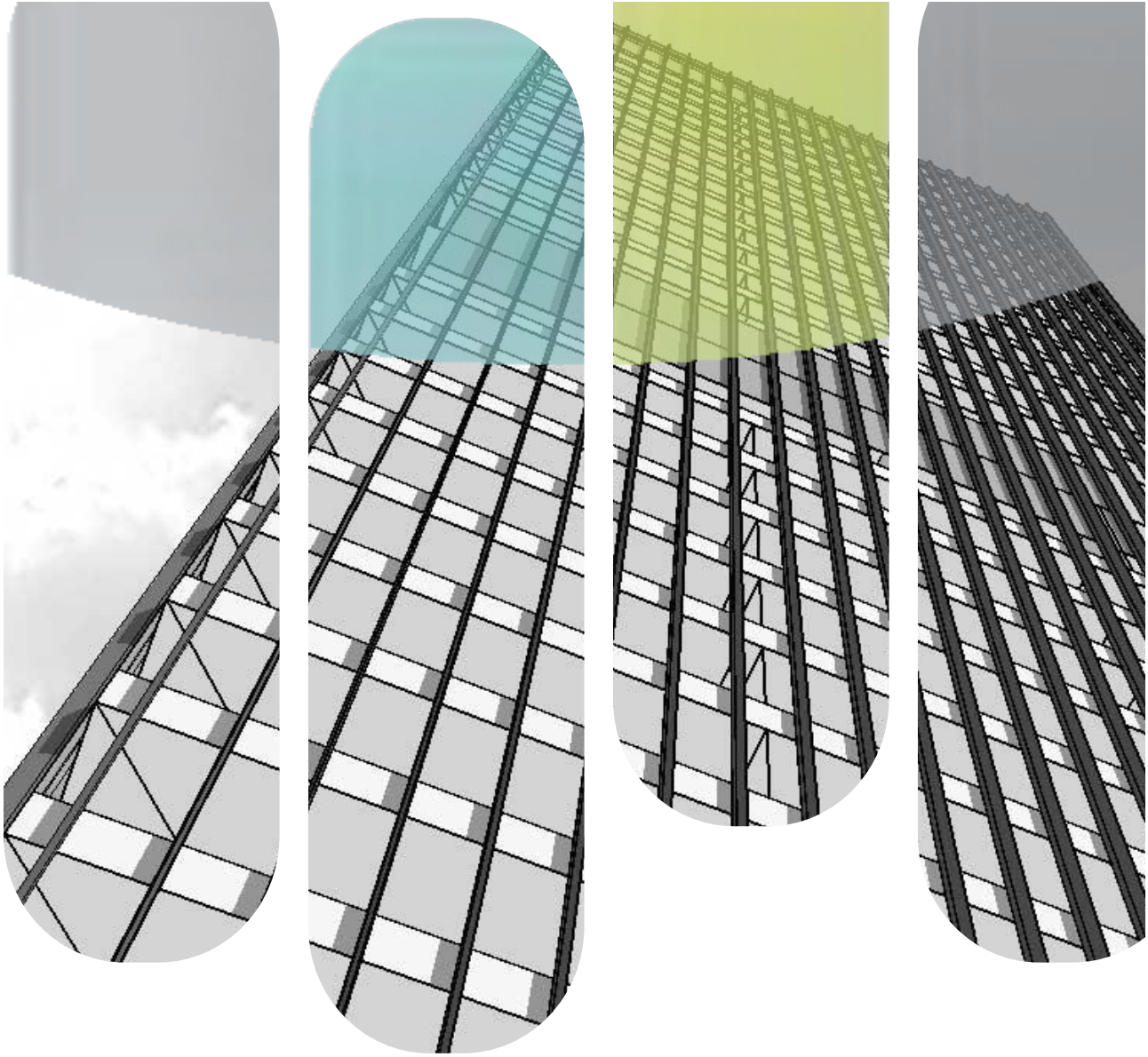
Annexure 11

Sustainability Strategy Design



PROPOSED MIXED USE DEVELOPMENT

10 Morley Drive, Tuart Hill

CADDSGROUP
ENERGY + SUSTAINABILITY

SUSTAINABLE DESIGN STRATEGY

PREPARED BY

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CONTENTS

TABLES & FIGURES

1 INTRODUCTION

CADDS Group has undertaken a Sustainable Design Review on the proposed Mixed-use development designed by Architectus

The purpose of this report is to support the development application by identifying the principles incorporated in the design that meet sustainable objectives and targets for the site.

The review and recommendations are based on experience; an understanding of functionality; a review of current project documentation and an analysis of the site. The initial assessment is based on preliminary documentation with the outcomes subject to change during design development.

1.1 Project

The proposed mixed use development comprises the following National Construction Code (NCC) space use classification that are all eligible to be rated under the single tool.

Table 1 Development Classification

Type	Components	Class of Building
Commercial	426 sqm	Class 5 or 6
Apartments	68 Apartments + Gym	2

1.2 Targets

The development is being designed to fulfil the requirement of sustainable design and the targets of the the National Construction Code and Design WA (Stage Planning Policy 7.3) and include:

- Targeting minimum 5.5 Star NatHERS, average 7 Star NatHERS rating for the residential components of the development (refer to 4.1 NatHERS)

2 SITE ANALYSIS

CADDS Group has undertaken a review of the current site, building layout and included a number of sustainable strategies included in design or potential commitments to specification.

Table 2 Sustainable Initiatives

Initiative	Target	Green Star Category
Thermal and Visual comfort	Average 7 Star NatHERS High Level of natural daylight Maximised north facing glazing where possible.	Indoor Environmental Quality & Energy Efficiency.
High WELS & Drought tolerant / native vegetation	High WELS Ratings Reduced irrigation requirement for landscaping	Water Efficiency, Storm Water Management & Urban Ecology
Cyclist Facilities	Secure bike racks provided	Transport
Operational Waste Management Plan and adequate size of bin store	75%+ recycling in operation	Waste Management
Energy Efficiency	Natural ventilation where possible LED Lighting Solar Hot Water	Energy Efficiency

3 SUSTAINABLE DESIGN APPROACH

Architectus are designing the development with an emphasis on best practice across all aspects of sustainable design. With an emphasis placed on energy and water efficiency, reduction in waste, improved indoor environment quality, low carbon transportation options, minimal site emissions, improved local ecology and ongoing excellence with building management.

3.1 Indoor Environment Quality

Through the enhancement of indoor environment quality, occupants will see improvements to health along with benefits to thermal and acoustic comfort resulting in a more inviting and liveable internal environment.

The project will review acoustic separation throughout the design. This will focus on internal noise levels and enclosed spaces.

A lighting system shall be designed to provide appropriate lighting levels, where required, and suitable control systems. Additionally, lighting control systems shall be provided to all common areas, with the inclusion of a void to maximise natural daylight.

Ample external views have been provided to residences through the utilisation of dedicated solar passive design principles.

Materials that emit VOC’s or formaldehyde shall be minimised within this project.

3.1.1 Thermal Performance (NatHERS Rating)

A high performing building façade will be considered (double glazed windows) for the project that will provide comfortable conditions within the building throughout the year, minimising the need for heating and cooling. This is to be achieved through optimised insulation and appropriate glass selection along with solar passive design.

CADDS have undertake initial modelling to demonstrate targets are achievable

Apartment Type	Apt Number	Cooling (MJ/m2)	Heating (MJ/m2)	Total (MJ/m2)	Star Rating
Type 2B	101	43.3	29.3	72.6	6
Type 2B	201, 301	42.5	12.6	55.1	7
Type 2A	102, 103, 104, 105	20.5	27	47.5	7
Type 2A	202, 203, 204, 205, 206, 302, 303, 304, 305, 306	20.8	17	37.8	8
Type 2A	106	20.9	31.3	52.2	7
Type 2C	107, 208, 115, 207, 215, 307, 308, 315	25.8	7.4	33.2	8
Type 2C	108	25.1	19.8	44.9	7
Type 1A	109, 110, 113, 114	31.8	32.6	64.4	6
Type 1A	209, 210, 213, 214, 309, 310, 313, 314	32	13.6	45.6	7
Type 1A	111, 112, 211, 212, 311, 312	42.8	35.6	78.4	6
Type 2D	116	40.6	19.2	59.8	7
Type 2D	216, 316	39.2	12.5	51.7	7
Type 2E	117	33.5	28.4	61.9	6
Type 2E	217, 317	33.3	16.7	50	7
Type 3B	402, 405	36.5	30.9	67.4	6
Type 3B	401, 403, 404, 406	41.7	22.3	64	6
Type 3A	407, 415	36.1	32	68.1	6
Type 3A	408	36.8	24.7	61.5	6
Type 2F	409, 410, 413, 414	32.6	29.4	62	6
Type 2F	411, 412	36.2	33.4	69.6	6
Type 3A	416, 417	38.9	28.1	67	6
Average					7

Figure 1 NatHERS Ratings

3.2 Energy

A key concern with new buildings is greenhouse gas emissions, making up approximately 20% of total GHG emissions in Australia. A number of initiatives and various technology will be incorporated with in the project to ensure these are mitigated.

A crucial aspect will be minimising energy usage. This will be achieved through the following strategies:

- Solar passive design and optimised levels of insulation.
- Efficient lighting & control systems.
- Solar Hot Water Unit

It is estimated based on the above strategies the development could achieve a 20% reducing in energy use compared to Business as Usual building.

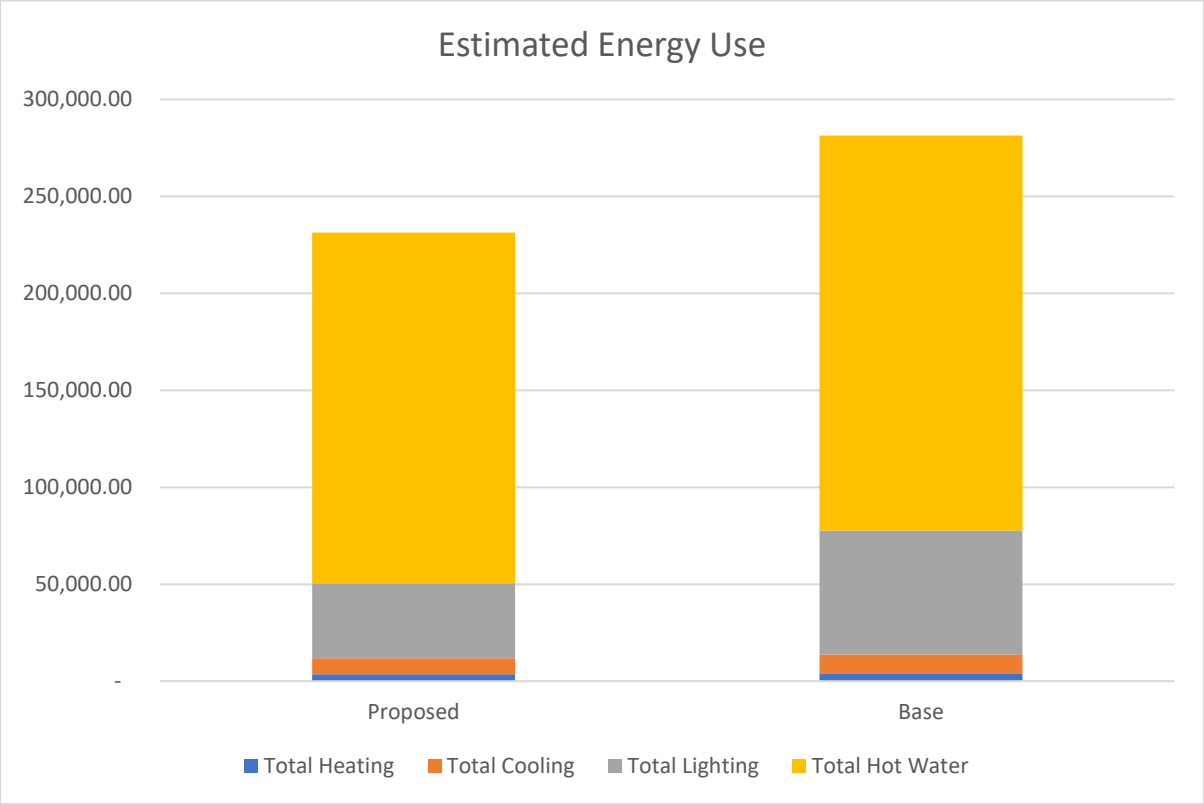

Figure 2 Predicted Energy use

3.2.1 Natural Ventilation

Access to natural ventilation has been provided to all living spaces and bedrooms through cross flow ventilation.

Stack ventilation (convective air movement) has been incorporated, to allow buoyancy of warm air which rises to escape the building. Stack Ventilation improves cross-ventilation and overcomes many of the limitations of unreliable cooling breezes. Even when there is no breeze, convection allow heat to leave the building through

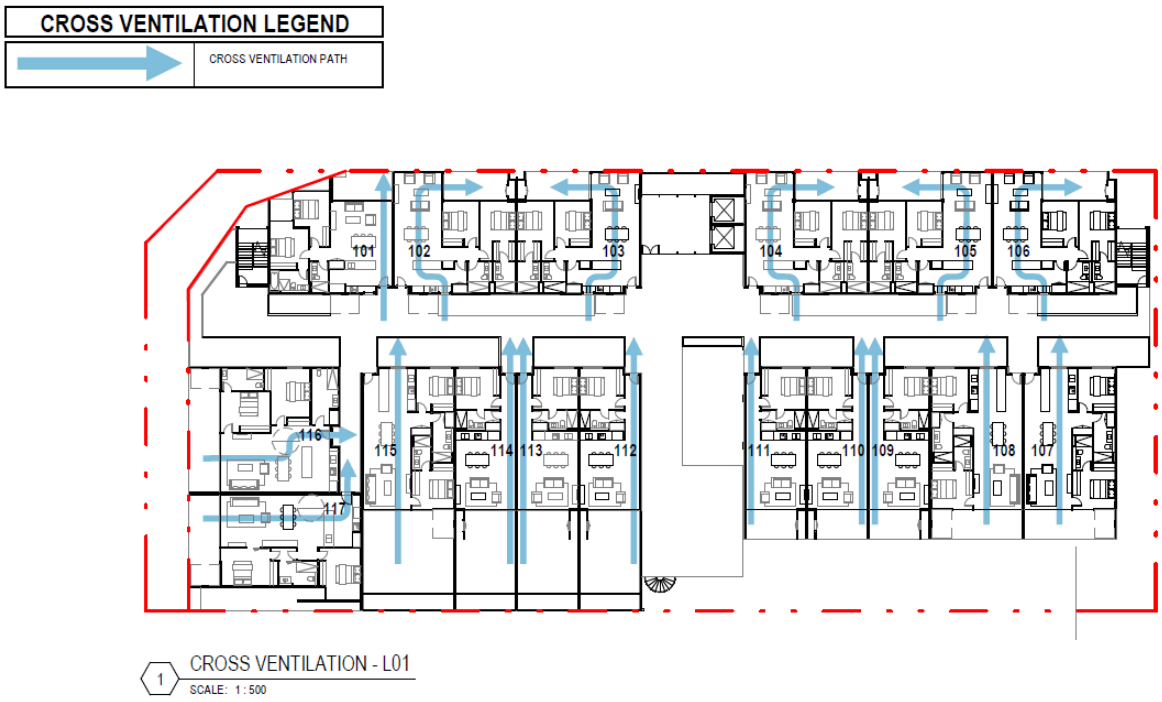

Figure 3 Cross Ventilation

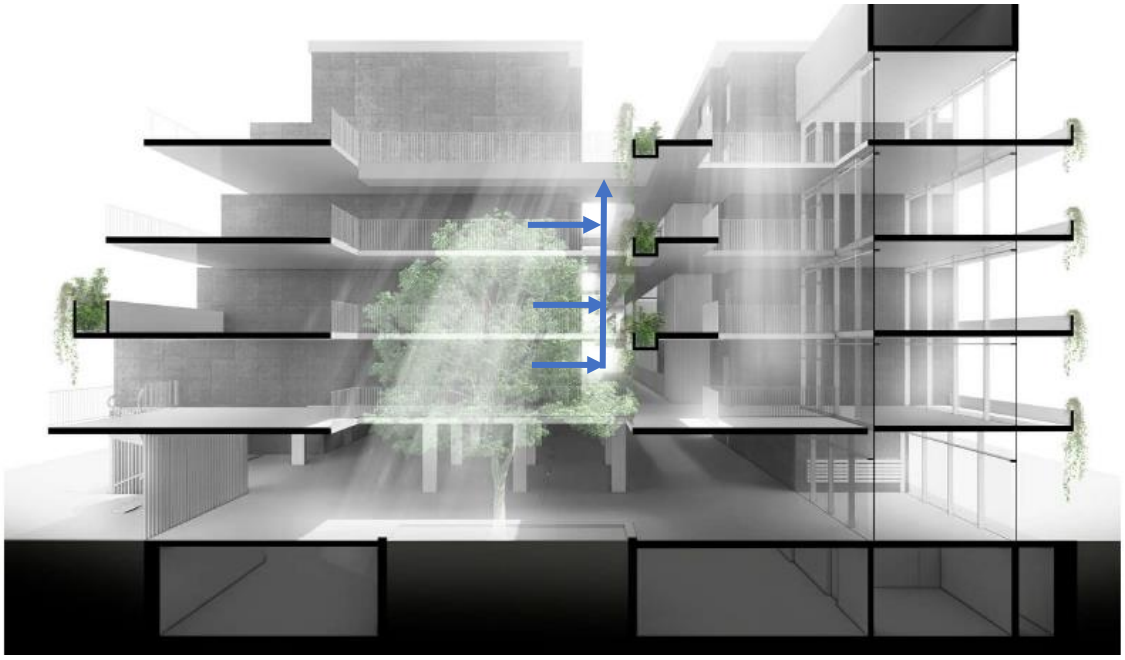

Figure 4 Stack Ventilation

3.2.2 Daylight

To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants, 60% of the nominated area receives high levels of daylight during, 80% of the nominated hours

3.2.3 Lighting

The development will incorporate high efficient LED lighting with exceptional lifespans throughout. The common area lighting is made up of lobbies, stairs, and car park. The implementation of motion sensors and daylight sensors in all common areas should reduce lamp run-times from an estimated 24 hours per day to 4-6 hours per day.

3.2.4 Solar Hot Water System

Solar Thermal system connected to hot water system for domestic hot water system. This system will provide 30% saving on energy used through renewable energy.

3.2.5 Building Monitoring System

A monitoring system will be provided capable of monitoring at a minimum electrical and potential for water consumption throughout the building with software providing easy to read monitoring and trend usage data. The information recorded by this system shall be available to the property owner/tenant. This information shall be utilised by the Strata Management company in relation to billing of water and electricity usage.

3.3 Water

Perth has a limited potable water supply due to the increases in population and reductions in rainfall levels. By reducing this demand will help to alleviate the concerns related to potable water usage. All new water services are to ensure that high WELS rating fixtures and fitting are to be installed as appropriate.

Table 3 WELS Ratings

Fixture / Equipment Type	WELS Rating
Taps	5 Star
Toilets	4 Star
Showers	3 Star (not more than 7.5L/m)

Sub-soil drip Irrigation for plantings to be determined during design development.

3.4 Stormwater Management

The project shall be designed to minimise the peak storm water outflows from the site with the use of deep-rooted zones and landscaped gardens.

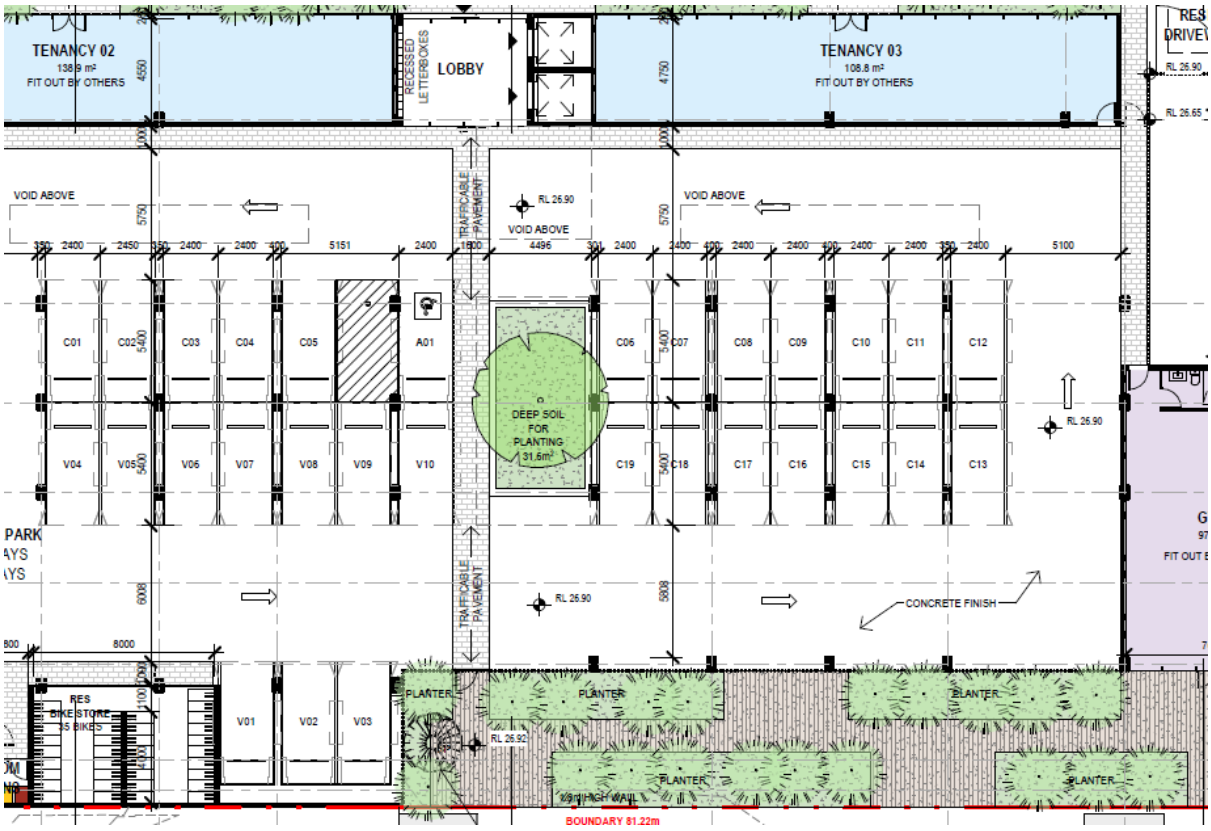

Figure 5 Deep Soil Areas

3.5 Building Materials

The project will improve the procurement processes related to material sourcing, resulting in reduction in embodied energy along with improvements in the quality and longevity. By incorporating these aspects into the supply chain, it will facilitate in increasing the frequency in recycling and re-use of these materials.

Preference will be given to environmentally responsible materials during the selection process. All materials, where applicable, shall have environmental certifications and manufacturing quality certification, shall have low VOC, reduced PVC content and formaldehyde content, shall seek to have recycled or eco preferred content and product stewardship.

3.6 Transport

It is the intention of this category to reduce occupant's dependency on private vehicle usage. This is achieved by providing alternatives methods of transport and provide a high level of amenity in the surrounding vicinity. The development will provide bicycle storage facilities.

10 Morley Drive has a Walk Score of 70 out of 100. This location is very walkable so most errands can be accomplished on foot.

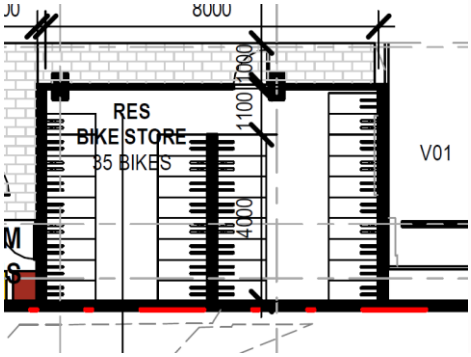

Figure 7 Bicycle storage

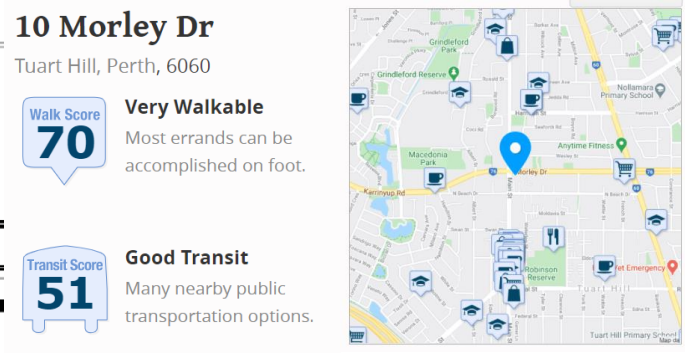

Figure 6 Walk score

3.7 Waste Management

A waste planning expert will produce an Waste Management Plan (WMP) that addresses best practice in waste management, including:

- Identifying the objectives of the plan, by setting diversion from landfill targets and / or target for reducing total materials generation (general waste materials + recyclable / reusable materials).
- Clearly identify the areas to which the OWMP applies. Some areas within the development may not be served by the plan. If this is the case, this must be clearly identified within the OWMP.
- Clearly identify waste streams including general waste, paper and cardboard, glass and plastic.
- Clearly identify applicable bins for various waste streams, that allow for separation of recyclable streams – or use of comingled systems where appropriate.
- Clearly identify at least one other waste stream that can be recycled, and for which recycling facilities are provided. Examples of other waste streams that can be recycled include food waste, cooking oil, batteries and electronics.
- Clearly identify storage areas for all waste streams identified in the OWMP.
    - Area to be sized sufficiently for all streams nominated above, based on waste generated by the project and the collection frequency for each stream; and
    - Calculations shall be based on third-party best practice guidelines.
- Outline best practice access requirements for the collection of all waste streams identified in the OWMP.
- Outline individual roles responsible for delivering and reviewing the OWMP.

3.8 Urban Ecology

The category will seek to mitigate the negative impacts that buildings have on the surrounding natural environment.

This development site has been previously developed. The development will seek to improve the ecological value of the current site by incorporating soft landscaping, drought tolerant planting and the use of materials that will provide an aesthetically pleasing surrounding to the project.

Appropriate colours will be selected throughout the development to help mitigate the Heat Island effect.

3.9 Emissions

Building emissions have a large negative impact on the natural environment. Emissions from the site will be minimised as far as possible. By using environmentally friendly refrigerants and insulation and eliminating light spill, any significant impact of the building’s emissions can be significantly reduced.

3.10 Construction and Management

The project will encourage an environmental focus in the management of design, construction, and operational phases of the development. The project will have a thoroughly integrated approach to constructing and operating a building with good environmental performance.

The building will undergo a servicing and maintainability review along with a commissioning process. Project Teams will develop building operations and maintenance information along with a Building Users' Guide to inform the building owner and occupants of the environmental features in the building and the requirements for their maintenance.

4 CODES AND RATINGS

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

4.1 NatHERS

Residential building compliance is achieved through a thermal modelling process defined as the Nationwide House Energy Rating Scheme (NatHERS). This process requires a minimum star rating to be achieved for the thermal comfort of the building, which informs the energy efficiency of the building. The Nationwide House Energy Rating Scheme (NatHERS) is a tool to assess the energy usage of residential dwellings.

For a multi-residential project as the development, every apartment is investigated as a separate unit with its own rating before an overall average rating is calculated. The NatHERS tool considers a wide range of parameters like orientation, glazing, insulation, size of rooms and door openings, shading and awnings and ceiling fans.

The National Construction Code (NCC) requires a minimum of a 5 Star NatHERS rating for the worst performing apartment in the complex and an overall average NatHERS rating of 6-stars.

The proposed development is designed to exceed the minimum requirement of the NCC by reducing its heating and cooling requirement by 25%

Table 4 NatHERS Targets

	NCC	Design WA	Morley Drive
Worst case NatHERS rating	5	5.5	5.5
Overall average NatHERS rating	6	6.5	7
Estimate average energy load	70	61	52