Metro Outer Development Assessment Panel Agenda

Meeting Date and Time: Thursday, 10 October 2024; 2:00pm
Meeting Number: MODAP/42
Meeting Venue: 140 William Street, Perth

A live stream will be available at the time of the meeting, via the following link:
MODAP/42 – 10 October 2024 – City of Rockingham

PART A – INTRODUCTION

1. Opening of Meeting, Welcome and Acknowledgement
2. Apologies
3. Members on Leave of Absence
4. Noting of Minutes

PART B – CITY OF ROCKINGHAM

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lot 10 (No. 81) Louise Street, Rockingham – Fourteen (14) Grouped Dwellings – DAP/24/02703
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART C – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals
2. General Business
3. Meeting Closure

Please note, presentations for each item will be invited prior to the items noted on the agenda and the presentation details will be contained within the related information documentation

ATTENDANCE

DAP Members

Tony Arias (Presiding Member)
Neema Premji (Deputy Presiding Member)
Cr Lorna Buchan (Local Government DAP Member, City of Rockingham)
Cr Mark Jones (Local Government DAP Member, City of Rockingham)

Minute Secretary

Claire Ortlepp (DAP Secretariat)

Officers in Attendance

Ashlee Kelly (DAP Secretariat)

PART A – INTRODUCTION

1. **Opening of Meeting, Welcome and Acknowledgement**
2. **Apologies**
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PART B – CITY OF ROCKINGHAM

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

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4. Form 2 DAP Applications

Nil.

5. Section 31 SAT Reconsiderations

Nil.

Part B – Item 3.1 – LOT 10 (No.81) LOUISE STREET, ROCKINGHAM – FOURTEEN (14) GROUPED DWELLINGS

Form 1 – Responsible Authority Report
(Regulation 12)

DAP Name:	Metro Outer Development Assessment Panel
Local Government Area:	City of Rockingham
Applicant:	Nick Grindrod, Rise Urban
Owner:	Stellar Living Ltd
Value of Development:	$4.1million
Responsible Authority:	City of Rockingham
Authorising Officer:	Mr Peter Ricci, Director Planning and Development Services
LG Reference:	DD020.2024.00000132.001
DAP File No:	DAP/24/02703
Application Received Date:	22 May 2024
Report Due Date:	25 September 2024
Application Statutory Process Timeframe:	90 Days
Attachment(s):	1. Development Plans 2. Original Application 3. Additional Information Received 4. Schedule of Submissions 5. Design Review Panel Report 6. Residential Design Codes Assessment

Responsible Authority Recommendation

That the Metro Outer Development Assessment Panel resolves to:

Defer the Development Application for Fourteen (14) Grouped Dwellings on Lot 10 Louise Street, Rockingham for up to 90 days, in accordance with the reasons listed below.

Reason:

1. The proposed development in its current form is incompatible with the desired future character of its setting and the relationship with other development in the locality.

2. The Application should be amended to comply with the provisions of the proposed draft Rockingham Strategic Centre Precinct Structure Plan, with respect to the desired street interface and setback requirements for the 'City Park Sub-Precinct'.

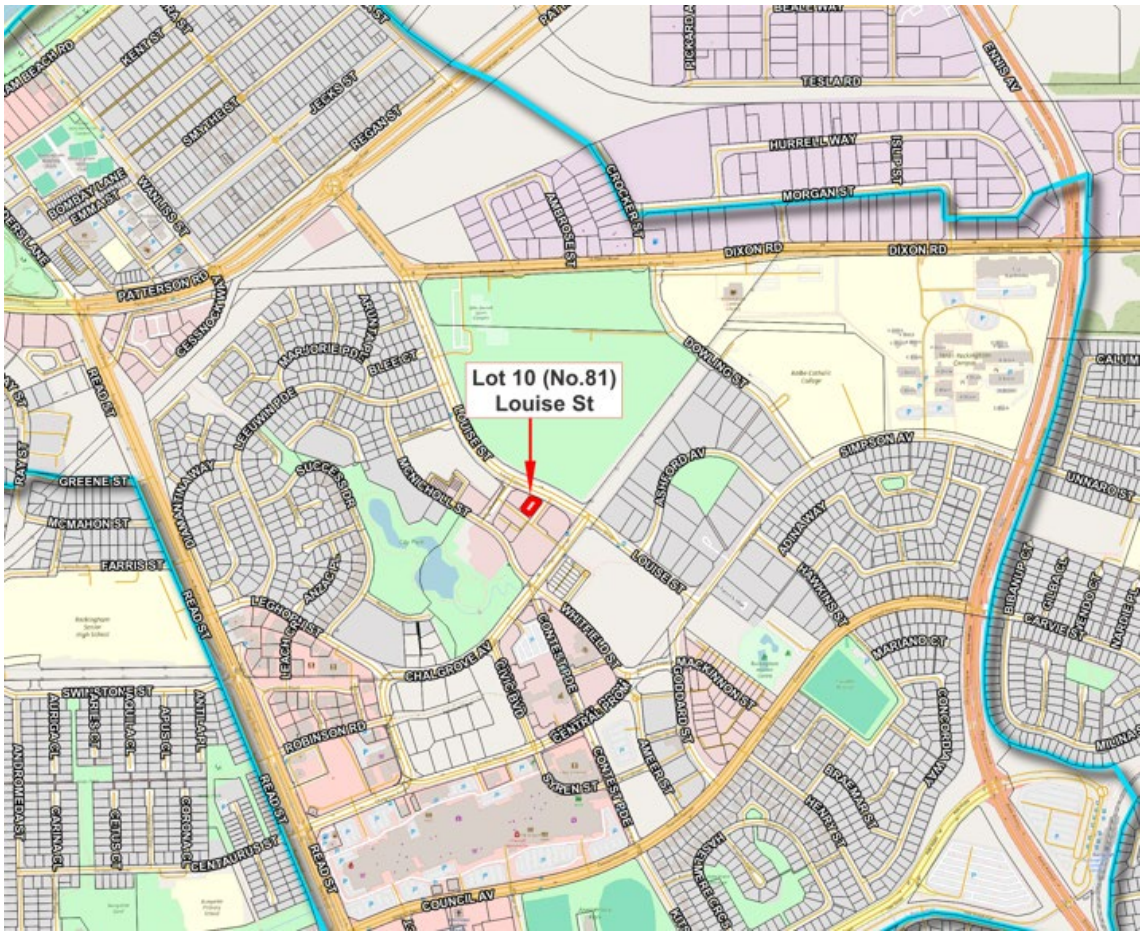
3. The Application should be amended to comply with *State Planning Policy 7.0 - Design of the Built Environment* with regard to the following Design Principles: Context and Character, Built Form and Scale, Legibility, Safety and Aesthetics.

4. The Application should be amended to demonstrate that adequate and legal pedestrian access is made available for the occupants and visitors of all proposed dwellings.

5. The Application should be amended to provide for a clearly definable and accessible communal letter-box.

6. The Bushfire Attack Level Assessment should be amended to correctly classify 'Plot A' as 'Class A Forrest'.

Background:



1. Location Plan



2. Aerial Photograph

The subject site has remained vacant for a number of years.

Public access easements for shared parking and access were registered over land bounded by Market Street, Goddard Street, Chalgrove Avenue and McNicholl Street, in accordance with the (then) 1993 approved Integrated Development Guide Plan (Refer Figure 3 below).



3. Aerial Photo with Easements Shown

Notably, the north-eastern corner of the subject site is truncated where it adjoins Lot 303 Chalgrove Avenue. The area of the abutting truncation is within Lot 303, not the Louise Street road reserve.



4. Aerial Image Showing Lot 303 Truncation

Adjoining the subject site to the north is Louise Street (formally Goddard Street), which is a four lane dual carriageway road providing a key gateway connection to the City Centre. Four (4) embayment car parking bays, a 2.5m wide footpath and four (4) established street trees (Plane Trees) are situated in the southern road verge along frontage of the subject site.

Vacant land adjoins the subject site to the west and south-west, comprising:

- Lot 9 Market Street (valid Development Approval);
- Lot 14 Market Street;
- Lot 8 McNicholl Street, and
- Lot 7 McNicholl Street.

Lot 303 Chalgrove Avenue adjoins the subject site to the east, containing State and Commonwealth Government offices and a two storey decked car park at the southern end. North of these structures, abutting the subject site, are dedicated line marked car parking bays.

Vehicle circulation areas provide access over Lot 303 between Chalgrove Avenue and Louise Street.







5. Lot 303 Chalgrove Avenue Photos

Lot 304 Chalgrove Avenue is located approximately 20m east of the subject site on the corner of Louise Street and Chalgrove Avenue. The site contains a four (4) storey mixed use development with multiple dwellings (apartments) above a commercial ground floor.





6. Lot 304 Chalgrove Avenue Photos

In a broader context, the subject site is situated within the 'Rockingham Strategic Centre' (**RSC**), the details of which are discussed in the 'Planning Assessment' section of this Report.



7. Rockingham Strategic Centre Area

The RSC falls within the existing 'Central City Area' zone under the Metropolitan Region Scheme. In the City of Rockingham (**City**) Town Planning Scheme No.2 (**TPS2**), there are presently six (6) 'Primary Centre' zones. The subject site forms part of the Primary Centre City Centre zone.

Under the current local planning framework, the desired future character of the City Centre zone is to continue to be the tertiary economic and employment focus of the RSC. Provision has also been made for higher density development, with offices and residential apartments over street level retail and commercial tenancies.

Despite the evolving nature of the Strategic Centre, there are examples of development in proximity to the subject site which aligns with the existing local planning framework. These include commercial and mixed use developments as illustrated in Figures 5 and 6 above, as well as developments immediately west of this street block on Market Street and McNicholl Street, where two (2) and three (3) storey mixed use (involving Multiple Dwellings) and Grouped Dwelling developments have been constructed, as illustrated in Figure 8 below.



8. Photos of Existing Development on Market Street and McNicholl Street

Prior Development Approval

In April 2013, the City granted Development Approval for a three (3) storey mixed use development on the subject site.

The development framed the northern (Louise Street) and eastern (side) property boundaries, with the 'sleeved' on-site carpark providing access to the site from the south, via the access easement over adjoining Lot 14 Market Street.

The development largely reflected the intended land use and built form expectations of the existing local planning framework, however, construction never proceeded and the Development Approval eventually lapsed.



9. North Elevation of Approved Development

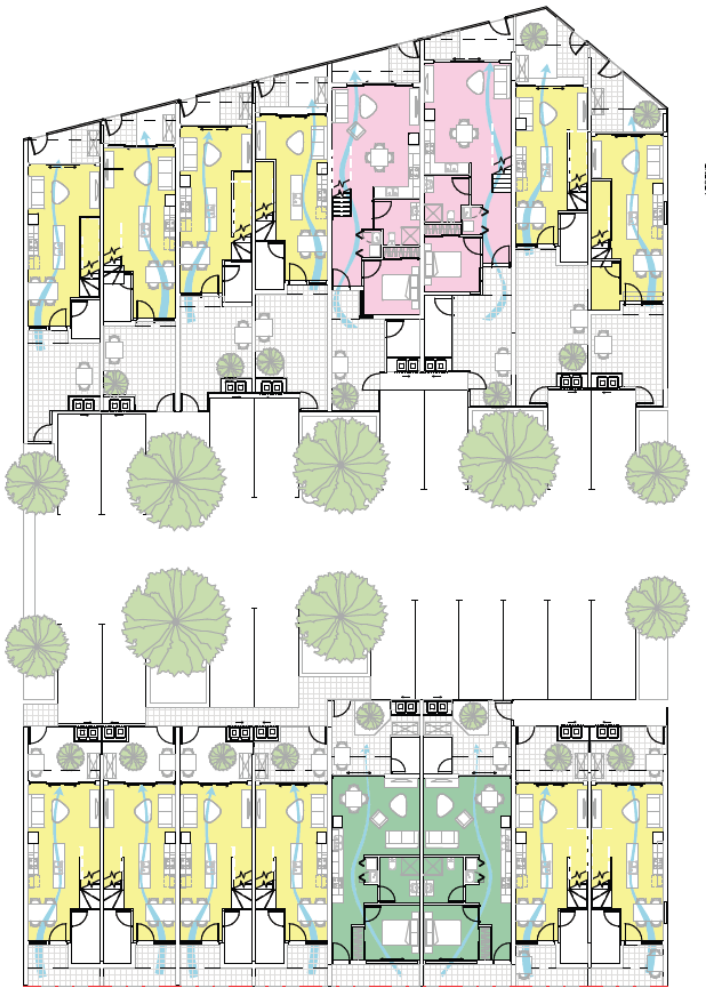
Design Review Panel

On 30 August 2023, a concept proposal for the subject development was presented to the City's Design Review Panel (**DRP**) for review, the details of which are discussed later in this Report.

The initial concept involved two (2) single storey and fourteen (14) two storey Grouped Dwellings, with vehicle access obtained from via the existing access easement over the adjoining Lot to the east.



10. North Elevation of Initial Concept Design



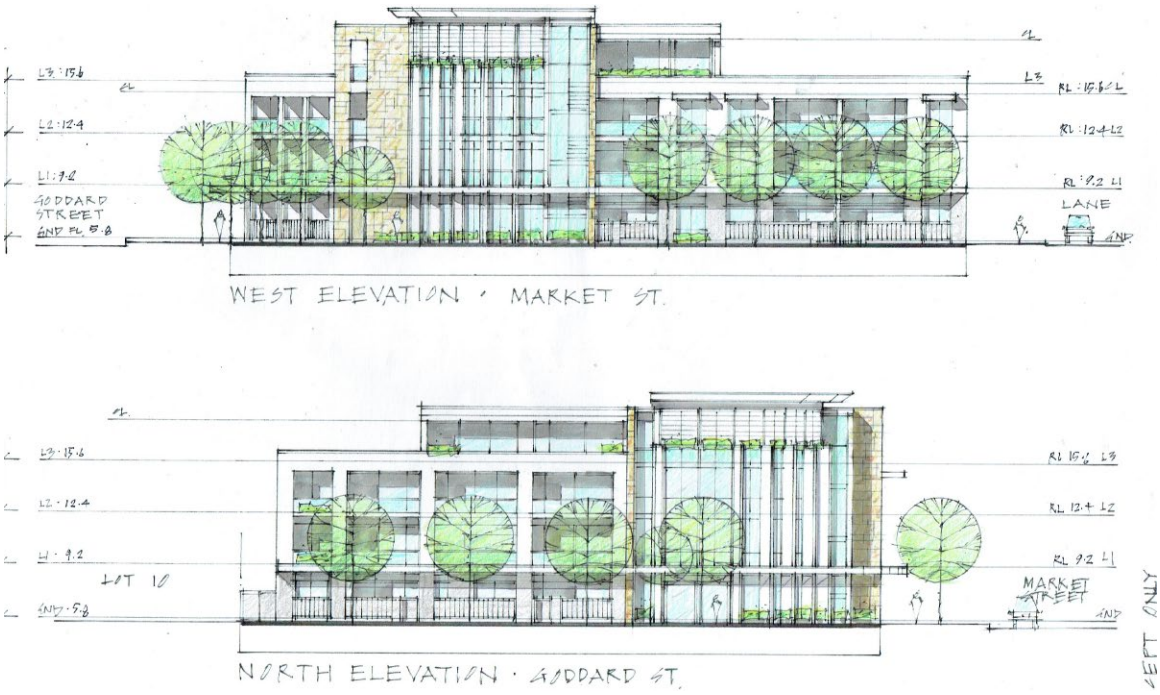
11. Site Plan Layout - Initial Concept Design

The front row of dwellings were setback (generally) 0-2m from Louise Street in a ‘saw tooth’ pattern and included a 1.8m high solid fence across the street frontage.

The DRP did not support the concept proposal and primarily noted that the scale of development did not address the context of the immediate area under either the existing or proposed (draft) local planning framework for the RSC.

On 30 August 2023, an initial concept design for a development on the adjoining land, Lot 9 Market Street, was also presented to the City’s DRP, which provided context for the DRP when reviewing the concept plan for the subject site.

The DRP supported this proposal, for a four (4) storey ‘Multiple Dwelling’ development, subject to minor improvements to the design, in order to facilitate improved occupant amenity as well as to ensure the development can provide for land use adaptability over time.



12. Initial Concept for Lot 9 Market Street (Adjoining Site)

In response to comments made by the DRP, the applicant made significant changes to the proposal and submitted a Development Application, seeking approval from the City for a four storey, 17 'Multiple Dwelling' development.

In July 2024, the City approved the development under delegated authority.



13. Approved Development on Lot 9 Market Street (Adjoining Site)

Details: outline of development application

Region Scheme	Metropolitan Region Scheme
Region Scheme - Zone/Reserve	Central City Area
Local Planning Scheme	Town Planning Scheme No.2
Local Planning Scheme - Zone/Reserve	Primary Centre City Centre
Structure Plan/Precinct Plan	Draft Rockingham Strategic Centre Precinct Structure Plan
Structure Plan/Precinct Plan - Land Use Designation	Residential R80
Use Class and permissibility:	"D" Use - Grouped Dwellings
Lot Size:	1,744m²
Existing Land Use:	Vacant Land
State Heritage Register	No
Local Heritage	☒ N/A ☐ Heritage List ☐ Heritage Area
Design Review	☐ N/A ☒ Local Design Review Panel ☐ State Design Review Panel ☐ Other
Bushfire Prone Area	Yes
Swan River Trust Area	No

The landowner intends to develop the subject site for affordable rental community housing, to retain ownership and lease the Grouped Dwellings over the longer term, specifically targeting pensioners seeking affordable accommodation.

The Development Application proposes two rows of seven (7), two-storey, north-facing townhouses aligned east-west across the site.

A common driveway, landscaping and car parking is provided between the two rows of buildings. All the dwellings have identical floor plans and are intended to be constructed in a modular format.

Each dwelling has:

- An open plan living area, laundry and under stair toilet on the ground floor;
- Two double bedrooms and a bathroom on the first floor, with a balcony provided to the north facing bedrooms;
- A fenced, landscaped private courtyard on the northern side and a small drying court on the southern side;
- A single car bay and store room provided to the rear of the front row of units, and in front of the rear row of units.

Units 1 and 2 propose pedestrian access to Louise Street over a portion of privately owned land in the ownership of Lot 303 Chalgrove Avenue (refer to Figure 4).

On 14 August 2024, the applicant submitted additional information in response to a request by the City.

The City requested clarification around the Residential Design Code (R-Code) requirements, and among other matters, identified concerns with built form and scale; the waste management plan; bushfire report, and traffic safety due the lack of ability to provide a continuous dedicated path of travel for pedestrians across Lot 303 Chalgrove Avenue.

The following sections of the Report are based upon the Amended Plans and additional information provided by the applicant, in response to the City's request for further information.

Legislation and Policy:

Legislation

- Planning and Development Act 2005
- Planning and Development (Development Assessment Panels) Regulations 2011
- Planning and Development (Local Planning Schemes) Regulations 2015 (the Regulations)
- Metropolitan Region Scheme
- City of Rockingham Town Planning Scheme No.2 (TPS2)
- Scheme Amendment No.191 to TPS2

State Government Policies

- State Planning Policy 3.7 - Planning in Bushfire Prone Areas (SPP3.7)
- State Planning Policy 4.2 - Activity Centres (SPP4.2)
- State Planning Policy 7.0 - Design of the Built Environment (SPP7.0)
- State Planning Policy 7.2 - Precinct Design (SPP7.2)
- Residential Design Codes (R-Codes)

Structure Plans/Activity Centre Plans

- Rockingham Strategic Centre: Centre Plan (Centre Plan)
- Draft Rockingham Strategic Centre Precinct Structure Plan (RSCPSP)

Local Policies

- Local Planning Policy No.3.2.1 – Development Policy Plan City Centre Sector (LPP3.2.1)

Consultation:

Public Consultation

The application was not required to be advertised for public comment under the *Planning and Development (Local Planning Schemes) Regulations 2015* and Local Planning Policy No.3.3.27 - Community Consultation for Development Applications for the following reasons:

- A Grouped Dwelling is a discretionary land use, being a 'D' in the zone;
- Vehicle access to the development is provided via an existing right-of-way access easement over Lot 303; and
- There are no material impacts of the proposed development on adjoining properties.

Referrals/consultation with Government/Service Agencies

The application was referred to Department of Health (**DoH**) and Department of Water and Environmental Regulation (**DWER**) for comment, due to the possible ground disturbance of the asbestos contaminated fill encapsulated beneath a capping layer of geo-fabric and clean fill material, resulting from any potential future works commencing.

Both Departments supported the proposal on the basis that a Remediation Plan and updated Site Management Plan are required, in the event Development Approval was to be granted. This is to ensure that site contamination is investigated, and the site is remediated if necessary prior to commencing of development works at the site.

A copy of the Agency responses are included in Attachment 4 to this Report.

Design Review Panel Advice

A concept proposal was referred to the DRP prior to lodgement of the application as detailed previously in the 'Background' section of this Report.

The DRP concluded in summary that:

- *"The purpose of the development is strongly supported. However the scale of the development does not address the context of the immediate area under the existing or proposed planning frameworks. The DRP considered that scale is critical to the success of the development given the site context, and fell short of the expectations of the existing and proposed planning frameworks.*
- *Improved amenity for all outdoor area and communal areas is required.*
- *Internal dimensions do not appear to meet minimum requirements.*
- *Front entries are not legible."*

A copy of the full notes from the abovementioned DRP meeting is contained within Attachment 5 to this Report.

As part of the City's assessment of this development application, it was considered unwarranted to present the matter to DRP post-lodgement. The outcomes of the DRP meeting are discussed further below in the 'Planning Assessment' section of this Report.

Other Advice

Nil.

Planning Assessment:

This proposal has been assessed against the relevant legislative requirements of the Scheme, State and Local Planning Policies and applicable Centre Plan as well as the impending local planning framework, as outlined in the 'Legislation and Policy' section of this Report.

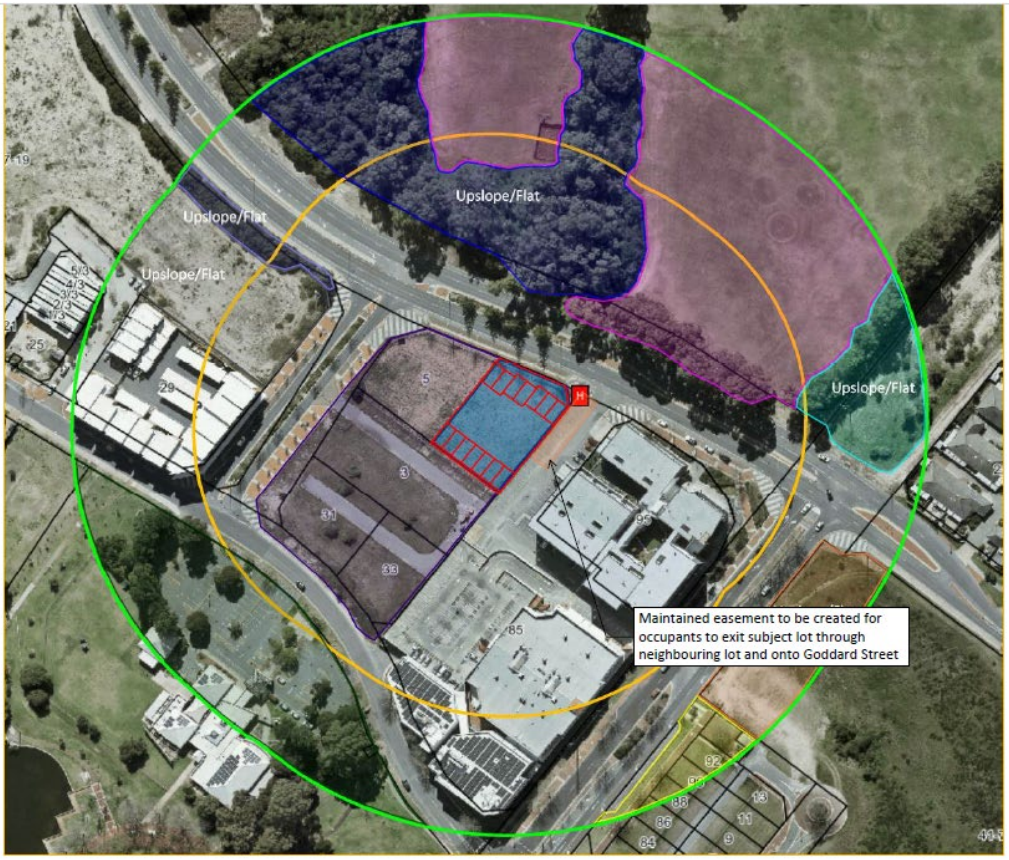
The following matters have been identified as key considerations for the determination of this application:

- Bushfire Prone Areas;
- Design of the Built Environment;
- Residential Design Codes;
- Rockingham Strategic Centre: Centre Plan;
- Development Plan Policy - City Centre Sector;
- Rockingham Strategic Centre: Framework Review;
- Town Planning Scheme No.2; and
- Consideration of application by local government - Clause 67 of Deemed Provision.

Bushfire Prone Areas

As required by SPP3.7, a Bushfire Attack Level (BAL) Assessment was submitted with the application that indicated a BAL12.5 rating applies to the development. SPP3.7 Policy measure 6.2 states that a Development Application in a bushfire prone area may be considered for approval where it can be undertaken in accordance with policy measures and BAL12.5 to BAL 40 can be achieved.

The site context is such that the greatest bushfire threat to this proposal arises from established trees and vegetation approximately 33m away on the northern side of Louise Street in the 'Dowling Street' Reserve, and is indicated in the BAL Assessment as ‘Class B Woodland’ per Figure 14 below.



14. Vegetation Classification Map

As discussed further below, the City considers that the BAL Assessment should be amended to correctly classify Plot A as '*Class A Forrest'*. This would result in a BAL-19 rating for the development. The BAL rating refers to the level of bushfire resistant construction applicable to the development under the Building Code of Australia.

Guidelines for Planning in Bushfire Prone Areas (the Guidelines)

The Guidelines provide supporting information to assist in the interpretation of the objectives and policy measures outlined in SPP3.7. An assessment against the Guidelines is provided in the table below, only to the extent where it requires greater consideration.

Element	Provided	Comment
Element 1 Location	The determined Bushfire Attack Level is BAL 12.5, which is based upon the separation of the buildings from the vegetation classified as 'Class B Woodland' 33m to the north across Louise Street.	The City disagrees and considers that the correct classification of vegetation 'Plot A' is 'Class A Forrest', based mainly on the dense vegetation understorey that is more representative of *Class A Forrest* than *Class B Woodland*. AS3959 characterises *Class B Woodland* to include 10%-30% foliage cover with a predominantly grassy understorey. This is likely to change the BAL from BAL-12.5 to BAL-19.

Design of the Built Environment

SPP7.0 is the lead Policy that elevates the importance of design quality across the whole built environment in Western Australia.

The purpose of SPP7.0 is to inform and guide landowners, proponents, designers, reviewers and decision-makers to achieve good design outcomes in the built environment.

The City's consideration of the proposed development against the 10 design principles in SPP7.0 is summarised in the Table below, having regard to the existing and proposed (draft) local planning framework.

SPP7.0 - Design of the Built Environment		
Design Principle	**Officer Comment**	**Compliance**
1. Context and Character *Good design responds to and enhances the distinctive characteristics of a local area, contribution to a sense of place.*	The distinctive character of the immediate area is 'urban' in nature, which is articulated through the street setbacks, built form and scale of existing nearby development, as well as land use composition. Contrary to the immediate context and character of the area, the architecture of the proposed development is uniform in style, with its presence and street setback akin to a 'suburban' form of development. This is primarily due to the way in which the proposed built form presents to Louise Street.	Non-compliant
2. Landscape Quality *Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*	The proposed landscaping includes deep soil areas, 23 small trees to the courtyards and car parking areas (exceeding minimum requirements) and a variety of groundcovers, grasses and shrubs that contribute to the streetscape, tree canopy and landscape character of the area.	Compliant

Design Principle	Officer Comment	Compliance
3. Built Form and Scale *Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*	While the proposal complies with the two (2) storey minimum height requirement (discussed further below), the massing and height of development does not successfully negotiate between the existing built form and the intended future character of the area. The proposed street boundary setbacks and building typology for the front row of dwellings is inappropriate for this site given the planning framework expects an urban residential frontage to be provided. Multiple Dwellings or terrace housing where development frames the street edge is generally envisioned. The proposal is partially compliant with respect to building height, however, collectively the proposal does not satisfy this design principle.	Non-compliant
4. Functionality and Design *Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life cycle.*	The design of the dwellings provide for reasonable amenity and functionality both internally and externally to meet the needs of future occupants.	Compliant
5. Sustainability *Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*	The development incorporates passive sustainability measures including building orientation, placement of courtyards on the northern side optimise access to winter sunlight and provision for natural ventilation.	Compliant
6. Amenity *Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors, and neighbours, providing environments that are comfortable, productive and healthy.*	There have been changes to the plans since the DRP review that improve internal and external amenity for future occupants by providing wider dwellings and rooms/ balconies to the northern upstairs bedrooms.	Compliant

Design Principle	Officer Comment	Compliance
7. Legibility *Good design results in buildings that are legible, with clear connections and easily identifiable elements to help people find their way around.*	Legibility is very poor for pedestrians accessing Units 8-14 from Louise Street or vice versa, as it is not possible to provide a dedicated path of travel across Lot 303 Chalgrove Avenue between the street and driveway within the subject site. This is because Lot 303 has not been included in the Development Application. Unit 1 and 2 also do not have legal access over Lot 303 Chalgrove Avenue between the front gates and the street boundary, as such, are considered to have poor legibility in this respect. Additionally, a communal letterbox is proposed where the common driveway meets the access easement over Lot 303 Chalgrove Avenue mid-way along the eastern side boundary. The City considers that the general location of the letterboxes may not be fit for purpose due to its physical location and thus is not easily identifiable, particularly with respect to letter drop-off.	Non-compliant
8. Safety *Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and uses.*	The design of the dwellings provides for good passive surveillance both within the development and addressing the street in this regard. Without a dedicated path of travel for pedestrians to access Units 8-14 across Lot 303 Chalgrove Avenue, the City has unresolved traffic safety concerns however.	Non-compliant
9. Community *Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*	The provision of community housing is supported by the City, and the social benefits are acknowledged.	Compliant
10. Aesthetics *Good design is the product of a skilled judicious design process that results in attractive and inviting buildings and places that engage the sense.*	The building facades utilise a range of cladding materials, colours and design techniques to provide articulated elevations that are aesthetically acceptable in a suburban street context, where generous building setbacks are expected.	Non-compliant

Design Principle	Officer Comment	Compliance
	The City considers the proposed building form, however, particularly the front row of dwellings is not appropriate for this inner city urban street context, where the planning framework expects 'low-mid-rise' multiple dwelling building typologies where the built form is close to and engages with the street. This would result in a completely different building appearance and aesthetic.	

Consequently, the City considers that the proposal does not satisfy five (5) of the 10 Design Principles of SPP 7.0, being Context and Character, Built Form and Scale, Legibility, Safety and Aesthetics.

The City's DRP recommendation is summarised above as well as discussed further below, and provides the basis for the City's assessment against the aforementioned Design Principles.

Residential Design Codes (Volume 1)

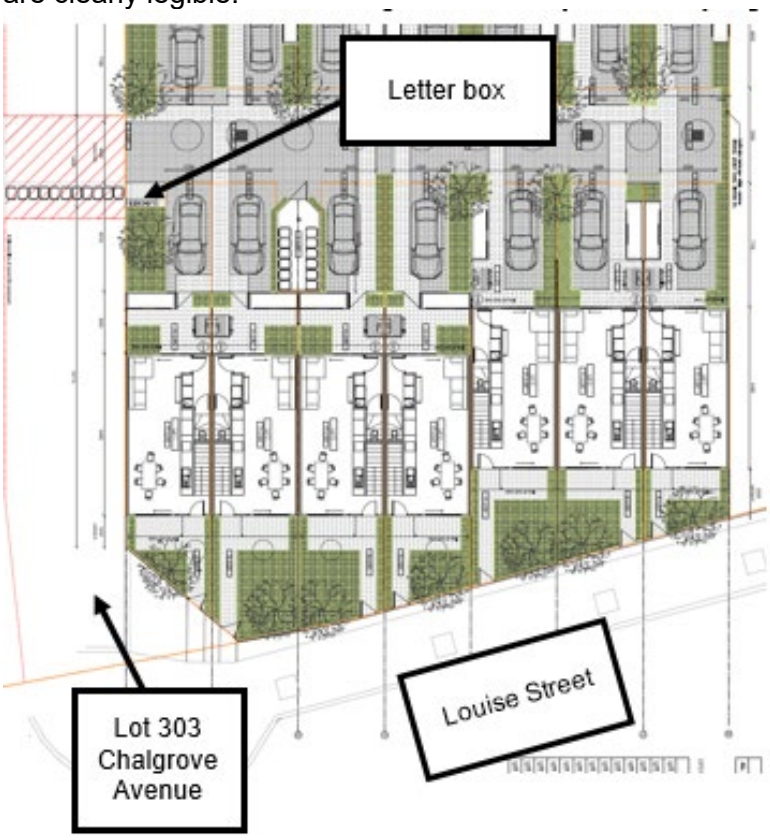
The R Codes outline the planning and design parameters for residential development across Western Australia, with an emphasis on achieving quality design outcomes. The R-Codes apply to this development in accordance with the provisions of the proposed RSCPSP.

Applications for Development Approval need to demonstrate the design either complies with the 'Deemed-to-Comply' criteria or satisfactorily addresses the relevant 'Design Principles' and objectives of the R-Codes.

It should also be noted that some sections of the R-Codes are modified by provisions within the draft RSCPSP. As the draft RSCPSP was prepared before the updated R-Codes were gazetted on 10 April 2024, incorporating the medium density provisions, the RSCPSP refers to sections of the R-Codes that have since been restructured, and as such, are no longer workable.

Consequently, the application has been assessed in accordance with the R-Code provision with respect to Open Space, Landscape and Deep Soil, where the R-Codes and the RSCPSP conflict.

Consideration against the relevant Design Principles is discussed in the Table below only where the City considers the proposal is non-compliant with the R-Codes.

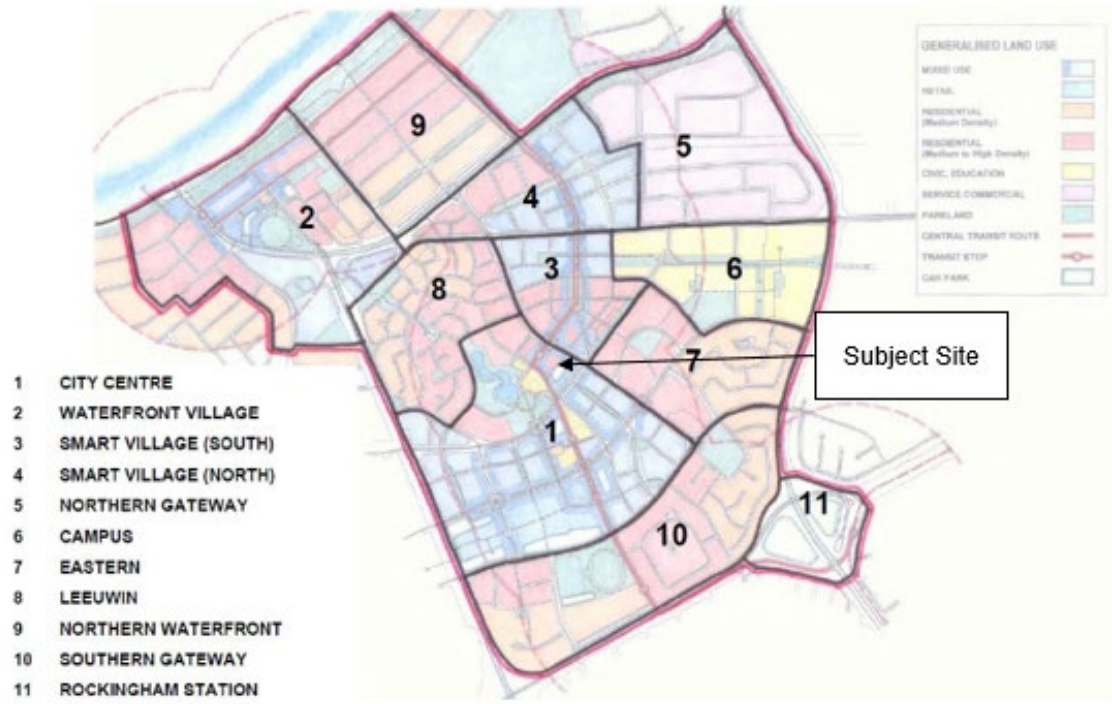
Design Principle	Comment
P2.5.1 *The site is serviced with utilities that that are fit for purpose and meet current performance and access requirements of service providers, addressing access, maintenance and safety considerations*	*Deemed to Comply - C2.5.1* *Service utilities are designed and located such that they:* *i. are accessible and can be safely maintained;* *ii. maintain clear sightlines for vehicle access; and* *iii. integrated into the design of the development and/or screened from view of the street.* A communal letterbox is proposed where the common driveway meets the access easement over Lot 303 Chalgrove Avenue mid-way along the eastern side boundary. Access to this letterbox is provided over private land (Lot 303). It is unclear whether Australia Post is willing to traverse Lot 303 to deliver mail to the development considering the letterbox is remote from the public realm (street). The applicant was requested to check this with Australia Post which they are following up. In the absence of any confirmation by Australia Post that the letterbox is satisfactorily accessible, there is insufficient information provided that demonstrates that the Design Principle has been satisfied. The City also considers that the general location of the letter boxes may not be fit for purpose due to its physical location and should be relocated instead to Louise Street frontage, so that they are clearly legible. 

Design Principle	Comment
P3.7.5 *Legible, safe, and direct access for residents and their visitors to move between communal car parking areas or public streets and individual dwellings*	*Deemed to Comply - C3.7.9* *Delineated or separate pedestrian access (10+ grouped and multiple dwellings)* *For 10 or more grouped dwellings that are served by a communal street, a pedestrian path is provided as follows:* *i. minimum 1m wide, clear of any utilities or minor projections;* *ii. clearly delineated or separate from the vehicular access; and* *iii. continuous path of travel from the street boundary to ground floor dwelling or building entries.* All 14 Units are served by a common driveway meaning that a dedicated pedestrian path separate from the vehicle access needs to be provided. There is no gap in the front building row to facilitate direct pedestrian access to the street for the rear dwellings. As such, Units 8-14 rely on gaining pedestrian access from the street boundary via an access easement over Lot 303 Chalgrove Avenue. While it may be argued this pedestrian path requirement does not apply because 5 Grouped Dwellings have direct frontage to Louise Street, the City considers that regardless, the principles of 'orderly and proper planning' should prevail to ensure the pedestrian access can be provided legibly and safely from the street to Units 8-14 as well as Units 1-2. This is a fatal flaw in the design, as it is not considered orderly and proper planning to expect elderly occupants and visitors of the occupants of Units 8-14 to navigate the vehicle carriageway in the access easement on foot without providing a dedicated pedestrian path. The Design Principle has not been satisfied as safe and legible for pedestrian access for Units 1-2 and Units 8-14.

Rockingham Strategic Centre: Centre Plan

Planning Context

In September 2009, Council adopted the Centre Plan for the Rockingham Strategic Metropolitan Centre (as it was then known). The 'Centre Plan' was endorsed by the Western Australian Planning Commission (**WAPC**) in November 2009, as a plan to guide future planning and development. The scope of the Centre Plan covers an area of almost 600 hectares between the Rockingham Train Station and Rockingham Foreshore, and is divided into 11 'Sectors', as shown in Figure 15 below. The subject site is within the City Centre sector.



15. Rockingham Strategic Centre Sectors

The Centre Plan is guided by the following vision:

"The vision is for a modern, distinctly coastal centre offering a wide range of mixed uses including retail, commercial, office, civic, residential, education and recreation within an accessible and highly inter-connected, urban-scaled townscape, comprising a major activity centre and related urban villages based on 'Main Street' principles."

The Centre Plan provides general direction for the detailed planning investigations which followed for each Sector, via preparation of individual Development Policy Plans (i.e. Local Planning Policies).

In addition, the Centre Plan laid out a series of guiding 'planning and development' principles, covering:

- Built Form and Urban Design;
- Access and Parking;
- Public Domain;
- Land Uses;
- Safety and Security; and
- Sustainability.

Transit Oriented Development

The Centre Plan applied sustainable development principles to land development and redevelopment options, with particular emphasis on the Transit Oriented Development (TOD) potential of land within the Centre.

The Centre Plan committed to achieving the vision of a fixed route, streetcar transit system as the focus of a corridor of high intensity, mixed-use development between Rockingham Train Station and Rockingham Foreshore.

In this regard, over a number of years the City has sought a Government funding commitment toward the construction of a fixed route transit system, known as the 'Rockingham City Centre Transit System' (**RCCTS**).

The approved route of the RCCTS is via a shared and partially dedicated transport corridor which starts and ends at the Rockingham Train Station, taking in the City Centre and Rockingham beachfront, as illustrated within Figure 16 below.



16. Rockingham City Centre Transit System Alignment

The subject site is within the walkable catchment of the central transit system, the alignment of which runs 50m west of the subject site along Market Street.

Development Policy Plan

A refined level of planning was subsequently undertaken in November 2009, for the City Centre Sector, through Local Planning Policy 3.2.1 - Development Policy Plan - City Centre Sector (**LPP3.2.1**), as detailed below.

Development Plan Policy - City Centre Sector

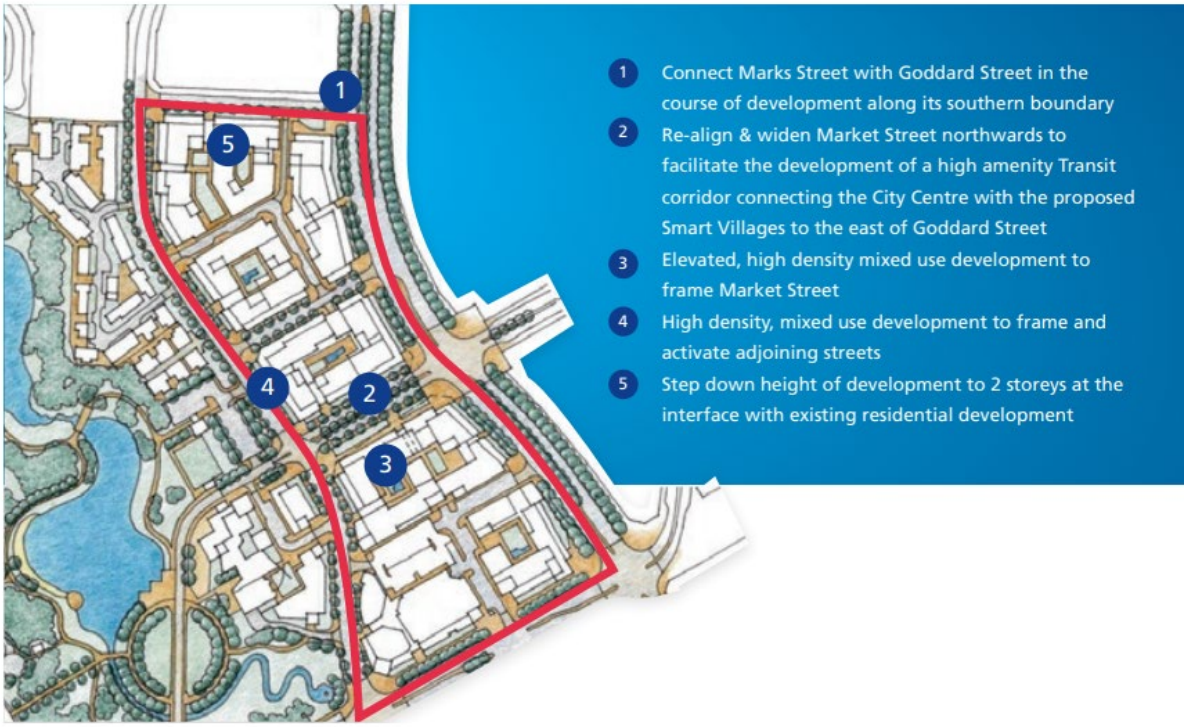
LPP3.2.1 guides development within the City Centre Sector, which is divided into seven (7) (sub)-precincts. For each of the precincts, LPP3.2.1 identifies a desired future character, preferred land uses and required elements for development proposals.

The policy seeks to provide for a balanced access and movement network and an integrated land use pattern across the Sector based on contemporary 'Main Street' and 'Transit Oriented Development' principles.

The subject site is located within the 'Goddard Precinct' that is bounded by Louise Street (formerly called Goddard Street), McNicholl Street, Marks Street and Chalgrove Avenue.

The Goddard Precinct policy requirements are read in conjunction with the Goddard Precinct Plan.

Figure 5.5 Goddard Precinct Concept Plan



17. Goddard Precinct Plan

The Policy states the following in respect to the desired future character of the precinct:

"*The characteristics of the Precinct are well suited to the further development of multi-level commercial and mixed use buildings along the Chalgrove Avenue and Goddard Street frontages. Frontages along a re-aligned Market Street would suit higher density, mixed use development framing a vista along a formally landscaped street through to the lake in the City Park."*

The application is assessed against the relevant policy measures below.

Indicative Development Plan	**Assessment**	**Compliance**
Figure 4.2 - Height Range (2 - 9 storeys) Preferred Density 180+	<u>Height and Preferred Density</u> Two storey dwellings proposed which is compliant. The development does not satisfy the preferred density (refer further below).	Non-Compliant

Indicative Development Plan	Assessment	Compliance
Figure 4.4 - Frontage Type 2 (Nil setback/Medium Activation) i.e. a medium level of frontage activation with secondary retail, customer oriented offices, inner-city commercial tenancies and residential lobbies at ground level and a 2 to 3 storey façade positioned at the streetfront boundary. At the ground level, buildings should address the street with a primary business entrance and a commercial façade that is transparent over at least 60% of the area of the facade.	Street Setback: The proposed building street setbacks do not align with the nil setback/'medium activation' requirement. Excluding the balconies (which project from the northern elevation), the front elevations are setback from the street boundary between 8.5m (at the eastern boundary of Unit 1) and 2.7m (at the western boundary of Unit 7). Activation: For 'Type 2 Frontage's the policy encourages a commercial ground floor and a 2-3 storey façade positioned at the street boundary, where as a residential 'suburban' built form is proposed that is setback from the street. Transparency: Nil, given residential development is proposed on the ground floor in lieu of a commercial use/uses.	Non-Compliant
Goddard Precinct - Desired Future Character, Preferred Land Use and Element Requirements		
The precinct is to be developed as a mixed use area conforming to an urban townscape discipline.	The proposed development does not provide for a mix of residential and commercial uses.	Non-compliant
Preferred land uses include: Office and Commercial, Professional Consulting Rooms, Showrooms, Residential, Serviced Apartments, Eating and Drinking, Retail, Leisure and Education.	'Residential' is a preferred land use in this location, however, a mixed use development is not proposed.	Non-Compliant

Goddard Precinct - Desired Future Character, Preferred Land Use and Element Requirements		
Buildings are to be located, configured and activated to frame and address street frontages and laneways in a way that is consistent with the Precinct Concept Plan, relevant 'Frontage Types' as indicated in Section 4.4.	The proposed building form comprises a 'townhouse' building typology with courtyards located between the building and the street which is reflective of a suburban context, not a City Centre, urban context. The built form envisaged by the Precinct Concept Plan resembles a multiple dwelling mixed use building typology with a nil street setback. The ground floor is transparent over 48% of the area of the façade in lieu of 60% expected, however a commercial ground floor is expected.	Non-Compliant
Consistent with Figure 4.2 'Density and Height' in Section 4.2, residential development within the Precinct is to be designed to accommodate a balanced mix of dwelling types and sizes at preferred densities ranging between 80 and 200 dwellings per hectare with a minimum density of 80 dwellings per hectare in any development which includes a residential component.	The development proposes 14 Grouped Dwellings which equates to approximately 80 [(10,000m^2 ÷ land area) x 14] dwellings per hectare. The development meets the minimum density of 80 dwellings per hectare.	Compliant
Consistent with Section 4.3, buildings are to present a minimum 2 storey or equivalent parapet height to the street or relevant public space subject to the maintenance of a 10.5 metre height limit along street frontages, with any additional height to be setback a minimum of 3 metres.	Two storey buildings are proposed (6.8m high), however, the provision clearly relates to buildings 2-3 storeys high along the street edge up to 10.5m high that step back with a 3m podium, beyond which up to 9 storey height is provided for.	Non-Compliant

The proposal is inconsistent with the desired future character for the precinct, as the front building is set back from the street boundary significantly, instead of framing and activating the street edge via ground floor commercial/retail land uses, with residential based land uses above.

Rockingham Strategic Centre: Framework Review

The local government is required, by Clause 67 of the *Planning and Development (Local Planning Schemes) Regulations 2015* to have 'due regard' to a range of matters. The pertinent matter which requires clarification for this development application relates to subclause b), which states that the local government is required to give due regard to any *"proposed planning instrument the local government is seriously considering adopting or approving".*

Since 2020, the City has been progressing the review of the existing local planning framework for the Rockingham Strategic Centre, in order to update and contemporise the planning requirements.

The City prepared the draft RSCPSP and the associated amendments to Town Planning Scheme No. 2, which were supported by Council in June 2022 for the purpose of public consultation.

On 19 December 2023, following consideration of submissions received during the public consultation, Council resolved to:

- Submit the proposed RSCPSP to the WAPC for approval (subject to modifications); and
- Adopt Scheme Amendment No.191 (subject to modifications) prior to submitting to the Planning Minister of for final approval.

More recently, the WAPC considered Amendment 191 and submitted its recommendation to the Minster for Planning. On 27 August 2024, the City was notified that the Minister had approved the Amendment subject to modifications.

Under Scheme Amendment No.191 it is proposed to zone the subject land 'Strategic Centre', and include a Rockingham Strategic Centre Sub Zone Zoning Table that provides for Grouped Dwellings as a 'D' use in the 'Residential Sub-Zone', that is referenced in the PSP.

The WAPC is anticipated to approve the RSCPSP, subject to modifications, by November 2024. At this stage, the City is aware that there are no proposed modifications to the PSP that would materially affect the consideration of this application.

As such, it is reasonable to consider the RSCPSP and Amendment 191 as seriously entertained planning proposals.

The main areas of difference between the existing and proposed local planning frameworks include:

- The subject site is a 'mixed use' site under the existing local planning framework, and transitions to a 'Residential R80' site under the RSCPSP which effectively means that a commercial ground floor will no longer be required;

- The building height limits reduce from nine (9) storeys to four (4) storeys maximum under the PSP. The minimum building height has remained unchanged at two (2) storeys; and
- Street setbacks change from nil under the current planning framework to 0-2m under the PSP.

The following table summarises compliance with key provisions of the Part 1 of the PSP, as they pertain to the proposal.

Precinct Structure Plan Provisions			
Provision	**Requirement**	**Comment**	**Compliance**
2.2.1 Residential Density:	R80 Minimum Site Area: 100m² Average Site Area: 120m²	Proposed minimum site area: 100m² Average site area: 124m²	Compliant
Provision	**Requirement**	**Comment**	**Compliance**
2.2.2 Building Height	2 Storey minimum 4 storey maximum	2 Storey proposed	Compliant
2.2.3 Street Interface	Building frontages shall be in accordance with precinct development requirements set out in Section 3. For residential development, fencing in the front setback areas shall be in accordance with the R Codes	Non-compliant with Provision CP2 (0-2m front setbacks required for an urban street); Provision CP4 (multiple dwelling is the preferred land use at the ground floor). The front fence along Louise Street boundary is compliant with the R-Codes.	Non-Compliant
2.2.5 Car Parking	• Parking to be sleeved behind buildings; • Consolidate access to one crossover; • Visitor parking to be accommodated on-site; • Residential use parking provided as per R Codes.	• Car parking is proposed behind buildings screened from Louise Street • A single crossover is provided • No on site visitor parking proposed, but a variation can be supported under the R-Codes as there is four on street embayment car bays adjacent to the Lot frontage.	Compliant

Section 3.5 P5 - City Park Precinct Development Requirements			
P1-Figure 11	2-4 storeys 0-2m street setback	2 storeys 2.7-8.5m street setback	Non-compliant
CP1 Building Height	Minimum podium height 2 storeys Maximum building height 4 storeys	Two storey proposed.	Compliant
CP2 Front setback	Minimum setback: nil Maximum setback 2m	The proposed building is setback from Louise Street ranging between 2.7m and 8.5m from the street boundary.	Non-Compliant
CP3 Side/Rear Setbacks	Minimum side setback 3m Minimum rear setback 6m	Nil setback proposed from the western and eastern side boundaries. 1.6m setback proposed to southern rear boundary.	Non-compliant
CP4 Land use	Preferred land use at street level: Multiple dwellings	Group Dwellings proposed.	Not a preferred (but permissible) use
CP5 Floor levels	As per Codes	N/A for Grouped Dwellings	N/A
CP6 Street level interface	Minimum frontage build out required: 70%	100% proposed	Compliant
CP7 Movement and Access	On-site parking between the street and building not permitted	Parking is sleeved from the street	Compliant

Sub-Precinct Intent:

*"**High quality medium density development** support sensitive and **quality urban infill outcomes**, primarily in the form of **grouped dwellings and small scale apartment typologies.** Heights are generally between **two-four storeys**, and generous street setbacks align with the existing suburban character of the area*" (emphasis added).

With respect to the proposed RSCPSP, the City's concern relates to the proposed building form and scale (in so far it can be viewed from the street) that represents a 'suburban', Group Dwelling building typology which is setback from the street. As such, the proposal does not respond appropriately to the 'urban' street context of this site, as articulated in the proposed local planning framework.

When considered in the broader context of the planning vision as articulated in the Part 2 Explanatory Section of the RSCPSP, regard should be given to the following objectives of the PSP Part 1:

Urban Structure:

"Planning provisions and land assembly strategies support high-quality development outcomes in nominated infill areas."

The application does not propose the intended built form outcome for this site as the RSCPSP envisages, and is therefore not considered to constitute a '*high quality development outcome'* that is cognisant of the proposed planning vision.

Built Form:

"Foster the development of a Strategic Centre which possesses a diversity of built form typologies, ***framed around a legible public street*** *pattern guided by the Movement and Place framework.*

Provide ***high-quality streetscapes through well considered approaches to building frontages****, which ensure generally contiguous and active street front buildings in the mixed use/commercial precincts.*

Achieve appropriate built form outcomes*, including a range of medium to high density housing, within the walkable catchment of the Rockingham City Centre Transit System" (emphasis added).*

While 'Grouped Dwellings' can be permitted in this location, this is contingent on the buildings framing Louise Street, and exhibiting an 'urban built form' outcome, reflective of a 'Urban Residential R80' frontage.

The expectation for urban residential streets is to provide for modest front setbacks, with the building becoming a more prominent feature on the street with balconies and vertical separation to courtyards, ensuring a clear delineation of the private space and public domain.

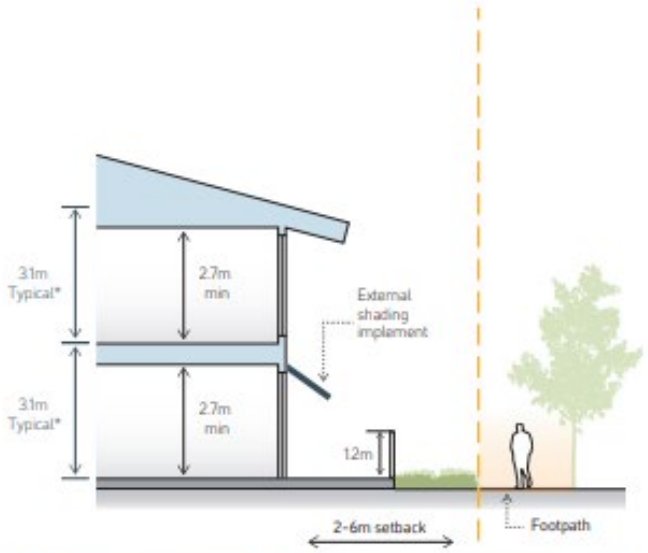
The proposed development is contrary to urban residential street expectation and is reflective of R40/60 'suburban' frontage as shown in the following figures, noting that it is also non-compliant with suburban based street setback requirements.

For clarity, the figures below depict the built form expectations between an 'Urban Street' (R80 sites) and a 'Suburban Street' (R40-60 sites), as contained in the RSCPSP Part 2 - Explanatory Section.



18. Urban Street Design Elements

SUBURBAN STREET

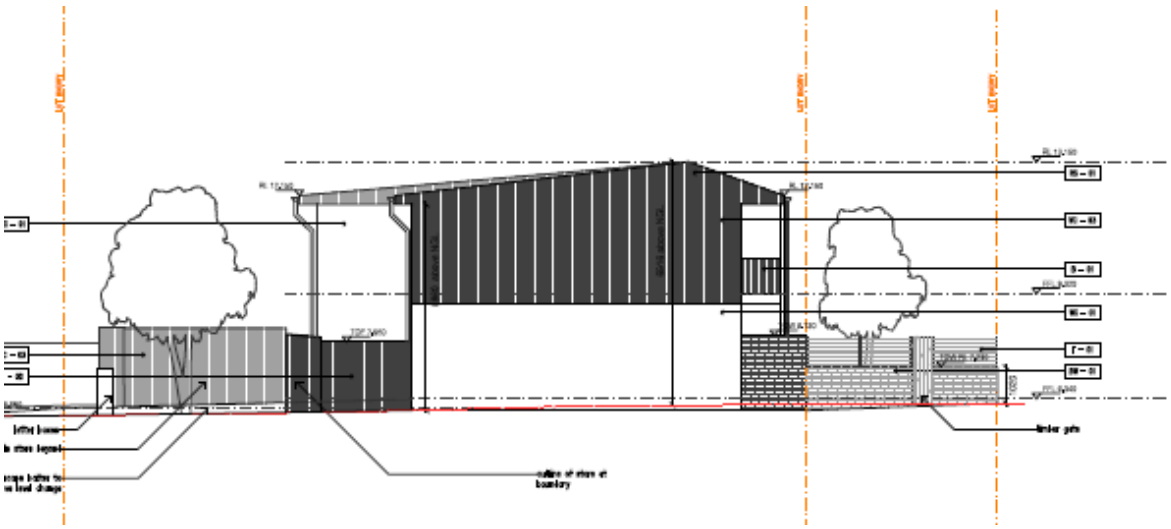




Suburban streets are residential in nature, with single houses, terraces, low-scale apartments interfacing with the street environment. They have a moderate relationship with the public realm, while creating amenity and maintaining a visual connection to streets:

+ Buildings are set back from the boundary to allow for landscaping, increased privacy and amenity for residents. The front setback is prominent, in response to the prevailing neighbourhood character.

19. Suburban Street Elements



20. Elevation of Proposed Development





21. Frontage of Proposed Development

Town Planning Scheme No.2 (TPS2)

Clause 3.2 - Zoning Table

A 'Grouped Dwelling' is a 'D' (discretionary) use in the Primary Centre City Centre zone, which may be approved.

Clause 4.3A.1

For the reasons outlined previously, the application is considered to be inconsistent with the following objectives for the Primary Centre City Centre zone:

"(a) to provide an identifiable 'City Centre' which provides for major CBD functions in a predominately 'Main Street' development configuration;

(b) to contribute to the development of integrated retail, office, commercial, residential, civic and community facilities generally in accordance with the requirements of the Development Policy Plan for the City Centre Sector and the Council Avenue Sub-Precinct forming part of the Southern Gateway and Rockingham Station Sectors;

(c) to achieve high intensity land use and built form outcomes, including a range of medium to high density housing, within a walkable catchment of the central public transit system;

(f) to provide contiguous, activated street front development."

Clause 4.3A.2 - R Codes do not apply

The R Codes do not to apply to the development of land in the Primary Centre City Centre Zone for any residential purposes dealt with by the R Codes.

It is acknowledged that the above provision was included at a point in time when the R-Codes did not sufficiently evolve to drive design excellence.

Clause 4.3A.3 - Minimum residential density

All development in the Primary Centre City Centre zone for Grouped Dwellings must have a minimum of one dwelling per 125m². The density proposed complies, resulting in a 14 Grouped Dwelling potential yield.

Clause 6.1 - Design Review Panel

Pursuant to Clause 6.1.1, the Council has appointed a DRP for the purpose of considering, and advising Council with respect to certain applications.

In considering the current plans against the DRP's findings for the pre-lodgement concept, the City notes that:

- The two single storey units have been deleted so the development is two storey throughout. When viewed from the street however, the building scale has not materially changed. The DRP considered that the lack of scale, given the site context, is a fatal flaw of the proposal.

- The City did request the applicant reconsider the roof form to provide a perceived increase in building scale, however, the applicant indicated that increasing the scale will render the project unfeasible.

- The DRP suggested improving occupant amenity by providing private courtyards on the northern side of the dwellings, and the plans were amended accordingly. This has had the effect of setting the built form back from the street, which is contrary to the intent of the local planning framework.

- The revised plans provide for greater landscaping, deep soil areas and tree planting in the courtyards and between car bays.

- The dwelling yield has reduced and the width of the buildings increased to improve functionality and amenity.

- Legible front doors and balconies have been added to the dwellings, noting that legible front doors are not available for Units 1 and 2 due to truncation legality.

While there has been some positive change to the development plans post DRP consideration, the building scale remains the same.

The DRP is an independent forum used by the City to offer an assessment of a proposal against SPP7.0. The Principles in SPP7.0 cut across a number of design related disciplines, with some more aligned to architecture and urban design, whilst others have a broader planning connotation. While the DRP encouraged the provision of courtyards on the northern side of the buildings to maximise occupant amenity, at a broader level this advice appears to conflict with the urban context of the subject site, as articulated in the planning framework. As such, the City has considered the DRP's advice in context with the intended planning vision.

Pursuant to clause 6.1.3, when dealing with applications on which a recommendation has been made by the DRP, the decision maker (MODAP) shall have due regard for that recommendation.

Consideration of application by local government - Clause 67 of Deemed Provision

The proposed development is required to be considered against the relevant matters listed under Clause 67 of the Deemed Provisions of the Regulations.

Commentary on the relevant considerations is provided below.

Deemed Provisions Clause 67	
"The aims and provisions of this Scheme.	As outlined throughout the Report, the proposal is not consistent with the aims and provisions of TPS2.
any amendment to a local planning scheme that has been advertised, or any other proposed planning instrument that the local government is seriously considering adopting or approving.	The development has been assessed in accordance with the draft local planning framework for the area.

Deemed Provisions Clause 67	
any approved state Planning Policy.	The development has been assessed against relevant state planning policies, where it is found to not satisfy the relevant design principles (detailed above), where discretion has been sought.
compatibility of the development with its setting including- *(i) the compatibility of the development with the desired future character of its setting; and* *(ii) the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development.*	As demonstrated throughout this Report, the proposed development in its current form is incompatible with the desired future character of its setting and the relationship with other development in the locality.
the availability and the adequacy for the development of the following – *(iv) access for pedestrians and cyclists;* *(v) access by older people and people with a disability".*	As demonstrated throughout this Report, pedestrian access to the parts of the proposed development remains unresolved.

Conclusion:

The proposed development has been assessed against the existing and proposed local planning framework for the area.

Given that the draft planning framework has sufficiently advanced, it is noted that some aspects of the current framework will not apply following final approval of the RSCPSP (likely to coincide around the time MODAP considers this application). As such, the City has taken a pragmatic approach to focus its assessment on areas of non-compliance with the proposal that will likely transition from the existing to the proposed local planning framework.

Having regard to the above, the application is found to be inconsistent with the development requirements and objectives of both the existing and proposed local planning frameworks, primarily due to the building form that is setback from the street edge and the lack of scale/presence in context with the surrounding and envisaged pattern of development.

Further to the above, pedestrian access to the parts of the proposed development remains unresolved, particularly given the intended occupants will be elderly, some of which may have, or have visitors with, access limitations.

Additionally:

- Direct pedestrian access for occupants and visitors to Units 8-14 is required, but is not possible to provide as Lot 303 Chalgrove Avenue was not included in the Development Application;

- Units 1 and 2 have been designed with front gates that open into the adjoining private property rather that the road reserve; and

- The physical location of the communal letter box is not clearly identifiable.

In essence, the development meets the residential density expectation under the impending framework, however, the delivery of this density is considered inappropriate due to the selected dwelling typology and general site planning and layout of the proposal.

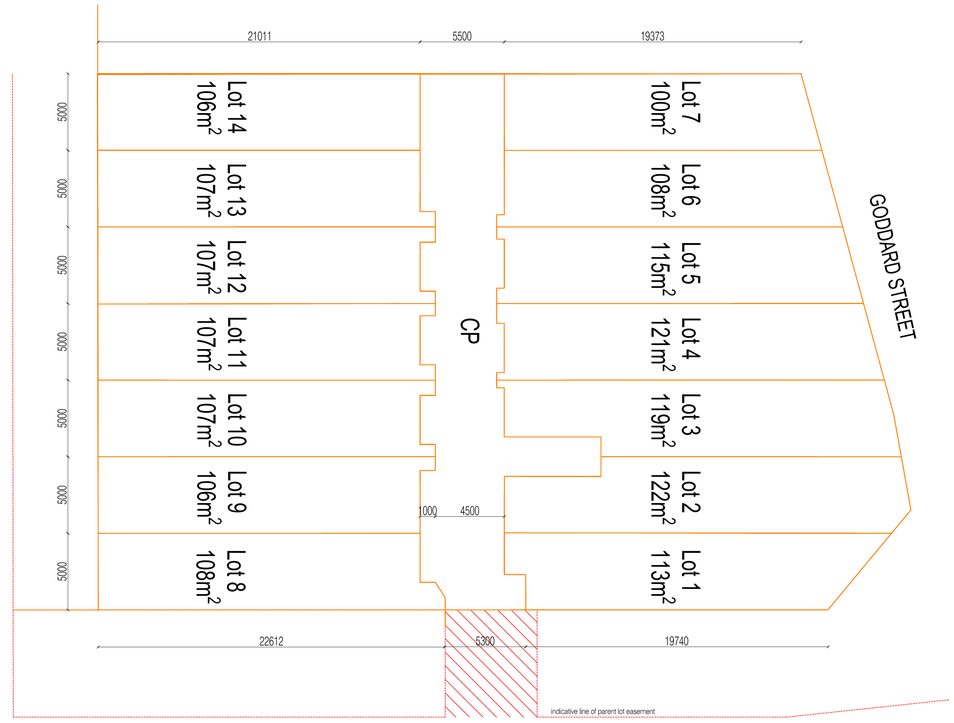
Whilst it is recognised that the project will potentially provide much needed, specialised housing supply, the proposal in its current form undermines the integrity and key outcomes sought through the existing and impending local planning framework.

Instead of recommending Refusal, the City considers that the Applicant should address the matters raised in the City's assessment and provide amended plans and additional information to facilitate a favourable recommendation.

As such, Deferral of this application is recommended.



Existing Feature Survey



Overall Lot Plan

Revision	Issued	Date
3	Issue for Approval – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: EXISTING FEATURE SURVEY & LOT PLAN

CLIENT: Dale Alcock Projects

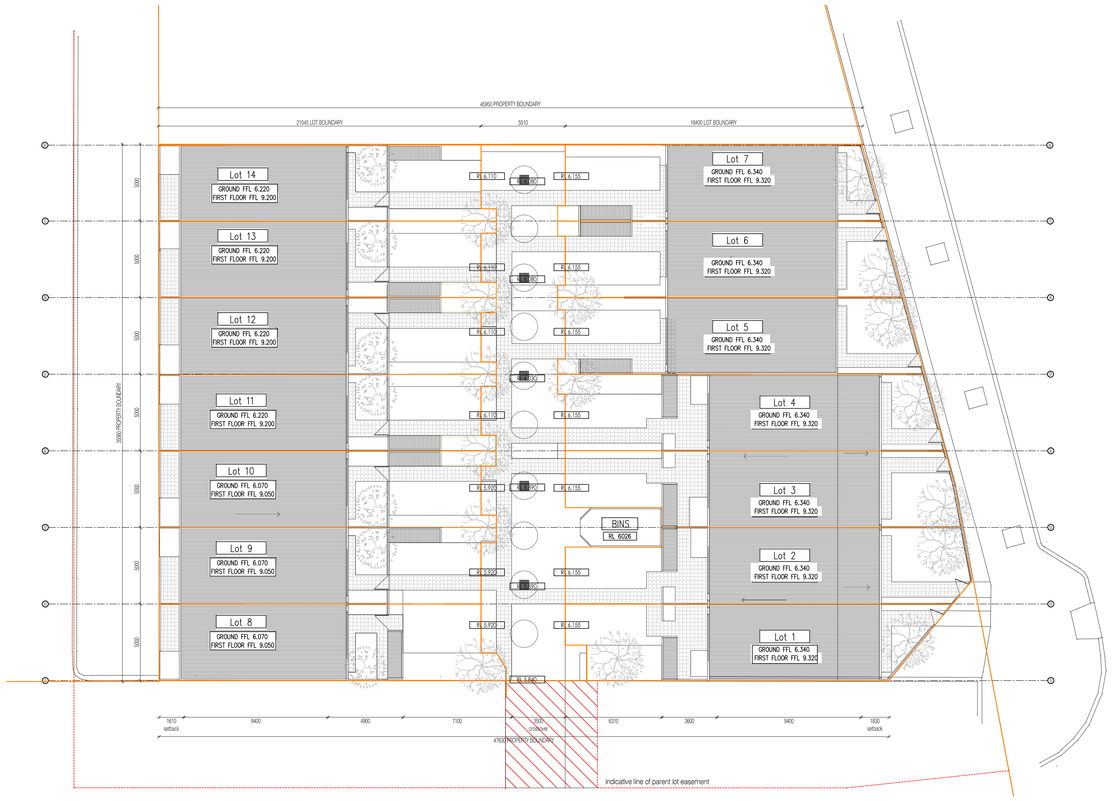
SCALE: 1:200 AT A1

DATE: 08.08.2024

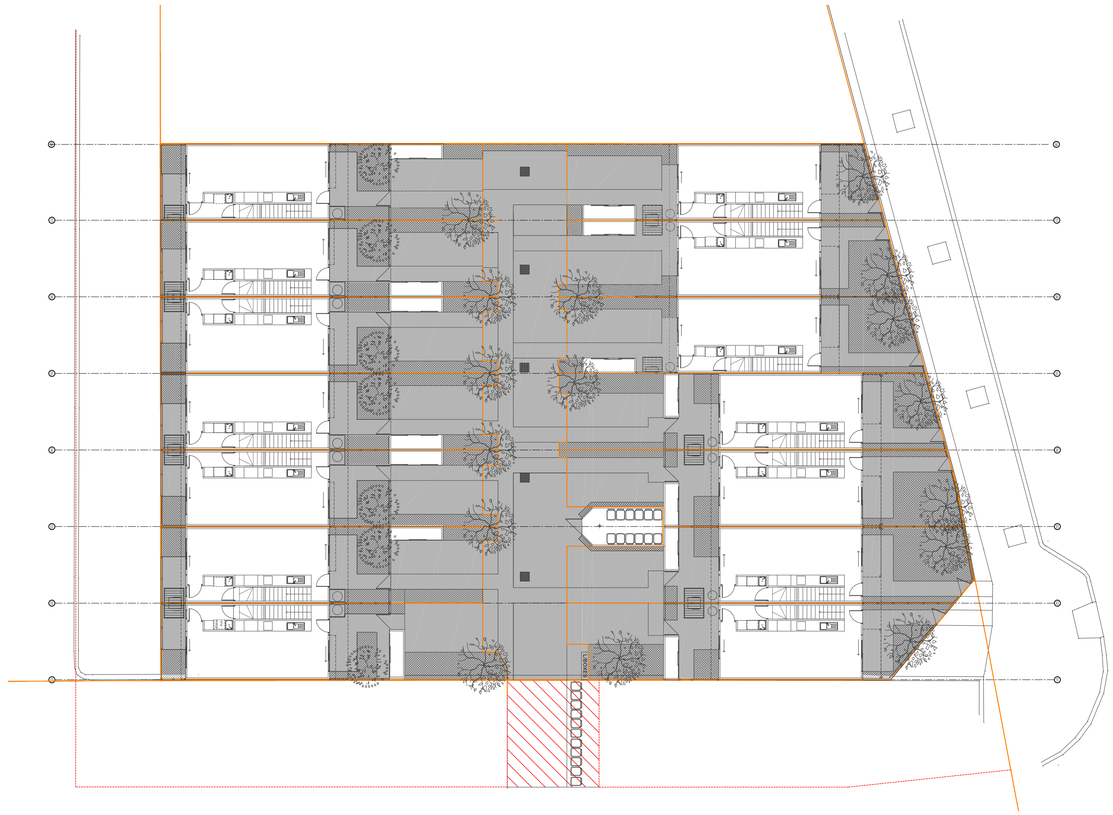
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_001

REVISION: 3



Site Plan



Total Site Area: 1744m^2
Building Footprint: 713m^2 or 41%

Site Cover Plan

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

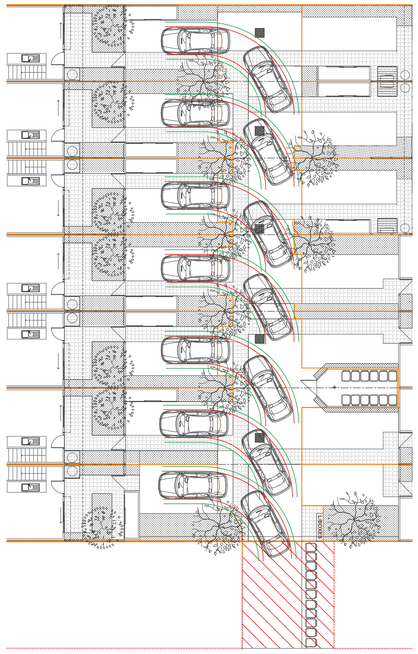
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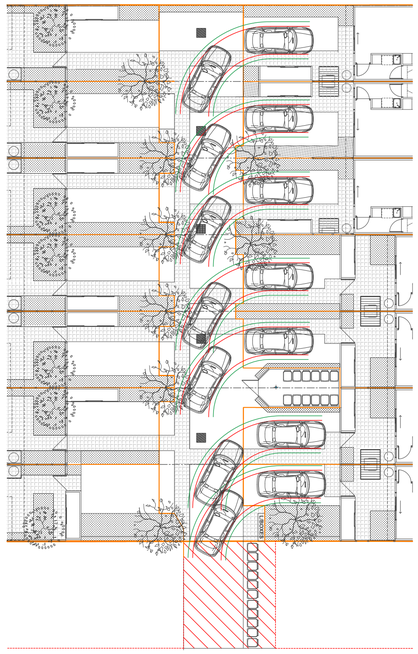
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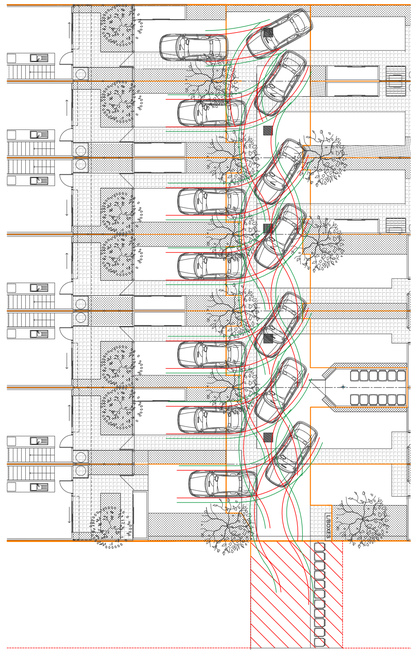
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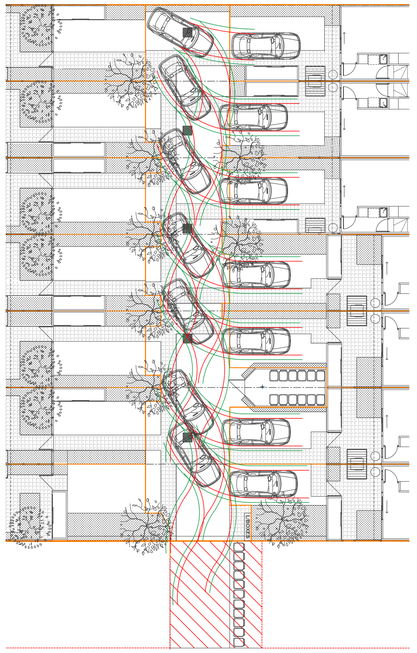
PROJECT: Lot 10, Goddard St, Rockingham
DRAWING: SITE PLAN
CLIENT: Dale Alcock Projects
SCALE: 1:200 AT A1
DATE: 08.08.2024
DRAWING STATUS: ISSUE FOR PLANNING
DRAWING NUMBER: A_002
REVISION: 3





Turning Circles (Inbound)





Turning Circles (Outbound)

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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DALE ALCOCK PROJECTS

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ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: TURNING CIRCLES

CLIENT: Dale Alcock Projects

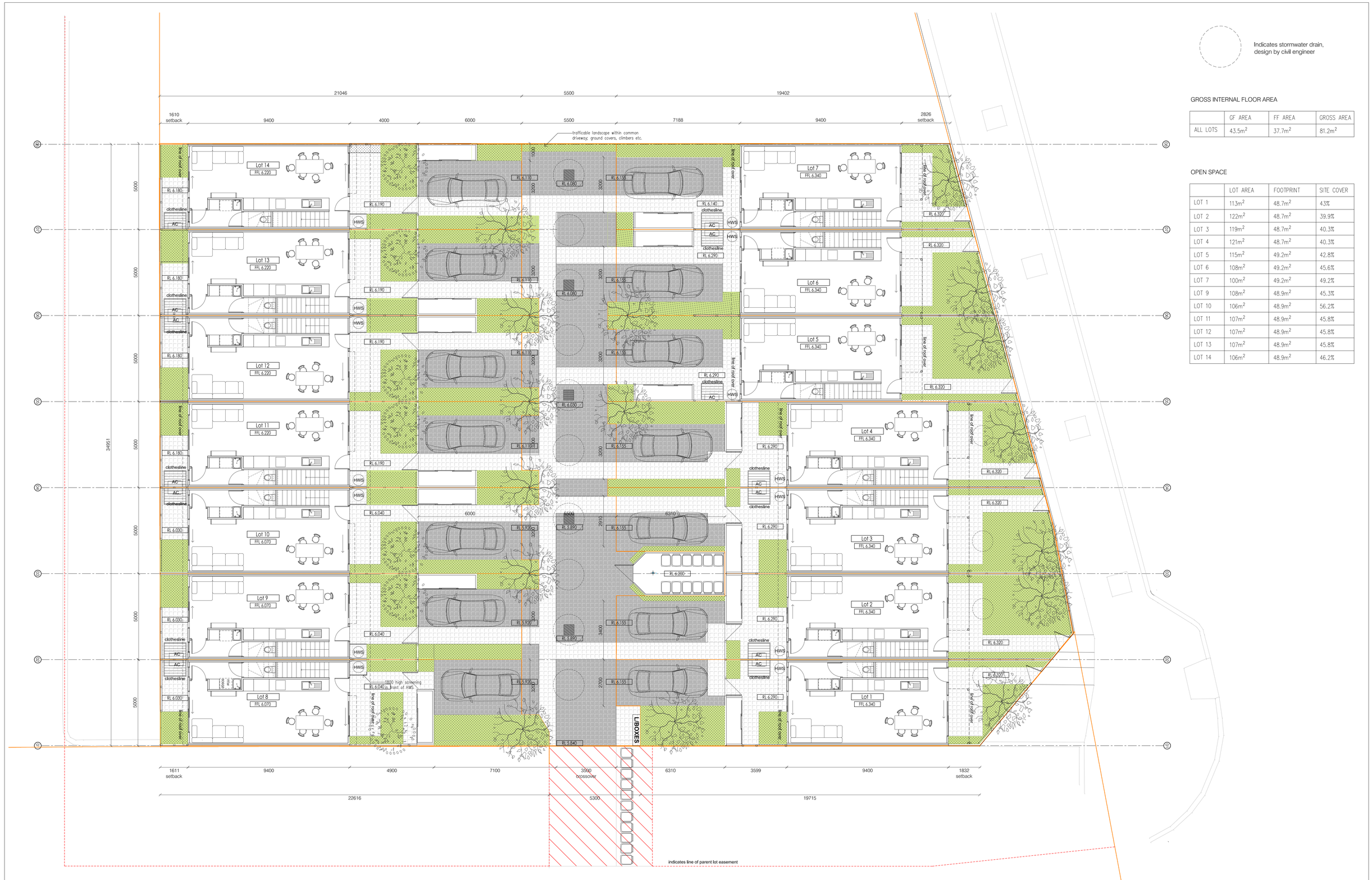
SCALE: 1:200 AT A1

DATE: 08.08.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_003

REVISION: 3



Indicates stormwater drain, design by civil engineer

GROSS INTERNAL FLOOR AREA

	GF AREA	FF AREA	GROSS AREA
ALL LOTS	43.5m²	37.7m²	81.2m²

OPEN SPACE

	LOT AREA	FOOTPRINT	SITE COVER
LOT 1	113m²	48.7m²	43%
LOT 2	122m²	48.7m²	39.9%
LOT 3	119m²	48.7m²	40.3%
LOT 4	121m²	48.7m²	40.3%
LOT 5	115m²	49.2m²	42.8%
LOT 6	108m²	49.2m²	45.6%
LOT 7	100m²	49.2m²	49.2%
LOT 9	108m²	48.9m²	45.3%
LOT 10	106m²	48.9m²	56.2%
LOT 11	107m²	48.9m²	45.8%
LOT 12	107m²	48.9m²	45.8%
LOT 13	107m²	48.9m²	45.8%
LOT 14	106m²	48.9m²	46.2%

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
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ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: PLAN - GROUND FLOOR

CLIENT: Dale Alcock Projects

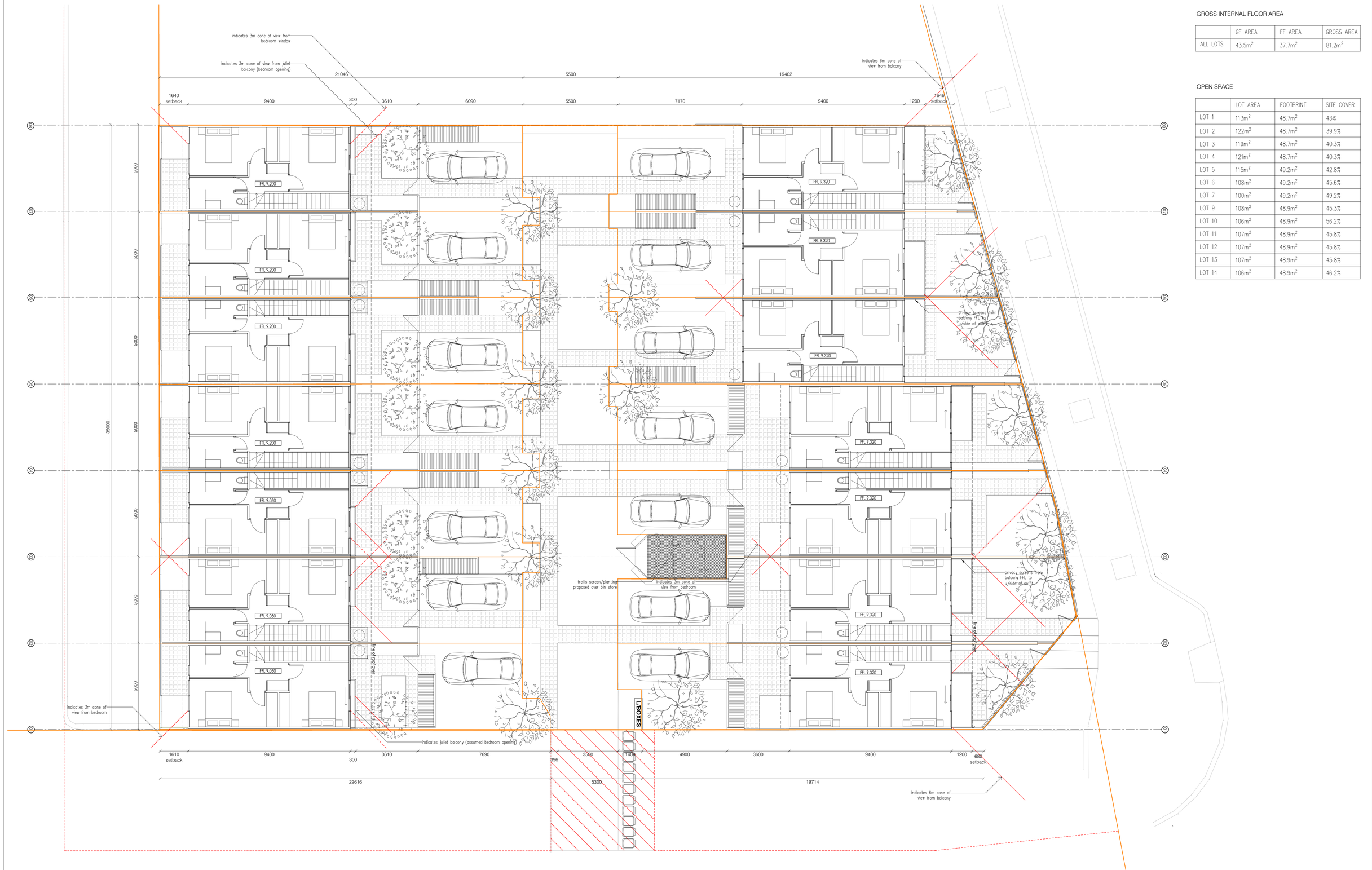
SCALE: 1:100 AT A1

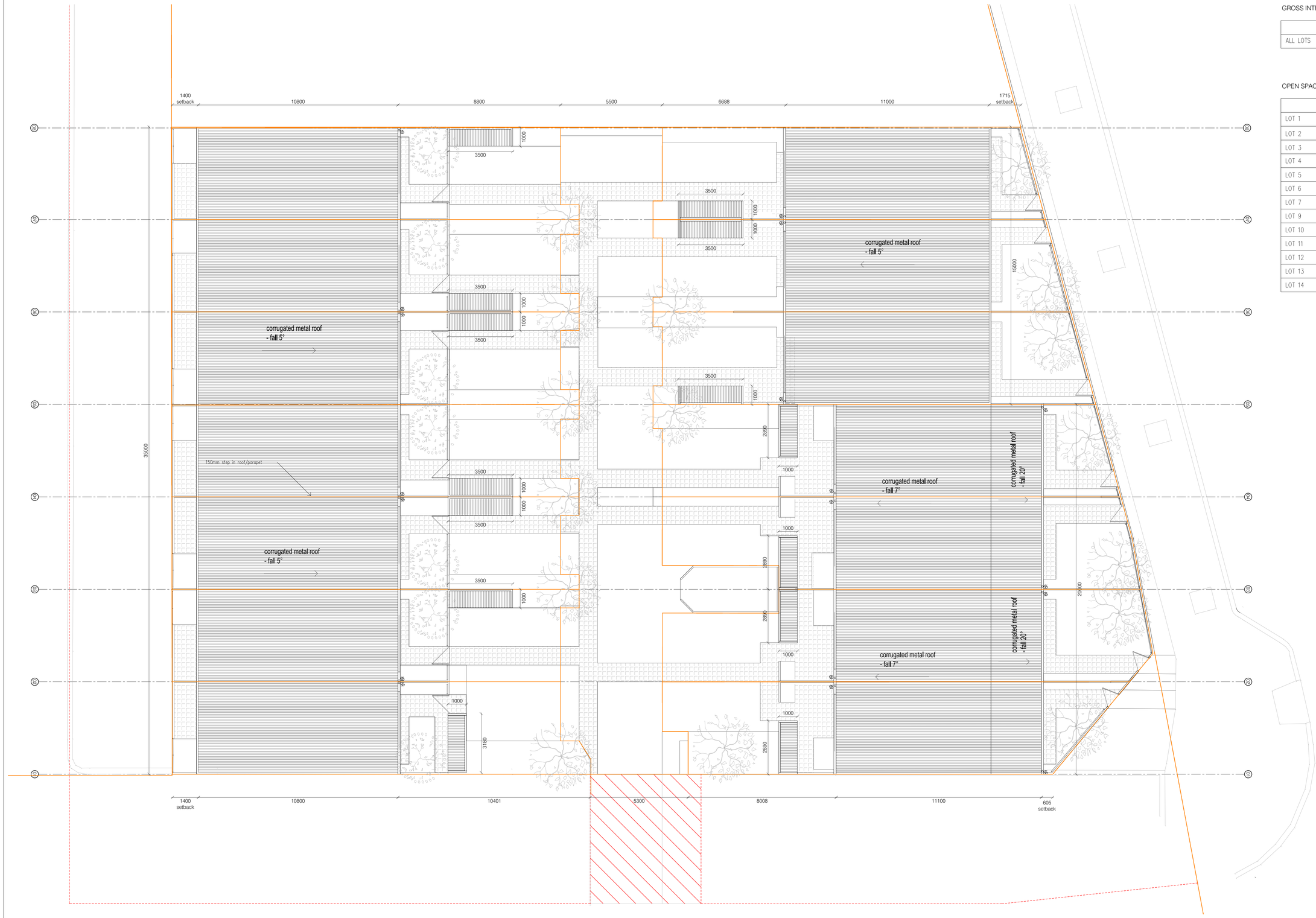
DATE: 08.08.2024

DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_010

REVISION: 3


indicates 3m cone of view from bedroom window
indicates 3m cone of view from juliet balcony (bedroom opening)
indicates 6m cone of view from balcony
21046
5500
19402
1640 setback
9400
300
3610
6090
5500
7170
9400
1200
1646 setback
35000
5000
5000
5000
5000
5000
FFL 9.200
FFL 9.050
FFL 9.320
privacy screens from balcony FFL to u/side of soffit
trellis screen/planting proposed over bin store
indicates 3m cone of view from bedroom
line of roof over
LIFT
LIFT
LIFT



GROSS INTERNAL FLOOR AREA

	GF AREA	FF AREA	GROSS AREA
ALL LOTS	43.5m²	37.7m²	81.2m²

OPEN SPACE

	LOT AREA	FOOTPRINT	SITE COVER
LOT 1	113m²	48.7m²	43%
LOT 2	122m²	48.7m²	39.9%
LOT 3	119m²	48.7m²	40.3%
LOT 4	121m²	48.7m²	40.3%
LOT 5	115m²	49.2m²	42.8%
LOT 6	108m²	49.2m²	45.6%
LOT 7	100m²	49.2m²	49.2%
LOT 9	108m²	48.9m²	45.3%
LOT 10	106m²	48.9m²	56.2%
LOT 11	107m²	48.9m²	45.8%
LOT 12	107m²	48.9m²	45.8%
LOT 13	107m²	48.9m²	45.8%
LOT 14	106m²	48.9m²	46.2%

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

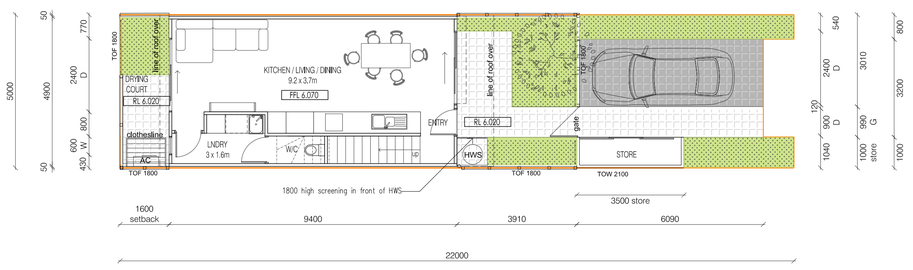
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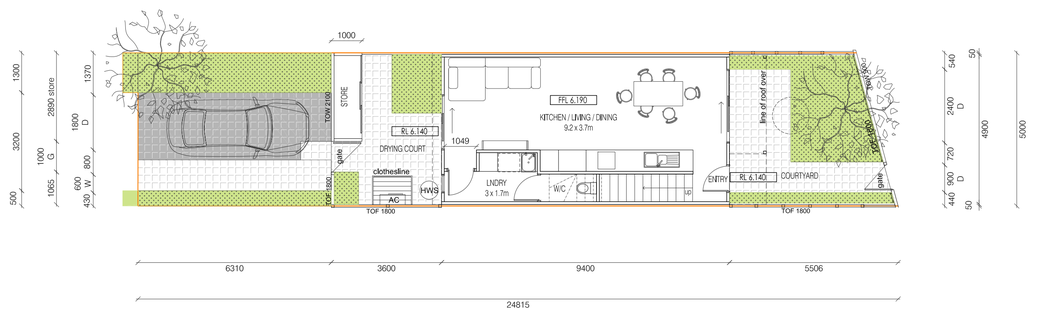
DALE ALCOCK PROJECTS

MDC
ARCHITECTS
1 Silas Street, East Fremantle WA 6158
t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

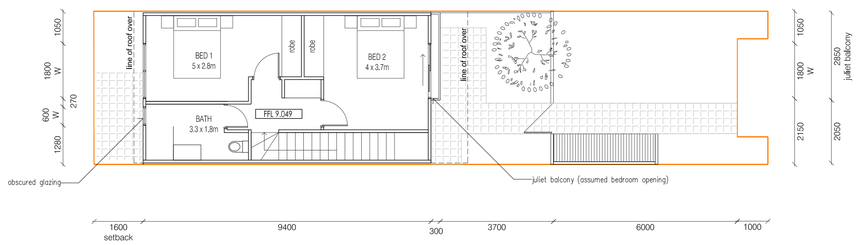
PROJECT: Lot 10, Goddard St, Rockingham
DRAWING: ROOF PLAN
CLIENT: Dale Alcock Projects
SCALE: 1:100 AT A1
DATE: 08.08.2024
DRAWING STATUS: ISSUE FOR INFORMATION
DRAWING NUMBER: A_012
REVISION: 3



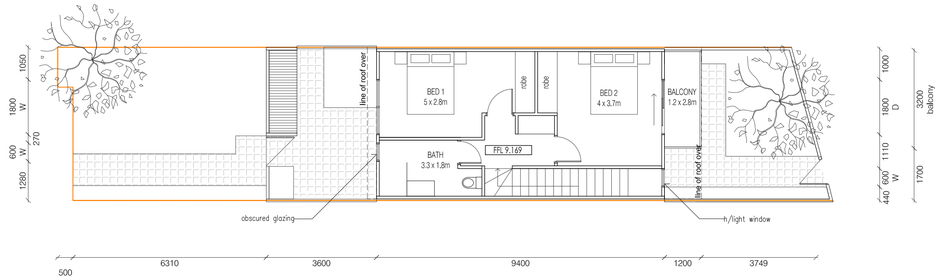
South Row- Ground Floor



North Row- Ground Floor



South Row- First Floor



North Row- First Floor

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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MDC ARCHITECTS

1 Silas Street, East Fremantle WA 6158
t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: DWELLING FLOOR PLANS

CLIENT: Dale Alcock Projects

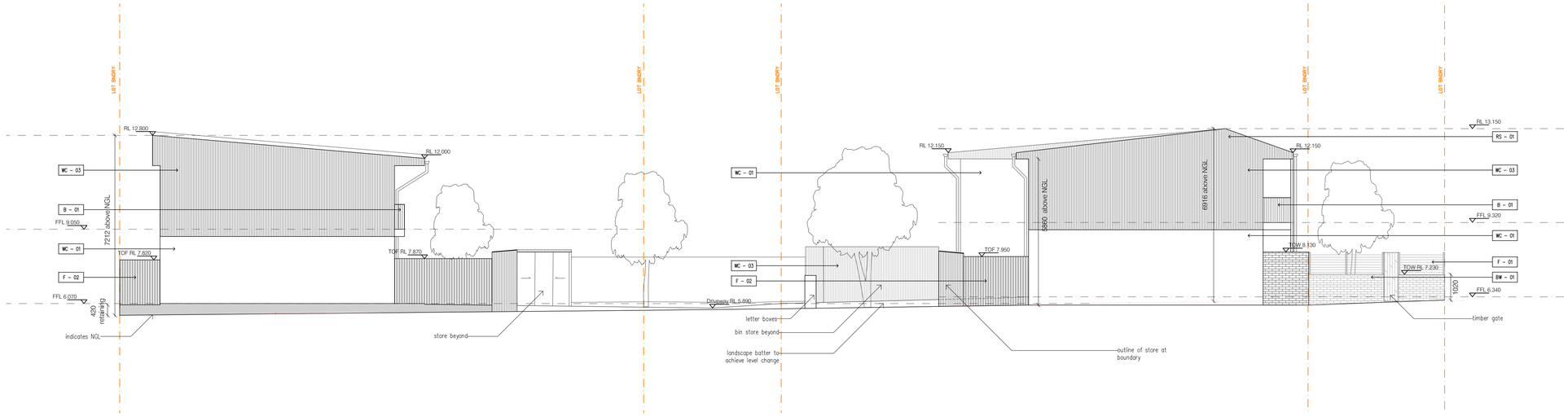
SCALE: 1:100 AT A1

DATE: 08.08.2024

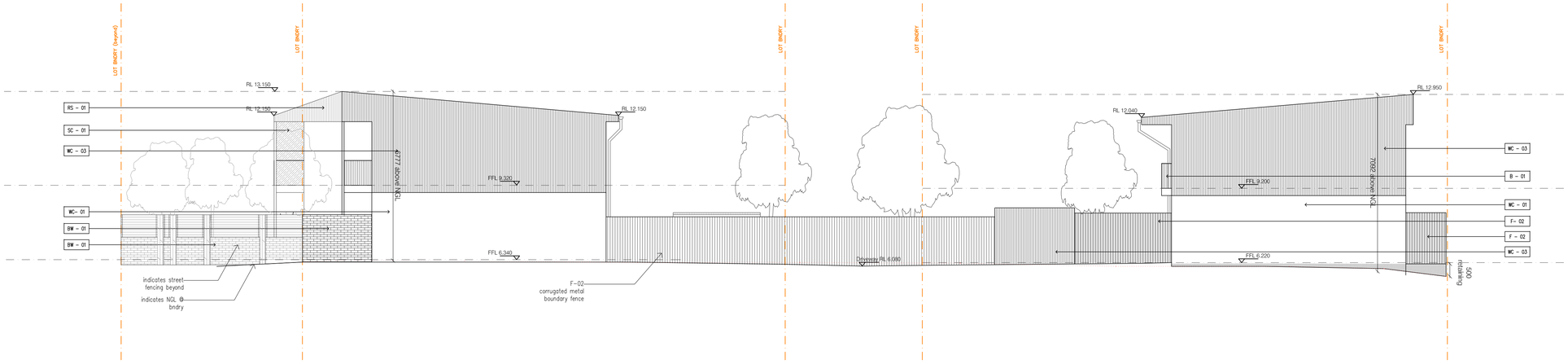
DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_100

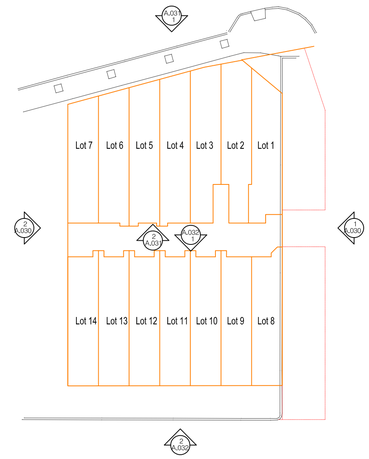
REVISION: 3



East Elevation



West Elevation



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
F – 01	Steel post and wire fencing
F – 02	corrugated metal fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Revision	Issued	Date
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 08.08.2024

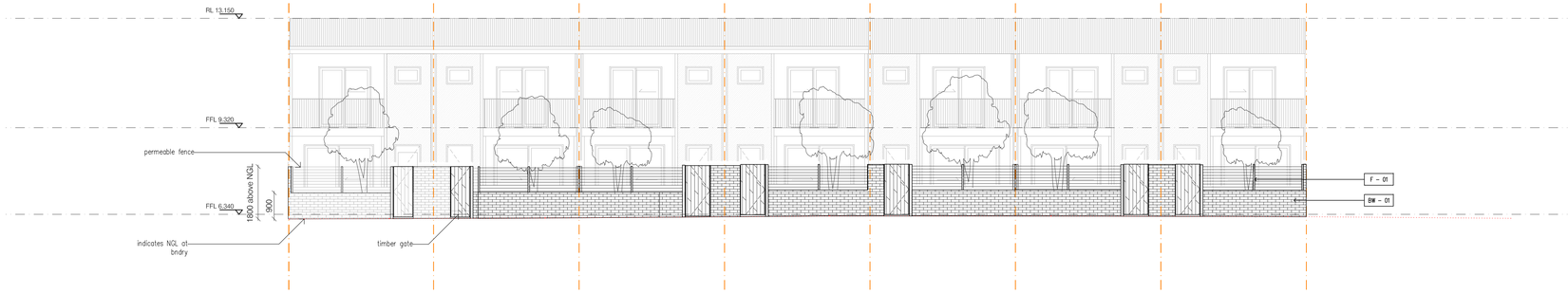
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_300

REVISION: 3



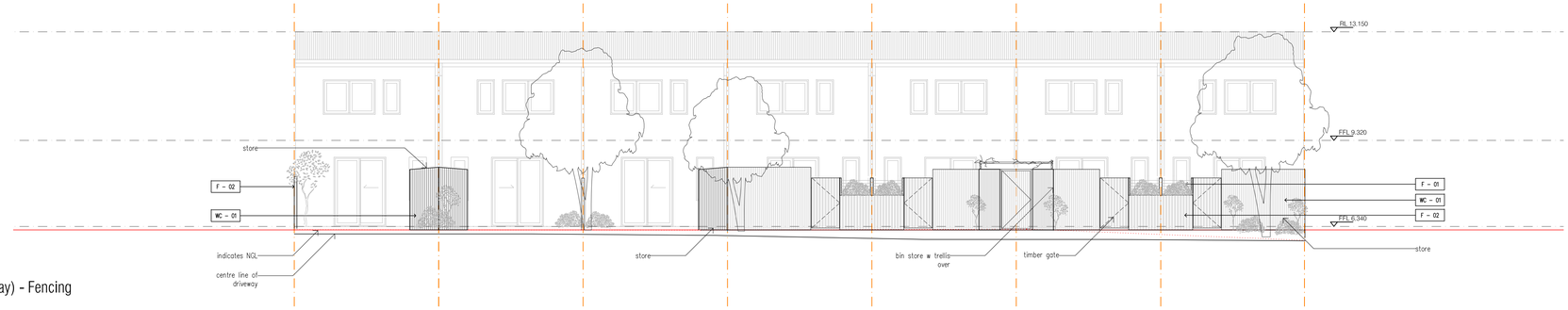
North Elevation (From Goddard Street)



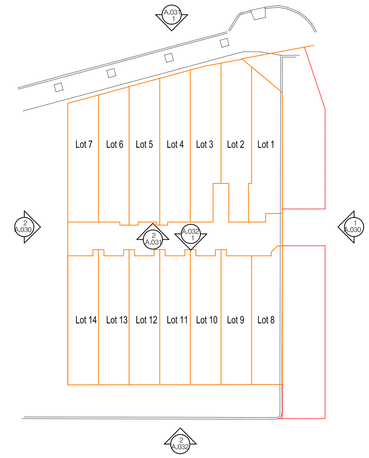
North Elevation (From Goddard Street) - Fencing



South Elevation (From driveway)



South Elevation (From driveway) - Fencing



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
F – 01	Steel post and wire fencing
F – 02	corrugated metal fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Revision	Issued	Date
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 08.08.2024

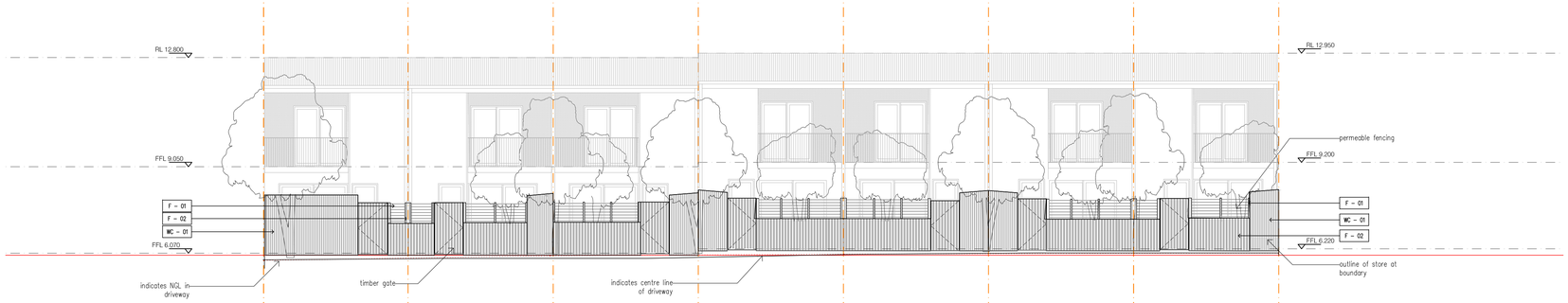
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_310

REVISION: 3



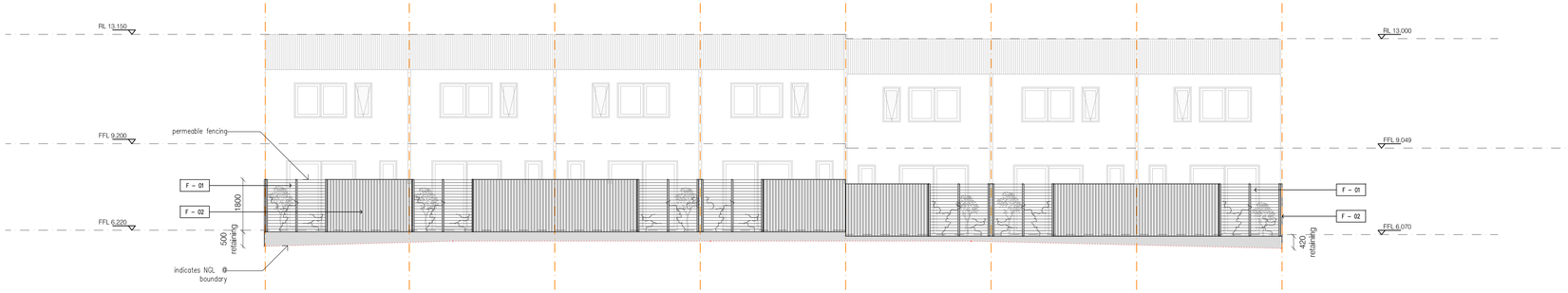
North Elevation (From Driveway)



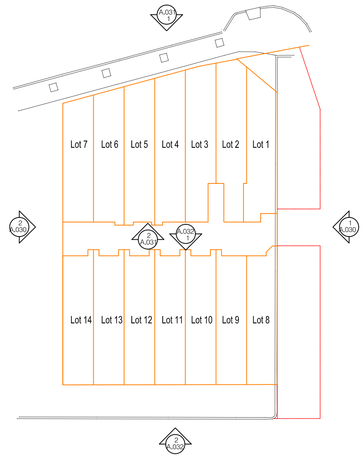
North Elevation (From Driveway) - Fencing



South Elevation (From boundary)



South Elevation (From boundary) - Fencing



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
F – 01	Steel post and wire fencing
F – 02	corrugated metal fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
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Revision	Issued	Date
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

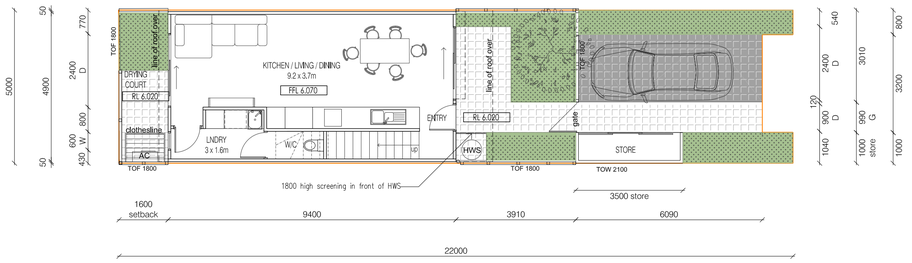
SCALE: 1:100 AT A1

DATE: 08.08.2024

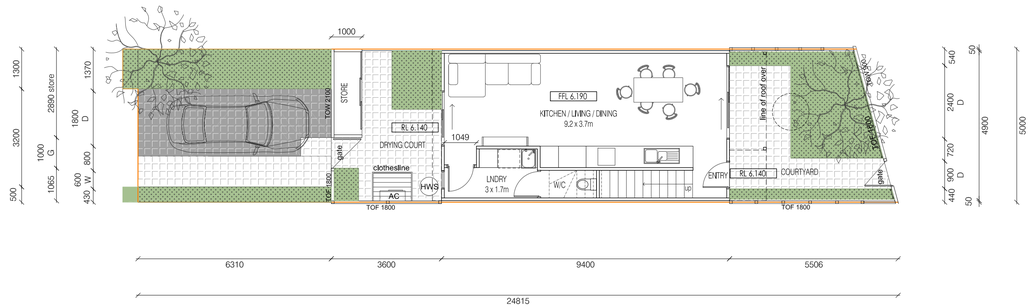
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_320

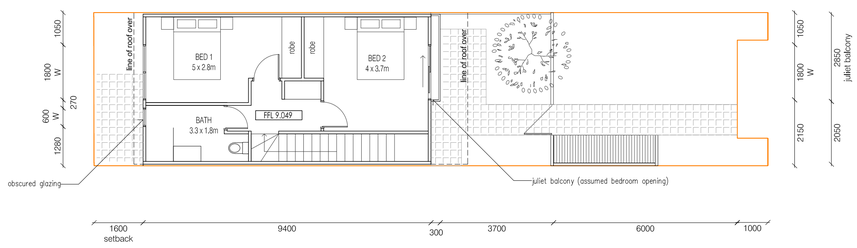
REVISION: 3



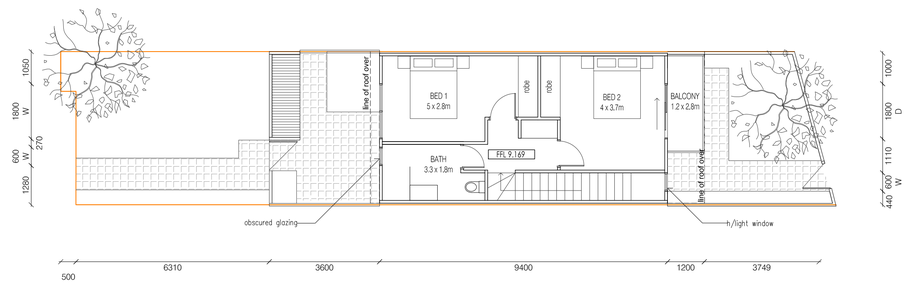
South Row- Ground Floor



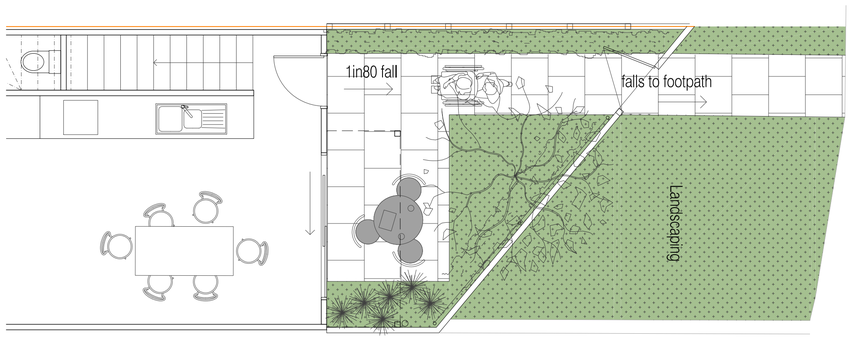
North Row- Ground Floor



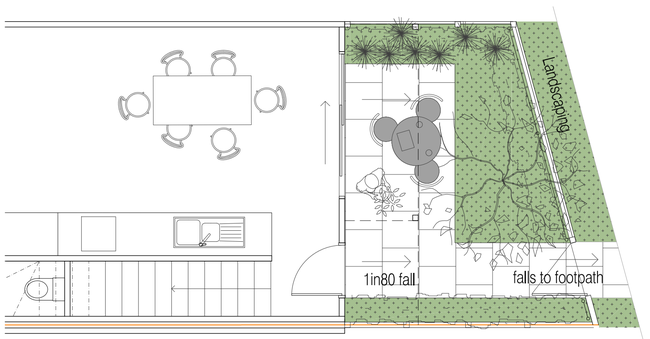
South Row- First Floor



North Row- First Floor



Lot 1 northern courtyard layout
- 1:50



Lot 7 northern courtyard layout
- 1:50

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
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0	Issue for Approval – Planning	20.03.2024

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1 Silas Street, East Fremantle WA 6158
t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: DWELLING FLOOR PLANS

CLIENT: Dale Alcock Projects

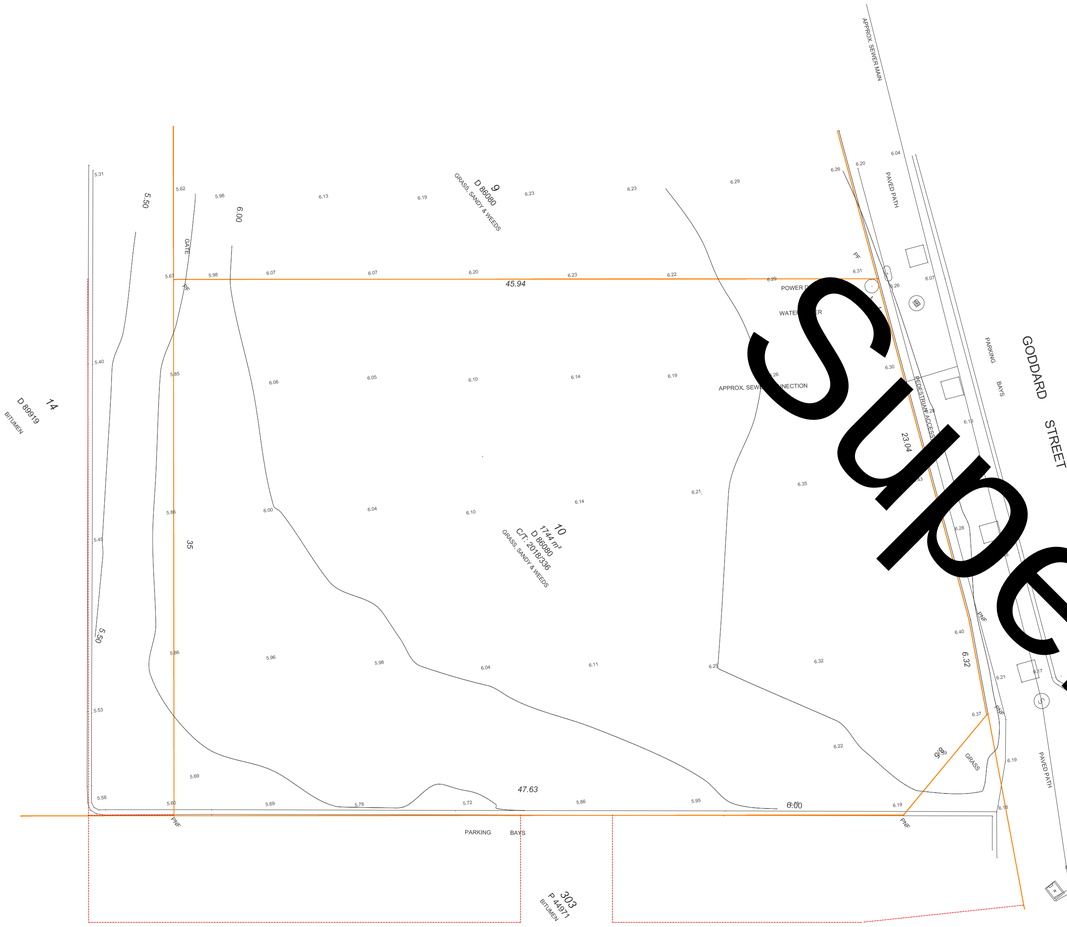
SCALE: 1:100 AT A1

DATE: 14.08.2024

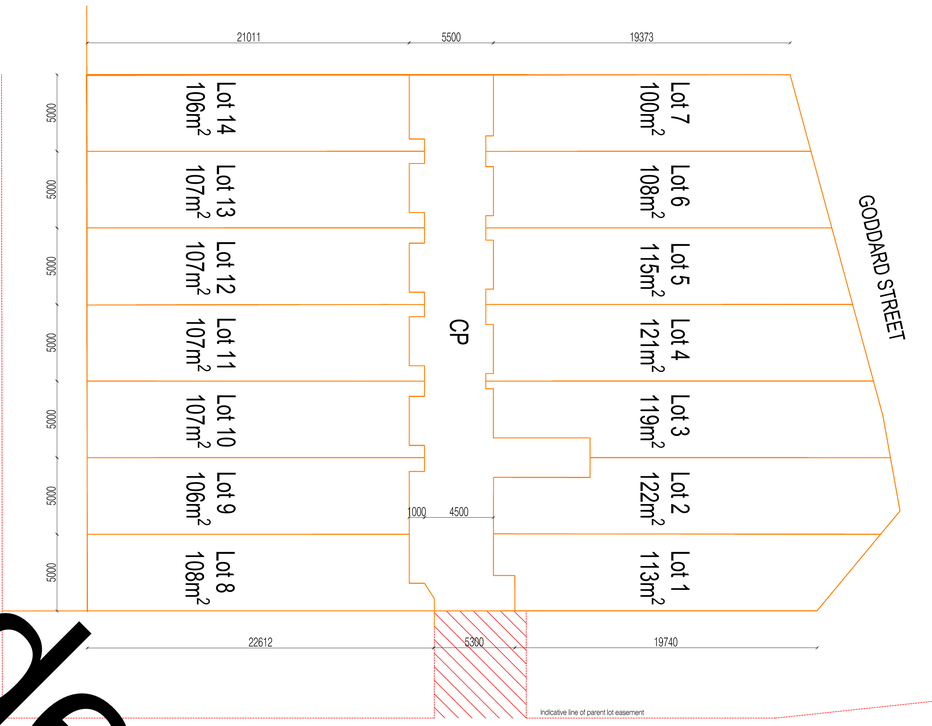
DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_100

REVISION: 3



Existing Feature Survey



Overall Lot Plan

Superseded

Revision	Issued	Date
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

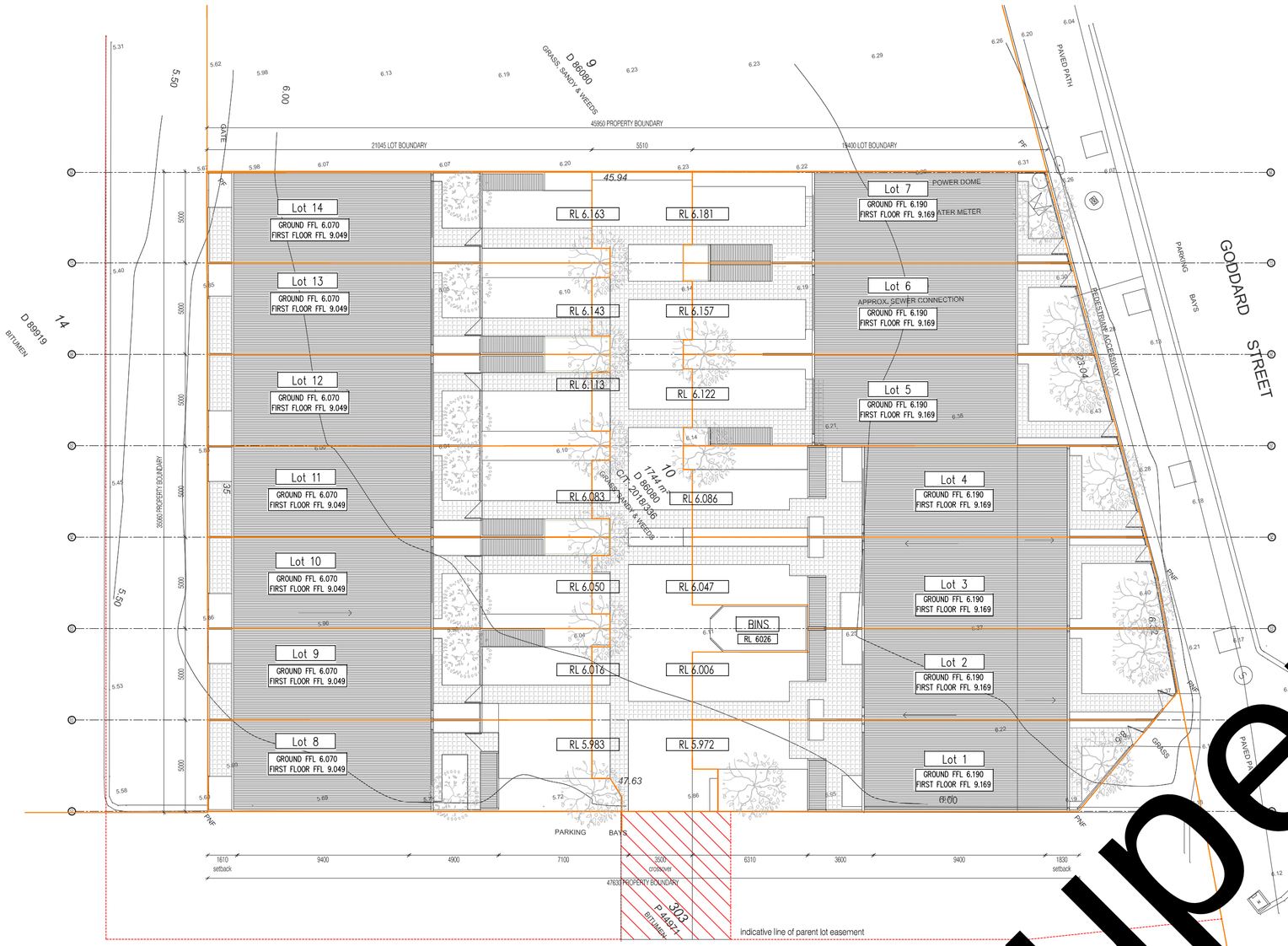
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT	Lot 10, Goddard St, Rockingham
DRAWING	EXISTING FEATURE SURVEY & LOT PLAN
CLIENT	Dale Alcock Projects
SCALE	1:200 AT A1
DATE	09.04.2024
DRAWING STATUS	ISSUE FOR PLANNING
DRAWING NUMBER	A_001
REVISION	2



Site Plan



Total Site Area: 1744m^2
Building Footprint: 713m^2 or 41%

Site Cover Plan

Supersede

Revision	Issued	Date
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

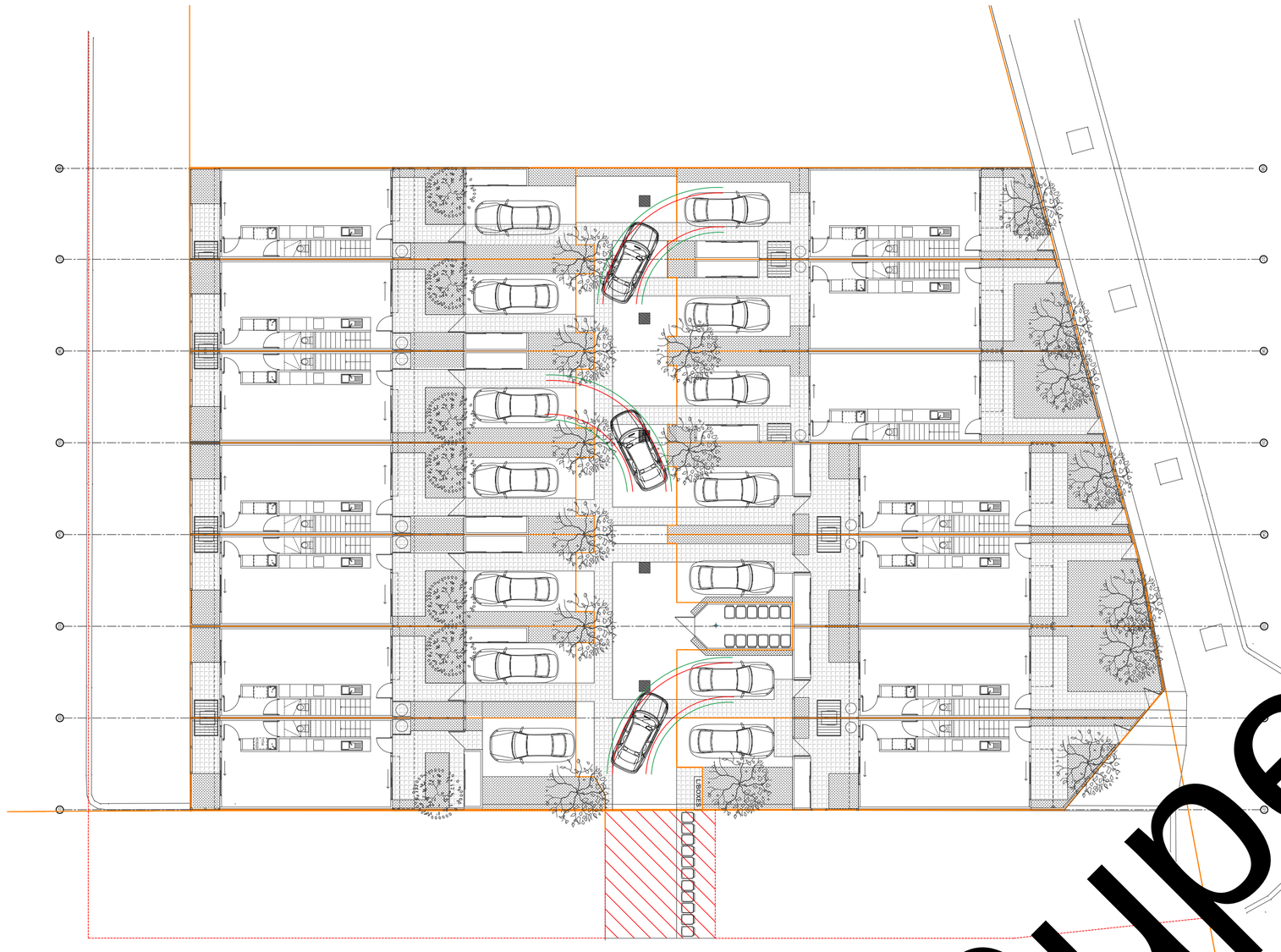
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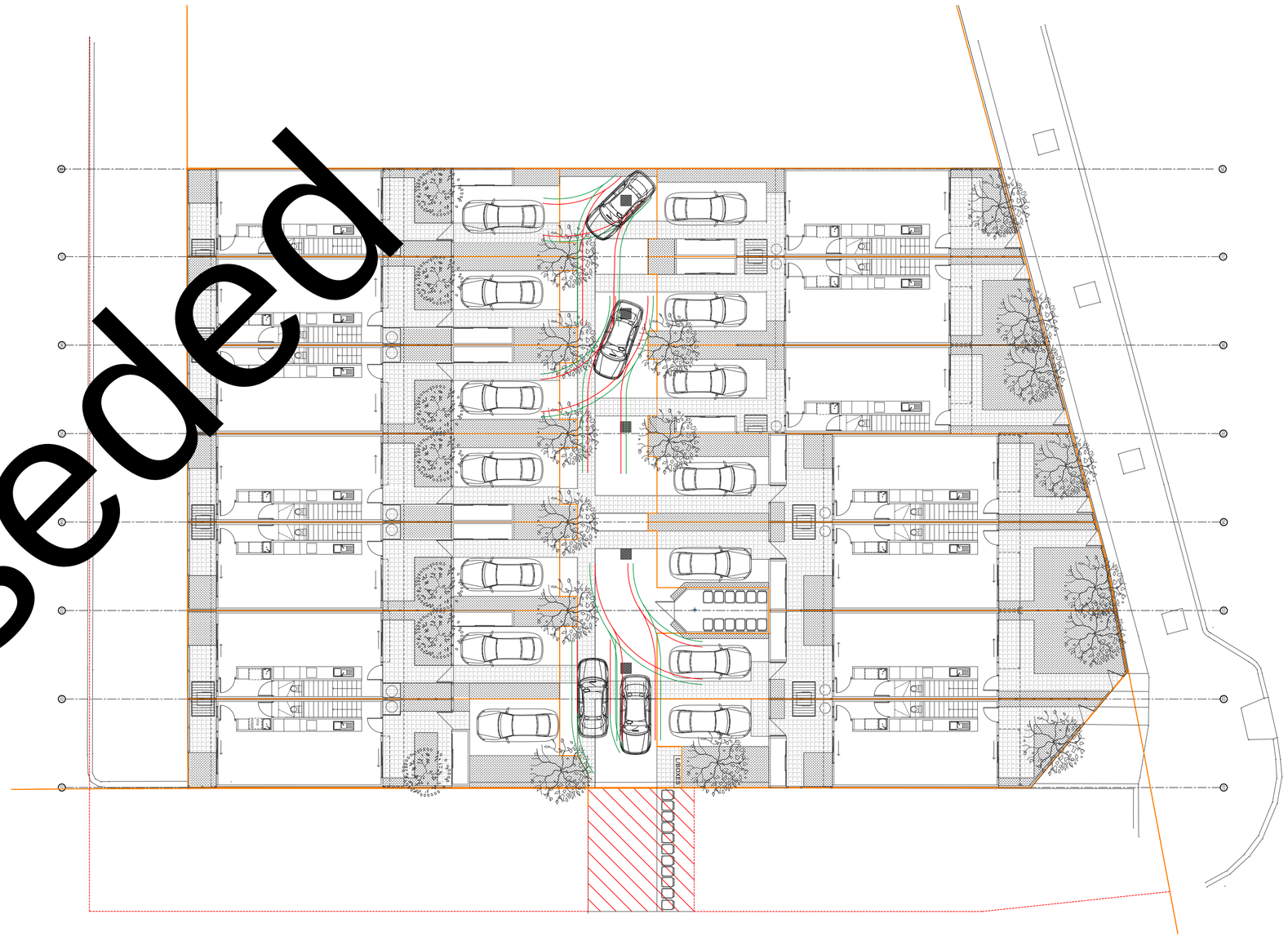
DALE ALCOCK PROJECTS

MDC ARCHITECTS
1 Silas Street, East Fremantle WA 6158
t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT	Lot 10, Goddard St, Rockingham		
DRAWING	SITE PLAN		
CLIENT: Dale Alcock Projects		SCALE: 1:200 AT A1	DATE: 09.04.2024
DRAWING STATUS: ISSUE FOR PLANNING		DRAWING NUMBER: A_002	REVISION: 2



Turning Circles (Inbound)



Turning Circles (Outbound)

Superseded

Revision	Issued	Date
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: TURNING CIRCLES

CLIENT: Dale Alcock Projects

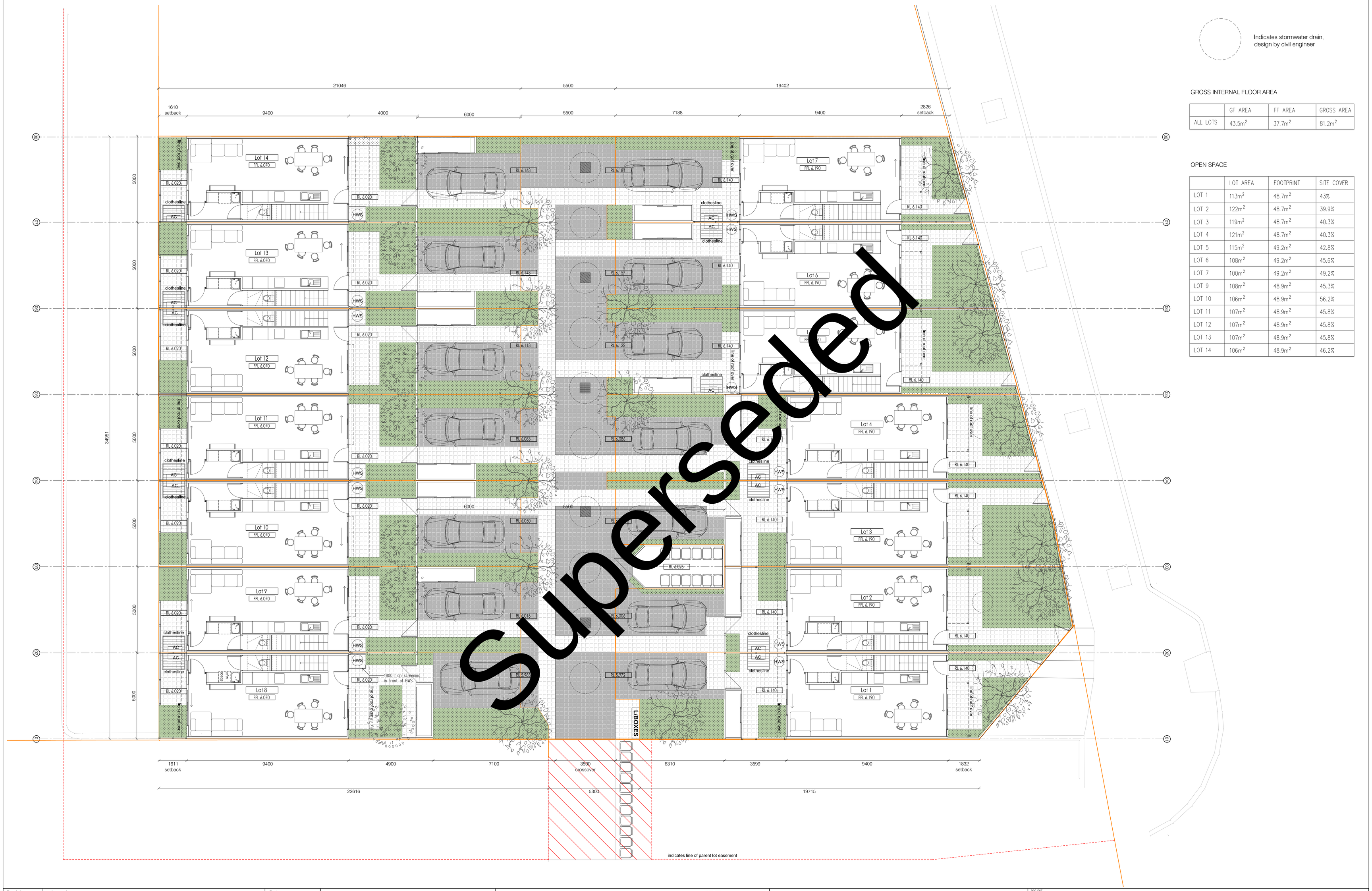
SCALE: 1:200 AT A1

DATE: 09.04.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_003

REVISION: 2



Supersede

Indicates stormwater drain, design by civil engineer

GROSS INTERNAL FLOOR AREA

	GF AREA	FF AREA	GROSS AREA
ALL LOTS	43.5m²	37.7m²	81.2m²

OPEN SPACE

	LOT AREA	FOOTPRINT	SITE COVER
LOT 1	113m²	48.7m²	43%
LOT 2	122m²	48.7m²	39.9%
LOT 3	119m²	48.7m²	40.3%
LOT 4	121m²	48.7m²	40.3%
LOT 5	115m²	49.2m²	42.8%
LOT 6	108m²	49.2m²	45.6%
LOT 7	100m²	49.2m²	49.2%
LOT 9	108m²	48.9m²	45.3%
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MDC ARCHITECTS
1 Silas Street, East Fremantle WA 6158
t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: PLAN - GROUND FLOOR

CLIENT: Dale Alcock Projects

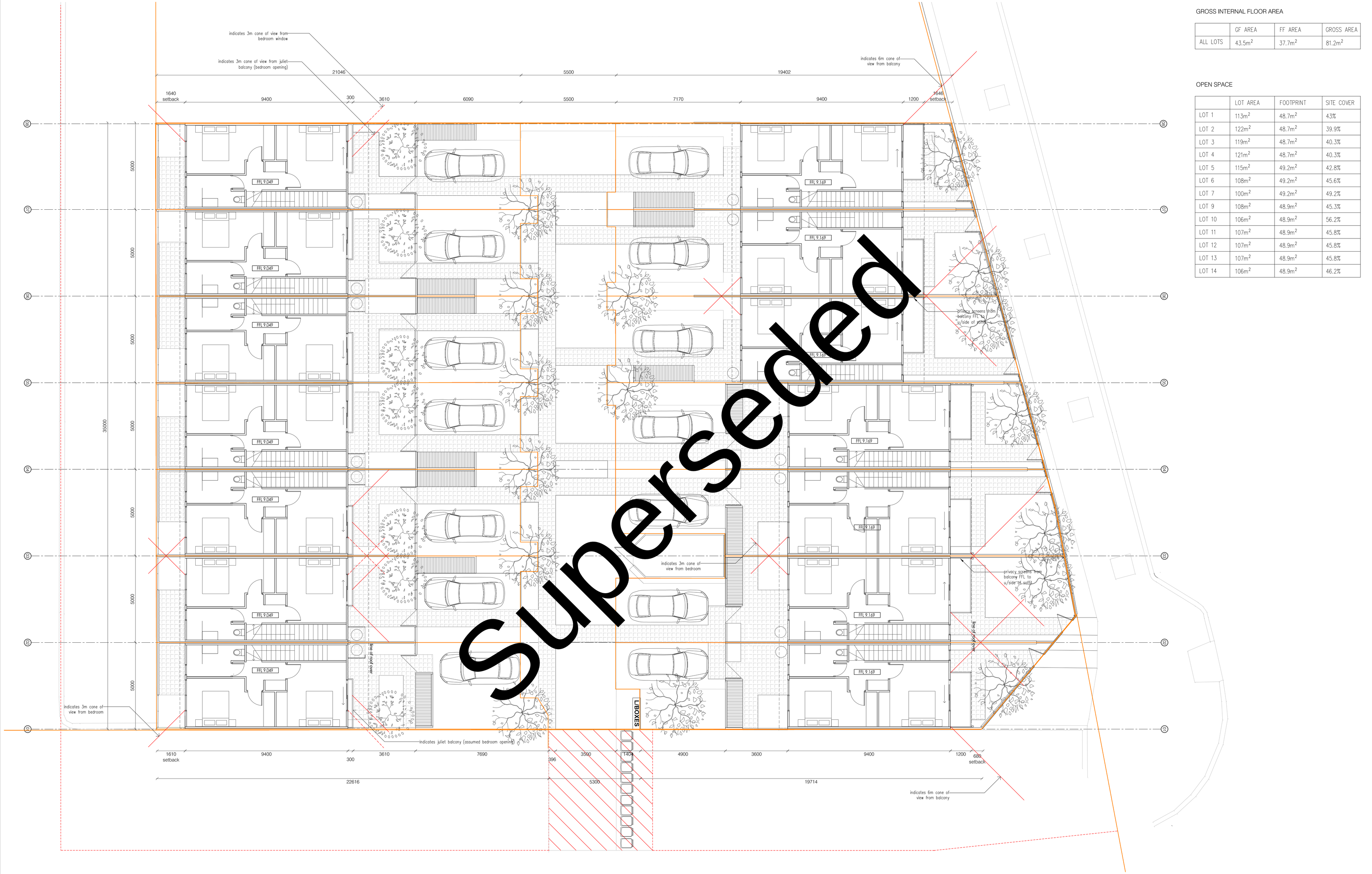
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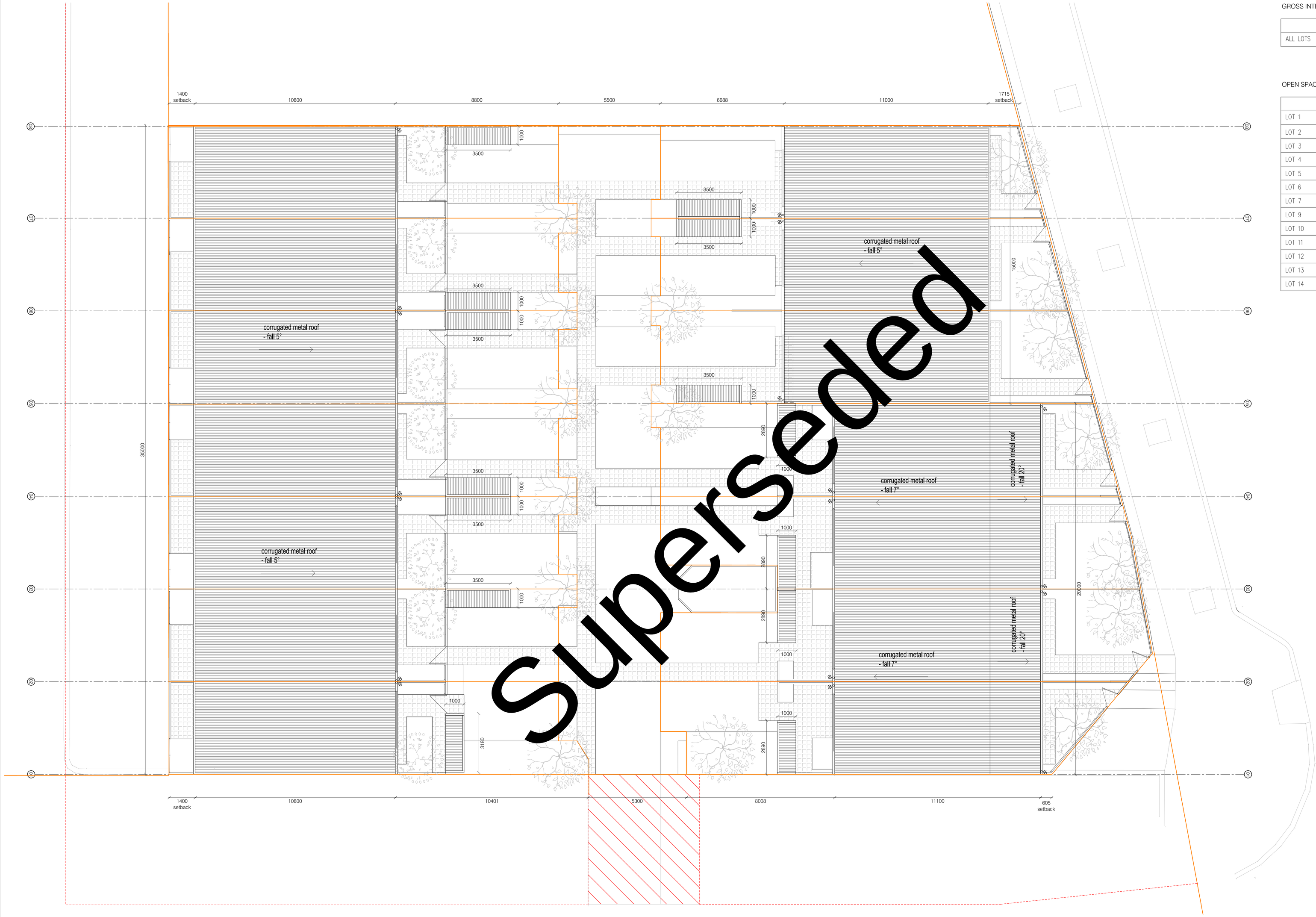
DATE: 09.04.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_010

REVISION: 2


indicates 3m cone of view from bedroom window
indicates 3m cone of view from juliet balcony (bedroom opening)
indicates 6m cone of view from balcony
21046
5500
19402
1640 setback
9400
300
3610
6090
5500
7170
9400
1200
1646 setback
35000
5000
5000
5000
5000
FFL 9.049
FFL 9.169
privacy screens from balcony FFL to u/side of soffit
indicates 3m cone of view from bedroom
line of roof over
LIFT
LIFT
LIFT



Superseded

GROSS INTERNAL FLOOR AREA

	GF AREA	FF AREA	GROSS AREA
ALL LOTS	43.5m²	37.7m²	81.2m²

OPEN SPACE

	LOT AREA	FOOTPRINT	SITE COVER
LOT 1	113m²	48.7m²	43%
LOT 2	122m²	48.7m²	39.9%
LOT 3	119m²	48.7m²	40.3%
LOT 4	121m²	48.7m²	40.3%
LOT 5	115m²	49.2m²	42.8%
LOT 6	108m²	49.2m²	45.6%
LOT 7	100m²	49.2m²	49.2%
LOT 9	108m²	48.9m²	45.3%
LOT 10	106m²	48.9m²	56.2%
LOT 11	107m²	48.9m²	45.8%
LOT 12	107m²	48.9m²	45.8%
LOT 13	107m²	48.9m²	45.8%
LOT 14	106m²	48.9m²	46.2%

Revision	Issued	Date
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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DALE ALCOCK PROJECTS

MDC
ARCHITECTS

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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: ROOF PLAN

CLIENT: Dale Alcock Projects

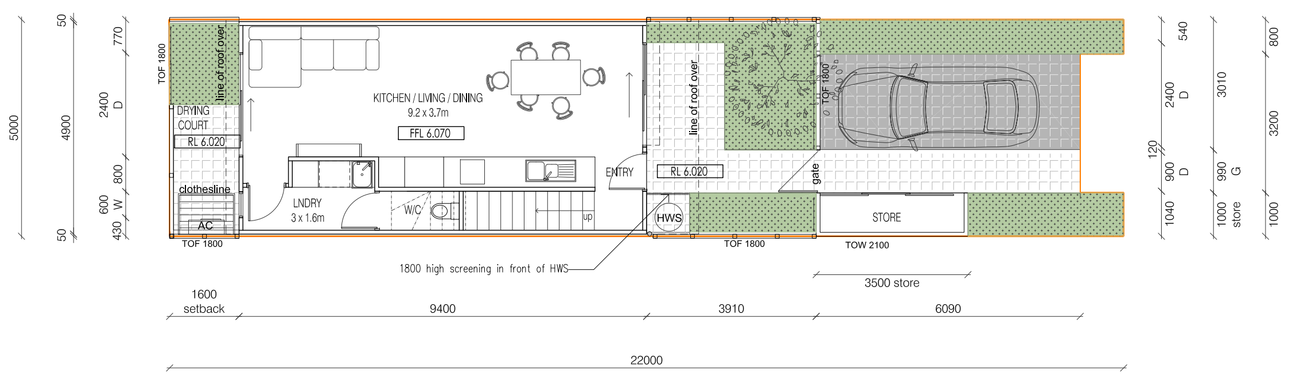
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DATE: 09.04.2024

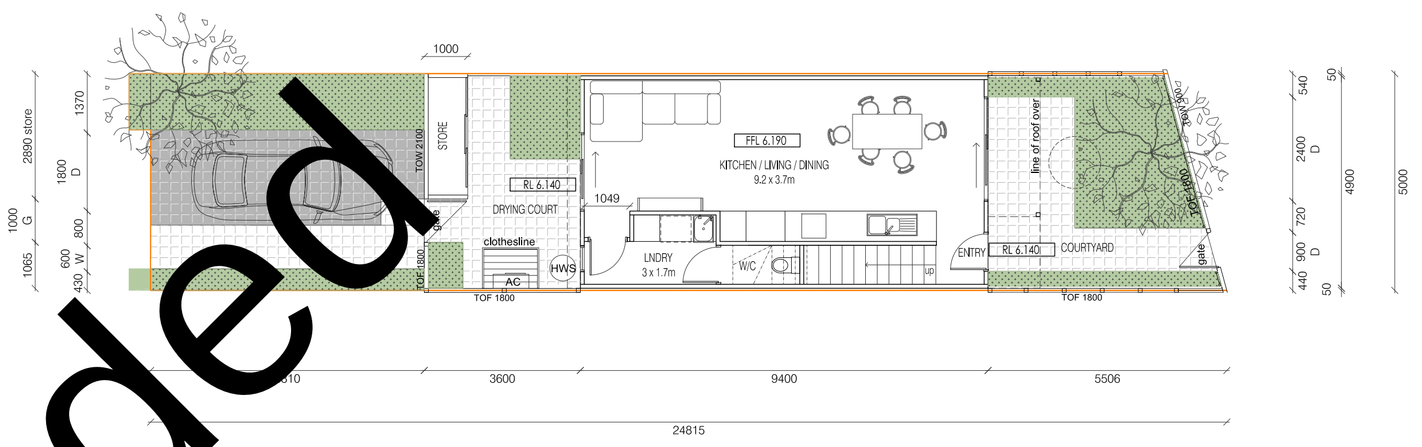
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DRAWING NUMBER: A_012

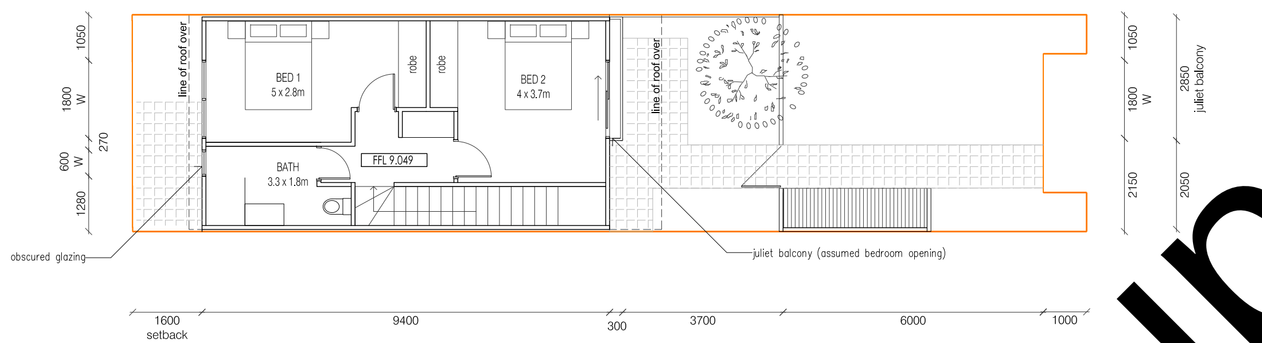
REVISION: 2



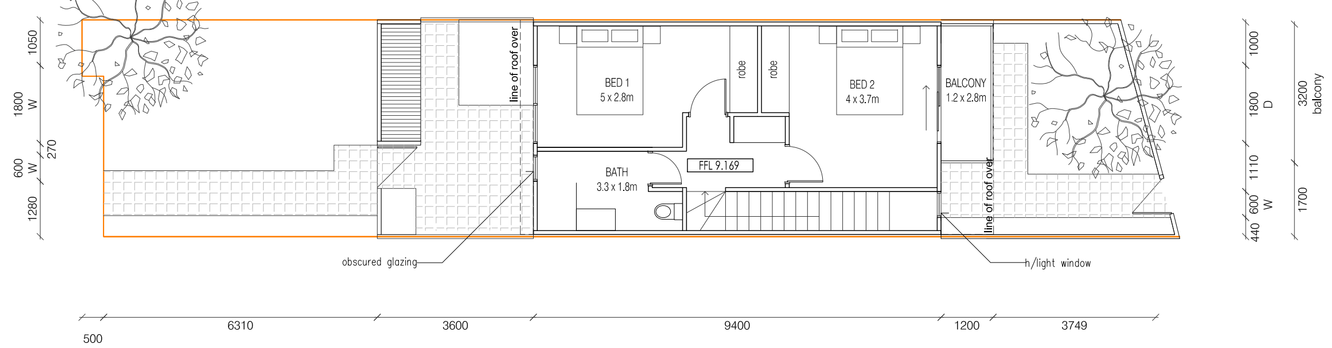
South Row- Ground Floor



North Row- Ground Floor



South Row- First Floor



North Row- First Floor

Superseded

Revision	Issued	Date
2	Issue for Approval – Planning	09.04.2024
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: DWELLING FLOOR PLANS

CLIENT: Dale Alcock Projects

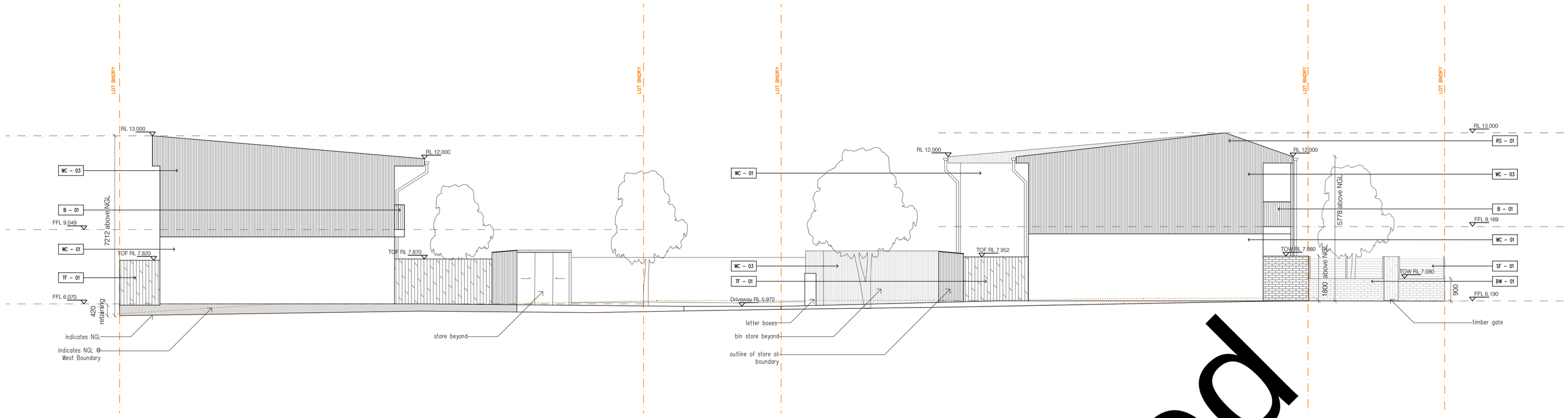
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DATE: 09.04.2024

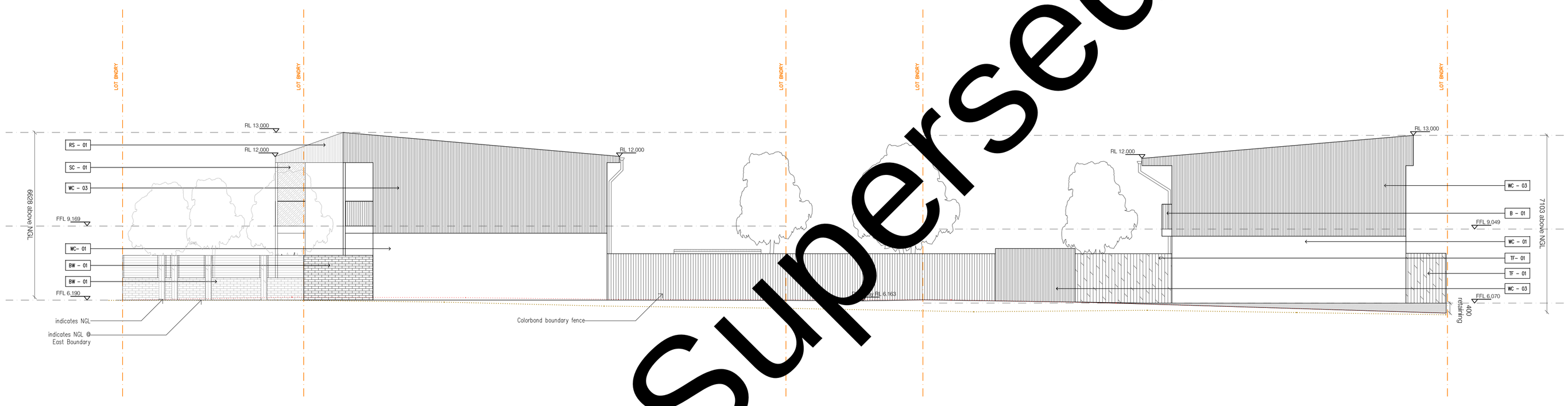
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DRAWING NUMBER: A_100

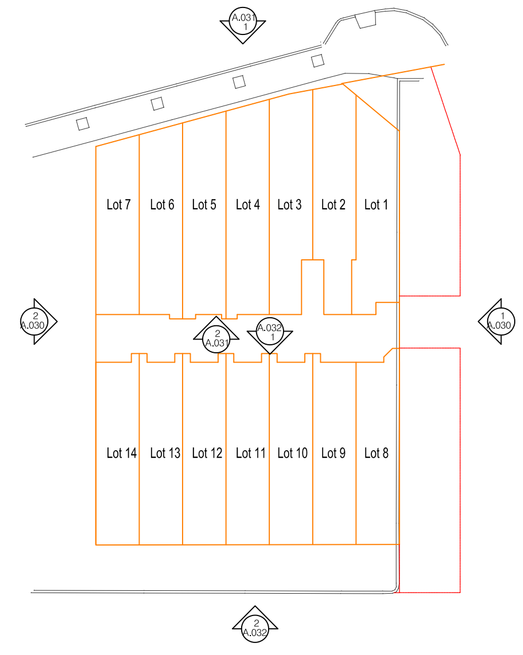
REVISION: 2



East Elevation



West Elevation



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
SF – 01	Steel post and wire fencing
TF – 01	Timber pinelap fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Superseded

Revision	Issued	Date
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 09.04.2024

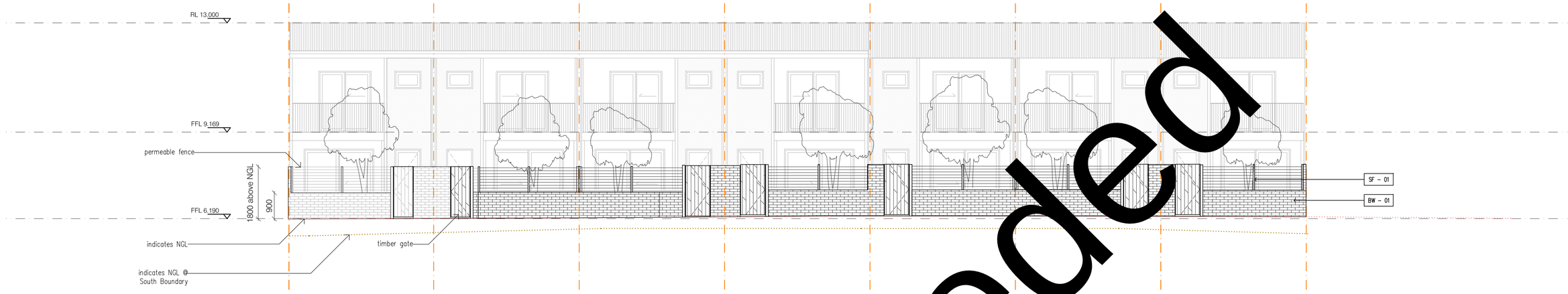
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DRAWING NUMBER: A_300

REVISION: 2



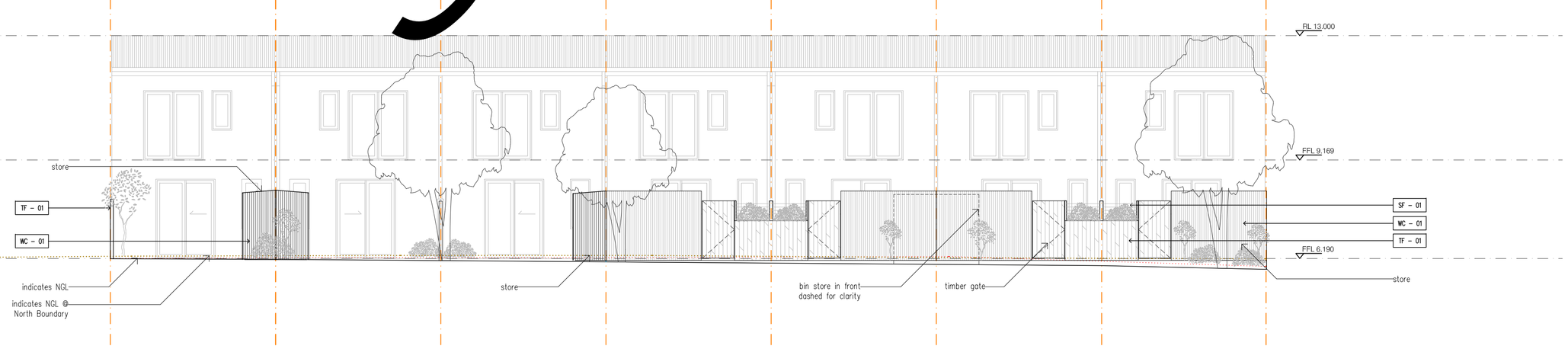
North Elevation (From Goddard Street)



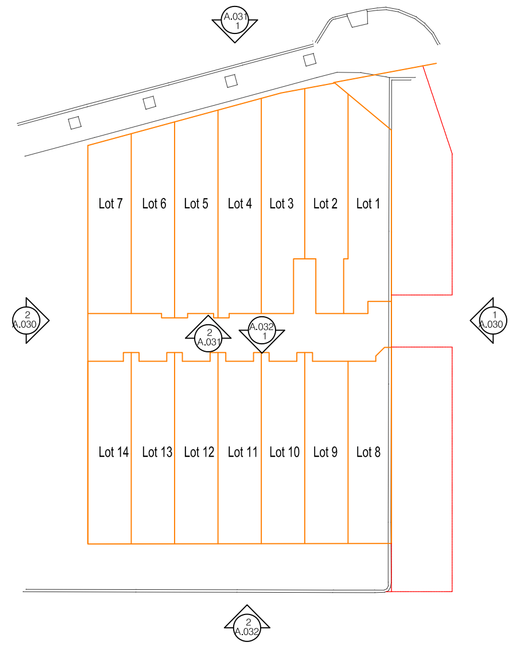
North Elevation (From Goddard Street) - Fencing



South Elevation (From driveway)



South Elevation (From driveway) - Fencing



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
SF – 01	Steel post and wire fencing
TF – 01	Timber pinelap fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Superseded

Revision	Issued	Date
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1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 09.04.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_310

REVISION: 2



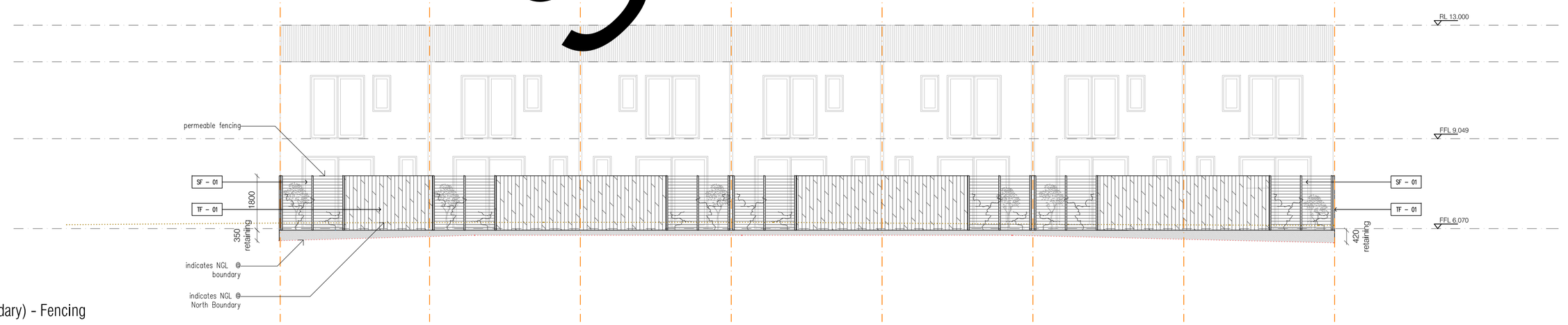
North Elevation (From Driveway)



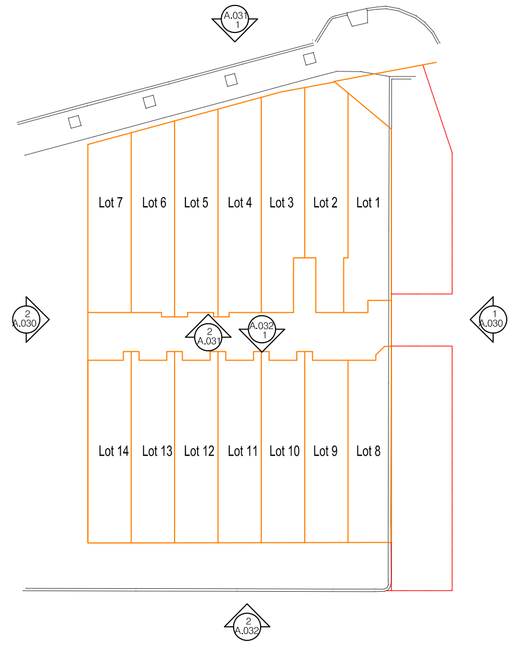
North Elevation (From Driveway) - Fencing



South Elevation (From boundary)



South Elevation (From boundary) - Fencing



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
SF – 01	Steel post and wire fencing
TF – 01	Timber pinelap fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Superseded

Revision	Issued	Date
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 09.04.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_320

REVISION: 2

Rise Urban

Lot 10 Goddard Street, Rockingham

14 Grouped Dwellings

Stellar Living Ltd



RISEURBAN.COM.AU

Lot 10 Goddard Street, Rockingham

Stellar Living Ltd

Community Housing – 14 Grouped Dwellings

Application for Development Approval – Planning Report

Prepared for:	Stellar Living Ltd
Prepared by:	Rise Urban Pty Ltd 3/448 Roberts Road Subiaco WA 6008 hello@riseurban.com.au
Project Planner	Nick Grindrod – Senior Planner
Job Code:	0992022
Doc Reference:	Rep08-0992022
Issue No:	1 – Lodgement
Date:	30 April 2024

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Appendices

1. **Completed City of Rockingham application form, DAP Form 1 and MRS Form 1;**
2. **Completed City of Rockingham DAP Application Checklist;**
3. **Current Certificate of Title and Deposited Plan – Lot 10 Goddard Street, Rockingham;**
4. **Plan set (MDC Architects, April 2024);**
5. **3D Perspectives (MDC Architects, April 2024);**
6. **R-Codes Volume 1 – Part C Assessment (Rise Urban, April 2024);**
7. **Response to Design Review Panel Advice (Rise Urban, April 2024);**
8. **Design Report (MDC Architects, April 2024);**
9. **BAL Assessment Report (Building Certification Services WA, February 2024);**
10. **Transport Impact Statement (Urbii, April 2024); and**
11. **Waste Management Plan (Urbii, April 2024).**

1.0 Introduction

Rise Urban is assisting Stellar Living Ltd to seek development approval from the Metro Outer Development Assessment Panel (DAP) for 14 'grouped dwellings' (townhouses) at Lot 10 Goddard Street, Rockingham ('the site').

Stellar Living is a Registered Community Housing Provider under the WA Community Housing Regulatory Framework. Stellar Living intends to retain ownership of the entire site and lease the townhouses over the long term, meaning that this is a build-to-rent development.

A key benefit of build-to-rent developments is that they provide stable, long-term rental accommodation for people who cannot afford to purchase a home. This development will form a key component of Stellar Living's portfolio and will primarily be targeted at pensioners in need of affordable, secure and homely accommodation. This proposed build-to-rent community housing will be a critical and undersupplied part of the solution to the well-publicised housing shortage.

This proposal has been conceptualised as an outwards-focused development that addresses the public realm and adjacent public access easement to the south, while also maintaining sufficient privacy and internal private and communal amenity for the future residents.

The overarching intent of this development is to provide high-amenity affordable housing on underutilised and vacant land within the Rockingham Strategic Regional Centre. The proposal achieves a distinct and well-considered aesthetic response to the site and surrounding context, while also ensuring affordability for Stellar Living as a not-for-profit entity.

The townhouses are intended to be constructed using an innovative modular technique, with most of the construction of the structures themselves to occur off site. This method of construction is much more affordable than typical on-site construction methodologies, whilst still responding to the site constraints and will not compromise the final design outcome.

This report sets out detailed justification for this proposal and is supported by the following documentation and technical reporting:

- Appendix 1 – Completed City of Rockingham application form, DAP Form 1 and MRS Form 1;
- Appendix 2 – Completed City of Rockingham DAP Application Checklist;
- Appendix 3 – Current certificate of title and deposited plan – Lot 10 Goddard Street, Rockingham;
- Appendix 4 – Plan set (MDC Architects, April 2024);
- Appendix 5 – 3D Perspectives (MDC Architects, April 2024);
- Appendix 6 – R-Codes Volume 1 – Part C Assessment (Rise Urban, April 2024);
- Appendix 7 – Response to Design Review Panel Advice (Rise Urban, April 2024);
- Appendix 8 – Design Report (MDC Architects, April 2024);
- Appendix 9 – BAL Assessment Report (Building Certification Services WA, February 2024);
- Appendix 10 – Transport Impact Statement (Urbii, April 2024); and
- Appendix 11 – Waste Management Plan (Urbii, April 2024).

This report, the plans and supporting appendices demonstrate that this proposal meets the requirements of the applicable planning framework. In particular, the proposal meets the relevant deemed-to-comply and/or design principle requirements of the City of

Rockingham Local Planning Scheme No. 2, R-Codes Volume 1, the draft Rockingham Strategic Centre Precinct Structure Plan and the applicable State and Local Planning Policies. Discretion is sought in some isolated instances, however in each case this report and the appendices provide strong planning justification that demonstrates how the exercise of discretion will result in good planning (and amenity and streetscape) outcomes.

This development application seeks for the City to treat draft Amendment 191 of the City of Rockingham Local Planning Scheme No. 2 and the draft Rockingham Strategic Centre Precinct Structure Plan as 'seriously entertained', and give the incoming draft planning framework greater weight than the current planning framework (being the current Scheme and Local Planning Policies). The R-Codes Volume 1 also apply on this basis. This is as the draft planning framework is highly likely to commence operation prior to completion of construction of the development, and it is logical to apply the planning framework that will be in effect when the development has been completed and is operational instead of the current soon to be superseded planning framework.

This proposal has been through a pre-lodgement design review process with the City of Rockingham Design Review Panel (DRP), with a meeting held on Wednesday 30 August 2023. Since the meeting minutes were issued, the project team has worked to address the advice provided by the DRP where practical to do so. This report and the appendices detail how the submitted development design responds to the DRP advice.

2.0 Site Context

2.1 Site Location and Description

Lot 10 Goddard Street is located within the Rockingham Strategic Regional Centre, directly across the road from the Dowling Street reserve playing fields and approximately 700m west of Rockingham Shopping Centre, 1.6km north west of Rockingham Station and 1.6km south east of Rockingham foreshore.

The site is also located in close proximity to the Rockingham Autumn Centre for senior citizens, HMAS Warramunga Park, and within 700m walking distance of Rockingham shopping centre. The site is located within 150m walking distance of bus stops, and 300m of a planned stop for the future Rockingham City Centre Transit System (RCCTS). This site is in an ideal location given the intended residents will be senior citizens in need of affordable accommodation.

The site forms part of a 7-lot street block that was subdivided in the 1990's and comprises the land bounded by Goddard Street, Market Street, McNicholl Street and Chalgrove Avenue. The two lots to the east and south-east of the site have been developed with apartments and commercial tenancies respectively. The remaining four lots to the south and west have remained vacant since subdivision.

The site is generally rectangular and 1,744m^2 in size, and is vacant and cleared. The site is flat at a level of 6m AHD.

Public access easements divide the street block into four quadrants, and these easements are located on the lots adjacent to the eastern and southern boundaries of the site. The easements benefit the site and are set back 5.4-7m from the lot boundaries, except for two extensions to the east and south site boundaries that provide access to the site. The easement network is shown on the site plan (Figure 2) after section 2.4.

2.2 Legal Description

Table 1 below lists the address, legal description and area of the site.

Lot No / Address	Landowner	Diagram	Volume	Folio	Area
Lot 10 Goddard Street, Rockingham	Stellar Living Ltd	86080	2018	336	1,744m^2

2.3 Site Surrounds

The site is bounded by Goddard Street to the north. Goddard Street is constructed as a dual carriageway with two lanes in each direction, separated by a median. Two pedestrian crossings are located near Market Street and the public access easement in close proximity to the site. Nine parallel public car bays are located on the south side of Goddard Street between Market Street and the public access easement, four of which are located in front of the site. A 4.4m verge is located between the car bays and the northern site boundary comprising a footpath and four plane trees.

A very thin (approximately 0.1m) lot owned by the State of Western Australia is located between the site and Goddard Street, presumably to prevent vehicular access being obtained from Goddard Street.

Lot 303 (No. 37) McNicholl Street is located to the east of the site and comprises a car park, laid out as a single circulation aisle with a row of perpendicular car bays on either side. The circulation aisle is protected as a public access easement, but the car bays are not. A row of car bays runs along the entirety of the boundary between lot 303 and the site. The public access easement extends across approximately 2.5 car bays (6m width)

to meet the lot boundary and provide access to the site. Other than this protrusion, the public access easement is set back 7m from the east site boundary to accommodate the abovementioned row of car bays.

Further to the east of lot 303 is lot 304 (No. 95) Chalgrove Avenue, a four-storey mixed-use development with commercial uses on the ground floor, apartments above and a two-level above ground basement. A nil boundary wall with a 4-storey height is located on the west boundary of the lot, directly adjacent to the lot 303 car park and facing the east boundary of the site.

Lot 14 (No. 3) Market Street is located to the south of the site and is currently vacant. The rear half of the 3 Market Street north side boundary is shared with the site. An unmarked asphalt circulation aisle corresponding with a public access easement is located at a 5.5m setback from the site within 3 Market Street. The public access easement extends across approximately one third of the 5.5m setback adjacent to the site to connect to the south lot boundary. The 5.5m setback is undeveloped, and it is presumed that this setback will be developed with car parking in the future when the rest of the site is developed, similar to lot 303 McNicholl Street.

Lot 9 (No. 5) Market Street is located to the west of the site, on the corner of Goddard Street and Market Street. The site is currently vacant, however it is understood that a development application was lodged with the City of Rockingham for this site a few weeks prior to lodgement of this development application. This development proposal has been prepared independently of the proposal on lot 9 as the plans were not made available prior to lodgement of this development application.

The lots and public access easements described in this section are shown on the site plan (Figure 2) at the end of section 2.4.

Power, water and sewer infrastructure are located in the north-western corner of the site and connect to infrastructure under Goddard Street.

2.4 Mapped Site Features and Classifications

The site is mapped as being located within a Bushfire Prone Area. This will be discussed further in section 4.5 of this report.

Contaminated fill exists underneath the site, and as it is classified as ‘remediated for restricted use’, it is suitable for residential development. This will be discussed further in section 5.4 of this report.

A context plan depicting the site and its immediate surrounds is shown at Figure 1 overleaf, and an aerial photo depicting the site is shown at Figure 2 on the following page.

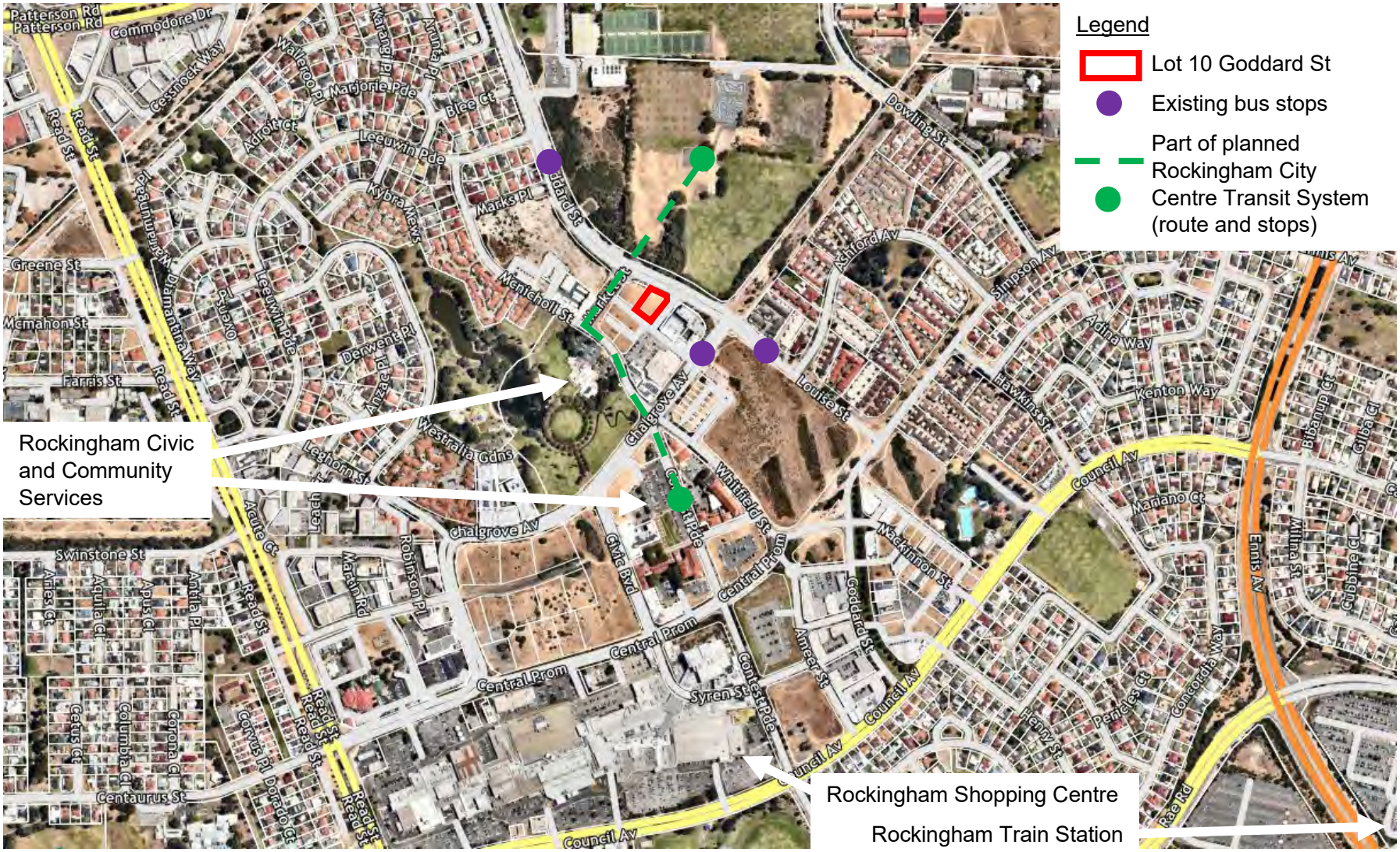


Figure 1 – Context Plan – Lot 10 Goddard Street, Rockingham (source: Nearmap, 2024)



Figure 2 - Site Plan – Lot 10 Goddard Street, Rockingham (source: Nearmap, 2024)

3.0 Description of Proposed Development

This proposal comprises 14 two-storey two-bedroom townhouses aligned in two rows of 7 (each facing the northern and southern site boundaries), with a driveway running east-west through the centre of the site between the townhouse rows including car parking, landscaping, a communal bin store and letterboxes.

3.1 Townhouse Internal Specifications

As the townhouses are modular, they are all identical (except for a traditional balcony for the north row of townhouses and juliet balconies for the south-facing row).

Each townhouse is 9.4m x 5.0m and includes the following:

- One 9.2m x 3.0-3.7m primary living space on the ground floor including living, kitchen and dining areas;
- A laundry and under-stair toilet on the ground floor;
- A 3.7m x 3.4m (12.6m^2) master bedroom with built in robe on the north side of the upper floor;
- For the north row of townhouses, a 3.2m x 1.2m (3.8m^2) balcony facing Goddard Street can be accessed from the master bedroom;
- For the south row of townhouses, a 2.8m x 0.4m (1.1m^2) juliet balcony facing the internal driveway can be accessed from the master bedroom;
- A 4.45m x 2.8m (11.6m^2) second bedroom with built in robe on the south side of the upper floor;
- A 5.4m^2 bathroom also on the south side of the upper floor; and
- A 1.2m deep eave projecting to the north above the upper floor.

Units 2 and 4-14 are capable of meeting the silver level universal design standard.

3.2 Townhouse External Specifications

The external areas for exclusive use of each townhouse are as follows:

- For units 1-7, primary garden areas between the north wall of the townhouse and the Goddard Street boundary, ranging in size from 17.3m^2 (unit 7) to 34.2m^2 (unit 2), with most of each area landscaped and including a small tree;
- For units 1-4, a fenced service courtyard on the south side of the townhouse with utilities, a store and landscaping;
- For units 1-4, an uncovered car bay, footpath and more landscaping and trees between the driveway and service courtyard;
- For units 5-7, a multi-purpose space on the south side of the townhouse including an uncovered car bay, footpath, landscaping, trees, utilities and store;
- For units 8-14, a 1.61m fenced setback area between the south wall of the townhouse and the south lot boundary facing towards the lot 14 Market Street public access easement, comprising a clothes line and landscaping area;
- For units 8-14, a 20m^2 fenced primary garden area on the north side of the townhouse with half of each area landscaped and including a small tree;
- For units 8-14, an uncovered car bay, footpath, more landscaping and trees and a store between the driveway and primary garden area.

The external materials are as follows:

- The north-facing external walls comprise painted fibre cement wall cladding, with some areas painted in various colours to provide individuality to each dwelling;
- The south-facing external walls comprise painted fibre cement wall cladding;
- The side boundary walls of units 1, 7, 8 and 14 will comprise painted fibre cement wall cladding for the ground floor and steel cladding for the upper floor;

- The skillion roofs will be steel; and
- The balcony balustrading will comprise metal bars.

The site boundary setbacks are as follows:

- For units 1-4, due to the angled street boundary the setbacks range from 1.832m to 7.2m, with an approximate average setback of 6m for these units.
- Units 5-8 are aligned further back than units 1-4 due to the angled street boundary, with setbacks ranging from 2.8m to 6.9m and an approximate average setback of 5m for these units.
- For units 1-7, the balcony and skillion roof eave projects 1.2m into the setback, providing an improved visual connection and sense of bulk to the street.
- Units 8-14 are set back 1.61m from the south lot boundary, 7.11m from the public access easement in lot 14 and 13.11m from the far side of the same easement.
- Units 1, 7, 8 and 14 have nil setbacks to the side boundaries of the site.

Different fencing treatments are proposed on each side of each row of the townhouses to respond to the context of the threshold or boundary being fenced and also provide visual interest around the development. The fencing is as follows in each location:

- On the Goddard Street boundary, a 0.9m brick wall with a 0.9m visually permeable steel fence above and a timber access gate for each townhouse;
- On the south side of the unit 1-4 service courtyards, a 2.1m painted fibre cement cladded fence and a timber access gate and infill panel to the side of each gate for each townhouse;
- No fencing on the south side of units 5-7;
- On the south site boundary, a 1.8m timber fence to screen each clothes line and otherwise a 1.8m visually permeable steel fence; and
- On the north side of the unit 8-14 primary garden areas, a 1.2m timber fence with a 0.6m visually permeable steel fence above and a timber access gate for each townhouse, except where stores are located where the fence would be, which will be treated with painted fibre cement cladding.

The dimensions of the paved areas accommodating the car bay and footpath for each townhouse are 6-6.3m x 2.9-3m. No visitor parking is proposed in recognition of the location of the site in an area with excellent current and future transport connections, and within walking distance of amenities that are likely to be of interest to the occupants. In addition, there are significant public parking options within a very short walk of the site should a visitor wish to drive.

Nine trees are proposed within landscaped areas along the driveway. Further landscaping details will be provided post-approval.

As the development is build-to-rent there is no intention to subdivide the site into strata lots, however a plan has been provided showing the site area associated with each dwelling. The areas for exclusive use by each dwelling range in size from 100m^2 to 121m^2.

3.3 Common Site Features

The following common site features are proposed:

- A driveway ranging in width from 3m to 5.5m due to landscaping protrusions and the alignment of the footpath through the site;
- The driveway, car bays and footpaths in the central part of the site will be delineated through differently coloured materials to confirm their multiple uses, but are intended to function as shared spaces in practice;

- A communal bin store located between the driveway and units 2 and 3 with sufficient space for 12 bins and screened with 2.1m steel cladding; and
- A communal letterbox adjacent to the vehicular entrance to the site.

Further details regarding transport and waste management are provided in Appendices 10 and 11 respectively.

3.4 Sustainability Initiatives

Due to the limited financial means of this project, the project sustainability initiatives focus on passive design and materiality as opposed to use of expensive equipmentapartments. The key sustainability achievements and targets are detailed below:

- The project is targeting a 7 star NatHERS rating;
- Provision of a comprehensive all-electric network, with provisioning for roof-mounted solar panels on all buildings if possible;
- Siting and orientation of buildings and openings as per passive solar design principles and to optimise natural ventilation;
- Framed wall construction and use of an eco concrete mix will reduce the embodied energy in the construction materials;
- The efficiency associated with modular construction will significantly decrease the scope three emissions of the project;
- Wall and ceiling insulation will be provided to a standard that ensures thermal efficiency for the townhouses;
- Waterwise and power efficient fittings and fixtures will be standard;
- Stormwater will initially be directed to the deep soil area across the site; and
- Five more trees than required are provided across the site, and nearly double the site area percentage required by the draft Rockingham Strategic Centre Precinct Structure Plan is provided as deep soil area.

4.0 Planning Context and Assessment

The key planning instruments relevant to the site and to this proposal are:

1. The *City of Rockingham Local Planning Scheme No. 2* (LPS 2), which provides a land use permissibility framework, establishes the objectives for activity centres and acts as a head of power for Structure Plans. The current Scheme also includes development controls for residential development in the Rockingham Strategic Centre;
2. The draft *Rockingham Strategic Centre Precinct Structure Plan* (RSCPSP), which establishes a detailed urban structure and establishes R-Codes and development and requirements for development sites in the Rockingham Strategic Centre;
3. *Residential Design Codes Volume 1*, Part C of which sets out the key residential development standards for grouped dwellings;
4. *State Planning Policy 7.0 – Design of the Built Environment*, which sets out ten design principles to guide the design and review of built form development;
5. *State Planning Policy 3.7 – Planning in Bushfire Prone Areas*, which aims to reduce the risk and impacts of bushfire on development;
6. *City of Rockingham Strategic Regional Centre Plan*, which will be rescinded once the RSCPSP takes effect and details the vision and development principles for the Rockingham Strategic Regional Centre; and
7. *City of Rockingham Local Planning Policy 3.2.1: Development Policy Plan – City Centre Sector*, which will also be rescinded once the RSCPSP takes effect and establishes the development standards for the City Centre Sector of the Rockingham Strategic Centre.

<u>Application of Scheme Amendment No. 191 and draft Precinct Structure Plan</u>
This application seeks for the City to assess the design against draft amendment 191 of LPS 2, the draft RSCPSP and R-Codes. This is on the basis that amendment 191 and the draft RSCPSP are substantially progressed in the approval process to the extent that they are 'seriously entertained', and are likely to take effect prior to completion of construction of the development. Therefore, the draft planning framework (and therefore the R-Codes, which are given effect by the RSCPSP) should be given more weight in the decision-making process than the current planning framework.

In determining how much weight to give a seriously entertained proposal, it is appropriate to refer to *Nicholls and Western Australian Planning Commission* [2005] WASAT 40 (Nicholls) which establishes the following criteria in considering seriously entertained planning proposals:

i. The degree to which the draft addresses the specific application.
ii. The degree to which the draft is based on sound town planning principles.
iii. The degree to which its ultimate approval could be regarded as certain.
iv. The degree to which its ultimate approval could be regarded as imminent.

In assessing this proposal against these four criteria, the draft planning framework should be given considerable weight in the decision making process as:

i. The draft planning framework was prepared specifically to reform the planning requirements that apply to the Rockingham Strategic Centre, in which this site is located. The provisions of the draft planning framework that are relevant to this site are vastly different to the current development controls – for example they include a change in the site yield from a minimum of 14 dwellings to a maximum of 14 dwellings, and apply the R-Codes when the current planning framework does not apply them. The draft planning framework therefore directly addresses this development application.

ii. The draft planning framework is based on sound town planning principles given it comprises comprehensive strategic and statutory planning for the future of the Rockingham Strategic Centre, and has undergone an extended preparation and consultation process since 2020. The format of the draft planning framework, the principles on which it is based and the new requirements themselves appear to have strong planning merits and are the most contemporary and fit-for-purpose planning instruments available to plan for a strategic activity centre such as this.

iii. The ultimate approval of the draft planning framework can be regarded as *certain* as it is approaching the end of the second-last stage in the process, being approval by the WAPC. The final stage will be approval from the Minister for Planning, which is typically a formality and is likely to occur in Q3 or Q4 of 2024 (as advised by the City). This provides further certainty. It is also worth noting that typically draft planning framework documents are considered as sufficiently 'certain' to be seriously entertained after advertising, and that occurred approximately 9-12 months prior to lodgement of this development application.

iv. As detailed above, the City of Rockingham has advised that as of the date of lodgement of this development application WAPC approval is anticipated to occur in 1-2 months, and Ministerial approval is likely to occur within a short period of time afterwards. The new planning framework is therefore likely to take effect shortly after determination of this development application. In any case, it is highly likely that the new planning framework will apply prior to completion of construction of the development. In the context of the 4-year preparation and approval process for the new planning framework, approval can be regarded as *imminent*.

The new planning framework is therefore 'seriously entertained'. This application seeks for the City to give the new 'seriously entertained' planning framework greater weight than the current planning framework on the grounds that by the time construction of the development has been completed (if not earlier), the new planning framework will apply and from that point in time, the built form outcome will respond to the applicable planning framework. We believe this is good planning practice.

The following sections demonstrate that this proposal responds to the requirements of the abovementioned planning instruments. As the incoming planning framework is 'seriously entertained', it is addressed first in subsections 4.1 to 4.3. As the current framework still has effect but should be given less weight than the incoming planning framework, it is addressed later in sections 4.6 to 4.8 of this report.

4.1 City of Rockingham Local Planning Scheme No. 2 (draft Amendment 191)

The site is located within the 'Residential' sub-zone of the 'Strategic Centre' zone in draft Amendment 191 of Local Planning Scheme No. 2 (Amd 191).

Pursuant to Table 1(a) of Amd 191, 'Grouped Dwelling' land uses are classified as 'D' uses and are therefore capable of approval in the 'Residential' sub-zone.

Clause 4.3.3 of Amd 191 lists matters that the City will consider when assessing development applications in the Strategic Centre zone, which are as follows:

"*a) the objectives of the Strategic Centre Zone;*
b) the provisions of the Rockingham Strategic Centre Precinct (Structure) Plan;
c) the objectives of the Zone set out in Table 1 (a) in which the development is proposed;
d) any additional development requirements set out in Table 4 (1); and
e) any other relevant planning document."

Clauses 4.3.3 (a) and (c) are addressed below, while clause 4.3.3 (b) is addressed in section 4.2 of this report. This development complies with clause 4.3.3 (d) as it meets the minimum building height of 2 storeys and is generally in accordance with the RSCPSP as per clause 4.3.3 (b). Clause 4.3.3 (e) is addressed throughout this report.

Strategic Centre Zone Objectives

The objectives of the Strategic Centre zone are to designate land within the Rockingham Strategic Centre for development, provide a basis for structure planning of the centre and meet a list of objectives that align with the RSCPSP objectives.

This development meets the objectives of the Strategic Centre zone (and therefore the RSCPSP) as follows:

1.2.1: This development has taken an environmentally sustainable approach as detailed in section 3.4 of this report. Substantial deep soil landscaping and tree planting has been provided, especially within the setback adjacent to Goddard Street, as shown on the plans and perspectives.

1.2.2: This development has been designed to respond to the current and planned surrounding urban structure, with the increased front setback responsive to the planned public open space across Goddard Street and the decreased side and rear setbacks responsive to the adjacent laneways. The development design has responded to the preliminary Design Review Panel comments where possible to ensure that a high-quality development outcome is achieved.

1.2.3: The building façade facing Goddard Street has been designed to a high standard given the innovative modular design, and use of high-amenity landscaped primary garden areas as the interface with Goddard Street will promote social interaction and provide targeted greening and new planting.

1.2.4: This development will add to the critical mass of population necessary to support the future Rockingham City Centre Transit System (RCCTS), and the primary garden areas adjacent to Goddard Street will contribute to the amenity of the adjacent pedestrian and cycle paths.

1.2.5: The proposed social housing will contribute to the existing land use mix and population base throughout the Strategic Centre and support the continued operation of those uses, including the shopping centre, Autumn Centre for senior citizens and other social services nearby.

1.2.6: The proposed medium-density modular townhouse typology is innovative and will add further diversity to the built form in the Strategic Centre, while the primary garden area and balcony combination will provide activity and a strong connection to the street. The angled street boundary and separation from the apartment building to the east across the easement enable the buildings to be set back as proposed without impacting the contiguity of the future streetscape.

Residential Sub-Zone Objectives

This development meets the objectives of the Residential sub-zone as follows:

- The development has been designed to a high standard given the innovative modular design, and has responded to the Design Review Panel advice regarding the design standard set by State Planning Policy 7.0 where possible.
- The development will enhance the quality of the emerging residential area in which it is located through site-responsive positioning of buildings and the orientation of various parts of those buildings and associated outdoor areas.
- The development will add to the range of densities and housing types available in the precinct.

4.2 Draft Rockingham Strategic Centre Precinct Structure Plan

The Draft Rockingham Strategic Centre Precinct Structure Plan (RSCPSP) codes the site R80 and acts as a head of power for the R-Codes. The RSCPSP also applies development standards to the site.

The proposed yield of 14 dwellings is permissible on the site under the R80 code. The site is located within Sub-Precinct 5 – City Park and the Goddard Street site boundary is denoted as an 'Urban Residential' frontage type.

Urban Residential Frontage

Section 4.6.3 of the Explanatory Section of the RSCPSP explains the intended outcomes for 'Urban Residential' frontages in greater detail. These include terrace or mid-rise apartment typologies with modest landscaped front setbacks and design of buildings as the prominent streetscape feature, with a strong connection to the street.

This proposal responds to those outcomes by adopting a terrace typology with substantial landscaping of the front setback. This application seeks to increase the front setback beyond the maximum enabled by the RSCPSP, and this is justified below.

Setbacks

Variations are proposed to the RSCPSP lot boundary setback requirements. Each setback variation is detailed and justified in the subsections below.

- *Table 11 – CP2 – Front Setback*

A maximum 2m setback is required along the front (Goddard Street) boundary, however the building line is proposed to be set back between 1.832m and 7.2m, and the balcony and building eave is proposed to be set back between 0.6m and 6m.

The Goddard Street setback is proposed to be increased to achieve north-facing, heavily landscaped, functional primary garden areas for the street facing townhouses. The depth of the setbacks in some areas is also necessary due to the irregular angle of the lot frontage. This increased setback is appropriate in this location as:

- The tapered building line away from the angled lot boundary provides flexibility for the building line to tie in with a likely future building setback on lot 9 to the west, and the width of the public access easement to the east provides sufficient space between the east townhouse (unit 1) and the existing apartment building further to the east to mediate the different setbacks;
- It reflects the substantial planned setback of development from the north side of Goddard Street due to the RSCPSP protecting the existing stand of trees in public open space, and will result in a wider area along this small section of Goddard Street which will add visual interest and character to the precinct;
- A substantial eave and balconies will increase the building bulk presentation to the street and maintain a strong visual connection and passive surveillance;
- The solid portion of the front fence is lower than required to maintain a ground level visual connection to the street;
- The setback will improve the amenity and solar access to the primary garden area associated with the proposed townhouses, and this element of the proposal is supported by the Design Review Panel for this reason; and
- The increased setback enables units 1-7 to achieve compliance with the major opening orientation requirement (C2.2.4) of the R-Codes.

- *Table 11 – CP3 – Side Setbacks*

A minimum 3m side setback is required, however nil setbacks are proposed on the east and west sides of the lot.

The nil setback is proposed along the east lot boundary as a design response to the nil setback of the apartment building across the public access easement to the east (refer to Figure 3 below). A nil setback will achieve a consistent medium-high density built-form presentation to the easement, which is consistent with the sub-precinct objectives.



Figure 3 – Photo of easement and apartment building to the east of the site (MDC Architects, 2024)

A nil setback is also proposed to the west lot boundary in recognition of the planned medium-high density built-form outcomes for this precinct. The proposed setback also anticipates nil side setbacks being proposed by the development on lot 9 to the west, based on previous advice from the City of Rockingham that a medium-high density development proposal was being prepared for that site.

- *Table 11 – CP3 – Rear Setback*

It is debatable as to whether the south lot boundary is a side or rear boundary given a public access easement is located on lot 14 to the south. Regardless, the proposed 1.61m lot boundary setback is a variation to the Structure Plan requirement. This reduced rear setback is proposed in response to the public access easement within the adjacent lot to the south, and to provide increased bulk and a better connection to the laneway within the easement, which is a good urban design outcome.

The easement is set back 5.5m from the lot boundary, which is an insufficient depth to build on. It is highly likely that the setback area on the adjacent lot will be used for car parking in the future, similar to the space between the lot boundary and the public access easement to the east. The combined width of the on-site setback, the 5.5m setback to the south and the public access easement itself is 13.11m, meaning the development is likely to be setback 13.11m from any future built form to the south.

This is over double the minimum requirement set by the RSCPSP for rear boundaries, and will achieve a similar building separation outcome compared to a scenario where two buildings achieved compliant 6m setbacks to typical rear lot boundaries abutting each other.

This setback is also consistent with the objectives of the RSCPSP which advocate for modest setbacks from thoroughfares to be provided. It will not impact the amenity, overshadowing or privacy of any realistic future development of the site to the south. A 6m setback in this location would be an inefficient use of land and would not meet the objectives of the RSCPSP or the Strategic Centre zone.

- *Conclusion*

Cl. 4.23 of Amd 191 and the Deemed Provisions both enable any development control set by the RSCPSP except for the two-storey minimum height requirement to be varied, given its status as a 'due regard' document. Importantly, all townhouses comply with the minimum height of 2 storeys.

The justification in this subsection demonstrates that the proposed setback variations will achieve high-quality and context-responsive interfaces between this site and the adjacent public realm, public access easements and privately owned lots that are consistent with the intent and objectives of the RSCPSP and the Strategic Centre zone.

The increased front setback reflects the increased built form setback across Goddard Street due to the planned public open space, but will not affect the connection between the townhouses and the street and will not compromise the consistency of the future building frontage alignment along this stretch of Goddard Street due to the angled front boundary alignment.

The side and rear setbacks acknowledge the urban setting of the site and achieve best practice infill residential development principles on the basis that in contexts such as this it is a better urban design outcome to minimise building setbacks adjacent to laneways. This is also consistent with the requirements of the current planning framework for buildings to frame laneways, as set out in sections 4.6 to 4.8 of this report.

These setback variations warrant approval as they respond to the site context and are consistent with orderly and proper planning principles.

<u>Land Use</u>
CP4, Table 11 of the RSCPSP identifies that 'Multiple Dwellings' are the Preferred land use at street level on this site. Cl. 2.1.1 of the RSCPSP confirms that land use permissibility is determined in accordance with the land use table in Amd 191 of LPS 2. In this regard, both Grouped and Multiple Dwellings are 'D' uses as described previously, and are therefore given the same priority by Amd 191, which is the statutory requirement. This should be given greater weight than a *preferred* (but not *required*) outcome in a discretionary document such as the RSRPSP.

Notwithstanding the above, the townhouses have been designed such that when viewed by passers-by on Goddard Street there is no reason why the ground and upper floors

could not be separate apartments. The proposed site yield is at its maximum and the building height is also compliant. Therefore the development does not compromise the yield and visual presentation outcomes that are implied by the preference for multiple dwellings on this site, and on this basis there is no planning reason for this *preference* to form an impediment to approval of the proposal.

Car Parking

This development application seeks for the lack of visitor parking to be approved with no cash in lieu requirement on the following grounds:

- Cl. 77G(2) of the Deemed Provisions prevents a payment in lieu of parking condition from being imposed if there is no payment in lieu of parking plan that applies to this site, and there is no operative payment in lieu of parking plan in the City of Rockingham;
- The draft payment in lieu of parking plan adopted by the City of Rockingham Council for the purposes of advertising in November 2023 does not apply to this site, and it is unclear if or when it will be adopted. Therefore, the payment in lieu of parking plan fails criteria i), iii) and iv) of *Nicholls* detailed in section 4.0 above;
- Cl. 4.5.5 of LPS 2 and the R-Codes themselves specifically enable the City to exercise discretion in relation to R-Codes car parking requirements without requiring cash in lieu of parking; and
- There are strong planning grounds for the City to exercise the available discretion on the basis that this development meets the corresponding R-Code design principle as demonstrated in section 4.3 below.

Landscaping

The version of the RSCPSP that was adopted by the City of Rockingham Council applied an annotation to provision 2.2.7 identifying that it will be reviewed against the landscaping requirements of new R-Codes. The City has advised that the review has not yet occurred. Therefore, it is reasonable to assess this application against both the RSCPSP and R-Code landscaping requirements.

18% of the site is proposed as deep soil area, which significantly exceeds and almost doubles the minimum 10% requirement of provision 2.2.7.

There is also an option to provide either 1 large tree and 2 medium trees or 2 large trees. This development proposes 23 small trees instead, in response to the requirements of Part C of the R-Codes. The tree canopy and visual amenity associated with 23 small trees dispersed across the site, in lieu of 2-3 medium to large trees in isolated parts of the site, represents an improved environmental outcome that is likely to reduce the urban heat island effect to a greater extent than compliant trees would, and warrants approval on that basis. The improved amenity that will result from this outcome is clearly visible from the perspectives provided in support of this application.

4.3 Residential Design Codes Volume 1

The proposed townhouses meet most of the deemed-to-comply requirements of Part C of the R-Codes Volume 1 as they relate to the R80 code, except for some requirements where the design principles have been met instead. This is demonstrated in the completed R-Codes Volume 1 (Part C) Assessment at Appendix 6, and for the small number of deemed-to-comply requirements that have not been met, justification confirming that the design principle has been met is provided in the table overleaf.

Cl.	Location	Deemed-to-comply not met	Design Principle	Design Principles Assessment
1.1	Units 1 and 7	Units 1 and 7 primary garden areas are 19.5m^2 and 17.3m^2 respectively in lieu of 20m^2, and do not include 20m^2 open to the sky (excluding minor projections) Units 1-7 primary garden areas provided within the primary street setback.	P1.1.1 Dwellings are designed to have direct access to private open space which provides for entertaining, leisure and connection to the outdoors that is: i. of sufficient size and dimension to be functional and usable for the intended number of dwelling occupants; ii. is sited, oriented and designed for occupant amenity, including consideration of solar access and natural ventilation appropriate to the climatic region; and iii. capable of use in conjunction with a primary living space of the dwelling.	Units 1 and 7 have been designed with direct access between the primary living space and primary garden area. i. These two primary garden areas include the same amount of paved area as the other compliant primary garden areas along with appropriate landscaping. They are functional and also provide for entertaining, leisure and connection to the outdoors in a way that is appropriate for the future aged occupants. ii. The primary garden areas have been sited, oriented and designed to maximise solar access, and the ground floors are openable on both sides to provide natural ventilation through the house during summer. iii. The primary garden areas are directly accessible from the primary living spaces of the dwellings. The smaller primary garden areas for units 1 and 7 are only proposed due to the irregular site boundary and will provide dwelling diversity across the development. They are intended to be suitable for occupants with easy-care living requirements. The location of the primary garden areas adjacent to Goddard Street will optimise occupant amenity, provide passive surveillance to Goddard Street and respond to the medium-high density urban context.
			P1.1.2 Private open space allows for sufficient uncovered area to: i. permit winter sun and natural ventilation into the dwelling; and	i. The balconies and eaves have been designed specifically to limit summer sun and maximise winter sun into the dwellings. Natural ventilation in summer is from the other side of the dwelling.

			ii. provide for soft landscaping, including the planting of a tree(s) and deep soil area.	ii. Soft landscaping and a tree in deep soil area are provided. Unit 1 complies with the R-Codes landscaping and tree requirements. Refer to 1.2 below for further justification regarding Unit 7.
			P1.1.3 Balconies balance the need for outlook, solar access and natural ventilation with: i. visual privacy considerations; ii. acoustic and noise impacts; and iii. local climatic considerations such as high winds.	The balconies do not form part of the primary garden areas, so are not relevant. Notwithstanding, the balconies will improve the outlook for the upper floors and limit summer sun for the lower floors. i. The balconies will provide partial visual privacy screening from adjacent upper floor windows. ii. Acoustic impacts will be mitigated through appropriate building standards. iii. The balconies are not oriented in the direction of any prevailing winds.
			P1.1.4 Increasing the area of communal open space commensurate with a decrease in private open space may be appropriate where there is an explicit intent to facilitate communal living and it can be demonstrated that the communal open space: i. is of high amenity and provided with quality landscaping; ii. is easily accessible and equitable for all dwellings within the development; and iii. meets the needs of the occupants and provides opportunities for social interaction.	No formal communal open space is proposed, although the communal shared space / driveway area has been designed in accordance with this design principle as detailed below. As the residents will be pensioners of limited means, this project intends to maximise opportunities for communal use of the shared space. i. The heavily landscaped shared space, including the design and finishes, are of a high standard. ii. The shared space is directly accessible from all 14 dwellings. iii. The shared space will likely be used informally as a 'break-out area' when it is not performing its vehicular access function.
1.2	Units 7 and 9	Landscaping with dimensions over 1m covers 17.88% and	P1.2.1 Site planning allows for: i. site responsive and sustainable landscape design; and	i. Opportunities for landscaping in deep soil areas have been maximised across the entire site. The deep soil areas for units 7-14 will accommodate

12.06% of units 7 and 9 respectively, in lieu of 15%. The deep soil area in which the trees associated with units 7 and 8 are located have a minimum deep soil area dimension of less than 1.5m. The deep soil areas in which the trees associated with units 7, 8 and 9-14 are located have areas of 5m^2, 4m^2 and 6.4m^2 respectively, in lieu of 9m^2.	ii. the retention of existing trees on the subject site and adjoining properties. P1.2.2 Provision of trees and high quality landscaping: i. enhances the built form, streetscape and pedestrian amenity, as viewed from the street; ii. provides shade and amenity for communal streets and parking areas; and iii. contributes to the visual appeal, comfort and amenity of the development, in particular private open space and communal open space and outlook from habitable rooms. P1.2.3 Development provides sufficient deep soil area to sustain healthy tree and plant growth, providing for an increase in urban tree canopy over time, and assist in managing the quantity and quality of stormwater.	the selected tree species 'Eucalyptus silver princess' or 'Chinese tallow', thereby addressing the reduced deep soil areas and dimensions. ii. The existing trees in the road reserve will not be impacted by this development. There are no existing trees on the site. i. 7 trees are proposed along the 35m street frontage, and will combine with the 3 mature trees along Goddard Street to provide a substantial tree canopy. The trees will also add visual interest and depth to the building façade. ii. 9 trees (5 more than required) are provided along the communal driveway and adjacent to the car bays, and are fundamental design features that will provide shade and amenity for the occupants in this space. iii. The proposed 23 trees and 314m^2 (18%) of deep soil area across the site, along with the 7 trees and 52% deep soil area in the front setback, represent significant landscaping and canopy coverage that will provide visual appeal, comfort and amenity for residents using habitable rooms and private open space, along with passers by on Goddard Street. 18% of the site has been provided as deep soil area, which would comply with C1.2.1 if it was measured on a parent lot basis. The Design Report provided at Appendix 8 details the tree species and sizes, which have been chosen based on the size and context of the deep soil area. The deep soil area will assist with stormwater management in an environmentally responsible way.

2.1	Dwelling stores	Dwelling stores provided with areas of 2.9m^2 for units 1-4, 3.3m^2 for unit 8 and 3.5m^2 for units 5-7 and 9-14 in lieu of 4m^2.	P2.1.5 Each dwelling provides adequate, conveniently located storage for large items that are: i. proportionate to the size of the dwelling and intended number of occupants; and ii. integrated into the design of the building and/ or screened from view to ensure that it is not visually intrusive when viewed from the street.	An external store has been provided for each dwelling that is conveniently located between the car bay and entrance, and is dimensioned and sized to provide easy access for aged people. i. The slightly reduced storage areas are reflective of the small dwelling sizes and intent for them to be occupied by pensioners of limited means (who may not have lots of bulky possessions). ii. The units 1-4 and 8 stores have been located inside the fence between the courtyard and car bay to reduce visibility. The units 5-7 and 9-14 stores have been located side-on and will be screened from the driveway by landscaping. No stores will be prominently visible from the street or public access easements.
2.3	Car parking area	0 visitor bays provided in lieu of 4.	P2.3.1 Siting and the extent of parking does not dominate the development or streetscape and responds to the context and local character by: i. supporting the efficient use of the site; and ii. minimising the extent of paving for parking and vehicle access. P2.3.2 Adequate parking is provided for various modes of transport, including bicycles, motorcycles, scooters and cars, that has regard to the following considerations: i. the proximity of the proposed development to public transport,	The parking area has been sleeved to minimise visibility from the street or public access easements, and the car bays do not dominate the central area as they are separated by landscaping. i. The lack of visitor parking supports the efficient use of the site by recognising its location in a medium to high density urban area with high-frequency public transport in close proximity. ii. Providing visitor parking would decrease the amount of landscaping on the site and compromise amenity through excessive paving. Adequate parking is available for residents, and informal space is available to park bicycles, motorcycles or scooters – although the intended residents are not likely to own these. i. As shown in Figure 1 of this report and demonstrated by the TIS, the site is in a highly walkable area and is located within 150m

			activity centres, areas of amenity and other facilities; ii. the type, size and number of dwellings; and iii. the availability of on-street and other off-street parking.	walking distance of bus stops, 300m of a planned stop for the future RCCTS, 150m from the Rockingham Autumn Centre for senior citizens and HMAS Warramunga Park, and 700m from Rockingham shopping centre. ii. The dwellings are quite small, and the intended occupants are less likely than usual to generate lots of visitors to the site at any given time. iii. Four embayed car bays (the required number of visitor bays) are located directly adjacent to the site on Goddard Street. More public car parking is available nearby on-street and at the Rockingham Autumn Centre within an acceptable walking distance of the site, as confirmed by the TIS.
			P2.3.3 Parking spaces are designed for flexibility and adaptability having regard for: i. the needs of occupants, including consideration of universally accessible parking spaces; and ii. the ability to use the space for alternative purposes.	The target occupant cohort has lower levels of vehicular ownership than usual, so it is possible that an occupant bay could be used by visitors if the occupant does not own a car and agrees to this. i. Car bays and footpaths have been co-located to provide extra manoeuvring space if needed. ii. The direct accessibility between car bays and courtyards, along with the additional width provided by the footpaths, provide flexibility for the bays to be used as break-out spaces if not used by residents for vehicle parking.
3.7	Units 8-14	No direct footpath between Goddard Street and the site pedestrian entrance next to	P3.7.1 Access for each development site is to: i. balance pedestrian and cyclist safety while providing safe vehicle access;	This matter is the result of a legacy planning issue associated with the format of the public access easement designed in the early 1990's. i. The on-site pedestrian footpath has been delineated to ensure safety, however this is not possible on the easement as it has already been constructed and is on land owned by a third

		the driveway entrance, due to the configuration of the adjacent public access easement.	ii. minimise the extent of impervious surfaces; iii. provide legible access; and iv. include high quality landscaping features.	party. The safety of the site access has therefore been balanced as much as reasonably possible. ii. The extent of impervious surfaces has been minimised through extensive deep soil area on the site. iii. The public access easement is the logical access point to the site given it is effectively constructed as a road. iv. High quality landscaping is proposed along the driveway and footpaths on the site.
			P3.7.5 Legible, safe, and direct access for residents and their visitors to move between communal car parking areas or public streets and individual dwellings.	Legible, safe and direct access has been provided between the car bays and individual dwellings. The public access easement is reasonably direct and legible, and access to this site via that easement has been planned for over 30 years as confirmed at Appendix 3.
3.10	All primary garden areas, and east and west lot boundaries	Cones of vision from both sides of units 1, 7, 8 and 14 overlook small areas of lot 9 to the west and lot 303 to the east. Cones of vision from all upstairs balconies and juliet balconies overlook primary garden areas of adjacent units.	P3.10.1 Direct overlooking of major openings and active habitable spaces of adjacent dwellings and adjoining properties minimised through: i. building siting, layout and design; ii. design and location of major openings; iii. landscape screening of outdoor active habitable spaces; and/or iv. design and location of screening devices.	Direct overlooking of active habitable spaces of adjacent dwellings has been minimised through the design and location of major openings, combined with the paved (ie. active habitable) part of the space being located under the balcony such that only landscaping areas or stores are overlooked. Cones of vision only extend from units 7 and 14 into negligible parts of lot 9 to the west (2.8m^2 in the front setback area to the north and 0.2m^2 in the rear setback area to the south), and are unlikely to reduce the privacy of any active habitable space. Minor overlooking of the car park of lot 303 to the east will not cause any privacy or amenity issues.
			P3.10.2 Adequate visual privacy achieved through appropriate interfaces between dwellings and	Visual privacy impacts have been minimised through careful design of interfaces between dwellings including:

Cones of vision from unit 2-7 and 9-13 bedroom 2 windows slightly protrude over rear landscaping strips for units 2-7 and setback areas for units 9-13.	adjoining properties including measures such as: i. offsetting the location of ground and first floor windows so that viewing is oblique rather than direct; ii. building boundary walls where appropriate; iii. setting back the upper storeys from the lot boundary; iv. providing higher or lower windows, or windows with obscure glazing; and/or v. screening (including landscaping, fencing, timber screens, external blinds, window hoods and shutters).	i. balconies and windows have been offset such that overlooking is oblique and only at an angle close to 45 degrees. No direct overlooking is proposed. ii. Boundary walls minimise overlooking between units 4 and 5. iii. N/A. iv. Obscure glazing is not proposed for the south-facing windows given overlooking is only of very small parts of neighbouring landscaping strips. All other sources of overlooking are balconies. v. Landscaping has been strategically placed at ground level such that in the future, tree canopies will minimise overlooking. Standard 1.6m screens have not been proposed so as to maintain a strong visual connection between the balconies and Goddard Street or the communal driveway, consistent with the intent of the RSCPSP and other provisions of the R-Codes.
	P3.10.3 Visual privacy strategies maintain amenity of habitable rooms and active habitable space with regard to solar access, natural ventilation and external outlook both within the development and for adjoining properties.	The passive sustainable site design strategy adopted by this project means that the balconies maintain solar access to the habitable rooms in a seasonally appropriate manner and prevent overlooking of the active habitable parts of adjacent outdoor spaces. Screening of the balconies has been limited to optimise the external outlook and visual connection to Goddard Street or the communal driveway.

4.4 State Planning Policy 7.0 – Design of the Built Environment

On 30 August 2023 the City of Rockingham Design Review Panel reviewed a preliminary design of this proposal. The Panel's comments were provided in the Meeting Notes and addressed how the Panel believed the preliminary design responded to the ten principles of good design set out in State Planning Policy 7.0 (SPP 7.0).

The Panel did not support the proposal given in their view it did not achieve the built form and scale expectations under the current and proposed planning framework.

Since the Panel provided those comments, the design has been reviewed and now achieves a 2 storey building height across the entire development, which meets the minimum 2 storey height requirement of both the draft and current planning frameworks. On this basis, the Panel's grounds for not supporting the proposal no longer apply.

As the scale is no longer an issue, when progressing the design of this development we considered the remainder of the Panel's advice. Our response to the advice is provided at Appendix 7 and details where the project has responded by either revising the design, providing further information, or providing justification as to why some advice has not been actioned. A Design Report has also been prepared by MDC Architects detailing how the proposal responds to the ten principles of good design, and is provided at Appendix 8.

The project team looks forward to working constructively with the Panel during the development application process to ensure that the principles of design contained within SPP 7.0 are met by this project.

4.5 State Planning Policy 3.7 – Planning in Bushfire Prone Areas

As the entirety of the site is mapped as a Bushfire Prone Area, State Planning Policy 3.7 (SPP 3.7) requires a Bushfire Attack Level (BAL) Assessment to be provided in support of the development application. In this regard, a BAL Assessment Report is provided at Appendix 9 addressing the items listed in provision 6.5 a)(i), b) and c) of SPP 3.7.

The BAL Assessment Report identifies the primary source of the bushfire hazard as the vegetation on the north side of Goddard Street across the road from the site, and applies the BAL-12.5 contour to the site based on its current state. The Report confirms that the development complies with the Bushfire Protection Criteria set out in the SPP 3.7 Guidelines, and will be constructed to the required BAL-12.5 standard.

4.6 City of Rockingham Local Planning Scheme No. 2 (Current)

Although this development application seeks for the City to give more weight to the draft planning framework (Amd 191, the RSCPSP and R-Codes) than the current planning framework, the current version of LPS 2 still has effect.

Clause 4.3.3 of LPS 2 lists matters that the City will consider when assessing development applications in the Primary Centre City Centre zone, which are as follows:

"*a) the objectives of the Primary Centre;*
b) the provisions of the Centre Plan;
c) the objectives of the Zone in which the development is proposed;
d) in the case of the Primary Centre City Centre Zone – the provisions of the Development Policy Plan (City Centre Sector and Southern Gateway and Rockingham Station Sectors) and any other Policy adopted under Clause 4(3) of the deemed provisions which applies to the Primary Centre City Centre Zone;"

Clause 4.3.3(a) and (c) are addressed in the subsections below, while clauses 4.3.3 (b) and (d) are addressed in sections 4.7 and 4.8 of this report respectively.

Primary Centre Objectives
With regard to clause 4.3.3(a), the proposed scale, typology, design and interface of this development are consistent with the objectives of the Primary Centre as follows:

- The proposed townhouse typology and two-storey height are compliant and comprise urban scaled housing in the context of a strategic centre (as per objective a);
- The proposed medium-density yield and decreased side and rear setbacks will enable the development to present as a consolidated form to the public access easements, while the front setback will augment the sense of space to be provided along this section of Goddard Street by the planned public open space opposite (as per objective b);
- The passive surveillance and visual connection to Goddard Street, along with the thoughtfully designed front elevations will assist in developing an active and interesting character through a high standard of amenity and urban design (as per objectives c, f and l);
- The development will add a critical mass of population in close proximity to the future public transport system (RCCTS) that will also sustain the mixed-use developments in the locality (as per objectives c and m); and
- The angled street boundary and width of the public access easement enables rationalisation of the building alignment without significantly impacting the contiguity of the future streetscape, as agreed by the DRP (as per objective f).

Primary Centre City Centre Zone Objectives
With regard to clause 4.3.3(c), the proposed scale, typology, design and interface of this development are consistent with the objectives of the Primary Centre City Centre zone as follows:

- The passive surveillance and visual connection to Goddard Street provided by the front elevation and courtyards, along with the access from the public access easement to a sleeved car parking area, will contribute to the main street development configuration as per objectives a, e and f;
- The proposed medium-density yield located within a walkable catchment of the central public transit system is consistent with objective c; and
- The passive sustainability approach of this development meets objective j.

Built Form Controls
Clauses 4.3A2 and 4.3A3 of LPS 2 apply in the Primary Centre City Centre zone, and are as follows:

4.3A.2: The R-Codes are not to apply to the development of land in the Primary Centre City Centre Zone for any of the residential purposes dealt with by the R-Codes.

4.3A.3: In the Primary Centre City Centre Zone, all development for the purpose of grouped or multiple dwellings must have a minimum of one dwelling per 125m² of land area.

Clause 4.3A.3 effectively requires a minimum of 14 dwellings to be developed at this site, which is achieved by this development. It is important to note that under the current planning framework the minimum site yield is 14 dwellings and under the 'seriously entertained' draft planning framework the maximum site yield is 14 dwellings, meaning that the proposed 14 dwelling medium-density yield reflects the changing strategic aspirations for the density to be achieved on this site (ie. reduced density and scale of development).

Car Parking
Clause 4.15.1.1 and Table 5 of the Scheme provide that the parking requirements of the R-Codes do apply to the Primary Centre City Centre zone. In this regard, refer to the car parking assessments in sections 4.2 and 4.3 of this report.

4.7 Rockingham Strategic Regional Centre Plan

The Rockingham Strategic Regional Centre Plan (RSRCP) adds further detail to the objectives for the Primary Centre area and the Primary Centre City Centre zone. The Planning and Development Principles set out in the RSRCP have been addressed in section 4.6 above.

This development is within (albeit at the lower end of) the permissible range of densities and scales planned for this site by the RSRCP due to its compliant density and height.

The RSRCP encourages the following typologies for the city centre:

> "*A variety of residential dwelling types and tenures will be encouraged, including traditional street front townhouses, contemporary row houses, mews housing, low rise apartment blocks and medium to high–rise multiple apartments with a lifestyle focus ranging in height from three to twenty or more storeys, subject to precinct–specific guidelines.*"

Street front town houses are proposed of a similar scale to the example provided in section 6.7 of the RSRCP, although with increased setbacks that are capable of generally aligning with a development on lot 9 to the west due to the angled front lot boundary. The two-storey height meets the minimum height requirement of the current planning framework as detailed in section 4.8 below.

The medium density achieved by this development reflects the preferred "Medium to high density residential" uses that are preferred for the city centre. The upper floor balconies mean that to a passer by that does not understand the development layout, the ground floor and upper floor could be separate apartments, as is the preference for this location by the RSRCP.

The proposed reduced setbacks to the public access easements are consistent with the RSRCP intent for laneways to be framed with "generally contiguous, urban scaled buildings".

4.8 City of Rockingham Local Planning Policy No. 3.2.1 – Development Policy Plan – City Centre Sector

In the absence of the R-Codes, Local Planning Policy 3.2.1 (LPP 3.2.1) is the key planning framework document that establishes development controls for the site where not otherwise established by LPS 2.

Although the requirements in LPP 3.2.1 are soon to be superseded by the RSCPSP and therefore should not be given significant weight by the City, this development has been designed to respond to the general and precinct-specific development controls set out in the Policy, as detailed in the following subsections.

General Development Requirements
Figure 4.2 of LPP 3.2.1 establishes a height range of 2-9+ storeys for the subject site. The two storey height of this development meets this requirement.

Figure 4.4 of LPP 3.2.1 applies a 'Type 2 frontage' to this side of Goddard Street, which triggers a nil front setback requirement and is described as follows:

> "*A medium level of frontage activation with secondary retail, customer oriented offices, inner-city commercial tenancies and residential lobbies at ground level and a two to three storey façade positioned at the streetfront boundary. At the ground level, buildings should address the street with a primary business entrance and a commercial façade that is transparent over at least 60% of the area of the facade.*"

This development is wholly residential and therefore seeks discretion in relation to the front setback and frontage activation requirements. Primary garden areas (courtyards) and balconies are proposed to front onto Goddard Street in recognition of the planned public open space across the road. This outcome will maintain a high level of pedestrian amenity and is supported by the Design Review Panel, but necessitates the proposed increased setback.

The Goddard Street façade has been designed to meet the intent of this requirement by achieving a medium level of frontage activation by promoting active use of a well-landscaped primary garden area directly adjacent to the public footpath by residents, providing a balcony at the upper level to encourage further passive surveillance and by glazing over 60% of the ground level façade.

Goddard Precinct Development Requirements

Section 5.4.4 of LPP 3.2.1 provides that development controls for the subject site will be assessed against the overall concept design for the Goddard Precinct provided at Figure 5.5, with scope for flexibility in interpretation of the plan. The development form shown on Figure 5.5 cannot be achieved as the public access easement to the south of the site is not shown on the plan, and should be given little weight as it is an indicative concept plan and is soon to be superseded by the RSCPSP.

This development application seeks for the City to apply a flexible approach to interpretation of the precinct-specific requirements set out in section 5.4 of LPP 3.2.1 on the basis that the RSCPSP should be given greater weight as it is the most up-to-date planning document that sets out the development intent for this site, and that the proposed townhouse typology is permissible on this site and meets the applicable objectives of the current planning framework, but is not shown at Figure 5.5.

Section 5.4 also sets out specific 'Required Elements', which this development meets as detailed below:

- This development has been designed in accordance with an urban townscape discipline at a medium density as per Required Element (a).
- Nil side and rear building setbacks are shown on Figure 5.5, which have generally been achieved by this development despite the significantly increased setback requirements of the RSCPSP on the basis that it is good urban design practice to site buildings in a built-up urban context to frame and address laneways. Doing so meets Required Elements (c) and (e).
- This development achieves a density of 80 dwellings per hectare as per Required Element (f).
- The north row of townhouses present a two-storey parapet height to the street as per Required Element (g).
- Required Element (i) (car parking) has been addressed in sections 4.2, 4.3 and 4.6 of this report. Car parking has been sleeved between the two townhouse rows as per Required Elements (j) and (k).
- Landscaping details are provided at 'Plan – Ground Floor' (A_010) and pages 4-6 of the Design Report as per Required Element (p), and demonstrate that this development will add significant landscape-based amenity and additional tree canopy to the Goddard Street streetscape.

5.0 Technical and Servicing

The following sections confirm that transport, waste, stormwater drainage and the contamination underneath the site have been given consideration in the design and intended operation of the development.

5.1 Traffic and Transport

A Transport Impact Statement (TIS) is provided at Appendix 10, as required by the WAPC's Transport Impact Assessment Guidelines. Consistent with the parking assessment earlier in this report, the TIS concludes that there is sufficient parking available for residents of and visitors to the development.

The TIS analyses the traffic to be generated by the development, and concludes that the traffic to be generated falls below the WAPC thresholds for further investigation. Therefore, the impact on the surrounding road network and public access easements is minor and consistent with the intended function of the roads and easements.

The TIS also concludes that the site is well-located adjacent to pedestrian and cyclist infrastructure on Goddard Street and nearby bus stops, which is likely to encourage use of alternative modes of transport by the residents.

The bins are proposed to be collected by a City of Rockingham waste vehicle from a bin presentation area on the public access easement crossover adjacent to the site entrance. The TIS confirms that the public access easement is sufficient to accommodate the necessary manoeuvres to be undertaken by a Medium Rigid design vehicle positioning itself next to the bin presentation area to empty the bins.

5.2 Waste Management

A Waste Management Plan (WMP) is provided at Appendix 11 projecting volumes of waste to be generated by the development and methods of disposal. The WMP is based on the WALGA better practice waste management principles and uses WALGA waste generation rates.

The WMP calculates that 6 general and 5 recycling bins (240L each) will accommodate the waste that is projected to be generated by the residents, and will be stored in the communal bin store. The WMP confirms that sufficient clearance is provided in the bin store to accommodate the bins, and the bin store is easily accessible and will not cause amenity impacts. It is intended that the City of Rockingham waste service will collect the bins as per the usual schedule.

5.3 Stormwater Management

A detailed stormwater plan and calculations will be developed at detailed design stage and provided post-approval as per clause 4.14 of the City's Planning Policy 3.4.3 – Urban Water Management. It is intended that the site drainage system will be primarily located in the central driveway, and will be able to accommodate the first 15mm of rain.

5.4 Site Contamination

In 2021 contaminated fill was identified on the site. The upper layer of contaminated fill was subsequently removed, a geofabric warning barrier was placed across the site and then approximately 0.55m of clean fill was spread across the site on top of the barrier.

The Department of Water and Environmental Regulation Notice of Classification now classifies this site as 'remediated for restricted use' and is suitable for residential development, subject to the existing Site Management Plan being implemented at construction stage.

The Site Management Plan includes procedures for undertaking subsurface activities or intrusive works during construction, such as only using contractors qualified to handle bonded asbestos materials and taking care not to disturb the geofabric warning barrier. This project intends to implement the Site Management Plan during construction.

6.0 Conclusion

This affordable, build-to-rent community housing development proposes 14 modular townhouses that will positively contribute to the Rockingham Strategic Regional Centre and play a role in addressing the current housing shortage.

The site design responds to the shape and surroundings of the site, while also providing sufficient solar access, functional indoor and outdoor living spaces and private and communal garden areas for the use and enjoyment of the future residents.

The building elevations incorporate well-considered articulation, robust materiality and large major openings to ensure high-quality and context-responsive presentation to Goddard Street and the adjoining public access easements. Substantial landscaping is provided in deep soil zones throughout the site and reflects the project's environmentally responsible and sustainable design approach that achieves a high level of amenity for both the residents and passers-by in the public realm.

The current development design has responded as much as possible to the preliminary comments from the City of Rockingham's Design Review Panel. The project team will continue to work with the Design Review Panel through the development application process to ensure that the design meets the standard set by State Planning Policy 7.0.

This proposal meets the relevant planning requirements, including the deemed-to-comply and design principle / objective requirements (where relevant) of the draft Precinct Structure Plan and R-Codes, along with the current Local Planning Scheme and Local Planning Policy requirements, other than some isolated requirements where a context-responsive and future-focused approach is proposed.

The planning framework that applies to this site is currently under review, and this development application seeks for greater weight to be given to the incoming planning framework than the current planning framework on the basis that the draft framework is 'seriously entertained' and is likely to take effect prior to completion of this development.

The key planning consideration for this development application is the setbacks. Variations are proposed to allow for a site-responsive outcome to be achieved. In this regard, the siting of the buildings balances best practice infill residential development principles, strong connections to the street and adjacent public access easements, and responds to the current and future planned development outcomes around the site.

A limited number of R-Code design principle assessments are necessary for this development, as is typical for developments of this size and scale. This report and the appendices demonstrates that there is a strong rationale for each design principle, and there are strong planning grounds for discretion to be exercised in these instances.

The justification provided in this report and the supporting appendices demonstrates that this development application is worthy of approval by the Development Assessment Panel. In this regard, we look forward to working with the City of Rockingham to progress this application through the referral, advertising, Design Review Panel and planning assessment phases towards a favourable recommendation to the DAP and subsequent approval.

Rise Urban.

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
2018	**336**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 10 ON DIAGRAM 86080

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

STELLAR LIVING LTD OF UNIT 1 1 HADLOW PLACE THORNLIE WA 6108

(T P205512) REGISTERED 4/7/2022

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. F706571 EASEMENT BENEFIT SEE SKETCH ON VOL 2018 FOL 336. REGISTERED 19/10/1994.
2. M760160 EASEMENT BENEFIT FOR ACCESSWAY PURPOSES - SEE SKETCH ON DEPOSITED PLAN 76371 REGISTERED 25/9/2014.
3. P053638 MEMORIAL. CONTAMINATED SITES ACT 2003 REGISTERED 24/2/2022.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	2018-336 (10/D86080)
PREVIOUS TITLE:	1993-380
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF ROCKINGHAM

LANDGATE COPY OF ORIGINAL NOT TO SCALE 11/04/2024 09:18 AM Request number: 66452328

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R-CODES VOLUME 1, PART C – ASSESSMENT TEMPLATE

Local government:	**City of Rockingham**
Assessing officer:	
Development details:	**14 Grouped Dwellings**
R-Coding:	**R80**
Site area:	**1,744m²**

1.0 THE GARDEN

1.1 PRIVATE OPEN SPACE

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS / CONDITION OF APPROVAL
C1.1.1 – Primary garden area in accordance with Table 1.1a	☐	☒	☐	20m² minimum primary garden area, to be open to the sky.	Unit: total m², uncovered m² 1: **19.5m², 15.6m²** 2: 34.2m², 28.3m² 3: 30.6m², 26.7m² 4: 24.1m², 20.2m² 5: 30.9m², 27.0m² 6: 24.1m², 20.2m² 7: **17.3m², 13.4m²** 8-14: 20m², 20m²	Refer to section 4.3 of the DA report.	
C1.1.2 – Splitting of PGA for grouped dwellings	☐	☐	☒				
C1.1.3 – Private open space to multiple dwellings (balcony) in accordance with Table 1.1b	☐	☐	☒				
C1.1.4 – Balconies to be unscreened for 25%	☐	☐	☒				

1.2 TREES AND LANDSCAPING

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS / CONDITION OF APPROVAL
C1.2.1 – 15% soft landscaping per site	☐	☒	☐	See left. Only landscaping with minimum dimensions of 1m to be measured. Also see provision 2.2.7.3 of the RSCPSP which requires minimum 10% deep soil area.	1: 16.71% (18.88m²) 2: 16.30% (19.89m²) 3: 17.58% (20.92m²) 4: 19.94% (24.13m²) 5: 19.87% (22.85m²) 6: 17.78% (19.20m²) 7: **7.88% (7.88m²)** 8: 17.06% (18.43m²) 9: **12.06% (12.78m²)** 10: 15.06% (16.11m²) 11: 17.67% (18.91m²) 12: 17.67% (18.91m²) 13: 17.67% (18.91m²) 14: 16.57% (17.56m²) Entire site (RSCPSP): 17.99%	Refer to section 4.3 of the DA report.	
C1.2.2 – 30% soft landscaping of the primary street setback area	☒	☐	☐	See left.	92.3m² (51.1%) landscaping provided in Goddard St setback.		
C1.2.3 – Communal street and communal open space is landscaped and provided with adequate lighting to footpaths and vehicle access areas	☒	☐	☐	See left.	Communal street is landscaped to the greatest extent possible. Lighting will be provided, details to be confirmed at BP stage.		
C1.2.4 – Minimum trees and deep soil area in accordance with Tables 1.2a & 1.2b.	☐	☒	☐	1 small tree in 1.5m / 9m² deep soil area per grouped dwelling. Also see provision 2.2.7.3 of the RSCPSP addressed in section 4.2 of the DA report.	1 small tree with canopy diameter over 2m provided for each townhouse. Trees located in deep soil areas with areas and dimensions as follows: 1: 2.3m / 11.4m² 2: 3.5m / 16.9m² 3: 3.5m / 14.5m² 4: 2.1m / 9m² 5: 3.5m / 14.7m² 6: 2.6m / 11.1m² 7: **1-1.9m / 5m²** 8: **1.3m / 4m²** 9-14: 2.1m / **6.45m²**	Refer to section 4.3 of the DA report.	
C1.2.5 – Shade trees for uncovered at grade car-parking for grouped and multiple dwellings	☒	☐	☐	4 shade trees required near car parking area.	9 shade trees provided over 14 car bays.		
C1.2.6 – reduced landscaping subject to retaining a significant existing tree	☐	☐	☒	See left.	No existing trees on site.		
C1.2.7 – Where a significant existing tree is retained on site, tree protection zone is provided in accordance with *AS4970*	☐	☐	☒	See left.	No existing trees on site.		
C1.2.8 – Landscaping plan (for multiple dwellings or 5+ dwellings) in accordance with Appendix 3	☒	☐	☐	See left.	Refer to 'Plan – Ground Floor' (A_010) and pages 4-6 of the Design Report.		

1.3 COMMUNAL OPEN SPACE – Multiple dwellings only

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS / CONDITION OF APPROVAL
C1.3.1 – Minimum communal open space requirements	☐	☐	☒				
C1.3.2 – Communal open space separated or screened sources of noise and odour	☐	☐	☒				

C1.3.3 – Design and orientation of communal open space to minimise impacts of noise, odour, lightspill and overlooking	☐	☐	☒				

1.4 WATER MANAGEMENT AND CONSERVATION

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS / CONDITION OF APPROVAL
C1.4.1 – Stormwater retained on site	☒	☐	☐	See left.	Soakwells shown on plans will retain water from small rainfall events on site. Further stormwater details will be provided at BP stage.		
C1.4.2 – Notwithstanding C1.4.1, stormwater directed to a district or local stormwater drainage system where required by the decision-maker	☐	☐	☒				

2.0 THE BUILDING

2.1 SIZE AND LAYOUT OF DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.1.1 – Designated primary living space, for multiple dwellings the primary living space with a minimum dimension of 3.8m	☒	☐	☐	See left.	All dwellings provided with a designated primary living space on the ground floor.		
C2.1.2 – Primary living space to have direct and physical access to primary garden area/private open space (single houses and grouped dwellings)	☒	☐	☐	See left.	All primary living spaces provided with direct physical access to the PGA.		
C2.1.3 – Primary living space to have direct access to private open space (multiple dwellings)	☐	☐	☒				
C2.1.4 – Max depth of single aspect primary living space (multiple dwellings only)	☐	☐	☒				
C2.1.5 – Bedrooms to have a minimum internal floor area of 9m^2 and a minimum dimension of 2.7m (multiple dwellings only)	☐	☐	☒				
C2.1.6 – Minimum ceiling height (multiple dwellings)	☐	☐	☒				
C2.1.7 –Minimum internal dwelling floor area (multiple dwellings)	☐	☐	☒				
C2.1.8 – Dwelling mix (10+ multiple dwellings)	☐	☐	☒				
C2.1.9 – Storage requirements in Table 2.1b	☐	☒	☐	See below.	See below.	See below.	
C2.1.10 – Reduced storage area dimension	☐	☒	☐	Min 4m^2 area, 1m dimension and 2.1m height store with 80% length openable door and 0.9m clearance required for each dwelling.	1m dimension and 2.1m height stores with 100% length openable doors and 1m clearance provided for each unit. Areas of **2.9m^2** for units 1-4, **3.3m^2** for unit 8 and **3.5m^2** for units 5-7 and 9-14 provided.	Refer to section 4.3 of the DA report.	
C2.1.11 – Major openings setback a minimum of 3m where facing directly onto car parking and corridors (multiple dwellings)	☐	☐	☒				
C2.1.12 – Separation of noise sources (multiple dwellings)	☐	☐	☒				

2.2 SOLAR ACCESS AND NATURAL VENTILATION

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.2.1 – Openable external window requirements for habitable rooms	☒	☐	☐	All habitable rooms to be provided with a window visible from all parts of the room, 50% transparent and min 10% of size of room.	All windows visible from all parts of habitable rooms and 100% transparent. Window areas are as follows: Ground floor primary living areas: 26.4% (8.95m^2) Upper floor bed 1: 19.1% (2.67m^2) Upper floor bed 2: 19.6% (2.52m^2)		
C2.2.2 – Courtyard requirements (when proposed as the only source of daylight to a habitable room)	☐	☐	☒				
C2.2.3 – Openable window requirements for bathrooms on external walls (excluding boundary walls)	☒	☐	☐	Bathroom windows to be provided on external walls (not boundary walls).	Windows to all bathrooms provided on external walls.		
C2.2.4 – Orientation of major openings to primary living spaces (single houses and grouped dwellings)	☒	☐	☐	Major opening to primary living space to be provided oriented between north-west and east with open area of min dimension of 3m x 3m adjacent, shading devices limited to 2m depth.	All primary living spaces provided with glazed double sliding doors facing north-east with a min 3m x 3m dimension open area adjacent, shading device max depth of 1.2m.		
C2.2.5 – Percentage of dwellings achieving solar access to major openings to primary living spaces (multiple dwellings)	☐	☐	☒				

2.3 PARKING

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.3.1 – Occupant parking in accordance with Table 2.3a	☒	☐	☐	Location A, therefore 0 occupant parking spaces required on site for each 2 bedroom dwelling.	1 occupant car bay per dwelling provided on site.		
C2.3.2 – Motorcycle/scooter parking (multiple dwellings)	☐	☐	☒				
C2.3.3 – Design of car spaces and manoeuvring areas as per *AS2890.1*	☒	☐	☐	See left.	All car bay dimensions are compliant and swept paths		

					demonstrate sufficient manoeuvring areas.		
C2.3.4 – Visitor parking in accordance with Table 2.3a	☐	☒	☐	4 visitor bays required as 14 dwellings proposed.	No visitor parking proposed on site.	Refer to section 4.3 of the DA report.	
C2.3.5 – Design and location of visitor parking	☐	☐	☒	Visitor parking to be marked for visitor use, located on common property and accessible to entrances.	N/A as no visitor parking proposed.		
C2.3.6 – Bicycle parking in accordance with Table 2.3b	☐	☐	☒	No bicycle parking required for grouped dwellings.	No bicycle parking proposed.		

2.4 WASTE MANAGEMENT

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.4.1 – Space for bin storage	☒	☐	☐	Bin storage space to be provided as per Local Government requirements.	Communal bin store sized to accommodate bins with sufficient capacity to meet WALGA requirements. Refer to the Waste Management Plan for more details.		
C2.4.2 – Waste management plan (multiple dwellings or 5+ grouped dwellings)	☒	☐	☐	See left.	Refer to the WMP provided as part of this DA.		
C2.4.3 – Screening of waste storage	☒	☐	☐	Bin stores to be screened from communal areas, street and public areas.	Bin store wholly screened with 2.1m wall.		
C2.4.4 – Communal waste storage area requirements	☒	☐	☐	Bin stores to be separated or screened from major openings, primary garden areas and communal open space.	Bin store screened from major openings, courtyards and driveway. Stores screen view from unit 2/3 upper floor major openings.		

2.5 UTILITIES

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.5.1 – Service utilities	☒	☐	☐	Utilities to be accessible, maintain sight lines and integrated or screened.	All utilities will meet this requirement. Letterboxes logically located at site entrance.		
C2.5.2 – Functional utilities	☒	☐	☐	Utilities not to be visible from primary street or visually intrusive generally, to be integrated and not cause noise impacts.	All utilities will meet this requirement. All clothes lines will be screened and are not located in primary garden areas. Hot water systems in courtyards will be screened.		
C2.5.3 – Solar collectors (where provided)	☒	☐	☐	Solar panels to be provided on roofs or equivalent.	If solar panels are provided they will be located on the roof.		

2.6 OUTBUILDINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.6.1 – Requirements for outbuildings	☐	☐	☒				
C2.6.2 – Additional outbuilding standards where designed to be compatible with the colour and materials of the dwelling	☐	☐	☒				

2.7 UNIVERSAL DESIGN

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.7.1 – 20% of dwellings to achieve silver level universal design (10 + grouped or multiple dwellings)	☒	☐	☐	3 dwellings required to meet silver level universal design.	All dwellings except units 1 and 3 (due to 2.9m car bay width) meet silver universal design requirements in A4 of the R-Codes.		
C2.7.2 – Gold level universal design requirements where seeking to apply site area variation in Part D, C1.1.6 or C1.1.7	☐	☐	☒				

2.8 ANCILLARY DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.8.1 – Ancillary dwelling requirements	☐	☐	☒				

2.9 SMALL DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.9.1 – Small dwelling requirements	☐	☐	☒				

2.10 HOUSING ON LOTS LESS THAN 100m^2

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.10.1 – Design standards for houses on lots less than 100m^2	☐	☐	☒				

3.0 NEIGHBOURLINESS

3.1 SITE COVER

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.1.1 – Site cover in accordance with Table 3.1a *(For single house and grouped dwelling development, refer section 5, C5.1 until 10 April 2026)*	☒	☐	☐	30% open space required per grouped dwelling area.	Each dwelling occupies 47m^2. Open spaces provided range from 53% to 61.5%.		

3.2 BUILDING HEIGHT

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.2.1 – Building height in accordance with Table 3.2a	☐	☐	☒	Refer to RSCPSP.	Refer to assessment against RSCPSP in DA submission.		

3.3 STREET SETBACKS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.3.1 – Setback of buildings in accordance with Table 3.3a	☐	☐	☒	Refer to RSCPSP.	Refer to assessment against RSCPSP in DA submission.		
C3.3.2 – Porch, verandah, balcony projections into the street setback area	☐	☐	☒	Refer to RSCPSP.	Refer to assessment against RSCPSP in DA submission.		
C3.3.3 – Setback from corner truncations	☐	☐	☒	Refer to RSCPSP.	Refer to assessment against RSCPSP in DA submission.		
C3.3.4 – Garages setback from primary street in accordance with Table 3.3b	☐	☐	☒		No garages proposed.		
C3.3.5 – Setback of carports from a primary street	☐	☐	☒		No carports proposed.		
C3.3.6 – Setback of garages and carports from a secondary street, right-of way and communal street in accordance with Table 3.3a	☐	☐	☒		No garages or carports proposed.		

3.4 LOT BOUNDARY SETBACKS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.4.1 – Buildings set back from lot boundaries in accordance with Table 3.4a	☐	☐	☒	Refer to RSCPSP.	Refer to assessment against RSCPSP in DA submission.		
C3.4.2 – Maximum length for two storey walls	☐	☐	☒	Refer to RSCPSP.	Refer to assessment against RSCPSP in DA submission.		
C3.4.3 – Setback of carports, patios, verandahs or equivalent structure	☐	☐	☒		Not proposed.		
C3.4.4 – Maximum height and length of boundary walls in accordance with Table 3.4b	☐	☐	☒	Refer to RSCPSP and see below.	Refer to assessment against RSCPSP in DA submission for units 1, 7, 8 and 14, otherwise see below.		
C3.4.5 – Boundary wall abutting an existing or simultaneously constructed wall	☒	☐	☐	Boundary walls may be built up to existing or simultaneous boundary walls.	All internal boundary walls proposed directly abutting each other.		
C3.4.6 – Grouped dwellings on the same lot set back as if there is a boundary between them	☐	☐	☒	See left.	Only boundary walls proposed.		
C3.4.7 – Multiple dwelling buildings on the same lot set back as though there is a lot boundary	☐	☐	☒				

3.5 SITE WORKS AND RETAINING WALLS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.5.1 – Retaining walls, fill and excavation in the street setback area max 0.5m, except where necessary to provide for pedestrian universal access and/or vehicle access, drainage works, or natural light to a dwelling	☒	☐	☐	See left.	Maximum level difference across entire site is 0.5m. Fill/retaining will remain within this limit.		
C3.5.2 - Retaining walls and fill behind the street setback in accordance Table 3.5a	☒	☐	☐	See left.	Maximum height 0.5m or less.		
C3.5.3 – Excavation behind the street setback line and up to the lot boundary	☒	☐	☐	See left.	No excavation is possible due to the contamination cap under the site.		

3.6 STREETSCAPE

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.6.1 – Single houses and grouped dwellings address the street	☒	☐	☐	Primary entrance to each dwelling must be readily identifiable from the street and one major opening must face the street.	The north row of dwellings have the primary entrance and two major openings (one on each level) addressing Goddard St. The south row of dwellings have the primary entrance facing the communal street to the north and two major openings each facing the communal street to the north and right-of-way to the south.		
C3.6.2 – Multiple dwelling upper level balconies address the street	☐	☐	☒				
C3.6.3 – Front door protection from the weather	☒	☐	☐	Front doors to be protected from the weather by a structure with a 1.2m depth.	1.2m deep roof provided over all front doors.		

C3.6.4 – Ground floor multiple dwellings access to the street	☐	☐	☒				
C3.6.5 – Maximum garage door width	☐	☐	☒		No garages proposed.		
C3.6.6 – Maximum carport width	☐	☐	☒		No carports proposed.		
C3.6.7 – Fence or wall within the primary street setback area requirements	☒	☐	☐	Fences along Goddard St to be maximum height 1.8m and visually permeable above 1.2m.	Goddard St fence proposed to be 1.8m high and visually permeable above 0.9m.		
C3.6.8 – Pillars as part of street fence/wall	☒	☐	☐	Pillars in fence to be maximum height of 1.8m and maximum horizontal dimension of 450mm.	Pillars proposed to maximum height of 1.8m and horizontal dimension of 50mm.		
C3.6.9 – Secondary street fencing for corner sites	☐	☐	☒		There is no secondary street for this site within the R-Codes definition.		

3.7 ACCESS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.7.1 – Vehicle access hierarchy	☒	☐	☐	Vehicle access to be provided from a right-of-way.	Vehicle access is provided from the adjacent right-of-way to the east.		
C3.7.2 – One vehicle access per lot	☒	☐	☐	See left. Reiterated by provision 2.2.5.2(a) of the RSCPSP.	One vehicle access proposed.		
C3.7.3 – Driveway dimension requirements	☒	☐	☐	Driveways to be min 3m wide, max 6m at the street, aligned at right angles and adequately trafficable and drained.	All requirements in this provision have been met. Minimum width of 3.9m proposed at the crossover (3m on site if footpath excluded).		
C3.7.4 – Driveways that allow vehicles to exit in forward gear	☒	☐	☐	See left. Applies as driveway serves over 5 dwellings and is over 30m long.	Swept paths in DA plan set confirm that cars will be able to manoeuvre out of any bay and exit the site forwards.		
C3.7.5 – Driveway allow passing (when 30m+)	☒	☐	☐	Passing points required to be provided every 30m with 5.5m width for 6.3m length in these locations.	7.2m x 5.5m passing point provided within site adjacent to crossover, located 25m from end of driveway.		
C3.7.6 – Driveways onto primary distributor or integrator arterial roads	☐	☐	☒				
C3.7.7 - Sightlines	☒	☐	☐	Solid structures truncated or reduced to 0.75m height within 1.5m of where a driveway adjoins a right-of-way.	As the public access easement is set back 7m from the lot boundary, the letterbox is also set back 7m from the point where the driveway and right-of-way intersect for the purposes of this requirement.		
C3.7.8 – Pedestrian access (grouped and multiple dwellings)	☐	☒	☐	Legible, well-defined, continuous path provided from public footpath and car parking areas to dwelling entries.	Individual access to each dwelling proposed from the Goddard St footpath (north row) and the right-of-way to the south (south row). Access to units 8-11 and 14 not entirely via land protected by public access easement.	Refer to section 4.3 of the DA report.	
C3.7.9 – Delineated or separate pedestrian access (10+ grouped and multiple dwellings)	☒	☐	☐	Minimum 1m wide footpath required along communal street delineated from vehicle access and providing access to dwelling entries.	1m wide footpath delineated along communal street providing access to all dwelling entries.		
C3.7.10 – Pedestrian access legs	☐	☐	☒				
C3.7.11 – Communal street or battleaxe leg requirements	☒	☐	☐	Minimum width of communal street to be 3.6m including minimum 3m wide driveway and 0.3m setback either side.	Compliant minimum 4m width and 3m driveway proposed, min 1m setback to closest wall.		
C3.7.12 – Lighting and landscaping of communal streets or battleaxe legs	☒	☐	☐	Refer to C1.2.3.	Communal street is landscaped to the greatest extent possible. Lighting will be provided, details to be confirmed at BP stage.		
C3.7.13 – Notwithstanding C3.7.11, communal streets to 20 or more lots requirements	☐	☐	☒				

3.8 RETAINING EXISTING DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.8.1 – Requirements where a dwelling is retained	☐	☐	☒				

3.9 SOLAR ACCESS FOR ADJOINING SITES

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.9.1 – Maximum overshadowing in accordance with Table 3.9a	☒	☐	☐	Maximum 23.65% of lot 14 (3) Market St may be overshadowed as the R-Codes allow 50%, but this site comprises 47.3% of its northern lot boundary.	7.2% overshadowing of lot 14. Not applicable to Lot 303 McNicholl St to the south-east as it is commercial and therefore not included in the R-Codes “Lot” definition for the purposes of this requirement.		
C3.9.2 – Maximum overshadowing where R40 or greater and has a lot frontage of 7.5m or less	☐	☐	☒		Not applicable to individual grouped dwellings as they are not included in the R-Codes “Lot” definition for the purposes of this requirement.		
C3.9.3 – Maximum overshadowing requirements where the adjoining property shares a northern lot boundary with more than one lot	☒	☐	☐	See C3.9.1.	See C3.9.1.		

3.10 VISUAL PRIVACY

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.10.1 – Visual privacy requirements where adjoining a developed site	☐	☒	☐	Cones of vision from upper floors not to capture major openings or active habitable spaces for adjoining grouped dwellings or lots. Cones of vision not to capture adjoining major openings or active habitable spaces. 3m length applied from upper floor bedroom major openings (ie all openings) except for north frontage facing Goddard St where 6m length applies from balconies.	Cones of vision from both sides of units 1, 7, 8 and 14 overlook small areas of lot 9 to the west and lot 303 to the east. Cones of vision from all upstairs balconies and juliet balconies overlook parts of primary garden areas of adjacent units. Cones of vision from unit 2-7 and 9-13 bedroom 2 windows slightly protrude over rear landscaping strips for units 2-7 or setback areas for units 9-13.	Refer to section 4.3 of the DA report.	
C3.10.2 – Notwithstanding C3.10.1, Visual privacy design solutions	☐	☐	☒		Obscured glazing, screening or other building elements not proposed as design principle has been met as confirmed in section 4.3 of the DA report.		
C3.10.3 – Offsetting of bedroom and study windows	☐	☐	☒				
C3.10.4 – Overlooking for grouped or multiple dwellings within a lot	☐	☒	☐	C3.10.1, C3.10.2 and C3.10.3 apply to each dwelling.	See C3.10.1-3 above.	Refer to section 4.3 of the DA report.	
C3.10.5 – Visual privacy where adjoining a vacant or unknown site	☐	☒	☐	Cones of vision not to protrude into lots 9 and 14 adjacent.	See C3.10.1 above.	Refer to section 4.3 of the DA report.	
C3.10.6 – Notwithstanding C3.10.5, visual privacy design solutions where adjoining a vacant or unknown site	☐	☐	☒	Obscured glazing, screening or other building elements to be provided to prevent overlooking of cone of vision protrusion into lots 9 and 14.	See C3.10.2 above.		

CONSULTATION

FURTHER COMMENTS

RECOMMENDATION

APPROVE ☐ REFUSE ☐

Design Review Comment	Response
Principle 1 – Context and character	
The matter of scale is critical to the success of the development and the site context. At present the development falls short of the expectations of the planning framework which also means that it would be out of context with both existing and currently envisaged future development, including the Reserve on the opposite side of Goddard Street.	All dwellings are now 100% two-storey and therefore comply with the height requirements of the current and draft planning framework. The proposed typology and size of the dwellings is suitable for the intended end users (aged people), with exclusive use primary garden areas and ground floor living areas optimising living standards and accessibility for the residents.
The applicant is encouraged to demonstrate the relationship of the proposal to the future character of the area with particular consideration given to the relative heights of neighbouring sites.	The character of the precinct is still developing, given most lots are vacant. The different roof height of this development will add variability to the area once built out, which is a good urban design outcome. The significant setback between this site and the apartments at lot 304 to the east will also moderate the differences between the two buildings. Development plans for lot 9 to the west have not been made available, which has prevented this project from responding to that proposal.
One of the key negative components of the design as proposed, is the tall, visually impermeable fence along Goddard Street.	This has been replaced with a 0.9m solid wall base and 0.9m visually permeable fence above.
Southern elevation is less resolved; it should have same consideration, similar to northern elevation.	The south elevation has been given the same treatment as the north elevation of each row of dwellings, without the balcony and colour feature as these are necessary to ensure legibility by denoting the front access point of each dwelling.
The Panel would favour larger street setback to gain benefit of northern aspect to Goddard Street, across all floors. This would also allow the primary outdoor open space for each of the northern bank of units to be on the northern side which would significantly improve the amenity of these spaces.	These larger street setbacks are proposed for the reasons identified by the Panel in this comment and have been justified against the planning framework requirements in the planning report.
Incorporate permeable fencing, to provide interface and relationship with street.	This has been provided.
Greater articulation at corners is encouraged to relate to and address the immediate context.	The modular construction approach requires all dwellings to be identical, which prevents unique dwellings from being proposed to address corners (eg. via a truncation). To do so would compromise the viability of the project. Due to this, a deliberate design decision has been taken to align the townhouses as consistent volumes.

Principle 2 – Landscape quality

Provision for tree planting in carpark is good.	Additional space to increase the tree canopy coverage has been provided in the revised design.
Car parking in laneway is unresolved, especially regarding pedestrian movements.	It is beyond the scope of the landowner to propose development on adjoining privately owned land, which this comment would necessitate.
Provision of tables in front of doors in private open spaces, highlights the spatial inadequacy of several of the courtyards.	Space has now been provided for tables in courtyards that do not block entrance doors.
Could nut trees be provided for owners and native wildlife?	Lower maintenance trees are proposed.
Panel prefers more trees in lieu of visitor bays.	Larger and more trees in lieu of visitor bays have been provided.
Courtyards feel heavily paved. Further development of the landscape response should consider greening this space and the exploration of hardscape materials that soften this space with the view to a shared pedestrian and vehicle zone.	Substantial deep soil area has been added to all courtyards and alongside the shared pedestrian and vehicle zone.
Size of all courtyards is a concern, apart from those on the southern side of the northern bank of units. However, the amenity of these larger southern courtyards is compromised due to them being in shade for much of the time and the extent of paving.	The courtyard sizes for units 2-6 and 8-14 are compliant. The units 1 and 7 courtyards are marginally below the minimum size requirement and this is compensated for by additional outdoor space on the south side of these dwellings.
Provision of mini landscapes in large carpark tree wells is encouraged.	Substantial additional landscaping has been provided throughout and around the car park.
Central area road could be moved more to the north, to allow for expansion of the northern courtyards associated with the southern bank of units.	This has not been able to be achieved as doing so would compromise the functionality of the primary garden areas and open space associated with units 1-7.
Landscape as proposed for the courtyards in general requires further work to improve the usability and amenity of these spaces.	Substantial additional landscaping has been provided in all courtyards.
Opportunity to improve landscape interface with Goddard Street.	Substantial additional landscaping has been added in the setback between the units and Goddard Street.

The central carpark area could be partially trellised and repurposed, more in the form of a shared space/piazza, to provide an attractive communal gathering space and thus help engender a stronger sense of community.	It is intended that the central driveway/footpath area will function as a shared 'break-out' space to foster a sense of community among the future residents.
Principle 3 – Built form and scale	
Built form/scale is too low in comparison to context. This is considered the fatal flaw of the proposal.	All dwellings are now 100% two-storey and therefore comply with the height requirements of the current and draft planning framework.
The single storey units are not supported. Consider apartment incorporation above with stairs.	All dwellings are now 100% two-storey.
Issue of (lack of) scale and presence on Goddard Street.	All dwellings are now 100% two-storey and are compliant. The Goddard Street elevation has been designed with upper floor balconies and a deep eave projecting towards the street, along with shade trees in very close proximity to the street, to increase the bulk of the development that will be perceived by passers by.
Comment was made that the floor to ceiling height of ground floor could be increased.	A 2.75m floor-to-ceiling height is proposed, which is sufficient for dwellings of this size and depth. This height would meet the R-Codes apartment floor-to-ceiling height requirement if it applied.
Provision of balconies onto Goddard street encouraged	Balconies facing Goddard Street have been provided.
Concern in relation to the width of proposed units being undersize. This may require a reduction in the number of units across the width of the site to ensure compliance, functionality and amenity.	Both rows of apartments now include 7 dwellings instead of 8 and now have sufficient width to ensure appropriate internal circulation.
Double storey on laneway would provide better passive surveillance.	All dwellings are now 100% double storey and are positioned in close proximity to the laneway. Major openings are provided on both storeys to provide passive surveillance.
Principle 4 – Functionality and build quality	
Type 1 units look narrow and cramped to the extent that this appears to be impacting upon ease of circulation, e.g. the dining table and chairs are uncomfortably close to the back door, and leave only a restricted width for the primary access here.	Both rows of apartments now include 7 dwellings instead of 8 and now have sufficient width to ensure enough room for furniture and appropriate internal circulation space.

Provision for three bins needs to be considered.	A communal bin store has now been provided. The Waste Management Plan provided in support of this development application confirms that sufficient space for bins has been provided.
Don't support drying areas in front areas - sub-optimal.	All drying areas are screened from the street and public access easements.
Where is the location of air-conditioning plant?	This will be confirmed at a later design stage, however it is intended that they will not be prominently visible and/or screened.
Too much variation in storeroom sizing.	The store rooms are now similar and have been reconfigured as thin, sliding-door stores as per the option provided in Part C of the R-Codes.
Dimensioned drawings are required to aid in assessment.	The development application drawings are dimensioned.
High level windows in all bedrooms creates issue with blocking out light.	All windows to habitable rooms have been increased in size to ensure appropriate solar access, natural ventilation and an attractive outlook.
Consider waste collection location.	Waste collection is proposed within the public access easement that serves as the site crossover, as shown on the plans.
Principle 5 – Sustainability	
The Panel questions the true cross ventilation of the proposal and request clarification. For example the manner in which crossflow ventilation is achieved on the upper levels where there are bedrooms across the whole width of the unit, on either side of the unit. A strategy to maximise north facing habitable internal and external spaces is fully supported	The south side of the upper floor of each dwelling now includes two windows, one to a bedroom and one to a bathroom, to provide improved cross-ventilation options for occupants. The master bedrooms and primary living spaces all face north, which is sufficient given the second south-facing bedroom is likely to be used as a spare room by many of the aged residents.
Consider micro EV capability and opportunities.	This will be considered at a later detailed design stage.
The applicant is encouraged to integrate elements to optimise passive solar design principles for winter and summer sun.	Passive solar design and broader sustainability is a strong focus of this project. The design report confirms that solar passive design principles have been optimised by this development.
An increase in sustainability commitment is necessary.	Refer to the sustainability initiatives detailed in section 3.4 of the development application submission report.

Principle 6 – Amenity	
Consider providing balconies on upper floors for outdoor areas.	Balconies have been provided.
Amenity hasn't been optimised on northern bank. Southern units also lack amenity. Refer above for various comments.	We believe that the revised design optimises amenity for both the northern and southern banks.
Central carpark area could have more trees, plus seating and other measures to create a private park or piazza.	Substantial deep soil area and five more trees than required by the R-Codes have been provided in the central carpark area.
Type 1 units are considered too narrow and clarification is sought. Type 2 has the potential to incorporate a double height void and this is encouraged.	Both rows of apartments now include 7 dwellings instead of 8 and now have sufficient width to ensure appropriate internal circulation. The revised unit designs do not include opportunities for a void.
The location of air-conditioning condensers needs to be considered and indicated on drawings.	This will be confirmed at a later detailed design stage.
Bedrooms and bathrooms upstairs - perhaps provide a toilet under the stairs for ground floor use to allow for flexibility of spaces.	A toilet has been provided under the stairs.
Collective bin storage area for consideration.	This has been provided.
Design robust ground floors to cater for office/work from home type environment.	The ground floors are open plan and regularly shaped to maximise flexibility for future adaptability.
Principle 7 – Legibility	
Where is the front door? It's not clear. Greater legibility required.	The front doors face north for all dwellings and are legible through the colour scheme on this side of the dwellings. The front doors of the north bank of dwellings are visible and legible from Goddard Street, and for the south bank of dwellings footpaths lead directly to the courtyard entrance gate which aligns with the front door.
Gates and entries off car parking require further work to make more legible.	Delineated footpaths provide legible access for all dwellings from the car parking area.
Mailboxes for southern units - how is numbering/mail delivery going to work?	A mailbox for all dwellings has been provided at the site entrance adjacent to the public access easement.

Principle 8 – Safety	
Good passive surveillance is provided generally, apart from the tall garden walls on Goddard Street.	The tall walls along Goddard Street have been replaced with a 0.9m solid wall base and 0.9m visually permeable fence above
Encourage lower, and/or more transparent walls to Goddard Street frontage.	This has been actioned as mentioned above.
Passive surveillance is provided over both laneways; consider from upper floors.	Passive surveillance is provided via balconies and large major openings on both sides of all upper floors.
The carpark is a shared pedestrian zone and the panel encourages a design resolution that acknowledges and celebrates this.	This outcome has been retained.
Principle 9 – Community	
Support building type and strongly support addressing need.	We thank the Panel for this positive comment.
Central space needs to provide more to residents and the exploration of a shared vehicle and community space is encouraged.	The central space has been enhanced with additional landscaping and tree canopy to improve its amenity. It has been designed to maximise opportunities for use as an informal 'break-out' space for occupants.
Generous tree planting in the central carpark area would also be good for community and passive solar design for southern units.	Five more trees than required by the R-Codes have been provided along the driveway and adjacent to car bays.
Look at landscaping public domain; this should be indicated on drawings and form a part of the conditions of approval.	The scope of this project is limited to the site boundaries of Lot 10 Goddard Street, other than the crossover to the public access easement which is necessary to gain access to the site.
Principle 10 – Aesthetics	
Dark cladding would add to urban heat island effect. Recommend moderating use of dark cladding.	The dark cladding has been deleted.
Address ends and corners of laneway units to better address their context	As mentioned previously, corners are unable to be addressed through unique dwelling design (such as a truncation) due to the modular construction of the dwellings. Windows were considered for the east-facing dwellings, however as they are boundary walls on a private lot boundary, the project team has received advice that these cannot be provided due to fire separation requirements.

The frontage along Goddard Street is composed of two cladding materials. The comment was made this scale of the development may benefit from a more singular approach.	The materials on the front elevation have been simplified in response to this comment. Different colours are proposed to provide personality to the development.
Some further work required on materials.	Refer to the plans and design report which provide material details.
Summary (Key Issues)	
The purpose of the development is strongly supported. However, the scale of the development does not address the context of the immediate area under the existing or proposed planning framework.	All dwellings are now 100% two-storey and therefore comply with the height requirements of the existing and proposed planning frameworks.
Improved amenity for all outdoor areas and communal areas is required.	The amenity of all outdoor areas has been improved by setting back the northern bank of dwellings from Goddard Street, adding significant landscaping and ensuring that all outdoor and communal areas are sized appropriately.
Internal dimensions do not appear to meet the minimum requirements.	Both rows of apartments now include 7 dwellings instead of 8 and now have sufficient width to ensure appropriate internal circulation.
Front entries are not legible.	This has been resolved through colours on the front elevations and legible delineated pathways along pedestrian desire lines to all dwelling entrances.



STELLAR LIVING COMMUNITY HOUSING

DEVELOPMENT APPLICATION

14 dwelling terrace housing development

MDC ARCHITECTS

DALE ALCOCK PROJECTS & STELLAR LIVING

LOT 10 (5) GODDARD STREET, ROCKINGHAM

stellar living
Sustainable Affordable Innovative

DALE ALCOCK PROJECTS

PRINCIPLE 1 - CONTEXT & CHARACTER

OBJECTIVE
Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.



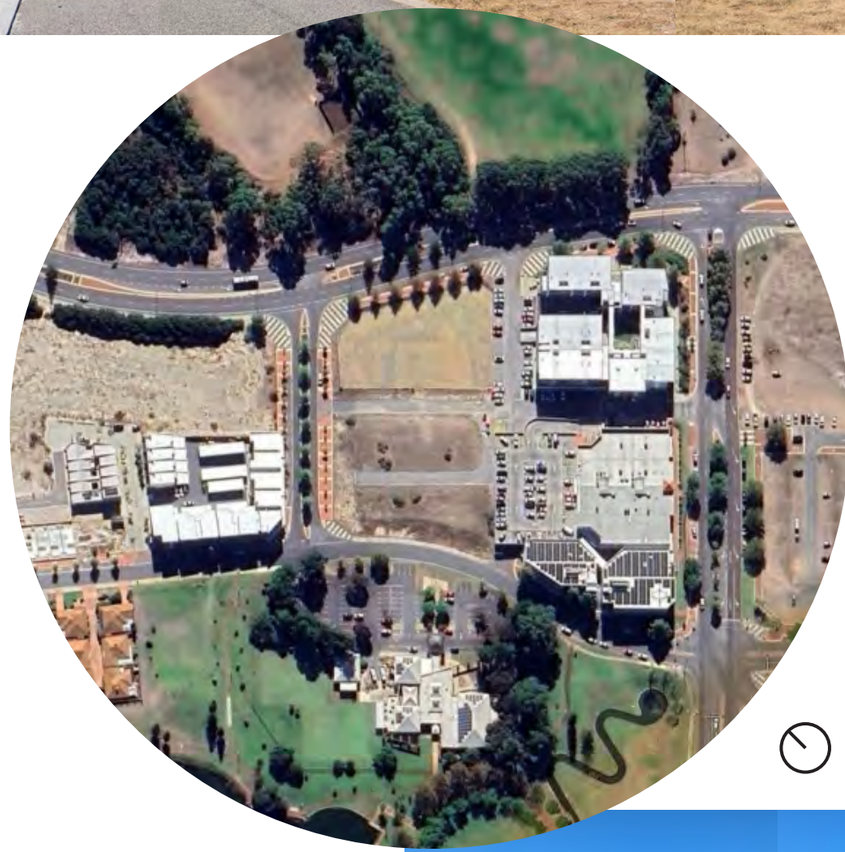
varied context of adjacent built form to the SE

The site, located within the City Park Sub-Precinct, provides opportunity for development under the Rockingham Strategic Centre Precinct Structure Plan (RSCPSP) of increased residential density, responding to the City's need to provide a variety of housing typologies.

The RSCPSP calls for new developments that are flexible and adaptable, ones that; foster the development of a Strategic Centre which possesses a diversity of built form typologies, provide high-quality streetscapes through well considered approaches to building frontages, and achieve appropriate built form outcomes, including a range of medium to high density housing.

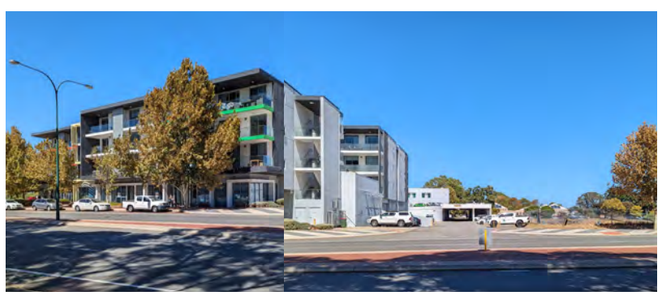
The proposal for Lot 10 (5) Goddard St is aligned with the future ambitions and objectives of the RSCPSP. It offers a high-quality terrace housing development that meets the R80 zoning requirements of the site.
The proposed density is in line with the RSCPSP's ambition, but more importantly, the proposal prioritises the amenity of future occupants and the surrounding urban environment. The 'mews' typology provides dwellings that are well-lit and well-ventilated, with access to winter sunlight and addressing public space. This includes Goddard St and the generous open mews between the built form.

This building typology situates itself well within an evolving new precinct of diverse built form, providing a much needed housing typology that is inclusive and provides high quality amenity to the users.





view SW to existing low rise built form



View from opposite side of Goddard st to adjacent mixed-use development



View north-west towards 2-3 storey townhouse development

PRINCIPLE 2 - LANDSCAPE QUALITY

OBJECTIVE
Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.

The proposal seeks to consolidate open space and deep planting areas, facilitating a landscape design approach that enables increased tree canopy coverage and high quality amenity in both the public and private outdoor areas.

The mews typology, with dual aspect living, enables every dwelling to have a front and rear courtyard. The northern courtyards, as the primary outdoor area, have been designed as the main address to the building for visitors, accessed from the communal mews area or from Goddard St. This creates a street address, on both levels, that is prefaced by consolidated greenery and tree canopy, enhancing the quality of the public urban realm.

A soft palette of endemic ground covers and shrubs comprises the majority of planting beds, whilst each of the deep soil zones is provided with a small-medium tree that mediates shade and solar access as required. Paving is minimized to encourage water run-off into garden beds and to reduce urban heat island effects. The communal mews space is conceived as a shared realm, for pedestrians and vehicles alike. It offers shade and greenery whilst also providing a sense of separation and privacy between the built form.



3 Courtyard planting to Goddard St



Driveway planting

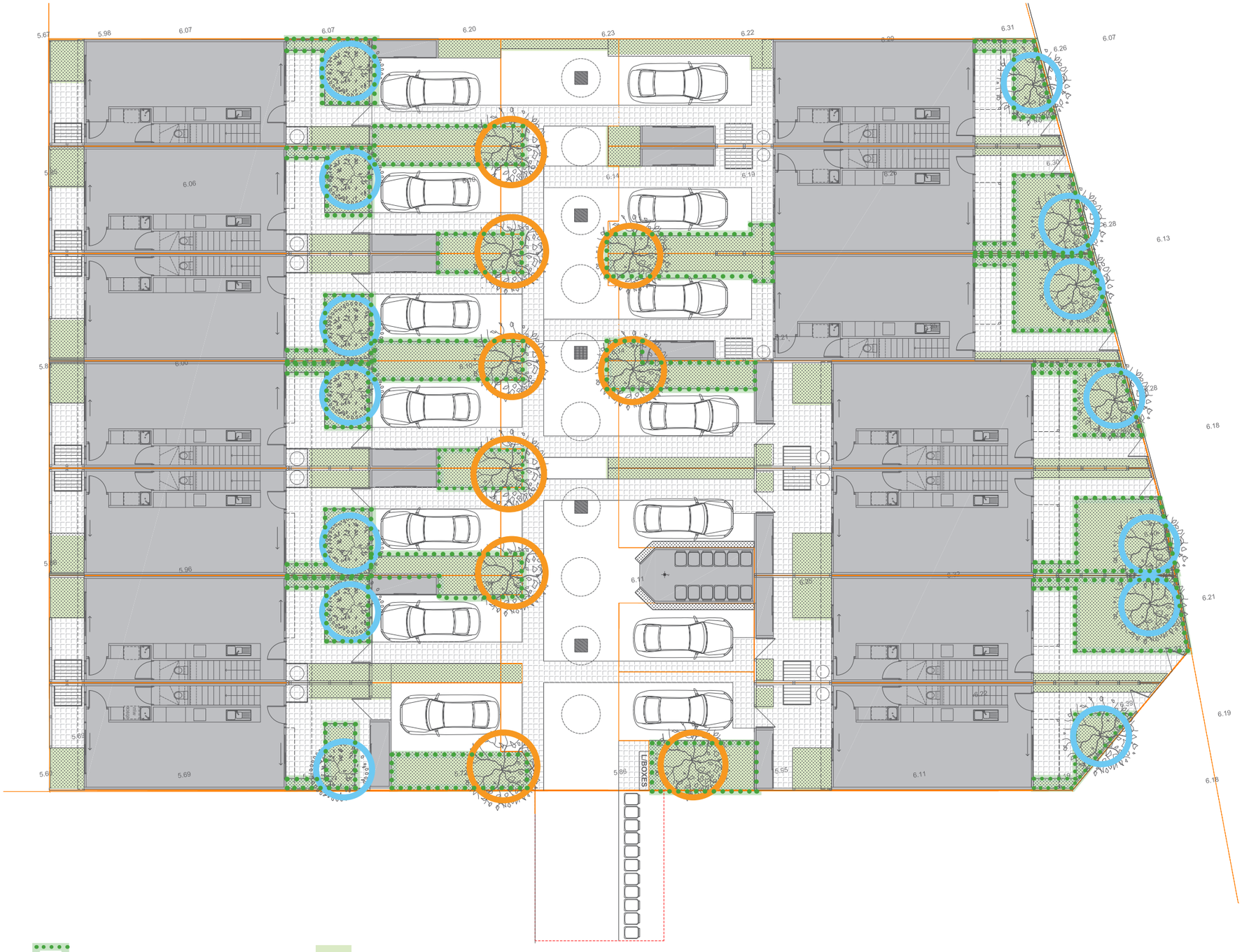


North courtyard (Goddard Street)



North couryard (Driveway)

LANDSCAPE DESIGN
tree planting



courtyard trees



Eucalyptus caesia
silver princess



Sapium sebiferum
chinese tallow

driveway trees



Eucalyptus victrix
coolibah



Corymbia ptychocarpa
pink-flowering bloodw-
dood

deep soil zone

planting

LANDSCAPE DESIGN
planting palette - driveway & north facing courtyards

GROUND COVERS + CLIMBERS



Eremophila glabra



Acacia ashbyae



Chorizema varium (pros-trate)



Casuarina glauca



hibbertia scandens

GRASSES



Lomandra ‘wingara’



Lomandra ‘tanika’



Conostylis candicans

SHRUBS



Leucophyta brownii



Guichenotia ledifolia



Beaufortia aestiva summer flame



Correa backhouseana



NORTH ROW



SOUTH ROW

LANDSCAPE DESIGN
planting palette - south facing courtyards

GROUND COVERS + CLIMBERS



Hibbertia scandens



Dichondra silverfalls



Liriope just right



Parthenocissus tricuspidata
'boston ivy'



NORTH ROW

GRASSES/SHRUBS



Correa backhouseana



Boronia crenulata



Lomandra tanika



SOUTH ROW

PRINCIPLE 3 - BUILT FORM & SCALE

OBJECTIVE
Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.

Through the adoption of a terrace housing typology with party wall construction, the built form can be consolidated into larger ‘groupings’ of dwellings, presenting a more cohesive address to the public realm, more akin to that of an apartment building. The terrace house typology is efficient, both in its construction methodology and its land-use, enabling more affordable housing that offers a high quality amenity and generous open, landscaped spaces.

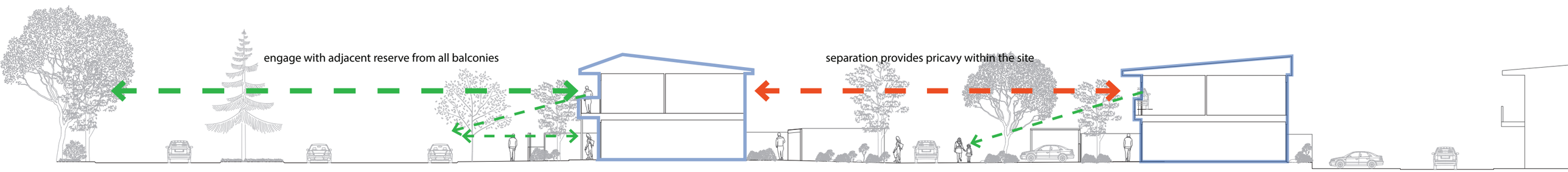
The relationship between the two rows of buildings encourages an active landscaped are in the mews, whilst also providing privacy between the rows.

Timber-framed construction has been chosen for its cost-effectiveness and quick construction time. Additionally, it helps to reduce the carbon footprint of the building due to its low embodied carbon. The party walls of the construction also contribute to reducing thermal exposure. The two-storey development is affordable to build and meets the client’s requirement for low-cost housing. The construction of these homes broadens the range of people who could potentially occupy them.

The two-story structure allows us to construct our building up to the East and West boundaries without causing any negative impact on the surrounding sites. The Western boundary is next to a neighboring site that is likely to adopt similar building principles. On the other hand, the Eastern boundary is adjacent to a larger mixed-use building with a nil setback to the public access easement boundary, consistent with the siting of the townhouse rows. The overall site planning approach provides the necessary articulation to this elevation. The richly vegetated open mews road offers ample greenery to the road/easement while the building elevation is emphasized by the ‘wrapping’ of the roofing down the wall, creating a ‘carapace’ of sorts. Further articulation is achieved by incorporating the northern balconies and courtyards into this elevation.



connection to adjacent nature reserve & Goddard St



PRINCIPLE 4 - FUNCTIONALITY & BUILD QUALITY

OBJECTIVE
Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.

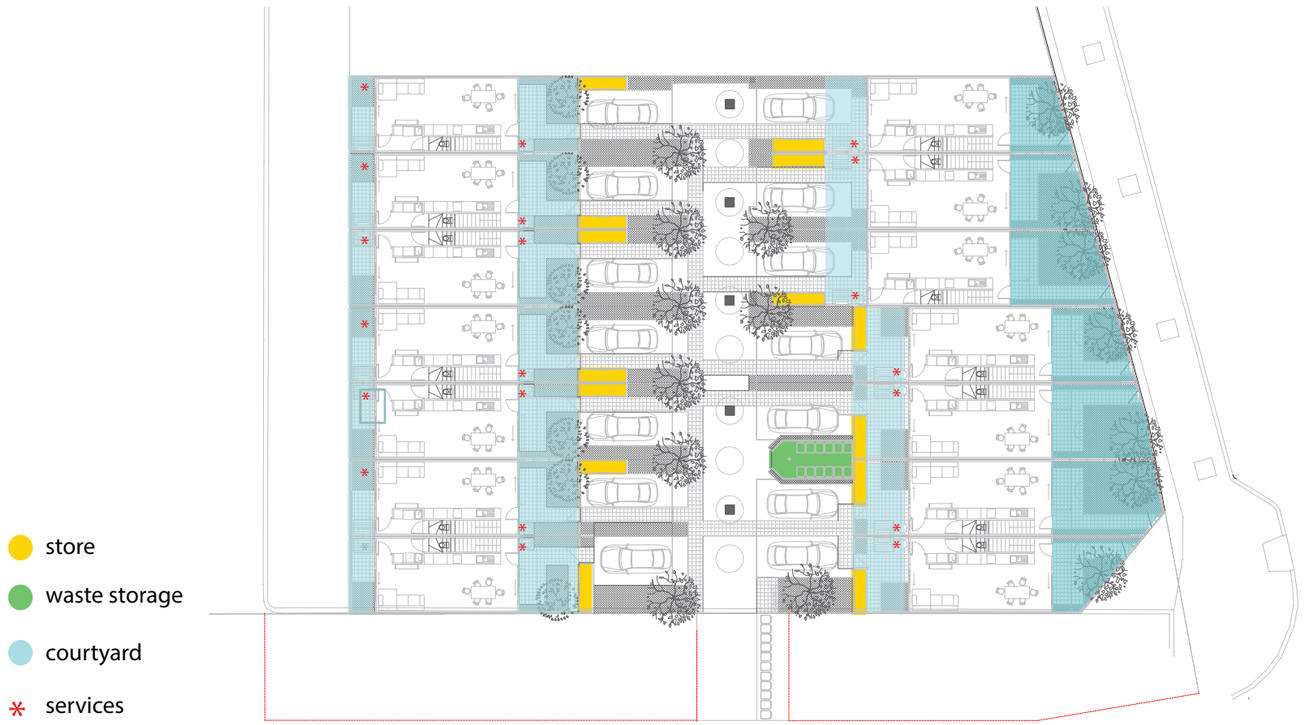
The terrace housing typology enables the collectivisation of certain aspects of the building program, similar to an apartment complex, whilst still providing the amenity and individuality of a grouped dwelling development.

Waste has been consolidated into a singular bin store, reducing the number of bins and the physical impact they would otherwise have on the site.

Private stores have been designed to meet the needs of the end users and located between the dwelling and common driveway are for ease of use. The added benefit of this location will be the partial sleeving of vehicles from the easement road as well as providing a sense of privacy and screening between the individual dwelling courtyards and/or additional services such as heat pump units and washing lines.

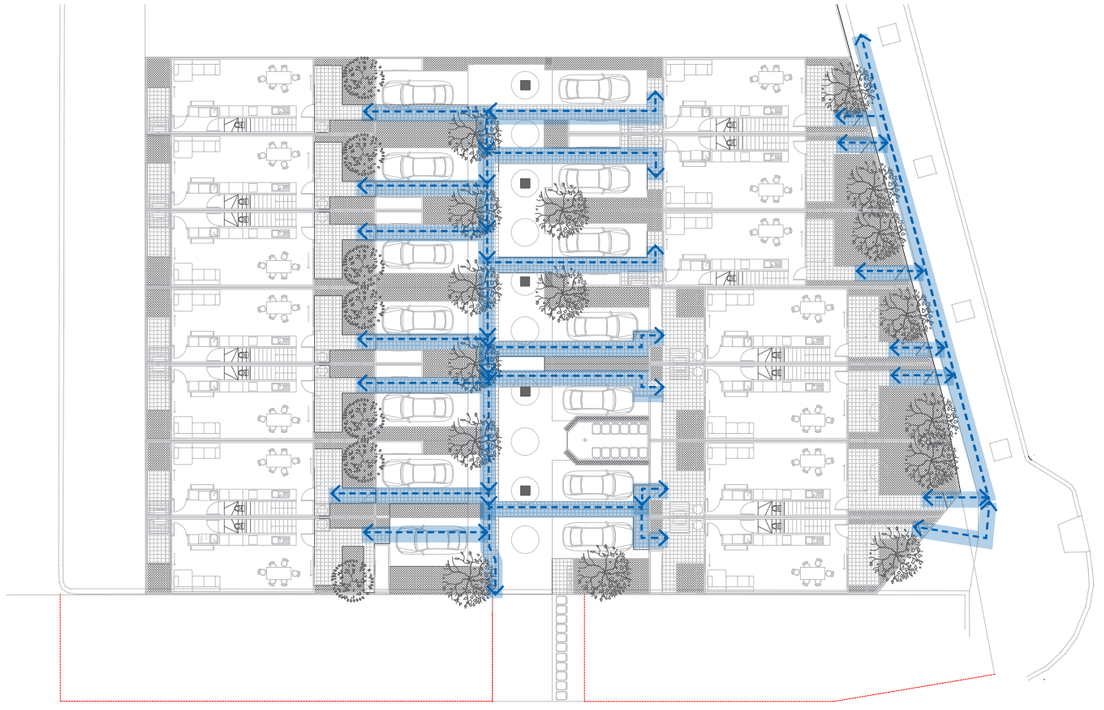
Pedestrian movement into and within the site is clear and functional, designed to meet silver standard of accessibility into every dwelling. Vehicles are slowed through the use of planting beds and trees within the central common mews space.

The dwellings are clearly laid out, compact yet uncompromising on the quality of amenity to each individual living space (internally and externally). All rooms have access to natural light and ventilation and the primary living areas all face to the north to maximise winter solar gain.





central mews space



pedestrian movement through site

PRINCIPLE 5 - SUSTAINABILITY

OBJECTIVE
Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.

Passive sustainability is at the core of the design proposal. The siting of the buildings and their orientation optimises access to winter sunlight whilst the roof and balcony overhangs have been strategically designed to respond to shielding from the summer sun (and minimising solar penetration during the equinox).

Party wall construction minimises thermal exposure of the envelope of each building to the east and west, assisting maintaining a stable internal environment through shading and the use of a thermal mass in the ground floor concrete slab. Upper floors are all framed, assisting in the rapid purging of hot air through well-placed openings that make use of the site's coastal proximity and sea breezes. The aim, to achieve a minimum 7star NatHERS rating.

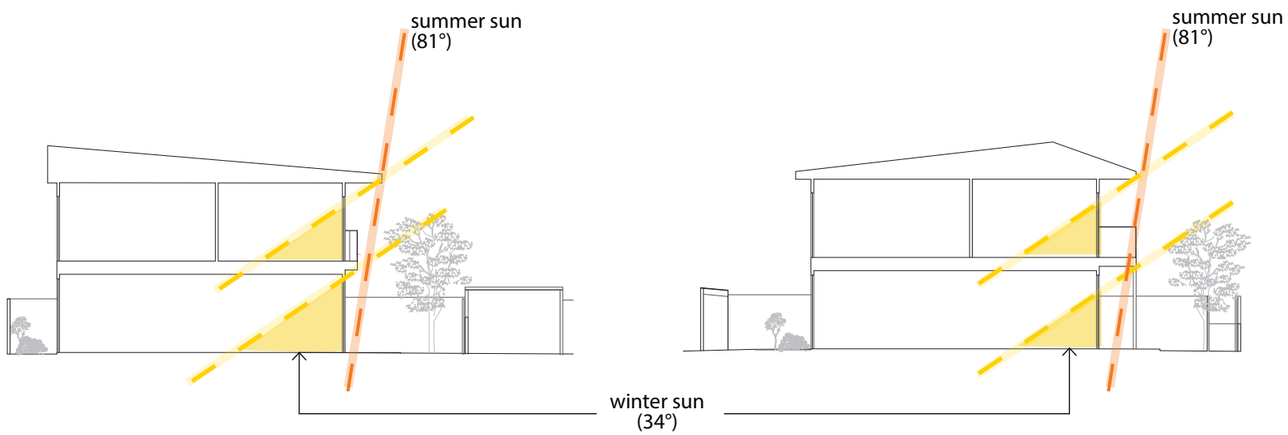
Vegetation has been considered as part of the sustainability proposal, providing green canopy to shade during summer, reducing the urban heat island effect of the communal mews space and private courtyards.

At a base level, this low-tech approach to sustainability will ensure comfortable year round internal environments and reduced on-going running costs to the occupants.

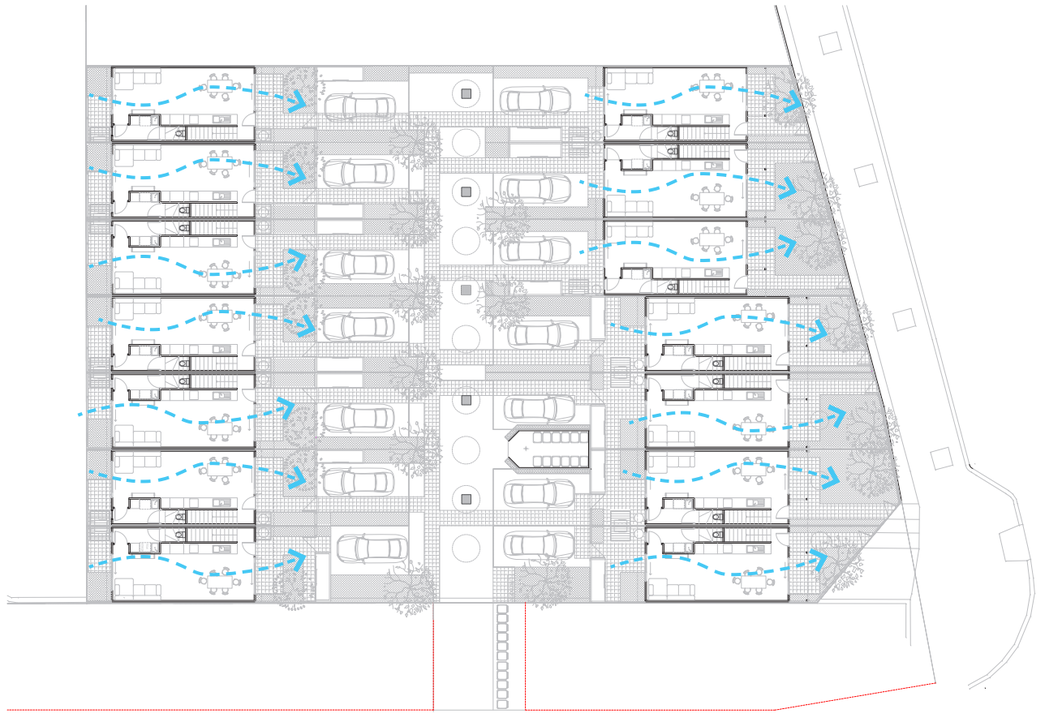
The development is proposed to be all-electric, relying on high efficiency heat pumps for hot water and provisioning for solar to offset energy consumption where possible.

Hardscape has been balanced with ample vegetation and planting beds for rainwater run-off, encouraging infiltration, reducing the reliance on soakwells.

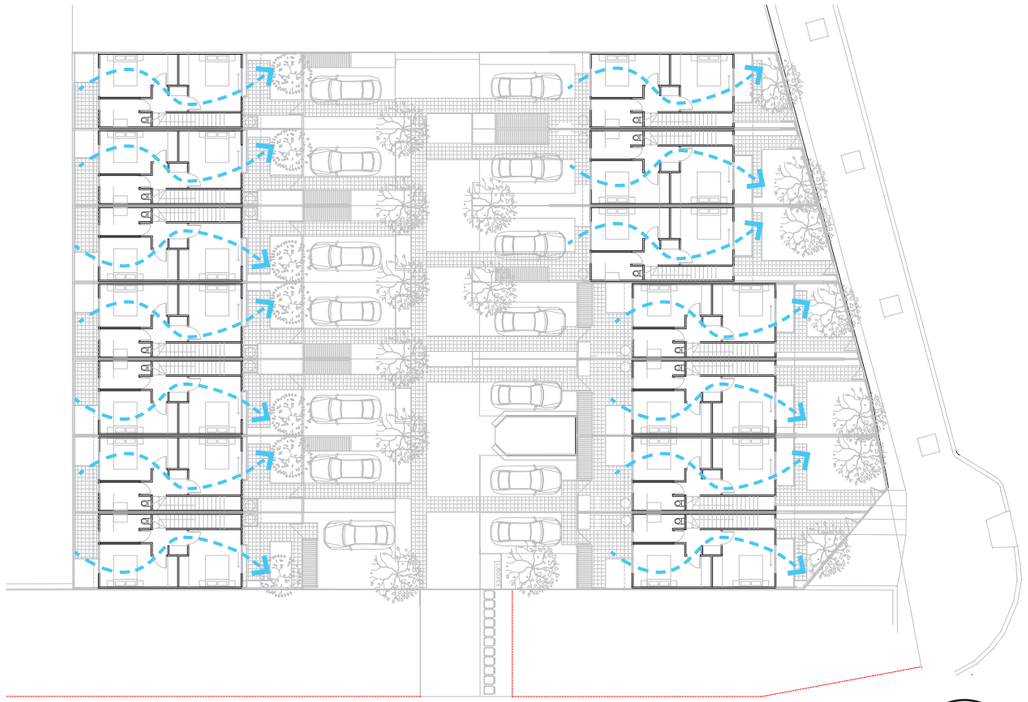
The development's carbon footprint has been considered through the use of all framed construction, with the exception of the ground floor slabs that will adopt the use of an 'Eco' concrete mix. The speed of construction means less energy consumed during the construction of the project and, with the all-electric, thermally efficient dwellings, significantly reduced lifetime operational carbon costs.



Daylight Access



Cross Ventilation - GF



Cross Ventilation - FF

OVERSHADOWING



Overshadowing at 9am, 21st June



Overshadowing at 12pm, 21st June

to lot 9 = N/A

to lot 14 = 180m^2 or 7.2%



Overshadowing at 3pm, 21st June

PRINCIPLE 6 - AMENITY

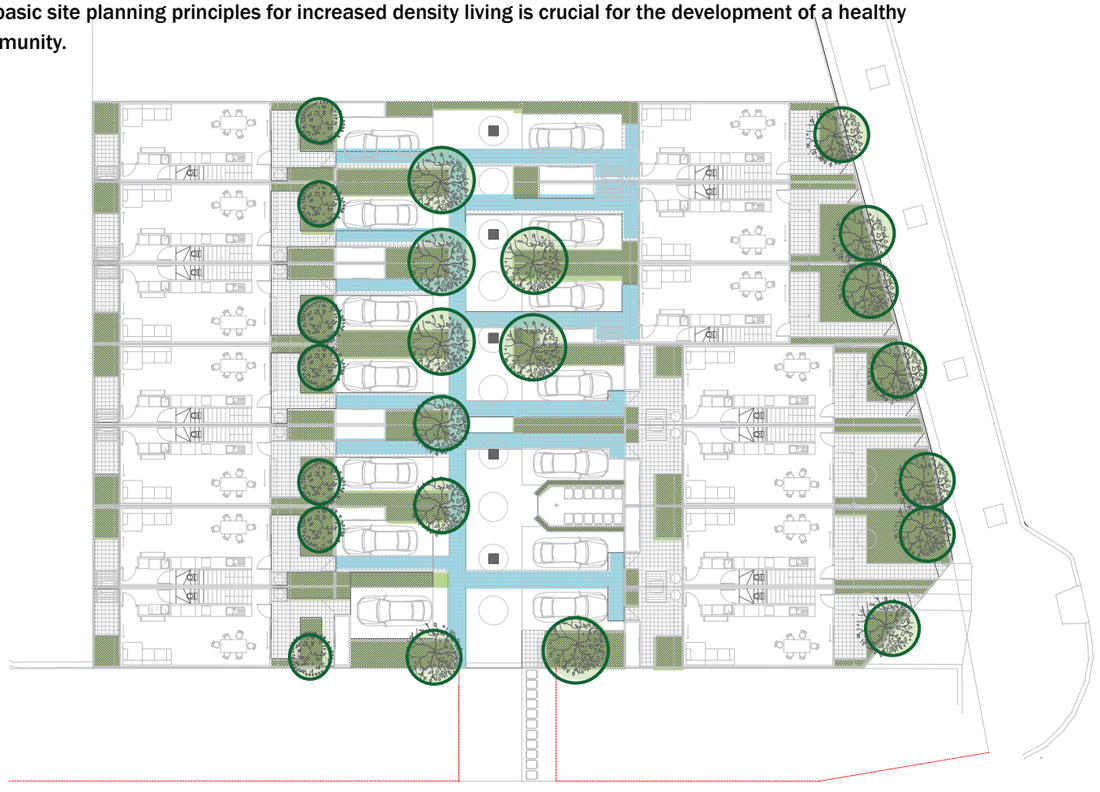
OBJECTIVE
Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.

The townhouse typology provides a high level of amenity to occupants both internally and externally.

The ground floor plan of each dwelling is open and connected to courtyards and green space at both ends, providing a well-ventilated and flexible use space, though also providing a sense of generosity through the use of openings at each end, a borrowed landscape that occupants will engage with from the primary living areas. This sense of generosity is carried through on the first floor in the bedrooms, each being able to have views out across gardens or the surrounding urban environment. Additionally, every single room in the dwellings has been provided with a window, a means of accessing natural light and ventilation that can otherwise be limited in an apartment setting.

The spatial generosity between built form adds to the amenity of the central mews, a layered public/private space that has flexible use and landscape treatment embedded within its design context. By providing a 25m separation between built form, ample deep soil zones have been provided both within the mews and the private courtyards, enabling a rich landscape ecology as well as the capacity for large tree canopies to establish, shading the ground plane whilst creating a sense of privacy between North and South dwellings.

The design engages with community, both internal and external, connecting with the public realm through well-articulated gated courtyards from Goddard St and through the internal landscaped mews. Providing the basic site planning principles for increased density living is crucial for the development of a healthy community.



South row

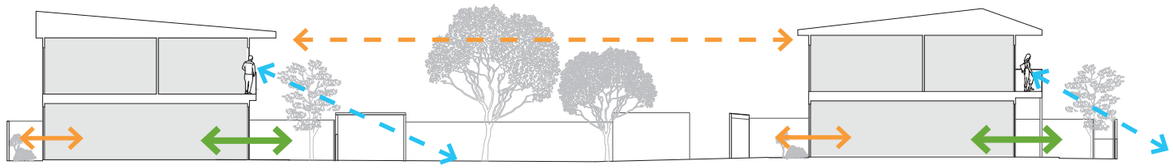


North row









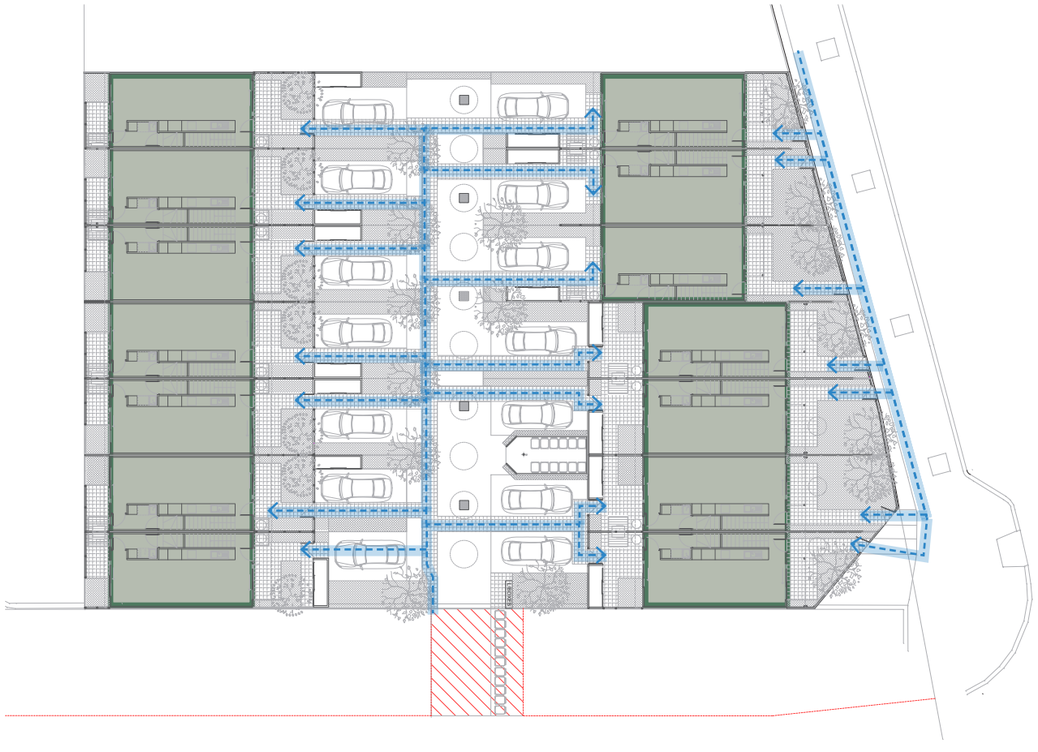
PRINCIPLE 7 - LEGIBILITY

OBJECTIVE
Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their eay around.

The site resides within a precinct proposed to undergo significant change to its urban environment and diversity of built form. This design proposes a clear and well-articulated urban response that provides the desired density through a built form typology that creates clear connections to its immediate surroundings through the use of consolidated and legible built form with direct and inviting connections to the public realm. The two rows of built form enable a clear, well-articulated site strategy that responds to the needs of Goddard St as well as creating a high amenity internal mews for the development of a micro-community within the site.

Fencing to private courtyards offers permeability and visual surveillance to the public realm, providing a sense of connection and safety whilst also creating a landscape buffer that the public realm can benefit from.

Movement patterns are considered within and around the site providing clear pedestrian pathways from both public realms. The central mews has been conceived as a 'shared' space for use by pedestrian and vehicle alike, with planting beds placed strategically as traffic calming devices, enabling a space for recreation and play as much as being purely functional



pedestrian movement through site

built form - massing



Goddard street legibility



driveway entrance to site



built form legibility

PRINCIPLE 8 - SAFETY

OBJECTIVE
Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.

The design of the site and individual dwelling takes into account safety and security as an integral part of its overall approach. The Goddard Street elevation features balconies that serve a dual purpose - they provide passive surveillance of the public realm and also act as sun shading devices for primary living areas. This offers depth and articulation to the building's facade. Additionally, the design incorporates permeable sections of fencing that allow connection to the public realm while also utilising vegetation as a privacy buffer where needed.

Similarly, the mews road features Juliet balconies that provide connection to the shared space, while higher fencing within the courtyards of southern dwellings allows for the required internalised privacy to exist.

The common mews road will be well-lit and have clear sight lines throughout. Strategically places stores will limit view cones into dwellings without resulting in concealed, and dark spaces in the common areas.



North row balconies provide passive surveillance to Goddard Street.



South row juliet balconies provide passive surveillance to driveway.



Passive surveillance to Goddard Street from primary living spaces of North row, courtyards also provide privacy.



Courtyards provide privacy to primary living spaces of South row.



Pedestrian safety.

PRINCIPLE 9 - COMMUNITY

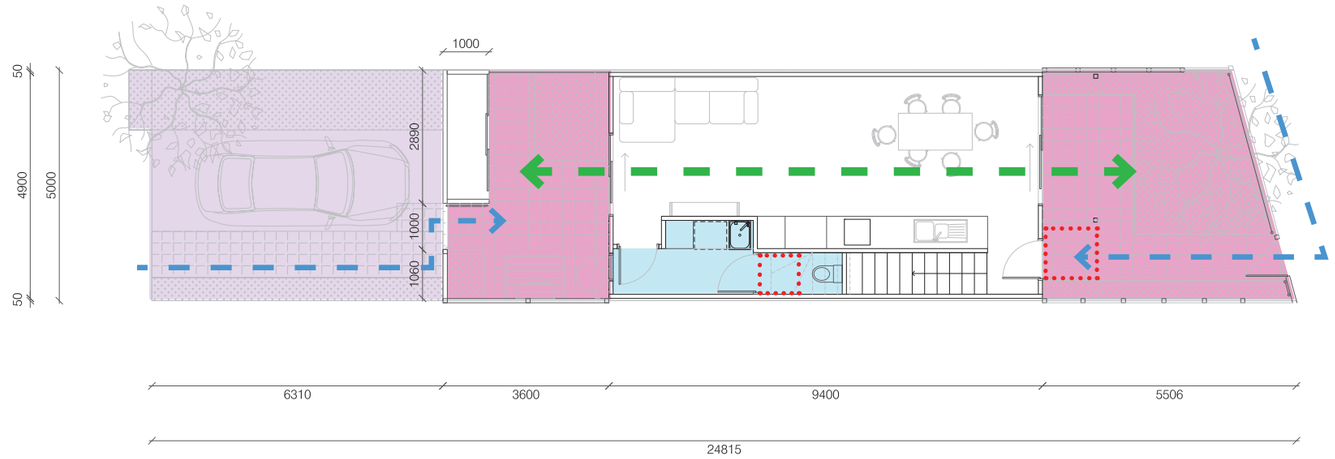
OBJECTIVE

Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.

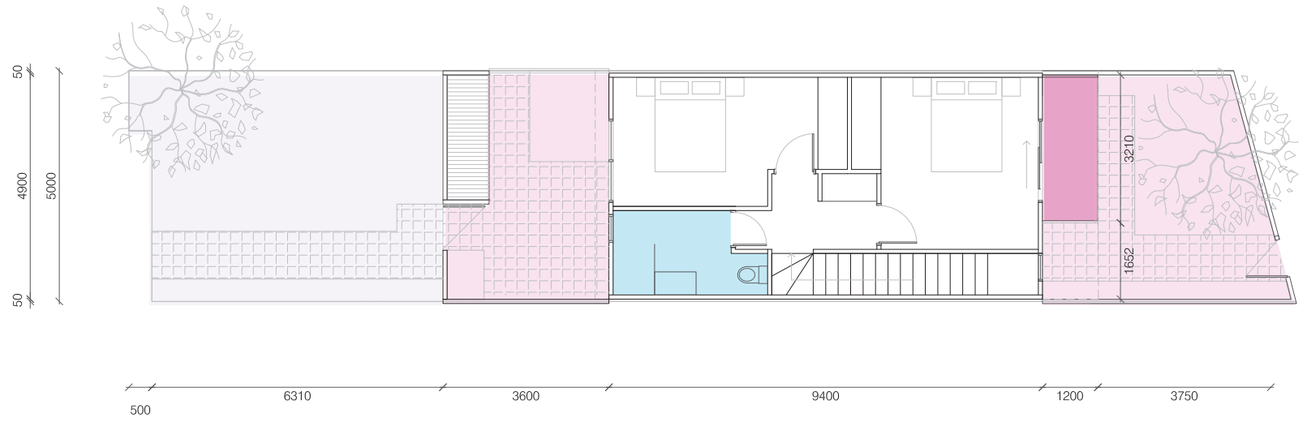
The Client, Stellar Living, are a not-for-profit institution, providing affordable housing to the rental market in various locations. The site at Goddard st provides an excellent opportunity to provide an affordable housing solution in a highly challenging housing and construction market.

The design proposes a housing solution that is equitable for the target demographic. Each of the homes are spatially generous and provides great amenity. They offer very functional floor plans that encourage an improved quality of living through connection to high amenity landscaped spaces.

The site encourages social engagement between occupants and visitors alike inclusively and equitably. Future adaptability of the site (and subsequent building typology) allows for the on-selling of individual lots for affordable housing to a broad user range; couples, single parents, young families, etc. all of whom may have been unfairly locked out of the housing market.



The ground floor of each dwelling has been designed to Silver Level Design standard



The upper level of each dwelling provides a high level of amenity and liveability, each room having access to natural light and ventilation

PRINCIPLE 10 - AESTHETICS

OBJECTIVE
Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.

Materials have been chosen for their affordability, longevity and overall aesthetics. Natural materials are used strategically to create more depth and tactility throughout the site to compliment the landscape intent.

The buildings have been conceived as consolidated volumes, rather than individual building envelopes. Northern facades have been articulated through the use of balconies and façade treatment to identify entry points, depth, shadow and individuality through the expression of differing coloured finishes to the vertical stairwells (fronting Goddard St) or the Juliet balconies (fronting the central mews).

SC- 01
translucent corrugated panel - visual screen

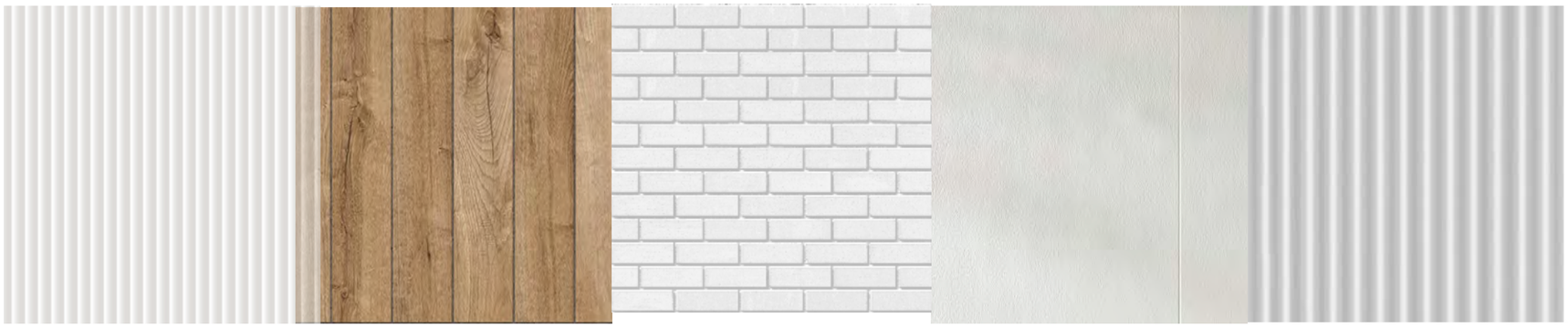
TF - 01
timber pinelap fencing

BW - 01
facebrick wall- painted white

WC - 01 WC - 02
fibre cement cladding - paint finish

RS - 01 WC - 03
corrugated zincalume sheeting

SF- 01 B - 01
open style metal fencing & balustrade









AS 3959 Bushfire Attack Level Assessment

Lot 10 Goddard Street, Rockingham WA 6168

DATE: 5 February 2024
REV: 1

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PH: 6102 6401
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DOCUMENT CONTROL

Description:		AS 3959 Bushfire Attack Level Assessment		
Revision	**Date**	**Certified By**		**BMS Reviewed & Checked By**
1	5 February 2024 AS 3959 Bushfire Attack Level Assessment	Name:	Matthew Sobelik Senior Building Surveyor BPAD Level 1 - 36534	Rene Hutter Xero Fire BPAD Level 2 - 38247
		Signature:		

Liability limited by a scheme approved under Professional Standards Legislation

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JOB DETAILS

Client:	Stellar Living
Address:	Lot 10 Goddard Street, Rockingham
Local Government Area:	City of Rockingham
Building Classification:	1A
Description of Building Works:	14 x Double Storey Townhouses

ASSESSMENT DETAILS

Assessment Date:	11 January 2024
Determined BAL Rating:	12.5
Indicative BAL Rating:	12.5
BAL Exposure Level:	Ember attack
Applicable Construction:	AS 3959-2018 Section 3 & 5, requirements listed in Appendix 3 of this document

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SITE ASSESSMENT & SITE PLAN

The assessment of this site / development was undertaken on 11/01/24 by Building Certification Services WA for the purpose of determining the Bushfire Attack Level on the 14 x Double Storey Townhouses in accordance with AS 3959-2018 Simplified Procedure (Method 1).

Designated Bushfire Prone Area

The following map identifies the area designated by the Department of Fire and Emergency Services (DFES) as being subject, or likely to be subject, to bushfire attack.



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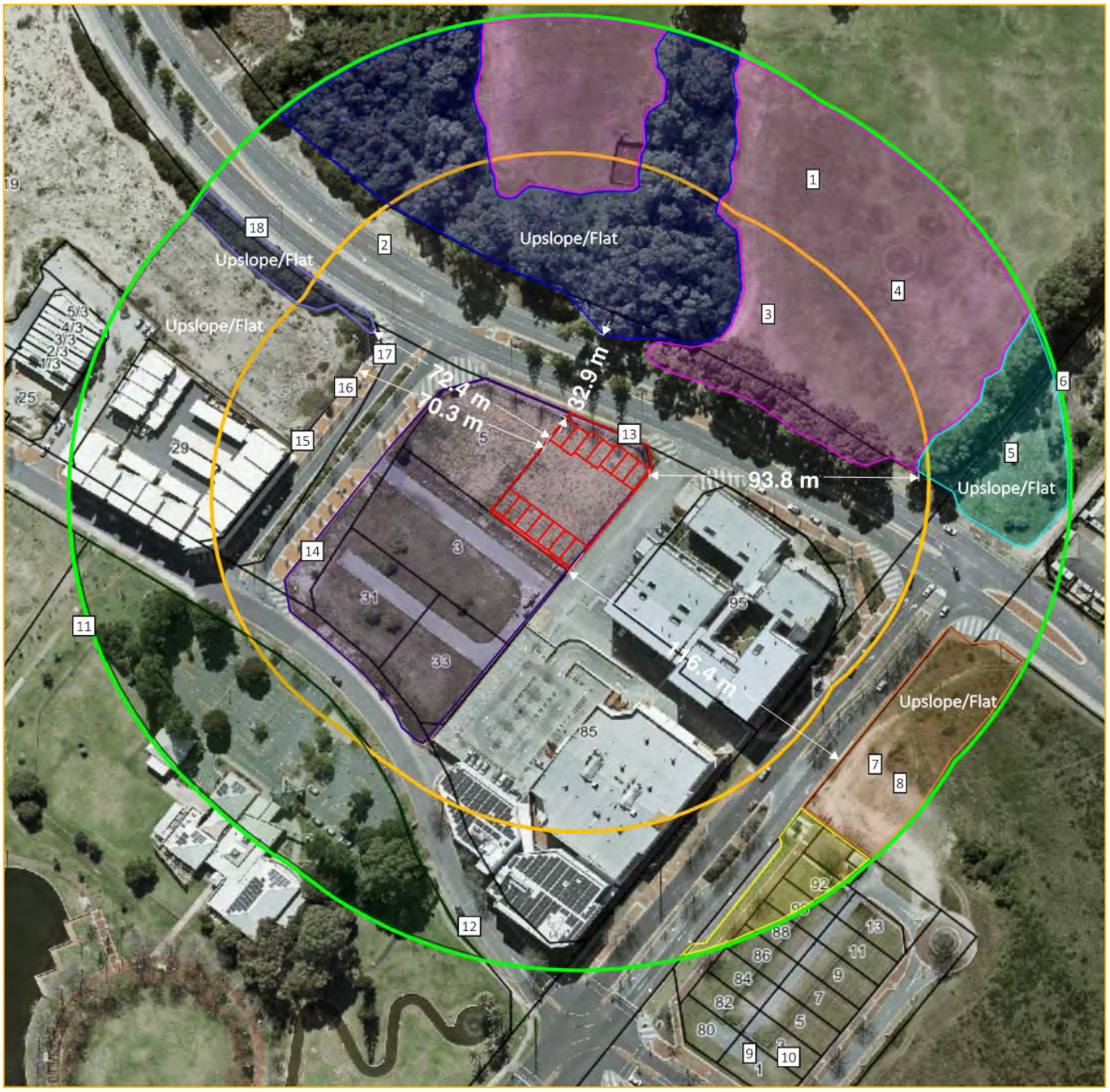
Proposed Site Plan

The site assessment has been undertaken in conjunction with the site plan provided by the client, as detailed below, and is limited to the surrounding environment within 150m of the proposed building at the time of the inspection.



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The following map identifies the plots that impact on the bushfire attack level assessment of the subject lot.



LEGEND

- North Point
- 100m Assessment Area
- 150m Assessment Area
- Subject lot and works
- Photo ID
- Plot A - Class B Woodland
- Plot B - Exclusion 2.2.3.2(f)
- Plot C - Class B Woodland
- Plot D - Class G Grassland
- Plot E - Exclusion 2.2.3.2(f)
- Plot F - Exclusion 2.2.3.2(f)
- Plot G - Exclusion 2.2.3.2(f)
- Plot H - Class D Scrub
- Plot I - Class G Grassland

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VEGETATION CLASSIFICATION

All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Plot :	A	Classification or Exclusion Clause:	Class B Woodland
Description / Justification for Classification:			
Trees 10-30m high, foliage cover up to 30%, understorey contains grasses, shrubs other smaller trees			



Photo ID: 1



Photo ID: 2

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Plot :	B	Classification or Exclusion Clause:	Exclusion 2.2.3.2(f)

Description / Justification for Classification:

Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks



Photo ID: 3



Photo ID: 4

Plot :	C	Classification or Exclusion Clause:	Class B Woodland

Description / Justification for Classification:

Trees 10-30m high, foliage cover up to 30%, understorey contains grasses, shrubs other smaller trees



Photo ID: 5



Photo ID: 6

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Plot :	D	Classification or Exclusion Clause:	Class G Grassland

Description / Justification for Classification:

Grass over 100mm high, overstorey foliage less than 10%



Photo ID: 7



Photo ID: 8

Plot :	E	Classification or Exclusion Clause:	Exclusion 2.2.3.2(f)

Description / Justification for Classification:

Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks



Photo ID: 9



Photo ID: 10

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Plot :	F	Classification or Exclusion Clause:	Exclusion 2.2.3.2(f)

Description / Justification for Classification:

Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks



Photo ID: 11



Photo ID: 12

Plot :	G	Classification or Exclusion Clause:	Exclusion 2.2.3.2(f)

Description / Justification for Classification:

Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks



Photo ID: 13

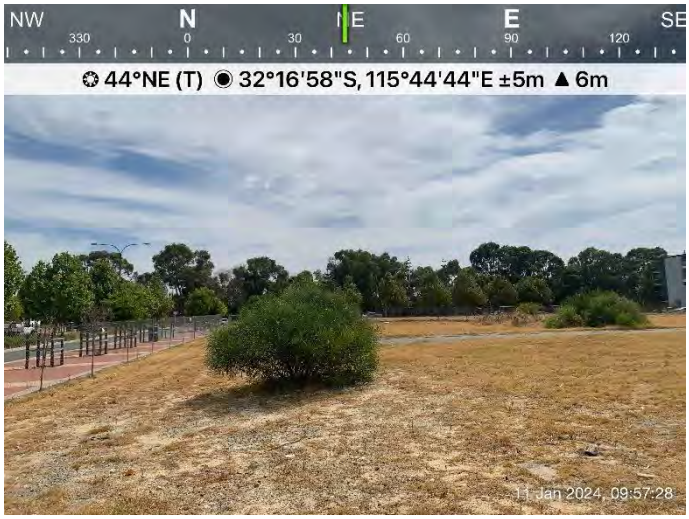


Photo ID: 14

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Plot :	H	Classification or Exclusion Clause:	Class D Scrub

Description / Justification for Classification:

Shrubs greater than 2m high, 10-30% foliage cover, poor sandy soil



Photo ID: 15



Photo ID: 16

Plot :	I	Classification or Exclusion Clause:	Class G Grassland

Description / Justification for Classification:

Grass over 100mm high, overstorey foliage less than 10%



Photo ID: 17



Photo ID: 18

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RELEVANT FIRE DANGER INDEX

The fire danger index for this site has been determined in accordance with Table 2.1 or otherwise determined in accordance with a jurisdictional variation applicable to the site.

Fire Danger Index			
FDI 100 - Table 2.4 ☐	FDI 80 - Table 2.5 ☒	FDI 50 - Table 2.6 ☐	FDI 40 - Table 2.7 ☐

Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below

Plot	Vegetation Classification	Effective Slope	Separation (m)	BAL
A	Class B Woodland	All Upslopes and Flat Land	32.9	12.5
B	Exclusion 2.2.3.2(f)			Low
C	Class B Woodland	All Upslopes and Flat Land	93.8	12.5
D	Class G Grassland	All Upslopes and Flat Land	116.4	Low
E	Exclusion 2.2.3.2(f)			Low
F	Exclusion 2.2.3.2(f)			Low
G	Exclusion 2.2.3.2(f)			Low
H	Class D Scrub	All Upslopes and Flat Land	72.4	12.5
I	Class G Grassland	All Upslopes and Flat Land	70.3	Low

Table 1: BAL Analysis

Determined Bushfire Attack Level (BAL)

The determined bushfire attack level has been calculated using the above Table 1: BAL Analysis and represents the highest BAL rating for the site/development where there is no requirement for additional vegetation to be modified or cleared. The rating represents the site's current state.

Determined Bushfire Attack Level (BAL)	BAL 12.5

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Indicative Bushfire Attack Level (BAL)

The indicative bushfire attack level has been calculated using the above Table 1: BAL Analysis and the Bushfire Management Statement provisions in this report, specifically the implementation of an asset protection zone. The indicative BAL is determined in support of the planning application only and serves to illustrate what BAL may be achieved across the site.

Where the indicative bushfire attack level is intended to be used for the building approval process a site inspection is required to confirm the Bushfire Management Statement provisions have been implemented and the indicative bushfire attack level is achieved. Upon confirmation, a BAL compliance report and certificate will be issued to confirm the new determined bushfire attack level.

Indicative Bushfire Attack Level (BAL)	BAL 12.5

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BUSHFIRE MANAGEMENT STATEMENT

In accordance with City of Rockingham requirements, the following bushfire management statement (BMS) has been prepared to identify the ongoing measures to reduce bushfire risk. The BMS comprises of an assessment against the bushfire protection criteria as per the Guidelines for the Planning in Bushire Prone Areas Version 1.4. The information used to prepare this BMS is contained in the existing BAL report for the subject site prepared by BCSWA, dated 05/02/24.

ELEMENT 1: LOCATION

The report demonstrates that the proposed development will be located in an area of low hazard on the subject site, with the maximum BAL that the 14 x Double Storey Townhouses will be subject to is 12.5.

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

A2.1 Asset protection zone (APZ)

The site shall incorporate an APZ across the entire subject lot.

Performance criterion can be met within the Lot as a result of the management of bushfire hazards through programmed maintenance of the Lot by landowner/s in perpetuity, providing a low fuel buffer around the subject building site. The Landowner is to maintain an APZ standard within the Lot as depicted on the BMS. The APZ is to be managed in accordance with the requirements of Guidelines for Planning in Bushfire Prone Areas version 1.4, refer to Bushfire Management Statement - Technical Specifications in this report.

ELEMENT 3: VEHICULAR ACCESS

A3.1 Public roads

Existing public road network, constructed in accordance with previously approved subdivision and City of Rockingham.

A3.2a Multiple access routes

Lot is connected to existing public road which provides travel in two different directions with an all-weather surface, refer to aerial photo below.

A3.2b Emergency access way

Not applicable, access to existing public road provided in accordance with A3.2a.

A3.6 Private driveways

There are no technical requirements for the private driveway as it is within a lot serviced by reticulated water, is no greater than 70.0m in length (between the most distant part of the development site and public road) and is access by a public road with a speed limit no greater than 70km/h.

ELEMENT 4: WATER

A4.2 Provision of Water for Firefighting Purposes

There is no requirement for a water tank on site as the lot is serviced by an existing street hydrant, refer to aerial photo below.

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LEGEND

- 100m Assessment Area
- 150m Assessment Area
- Subject lot and works
- Photo ID
- Asset Protection Zone
- H Hydrant
- Plot A - Class B Woodland
- Plot B - Exclusion 2.2.3.2(f)
- Plot C - Class B Woodland
- Plot D - Class G Grassland
- Plot E - Exclusion 2.2.3.2(f)
- Plot F - Exclusion 2.2.3.2(f)
- Plot G - Exclusion 2.2.3.2(f)
- Plot H - Class D Scrub
- Plot I - Class G Grassland

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ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

E2 Managing an Asset Protection Zone (APZ) to a low threat state

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29), or 10kW/m² where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves 29kW/m² (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

An APZ should include an area of defendable space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve 29kW/m² (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated that the vegetation on the adjoining land is managed in a low threat state, as per cl. 2.2.3.2 of AS 3959, such as a road, managed park, rocky outcrop or a water body.

The siting of a habitable building and associated APZ should aim to minimise the clearing of vegetation. The BMP should demonstrate that the proposed APZ has minimised the unnecessary loss of vegetation or potential for conflict with landscape or environmental objectives; and complies with environmental approvals/exemptions (where necessary). A re-design or reduction in lot yield may be necessary to minimise the removal and modification of remnant vegetation.

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and 29kW/m² (BAL-29) or lower can be achieved for the whole development site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.



Figure 17: Topography considerations for building locations

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ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment. Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.

A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

The landowner or proponent is responsible for maintaining an APZ in accordance with Schedule 1 - Standards for Asset Protection Zones. Ongoing maintenance of an APZ is usually enforced through the local government firebreak notice issued under section 33 of the *Bushfires Act 1954*, and/or through a condition of a development approval, which requires the implementation of measures identified within a BMP.

A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

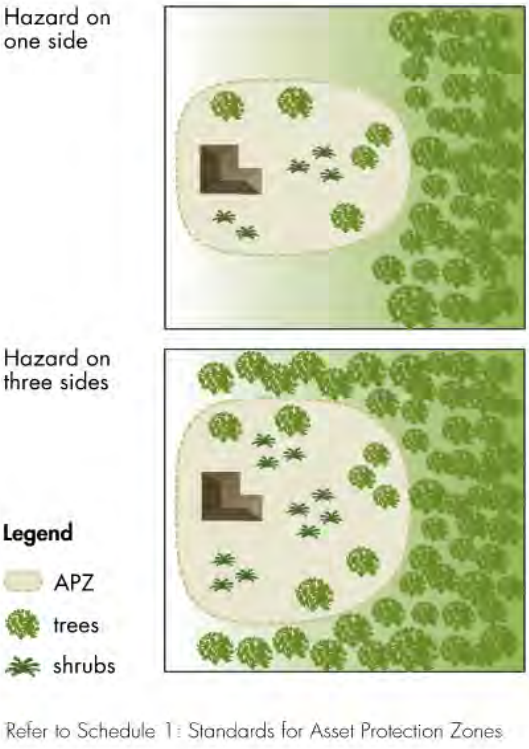


Figure 18: Design of Asset Protection Zone

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ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

E2 Landscaping and design of an asset protection zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed 5m². It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a 5m² clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of 29kW/m² (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

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ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
- outdoor furniture;
- potted plants;
- shade sails or umbrellas;
- plastic garbage bins;
- firewood stacks;
- flammable sculptures; and/or
- playground equipment and children's toys.

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

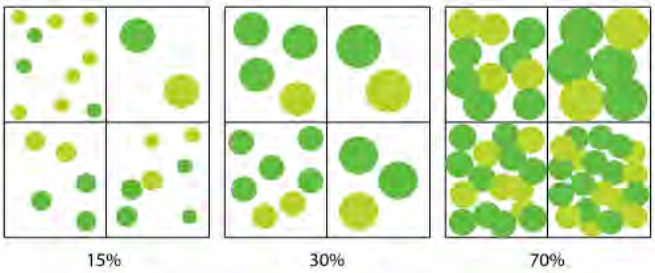
Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

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ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity  15% 30% 70%
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.

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ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

* *Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

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APPENDIX 1 - VEGETATION CLASSIFICATION

Vegetation Classification

Vegetation shall be classified in accordance with Table 2.3 and Figures 2.4(A) to 2.4(G). Where there is more than one vegetation type, each type shall be classified separately with the worst case scenario (predominant vegetation is not necessarily the worst case scenario) applied.

2.2.3.2 *Exclusions - Low threat vegetation and non-vegetated areas*

The Bushfire Attack Level shall be classified BAL - LOW where the vegetation is one or a combination of any of the following:

(a) Vegetation of any type that is more than 100m from the site

(b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified

(c) Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site, or each other

(d) Strips of vegetation less than 20m in width regardless of length and not within 20m of the site, or each other, or other areas of vegetation being classified

(e) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops

(f) Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks

Table 2.3 Classification of Vegetation

Vegetation Classification	Vegetation Type	Description
A Forest	Tall open forest Tall woodland	Trees over 30m high; 30-70% foliage cover. Found in areas of high reliable rainfall. Typically dominated by eucalyptus
	Open forest Low open forest	Trees 10-30m high; 30-70% foliage cover. Typically dominated by eucalyptus
	Pine Plantation	Trees 10-30m in height at maturity, generally compromising Pinus species or other softwood pieces, planted as a singled species
B Woodland	Woodland Open Woodland	Tress 10-30m high; 10-30% foliage cover dominated by eucalyptus; understorey or low trees to tall shrubs
	Low woodland Low open woodland Open shrubland	Low trees and shrubs 2-10m high; foliage cover less than 10%. Dominated by eucalyptus and Acacias. Often have a grassy understorey or low shrubs
C Shrubland	Closed heath Open heath	Found in wet areas and/or areas affected by poor soil fertility or shallow soils. Shrubs 1-2m high
	Low shrubland	Shrubs <2m high; greater than 30% foliage cover. Understorey may contain grasses
D Scrub	Closed scrub	Found in wet areas and/or areas affected by poor soil fertility or shallow soils; >30% foliage cover. Shrubs >2m high
	Open scrub	Shrubs greater than 2m high; 10-30% foliage cover with a mixed species composition

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E Mallee/ Mulga	Tall shrubland	Vegetation dominated by shrubs with a multi-stemmed habit; usually greater than 2m in height; <30% foliage cover. Understorey of widespread to dense low shrubs or sparse grasses
F Rainforest	Tall closed forest Closed forest Low closed forest	Trees 10-40m in height; >90% foliage cover; understorey may contain a large number of species with a variety of heights
G Grassland	Low open shrubland Tussock grassland Hummock grassland Herbfield	All forms, including situations with shrubs and trees, if the overstorey foliage cover is less than 10%

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APPENDIX 2 - BUSHFIRE ATTACK LEVEL

Bushfire Attack Level Assessment Explained

A Bushfire Attack Level (BAL) Assessment is a means of measuring the severity of a buildings potential exposure to ember attack, radiant heat and direct flam contact in a bushfire event, and thereby determining the construction measures required for the dwelling.

The methodology used for the determination of the BAL rating, and the subsequent building construction standards, are directly referenced from Australian Standard AS 3959-2018 Construction of buildings in bushfire prone areas.

The BAL rating is determined through identification and assessment of the following parameters:

- Fire Danger Index (FDI) rating; assumed to be FDI-80 for WA;
- All classified vegetation within 100m of the subject building;
- Separation distance between the building and the classified vegetation source/s; and
- Slope of the land under the classified vegetation.

AS 3959-2018 has six (6) levels of BAL, based on the radiant heat flux exposure to the building, and also identifies the relevant sections for building construction, as detailed below:

Bushfire Attack Level (BAL)	Heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure	Construction Section (within AS 3959)
BAL Low	See clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements	4
BAL 12.5	≤ 12.5kW/m²	Ember attack	3 & 5
BAL 19	> 12.5kW/m² ≤ 19kW/m²	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 & 6
BAL 29	> 19kW/m² ≤ 29kW/m²	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 & 7
BAL 40	>29kW/m² ≤ 40kW/m²	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with the increased likelihood of exposure to flames	3 & 8
BAL FZ	> 40kW/m²	Direct exposure to flames from the front in addition to heat flux and ember attack	3 & 9

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APPENDIX 3 - CONSTRUCTION REQUIREMENTS

SECTION 5 BAL - 12.5

5.1 GENERAL

A building assessed in section 2 as being BAL-12.5 shall conform with section 3 and clauses 5.2 to 5.8

Any element of construction or system that satisfies the test criteria of AS 1530.8.1 may be used in lieu of the applicable requirements contained in clauses 5.2 to 5.8 (see clause 3.8)

5.2 SUB-FLOOR SUPPORTS

This standard does not provide construction requirements for subfloor supports where the subfloor space is enclosed with -

(a) A wall that conforms with clause 5.4; or

(b) A mesh or perforated sheet with a maximum aperture of 2mm, made of corrosion-resistant steel, bronze or aluminium; or

(c) A combination of items (a) and (b)

5.3 FLOORS

5.3.1 General

This standard does not provide construction requirements for concrete slabs on the ground

5.3.2 Elevated floors

5.3.2.1 *Enclosed subfloor space*

This standard does not provide construction requirements for elevated floors, including bearers, joists and flooring, where the subfloor space is enclosed with -

(a) A wall that conforms with clause 5.4; or

(b) A mesh or perforated sheet with a maximum aperture of 2mm, made of corrosion-resistant steel, bronze or aluminium; or

(c) A combination of items (a) and (b) above

5.3.2.2 *Unenclosed subfloor space*

Where the subfloor space is unenclosed, the bearers, joists and flooring, less than 400mm above finished ground level, shall be one of the following:

(a) Materials that conform with the following:

- (i) Bearers and joists shall be -
  - (A) Non-combustible; or
  - (B) Bushfire-resisting timber (see Appendix F); or
  - (C) A combinations of items (A) and (B)
- (ii) Flooring shall be -
  - (A) Non-combustible; or
  - (B) Bushfire-resisting timber (see Appendix F); or
  - (C) Timber (other than bushfire-resisting timber), particleboard or plywood flooring where the underside is lined with sarking-type material or mineral wool insulation; or
  - (D) A combination of any of items (A), (B) or (C); or

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(b) A system conforming with AS 1530.8.1

This standard does not provide construction requirements for elements of elevated floors, including bearers, joists and flooring, if the underside of the element is 400mm or more above finished ground level

5.4 WALLS

5.4.1 General

The exposed components of an external wall that are less than 400mm from the ground or less than 400mm above decks, carport roofs, awnings and similar elements or fittings having an angle of less than 18 degrees to the horizontal and extending more than 110mm in width from the wall shall be one of the following:

(a) Non-combustible material including the following provided with minimum thickness is 90mm:
  (i) Full masonry or masonry veneer walls with an outer leaf of clay, concrete, calcium silicate or natural stone
  (ii) Precast or in situ walls of concrete or aerated concrete
  (iii) Earth wall including mud brick; or

(b) Timber logs of a species with a density of 680kg/m^3 or greater at a 12% moisture content; of a minimum nominal overall thickness of 90mm and a minimum thickness of 70mm (see clause 3.11); and gauge planed; or

(c) Cladding that is fixed externally to a timber-framed or a steel-framed wall and is -
  (i) Non-combustible material; or
  (ii) Fibre-cement a minimum of 6mm in thickness; or
  (iii) Bushfire-resisting timber (see Appendix F); or
  (iv) A timber species as specified in Paragraph E1, Appendix E; or
  (v) A combination of any of items (i), (ii), (iii) or (iv); or

(d) A combination of any of items (a), (b) or (c)

This standard does not provide construction requirements for the exposed components of an external wall that are 400mm or more from the ground or 400mm or more above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110mm in width from the wall

5.4.2 Joints

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed

5.4.3 Vents and weepholes

Except for exclusions provided in clause 3.6, vents and weepholes in external walls shall be screened with a mesh made of corrosion-resistant steel, bronze or aluminium

5.5 EXTERNAL GLAZED ELEMENTS, ASSEMBLIES AND DOORS

5.5.1 Bushfire shutters

Where fitted, bushfire shutters shall conform with clause 3.7 and be made from -

(a) Non-combustible material; or

(b) A timber species as specified in Paragraph E1, Appendix E; or

(c) Bushfire-resisting timber (see Appendix F); or

(d) A combination of any of items (a), (b) or (c)

5.5.2 Screens for windows and doors

Where fitted, screens for windows and doors shall have a mesh or perforated sheet made of corrosion-resistant steel,

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bronze or aluminium

The frame supporting the mesh or perforated sheet shall be made from -

(a) Metal; or

(b) Bushfire-resisting timber (see Appendix F); or

(c) A timber species as specified in Paragraph E2, Appendix E

5.5.3 Windows and sidelights

Windows assemblies shall:

(a) Be completely protected by a bushfire shutter that conforms with clause 3.7 and clause 5.5.1; or

(b) Be completely protected externally by screens that conform with clause 3.6 and clause 5.5.2; or

(c) Conform with the following:

(i) *Frame material* For window assemblies less than 400mm from the ground or less than 400mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110mm in width from the window frame, window frames and window joinery shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F); or

(B) A timber species as specified in Paragraph E2, Appendix E; or

(C) Metal; or

(D) Metal-reinforced uPVC. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel

There are no specific restrictions on frame material for all other windows

(ii) *Hardware* There are no specific restrictions on hardware for windows

(iii) *Glazing* Where glazing is less than 400mm from the ground or less than 400mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110mm in width from the window frame, the glazing shall be Grade A safety glass minimum 4mm thickness or glass blocks with no restriction on glazing methods

(iv) *Seals and weather strips* There are no specific requirements for seals and weather strips at this BAL level

(v) *Screens* The openable portions of window shall be screened internally or externally with screens that conform with clause 3.6 and clause 5.5.2

5.5.4 Doors – Side-hung external doors (including french doors, panel fold and bi-fold doors)

Side-hung external doors, including french doors, panel fold and bi-fold doors, shall -

(a) Be completely protected by bushfire shutters that conform with clause 3.7 and clause 5.5.1; or

(b) Be completely protected externally by screens that conform with clause 3.6 and clause 5.5.2; or

(c) Conform with the following:

(i) *Door panel material* Materials shall be -

(A) Non-combustible; or

(B) A solid timber, laminated timber or reconstituted timber door, having a minimum thickness of 35mm for the first 400mm above the threshold; or

(C) Hollow core, solid timber, laminated timber or reconstituted timber with a non-combustible kickplate on the outside for the first 400mm above the threshold; or

(D) Hollow core, solid timber, laminated timber or reconstituted timber protected externally by a screen that conforms with clause 5.5.2; or

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(E) For fully framed glazed door panels, the framing shall be made from metal or bushfire resisting timber (see Appendix F) or a timber species as specified in Paragraph E2, Appendix E or uPVC

(ii) *Door frame material* Door frame materials shall be -

(A) Bushfire-resisting timber (see Appendix F); or

(B) A timber species as specified in Paragraph E2, Appendix E; or

(C) Metal; or

(D) Metal-reinforced uPVC. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel

(iii) *Hardware* There are no specific requirements for hardware at this BAL level

(iv) *Glazing* The glazing shall be Grade A safety glass a minimum of 4mm in thickness or glass blocks with no restriction on glazing methods

(v) *Seals and weather strips* Weather strips, draft excluders or draft seals shall be installed

(vi) *Screens* There are no requirement to screen the openable part of the door at this BAL level

(vii) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable

5.5.5 Doors - Sliding doors

Sliding doors shall -

(a) Be completely protected by a bushfire shutter that conforms with clause 3.7 and clause 5.5.1; or

(b) Be completely protected externally by screens that conform with clause 3.6 and clause 5.5.2; or

(c) Conform with the following:

(i) *Frame material* The material for door frames, including fully framed glazed doors shall be -

(A) Bushfire-resisting timber (see Appendix F); or

(B) A timber species as specified in Paragraph E2, Appendix E; or

(C) Metal; or

(D) Metal-reinforced uPVC. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel

(ii) *Hardware* There are no specific requirements for hardware at this BAL level

(iii) *Glazing* Where doors incorporate glazing, the glazing shall be grade A safety glass a minimum of 4mm in thickness

(iv) *Seals and weather strips* There are no specific requirements for seals and weather strips at this BAL level

(v) *Screens* There is no requirement to screen the openable part of the sliding door at this BAL level

(vi) *Sliding panels* Sliding panels shall be tight-fitting in the frames

5.5.6 Doors – Vehicle access doors (garage doors)

The following applies to vehicle access doors:

(a) The lower portion of a vehicle access door that is within 400mm of the ground when the door is closed (see Figure D4, Appendix D) shall be made from -

(i) Non-combustible material; or

(ii) Bushfire-resisting timber (see Appendix F); or

(iii) Fibre-cement sheet a minimum of 6mm in thickness; or

(iv) A timber species as specified in Paragraph E1, Appendix E; or

(v) A combination of any of items (i), (ii), (iii) or (iv)

(b) All vehicle access doors shall be protected with suitable weather strips, draught excluders, draught seals or brushes.

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Door assemblies fitted with guide tracks do not need edge gap protection

(c) Vehicle access doors with ventilation slots shall be protected in accordance with clause 3.6

5.6 ROOFS (INCLUDING PENETRATIONS, EAVES, FASCIAS AND GABLES, AND GUTTERS AND DOWNPIPES)

5.6.1 General

The following applies to all types of roofs and roofing systems:

(a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible

(b) The roof/wall and roof/roof junction shall be sealed or otherwise protected in accordance with clause 3.6

(c) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet conforming with clause 3.6 and made of corrosion-resistant steel, bronze or aluminium

(d) Only evaporative coolers manufactured in accordance with AS/NZS 60335.2.98 shall be used. Evaporative coolers with an internal damper to prevent the entry of embers into the roof space need not be screened externally

5.6.2 Tiled roofs

Tiled roofs shall be fully sarked. The sarking shall -

(a) Be located on top of the roof framing, except that the roof battens may be fixed above the sarking;

(b) Cover the entire roof area, including ridges and hips; and

(c) Extend into gutters and valleys

5.6.3 Sheet roofs

Sheet roofs shall -

(a) Be fully sarked in accordance with clause 5.6.2, except that foil-backed insulation blankets may be installed over the battens; or

(b) Have any gaps sealed at the fascia or wall line, hips and ridges by -

  (i) A mesh or perforated sheet that conforms with clause 3.6 and that is made of corrosion-resistant steel, bronze or aluminium; or

  (ii) Mineral wool; or

  (iii) Other non-combustible material; or

  (iv) A combination of any items (i), (ii) or (iii)

5.6.4 Veranda, carport and awning roof

The following applies to veranda, carport and awning roofs:

(a) A veranda, carport or awning roof forming part of the main roof space shall meet all the requirements for the main roof, as specified in clauses 5.6.1 to 5.6.6

(b) A veranda, carport or awning roof separated from the main roof space by an external wall conforming with clause 5.4 shall have a non-combustible roof covering, except where the roof covering is a translucent or transparent material

5.6.5 Roof penetrations

The following applies to roof penetrations:

(a) Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors or the like, shall be sealed. The material used to seal the penetration shall be non-combustible

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(b) Openings in vented roof lights, roof ventilators or vent pipes shall conform with clause 3.6 and be made of corrosion-resistant steel, bronze or aluminium

This requirement does not apply to a room sealed gas appliance

In the case of gas appliance flues, ember guards shall not be fitted

(c) All overhead glazing shall be Grade A safety glass complying with AS 1288

(d) Glazed elements in roof lights and skylights may be of polymer provided a Grade A safety glass diffuser, complying with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass of minimum 4mm in thickness shall be used in outer pane of the IGU

(e) Flashing elements of tubular skylights may be of fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index not exceeding five

(f) Evaporative cooling units shall be fitted with non-combustible butterfly closers as close as practicable to the roof level or the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2mm, made of corrosion-resistant steel, bronze or aluminium

(g) Vent pipes made from PVC are permitted

(h) Eaves lighting shall be adequately sealed and not compromise the performance of the element

5.6.6 Eaves, linings, fascias and gables

The following apply to eaves lining, fascias and gables:

(a) Gables shall comply with clause 5.4

(b) Eaves penetrations shall be protected in the same way as roof penetrations, as specified in clause 5.6.5

(c) Eaves ventilation openings shall be fitted with ember guards in accordance with clause 3.6 and made of corrosion-resistant steel, bronze or aluminium

Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds

This standard does not provide construction requirements for fascias, bargeboards and eaves linings

5.6.7 Gutters and downpipes

This standard does not provide material requirements for -

(a) Gutters, with the exception of box gutters; and

(b) Downpipes

If installed, gutter and valley leaf guards shall be non-combustible

Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible material

5.7 VERANDAS, DECKS, STEPS AND LANDINGS

5.7.1 General

Decking may be spaced

There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings

5.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.2.1 *Materials to enclose a subfloor space*

This standard does not provide construction requirements for the materials used to enclose a subfloor space except where those materials are less than 400mm from the ground

Where the materials used to enclose a subfloor space are less than 400mm from the ground, they shall conform with clause 5.4

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5.7.2.2 *Supports*

This standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles

5.7.2.3 *Framing*

This standard does not provide construction requirements for the framing of verandas, pergolas, decks, ramps or landings (i.e. bearers and joists)

5.7.2.4 *Decking, stair treads and the trafficable surfaces of ramps and landings*

This standard does not provide construction requirements for decking, stair treads and the trafficable surfaces of ramps and landings that are more than 300mm from a glazed element

Decking, stair treads and the trafficable surfaces of ramps and landings less than 300mm (measured horizontally at deck level) from glazed elements that are less than 400mm (measured vertically) from the surface of the deck shall be made from -

(a) Non-combustible material; or
(b) Bushfire-resisting timber (see Appendix F); or
(c) A timber species as specified in Paragraph E1, Appendix E; or
(d) uPVC; or
(e) A combination of any of items (a), (b), (c) or (d)

5.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.3.1 *Supports*

This standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles

5.7.3.2 *Framing*

This standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e. bearers and joists)

5.7.3.3 *Decking, stair treads and trafficable surfaces of ramps and landings*

This standard does not provide construction requirements for decking, stair treads and the trafficable surfaces of ramps and landings that are more than 300mm from a glazed element

Decking, stair treads and the trafficable surfaces of ramps and landings less than 300mm (measured horizontally at deck level) from glazed elements that are less than 400mm (measured vertically) from the surface of the deck shall be made from -

(a) Non-combustible material; or
(b) Bushfire-resisting timber (see Appendix F); or
(c) A timber species as specified in Paragraph E1, Appendix E; or
(d) A combination of any of items (a), (b) or (c) above

5.7.4 Balustrades, handrails or other barriers

This standard does not provide construction requirements for balustrades, handrails and other barriers

5.7.5 Veranda posts

Veranda posts -

(a) Shall be timber mounted on galvanised mounted shoes or stirrups with a clearance of not less than 75mm above the adjacent finished ground level; or

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(b) Less than 400mm (measured vertically) from the surface of the deck or ground shall be made from -

(i) Non-combustible material; or

(ii) Bushfire-resisting timber (see Appendix F); or

(iii) A timber species as specified in Paragraph E1, Appendix E; or

(iv) A combination of any items (a) or (b)

5.8 WATER AND GAS SUPPLY PIPES

Above-ground, exposed water supply pipes shall be metal

External gas pipes and fittings above ground shall be of steel or copper construction having a minimum wall thickness in accordance with gas regulations or 0.9mm whichever is the greater. The metal pipe shall extend a minimum of 400mm within the building and 100mm below ground

(c) Bushfire-resisting timber (see Appendix F); or

(d) A combination of any of items (a), (b) or (c) above

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SECTION 3 GENERAL

3.1 GENERAL

This section specifies general requirements for the construction of buildings for all Bushfire Attack Levels (BALs)

3.2 CONSTRUCTION REQUIREMENTS FOR SPECIFIC STRUCTURES

3.2.1 Attached structures and structures sharing a common roof space

Where any part of a garage, carport, veranda, cabana, studio, storage area or similar roofed structure is attached to, or shares a common roof space with, a building required to conform with this standard, the entire garage, carport, veranda or similar roofed structure shall conform with the construction requirements of this standard, as applicable to the subject building

Alternatively, the structure shall be separated from the subject building by a wall that extends to the underside of a non-combustible roof covering, and that conforms with one of the following:

(a) The wall shall have an FRL of not less than 60/60/60 for loadbearing walls and -/60/60 for non-loadbearing walls when tested from the attached structure side and shall have openings protected as follows:

- (i) *Doorways* - By self-closing fire doors with an FRL of -/60/30, conforming with AS 1905.1 and tested in accordance with AS 1530.4
- (ii) *Windows* - By fire windows with an FRL of -/60/- when tested in accordance with AS 1530.4 and permanently fixed in the closed position
- (iii) *Other openings* - By construction with an FRL of not less than -/60/- when tested in accordance with AS 1530.4; or

(b) The wall shall be of masonry, earth or masonry-veneer construction with the masonry leaf of not less than 90mm in thickness and shall have openings protected as follows:

- (i) *Doorways* - By self-closing fire doors with an FRL of -/60/30, conforming with AS 1905.1 and tested in accordance with AS 1530.4
- (ii) *Windows* - By fire windows with an FRL of -/60/- when tested in accordance with AS 1530.4 and permanently fixed in the closed position
- (iii) *Other openings* - By construction with an FRL of not less than -/60/- when tested in accordance with AS 1530.4

3.2.2 Garages and carports beneath the subject building

Where a garage or carport is beneath a building required to comply with this standard, it shall conform with the construction requirements of this standard, as applicable to the subject building

Alternatively, any construction separating the garage or carport (including walls and flooring systems) from the remainder of the building shall conform with one of the following:

(a) The separating construction shall have an FRL of not less than 60/60/60 for loadbearing construction and -/60/60 for non-loadbearing construction when tested from the garage or carport side and shall have openings protected in accordance with the following:

- (i) *Doorways* - By self-closing fire doors with an FRL of -/60/30, conforming with AS 1905.1 and tested in accordance with AS 1530.4
- (ii) *Windows* - By fire windows with an FRL of -/60/- when tested in accordance with AS 1530.4 and permanently fixed in the closed position
- (iii) *Other openings* - By construction with an FRL of not less than -/60/- when tested in accordance with AS 1530.4*; or*

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(b) Where part of all of the separating construction is a wall, the wall need not conform with item (a) above, provided the wall is of masonry, earth or masonry-veneer construction with the masonry leaf of not less than 90mm in thickness and the wall has openings protected in accordance with the following:

(i) *Doorways* - By self-closing fire doors with an FRL of -/60/30, conforming with AS 1905.1 and tested in accordance with AS 1530.4

(ii) *Windows* - By fire windows with an FRL of -/60/- when tested in accordance with AS 1530.4 and permanently fixed in the closed position

(iii) *Other openings* - By construction with an FRL of not less than -/60/- when tested in accordance with AS 1530.4

3.2.3 Adjacent structures on the subject allotment

Where any garage, carport, or similar roofed structure on the subject allotment is not attached to a building required to conform with this standard, that structure shall conform with the construction requirements of this standard

Alternatively, the adjacent structure shall be separated from the subject building by one of the following:

(a) A distance of not less than 6m from the building required to conform with this standard. This distance is measured as any of the horizontal straight lines from the adjacent structure to the subject building; or

(b) A wall of the building required to conform that extends to the underside of a non-combustible roof covering and has an FRL of not less than 60/60/60 for loadbearing walls and -/60/60 for non-loadbearing walls when tested from the outside. Any openings in the wall shall be protected in accordance with the following:

(i) *Doorways* - By self-closing fire doors with an FRL of -/60/30, conforming with AS 1905.1 and tested in accordance with AS 1530.4

(ii) *Windows* - By fire windows with an FRL of -/60/- when tested in accordance with AS 1530.4 and permanently fixed in the closed position

(iii) *Other openings* - By construction with an FRL of not less than -/60/- when tested in accordance with AS 1530.4*; or*

(c) A wall of the building required to conform that extends to the underside of a non-combustible roof covering and is of masonry, earth or masonry-veneer construction with the masonry leaf of not less than 90mm in thickness. Any openings in the wall shall be protected in accordance with the following:

(i) *Doorways* - By self-closing fire doors with an FRL of -/60/30, conforming with AS 1905.1 and tested in accordance with AS 1530.4

(ii) *Windows* - By fire windows with an FRL of -/60/- when tested in accordance with AS 1530.4 and permanently fixed in the closed position

(iii) *Other openings* - By construction with an FRL of not less than -/60/- when tested in accordance with AS 1530.4*; or*

3.3 EXTERNAL MOULDINGS

Unless otherwise required in clause 3.6.1 and sections 5 to 9, combustible external mouldings, jointing strips, trims and sealants may be used for decorative purposes or to cover joints between sheeting material

3.4 HIGHER LEVELS OF CONSTRUCTION

The construction requirements specified for a particular BAL shall be acceptable for a lower level

3.5 REDUCTION IN CONSTRUCTION REQUIREMENTS DUE TO SHIELDING

Where an elevation is not exposed to the source of bushfire attack, then the construction requirements for that elevation

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can reduce to the next lower BAL. However it shall not reduce to below BAL-12.5

An elevation is deemed to be not exposed to the source of bushfire attack if all of the straight lines between that elevation and the source of bushfire attack are obstructed by another part of the same building. However it shall not reduce to below BAL 12.5

The shielding of an elevation shall apply to all the elements of the wall, including openings, but shall not apply to subfloors or roofs

3.6 VENTS, WEEPHOLES, GAPS AND SCREENING MATERIALS

3.6.1 Vents, weepholes, joints and the like

All gaps including vents, weepholes and the like shall be screened, except for weepholes to the sills of windows and doors

All joints shall be suitably backed with a breathable sarking or mesh, except as permitted by Clause 3.3.

The maximum allowable aperture size of any mesh or perforated material used as a screen shall be 2mm.

3.6.2 Gaps to door and window openings

Where screens are fitted to door openings for ember protection, they shall have a maximum aperture of 2.0mm and be tight fitting to the frame in the closed position.

Gaps between doors including jambs, heads or sills (thresholds) shall be protected using draught seals and excluders of the like.

Windows conformant with AS 2047 will satisfy the requirements for gap protection. Screens fitted to window openings shall have a maximum aperture of 2.0mm and these shall be tight fitting to the frames.

3.7 BUSHFIRE SHUTTERS

Bushfire shutters shall -

(a) Protect the entire window assembly including framing, glazing, sash and sill;

(b) Protect the entire door assembly including framing, glazing, sill and hardware;

(c) Consist of materials specified in Clauses 5.5.1, 6.5.1, 7.5.1, 8.5.1 and 9.5.1 for the relevant BAL;

(d) Be fixed to the building and be non-removable;

(e) Be capable of being closed manually from either inside or outside or motorised shutter systems, where they are not reliant on mains power to close;

(f) When in the closed position, have no gap greater than 2mm between the shutter and the wall, frame or sill; and

(g) Where perforated, have uniformly distributed perforations with a maximum aperture of 2mm and a perforated area no greater than 20% of the shutter.

If bushfire shutters are fitted to all external doors then at least one of those shutters shall be operable from inside to facilitate safe egress from the building.

3.8 TESTING OF MATERIALS, ELEMENTS OF CONSTRUCTION AND SYSTEMS TO THE AS 1530.8 SERIES

Unless otherwise specified, elements of construction and systems satisfy this Standard when tested in accordance with the AS 1530.8 series for the relevant BAL level and Crib Class in Table 3.2.

Elements of construction or systems tested in accordance with AS 1530.8.1-2007 with Crib Class A prior to the issue of this Standard are acceptable.

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TABLE 3.2

TESTING OF MATERIALS, ELEMENTS OF CONSTRUCTION AND SYSTEMS

Acceptable test criteria	Relevant allowable BAL level	Crib class
AS 1530.8.1	BAL-12.5 to BAL-40	AA
AS 1530.8.2	BAL-FZ	Not applicable

Where any element of construction or system satisfies the test criteria in the AS 1530.8 series without screening for ember protection, the requirements of this Standard for screening of openable parts of windows shall still apply.

Where a window protected with a shutter satisfies the test criteria of the AS 1530.8 series, the additional requirements of this Standard for screening of openable parts of windows do not apply.

3.9 GLAZING

Glazing requirements shall be in accordance with Sections 5 to 9 of this Standard.

3.10 SARKING

Where sarking is required in Sections 5 to 9, the flammability index shall not exceed five when tested to AS 1530.2.

3.11 TIMBER LOG WALLS

Where the thickness of a timber log wall is specified in Sections 5, 6 and 7, two criteria are nominated as follows:

(a) The nominal overall thickness is the overall thickness of the wall.

(b) The minimum thickness is the thickness of the wall at the interface of two logs in the wall.

For most log profiles, the thickness of the log at the interface with an adjacent log is less than the overall thickness of the wall.

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DISCLAIMER & LIMITATION

This assessment has been carried out in accordance with AS 3959-2018 for the purpose of calculating the potential Bushfire Attack Level (BAL).

A fire event is unpredictable and can be influenced by many factors such as, but not limited to, temperature, wind speed, wind direction, humidity, the slope of the land, vegetation fuel load, growth, planting or removal, level of implementation and maintenance of fire prevention measures and the construction of additional structures upon the property that are not included as part of this assessment. If you are concerned or notice that factors have changed a new Bushfire Attack Level should be undertaken.

As permitted by the law and to its greatest extent, BCSWA Pty Ltd and its associated employees excludes all liability whatsoever for: Damage, loss, injury, death or claim to any property and/or person caused by a fire regardless of how that fire was caused and Errors and/or omissions in this report with the client expressly acknowledging that such exclusion of liability is reasonable in all circumstances.

This assessment is not a Bushfire Management Plan and does not in any way certify that the proposed structure has been built in accordance with the assessed BAL rating. In providing this report as part of a development application or building licence the client and landowner acknowledges that they understand, approve and will comply with all requirements to maintain the separation distances detailed in this report. Furthermore, the client/landowner acknowledges and accepts all responsibility in maintaining the required building protection zone defined in AS 3959-2018.

This report is valid for 12 months only from the date of issue.

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Sustainable Transport. Safe Solutions

Lot 10 Goddard St, Rockingham

Proposed Residential Development

TRANSPORT IMPACT STATEMENT



Prepared for:

Dale Alcock Projects

April 2024

Lot 10 Goddard St, Rockingham

Prepared for: Dale Alcock Projects
Prepared by: Paul Ghantous
Date: 10 April 2024
Project number: U24.015

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1 Introduction

This Transport Impact Statement has been prepared by Urbii on behalf of Dale Alcock Projects with regards to the proposed residential development, located at Lot 10 Goddard St, Rockingham.

The subject site is situated on the southern side of Goddard Street, as shown in Figure 1. The site is presently vacant and is surrounded by a mix of commercial, civic and residential land uses.

It is proposed to develop the site into a residential development, delivering 14 townhouses.

The key issues that will be addressed in this report include the traffic generation and distribution of the proposed development, access and egress movement patterns, car parking and access to the site for alternative modes of transport.



Figure 1: Subject site

2 Scope of work

The WAPC *Transport Assessment Guidelines 2016* identifies the proposed development as being "Low Impact" (Figure 2). A Transport Impact Statement (TIS) has been prepared to support a robust Development Application and to assist the City with demonstration of traffic impact.

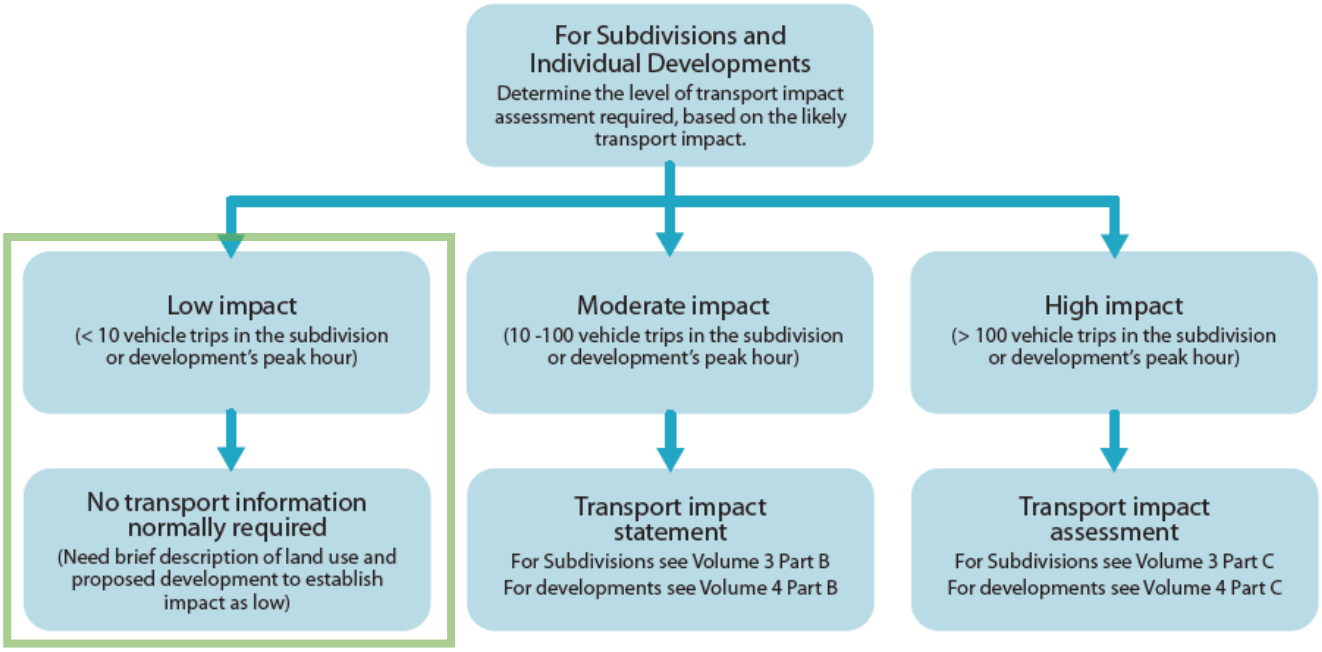


Figure 2: WAPC Transport Assessment Guidelines – reporting requirements

3 Proposed development

The proposal for the subject site is for a grouped dwelling residential development, comprising:

- A total of 14 residential dwellings configured as townhouses;
- Car parking providing 1 bay per dwelling;
- 1.0m wide flush path for walking and cycling; and,
- Communal bin store on the ground level located near the site entry.

Vehicle access to the site is proposed via one crossover to an adjoining access easement. Bins will be wheeled out from the communal bin store for internal waste collection from the adjoining access easement.

People walking and cycling will access the development from the external path network abutting the site. The proposed development has been designed to accommodate a ‘shared space’ for residents who choose to walk, cycle or drive.

The proposed development plans are included for reference in Appendix A.

4 Vehicle access and parking

4.1 Vehicle access

The proposed vehicular access arrangements have been reviewed for efficient and safe traffic circulation.

As detailed in the proposed development plans and in Figure 3, vehicle access to the site is proposed via one crossover to an adjoining access easement. The site has access via several easements, which connect to four public roads.

Internally, there is a street which is proposed to be shared for the movement of people choosing to drive, cycle or walk. The street will also be a place where locals can dwell and do other activities. There is a functional internal street width of 4.5m, which is sufficient for people driving in opposite directions to pass each other at low speed. There is localised narrowing at several points along the internal road. The localised narrowing helps slow down motorised traffic and provides extra space for landscaping.

The internal circulation roadway employs a variety of road surface textures and colours to calm the speed of motorised traffic. Space for walking is level (flush) with space for motorised traffic, to make the internal road easy to cross and to create opportunities for flexible use of the space by residents.

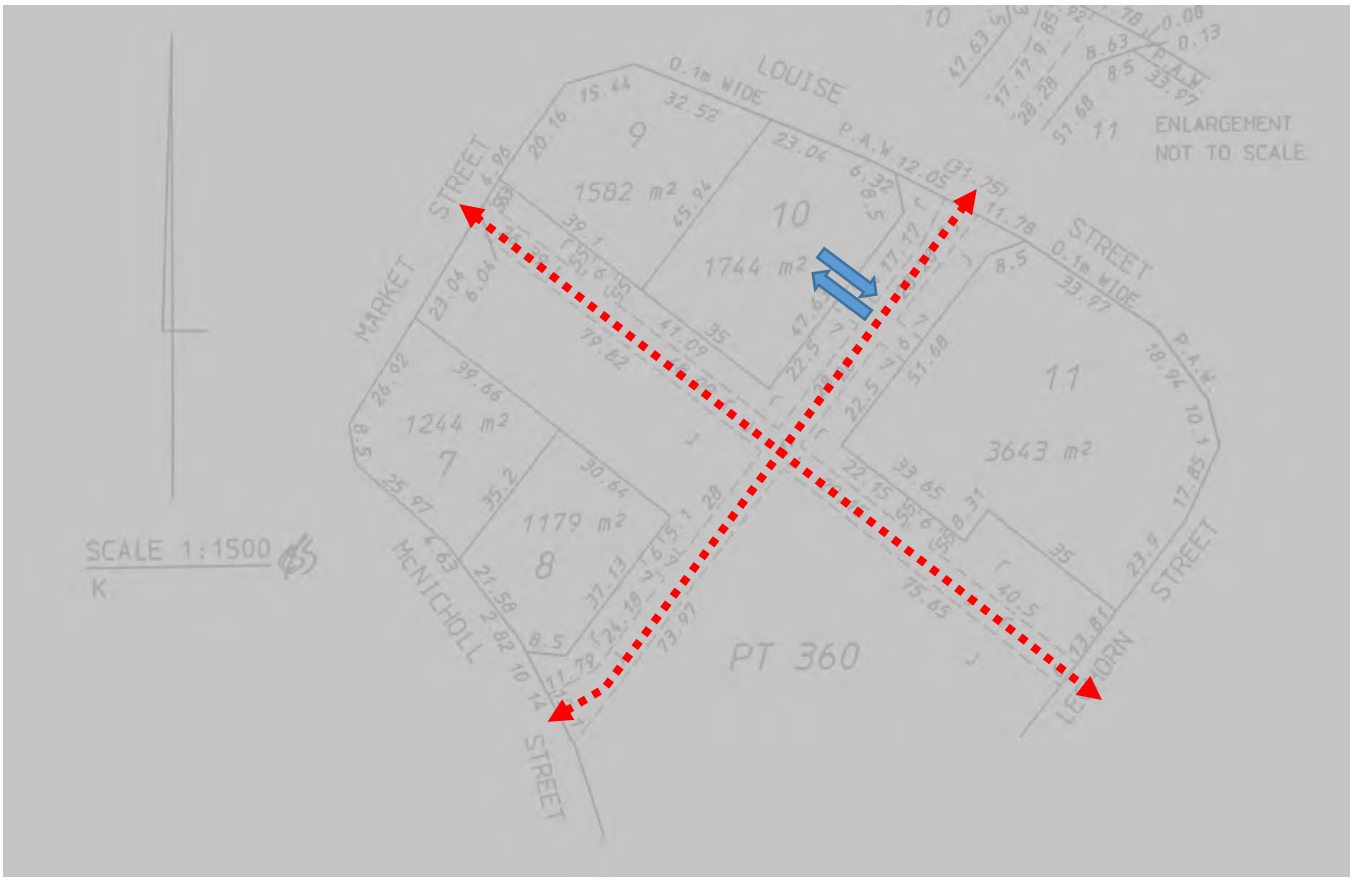


Figure 3: Proposed vehicle access

4.2 Movement and place analysis

The philosophy of movement and place recognises that streets perform multiple functions. Transport links not only move people from point A to B, but they can also function as key places. There is a natural tension between these two functions. As a movement corridor, every link aims to minimise travel time and keep people and goods moving. On the other hand, as a place, streets aim to increase visitor dwell time.

Not all streets can be popular destinations, just as not all streets can prioritise vehicle movement. It is important to recognise the roles of movement and place on our roads and streets. Finding an appropriate balance is key for integrated transport planning.

The movement and place framework, categorises roads and streets as a function of their role in moving people and being a place (Figure 4).

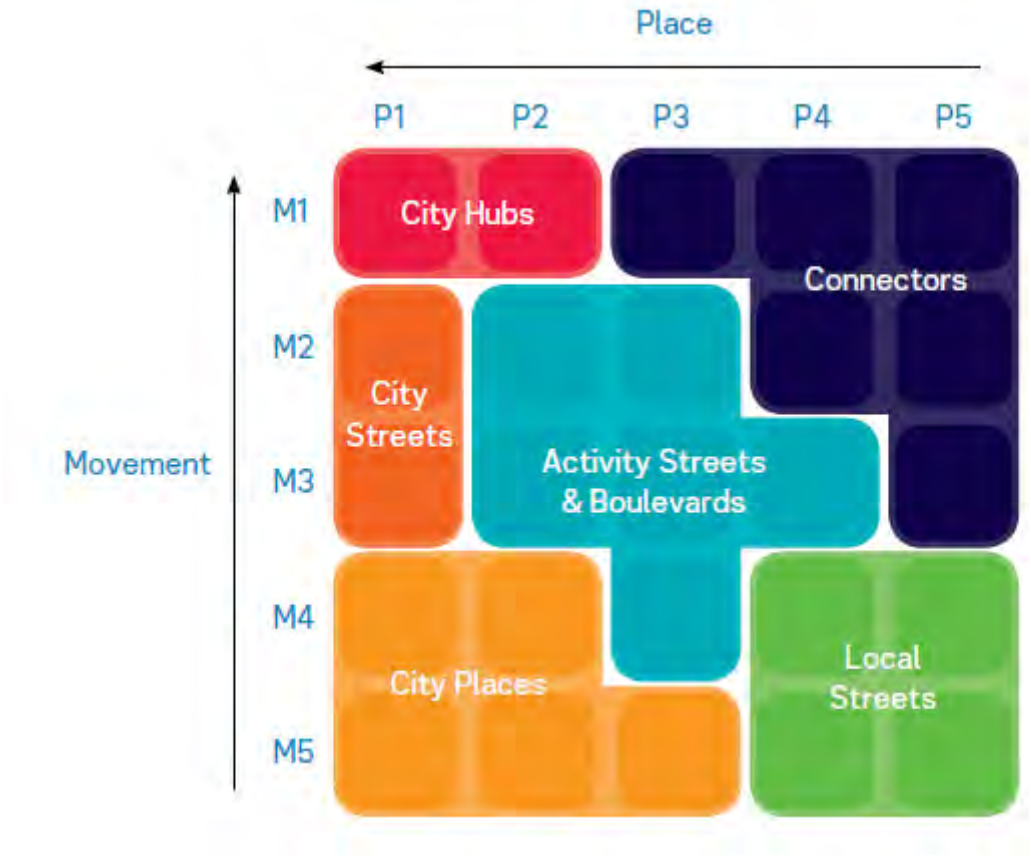


Figure 4: Movement and place – road and street categories

Source: *Movement and Place in Victoria*, Department of Transport Victoria, 2019

The proposed internal street meets the functional definition of 'M5' for movement. M5 links are for local movements. The internal street has no through connectivity, and its sole function is to facilitate movement for the proposed townhouses. The internal street meets the functional definition of 'P5' for place. P5 links are places of local significance. The internal street functions as a place for residents and visitors of the development.

Based on the movement and place categories, the proposed internal access street can be defined as a Local Street. Successful Local Streets should provide quiet, safe and desirable residential access for all ages and abilities that foster community spirit and local pride. They are part of the fabric of our neighbourhoods, where we live our lives and facilitate local community access.

The Main Roads WA *Speed Zoning - Policy and Application Guidelines - May 2021* recommends a speed limit of 10km/h in confined areas where movement of people walking and cycling has priority over motorised traffic. Generally, the volume of traffic is very low. This definition is appropriate for the proposed development internal street.

To support the successful function of the proposed internal street, it is therefore recommended that a 10km/h speed limit apply internally. This speed limit applies equally for all modes of transport and can be reinforced through installation of shared zone signs.

The Australian Standard AS 1742.4-2008: *Manual of uniform traffic control devices - Speed controls*, provides guidance on the use of shared zones. Signs shall be used at the start and end of shared zones as specified in Clause 3.2.6 and shown in Figure 5. A typical shared zone treatment is shown in Appendix C.

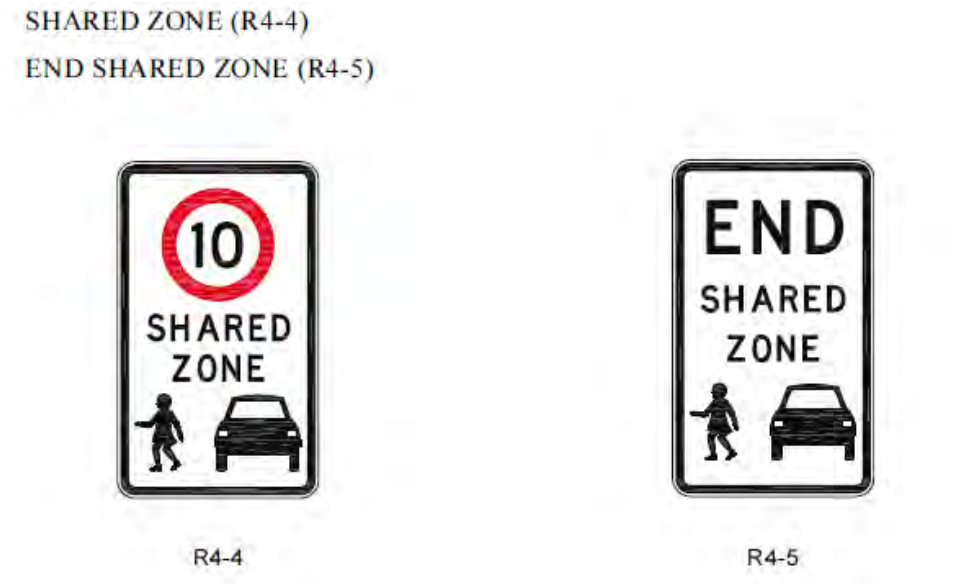


Figure 5: Signs for shared zones

Clause 3.2.6 Shared zones

"Shared zones are generally provided in areas where the competing demands of pedestrians, moving vehicles and parking require a form of control which allows complete pedestrian mobility and restricts vehicle speeds thereby enhancing pedestrian safety. A speed limit of 10 km/h is recommended.

In the design of a shared zone the environment needs to be altered to make it obviously different from other streets. This can be achieved by the use of different coloured and textured paving, by the use of full width paving between property lines and by judicial and aesthetic placement of planters and other landscaping. Perimeter (threshold) treatments in accordance with AS 1742.13 should also be considered. The signs SHARED ZONE (R4-4) and END SHARED ZONE (R4-5) (see Clause 3.1.5) shall be used at every entrance to and exit from the shared zone."

4.3 Parking supply and demand

Each residence is provided allocated car parking. No visitor car parking is provided onsite. There are nine on-street parking spaces provided on Goddard Street adjacent to the site.

A geospatial analysis was undertaken to assess the 5-minute walking catchment of the site. As detailed in Section **Error! Reference source not found.** of this report, there are many public parking opportunities located within the short 5-minute walkable catchment area, including parking on Goddard St, McNicholl St, Chalgrove Ave and Market St. Public parking can be used by residential visitors, with the peak demand time for visitors being weekday evenings and weekends.

Additionally, there are high-frequency bus connections as described in Section 9 of this report.

The proposed car parking supply is sufficient for the development.

5 Provision for service vehicles

The proposed development is residential in nature and will not generate significant delivery and other service vehicle traffic. Bins will be wheeled from the communal bin store out to a temporary presentation area near the access easement on designated days.

6 Hours of operation

For most residential developments, the peak traffic hours typically coincide with the weekday commuter AM and PM peak hours on the surrounding road network.

The weekday AM peak hour for the adjacent road network occurs between 8am to 9am and the weekday PM peak hour occurs between 3pm to 4pm. The peak hours for the proposed development are anticipated to coincide at around these times.

7 Daily traffic volumes and vehicle types

7.1 Traffic generation

The traffic volume that will be generated by the proposed development has been estimated using trip generation rates derived with reference to the following sources:

- Roads and Traffic Authority of New South Wales *Guide to Traffic Generating Developments (2002);* and
- RTA TDT 2013/ 04a.

The trip generation rates adopted are detailed in Table 1.

Table 1: Adopted trip rates for traffic generation

Land use	Trip rate source	Daily rate	AM rate	PM rate	AM-in	AM-out	PM-in	PM-out
Residential	RTA NSW - Medium density residential building	5	0.5	0.5	25%	75%	65%	35%

The estimated traffic generation of the proposed development is detailed in Table 2. The proposed development is estimated to generate a total of 70 vehicles per day (vpd), with 7 vehicles per hour (vph) generated during the AM and PM peak hours, respectively.

These trips include both inbound and outbound vehicle movements. It is anticipated that most of the vehicle types would be passenger cars and SUVs.

Table 2: Traffic generation – Weekday AM and PM peak hours

Land use	Quantity	Daily Trips	AM Trips	PM Trips	AM Peak Trips		PM Peak Trips	
					IN	OUT	IN	OUT
Residential	14	70	7	7	2	5	5	2

7.2 Impact on surrounding roads

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provides the following guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The proposed development will not increase traffic flows on any roads adjacent to the site by the quoted WAPC threshold of +100vph to warrant further analysis. Therefore, the impact on the surrounding road network is acceptable.

8 Traffic management on the frontage roads

Information from online mapping services, Main Roads WA, Local Government, and/or site visits was collected to assess the existing traffic management on frontage roads.

8.1.1 Goddard Street

Goddard Street near the subject site is an approximately 23m wide, four-lane divided road. Goddard Street is presented as a boulevard style road. It features a 6m wide raised and kerbed median with tree planting and lighting.

A path for walking and cycling is provided on the southern side of the road. On-street parallel parking is provided adjacent to the subject site.

Goddard Street is classified as a *Local Distributor* road in the Main Roads WA road hierarchy (Figure 6) and operates under a posted speed limit of 60km/h (Figure 7). Local Distributor roads are the responsibility of Local Government and are typically for movement of traffic within local areas and connect access roads to higher order Distributors. (Figure 8).

No traffic data is available at the time of preparation of this report. Analysis of SCATS signal data for the intersection of Goddard Street and Dixon Road indicates that Goddard Street presently carries an estimated 7,000 to 9,000 vehicles per day.

8.1.2 Other roads

The internal access easements provide site access to Market Street, McNichol Street and Chalgrove Avenue. Chalgrove Avenue is a Local Distributor road, and the other streets are Access roads. A 50km/h speed limit applies on all three roads.

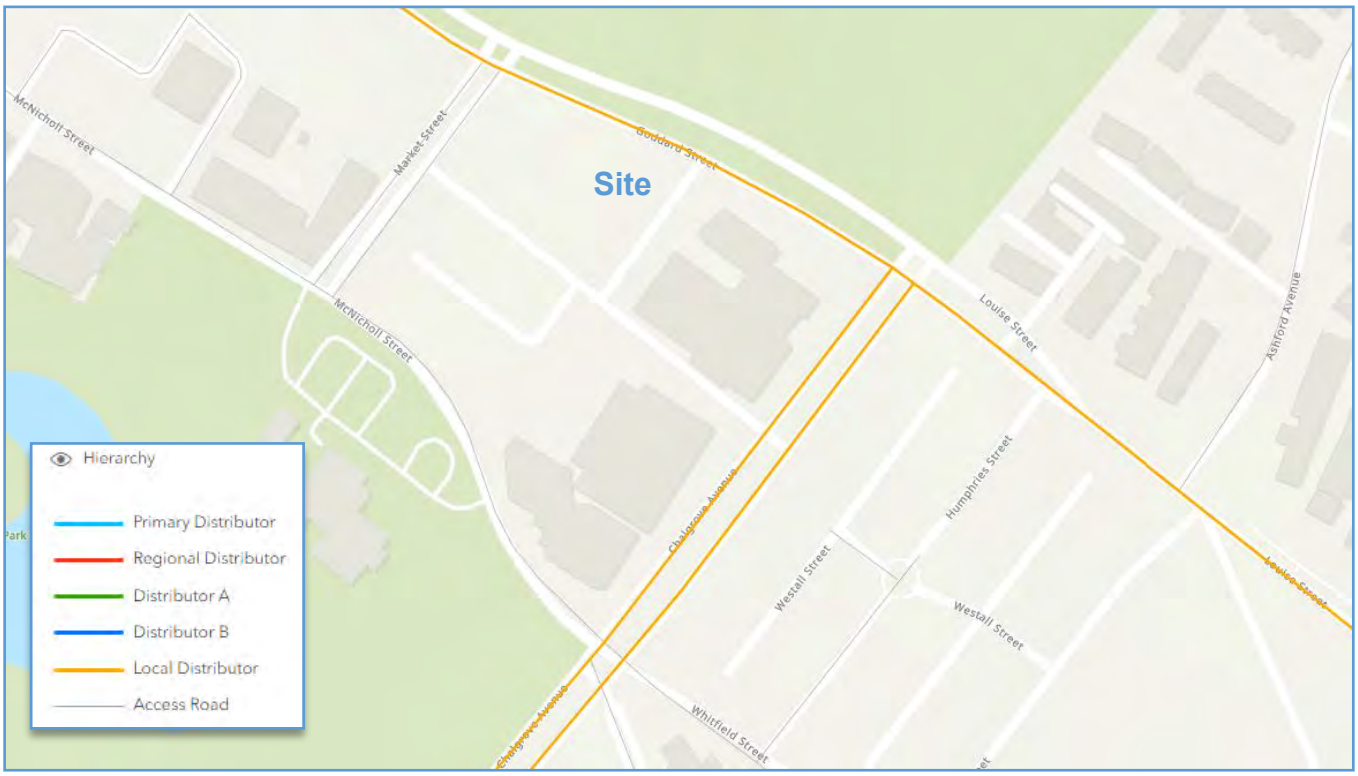


Figure 6: Main Roads WA road hierarchy plan

Source: Main Roads WA Road Information Mapping System (RIM)

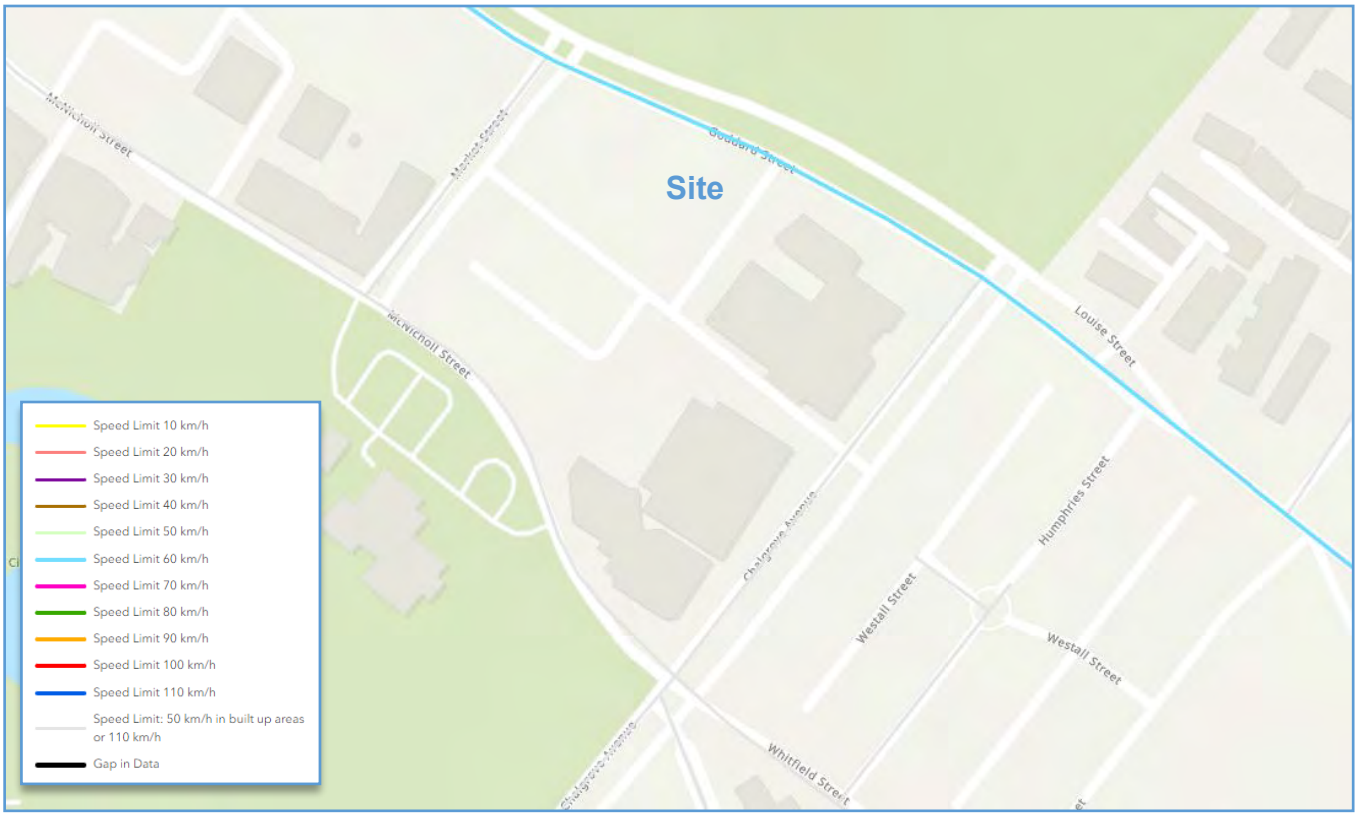


Figure 7: Main Roads WA road speed zoning plan

Source: Main Roads WA Road Information Mapping System (RIM)

ROAD HIERARCHY FOR WESTERN AUSTRALIA
ROAD TYPES AND CRITERIA (see Note 1)

CRITERIA	PRIMARY DISTRIBUTOR (PD) (see Note 2)	DISTRICT DISTRIBUTOR A (DA)	DISTRICT DISTRIBUTOR B (DB)	REGIONAL DISTRIBUTOR (RD)	LOCAL DISTRIBUTOR (LD)	ACCESS ROAD (A)
Primary Criteria						
1. Location (see Note 3)	All of WA incl. BUA	Only Built Up Area.	Only Built Up Area.	Only Non Built Up Area. (see Note 4)	All of WA incl. BUA	All of WA incl. BUA
2. Responsibility	Main Roads Western Australia.	Local Government.	Local Government.	Local Government.	Local Government.	Local Government.
3. Degree of Connectivity	High. Connects to other Primary and Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	Medium. Minor Network Role Connects to Distributors and Access Roads.	Low. Provides mainly for property access.
4. Predominant Purpose	Movement of inter regional and/or cross town/city traffic, e.g. freeways, highways and main roads.	High capacity traffic movements between industrial, commercial and residential areas.	Reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas.	Roads linking significant destinations and designed for efficient movement of people and goods between and within regions.	Movement of traffic within local areas and connect access roads to higher order Distributors.	Provision of vehicle access to abutting properties
Secondary Criteria						
5. Indicative Traffic Volume (AADT)	In accordance with Classification Assessment Guidelines.	Above 8 000 vpd	Above 6 000 vpd.	Greater than 100 vpd	Built Up Area - Maximum desirable volume 6 000 vpd. Non Built Up Area – up to 100 vpd.	Built Up Area - Maximum desirable volume 3 000 vpd. Non Built Up Area – up to 75 vpd.
6. Recommended Operating Speed	60 – 110 km/h (depending on design characteristics).	60 – 80 km/h.	60 – 70 km/h.	50 – 110 km/h (depending on design characteristics).	Built Up Area 50 - 60 km/h (desired speed) Non Built Up Area 60 – 110 km/h (depending on design characteristics).	Built Up Area 50 km/h (desired speed). Non Built Up Area 50 – 110 km/h (depending on design characteristics).
7. Heavy Vehicles permitted	Yes.	Yes.	Yes.	Yes.	Yes, but preferably only to service properties.	Only to service properties.
8. Intersection treatments	Controlled with appropriate measures e.g. high speed traffic management, signing, line marking, grade separation.	Controlled with appropriate measures e.g. traffic signals.	Controlled with appropriate Local Area Traffic Management.	Controlled with measures such as signing and line marking of intersections.	Controlled with minor Local Area Traffic Management or measures such as signing.	Self controlling with minor measures.
9. Frontage Access	None on Controlled Access Roads. On other routes, preferably none, but limited access is acceptable to service individual properties.	Prefer not to have residential access. Limited commercial access, generally via service roads.	Residential and commercial access due to its historic status Prefer to limit when and where possible.	Prefer not to have property access. Limited commercial access, generally via lesser roads.	Yes, for property and commercial access due to its historic status. Prefer to limit whenever possible. Side entry is preferred.	Yes.
10. Pedestrians	Preferably none. Crossing should be controlled where possible.	With positive measures for control and safety e.g. pedestrian signals.	With appropriate measures for control and safety e.g. median/islands refuges.	Measures for control and safety such as careful siteing of school bus stops and rest areas.	Yes, with minor safety measures where necessary.	Yes.
11. Buses	Yes.	Yes.	Yes.	Yes.	Yes.	If necessary (see Note 5)
12. On-Road Parking	No (emergency parking on shoulders only).	Generally no. Clearways where necessary.	Not preferred. Clearways where necessary.	No – emergency parking on shoulders – encourage parking in off road rest areas where possible.	Built Up Area – yes, where sufficient width and sight distance allow safe passing. Non Built Up Area – no. Emergency parking on shoulders.	Yes, where sufficient width and sight distance allow safe passing.
13. Signs & Linemarking	Centrelines, speed signs, guide and service signs to highway standard.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs and guide signs.	Speed and guide signs.	Urban areas – generally not applicable. Rural areas - Guide signs.
14. Rest Areas/Parking Bays	In accordance with Main Roads' *Roadside Stopping Places Policy*.	Not Applicable.	Not Applicable.	Parking Bays/Rest Areas. Desired at 60km spacing.	Not Applicable.	Not Applicable.

Figure 8: Road types and criteria for Western Australia

Source: Main Roads Western Australia D10#10992

9 Public transport access

Information was collected from Transperth, PTA and site visits to assess the existing public transport access to and from the site.

The subject site has access to the following bus service within walking distance:

- Bus Route 548: Fremantle Stn - Rockingham Stn via Cockburn Rd & Patterson Rd.
- Bus Route 549: Fremantle Stn - Rockingham Stn via Rockingham Rd & Kwinana.
- Bus Route 551: Rockingham Stn - Shoalwater via Parkin St.
- Bus Route 555: Rockingham City Transit System.

Public transport services provide a viable alternative mode of transport for residents and visitors of the proposed development. The closest bus stops are located within 200m walking distance on Chalgrove Avenue and Louise Street (Figure 9).

Bus services provide excellent coverage and connectivity to the rail network. The public transport network plan is shown in Figures 10 to 13.

The site is located within 100m of the planned alignment of the Rockingham City Centre Transit System (RCCTS), which will further promote use of public transport by residents and visitors to the site in the future.



Figure 9: Closest bus stops serving the proposed development

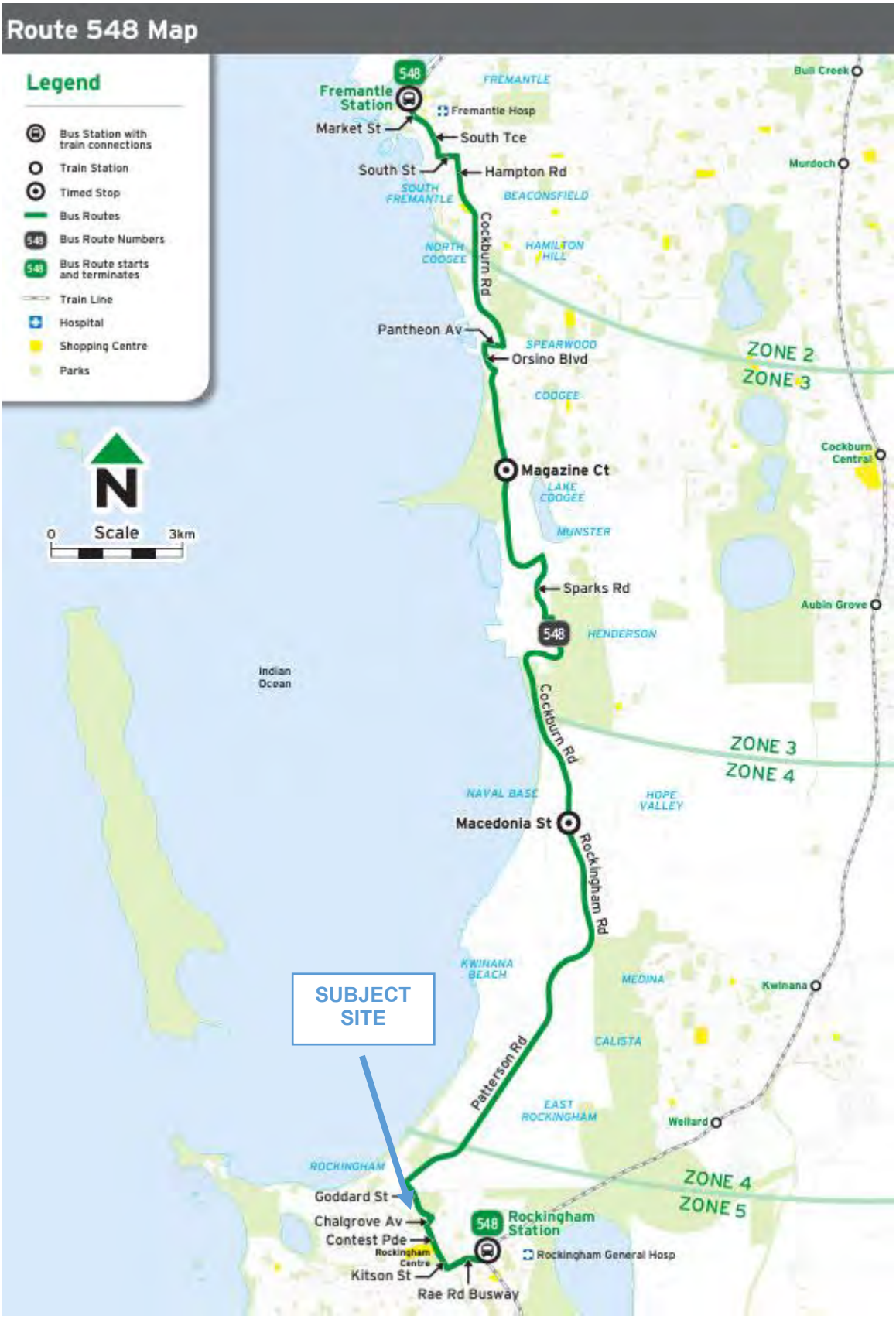


Figure 10: Transperth public transport plan – Bus route 548

Source: Transperth



Figure 11: Transperth public transport plan – Bus route 549

Source: Transperth

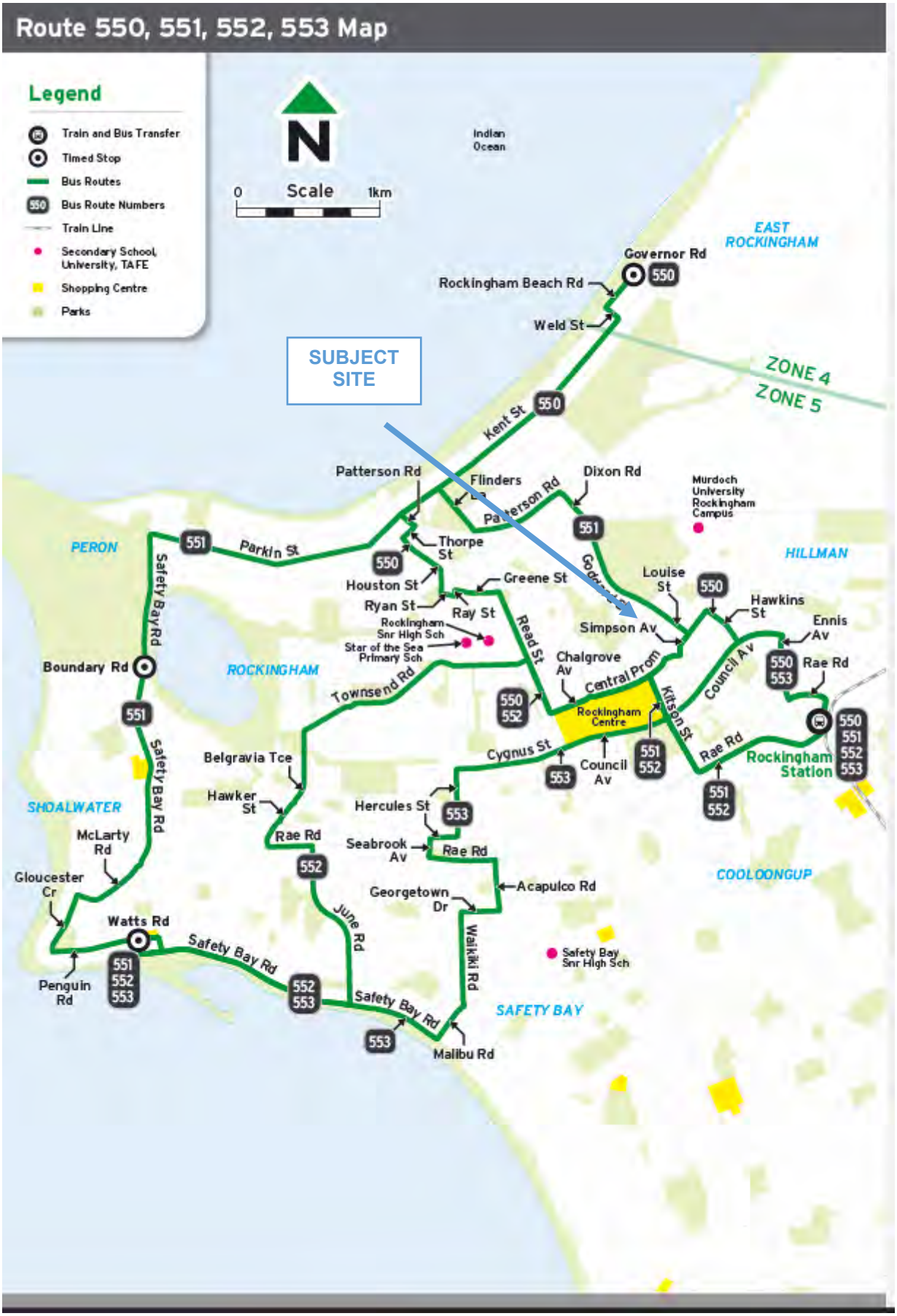


Figure 12: Transperth public transport plan – Bus route 551

Source: Transperth

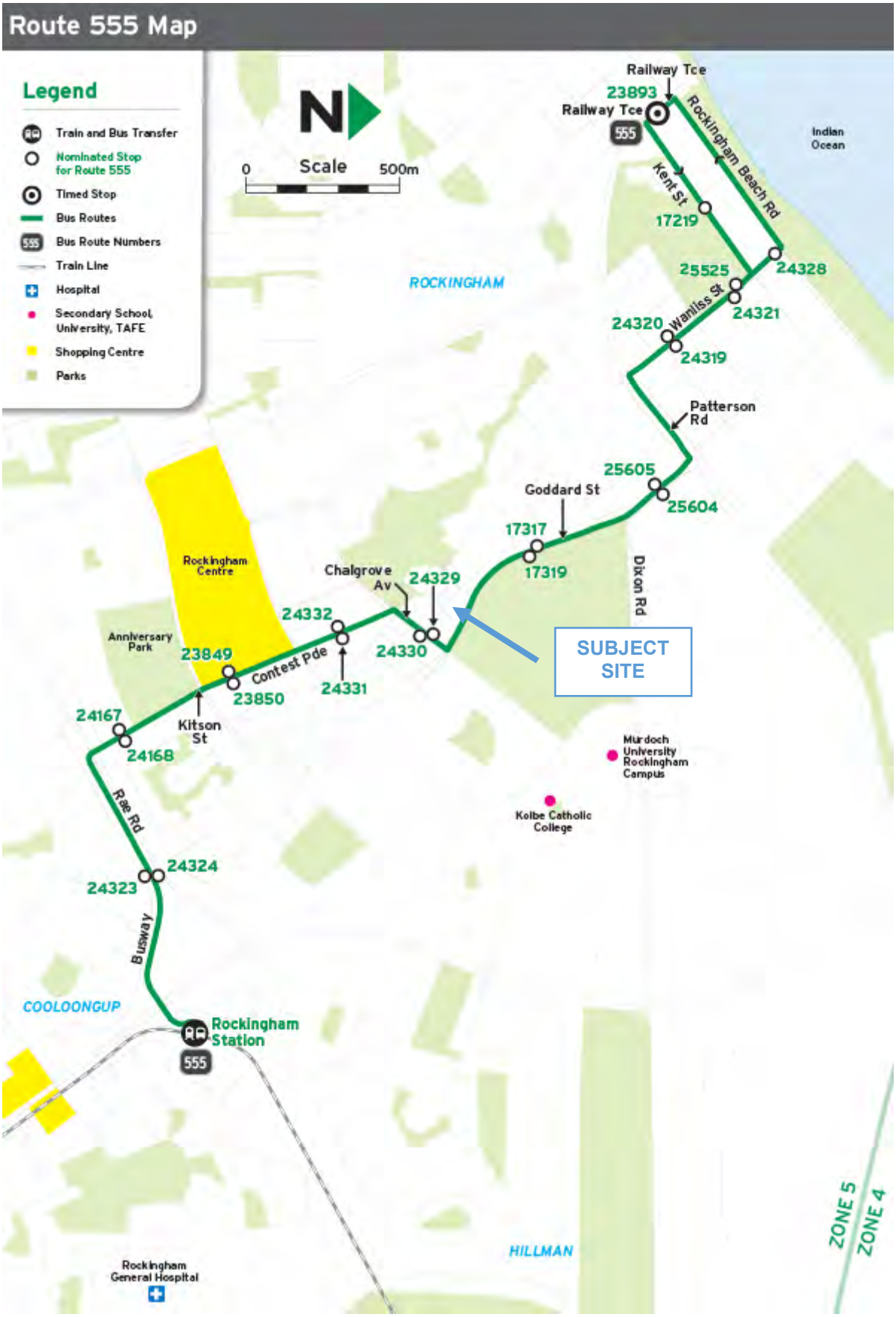


Figure 13: Transperth public transport plan – Bus route 555

Source: Transperth

10 Pedestrian access

Information from online mapping services, Main Roads WA, Local Government, and site visits was collected to assess the pedestrian access for the proposed development.

10.1 Pedestrian facilities and level of service

A path for walking and cycling is provided along the southern side of Goddard Street.

Pedestrian crossing facilities including kerb ramps and refuge islands are provided for crossing at nearby intersections, which promotes improved access for bicycles, wheelchairs, and prams. Median refuge crossings are also provided midblock on Goddard Street.

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provide warrants for installing pedestrian priority crossing facilities. This is based on the volume of traffic as the key factor determining if pedestrians can safely cross a road. The guidelines recommend pedestrian priority crossing facilities be considered once the peak hour traffic exceeds the volumes detailed in Table 3.

The traffic volumes in this table are based on a maximum delay of 45 seconds for pedestrians, equivalent to Level of Service E. The pedestrian crossing facilities on adjacent roads near the site are sufficient and within the traffic volume thresholds.

Table 3: Traffic volume thresholds for pedestrian crossings

Broad cross-section	Maximum traffic volumes providing safe pedestrian gap
2-lane undivided	1,100 vehicles per hour
2-lane divided (with refuge)	2,800 vehicles per hour
4-lane undivided*	700 vehicles per hour
4-lane divided (with refuge)*	1,600 vehicles per hour

A geospatial analysis was undertaken to assess the 5-minute walking catchment of the site. As depicted in Figure 14, there are many public parking opportunities located within the short 5-minute walkable catchment area, including parking on Goddard St, McNicholl St, Chalgrove Ave and Market St. This car parking can be used by residential visitors, with the peak demand time for visitors being weekday evenings and weekends.



Figure 14: 5-minute walking catchment to the site

Refer to Section 4.3 of this report.

11 Bicycle access

Information from online mapping services, Department of Transport, Local Government, and/or site visits was collected to assess bicycle access for the proposed development.

11.1 Bicycle network

The Department of Transport Perth Bicycle Network Map (see Figure 15) shows the existing cycling connectivity to the subject site. A shared path is provided on Goddard Street, which connects to the broader network.

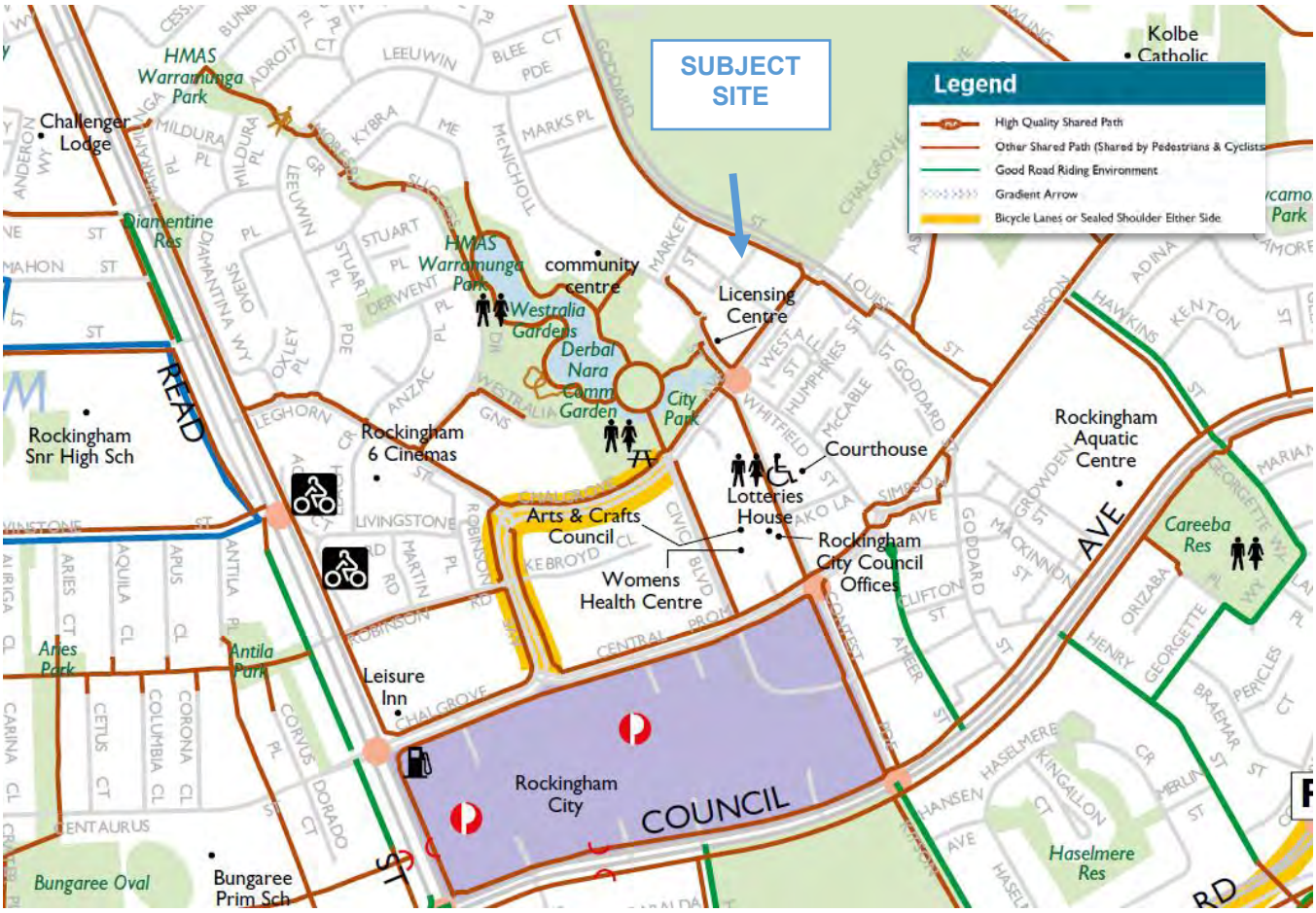


Figure 15: Perth bicycle network plan

The Strava cycling heatmap tool shows that Goddard Street and Chalgrove Avenue are relatively popular cycling routes near the site (Figure 16). The nearby City Park is also popular for cycling.



Figure 16: Strava cycling heatmap

11.2 Sustainable transport catchment

As detailed in Figure 17, the subject site is well placed for residents and visitors to travel by sustainable modes of transport. A comfortable 8km or 20-25min cycle will provide the development with a large catchment.

This range can be further increased through a combination of micro-mobility and train travel with access to train stations.

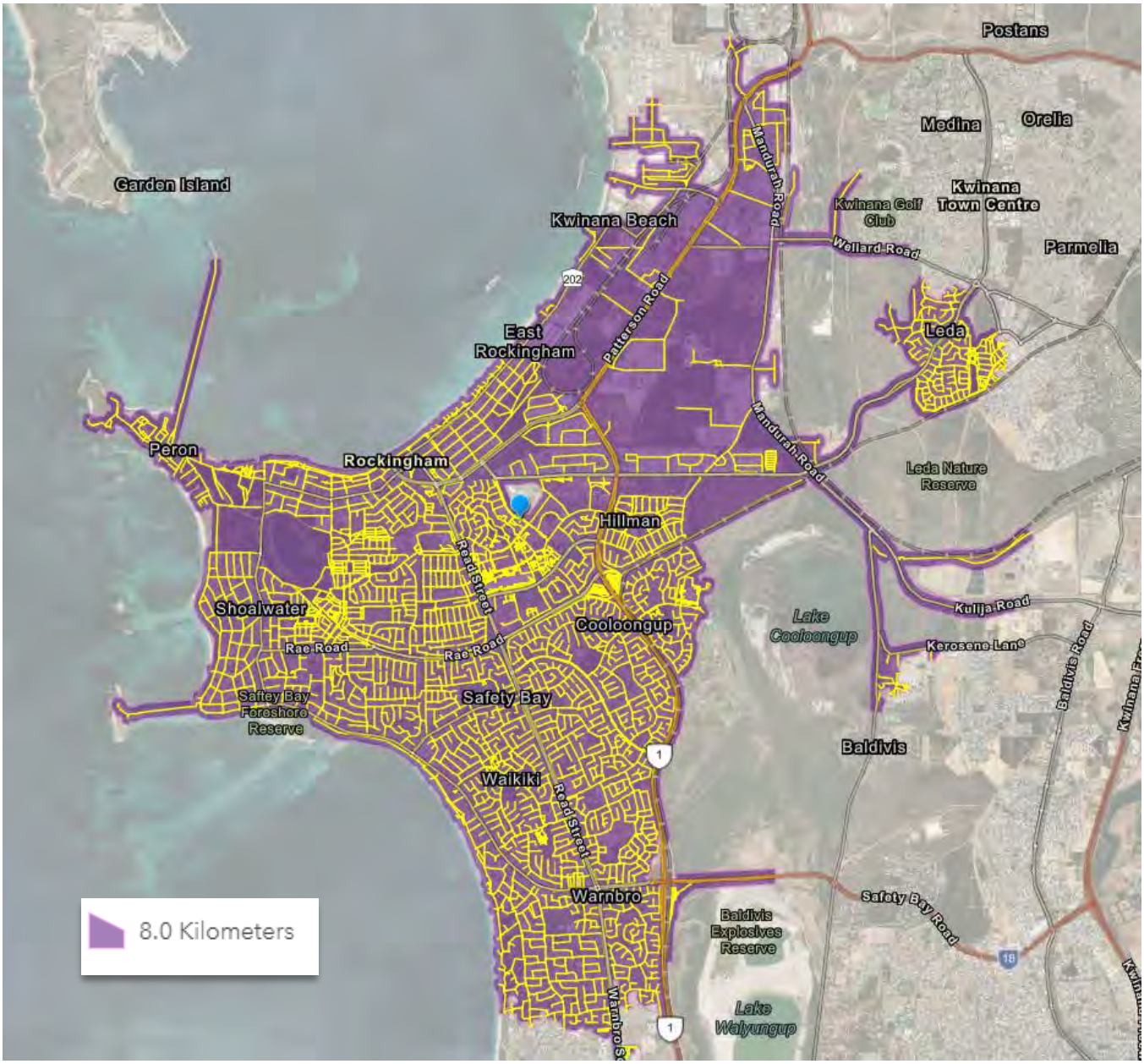


Figure 17: Cycling and micro-mobility catchment

12 Site specific issues

No additional site-specific issues were identified within the scope of this assessment.

13 Safety issues

The five-year crash history in the vicinity of the site was obtained from Main Roads WA. As detailed in Figure 18, one crash was recorded in the locality in the last five years. The detailed crash history is presented in Table 4. The low traffic generation of the proposed development is unlikely to impact traffic safety in the area.



Figure 18: 5-year crash map in the locality (2019-2023)

Source: MRWA crash mapping tool

Table 4: 5-year crash history in the locality (2019-2023)

Severity	No.	%
Fatal	0	0
Hospital	0	0
Medical	0	0
PDO Major	1	100.00
PDO Minor	0	0

Year	No.	%
2020	1	100.00

Nature	No.	%
Head On	0	0
Hit Animal	0	0
Hit Object	1	100.00
Hit Pedestrian	0	0
Non Collision	0	0
Not Known	0	0
Rear End	0	0
Right Angle	0	0
Right Turn Thru	0	0
Sideswipe Opposite Dirn	0	0
Sideswipe Same Dirn	0	0

Light	No.	%
Dark - Street Lights Not Provided	0	0
Dark - Street Lights Off	0	0
Dark - Street Lights On	0	0
Dawn Or Dusk	0	0
Daylight	1	100.00
Not Known	0	0

Conditions	No.	%
Dry	1	100.00
Not Known	0	0
Wet	0	0

Alignment	No.	%
Curve	0	0
Not Known	0	0
Straight	1	100.00

Total	1

14 Conclusion

This Transport Impact Statement has been prepared by Urbii on behalf of Dale Alcock Projects with regards to the proposed residential development, located at Lot 10 Goddard St, Rockingham.

The subject site is situated on the southern side of Goddard Street. The site is presently vacant and is surrounded by a mix of commercial, civic and residential land uses.

It is proposed to develop the site into a residential development, delivering 14 townhouses.

The site features good connectivity with the existing road, walking and cycling network. There is good public transport coverage through nearby bus services which connect to the rail network.

The car parking supply is satisfactory and can accommodate the car parking demand of the proposed development.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development is low (less than 10vph on any lane) and as such would have minimal impact on the surrounding road network.

It is concluded that the findings of this Transport Impact Statement are supportive of the proposed development.

15 Appendices

Appendix A: Proposed development plans



Lot 10, Goddard St, Rockingham

Site Plan - Ground Floor

1:200 AT A3

05.03.24

A_010

sk

Dale Alcock Projects

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DALE ALCOCK PROJECTS

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Revision | Issued | Date

Appendix B: Movement and place classifications

Source: *Movement and Place in Victoria*, Department of Transport Victoria, 2019

Movement classifications

Movement classifications represent the mix of transport links that are required to support the overall demand for movement across a network.

Movement classifications communicate the broad aspirational movement function of a transport link in relation to its place function. The classification of M1 to M5 is determined by examining the overall mix and function of different transport modes on the link.

Movement definitions

M1	Mass movement of people and/or goods on routes with a state or national-level movement function or provides primary access to state-level places.
M2	Significant movement of people and/or goods on routes connecting across multiple municipalities or provides primary access to regional-level places.
M3	Moderate movement of people and/or goods on routes connecting municipalities or provides primary access to municipal-level places.
M4	Movement of people and/or goods within a municipality.
M5	Local movement.

Mode classification types

Victoria's multi-modal transport system is represented in a series of sub-movement types with a defined hierarchy within each.

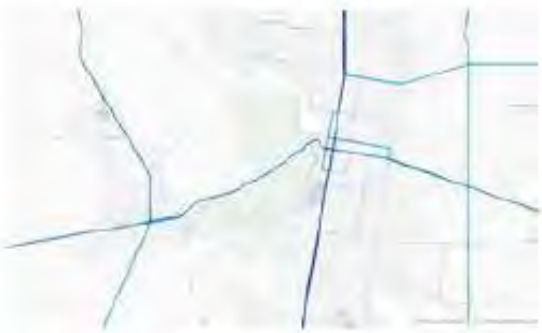
- General Traffic
- Tourist
- Rail
- Interchange
- Tram
- Cycling
- Bus
- Walking
- Freight



Melbourne – Example of mapping available which shows the various movement classifications on the arterial road network.



Wangaratta



Shepparton

General Traffic

- GT1
- GT2
- GT3
- GT4
- GT5

Movement and Place in Victoria 13

Place classifications

Place classifications are defined by State-level planning strategies such as the Plan Melbourne's activity centre hierarchy, State Planning Policy Framework, Planning Zones and regional growth plans.

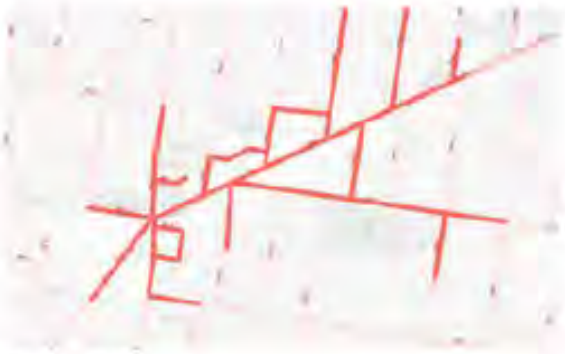
Place classifications represent the future vision for a place. It is the first classification applied to a link and takes account of all place characteristics that have an impact on movement.

Place definitions

P1	Place of state or national significance.
P2	Place of regional significance.
P3	Place of municipal significance .
P4	Place of neighbourhood significance.
P5	Place of local significance.



Central Bendigo



Kew Junction

Places of Activity (PA)

PA1
PA2
PA3
PA4
PA5

Place classification types

Place categories are currently being defined to identify three different types of places, and how they are experienced by users.

Places of activity

- Applies to areas with differing street-based activity such as areas with retail and commercial frontages and public uses.

Typical areas classified:

- Activity centres with strip shopping areas.
- Precincts with active ground floor frontages as part of their zoning requirements.
- Parks and public amenities.

Places of off-street activity

- Applies to areas often set-back from the street but still having an impact on the road & street network.

Typical areas classified:

- Shopping centres and land-uses set-back from the street
- Industrial areas
- Event spaces such as stadia and sports complexes

Places of landscape and culture

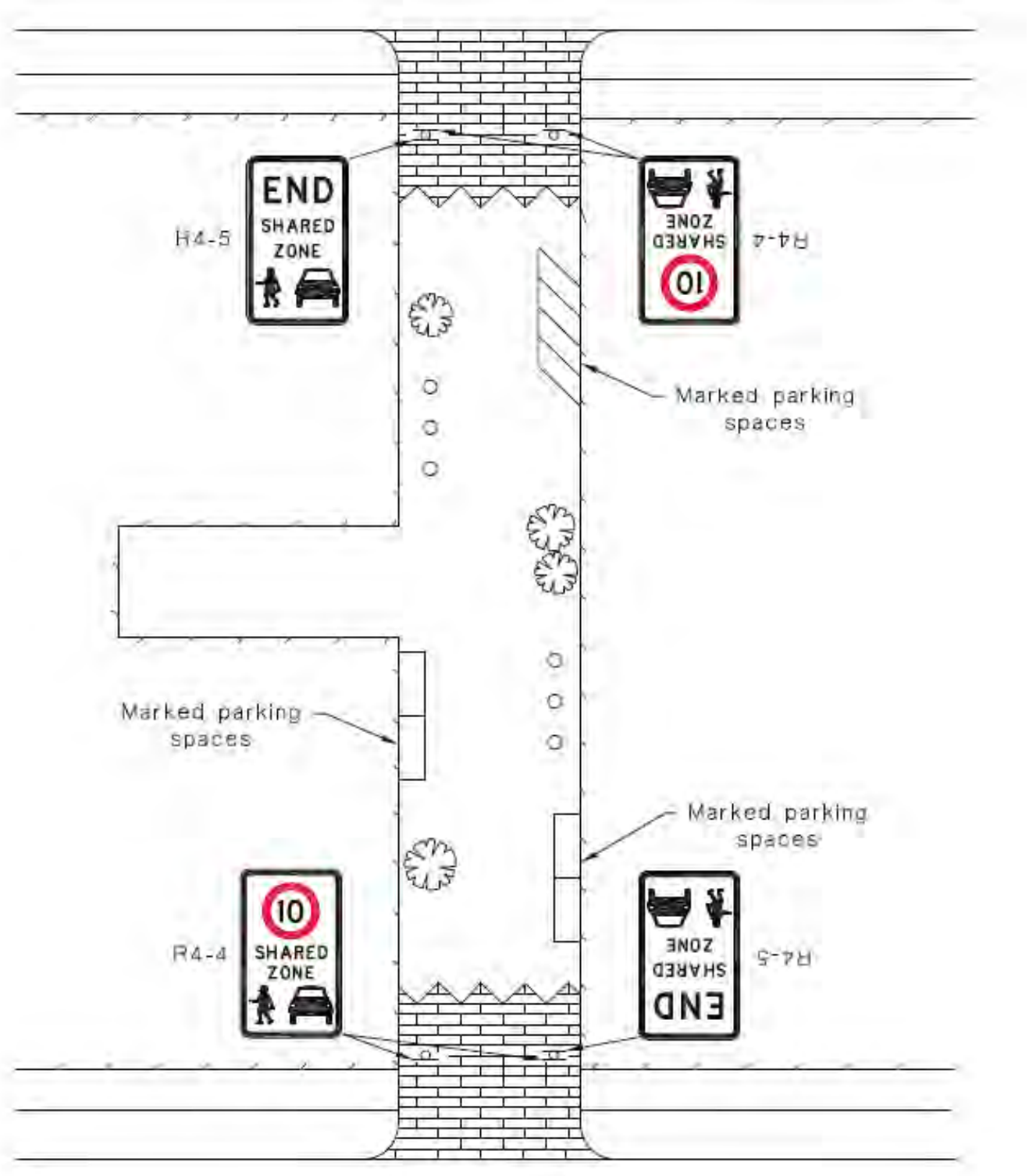
- Applies to open space zoning of places of landscape or cultural significance. Predominantly urban parks and in regional Victoria.

Typical areas classified:

- Rural and regional landscapes
- Farming zones
- National parks and world-heritage areas
- Urban open space.

Appendix C: Typical shared zone treatment

Source: AS 1742.4 – 2008



Appendix D: Swept path diagrams

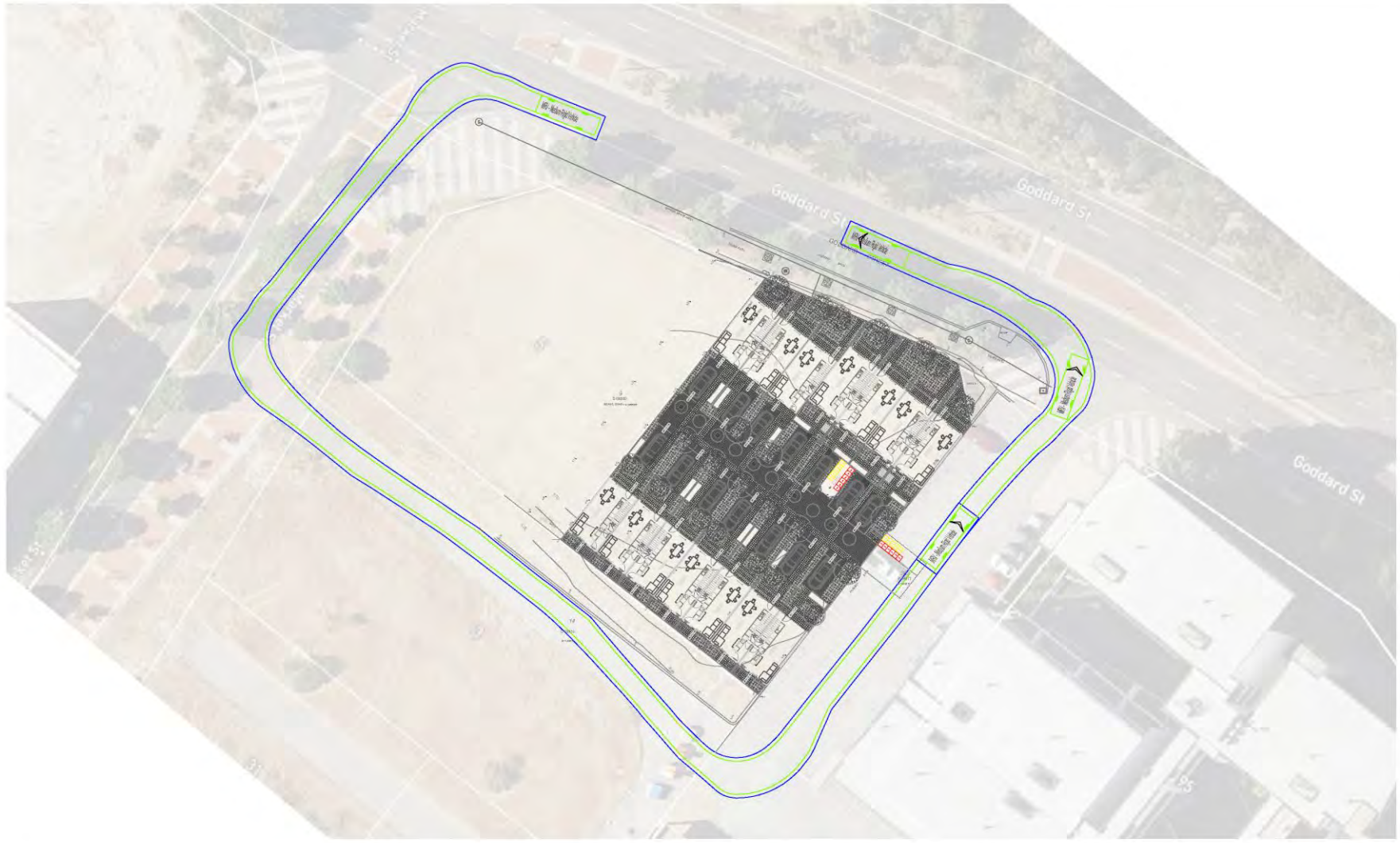
Swept path diagrams are included in this section of the report. Different coloured lines are employed to represent the various envelopes of the vehicle swept path, as described below:

Cyan represents the wheel path of the vehicle

Green represents the vehicle body envelope

Blue represents a 500mm buffer line, offset from the vehicle swept path

The swept path diagrams are also provided separately in high-quality, A3 PDF format.



Revision notes:		
Rev:	Date:	Notes:
1	22/03/2024	Dark blue line represents a 500mm buffer

Drawn by: Paul Ghantous

Client: Dale Alcock Projects

Project: U24.015 - Lot 10 Goddard Street, Rockingham
Proposed Residential Development

Drawing Title: Truck entry, circulation and exit
AS2890.2 - 8.8m Medium Rigid Vehicle (MRV)

Date: 22/03/2024

Scale @ A3: 1:500

Revision: sk01

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Urbii

Reduce. Reuse. Recycle

Lot 10 Goddard St, Rockingham

Proposed Residential Development

Waste Management Plan



Prepared for:

Dale Alcock Projects

April 2024

Lot 10 Goddard St, Rockingham

Prepared for: Dale Alcock Projects
Prepared by: Paul Ghantous
Date: 10 April 2024
Project number: U24.015

Version control

Version No.	Date	Prepared by	Revision description	Issued to
U24.015.r02	22/03/24	PG	DRAFT	Dale Alcock Projects
U24.015.r02a	10/04/24	PG	FINAL	Dale Alcock Projects

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1 Introduction

This Waste Management Plan has been prepared by Urbii on behalf of Dale Alcock Projects with regards to the proposed residential development, located at Lot 10 Goddard St, Rockingham.

The subject site is situated on the southern side of Goddard Street, as shown in Figure 1. The site is presently vacant and is surrounded by a mix of commercial, civic and residential land uses.

It is proposed to develop the site into a residential development, delivering 14 townhouses.

The key issues that will be addressed in this WMP include calculation of the waste generation of the site, assessment of waste storage provisions and documentation of the waste collection arrangements.



Figure 1: Subject site

2 Objectives

The objectives of this WMP are adapted from WALGA:

- Ensure that the long-term waste management needs for the development are met in an efficient and sustainable manner.
- Minimise the impact of waste services and facilities on the streetscape and surrounds, in relation to both the footpath/public realm and the frontage of the development.
- Reduce the impact of waste collection services and facilities on the amenity of the locality particularly in terms of noise and odour.
- Maximise safety for both waste collection staff and the public.
- Minimise traffic and footpath obstruction.

3 Referenced documents

The documents referenced in preparing this WMP may include, but are not limited to:

- City of Melbourne *Guidelines for Waste Management Plans* 2021;
- City of Perth *Waste Guidelines for all Developments* 2019;
- WALGA *Multiple Dwelling Waste Management Plan Guidelines*;
- WALGA *Subdivision Waste Management Plan Guidelines*; and,
- Waste Authority WA *Waste Avoidance and Resource Recovery Strategy for 2030*.

4 Guiding concepts

Urbii adopts the guiding concepts of the State's Waste Strategy and encourages these concepts to be considered in all developments to the furthest extent feasible.

4.1 Waste hierarchy

The *Waste Avoidance and Resource Recovery Strategy 2030* applies the waste hierarchy (Figure 2), which is a widely accepted decision-making tool. The waste hierarchy ranks waste management options in order of their general environmental desirability. Waste avoidance is the most preferred option in the hierarchy.

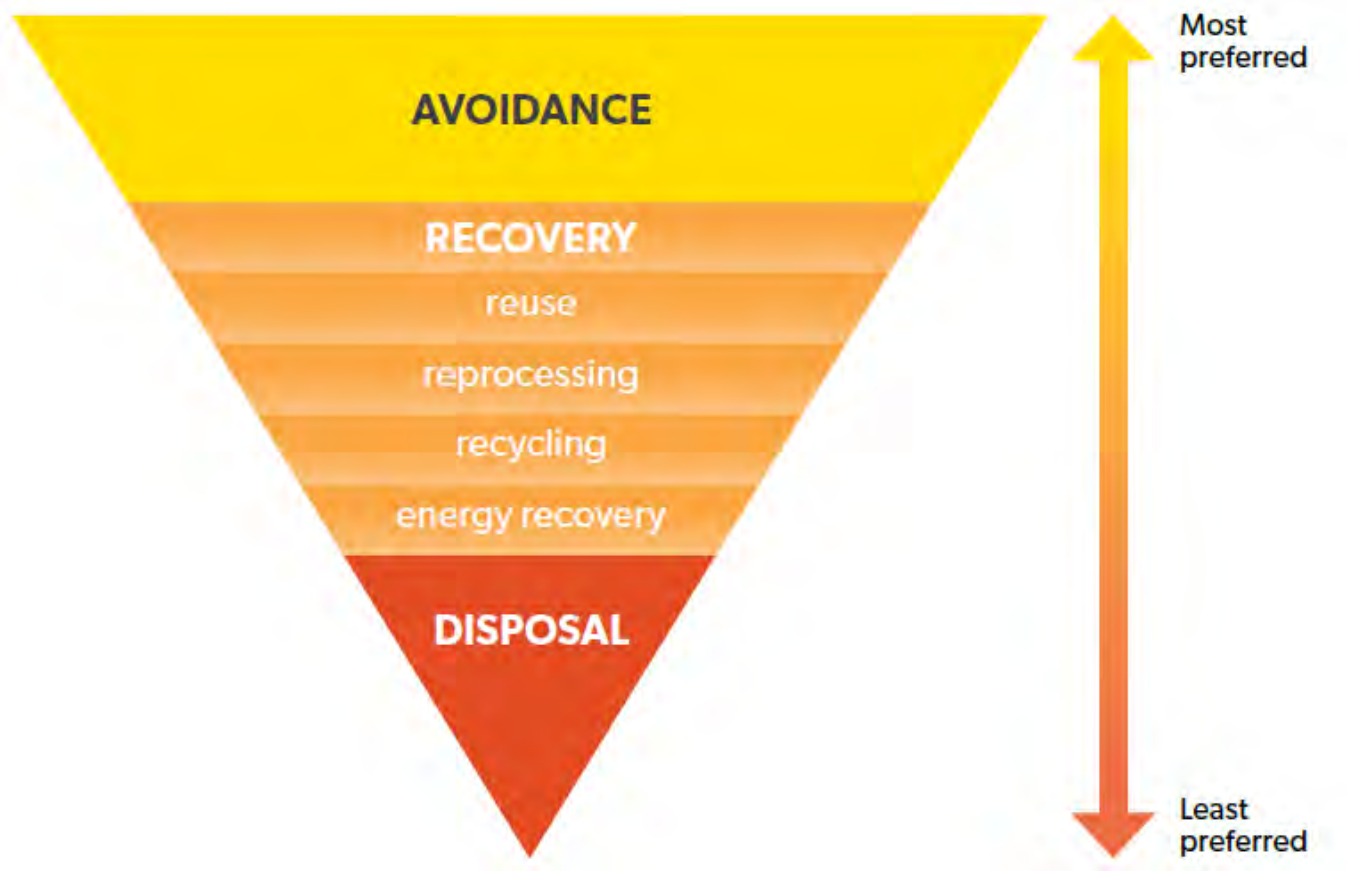


Figure 2: Waste hierarchy

Source: Waste Authority WA *Waste Avoidance and Resource Recovery Strategy for 2030.*

Resource recovery options recover value from materials, thereby offsetting the environmental impacts of extracting and processing raw materials. Energy recovery is the least preferred recovery option. Disposal is the least preferred option. Disposal generally recovers the least value from materials and delivers the least environmental benefit.

4.2 Circular economy

A circular economy (Figure 3) makes use of established sustainability concepts, including life cycle thinking and resource efficiency. A circular economy should consider the flow of both materials and energy. It moves away from the linear 'take, make, use and dispose' model, to one which keeps materials and energy circulating in the economy for as long as possible.

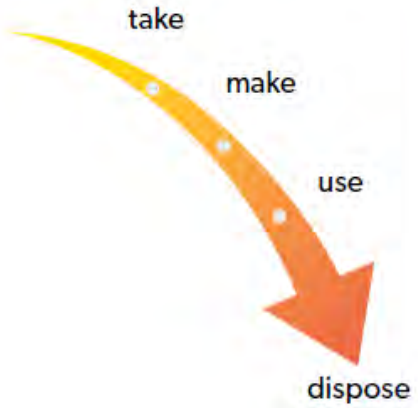
Current approach	Circular economy
	
Linear flow of materials – 'take, make, use and dispose' model.	Circular flow of materials – materials sorted and retained in the economy for as long as possible.
Limited use of renewable materials and energy.	Preference for renewable materials and energy.
Significant volumes of materials disposed of and lost to the economy. Loss of embodied materials, energy and water.	Materials recovered as high up the waste hierarchy as possible. Embodied materials, energy and water retained in the economy. Organic materials re-enter and regenerate the environment safely (for example, as compost).
Materials managed locally and globally.	Preference to manage materials locally to reduce the costs and impacts of transport, and to provide local employment and investment opportunities.
Economic value of materials, employment and investment not fully accounted for.	Economic value of materials, employment and investment accounted for.
Limited focus on life cycle thinking.	Products designed and manufactured to minimise environmental impact through whole of life.

Figure 3: Transitioning to a circular economy

5 Proposed development

The proposal for the subject site is for a multiple dwelling residential development, comprising:

- A total of 14 x 2-bed residential dwellings configured as townhouses; and,
- Communal bin store on the ground level located near the site entry.

Bins will be wheeled out from the communal bin store for internal waste collection from the adjoining access easement.

The proposed development plans are included for reference in Appendix A.

6 Waste generation

6.1 Waste generation rates

The waste generation rates for general waste and recyclables are sourced from the WALGA Guidelines. Residential waste generation rates for different multiple dwelling sizes are detailed in Table 1.

Table 1: Residential waste generation rates

Waste Stream	Dwelling Size	Waste Generation Rate/ Storage Requirement <12 dwellings	Waste Generation Rate/ Storage Requirement >12 dwellings
General Waste (on FOGO system)	1 bedroom	30L/week	40L/week
	2 bedroom	50L/week	60L/week
	3+ bedroom	70L/week	80L/week
Recycling	1 bedroom	40L/week	20L/week
	2 bedroom	60L/week	40L/week
	3+ bedroom	120L/week	90L/week
FOGO	1 bedroom	40L/week	20L/week
	2 bedroom	80L/week	40L/week
	3+ bedroom	140L/week	60L/week

6.2 Waste generation calculations

The waste generation calculations are detailed in Appendix D. The estimated waste generation for the development is:

- General Waste: around 1,400L per week.
- Recyclables: around 560L per week.

7 Waste systems

7.1 Internal waste storage

Designers should aim to incorporate sufficient space within the kitchen, laundry room or other convenient location within each dwelling for the temporary storage of accumulated waste and recycling. Space should be sufficient to allow for the separate storage of recyclables and general waste. Possible ways to encourage recycling and minimise contamination include:

- Provision of adequate internal storage space within dwellings (kitchen or laundry) to accommodate the temporary storage of at least 2 days' worth of general waste, organics (where applicable) and recycling. This should comprise:
  - A minimum 30L general waste bin
  - A minimum 30L comingled recyclables bin
- Provision of reusable, robust containers to residents to assist them in transporting recyclable materials from their dwelling to recycling bins without resorting to plastic garbage bags e.g., reusable, washable tote-bags.
- Posting signage in public areas of the building (including the bin store) to educate residents/tenants about the location and use of the waste management system, including what materials are suitable for recycling and composting.
- Providing information in Strata and/or sales documents, to educate residents/tenants about the location and use of the waste management system, including what materials are suitable for recycling and general waste.

7.2 External bin storage areas

Bin storage areas at this development must be adequate to contain all waste and recycled material generated on the premises for the proposed waste collection frequency.

7.2.1 Bin size, quantity and colour

The development requires the following minimum number of bins in a centralized bin store:

- 6 x 240L General waste (red lid bin).
- 5 x 240L Co-mingled recycling (yellow lid bin).

The proposed development bin store is large enough to accommodate more than the minimum number of bins. The minimum number of bins required for the development is detailed in Appendix D.

7.2.2 Bin storage area size

As detailed in Table 2, each 240L bin has a footprint area of 0.43m^2. A 50mm gap is allowed between the bins to allow easy pull movement, and suitable clearance allowed between opposite bins and in walkways to maintain convenient walking access. The proposed bin storage area size is more than sufficient to accommodate the required bins. An indicative bin layout plan is shown in Appendix B.

Table 2: Standard Mobile Garbage Bin (MGB) dimensions

Bin capacity	80L	120L	140L	240L	360L
Height (mm)	870	940	1065	1080	1100
Depth (mm)	530	560	540	735	885
Width (mm)	450	485	500	580	600
Approximate footprint (m^2)	0.24	0.27	0.27	0.43	0.53

Source: WALGA

7.2.3 Bin storage area design

Urbii has checked the proposed bin storage location and confirmed that required clearances are provided. A bin storage plan is included in Appendix B. The following is a list of generic advice offered for consideration at subsequent detailed design stages of the project:

- **Ventilation and odour:** For enclosed storage and service areas, the air flowing from any storage areas should not exit close to residences. Ventilation openings should be protected against flies and vermin and located as near the ceiling and floor as possible, but away from the windows of dwellings. If a forced ventilation or air conditioning system is used (for enclosed storage areas), It should be in accordance with the ventilation requirements of the Building Code of Australia and *Australian Standard AS 1668.2 The use of Ventilation and Air Conditioning in Buildings.* It should not be connected to the same ventilation system supplying air to the units.
- **Lighting:** Artificial light controlled by switches should be located near the bin store entrance.
- **Noise:** Bins will be collected from the waste collection presentation point on the road.
- **Aesthetics:** The bin store should be consistent with the overall aesthetics of the development.
- **Vermin:** Self-closing doors can be considered to eliminate access to vermin. Doors will be able to be locked open when required.
- **Washing bins and waste storage area:** The internal bin store will have bin-washing facilities including an adequate supply of hot and cold water mixed through a centralised mixing valve with hose cock and have floor drainage installed. The building caretaker will be responsible for washing bins (or contracting a provider to wash bins) and for maintenance of the bin store.

7.3 Access to bins

Residents will access the bin store through an access door from the car park. The site caretaker will access the bin store to wheel bins to a designated presentation point on waste collection days.

It is proposed to transfer bins from the ground level bin store to the bin presentation pad on the ground level adjacent to the development driveway.

8 Waste collection

8.1 Waste vehicle types

Waste collection will be serviced from the access easement on the eastern boundary of the site. A rear loader waste truck will be used to empty bins which are presented on a designated pad adjacent to the development driveway.

The City of Rockingham residential waste service will be sought to service the site.

8.2 Waste collection frequency

The proposed collection frequency is once weekly for general waste collection and once per fortnight for recycling collection.

8.3 Waste collection method and presentation points

Bins are proposed to be wheeled out from the bin store to a bin presentation pad adjacent to the development driveway, on scheduled collection days.

A bin presentation plan is included in Appendix B.

8.4 Vehicle access and maneuvering

Waste collection will be serviced from the access easement on the eastern boundary of the site. A rear loader waste truck will be used to empty bins which are presented on a designated pad adjacent to the development driveway. Swept path analysis was undertaken to confirm there is sufficient road geometry to accommodate the waste truck movement.

The swept path analysis is presented in Appendix C.

9 Additional waste requirements

9.1 Bulk waste

Bulk waste can be temporarily stored in the bin store, or individual store rooms until it is removed by either private service or the City of Rockingham. Bulk waste can be placed in the designated bin presentation pad adjacent to the development driveway for collection from the adjacent access easement.

9.2 E-Waste

Storage space for E-waste will be accommodated in storage areas or individual dwellings. E-waste will be disposed of in a suitable manner, such as bulk drop-off to the tip or using public battery recycling boxes.

9.3 Garden organics

The site caretaker will manage garden organic waste associated with landscape maintenance. Garden waste can be placed in bins if there is space or can be removed by trailer to be disposed offsite in a suitable location.

10 Waste management

The building caretakers or contracted staff will be responsible for:

- Arranging for the bins to be cleaned and sanitised;
- Coordinating the cleaning of the bins and bin storage areas every two (2) to three (3) weeks;
- Dealing promptly with any issues or complaints relating to hygiene, noise, odour or other inconvenience; and,
- Providing adequate training for relevant staff regarding waste management.

Residents should comply with the City's waste sorting requirements and only place permitted waste in each respective bin type. Waste that does not belong in any bin should be disposed of through on-demand services or another appropriate method.

A copy of the Waste Management Plan will be maintained within the premises and strata plan for reference and records.

11 Signage and education

Ongoing education, to support the waste management service, is one of the most important factors in encouraging residents to continue to utilise services and systems as originally intended. The following recommendations have been adapted from the WALGA Guidelines.

"Educational signage should:

- *Clearly identify what items are and are not accepted in the general waste and recycling systems. If signage within the bin store is not possible due to space or other restrictions, bin stickers may be appropriate.*
- *Outline appropriate waste management behaviour i.e. placing refuse/recyclables inside as opposed to adjacent to bins, placing mixed recyclables into the bin loose (not in a plastic bag), closing bin lids etc.*
- *Where the strata body/building management holds tenants' induction schemes, these should include the use of waste and recycling facilities. The strata body/building management, in conjunction with the Local Government, should issue a leaflet on the correct use of the waste and recycling facilities and the materials recycled. Tenants' handbooks should include a section on the correct use of general waste and recycling facilities.*
- *Ensuring education is 'ongoing' is beneficial because it tackles the transient nature of residents and differences between different Local Government services. All waste and recycling bins or receptacles should be clearly and correctly labelled and signage should be erected in bin storage areas to instructing residents as to the correct separation of recyclables from general waste.*
- *Any hazards or potential dangers associated with the waste facilities, including those from the use of any waste handling equipment, should also be clearly identified. It is recommended that building managers post information in communal areas which clearly identified the relevant points of contact regarding recycling and/or other services within the development. As part of the ongoing education program, welcome packs should be produced and provided to all new residents. These packs should contain information outlining the developments waste management system, required actions and appropriate waste management behaviours."*

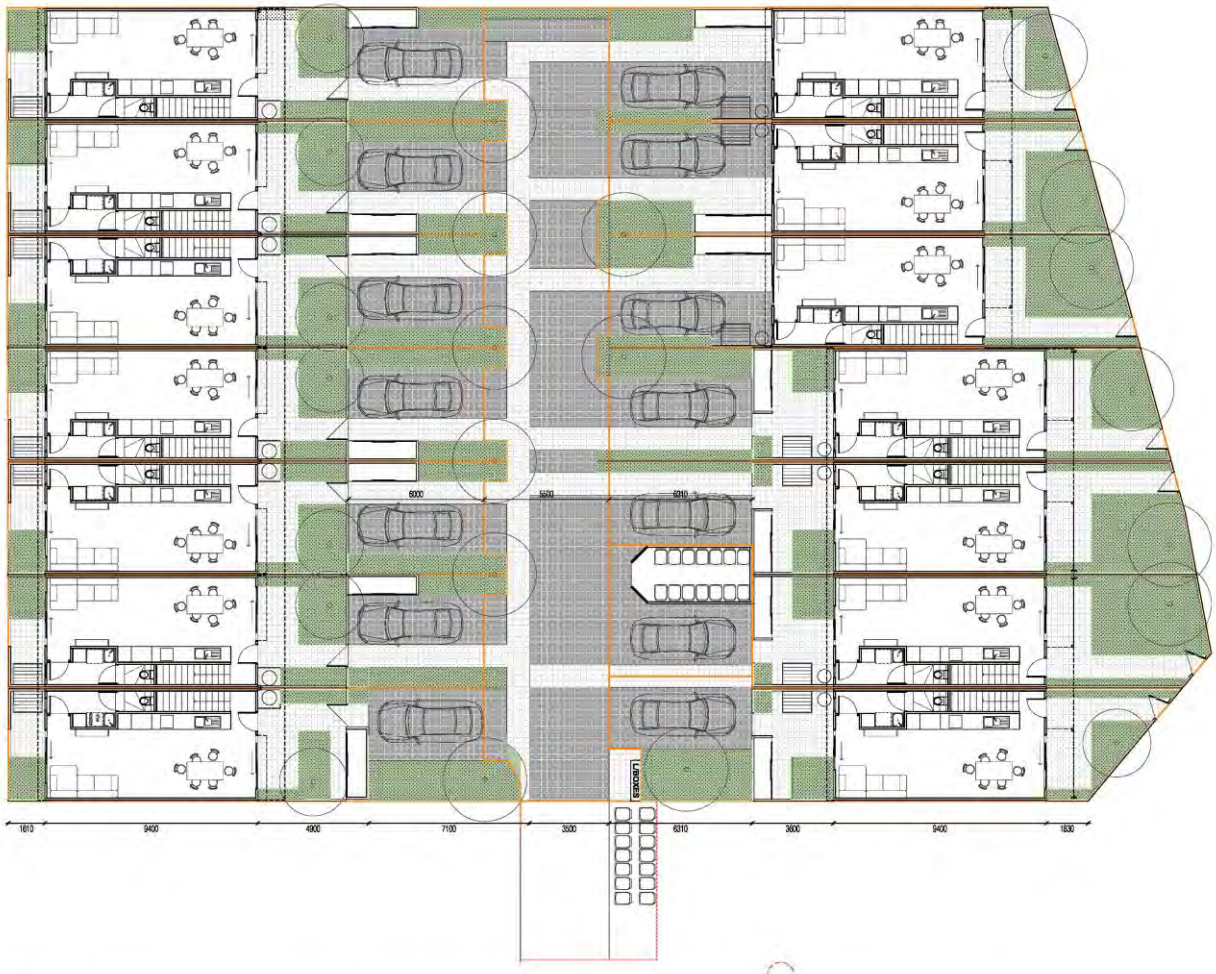
12 Conclusion

As demonstrated within this Waste Management Plan, the proposed residential development provides sufficient bin storage and adequate bins to service the site for general waste and recyclables.

Furthermore, the servicing of the bins by private collection can be adequately achieved without having an adverse impact on the site and the local street network.

Appendices

Appendix A: Proposed development plans



Revision	Issued	Date

Use figured dimensions at all times. Do not scale or measure off drawings. All dimensions and levels to be checked on site by the Contractor prior to commencing. If discrepancies are found notify the Architect and seek direction prior to proceeding.

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DALE ALCOCK PROJECTS

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ACN: 624 192 605

PROJECT	Lot 10, Goddard St, Rockingham		
DRAWING	Site Plan - Ground Floor		
CLIENT	Dale Alcock Projects	SCALE 1:200 AT A3	DATE 05.03.24
DRAWING STATUS	ISSUE FOR INFORMATION	DRAWING NUMBER A_010	REVISION sk

Appendix B: Bin storage and presentation plans



Revision notes:		
Rev:	Date:	Notes:
1	22/03/2024	6 x 240L General Waste collected once per week. 5 x 240L Recycling Bins collected once per fortnight.

Drawn by: Paul Ghantous	Project: U24.015 - Lot 10 Goddard Street, Rockingham Proposed Residential Development	Date: 22/03/2024	urbii Sustainable Transport. Safe Solutions
Client: Dale Alcock Projects	Drawing Title: Bin storage and presentation plan	Scale @ A3: 1:100	
		Revision: sk02	

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Appendix C: Swept path analysis

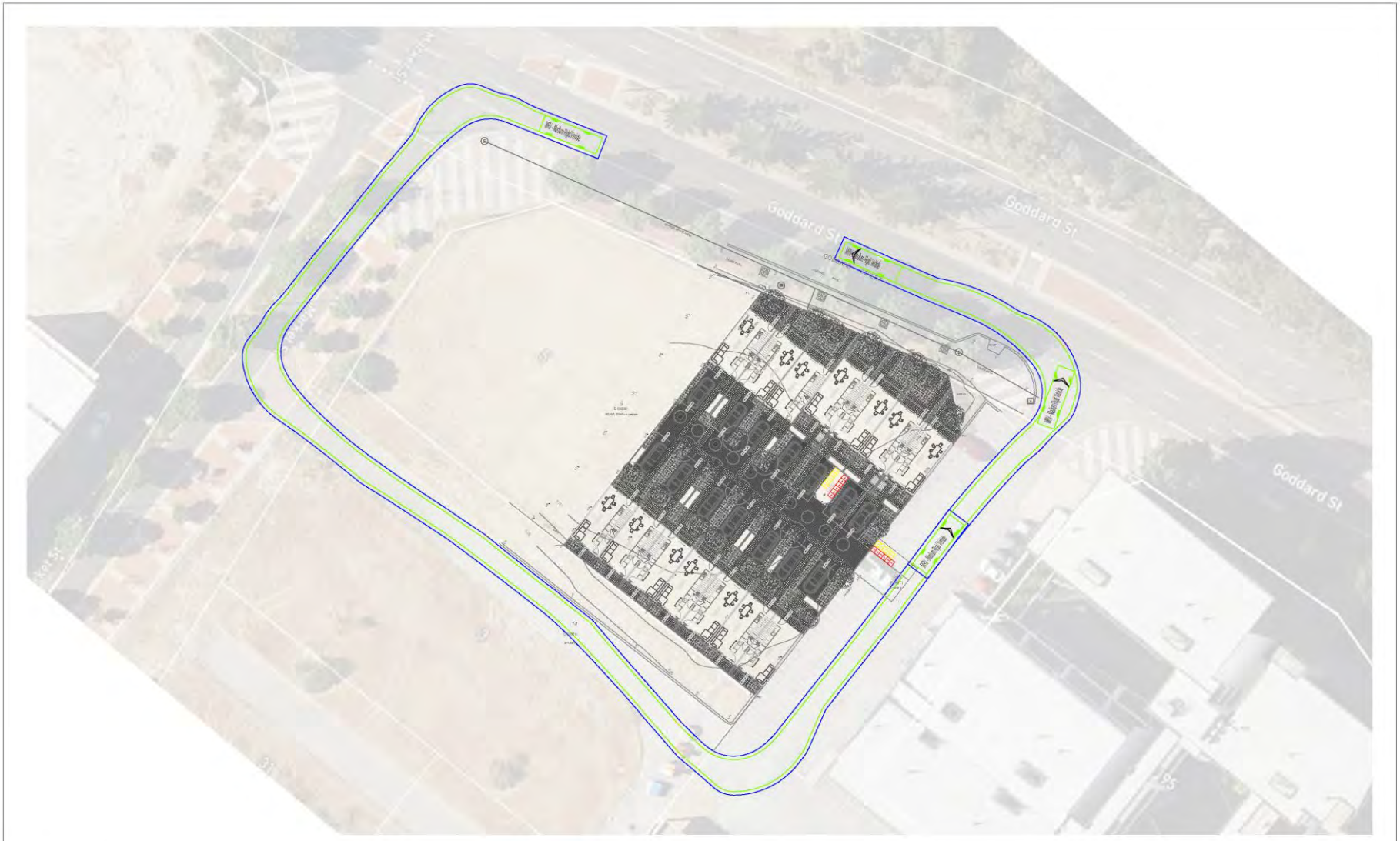
Swept path diagrams are included in this section of the report. Different coloured lines are employed to represent the various envelopes of the vehicle swept path, as described below:

Cyan represents the wheel path of the vehicle

Green represents the vehicle body envelope

Blue represents a 500mm buffer line, offset from the vehicle swept path

The swept path diagrams are also provided separately in high-quality, A3 PDF format.



Revision notes:		
Rev:	Date:	Notes:
1	22/03/2024	Dark blue line represents a 500mm buffer

Drawn by: Paul Ghantous

Client: Dale Alcock Projects

Project: U24.015 - Lot 10 Goddard Street, Rockingham
Proposed Residential Development

Drawing Title: Truck entry, circulation and exit
AS2890.2 - 8.8m Medium Rigid Vehicle (MRV)

Date: 22/03/2024

Scale @ A3: 1:500

Revision: sk01

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Appendix D: Waste calculations

Table 3: Weekly waste generation and collection – Residential 2 bin system

2 Bin System
3 Bin System

Clear Form

Recalculate

Residential Less Than 12 Dwellings

Number of 1 Bedroom Apartments	0
Number of 2 Bedroom Apartments	0
Number of 3 or more Bedroom Apartments	0

Residential Greater Than 12 Dwellings

Number of 1 Bedroom Apartments	0
Number of 2 Bedroom Apartments	14
Number of 3 or more Bedroom Apartments	0

Results - Weekly Waste Generation

Residential Dwellings

General Waste	Food & Garden Organics	Comingled Recyclables	Total
1400L	0L	560L	1960L

Commercial Food & Beverage

General Waste	Food & Garden Organics	Comingled Recyclables	Total
0L	0L	0L	0L

Retail

General Waste	Food & Garden Organics	Comingled Recyclables	Total
0L	0L	0L	0L

Other Commercial

General Waste	Food & Garden Organics	Comingled Recyclables	Total
0L	0L	0L	0L

Totals

General Waste	Food & Garden Organics	Comingled Recyclables	Total
1400L	0L	560L	1960L

Waste type	Weekly waste generation (L)	Weekly collection frequency
General waste	1400	1
Recyclables	560	0.5

General Waste
Bins

Bin Size (L)	Number of bins	Weekly capacity
240	6	1440
	Total weekly capacity (L)	1440

Recycle Waste Bins

Bin Size (L)	Number of bins	Weekly capacity
240	5	600
	Total weekly capacity (L)	600

Site Management Plan

Site Address:

Lo. 9 and Lot 10 on Plan 86080

Prepared for:

McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd and William Thomas

Prepared b. :

Environmental Site Services | ABN 33 590 521 277
43 Stiles Avenue, Burswood
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Project Details	
Report Reference: 0011340 **Site Address:** Lot 9 and Lot 10 on Plan 86080 **Date:** 20 December 2021	**Project Manager** **Name:** Darcy Boyd **Title:** Senior Environmental Scientist **E-mail**: dboyd@envss.com.au **Phone:** (08) 9355 4010

Quality Information

Revision History & Status

Version	Revision	Detail	Date	Author	Reviewer	Approver
DRAFT	Rev0	Issued for client review and comment	14/12/2021	Darcy Boyd	Amit Bhullar	Darcy Boyd

Distribution

Version	Revision	Issued To	No. of copies	Format	Date
DRAFT	Rev0	Colin Jackson	1	PDF	20/12/2021

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1. Introduction

1.1 Introduction

Environmental Site Services (ENVSS) was engaged by McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd and William Thomas (the client) to prepare an Site Management Plan at Lot 9 and 10 on Plan D086080, located to the south of the intersection of Goddard Street and Market Street, Rockingham, WA (the site).

The site location is presented in **Figure 1**.

1.2 Background

The site, and surrounds, was historically used for uncontrolled landfilling purposes. An asbestos in soils investigation, completed by ENVSS in January 2021, identified the presence of asbestos-containing-materials (ACM) in filling soils across the site in concentrations above the adopted screening for any site use. The site was subsequently classified as '*Con.aminated - remediation required*' under the *Contaminated Sites Act 2003* (the Act) by the Department of Water (DWER) in March 2021.

Remediation works were undertaken at the site in October and November 2021 and involved the encapsulation of asbestos contaminated soils beneath a geofabric overlain by clean capping soils.

Following remediation activities, ENVSS prepared a Site Remediation and Validation Report which documents remediation works undertaken and subsequent validation activities. ENVSS concluded that the remedial capping layer was successfully installed and the potential for the generation of airborne asbestos fibres at the site is mitigated, provided the integrity of the capping layer remains intact.

1.3 Purpose

The purpose of the SMP is to provide a framework to manage potential risks to human health associated with asbestos-impacted filling at the site during ongoing (post-remediation) use of the site.

Specifically, the objectives of the SMP are as follows:

- Outline previous environmental investigations and remediation works undertaken at the site;
- Outline the contamination status of the site and remediation installation;
- Reduce the potential for human exposure to asbestos-impacted soils at the site;
- Maintain the integrity of
- Outline the management measures to be adopted where
- Ensure that any subsurface works are undertaken with the management measures outlined in this SMP to protect human health;
- Outline the ongoing monitoring requirements to assess the integrity of the capping layer;
- Outline contingency measures to be adopted in the event that the integrity of the capping layer is compromised.

2. Site Identification

2.1 Legal Identification

Site details are presented in **Table 1.**

Table 1. Site Identification

Site Identification	
Lot and Plan	Lot 9 on Plan 86080 (5 Market Street, Rockingham) Lot 10 on Plan 86080 (Goddard Street, Rockingham)
Title Information	Lot 9 on Plan D086080: Vol: 2018 Folio: 335

	Lot 10 on Plan 86080: Not identified		
Council Parcel ID	Lot 9 on Plan D086080: 5237 Lot 10 on Plan 86080: 5236		
Total Area	Approximately 3,326m^2		
Local government	City of Rockingham		
Planning scheme zone	“Primary City Centre” under the City of Rockingham, Town Planning Scheme No.2.		
Current land use	Vacant		
Proposed land use	ENVSS is not aware of any proposed developments for the site		
Approximate Coordinates (GDA94 / MGA 50)	Location	Easting	Northing
	North-west North North-east North-east South West	381929.7 381943.9 382001.7 382003.3 381974.5 381915.8	6427588.5 6427592.7 6427568.2 6427560.6 6427522.8 6427566.9

2.2 Site description

The site is currently vacant, fenced and locked to prevent public access. Remediation works, involving the capping of asbestos-impacted soils with a geotextile barrier and clean soils, which were undertaken in October - November 2021. The site has since been sprayed with hydroseed to prevent dust generation and migration from the site.

2.3 Surrounding land use

Land use surrounding the site is presented in **Table 2**.

Table 2. Surrounding land use

Direction relative to the site	Description
North	Recreational / Public open space (Dowling Street Reserve)
East	Mixed use (High density residential land use and commercial units)
South	Vacant land and multi-storey car park
West	Mixed use (High density residential land use and commercial units)

3. Environmental Setting

3.1 Topography

The Government of Western Australia’s Landgate database indicates that the site is located approximately 9.0mAHD. The site and land surrounding the site is generally flat with a slight decline towards the south-west.

3.2 Geology

The Government of Western Australia Department of Mines, Industry Regulation and Safety Geoview database indicates surficial geology beneath the site consists of calcareous sand described as white, medium-grained, rounded quartz and shell debris and of eolian deposit (Safety Bay Sand).

3.3 Hydrology

There are no surface water features identified onsite or on the properties immediately neighbouring the site. No surface water features are proposed for the site as part of remediation works.

DWER'S Perth Groundwater Map Database indicates that ground surface at the site is approximately 6.0mAHD. The database indicates that groundwater is expected to be encountered beneath the site at 1.0mBGL (approximately 5.0m below natural surface levels at the site).

Groundwater is expected to follow topography and flow in a south-westerly direction beneath the site.

3.4 Acid Sulfate Soil

A review of DWER's Acid Sulfate Soil Risk Map 50K (DWER-049) did not identify the risk of Potential Acid Sulfate Soils (PASS) materials within 3m of the ground surface at the site.

4. Previous investigations and remediation works

4.1 Summary of previous Investigations and Remediation Works

ENVSS is aware of the following previous environmental assessment and remediation works at the site:

- City of Rockingham, Asbestos Complaint - Exposed Asbestos Fragments - Lot 10 Goddard Street, Rockingham, 22 October 2020;
- Environmental Site Services, Asbestos in Soils Investigation Lot 9 and 10 Goddard Street, Rockingham, 18 January 2021;
- Environmental Site Services, Remediation Activities Lot 9 and 10 Goddard Street, Rockingham, June 2021;
- Surficial ACM Removal at Lot 9 and 10 Goddard Street, Rockingham, 25 August, 2021.

A brief summary of each investigation / remediation works is presented in Section 4.2 - 4.5.

4.2 City of Rockingham, October 2020

In October 2020, the City of Rockingham (Council) City Health Services completed an assessment of surficial cement sheet debris on the surface of Lot 10. Laboratory analysis confirmed the presence of asbestos in the cement sheet debris. Council directed that site owners undertake remediation at the site.

4.3 Environmental Site Services, January 2021

ENVSS completed an Asbestos in Soils Investigation in January 2021. Key findings included:

- Historically the site was used for uncontrolled landfilling;
- A layer of filling was present across the site and generally consisted of grey brown silty sand with foreign material (including limestone gravel/rock, concrete and glass;
- A total of 5.2kg of ACM, in the form of non-friable cement sheet debris or highly degraded material was identified across the surface of the site;
- ACM identified 25 of 29 test pits advanced across the site. Asbestos fines (defined as ACM less than 7mm in size) were identified in 8 of 29 500g soils samples collected from across the 29 test pits advanced across the site;
- Based on the assessment investigation undertaken it was concluded that bonded ACM and Asbestos Fines were present throughout the site filling above the adopted screening criteria for any land use.

4.4 Environmental Site Services, June 2021

Remediation works were undertaken between 21 - 26 June by a client-appointed civil contractor. Remediation involved the removal of approximately 2,620m^3 of asbestos-impacted soils to a suitably licensed facility under asbestos removal conditions.

Following the removal of the 2,620m^3 of asbestos-impacted filling, as identified during the ENVSS assessment completed in intrusive assessment (ENVSS Jan 2021) grid-based soil validation works were carried out to determine the suitable removal of the asbestos-impacted filling. It was determined that ACM (in the form of non-friable cement sheet and asbestos fines) remained present in soils across the site. The concentrations were determined to be in exceedance of DoH (2009) criteria for residential and commercial land uses.

The average depth of asbestos-impacted filling was assessed to be approximately 1.2m below the ground level at the completion of the remediation undertaken to date. At the request of the client, remediation works, involving the excavation and disposal of ACM-impacted soils to landfill, were ceased. It was decided that the further remediation works would involve the capping of asbestos-impacted soils with a geotextile barrier and clean soils.

4.5 Environmental Site Services, October - November 2021

Remediation involved the installation of a remedial capping layer across the site. The capping layer consisted of a geofabric across the site followed by the importation and installation of approximately 3,000m^2 of clean capping soils. The capping layer was generally installed to a depth between 0.5m to 0.7m below the current ground level across the site.

A site plan, with an approximation of the capping depth following installation, is presented in **Figure 2**.

Photographs collected during the installation of the capping layer are presented in **Appendix A**.

5. Current site condition and risk

ENVSS considers that asbestos-contaminated soils at the site site do not pose a risk to human health and the site is suitable for commercial and residential land use, provided that asbestos-impacted soils remain encapsulated beneath the capping layer.

There does, however, exist a potential risk to human health should the capping layer and underlying asbestos-impacted soils be distrubed. Disturbance works may involve isolated excavations (such as the installation of underground services) or more broad disturbances (such as the construction of an underground car park as part of the redevelopment of the site). A conceptual site model, in consideration of the risk where asbestos-contaminated soils are exposed, is presented in **Table 3**.

Table 3. Post-remediation conceptual site model - exposure of asbestos-impacted soils

Sources	Migration Pathways	Potential Receptors	Exposure Scenarios
Asbestos fibres released from AF or ACM in site soils soil	- Inhalation & ingestion - Physical disturbance of asbestos impacted soils.	- Site visitors - Remediation workers - Future construction and maintenance workers - Future occupants - Neighbouring site users	- Inhalation of airborne asbestos fibres

6. Legislative requirements

Section 6.1 - 6.2 documents guidelines that will be adopted for the development and implementation of this SVR.

6.1 Acts and Regulations

- Occupational Safety and Health Act 1984, Government of Western Australia;
- Environmental Protection Act 1986, Government of Western Australia;

- Occupational Safety and Health Regulations 1996, Government of Western Australia;
- Contaminated Sites Act 2003, Government of Western Australia;
- Contaminated Sites Regulations 2006, Government of Western Australia; and
- Environmental (Controlled Waste) Regulations 2004, Government of Western Australia.

6.2 Codes of Practice and Guidance Notes

- Guidance Note Occupational Safety and Health Management and Contaminated Sites Work (COSH, 2005);
- Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)], (NOHSC, 2005a);
- Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002(2005)],(NOHSC, 2005b);
- Assessment and Management of Contaminated Sites (DER, 2014);
- Landfill Waste Classifications and Waste Definitions (DWER, 2019);
- Environmental management systems - Requirements with guidance for use (Australian / New Zealand Standards, 2016);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia (DoH, 2021);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia Consultation Draft November 2019 (DoH, 2019) (which is not officially endorsed for use by any agency); and
- A Guideline for Managing the Impacts of Dust and Associated Contamination Development Sites (DEC, 2011).

7. Ongoing management requirements

Section 6 discusses the implementation and ongoing management requirements to be adopted as part of this SMP to ensure the integrity of the capping layer and mitigate unacceptable risk where disturbances to the asbestos-contaminated filling is to be undertaken.

7.1 Timeframe of the SMP

This SMP will be in operation from the completion of remediation works at the site (November 2021) until such time as asbestos-contaminated soils are completely removed from the site or superseded by an updated SMP.

7.2 Extent of asbestos-contaminated fill

Asbestos-contaminated filling is considered to be present across the entire footprint of the site, as presented in **Figure 2**.

7.3 Roles and responsibilities

Identified stakeholders, associated roles and responsibilities relevant to the implementation of the SMP are presented **Table 4**.

Table 4. Roles and responsibilities for the implementation of the SMP

Stakeholder	SMP Responsibility
Site Owners	- Overall responsibility for implementing the SMP. - Maintenance of the overall SMP, including coordinating periodic reviews of the SMP. - Periodic inspections of the capping layer. - Ensure ongoing controls (i.e. fencing, locked gates) are implemented, prior to the redevelopment of the site. - Provide this SMP to appointed subcontractors as required.

Contractors / Workers	- Develop safe works procedures in accordance with methodologies outlined herein and relevant guidance. - Review and understand the SMP prior to the commencement of any intrusive works that may disturb the asbestos-contaminated filling. - Implement a Asbestos Removal Control Plan outlining the management measures and controls to be adopted. - Train staff in awareness of SMP and control measures.
Environmental Consultant	- Periodic reviews of the SMP, as requested by the site owners - Supervision and
Department of Water and Environmental Regulation	- Endorsement of this SMP
Department of Health	- Endorsement of this SMP

7.4 Competency requirements

The competencies of any who may come into contact with asbestos-contaminated filling or make decisions relating to its management is presented in **Table 5**.

Table 5. Roles and responsibilities for the implementation of the SMP

Stakeholder / Task	Competency
Contractors / Workers	Licensed Asbestos Removal License holder.
Environmental Consultant	Competencies as presented in DoH (2021).
Airborne Fibre Monitoring	Competent person able to sampling in accordance with NOHSC:3003 (2005).
Laboratory analysis	Laboratory with NATA accreditation for the analysis undertaken.

7.5 Procedure for undertaking subsurface activities

The management measures to be adopted where intrusive works are undertaken at the site:

- Works must only be undertaken by suitably experienced and qualified contractors. The contractors must hold a Worksafe Restricted License for the handling of bonded asbestos materials;
- The contractor must prepare a works-specific Asbestos Removal Control Plan that outlines:
    - The legislative guidance to be followed;
    - The procedures and controls to be adopted to mitigate the generation of airborne asbestos fibres and prevent any unacceptable risks to human health;
    - A dust management strategy;
    - Awareness training and inductions for all workers
    - A specific methodology to prevent cross-contamination of capping soils and asbestos-impacted filling; and
    - A methodology for the reinstatement of the capping layer disturbed during site works;

- Works should preferably be undertaken during favourable weather conditions (ie. during the winter months and/or when the wind is low);
- Appropriate personal protective equipment (PPE) should be worn in accordance with the relevant legislation and guidelines;
- Any works that require penetrations of the capping layer must be supervised by a suitably experienced and competent environmental consultant.
- Airborne fibre monitoring must be undertaken to monitor potential impacts to onsite workers and offsite land users.

7.6 General procedures for undertaking subsurface activities

The general procedure to be adopted where intrusive works are undertaken at the site:

- Care should be taken to excavate and stockpile capping material so as not to damage the geofabric and expose underlying asbestos-contaminated filling;
- Geofabric should be cut with the knife to prevent disturbance to geofabric under the capping layer;
- The asbestos-contaminated filling should be sprayed with water prior to handling;
- Asbestos-impacted filling should be excavated and either stockpiled on plastic sheet and covered or removed from site as Special Waste Type 1 to a suitably licensed landfill facility;
- Geofabric is installed on the walls and floor of the excavation within the asbestos-contaminated filling;
- The excavation is backfilled with imported clean filling material to the existing ground level, or
- If backfilled with the asbestos-contaminated filling, filling is be reinstated to the surrounding level of the asbestos-impacted filling, covered in geofabric (20cm beyond the excavation boundary) with clean material reinstated to the surrounding ground level; and
- Surplus asbestos-contaminated must be disposed of to a suitably licensed landfilling facility.

7.7 Considerations for redevelopment of the site

In the event the site is to be redeveloped, and disturbance of the asbestos-contaminated filling is proposed, it is recommended that management procedures and controls be documented in an works-specific Remediation Action Plan.

8. Contingency Plan

In the event that the capping layer is accidentally breached, the site owner, or person in control of the site, must take immediate measures to mitigate the potential for the generation and migration of airborne asbestos fibres. All work at the site must cease. It is recommended that a suitably experienced and competent environmental consultant be contacted to provide advice.

Interim risk reduction should include segregating the affected area. Where practical to do so, the affected area should be covered with an impermeable barrier (such as geofabric or black builders plastic) until permanent remedial activities are undertaken.

9. SMP control and review

The SMP is to be updated where;

- New legislative requirements or guidance come into effect;
- Any change in land use at the site;
- Where periodic inspections are undertaken;
- Further assessment works are undertaken;
- Intrusive works, and subsequent validation works, are undertaken; and
- Any loss in the integrity of the capping layer and reinstatement works.

10. References

- Occupational Safety and Health Act 1984, Government of Western Australia;
- Environmental Protection Act 1986, Government of Western Australia;
- Occupational Safety and Health Regulations 1996, Government of Western Australia;
- Contaminated Sites Act 2003, Government of Western Australia;
- Contaminated Sites Regulations 2006, Government of Western Australia;
- Environmental (Controlled Waste) Regulations 2004, Government of Western Australia;
- Asbestos in Soils Investigation, Lot 9 and 10 Goddard Street Rockingham Environmental Site Services, January 2021;
- Remediation Action Plan, Lot 9 and 10 Goddard Street Rockingham Environmental Site Services, September, 2021;
- Site Remediation and Validation Report, Lot 9 and Lot on Plan 86080, Environmental Site Services, December 2021;
- Guidance Note Occupational Safety and Health Management and Contaminated Sites Work (COSH, 2005);
- Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)], (NOHSC, 2005a);
- Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002(2005)],(NOHSC, 2005b);
- Assessment and Management of Contaminated Sites (DER, 2014);
- Landfill Waste Classifications and Waste Definitions (DWER, 2019);
- Environmental management systems - Requirements with guidance for use (Australian / New Zealand Standards, 2016);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia (DoH, 2021);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia Consultation Draft November 2019 (DoH, 2019) (which is not officially endorsed for use by any agency); and
- A Guideline for Managing the Impacts of Dust and Associated Contamination Development Sites (DEC, 2011).

11. Statement of Limitations

This report is prepared for clients objectives and is formulated on this basis only. All limitations and conditions in the writing of this report are clearly agreed to by the client and Environmental Sites Services prior to its formulation and may not be suitable or applicable for any other use other than that of the original intended objective. No other parties other than the client and Environmental Sites Services should use this information without firstly conferring with Environmental Sites Services.

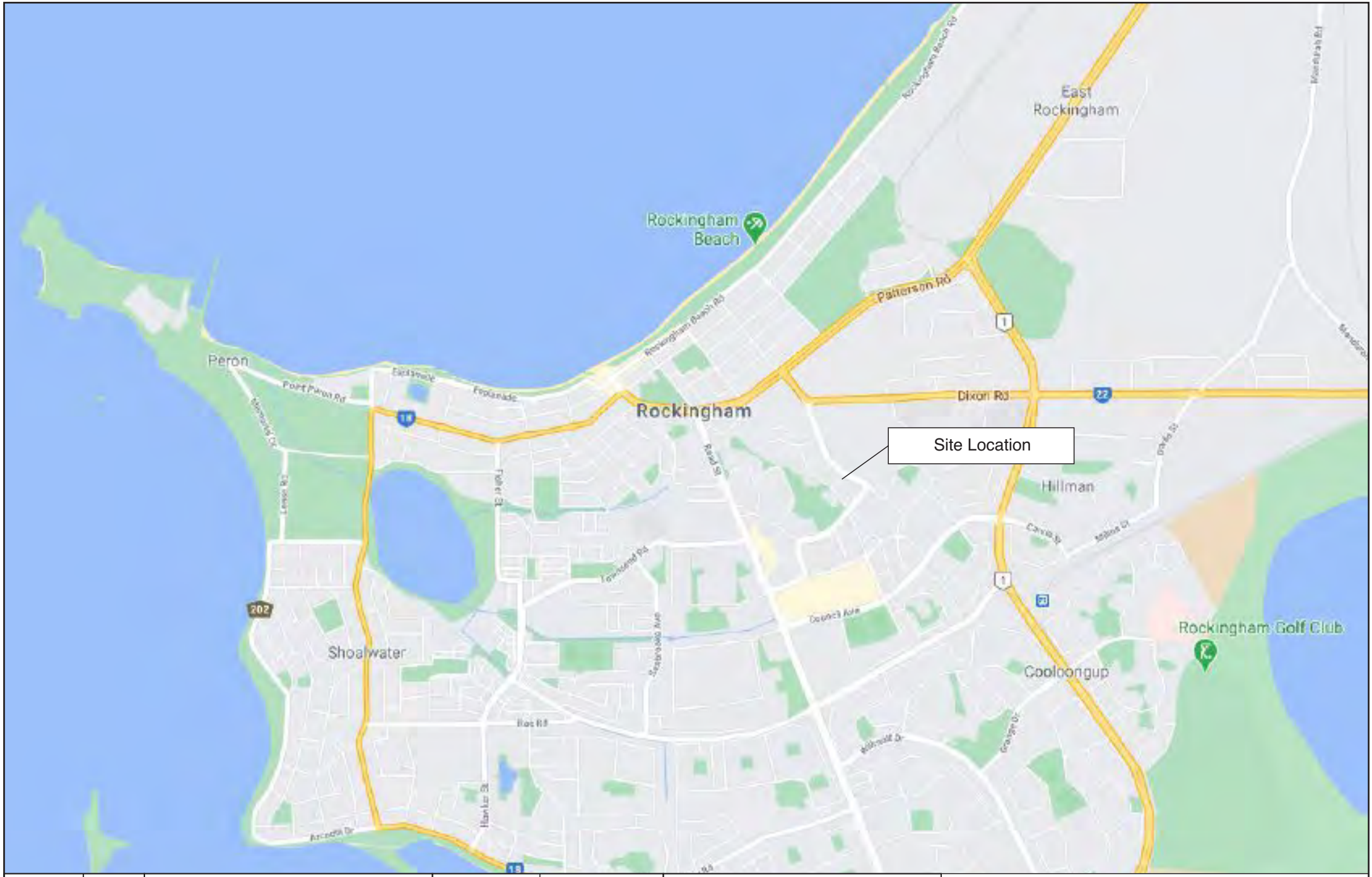
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Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can

reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.
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Figures



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FIGURE: 01	DATE: 27/11/21	TITLE: Site Location Plan	
PROJ. REF: 0011310			
CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas		LOCATION: Goddard Street, Rockingham	
DRAWN: DB	APPROVED: AB / REVISION: 00	SOURCE: Google Maps	



METRES

5 10

FIGURE: 02	DATE: 08/12/21
PROJ. REF: 0011310	
CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas	
DRAWN: DB	APPROVED: DB REVISION: 00

TITLE:
Installation of capping layer

LOCATION: Lot 9 & Lot 10, Goddard Street, Rockingham

IMAGE SOURCE: Nearmap, photo captured 21/08/2021

LEGEND:
Site Boundary
Lot 9 Boundary
Lot 10 Boundary



METRES

5 10

FIGURE: 03	DATE: 08/12/21
PROJ. REF: 0011310	
CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas	
DRAWN: DB	APPROVED: DB REVISION: 00

TITLE:
Site Plan: Survey Plan Comparison

LOCATION: Goddard Street, Rockingham

IMAGE SOURCE: Nearmap

LEGEND:
Site Boundary

+0.XXm Approximate depth of capping layer installation(m)

Appendix A. Photographic Plates



PHOTOGRAPH NO: 01 TITLE: Importation of capping material ORIENTATION: FACING SOUTH DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 02 TITLE: Installation of capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 03 TITLE: Installation of geofabric ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 04 TITLE: Installation of geofabric and capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas

Site Remediation and Validation Report

Site Address:

Lo. 9 and Lot 10 on Plan 86080

Prepared for:

McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd and William Thomas

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Report Reference: 0011340 **Site Address:** Lot 9 and Lot 10 on Plan 86080 **Date:** 20 December 2021	**Project Manager** **Name:** Darcy Boyd **Title:** Senior Environmental Scientist **E-mail**: dboyd@envss.com.au **Phone:** (08) 9355 4010

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1. Introduction

1.1 Background

Environmental Site Services (ENVSS) was engaged by McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd and William Thomas (the client) to undertake a Site Remediation and Validation Report (SRVR) for Lot 9 and Lot 10 on Plan D086080 (the site). The site location is presented in **Figure 1**.

The purpose of this SRVR is to document the soil remediation and validation works undertaken at the site as part of the remediation of asbestos-impacted soils at the site and provide data to the Department of Water and Environmental Regulation (DWER) in consideration of reclassification of the site in accordance with Contaminated Sites, 2003 (the Act). It is understood that the client intends for the site to be reclassified as *Remedia.ed for restricted use* in accordance with the Act.

All remediation works have been undertaken in accordance with the DWER-endorsed 'Remediation Action Plan - Lot 9 and 10 Goddard Street, Rockingham (Environmental Site Services, September 2021, Ref: ENVSS_0010142_ENV_ASB_RAP_20210712_Rev3) prepared for the site.

1.2 Objectives

The objectives for the soil remediation and validation report is to:

- Provide direction and advice to client-appoint subcontractors to ensure that all remedial works are undertaken in accordance with the RAP developed for the site;
- Undertake validation activities to assess the suitability of the site for use;
- Provide data to DWER to consider site reclassification in accordance with the Act; and
- Outline the post-remediation management requirements for the site.

1.3 Scope of Works

The scope of works undertaken as part of this Remediation Validation Report included:

- The implementation of environmental management measures outlined in the RAP (ENVSS 2021);
- Undertake a site walkover and removal of surficial visible ACM debris prior to commencement of remediation activities;
- Inspect the source site of capping materials and capping materials during importation to site;
- Supervise contractor remediation activities and provide direction (as outlined in the RAP) including:
    - The installation of a geotextile barrier / warning marker; and
    - The importation and placement of capping soils.
- Undertake a soil characterisation assessment to assess the suitability of the proposed capping material;
- Review survey data to assess whether the capping layer installation meets the requirements specified in the RAP;
- Present the findings of the remediation and validation to demonstrate that the site has been suitably remediated and successfully validated; and
- Provide this report to DWER in consideration of site reclassification.

2. Site Identification

2.1 Legal Identification

Site details are presented in **Table 1.**

Table 1. Site Identification

Site Identification			
Lot and Plan	Lot 9 on Plan 86080 (5 Market Street, Rockingham) Lot 10 on Plan 86080 (Goddard Street, Rockingham)		
Title Information	Lot 9 on Plan D086080: Vol: 2018 Folio: 335 Lot 10 on Plan 86080: Not identified		
Council Parcel ID	Lot 9 on Plan D086080: 5237 Lot 10 on Plan 86080: 5236		
Total Area	Approximately 3,326m^2		
Local government	City of Rockingham		
Planning scheme zone	"Primary City Centre" under the City of Rockingham, Town Planning Scheme No.2.		
Current land use	Vacant		
Proposed land use	ENVSS is not aware of any proposed developments for the site		
Approximate Coordinates (GDA94 / MGA 50)	Location	Easting	Northing
	North-west North North-east North-east South West	381929.7 381943.9 382001.7 382003.3 381974.5 381915.8	6427588.5 6427592.7 6427568.2 6427560.6 6427522.8 6427566.9

2.2 Site description

The site is currently vacant, fenced and locked to prevent public access. Remediation works, involving the capping of asbestos-impacted soils with a geotextile barrier and clean soils, were undertaken in October and November 2021. The site has since been sprayed with hydroseed to prevent dust generation and migration from the site.

2.3 Surrounding land use

Land use surrounding the site is presented in **Table 2**.

Table 2. Surrounding land use

Direction relative to the site	Description
North	Recreational / Public open space (Dowling Street Reserve)
East	Mixed use (High density residential land use and commercial units)
South	Vacant land and multi-storey car park

West	Mixed use (High density residential land use and commercial units)

2.4 Contamination status of the site

The site was identified as 'Contamination - remediation required', in accordance with the Act, on 20 April 2021 due to elevated concentrations of asbestos-containing materials in soils.

A classification letter from DWER is presented in **Appendix A**.

3. Environmental Setting

3.1 Topography

The Government of Western Australia's Landgate database indicates that the site is located approximately 9.0mAHD. The site and land surrounding the site is generally flat with a slight decline towards the south-west.

3.2 Geology

The Government of Western Australia Department of Mines, Industry Regulation and Safety Geoview database indicates surficial geology beneath the site consists of calcareous sand described as white, medium-grained, rounded quartz and shell debris and of eolian deposit (Safety Bay Sand).

3.3 Hydrology

There are no surface water features identified onsite or on the properties immediately neighbouring the site. No surface water features are proposed for the site as part of remediation works.

DWER'S Perth Groundwater Map Database indicates that ground surface at the site is approximately 6.0mAHD. The database indicates that groundwater is expected to be encountered beneath the site at 1.0mBGL (approximately 5.0m below natural surface levels at the site).

Groundwater is expected to follow topography and flow in a south-westerly direction beneath the site.

3.4 Acid Sulfate Soil

A review of DWER's Acid Sulfate Soil Risk Map 50K (DWER-049) did not identify the risk of Potential Acid Sulfate Soils (PASS) materials within 3m of the ground surface at the site.

4. Previous investigations and remediation works

4.1 Summary of previous Investigations and Remediation Works

ENVSS is aware of the following previous environmental assessment and remediation works at the site:

- City of Rockingham, Asbestos Complaint - Exposed Asbestos Fragments - Lot 10 Goddard Street, Rockingham, 22 October 2020;
- Environmental Site Services, Asbestos in Soils Investigation Lot 9 and 10 Goddard Street, Rockingham, 18 January 2021; and
- Environmental Site Services, Remediation Activities Lot 9 and 10 Goddard Street, Rockingham, June 2021.

A brief summary of each investigation / remediation works is presented in Section 4.2 - 4.4

4.2 City of Rockingham, October 2020

In October 2020, the City of Rockingham (Council) City Health Services completed an assessment of surficial cement sheet debris on the surface of Lot 10. Laboratory analysis confirmed the presence of asbestos in the cement sheet debris. Council directed that site owners undertake remediation works at the site.

4.3 Environmental Site Services, January 2021

ENVSS completed an Asbestos in Soils Investigation in January 2021. Key findings included:

- Historically the site was used for uncontrolled landfilling;
- A layer of filling was present across the site and generally consisted of grey brown silty sand with foreign material (including limestone gravel/rock, concrete and glass;
- A total of 5.2kg of ACM, in the form of non-friable cement sheet debris or highly degraded material was identified across the surface of the site;
- ACM identified 25 of 29 test pits advanced across the site. Asbestos fines (defined as ACM less than 7mm in size) were identified in 8 of 29 500g soils samples collected from across the 29 test pits advanced across the site;
- Based on the assessment investigation undertaken it was concluded that bonded ACM and Asbestos Fines were present throughout the site filling above the adopted screening criteria for any land use.

4.4 Environmental Site Services, June 2021

Remediation works were undertaken between 21 - 26 June by a client-appointed civil contractor. Remediation involved the removal of approximately 2,620m^3 of asbestos-impacted soils to a suitably licensed facility under asbestos removal conditions.

Following the removal of the 2,620m^3 of asbestos-impacted filling, as identified during the ENVSS assessment completed in intrusive assessment (ENVSS Jan 2021) grid-based soil validation works were carried out to determine the suitable removal of the asbestos-impacted filling. It was determined that ACM (in the form of non-friable cement sheet and asbestos fines) remained present in soils across the site. The concentrations were determined to be in exceedance of DoH (2009) criteria for residential and commercial land uses.

The average depth of asbestos-impacted filling was assessed to be approximately 1.2m below the ground level at the completion of the remediation undertaken to date. At the request of the client, remediation works, involving the excavation and disposal of ACM-impacted soils to landfill, were ceased. It was decided that the further remediation works would involve the capping of asbestos-impacted soils with a geotextile barrier and clean soils.

5. Site condition pre-remediation and conceptual site model

5.1 Site Condition

The extent of the site's surface is considered to be contaminated by ACM in soils. Asbestos in soils is present in filling which extends to an approximate average depth of 1.2mBGL. The extent of the site is presented in **Figure 2**.

5.2 Conceptual site model

The Conceptual Site Model (CSM) is a qualitative analysis tool that presents the potential contamination sources, transport mechanisms, exposure pathways and receptors. **Table 3** presents ENVSS' understanding of asbestos-contaminated filling at the site prior to commencement of remediation activities.

Table 3. Conceptual Site Model

Sources	Migration Pathways	Potential Receptors	Exposure Scenarios
Asbestos fibres released from AF or ACM in site soils soil	- Inhalation & ingestion - Physical disturbance of asbestos impacted soils.	- Site visitors - Remediation workers - Future construction and maintenance workers - Future occupants - Neighbouring site users	- Inhalation of airborne asbestos fibres

5.3 CSM Summary

The Pre-remediation CSM has identified a possible pathway for airborne asbestos fibres to pose a risk to human health . As such, these contaminants are recognised as posing an unacceptable risk to human health and require remediation prior to any redevelopment and ongoing management to mitigate the potential generation and inhalation of airborne asbestos fibres.

6. Summary of Remediation Action Plan

6.1 Introduction

Asbestos-impacted soils at the site were considered to pose a potential risk to human health. In order to reduce the potential risk to human-health, to comply with Council and DWER directives and to make the site suitable for use / redevelopment, it was necessary to undertake remediation works at the site.

Section 6 provides a summary of the Remediation Action Plan (RAP) developed for the remediation works.

6.2 Remediation Objectives

The objective of this RAP were to document the procedures, plans and standards required to:

- Identify and document the necessary approvals required by regulatory authorities;
- Complete remediation of asbestos-impacted soils at the site that mitigates risk to human health and the environment;
- Outline requirements to be adopted to ensure the site will not pose an unacceptable risk to human health or the environment at the completion of remediation works; and
- Outline requirements for ongoing management considerations at the completion of remediation / management works.

6.3 Remediation options and preferred remediation selection

The objective of this RAP is to document the procedures, plans and standards required to:

6.4 Evaluation of remediation options and selection of preferred remediation method

In accordance with DWER (2014), a discussion on potential remediation options should consider constraints that apply to the site, the surrounding area and the environmental setting of the site. Issues that should be taken into consideration include technical constraints, logistical constraints, site management issues that may arise from the adoption of remediation methods, acceptability of remediation methods to stakeholders and sustainability (including waste minimisation).

Potential remediation options for asbestos-impacted sites are outlined in DoH (2021) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* and are discussed below.

6.4.1 In-situ Management (Cap and Contain)

Management in-situ primarily involves the encapsulation of asbestos-contaminated soils with a cover system so that it prevents the generation of airborne asbestos fibres and cannot be readily disturbed by site users. Encapsulation would require the placement of a minimum of 0.5m for residential or commercial land uses of clean material and a geo-textile warning barrier.

In-situ management would likely require ongoing site management measures and a Memorial on Title (MoT).

Advantages

- Minimal disturbance of soil, therefore mitigating dust generation; and
- Eliminates the need for offsite disposal of soils.

Disadvantages

- Contamination remains onsite;
- Potential restrictions on land use and a MoT;
- Requirement for ongoing management to ensure the integrity of the encapsulation; and
- Requirement for management measures for intrusive works.

This method is considered a suitable option given the diffuse nature of asbestos-contamination across the site, the presence of asbestos fines and the significant volume of asbestos-impacted soils.

6.4.2 Treatment onsite

Treatment onsite involves the physical treatment or manipulation of the contaminated soils on-site including hand-picking, tiling or mechanical screening. Any ACM collected would need to be appropriately handled and disposed of to a suitably licensed landfill.

Hand-picking

Hand-picking involves a visual inspection of the site soil and manual collection of ACM. Hand picking involves undertaking of at least two passes over a gridded area with a manual or mechanical rake, the collection and weighing of asbestos collected and disposal to a suitably licensed landfill.. Hand picking is a suitable method where asbestos is confined to the top 10cm of soils, asbestos is in the form of ACM and soils consist of sand.

Tiling

Tilling is the process of mechanically turning over surface soils to facilitate the presentation and collection of ACM. Hand picking is also employed to collect and dispose of ACM. Tilling is suitable where ACM impaction does not exceed 30cm.

Mechanical Screening

Mechanical screening involves the separation of ACM fragments from the soil matrix by screening soils through a 7mm mesh. ACM fragments are collected from the mesh. Screened material is validated to confirm the efficacy of the screening process. Mechanical screening is not an appropriate remediation option for friable asbestos or asbestos fines.

Advantages

- No contaminated soil needs to be moved offsite for disposal;
- No requirement for ongoing site management; and
- No ongoing restrictions on land use and a MoT is not required.

Disadvantages

- Risk of dust generation;
- Only suitable where contamination includes only a very small quantity of free asbestos fibres;
- Not suitable where there is considerable additional demolition debris.

6.4.3 Excavation and On Site Burial

Involves the excavation of the impacted material, placement on another area of the site and encapsulation. This option can lessen the risks associated with asbestos-impacted soils by moving the contamination to a less sensitive area. The process requires over-excavation of the asbestos-impacted soils to confirm removal of asbestos-impacted soils. Exposed surfaces require validation prior to backfilling with clean fill. Encapsulation would require the placement of a minimum of 0.5m for residential or commercial land uses of clean material and a geo-textile warning barrier. In-situ management would likely require ongoing site management measures and a Memorial on Title (MoT).

Advantages

- No contaminated soil needs to be moved offsite for disposal;
- A MoT will only be placed on the reburied area if burial depth is less than 3mBGL; and

- Lower risk from transport of contaminated material.

Disadvantages

- Risk of dust generation;
- Restriction on land use and possible MoT in reburied area;
- Requirement for ongoing management to ensure the integrity of the encapsulation; and
- Requirement for management measures for intrusive works.

6.4.4 Excavation for Off Site Disposal or Treatment

Excavation and removal off-site involves the excavation of asbestos-impacted soils and disposal to a suitably licensed landfill. This remediation option eliminates the risk associated with asbestos-impacted soils by removal to an off-site location. This process requires over-excavation to confirm removal of asbestos-impacted soils. The process requires surface validation prior to reinstatement with clean fill.

Advantages

- No restriction on land use;
- No requirement for ongoing management; and
- No requirement for a MoT.

Disadvantages

- Risk of dust generation;
- High cost associated with disposal to landfill; and
- Least preferred in the remediation hierarchy.

6.5 Preferred Remedial Option

Based on an understanding of current site conditions, the advantages and limitations of each remediation option and client considerations, the most preferred remedial option is the Management Insitu (Cap and Contain).

6.6 Remediation Boundaries and Extent

The extent of the site's surface (approximately 3,362m^2) is considered to be contaminated by ACM in soils. The extent of the site is presented in **Figure 2**.

6.7 Roles and responsibilities

Identified stakeholders, associated roles and responsibilities relevant to the implementation of the RAP are presented **Table 4**.

Table 4. Stakeholder roles and responsibilities

Role and Name of Stakeholder	RAP Responsibility
Principal (Site Owners)	- Endorsement of the RAP. - Appoint subcontractors, as required
Environmental Consultant	- Preparation and revision of the RAP as required. - Validation of remediation works, as required. - Contingency actions prescribed in the RAP; - Preparation of Site Validation Report and Ongoing Management Plan (for post RAP operation) - Liaison with regulatory bodies, as required.
Contractors	- Develop safe works procedures in accordance with methodologies outlined herein and relevant guidance. - Undertake relevant civil activities described in the RAP.

Department of Water and Environmental Regulation	- Endorsement of this RAP.
Department of Health	- Endorsement of this RAP.
City of Rockingham	- Endorsement of this RAP.
Worksafe	- Endorsement of this RAP.

6.8 Competencies of ENVSS Personnel

ENVSS personnel involved in the remediation and validation works had 10 years continuous experience in the assessment and remediation of contaminated sites in Australia. A summary of relevant competencies of ENVSS personnel involved in the remediation works are presented in **Appendix B**.

6.9 Community consultation

A comprehensive community engagement program was developed and implemented as part of the RAP. This included erecting signage at the site boundary and contingencies for complaint handling and communication measures in the event that unacceptable airborne asbestos fibres are reported.

ENVSS was not made aware of any concerns raised by the local community during remediation works. There were no requirements for the implementation of any contingency measures.

7. Guidelines for Remediation and Validation

Section 7.1 - 7.2 documents guidelines that will be adopted for the development and implementation of this SVR.

7.1 Acts and Regulations

- Occupational Safety and Health Act 1984, Government of Western Australia;
- Environmental Protection Act 1986, Government of Western Australia;
- Occupational Safety and Health Regulations 1996, Government of Western Australia;
- Contaminated Sites Act 2003, Government of Western Australia;
- Contaminated Sites Regulations 2006, Government of Western Australia; and
- Environmental (Controlled Waste) Regulations 2004, Government of Western Australia.

7.2 Codes of Practice and Guidance Notes

- Guidance Note Occupational Safety and Health Management and Contaminated Sites Work (COSH, 2005);
- Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)], (NOHSC, 2005a);
- Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002(2005)],(NOHSC, 2005b);
- Assessment and Management of Contaminated Sites (DER, 2014);
- Landfill Waste Classifications and Waste Definitions (DWER, 2019);
- Environmental management systems - Requirements with guidance for use (Australian / New Zealand Standards, 2016);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia (DoH, 2021);

- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia Consultation Draft November 2019 (DoH, 2019) (which is not officially endorsed for use by any agency); and
- A Guideline for Managing the Impacts of Dust and Associated Contamination Development Sites (DEC, 2011).

8. Validation assessment criteria

8.1 Introduction

The objective of the Validation Program is to demonstrate compliance with remediation objectives and criteria set out in the RAP. The validation objectives and criteria are presented in Section 8.2 - 8.4.

8.2 Site Surface Prior to Remedial Activities

Where hand-picking is undertaken to remove visually identifiable ACM across the surface of the site, validation shall be achieved where no ACM is visually identified during the walkover across the surface of the site.

A visual clearance certificate, in accordance with the relevant guidances, shall be provided to the relevant party (i.e. site owner or civil contractor) where a visual inspection was undertaken.

8.3 Capping Layer

8.3.1 Geotextile Material and Installation

Installation of geotextile separation / warning barrier across site extent. In accordance with DoH (2021) the geotextile layer shall be:

- water permeable;
- highly visible and readily distinguishable from the overlying capping material;
- rot-proof and chemically inert;
- high tensile strength;
- coverage of contaminated area and 0.5m beyond boundary, if practical; and
- Parallel sheets to be fixed together or overlay by 20cm to prevent cross contamination of asbestos-contaminated and uncontaminated soils.

8.3.2 Capping Material

Imported fill must be demonstrated by the Contractor to be suitable for its intended use. This shall include (but not limited to) evidence demonstrating that the material:

- Does not contain any substances above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or environmental values, such that it does not meet the definition of ‘contaminated’ with respect to the Contaminated Sites Act 2003; and
- Is weed and dieback free.

The Contractor shall provide appropriate documentation to confirm the suitability of the proposed imported fill prior to importation to site. Certification shall be provided to demonstrate the fill to be imported to site is ‘clean fill’ where, in accordance with DWER (2019), ‘clean fill’ means raw excavated natural material such as clay, gravel, sand, soil or rock fines that:

- Has been excavated or removed from the earth in areas that have not been subject to potentially contaminating industries (as defined in DWER (2019)); and
- Has not been processed except for the purposes of:
    - achieving desired particle size;
    - removing naturally occurring organic material such as roots;
    - does not contain acid sulfate soils; and
    - does not contain other types of waste.

Where the contactor cannot provide adequate documentation confirming the suitability of the proposed capping material for use, ENVSS shall undertaken a soil characterisation assessment to assess the suitability of the material onsite,

Table 5 presents the screening criteria adopted for the soil characterisation assessment:

Table 5. Adopted soil assessment criteria

Consideration	Adopted Assessment Criteria
Ecological	NEPM 2013 Table 1B(6) Ecological Screening Levels (ESLs) for Res/Ind, fine sand (0 m - 2 m) NEPM 2013 Table 1B(5) Generic Ecological Investigation Levels (EILs) for Comm/Ind (0 m - 2 m)
Human Health	NEPM 2013 Table 1(A) Health Investigation Levels for soil - Residential 'A' NEPM 2013 Table 1A(3) Soil HSL for vapour intrusion HIL 'A/B' for vapour intrusion (0-1m) CRC Care 2011 Table B3 Soil Health (LSH) Intrusive Maintenance Worker (Shallow trench) Sand (0-2m) CRC Care 2011 Table 4B Soil HSL for Direct Contact (Intrusive Maintenance Worker) CRC Care 2011 Table B4 Soil HSL for Direct Contact (Intrusive Maintenance Worker)
Other	NEPM 2013 Table 1B(7) Management Limits
Waste Classification & Off-site reuse	DWER 2019 Table 3 Contaminant threshold values for waste not requiring a leach test DWER 2019 Table 6 Maximum concentrations (threshold) of relevant physical attributes for uncontaminated fill

8.3.3 Capping Material Installation

To demonstrate that the 500mm of clean capping soils have been imported to site, a topographical survey shall be undertaken at the site prior to and at the completion of remediation works.

A calculation of material importation and compared to the site area to provide a further line of evidence that at least 500mm of soil was imported to the site.

8.4 Air Quality Management

8.4.1 Airborne Fibre Monitoring

In accordance with 'How to Safely Remove Asbestos - Code of Practice (Safe Work Australia, 2020), **Table 6** presents the adopted screening criteria, control measures and contingency actions that were adopted.

Table 6. AFM contingency measures

AFM Concentrations	Control Review	Action
Less than 0.01 fibre/mL	No new control measures required.	Continue with control measures.
At 0.01 fibre/mL to less than or equal to 0.02 fibres/mL	Review current control measures. Investigate the cause of airborne fibre concentrations.	Implement additional controls to eliminate or minimise exposure and prevent further release (i.e. mobilise full time dust suppression and operator site).
More than 0.02 fibres/mL	Review current control measures. Investigate the cause of airborne fibre concentrations.	Cease any intrusive works (unrelated to dust suppression). Undertake SEM analysis to determine whether airborne fibres are asbestos. If asbestos: Notify the relevant regulators by phone and in writing. Notify community (discussed in Section 9) Implement additional controls (i.e. encapsulation the site surface with geofabric). Undertake daily AFM until results are below 0.01 fibres/mL.

8.4.2 Dust Emissions

Dust suppression techniques shall be employed with the objective that there shall be no visible generation of dust during remediation activities. Factors that may influence dust generation include:

- Wind blowing across the site ground surface;
- Loose stockpiled material;
- The movement of machinery over loosely placed material; and
- Trucks transporting material to site.

During the remediation works, the following methods shall be employed to minimise dust generation:

- Periodically dampening the surface of the site with a water spray cart or similar control;
- Ceasing works in strong winds;
- Handling material and reinstating onsite in a single action to avoid stockpiling and multiple events;
- Following reinstatement, contaminated soils should be sprayed with water and compacted by onsite machinery (i.e. excavator); and
- Trucks transporting material to site must be covered at all times.

9. Remediation Program

9.1 Summary of remedial works completed

A brief summary of the remedial works undertaken at the site is presented in **Table 7**.

Table 7. Remediation Works Summary

Item	Date	Summary
Pre-remediation survey	11/10/2021	A topographical survey was undertaken to assess the levels of the site in mAHD prior to remedial works.
Hand Picking	21/10/2021	A site walkover and hand-pick of surficial ACM was undertaken prior to the installation of the geofabric layer.
Installation of Geofabric Layer	21/10/2021	A geofabric layer was installed across the site's surface on 21/10/21 in general accordance with the
Airborne Fibre Monitoring	21/10/2021	ENVSS undertook airborne fibre monitoring during the installation of the geofabric layer.
Importation and placement of capping material	21/10/2021 - 27/10/2021	A total of 2,999.65t of soils were imported to site to form the capping layer. The material was spread across the site and compacted using a 11.5t front end loader.
Capping material Soil characterisation assessment	21/10/2021 - 27/10/2021	ENVSS undertook a soil characterisation assessment of the capping material; and Periodic Inspections of capping material importation to site and installation.
Post-remediation survey	08/11/2021	A topographical survey was undertaken to assess the levels of the site in mAHD at the completion of remedial works.
Hydroseeding	12/11/2021	The site surface was sprayed with a hydroseeding solution to mitigate erosion.

9.2 Supervision

An ENVSS Senior Environmental Scientist was present during the installation of the geofabric layer, and partial importation on capping material on 21 October 2021. An inspection of the capping material importation was undertaken on 22 October 2021. An inspection of the site was undertaken on 27 October 2021 at the completion of the importation and installation of capping material.

Photographs taken during the remediation program are presented in **Appendix C**.

9.3 Variations to RAP

The remediation works were carried out in general accordance with the RAP. It was noted however that the height of capping material was below the prescribed 0.5m in some locations along the boundary of the site. It was the opinion of the civil contractor that the capping material would not be stable if placed to a depth of 0.5m to the site boundary. The capping material was battered towards the boundary of the site to prevent erosion.

10. Validation Program

10.1 Site surface validation

A site walkover and hand-picking of visible ACM debris was undertaken across the site's surface, immediately prior to installation of the geofabric layer, on 21 October 2021. No ACM was visually identified during the final walkover. A visual clearance was issued to the client and civil contractor prior to the commencement of the installation of the capping layer.

The visual clearance certificate issued to the client on 21 October 2021 is presented in **Appendix D**.

10.2 Geofabric Material and Installation

The contractor supplied a Geofabrics-branded Bidem Green 'A24G' geofabric material for the geofabric capping material. ENVSS considers the geofabric material to be suitable for purpose and installed in accordance with the specification of the RAP. A discussion of the geofabric validation is presented in **Table 8**.

Table 8. Geofabric material validation

Validation Consideration	Comment
Geofabric condition	Prior to installation the geofabric material was covered in a plastic cover sleeve. On installation the geofabric appeared to be in good condition with no evidence of rips or tears.
Water Permeability	Geofabrics describe the Bidim Green as 'highly porous, allowing water to pass through while preventing soil migration' and 'ideal for use in subsurface drainage'. Hydraulic properties of the geofabric include: ● Pore size: 80µm; ● Permittivity: 2.65s^{-1} ● Coefficient of Permeability: 43m/s x 10^{-4} ● Flow rate @ 100mm Head: 265L/m^2/sec ENVSS considers the geofabric meet to be water permeable whilst not allowing for the migration / cross-contamination of soils.
Highly visible and distinguishable from overlying capping material	ENVSS describes asbestos-impacted filling soils at the site to be grey-brown in colour. ENVSS describes the imported capping layer at the site to be orange-brown in colour. The geotextile fabric is described as being light grey in colour. On inspection during the remediation works, ENVSS considers the geotextile fabric to be highly visible and readily distinguishable from the overlying capping soils.
Rot-proof and chemically inert	Bidem Green is described as being constructed from recycled plastics and as such is considered to be chemically inert and root-proof.
High tensile strength	Mechanical properties of the geofabric include: Grab Tensile Strength: 850N Trapezoidal Tear Strength: 345N CBR Burst Strength: 2,500N ENVSS considers the geofabric meets the standard for "High tensile strength'.
Coverage of contaminated area and 0.5m beyond the boundary if practicable	During installation it was determined that geofabric installation would not extend laterally 500mm beyond the boundary of the remediation (i.e. the site boundary) due to paved

	areas in these locations and/or the likely that these areas will be used vehicle parking / movement which may disturb the integrity of the onsite geotextile fabric onsite.
Parallel sheets to be fixed together or overlay by 20cm to prevent cross-contamination of asbestos-contaminated and uncontaminated soils	ENVSS personnel were present during the installation of the geofabric by the civil contractor. It was assessed that each layer of geofabric was overlain by 0.2m of the subsequent geofabric layer.

ENVSS considers that the geofabric layer has been successfully installed and in general accordance with the methodology prescribed in the RAP.

A Technical data sheet for the geotextile capping layer is presented in **Appendix E**. Photographs collected during the installation of the geotextile material are presented in **Appendix C**.

An aerial photograph of the site, captured on the 24 October 2021, is presented in **Figure 3**.

10.3 Capping Material

10.3.1 Introduction

Capping soils were imported from 5 Ashwood Parkway, Lakelands (the source site). At the time of importation of soils to the site, the civil contractor was undertaking civil works as part of the redevelopment of the site as Lakelands Railway Station.

As the proposed source site did not have a DWER Extractive Industry License, in accordance with the RAP, ENVSS undertook the following assessments to assess the suitability of the material for importation to site:

- A review of the history of the material and land uses at the material source location;
- A visual inspection of the material for evidence of construction rubble, weeds, odours, sheens or staining; and
- A soil characterisation assessment in accordance with DWER 2019 and NEPM 2013.

Information on the source site is presented in Table 9.

Table 9. Source Site Identification

Source Material Site Identification	
Street Address	5 Ashwood Parkway, Lakelands
Lot and Plan	Lot 800 on Plan P077032
Land ID Number	4111552
Proprietor	Public Transport Authority (PTA)
Parcel Area	Approximately 1.8933ha
Local government	City of Mandurah
Planning scheme zone	“Railways” under the City of Mandurah, Town Planning Scheme No.3
Current land use	Construction site
Proposed land use	Lakelands Railway Station
Surrounding land uses	North: Low density residential housing East: Railway line and Blackswan Lake South: Low density residential housing West: Low density residential housing

A soil characterisation assessment for the material is presented in Appendix F.

10.3.2 Source site historical review

A review of the historical aerial photographs indicated that the site was vacant and generally covered in vegetation from 1961 until sometime after 17 June 2021. It is understood that civil construction, including excavation and stockpiling works, commenced after this time and this was evident in aerial photographs taken on 13 August 2021 and 24 October 2021.

The client provided ENVSS with a geotechnical report, undertaken at the source site as part of this investigation. The geotechnical report reviewed was titled: Golder, *Lakeland Station Project: Geotechnical Factual Report* (December, 2020). The investigation was commissioned by the Public Transport Authority as part of planning for the construction of Lanklands Station.

The investigation included:

- The drilling of three geotechnical boreholes to between 15.0m and 22.1m;
- Installation of three groundwater monitoring wells;
- Progression of of seven test pits and 11 hand auger boreholes; and
- Geotechnical testing including laboratory analysis for acid sulfate soils.

A review of the investigation indicated dark grey/brown sandy topsoil was typically encountered to around 0.15m below ground level (BGL) and underlain by orange/brown sand.

10 samples submitted to a NATA-accredited laboratory as part of a acid sulfate soils assessment indicated the soils were unlikely to be acid-generating under aerobic conditions.

10.3.3 Source Material Inspection

ENVSS personnel attended 5 Ashwood Parkway, Lakelands on 22 October 2021 to undertake an inspection of the material during the loading out and importation to site, which was undertaken by the client between 21 - 27 October 2021.

At the time of inspection, the source material was either stockpiled in the central area of the source site. The source material generally consisted of orange-brown sand with trace amounts of dark grey sandy topsoil. No foreign material (i.e. construction or demolition debris), weeds or vegetation, odorous or stained soils were encountered during the inspection.

10.3.4 Soil Characterisation Assessment

A soil assessment was undertaken on the material following commencement of the importation of the capping material to the site. A brief summary of the scope of works is presented in **Table 10**.

Table 10. Fieldwork Methodology

Item	Detail
Date of assessment	27/10/2021
Personnel	Fieldworks and the overall assessment were undertaken by a Senior Environmental Scientist with 10 years continuous experience in the assessment and remediation of asbestos-contaminated sites in Australia.
Visual Inspection	ENVSS personnel undertook periodic visual inspection of the source material during load out from the source site and during importation to the site.
Sampling Location Strategy	Following placement of the source material, a grid-based sampling program was adopted for this assessment.
Sampling Density	In accordance with DWER Landfill Waste Classification and Waste Definitions 1996 (as amended 2019) a total of 15 primary samples were collected for the classification of up to 3,000m^3.
Sampling Method	Samples were collected from using hand auger methodologies.
Target Depth	Samples were collected at 0.2mBGL at each sampling location.

Soil Logging	Soils were logged by an experienced field technician on log sheets produced in accordance with AS4482.1-2005.
Sample collection	All samples were placed in laboratory supplied glass jars and placed in a chilled sampling container for transportation to the ENVSS office and laboratory.
Cross Contamination Mitigation	Reusable sampling equipment was washed with water mixed with a phosphate-free detergent, tap water and rinsed in deionised water at the completion of intrusive works at each sampling location. A fresh pair of disposable nitrile gloves was used at each sampling location to mitigate the potential for cross contamination.
Laboratories Used	ALS and Eurofins. Both laboratories are NATA-accredited for the analysis undertaken.

A comparison of laboratory results against the adopted screening criteria of the soil assessment indicated that all concentrations were reported either below laboratory detection limits or below the adopted human health and ecological screening criteria.

10.3.5 Supervision and inspections

Material imported to site by the civil contactor was visually consistent with the material inspected at the source site. No foreign material (including construction or demolition rubble), weeds, vegetation, odorous or stained soils were visually identified during full time supervision or periodic inspections of the imported material.

Representative photographs from the assessment are provided in **Appendix C**.

10.3.5 Capping Material Suitability

Based on the soil characterisation assessment and visual inspections undertaken, ENVSS considers the material imported to site to meet the criteria for use at the site.

10.4 Capping Material Installation

10.4.1 Lateral Extent

A visual inspection of the site at the completion of the installation of the capping layer, confirmed that the capping layer laterally extended to the boundary of the site. Photographs of the site following installation of the capping layer are presented in **Appendix C**.

10.4.2 Vertical Extent

Pre and post-remediation topographical surveys were undertaken to confirm the installation of a minimum of 500mm of capping material, so far as reasonably practicable.

It was noted that given that the remediation area extended to the boundary of the site, it was not reasonably practicable to install the capping layer to 0.5m above the existing ground level. ENVSS does not consider the reduced capping levels to adversely impact the overall effectiveness of the remediation.

Survey Plans, undertaken prior to the commencement of remediation and following the completion of remediation, are presented in **Appendix G**.

A figure presenting the level changes between the surveys is presented in **Figure 4**.

10.4.3 Estimated volume of importation and capping depth

Based on a review of the trucking dockets supplied by the civil contractor a total of 2,999.65t of soils was imported to site. Applying a bulking factor of 1.65 a total of approximately 1,814.93m^3 of soils were imported to site to form the capping layer. Considering a site area of 3,326m^2 the average volume of imported material is approximately 0.55m across the site.

Trucking dockets are presented within **Appendix F**.

10.5 Air Quality

10.5.1 Airborne Fibre Monitoring

Airborne Fibre Monitoring was undertaken on 21 October 2021 during:

- A site walkover and collection and removal of visible ACM debris; and
- installation of geofabric layer.

Airborne fibre monitors were set in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003(2005)]. Four airborne fibre monitoring stations were placed at the northern, eastern, western and southern boundaries of the site. Using the membrane filter method, fibres of a specific size were collected and counted by a NATA-accredited laboratory for that analysis.

Control levels were reported at <0.1fibres/mL and as such no unacceptable concentrations were considered to have been generated and the adopted controls were considered to have been effective.

The Airborne Fibre Monitoring report is presented in **Appendix H**.

10.5.2 Dust Management

No dust, originating from the asbestos-impacted soils or imported capping material, was visually identified by ENVSS personnel during supervision works and periodic inspections undertaken by ENVSS.

11. Discussion

11.1 Human Health Risk Assessment

The objective of the Human Health Risk Assessment is to identify the relevant contamination issues and migration pathways (if any) that may pose an unacceptable risk to human health following the completion of remediation. The

The remediation works at the site have been completed through the installation of a capping layer across the site. The suitability of capping layer installation was confirmed via the implementation of a validation program undertaken by ENVSS.

ENVSS considers that the site does not pose a risk to human health and the site is suitable for commercial and residential land use, provided that asbestos-impacted soils remain encapsulated beneath the capping layer.

There exists a potential risk to human health should the capping layer and underlying asbestos-impacted soils be distrubed. Disturbance works may involve isolated excavations (such as the installation of underground services) or more broad disturbances (such as the construction of an underground car park as part of the redevelopment of the site). The potential risks to receptors would need to be fully assessed in light of the proposed scope of works.

11.2 Post-remediation conceptual site model

No potential exposure pathways exist for asbestos fibres to adversely affect human health during non-intrusive use at the site where the capping layer remains in effect.

Table 11 presents the CSM under conditions where the asbestos-impacted filling is disturbed.

Table 11. Post-remediation conceptual site model - exposure of asbestos-impacted soils

Sources	Migration Pathways	Potential Receptors	Exposure Scenarios
Asbestos fibres released from AF or ACM in site soils soil	- Inhalation & ingestion - Physical disturbance of asbestos impacted soils.	- Site visitors - Remediation workers - Future construction and maintenance workers - Future occupants - Neighbouring site users	- Inhalation of airborne asbestos fibres

11.3 Confirmation of completion of remedial outcomes

The primary objective of the remediation works was to remove the risk to human health posed by asbestos-impacted filling, such that the site is suitable for use. Following the installation of the capping layer, and validation activities, ENVSS considers that the objective has been achieved and the site is suitable for residential and commercial land use.

ENVSS considers that remediation works were completed in general accordance with the RAP. The installation of the capping layer below 0.5m along the boundary of the site is considered to provide adequate encapsulation of asbestos-impacted filling and does not affect the overall integrity of the capping layer.

It is noted that the presence of asbestos-impacte filling onsite pose a potential risk to human health should the capping layer and underlying asbestos-impacted filling be distrurbed. An ongoing Site Management Plan should be developed in consideration of future soil disturbance works, redevelopment and management of the capping layer.

11.4 Ongoing Site Management Plan

Due to the presence of asbestos-contaminated filling remaining at the site, it is recommended that an Ongoing Site Management Plan be developed to outline the procedures and controls to be adopted where disturbance to the asbestos be undertaken and to maintain the ongoing effectiveness of the capping layer.

In accordance with the Contaminated Sites Act 2003, a memorial should be placed on the certificate of titles that make up the site.

12. Conclusions and Recommendations

12.1 Summary of findings

Remediation works were completed at the site in general accordance with the Remediation Action Plan, developed for the site. The remediation involved the installation of a geofabric layer and capping soils across the site footprint. A validation assessment program undertaken by ENVSS confirmed that the capping layer was effectively installed and the remediation met the objectives.

Due to the presence of asbestos contaminated filling at the site there is a requirement for ongoing management, which is discussed in Section 11.3.

12.2 Suitability for use

The site in its entirety is considered suitable for residential and commercial land use, provided that an Ongoing Site Management Plan is developed and adopted by future users of the site to manage the risks associated with the asbestos in soils at the site.

ENVSS recommends that the site should be reclassified as *'Remediated for restricted use'* in accordance with the Contaminated Sites Act 2003. A Memorial should be placed on the certificate of titles that make up the site.

In accordance with the Act, due to the presence of asbestos-contaminated filling at the site, a memorial should be placed on the site to notify prospective land users / purchasers and relevant planning authorities of the contamination and need for ongoing management.

12.3 Ongoing management

Due to the presence of asbestos-contaminated filling remaining at the site, it is recommended that an Ongoing Site Management Plan be developed to outline the procedures and controls to be adopted where disturbance to the asbestos be undertaken and to maintain the ongoing effectiveness of the capping layer.

In accordance with the Act, a memorial should be placed on the certificate of titles that make up the site.

13. References

- Occupational Safety and Health Act 1984, Government of Western Australia;
- Environmental Protection Act 1986, Government of Western Australia;
- Occupational Safety and Health Regulations 1996, Government of Western Australia;
- Contaminated Sites Act 2003, Government of Western Australia;
- Contaminated Sites Regulations 2006, Government of Western Australia;
- Environmental (Controlled Waste) Regulations 2004, Government of Western Australia;
- Asbestos in Soils Investigation, Lot 9 and 10 Goddard Street Rockingham Environmental Site Services, January 2021;
- Remediation Action Plan, Lot 9 and 10 Goddard Street Rockingham Environmental Site Services, September, 2021;
- Guidance Note Occupational Safety and Health Management and Contaminated Sites Work (COSH, 2005);
- Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)], (NOHSC, 2005a);
- Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002(2005)],(NOHSC, 2005b);
- Assessment and Management of Contaminated Sites (DER, 2014);
- Landfill Waste Classifications and Waste Definitions (DWER, 2019);
- Environmental management systems - Requirements with guidance for use (Australian / New Zealand Standards, 2016);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia (DoH, 2021);
- Guidelines for the Assessment, Management and Remediation of Asbestos-Contaminated Sites in Western Australia Consultation Draft November 2019 (DoH, 2019) (which is not officially endorsed for use by any agency); and
- A Guideline for Managing the Impacts of Dust and Associated Contamination Development Sites (DEC, 2011).

14. Statement of Limitations

This report is prepared for clients objectives and is formulated on this basis only. All limitations and conditions in the writing of this report are clearly agreed to by the client and Environmental Sites Services prior to its formulation and may not be suitable or applicable for any other use other than that of the original intended objective. No other parties other than the client and Environmental Sites Services should use this information without firstly conferring with Environmental Sites Services.

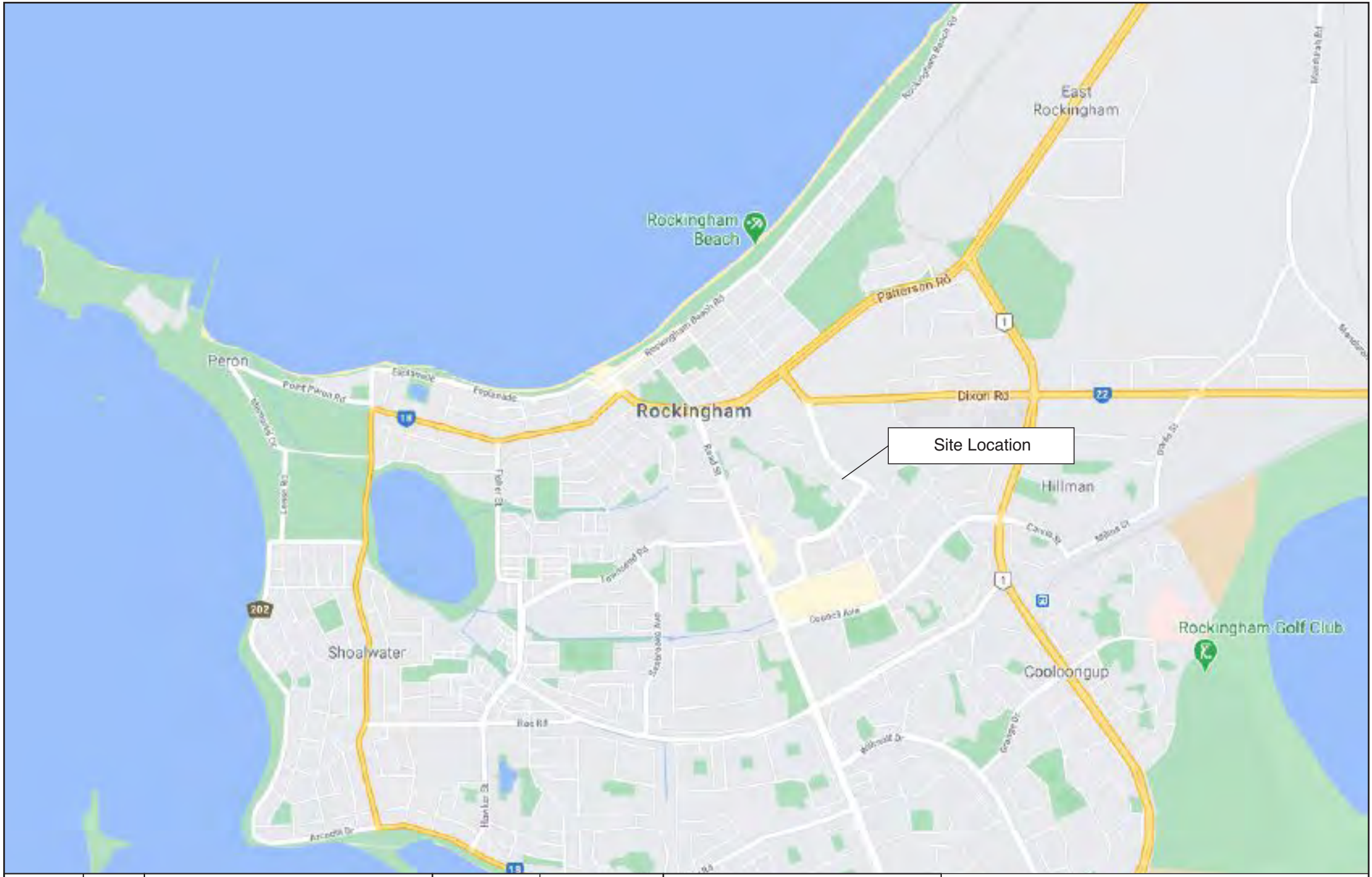
Whilst all due care is taken, any information within this report that has relied on information from previous assessments made by others including visual inspections, laboratory testing and overall methodologies cannot be guaranteed for its accuracy or competency by Environmental Sites Services.

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. The recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

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Figures



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0.5 1.0

FIGURE: 01	DATE: 27/11/21	TITLE: Site Location Plan	
PROJ. REF: 0011310			
CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas		LOCATION: Goddard Street, Rockingham	
DRAWN: DB	APPROVED: AB / REVISION: 00	SOURCE: Google Maps	



METRES

5 10

FIGURE: 02 | DATE: 29/10/21

PROJ. REF: 0011310

CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas

DRAWN: DB | APPROVED: DB REVISION: 00

TITLE:
Site Extent

LOCATION: Lot 9 & Lot 10, Goddard Street, Rockingham

IMAGE SOURCE: Nearmap, photo captured 21/08/2021

LEGEND:
Site Boundary
Lot 9 Boundary
Lot 10 Boundary



METRES

5 10

FIGURE: 03	DATE: 08/12/21
PROJ. REF: 0011310	
CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas	
DRAWN: DB	APPROVED: DB REVISION: 00

TITLE:
Installation of capping layer

LOCATION: Lot 9 & Lot 10, Goddard Street, Rockingham

IMAGE SOURCE: Nearmap, photo captured 21/08/2021

LEGEND:
Site Boundary
Lot 9 Boundary
Lot 10 Boundary



METRES

5 10

FIGURE: 04	DATE: 08/12/21	TITLE: Site Plan: Survey Plan Comparison
PROJ. REF: 0011310		
CLIENT: McNicholl Rockingham, Endeavour Hills, W. Thomas		LOCATION: Goddard Street, Rockingham
DRAWN: DB	APPROVED: DB / REVISION: 00	IMAGE SOURCE: Nearmap

LEGEND:

Site Boundary

+0.XXm — Approximate depth of capping layer installation(m)

Appendix A. DWER Classification Letter

Government of Western Australia
Department of Water and Environmental Regulation

Our ref: DMO11985
Enquiries: Chek Cher, Ph (08) 6364 7207
Email: chek.cher@dwer.wa.gov.au

Mr Rory Macleod
Senior Environmental Scientist
Environmental Site Services
PO Box 440
WEMBLEY WA 6913
By email: admin@envss.com.au

Dear Mr Macleod

LOT 9 MARKET STREET AND LOT 10 ON DIAGRAM 86080, ROCKINGHAM – ASBESTOS INVESTIGATION

The Department of Water and Environmental Regulation (the department) has .eceived the report titled "Asbestos in Soils Investigation Lots 9 & 10 Goddard Street, Rockingham WA" (Environmental Site Services, January 2021) on 9 and 31 March 2021 in relation to Lot 9 Market Street and Lot 10 on Diagram 86080, Rockingham (the site).

The department understands that the report was submitted to present the findings of the asbestos investigation and to update the site classification under the *Contaminated Sites Act 2003* (CS Act).

The department has reviewed the report and concurs with the investigation findings that a layer of uncontrolled fill material is present across the site to a depth of one metre below ground level (bgl). The uncontrolled fill layer was found to extend deeper in the northern portion compared to the southern and eastern portions of the site. The fill comprised mainly of sand with some inert waste such as concrete, gravel, brick and glass. Soil sampling also found that asbestos-containing material (ACM) fragments and asbestos fines were present within the uncontrolled fill layer at quantities exceeding the assessment criteria specified in 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia' (Department of Health, May 2009) for all land uses.

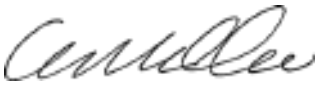
The Department of Health has also reviewed the report and advises that the site represents a risk to public health and is not suitable for commercial/industrial or other more sensitive land uses without further risk assessment and remediation. A copy of the Department of Health's advice is attached for your information.

The Department of Health recommended that an interim site management plan (ISMP) is developed and implemented as a matter of priority to monitor and manage current dust/fibre emissions until such a time that the site is remediated and redeveloped. The ISMP should include the maintenance of the existing perimeter fencing, appropriate warning signage, installation of either a temporary dust-suppression hydro-mulch or a permanent minimum 500 millimetre clean capping solution, and a surface water drainage management strategy to minimise soil erosion. These measures should be implemented until the site is permanently remediated. The department agrees with the Department of Health's advice.

Based on the information provided, the site will likely be reclassified to *contaminated – remediation required* under the CS Act. A formal notification of site classification will be provided in due course including timeframes for actions required.

If you have any further queries, please contact Environmental Officer, Chek Cher, on 6364 7207.

Yours sincerely



Andrew Miller
SENIOR MANAGER
CONTAMINATED SITES
20 / 04 / 2021

c.c. Mr Graeme Goff (McNicholl Rockingham Pty Ltd), Graeme.goff@questus.com.au
Mr William Thomas, bthomas@global.net.au

Attachment 1: Department of Health's advice dated 16 March 2021 – Rockingham Lot 9 & 10 Goddard Street

Government of Western Australia
Department of Health

Your Ref: DMO11944
Our Ref: F-AA-74880
Enquiries: David E Jackson, 9222 2000

Mr Andrew Miller
Senior Manager Contaminated Sites
Department of Water and Environmental Regulation
Locked Bag 10
Joondalup WA 6919

Dear Andrew,

ROCKINGHAM LOT 9 & 10 GODDARD STREET – ASBESTOS

Thank you for your correspondence of 12 March 2021 requesting the Department of Health (DoH) review the current assessment for the site under the *Contaminated Sites Act 2003 (CSAct)*. Relevant officers from the Environmental Health Directorate have considered the information provided in the following reports; please be aware that comments are limited to the scope of the advice sought.

- Asbestos in Soils Investigation Lots 9 & 10 Goddard Street, Rockingham WA (Environmental Site Services, January 2021)

The site is a vacant development lot within an existing commercial area. DoH has previously provided advice (FAA26944) dated 2015, in relation to land immediately to the northwest (Lot 359) which was known to contain shallow deposits of uncontrolled fill impacted by asbestos fragments. At that time the site was excavated, and waste material relocated and encapsulated in cells on site under 1m depth of clean soils. These cells were classified as "*Remediated for Restricted Use*" separately and included a Site Management Plan restricting excavation depth. Although waste material was found to extend under the Market Street reserve and approximately 20m into the western part of Lot 9 Goddard Street, this material does not appear to have been remediated.

The current submission follows an inspection by Council Officers of Lot 9/10 Goddard Street in September 2020, which found visual evidence of uncontrolled fill (i.e. rubble, glass) containing asbestos fragments across the site. The site was believed to have been used for historical unauthorised waste disposal and was now being used as an informal carpark with inherent health risks from dust/fibre generation.

An asbestos assessment (ESS, January 2021) reported that the site (and surrounding land) has been used for unauthorised infilling prior to 1953 where upon the site was vested to City of Rockingham as a golf course. The site was divided into twenty-nine 10m x 10m grid squares subject to systematic visual inspection and "emu-pick" comprising three passes. DoH recommends smaller grid sizes (e.g. 4m x 4m) to maintain the veracity of the inspection process. The visual inspection identified approximately 5.2kg of visible asbestos fragments distributed across the site, but predominantly within grids 1A, 5A, 1B, and 1C along the south-eastern boundary. The fragments were described as various fibre-cement fragments in a non-friable or degraded condition. The report notes that the visual inspection was impeded by heavy vegetation and no raking to 10cm depth was carried out. The report notes that by the third pass inspection

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ABN 28 684 750 332
www.health.wa.gov.au

all visible asbestos fragments had been removed. Details of the consultant's asbestos experience/competency has not been provided within the report.

The site was subject to 29 test pits (one in each grid). Although DoH favours a targeted sampling rationale, test pit frequency exceeds minimum sampling frequencies for widespread homogeneous contamination, as set out in DoH 2009 (18 - 22 locations per 0.35ha). Test pit logs describe the waste body as comprising 'silty sand with gravel, brick, concrete and glass' up to 1m depth, over natural sand. Two bulk (10L) samples where obtained from each test pit location at between 0.1 and 0.9m depth. Samples were taken from the identified waste body and from the underlying natural sand. Bulk soil sampling found wide-spread asbestos fragments (>7mm) including exceeding DoH, 2009 criteria for asbestos fragments at commercial/industrial land (0.04%w/w) at grids 2B:0.3m, 4B:0.3m, 7B:0.4m, 1C:0.5m, 3C:0.5m, 7C:0.3m and 1E:0.8m. The type and condition/friability of fragments has not been recorded. A further twenty-nine laboratory (500ml) soil samples were obtained from each grid. Asbestos fines (<7mm) were found in grids 6A:0.3m, 1B:0.7m, 5B:0.1m, 3C:0.5m & 7C:0.3m exceeding DoH, 2009 criteria for asbestos fines at all land uses (0.001%w/w). The report recommends the implementation of a Site Management Plan (SMP), and a program of effective stakeholder/community engagement.

Based on the available information the site represents a risk to public health and is not suitable for commercial/industrial or other more sensitive land uses without further risk assessment and remediation. As such the site should be reclassified as *Contaminated – Remediation Required* (C-RR).

At this time there are no proposals for the redevelopment of the site. Until such proposals are forthcoming the proponent should implement, as a matter of priority, an Interim Site Management Plan (SMP) to monitor and manage dust/fibre emissions from the site. This should include the maintenance of the existing perimeter fencing, the installation of appropriate warning signage, installation of either *temporary* dust-suppression hydro-mulch or a *permanent* minimum 500mm clean capping solution, and surface water drainage management strategy to minimise soil erosion. These measures should be regularly inspected, and their effectiveness maintained, by trained and experienced operatives, in accordance with WorkSafe OHS requirements, until a more permanent remediation solution is available.

The proponent should satisfy themselves that they have complied fully with all legislative and regulatory requirements (e.g. Regulation 43 - Disposal of Asbestos, Health (Asbestos) Regulations, WorkSafe occupational health & safety requirements)

The DoH requests that the above comments are provided to the consultant for their information/consideration. Please do not hesitate to contact David E Jackson on 9222 2000 if you need further information.

Yours sincerely



Mirella Goetzmann
PRINCIPAL TOXICOLOGIST
ENVIRONMENTAL HEALTH DIRECTORATE

16 March 2021
cc: chek.cher@dwer.wa.gov.au

Government of Western Australia
Department of Water and Environmental Regulation

Your ref:
Our ref: DMO 11985
Enquiries: Chek Wui Cher
Phone: 1300 762 982
Fax: (08) 6364 7001
Email: info@dwer.wa.gov.au

Attention: Graeme Goff
McNicholl Rockingham Pty Ltd
3/110-116 East Pde
East Perth WA 6004

Dear Sir/Madam

NOTICE OF A CLASSIFICATION OF A KNOWN OR SUSPECTED CONTAMINATED SITE GIVEN UNDER SECTION 15 OF THE *CONTAMINATED SITES ACT 2003*

The site detailed below (the site), was classified by the Department of Water and Environmental Regulation (the department) under the *Contaminated Sites Act 2003* (the Act) on 28 January 2021 as *'Possibly contaminated - investigation required'*:

- LOT 9 ON DIAGRAM 86080 as shown on certificate of title 2018/335 known as 5 Market St, Rockingham WA 6168
- LOT 10 ON DIAGRAM 86080 as shown on certificate of title 2018/336 known as Rockingham WA 6168

Following the submission of further information, the site has been reclassified.

This notification is being sent to you in accordance with section 15(1) of the Act on the grounds that you, as the recipient, are one or more of the following:

(a) owner of the site (contact details sourced from the current certificate of title);
(b) occupier of the site;
(c) relevant public authority;
(d) person who, in the CEO's opinion, there is particular reason to notify;
(e) person who made the report under section 11 or 12; and
(f) person who, in the CEO's opinion, may be responsible for remediation of a site classified as *contaminated – remediation required.*

Site Re-classification

Category of site classification: Contaminated - remediation required

Date of site classification: 21/04/2021

Reasons for classification: This site comprises Lot 9 Market Street and Lot 10 on Diagram 86080, Rockingham, and was reported to the Department of Water and Environmental Regulation (the department) under section 11 of the 'Contaminated Sites Act 2003' (the Act), which commenced on 1 December 2006. The site was first classified under section 13 of the Act based on information submitted to the department by January 2021. The site has been classified again under section 13 of the Act to reflect additional technical information submitted to the department by March 2021.

The site was reported because fragments of asbestos-containing material (ACM) were found to be present in surface soil across the site. Anecdotal evidence indicates that the site was historically used as an uncontrolled landfill prior to 1953 and is therefore suspected of being the source of the ACM. Landfilling is a land use which has the potential to cause contamination, as specified in the guideline 'Assessment and management of contaminated sites' (Department of Environment Regulation [DER], 2014). The site is currently vacant.

A soil investigation, carried out in January 2021, found that a layer of uncontrolled fill material is present across the site to a depth of one metre below ground level (bgl) and is underlain by natural sands. The uncontrolled fill layer was found to extend deeper in the northern portion (i.e. 0.9 to 1 metre bgl) compared to the southern and central portions (i.e. 0.4 to 0.7 metres bgl) of the site. The fill comprised mainly of sand with some inert waste such as concrete, gravel, brick and glass. Soil sampling also found that ACM fragments and asbestos fines were present within the uncontrolled fill layer at quantities exceeding the assessment criteria specified in 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia' (Department of Health, May 2009) for all land uses.

Groundwater has not been investigated. However, groundwater is not considered to be a receptor at the site.

The site is not suitable for any land use or occupation until remedial measures have been undertaken.

The site is contaminated and remediation is required to reduce risks to human health, the environment and environmental values to acceptable levels. Therefore, the site is classified as 'contaminated - remediation required'.

The department, in consultation with the Department of Health, has classified this site based on the information available to the department at the time of classification. It is acknowledged that the contamination status of the site may have changed since the information was collated and/or submitted to the department, and as such, the usefulness of this information may be limited.

In accordance with Department of Health advice, if groundwater is being, or is proposed to be abstracted, the department recommends that analytical testing should be carried out to determine whether the groundwater is suitable for its intended use.

Other Relevant Information:

Additional information included herein is relevant to the contamination status of the site and includes the department's expectations for action that should be taken to address potential or actual contamination described in the Reasons for Classification.

Where the land is part of a transaction - sale, mortgagee or lease agreement, the land owners MUST PROVIDE WRITTEN DISCLOSURE (on the prescribed Form 6) of the site's status to any potential owner, mortgagee (e.g financial institutions) or lessee at least 14 days before the completion of the transaction. A copy of the disclosure must also be forwarded to the department.

Action Required:

This site is high priority for action to be taken to address contamination, as described below.

Asbestos remediation is to be carried out in accordance with the 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia' (Department of Health, May 2009).

Due to the presence of asbestos-impacted fill beneath the site, an interim site management plan (ISMP) is required to be developed and implemented to monitor and manage current dust emissions until such a time that the site is remediated and redeveloped. The ISMP should include the

maintenance of the existing perimeter fencing, appropriate warning signage, installation of either a temporary dust-suppression hydro-mulch or a permanent minimum 500-millimetre clean capping solution, and a surface water drainage management strategy to minimise soil erosion. These measures should be implemented until the site is permanently remediated.

A schedule for carrying out the actions required is to be provided to the department in writing by no later than 31 May 2021. Timeframes in the schedule should meet the department's expectations for action at high priority sites, as published in section 8.3 of 'Identification, reporting and classification of contaminated sites in Western Australia' (DER, June 2017).

General Information

The nature and extent of contamination and any restrictions on the use of the land, if applicable, are listed in Attachment A.

Information in relation to the classification of the site is available free of charge as a summary of records via the Contaminated Sites Database at www.der.wa.gov.au/contaminatedsites.

In some instances the department has had to classify sites based on historical information. A site may be re-classified at any stage when additional information becomes available, for example where a new investigation or remediation report completed in accordance with the department's 'Contaminated Sites Guidelines' and the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, is submitted to the department. The current site classification is the classification most recently conferred on the site.

Memorials

In accordance with sections 58 (1) and (3) of the Act, the department will give notice to Landgate to withdraw the current memorial(s) lodged against the Certificate(s) of Title relating to the site, and subsequently lodge a new memorial against the Certificate(s) of Title which will record the new site classification. Parcel(s) without a registration number or certificate of title will not have a memorial lodged against them until a certificate of title has been created. Once complete, confirmation of the lodgement of the memorial(s) will be forwarded to the following people:

(a) each owner,
(b) Western Australian Planning Commission;
(c) CEO of the Department of Health;
(d) Local Government Authority;
(e) relevant scheme authority.

Given that memorial(s) will be lodged against the site, the Western Australian Planning Commission (WAPC) may not approve the subdivision of the land under Section 135 of the *Planning and Development Act 2005*, or the amalgamation of that land with any other land without seeking, and taking into account, the advice of the department as to the suitability of the land for subdivision or amalgamation. Furthermore, a responsible authority (e.g. Local Government Authorities) may not grant approval under a scheme for any proposed development of the land without seeking, and taking into account, advice from the department as to the suitability of the proposed development.

Disclosure upon sale / lease / mortgage of the site

Where the land is part of a transaction – sale, mortgage or lease agreement – and is classified as

- *contaminated – remediation required;*
- *contaminated – restricted use; or*
- *remediated for restricted use;*

land owners MUST PROVIDE WRITTEN DISCLOSURE (on the prescribed Form 6 enclosed) of the site's status to any potential owner, mortgagee (e.g. financial institutions) or lessee at least 14 days

before the completion of the transaction. A copy of the disclosure must also be forwarded to the department.

Important note: Failure to provide written notice is an offence and carries a penalty of up to $125,000 and a daily penalty of $25,000.

Transferring responsibility for remediation

This site has been classified *'contaminated – remediation required'*. Where transfer of responsibility for remediation is proposed, the person responsible for remediation must obtain written agreement from the person to whom the whole or part of that responsibility will transfer, and seek written approval of that agreement from the department in accordance with section 30 of the Act. If it is proposed to transfer responsibility for remediation to the State, then written approval from the Minister for Environment must be obtained.

The memorial lodged against the Certificate(s) of Title for this site specifies that in accordance with section 58(5) of the Act, the Registrar of Landgate may not register, or accept for registration, an instrument affecting the land unless the department gives written consent to that registration.

Appealing the Site Classification

All site classifications given by the department are appealable. However, only certain people can lodge a valid appeal. The people who can lodge a valid appeal varies, depending on the classification category, as detailed in Fact Sheet 4: *Site classifications and appeals*. Appeals need to be lodged in writing with the Contaminated Sites Committee at Forrest Centre, Level 22, 221 St Georges Terrace, Perth WA 6000, within **45 days** of being given this notification. The appeal should set out the appellant's relationship to the site, and must include the grounds and facts upon which it is based. An appeal fee (currently $45) applies.

To find out more about the appeal process, see the Contaminated Sites Committee website at www.csc.wa.gov.au or contact the office of the Committee on (08) 6364 7264.

For further information on all aspects of site classification, please refer to Fact Sheet 4 and the 'Contaminated Sites Guidelines', which are available from the department's website at www.der.wa.gov.au/contaminatedsites or by contacting the Contaminated Sites Information Line on 1300 762 982.

Yours sincerely



Michelle Brierley, A/Manager

CONTAMINATED SITES REGULATION
Delegated Officer under section 91
of the *Contaminated Sites Act 2003*

21/04/2021

Enc. Attachment A – Nature and Extent and Restrictions on Use.

Fact Sheet 4: *Site classifications and appeals*
Fact Sheet 5: *Buyer beware – buying and selling contaminated land*
Form 6 – Land Owner's Disclosure Before Completion of Land Transaction

ATTACHMENT A – Nature and Extent and Restrictions on Use

- LOT 9 ON DIAGRAM 86080
- LOT 10 ON DIAGRAM 86080

Nature and Extent: Asbestos-impacted fill material is present across the site to a depth of one metre below ground level.

Restriction on Use: The site is not suitable for occupation or any land use until remediation has been undertaken.

Excavation or soil disturbance works are restricted until remediation or further investigations and an assessment of the risk to site users are undertaken.

Government of Western Australia
Department of Water and Environmental Regulation

Our ref: DMO11985
Enquiries: Chek Cher, Ph (08) 6364 7207
Email: chek.cher@dwer.wa.gov.au

Mr Darcy Boyd
Senior Environmental Scientist
Environmental Site Services
PO Box 440
WEMBLEY WA 6913

By email: dboyd@envss.com.au

Dear Mr Boyd

LOT 9 MARKET STREET AND LOT 10 GODDARD STREET, ROCKINGHAM

The Department of Water and Environmental Regulation (the department) received the .eports titled "Interim Site Management Plan Lot 9 and 10 Goddard Street, Rockingham" (Environmental Site Services, 12 July 2021) and "Remediation Action Plan Lot 9 and 10 Goddard Street, Rockingham" (Environmental Site Services, 12 July 2021) on 12 July 2021.

It is understood the Interim Site Management Plan (ISMP) and the Remediation Action Plan (RAP) were submitted to address previous comments provided by the Department of Health (DoH). The department further understands that soil remediation works commenced in late June 2021, but have since been put on hold until the ISMP and RAP are reviewed by DoH from a public health perspective and to their satisfaction.

DoH have now completed a review of both documents and their comments are enclosed in Attachment 1. A summary of the data gaps identified by DoH include:

- Confirmation of the final disposal location of all excavated material.
- Source of the proposed capping material and evidence that the materials are certified clean soils.
- Personal details of each role and responsibility under the RAP.
- Evidence to demonstrate that the community (e.g. neighbours), WorkSafe and the Local Council have been consulted with the ISMP and proposed remediation strategy.

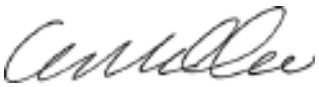
DoH has also recommended that all stakeholders including the Local Council, neighbours and WorkSafe formally endorse the ISMP and RAP.

The department agree with DoH's comments and advises that the ISMP and RAP address all data gaps identified and to resubmit both documents to the department prior to the recommencement of site works.

The site will remain classified as *contaminated – remediation required* under the *Contaminated Sites Act 2003* in the interim.

If you have any further queries, please contact Environmental Officer, Chek Cher, on 6364 7207.

Yours sincerely



Andrew Miller
SENIOR MANAGER
CONTAMINATED SITES
26 / 07 / 2021

Attachment 1: Department of Health's advice July 2021 – Lot 9 Market Street and Lot 10 Goddard Street, Rockingham – ISMP and RAP

Government of Western Australia
Department of Health

Your Ref: DMO11944
Our Ref: FAA74880
Enquiries: David E Jackson, 9222 2000

Mr Andrew Miller
Senior Manager Contaminated Sites
Department of Water and Environmental Regulation
Locked Bag 10
Joondalup WA6919

Dear Andrew,

ROCKINGHAM LOT 9 & 10 MARKET-GODDARD ST – ASBESTOS – ISMP & RAPv2

Thank you for your correspondence of 15 July 2021 requesting the Department of Health (DoH) review the current assessment for the site under the Contaminated Sites Act 2003 (CSAct). Relevant officers from the Environmental Health Directorate have considered the information provided in the following reports; please be aware that comments are limited to the scope of the advice sought.

- Interim Site Management Plan Lot 9/10 Goddard Street, Rockingham (ESS, 12 July 2021)
- Remediation Action Plan Lot 9/10 Goddard Street, Rockingham (ESS, 12 July 2021)
- Basic Summary of Records – Lot 9 Market Street and Lot 10 Goddard Street, Rockingham and GIS Viewer Aerial Map - Lot 9 Market Street and Lot 10 Goddard Street, Rockingham

DoH has previously provided advice (FAA74880) dated 16 March 2021 recommending that the site contains significant deposits of uncontrolled fill known to contain asbestos fragments and fibres at levels exceeding published risk criteria for commercial/industrial uses. At that time DoH recommended that the proponent implement as a matter of priority an interim Site Management Plan whilst a permanent remediation solution was being developed. The site should be classified as C-RR.

It is understood that in the meantime, the site was the subject of significant earth works in preparation for the redevelopment of the site for commercial uses. During these works, deeper deposits of asbestos contaminated fill were identified. DoH was contacted by the consultant on site on 26 June 2021. DoH expressed concerns that any uncontrolled excavation or soil disturbance at this site may generate asbestos fibres and dusts which may pose an occupational and public health risk and DoH recommended that works cease until an interim Site Management Plan is implemented on site and an appropriate Remediation Action Plan is submitted as a matter of priority. The proponent submitted various documents, including information about the air dust/fibre monitoring/management measures employed during the recent earthworks but did not provide details of actions in the event of non-compliance, or effective and timely community engagement that had occurred. The current submission attempts to address these data gaps.

The interim Site Management Plan (iSMP) provides a summary of the investigations and earth moving works conducted to date. After the excavation/removal of 2620m^3 of uncontrolled fill containing asbestos fragments and fibres, a further 1.2m depth of similar contaminated fill material was encountered across the site.

189 Royal Street East Perth Western Australia 6004
Telephone (08) 9222 2000 TTY 133 677
PO Box 8172 Perth Business Centre Western Australia 6849
ABN 28 684 750 332
www.health.wa.gov.au

The iSMP provides details of roles and responsibilities under the iSMP and measures to restrict site access, signage, application of dust-suppressing hydro-mulch, and use of PPE. The final disposal location of this excavated material has not been provided and DoH is concerned that this material has not been disposed of appropriately.

The revised Remediation Action Plan (RAP, July 2021) describes the revised remediation strategy as comprising the installation of a geotextile warning barrier and placement of 0.5m of .validated capping material' across the site. The proponent should provide details of the source/origin of capping material to be used and commit to providing evidence that the material is *certified clean soils*.

Air dust/fibre monitoring will be carried out during the works, and final capping surface will be validated by visual inspection by a competent person to confirm that there is no visible asbestos material within the surface 10cm soil horizon as per DoH 2009. This is only an appropriate validation method *if* the capping material used is certified clean material. The RAP includes details of roles and responsibilities under the RAP, but omits the names, contact details and competency (i.e. CV) information for each role. This should be provided.

The RAP provides measures to secure and signpost the site, OHS and induction/training, equipment/personnel decontamination, and measures to monitor and manage dust emissions, and daily asbestos fibre monitoring from four static monitoring locations around the perimeter of the site, in accordance with (NOHSC, 2005b) and compliance level of 0.01f/ml. No further community or stakeholder engagement will be undertaken although complaints and actions will be recorded. On completion of works a remediation and validation report will be submitted.

The iSMP indicates that both WorkSafe and the Local Council have been consulted, but neither made comment on the iSMP or proposed remediation strategy. No evidence of this correspondence has been provided. Furthermore, the proponent has not provided any evidence of community engagement with neighbours (owners or occupiers). As previous investigations have identified significant quantities of degraded 'asbestos fines' (<7mm) in 8 of 29 samples DoH considers that the risk from airbourne fibres to both construction workers and neighbours is significant and requires monitoring and management; and that stakeholders, including neighbours, Local Council (EHO) and WorkSafe should formally endorse the plans prior to the commencement of remediation works.

DoH recommend that the RAP be reissued addressing the above data-gaps. The site should remain classified as C-RR until an approved RAP has been implemented and completed remediation works have been validated. Thereafter, an Ongoing Site Management Plan will be required to manage and maintain the integrity of the approved capping system into the future.

The proponent should satisfy themselves that they have complied fully with all legislative and regulatory requirements (e.g. Regulation 43 - Disposal of Asbestos, Health (Asbestos) Regulations, Waste Regulations, and given the site is an operational workplace, *Worksafe should be consulted regarding the protection of worker health at the site*. The DoH requests that the above comments are provided to the consultant for their information/consideration.

Please do not hesitate to contact David E Jackson on 9222 2000 if you need further information.

Yours sincerely,



Peter Franklin
A/MANAGER – CHEMICAL HAZARDS
ENVIRONMENTAL HEALTH DIRECTORATE

cc. chek.cher@dwer.wa.gov.au

Appendix B. ENVSS Relevant Competencies

Da. cy Boyd

Senior Environmental Scientist

D. rcy is a highly skilled Senior Environmental Consultant with 10 years continued experience in the assessment, management and remediation of contaminated land across a diverse range of projects including development, mining and industrial environments.

In the built environment, Darcy has competencies in the assessment of hazardous materials including asbestos identification and sampling, safe work measures, asbestos removal enclosure inspections, visual clearances inspections and reporting in accordance with relevant standards and guidelines.

In the subsurface environment, Darcy has competencies and experiences in the assessment, management and remediation of asbestos-in-soils contaminated sites.

The following provides a brief summary of Darcy's relevant education, specific training and work experiences.

Education

- Bachelor of Environmental Science, RMIT 2009
- Bachelor of Business (Management), RMIT 2009

Relevant Training

- Asbestos Awareness Training Course;
- Asbestos Assessment Training Course;
- Australian Contaminated Land Consultants Association (ACLCA) Introduction to Environmental Site Assessments (9 Modules);
- ACLCA Investigation, Remediation & Management of Contaminated Soil and Groundwater;
- ACLCA Advanced Site Characterisation;
- ACLCA An Integrated Approach to Evaluating Monitored Natural Attenuation;
- ACLCA Asbestos in Soil;
- ACLCA Work, Health & Safety; and
- Apply First Aid (Level Two).

Employment Summary

- Senior Environmental Scientist, June 2020 - Current

  Environmental Site Services, Burswood, WA

- Senior Environmental Scientist, December 2015 - June 2020

  AGS Environmental Services, Collingwood, VIC

- Environmental Scientist, September 2012 - December 2015

  Alpha Environmental, Collingwood, VIC

- Graduate Environmental Scientist, June 2011 - October 2012

  Environmental Earth Sciences, Footscray, VIC

Relevant Experiences

- Asbestos in soils sampling investigations, various sites and projects;
- Surficial asbestos walkovers, and ACM in soils calculations in accordance with DoH 2009;
- Soil validation during mechanical screening;
- Visual clearance inspections;
- Development of various safe work methodologies for the identification and handling of asbestos-impacted soils;
- Airborne Fibre Monitoring and reporting
- Hazardous Materials surveys, various location;
- Asbestos removal enclosure inspections prior to friable asbestos removal works; and
- Visual clearances inspections and reports following asbestos removal works.

Affiliations

- Australasian Land and Groundwater Association (ALGA)
- Australian Contaminated Land Consultants Association (ACLCA)

Appendix C. Site Photographs



PHOTOGRAPH NO: 01 TITLE: Site surface prior to remediation activities ORIENTATION: FACING WEST DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 02 TITLE: Site surface prior to remediation activities ORIENTATION: FACING SE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 03 TITLE: Site surface prior to remediation activities ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 04 TITLE: Site surface prior to remediation activities ORIENTATION: FACING EAST DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 05 TITLE: Installation of geofabric layer ORIENTATION: FACING NORTH DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 06 TITLE: Installation of geofabric layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 07 TITLE: Importation of capping material ORIENTATION: FACING SOUTH DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 08 TITLE: Installation of capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 09 TITLE: Installation of capping material ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 10 TITLE: Installation of capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 11 TITLE: Installation of geofabric ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 12 TITLE: Installation of geofabric and capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 13 TITLE: Installation of geofabric and capping material ORIENTATION: FACING SW DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 14 TITLE: Installation of geofabric and capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 15 TITLE: Installation of geofabric and capping material ORIENTATION: FACING SW DATE COLLECTED: 21/10/2021



PHOTOGRAPH NO: 16 TITLE: Installation of geofabric and capping layer ORIENTATION: FACING NE DATE COLLECTED: 21/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 17 TITLE: Installation of capping material ORIENTATION: FACING NW DATE COLLECTED: 26/10/2021



PHOTOGRAPH NO: 18 TITLE: Installation of capping material ORIENTATION: FACING SE DATE COLLECTED: 26/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 19 TITLE: Compaction of capping layer ORIENTATION: FACING SE DATE COLLECTED: 26/10/2021



PHOTOGRAPH NO: 20 TITLE: Compaction of capping material ORIENTATION: FACING SE DATE COLLECTED: 26/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 21 TITLE: Site surface following compaction ORIENTATION: FACING EAST DATE COLLECTED: 27/10/2021



PHOTOGRAPH NO: 22 TITLE: Site surface following compaction ORIENTATION: FACING NORTH DATE COLLECTED: 27/10/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas



PHOTOGRAPH NO: 23 TITLE: Site surface following hydroseeding ORIENTATION: FACING NE DATE COLLECTED: 15/11/2021



PHOTOGRAPH NO: 24 TITLE: Site surface following hydroseeding ORIENTATION: FACING N DATE COLLECTED: 15/11/2021

Environmental Site Services

PROJ. REF: ENVSS011310		
TITLE: Site remediation and validaton		
DATE: 20/11/21	REVISION: 0	LOCATION: Lot 9 and Lot 10 on Plan 86080
DRAWN: DB	APPROVED: DB	CLIENT: McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd W. Thomas

Appendix D. Visual Clearance Certificate

E. vironmental Site Services (AUS)
T/A Environmental Site Services
ABN: 33590521277
ACN: 168142247
Office: 43 Stiles Avenue, Burswood WA 6100
Postal: PO Box 440, Wembley WA 6913
P: (08) 9355 4010
Email: admin@envss.com.au
Web: www.environmentalsiteservices.com.au

Thursday 21 October 2021
Reference: ENVSS_0011340_HAZ_VCC_20211021

Colin Jackson
Jackson Corp Pty Ltd
. McNicholl Rockingham Pty Ltd, Endeavour Hills Pty and W. Thomas
P: 0318 791 591
E: jacksoncorp@bigpond.com.au

Subject: Surficial Asbestos Clearance at Lot 9 and 10 Goddard Street, Rockingham

Dear Colin,

This is to certify that Darcy Boyd (Senior Environmental Scientist) of Environmental Site Services (ENVSS) was engaged by Jackson Corp on behalf of the McNicholl Rockingham Pty Ltd, Endeavour Hills Pty Ltd and W. Thomas (the client) to attend the Lot 9 and 10 Goddard Street, Rockingham on 21 October, 2021 at 9:10am to conduct a Visual Clearance Inspection (VCC), post Asbestos Containing Material (ACM) removal works.

Prior to the visual inspection, ENVSS personnel completed a systematic walkover, involving three passes with a 90° change between each pass, and removal of visible asbestos debris was undertaken across the site.

The inspection was conducted in the form of a visual inspection, as required under the national code and the accepted method for clearance certification purposes, where safe to do so. On inspection of the reinstated screened soils, no ACM was visually identified on exposed surface areas.

It is noted that the presence of ACM in filling soils across the site has been established during previous assessment works that may become exposed due to weathering events. As such, this VCC is limited to the exposed surfaces and limited to the time of inspection only. Further this VCC is not a clearance of the site surface of microscopic asbestos fibres.

The inspection was completed in a thorough and conscientious manner, with no warranty expressed or implied. This certificate should only be presented in full and may not be used to support any other objective other than that agreed between the client and Environmental Site Services.

If you have any questions or require any further information, please do not hesitate to contact me.

For and on behalf of Environmental Site Services.



Darcy Boyd
Senior Environmental Scientist
Environmental Site Services

Appendix E. Geofabric Technical Information

bidim® GREEN

PROUDLY AUSTRALIAN MADE
NON-WOVEN GEOTEXTILE

TECHNICAL DATA SHEET: TYPICAL VALUES

☑ Recycled Geotextile

☑ Recycled Wrap

☑ Recycled Core



bidim® Green is the newest version of Australia's Number 1 geotextile – you can expect the same performance, now utilising recycled materials.

bidim® Green is made with Australian sourced recycled material while still leading the way in terms of technical performance and versatility. Geofabrics now offers this sustainable solution that has applications in virtually every civil engineering construction project.

bidim® Green nonwoven geotextiles provide an effective, economical solution to a range of engineering problems including weak soil, rutted and cracked roads and liquid and gas leaks from landfill sites.

bidim® Green nonwoven geotextiles provide excellent filtration, separation and cushioning properties and feature a strong three-dimensional structure with high elongation. bidim® Green nonwoven geotextiles also have a high melting point and high UV resistance.

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SECTOR SUITABILITY

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bidim® GREEN NON WOVEN GEOTEXTILES – A12G – A64G TYPICAL VALUES
Technical Data

TEST	STANDARD	UNITS	A12G		A14G		A24G		A34G		A44G		A64G	
Mechanical Properties														
Wide Strip Tensile Strength (MD/XMD)	AS3706.2	kN/m	8.0	8.0	11.0	11.0	14.0	14.0	18.5	18.5	26.5	26.5	37.5	37.5
Wide Strip Toughness (MD/XMD)	AS3706.2	kJ/m^2	1.5	1.5	3.1	3.1	2.7	2.7	3.5	3.5	4.8	4.8	8.2	8.2
Grab Tensile Strength (MD/XMD)	AS3706.2	N	500	500	720	720	850	850	1,270	1,270	1,850	1,850	2,620	2,620
Trapezoidal Tear Strength (MD/XMD)	AS3706.3	N	200	200	300	300	345	345	440	440	590	590	830	830
CBR Burst Strength	AS3706.4	N	1,500		2,000		2,500		3,400		4,650		6,400	
G Rating	Austroads	-	1,200		1,550		1,900		2,510		3,500		5,100	
Hydraulic Properties														
Pore Size (095)	AS3706.7	µm	130		110		80		75		75		75	
Permittivity	AS3706.9	s^{-1}	3.40		3.20		2.65		1.75		1.35		0.90	
Coefficient of Permeability	AS3706.9	m/s x10^{-4}	43		43		43		43		43		43	
Flow Rate @ 100mm Head	AS3706.9	$l/m^2/sec$	340		320		265		175		135		90	

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Appendix F. Soil Characterisation Assessment

.. il Characterisation Assessment

Site Address:

L. t 9 and 10 Goddard Street, Rockingham

Prepared for:

GMF Contractors

Prepared by:

Environmental Site Services | ABN 33 590 521 277
43 Stiles Avenue, Burswood
Burswood, Western Australia, 6001
T 08 9355 4010 **E**: admin@envss.com.au **WEB** envss.com.au

Project Details	
Report Number: 0011406 **Site Address:** Lot 9 & 10 Goddard Street, Rockingham **Date:** 1 December 2021 **Client:** GMF Contractors	**Project Manager** **Name:** Darcy Boyd **Title:** Senior Environmental Scientist **E-mail**: dboyd@envss.com.au **Phone:** (08) 9355 4010

Quality Information

Revision History & Status

Version	Revision	Detail	Date	Author	Reviewer	Approver
FINAL	Rev0		01/12/2021	Darcy Boyd	Amit Bhullar	Darcy Boyd

Distribution

Version	Revision	Issued To	No. of copies	Format	Date
FINAL	Rev0	Anthony Maniaci - GMF Contractors	1	PDF	01/12/2021

1. Introduction

1.1 Introduction

Environmental Site Services (ENVSS) was engaged by Anthony Maniaci on behalf of GMF Contractors (the client) to undertake a soil characterisation assessment (the assessment) of soils imported to Lot 9 and Lot 10 Market Street, Rockingham (the site).

The source material was imported from 5 Ashwood Parkway, Lakelands (the source site). The purpose of the assessment was to assess the suitability of the source materials for use at the site as part of the construction of a remedial capping layer of asbestos-impacted soils.

A summary of site details are present in **Table 1**.

Table 1. Site Identification

Site Identification	
Lot and Plan	Lot 9 on Plan 86080 (5 Market Street, Rockingham) Lot 10 on Plan 86080 (Goddard Street, Rockingham)
Proprietor	McNicholl Rockingham Pty Ltd W Thomas & Endeavour Hills Pty Ltd
Site area	Approximately 3,326m^2
Local government	City of Rockingham
Planning scheme zone	“Primary City Centre” under the City of Rockingham, Town Planning Scheme No.2.
Current land use	Vacant site
Proposed land use	ENVSS is not aware of any proposed development plans for the site.
Surrounding land uses	North: Recreation/Public open space (Dowling St Reserve) East: Mixed use (High density residential apartments and commercial units) South: Vacant land and commercial/offices. West: Mixed use (High density residential apartments and commercial units)

1.2 Contamination status of the site

The site was identified as ‘Contamination - remediation required’, in accordance with the *C. ntaminated Sites Act 2003*, due to the identified presence of asbestos-containing materials (ACM) in soils which was imported to the site as part of historical uncontrolled landfilling activities.

1.3 Previous site assessment works

An inspection by a City of Rockingham (Council) Environmental Health Officer, in October 2020, identified exposed asbestos fragments on the surface of the site. The presence of asbestos at the site was attributed to a possible uncontrolled landfill in the vicinity of the site. Council directed the client to restrict access to the site and undertake removal and disposal of asbestos at the site. The site was referred to the Department of Water and Environmental Regulation (DWER) as a suspected contaminated site.

On 28 January 2021 DWER classified the site as *‘Possibly Contaminated - Investigation Required’* under the Contaminated Sites Act 2003 (the Act). An Asbestos in Soils Investigation undertaken at the site by ENVSS determined the presence of asbestos in filling soils at the site. The report was submitted to DWER and on the 21 April 2021, the site was reclassified as ‘Contaminated - Remediation Required in accordance with the Act.

Remediation works were carried out at the site between 21 - 26 June 2021 and involved the removal and disposal 2,620m^3 of asbestos impacted soils to a suitably licensed landfill under asbestos removal conditions. Further remediation works shall involve the construction of a remedial capping layer across the site.

1.4 Current site condition

At the time of reporting (30 November, 2021), the site is currently vacant. Remediation works, including the installation of geofabric and the importation of soil capping material has been completed (October 2021).

1.5 Remediation Action Plan conditions

In accordance with *Section 7.6 Capping Material Specification* of the Remediation Action Plan, any material imported to the site must meet the following conditions:

Imported fill must be demonstrated by the Contractor to be suitable for its intended use. This shall include (but not limited to) evidence demonstrating that the material:

- Does not contain any substances above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or environmental values, such that it does not meet the definition of 'contaminated' with respect to the Contaminated Sites Act 2003; and
- Is weed and dieback free.

The Contractor shall provide appropriate documentation to confirm the suitability of the proposed imported fill prior to importation to site. Certification shall be provided to demonstrate the fill to be imported to site is 'clean fill' where, in accordance with DWER (2019), 'clean fill' means raw excavated natural material such as clay, gravel, sand, soil or rock fines that:

- Has been excavated or removed from the earth in areas that have not been subject to potentially contaminating industries (as defined in DWER (2019)); and
- Has not been processed except for the purposes of:
    - achieving desired particle size;
    - removing naturally occurring organic material such as roots;
    - does not contain acid sulfate soils; and
    - does not contain other types of waste.

It is preferred that the material is derived from a source subject to a DWER Extractive Industry License and information on the insitu location, date of extraction, stockpiling and material tracking is provided to the Environmental Consultant.

If the Contractor proposes to derive material from a source that does not have an extractive license (i.e. virgin development site) the Environmental Consultant shall undertake additional testing to confirm the suitability of the material for use, prior to importation to site. In such an instance, the Environmental Consultant shall undertake an assessment of the material in accordance with relevant guidelines and standards and shall include:

- A review of history of the material and land uses at material source location;
- A visual inspection of the material for evidence of construction rubble, weeds, odours and sheens and/or staining. The material may be rejected for use based on visual inspection alone;
- Sampling in accordance with density recommended in DWER 2019;
- Submission of samples to NATA-accredited laboratories for analysis potential chemicals of potential concern identified in the material history review as well as analysis of a broad range of chemical of potential concern;
- Interpretation of laboratory results against NEPM criteria for residential land use; and
- The material shall be considered suitable for use if all analytes are below the adopted screening criteria, or below statistical analysis methodology outlined in Schedule B1 of NEMP 2013; and
- Material not meeting the criteria shall be rejected for importation.

2. Objectives

The purpose of the Soil Characterisation Assessment is to assess the contamination status, and suitability for use, of soils imported from the Lanklands Station Project construction to the site as part of the installation of a remedial capping layer in accordance with the relevant regulatory standards and the RAP developed for the site.

3. Scope of works

To achieve the objectives, the following scope of works was completed as part of the investigation:

- Undertake a review of the source material site to identify likely contaminants of potential concern;
- Undertake an inspection of the source material during excavation, prior to transport to the site;
- Collect samples of the source material at a sampling density prescribed in *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)* (DWER, 2019);
- Collection of appropriate quality assurance and quality control (QAQC) samples;
- Submission of primary and QAQC samples to National Association of Testing Authorities (NATA) accredited laboratories for the analytical program outlined in Section 5;
- Comparison of laboratory results against appropriate soil investigation screening;
- Conclusions as to the suitability of the material for site use;
- Preparation of this factual report presenting the findings of the assessment.

3. Source Site History Summary

3.1 Introduction

The client proposed to import soils to site for the development of the remedial capping layer from 5 Ashwood Parkway, Lakelands (the source site) The source site is not identified as a DWER licensed for material extraction and use. The following sections presents information on the material and source site and assesses the suitability for use.

Source site details are presented in **Table 2.**

Table 2. Source Site Identification

Source Material Site Identification	
Street Address	5 Ashwood Parkway, Lakelands
Lot and Plan	Lot 800 on Plan P077032
Land ID Number	4111552
Proprietor	Public Transport Authority (PTA)
Parcel Area	Approximately 1.8933ha
Local government	City of Mandurah
Planning scheme zone	“Railways” under the City of Mandurah, Town Planning Scheme No.3

Current land use	Construction site
Proposed land use	Lakelands Railway Station
Surrounding land uses	North: Low density residential housing East: Railway line and Blackswan Lake South: Low density residential housing West: Low density residential housing

3.2 Geology

Surface geology beneath the source site is described as Tamala Limestone-derived SAND: pale and olive yellow, medium to coarse grained, sub angular quartz, moderately sorted and of residual origin modified by marine inundation.

3.3 Acid sulfate soils

The site is not identified as a risk of containing Potential Acid Sulfate Soils within 3m of the ground surface in a Department of Water and Environmental Regulation's (DWER) Acid Sulfate Soil Risk Map (DWER-049).

3.4 Contaminated sites database search

5 Ashwood Parkway, Lakelands, is not identified in DWER's Contaminated Sites Database.

The nearest property identified on the database is located approximately 0.82km to the south-west and is identified as Remediated for restricted use. Given the distance, any contamination sourced from this property is not considered to have potentially impacted soils at 5 Ashwood Parkway, Lanklands.

3.5 Current condition / Use of land

5 Ashwood Parkway, Lakelands, is currently undergoing civil construction works in preparation for the development of Lakelands Railway Station.

3.6 Review of historical aerial photographs

A brief review of historical aerials reviewed is presented in **Table 3**.

Table 1. Source Site Identification

Date	Photo Source	Description
1961	Landgate (Mandurah Townsite)	5 Ashwood Parkway is vacant and covered in vegetation. The surrounding area is undeveloped and generally covered in vegetation
1979	Landgate (Perth Metropolitan Area)	5 Ashwood Parkway is vacant and covered in vegetation. The surrounding area is generally vacant. An unpaved roadway is present to the west of the site. A farmhouse and
1989	Landgate (Perth Metropolitan Area)	5 Ashwood Parkway and surrounds appear unchanged from the 1989 aerial photograph reviewed.
2000	Landgate (Metropolitan West)	5 Ashwood Parkway and surrounds appear unchanged from the 1999 aerial photograph reviewed.
2012	Landgate (Perth Metropolitan Area South)	Unpaved roads are present in the southern and western areas of the 5 Ashwood Parkway at this time. A small structure is present in the south-western area. The remaining area is covered in vegetation.

		Significant residential development has been undertaken in the surrounding area.
13/12/2018	Landgate (Metro Inset)	No significant changes to 5 Ashwood Parkway are evident compared to the 2012 aerial photograph. Further residential development is evident in the surrounding land.
17/06/2021	Nearmap	No significant changes to 5 Ashwood Parkway are evident compared to the 2018 aerial photograph.
13/08/2021	Nearmap	Significant changes are evident at 5 Ashwood Parkway at this time. All trees and most grassed areas have been removed. Dwellings (assumed to be use for construction site offices) are present in the north-western area.
24/10/2021	Nearmap	Further excavation and stockpiling works are evident.

3.7 Review of client-supplied reports

The client provided ENVSS with a geotechnical report, undertaken at the source site as part of this investigation. The geotechnical report reviewed was titled: Golder, *Lakeland Station Project: Geotechnical Factual Report* (December, 2020). The investigation was commissioned by the Public Transport Authority as part of planning for the construction of Lanklands Station.

The investigation included:

- The drilling of three geotechnical boreholes to between 15.0m and 22.1m;
- Installation of three groundwater monitoring wells;
- Progression of of seven test pits and 11 hand auger boreholes; and
- Geotechnical testing including laboratory analysis for acid sulfate soils.

A review of the investigation indicated dark grey/brown sandy topsoil was typically encountered to around 0.15m below ground level (BGL) and underlain by orange/brown sand.

10 samples submitted to a NATA-accredited laboratory as part of a acid sulfate soils assessment indicated the soils were unlikely to be acid-generating under aerobic conditions.

3.8 Material Inspection

ENVSS personnel attended 5 Ashwood Parkway, Lakelands on 22 October 2021 to undertake an inspection of the material during the loading out and importation to site, which was undertaken by the client between 21 - 27 October 2021.

At the time of inspection, the source material was either stockpiled in the central area of the source site. The source material generally consisted of orange-brown sand with trace amounts of dark grey sandy topsoil. No foreign material (i.e. construction or demolition debris), weeds or vegetation, odorous or stained soils were encountered during the inspection.

Trucking dockets are presented in **Appendix A**.

4. Methodology

4.1 Adopted guidance

All works were completed in general accordance with the relevant guidelines, including (but not limited to):

- Australian Standard AS4482.1-2005. Guide to the investigation and sampling of Sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds;

- Australian Standard AS4482.2 -1999. Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile Substances;
- CRC CARE (2011), Technical Report No.10: Health screening levels for petroleum hydrocarbons in soil and groundwater Part 1: Technical development document. E Fiebel and P. Nadebaum;
- CRC CARE (2011), Technical Report No.10: Health screening levels for petroleum hydrocarbons in soil and groundwater Part 2: Technical development document. E Fiebel and P. Nadebaum.
- National Environment Protection (Assessment of Site Contamination) Measure (NEPM, 2013);
- WA DER Contaminated Sites Management Series Guidelines, (2014);
- WA DWER *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019);* and
- WA Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021).

4.2 Fieldwork Methodology

The scope of works for the Soil Assessment in Soils Investigation presented in **Table 3**.

Table 3. Fieldwork Methodology

Item	Detail
Date of assessment	27/10/2021
Personnel	Fieldworks and the overall assessment were undertaken by a Senior Environmental Scientist with 10 years continuous experience in the assessment and remediation of asbestos-contaminated sites in Australia.
Visual Inspection	ENVSS personnel undertook periodic visual inspection of the source material during load out from the source site and during importation to the site.
Sampling Location Strategy	Following placement of the source material, a grid-based sampling program was adopted for this assessment.
Sampling Density	In accordance with DWER Landfill Waste Classification and Waste Definitions 1996 (as amended 2019) a total of 15 primary samples were collected for the classification of up to 3,000m^3.
Sampling Method	Samples were collected from using hand auger methodologies.
Target Depth	Samples were collected at 0.2mBGL at each sampling location.
Soil Logging	Soils were logged by an experienced field technician on log sheets produced in accordance with AS4482.1-2005.
Sample collection	All samples were placed in laboratory supplied glass jars and placed in a chilled sampling container for transportation to the ENVSS office and laboratory.
Cross Contamination Mitigation	Reusable sampling equipment was washed with water mixed with a phosphate-free detergent, tap water and rinsed in deionised water at the completion of intrusive works at each sampling location. A fresh pair of disposable nitrile gloves was used at each sampling location to mitigate the potential for cross contamination.
Laboratories Used	ALS and Eurofins. Both laboratories are NATA-accredited for the analysis undertaken.

5. Contaminants of Potential Concern

A broad range of contaminants of potential concern (CoPC) were adopted as part of this assessment. The analytical schedule was based on CoPC presented in DWER 2019 and NEPM 2013 and includes:

- Metals and metalloids (antimony, arsenic, barium, beryllium, boron, cadmium, chromium (trivalent and hexavalent), cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium and zinc);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN);
- Polycyclic aromatic hydrocarbons (PAHs);

- Asbestos-containing materials (ACM);
- Inorganics (cyanide, pH, sulfate,
- Phenols;
- Halogenated benzenes;
- Chlorinated pesticides; and
- Polychlorinated biphenyls (PCBs).

5. Adopted Assessment Criteria

Soil data collected during the assessment have been evaluated against soil investigation screening criteria for both use onsite and waste disposal / off-site reuse. The adopted screening is presented in **Table 4**.

Table 4. Adopted Screening Criteria

Consideration	Screening criteria	COPC
Human Health	NEPM 2013 Table 1(A) Health Investigation Levels for soil - Residential 'A' NEPM 2013 Table 1A(3) Soil HSL for vapour intrusion HIL 'A/B' for vapour intrusion (0-1m)	Metals Naphthalene
	CRC Care 2011 Table B3 Soil Health (LSH) Intrusive Maintenance Worker (Shallow trench) Sand (0-2m) CRC Care 2011 Table 4B Soil HSL for Direct Contact (Intrusive Maintenance Worker) CRC Care 2011 Table B4 Soil HSL for Direct Contact (Intrusive Maintenance Worker)	TRH BTEXN
Ecological	NEPM 2013 Table 1B(6) Ecological Screening Levels (ESLs) for Res/Ind, fine sand (0 m - 2 m) NEPM 2013 Table 1B(5) Generic Ecological Investigation Levels (EILs) for Comm/Ind (0 m - 2 m)	TRH BTEXN Metals (As, Cr^{3+}, Cu, Pb, Ni, Zn) DDT Benzo(a)pyrene
Other	NEPM 2013 Table 1B(7) Management Limits	TRH F1 (C6-C10) TRH F2 (>C10-C16) TRH F3 (>C16-C34) TRH F4 (>C34-C40)
Waste Classification & Off-site reuse	DWER 2019 Table 3 Contaminant threshold values for waste not requiring a leach test DWER 2019 Table 6 Maximum concentrations (threshold) of relevant physical attributes for uncontaminated fill	Metals and metalloids Inorganics Asbestos* BTEXN TRH Naphthalene Benzo(a)pyrene Polycyclic aromatic hydrocarbons (PAHs) Phenols Cresols PCBs Pesticides pH

A visual inspection of the material was conducted to assess for foreign materials (i.e. construction and demolition rubble, plastic, wood, glass, metal, bitumen, ceramics etc) for the protection of aesthetic / environmental values.

7. Results

7.1 Field Observations

A visual inspection of the material imported to site was consistent with the material inspected at the source site and is described as coarse-grained, orange brown sand. No foreign material (i.e. construction or demolition debris), weeds or vegetation, odorous or stained soils were encountered during inspections conducted during importation.

Soils encountered during the intrusive investigation (27 October 2021) were consistent with the above description, with no evidence of foriegn material or weeds/vegetation. No potentially ACM was visually identified during visual inspection or sampling works.

Representative photographs from the assessment are provided in **Appendix B**.

7.2 Laboratory results

Laboratory analytical results were compared to various adopted screening criteria and are presented in section 6.1 to 6.3. Results summary tables for are presented in **Appendix C**. Chain of custody documentation and laboratory test certificates are presented in **Appendix D**.

Table 1. Assessment of CoPC against human health screening criteria;

Table 2. Assessment of CoPC against ecological (and other) screening criteria; and

Table 3. Assessment against waste classification / reuse screening criteria.

7.2.1 Human Health Screening Criteria

All concentrations of organic analytes (including TRH, BTEXN, phenols, halogenated benzene, organochlorinated pesticides, PAHs and PCBs) were reported below laboratory detection limits.

Concentrations of metals (including arsenic, chromium (trivalent), manganese, and vanadium) were reported above detection limits but below the adopted screening criteria threshold values. The reported concentrations are attributed to naturally occuring background concentrations and not to anthropogenic sources.

7.2.2 Ecological Screening Criteria

All concentrations of organic analytes (including TRH, BTEXN, phenols, halogenated benzene, organochlorinated pesticides, PAHs and PCBs) were reported below laboratory detection limits.

Concentrations of metals (including arsenic, chromium (trivalent), manganese, and vanadium) were reported above detection limits but below the adopted screening criteria threshold values. The reported concentrations are attributed to naturally occuring background concentrations and not to anthropogenic sources and will not pose an unacceptable risk to on-site or offsite ecosystems following importation to the site.

7.2.2 Waste Classification & Offsite Reuse

All CoPC were reported below either below laboratory detection limits and/or below the adopted screening for Uncontaminated Fill presented in Table 6 of Landfill Waste Classification and Waste Definitions (1996) (as amended 2019). As such, the source material is considered to be environmentally suitable for off-site reuse and is not subject to licensing or levies.

8. Quality Assurance and Quality Control

NEPM (2013) and Australian Standard (AS4482.1-2005) recommend that a quality assurance and quality control (QA/QC) program be implemented in order to determine whether data is suitable for interpretive use and meet the project objectives.

The aim of a QA/QC program is to deliver data that is representative of what is sampled; that is, precise, accurate and reproducible. The approach is generally based on the guidance from the following source:

- Australian Standards AS4482.1-2005;
- National Environment Protection Measure 2013;

- United States Environmental Protection Agency (USEPA) - Guidance on Systematic Planning Using the Data Quality Objectives Process EPA QA/G-4, (2000); and
- United States Environmental Protection Agency (USEPA) - Guidance on Environmental Data Verification and Data Validation EPA QA/G-8, (2002).

Laboratories utilised by ENVSS are NATA accredited for the specified analytical method requested and have appropriate internal controls to ensure the data produced is also accurate and repeatable.

A summary of the QA/QC program adopted and results are summarised in 7.1 to 7.5.

8.1 Field Duplicate Samples

A blind duplicate, or intra-laboratory duplicate, was taken from a larger than normal quantity of soil from the same sampling point as the identified primary sample. The samples were obtained simultaneously with both of them submitted to the primary laboratory with only ENVSS being aware of which sample has been replicated.

A split sample, or inter-laboratory duplicate sample, was obtained using the same methodology as the blind duplicate. In both cases, the analysis of the duplicate samples was so that the results from the analysis could be compared for repeatability.

A total of two duplicate samples were collected during the soil characterisation assessment works, as detailed in **Table 5.**

Table 5. Field Duplicate Samples

Routine Sample ID	Intra-laboratory duplice Sample ID (ALS)	Inter-laboratory duplicate Sample ID
SS01	QC1	QC1A

Validation and interpretation of the QA/QC data was undertaken by calculating the relative percentage difference (RPD) for each duplicate pair. The RPD value was calculated using the formula:

RPD% = ((Results No.1 - Results No.2)/Mean Result)x100.

In accordance with AS4482.1-2005, RPD values should not exceed 30-50%, however variation can be expected for organic analytes and for lower concentrations. ENVSS considers those duplicate samples with an RPD of between 0 to 50% to have acceptable correlation. The results are presented in
Appendix E.

The soil RPD results indicate a sound correlation between the primary and duplicate results.

8.2 Internal Laboratory Controls

Primary analysis for this project was completed by ALS and the split samples were analysed by Eurofins. Both laboratories are NATA-accredited laboratories for the methods used. All analysis was completed within the allowable holding times.

The issued laboratory reports include details of surrogates and spikes used, percentage recoveries surrogates and spikes used, the instrumentation detection limits, the practical quantification limits and the reference sample results. ENVSS undertook a review of the laboratories internal quality assurance program to analyse the accuracy of the dataset obtained from the laboratories and is satisfied with the robustness of the dataset.

All internal laboratory samples were reported within acceptable limits.

8.3 Sample Holding Times

In accordance with the NEPM and AS4482.1-2005, the maximum holding times and preservation required for samples prior to extraction for analysis of analytes were observed during all the sampling events for this investigation.

Chain of custody information and sample receipt notification is presented in **Appendix D**. The documentation provides evidence that all samples were received and analysed within holding times.

8.4 Field Blank Analysis

In addition to the intra-laboratory and interlaboratory duplicate samples, transport blanks (TB1) and a rinsate blank (RB1) were collected at a frequency of one per day of soil sampling taken on 27 October 2021. The samples were

sent to ALS for laboratory analysis of selected COPCs. Both samples reported concentrations below the LOR for all analytes tested for.

Result summary tables for field blank analysis are presented in **Appendix D**. Laboratory test certificates are presented in **Appendix D**.

9. Conclusions

Based on the soil characterisation assessment undertaken, ENVSS considers that soils imported from 5 Ashwood Parkway, Lakelands, are suitable for use as part of the remedial capping layer at Lot 9 and 10 Market Street, Rockingham.

Appendix A. Trucking Dockets

GMF Contractors Pty Ltd

306 Victoria Road
Malaga, Western Australia
6090, Australia
ABN: 86968740626

Docket Summary Report

08/11/2021 02:37 PM
14/07/2021 to 08/11/2021

Items Summary

Item	Total Quantity
Cartage Only - Loaded	2999.65 T

Dockets Summary

Date	Docket	Status	Order	Customer	Customer Ref	Supplier Ref	Operator	Item	Description	Quantity
2021-10-27	ACH-DKT-173719	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	Graham Cavill	Cartage Only - Loaded		152.90 T
2021-10-27	ACH-DKT-173715	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	parvinder singh	Cartage Only - Loaded		58.80 T
2021-10-27	ACH-DKT-173690	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	nick shumba	Cartage Only - Loaded		174.30 T
2021-10-27	ACH-DKT-173583	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	jim burford	Cartage Only - Loaded		199.10 T
2021-10-26	ACH-DKT-173529	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	Graham Cavill	Cartage Only - Loaded		203.80 T
2021-10-26	ACH-DKT-173519	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	jagdeep singh parmar	Cartage Only - Loaded		229.20 T
2021-10-26	ACH-DKT-173485	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	nick shumba	Cartage Only - Loaded		260.50 T
2021-10-26	ACH-DKT-173483	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	parvinder singh	Cartage Only - Loaded		265.10 T
2021-10-25	ACH-DKT-173359	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	Graham Cavill	Cartage Only - Loaded		177.80 T
2021-10-25	ACH-DKT-173357	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	nick shumba	Cartage Only - Loaded		203.30 T
2021-10-25	ACH-DKT-173339	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	jagdeep singh parmar	Cartage Only - Loaded		227.90 T
2021-10-25	ACH-DKT-173309	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	parvinder singh	Cartage Only - Loaded		235.60 T
2021-10-22	ACH-DKT-173149	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	jagdeep singh parmar	Cartage Only - Loaded		205.70 T
2021-10-21	ACH-DKT-173000	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	jagdeep singh parmar	Cartage Only - Loaded		200.10 T
2021-10-21	ACH-DKT-172997	Sent	48416CO	GMF Contractors Pty Ltd		48416CO	parvinder singh	Cartage Only - Loaded		205.55 T

Docket ACH-DKT-173719

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
27/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48830	48416CO	Graham Cavill

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
CH10438	1TVF642	698	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
07:00 AM	01:55 PM			6.92 hours

Items

Cartage Only (CO2)	**152.90 T**	
Loaded	25.6 T	07:07 am
Loaded	25.5 T	08:43 am
Loaded	25.3 T	09:56 am
Loaded	25.3 T	11:07 am
Loaded	25.7 T	12:17 pm
Loaded	25.5 T	01:24 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (Graham Cavill)



Customer (Reno)



Docket ACH-DKT-173715

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
27/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48830	48416CO	parvinder singh

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1 hfv751	1ttz122	2907a	Tri-Axle
Shift	**Confirm you are fit for work**		
Day	Yes		

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:00 AM	04:31 PM	20 Minutes	55 Minutes	11.10 hours

Items

Cartage Only (CO2)	**58.80 T**	
Loaded	29.5 T	07:14 am
Loaded	29.3 T	02:42 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (parvinder singh)



Customer (Rino)



Docket ACH-DKT-173690

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
27/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48830	48416CO	nick shumba

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1gmi249	1toa827	2226	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:15 AM	01:45 PM			7.50 hours

Items

Cartage Only (CO2)	**174.30 T**	
Loaded	29.1 T	07:23 am
Loaded	29 T	08:35 am
Loaded	29 T	09:51 am
Loaded	29.1 T	10:58 am
Loaded	29 T	12:10 pm
Loaded	29.1 T	01:12 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (nick shumba)



Customer (Brett)



Docket ACH-DKT-173583

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
27/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48830	48416CO	jim burford

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1HGY009	1TWF072	2253	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
07:00 AM	02:25 PM	20 Minutes	40 Minutes	7.75 hours

Items

Cartage Only (CO2)	**199.10 T**	
Loaded	28.6 T	07:13 am
Loaded	28.5 T	08:17 am
Loaded	28.6 T	09:23 am
Loaded	28.4 T	10:33 am
Loaded	28.3 T	11:27 am
Loaded	28.2 T	12:22 pm
Loaded	28.5 T	01:34 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (jim burford)



Customer (jocko)



Docket ACH-DKT-173529

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
26/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48778	48416CO	Graham Cavill

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
CH10438	1TVF642	698	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
07:05 AM	03:30 PM			8.42 hours

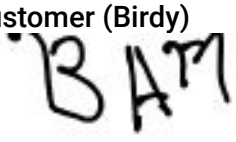
Items

Cartage Only (CO2)	**203.80 T**	
Loaded	25.6 T	07:21 am
Loaded	25.7 T	08:24 am
Loaded	25.4 T	10:32 am
Loaded	25.4 T	11:35 am
Loaded	25.6 T	12:37 pm
Loaded Notes: 9.30 am	25.3 T	01:44 pm
Loaded	25.5 T	01:44 pm
Loaded	25.3 T	02:53 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (Graham Cavill)

Customer (Birdy)





Docket ACH-DKT-173519

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
26/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48778	48416CO	jagdeep singh parmar

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1HJQ135	CH25036	2907	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:10 AM	04:05 PM	20 Minutes	40 Minutes	10.25 hours

Items

Cartage Only (CO2)	**229.20 T**	
Loaded	28.3 T	07:19 am
Loaded	28.5 T	08:22 am
Loaded	28.9 T	09:29 am
Loaded	28.7 T	10:33 am
Loaded	28.9 T	11:37 am
Loaded	28.6 T	12:42 pm
Loaded	28.5 T	01:54 pm
Loaded	28.8 T	02:55 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (jagdeep singh parmar)



Customer (Reno)



Docket ACH-DKT-173485

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
26/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48778	48416CO	nick shumba

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1gmi249	1toa827	2226	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:05 AM	03:55 PM			9.83 hours

Items

Cartage Only (CO2)	**260.50 T**	
Loaded	28.9 T	07:12 am
Loaded	29.1 T	09:20 am
Loaded	28.9 T	09:20 am
Loaded	28.6 T	10:19 am
Loaded	29 T	11:19 am
Loaded	28.9 T	12:20 pm
Loaded	29.1 T	01:22 pm
Loaded	28.9 T	02:18 pm
Loaded	29.1 T	03:16 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (nick shumba)

Customer (Brett)



BT

Docket ACH-DKT-173483

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
26/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48778	48416CO	parvinder singh

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1hfv751	1ttz122	2907a	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:00 AM	04:22 PM	20 Minutes	55 Minutes	10.95 hours

Items

Cartage Only (CO2)	**265.10 T**	
Loaded	29.5 T	07:09 am
Loaded	29.4 T	08:08 am
Loaded	29.5 T	09:13 am
Loaded	29.2 T	10:09 am
Loaded	29.4 T	11:01 am
Loaded	29.5 T	12:01 pm
Loaded	29.6 T	12:59 pm
Loaded	29.5 T	01:52 pm
Loaded	29.5 T	02:49 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (parvinder singh)

Customer (Reno)





Docket ACH-DKT-173359

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
25/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48713	48416CO	Graham Cavill

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
CH10438	1TVF642	698	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
08:30 AM	04:05 PM			7.58 hours

Items

Cartage Only (CO2)	**177.80 T**	
Loaded	25.4 T	08:34 am
Loaded	25.5 T	09:53 am
Loaded	25.2 T	11:01 am
Loaded	25.6 T	12:07 pm
Loaded	25.3 T	01:08 pm
Loaded	25.4 T	02:17 pm
Loaded	25.4 T	03:22 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (Graham Cavill)



Customer (Birdy)



Docket ACH-DKT-173357

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
25/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48713	48416CO	nick shumba

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1gmi249	1toa827	2226	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
08:20 AM	03:40 PM			7.33 hours

Items

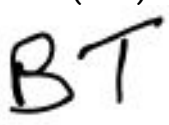
Cartage Only (CO2)	**203.30 T**	
Loaded	29 T	09:54 am
Loaded	29.1 T	09:54 am
Loaded	29.2 T	10:56 am
Loaded	28.9 T	12:03 pm
Loaded	29.1 T	01:02 pm
Loaded	29 T	02:02 pm
Loaded	29 T	03:03 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (nick shumba)



Customer (Bert)



Docket ACH-DKT-173339

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
25/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48713	48416CO	jagdeep singh parmar

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1HJQ135	CH25036	2907	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:10 AM	05:00 PM	20 Minutes	40 Minutes	11.17 hours

Items

Cartage Only (CO2)	**227.90 T**	
Loaded	27.7 T	07:16 am
Loaded	28.7 T	08:46 am
Loaded	28.3 T	09:59 am
Loaded	28.8 T	11:12 am
Loaded	28.3 T	12:20 pm
Loaded Notes: Pic up time 1:37 pm	28.8 T	01:47 pm
Loaded	28.5 T	02:49 pm
Loaded Notes: Pic up time 3:349 pm	28.8 T	04:11 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (jagdeep singh parmar)

Customer (Reno)

Docket ACH-DKT-173309

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
25/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48713	48416CO	parvinder singh

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1hfv751	1ttz122	2907a	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:00 AM	04:30 PM	20 Minutes	50 Minutes	11.00 hours

Items

Cartage Only (CO2)	**235.60 T**	
Loaded	29.6 T	07:13 am
Loaded	29.2 T	08:40 am
Loaded	29.3 T	10:01 am
Loaded	29.3 T	11:04 am
Loaded	29.5 T	12:11 pm
Loaded	29.6 T	01:12 pm
Loaded	29.5 T	02:12 pm
Loaded	29.6 T	03:16 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (parvinder singh)



Customer (Reno)



Docket ACH-DKT-173149

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
22/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48681	48416CO	jagdeep singh parmar

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1hfv751	1ttz122	2907A	Tri-Axle

Shift	Confirm you are fit for work
Day	Yes

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:10 AM	04:05 PM	20 Minutes	40 Minutes	10.25 hours

Items

Cartage Only (CO2)	**205.70 T**	
Loaded	29.2 T	07:17 am
Loaded	29.1 T	08:35 am
Loaded	29.5 T	09:47 am
Loaded	29.2 T	11:04 am
Loaded	29.6 T	12:19 pm
Loaded	29.6 T	01:36 pm
Loaded	29.5 T	02:54 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (jagdeep singh parmar)



Customer (Reno)



Docket ACH-DKT-173000

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
21/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48624	48416CO	jagdeep singh parmar

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1HJQ135	CH25036	2907	Tri-Axle
Shift	**Confirm you are fit for work**		
Day	Yes		

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:15 AM	04:30 PM	20 Minutes	40 Minutes	10.58 hours

Items

Cartage Only (CO2)	**200.10 T**	
Loaded	28.6 T	07:15 am
Loaded	28.7 T	08:46 am
Loaded	28.5 T	10:05 am
Loaded	28.7 T	11:27 am
Loaded	28.6 T	12:44 pm
Loaded	28.6 T	01:57 pm
Loaded	28.4 T	03:14 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (jagdeep singh parmar)



Customer (Matt/reno)



Docket ACH-DKT-172997

20, 28 Belmont Avenue
Belmont, Western Australia
6103, Australia

ABN: 95606788283

Date	Supplier Ref	Status
21/10/21	48416CO	Sent
Job	**Order**	**Operator**
ACH-JOB-48624	48416CO	parvinder singh

Customer	Customer Address	Customer Ref
GMF Contractors Pty Ltd	Goddard St & Harvest St Rockingham, Western Australia 6090, Australia	

Vehicle

Truck Registration	Trailer Registration	Fleet Number	Vehicle Type
1 hfv751	1ttz122	2907a	Tri-Axle
Shift	**Confirm you are fit for work**		
Day	Yes		

Time

Start Time	End Time	Break Time	Travel Time	Total Time
06:00 AM	05:00 PM	20 Minutes	50 Minutes	11.50 hours

Items

Cartage Only (CO2)	**205.55 T**	
Loaded	29.4 T	07:24 am
Loaded	29.6 T	08:48 am
Loaded	29.15 T	10:12 am
Loaded	29.4 T	11:30 am
Loaded	29.5 T	12:41 pm
Loaded	29.2 T	01:59 pm
Loaded	29.3 T	03:16 pm
Waiting Time (WT)	**0.00 Mins**	

Signatures

Operator (parvinder singh)



Customer (Reno)



Appendix B. Photographic Plates



Plate 1. Source material stockpiled at the source site



Plate 2. Source material stockpiled at the source site



Plate 3. Source material following importation to site



Plate 4. Source material placement during the construction of the remedial capping later



Plate 5. Source material following placement to the site



Plate 6. Source material following placement to the site

Appendix C. Results Summary Tables

		BTEX								Cyanides	TRH								
		Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	Cyanide (WAD)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	3&4-Methylphenol (m&p-cresol)	2,4,5-Trichlorophenol
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.1	0.1	0.1	0.2	0.1	0.3	0.2	1	10	10	20	20	100	100	20	1	0.5
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)		3	0.5	160	55			40				45		110					
NEPM 2013 Table 1A(1) HILs Res A Soil																			
Field ID	**Date**																		
QC1	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
QC1A	**10/27/2021**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3			<20	<20	<50	<50	<100	<100	<100		
SS01	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS02	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5
SS03	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS04	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS05	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS06	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS07	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS08	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5
SS09	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS10	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS11	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS12	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS13	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		
SS14	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5
SS15	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50		

Statistics

Number of Results	**1**	**17**	**17**	**17**	**17**	**17**	**17**	**16**	**3**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.5**	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.3**	**<0.2**	**<1**	**<10**	**<10**	**<20**	**<20**	**<100**	**<100**	**<20**	**<1**	**<0.5**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<1**	**<0.2**	**<1**	**<20**	**<20**	**<50**	**<50**	**<100**	**<100**	**<100**	**<1**	**<0.5**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *		**0.097**	**0.24**	**0.24**	**0.24**	**0.24**	**0.29**	**0.1**	**0.5**	**5.3**	**5.3**	**22**	**22**	**50**	**50**	**24**	**0.5**	**0.25**
Median Concentration *	**0.25**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.1**	**0.5**	**5**	**5**	**25**	**25**	**50**	**50**	**25**	**0.5**	**0.25**
Standard Deviation *		**0.012**	**0.049**	**0.049**	**0.036**	**0.049**	**0.1**	**0**	**0**	**1.2**	**1.2**	**5.9**	**5.9**	**0**	**0**	**8.9**	**0**	**0**
95% UCL (Student's-t) *		**0.102**	**0.259**	**0.259**	**0.257**	**0.259**	**0.332**	**0.1**	**0.5**	**5.808**	**5.808**	**24.85**	**24.85**	**50**	**50**	**27.61**	**0.5**	**0.25**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand

2013, NEPM 2013 Table 1A(1) HILs Res A Soil

		Phenols											Halogenated Benzenes	Inorganics						
		2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-chloro-3-methylphenol	Cresol Total	Pentachlorophenol	Phenol	Hexachlorobenzene	Moisture Content	Cyanide (Free)	Moisture Content (dried @ 103°C)	pH (Lab)	Sulphate	Antimony	Arsenic
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	%	-	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.05	0.1	1	1	0.1	100	5	2
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)																				
NEPM 2013 Table 1A(1) HILs Res A Soil										400	100	3,000	10		250					100
Field ID	**Date**																			
QC1	**10/27/2021**													3.8						6
QC1A	**10/27/2021**															4.0				6.5
SS01	**10/27/2021**													3.7						5
SS02	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.8	<1		8.1	<100	<5	6
SS03	**10/27/2021**													3.8						5
SS04	**10/27/2021**													3.4						5
SS05	**10/27/2021**													3.7						6
SS06	**10/27/2021**													3.6						6
SS07	**10/27/2021**													3.8						5
SS08	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.6	<1		8.2	<100	<5	6
SS09	**10/27/2021**													4.1						5
SS10	**10/27/2021**													4.2						5
SS11	**10/27/2021**													3.8						6
SS12	**10/27/2021**													3.9						6
SS13	**10/27/2021**													4.9						6
SS14	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.6	<1		8.4	<100	<5	6
SS15	**10/27/2021**													3.6						5
Statistics																				
Number of Results		**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**16**	**3**	**1**	**3**	**3**	**3**	**17**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**1**	**3**	**0**	**0**	**17**
Minimum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<2**	**<0.5**	**<0.05**	**3.4**	**<1**	**4**	**8.1**	**<100**	**<5**	**5**
Minimum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**3.4**	**ND**	**4**	**8.1**	**ND**	**ND**	**5**
Maximum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<2**	**<0.5**	**<0.05**	**4.9**	**<1**	**4**	**8.4**	**<100**	**<5**	**6.5**
Maximum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**4.9**	**ND**	**4**	**8.4**	**ND**	**ND**	**6.5**
Average Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.8**	**0.5**		**8.2**	**50**	**2.5**	**5.6**
Median Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.8**	**0.5**	**4**	**8.2**	**50**	**2.5**	**6**
Standard Deviation *		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.35**	**0**		**0.15**	**0**	**0**	**0.55**
95% UCL (Student's-t) *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.983**	**0.5**		**8.491**	**50**	**2.5**	**5.849**
% of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**100**	**0**	**100**	**100**	**0**	**0**	**100**
% of Non-Detects		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**0**	**100**	**0**	**0**	**100**	**100**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand

2013, NEPM 2013 Table 1A(1) HILs Res A Soil

		Metals																		
		Barium	Beryllium	Boron	Cadmium	Chromium (hexavalent)	Chromium (III+VI)	Chromium (Trivalent)	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Uranium
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		10	1	10	0.1	0.5	2	2	2	5	5	5	0.1	2	2	1	2	0.1	5	0.1
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)																				
NEPM 2013 Table 1A(1) HILs Res A Soil			60	4,500	20	100			100	6,000	300	3,800	40		400	200				
Field ID	**Date**																			
QC1	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	13	<0.1		<2	<5				
QC1A	**10/27/2021**		<2	<10	<0.4	<1	9		<5	<5	<5	40	<0.1		<5	<2				
SS01	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	15	<0.1		<2	<5				
SS02	**10/27/2021**	<10	<1		<0.1	<0.5	8	8	<2	<5	<5	14	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1
SS03	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	17	<0.1		<2	<5				
SS04	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	16	<0.1		<2	<5				
SS05	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	17	<0.1		<2	<5				
SS06	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	16	<0.1		<2	<5				
SS07	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	16	<0.1		<2	<5				
SS08	**10/27/2021**	<10	<1		<0.1	<0.5	8	8	<2	<5	<5	15	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1
SS09	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	15	<0.1		<2	<5				
SS10	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	14	<0.1		<2	<5				
SS11	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	16	<0.1		<2	<5				
SS12	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	13	<0.1		<2	<5				
SS13	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	12	<0.1		<2	<5				
SS14	**10/27/2021**	<10	<1		<0.1	<0.5	8	8	<2	<5	<5	14	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1
SS15	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	14	<0.1		<2	<5				

Statistics

Number of Results	**16**	**17**	**14**	**17**	**4**	**16**	**3**	**17**	**17**	**17**	**17**	**17**	**3**	**17**	**17**	**3**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**16**	**3**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<10**	**<1**	**<10**	**<0.1**	**<0.5**	**8**	**8**	**<2**	**<5**	**<5**	**12**	**<0.1**	**<2**	**<2**	**<1**	**<2**	**<0.1**	**<5**	**<0.1**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**8**	**8**	**ND**	**ND**	**ND**	**12**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<10**	**<2**	**<50**	**<1**	**<1**	**9**	**8**	**<5**	**<5**	**<5**	**40**	**<0.1**	**<2**	**<5**	**<5**	**<2**	**<0.1**	**<5**	**<0.1**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**9**	**8**	**ND**	**ND**	**ND**	**40**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**5**	**0.53**	**24**	**0.4**	**0.31**	**8.5**	**8**	**1.1**	**2.5**	**2.5**	**16**	**0.05**	**1**	**1.1**	**2.1**	**1**	**0.05**	**2.5**	**0.05**
Median Concentration *	**5**	**0.5**	**25**	**0.5**	**0.25**	**8.5**	**8**	**1**	**2.5**	**2.5**	**15**	**0.05**	**1**	**1**	**2.5**	**1**	**0.05**	**2.5**	**0.05**
Standard Deviation *	**0**	**0.12**	**5.3**	**0.18**	**0.12**	**0.52**	**0**	**0.36**	**0**	**0**	**6.3**	**0**	**0**	**0.36**	**0.83**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**5**	**0.581**	**26.1**	**0.481**	**0.46**	**8.726**	**8**	**1.242**	**2.5**	**2.5**	**18.95**	**0.05**	**1**	**1.242**	**2.409**	**1**	**0.05**	**2.5**	**0.05**
% of Detects	**0**	**0**	**0**	**0**	**0**	**100**	**100**	**0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**0**	**0**	**100**	**100**	**100**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand

2013, NEPM 2013 Table 1A(1) HILs Res A Soil

				Organochlorine Pesticides																
		Vanadium	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		5	5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)																				
NEPM 2013 Table 1A(1) HILs Res A Soil			7,400				6		50						240		270			
Field ID	**Date**																			
QC1	**10/27/2021**	5	<5																	
QC1A	**10/27/2021**		<5																	
SS01	**10/27/2021**	<5	<5																	
SS02	**10/27/2021**	5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS03	**10/27/2021**	5	<5																	
SS04	**10/27/2021**	<5	<5																	
SS05	**10/27/2021**	5	<5																	
SS06	**10/27/2021**	5	<5																	
SS07	**10/27/2021**	<5	<5																	
SS08	**10/27/2021**	<5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS09	**10/27/2021**	5	<5																	
SS10	**10/27/2021**	5	<5																	
SS11	**10/27/2021**	5	<5																	
SS12	**10/27/2021**	<5	<5																	
SS13	**10/27/2021**	<5	<5																	
SS14	**10/27/2021**	<5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS15	**10/27/2021**	<5	<5																	
Statistics																				
Number of Results		**16**	**17**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Number of Detects		**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**5**	**<5**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Minimum Detect		**5**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration		**5**	**<5**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Detect		**5**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *		**3.8**	**2.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
Median Concentration *		**3.75**	**2.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
Standard Deviation *		**1.3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *		**4.316**	**2.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
% of Detects		**50**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects		**50**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand

2013, NEPM 2013 Table 1A(1) HILs Res A Soil

									PAH											
		Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)																				
NEPM 2013 Table 1A(1) HILs Res A Soil		10				6		300												
Field ID	**Date**																			
QC1	**10/27/2021**																			
QC1A	**10/27/2021**																			
SS01	**10/27/2021**																			
SS02	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SS03	**10/27/2021**																			
SS04	**10/27/2021**																			
SS05	**10/27/2021**																			
SS06	**10/27/2021**																			
SS07	**10/27/2021**																			
SS08	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SS09	**10/27/2021**																			
SS10	**10/27/2021**																			
SS11	**10/27/2021**																			
SS12	**10/27/2021**																			
SS13	**10/27/2021**																			
SS14	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SS15	**10/27/2021**																			

Statistics

Number of Results	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
Median Concentration *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand

2013, NEPM 2013 Table 1A(1) HILs Res A Soil

						PCBs	TPH					
		Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	PCBs (Sum of total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.1	10	20	50	50	20
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand (0-1m)			3									
NEPM 2013 Table 1A(1) HILs Res A Soil						300	1					
Field ID	**Date**											
QC1	**10/27/2021**		<1					<10	<50	<100	<100	<50
QC1A	**10/27/2021**							<20	<20	<50	<50	<50
SS01	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS02	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<10	<20	<100	<100	<20
SS03	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS04	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS05	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS06	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS07	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS08	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<10	<20	<100	<100	<20
SS09	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS10	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS11	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS12	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS13	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS14	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<10	<20	<100	<100	<20
SS15	**10/27/2021**		<1					<10	<50	<100	<100	<50

Statistics

Number of Results	**3**	**16**	**3**	**3**	**3**	**3**	**17**	**17**	**17**	**17**	**17**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.1**	**<10**	**<20**	**<50**	**<50**	**<20**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.5**	**<1**	**<0.5**	**<0.5**	**<0.5**	**<0.1**	**<20**	**<50**	**<100**	**<100**	**<50**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.25**	**0.45**	**0.25**	**0.25**	**0.25**	**0.05**	**5.3**	**21**	**49**	**49**	**22**
Median Concentration *	**0.25**	**0.5**	**0.25**	**0.25**	**0.25**	**0.05**	**5**	**25**	**50**	**50**	**25**
Standard Deviation *	**0**	**0.1**	**0**	**0**	**0**	**0**	**1.2**	**6.6**	**6.1**	**6.1**	**5.9**
95% UCL (Student's-t) *	**0.25**	**0.497**	**0.25**	**0.25**	**0.25**	**0.05**	**5.808**	**24.25**	**51.1**	**51.1**	**24.85**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand

2013, NEPM 2013 Table 1A(1) HILs Res A Soil

		BTEX								Cyanides	TRH									
		Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	Cyanide (WAD)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	3&4-Methylphenol (m&p-cresol)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.1	0.1	0.1	0.2	0.1	0.3	0.2	1	10	10	20	20	100	100	20	1	0.5	0.5
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil											**700**		**1,000**		**2,500**	**10,000**				
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space		170																		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil			50	85	70			105				180	120	120	300	2,800				
Field ID	**Date**																			
QC1	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
QC1A	**10/27/2021**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3			<20	<20	<50	<50	<100	<100	<100			
SS01	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS02	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5	<0.5
SS03	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS04	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS05	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS06	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS07	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS08	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5	<0.5
SS09	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS10	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS11	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS12	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS13	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			
SS14	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5	<0.5
SS15	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50			

Statistics

Number of Results	**1**	**17**	**17**	**17**	**17**	**17**	**17**	**16**	**3**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.5**	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.3**	**<0.2**	**<1**	**<10**	**<10**	**<20**	**<20**	**<100**	**<100**	**<20**	**<1**	**<0.5**	**<0.5**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<1**	**<0.2**	**<1**	**<20**	**<20**	**<50**	**<50**	**<100**	**<100**	**<100**	**<1**	**<0.5**	**<0.5**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *		**0.097**	**0.24**	**0.24**	**0.24**	**0.24**	**0.29**	**0.1**	**0.5**	**5.3**	**5.3**	**22**	**22**	**50**	**50**	**24**	**0.5**	**0.25**	**0.25**
Median Concentration *	**0.25**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.1**	**0.5**	**5**	**5**	**25**	**25**	**50**	**50**	**25**	**0.5**	**0.25**	**0.25**
Standard Deviation *		**0.012**	**0.049**	**0.049**	**0.036**	**0.049**	**0.1**	**0**	**0**	**1.2**	**1.2**	**5.9**	**5.9**	**0**	**0**	**8.9**	**0**	**0**	**0**
95% UCL (Student's-t) *		**0.102**	**0.259**	**0.259**	**0.257**	**0.259**	**0.332**	**0.1**	**0.5**	**5.808**	**5.808**	**24.85**	**24.85**	**50**	**50**	**27.61**	**0.5**	**0.25**	**0.25**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

		Phenols										Halogenated Benzenes	Inorganics							
		2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-chloro-3-methylphenol	Cresol Total	Pentachlorophenol	Phenol	Hexachlorobenzene	Moisture Content	Cyanide (Free)	Moisture Content (dried @ 103°C)	pH (Lab)	Sulphate	Antimony	Arsenic
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	%	-	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.05	0.1	1	1	0.1	100	5	2
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																			
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																			100
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																			
Field ID	**Date**																		
QC1	**10/27/2021**												3.8						6
QC1A	**10/27/2021**														4.0				6.5
SS01	**10/27/2021**												3.7						5
SS02	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.8	<1		8.1	<100	<5	6
SS03	**10/27/2021**												3.8						5
SS04	**10/27/2021**												3.4						5
SS05	**10/27/2021**												3.7						6
SS06	**10/27/2021**												3.6						6
SS07	**10/27/2021**												3.8						5
SS08	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.6	<1		8.2	<100	<5	6
SS09	**10/27/2021**												4.1						5
SS10	**10/27/2021**												4.2						5
SS11	**10/27/2021**												3.8						6
SS12	**10/27/2021**												3.9						6
SS13	**10/27/2021**												4.9						6
SS14	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.6	<1		8.4	<100	<5	6
SS15	**10/27/2021**												3.6						5
Statistics																			
Number of Results		**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**16**	**3**	**1**	**3**	**3**	**3**	**17**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**1**	**3**	**0**	**0**	**17**
Minimum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<2**	**<0.5**	**<0.05**	**3.4**	**<1**	**4**	**8.1**	**<100**	**<5**	**5**
Minimum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**3.4**	**ND**	**4**	**8.1**	**ND**	**ND**	**5**
Maximum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<2**	**<0.5**	**<0.05**	**4.9**	**<1**	**4**	**8.4**	**<100**	**<5**	**6.5**
Maximum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**4.9**	**ND**	**4**	**8.4**	**ND**	**ND**	**6.5**
Average Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.8**	**0.5**		**8.2**	**50**	**2.5**	**5.6**
Median Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.8**	**0.5**	**4**	**8.2**	**50**	**2.5**	**6**
Standard Deviation *		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.35**	**0**		**0.15**	**0**	**0**	**0.55**
95% UCL (Student's-t) *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.983**	**0.5**		**8.491**	**50**	**2.5**	**5.849**
% of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**100**	**0**	**100**	**100**	**0**	**0**	**100**
% of Non-Detects		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**0**	**100**	**0**	**0**	**100**	**100**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

		Metals																		
		Barium	Beryllium	Boron	Cadmium	Chromium (hexavalent)	Chromium (III+VI)	Chromium (Trivalent)	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Uranium
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		10	1	10	0.1	0.5	2	2	2	5	5	5	0.1	2	2	1	2	0.1	5	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space								190		60	1100				30					
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
Field ID	**Date**																			
QC1	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	13	<0.1		<2	<5				
QC1A	**10/27/2021**		<2	<10	<0.4	<1			<5	<5	<5	40	<0.1		<5	<2				
SS01	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	15	<0.1		<2	<5				
SS02	**10/27/2021**	<10	<1		<0.1	<0.5	8	8	<2	<5	<5	14	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1
SS03	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	17	<0.1		<2	<5				
SS04	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	16	<0.1		<2	<5				
SS05	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	17	<0.1		<2	<5				
SS06	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	16	<0.1		<2	<5				
SS07	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	16	<0.1		<2	<5				
SS08	**10/27/2021**	<10	<1		<0.1	<0.5	8	8	<2	<5	<5	15	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1
SS09	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	15	<0.1		<2	<5				
SS10	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	14	<0.1		<2	<5				
SS11	**10/27/2021**	<10	<1	<50	<1		9		<2	<5	<5	16	<0.1		<2	<5				
SS12	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	13	<0.1		<2	<5				
SS13	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	12	<0.1		<2	<5				
SS14	**10/27/2021**	<10	<1		<0.1	<0.5	8	8	<2	<5	<5	14	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1
SS15	**10/27/2021**	<10	<1	<50	<1		8		<2	<5	<5	14	<0.1		<2	<5				

Statistics

Number of Results	**16**	**17**	**14**	**17**	**4**	**16**	**3**	**17**	**17**	**17**	**17**	**17**	**3**	**17**	**17**	**3**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**16**	**3**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<10**	**<1**	**<10**	**<0.1**	**<0.5**	**8**	**8**	**<2**	**<5**	**<5**	**12**	**<0.1**	**<2**	**<2**	**<1**	**<2**	**<0.1**	**<5**	**<0.1**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**8**	**8**	**ND**	**ND**	**ND**	**12**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<10**	**<2**	**<50**	**<1**	**<1**	**9**	**8**	**<5**	**<5**	**<5**	**40**	**<0.1**	**<2**	**<5**	**<5**	**<2**	**<0.1**	**<5**	**<0.1**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**9**	**8**	**ND**	**ND**	**ND**	**40**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**5**	**0.53**	**24**	**0.4**	**0.31**	**8.5**	**8**	**1.1**	**2.5**	**2.5**	**16**	**0.05**	**1**	**1.1**	**2.1**	**1**	**0.05**	**2.5**	**0.05**
Median Concentration *	**5**	**0.5**	**25**	**0.5**	**0.25**	**8.5**	**8**	**1**	**2.5**	**2.5**	**15**	**0.05**	**1**	**1**	**2.5**	**1**	**0.05**	**2.5**	**0.05**
Standard Deviation *	**0**	**0.12**	**5.3**	**0.18**	**0.12**	**0.52**	**0**	**0.36**	**0**	**0**	**6.3**	**0**	**0**	**0.36**	**0.83**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**5**	**0.581**	**26.1**	**0.481**	**0.46**	**8.726**	**8**	**1.242**	**2.5**	**2.5**	**18.95**	**0.05**	**1**	**1.242**	**2.409**	**1**	**0.05**	**2.5**	**0.05**
% of Detects	**0**	**0**	**0**	**0**	**0**	**100**	**100**	**0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**0**	**0**	**100**	**100**	**100**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

				Organochlorine Pesticides																
		Vanadium	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		5	5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space			70											180						
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
Field ID	**Date**																			
QC1	**10/27/2021**	5	<5																	
QC1A	**10/27/2021**		<5																	
SS01	**10/27/2021**	<5	<5																	
SS02	**10/27/2021**	5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS03	**10/27/2021**	5	<5																	
SS04	**10/27/2021**	<5	<5																	
SS05	**10/27/2021**	5	<5																	
SS06	**10/27/2021**	5	<5																	
SS07	**10/27/2021**	<5	<5																	
SS08	**10/27/2021**	<5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS09	**10/27/2021**	5	<5																	
SS10	**10/27/2021**	5	<5																	
SS11	**10/27/2021**	5	<5																	
SS12	**10/27/2021**	<5	<5																	
SS13	**10/27/2021**	<5	<5																	
SS14	**10/27/2021**	<5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS15	**10/27/2021**	<5	<5																	

Statistics

Number of Results	**16**	**17**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Number of Detects	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**5**	**<5**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Minimum Detect	**5**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**5**	**<5**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Detect	**5**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**3.8**	**2.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
Median Concentration *	**3.75**	**2.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
Standard Deviation *	**1.3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**4.316**	**2.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
% of Detects	**50**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**50**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

									PAH											
		Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil													0.7							
Field ID	**Date**																			
QC1	**10/27/2021**																			
QC1A	**10/27/2021**																			
SS01	**10/27/2021**																			
SS02	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SS03	**10/27/2021**																			
SS04	**10/27/2021**																			
SS05	**10/27/2021**																			
SS06	**10/27/2021**																			
SS07	**10/27/2021**																			
SS08	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SS09	**10/27/2021**																			
SS10	**10/27/2021**																			
SS11	**10/27/2021**																			
SS12	**10/27/2021**																			
SS13	**10/27/2021**																			
SS14	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SS15	**10/27/2021**																			

Statistics

Number of Results	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
Median Concentration *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

							PCBs	TPH				
		Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	PCBs (Sum of total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.1	10	20	50	50	20
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil												
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space			170									
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil												
Field ID	**Date**											
QC1	**10/27/2021**		<1					<10	<50	<100	<100	<50
QC1A	**10/27/2021**							<20	<20	<50	<50	<50
SS01	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS02	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<10	<20	<100	<100	<20
SS03	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS04	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS05	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS06	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS07	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS08	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<10	<20	<100	<100	<20
SS09	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS10	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS11	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS12	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS13	**10/27/2021**		<1					<10	<50	<100	<100	<50
SS14	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<10	<20	<100	<100	<20
SS15	**10/27/2021**		<1					<10	<50	<100	<100	<50

Statistics

Number of Results	**3**	**16**	**3**	**3**	**3**	**3**	**17**	**17**	**17**	**17**	**17**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.1**	**<10**	**<20**	**<50**	**<50**	**<20**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.5**	**<1**	**<0.5**	**<0.5**	**<0.5**	**<0.1**	**<20**	**<50**	**<100**	**<100**	**<50**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.25**	**0.45**	**0.25**	**0.25**	**0.25**	**0.05**	**5.3**	**21**	**49**	**49**	**22**
Median Concentration *	**0.25**	**0.5**	**0.25**	**0.25**	**0.25**	**0.05**	**5**	**25**	**50**	**50**	**25**
Standard Deviation *	**0**	**0.1**	**0**	**0**	**0**	**0**	**1.2**	**6.6**	**6.1**	**6.1**	**5.9**
95% UCL (Student's-t) *	**0.25**	**0.497**	**0.25**	**0.25**	**0.25**	**0.05**	**5.808**	**24.25**	**51.1**	**51.1**	**24.85**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

		BTEX								Cyanides	TRH										
		Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	Cyanide (WAD)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	3&4-Methylphenol (m&p-cresol)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.1	0.1	0.1	0.2	0.1	0.3	0.2	1	10	10	20	20	100	100	20	1	0.5	0.5	0.5
WA DWER Waste Classification (Table 3) CT1 Class I			0.2	160	60			120													
WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)			0.5	85	55			40			45		110		300	2,800					
Field ID	**Date**																				
QC1	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
QC1A	**10/27/2021**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3			<20	<20	<50	<50	<100	<100	<100				
SS01	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS02	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5	<0.5	<0.5
SS03	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS04	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS05	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS06	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS07	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS08	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5	<0.5	<0.5
SS09	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS10	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS11	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS12	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS13	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
SS14	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<1.0	<0.2	<1	<10	<10	<20	<20	<100	<100	<20	<1	<0.5	<0.5	<0.5
SS15	**10/27/2021**		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2		<10	<10	<50	<50	<100	<100	<50				
Statistics																					
Number of Results		**1**	**17**	**17**	**17**	**17**	**17**	**17**	**16**	**3**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**3**	**3**	**3**	**3**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**<0.5**	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.3**	**<0.2**	**<1**	**<10**	**<10**	**<20**	**<20**	**<100**	**<100**	**<20**	**<1**	**<0.5**	**<0.5**	**<0.5**
Minimum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration		**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<1**	**<0.2**	**<1**	**<20**	**<20**	**<50**	**<50**	**<100**	**<100**	**<100**	**<1**	**<0.5**	**<0.5**	**<0.5**
Maximum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *			**0.097**	**0.24**	**0.24**	**0.24**	**0.24**	**0.29**	**0.1**	**0.5**	**5.3**	**5.3**	**22**	**22**	**50**	**50**	**24**	**0.5**	**0.25**	**0.25**	**0.25**
Median Concentration *		**0.25**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.1**	**0.5**	**5**	**5**	**25**	**25**	**50**	**50**	**25**	**0.5**	**0.25**	**0.25**	**0.25**
Standard Deviation *			**0.012**	**0.049**	**0.049**	**0.036**	**0.049**	**0.1**	**0**	**0**	**1.2**	**1.2**	**5.9**	**5.9**	**0**	**0**	**8.9**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *			**0.102**	**0.259**	**0.259**	**0.257**	**0.259**	**0.332**	**0.1**	**0.5**	**5.808**	**5.808**	**24.85**	**24.85**	**50**	**50**	**27.61**	**0.5**	**0.25**	**0.25**	**0.25**
% of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

DWER, April 2018, WA DWER Waste Classification (Table 3) CT1 Class I

WA DWER, December 2019, WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)

		Phenols									Halogenated Benzenes	Inorganics									
		2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-chloro-3-methylphenol	Cresol Total	Pentachlorophenol	Phenol	Hexachlorobenzene	Moisture Content	Cyanide (Free)	Moisture Content (dried @ 103°C)	pH (Lab)	Sulphate	Antimony	Arsenic	Barium	Beryllium	Boron
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	%	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.05	0.1	1	1	0.1	100	5	2	10	1	10
WA DWER Waste Classification (Table 3) CT1 Class I								400										14		2	
WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)										1			1		5.5-8.5	2,500	20	100	500	4	
Field ID	**Date**																				
QC1	**10/27/2021**											3.8						6	<10	<1	<50
QC1A	**10/27/2021**													4.0				6.5		<2	<10
SS01	**10/27/2021**											3.7						5	<10	<1	<50
SS02	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.8	<1		8.1	<100	<5	6	<10	<1	
SS03	**10/27/2021**											3.8						5	<10	<1	<50
SS04	**10/27/2021**											3.4						5	<10	<1	<50
SS05	**10/27/2021**											3.7						6	<10	<1	<50
SS06	**10/27/2021**											3.6						6	<10	<1	<50
SS07	**10/27/2021**											3.8						5	<10	<1	<50
SS08	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.6	<1		8.2	<100	<5	6	<10	<1	
SS09	**10/27/2021**											4.1						5	<10	<1	<50
SS10	**10/27/2021**											4.2						5	<10	<1	<50
SS11	**10/27/2021**											3.8						6	<10	<1	<50
SS12	**10/27/2021**											3.9						6	<10	<1	<50
SS13	**10/27/2021**											4.9						6	<10	<1	<50
SS14	**10/27/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.05	3.6	<1		8.4	<100	<5	6	<10	<1	
SS15	**10/27/2021**											3.6						5	<10	<1	<50
Statistics																					
Number of Results		**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**16**	**3**	**1**	**3**	**3**	**3**	**17**	**16**	**17**	**14**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**1**	**3**	**0**	**0**	**17**	**0**	**0**	**0**
Minimum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<2**	**<0.5**	**<0.05**	**3.4**	**<1**	**4**	**8.1**	**<100**	**<5**	**5**	**<10**	**<1**	**<10**
Minimum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**3.4**	**ND**	**4**	**8.1**	**ND**	**ND**	**5**	**ND**	**ND**	**ND**
Maximum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<2**	**<0.5**	**<0.05**	**4.9**	**<1**	**4**	**8.4**	**<100**	**<5**	**6.5**	**<10**	**<2**	**<50**
Maximum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**4.9**	**ND**	**4**	**8.4**	**ND**	**ND**	**6.5**	**ND**	**ND**	**ND**
Average Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.8**	**0.5**		**8.2**	**50**	**2.5**	**5.6**	**5**	**0.53**	**24**
Median Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.8**	**0.5**	**4**	**8.2**	**50**	**2.5**	**6**	**5**	**0.5**	**25**
Standard Deviation *		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.35**	**0**		**0.15**	**0**	**0**	**0.55**	**0**	**0.12**	**5.3**
95% UCL (Student's-t) *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1**	**0.25**	**0.025**	**3.983**	**0.5**		**8.491**	**50**	**2.5**	**5.849**	**5**	**0.581**	**26.1**
% of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**100**	**0**	**100**	**100**	**0**	**0**	**100**	**0**	**0**	**0**
% of Non-Detects		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**0**	**100**	**0**	**0**	**100**	**100**	**0**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

DWER, April 2018, WA DWER Waste Classification (Table 3) CT1 Class I

WA DWER, December 2019, WA DWER Waste Classification (Table 6) Uncontaminated Fill (2

		Metals																			
		Cadmium	Chromium (hexavalent)	Chromium (III+VI)	Chromium (Trivalent)	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Uranium	Vanadium	Zinc	4,4-DDE	a-BHC
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.5	2	2	2	5	5	5	0.1	2	2	1	2	0.1	5	0.1	5	5	0.05	0.05
WA DWER Waste Classification (Table 3) CT1 Class I		0.4	10					2		0.2	10	4	2	20							
WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)		1	1		160	50	50	300	500	0.5	10	10	1	20	1	50	25	130	120		
Field ID	**Date**																				
QC1	**10/27/2021**	<1		9		<2	<5	<5	13	<0.1		<2	<5					5	<5		
QC1A	**10/27/2021**	<0.4	<1			<5	<5	<5	40	<0.1		<5	<2						<5		
SS01	**10/27/2021**	<1		8		<2	<5	<5	15	<0.1		<2	<5					<5	<5		
SS02	**10/27/2021**	<0.1	<0.5	8	8	<2	<5	<5	14	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1	5	<5	<0.05	<0.05
SS03	**10/27/2021**	<1		9		<2	<5	<5	17	<0.1		<2	<5					5	<5		
SS04	**10/27/2021**	<1		8		<2	<5	<5	16	<0.1		<2	<5					<5	<5		
SS05	**10/27/2021**	<1		9		<2	<5	<5	17	<0.1		<2	<5					5	<5		
SS06	**10/27/2021**	<1		9		<2	<5	<5	16	<0.1		<2	<5					5	<5		
SS07	**10/27/2021**	<1		9		<2	<5	<5	16	<0.1		<2	<5					<5	<5		
SS08	**10/27/2021**	<0.1	<0.5	8	8	<2	<5	<5	15	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1	<5	<5	<0.05	<0.05
SS09	**10/27/2021**	<1		9		<2	<5	<5	15	<0.1		<2	<5					5	<5		
SS10	**10/27/2021**	<1		9		<2	<5	<5	14	<0.1		<2	<5					5	<5		
SS11	**10/27/2021**	<1		9		<2	<5	<5	16	<0.1		<2	<5					5	<5		
SS12	**10/27/2021**	<1		8		<2	<5	<5	13	<0.1		<2	<5					<5	<5		
SS13	**10/27/2021**	<1		8		<2	<5	<5	12	<0.1		<2	<5					<5	<5		
SS14	**10/27/2021**	<0.1	<0.5	8	8	<2	<5	<5	14	<0.1	<2	<2	<1	<2	<0.1	<5	<0.1	<5	<5	<0.05	<0.05
SS15	**10/27/2021**	<1		8		<2	<5	<5	14	<0.1		<2	<5					<5	<5		
Statistics																					
Number of Results		**17**	**4**	**16**	**3**	**17**	**17**	**17**	**17**	**17**	**3**	**17**	**17**	**3**	**3**	**3**	**3**	**16**	**17**	**3**	**3**
Number of Detects		**0**	**0**	**16**	**3**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**
Minimum Concentration		**<0.1**	**<0.5**	**8**	**8**	**<2**	**<5**	**<5**	**12**	**<0.1**	**<2**	**<2**	**<1**	**<2**	**<0.1**	**<5**	**<0.1**	**5**	**<5**	**<0.05**	**<0.05**
Minimum Detect		**ND**	**ND**	**8**	**8**	**ND**	**ND**	**ND**	**12**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**5**	**ND**	**ND**	**ND**
Maximum Concentration		**<1**	**<1**	**9**	**8**	**<5**	**<5**	**<5**	**40**	**<0.1**	**<2**	**<5**	**<5**	**<2**	**<0.1**	**<5**	**<0.1**	**5**	**<5**	**<0.05**	**<0.05**
Maximum Detect		**ND**	**ND**	**9**	**8**	**ND**	**ND**	**ND**	**40**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**5**	**ND**	**ND**	**ND**
Average Concentration *		**0.4**	**0.31**	**8.5**	**8**	**1.1**	**2.5**	**2.5**	**16**	**0.05**	**1**	**1.1**	**2.1**	**1**	**0.05**	**2.5**	**0.05**	**3.8**	**2.5**	**0.025**	**0.025**
Median Concentration *		**0.5**	**0.25**	**8.5**	**8**	**1**	**2.5**	**2.5**	**15**	**0.05**	**1**	**1**	**2.5**	**1**	**0.05**	**2.5**	**0.05**	**3.75**	**2.5**	**0.025**	**0.025**
Standard Deviation *		**0.18**	**0.12**	**0.52**	**0**	**0.36**	**0**	**0**	**6.3**	**0**	**0**	**0.36**	**0.83**	**0**	**0**	**0**	**0**	**1.3**	**0**	**0**	**0**
95% UCL (Student's-t) *		**0.481**	**0.46**	**8.726**	**8**	**1.242**	**2.5**	**2.5**	**18.95**	**0.05**	**1**	**1.242**	**2.409**	**1**	**0.05**	**2.5**	**0.05**	**4.316**	**2.5**	**0.025**	**0.025**
% of Detects		**0**	**0**	**100**	**100**	**0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**0**	**0**	**0**
% of Non-Detects		**100**	**100**	**0**	**0**	**100**	**100**	**100**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**50**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

DWER, April 2018, WA DWER Waste Classification (Table 3) CT1 Class I

WA DWER, December 2019, WA DWER Waste Classification (Table 6) Uncontaminated Fill (2

		Organochlorine Pesticides																		
		Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
WA DWER Waste Classification (Table 3) CT1 Class I																					
WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)											3										
Field ID	**Date**																				
QC1	**10/27/2021**																				
QC1A	**10/27/2021**																				
SS01	**10/27/2021**																				
SS02	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS03	**10/27/2021**																				
SS04	**10/27/2021**																				
SS05	**10/27/2021**																				
SS06	**10/27/2021**																				
SS07	**10/27/2021**																				
SS08	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS09	**10/27/2021**																				
SS10	**10/27/2021**																				
SS11	**10/27/2021**																				
SS12	**10/27/2021**																				
SS13	**10/27/2021**																				
SS14	**10/27/2021**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS15	**10/27/2021**																				

Statistics

Number of Results	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
Median Concentration *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

DWER, April 2018, WA DWER Waste Classification (Table 3) CT1 Class I

WA DWER, December 2019, WA DWER Waste Classification (Table 6) Uncontaminated Fill (2

				PAH																PCBs
		Heptachlor epoxide	Methoxychlor	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	PCBs (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1
WA DWER Waste Classification (Table 3) CT1 Class I																					
WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)								1									3			300	1
Field ID	**Date**																				
QC1	**10/27/2021**																<1				
QC1A	**10/27/2021**																				
SS01	**10/27/2021**																<1				
SS02	**10/27/2021**	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
SS03	**10/27/2021**																<1				
SS04	**10/27/2021**																<1				
SS05	**10/27/2021**																<1				
SS06	**10/27/2021**																<1				
SS07	**10/27/2021**																<1				
SS08	**10/27/2021**	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
SS09	**10/27/2021**																<1				
SS10	**10/27/2021**																<1				
SS11	**10/27/2021**																<1				
SS12	**10/27/2021**																<1				
SS13	**10/27/2021**																<1				
SS14	**10/27/2021**	<0.05	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
SS15	**10/27/2021**																<1				

Statistics

Number of Results	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**16**	**3**	**3**	**3**	**3**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.05**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.1**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<0.05**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<1**	**<0.5**	**<0.5**	**<0.5**	**<0.1**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.45**	**0.25**	**0.25**	**0.25**	**0.05**
Median Concentration *	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.5**	**0.25**	**0.25**	**0.25**	**0.05**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.1**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *	**0.025**	**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.497**	**0.25**	**0.25**	**0.25**	**0.05**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

DWER, April 2018, WA DWER Waste Classification (Table 3) CT1 Class I

WA DWER, December 2019, WA DWER Waste Classification (Table 6) Uncontaminated Fill (2

	TPH				
	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	20	50	50	20
WA DWER Waste Classification (Table 3) CT1 Class I					
WA DWER Waste Classification (Table 6) Uncontaminated Fill (2019)					
Field ID	**Date**					
QC1	**10/27/2021**	<10	<50	<100	<100	<50
QC1A	**10/27/2021**	<20	<20	<50	<50	<50
SS01	**10/27/2021**	<10	<50	<100	<100	<50
SS02	**10/27/2021**	<10	<20	<100	<100	<20
SS03	**10/27/2021**	<10	<50	<100	<100	<50
SS04	**10/27/2021**	<10	<50	<100	<100	<50
SS05	**10/27/2021**	<10	<50	<100	<100	<50
SS06	**10/27/2021**	<10	<50	<100	<100	<50
SS07	**10/27/2021**	<10	<50	<100	<100	<50
SS08	**10/27/2021**	<10	<20	<100	<100	<20
SS09	**10/27/2021**	<10	<50	<100	<100	<50
SS10	**10/27/2021**	<10	<50	<100	<100	<50
SS11	**10/27/2021**	<10	<50	<100	<100	<50
SS12	**10/27/2021**	<10	<50	<100	<100	<50
SS13	**10/27/2021**	<10	<50	<100	<100	<50
SS14	**10/27/2021**	<10	<20	<100	<100	<20
SS15	**10/27/2021**	<10	<50	<100	<100	<50

Statistics

Number of Results	**17**	**17**	**17**	**17**	**17**
Number of Detects	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<10**	**<20**	**<50**	**<50**	**<20**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<20**	**<50**	**<100**	**<100**	**<50**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**5.3**	**21**	**49**	**49**	**22**
Median Concentration *	**5**	**25**	**50**	**50**	**25**
Standard Deviation *	**1.2**	**6.6**	**6.1**	**6.1**	**5.9**
95% UCL (Student's-t) *	**5.808**	**24.25**	**51.1**	**51.1**	**24.85**
% of Detects	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

DWER, April 2018, WA DWER Waste Classification (Table 3) CT1 Class I

WA DWER, December 2019, WA DWER Waste Classification (Table 6) Uncontaminated Fill (2

Appendix D. Chain of Custody documentation and Laboratory test Certificates

Environmental Site Services

Consigning Office: Environmental Site Services, 43 Stiles Ave. Burswood

Report Results to: lab@enviss.com.au Phone: Email:

Report Results to: dboyd@enviss.com.au Phone: Email:

Invoices to: dboyd@enviss.com.au Phone: Email:

Project No. 0010436 Task No.

Project Name: Rockingham Laboratory: ALS / Eurofins

Sampler's Name: DF Project Manager: DB

Special Instructions: Please forward sample UCLA to Eurofins Laboratory

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite E10/4 Screen	Suite E19/5	Suite S4 TRH/BTEXN	Suite S3-15 Metals	Suite S18 TRH/BTEXN	Suite E1 TRH/BTEXN	Suite M13, 15 Metals	Notes
1	SS01	27/10/2021	AM	S	NP	5 DAY			X	X				
2	SS02	27/10/2021	AM	S	NP	5 DAY	X							
3	SS03	27/10/2021	AM	S	NP	5 DAY			X	X				
4	SS04	27/10/2021	AM	S	NP	5 DAY			X	X				
5	SS05	27/10/2021	AM	S	NP	5 DAY			X	X				
6	SS06	27/10/2021	AM	S	NP	5 DAY			X	X				
7	SS07	27/10/2021	AM	S	NP	5 DAY			X	X				
8	SS08	27/10/2021	AM	S	NP	5 DAY	X	X						
9	SS09	27/10/2021	AM	S	NP	5 DAY			X	X				
10	SS10	27/10/2021	AM	S	NP	5 DAY			X	X				
11	SS11	27/10/2021	AM	S	NP	5 DAY			X	X				
12	SS12	27/10/2021	AM	S	NP	5 DAY			X	X				
13	SS13	27/10/2021	AM	S	NP	5 DAY			X	X				
14	SS14	27/10/2021	AM	S	NP	5 DAY	X							
15	SS15	27/10/2021	AM	S	NP	5 DAY			X	X				
16	QC1	27/10/2021	AM	S	NP	5 DAY			X	X				
Rev	QC1A	27/10/2021	AM	S	NP	5 DAY						X	X	Please forward to Eurofins Laboratory
17	QB1	27/10/2021	AM	W	NC	5 DAY			X	X				
18	TB1	27/10/2021	AM	W	N	5 DAY					X			
						TOTAL	2	1	10	14	1	1	1	

Environmental Division Perth

Work Order Reference

EP2113053

Telephone: 61-8-6496 7000

RELINQUISHED BY		RECEIVED BY	
Name: Darcy Boyd	Date: 27/10/2021	Name: BA	Date:
Company: ENVSS	Time: PM	Company: 28/10 1530	Time:
Name:	Date:	Name:	Date:
Company:	Time:	Company:	Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition

All Documentation is in Proper Order

Samples Received Properly Chilled

Lab Ref/Batch No:

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2113053**

Client	: **ENVIRONMENTAL SITE SERVICES**	Laboratory	: Environmental Division Perth
Contact	: David Boyd	Contact	: Customer Services EP
Address	: 10/31 STANLEY STREET SCARBOROUGH PERTH, WESTERN AUSTRALIA 6019	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: dboyd@envss.com.au	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: 0011406 Rockingham	Page	: 1 of 3
Order number	: ----	Quote number	: EP2019ENVSITSER0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Darcy Boyd		

Dates

Date Samples Received	: 28-Oct-2021 15:30	Issue Date	: 29-Oct-2021
Client Requested Due Date	: 05-Nov-2021	Scheduled Reporting Date	: **05-Nov-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA002 pH (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - P-19/4 Metals WA Waste Classification (Uncontaminated Fill)	SOIL - S-03 15 Metals (NEPM 2013 Suite - incl. Digestion)	SOIL - S-04 TRH/BTEXN
EP2113053-001	27-Oct-2021 00:00	SS01		✓				✓	✓
EP2113053-002	27-Oct-2021 00:00	SS02	✓	✓	✓	✓	✓		
EP2113053-003	27-Oct-2021 00:00	SS03		✓				✓	✓
EP2113053-004	27-Oct-2021 00:00	SS04		✓				✓	✓
EP2113053-005	27-Oct-2021 00:00	SS05		✓				✓	✓
EP2113053-006	27-Oct-2021 00:00	SS06		✓				✓	✓
EP2113053-007	27-Oct-2021 00:00	SS07		✓				✓	✓
EP2113053-008	27-Oct-2021 00:00	SS08	✓	✓	✓	✓	✓		
EP2113053-009	27-Oct-2021 00:00	SS09		✓				✓	✓
EP2113053-010	27-Oct-2021 00:00	SS10		✓				✓	✓
EP2113053-011	27-Oct-2021 00:00	SS11		✓				✓	✓
EP2113053-012	27-Oct-2021 00:00	SS12		✓				✓	✓
EP2113053-013	27-Oct-2021 00:00	SS13		✓				✓	✓
EP2113053-014	27-Oct-2021 00:00	SS14	✓	✓	✓	✓	✓		
EP2113053-015	27-Oct-2021 00:00	SS15		✓				✓	✓
EP2113053-016	27-Oct-2021 00:00	QC1		✓				✓	✓

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EK025SF (Solids) Free CN by Segmented Flow Analyser	SOIL - EK028SF (Solids) Weak Acid Dissociable Cyanide By Segmented	SOIL - EP071/80 WA WASTE TRH(V)/BTEXN Standard Limits of Reporting WA	SOIL - EP071-SV ESL TRH(SV) Standard Limits of Reporting	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - EP075 SIM Phenols only SIM - Phenols only	SOIL - EP075(SIM) WA WASTE SIM - Phenols/PAH WA Waste Classification
EP2113053-002	27-Oct-2021 00:00	SS02	✓	✓	✓	✓	✓	✓	✓
EP2113053-008	27-Oct-2021 00:00	SS08	✓	✓	✓	✓	✓	✓	✓
EP2113053-014	27-Oct-2021 00:00	SS14	✓	✓	✓	✓	✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - ED040T Sulfate Total
EP2113053-002	27-Oct-2021 00:00	SS02	✓
EP2113053-008	27-Oct-2021 00:00	SS08	✓
EP2113053-014	27-Oct-2021 00:00	SS14	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-03T 15 Metals (Total) (NEPM)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP2113053-017	27-Oct-2021 00:00	RB1	✓	✓	
EP2113053-018	27-Oct-2021 00:00	TB1			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ANDREW BREED

- A4 - AU Tax Invoice (INV)	Email	admin@environmentalsiteservices.com.au

David Boyd

- *AU Certificate of Analysis - NATA (COA)	Email	dboyd@envss.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	dboyd@envss.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	dboyd@envss.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	dboyd@envss.com.au
- A4 - AU Tax Invoice (INV)	Email	dboyd@envss.com.au
- Chain of Custody (CoC) (COC)	Email	dboyd@envss.com.au
- EDI Format - ESDAT (ESDAT)	Email	dboyd@envss.com.au
- EDI Format - XTab (XTAB)	Email	dboyd@envss.com.au

Lab

- *AU Certificate of Analysis - NATA (COA)	Email	lab@envss.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lab@envss.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lab@envss.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lab@envss.com.au
- Chain of Custody (CoC) (COC)	Email	lab@envss.com.au
- EDI Format - ESDAT (ESDAT)	Email	lab@envss.com.au
- EDI Format - XTab (XTAB)	Email	lab@envss.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2113344**	Page	: 1 of 4
Client	: **ENVIRONMENTAL SITE SERVICES**	Laboratory	: Environmental Division Perth
Contact	: David Boyd	Contact	: Customer Services EP
Address	: 10/31 STANLEY STREET SCARBOROUGH PERTH, WESTERN AUSTRALIA 6019	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: 0011395 Inglewood	Date Samples Received	: 02-Nov-2021 09:50
Order number	: ----	Date Analysis Commenced	: 04-Nov-2021
C-O-C number	: ----	Issue Date	: 08-Nov-2021 17:23
Sampler	: DB		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 4		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Daniel Fisher	Inorganics Analyst	Perth ASS, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- This W/O is a re-batch of EP2113344
- EA029 (SPOCAS): Titratable Peroxide Acidity (23B) LCS recovery falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.
- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime ($CaCO_3$) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m3 in-situ soil, multiply reported results x wet bulk density of soil in t/m3.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SP01	SP03	----	----	----
			Sampling date / time	01-Nov-2021 00:00	01-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EP2113344-001	EP2113344-003	--------	--------	--------
				Result	Result	----	----	----
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	**9.2**	**9.4**	----	----	----
pH OX (23B)	----	0.1	pH Unit	**7.2**	**7.2**	----	----	----
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	----	----	----
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	----	----	----
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	----	----	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.005	% pyrite S	<0.005	<0.005	----	----	----
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.005	% pyrite S	<0.005	<0.005	----	----	----
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.005	% pyrite S	<0.005	<0.005	----	----	----
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.005	% S	<0.005	<0.005	----	----	----
Peroxide Sulfur (23De)	----	0.005	% S	**0.006**	<0.005	----	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.005	% S	<0.005	<0.005	----	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	5	mole H+ / t	<5	<5	----	----	----
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.005	% Ca	**0.088**	**0.083**	----	----	----
Peroxide Calcium (23Wh)	----	0.005	% Ca	**0.110**	**0.090**	----	----	----
Acid Reacted Calcium (23X)	----	0.005	% Ca	**0.022**	**0.007**	----	----	----
acidity - Acid Reacted Calcium (a-23X)	----	5	mole H+ / t	**11**	<5	----	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.005	% S	**0.018**	**0.006**	----	----	----
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.005	% Mg	<0.005	<0.005	----	----	----
Peroxide Magnesium (23Tm)	----	0.005	% Mg	<0.005	<0.005	----	----	----
Acid Reacted Magnesium (23U)	----	0.005	% Mg	<0.005	<0.005	----	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	5	mole H+ / t	<5	<5	----	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.005	% S	<0.005	<0.005	----	----	----
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3	**0.256**	**0.181**	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	**51**	**36**	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S	**0.082**	**0.058**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SP01	SP03	----	----	----
			Sampling date / time	01-Nov-2021 00:00	01-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EP2113344-001	EP2113344-003	--------	--------	--------
				Result	Result	----	----	----
EA029-F: Excess Acid Neutralising Capacity - Continued								
EA029-H: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	**1.5**	**1.5**	**----**	**----**	**----**
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	**----**	**----**	**----**
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	**----**	**----**	**----**
Liming Rate	----	1	kg CaCO3/t	<1	<1	**----**	**----**	**----**
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	<0.02	**----**	**----**	**----**
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	<10	**----**	**----**	**----**
Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	<1	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2113344**	Page	: 1 of 4
Client	: **ENVIRONMENTAL SITE SERVICES**	Laboratory	: Environmental Division Perth
Contact	: David Boyd	Contact	: Customer Services EP
Address	: 10/31 STANLEY STREET SCARBOROUGH PERTH, WESTERN AUSTRALIA 6019	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: 0011395 Inglewood	Date Samples Received	: 02-Nov-2021
Order number	: ----	Date Analysis Commenced	: 04-Nov-2021
C-O-C number	: ----	Issue Date	: 08-Nov-2021
Sampler	: DB		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 4		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Daniel Fisher	Inorganics Analyst	Perth ASS, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA029-A: pH Measurements (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: pH KCl (23A)	----	0.1	pH Unit	9.2	9.2	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	7.2	7.1	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.005	<0.005	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.005	<0.005	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.005	<0.005	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EA029-C: Sulfur Trail (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.005	<0.005	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.006	0.006	0.0	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.005	<0.005	0.0	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<5	<5	0.0	No Limit
EA029-D: Calcium Values (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.088	0.090	1.7	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.110	0.110	0.0	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	0.022	0.020	9.1	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.018	0.016	9.0	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	11	10	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA029-E: Magnesium Values (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.005	<0.005	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.005	<0.005	0.0	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.005	<0.005	0.0	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.005	<0.005	0.0	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<5	<5	0.0	No Limit
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	0.256	0.200	24.4	0% - 50%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	0.082	0.064	24.4	No Limit
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	51	40	24.4	No Limit
EA029-H: Acid Base Accounting (QC Lot: 3998181)									
EP2113344-001	SP01	EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA029-A: pH Measurements (QCLot: 3998181)								
EA029: pH KCl (23A)	----	----	pH Unit	----	5.047 pH Unit	97.9	94.3	105
EA029: pH OX (23B)	----	----	pH Unit	----	3.5615 pH Unit	104	91.7	120
EA029-B: Acidity Trail (QCLot: 3998181)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	22.26 mole H+ / t	94.0	80.4	108
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	55.0798 mole H+ / t	# 126	91.1	117
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 3998181)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.05325 % S	95.0	75.8	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.158 % S	86.6	81.7	122
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 3998181)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.22305 % Ca	86.2	84.5	128
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.2064 % Ca	94.4	82.6	119
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 3998181)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.1208 % Mg	77.6	77.5	120
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.18219 % Mg	95.9	80.6	111
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2113344**	Page	: 1 of 4
Client	: **ENVIRONMENTAL SITE SERVICES**	Laboratory	: Environmental Division Perth
Contact	: David Boyd	Telephone	: +61-8-9406 1301
Project	: 0011395 Inglewood	Date Samples Received	: 02-Nov-2021
Site	: ----	Issue Date	: 08-Nov-2021
Sampler	: DB	No. of samples received	: 4
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EA029-B: Acidity Trail	QC-3998181-002	----	**Titratable Peroxide Acidity (23G)**	----	126 %	91.1-117%	**Recovery greater than upper control limit**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-B: Acidity Trail							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-C: Sulfur Trail							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-D: Calcium Values							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-E: Magnesium Values							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-F: Excess Acid Neutralising Capacity							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-G: Retained Acidity							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓
EA029-H: Acid Base Accounting							
80* dried soil (EA029)							
SP01, SP03	**01-Nov-2021**	**04-Nov-2021**	27-Jul-2024	✓	**05-Nov-2021**	02-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.

Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house

Environmental Site Services

Consigning Office: Environmental Site Services, 43 Scilla Ave, Burswood

Report Results to: lab@envss.com.au Phone: Email:

Report Results to: dboyd@envss.com.au Phone: Email:

Invoices to: dboyd@envss.com.au Phone: Email:

Project No. 0011406 Task No:

Project Name: Rockingham Laboratory: ALS / Eurofins

Sampler's Name: DB Project Manager: DB

Special Instructions: Please forward sample QC1A to Eurofins Laboratory

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-a-T (specify)	Suite: P15/4 Screen	Suite: P15/S	Suite: 5a TRH/BTEXN	Suite: S3: 8S Metals	Suite: S1b TRH/BTEXN	Suite: S1 TRH/BTEXN	Suite M13: 13 Metals	Notes
	SS01	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS02	27/10/2021	AM	S	NP	5 DAY	X							No asbestos analysis please
	SS03	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS04	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS05	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS06	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS07	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS08	27/10/2021	AM	S	NP	5 DAY	X							No asbestos analysis please
	SS09	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS10	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS11	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS12	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS13	27/10/2021	AM	S	NP	5 DAY			X	X				
	SS14	27/10/2021	AM	S	NP	5 DAY	X							No asbestos analysis please
	SS15	27/10/2021	AM	S	NP	5 DAY			X	X				
	QC1	27/10/2021	AM	S	NP	5 DAY			X	X				
	QC1A	27/10/2021	AM	S	NP	5 DAY						X	X	Please forward to Eurofins Laboratory
	RB1	27/10/2021	AM	W	HC	5 DAY			X	X				
	TB1	27/10/2021	AM	W	H	5 DAY					X			
						TOTAL	3	0	14	14	1	1	1	

27/10/21 16:00

14.9

14.2

14.50

RELINQUISHED BY		RECEIVED BY	
Name: Darcy Boyd	Date: 27/10/2021	Name: Rob Johnston	Date: 28/10/21
Company: ENVSS	Time PM	Company: Eurofins	Time: 8:05
Name	Date:	Name:	Date:
Company:	Time:	Company:	Time:

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, M - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ✓

All Documentation is in Proper Order ✓

Samples Received Properly Chilled ✓

Lab Ref/Batch No 837050

Environmental Site Services
43 Stiles Ave
Burswood
WA 6100

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Darcy Boyd**

Report **837050-S**
Project name ROCKINGHAM
Project ID 11406
Received Date Nov 01, 2021

Client Sample ID			**QC1A**
Sample Matrix			**Soil**
Eurofins Sample No.			**L21-No03441**
Date Sampled			**Oct 27, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	118
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Chromium (hexavalent)	1	mg/kg	< 1
% Moisture	1	%	4.0
Heavy Metals			
Arsenic	2	mg/kg	6.5
Beryllium	2	mg/kg	< 2
Boron	10	mg/kg	< 10
Cadmium	0.4	mg/kg	< 0.4
Cobalt	5	mg/kg	< 5
Copper	5	mg/kg	< 5
Lead	5	mg/kg	< 5
Manganese	5	mg/kg	40

Client Sample ID			QC1A
Sample Matrix			**Soil**
Eurofins Sample No.			**L21-No03441**
Date Sampled			**Oct 27, 2021**
Test/Reference	LOR	Unit	
Heavy Metals			
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Selenium	2	mg/kg	< 2
Zinc	5	mg/kg	< 5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Nov 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Chromium (hexavalent)	Melbourne	Nov 05, 2021	28 Days
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Heavy Metals	Melbourne	Nov 05, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Nov 02, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Environmental Site Services (AUST) P/L
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WA 6100

Project Name: ROCKINGHAM
Project ID: 11406

Order No.:
Report #: 837050
Phone: (08) 9355 4010
Fax:

Received: Nov 1, 2021 4:06 PM
Due: Nov 8, 2021
Priority: 5 Day
Contact Name: Darcy Boyd

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						NEPM 2013 Metals : Metals M13	Moisture Set	Eurofins Suite B1
Perth Laboratory - NATA # 2377 Site # 2370								
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QC1A	Oct 27, 2021		Soil	L21-No03441	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	97			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	115			70-130	Pass	
m&p-Xylenes	%	107			70-130	Pass	
Xylenes - Total*	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	%	114			70-130	Pass	
TRH C6-C10	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	96			70-130	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	95			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	114			80-120	Pass	
Beryllium	%	89			80-120	Pass	
Boron	%	104			80-120	Pass	
Cadmium	%	112			80-120	Pass	
Cobalt	%	115			80-120	Pass	
Copper	%	117			80-120	Pass	
Lead	%	116			80-120	Pass	
Manganese	%	118			80-120	Pass	
Mercury	%	114			80-120	Pass	
Nickel	%	109			80-120	Pass	
Selenium	%	111			80-120	Pass	
Zinc	%	109			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M21-No01801	NCP	%	82			70-130	Pass	
TRH C10-C14	M21-No01802	NCP	%	127			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M21-No01801	NCP	%	98			70-130	Pass	
Toluene	M21-No01801	NCP	%	84			70-130	Pass	
Ethylbenzene	M21-No01801	NCP	%	87			70-130	Pass	
m&p-Xylenes	M21-No01801	NCP	%	86			70-130	Pass	
o-Xylene	M21-No01801	NCP	%	79			70-130	Pass	
Xylenes - Total*	M21-No01801	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M21-No01801	NCP	%	90			70-130	Pass	
TRH C6-C10	M21-No01801	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M21-No01802	NCP	%	125			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M21-No02339	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M21-No01216	NCP	%	100			75-125	Pass	
Beryllium	M21-No01216	NCP	%	84			75-125	Pass	
Boron	M21-No01216	NCP	%	92			75-125	Pass	
Cadmium	M21-No01216	NCP	%	91			75-125	Pass	
Cobalt	M21-No01216	NCP	%	97			75-125	Pass	
Copper	M21-No01216	NCP	%	106			75-125	Pass	
Lead	M21-No01216	NCP	%	103			75-125	Pass	
Manganese	M21-Oc64808	NCP	%	114			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	M21-No01216	NCP	%	108			75-125	Pass	
Nickel	M21-No01216	NCP	%	121			75-125	Pass	
Selenium	M21-No01216	NCP	%	97			75-125	Pass	
Zinc	M21-No01216	NCP	%	108			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M21-No16734	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M21-No01797	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M21-No01797	NCP	mg/kg	100	120	15	30%	Pass	
TRH C29-C36	M21-No01797	NCP	mg/kg	89	55	48	30%	Fail	Q15
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M21-No16734	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M21-No16734	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M21-No16734	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M21-No16734	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M21-No16734	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M21-No16734	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M21-No16734	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M21-No16734	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M21-No01797	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M21-No01797	NCP	mg/kg	160	150	5.0	30%	Pass	
TRH >C34-C40	M21-No01797	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M21-Oc65403	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
% Moisture	M21-No03149	NCP	%	16	16	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M21-Oc65586	NCP	mg/kg	8.6	7.9	8.0	30%	Pass	
Beryllium	M21-Oc65586	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M21-Oc65586	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M21-Oc65586	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Cobalt	M21-Oc65586	NCP	mg/kg	15	15	<1	30%	Pass	
Copper	M21-Oc65586	NCP	mg/kg	16	16	3.0	30%	Pass	
Lead	M21-Oc65586	NCP	mg/kg	27	28	4.0	30%	Pass	
Manganese	M21-Oc65586	NCP	mg/kg	55	61	10	30%	Pass	
Mercury	M21-Oc65586	NCP	mg/kg	0.1	0.2	13	30%	Pass	
Nickel	M21-Oc65586	NCP	mg/kg	32	29	11	30%	Pass	
Selenium	M21-Oc65586	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Zinc	M21-Oc65586	NCP	mg/kg	46	45	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Robert Johnston	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)
Vivian Wang	Senior Analyst-Volatile (VIC)



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Appendix E. QAQC Results Summary Tables

ENVSS Reference: 0011406

QAQC Summary Table: RPD Calculations

	Lab Report Number		EP2113053	EP2113053		EP2113053	837050	
	Field ID		SS01	QC1		SS01	QC1A	
	Date		10/27/2021	10/27/2021		10/27/2021	10/27/2021	
	Matrix Type		Soil	Soil	RPD	Soil	Soil	RPD
	Unit	EQL						
BTEX								
Naphthalene (VOC)	mg/kg	0.5					<0.5	
Benzene	mg/kg	0.1	<0.2	<0.2	0	<0.2	<0.1	0
Toluene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.1	0
Ethylbenzene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.1	0
Xylene (m & p)	mg/kg	0.2	<0.5	<0.5	0	<0.5	<0.2	0
Xylene (o)	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.1	0
Xylene Total	mg/kg	0.3	<0.5	<0.5	0	<0.5	<0.3	0
Total BTEX	mg/kg	0.2	<0.2	<0.2	0	<0.2		
TRH								
C6-C10 Fraction (F1)	mg/kg	10	<10	<10	0	<10	<20	0
C6-C10 (F1 minus BTEX)	mg/kg	10	<10	<10	0	<10	<20	0
>C10-C16 Fraction (F2)	mg/kg	50	<50	<50	0	<50	<50	0
>C10-C16 Fraction (F2 minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0
>C16-C34 Fraction (F3)	mg/kg	100	<100	<100	0	<100	<100	0
>C34-C40 Fraction (F4)	mg/kg	100	<100	<100	0	<100	<100	0
>C10-C40 Fraction (Sum)	mg/kg	50	<50	<50	0	<50	<100	0
Inorganics								
Moisture Content	%	1	3.7	3.8	3	3.7		
Moisture Content (dried @ 103°C)	%	1					4.0	
Metals								
Arsenic	mg/kg	2	5	6	18	5	6.5	26
Barium	mg/kg	10	<10	<10	0	<10		
Beryllium	mg/kg	1	<1	<1	0	<1	<2	0
Boron	mg/kg	10	<50	<50	0	<50	<10	0
Cadmium	mg/kg	0.4	<1	<1	0	<1	<0.4	0
Chromium (hexavalent)	mg/kg	1					<1	
Chromium (III+VI)	mg/kg	2	8	9	12	8		
Cobalt	mg/kg	2	<2	<2	0	<2	<5	0
Copper	mg/kg	5	<5	<5	0	<5	<5	0
Lead	mg/kg	5	<5	<5	0	<5	<5	0
Manganese	mg/kg	5	15	13	14	15	40	91
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	2	<2	<2	0	<2	<5	0
Selenium	mg/kg	2	<5	<5	0	<5	<2	0
Vanadium	mg/kg	5	<5	5	0	<5		
Zinc	mg/kg	5	<5	<5	0	<5	<5	0
PAH								
Naphthalene	mg/kg	1	<1	<1	0	<1		
TPH								
C6-C9 Fraction	mg/kg	10	<10	<10	0	<10	<20	0
C10-C14 Fraction	mg/kg	20	<50	<50	0	<50	<20	0
C15-C28 Fraction	mg/kg	50	<100	<100	0	<100	<50	0
C29-C36 Fraction	mg/kg	50	<100	<100	0	<100	<50	0
C10-C36 Fraction (Sum)	mg/kg	50	<50	<50	0	<50	<50	0

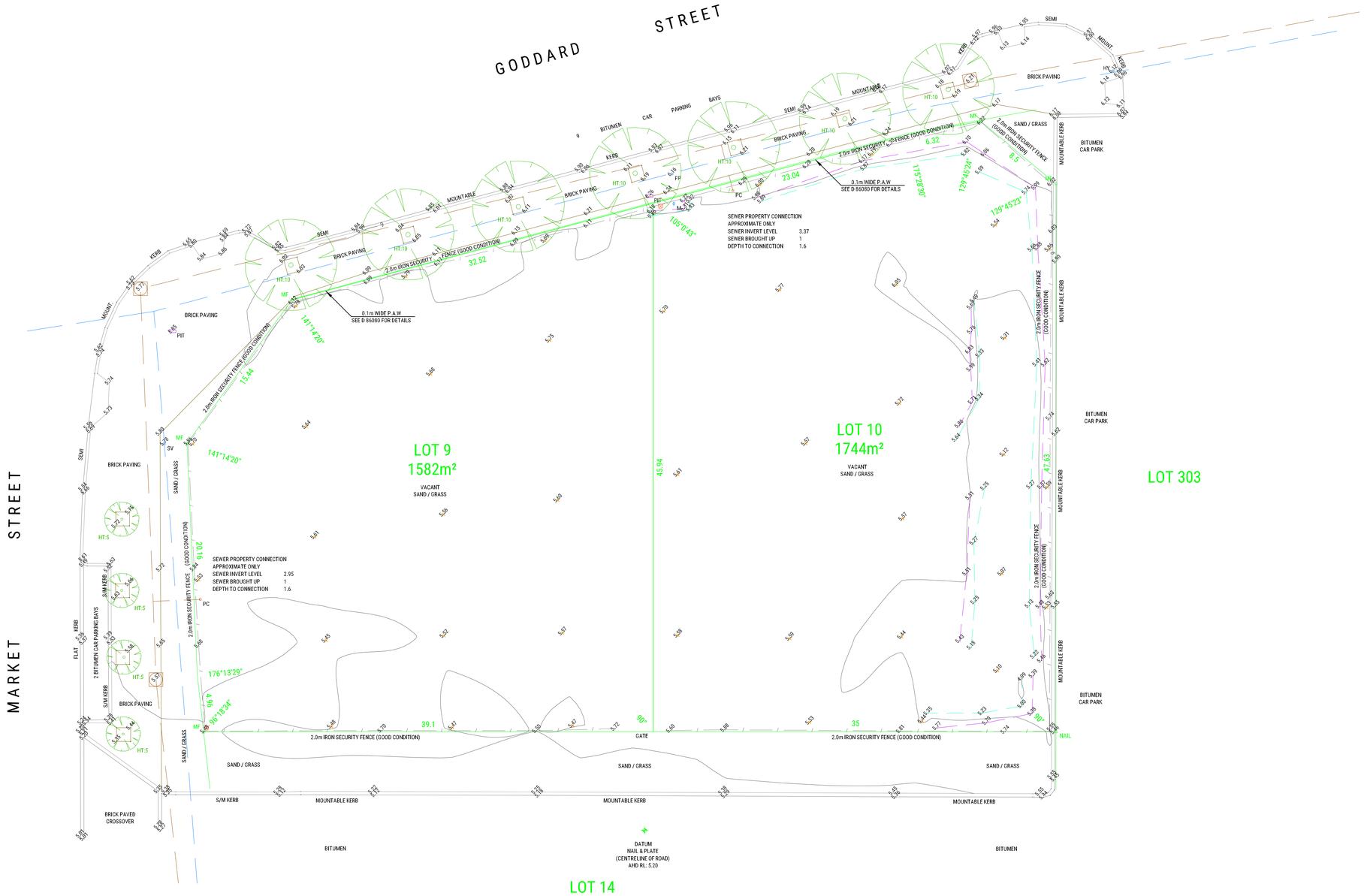
***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

		Lab Report Number	**EP2113053**	**EP2113053**
		Date	**10/27/2021**	**10/27/2021**
		Matrix Type	**Water**	**Water**
	Unit	EQL		
BTEX				
Benzene	**µg/L**	1	<1	<1
Toluene	**µg/L**	2	<2	<2
Ethylbenzene	**µg/L**	2	<2	<2
Xylene (m & p)	**µg/L**	2	<2	<2
Xylene (o)	**µg/L**	2	<2	<2
Xylene Total	**µg/L**	2	<2	<2
Total BTEX	**µg/L**	1	<1	<1
TRH				
C6-C10 Fraction (F1)	**µg/L**	20	<20	<20
C6-C10 (F1 minus BTEX)	**µg/L**	20	<20	<20
>C10-C16 Fraction (F2)	**µg/L**	100	<100	
>C10-C16 Fraction (F2 minus Naphthalene)	**µg/L**	100	<100	
>C16-C34 Fraction (F3)	**µg/L**	100	<100	
>C34-C40 Fraction (F4)	**µg/L**	100	<100	
>C10-C40 Fraction (Sum)	**µg/L**	100	<100	
Metals				
Arsenic	**mg/L**	0.001	<0.001	
Barium	**mg/L**	0.001	<0.001	
Beryllium	**mg/L**	0.001	<0.001	
Boron	**mg/L**	0.05	<0.05	
Cadmium	**mg/L**	0.0001	<0.0001	
Chromium (III+VI)	**mg/L**	0.001	<0.001	
Cobalt	**mg/L**	0.001	<0.001	
Copper	**mg/L**	0.001	<0.001	
Lead	**mg/L**	0.001	<0.001	
Manganese	**mg/L**	0.001	<0.001	
Mercury	**mg/L**	0.0001	<0.0001	
Nickel	**mg/L**	0.001	<0.001	
Selenium	**mg/L**	0.01	<0.01	
Vanadium	**mg/L**	0.01	<0.01	
Zinc	**mg/L**	0.005	<0.005	
PAH				
Naphthalene	**µg/L**	5	<5	<5
TPH				
C6-C9 Fraction	**µg/L**	20	<20	<20
C10-C14 Fraction	**µg/L**	50	<50	
C15-C28 Fraction	**µg/L**	100	<100	
C29-C36 Fraction	**µg/L**	50	<50	
C10-C36 Fraction (Sum)	**µg/L**	50	<50	

Appendix G. Surve. Plans



NOTE:
LOT 9 C/T: 2018/335
LOT 10 C/T: 2018/336

CLIENT :			
LOT : LOT 9 & 10 (#5) MARKET STREET			
SUBURB: ROCKINGHAM		AUTHORITY: CITY OF ROCKINGHAM	
PLAN: D 86080	C/T: SEE NOTE	SURVEYED BY: MC	ON: 11/10/21
DRAWN BY: MC	ON: 15/10/21	HOR DATUM: LOCAL	VERT DATUM: AHD
SCALE: 1:200 AT A1 LANDSCAPE	0 2.5 5 10 15		

CARLTON SURVEYS
SUITE 4, 160 BURSWOOD ROAD,
BURSWOOD, W.A., 6100.
TEL 9361 5358 FAX 9361 3457
E-mail : carlton@carlton-surveys.com.au

JOB NUMBER: 16098 & 16099	DRAWING NUMBER: 001	REV: A

NOTES: SITE SURVEY only. The information shown on this plan is current as at the date of survey. Boundary information, easements etc. to be verified from the Certificate of Title, Plan / Diagram or a Boundary Regeg. Boundary position approximate only. Location of boundary pegs or fences in relation to the boundary lines are not guaranteed. Sewer / Drainage may vary from schematic presentation, clearances to be checked on site. Services information to be confirmed with relevant AUTHORITIES. For underground services - ring "DIAL BEFORE YOU DIG" for confirmation of those services.

N

NOTE:
AHD LEVEL DERIVED FROM STANDARD SURVEY MARK ROC 181A

WARNING!
BOUNDARY RE-ESTABLISHMENT SURVEY REQUIRED TO CONFIRM LOT BOUNDARY POSITION AND DIMENSIONS.

SERVICE LEGEND

DRAINAGE
- COMBO PIT
- GRATE
- SIDE ENTRY PIT
- STORM WATER MANHOLE

ELECTRICITY
- CABLE MANHOLE
- CABLE PIT / BOX — ECP, ECB
- CABLE DOME
- CONSUMER POLE — CP
- LIGHT POLE — LP
- POWER POLE — PP
- STAY POLE — SP
- STAY WIRE ANCHOR — SWA
- O/H POWER LINE

GAS
- GAS MANHOLE
- GAS MARKER — G
- GAS METER — GM
- GAS VALVE — GV

SEWERAGE
- SEWER MANHOLE
- PROPERTY CONNECTION — PC
- SEWER LINE

TELECOMMUNICATION
- TEL / COMMS MANHOLE
- TEL / COMMS MARKER — T, C
- TEL / COMMS PIT — PIT, COM

WATER
- FLUSH POINT — FP
- HYDRANT — HY
- STOP VALVE — SV
- TAP — TAP
- WATER MARKER — W
- WATER METER — M
- WATER LINE

SURVEY
- DATUM
- MARK FOUND — MF

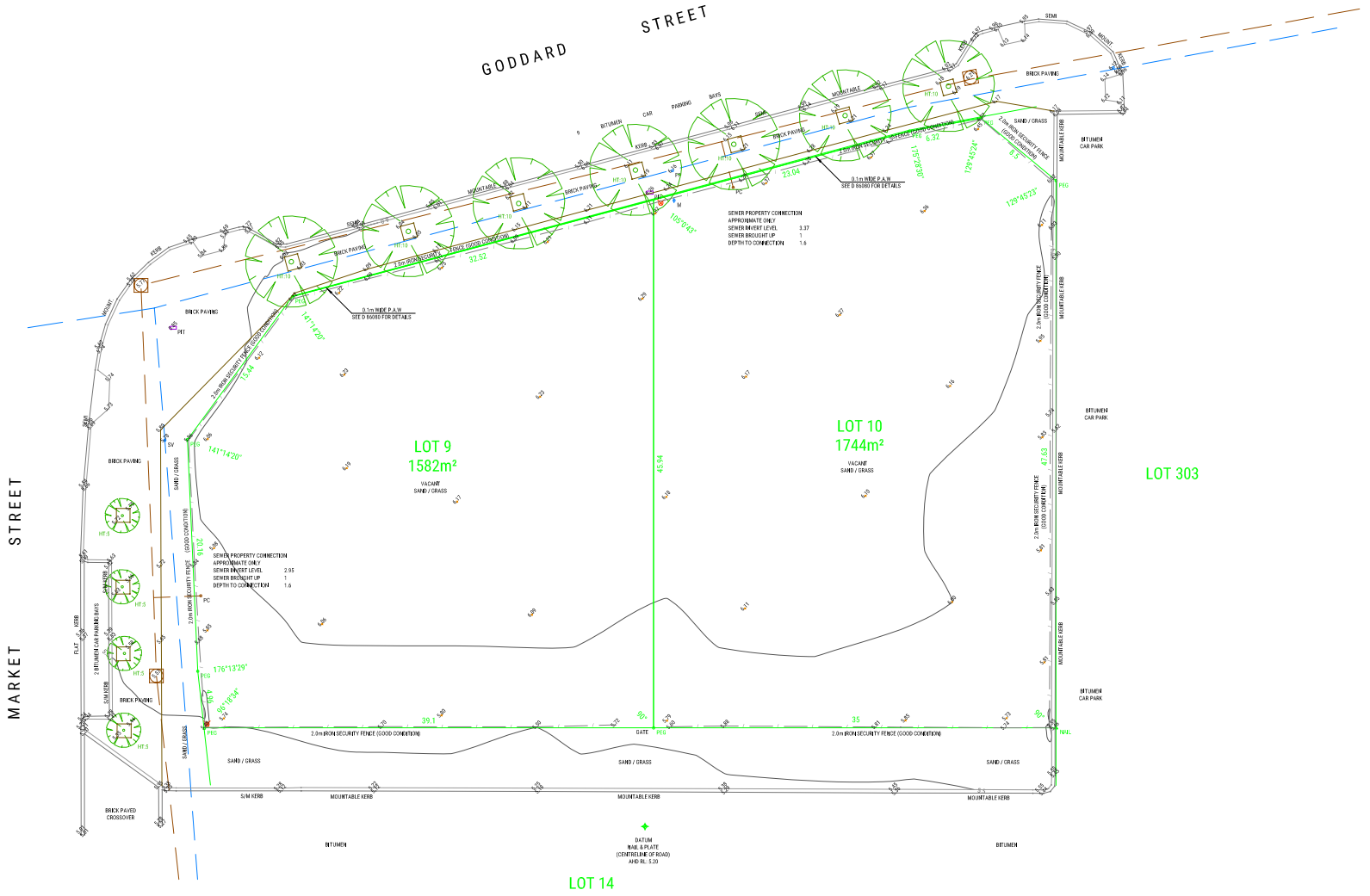
OTHER
- AWNING / EAVES
- ROOF RIDGE
- FLOOR RL
- WINDOW — 1ST
- BANK - BOTTOM
- BANK - TOP

SERVICE RECORD

SERVICE \ STATUS	LOCATED	AVAILABLE	NO SERVICE	CONFIRM
WATER	✓			
SEWERAGE	✓			
GAS		✓		✓
TEL / COMM	✓			
POWER U/G	✓			
POWER O/H				

SERVICES MARKED CONFIRM PLUMB. BUILDER / CLIENT TO CONFIRM POSITION AND / OR AVAILABILITY ON SITE.

SEWER AND WATER INFORMATION SHOWN HAS BEEN TAKEN FROM THE WATER CORP. ONLINE DATABASE.



NOTE:
LOT 9 C/T: 2018/335
LOT 10 C/T: 2018/336

CLIENT :			
LOT : LOT 9 & 10 (#5) MARKET STREET			
SUBURB: ROCKINGHAM		AUTHORITY: CITY OF ROCKINGHAM	
PLAN: D 86080	C/T: SEE NOTE	SURVEYED BY: MC ON: 8/11/21	
DRAWN BY: MC ON: 18/11/21	HOR DATUM: LOCAL	VERT DATUM: AHD	
SCALE: 1:200 AT A1 LANDSCAPE	0 2.5 5 10 15		

C|S CARLTON SURVEYS
SUITE 4, 160 BURSWOOD ROAD,
BURSWOOD, W.A., 6100.
TEL 9361 5358 FAX 9361 3457
E-mail : carlton@carlton-surveys.com.au

JOB NUMBER: 16111	DRAWING NUMBER: 002	REV: A

NOTES: SITE SURVEY only. The information shown on this plan is current as at the date of survey. Boundary information, easements etc. to be verified from the Certificate of Title / Plan / Diagram or a Boundary Survey. Boundary points approximate only. Location of boundary pegs or fences in relation to the boundary lines are not guaranteed. Sewer / Drainage may vary from schematic presentation, dimensions to be checked on site. Services information to be confirmed with relevant AUTHORITIES. For underground services - any TIAL BEFORE YOU DIG for confirmation of those services.

NOTE:
AHD LEVEL DERIVED FROM STANDARD SURVEY MARK ROC 181A

NOTE: CADASTRAL CONNECTION HAS BEEN MADE. BOUNDARY LINES SHOWN ARE TRUE POSITIONS.

SERVICE LEGEND

DRAINAGE
COMBO PIT
GRATE
SIDE ENTRY PIT
STORM WATER MANHOLE

ELECTRICITY
CABLE MANHOLE
CABLE PIT / BOX (EP, EB)
CABLE DOME
CONSUMER POLE (CP)
LIGHT POLE (LP)
POWER POLE (PP)
STAY POLE (SP)
STAY WIRE ANCHOR (SWA)
O/H POWER LINE

GAS
GAS MANHOLE
GAS MARKER (G)
GAS METER (GM)
GAS VALVE (GV)

SEWERAGE
SEWER MANHOLE
PROPERTY CONNECTION (PC)
SEWER LINE

TELECOMMUNICATION
TEL / COMMS MANHOLE
TEL / COMMS MARKER (T, C)
TEL / COMMS PIT (PIT, COM)

WATER
FLUSH POINT (FP)
HYDRANT (HY)
STOP VALVE (SV)
TAP (TAP)
WATER MARKER (W)
WATER METER (M)
WATER LINE

SURVEY
DATUM
PEG FOUND (PF)

OTHER
AWNING / EAVES
ROOF RIDGE
FLOOR RL
WINDOW (1ST)
BANK - BOTTOM
BANK - TOP

SERVICE RECORD

SERVICE	STATUS: LOCATED	AVAILABLE	NO SERVICE	CONFIRM
WATER	✓			
SEWERAGE	✓			
GAS	✓	✓		✓
TEL / COMM	✓			
POWER U/E	✓			
POWER O/H				

SERVICES MARKED CONFIRM REQUIRE BUILDER / CLIENT TO CONFIRM POSITION AND / OR AVAILABILITY OF TAIL

SEWER AND WATER INFORMATION SHOWN HAS BEEN TAKEN FROM THE WATER CORP. ONLINE DATABASE.

Appendix H. Airborne Fibre Monitoring Report

McNicholl Rockingham Pty Ltd

Airborne Fibre Monitoring Report

Lots 9 & 10 Goddard Street, Rockingham

27 Oct 2021

Prepared for:	**McNicholl Rockingham Pty Ltd**
Reference:	**envss-env-afm-0011310-2-20211021**
Prepared by:	**Environmental Site Services (AUS)** **T/A Environmental Site Services** **ABN: 33590521277** **ACN: 168142247** **Office: 43 Stiles Avenue, Burswood WA 6100** **Postal: PO Box 440, Wembley WA 6913** **P: (08) 9355 4010** **Email: admin@envss.com.au** **Web: www.environmentalsiteservices.com.au**

27 Oct 2021

Reference: envss-env-afm-0011310-2-20211021

Colin Jackson
McNicholl Rockingham Pty Ltd
P: work:0418 791 591
E: work:jacksoncorp@bigpond.com

Subject: Airborne Fibre Monitoring at Lots 9 & 10 Goddard Street, Rockingham

Dear Colin,

Environmental Site Services attended the subject Site to conduct Respirable Airborne Fibre Monitoring for the following task(s):

- Airborne Fibre Monitoring during the installation of remedial capping layer.

Airborne fibre monitors were set in accordance with the*Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres* [NOHSC:3003(2005)]. Using the Membrane Filter Method, fibres of a specific size were collected and counted by a NATA accredited laboratory.

Samples returned results of:

Control levels were <0.01 fibres/mL, therefore controls are considered to have been effective.

Please refer to Field Sampling Sheet and Chain of Custody for volume measurements, results, respirable fibre control levels and actions and Appendices A and B for laboratory report and location plan.

If you have any questions or require any further information please do not hesitate to contact me.

For and on behalf of Environmental Site Services.



Darcy Boyd
Environmental Scientist
Environmental Site Services

Field Sampling Sheet and Chain of Custody - Environmental Site Services

Environmental Site Services, 43 Stiles Avenue, Burswood WA 6100 - lab@envss.com.au **- 9355 4010**

Job Number	envss-env-afm-0011310-2-20211021	**Result Interpretation**	
Site Project	Lots 9 & 10 Goddard Street, Rockingham	**Airborne Asbestose fibres/mL**	**Control/Action**
Test Protocol:	Control Monitoring	<0.01	Continue with implemented controls
Sample Media:	Asbestos Cowl 25mm Exposed Filter Dia 22.1mm	>=0.01	Review control measures
Sampled by:	Darcy Boyd	>=0.02	Stop removal works and find the cause
Flowmeter No.	FR4A40BNBN-NL-02	**Occupational Exposure Level TWA (Airborne Asbestos fibres/mL)**	
Date Sampled:	21 Oct 2021 7:22 AM	**>=0.1**	

Cowl No.	Sample No.	Pump No.	START		FINISH		Sample time (mins)	Sample vol. (lts)	Sample Location	Fibre Count	Fibres/mL
			Time	Rate (Lpm)	Time	Rate (Lpm)					
ESSA1150	0	n/a	21/10/2021 00:00	n/a	21/10/2021 00:00	n/a	0	0	0-Field Blank	0.0/100	-
ESSA1137	1	85030 (4)	21/10/2021 07:22	1.6	21/10/2021 15:18	1.6	476	761.6	1- Northern Boundary	1.0/100	< 0.01
ESSA1138	2	75647 (XR-11)	21/10/2021 07:22	1.6	21/10/2021 15:24	1.6	482	771.2	2- Eastern Boundary	0.0/100	< 0.01
ESSA1139	3	84402	21/10/2021 07:34	1.6	21/10/2021 15:28	1.6	474	758.4	3- Southern Boundary	0.0/100	< 0.01
ESSA1140	4	75600 (XR-09)	21/10/2021 07:36	1.6	21/10/2021 15:32	1.6	476	761.6	4- Western Boundary	0.0/100	< 0.01

Date Samples Submitted:	21 Oct 2021		
Date sample analysis requested by:	22 Oct 2021	**Time sample analysis requested by:**	7:00
Analysis Required:	Guidance Note on the Membrane Filter method for Estimating Airborne Asbestos Fibres [NOHSC:3003(2005)]		
Submitted by:	Darcy Boyd		
Signature:			

Notes: Samples taken as specified in NOHSC:3003(2005) and Lifetree Environmental Pty Ltd in-house Procedures Manual 3.

Appendix A – Laboratory Report

Lifetree Environmental Pty Ltd

[illegible]
Phone: 08 9314 7467
Fax: 08 6121 0929
Email: admin@lifetreeenvironmental.com.au
www.lifetreeenvironmental.com.au

CERTIFICATE OF FIBRE COUNTING

Client: Environmental Site Services
Contact Name: John Breed
Client Address: 43 Stiles Ave, Burswood WA 6100
Contact No.: 08 9355 6010
Email: admin@envss.com.au

Certificate No.: AT4829 **(Issue Date:** 22.10.21)
Date Sampled: 21.10.21
Sampled by: Darcy Boyd
Date Received: 22.10.21
Date Analysed: 22.10.21

Description and Condition of the sample(s) received: *5 sampling cowls which contain 25mm cellulometer filter received in good condition from the client.*
Test Method: *Filters examined at Lifetree Environmental Pty Ltd's laboratory as specified in NOHSC:3003 (2005) and Lifetree Environmental Pty Ltd in-house Procedures Manual 8.*

Notes: *The results contained within this report relate only to sample(s) submitted for testing, in the condition received at the laboratory. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA does not accredit sampling.*
NATA endorsement is only applicable to the fibre counting (fibres/ Fields) and not the fibre concentration (Fibres/mL).
Please note that tests not covered by NATA are denoted with ^.

Job Number: ENVSS-HAZ-AFM-0011310-2-20211021

Lab No.	Sample No.	Sample Description/ Location	Result (Fibres/ Fields)	*Concentration (Fibres/mL)
AT4829/01	ENVSSA1137	1 – Northern Boundary	1.0/100	<0.01
AT4829/02	ENVSSA1138	2 – Eastern Boundary	0/100	<0.01
AT4829/03	ENVSSA1139	3 – Southern Boundary	0/100	<0.01
AT4829/04	ENVSSA1140	4 – Western Boundary	0/100	<0.01
AT4829/05	ENVSSA1150	Field Blank	0/100	

Approved Analyst:
Name: H. Chang
Signature: _____

Approved Signatory:
Name: C. Tan
Signature: _____

NATA Accredited Laboratory Number: [illegible]

Appendix B – Site Plan



Appendix C – Definitions

Accredited Laboratory	means a testing laboratory accredited by the National Association of Testing Authorities, Australia (NATA) or a similar accreditation authority, or otherwise granted recognition by NATA, either solely or in conjunction with one or more other persons.
Air Monitoring	means airborne asbestos fibre sampling to assist in assessing exposures and the effectiveness of control measures. Air monitoring includes exposure monitoring, control monitoring and clearance monitoring. Note: Air monitoring should be undertaken in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003 (2005)] .
Airborne Asbestos Fibres	means any fibres of asbestos small enough to be made airborne. For the purposes of monitoring airborne asbestos fibres, only respirable asbestos fibres (those fibres less than 3 µm wide, more than 5 µm long and with a length to width ratio of more than 3 to 1) are counted. Note: Airborne asbestos fibres are generated by the mechanical disintegration of Asbestos-Containing Materials (ACM) and subsequent dispersion of the fibres into the air from activities such as mining and the use, removal and disposal of asbestos and ACM. Airborne dust has the potential to contain respirable asbestos fibres.
ALARP	means As Low As Reasonably Practicable. The exposure of workers and others to asbestos must be eliminated or otherwise kept as low as reasonably practicable, and in all circumstances must be kept below the NES.
Asbestos	means the fibrous form of mineral silicates belonging to the serpentine and amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophyllite, chrysotile (white asbestos), crocidolite (blue asbestos), tremolite, or any mixture containing one or more of the mineral silicates belonging to the serpentine and amphibole groups.
Asbestos-Containing Material (ACM)	means any material, object, product or debris that contains asbestos.
Analytical Blank (Field blank)	Analytical Blank means a filter that has had no air passed through it, generally selected at random from an unused batch of filters. The blank is analysed along with other sample filters to ensure that no unacceptable fibres as defined in this method are present on unused filters (see also Field Blank).

Asbestos Removalist	means a competent person who performs asbestos removal work Note: An asbestos removal licence is required in all State and Territory jurisdictions for the removal of friable ACM. Some States and Territories also require a licence for removal of specified quantities of ACM, regardless of whether they are friable, and relevant OHS authorities should be consulted prior to any removal work.
Bonded (Asbestos)	means asbestos-containing material which in its current form is bonded to another material, such as resin, cement, bitumen and is in a stable condition. Note: Bonded ACM may become friable due to weathering, mechanical action such as a result of removal methods. ds. Example: highly weathered asbestos cement roofing, the grinding of waterproof membranes and adhesives.
Friable (Asbestos)	means asbestos-containing material which, when dry, is or may become crumbled, pulverised or reduced to powder by hand pressure. Note: This may include ACM that have been subjected to conditions that leave them in a state where they meet the above definition, such as weathering, physical damage, water damage etc.
Membrane Filter Method (MFM)	means the technique outlined in the NOHSC Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003 (2005)]
National Exposure Standard (NES)	means an airborne concentration of a particular substance, within the worker's breathing zone, which according to current knowledge, should not cause adverse health effects or undue discomfort to nearly all workers. NES are established, from time to time, by the National Occupational Health and Safety Commission (NOHSC) and are published on the NOHSC website (see Appendix J). Note: The NES for all forms of asbestos is 0.1 fibres/mL of air, measured using the Membrane Filter Method (MFM).
Respirable Asbestos Fibre	means a fibre of asbestos small enough to penetrate into the gas exchange regions of the lungs. Respirable asbestos fibres are technically defined as fibres that are less than 3 µm wide, more than 5 µm in length and have a length to width ratio of more than 3 to 1.
Time Weighted Average (TWA)	TWA is the average exposure over a specified period, usually a nominal eight hours. This means that, for limited periods, a worker may be exposed to concentration excursions higher than the Permissible Exposure Limit, so long as the TWA is not exceeded and any applicable excursion limit is not exceeded.

Synthetic Mineral Fibre (SFM)	means a generic term used to collectively describe a number of amorphous (non-crystalline) fibrous materials including glassfibre, mineral wool and ceramic fibre.
Breathing zone	means a hemisphere of 300 mm radius extending in front of a person's face and measured from the midpoint of an imaginary line joining the ears. Breathing zone samples are usually obtained by fastening a filter holder to a jacket lapel of the worker.
Control Monitoring	means monitoring using static or positional samples to measure the level of a hazardous substance in an area. Control monitoring is designed to assist in assessing the effectiveness of implemented control measures. Control monitoring is not representative of actual occupational exposures and should not be used for that purpose.
Exposure Monitoring	means monitoring in a persons breathing zone to measure their likely exposure to a hazardous substance. Exposure monitoring is designed to reliably estimate exposure so that it can be compared with the occupational exposure standard or provide an estimate of a persons exposure.
Clearance Monitoring	Clearance monitoring means air monitoring using static or positional samples to measure the level of airborne asbestos fibres in, and immediately surrounding, an asbestos removal work area after work on asbestos containing material has been completed and the area decontaminated. Note:For friable asbestos removal work, clearance monitoring also includes air monitoring within an enclosure at completion of the work and prior to dismantling of the enclosure to ensure fibre concentrations are below 0.01 fibres/ml of air. An area is 'cleared' when the level of airborne asbestos fibres is measured as being below 0.01 fibres/ml.
<0.1 fibres/ml	Is a figure which is occupational hygiene 'best practice', and are not health-based standards, this is less than half the National Exposure Standard (NES).

Rise Urban.

Our reference: Ltr10-0992022
Enquiries: Cameron Leckey

14 August 2024

Mr Chris Parlane
Senior Planning Officer
City of Rockingham
Via email: Chris.Parlane@rockingham.wa.gov.au

Dear Chris

RE: 14 Grouped Dwellings – Social Housing – Lot 10 (No. 81) Louise Street, Rockingham

I write in response to the Request for Additional Information provided by the City of Rockingham on 28 June 2024 regarding the abovementioned development application.

In response to the City's comments we have modified the design in a number of respects. In addition, we have provided some additional commentary against each of the City's points to clarify and justify where necessary the planning merits of the proposal.

Attached to this letter you will find:

1. A complete set of revised plans for the proposal (MDC Architects – 8th August 2024);
2. A schedule of actions taken / additional information / justification in response to the City's correspondence from 28 June 2024 (Rise Urban ref: Misc11-0992022); and
3. A concept plan for the Private Garden Areas for units 1 and 7 as requested.

We trust that this revised proposal, along with the additional information set out in the attached schedule is sufficient for the City to progress with a favourable recommendation to the JDAP without further delay.

Should you require any further advice or information please contact Cameron Leckey of this office on 0427058484 or via email at Cameron@riseurban.com.au.

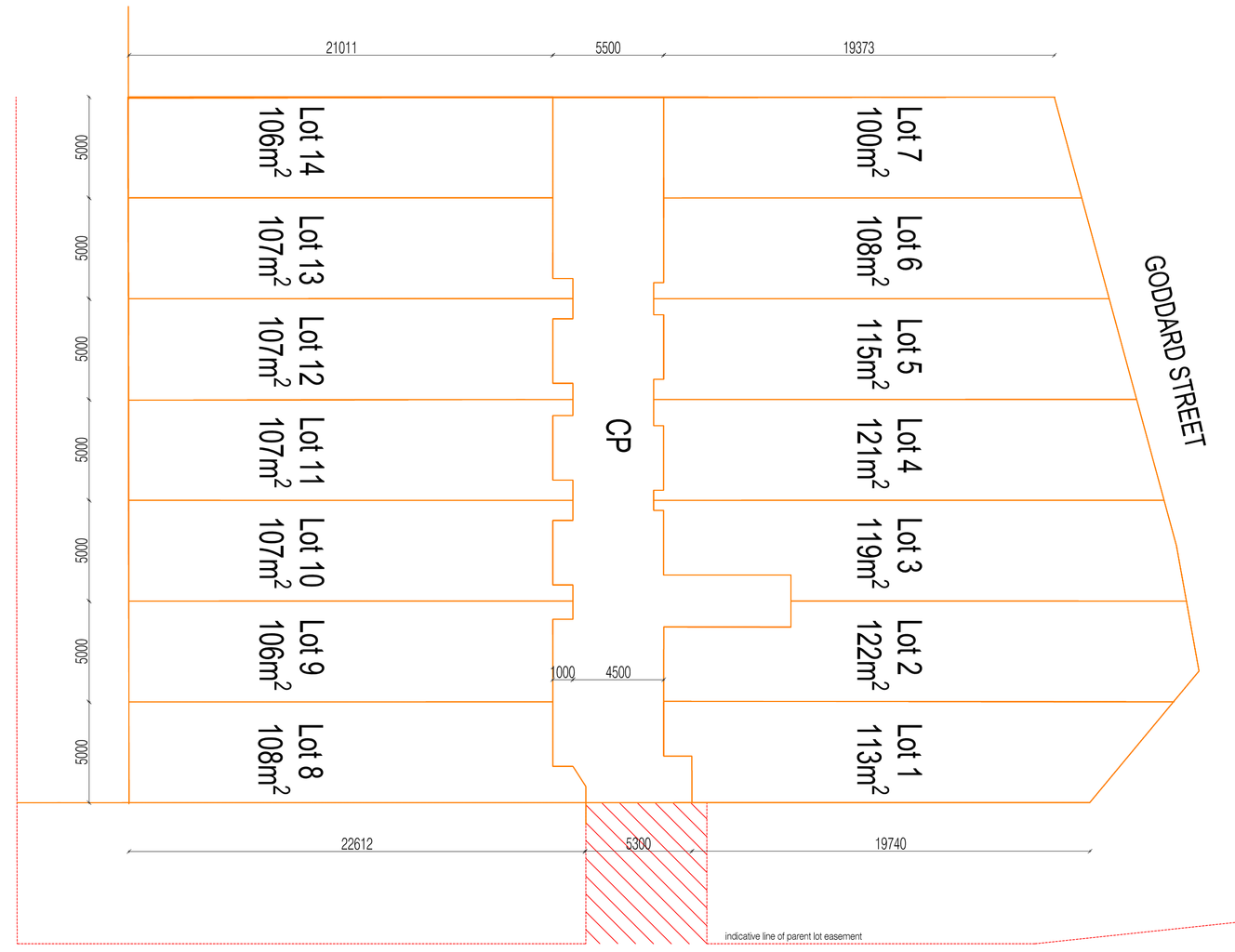
Yours sincerely

Cameron Leckey
Director
Rise Urban Pty Ltd

Cc: Thomas Chadwick, Chadwick Consulting



Existing Feature Survey



Overall Lot Plan

Revision	Issued	Date
3	Issue for Approval – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

Use figured dimensions at all times. Do not scale or measure off drawings. All dimensions and levels to be checked on site by the Contractor prior to commencing. If discrepancies are found notify the Architect and seek direction prior to proceeding.

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DALE ALCOCK PROJECTS

MDC ARCHITECTS
1 Silas Street, East Fremantle WA 6158
t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: EXISTING FEATURE SURVEY & LOT PLAN

CLIENT: Dale Alcock Projects

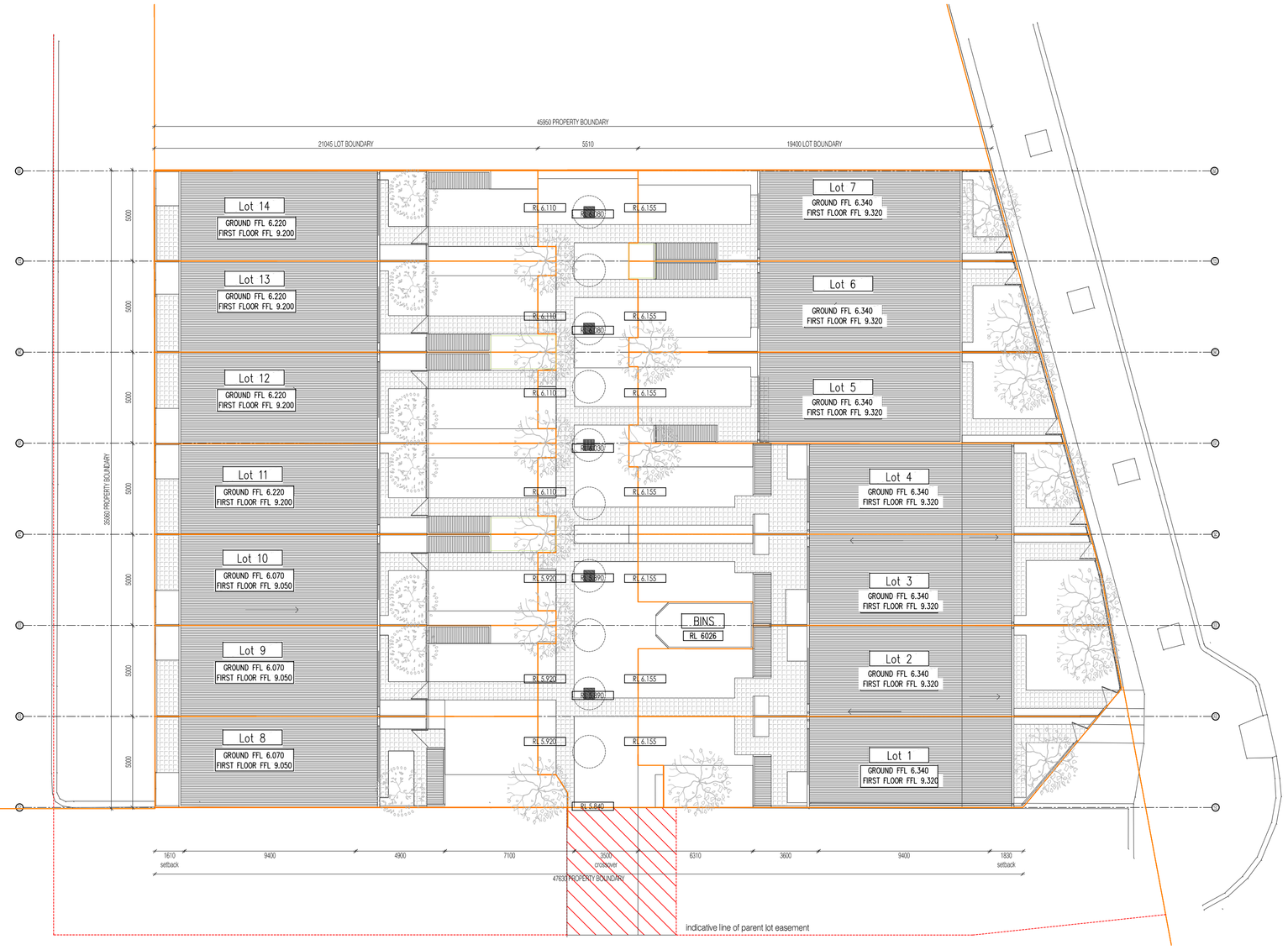
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DATE: 08.08.2024

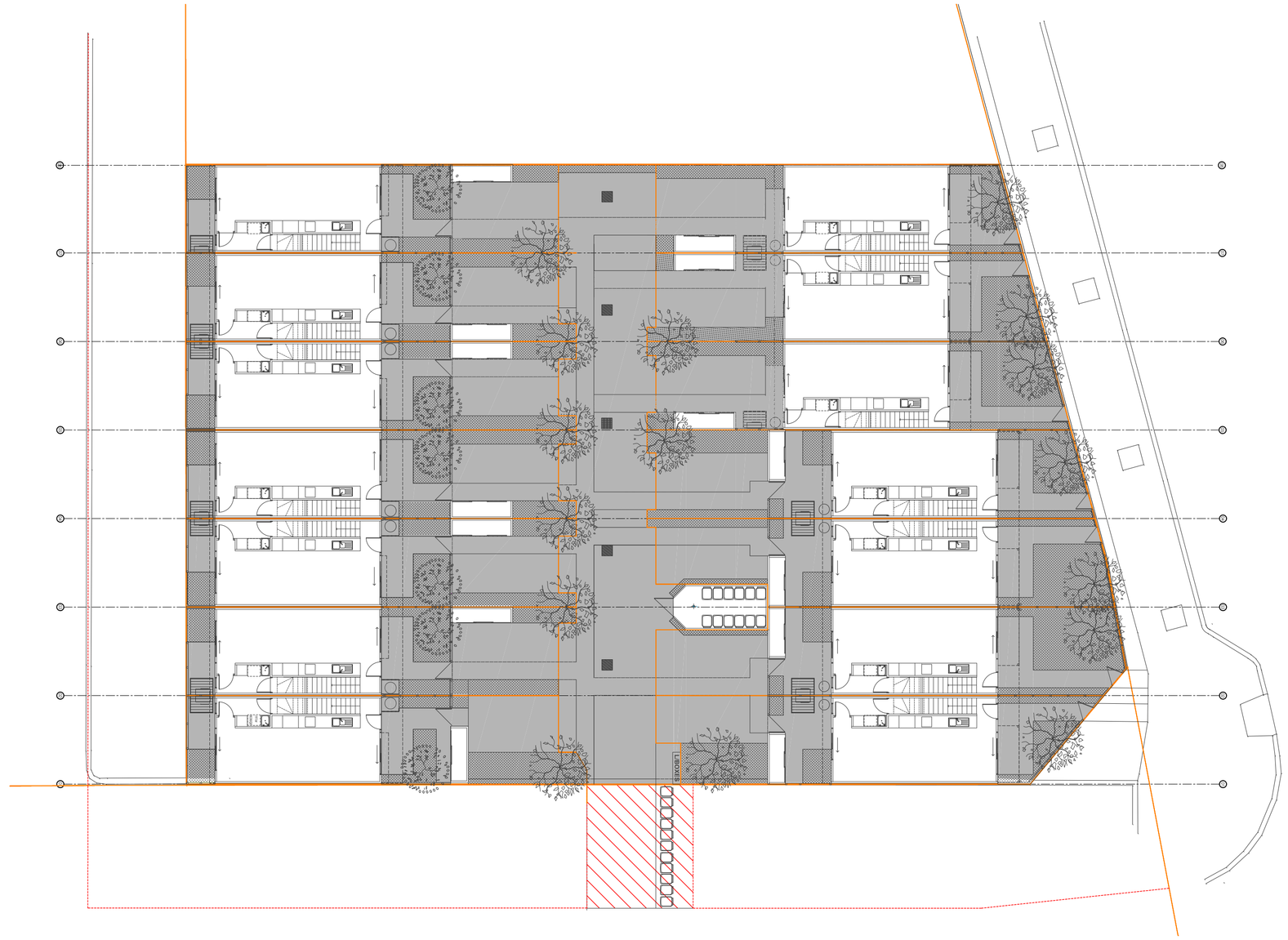
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_001

REVISION: 3



Site Plan



Total Site Area: 1744m^2
Building Footprint: 713m^2 or 41%

Site Cover Plan

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

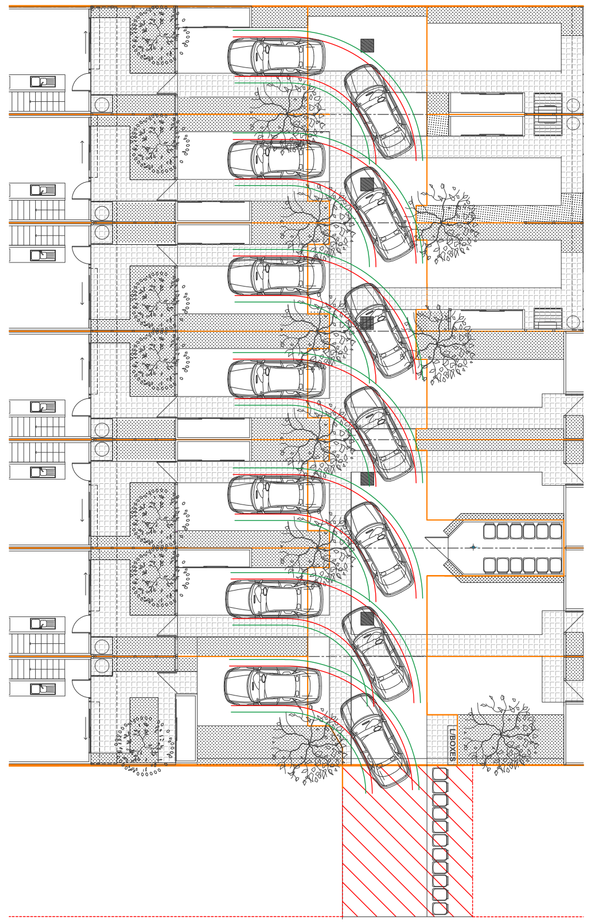
Use figured dimensions at all times. Do not scale or measure off drawings. All dimensions and levels to be checked on site by the Contractor prior to commencing. If discrepancies are found notify the Architect and seek direction prior to proceeding.

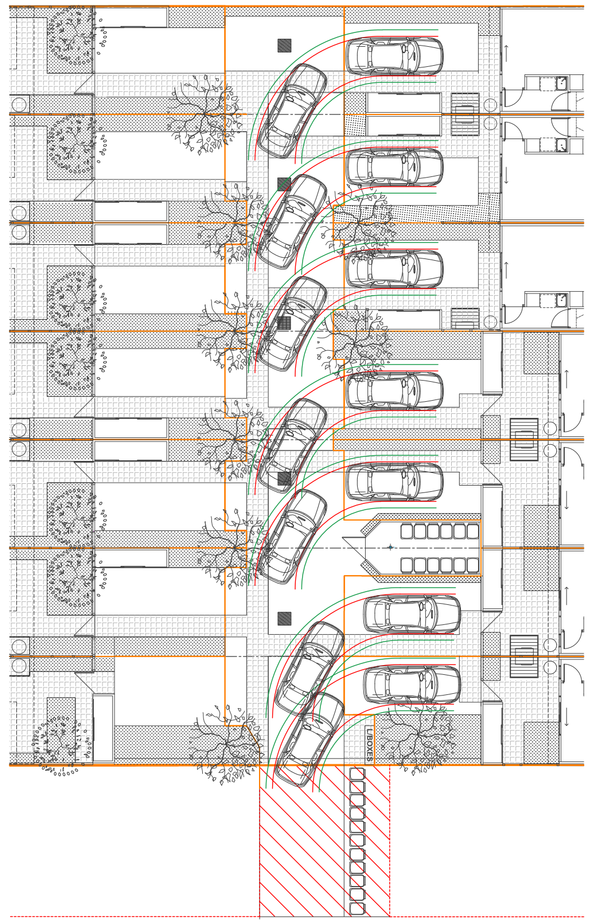
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DALE ALCOCK PROJECTS

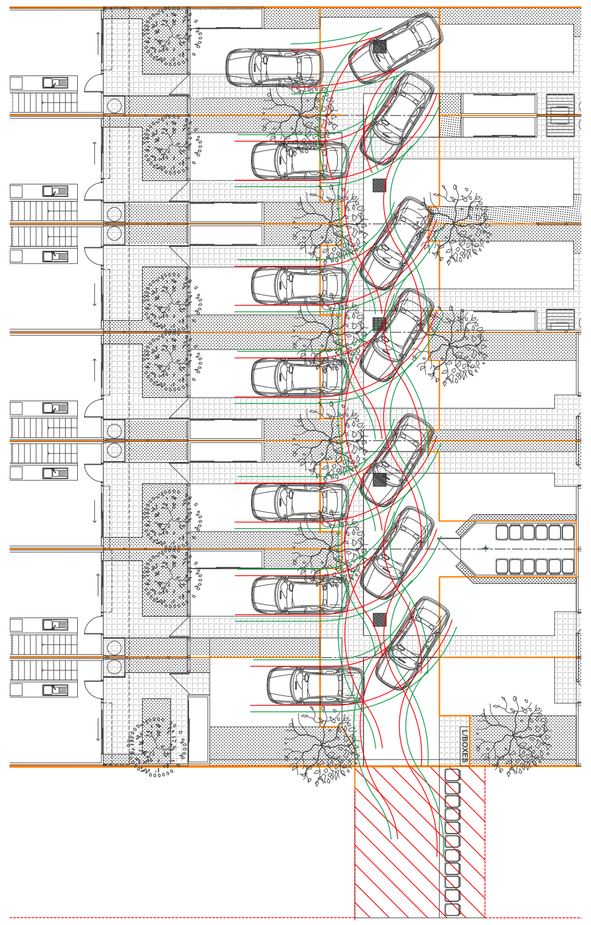
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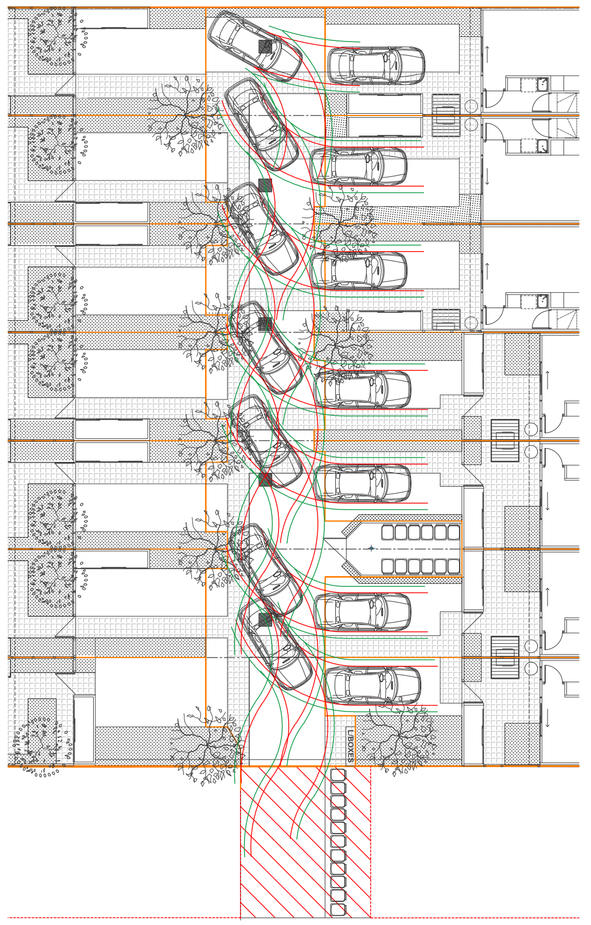
PROJECT: Lot 10, Goddard St, Rockingham
DRAWING: SITE PLAN
CLIENT: Dale Alcock Projects
SCALE: 1:200 AT A1
DATE: 08.08.2024
DRAWING STATUS: ISSUE FOR PLANNING
DRAWING NUMBER: A_002
REVISION: 3





Turning Circles (Inbound)





Turning Circles (Outbound)

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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DALE ALCOCK PROJECTS

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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: TURNING CIRCLES

CLIENT: Dale Alcock Projects

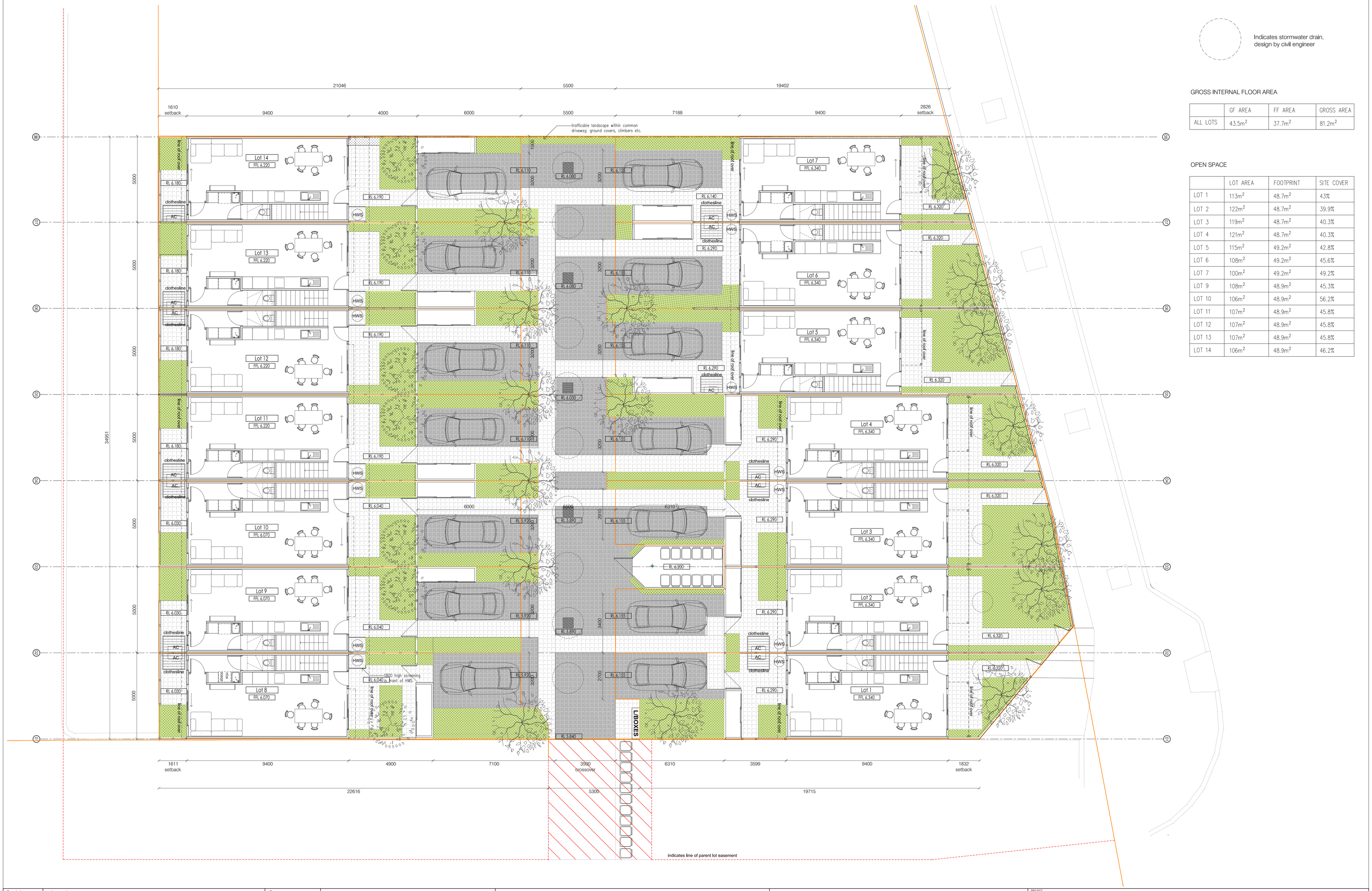
SCALE: 1:200 AT A1

DATE: 08.08.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_003

REVISION: 3



Indicates stormwater drain, design by civil engineer

GROSS INTERNAL FLOOR AREA

	GF AREA	FF AREA	GROSS AREA
ALL LOTS	43.5m²	37.7m²	81.2m²

OPEN SPACE

	LOT AREA	FOOTPRINT	SITE COVER
LOT 1	113m²	48.7m²	43%
LOT 2	122m²	48.7m²	39.9%
LOT 3	119m²	48.7m²	40.3%
LOT 4	121m²	48.7m²	40.3%
LOT 5	115m²	49.2m²	42.8%
LOT 6	108m²	49.2m²	45.6%
LOT 7	100m²	49.2m²	49.2%
LOT 9	108m²	48.9m²	45.3%
LOT 10	106m²	48.9m²	56.2%
LOT 11	107m²	48.9m²	45.8%
LOT 12	107m²	48.9m²	45.8%
LOT 13	107m²	48.9m²	45.8%
LOT 14	106m²	48.9m²	46.2%

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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DALE ALCOCK PROJECTS

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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: PLAN - GROUND FLOOR

CLIENT: Dale Alcock Projects

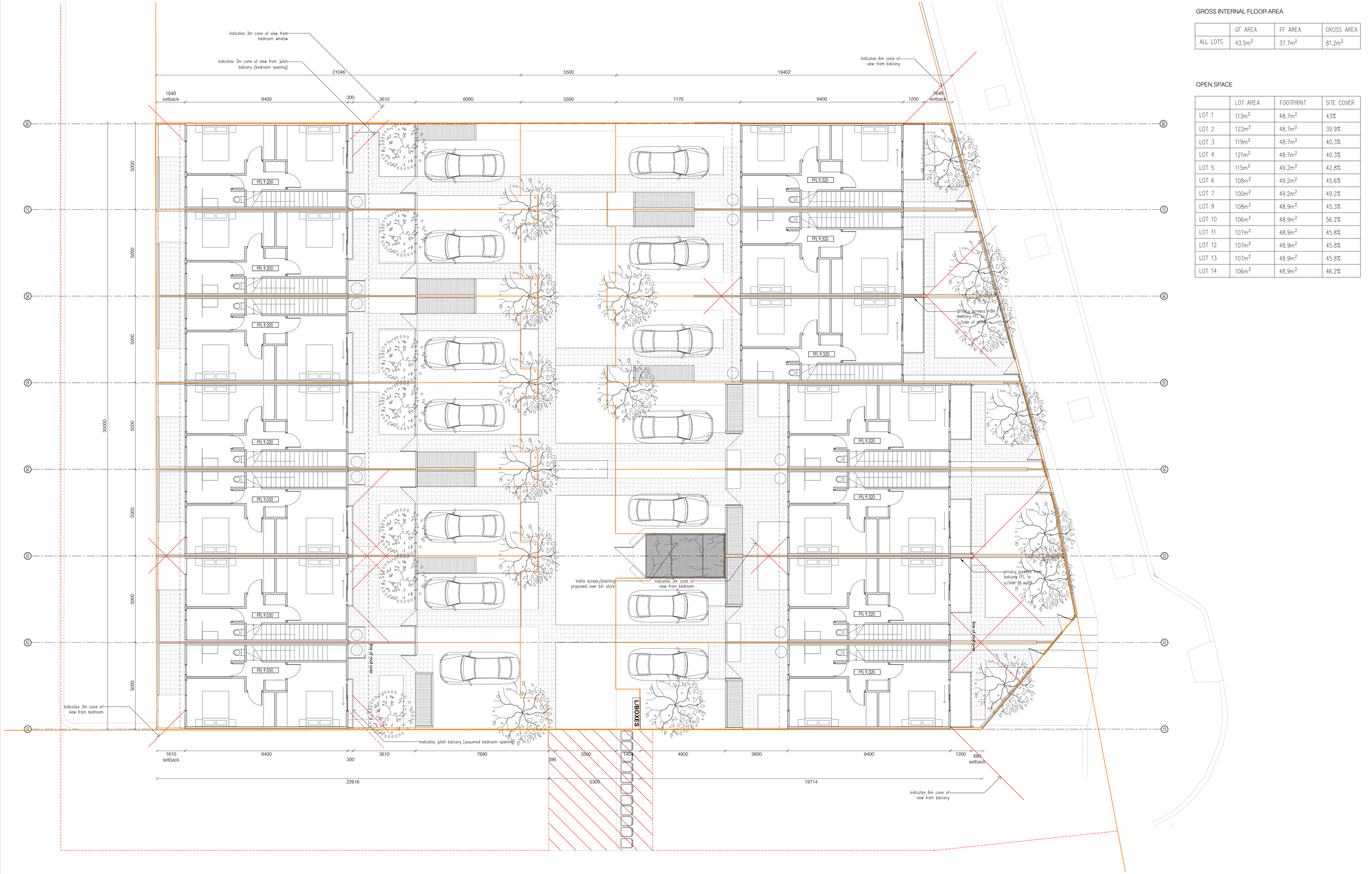
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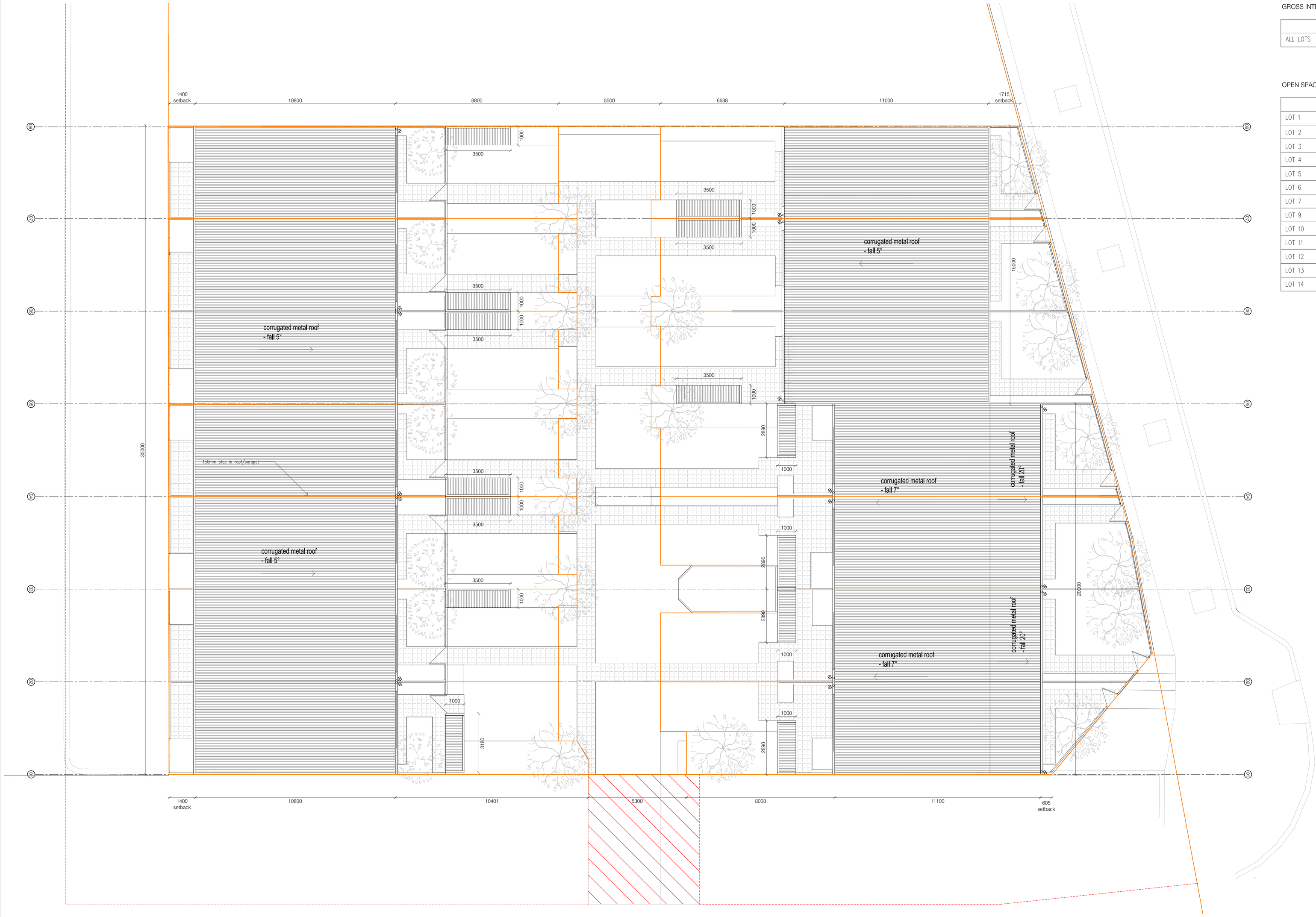
DATE: 08.08.2024

DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_010

REVISION: 3


indicates 3m cone of view from bedroom window
indicates 3m cone of view from juliet balcony (bedroom opening)
indicates 6m cone of view from balcony
21046
5500
19402
1640 setback
9400
300
3610
6090
5500
7170
9400
1200
1646 setback
35000
5000
5000
5000
5000
5000
FFL 9.200
FFL 9.050
FFL 9.320
privacy screens from balcony FFL to u/side of soffit
trellis screen/planting proposed over bin store
indicates 3m cone of view from bedroom
line of roof over
LIFT
LIFT
LIFT



GROSS INTERNAL FLOOR AREA

	GF AREA	FF AREA	GROSS AREA
ALL LOTS	43.5m²	37.7m²	81.2m²

OPEN SPACE

	LOT AREA	FOOTPRINT	SITE COVER
LOT 1	113m²	48.7m²	43%
LOT 2	122m²	48.7m²	39.9%
LOT 3	119m²	48.7m²	40.3%
LOT 4	121m²	48.7m²	40.3%
LOT 5	115m²	49.2m²	42.8%
LOT 6	108m²	49.2m²	45.6%
LOT 7	100m²	49.2m²	49.2%
LOT 9	108m²	48.9m²	45.3%
LOT 10	106m²	48.9m²	56.2%
LOT 11	107m²	48.9m²	45.8%
LOT 12	107m²	48.9m²	45.8%
LOT 13	107m²	48.9m²	45.8%
LOT 14	106m²	48.9m²	46.2%

Revision	Issued	Date
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0	Issue for Approval – Planning	20.03.2024

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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: ROOF PLAN

CLIENT: Dale Alcock Projects

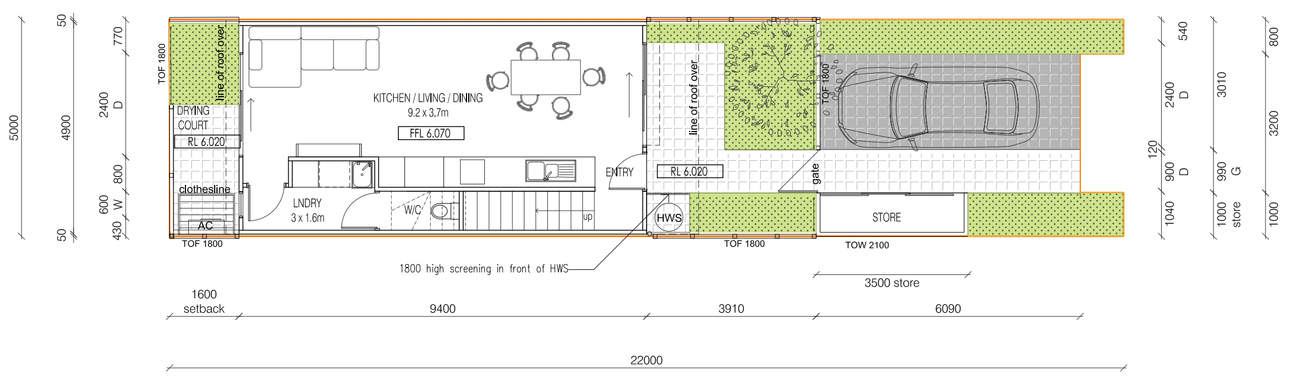
SCALE: 1:100 AT A1

DATE: 08.08.2024

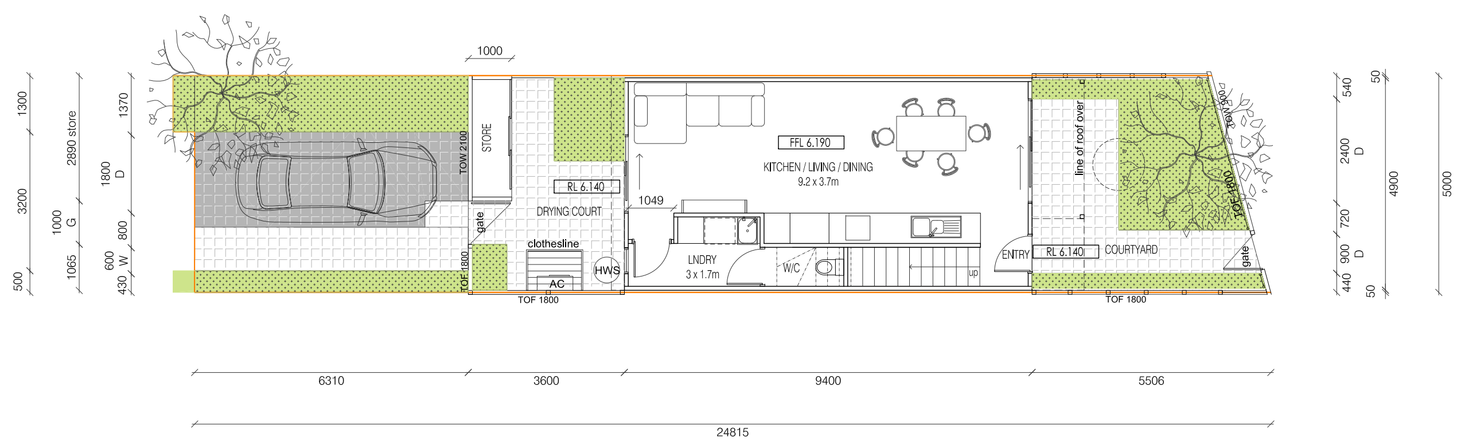
DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_012

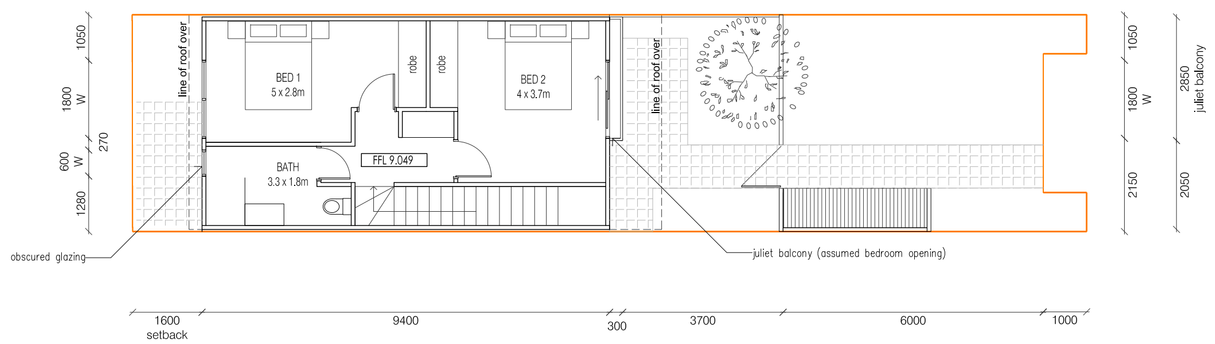
REVISION: 3



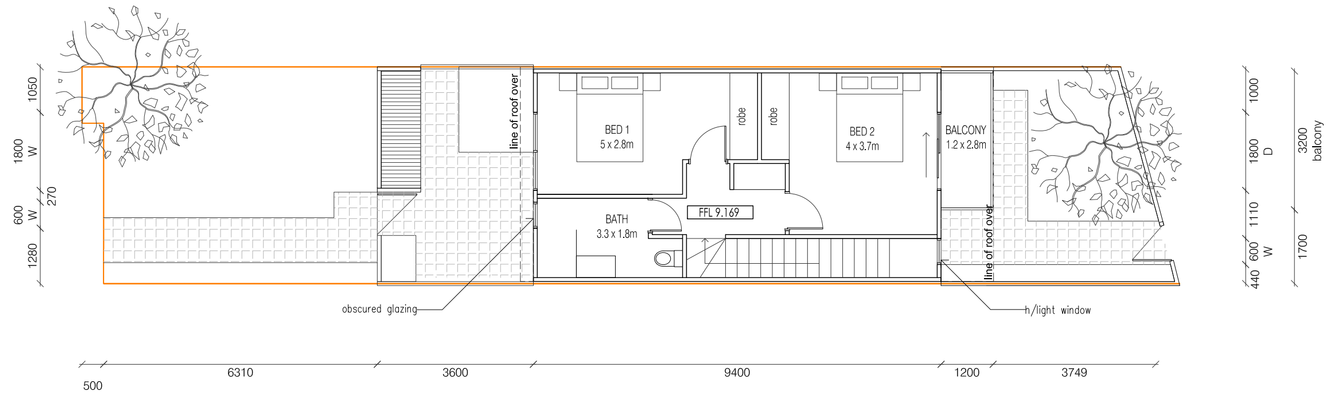
South Row- Ground Floor



North Row- Ground Floor



South Row- First Floor



North Row- First Floor

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
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0	Issue for Approval – Planning	20.03.2024

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ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: DWELLING FLOOR PLANS

CLIENT: Dale Alcock Projects

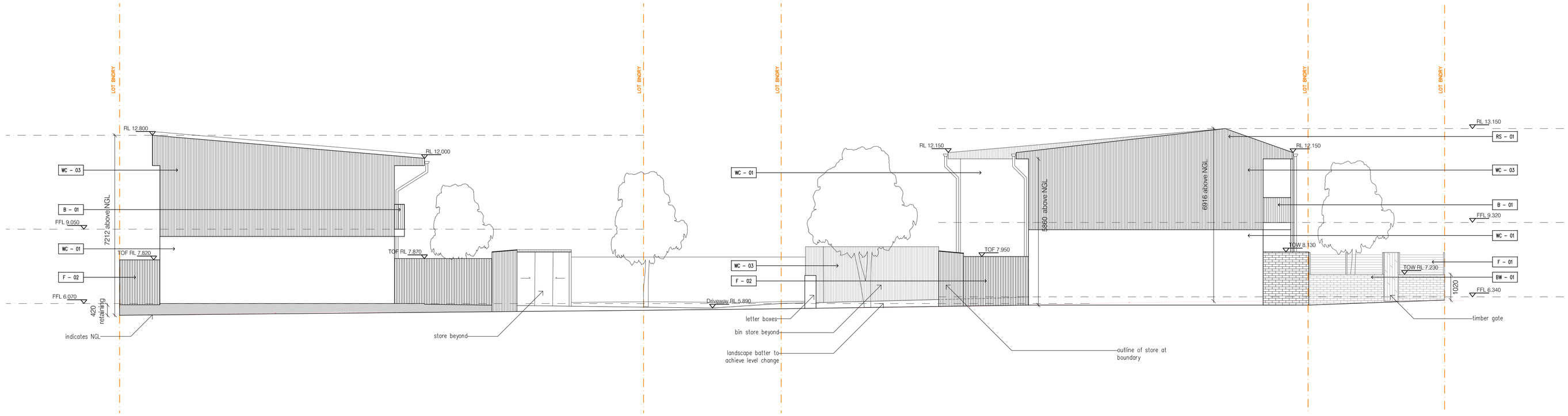
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DATE: 08.08.2024

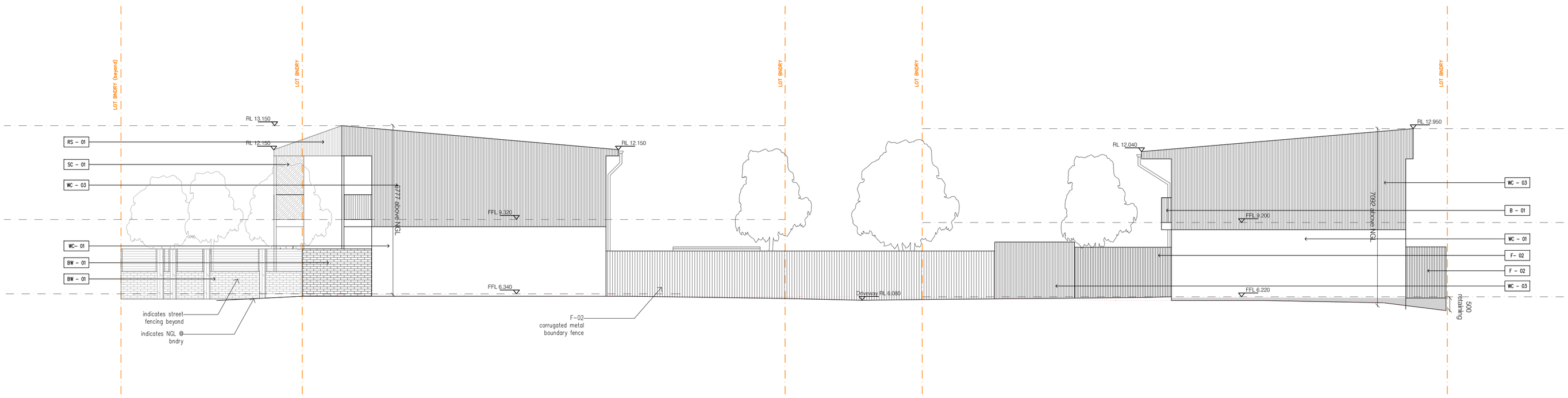
DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_100

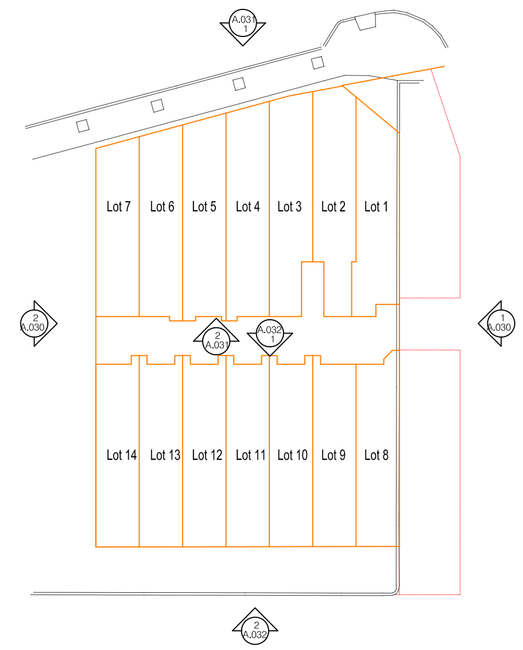
REVISION: 3



East Elevation



West Elevation



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
F – 01	Steel post and wire fencing
F – 02	corrugated metal fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 08.08.2024

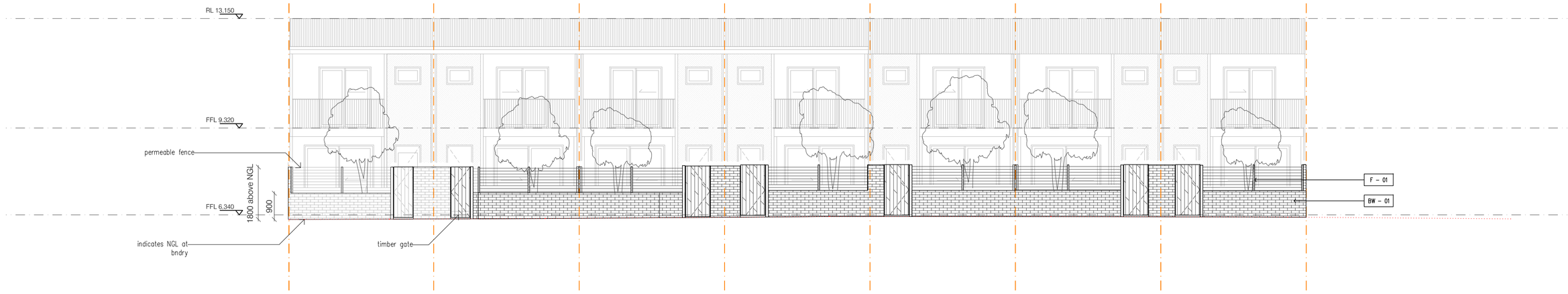
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_300

REVISION: 3



North Elevation (From Goddard Street)



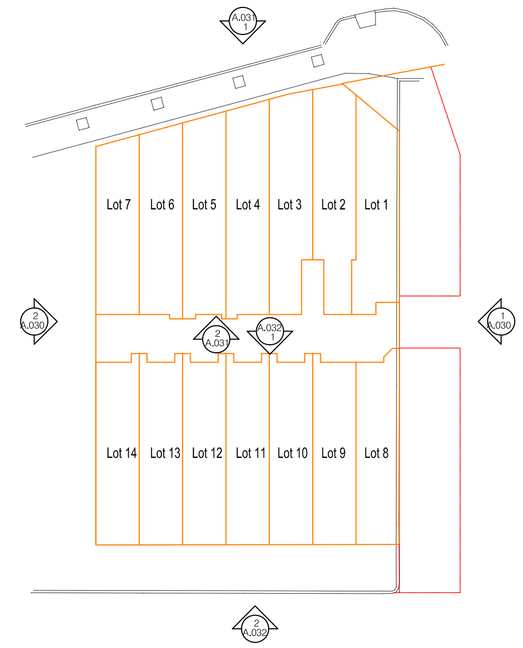
North Elevation (From Goddard Street) - Fencing



South Elevation (From driveway)



South Elevation (From driveway) - Fencing



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
F – 01	Steel post and wire fencing
F – 02	corrugated metal fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
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1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

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ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 08.08.2024

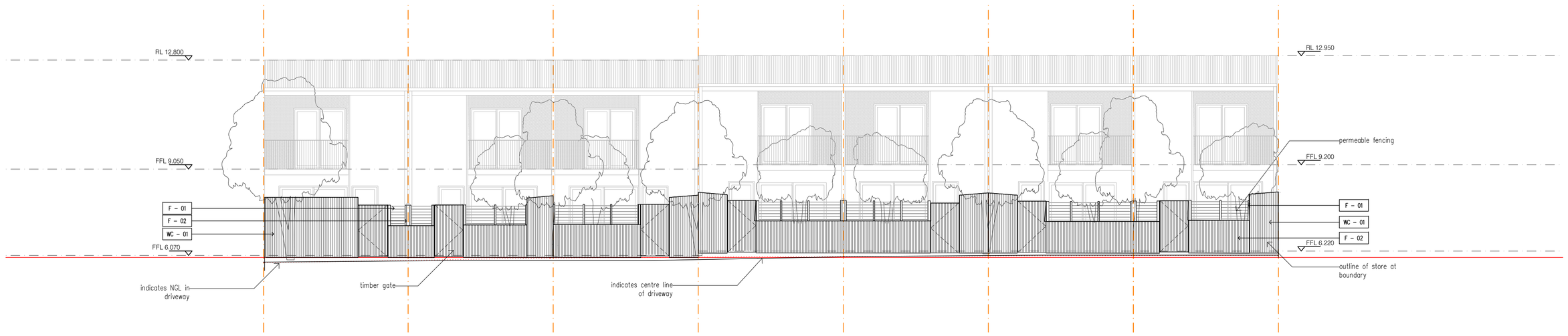
DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_310

REVISION: 3



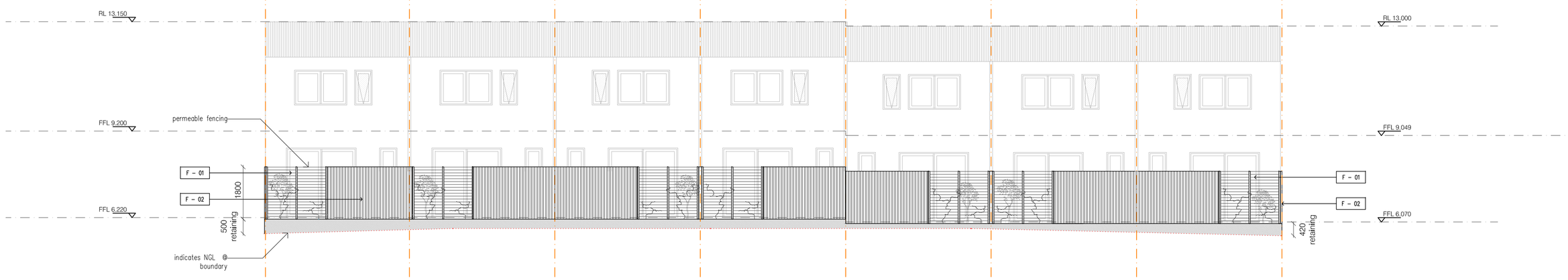
North Elevation (From Driveway)



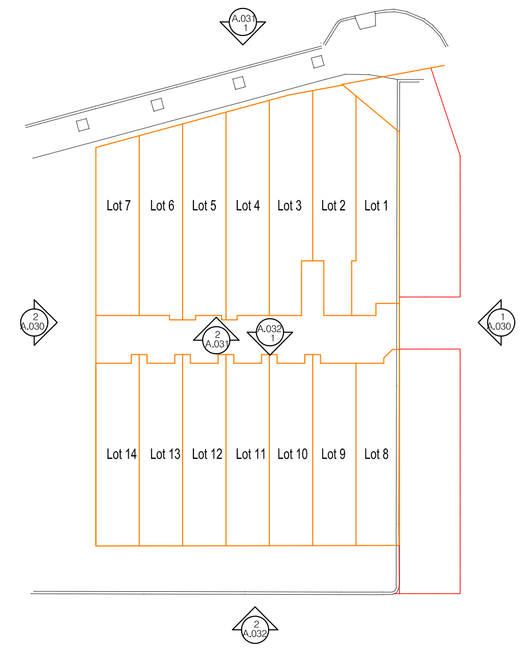
North Elevation (From Driveway) - Fencing



South Elevation (From boundary)



South Elevation (From boundary) - Fencing



MATERIAL LEGEND

WC – 01	Selected FC wall cladding paint finish as selected
WC – 02	Selected FC wall cladding paint finish – green – blue – red
WC – 03	Selected corrugated zincalume wall cladding
BW – 01	Brickwork – painted white
F – 01	Steel post and wire fencing
F – 02	corrugated metal fencing
SC – 01	Visual screening– translucent corrugated panel
RS – 01	selected corrugated zincalume roof sheeting
B – 01	Balustrade – metal bar

Revision	Issued	Date
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: SITE ELEVATIONS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 08.08.2024

DRAWING STATUS: ISSUE FOR PLANNING

DRAWING NUMBER: A_320

REVISION: 3

Lot 10 Louise Street, Rockingham – Response to City of Rockingham RFI dated 28 June 2024

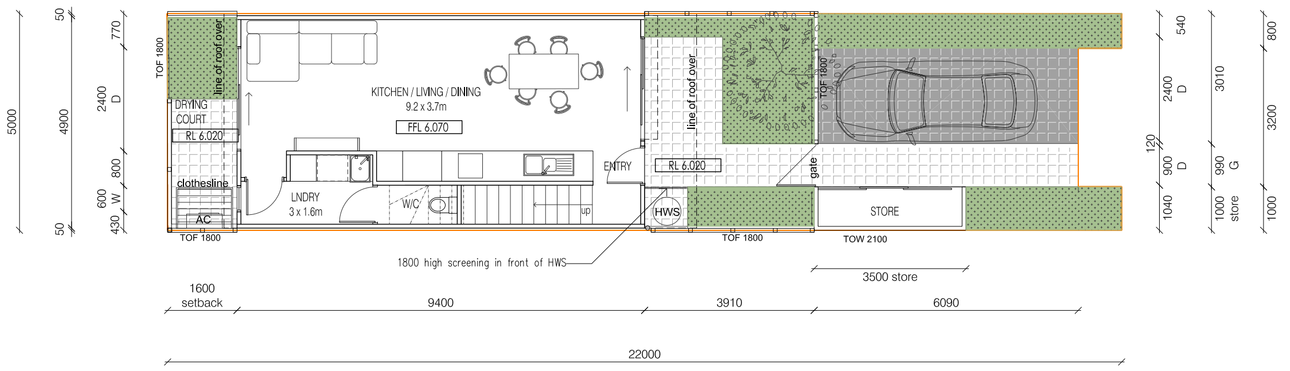
Section	City of Rockingham Comments	Project Response
Building Height	*The City is concerned that the proposed 2 storey building height does not adequately respond to the context of the existing and planned built environment considering the existing 4 storey development on Lot 304 (95) Chalgrove Avenue to the east and the proposed 4 storey development on Lot 9 (5) Market Street adjoining to the west. The plans for the proposed development on the land to the west are attached for your information.* *To be clear, the City does not necessarily expect a four storey development to be replicated on the subject site, but it does expect a development of greater scale than the proposed 6.9m high two storey built form. Without necessarily requiring the inclusion of a third storey on the plans, the City strongly encourages a review of the current plans which should aim to provide a development with an 'equivalent' three storey building height. This could entail reviewing the design of the roof form, or employing other design techniques to increase the apparent building height. Examples are attached showing a range of different roof form treatments.* *This is consistent with the advice provided by the City's Design Review Panel (DRP) in August 2023 which recommended additional building scale. The City considers the advice provided (relating to scale) still applies.*	No Change proposed. We have investigated various options to increase the building height or at least the perception of building height as suggested by the City. Unfortunately, we are unable to accommodate the City's suggested modifications without incurring additional construction costs which will render the project unviable. Delivery of this social housing project is fully reliant on external funding and Government grants which, in this current economic climate, do not allow for these types of non-essential costs. We note that both the current and draft planning frameworks set a minimum building height of 2 storeys and this proposal is fully compliant with this minimum height limit. We therefore request that this proposal is determined on its planning merits against the applicable planning framework.
C1.1.1 Primary Garden Areas	Units 1 and 7 have less than 20m² Primary Garden Area (PGA) required by the Deemed-to-Comply provisions (please also check the PGA's for units 8-14, as these appear around 19m²). The City is concerned about the functionality of the PGA's for these units given the extent of proposed paving.	As the Units 1 and 7 PGAs do not meet deemed-to-comply requirement C1.1.1, we provided justification confirming that these particular PGAs meet the P1.1.1-P1.1.4 design principles in our DA submission. We request that these PGAs are assessed against the design principles. To further demonstrate the functionality of these two PGAs, we have prepared the **attached** concepts for units 1 and 7 depicting one possible way in which the PGA could be used in a functional sense.
C1.2.1 Soft Landscaping	Based on the City's measurements of the site plan provided that depicts the landscaping, it appears that some of the units have significantly less than 15% soft landscaping provided with a minimum dimension of 1m per unit (ie 7 (7.8%), 9 (9%) and 14 (11%). A review of this outcome is recommended with the intent to provide increased soft landscaping to these lots.	No change The City has indicated via email dated 13/8 that the design principles justification can be considered.
C1.2.4 Tree Canopy	Some of the Deep Soil Areas DSA's) in the courtyards are significantly less than the 9m² minimum area required for a small tree (ie Units 1, 7, 8-14). It will need to be demonstrated how these DSA's can sustain the growth of the selected tree species.	No change The City has indicated via email dated 13/8 that the design principles justification can be considered.
	Applying the same principles to the trees in the carpark, you should review the ability of the space provided at the rear of unit 4 to accommodate a shade tree (it appears quite constrained by the adjacent store).	No change The City has indicated via email dated 13/8 that the design principles justification can be considered.
C2.1.1 Primary Living Spaces	The planning report states that the dimensions of the primary living areas comply with Deemed-to-Comply requirement of 3.8m minimum. This City has not been able to confirm this is correct for the horizontal dimension of the living areas (this has been measured at 3.7m). To confirm, please check and provide the dimensions on the floor plans.	No change The City has indicated via email dated 13/8 that this requirement does not apply.

C2.1.10 Stores	While the minimum dimension of the stores can be reduced to 1m, the required storage area (4m²) should be provided. The plans show 2.8m² stores.	No change The City has indicated via email dated 13/8 that the design principles justification is accepted.
C2.2.3 Bathroom windows	It is presumed that the obscure glass windows in the upper floor bathrooms are openable windows. Please confirm.	Confirmed. Plans have been notated accordingly
C2.3.3 Car Space Design and Manoeuvring	The dimensions of the car parking bays shown on the site plan are unclear, but manually measure approximately 2.2m wide. To ascertain compliance with AS2890.1 (and the Universal Design car bay requirements) clearly show the dimensions of all car parking spaces on the site plan, while making allowance for widening the bays by 0.3m where they are vertical obstructions nearby (ie like the bin stores or landscaping). Refer also to comments about Universal Design below as they relate to the dimensions of the car bays.	All bays meet the min 2.7m width and most are 3.2m to allow for parking plus access to the front door of the dwellings as stipulated in Livable Housing Design Guidelines Part 1(c). Paving is used to delineate the pathway, however is fully trafficable and can also be used for parking if desired.
C2.4.1 Waste bin storage	The bin store has not been designed to accommodate Food Organics Garden Organics (FOGO) bins which the City will be introducing in the future. As a result there would need to be two rows of 240ltr bins presented in the access easement for collection. This is unacceptable for the City's Waste Services due to the inconvenience this provides and is inconsistent with the purpose of the easement. Bulk waste bins may need to be considered that could be collected by rear lift waste collection vehicle from the bin store. You may wish to consult the City's Waste Services in this regard (Waste Coordinator, Mr Lee Katnich 9528 0554). Once the waste strategy is resolved, then an updated Waste Management Plan would be required.	Noted. We are working to resolve this matter and we request that this be a condition of approval if not resolved prior. As a contingent measure we are willing to utilise commercial waste services in the case that we cannot find a mutually agreeable solution with the City's Waste Services.
C2.4.4 Communal bin store	Please provide a diagram that demonstrates how the communal bin store will be screened from the major openings of the upper floor habitable rooms in the front row of units.	Plans have been modified to show a planted trellis over the bin store area to screen from view.
	Once the waste strategy is resolved then the bin store on the Site Plan may need to be amended.	Noted. We are working to resolve this matter and we request that this be a condition of approval if not resolved prior.
C2.5.1 Service utilities	The location of the letterboxes warrants review. They are remote from the public realm and it is unclear whether Australia Post will actually deliver mail to this location, over private land. Please check this with Australia Post. An appropriate design response would be to provide a pedestrian accessway to the Louise Street boundary within the site for the rear row of units.	Noted. We are working to resolve this matter and we request that this be a condition of approval if not resolved prior.
	Please also show on the plans a location where other service utilities (ie power/water meters, distribution boards etc) can be integrated or otherwise screened where they don't constrain sight distances where the driveway intersects with the right of way on Lot 303.	Service locations are unknown and cannot be confirmed with authorities until detailed design. We are happy to accept a condition requiring that they be integrated or otherwise screened where they don't constrain sight distances where the driveway intersects with the right of way on Lot 303.
C2.7.1 Universal design	Three dwellings in the development will need to comply with the Silver level universal design requirements. Please complete and submit the checklist in section A4 of the R-Codes Vol 1 to demonstrate how and which dwellings will meet the relevant design requirements. This is currently unclear.	All dwellings have been designed to accommodate silver standard accessibility. It will the onus of the documentation team and the contractor to ensure construction details comply with SLLHA Guidelines at detailed design and construction stage.
	It is noted that the car parking spaces must have a minimum unobstructed width of 3.2m and 5.4m length. The car bays on the site plan are approximately 2.2m wide.	The car bays are intended to be shared spaces with sufficient room for people to choose to either park their car partially across the white paved section (indicative footpath) to provide more manoeuvring space for their car, or they could choose to park their car hard up against

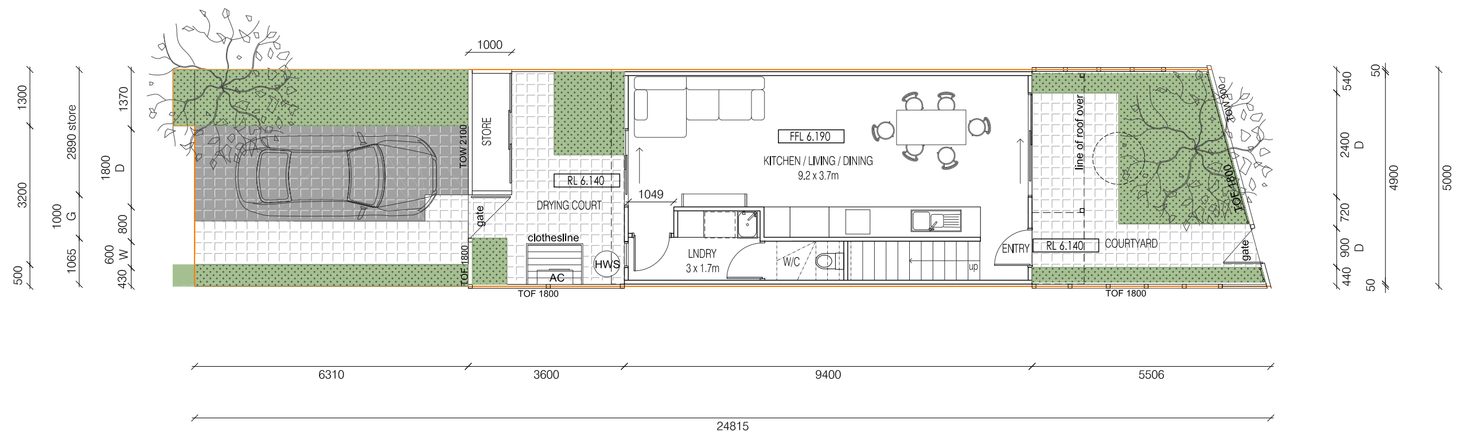
	the passenger side of the car bay to provide more footpath space on one side. Including the white paved areas, the car bay widths are 2.7m (Unit 1), 2.4m (Unit 2), 2.9m (Unit 3) and 3.2m (Units 4-14), and therefore meet and generally exceed the Australian Standards. As residents would have the choice to park their cars to the side of the bay in order to maintain sufficient width to meet the R-Codes definition of “continuous path of travel”, this arrangement meets C3.7.9iii but ultimately provides flexibility for residents to use the car bay / pedestrian access in a way that suits them – particularly for those with restricted mobility. Given our intention for the car bays, footpaths and broader driveway to be a shared space, compliance with C3.7.9ii for units 9-14 is achieved through delineation of the pedestrian paths via paving colours, rather than separation via line marking. The footpaths do not need to be separate from vehicular access / car bays due to use of “or” in C3.7.9ii. Ultimately, if the car bays and pedestrian footpaths and car bays needed to be provided separately, all with separate widths that complied with Australian Standards, there would be barely any landscaping in the central part of the site, which would adversely impact our ability to meet the C1.2.1 and C1.2.4 design principles and appropriately respond to the DRP comments. I also note that this shared space outcome was supported by the DRP. We think the solution we have proposed is the best outcome to balance landscaping/amenity with functionality/accessibility for both vehicles and pedestrians.
One of the requirements relates to the need to provide a continuous path of travel from the street to the front door of the dwelling. Please demonstrate how this will be achieved since all the rear dwellings require pedestrians to traverse the easement on the adjoining land where they would have to share the easement with vehicles. This is an unresolved matter relating to traffic safety concerns and provides a sub-optimal planning outcome.	It is our view that the Deemed to Comply Criteria C3.7.8 and C3.7.9 are either met, or do not apply to this application. *C3.7.8 For grouped and multiple dwellings, a legible, well defined, continuous path of travel is provided **from the public footpath and car parking areas** to building access areas such as lift lobbies, stairs, accessways **and individual dwelling entries**…..* Of the 14 dwellings proposed, seven of them have a legible, well defined, continuous path of travel from both the public footpath fronting Louise Street, and from the communal street / designated car parking area to the dwelling entries, while the seven to the rear of the site have a legible, well defined, continuous path of travel from the communal street / designated car parking area to the front door of the dwelling. We are of the view that this provision is not intended to be applied such that all dwellings must have both a footpath to the street, and a footpath from the car park to the dwelling. This is supported by Design Principle P3.7.5 which states: *P3.7.5 Legible, safe, and direct access for residents and their visitors to move between communal car parking areas **or** public streets and individual dwellings.* On this basis we believe that the proposal meets this Deemed to Comply criteria, and also meets Design Principle P3.7.5. *C3.7.9 For multiple dwellings and 10 or more grouped dwellings that are served by a communal street, a pedestrian path is provided as follows:* *i. minimum 1m wide, clear of any utilities or minor projections;* *ii. clearly delineated or separate from the vehicular access; and* *iii. A continuous path of travel from the street boundary to ground floor dwelling or building entries.* We are of the view that C3.7.9 does not apply to this proposal, as the proposal only has seven dwellings that are served by a communal street, while the other seven are served by Louise

		Street with respect to primary frontage, pedestrian access and service connections. Clearly this provision is not intended to apply to dwellings that have both a public street frontage and a communal street frontage, thereby excluding the seven dwellings that front Louise Street. The remaining dwellings that only have frontage to a communal street total seven in number and therefore this criterion does not apply. In any event, and once again the proposal clearly satisfies the Design Principle P3.7.5 (see above) as it provides legible and safe pedestrian access from either Louise Street *or* the communal street, and in some cases, both. Notwithstanding our position that we comply with these criteria, we have engaged with the consultant architect to adjoining lot 9 and have requested that they consider an easement along their approved pedestrian path which runs along the western boundary of lot 10. It is important to note that the City cannot compel this on either landowner as the DA for lot 9 is already approved, and it cannot be conditioned on the lot 10 approval without the lot 9 owner's consent. In the event that the owner of lot 9 does not agree to allow any formal access to the lot 10 occupants, we maintain that the proposal satisfies the Deemed to Comply criteria and Design Principles in any event.
C3.7.4 Driveways	The City has completed a preliminary swept path analysis which suggests that sufficient space has not been provided to allow for vehicle turning movements (refer to the attached swept path examples). Please review the site plan and provide swept path diagrams that demonstrate adequate vehicle manoeuvring.	Swept path diagrams have been included in the revised drawing set and demonstrate compliance with all applicable standards and requirements.
	AS2890.1 requires for a blind aisle that the parking aisle shall be extended at least 1.0m beyond the last car parking bay. The site plan suggests that this has not been provided. Please amend.	The blind aisle has been noted on the plan, and includes 'trafficable landscaping' i.e. ground planting that will allow the rear of the car to overhang when it reverses, without damaging the plants or providing a physical barrier.
	The width of the vehicle crossover is narrower that the internal driveway as well as not being aligned with the easement. This is likely to increase traffic safety risks and potentially become a bottle neck. It should also be noted that the narrow vehicle crossover does not allow for two-way traffic movements.	No change The City has indicated via email dated 13/8 that the justification is accepted.
	Furthermore, there are concerns that the existing car parking bays on Lot 303 adjacent the proposed crossover will restrict sight distance at the proposed vehicle crossover location. This will need to be addressed.	These bays will be removed at the time that the crossover is constructed.
C3.7.7 Sightlines	The letterbox is located within the 1.5m visual truncation (1m) where the driveway intersects the right of way on Lot 303.	The proposed letterbox complies with this requirement because the driveway does not intersect a right-of-way / communal street until the easement within Lot 303 which is set back 7m from the Lot 303 boundary. There is no sightline issue or associated safety risk for the current letterbox location because the intersection (for the purposes of this requirement) is 7m past the lot boundary.
C3.7.8-9 Pedestrian paths	Legacy issue or not, the City is concerned about traffic safety risk involved where the pedestrian occupants and visitors to the rear units are required to share the public access easement with vehicles without the provision of a clearly defined continuous path of travel provided to Louise Street. This is considered to be a fatal flaw in the design.	See comments above. We maintain that we comply with the R-Codes with respect to pedestrian access. In addition, we are doing everything we can to work with the owner of lot 9 (adjoining) to see if we can gain formal access via the pedestrian path on their site which will resolve this issue, but cannot be guaranteed.
Stormwater	The information presented also suggest the likelihood of flooding of the living spaces based on the levels and indicative grading provided.	Site levels have been revised on the amended drawings to address this comment. A detailed stormwater design will be prepared at building permit stage and will address this in detail.

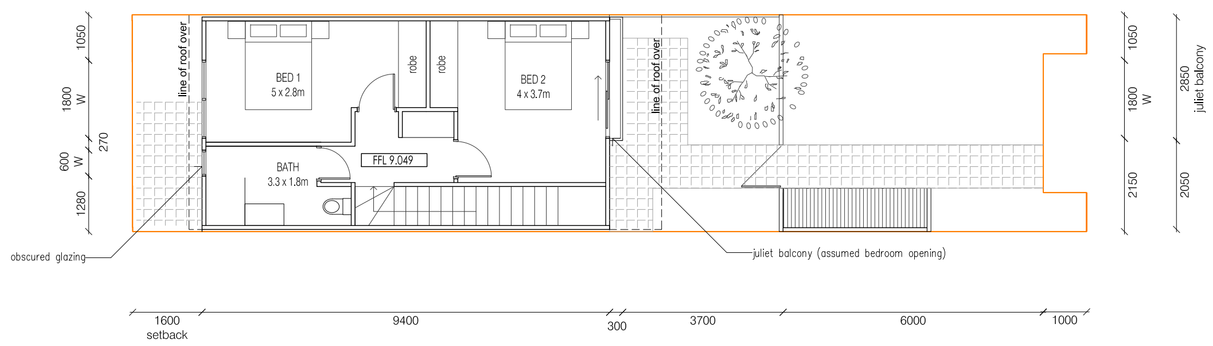
	There also appears to be marginal separation between the top of grate level in the common property and the finished floor level of the dwellings. As the 1% AEP will be stored on site, a minimum separation of 300mm is recommended unless there is an alternative overland flow path. Please review and amend the plans if required.	Site levels have been revised on the amended drawings to address this comment. A detailed stormwater design will be prepared at building permit stage and will address this in detail.
Bushfire Management Plan	The Bushfire Management Plan classifies 'Plot A' as 'Class B Woodland'. Based on the under storey vegetation the correct classification should be 'Class A Forrest', meaning a BAL-19 would apply.	Disagree. Advice from a level 2 accredited bushfire assessor confirms the majority of the trees in this plot are 10-30m high with which would classify this plot as Class B Woodland. Trees over 30.0m are considered Class A Forest.. The predominant vegetation within a plot defines the classification rather than any isolated trees within the plot. As such we maintain that Class B Woodland is the correct classification.
	Element 2 of the Guidelines requires fences within the APZ to be constructed from non-combustible materials. According to the development plans the gates to the courtyards and fencing for the rear courtyards is proposed of "Timber pinelap fencing", which is combustible.	Pinelap fencing has been replaced with non-combustible materials.
	Further, please clarify the intent of the note on the image on page 15 of the BMP that refers to a maintained easement on Lot 303. Please note that it is not possible to create this easement as Lot 303 is not included on the current Development Application.	Clarification: This note refers to the existing easement in lot 303 which can be used as an emergency egress for occupants in the event of a fire. It is not the intention to create a new easement over lot 303.



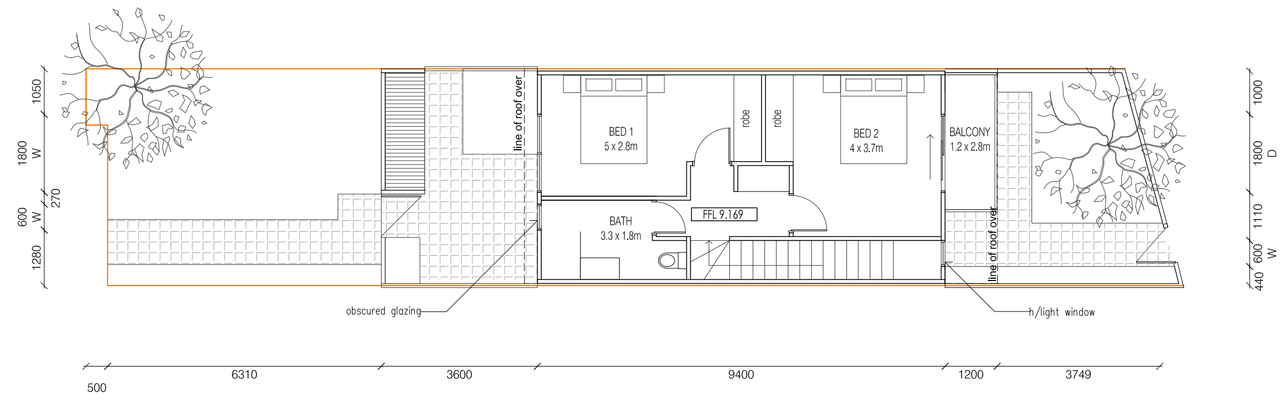
South Row- Ground Floor



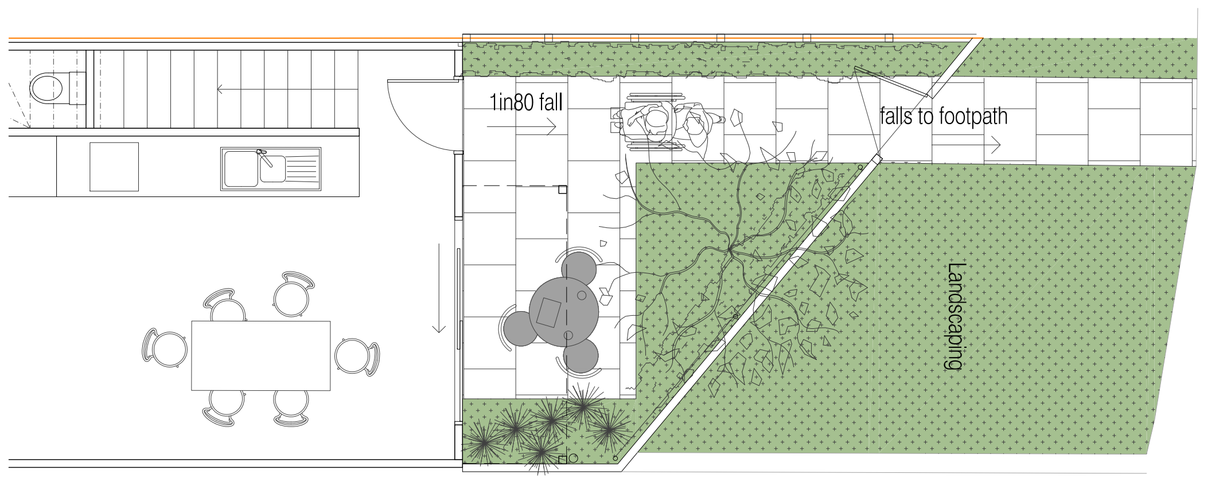
North Row- Ground Floor



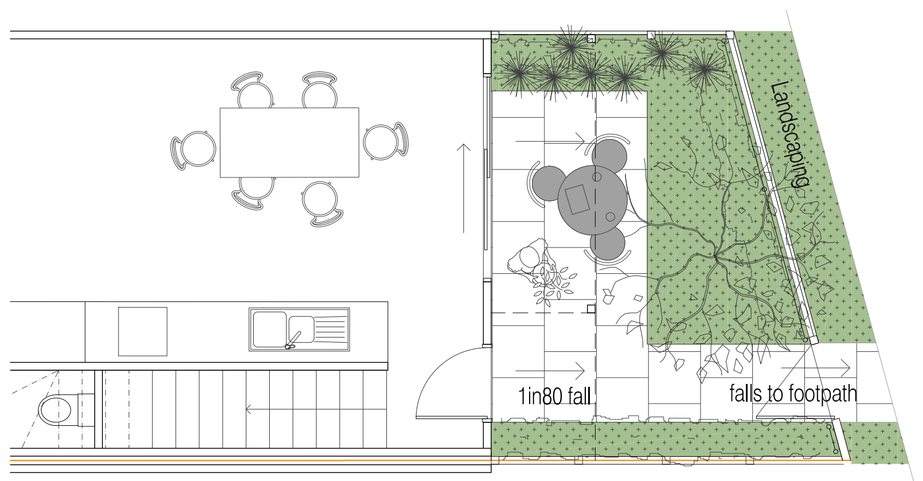
South Row- First Floor



North Row- First Floor



Lot 1 northern courtyard layout
- 1:50



Lot 7 northern courtyard layout
- 1:50

Revision	Issued	Date
3	Issue for Information – Planning RFI	08.08.2024
2	Issue for Approval – Planning	09.04.2024
1	Issue for Approval – Planning	05.04.2024
0	Issue for Approval – Planning	20.03.2024

Use figured dimensions at all times. Do not scale or measure off drawings. All dimensions and levels to be checked on site by the Contractor prior to commencing. If discrepancies are found notify the Architect and seek direction prior to proceeding.

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DALE ALCOCK PROJECTS

MDC ARCHITECTS
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t: 0405 003 035 e: info@mdcarchitects.com.au
ACN: 624 192 605

PROJECT: Lot 10, Goddard St, Rockingham

DRAWING: DWELLING FLOOR PLANS

CLIENT: Dale Alcock Projects

SCALE: 1:100 AT A1

DATE: 14.08.2024

DRAWING STATUS: ISSUE FOR INFORMATION

DRAWING NUMBER: A_100

REVISION: 3

Schedule of Submissions
Proposed Residential Development (14 Grouped Dwellings) – Lot 10 (No.81) Louise Street, Rockingham – 20.2024.132.1

PUBLIC SCHEDULE OF SUBMISSIONS						
No.	Content Manager File No.	Name	Address	Email	Support / Object / Other	Comment
SERVICING AUTHORITY SCHEDULE OF SUBMISSIONS						
1	D24/128645	Mr Patrick Mitchell Department of Water	Locked Bag10 JOONDALUP DC WA 6919	Patrick.mitchell@dwer.wa.gov.au	Support	I refer to your letter dated 24 May 2024 to the Department of Water and Environmental Regulation (the department) regarding an application to the City of Rockingham for the proposed development of the above-mentioned lot. As per the requirements under section 58(6)(b) of the Contaminated Sites Act 2003 (CS Act), advice is required as to the suitability of the land for the proposed development. The department understands that the proposed development comprises the construction of 14 townhouse units with associated stormwater drainage systems, deep soil garden beds, and driveways. Land at Lot 10 on Diagram 86080 (the site), and the adjacent land at Lot 9 on Diagram 86080, was classified under the CS Act as remediated for restricted use on 2 February 2022 and memorials (reference number P53638 ML and P53640 ML, respectively) were placed on the certificate of titles. The classification was based on several soil investigations undertaken between January 2021 and December 2021. A soil investigation in January 2021 found uncontrolled fill comprising of inert waste and asbestos-containing materials (ACM) present in soils to a depth of approximately 1 metre below ground level across the site.

SERVICING AUTHORITY SCHEDULE OF SUBMISSIONS						
No.	Content Manager File No.	Name	Address	Email	Support / Object / Other	Comment
No.1 - cont						Remedial works were undertaken in June 2021 comprising of the excavation and off-site disposal of 2620 m3 of impacted soils, however, validation testing revealed that ACM and waste materials were present at deeper depositions. Additional remedial works were carried out between October and November 2021 that comprised the removal of visible ACM prior the installation of a geofabric warning barrier over the remaining impacted soil at depth. Clean fill was deposited over the barrier to act as a capping layer with an average thickness of 0.55 metres, with a minimum thickness of 0.43 metres along the site's southern boundary. The site has been remediated and is suitable for development as commercial or residential land uses. Due to the asbestos impacted soils present beneath the sites' capping layer, the site is to be managed through the implementation of the existing site management plan that specifies ongoing management requirements. The site management plan also stipulates contingencies for if the capping layer is breached, and the requirement for a works-specific remediation action plan. Following changes to the site, the site management plan is to be updated to account for changed conditions. Given the proposed development is likely to disturb the capping layer at Lot 10, there are potential risks to human health from the generation and migration of airborne asbestos fibres.

SERVICING AUTHORITY SCHEDULE OF SUBMISSIONS						
No.	Content Manager File No.	Name	Address	Email	Support / Object / Other	Comment
No.1 – cont..						The department recommends that the following contamination condition and advice note are applied to any approval granted by the City of Rockingham. **Condition X** Given the proposed development works require disturbance of asbestos-contamination fill beneath the geofabric barrier beneath the site, a works-specific remediation plan and an updated Site Management Plan are required to be developed and reviewed by an accredited contaminated sites auditor prior to commencement of development works. **Advice** In relation to Condition [X] and in accordance with regulation 31(1)(c) of the Contaminated Sites Regulations 2006, a mandatory auditor's report, prepared by an accredited contaminated sites auditor, will need to be submitted to the Department of Water and Environmental Regulation as evidence of compliance with Condition [X]. A current list of accredited auditors is available from www.dwer.wa.gov.au. The site is not located within an area that is mapped as having a risk of encountering acid sulfate soils. The department therefore advises that no specific comment is required in relation to acid sulfate soil management during development. If you have any queries in relation to the above, please contact Environmental Officer, Patch Mitchell, on 6364 7199.

SERVICING AUTHORITY SCHEDULE OF SUBMISSIONS						
No.	Content Manager File No.	Name	Address	Email	Support / Object / Other	Comment
2	D24/124236	Mr John Coles Department of Health	PO Box 8172 PERTH BUSINESS CENTRE WA	EHD.ExecutiveSupport@health.wa.gov.au	Support	Thank you for your letter dated 24 May 2024 requesting comment from the Department of Health (DoH) on the above proposal. The DoH has the following comments: ***1. Chemical Hazards*** The site is known to contain deposits of uncontrolled waste, including asbestos containing materials, and has been reported and classified under the *Contaminated Sites Act 2003* (DMO78439). DoH has provided public health advice (FAA74880), most recently in January 2022, which concluded that after significant remediation works, including the installation of a geotextile warning barrier and 0.5m depth of clean capping, the risk to current site users is very low. A Site Management Plan to maintain the effectiveness of the capping system has been approved. The site was reclassified as "Remediated for Restricted Use" restricting use to the current undeveloped space subject to the requirements of site management plan. DoH also advised at the time that "although the site is zoned as "Primary City Centre" under the City of Rockingham Town Planning Scheme No2, the future use of the site was not clear.

SERVICING AUTHORITY SCHEDULE OF SUBMISSIONS						
No.	Content Manager File No.	Name	Address	Email	Support / Object / Other	Comment
No.2 – cont…						DoH would have expected that the remedial works would have been carried out as part of the wider redevelopment scheme, and the remediation strategy be designed to accommodate the proposed redevelopment. As such, if and when the site is redeveloped, or if the clean capping system is to be significantly disturbed or breached, a new Remediation Action Plan (RAP) may be required". On this basis, the site is NOT suitable for the proposed residential use without further action. DoH recommend that a formal planning Condition be attached to any planning approval granted, requiring the proponent develop a revised RAP, setting out the works required to make the site suitable for the proposed residential use. The RAP and subsequent remediation and validation works (and Site Management Plan as required) should be independently reviewed by an accredited Contaminated Sites Auditor as per Regulation 31(1) of the *Contaminated Sites Regulations 2006*. ***2. Drinking Water and Wastewater Management*** The DoH has no objection to the proposal, subject to ensuring connection to drinking water and sewage services, provided by a licensed service provider.

Schedule of Submissions
Proposed Residential Development (14 Grouped Dwellings) – Lot 10 (No.81) Louise Street, Rockingham – 20.2024.132.1

SERVICING AUTHORITY SCHEDULE OF SUBMISSIONS						
No.	Content Manager File No.	Name	Address	Email	Support / Object / Other	Comment
No.2 – cont…						Should you have any queries or require further information please contact System Performance on 9222 2000 or eh.eSubmissions@health.wa.gov.au.

City of Rockingham

Design Review Panel Meeting Notes

Notes of the Design Review Panel held on 30 August 2023

Panel Members:	Ms Emma Williamson Mr Trent Woods Mr Tony Blackwell
City Officers:	Mr David Banovic - Senior Projects Officer (Chair) Mr Chris Parlane - Senior Planning Officer
A/Panel Coordinator:	Mrs Melinda Wardle - EA to Director Planning and Development Services
Proponents:	Item 2 - Messrs Nick Grindrod (Rise Urban), Thomas Chadwick (Chadwick Consulting) Peter Keleman and Edward Davies (Cameron Chisholm Nicol)
Declarations of Interest:	Nil
Agenda Item 2	
Proposed Development	Two Storey Grouped Dwelling Development
Property Address	Lot 10 Goddard Street, Rockingham

Proposal	This conceptual proposal involves the development of a two storey grouped dwelling development, comprising the following:
	- A total of 16 town houses under an affordable housing scheme, and consisting of:
	  ○ Two single storey, single bedroom dwellings; and
	  ○ 14 two storey, two bedroom dwellings;
	- Associated private outdoor living areas (mostly paved);
	- A solid 1.8m high front fence along the Goddard Street frontage;
	- 16 occupant car parking spaces and 2 visitor parking spaces; and
	- a full movement, singular vehicular access point via north-eastern access easement onto the external road network.

Background	The subject land has remained vacant for a number of years. According to Department of Water and Environmental Regulation records, the land has been reported as a 'known or suspected contaminated site', since December 2006. The site is presently classified as "remediated for restricted use" and is identified as being suitable for future residential development, subject to conditions.

Background (cont…)	Public access easements were registered over land bounded by Market Street, Goddard Street, Chalgrove Avenue and McNicholl Street, in accordance with 1993 approved Integrated Development Guide Plan, to facilitate access and parking arrangements. The easement arrangements were modified during 2012 to 2014, to facilitate the 2015 Market Street upgrades and realignment. The Market Street upgrades also allowed for the relocation of the transit corridor away from Chalgrove Avenue.
Proponent deputation to the Panel	Mr Peter Keleman (Cameron Chisholm Nicol) provided an overview of the site in terms of site selection and context, development concept and design elements.
Officer presentation to the Panel	Mr Chris Parlane provided an overview of the planning assessment of the proposed development.

‘Design Quality Evaluation’		
		Supported
		Pending further attention
		Not supported
Design Principles		
Principle 1 ***Context and Character***		*Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
		• The matter of scale is critical to the success of the development and the site context. At present the development falls short of the expectations of the planning framework which also means that it would be out of context with both existing and currently envisaged future development, including the Reserve on the opposite side of Goddard Street. • The applicant is encouraged to demonstrate the relationship of the proposal to the future character of the area with particular consideration given to the relative heights of neighbouring sites. • One of the key negative components of the design as proposed, is the tall, visually impermeable fence along Goddard Street. • Southern elevation is less resolved; it should have same consideration, similar to northern elevation. • The Panel would favour larger street setback to gain benefit of northern aspect to Goddard Street, across all floors. This would also allow the primary outdoor open space for each of the northern bank of units to be on the northern side which would significantly improve the amenity of these spaces. • Incorporate permeable fencing, to provide interface and relationship with street. • Greater articulation at corners is encouraged to relate to and address the immediate context
Principle 2 ***Landscape Quality***		*Good design recognises that together, landscape and buildings cooperate as an integrated and sustainable system, within a broader ecological context.*
		• Provision for tree planting in carpark is good. • Car parking in laneway is unresolved, especially regarding pedestrian movements. • Provision of tables in front of doors in private open spaces, highlights the spatial inadequacy of several of the courtyards. • Could nut trees be provided for owners and native wildlife? • Panel prefers more trees in lieu of visitor bays. • Courtyards feel heavily paved. Further development of the landscape response should consider greening this space and the exploration of hardscape materials that soften this space with the view to a shared pedestrian and vehicle zone.. • Size of all courtyards is a concern, apart from those on the southern side of the northern bank of units. However, the amenity of these larger southern courtyards is compromised due to them being in shade for much of the time and the extent of paving. • Provision of mini landscapes in large carpark tree wells is encouraged.

Design Principles		
Principle 2 ***Landscape Quality*** ***(cont…)***		• Central area road could be moved more to the north, to allow for expansion of the northern courtyards associated with the southern bank of units. • Landscape as proposed for the courtyards in general requires further work to improve the usability and amenity of these spaces. • Opportunity to improve landscape interface with Goddard Street. • The central carpark area could be partially trellised and repurposed, more in the form of a shared space/piazza, to provide an attractive communal gathering space and thus help engender a stronger sense of community.
Principle 3 ***Built Form and Scale***		*Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*
		• Built form/scale is too low in comparison to context. This is considered the fatal flaw of the proposal. • The single storey units are not supported. Consider apartment incorporation above with stairs. • Issue of (lack of) scale and presence on Goddard Street. • Comment was made that the floor to ceiling height of ground floor could be increased. • Provision of balconies onto Goddard street encouraged • Concern in relation to the width of proposed units being undersize. This may require a reduction in the number of units across the width of the site to ensure compliance, functionality and amenity. • Double storey on laneway would provide better passive surveillance.
Principle 4 ***Functionality and Build Quality***		*Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.*
		• Type 1 units look narrow and cramped to the extent that this appears to be impacting upon ease of circulation, e.g. the dining table and chairs are uncomfortably close to the back door, and leave only a restricted width for the primary access here. • Provision for three bins needs to be considered. • Don't support drying areas in front areas - sub-optimal. • Where is the location of air-conditioning plant? • Too much variation in storeroom sizing. • Dimensioned drawings are required to aid in assessment. • High level windows in all bedrooms creates issue with blocking out light. • Consider waste collection location.
Principle 5 ***Sustainability***		*Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
		• The Panel questions the true cross ventilation of the proposal and request clarification. For example the manner in which crossflow ventilation is achieved on the upper levels where there are bedrooms across the whole width of the unit, on either side of the unit. • Consider role of landscaping to aid with passive solar design outcomes.

Design Principles		
Principle 5 ***Sustainability*** ***(cont…)***		• A strategy to maximise north facing habitable internal and external spaces is fully supported • Consider micro EV capability and opportunities. • The applicant is encouraged to integrate elements to optimize passive solar design principles for winter and summer sun. • An increase in sustainability commitment is necessary.
Principle 6 ***Amenity***		*Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*
		• Consider providing balconies on upper floors for outdoor areas. • Amenity hasn't been optimised on northern bank. Southern units also lack amenity. Refer above for various comments. • Central carpark area could have more trees, plus seating and other measures to create a private park or piazza. • Type 1 units are considered too narrow and clarification is sought. Type 2 has the potential to incorporate a double height void and this is encouraged. • The location of air-conditioning condensers needs to be considered and indicated on drawings. • Bedrooms and bathrooms upstairs - perhaps provide a toilet under the stairs for ground floor use to allow for flexibility of spaces. • Collective bin storage area for consideration. • Design robust ground floors to cater for office/work from home type environment.
Principle 7 ***Legibility***		*Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.*
		• Where is the front door? It's not clear. Greater legibility required. • Gates and entries off car parking require further work to make more legible. • Mailboxes for southern units - how is numbering/mail delivery going to work?
Principle 8 ***Safety***		*Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
		• Good passive surveillance is provided generally, apart from the tall garden walls on Goddard Street. • Encourage lower, and/or more transparent walls to Goddard Street frontage. • Passive surveillance is provided over both laneways; consider from upper floors. • The carpark is a shared pedestrian zone and the panel encourages a design resolution that acknowledges and celebrates this.
Principle 9 ***Community***		*Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*
		• Support building type and strongly support addressing need.

Design Principles		
Principle 9 ***Community*** ***(cont...)***		• Central space needs to provide more to residents and the exploration of a shared vehicle and community space is encouraged • Generous tree planting in the central carpark area would also be good for community and passive solar design for southern units. • Look at landscaping public domain; this should be indicated on drawings and form a part of the conditions of approval.
Principle 10 ***Aesthetics***		*Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*
		• Dark cladding would add to urban heat island effect. Recommend moderating use of dark cladding. • Address ends and corners of laneway units to better address their context • The frontage along Goddard Street is composed of two cladding materials. The comment was made this scale of the development may benefit from a more singular approach. • Some further work required on materials.
Summary **(Key Issues)**		• The purpose of the development is strongly supported. However, the scale of the development does not address the context of the immediate area under the existing or proposed planning framework. • Improved amenity for all outdoor areas and communal areas is required. • Internal dimensions do not appear to meet the minimum requirements. • Front entries are not legible.
Panel Recommendation		**The design is not supported.** **The Panel supports the land use intent, however, cannot support the scheme given built form and scale expectations under existing and proposed planning framework.**

Meeting Close	2:45pm
Chair Signature	
Date	30 August 2023

R-CODES VOLUME 1, PART C – ASSESSMENT TEMPLATE

1.0 THE GARDEN

1.1 PRIVATE OPEN SPACE

DEEMED-TO-COMPLY		YES	NO	N/A	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS/ CONDITION OF APPROVAL
C1.1.1	Primary garden area in accordance with Table 1.1a	☐	☒	☐	20m² primary garden area per dwelling, behind the street setback, min dim 3sqm, fully open to sky	U1 15.6m² uncovered U2 30m² U3 26.4m² U4 20.2m² U5 26.7m² U6 20m² U7 13.5m² U8-14 20m²	P1.1.1 Dwellings are designed to have direct access to private open space which provides for entertaining, leisure and connection to the outdoors that is: i. of sufficient size and dimension to be functional and usable for the intended number of dwelling occupants; ii. is sited, oriented and designed for occupant amenity, including consideration of solar access and natural ventilation appropriate to the climatic region; and iii. capable of use in conjunction with a primary living space of the dwelling. P1.1.2 Private open space allows for sufficient uncovered area to: i. permit winter sun and natural ventilation into the dwelling; and ii. provide for soft landscaping, including the planting of a tree(s) and deep soil area.	C1.1.1 Primary Garden Areas Units 1 and 7 have 15.6m² and 13.5m² primary garden area respectively. The primary garden areas are on the northern side of the dwelling and are directly accessible from the internal living area. Given the intended occupants are pensioners the primary garden areas are considered of sufficient size to accommodate their needs. An outdoor table setting can be accommodated in the paved areas. The proposal is consistent with P1.1. 1 and P1.1.2.
C1.1.2	Splitting of PGA for grouped dwellings	☐	☐	☒				N/A
C1.1.3	Private open space to multiple dwellings (balcony) in accordance with Table 1.1b	☐	☐	☒				N/A
C1.1.4	Balconies to be unscreened for 25%	☒	☐	☐		All balconies have open style ballistrading Screening provided between adjoining balconies (translucent corrogared panels)		Complies with DTC.

1.2 TREES AND LANDSCAPING

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS/CONDITION OF APPROVAL
C1.2.1 – 15% soft landscaping per site	☐	☒	☐	At least 15% of soft landscaping per site, minimum dimension 1m	U1 – 19.7m² (17%) U2 – 21.2m² (17.3%) U3 – 18.5m² (15.4%) U4 – 22m² (18.1%) U5 – 18.4m² (16%) U6 – 14.2m² (13.1%) U7 – 7.9m² (7.9%) U8 – 19.8m² (18.3%) U9 – 13.3m² (12.5%) U10 – 16.3m² (15%) U11 – 16.2m² (15.1%) U12 – 16.7m² (15.6%) U13 – 16.6m² (15.5%) U14 – 15.1 (14.2%)	P1.2.1 Site planning allows for: i. site responsive and sustainable landscape design; and ii. the retention of existing trees on the subject site and adjoining properties.	Lots 6, 7, 9 and 14 have less than 15% soft landscaping provided, with Lot 7 having the least (7.9%) and the others mentioned above marginally under size. A number of soft landscaping areas span lot boundaries and as such are slightly under dimension.

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS/CONDITION OF APPROVAL
						P1.2.2 Provision of trees and high quality landscaping: i. enhances the built form, streetscape and pedestrian amenity, as viewed from the street; ii. provides shade and amenity for communal streets and parking areas; and iii. contributes to the visual appeal, comfort and amenity of the development, in particular private open space and communal open space and outlook from habitable rooms	When considered collectively however, these additional landscaping areas are of sufficient width to provide for an effective landscaping design as well as deep soil areas that can support a small tree. While Lot 7 has insufficient deep soil area either in the front courtyard or to the rear of the dwelling to plant a small tree, the landscape concept plan provides for low level landscaping in the front courtyard utilising ground covers, grasses and shrubs, which is considered sufficient to satisfy P1.2.1 and P1.2.2.
C1.2.2 – 30% soft landscaping of the primary street setback area	☒	☐	☐	At least 30% soft landscaping within primary street setback	93m² (51%) soft landscaping provided in the street setback.		Complies
C1.2.3 – Communal street and communal open space is landscaped and provided with adequate lighting to footpaths and vehicle access areas	☒	☐	☐				Condition: Landscape plan to be provided showing lighting to communal street
C1.2.4 – Minimum trees and deep soil area in accordance with Tables 1.2a & 1.2b.	☐	☐	☐	1 small tree per dwelling, 1.5m/9m²	All units have 1 small tree in DSA's in the front yards, however DSA's for the following units are less than 9m² per unit: U7 2.8m² U9 6.8m² U10 6.8m² U11 6.6m² U12 6.5m² U13 6.4m² U14 6.7m². Courtyard trees: Eucalyptus caesia silver princess Sapium sebiferum Chinese tallow Driveway trees: Eucalptus victrix Coolabah Corymbia ptychocarpa pink flowering bloodwood.	P1.2.3 Development provides sufficient deep soil area to sustain healthy tree and plant growth, providing for an increase in urban tree canopy over time, and assist in managing the quantity and quality of stormwater.	The plan shows a small tree in the front courtyards of all Lots, however, the deep soil areas for lots 7, 9, 10, 11, 12, 13 and 14 are less than 9m². The site plan shows additional DSA's that span the lot boundaries which collectively offset the technical shortfall on the specified unit sites. While Lot 7 has insufficient deep soil area either in the front courtyard or to the rear of the dwelling to plant a small tree, the plans provide for the planting of 23 other trees across the development, which exceeds the DTC requirement for 14 trees. It is considered there is sufficient DSA's provided overall for this development to ensure healthy tree growth and provide increased urban tree canopy, while assisting manage stormwater runoff, and as such, satisfy P1.2.2 and P1.2.3
C1.2.5 – Shade trees for uncovered at grade car-parking for grouped and multiple dwellings	☒	☐	☐	4 trees required in car park	9 shade trees in the car park, an excess of 5 trees provided.		Complies
C1.2.6 – reduced landscaping subject to retaining a significant existing tree	☐	☐	☒				N/A
C1.2.7 – Where a significant existing tree is retained on site, tree protection zone is provided in accordance with *AS4970*	☐	☐	☒				N/A
C1.2.8 – Landscaping plan (for multiple dwellings or 5+ dwellings) in accordance with Appendix 3	☒	☐	☐		Landscape strategy provided on the Design Report and shown on site plan		Complies.

1.3 COMMUNAL OPEN SPACE – Multiple dwellings only

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS/CONDITION OF APPROVAL
C1.3.1 – Minimum communal open space requirements	☐	☐	☒				N/A
C1.3.2 – Communal open space separated or screened sources of noise and odour	☐	☐	☒				N/A
C1.3.3 – Design and orientation of communal open space to minimise impacts of noise, odour, lightspill and overlooking	☐	☐	☒				N/A

1.4 WATER MANAGEMENT AND CONSERVATION

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS/CONDITION OF APPROVAL
C1.4.1 – Stormwater retained on site	☒	☐	☐	Stormwater runoff to be retained on site	A stormwater managemt plan will be developed at detailed design stage and submitted for approval post DA.		Address by DA condition – referencing LPP3.4.3 Urban Water Management
C1.4.2 – Notwithstanding C1.4.1, stormwater directed to a district or local stormwater drainage system where required by the decision-maker	☐	☐	☒				N/A

2.0 THE BUILDING

2.1 SIZE AND LAYOUT OF DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.1.1 – Designated primary living space, for multiple dwellings the primary living space with a minimum dimension of 3.8m	☐	☐	☒				N/A
C2.1.2 – Primary living space to have direct and physical access to primary garden area/private open space (single houses and grouped dwellings)	☒	☐	☐		All units have primary living spaces on ground floor abutting the primary garden areas		Complies
C2.1.3 – Primary living space to have direct access to private open space (multiple dwellings)	☐	☐	☒				N/A
C2.1.4 – Max depth of single aspect primary living space (multiple dwellings only)	☐	☐	☒				N/A
C2.1.5 – Bedrooms to have a minimum internal floor area of 9m^2 and a minimum dimension of 2.7m (multiple dwellings only)	☐	☐	☒				N/A
C2.1.6 – Minimum ceiling height (multiple dwellings)	☐	☐	☒				N/A
C2.1.7 –Minimum internal dwelling floor area (multiple dwellings)	☐	☐	☒				N/A
C2.1.8 – Dwelling mix (10+ multiple dwellings)	☐	☐	☒				N/A
C2.1.9 – Storage requirements in Table 2.1b	☐	☒	☐	4m² stores, min dim 1.5m wide, 2.1m high, with a 0.9m circulation space in front of the store required for two bedroom dwellings	All stores are undersize and require consideration under the Design Principle. U1 2.9m² U2 2.9m² U3 2.9m² U4 2.9m² U5 3.5m² U6 3.5m² U7 3.5m² U8 3.3m² U9 3.5m² U10 3.5m² U11 3.5m² U12 3.5m² U13 3.5m² U14 3.5m² All stores 1m deep. Stores 2.1m high	P2.1.5 Each dwelling provides adequate, conveniently located storage for large items that are: i. proportionate to the size of the dwelling and intended number of occupants; and ii. integrated into the design of the building and/ or screened from view to ensure that it is not visually intrusive when viewed from the street.	The reduced storeage area can be supported due the the likely reduced needs of aged occupants of the dwellings.
C2.1.10 – Reduced storage area dimension	☐	☒	☐	Notwithstanding C2.1.9, minimum storage area dimension can be reduced to 1m where: i. it can be demonstrated that an adjacent circulation space achieves 0.9m clearance; ii. the door or opening is located on the greater dimension and is openable for a minimum 80 per cent of the length; and iii. the minimum storage area is still achieved (refer Figure 2.1d)	Stores are parallel to the car bays for units 5-7 and 9-14 which are 3.2m wide (collectively).	P2.1.5 Each dwelling provides adequate, conveniently located storage for large items that are: i. proportionate to the size of the dwelling and intended number of occupants; and ii. integrated into the design of the building and/ or screened from view to ensure that it is not visually intrusive when viewed from the street.	The doors to the stores are sliding doors that do not open outwards in a way that would impinge on circulation. The reduced internal dimension of the stores can be supported as there is a 1m wide path of travel adjacent to the doors for circulation space. For unit 9, while the store is directly abutting the car bay there is 3.2m space collectively adjacent to the store to accommodate a car space and path of travel to the dwelling. Should the occupant need to access this store then they can park the vehicle within this space away from the store to provide adequate access.
C2.1.11 – Major openings setback a minimum of 3m where facing directly onto car parking and corridors (multiple dwellings)	☐	☐	☒				N/A
C2.1.12 – Separation of noise sources (multiple dwellings)	☐	☐	☒				N/A

2.2 SOLAR ACCESS AND NATURAL VENTILATION

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.2.1 – Openable external window requirements for habitable rooms	☒	☐	☐	At least 1 openable external window required, at least 10% of internal floor area	Ground floor living (34m²): 2 major openings provided (8.8m² aggregate) 25% Bed 1 (12.6m²): 1 major opening provided 3.3m² (26%) Bed 2 (14.1m²): 1 major opening provided 3.3m² (23%)		Complies
C2.2.2 – Courtyard requirements (when proposed as the only source of daylight to a habitable room)	☐	☐	☒				N/A
C2.2.3 – Openable window requirements for bathrooms on external walls (excluding boundary walls)	☒	☐	☐	Openable bathroom windows on an external wall.	First floor bathrooms have obscure glazed window on external walls.		Complies
C2.2.4 – Orientation of major openings to primary living spaces (single houses and grouped dwellings)	☒	☐	☐		All units have a major openining facing courtyards orientied n/e		Complies.
C2.2.5 – Percentage of dwellings achieving solar access to major openings to primary living spaces (multiple dwellings)	☐	☐	☒				N/A

2.3 PARKING

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.3.1 – Occupant parking in accordance with Table 2.3a	☒	☐	☐	Location A 0-2 bays maximum	14 bays – 1 per dwelling		Complies
C2.3.2 – Motorcycle/scooter parking (multiple dwellings)	☐	☐	☒				N/A
C2.3.3 – Design of car spaces and manoeuvring areas as per *AS2890.1*	☐	☒	☐	AS2890.1 requires 2.4m wide x 5.4m long bays.	The site plan shows variable width car bays in spaces between 2.7m (unit 1) and 3.4m wide, though most units have a 3.2m wide space that include a 1m wide pedestrian path of travel. The length of the bay for unit 8 is 5.2m. The other bays are at least 5.4m long.	P2.3.3 Parking spaces are designed for flexibility and adaptability having regard for: i. the needs of occupants, including consideration of universally accessible parking spaces; and ii. the ability to use the space for alternative purposes.	The width of the car spaces and adjoining pedestrian paths collectively provide flexibility to the future occupants to park vehicle where they like within these spaces to suit their needs. Allowing 2.4m to park a car, then this leaves a 0.8m path of travel whch is considered acceptable. The 5.2m long bay for unit 8 should be marked as a 'small car' bay.
C2.3.4 – Visitor parking in accordance with Table 2.3a	☐	☒	☐	4 visitor bays required	Nil visitor bays proposed	P2.3.2 Adequate parking is provided for various modes of transport, including bicycles, motorcycles, scooters and cars, that has regard to the following considerations: i. the proximity of the proposed development to public transport, activity centres, areas of amenity and other facilities; ii. the type, size and number of dwellings; and iii. the availability of on-street and other offstreet parking.	There are 4 on street bays in Louise Street verge adjacent the site. The site is located in proximity to high frequency public transport and is in a TOD precinct. Variation supported.
C2.3.5 – Design and location of visitor parking	☐	☐	☒		No visitor bays on site		Refer above for C2.3.4.
C2.3.6 – Bicycle parking in accordance with Table 2.3b	☐	☐	☒				N/A

2.4 WASTE MANAGEMENT

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.4.1 – Space for bin storage	☐	☒	☐	A dedicated and accessible space is provided to accommodate the required number and type of waste storage bins for the development, in line with requirements of the local government and separate from any waste storage areas associated with the non-residential component of a mixed use development.	A centralised bin store is proposed at the rear of units 2 and 3. The site plan shows space for 11 bins to be presented in single file in the easement next to the common driveway.	P2.4.1 Sufficient space for waste storage is provided that: i. is convenient for residents; ii. has collection areas which can be accessed by service vehicles; and iii. can be secured and managed where required	There is no provision in the WMP for FOGO bins, meaning that the bin store may need to be increased; and an alternative method of waste collection considered, as additional bins presented in the easement for collection as shown on the site plan, would become problematic for the City to collect if they are presented in a double row. This concern can be managed by condition, which would address the Desigm Principe that requires an updated WMP to be provided to the satisfaction of the City, should approval be granted.
C2.4.2 – Waste management plan (multiple dwellings or 5+ grouped dwellings)	☐	☒	☐		A WMP was submitted with the application.	P2.4.1 Sufficient space for waste storage is provided that: i. is convenient for residents; ii. has collection areas which can be accessed by service vehicles; and iii. can be secured and managed where required	As above
C2.4.3 – Screening of waste storage	☒	☐	☐	Waste storage bins are screened from view from communal areas, the street, public open space, and other areas accessible to the public	A 2.1m high screened bin store is proposed with a planted trellis roof to screen from view from the upper floor of adjacent dwellngs.		Complies
C2.4.4 – Communal waste storage area requirements	☒	☐	☐	Where a communal waste storage area is provided, it is to be separated or screened from major openings, primary garden areas and communal open space to avoid the adverse impact of potential sources of noise and odour	As above. The bin store is on the south side of the northern building where it is separated from the primary garden areas.		Complies

2.5 UTILITIES

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.5.1 – Service utilities	☒	☐	☐	Service utilities are designed and located such that they: i. are accessible and can be safely maintained; ii. maintain clear sightlines for vehicle access; and iii. integrated into the design of the development and/or screened from view of the street.	A communal letterbox is proposed where the common driveway meets the access easement over Lot 303 Chalgrove Avenue mid-way along the eastern side boundary.	P2.5.1 The site is serviced with utilities that that are fit for purpose and meet current performance and access requirements of service providers, addressing access, maintenance and safety considerations.	Access to this letterbox is provided over private land (Lot 303). It is unclear whether Australia Post is willing to traverse Lot 303 to deliver mail to the development considering the letterbox is remote from the public realm (street). The applicant was requested to check this with Australia Post which they are following up. In the absence of any confirmation by Australia Post that the letterbox is satisfactorily accessible, there is insufficient information provided that demonstrates that the Design Principle has been satisfied.

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
							The City considers that the general location of the letter boxes may not be fit for purpose due to its physical location and should be relocated instead to Louise Street frontage, so that they are clearly legible. Design Principle not satisfied.
C2.5.2 – Functional utilities	☒	☐	☐	Functional utilities (with the exception of solar collectors and electric vehicle charging): i. are located behind the primary street setback and not visible from the primary street; ii. are designed to integrate with the development; and iii. are located and/or screened so that they are not visually obtrusive and minimise the impact of noise sources to habitable rooms and private open space both on the development site and adjoining properties.	A/C, HWS and clothes lines are located in the screened courtyards of U 1,2,3, 4, 8-14. The clothes lines, HWU and A/C a for U5-7 are to the rear of the dwellings where they are reasonably screened by the adjoining stores.		Complies
C2.5.3 – Solar collectors (where provided)	☐	☐	☒		Solar may be provided 'where possible'		

2.6 OUTBUILDINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.6.1 – Requirements for outbuildings	☐	☐	☒				N/A
C2.6.2 – Additional outbuilding standards where designed to be compatible with the colour and materials of the dwelling	☐	☐	☒				N/A

2.7 UNIVERSAL DESIGN

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.7.1 – 20% of dwellings to achieve silver level universal design (10 + grouped or multiple dwellings)	☒	☐	☐	Where 10 or more grouped or multiple dwellings are proposed, a minimum 20 per cent of all dwellings are: i. designed and constructed to a minimum silver level universal design in accordance with A4 Universal design requirements, or ii. certified Livable Housing Australia to a minimum silver level of performance. 3 Dwellings are to be designed to meet Silver Level UD standards.	The applicant states that the dwellings have been designed to be capabale of complying with silver level universal design standards to ensure that at least 3 dwellings comply. The City understands that the applicant intends to address this at the detailed design stage prior to Building Permit.		Three (3) of the dwellings need to be designed to meet the Silver Level universal design standard. The Sliver Level Universal Design standards include (among other matters): • Providing a continuous path of travel to a dwelling entrance door from: i. the street boundary; ii. a garage or carport for the exclusive use of the occupants of the dwelling; or iii. a car parking space within the lot for the exclusive use of the occupants of the dwelling.

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
							• Where an associated unenclosed car parking space for the dwelling is provided, at least one space must provide a continuous path of travel referred to (above) and have a minimum unobstructed dimension of 3200mm width. Complies with DtC, subject to a condtion to ensure compliance should approval be granted.
C2.7.2 – Gold level universal design requirements where seeking to apply site area variation in Part D, C1.1.6 or C1.1.7	☐	☐	☒				N/A

2.8 ANCILLARY DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.8.1 – Ancillary dwelling requirements	☐	☐	☒				N/A

2.9 SMALL DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.9.1 – Small dwelling requirements	☐	☐	☒				N/A

2.10 HOUSING ON LOTS LESS THAN 100m²

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C2.10.1 – Design standards for houses on lots less than 100m²	☐	☐	☒				N/A

3.0 NEIGHBOURLINESS

3.1 SITE COVER

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.1.1 – Site cover in accordance with Table 3.1a *(For single house and grouped dwelling development, refer section 5, C5.1 until 10 April 2026)*	☒	☐	☐	Open Space transitional provisions requires 30% open space for R80.	655.8m² building cover = 37.6% coverage. Open space = 62.3%		Complies

3.2 BUILDING HEIGHT

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.2.1 – Building height in accordance with Table 3.2a	☐	☐	☒				Precinct Structure Plan applies – refer to CP1

3.3 STREET SETBACKS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.3.1 – Setback of buildings in accordance with Table 3.3a	☐	☐	☒				Precinct Structure Plan applies – refer to CP2
C3.3.2 – Porch, verandah, balcony projections into the street setback area	☐	☐	☒				
C3.3.3 – Setback from corner truncations	☐	☐	☒				
C3.3.4 – Garages setback from primary street in accordance with Table 3.3b	☐	☐	☒				
C3.3.5 – Setback of carports from a primary street	☐	☐	☒				
C3.3.6 – Setback of garages and carports from a secondary street, right-of way and communal street in accordance with Table 3.3a	☐	☐	☒				

3.4 LOT BOUNDARY SETBACKS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.4.1 – Buildings set back from lot boundaries in accordance with Table 3.4a	☐	☐	☒		Nil side boundary setback proposed.		Precinct Structure Plan applies – refer to CP3
C3.4.2 – Maximum length for two storey walls	☐	☐	☒				PSP - CP3 applies.
C3.4.3 – Setback of carports, patios, verandahs or equivalent structure	☐	☐	☒				N/A
C3.4.4 – Maximum height and length of boundary walls in accordance with Table 3.4b	☐	☐	☒				Precinct Structure Plan applies – CP3 side and rear boundary setbacks.
C3.4.5 – Boundary wall abutting an existing or simultaneously constructed wall	☒	☐	☐		Similtaneously constructed internal boundary walls proposed.		Complies.
C3.4.6 – Grouped dwellings on the same lot set back as if there is a boundary between them	☒	☐	☐		Internal boundary walls proposed. At least 0.5m from the boundary of the common driveway.		Complies.
C3.4.7 – Multiple dwelling buildings on the same lot set back as though there is a lot boundary	☐	☐	☒				N/A

3.5 SITE WORKS AND RETAINING WALLS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.5.1 – Retaining walls, fill and excavation in the street setback area max 0.5m, except where necessary to provide for pedestrian universal access and/or vehicle access, drainage works, or natural light to a dwelling	☒	☐	☐		Filling and retaining across the site up to 0.5m in places is proposed.		Complies.
C3.5.2 - Retaining walls and fill behind the street setback in accordance Table 3.5a	☒	☐	☐		As above		Complies
C3.5.3 – Excavation behind the street setback line and up to the lot boundary	☒	☐	☐		Limited excavation if any is proposed within the site.		Complies.

3.6 STREETSCAPE

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.6.1 – Single houses and grouped dwellings address the street	☒	☐	☐	Single houses and grouped dwellings to address the street (including a communal street or rightof-way where this is the primary frontage) in accordance with the following: i. the primary entrance to each dwelling must be readily identifiable from the street; and ii. provide at least one major opening on the dwelling frontage with an outlook to the street.	U1-7 address Louise Street with legible front doors facing the street. U8-14 face north with front doors accessed from the common driveway that can be seen across the proposed courtyard fencing. All dwellings have major openings facing the street or common driveway.		Complies
C3.6.2 – Multiple dwelling upper level balconies address the street	☐	☐	☒				N/A
C3.6.3 – Front door protection from the weather	☒	☐	☐	For single houses and grouped dwellings, front doors to be protected from the weather (for example by a porch, verandah, building over or similar), with a minimum dimension of 1.2m (refer Figure 3.6a)	1.2m eave overhangs provided.		Complies
C3.6.4 – Ground floor multiple dwellings access to the street	☐	☐	☒				N/A
C3.6.5 – Maximum garage door width	☐	☐	☒				N/A
C3.6.6 – Maximum carport width	☐	☐	☒				N/A
C3.6.7 – Fence or wall within the primary street setback area requirements	☒	☐	☐	When provided, fences or walls within the primary street setback area are to be: i. a maximum height of 1.8m; and ii. visually permeable above 1.2m (refer Figure 3.6c); measured from natural ground level on the primary street side of the fence or wall.	Street boundary fencing 1.8m high, visually permeable above 0.9m. Side boundary fences between the units within the street setback are 1.8m high solid fencing  North courtyard (Goddard Street)		Can comply with the DtC, subject to a condition that requires any side boundary fencing within the street setback being permeable fencing above 1.2m.

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.6.8 – Pillars as part of street fence/wall	☐	☒	☐	Solid pillars that form part of front fences or walls are not more than 1.8m above natural ground level, provided the horizontal dimension of the pillars is not greater than 450mm by 450mm and pillars are separated by visually permeable fencing in line with C3.6.7 (Refer Figure 3.6c)	Pillars in the street fencing 1-1.2m wide	P3.6.5 The height of street walls and fences allows for passive surveillance of the street from the development whilst balancing the need for privacy of private open space and the impact of traffic noise, where located on a primary distributor, district distributor or integrator arterial road.	The only portions where there are wider pillars is where the gates on adjoining units abut. Adequate survellance of the street is obtained. Variation supported
C3.6.9 – Secondary street fencing for corner sites	☐	☐	☒				N/A

3.7 ACCESS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.7.1 – Vehicle access hierarchy	☒	☐	☐	Vehicle access to on site car parking spaces to be provided via the lowest available street in the hierarchy, as follows: i. where available, from a right-of-way or communal street available for lawful use to access the relevant site and which is trafficable and drained from the property boundary to a constructed street; or ii. from the secondary street or primary street where no right-of-way or communal street exists	Access proposed from a constructed right-of-way easement over Lot 303		Complies
C3.7.2 – One vehicle access per lot	☒	☐	☐		Single crossover is proposed		Complies
C3.7.3 – Driveway dimension requirements	☒	☐	☐	Driveways must be: i. a minimum 3m wide; ii. a maximum 6m wide at the street boundary; iii. set back 0.3m from a side lot boundary or street pole; iv. set back 6m to a street corner (refer Figure 3.7b); v. aligned at right angles to the road carriageway; and vi. adequately trafficable and drained.	The common driveway is: • 3.5m wide; • Set back 19m from corner; • Ailgned at right angles.		Complies
C3.7.4 – Driveways that allow vehicles to exit in forward gear	☒	☐	☐	Driveways designed to allow vehicles to exit to the street in forward gear where the driveway: i. serves five or more dwellings; ii. the distance from an on site car parking space to the street boundary is 30m or more; or	The applicant's swept path diagrams indicate adeqauet manouvering can occur for vehciles to leave in a forward direction.		Complies

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
				iii. the street to which it connects is a designated primary distributor or integrator arterial.			
C3.7.5 – Driveway allow passing (when 30m+)	☒	☐	☐	Driveways designed for vehciles to pass. Min 5.5m wide by 6.3 long, excluding manouvering tapers.	There is a 5.5m wide x 7m long space in the common driveway where vehciles can pass.		Complies
C3.7.6 – Driveways onto primary distributor or integrator arterial roads	☐	☐	☒				N/A
C3.7.7 - Sightlines	☒	☐	☐	Walls, fences truncated or reduced to no higher than 0.75m within 1.5m of where structures adjoin a driveway that intersects with a right of way			Complies
C3.7.8 – Pedestrian access (grouped and multiple dwellings)	☐	☒	☐	For grouped and multiple dwellings, a legible, well defined, continuous path of travel is provided from the public footpath and car parking areas to building access areas such as lift lobbies, stairs, accessways and individual dwelling entries.	Front dwellings: • POT provided to front doors from Louse Street • POT provided between car spaces and rear doors to dwellings – except unit 1 (shared with unit 2) Rear dwellings: • No POT provided from a public footpath to the front doors of the dwellings.	<u>P3.7.5</u> Legible, safe, and direct access for residents and their visitors to move between communal car parking areas or public streets and individual dwellings	As there is no ability to condtion the requirement for a POT across Lot 303 Chalgrove Avenue, the proposal is considered to be inconsistent with the Design Principle.
C3.7.9 – Delineated or separate pedestrian access (10+ grouped and multiple dwellings)	☐	☒	☐	For multiple dwellings and 10 or more grouped dwellings that are served by a communal street, a pedestrian path is provided as follows: i. minimum 1m wide, clear of any utilities or minor projections; ii. **clearly delineated or separate from the vehicular access**; and iii. continuous path of travel from the street boundary to ground floor dwelling or building entries.	Plans show a 1m wide pedestrian path along the common driveway within the site leading to the doors of the units, except for U8. There is no pedestrian, path separate from the driveway, that connects between the street and the front doors of units 8-14 (ie on Lot 303)	<u>P3.7.5</u> Legible, safe, and direct access for residents and their visitors to move between communal car parking areas or public streets and individual dwellings	All 14 Units are served by a common driveway meaning that a dedicated pedestrian path separate from the vehicle access needs to be provided. There is no gap in the front building row to facilitate direct pedestrian access to the street for the rear dwellings. As such, Units 8-14 rely on gaining pedestrian access from the street boundary via an access easement over Lot 303 Chalgrove Avenue. While it may be argued this pedestrian path requirement does not apply because 5 Grouped Dwellings have direct frontage to Louise Street, the City considers that regardless, the principles of 'orderly and proper planning' should prevail to ensure the pedestrian access can be provided legibly and safely from the street to Units 8-14 as well as Units 1-2. This is a fatal flaw in the design, as it is not considered orderly and proper planning to expect elderly occupants and visitors of the occupants of Units 8-14 to navigate the vehicle carriageway in the access easement on foot without providing a dedicated pedestrian path.

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
							The Design Principle has not been satisfied as safe and legible for pedestrian access for Units 1-2 and Units 8-14.
C3.7.10 – Pedestrian access legs	☐	☐	☒		No pedestrian access leg proposed. The buildings extend across the site from side boundary to side boundary.		N/A
C3.7.11 – Communal street or battleaxe leg requirements	☒	☐	☐	A communal street shall be a minimum width of 3.6m, inclusive of: • 3m wide driveway and • 0.3m setback either side of the driveway, provided with lighting and landscaping.	Communal street 4-5.5m wide, including 3m wide driveway. 0.3m wide landscape strip not shown between the driveway and the site boundary. But landscaping is proposed between the parking bays adjacent the common property that has the same effect.		Complies
C3.7.12 – Lighting and landscaping of communal streets or battleaxe legs	☒	☐	☐		No details provided.		Common property driveway lighting will be recomended as a conditon should approval be granted. Can comply.
C3.7.13 – Notwithstanding C3.7.11, communal streets to 20 or more lots requirements	☐	☐	☒				N/A

3.8 RETAINING EXISTING DWELLINGS

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.8.1 – Requirements where a dwelling is retained	☐	☐	☒				N/A

3.9 SOLAR ACCESS FOR ADJOINING SITES

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.9.1 – Maximum overshadowing in accordance with Table 3.9a	☒	☐	☐	Maximum overshadowing up to 50% of the adjoining lot area	No overshadowing to Lot 9. Up to 7.2% overshadowing to Lot 14		Complies
C3.9.2 – Maximum overshadowing where R40 or greater and has a lot frontage of 7.5m or less	☐	☐	☒				N/A
C3.9.3 – Maximum overshadowing requirements where the adjoining property shares a northern lot boundary with more than one lot	☐	☐	☒				N/A

3.10 VISUAL PRIVACY

DEEMED-TO-COMPLY	MEETS DEEMED-TO-COMPLY	ADDRESSES DESIGN PRINCIPLE	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
C3.10.1 – Visual privacy requirements where adjoining a developed site	☐	☒	☐	All sources of overlooking are oriented, offset or setback in accordance with Table 3.10a so that the cone of vision (refer Figure 3.10a) does not capture major openings and/or active habitable spaces on an adjoining property (refer Figure 3.10b)	In respect to the adjoining land: • Cone of vision from first floor bedrooms of U8-14 encroach up to 1.3m onto Lot 14 to the south;	<u>P3.10.1</u> Direct overlooking of major openings and active habitable spaces of adjacent dwellings and adjoining properties minimised through: i. building siting, layout and design;	On Lot 14 Market street there is an access easement traversing the lot parallel and set back from the southern boundary of the subject site by 5.5m.

DEEMED-TO-COMPLY	MEETS DEEMED-TO-	ADDRESSES DESIGN	NOT APPLICABLE	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	CONDITION OF APPROVAL (IF APPLIED)
				Table 3.10a Cone of vision radius **Type of habitable room/ active habitable space** *(with a floor level of more than 0.5m above natural ground level)* / **Cone of vision radius**: **Areas coded R50 or lower** / **Areas coded higher than R50** Major opening from bedroom and study: 4.5m / 3m Major opening from habitable room other than bedroom and study: 6m / 4.5m Outdoor active habitable space: 7.5m / 6m Cone of vision required from: • Bedrooms- 3m • Habitable rooms other than bedrooms, studies 4.5m Outdoor active habitable spaces 6m	• CoV from first floor bedrooms of U7 and 14 encroach up to 1.2m onto Lot 9 Market Street • CoV from the balcony of U7 enroaches 3m onto Lot 9 Market street at the front of the lot; • CoV from U1 and 8 first floor bedrooms encroach on Lot 303 Chalgrove Ave up to 1.5m • CoV from the balcony of U1 encroaches 6m onto Lot 303 Chalgrove Ave at the front of this lot.	ii. design and location of major openings; iii. landscape screening of outdoor active habitable spaces; and/or iv. design and location of screening devices.	Even though Lot 14 hasn't been developed yet, its unlikely that the space will be developed for residential purposes due to the easement proximity. Lot 9 Market Street is vacant also, but has an approved development. It is evident from the approved plans that the overlooking from the subject site will not impact outdoor active habitable spaces or any major openings. There is a parapet wall proposed on the front half of Lot 9 and a car park to the rear. As such, the minor encorachemnt of the cone of visions is unlikely to give rise to direct overlooking of adjacent outdoor active habiltable spaces. Complies with the Design Principle.
C3.10.2 – Notwithstanding C3.10.1, Visual privacy design solutions	☐	☐	☒				N/A
C3.10.3 – Offsetting of bedroom and study windows	☐	☐	☒				N/A
C3.10.4 – Overlooking for grouped or multiple dwellings within a lot	☐	☒	☐	Sources of overlooking for grouped or multiple dwellings on the same lot are to apply C3.10.1, C3.10.2 and C3.10.3	Within the development there are overlapping cones of vision from the bedrooms (3m) and balconies on the first floor onto adjoining lots. The unscreened balconies on U1&2, U3&4, U6&7 are separated by 3.5m (6m required, as per C3.10.1)	<u>P3.10.1</u> Direct overlooking of major openings and active habitable spaces of adjacent dwellings and adjoining properties minimised through: i. building siting, layout and design; ii. design and location of major openings; iii. landscape screening of outdoor active habitable spaces; and/or iv. design and location of screening devices.	The source of overlooking between the units on the subject site is from bedrooms and the balconies attached to the bedrooms on the first floor that are used only intermittently and provide for passive surveillance. The design is considered adequate for a building with this intended use in mind, and is considered satisfactory.
C3.10.5 – Visual privacy where adjoining a vacant or unknown site	☐	☒	☐		Refer to C3.10.1 above	Refer to C3.10.1 above	
C3.10.6 – Notwithstanding C3.10.5, visual privacy design solutions where adjoining a vacant or unknown site	☐	☒	☐	Notwithstanding C3.10.5, where the cone of vision extends beyond a lot boundary behind the street setback on an adjoining property, the source of overlooking is designed to restrict the view in the direction of the adjoining property through one or more design techniques.	Refer to C3.10.1 above.		N/A as the Design Principle P3.10.1 has been met.

PART D - LAND

1.1 SITE AREA

DEEMED-TO-COMPLY		YES	NO	N/A	DEEMED-TO-COMPLY REQUIREMENT	PROVIDED	DESIGN PRINCIPLE (IF APPLIED)	COMMENTS / CONDITION OF APPROVAL
C1.1.1	Average & Minimum site area in accordance with Table D	☒	☐	☐	Min site area: 100m² Average site area: 120m²	Minimum: 106m² Average: 124m²		Complies
C1.1.2	Minimum site area calculated as required for a single house or grouped dwelling	☒	☐	☐	Min site area: 100m²	U1 113 m² U2 122 m² U3 119 m² U4 121 m² U5 115 m² U6 108 m² U7 100 m² U8 108 m² U9 106 m² U10 107 m² U11 107 m² U12 107 m² U13 107 m² U14 106 m²		Complies
C1.1.3	Corner Truncation to a public street, up to a maximum of 20m2 to be added	☐	☐	☒				N/A
	Battle-axe access leg no more than 20% of required site area in Table D	☐	☐	☒				N/A
C1.1.4	Variation approved by the WAPC	☐	☐	☒				N/A
	Existing lot with permanent legal access to a public road	☐	☐	☒				N/A
C1.1.5	R25 & below only			☒				N/A
C1.1.6 R30 - R40 only	Reduced by up to 35% for an accessible dwelling to gold level universal design or a small dwelling	☐	☐	☒				N/A
	Site not less than100m2	☐	☐	☒				N/A
	Where 4 or more dwellings or sites, reduction applied to a maximum 50%	☐	☐	☒				N/A
C1.1.7 R50+	Reduced by up to 35% for an accessible dwelling to gold level universal design or a small dwelling	☐	☐	☒				N/A
	Site not less than100m2	☐	☐	☒				N/A
	Where 4 or more dwellings or sites, small dwelling reduction applied to a maximum 50%	☐	☐	☒				N/A
C1.1.8	For multiple dwellings in areas coded R30 to R60; where a significant existing tree is retained, the average site area may be reduced by 10%. (This reduction is limited to dwellings not already subject to a reduced average site area under C1.1.6 or C1.1.7)	☐	☐	☒				N/A

PART C – OTHER BUSINESS

1. **State Administrative Tribunal Applications and Supreme Court Appeals**
2. **General Business**
3. **Meeting Closure**