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Mos Lane – Mixed Use

Sustainable Design Assessment Report

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Title:	Mos Lane – Sustainable Design Assessment Report
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Description:	This report provides a summary of the proposed sustainable design targets and performance requirements for the proposed commercial mixed-use development of the Mos Lane retail precinct. The report provides a high-level summary for presentation and review by the Design Review Panel. A detailed scorecard which forms the basis of the report has been completed but has been omitted from the report for clarity.

Revision	Date	Checked by		Transmitted by	
A	24th September 2020				GEA
B	16th March 2021				GEA
C	17th March 2021				GEA

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Receiver	A	B	C						
ADC	X	X	X						

Executive Summary

FCDS have been commissioned to provide early project strategic advice for sustainable design relating to the proposed residential and commercial redevelopment of the Mos Lane retail precinct in Mosman Park, Western Australia. This document presents the project team's proposed goals and targets for the development, including a justification for the targets and a summary of some of the key features to be included as the design develops.

The sustainable design themes for the project have been coordinated with the overall development strategy, specifically aiming to address:

- Tangible benefits for owners and occupiers
    - Natural light and air quality
    - Utility savings / running costs
- Sustainability features which encourage engagement with community and surrounds
    - Sustainability used to engage and excite community, part of the planning and presentation
    - Transportation, community space
- Development to be a long term asset to the community
    - Future proof, climate change considerate.
    - Durable / Flexible
- Sustainability beyond energy and water
    - Lifestyle, health and well being
    - Community and economic sustainability
- Sustainability features should allow presentation and celebration, avoid greenwash
    - Authentic, real outcomes
    - Certified

The following report explains how these elements are expected to be included within the project, with key elements summarised below:

- Formal Green Star rating to Best Practice (4-Star) with an aspiration to achieve Australian Excellence (5 Star) level
- Design features to support a future Fitwel certification in operation
- Design to include renewable energy generation, up to 100kW
- Project is to connect well with the surrounding community on the ground plane, providing internal community facilities for occupants and visitors as well as connection to municipal infrastructure such as bike paths and bus stops

Specific responses to SDAU comments are as follows:

- LPP15 – D5
    - The design achieves superior sustainability ratings by targeting a 5-star Green Star outcome, committing to a 4-star outcome and seeking Fitwel certification in operation (Refer Section 6)
- Energy Efficiency
    - All dwellings shall exceed minimum BCA requirements by at least 0.5 stars (Refer Section 4.2)
- Water Efficiency
    - Each apartment will be separately metered (Section 2.2)
    - The site manages minor rainfall events on site (Section 5.2)
    - The design includes a safe overland flow for major rainfall events (Civil infrastructure)

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1. Introduction

1.1 Site Description

The proposed Mosman Height development is to be located at the corner of Wellington Street and Manning Street, in Mosman Park WA.

The development is to replace an existing local shopping centre, including a supermarket and specialty store offerings, with a new, larger retail space – including café and bar offerings – below two apartment buildings and a common area podium.

The development will be served by two layers of basement parking below the retail, increasing available area for shops and improving the connection between the retail and the street.

The project includes a substantial residential offering, with two buildings and a total of ~83 dwellings, including seven townhouses. The apartments are to be laid out to promote a relatable scale, allowing natural ventilation of common areas and corridors, good access to natural lighting and promotion of community.

1.2 Project Strategic Aims

This project is seeking to assist in the reinvigoration of the local Mosman Park area. At ground floor, the development is seeking to build on the existing supermarket, by providing complementary services including a variety of food and beverage options. The tenancy mix is intended to engage with the local community and provide a social hub not currently available in the area.

- Social connectivity of the development. The facility should provide a memorable and marketable presence at ground plane.
    - Pedestrian friendly with strong transport outcomes
    - High air quality
        - Outside air / natural ventilation
        - Shaded and controlled local climates
        - Planting / vegetation
    - Natural Light
        - Connection with level above

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    - Tenant Selection
        - Social offering
        - Health and well being
        - Waste control
        - Community space

The residential component of the development is targeting a range of occupants from diverse backgrounds and life stages. A mix of young people, couples, families and downsizers are anticipated and encouraged to improve the social cohesion within the community. To this end, the design includes a mix of apartment sizes (1 bed to 3 bed). The target market will likely include active people, across a wide age range but who will value a connection to the amenity and features at ground plane.

- Apartment features to improve sales will include health and well-being:
    - Water quality – filtration to all apartments
    - Thermal comfort – NatHERS ratings, building envelope performance
    - Daylight – glare protection and control, double glazing
    - Low toxicity

The development is intended to be a long-term asset, so should be future proofed to cater for changing needs and societal expectations. Similarly, sustainable design features must add value for the project, sustainability features with limited tangible benefits are low priority:

- Future ready
    - Potential to go 'all electric' – to take advantage of decarbonising grid
    - Onsite renewable generation – solar PV
    - Embedded network – share solar infrastructure across retail and residential
    - Batteries
    - Electric vehicles / car share schemes
    - Climate change resilient
- Economic Sustainability
    - Value add proposition
    - Economic payback
    - Leading edge, not bleeding edge

In addition to ecological benefits, sustainable design should positively influence most stakeholder groups, particularly where independently verified outcomes can be demonstrated. Sustainable design inclusions should; provide marketing collateral, improve owner confidence about the wisdom of their investment, reduce time and complications at planning and Design Approval Stage, assist in engagement with the local community and reduce investor risk.

- Certified Sustainability
    - Independently assessed and certified
    - Authentic sustainable design claims
    - No 'Green Wash'

1.3 Owners Project Requirements

The following table summarises the current design intent for the project team:

Category	Target	Comment
General ESD	Best Practice in Sustainable Design (4 Star)	Formal Certification of the project against Green Star Design and As Built V1.3 to at least 45 points, with an aspiration to achieve 5-star certification (60 points) following design development
Energy Consumption	20% Reduction in comparison to BCA Minimum Practice	Provision of a large – up to 100kW solar array – as well as efficient services and passive solar design are key to this outcome.
	20% Renewable Energy	Provision of renewable generation, with community engagement to overtly demonstrate best practice performance.
Water Consumption	20% Reduction over benchmark as determined by GBCA calculator	Low flow tapware Water wise irrigation
Transport	Reduce single use vehicles	Integration with ride share programs
	Increase active transport	Provide strong pedestrian and cyclist connections.
Waste Targets	Recycling in operation	The design is to encourage waste segregation and minimisation of landfill.
	>90% Recycling in construction	Careful consideration of demolition to facilitate high capture of materials from existing facility. Use of high efficiency resource recovery facility to sort waste in construction.
Indoor Environment Quality	Low exposure to pollutants	Selection of low VOC finishes Provision of low emissions printers
	Use of clear glazing	Design of shading schemes and orientation to minimise the need for tinted glass
	>60% of residential floor area with access to natural light and views	Use of transparent façade to facilitate high quality views for occupants
	Control of Outside Air	Utilisation of CO_2 detection and control and increased outside air rates to provide a high-quality occupied area.
Health and Wellness	Tenants with community benefit	Provision of tenancies like gyms and other health and wellness facilities.
	Engage with patrons	Utilise public art and digital signage to engage and educate staff, occupants, and visitors. Consider use of community engagement software platform, such as ResVu.

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2. Energy and Utilities

Most people identify sustainable design with the reduction of energy and water consumption. As the Green House effect is largely recognised as the main environmental challenge of our time and Perth has been under water restrictions since 1996, it is understandable why these features are so key to sustainable design.

In addition to environmental benefits, energy savings also have strong economic returns, with direct payback from energy savings usually paying off the initial investment in 5-10 years.

The following features are expected to be included within the design to reduce energy and water consumption on site:

2.1 Commissioning and Tuning

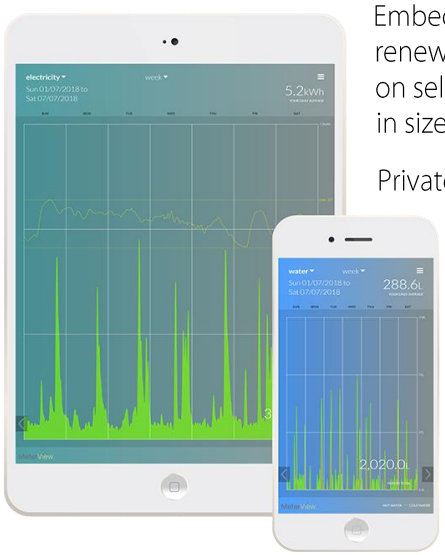
Commissioning and tuning involves increased emphasis on the final construction and handover phases of the development. Contractors will be required to follow detailed commissioning plans, intended to ensure operation and integration of systems prior to handover to occupants. In addition, the builder will be requried to pressure test the building façade to prove good quality construction and building sealing.

Post completion, this feature involves monitoring building performance for a period of twelve months after practical completion. The intent of this element is to track energy and water consumption, as well as indoor environment performance to ensure the building is operating to its full design intent.

As well as saving energy and water and improving system operation, building tuning will provide information for building occupants and visitors celebrating the performance of the building and assist with education and engagement of the community.

2.2 Embedded Meter Network and Monitoring System

Embedded meter networks allow building facilities managers to take control of utility purchasing and management. Embedded networks refer to privately owned and maintained meter systems which are used to bill tenants for their use.



Embedded networks are a key component of a solar PV array – or other renewable energy system – feasibility. Without the ability to collect and on sell power generated from the solar array, systems are either limited in size (to avoid exporting power) or much less economically viable.

Private networks also provide improved outcomes for building meter data visibility and presentation and can self-calibrate and check for water leaks.

The proposed development of Mos Lane will include an embedded meter network, allowing solar energy to be shared across the development, providing an improved economic and environmental return for residential and commercial occupants.

Meter data from the system will be made available to present and celebrate performance data with occupants.

2.3 Renewable Energy Generation

When sized correctly, solar systems have economic payback periods of less than 5 years in Perth. In addition to economic benefits, they also offer carbon-free electricity, acting to reduce the building's environmental footprint. Solar panels also offer some degree of protection from future electrical price rises or carbon taxes.

The proposed project would be expected to support an array of 90-100kW, based on the number of apartments and significant retail and car parking provisions on site.

Solar panels are expected to be included on the roof of the southern building and other strategic locations to ensure they are not overshadowed but are also visible to occupants to improve engagement and understanding of sustainable design.

2.4 Low Flow Tapware and Appliances

Rainwater capture and reuse in WA is generally not economically effective. Our climate patterns include a high concentration of rainfall over our winter months, with very little rainfall outside of the period May-October. As such, the design will provide water efficiency primarily by passive means, including low sanitaryware and appliances, as per below:

Fixture Type	Best Available WELS rating
Taps	6 stars
Urinals	6 stars
Toilets	5 stars
Showers	4 stars*
Clothes Washing Machines	5 stars**
Dishwashers	6 stars**

* Showers aiming for 6-7.5 l/min flow.
** Extent of appliance provision yet to be confirmed.

In addition to saving water use and the associated costs, water wise design for landscape, sanitary fixtures and fire systems will be important in engaging with the building occupants and local community.

2.5 Other Utility Features

In addition to the above features, the following elements, improving resource efficiency, are described elsewhere:

- Waste management and diversion (Future Proof)
- NatHERS Ratings (Internal Amenity)
- Urban Heat Island (Community Benefits)
- Electrical Site (Future Proof)

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3. Community Engagement

The project development team have already commenced community engagement and consultation as part of the initial project planning phase. Over a number of separate evenings, food trucks were provided on site, with local community members invited to attend and provide feedback for developers about what they would like to see on site.

As clearly evident by the popularity of the evenings, improved local food and café offerings are expected to be very popular with the community, providing economic opportunity as well as providing a social hub and improving the amenity available for the apartment owners and occupiers.

The following features have been recognised as a key component of the social sustainability offering for the site.

3.1 Urban Heat Island Effect

The urban heat island effect is the term used to describe increase temperatures in and around major population centres and built form. Dark and heavy materials (such as roads, or dark roofs) act to absorb, retain and reradiate heat, increasing local temperatures by 2 degrees or more in some instances.

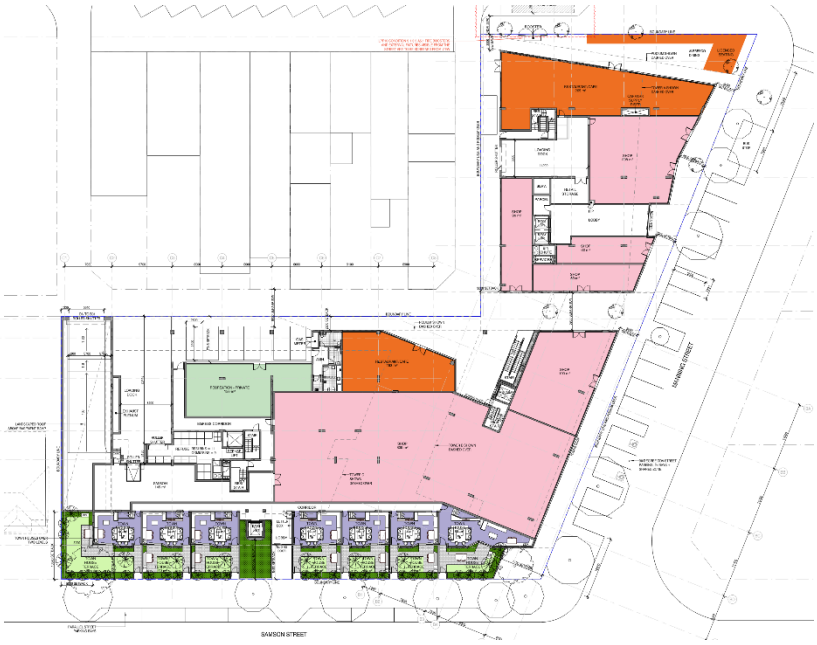
The proposed development will significantly reduce the urban heat island effect of the current site through the use of shade and vegetation at ground level and light roofs and ground finishes for the podium and residential levels.

This feature will improve local environmental outcomes as well as reduced operating costs for owners as air conditioning systems are required less frequently and can run more efficiently when needed.

3.2 Pedestrian and Community Infrastructure

The ground plane for the proposed development has an outstanding opportunity to connect with the local streetscape to improve outcomes for both occupants and the general community. Provision of trees and shaded sidewalks, as well as public art features, wayfinding, public seating and the like will attract the local community and increase the chance of their connection with and use of the site amenities.

In addition, for the building occupants, a strong connection to local pedestrian, public transport and cyclist infrastructure will encourage an active lifestyle and promote healthy living.



3.3 Community Engagement Platform

Utilise software such as ResVu to connect with stakeholders and manage interactions for the development.

These systems can connect facilities managers, occupants, retailers and visitors on a single platform, allowing better allocation of maintenance funds, identification of issues and opportunities and improvement of outcomes for all stakeholders.

3.4 Other Community Features

In addition to the above features, the following elements, improving community outcomes, are described elsewhere:

- Commissioning and Tuning (Energy)
- Embedded Meter Network (Energy)
- Low flow tapware and appliances (Energy)
- Control of outside air (Occupant Amenity)
- Active Transport (Occupant Amenity)

4. Occupant Amenity

Indoor Environment Quality (IEQ) is the basis for most business case justifications of sustainable design. Providing occupants with increased comfort, reduced distractions, improved outlook and better air quality will ultimately lead to better economic outcomes, including increased sales, better rental returns and increased investor satisfaction.

The following features are intended to improve occupant amenity:

4.1 Noise Levels

The design team will target compliance with the recommended noise levels in AS 2107 across the development. In addition, the provision of a large podium level, including a slab which extends past retail spaces below will improve noise isolation between the retail level and apartments above.

4.2 NatHERS Ratings

The project will target compliance with the BCA Section J 2019 which will require apartments to achieve an average rating of at least 6 Star NatHERS ratings (measurement of building envelope thermal performance). At this stage, designers are targeting an improvement 20-30% (7 – 8 star) over this benchmark as an effective means to demonstrate performance improvement in both occupant comfort and energy consumption.

Improved building shading and the use of double glazing will have dual benefits of improved building NatHERS ratings and better access to natural light for occupants. These features also improve climate change resilience for the development.

4.3 Controlled Outside Air

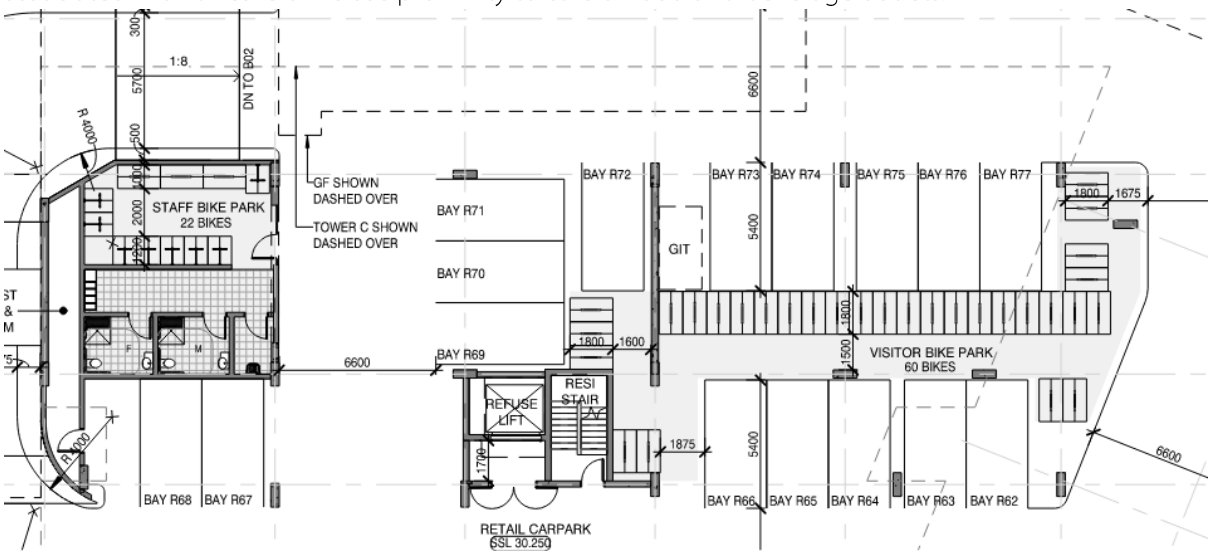
Apartment design in Perth typically relies on openable windows to provide outside air to occupants. This can have significant issues with mould growth and condensation, particularly in well-sealed buildings or spaces where exhaust systems are not generally operated. The proposed design will review the potential to connect outside air ducts directly to air conditioning systems within the occupied space, including filters on air intakes to optimise air quality in the occupied zone.

In addition to improved air quality outcomes, control of outside air rate is also expected to improve energy consumption, as excess air is not conditioned, or lost through windows during periods of low or high ambient temperatures.

4.4 Active Transport and Bike Share

The design will provide ample and well-connected bike facilities to encourage both occupants and visitors to cycle / walk to and from the precinct.

Large, secure bike areas will assist with patrons cycling to the building by eliminating the clutter associated with bikes left in close proximity to café or food and beverage outlets.



Similarly, bike storage provisions and/or bike share schemes for occupants – particularly when supported by connection to local cycle paths and networks, will assist in promotion of active and healthy living.

4.5 Podium Amenities

The podium space offers a chance for the development to add value across a range of different areas. FCDS acknowledge that this space should not detract from the service offering below, however, the following elements will be considered to add value to occupants and the local community:

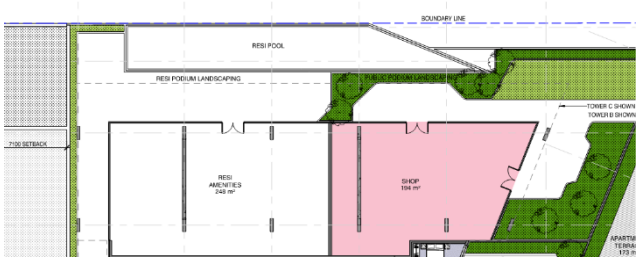
- Community garden with the potential to grow vegetables for consumption on site
- Restorative garden – quite space for connection to nature
- Exercise equipment and play space
- Wellness tenancy
- Barbeque or community cooking facilities

These elements will contribute to the local occupant value as well as certification under Green Star and FitWel.

4.6 Other Occupant Amenity Features

In addition to the above, the following elements, improving occupant amenity outcomes, are described elsewhere:

- Commissioning and Tuning – (Energy)



5. Future Proof and Flexible

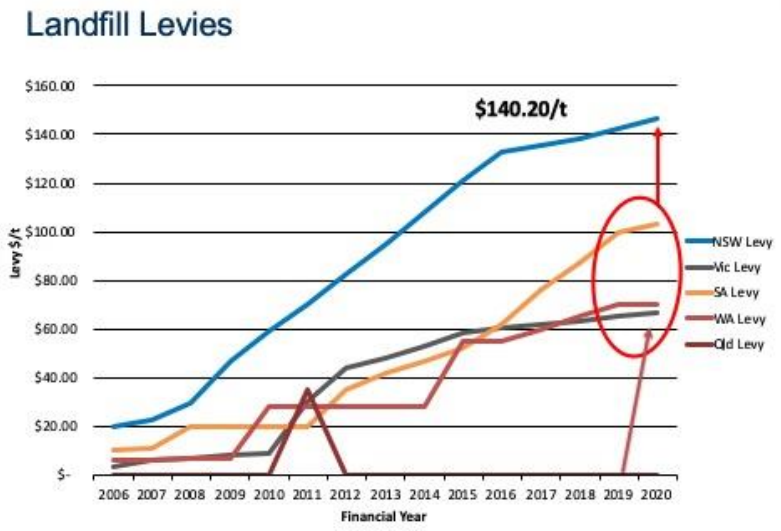
The project is expected to be a long-term asset for building owners and the general community and, as such, must still be economically and environmentally fit for purpose for then next 50+ years. The following features are intended to assist in this regard:

5.1 Operational Waste Diversion

The cost of landfill and waste disposal has increased significantly in Australia over the past decade, with the situation expected to continue to worsen in the short to medium term. It is therefore critical that the design team include sufficient space and design features within the project planning to allow for separation of waste streams – helping to minimise landfill costs.

It should be noted that recent trials in local councils have already seen a permanent move to three bins, including waste, mixed recycling and food / garden organics (FOGO) for residences – Melville recorded a 65% decrease in landfill waste in their trial zone.

The design will include a waste management plan to divert waste from landfill, improving environmental and financial performance for the site.



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5.2 Climate Change Resilience

Climate change impacts on our weather are already evident in reduced rainfall and increasing temperatures. Increasingly, project teams are seeking to build features into their design to mitigate the likely effects of the changing climate on building operation.

The design team will undertake a climate change risk review for the site to identify and mitigate key risks.

5.3 Electrical Site

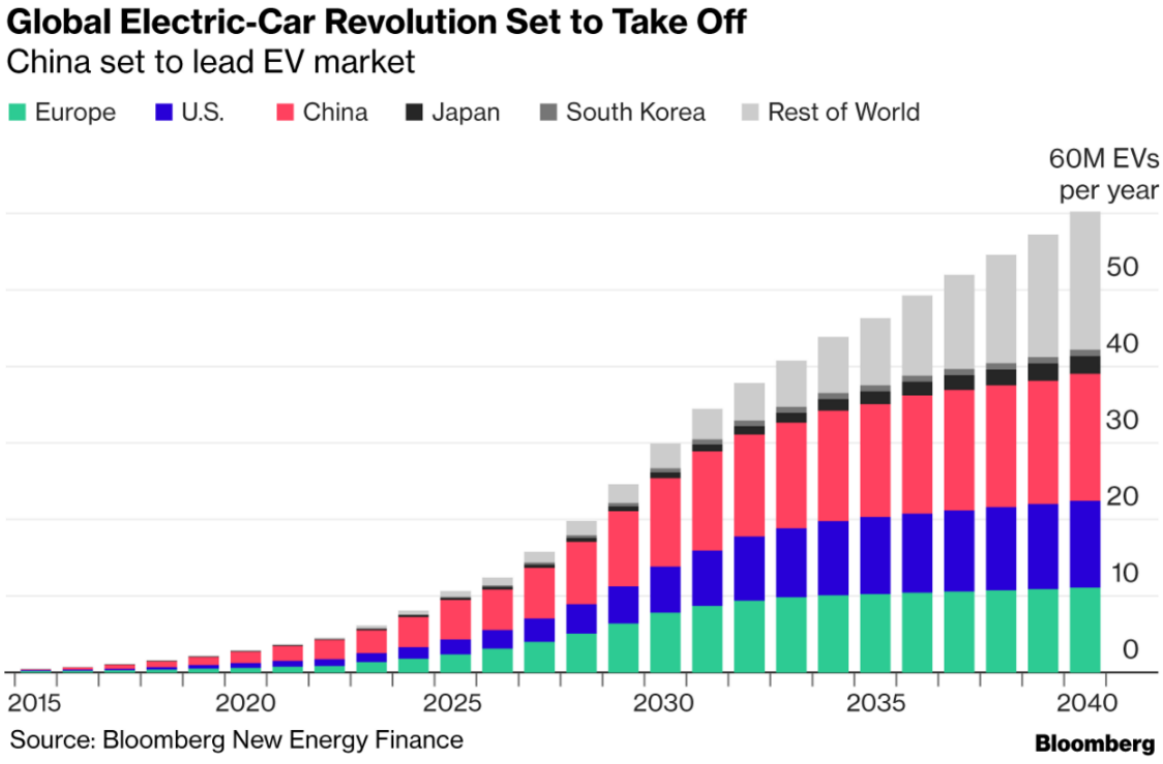
Gas and diesel have inherent carbon footprints associated with their use. Currently, 1 kWhr of energy from gas or diesel has a slightly lower carbon emission rate than from electricity, due to the loss factors and generation method of the Perth electrical grid.

The above notwithstanding, the carbon density of the electrical grid is continually decreasing as increased renewable energy is connected and older, dirtier coal generation is phased out. As a result, buildings which include gas or diesel systems now are expected to be locking themselves into life-time carbon emissions which are greater than buildings which are all electrical.

The design team expect to deliver a project with minimal fossil fuel use on site and, where fossil fuels are used currently, to offset their emissions and provide a plan to transition to electrical energy over time.

5.4 Electric Vehicles

The Australian Renewable Energy Agency are predicting electric vehicles to reach price parity with petrol / diesel combustion engine vehicles in the net 5-6 years. They are also forecasting a significant increase in uptake of vehicles after this point, with major disruptions in the demand for oil and petrol vehicle infrastructure by 2025.



To be future proof in this respect, the proposed Mos Lane development expects to provide electric vehicle parking and charging within the basement car park, for both visitors and occupants.

Increased use of electric vehicles will contribute to better economic returns from the solar array, reduced ventilation requirements in the car park and community benefits for electric vehicle users who are not residents.

5.5 Car Share Schemes

Given the size of the development, it is likely that the local residents could support a small car share scheme, where some of the development bays could be allocated to fuel efficient or electric vehicles with occupants able to subscribe to their use or pay per use.

Car share schemes are of benefit in reducing carbon emissions associated with transport (provided efficient vehicles are selected) and can significantly reduce the embodied energy associated with everyone owning their own vehicle.

Connection to car share schemes will be investigated closer to project completion.

5.6 Other Future-Proof Features

In addition to the above, the following elements, improving future outcomes, are described elsewhere:

- NatHERS Ratings (Internal Amenity)
- Solar Array (Energy)

6. Benchmarking

6.1 Overview

The design team have elected to formally-assess the project, rather than undertaking a self-assessment. Certification provides a level of confidence and comfort around the fact that the project team have designed and delivered in accordance with best practice or world leading sustainable design.

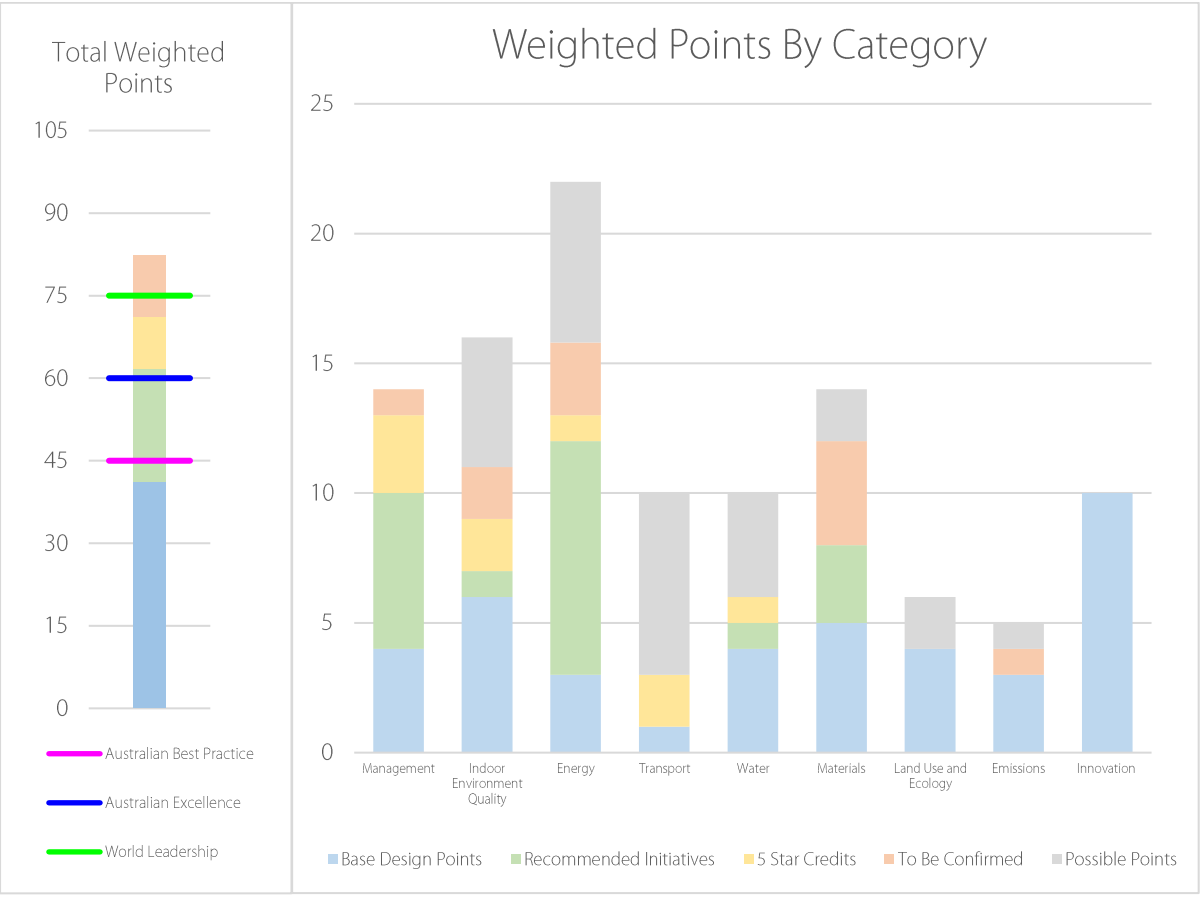
The design team are committed to achieving a 4-Star Green Star Design and As Built V1.3 rating for the project.

6.2 Aspirational Targets

In addition to the minimum requirements above, the design team hope to achieve a 5-Star Green Star certification and also the potential to achieve a Fitwel certification in the future. The project is not sufficiently progressed to commit to these ratings, however, initial assessments and feasibility indicate a strong likelihood of compliance.

6.3 Proposed Approach

FCDS initial self-assessment shows that the project is expected to score 62 green star points simply by including the recommended design initiatives for the project. There are an additional 11 points to be confirmed, following further design progression. FCDS are therefore confident that the project will achieve a 5-Star level of performance when assessed.



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