planet Living ten principles for this significant brownfield site in Marrickville, inner-west Sydney. We collaborated with the Mirvac project team and Inner West Council to build on the design, and identify and evaluate site-specific opportunities across the ten One Planet Principles. This culminated in the development of this One Planet Action Plan to guide implementation through design, construction and operation.

The One Planet Living ten principles provide an excellent framework for considering opportunities to integrate sustainable outcomes into any project. Similarly, the One Planet Living Common International Targets provide a clear set of performance-based measures linked back to the fixed reality of ecological foot-printing. Each project's context is different, and ultimately the specific sustainability objectives and targets adopted reflect this in order to allow and incentivise the project to meet the overarching principles and targets of One Planet Living ten principles in the most efficient and effective manner.

Within the context of the Marrickville project, working with Mirvac and Inner West Council we arrived at a compelling vision for a project that engages and enables both new residents and the surrounding community to transition towards One Planet Living. The vision centres on an engaged, supported community with all the facilities and supporting tools available to live a happy, healthy life within a fair share of the earth's resources.

The Marrickville project provides an excellent example of highly effective adaptive reuse, preserving cultural heritage while also avoiding unnecessary demolition waste and raw material use. This disused former hospital will be transformed into a thriving space designed with the local community and new residents in mind. The project builds on a significant history of community engagement and reflects a genuine consideration of community needs, as described by the community. Council's engagement with the community, starting in 2011, helped to form the tender specification that ultimately led to Mirvac's appointment as a partner on the project. Building on this foundational understanding the project has included a focus on enabling the formation and sustenance of community that is aligned with Australian leadership. Across the principles of Health and Happiness, Culture and Community, and Equity and Local Economy the Marrickville project excels.

The project as whole has been influenced by the strong community culture of the Inner West and provides many opportunities for residents and visitors to meet and feel included. A range of spaces from the public library, public open spaces and a community kitchen garden, through to shared spaces within the residential buildings aim to connect people to each other and the local area. Additionally, Mirvac has committed to providing opportunities for residents to meet through an online portal, community programming and seed funding for a One Planet Living committee within the residential community.

The project sits centrally in Marrickville and provides a genuine opportunity for residents to reduce their reliance on cars, and to support a range of local, ethical and sustainable businesses within walking distance of the site. The project will provide bicycle parking and a bike repair station to encourage cycling and car share vehicles, along with the provision for electric vehicle charging facilities to minimise the environmental impact when cars are used.

Landscaping is a productive and active part of the One Planet Living solution. In addition to providing community spaces for people to enjoy, the landscape design provides an increase in biodiversity onsite through the provision of locally native planting, treats stormwater through biofiltration systems, allows residents to grow their own food and aims to reduce the impacts of urban heat on site.

While the project has achieved excellent outcomes that represent Australian leadership in many areas, it is also important to acknowledge the challenges faced and lessons learned in other areas.

As an example, despite best efforts during the Action Plan development the project is not yet on track to achieve a zero-carbon outcome onsite and on delivery will maintain a connection to natural gas for hot water and cook tops. The building has been designed to allow a phase-out of gas in the future as all-electric technologies become more cost effective and induction cooktops become more palatable to residents. The project also includes some solar and batteries for common areas, but due to cost and physical challenges was not able to achieve substantial on-site renewable energy generation for apartments. This experience triggered a wider investigation within Mirvac on how they can provide access to renewable energy for residents living within apartment buildings, which has the potential to influence all future Mirvac projects. Another notable challenge exists regarding vehicle transport. While overall car parking rates are below statutory requirements, further reductions presented both a market risk and risk to Development Approval processes. Similarly, while some electric vehicle charging infrastructure is included, higher rates were not adopted due to a lack of current market uptake and concerns about implications for electrical infrastructure requirements and subsequent costs.

These challenges are important to acknowledge, as they aren't unique to this project or Mirvac. By working through a structured and detailed process using the One Planet Living ten principles framework, Mirvac and all project participants have been engaged in these important discussions and will further investigate them in subsequent projects, generating ripple effects across the industry.

The transition to One Planet Living is a process. This project is in the early stages of this process and challenges remain. However, we are confident that the building blocks are in place to enable the future community at Marrickville to progress along the path towards living happy, healthy life within a fair share of the earth's resources.

3. About the project

The project is underpinned by a long-standing commitment of Marrickville Council to the adaptive re-use of the site to provide value to the community. Building on significant community engagement and consultation, the final concept for the development will deliver a regionally significant community facility in the form of the Marrickville Community Hub and Library, along with 225 1, 2 and 3 bedroom apartments and terraces.

This includes the adaptive re-use of significant heritage hospital buildings to form part of both the community and residential components of the development.

The site is located 7 km from the CBD with proximity to the Marrickville Road and Illawarra Road retail and commercial precinct and significant green spaces in the form of Marrickville Oval, Sydney Park and Cooks River.

The site is well serviced by public transport with buses operating down Marrickville Road and Livingstone Road providing direct access to Sydney CBD, Bondi Junction to the East, Burwood and Ashfield to the West and Kingsgrove to the South. The site is approximately 600m from Marrickville Railway Station, which is a part of the Metro station upgrades that will result in a city-bound trains every four minutes.

The combination of scale, location, mixture of uses and the triple bottom line sustainability principles adopted from early concept have combined to enable this project to demonstrate a clear pathway towards becoming a One Planet Community.

4. What is One Planet Living

One Planet Living is a vision of a sustainable world, in which people everywhere can enjoy a high quality of life within the productive capacity of the planet, while leaving space for wilderness and wildlife. It uses ten principles of sustainability as a framework with a headline target for each principle that is linked to the environmental limits of the planet.

Today however, the world's population is consuming naturally renewing resources and polluting the planet at a rate 50% higher than what the earth can replenish or absorb. Global levels of biodiversity are falling with the *Living Planet Index* (WWF 2016) declining by over 58 percent between 1970 and 2012, with freshwater species declining by 81 per cent between 1970 and 2012. Unless action is taken now we could see a two-thirds decline in biodiversity in half a century from 1970 to 2020.

Ecological foot printing shows that if everyone in the world consumed as many natural resources as the average person in Western Europe, three planets would be needed to support human needs, where If everyone consumed as much as the average Australian, more than five planets would be needed. In some countries such as South Africa the overall average is just over one planet, however these figures disguise considerable variations between regions and lifestyles.

4.1 Ecological Footprint

Ecological footprint analysis is at the heart of One Planet Living as the overarching indicator of what constitutes a sustainable level of consumption, measuring our consumption of natural resources in global hectares of land and sea.

The Living Planet Report (WWF 2016) indicates humans are now exceeding the world's capacity to regenerate natural resources by 50% faster than can be replenished. If our demands on the planet continue at the same rate, by 2030 the equivalent of two planets' worth of resources will be needed to maintain our lifestyles, critically limiting the capacity for future generations to access resources on earth.

Over 150 Heads of State attended the opening of the Conference of Parties in Paris in December 2015, where the goal of limiting global temperature increase to well below 2 degrees Celsius was reaffirmed, with an aim for no more than a 1.5 degree Celsius rise. This is despite average global temperatures already increasing by over 0.8 degrees Celsius.

To avoid a two degree rise global greenhouse gas emissions need to be reduced by 50% from 1990 levels by 2050. For this to happen CO₂ emissions will have to be no more than 0.8 tonne per person per annum by 2050. This requires staged planning for the transition. The time to act, to reduce emissions and increase ecosystem services and biodiversity, is now.

5. One Planet Living Project Vision

Marrickville's One Planet Community is the newest addition to a community with a diverse and rich history and culture. The new residents join with the existing community in enjoying the amazing collections housed in the beautiful, comfortable library and community hub. Budding entrepreneurs are booking the meeting rooms and have signed up for some of the workshops on using LinkedIn and effective business plan development. The new cafe is serving up healthy, sustainable food and its Green Lease provisions are already reducing waste generation and operational costs.

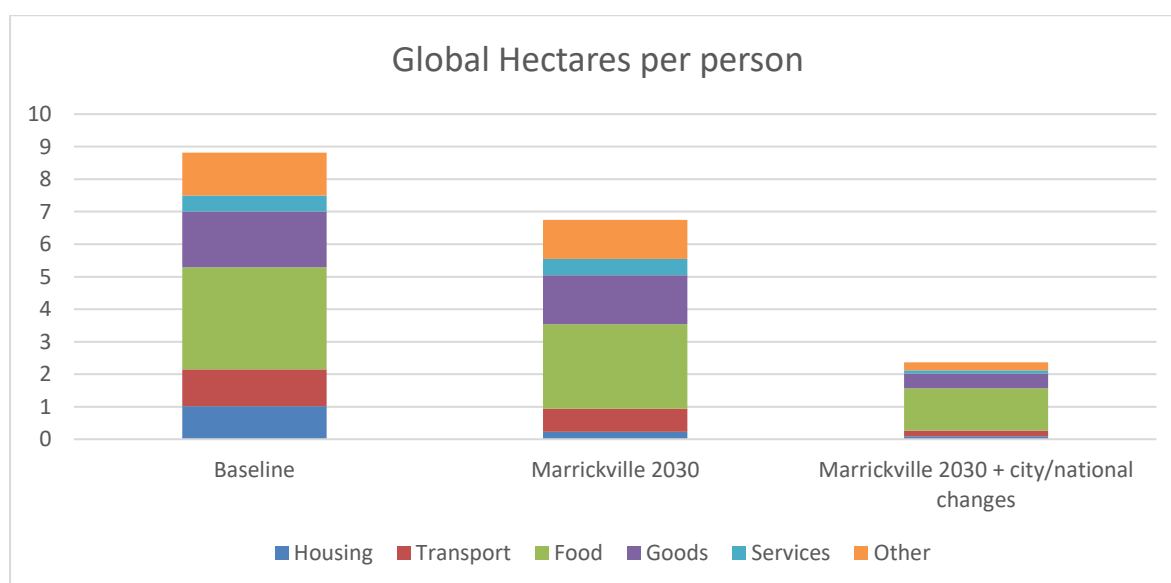
The addition of multiple new publicly accessible green spaces with free wifi and regular events (including organised and impromptu group fitness and yoga) creates new learning and recreation opportunities for all residents and visitors, of all ages.

Those living in the residential buildings are settling into a new way of life. Many didn't bring a car with them, and those that did have found it's rarely needed. A quick walk to Marrickville Road shops to pick up fresh organic vegetables, or a bike ride to work or university, helps them stay active and reduce their living costs. The first energy and water bills were a nice surprise, with costs kept low by the efficient design and servicing approach.

The residents on the One Planet Living subcommittee of the Owners Corporation have been busy helping others to get to know the building and how to make the most of its sustainability features. Part of the seed funding for the committee has been used to fund a workshop for residents who want to get started with a balcony garden or a plot within the two communal gardens.

Above all the residents have been enjoying getting to know each other. The community portal and Facebook group have been busy already, with people swapping tips and offering to help each other out with dog walking and baby-sitting. Many thought an apartment was a stepping stone to a house, however they're now seeing Marrickville as their long-term home.

5.1 Carbon/Ecological footprint baseline/assessment



Source: Data modelling completed through EUREAPA (<https://www.eureapa.net/>)

6. Summary

One Planet Principle	2020 Outcomes	Key strategies
Health and Happiness	Foster strong social connections Average of 9 Neighbours known by name	The project includes a variety of shared and communal spaces designed to encourage passive and active social connections between residents, visitors and the local community. An online portal will be set up to provide residents a place to connect and share.
	Fostering healthy lifestyles At least 60% residents are physically active	A wellbeing strategy for the site includes fitness classes to increase local exercise and encourages active transport over car use. The apartments and common areas have been designed to provide cool spaces and account for the impacts of climate change. Additional information will be provided in the One Planet Living guide and online portal.
Equity and Local Economy	Maximise proportion of household spending in local businesses At least 10% average of resident household expenditure is local	Small, sustainable and ethical local businesses will be supported and promoted throughout the sales, construction and operational phases.
	Provide accessible and affordable housing	All footpaths, building entrances and circulation spaces have been designed to allow universal access and all apartments have been designed to allow universal visitation. 20% of apartments will be provided as 'adaptable' in accordance with AS4299. Nine apartments will be handed over to Inner West Council for ongoing management as fixed-rent affordable housing units.
Culture and Community	Foster strong sense of community At least 85% of residents report satisfaction with their sense of community	The library and community hub, along with residential shared facilities and a One Planet Living Committee will provide a platform for the residents and visitors to form connections with place and their neighbours. The project was formed through extensive stakeholder engagement and consultation activities and the sites heritage is interpreted through the repurposing of buildings.
Land Use and Wildlife	Maximise use of indigenous species in landscape 50% of indigenous species in the landscaping	The landscape has been designed to improve the biodiversity value of the site, with a focus placed on utilising indigenous species.
Sustainable Water	Minimise mains water consumption Target no more than 110 litres/person/day	Water efficient apartment and landscaping measures along with rainwater capture and supply.

One Planet Principle	2020 Outcomes	Key strategies
Local and Sustainable Food	Maximise number of households growing their own food At least 30% of households grow some of their own food	Residents will have access to a kitchen garden and community garden plots to grow food. Residents will be encouraged to grow herbs and vegetables on their balconies and will be provided with information on balcony planting in a One Planet Living guide. Residents will also be encouraged to purchase local sustainable food at the nearby organic and fair-trade food stores. The café in the community hub will have a 'Green Lease' ensuring it serves sustainable and healthy food options.
Sustainable Materials	12.5% reduction in embodied carbon emissions	Utilising Life Cycle Assessment, material impacts will be reduced during Detailed Design. Materials reclaimed during demolition will be used on-site wherever practical. Recycled materials will be used wherever possible.
Sustainable Transport	Increase sustainable transport mode share 60% trips by sustainable modes	The community's location offers most services and amenities within walking distance, additionally the site is serviced by extensive public transport options. Bicycle parking and maintenance facilities will be provided for residents and visitors along with electric vehicle charging stations and car share spaces to reduce the reliance on carbon intensive personal vehicles.
Zero Waste	Maximise waste diverted from landfill during construction At least 95% of waste will be diverted from landfill	Mirvac Construction Waste Management policy will be implemented through construction. This will include a pilot of 'zero waste trades' for some subcontractors. Prefabrication will be utilised to reduce waste.
	Maximise waste diverted from landfill during operation 60% of waste diverted	Closed loop management of organic waste as well as information provided to residents on living low/zero waste lifestyles.
Zero Carbon	Reduce greenhouse gas emissions through building energy efficiency At least 43% reduction	Through passive building design, reduction in peak energy demand and utilising smart electricity meters to enhance energy management.
	Reduce greenhouse gas emissions through renewable energy	Through provision of renewable energy and encouraging residents to utilise GreenPower.

7. The One Planet Action Plan

Mirvac's sustainability plan 'This Changes Everything' sets in place specific strategies to deliver an ambitious series of goals, including the creation of its first One Planet Living Community.

The redevelopment of the Marrickville Hospital site has been selected as the ideal project for this. The project will deliver a new residential community in the heart of Marrickville that is built on the ten principles of One Planet Living. Mirvac is committed to delivering a community that makes living within a fair share of earth's resources simple, affordable and attractive. This One Planet Action Plan puts forward the targets and strategies that will enable this to be achieved.

However, the project also represents an opportunity for Mirvac to pilot and demonstrate the value of a broad range of sustainability initiatives that have strong potential for application to many other projects. As a result, the Marrickville One Planet Community will have far reaching impact in other parts of Australia.

This One Planet Action Plan summarises the key initiatives adopted by the project team to date, and will act as an important implementation tool as the project is delivered.

7.1 Health and Happiness

Encouraging active, social, meaningful lives to promote good health and wellbeing

	Outcome (date)	Target / Indicator	Baseline
	Foster strong social connections (2020)	>9 neighbours known by name	6 ¹
	Fostering healthy lifestyles (2020)	>60% of residents are physically active	44.9% (abs health survey)

7.1.1. Key strategies

Design:

Strategy	Action
Foster health and wellbeing	To foster healthy lifestyles the design has been guided by social and economic impacts review of local area. A health and wellbeing strategy will guide activities and events when construction is complete.
Provide access to open space	The strong focus on an open, inclusive, engaging ground plane adds a significant new public open space which the entire community will benefit from.
Ensure key infrastructure and services provide for the community's need now and into the future	Provision of IP backbone will future proof the buildings to allow for changes in technology. Installation of solar PV and batteries. Communal electric vehicle charging points with electrical allowance for additional chargers to be installed when needs arrives in the future.

¹ 2010 Andrew Leigh, Disconnected, UNSW Press.

Construction:

Strategy	Action
Foster health and wellbeing	Construction workers will be provided with a free health check and advice on healthy eating and wellbeing.

Operation:

Strategy	Action
Foster health and wellbeing	To foster healthy lifestyles at least one year of free group fitness classes will be hosted on the common, funded by Mirvac. To foster strong social connections resources will be provided to support a healthy, connected community through information in the One Planet Living guide and online portal.
Provide access to open space	Provide residents with information on surrounding public open spaces and recreation opportunities through the web portal and One Planet Living guide.
Create a safe and secure community	Support a healthy, connected and safe community through provision of resources and information in the One Planet Living guide and online portal.



Image: Community space outside the proposed library (Artist impression only)

7.2 Equity and Local Economy

Creating safe, equitable places to live and work which support local prosperity and international fair trade

	Outcome (date)	Target / Indicator	Baseline
	Maximise proportion of household spending in local businesses (within 1km) (2020)	10% of total household expenditure	0%
	Provide affordable housing	9 apartments as fixed-rent affordable housing units.	0%

7.2.1 Key strategies

Design:

Strategy	Action
Deliver positive economic and wellbeing outcomes for future residents and the surrounding neighbourhood	To deliver positive economic and wellbeing outcomes for future residents and the surrounding neighbourhood this project has included designing in significant new public space, as well as through a new community hub offering resources and ongoing education to support health, wellbeing and financial security.
Promote local, social, sustainable and ethical businesses, as well as startups and entrepreneurship	Mirvac will engage local sustainable and ethical businesses in the sales and marketing campaign for the site, and will promote local businesses in a handover gift to new residents on exchange of contracts.
Ensure buildings and infrastructure offers universal access	All footpaths, building entrances and circulation spaces have been designed to allow universal access. All apartments have been designed to allow universal visitation. 20% of apartments will be provided as 'adaptable' in accordance with AS4299.

Construction:

Strategy	Action
Deliver positive economic and wellbeing outcomes for future residents and the surrounding neighbourhood	In addition to creating direct jobs, the construction process will result in a significant indirect economic injection into local businesses. Local social, sustainable and ethical businesses will be promoted to site workers.
Create new jobs during construction and ongoing operation	The project will directly and indirectly employ approximately 540 people during the 2-year construction program.
Support upskilling and education of the existing and future Marrickville community	Subcontractors on the 12 largest trades on the residential site will have contract clauses requiring them be enrolled in the Supply Chain Sustainability school, a free school aimed at upskilling contractors in sustainability.

Operation:

Strategy	Action
Deliver positive economic and wellbeing outcomes for future residents and the surrounding neighbourhood	Through promotion and proximity, the new resident population will support existing and new local businesses, resulting in significant economic benefits to the local community. The library and cafe will employ approximately 24 full time equivalent staff. The new residential population of approximately 500 will support local businesses, supporting job creation in Marrickville.
Promote local, social, sustainable and ethical businesses, as well as start-ups and entrepreneurship	The community web portal will include a map that identifies local, social, sustainable and ethical businesses in Marrickville. The library will host various workshops supporting small businesses, sustainable business operation and business skills. Meeting spaces will also be available at low or zero cost for start-ups.
Provide affordable housing	Nine apartments will be handed over to Inner West Council for ongoing management as fixed-rent affordable housing units.
Provide excellent communications and internet connectivity	Free Wi-Fi will be available in and around the community hub, offering connectivity for any member of the local community.



Image: Cornersmith Cafe (snappystreet.com.au)

7.3 Culture and Community

Nurturing local identity and heritage, empowering communities and promoting a culture of sustainable living

	Outcome (date)	Target / Indicator	Baseline
	Foster strong sense of community (2020)	85% satisfaction with sense of community	61% ²

7.3.1 Key strategies

Design:

Strategy	Action
Ensure the project recognises, protects and enhances the heritage values of the site	The site's heritage has been recognised from project inception. Detailed heritage assessments have informed the design process and resulted in the protection of the Main Ward Block and Nurses Quarters buildings, which will undergo adaptive reuse as part of the development.
Demonstrate the project's positive social return on investment	A social return on investment (SROI) assessment and report has been prepared for the project. This has identified key design initiatives that support positive social outcomes and has informed the design team's approach.
Ensure the project engages with and responds to the views of the community and key stakeholders	Extensive stakeholder engagement and consultation activities have been undertaken for both the community hub and residential components of the project. This has resulted in a program of consultation, which has guided the resolution of the project's design.

Construction:

Strategy	Action
Ensure the project engages with and responds to the views of the community and key stakeholders	A community day will be held each year during construction, to provide support to local community groups or organisations, along with one additional event per year to support or raise money for the local community.

Operation:

Strategy	Action
Ensure the project engages with and responds to the views of the community and key stakeholders	Information and signage will be installed to communicate key elements of the site's history, including its relevance to culture and history. The library and community hub will host a wide range of resources as part of its cultural collection, and see programs and events across the year focusing on different cultural groups representing Marrickville's diverse community.
Demonstrate the project's positive social return on investment	Seed funding will be provided to establish a One Planet Living subcommittee of the owner's corporation.

² Vic Health Indicators Survey, Vic Health Research, 2011

Create a culture of sustainability within the community

A resident's guide will be prepared to effectively communicate how apartments and common facilities can be best used to live a 'One Planet' life.



Image: Marrickville Road during the Marrickville Festival (Inner West Voices)

7.4 Land and Nature

Protecting and restoring land and marine systems for the benefit of people and wildlife

	Outcome (date)	Target / Indicator	Baseline
	Maximise use of indigenous species in Landscape (2020)	50% of species indigenous	0%
	Contribute to an increase in biodiversity	N/A	N/A

7.4.1 Key strategies

Design:

Strategy	Action
Maximise future biodiversity value and the use of native, indigenous species.	Responding to the site's existing lack of significant biodiversity value, the landscape architects have designed open spaces and landscape that will provide significant new biodiversity to the site. A particular focus has been placed on utilising indigenous species.
Incorporate green infrastructure to support biodiversity, sustainable stormwater management and minimise urban heat island impacts	Significant Water Sensitive Urban Design and green infrastructure elements have been incorporated into the design. These include significant landscaping areas, swales, rain gardens and a green roof over the car park entry.

Construction:

Strategy	Action
Maximise future biodiversity value and the use of native, indigenous species.	Opportunities will be explored for sourcing tube-stock for the landscape from Council's indigenous nursery.

Operation:

Strategy	Action
Maximise future biodiversity value and the use of native, indigenous species.	A landscape management plan will be handed over to the body corporate of the residential component, and to Inner West Council for the community hub landscape, to support ongoing management of the site's landscape to maximise biodiversity and minimise the impact of invasive species. The One Planet Living guide will include information on the landscaping and green spaces, including biodiversity values. Signage will be used to communicate the key features of the landscaping and identify indigenous species within the public landscape.



Image: Seedlings (aroundyou.com.au)

7.5 Sustainable Water

Using water efficiently, protecting local water resources and reducing flooding and drought

	Outcome (date)	Target / Indicator	Baseline
	Minimise mains water consumption (2020)	110 litres/resident/day	147 ³ litres/resident/day

7.5.1 Key strategies

Design:

Strategy	Action
Minimise mains water consumption	Within the residential component, 103,000 litres of rainwater storage will collect water from all suited roof areas and utilise this to supplement toilet flushing and landscape irrigation requirements in the development. Within the community hub, a total of 49,000 litres of rainwater storage capacity will collect water from the roof and supply this for landscape irrigation.
Minimise impacts on the stormwater network and waterways	A variety of measures have been incorporated to achieve excellent Water Sensitive Urban Design outcomes. In addition to rainwater tanks, bioretention (in the form of a raingarden), vegetated swales, buffer strips and a detention basin will all contribute to reducing stormwater runoff and reducing pollutant loads.

Construction:

Strategy	Action
Minimise impacts on the stormwater network and waterways	Stormwater filtered prior to leaving site by gross pollutant traps and / or nutrient ponds

Operation:

Strategy	Action
Minimise mains water consumption	Residents will be provided with information on water saving behaviours in the One Planet Living guide. Annual surveys will be run via the online portal to assess water consumption behaviours and identify opportunities for improvement.

³ Minimum BASIX requirement

7.6 Local and Sustainable Food

Promoting sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein

	Outcome (date)	Target / Indicator	Baseline
	Maximise number of households growing their own food (2020)	30% of households growing some food	13% ⁴

7.6.1 Key strategies

Design:

Strategy	Action
Maximise number of households growing their own food	All apartments are provided with balconies and the majority of balconies will receive sufficient sunlight to enable herbs and some vegetables to be grown. A ground level 'kitchen garden' and a productive garden located on the level 10 terrace will provide further opportunities for all residents to grow their own food.
Provide access and encourage residents to shop locally for fresh, local, organic and fair-trade food	The project is located within a 5-minute walk of a wide variety of fresh, organic and fair-trade food stores, located along Marrickville Road and Illawarra Road.
Minimise food waste going to landfill	Worm farms or compost bins will be installed in the kitchen garden at ground level and the productive garden located on the level 10 terrace within the development.

Construction:

Strategy	Action
Encourage sustainable and healthy purchasing habits	During construction workers will be provided with information on healthy, fresh and organic eating options in the area.

Operation:

Strategy	Action
Provide access and encourage residents to shop locally for fresh, local, organic and fair-trade food	The cafe located within the community hub will serve sustainable and healthy food options. These requirements will be formalised in a 'Green Lease' which Council will require any operator to sign.
Minimise food waste going to landfill	Information on sustainable waste management, including the importance of composting, will be included in the One Planet Living guide.
Encourage residents to grow their own food	In addition to on-site growing opportunities, residents will be provided with information on multiple local community gardens located within a short walk or bike ride of the site. The One Planet Living guide will provide information on balcony and small plot gardening.
Encourage residents to think	Provide information on healthy and sustainable food choices through the One Planet Living guide and community online portal.

⁴ 2014, Grown Your Own, The Australia Institute

about where their food comes from and make informed decisions.	The library and/or community portal will provide resources exploring issues relating to sustainable and ethical food.
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Image: Vertical food production (Peter Steele)

7.7 Travel and Transport

Reducing the need to travel, encouraging walking, cycling and low-carbon transport

	Outcome (date)	Target / Indicator	Baseline
	Increase sustainable transport mode share (2020)	60% trips to work by sustainable modes	44% (local average) ⁵

7.7.1 Key strategies

Design:

Strategy	Action
Maximise the use of active transport and public transport modes	Capitalise on the site's close proximity to Marrickville road shopping strip, bus stops and train station through provision of signage identifying path and distance to key amenities. Provision of secure bicycle storage for residents in basement.
Minimise the reliance on private motor vehicles	Provision of two car share bays onsite, operated by commercial car share provider. These will provide residents who subscribe to this service with access to a car without having to own one.
Minimise greenhouse gas emissions associated with private vehicle use	Provision of two 'fast charge' electric vehicle charge points in shared parking spaces, available for use by all residents. A separate DB board provided for the car chargers, with space for an additional 10 x 32A car chargers, to facilitate the likely long-term mass migration to electric vehicles.

Construction:

Strategy	Action
Minimise the reliance on private motor vehicles	Construction workers will be encouraged to make use of the site's great public transport access and avoid car travel. Bike racks will also be provided on-site during construction.

Operation:

Strategy	Action
Maximise the use of active transport and public transport modes	One Planet Living guide to provide information on local bike paths, shops and services, public transport stops and timetables, and other support information to make active transport modes easy and attractive.
Minimise the reliance on private motor vehicles	Information on car share membership, and a special introductory offer, will be presented in the One Planet Living guide.
Minimise greenhouse gas emissions associated with private vehicle use	Information on electric vehicles to be provided in One Planet Living guide.

⁵ 2011, ABS, Census travel to work data.



Image: Tesla home charger (Tesla)

7.8 Products and Materials

Using materials from sustainable sources and promoting products which help people reduce consumption

	Outcome (date)	Target / Indicator	Baseline
	12.5% reduction in embodied carbon emissions (2020)	985 kg/CO2/m2	1125 kg/CO2/m2

7.8.1 Key strategies

Design:

Strategy	Action
Minimise the embodied emissions of the project	Utilising Life Cycle Assessment, material impacts will be reduced during Detailed Design.
Create healthy buildings	Materials assessment during detailed design will significantly reduce or eliminate the use of hazardous materials and VOCs in construction.
Enable and support sustainable consumption behaviours	Creating opportunities for residents to embrace 'collaborative consumption' through design elements such as the ground level kitchen garden, elevated terrace productive garden, shared tool library, bulky goods room and book-swap shelving.
Maximise the adaptive reuse of buildings and materials and use of recycled materials	Materials reclaimed during demolition, including bricks and fill, will be used on-site wherever practical. Recycled materials will be used wherever possible, including recycled aggregate in road and footpath bases.

Construction:

Strategy	Action
Minimise the embodied emissions of the project	Off-site modular construction of apartment bathrooms has been able to reduce material use and waste generation.
Create healthy buildings	Material Safety Data Sheets will be collected for use during construction.

Operation:

Strategy	Action
Minimise the embodied emissions of the project	Owners Corporation rules to include guidance around sustainable refurbishment, embodied emissions and durability.
Enable and support sustainable consumption behaviours	Connecting residents via the online portal and using this to encourage sharing of irregularly used tools or appliances (e.g. drills and other power tools).



Image: Recycled bricks (seier+seier Flickr)

7.9 Zero Waste

Reducing consumption, reusing and recycling to achieve zero waste and zero pollution

	Outcome (date)	Target / Indicator	Baseline
	Maximise waste diverted from landfill during construction (2020)	95% construction waste by mass diverted	80% - typical
	Maximise waste diverted from landfill during operation (2020)	60% waste diverted	37% - 2011/12

7.9.1 Key strategies

Design:

Strategy	Action
Minimise the generation of waste and disposal of waste to landfill during construction	The utilisation of modular bathroom 'pods' will reduce material use and waste generation.
Minimise the generation of waste and disposal of waste to landfill during construction	Include waste separated bins in joinery. Provide central composting facilities or worm farms for organic waste.
Closed loop management of organic waste	Provide compost bins or worm farms in the kitchen garden and productive terrace garden to enable organic waste to be treated to provide nutrient rich outputs for use in the gardens.

Construction:

Strategy	Action
Minimise the generation of waste and disposal of waste to landfill during construction	Reuse bricks onsite from the demolished heritage terrace homes and hospital building. Mirvac Construction Waste Management policy will be implemented through construction. This will include a pilot of 'zero waste trades' for some subcontractors.

Operation:

Strategy	Action
Minimise the generation of waste and disposal of waste to landfill during construction	One Planet Living guide to include waste section identifying methods for waste reduction and recycling. The community hub will develop and implement a sustainable waste management strategy and include requirements in the 'green lease' for the cafe around sustainable waste management.
Foster sustainable waste management behaviours	Include tips and information on sustainable waste behaviours in the One Planet Living guide. The Community Hub will host workshops on sustainable living, including waste topics.

Closed loop management of organic waste	Utilise outputs of organic waste treatment on shared vegetable gardens, landscaping.
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Image: Worm farm (wormlovers.com.au)

7.10 Zero Carbon Energy

Making buildings energy efficient and supplying energy with renewables

	Outcome (date)	Target / Indicator	Baseline
	Reduce greenhouse gas emissions from building energy consumption (2020)	1,157 tonnes co2/year (43% reduction)	2,037 tonnes co2/year

7.10.1 Key strategies

Design:

Strategy	Action
Minimise greenhouse gas emissions the project and define a pathway to zero carbon.	<u>Residential:</u> building orientation, glazing ratios and floorplan design will minimise ongoing energy requirements. <u>Community hub:</u> natural ventilation, natural light, exposed thermal mass, air-tightness, reduced thermal bridging and efficient HVAC will contribute to a significant reduction in energy consumption during operation.
Provide energy efficient heating, cooling and hot water services	Specify energy efficient heat pump heating and cooling systems for each apartment. Centralised condensing gas boiler for supply of domestic hot water. Ring main system provides future pathway to zero carbon by switching out gas boiler at end of life for heat pump.
Minimise peak energy demand	Building orientation, glazing ratios and floorplan design to minimise peak energy demand. Extensive landscaping, including mature trees and green roof area, reducing urban heat impacts. Highly energy efficient heating, cooling, lighting and appliances to minimise peak demand.
Maximise the provision of on-site renewable energy	An integrated energy system comprising solar PV and battery storage will supply power for the common area lighting. Mirvac's Innovation team is trialling a Hatch project to deliver the remaining rooftop solar to residents.
Enable proactive ongoing management of energy use	Specification of smart electricity meters to allow interval data to be used in ongoing energy management.

Construction:

Strategy	Action
Minimise greenhouse gas emissions of the project and define a pathway to zero carbon	We explored opportunities for electric cranes to be used during construction, supplied by 100% Green Power. This did not occur due to the availability. Instead, cranes were sourced from an Indigenous owned business through Supply Nation. We will continue to explore the option of using green powered electric cranes for future projects.
Deliver a thermally efficient building envelope for all dwellings	Sustainability spot checks to ensure insulation is correctly installed and buildings are constructed to the designed standard.
Provide energy efficient heating, cooling and hot water services	Effective commissioning to ensure centralised plant and mechanical ventilation operates at optimal efficiency.

Operation:

Strategy	Action
Minimise greenhouse gas emissions of the project and define a pathway to zero carbon	Work with power retailer to offer discounted Greenpower offer on move-in to maximise uptake. Preconnection of common areas to 100% Green Power, recommendations to be made to body corporate to maintain green power at time of hand-over.
Enable proactive ongoing management of energy use	One Planet Living guide to provide accessible information on sustainable apartment living, including passive thermal control and minimising overall energy consumption. Owners corporation reports on annual energy consumption and efforts to reduce this.



Image: Off-site renewable energy (Hugh Altschwager)

8 Monitoring plan

Design and Construction: Mirvac are tracking performance against the OPL targets through monitoring on site and regular team meetings. An annual update will be provided on the Marrick&Co. website.

Operation: Mirvac will provide the body corporate and Inner West Council with the resources required for them to monitor the outcomes during operation, if they choose to maintain the certification. Key resources provided include:

- Energy and water metering
- Preparation of a Residential survey
- Seed funding for a sub-committee to manage the OPL principles and monitoring

University research projects will be investigated prior to construction completion to assist in the operational review and monitoring.