Kingsway City Shopping Centre

Sustainability Report

Tah Land Pty Ltd

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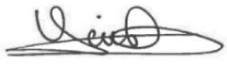
X 

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Executive summary

This report outlines the Sustainability Strategy for the proposed development at the Kingsway City Shopping Centre, in Madeley, Western Australia. The location of the development falls within the City of Wanneroo local area boundary. The new eight storey mixed use building will comprise several commercial tenancies on the ground floor, and serviced apartments on Levels 1 through 7.

Under the City of Wanneroo District Planning Scheme No. 2, the site is currently zoned as commercial.

The following Tables 1-1, 1-2, 1-3 and 1-4 describe how the proposed development meets City of Wanneroo and State requirements and outlines which sections of this report are relevant for each requirement. The following policies have been considered within this report.

- City of Wanneroo
  - *Local Planning Policy 4.4: Urban Water Management*
  - *Local Planning Policy 4.29: Renewable Energy Systems*
  - *Tree Preservation Policy*
- Department of Water and Environmental Regulation
  - *Western Australian Climate Policy*

Table 1-1 Local Planning Policy 4.4: Urban Water Management

Applicable action or target	Requirement will be met	Comments
Local Planning Policy 4.4: Urban Water Management The purpose of this Policy is to ensure planning and development within the City of Wanneroo optimises the use and management of water resources. Policy objectives are listed below.		
1. Integrate water and land use planning by considering water sources early in the planning and development process.	✓	Please refer to **Section 4.2 Water efficiency**.
2. Achieve catchment specific environmental criteria, and thereby deliver better water management outcomes for the catchments within the City.	✓	
3. Achieve total water cycle management outcomes via the structure plan, subdivision and development approvals processes.	✓	
4. Implement Water Sensitive Urban Design (WSUD) principles and best management practices for all planning proposals and City operations.	✓	
5. Improve water quality within the City and ensure the protection and management of sensitive environments.	✓	
6. Ensure all development connects to scheme water and reticulated sewerage (if available) and is in accordance with the Government Sewerage Policy (Department of Health, 2019).	✓	
7. Assess the practical and appropriate level of risk related to the proposal (guidance on level of risk is contained in Schedule 1).	✓	

Table 1-2. Local Planning Policy 4.29: Renewable Energy Systems

Development must demonstrate that:	Requirement will be met	Comments
The purpose of this policy is to provide guidance on the development of Renewable Energy Systems within the City that provide power to a dwelling or a business primarily for its needs and is not a commercial power generation land use.		
Section 2.1: Development approval will be required for: a. all wind energy systems b. solar energy systems that are not integrated with the roof or façade of a building; and c. for all other forms of renewable energy systems.	✓	The proposed renewable generation will consist of a solar energy system integrated with the roof of the building.

Table 1-3 City of Wanneroo – Waste Plan 2020 – 2025

Development must demonstrate that:	Requirement will be met	Comments
As per the *Strategic Community Plan*: 3.3.1 Treat waste as a resource. 3.3.2 Foster a partnership with community and industry to reduce waste. 3.3.3 Create and promote waste management solutions	✓	Four different waste streams will be managed within the new development. A target of 80% diversion from landfill will be set for construction waste. Please refer to **Section 4.4 Waste** for further information.

Table 1-4 Tree Preservation Policy

Development must demonstrate that:	Requirement will be met	Comments
This Policy does not apply to existing developed private property, however the City will promote the principles of the Policy when considering future development which may affect significant individual trees located within existing developed areas of the district, as well as all publicly owned land.	✓	No significant existing trees are present on site.

Table 1-5. Western Australian Climate Policy

Applicable action or target	Requirement will be met	Comments
Transition towards net zero by 2050	✓	Onsite solar PV, double glazing, and use of limited gas within the development will contribute to the policy aims. Refer to **Section 2.0** for further information.
Energy efficient housing, reducing carbon emissions.	✓	The project will not require NatHERS assessment, as all apartments are serviced/commercial. However, various energy efficiency measures are in place to ensure carbon is reduced. Refer to **Section 2.0** for further information.

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1.0 Introduction

This report outlines the sustainability strategy for the proposed mixed-use development at Kingsway City Shopping Centre, in Madeley, Western Australia, and considers the design against relevant state and local government policies.

The site is located within the current Kingsway City Shopping Centre and is approximately 20 km from Perth CBD.

A carpark servicing the Shopping Centre is existing on-site, and no major vegetation or existing buildings require to be cleared for the development. The new design will comprise several commercial tenancies and serviced short-stay apartments.

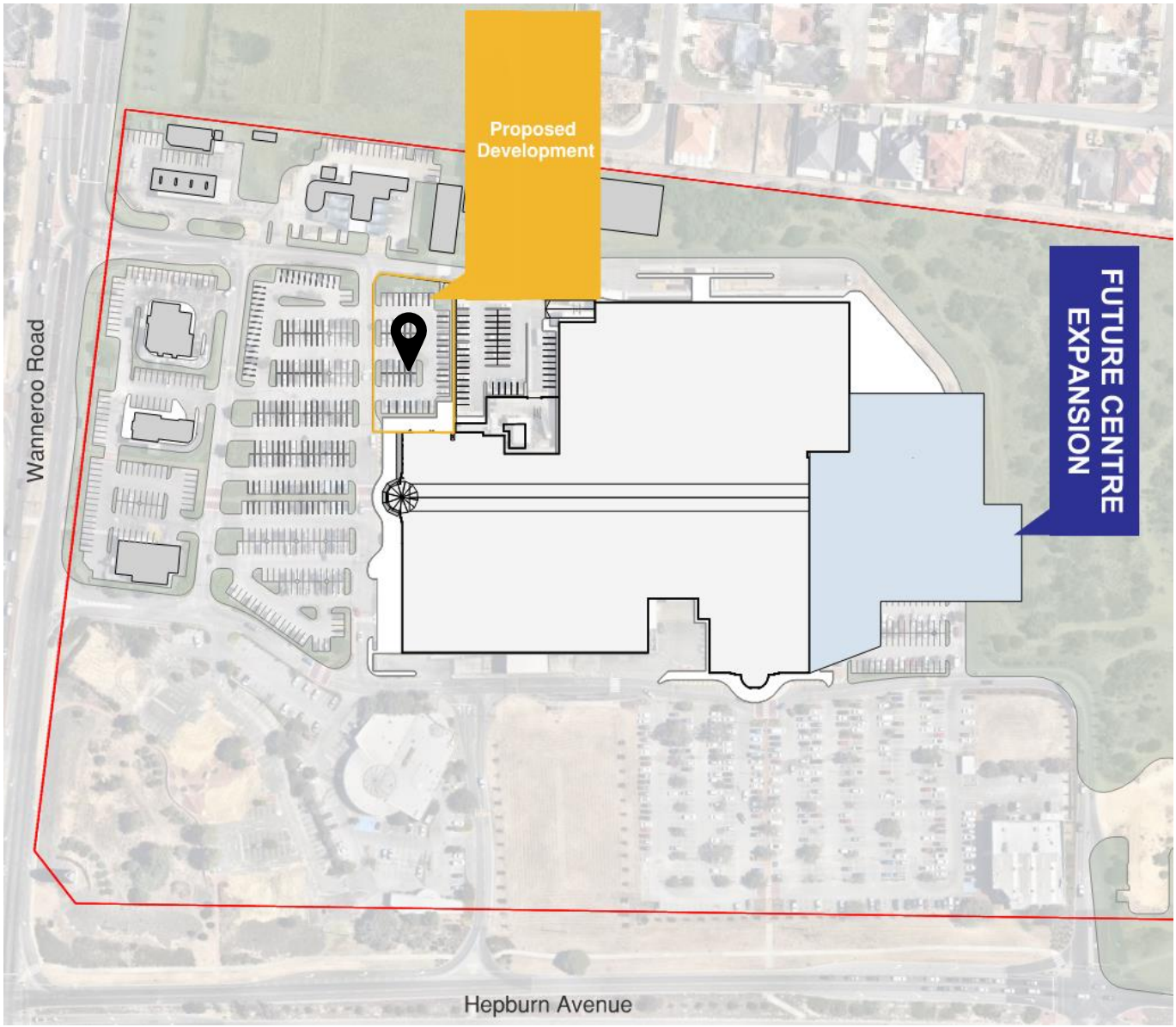

Figure 1-1 Site location of the proposed Kingsway City Shopping Centre development, as shown in orange.

Figure 1-2 Typical proposed floor plan of the proposed development, Levels 2-7 shown.

1.1 City of Wanneroo Schemes and Policies

1.1.1 City of Wanneroo – Local Planning Policy No. 4.4: Urban Water Management

This Policy applies to all planning proposals for Residential, Commercial, Industrial or Rural zoning, subdivision or development within the City of Wanneroo.

The purpose of this Policy is to ensure planning and development within the City of Wanneroo optimises the use and management of water resources (including rainwater, stormwater, groundwater, drinking water and wastewater) consistent with State Planning Policy 2.9: Water Resources (WAPC, 2006) and Better Urban Water Management (WAPC, 2008).

The Policy Objectives (pages 2-3) are to:

1. *Integrate water and land use planning by considering water sources early in the planning and development process.*

2. *Achieve catchment specific environmental criteria, and thereby deliver better water management outcomes for the catchments within the City.*

3. *Achieve total water cycle management outcomes via the structure plan, subdivision, and development approvals processes.*

4. *Implement Water Sensitive Urban Design (WSUD) principles and best management practices for all planning proposals and City operations. The following WSUD principles (in order of priority) adapted from Stormwater Management Manual for Western Australia (DoW, 2004 – 2007) must be applied for all new development proposals as well as City operational projects and activities:*

    a) *Provide protection to life and property from flooding that would occur in events up to a 1% Annual Exceedance Probability (AEP) event.*
    b) *Manage runoff from small rainfall events on-site or as close to the source as possible.*
    c) *Retain and restore existing elements of the natural drainage system, including waterway, wetland and groundwater features, regimes and processes, and integrate these elements into the urban landscape.*
    d) *Protect and enhance sensitive receiving environments.*
    e) *Minimise pollutant inputs.*
    f) *Increase water use efficiency and reduce potable water demand.*
    g) *Achieve good urban liveability and amenity.*
    h) *Reduce urban temperatures, runoff volumes, and peak flow rates and improve water quality, biodiversity and aesthetics by managing stormwater through the retention and planting of vegetation and mimicking natural hydrological processes.*

5. *Improve water quality within the City and ensure the protection and management of sensitive environments.*

6. *Ensure all development connects to scheme water and reticulated sewerage (if available) and is in accordance with the Government Sewerage Policy (Department of Health, 2019).*

7. *Assess the practical and appropriate level of risk related to the proposal (guidance on level of risk is contained in Schedule 1).*

1.1.2 City of Wanneroo – Local Planning Policy No. 4.29 Renewable Energy Systems

The purpose of this policy is to provide guidance on the development of Renewable Energy Systems within the City that provide power to a dwelling or a business primarily for its needs and is not a commercial power generation land use.

The objectives of this Policy (page 1) are:

1. *To provide guidance for the installation and development of Renewable Energy Systems throughout the City that provide power to the principle use of the land;*

2. *To ensure that Renewable Energy Systems do not unreasonably detract from the streetscape or amenity of adjoining properties and the area generally; and*

3. *To facilitate the environmental and sustainability benefits of utilising renewable energy systems such as wind and solar systems to power buildings and commercial activities within Wanneroo.*

1.2 City of Wanneroo – Tree Preservation Policy

This Policy does not apply to existing developed private property, however the City will promote the principles of the Policy when considering future development which may affect significant individual trees located within existing developed areas of the district, as well as all publicly owned land.

1.3 City of Wanneroo – Waste Plan 2020-2025

This Waste Plan summarises how the City of Wanneroo's plans for delivering waste management services over the next five years and outlines the City's priorities and measurable targets with those detailed in existing federal, state and local government strategic and policy frameworks.

The plan was developed in collaboration with the Department of Water and Environmental Regulation and the State Government's Waste Avoidance and Resource Recovery Strategy 2030. The document was also supported by feedback received from the community and other vital industry stakeholders.

1.4 Western Australia Climate Policy

Western Australia's Climate Policy produced in November 2020 by the Government of Western Australia is a policy to commit to a low carbon future for Western Australia. Relevant actions from the Climate Policy are summarised below:

Climate Resilience Action Plan 2022–25:

- Develop a coordinated, collaborative plan to support Western Australian industries, cities, and regions to identify and manage climate impacts and enhance climate resilience.

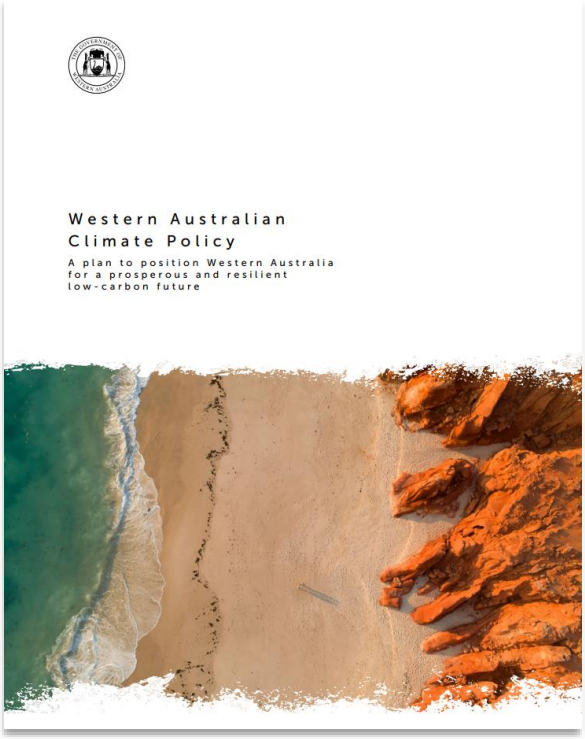

Figure 1-3 WA Climate Policy, November 2020

2.0 Carbon reduction

The construction industry is responsible for nearly 20% of Australia's carbon footprint. These emissions include embodied carbon, construction emissions, operational resource consumption, and end of life demolition.

The Government of Western Australia outlines their aspirations to achieve net zero greenhouse gas emissions by 2050 in their Climate Policy published in November 2020.

The following section summarises the specific initiatives being investigated for the development in relation to reducing carbon.

2.1 Upfront carbon

Carbon emissions produced by the building industry are not only released during a building's operation, but also during the sourcing, processing, and transportation of building materials. Embodied carbon is an often-overlooked source of emissions which acts a significant source of emissions, estimated at around 11% of global carbon emissions (World Green Building Council, 2019).

The project aims to address the issue of upfront carbon by considering various design initiatives, including but not limited to:

- Reducing concrete mass by optimising structural design.
- Consideration of replacing Portland cement in select concrete mixes with waste materials such as fly-ash.
- Minimise foundation mass where possible, in coordination with geotechnical requirements.

The above initiatives are significant as they help reduce concrete consumption, which can lower upfront carbon emissions given the high energy intensity of producing Portland cement.

Figure 2-1 A typical concrete production facility, which comprises several energy-intensive processes.

2.2 Energy efficiency

A wide range of energy efficiency features will be incorporated into the development. Please refer to **Section 4.1** for a full description of these initiatives.

2.3 Limited fossil fuels

Natural gas is a fossil fuel that when burnt releases significant amounts of greenhouse gas emissions, contributing to the negative effects of climate change.

Building services for all short stay apartments will be designed to ensure no gas is used for space heating, domestic hot water, or cooking within those areas.

Gas will only be provided to commercial tenancies, where it will be used for cooking purposes only (i.e., no gas hot water).

2.4 Renewable energy

The project is currently planning significant on-site electricity generation. This will be achieved through a large array of solar PV panels located on the roof.

At the current stage the specific system capacity is unknown, however it is anticipated to supply a significant portion of the buildings energy requirement.

2.5 Sustainable transport

Sustainable transport options are a major feature of the proposed development, with several sustainable modes of transport to be accommodated and encouraged within the development.

Provision of several electric (EV) vehicle bays and bicycle racks are under consideration, which help to encourage lower-carbon transport.

Please refer to **Section 6.0** for full details on these initiatives.

3.0 Social sustainability

Sustainable design is not only about environmental aspects. Social and governance initiatives are equally important and must be considered for a good design outcome and the successful operation of a building.

The following section summarises the specific initiatives included in the design in relation to social sustainability.

3.1 Healthy living and work environment

Good visual access to natural spaces, gardens, and greenery is an important way to support mental and physical health of building occupants.

Shopping centres are particularly devoid of these features, and the design will aim to incorporate vegetation throughout the ground floor to combat this. Small areas of vegetation will also be provided to the first-floor balcony. These initiatives may provide mental and physical health benefits to users of the building.

The use of outdoor living spaces will also be promoted within the development, to utilise Perth's favourable climate. Examples of this approach include the pavilion areas for each of the ground floor tenancies, as well the majority of apartments, which feature east and west facing balconies.

Figure 3-1 Outdoor vegetated areas will be present on the project.

3.2 Inclusive construction and workforce

The head contractor will aim to implement policies implemented on site that increase awareness and reduce instances of discrimination, racism, and bullying.

Provision of on-site mental and physical health support services is also being considered, through a provider such as Mates in Construction (MIC).

4.0 Resource consumption

The following sections set out design strategies being investigated for utilisation in this development to reduce the building's energy and water demand, and waste.

4.1 Energy efficiency

4.1.1 High performance building fabric

The proposed development will investigate high performance double glazing to all Class 3 facades to prevent excessive summer heating while allowing useful passive solar gains in winter.

A lower glazing U-Value would minimize the conductive loss or gain of heat between the interior and exterior of the building. This would enable an improved energy rating of the apartments, as well as reducing the operational carbon footprint of the development.

4.1.2 Natural ventilation and passive design

Short stay apartments within the development will aim to incorporate operable glazing elements along the facade. These façade elements will promote natural ventilation and allow for the passive release of warm air at night. When operable glazing is closed during the day, cool air can be stored within the apartment to reduce or eliminate the need for air conditioning.

Larger openings and balconies also enable occupants to make use of the favourable outdoor conditions which prevail in Perth for much of the year, again reducing the need for mechanical heating or cooling during these times. The development has considered this, with balconies provided throughout Levels 1-7.

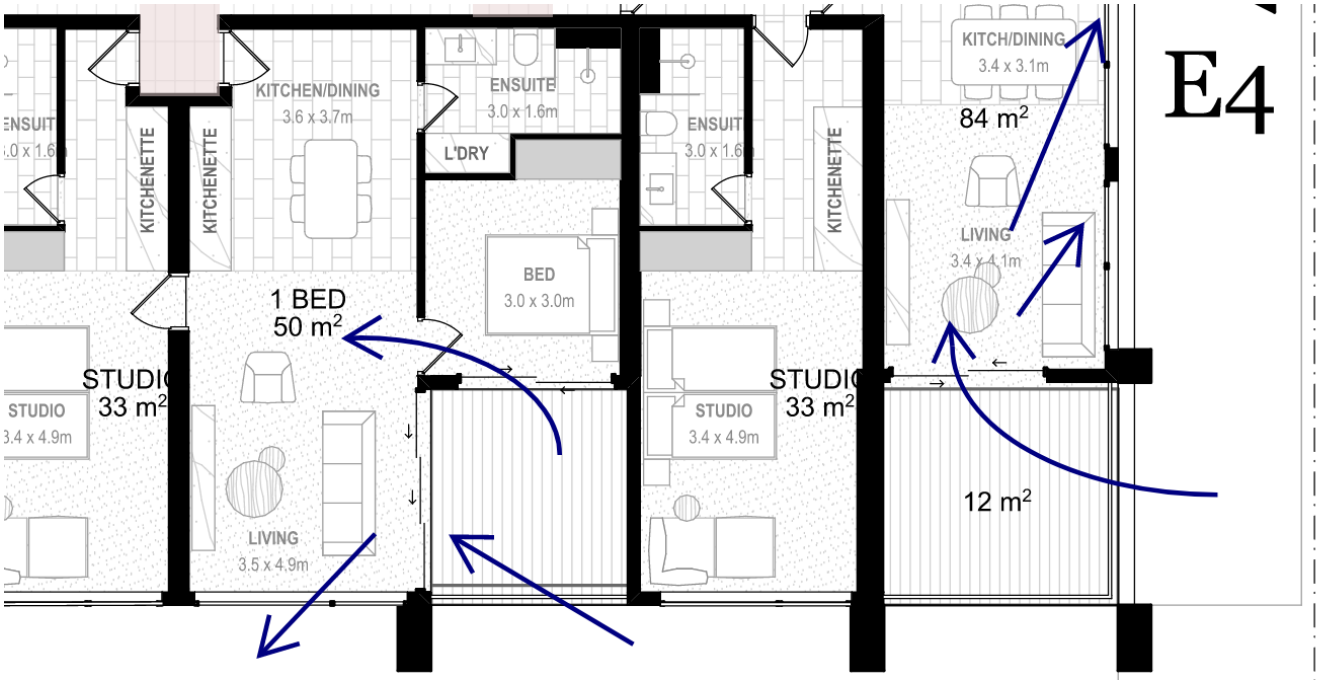

Figure 4-1 An example wind path for apartments with façade opening enabling cross ventilation.

4.1.3 Thermal bridging

Thermal bridging is the transference of heat through a wall at a point through which it can bypass the insulating layers of the structure. It is through these points in a building's envelope that they can experience unwanted heat gains and/or losses and as such will be considered when designing for sustainability and energy efficiency.

The wall and roof construction types for the project will consider the issue of thermal bridging and apply design principles where possible to introduce thermal breaks and other measures.

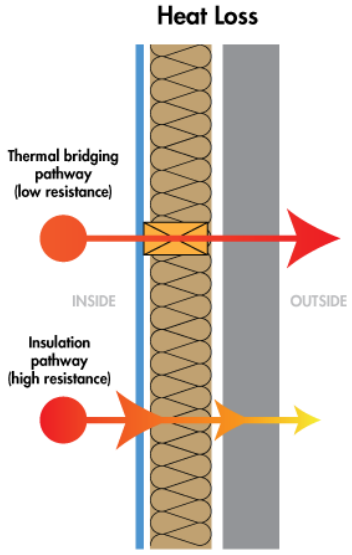

Figure 4-2 Thermal bridging principle

4.1.4 Lighting efficiency

All light fittings within the project will be specified as LED fittings, including lighting in the 'communal' corridors, stairwells, garage, and external lighting. Additionally, downward facing fittings will be considered for the external landscaped areas to reduce the negative effects of light pollution in the environment and further save energy.

Common area lighting in both indoor and outdoor settings will also consider incorporating sensing devices such as occupancy sensing (PIRs) to reduce lighting consumption when lighting is not required.

4.1.5 Solar photovoltaic (PV) panels

Solar photovoltaic panels are currently proposed for the project to help mitigate carbon emissions associated with operational energy.

Figure 4-3 Rooftop PV system, for example only.

4.2 Water efficiency

The water consumption of Western Australia is the second highest in Australia with an average of 241,000 litres per household per annum, well above the Australian average of 190,000 litres (Australian Bureau of Statistics, 2017).

A reduction of water usage does not only alleviate pressure from the local water supply but also helps reduce operational costs. Additionally, Perth's water system is highly energy intensive, so any water savings also help achieve significant energy savings.

The following section summarises the specific initiatives to be investigated for inclusion in the design in relation to water efficiency:

4.2.1 Water efficient fittings

Occupant consumption is a major contributor to potable water usage. The following water fixture WELS ratings will be targeted to ensure the efficient use of potable water by building occupants (to be within 1-star).

Table 4-1 Proposed water fittings WELS rating

Fixture / Fitting Type	Target WELS Rating
Taps	5 stars
Urinals	5 stars
Toilets	4 stars
Showers	3 stars
Clothes Washing Machine	4 stars
Dishwasher	5 stars

4.2.2 Water-wise landscaping

Over 40% of residential potable water usage in Perth is used for irrigation, meaning landscape water efficiency is essential to reducing overall water use.

For this development, water wise landscaping will be considered in the design, and may include the use of hardy natives and other drought tolerant vegetation. To further reduce the amount of water required for landscaped areas, a drip system with moisture sensor control may be installed for irrigation.

4.3 Building materials

The building will aim to reduce the total embodied energy and carbon considered in the construction and then aim to maximise the operational efficiency of the building's services.

Most notably, the proposed development will look to optimize the quantities of concrete required, and additionally aim to use low carbon concrete mixes. These typically involve the use of fly-ash and other cement replacements to mitigate emissions associated with producing general Portland cement, which is highly energy intensive.

4.4 Waste

In 2020-21, Australia generated 75.8 mega tonnes (Mt) of total waste, including 14 Mt from households and local government, 32.8 Mt from the commercial and industrial sector and 29 Mt from construction and demolition (Australian Circular Economy Hub, 2024). A reduction of both construction and operational waste is therefore an important target for the development.

The following section summarises the specific initiatives that will be investigated for inclusion in the design.

4.4.1 Construction and demolition waste

The design team is targeting a reduced waste generation footprint during construction.

Specifically, a target of 80% diversion from landfill will be set for construction and demolition waste.

4.4.2 Operational waste

An Operational Waste Management Plan will be developed for the building. This plan, in conjunction with the dedicated waste storage area within the building, will help ensure that operational wastes are managed correctly.

The development will seek to manage 4 separate waste streams comprising of general waste, comingled recycling, food and organics, and paper and carboard.

The separation of waste streams will enable good environmental outcomes and promote waste management principles in the City of Wanneroo's Waste Plan 2020 – 2025.

5.0 Indoor environment quality

The Indoor Environment Quality (IEQ) of a building aims to improve the occupants' experience of the space. A holistic approach to sustainability will result in multiple benefits both in energy efficiency and encouraging occupant wellbeing.

This can be achieved by improvements to air quality through appropriate ventilation, providing high levels of thermal, visual, and acoustic comfort, reduction to occupant stress and the creation of a low-toxicity environment through the reduction of pollutants.

The following section summarises the specific initiatives to be investigated for inclusion in the design in relation to IEQ:

5.1 Thermal comfort

An indoor environment that is too hot or too cold can affect mood, performance, and productivity. However, at which temperature a resident feels comfortable varies significantly from person to person. To control internal comfort and minimise excessive heat loss in winter and heat gains in summer, several strategies will be investigated for the proposed development:

- High-performance double-glazing systems are considered for this development to improve the thermal performance of the building envelope. Operable glazing elements will also enable natural ventilation which can benefit thermal comfort.
- The façade will be well sealed to avoid draughts and air leakage.
- External shading and screens to prevent excessive heat gains in summer (as shown in the below image)
- Use of light painted cladding to reduce excessive solar absorptance.

5.2 Visual comfort

Similar to thermal comfort, the human body feels best when receiving natural levels of daylight and views of the external environment. Additionally, excessive light in the form of glare is detrimental to user wellbeing and should be mitigated. To ensure these parameters are provided for building occupants, several strategies are being considered for the proposed development. These include:

- Large windows, with appropriate Visual Light Transmittance (VLT) to allow good daylight entry.
- Windows placed such that all apartments receive adequate daylight, with shading structures ensuring glare is avoided.
- High quality landscaping and inclusion of planter boxes throughout Level 1 and Ground Level, enhancing views.
- Sufficient building height to provide users with visual access across the external environment.
- Use of flicker-free lighting to improve artificial light quality.

In addition to this, lighting fittings used within the building will be targeted as flicker-free and designed to avoid glare, which will further improve occupant’s visual comfort.

5.3 Exposure to toxins

Volatile organic compounds (VOCs) are emitted as gases and are widely considered as an indoor pollutant. VOCs encompass a variety of chemicals, some of which may have short- and long-term adverse health effects. VOCs are emitted by a wide array of products, typically paint, cleaning supplies, pesticides, building materials and furnishings, and office equipment such as copiers and printers.

To create a healthy indoor environment for all building occupants, the proposed development will aim to specify materials with low-VOC and low formaldehyde content to avoid contaminating the indoor air.

Furthermore, the developments use of passive design principles means natural ventilation will be achievable in most spaces. This will likely occur through operable glazing, and through provision of liveable outdoor areas.

Figure 5-1 Example of VOC's that may negatively affect health of building occupants.

5.4 Acoustic comfort

Good acoustic separation between spaces is important to enable a sense of privacy.

An acoustic comfort strategy will be developed for the project.

Consideration of acoustic separation through provision of adequate acoustic insulation, as well as impact noise transfer between floors may also be considered.

6.0 Sustainable transport

The use of motor vehicles directly contributes to climate change. This occurs both through the energy required to produce cars and transport infrastructure, and the direct emissions that result from car operations. Therefore, providing sustainable transportation options within new developments is an important way to reduce emissions and mitigate further climate change.

To reduce reliance on individual petrol and diesel-based transportation, it is necessary to maximise alternative transportation options. This may include initiatives that encourage and make possible the use of mass transport options, cycling or walking, and the selection of sites that are close to many amenities.

The proposed development has considered the importance of sustainable transport early in the design process.

The following section summarises the specific initiatives present in the proposed design in relation to transport.

6.1 Low carbon vehicles

To accommodate and encourage the growth of electric vehicles (EVs), the proposed development will provide several EV bays and the required electrical infrastructure necessary to charge these vehicles.

With a significant solar PV array proposed for the building, and cars likely parked during the day by building staff, many of these vehicles will essentially be powered by renewables. Several EV car bays are shown in the image below.

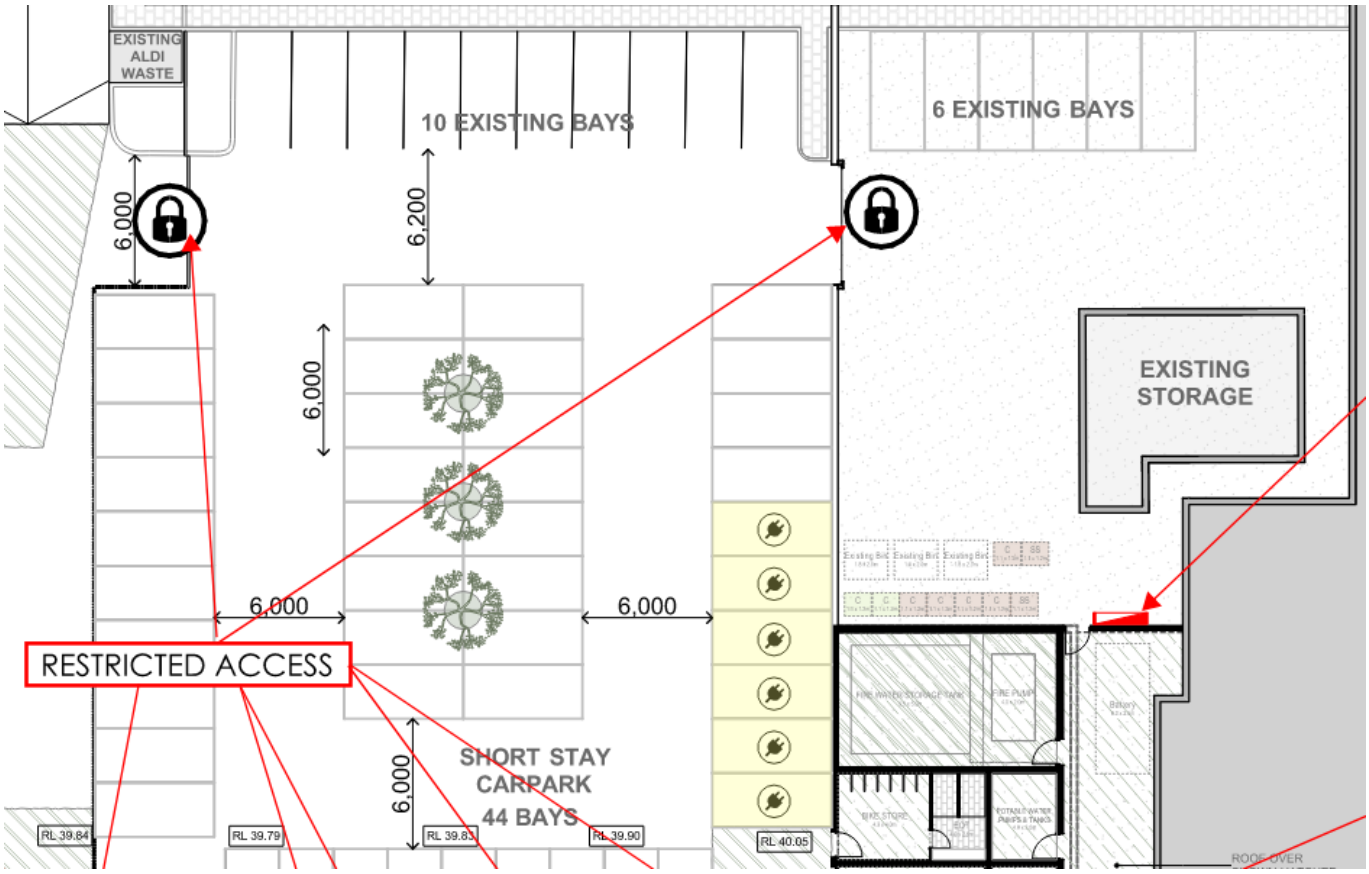

Figure 6-1 Ground Floor plan of the proposed development showing preliminary EV charging facilities, highlighted yellow.

6.2 Cyclist facilities

Bicycle facilities will be considered for the development to encourage staff and occupants to cycle. This may include end of trip facilities and secure bike storage facilities.

Figure 6-2 Cycling is a sustainable method of transport that will be encouraged.

6.3 Access to public transport and amenities

The proposed development in the Kingsway City Shopping Centre is bordered by Wanneroo Road and Hepburn Avenue, both major roads. As a result, building occupants will have great access to local public bus routes. There are several bus stops located within proximity, including the 385, 386, 448, and 450 bus routes.

Additionally, its location within a thriving retail and commercial areas ensures that numerous amenities are within walking distance of the building, which will further promote the pedestrian-friendly vision for the region.

Figure 6-3 Access to bus routes and local amenities that are walking distance from the proposed development. Source: Google Earth.

7.0 Impacts to nature

The following section summarises the specific initiatives included in the design in relation to natural systems impacted by the development.

7.1 Light pollution

Light pollution is an environmental issue where excessive amounts of light are projected upward. It is often a waste of energy and resources and has also been proven to impact local wildlife by affecting various vision and migration instincts.

Similar effects have been found in humans, with some people struggling to sleep and relax with prolonged exposure to artificial daylight and glare from poorly fitted external lights.

The project will investigate the use of all external light fittings pointing downwards, mitigating the effects of light pollution.

Figure 7-1 Example of a downward facing external lighting fixture.

7.2 Minimising heat island effect

The heat island effect describes the condition where urban areas have a higher average temperature than its rural surroundings owing to the make-up of the built environment. The use of light-coloured external materials combined with shaded and landscaped areas can reduce the heat island effect significantly and contributes to further energy savings.

The development includes landscaped areas on the ground floor and Level 1. Furthermore, the use of external materials on the façade and roof with a high Solar Reflectance Index (SRI) value has been considered in the design and will continue to be investigated.

Figure 7-2 Light coloured façade elements will help reduce heat absorption.

8.0 Codes and ratings

The development will be subject to voluntary and mandatory building codes and metrics to measure the performance of the building. This section of the report outlines the main codes and ratings and identifies the project's response.

8.1 NCC Section J – Building Energy Efficiency

All non-residential building compliance must satisfy the energy efficiency requirements laid out in Section J of the National Construction Code (NCC) Volume 1 Amendment 1. Compliance can be achieved through two separate pathways.

The first pathway is prescriptive, where a development must meet the Deemed to Satisfy (DTS) requirements for construction. In the event the DTS requirements cannot be met, the second pathway uses a modelling approach to verify that the building energy efficiency is equal to or better than what would be achieved under DTS.

The proposed development will look to satisfy the Section J requirements through either one of these two pathways, based on later versions of the design.

9.0 References

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