HUME CITY COUNCIL

Office Use Only

Application No.: Date Lodged: / /

Application for
Planning Permit

Planning Enquiries
Phone: 03 9205 2200
Web: http://www.hume.vic.gov.au

If you need help to complete this form, read How to complete the Application for Planning Permit form.

⚠ Any material submitted with this application, including plans and personal information, will be made available for public viewing, including electronically, and copies may be made for interested parties for the purpose of enabling consideration and review as part of a planning process under the *Planning and Environment Act 1987*. If you have any concerns, please contact Council's planning department.

⚠ **Questions marked with an asterisk (*) are mandatory and must be completed.**

⚠ **If the space provided on the form is insufficient, attach a separate sheet.**

Clear Form

The Land i

(1) Address of the land. Complete the Street Address and one of the Formal Land Descriptions.

Street Address *

Unit No.: | St. No.:16 | St. Name:Riversdale Street

Suburb/Locality:Craigieburn | Postcode:3064

Formal Land Description *
Complete either A or B.

⚠ This information can be found on the certificate of title.

A Lot No.:530 ◯Lodged Plan ◯Title Plan ◯Plan of Subdivision No.: **LP54592**

OR

B Crown Allotment No.: | Section No.:

Parish/Township Name:

If this application relates to more than one address, please click this button and enter relevant details. Add Address

The Proposal

⚠ You must give full details of your proposal and attach the information required to assess the application. Insufficient or unclear information will delay your application.

(2) i **For what use, development or other matter do you require a permit? ***

If you need help about the proposal, read: How to Complete the Application for Planning Permit Form

Secondary Dwelling on a residential lot

Provide additional information on the proposal, including: plans and elevations; any information required by the planning scheme, requested by Council or outlined in a Council planning permit checklist; and if required, a description of the likely effect of the proposal.

(3) i **Estimated cost of development for which the permit is required ***

Cost $285,000 ⚠ You may be required to verify this estimate. Insert `0' if no development is proposed.

If the application is for land within **metropolitan Melbourne** (as defined in section 3 of the *Planning and Environment Act 1987*) and the estimated cost of the development exceeds $1 million (adjusted annually by CPI) the Metropolitan Planning Levy **must** be paid to the State Revenue Office and a current levy certificate **must** be submitted with the application. Visit www.sro.vic.gov.au for information.

Existing Conditions i

(4) **Describe how the land is used and developed now ***

eg. vacant, three dwellings, medical centre with two practitioners, licensed restaurant with 80 seats, grazing.

Single dwelling on a residential lot

Provide a plan of the existing conditions. Photos are also helpful.

Title Information

5 **Encumbrances on title** *

If you need help about the title, read: How to complete the Application for Planning Permit form

Does the proposal breach, in any way, an encumbrance on title such as a restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope?

- ◯ Yes. (If 'yes' contact Council for advice on how to proceed before continuing with this application.)
- ◯ No
- ◯ Not applicable (no such encumbrance applies).

Provide a full, current copy of the title for each individual parcel of land forming the subject site. (The title includes: the covering 'register search statement', the title diagram and the associated title documents, known as 'instruments', eg. restrictive covenants.)

Applicant and Owner Details

6 Provide details of the applicant and the owner of the land.

Applicant *

The person who wants the permit.

Where the preferred contact person for the application is different from the applicant, provide the details of that person.

Please provide at least one contact phone number *

[redacted]

Owner *

The person or organisation who owns the land

Where the owner is different from the applicant, provide the details of that person or organisation.

[redacted]

Declaration

7 **This form must be signed by the applicant** *

⚠ Remember it is against the law to provide false or misleading information, which could result in a heavy fine and cancellation of the permit.

I declare that I am the applicant; and that all the information in this application is true and correct; and the owner (if not myself) has been notified of the permit application.

Signature: [redacted]

Date:16/03/2022

day / month / year

Need help with the Application?

If you need help to complete this form, read How to complete the Application for Planning Permit form
General information about the planning process is available at www.delwp.vic.gov.au/planning

Contact Council's planning department to discuss the specific requirements for this application and obtain a planning permit checklist. Insufficient or unclear information may delay your application.

8 **Has there been a pre-application meeting with a Council planning officer?**

◯ No ◯ Yes

Checklist

9 **Have you:**

☐ Filled in the form completely?

☐ Paid or included the application fee?

⚠ Most applications require a fee to be paid. Contact Council to determine the appropriate fee.

☐ Provided all necessary supporting information and documents?

- ☐ A full, current copy of title information for each individual parcel of land forming the subject site
- ☐ A plan of existing conditions.
- ☐ Plans showing the layout and details of the proposal
- ☐ Any information required by the planning scheme, requested by council or outlined in a council planning permit checklist.
- ☐ If required, a description of the likely effect of the proposal (eg traffic, noise, environmental impacts).
- ☐ If applicable, a current Metropolitan Planning Levy certificate (a levy certificate expires 90 days after the day on which it is issued by the State Revenue Office and then cannot be used). Failure to comply means the application is void.

☐ Completed the relevant Council planning permit checklist?

☐ Signed the declaration (section 7)?

Lodgement

Lodge the completed and signed form, the fee payment and all documents with:

Hume City Council
PO Box 119 Dallas VIC 3047
Pascoe Vale Road Broadmeadows VIC 3047

Contact information:

Telephone: 61 03 9205 2200
Email: email@hume.vic.gov.au
DX: 94718
Translation: 03 9205 2200 for connection to Hume Link's multilingual telephone information service

Deliver application in person, by fax, or by post:

Print Form

Make sure you deliver any required supporting information and necessary payment when you deliver this form to the above mentioned address. This is usually your local council but can sometimes be the Minister for Planning or another body.

Save Form:

Save Form To Your Computer

You can save this application form to your computer to complete or review later or email it to others to complete relevant sections.

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

VOLUME 08328 FOLIO 651 Security no : 124095348374R
Produced 08/02/2022 12:02 PM

LAND DESCRIPTION

Lot 530 on Plan of Subdivision 054592.
PARENT TITLE Volume 07993 Folio 138
Created by instrument B166400 19/12/1961

REGISTERED PROPRIETOR

Estate Fee Simple
Sole Proprietor
[redacted]

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AT634594T 24/09/2020
AUSTRALIA AND NEW ZEALAND BANKING GROUP LTD

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan or imaged folio set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE LP054592 FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

----------END OF REGISTER SEARCH STATEMENT----------

Additional information: (not part of the Register Search Statement)

Street Address: 16 RIVERSDALE STREET CRAIGIEBURN VIC 3064

ADMINISTRATIVE NOTICES

NIL

eCT Control 16165A AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED
Effective from 24/09/2020

DOCUMENT END

Imaged Document Cover Sheet

The document following this cover sheet is an imaged document supplied by LANDATA®, Victorian Land Registry Services.

Document Type	**Plan**
Document Identification	**LP054592**
Number of Pages (excluding this cover sheet)	**12**
Document Assembled	**08/02/2022 12:18**

PLAN OF SUBDIVISION

PART OF CROWN ALLOTMENT A – SEC 23

PARISH OF YUROKE

COUNTY OF BOURKE

VOL.7993 FOL.138

DEPTH LIMITATION: 50 FEET

Measurements are in Feet & Inches

Conversion Factor

FEET X 0.3048 = METRES

LP 54592

EDITION 2

PLAN MAY BE LODGED 20-10-61

11 SHEETS

SHEET 1

COLOUR CODE

E-1 = BLUE

R1, R2, R3 & R4 = BROWN

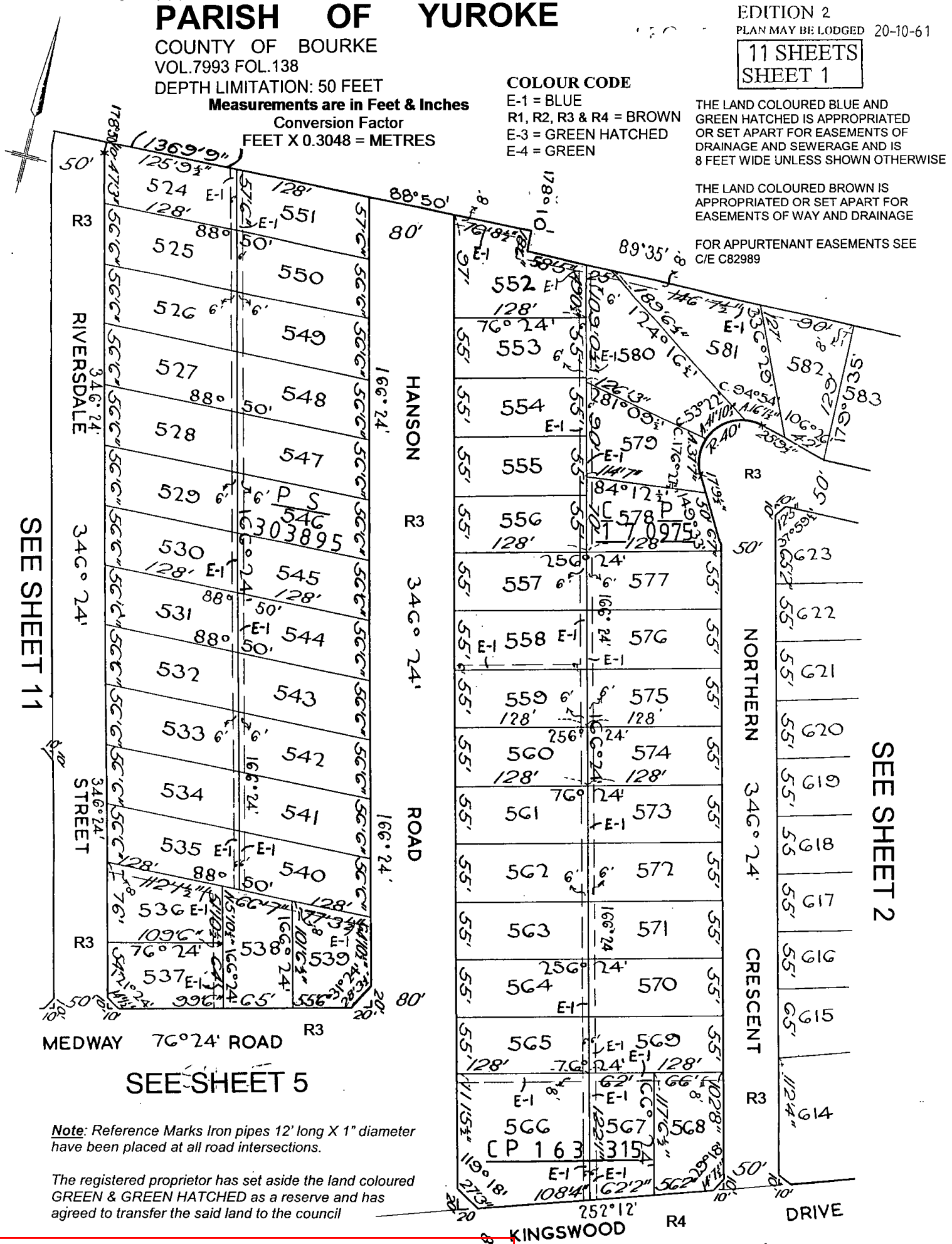
E-3 = GREEN HATCHED

E-4 = GREEN

THE LAND COLOURED BLUE AND GREEN HATCHED IS APPROPRIATED OR SET APART FOR EASEMENTS OF DRAINAGE AND SEWERAGE AND IS 8 FEET WIDE UNLESS SHOWN OTHERWISE

THE LAND COLOURED BROWN IS APPROPRIATED OR SET APART FOR EASEMENTS OF WAY AND DRAINAGE

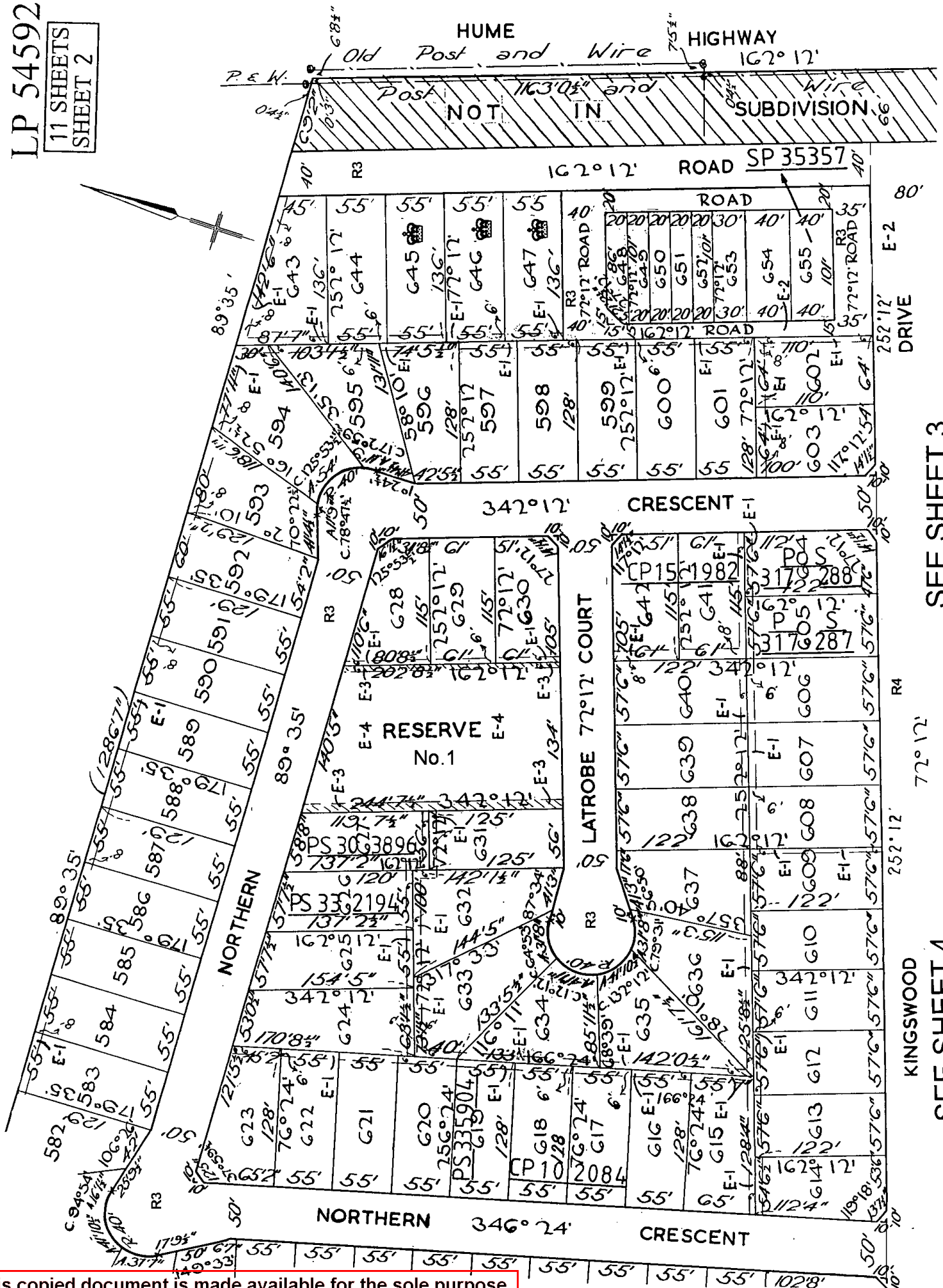
FOR APPURTENANT EASEMENTS SEE C/E C82989



***Note**: Reference Marks Iron pipes 12' long X 1" diameter have been placed at all road intersections.*

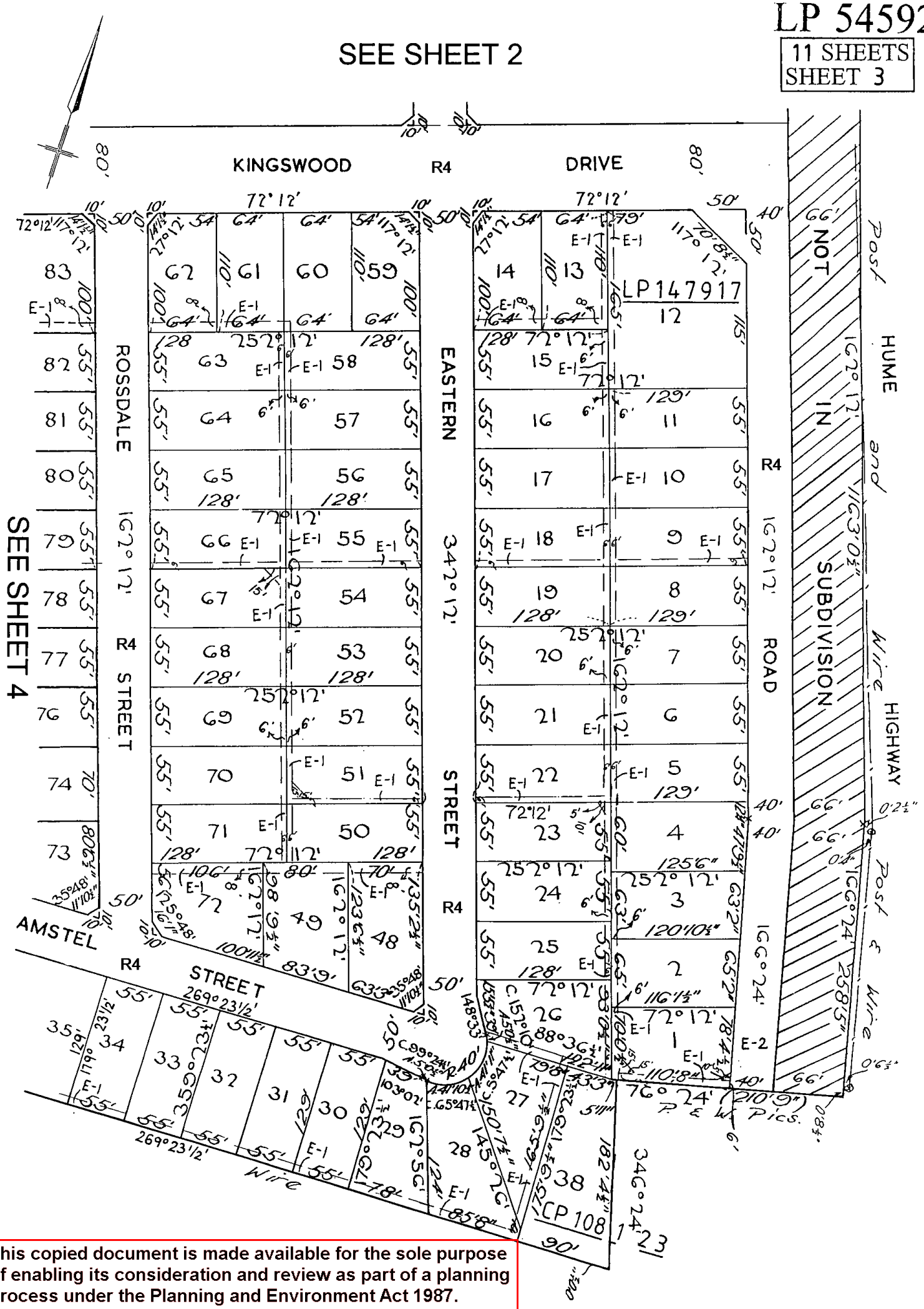
The registered proprietor has set aside the land coloured GREEN & GREEN HATCHED as a reserve and has agreed to transfer the said land to the council

LP 54592
11 SHEETS
SHEET 2



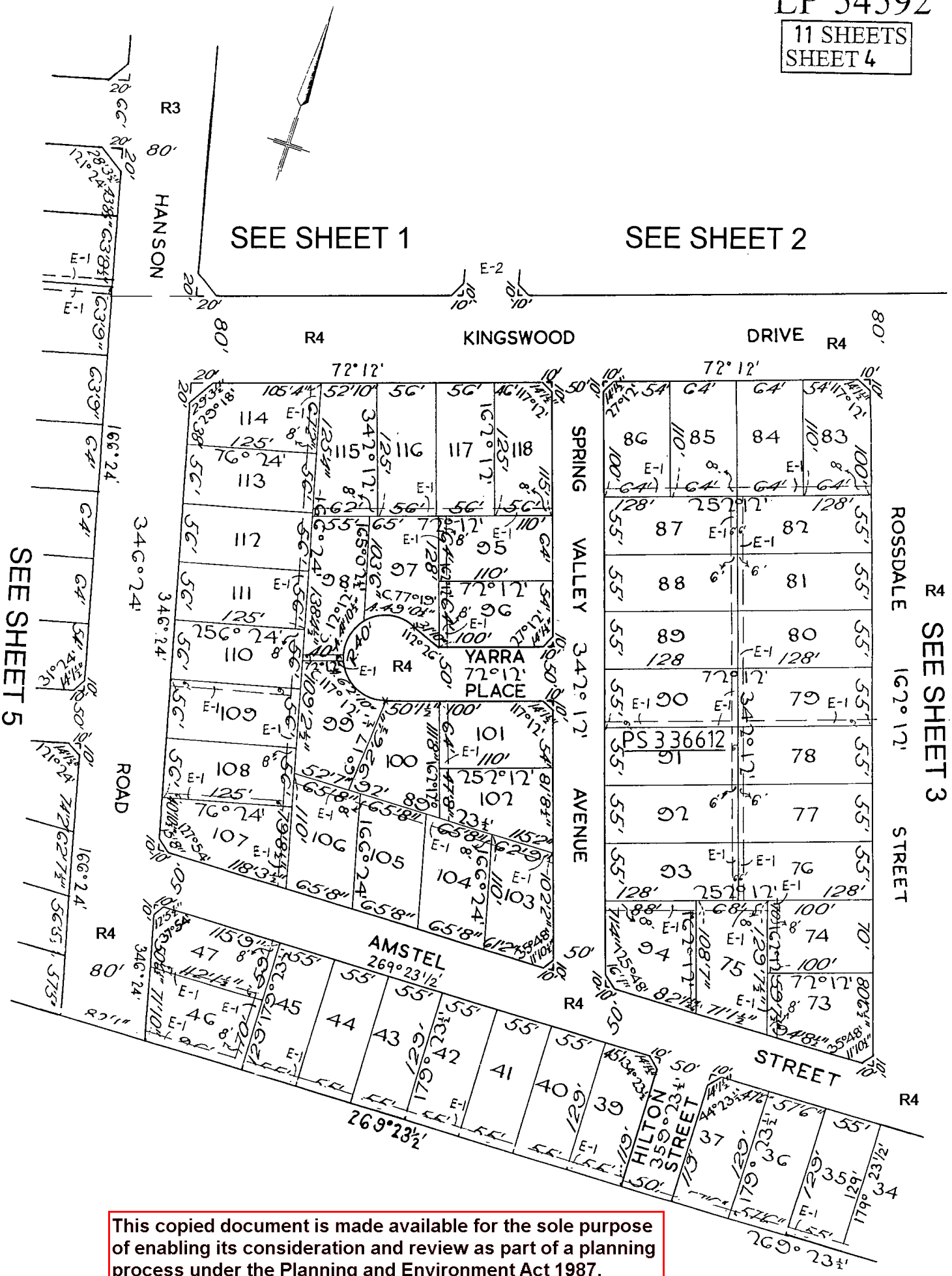
LP 54592

11 SHEETS
SHEET 3



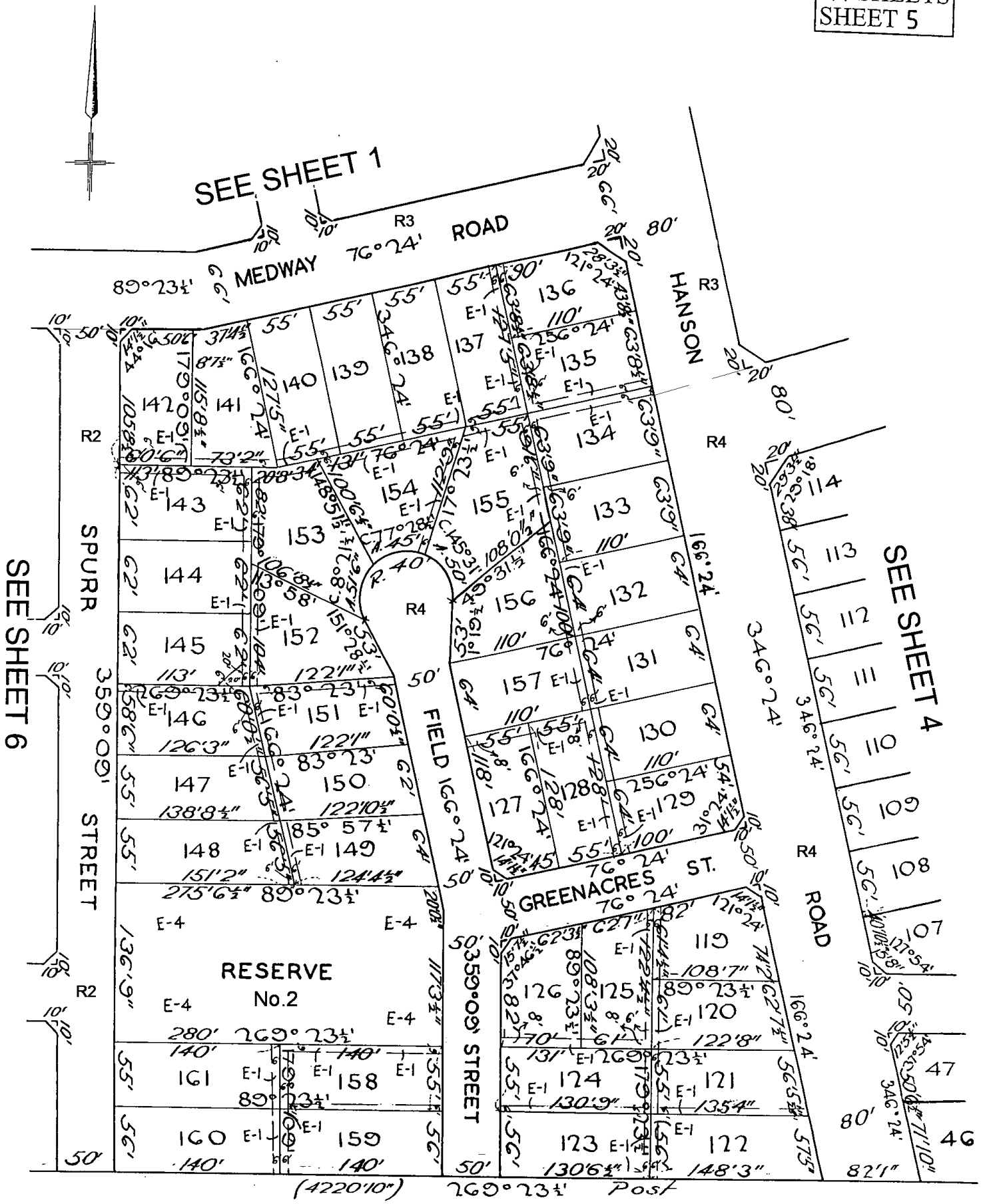
LP 54592

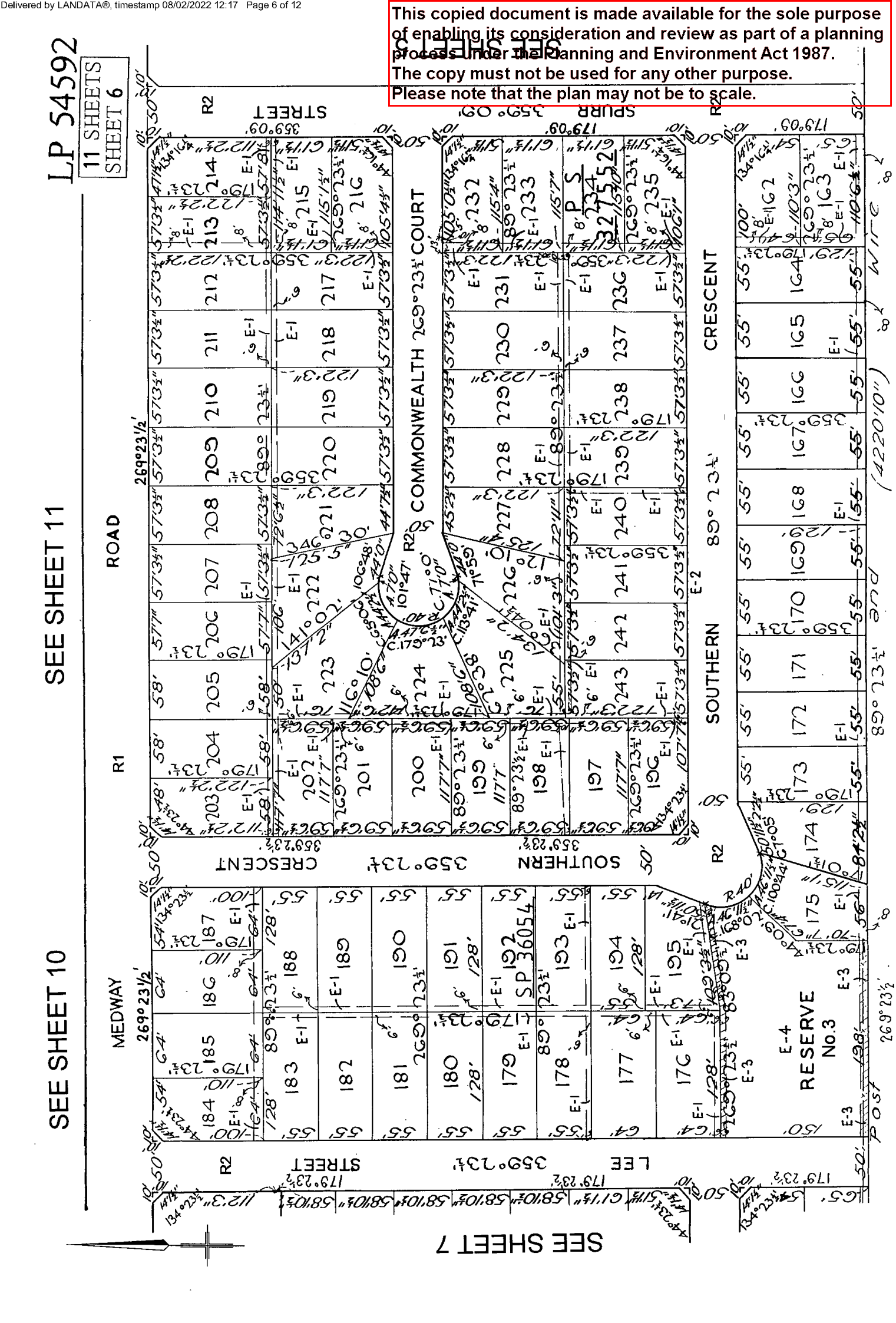
11 SHEETS
SHEET 4



LP 54592

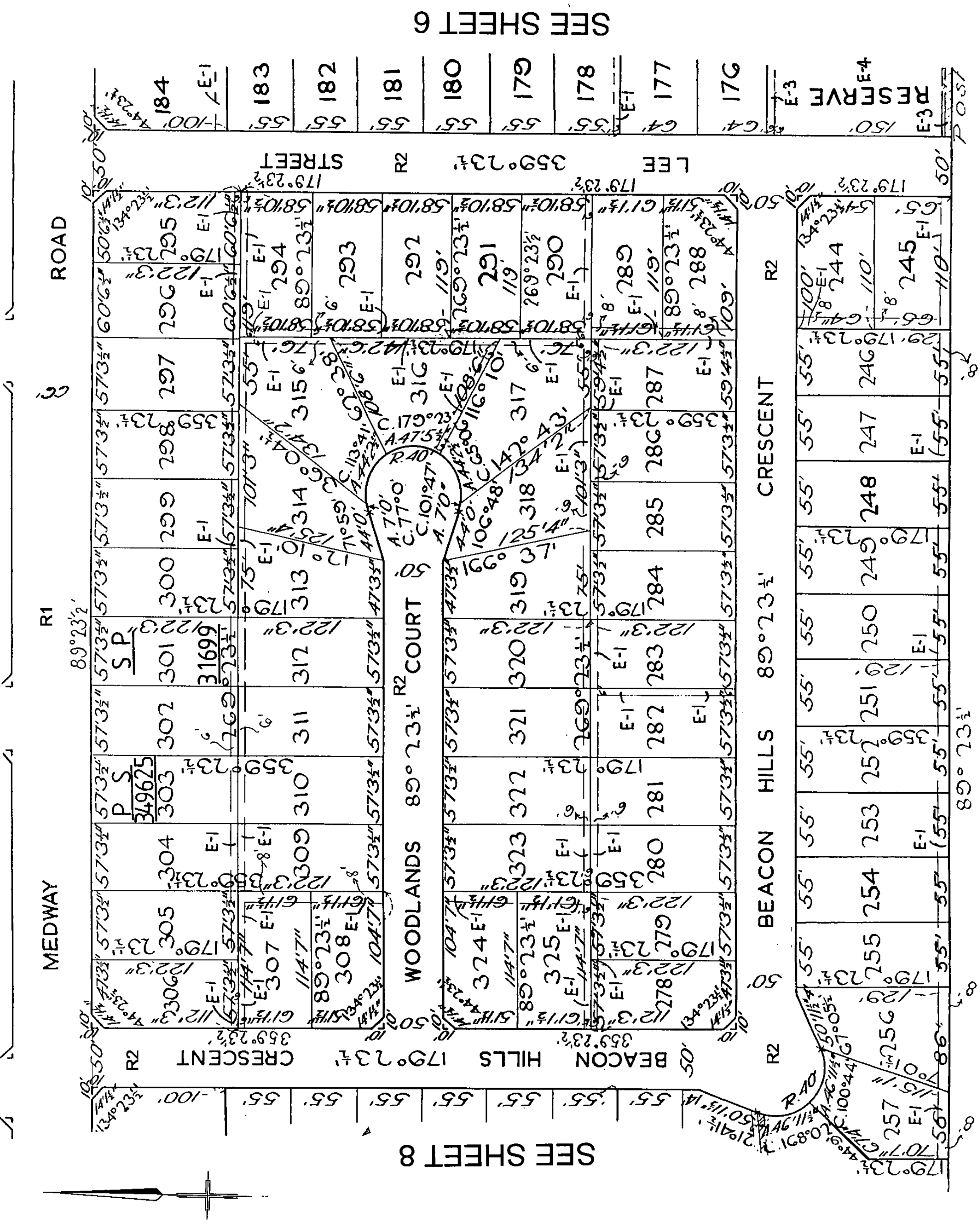
11 SHEETS
SHEET 5





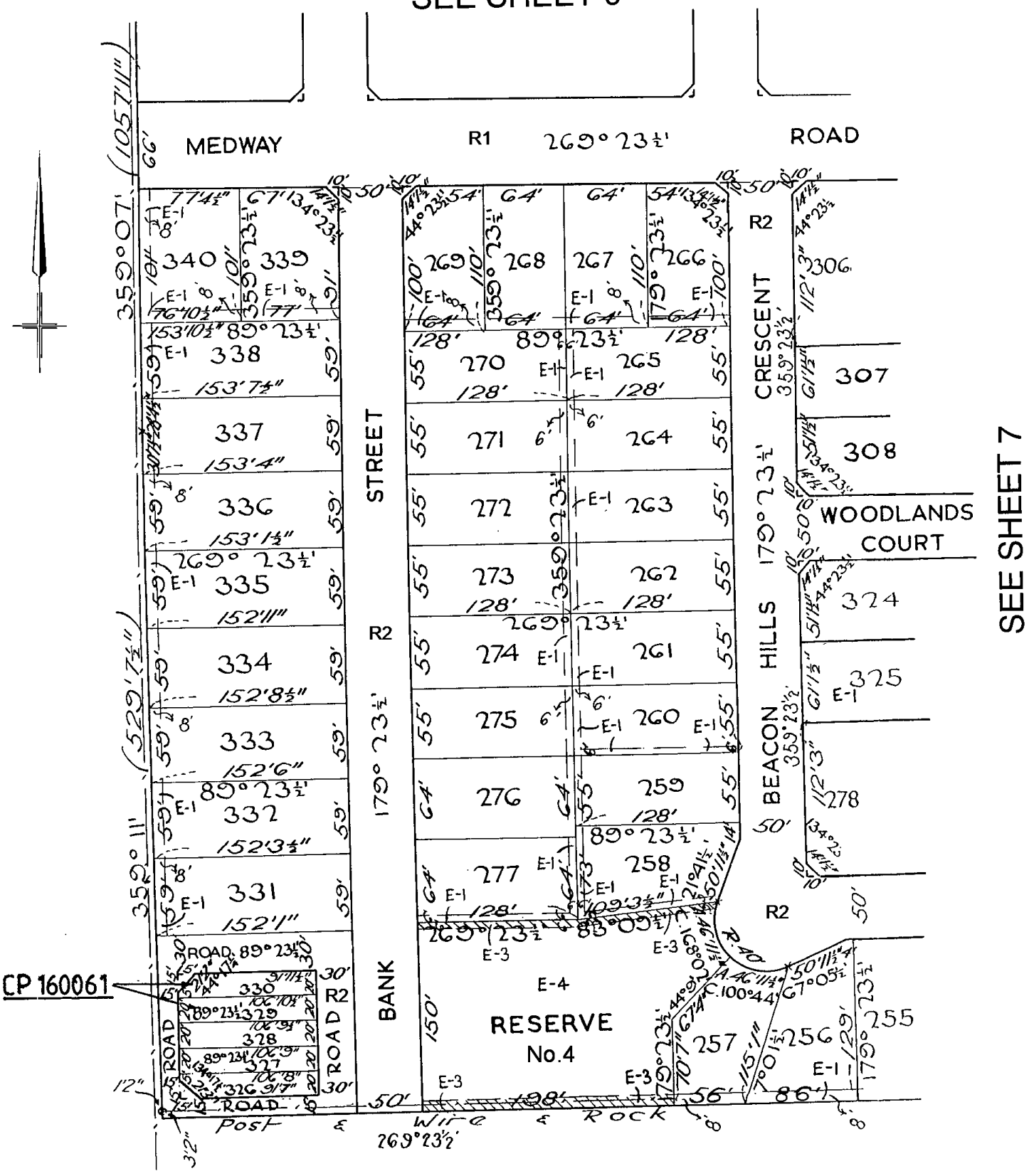
LP 54592

11 SHEETS
SHEET 7

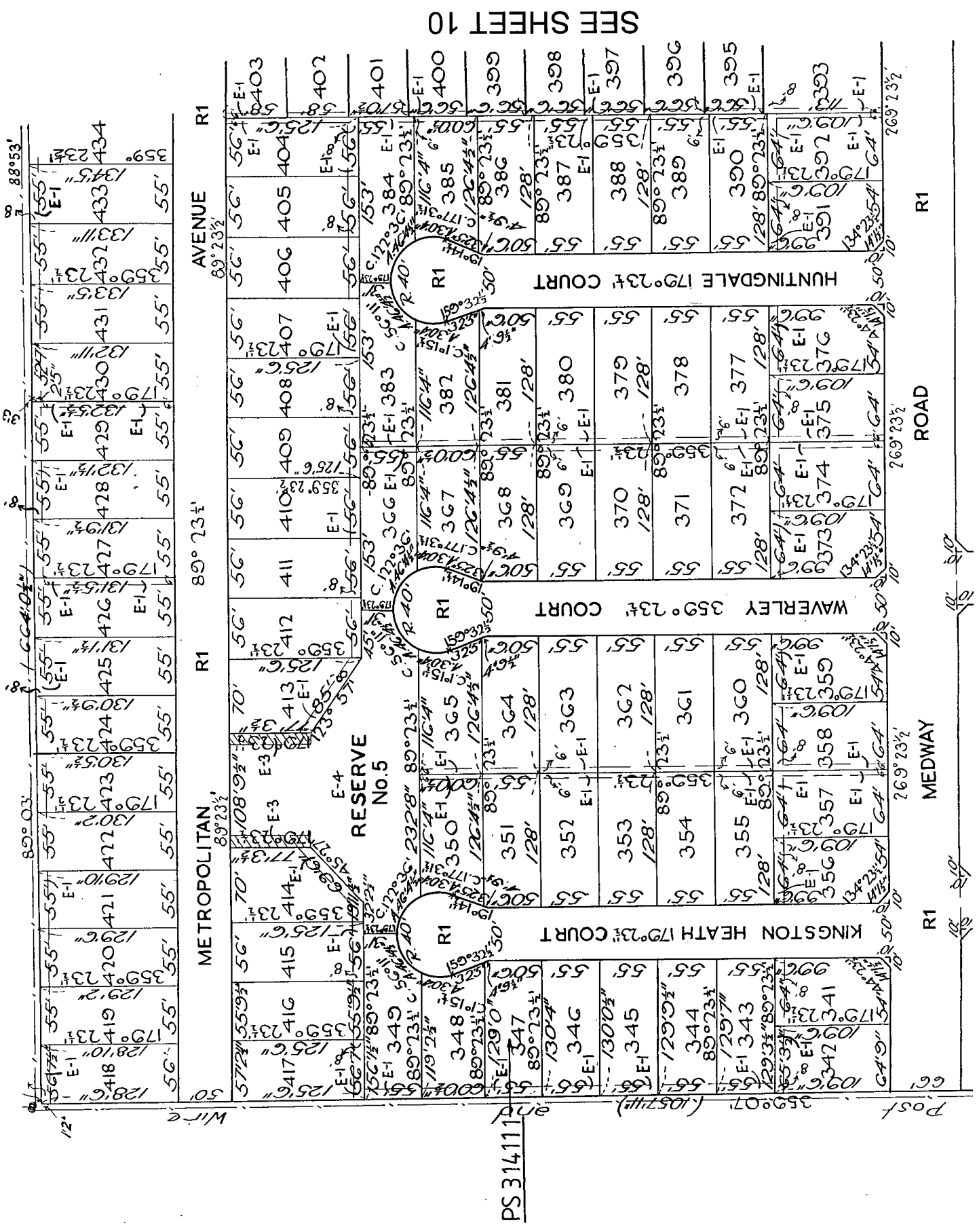


LP 54592
11 SHEETS
SHEET 8

SEE SHEET 9

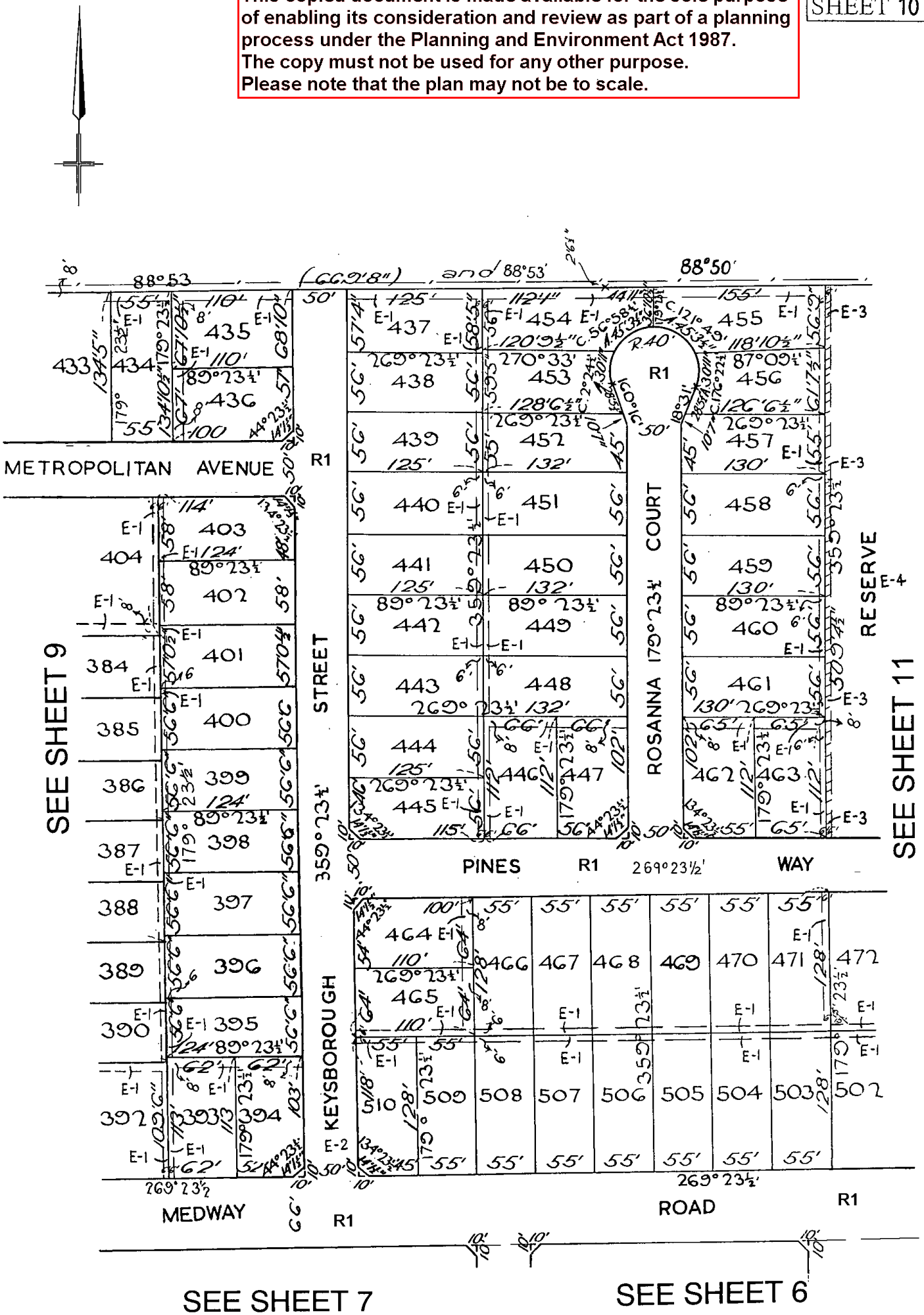


LP 54592
11 SHEETS
SHEET 9

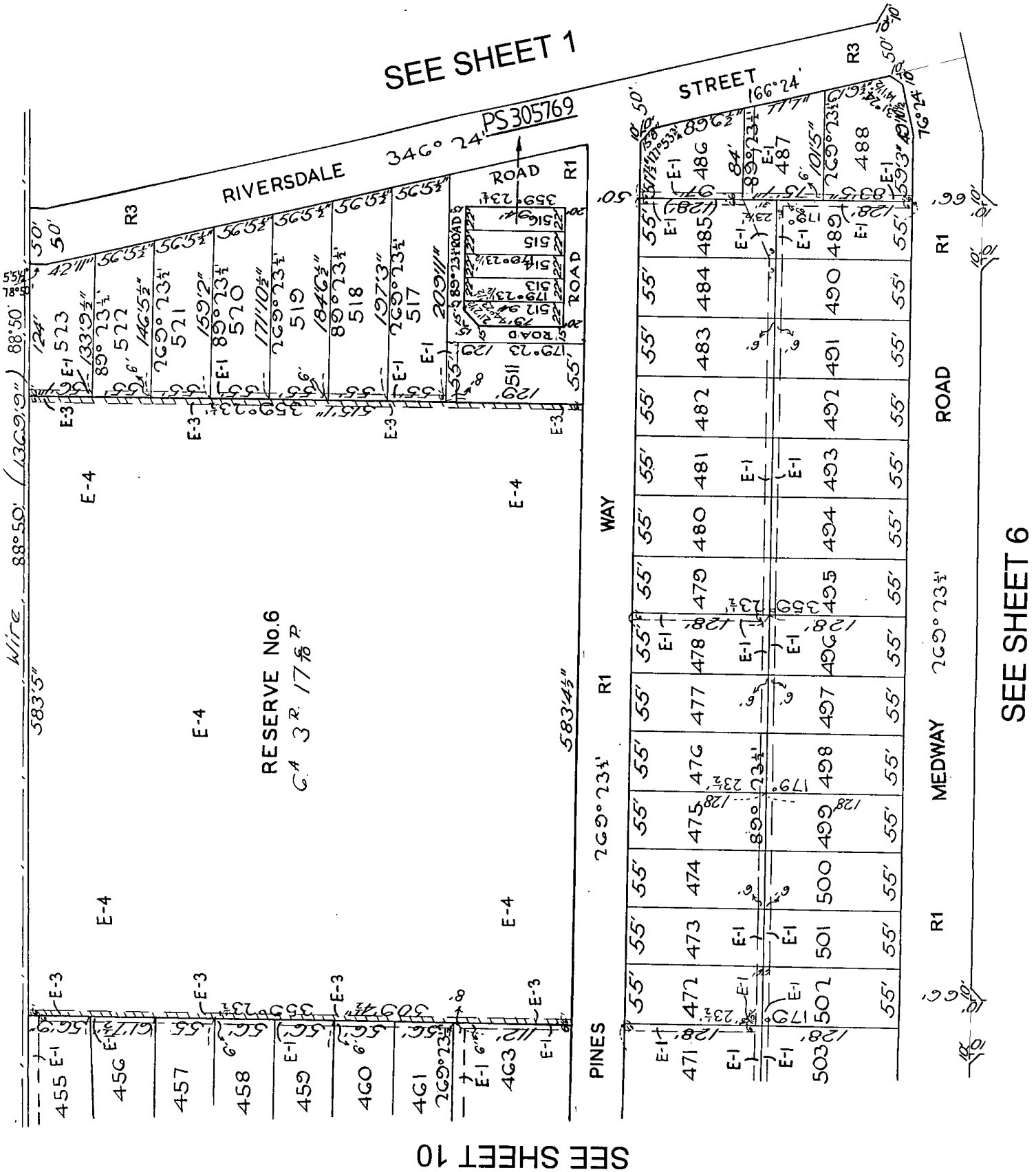


LP 54592

11 SHEETS
SHEET 10



LP 54592
11 SHEETS
SHEET 11



MODIFICATION TABLE

RECORD OF ALL ADDITIONS OR CHANGES TO THE PLAN

PLAN NUMBER

LP54592

AFFECTED LAND / PARCEL	LAND / PARCEL / IDENTIFIER CREATED	MODIFICATION	DEALING NUMBER	DATE	TIME	EDITION NUMBER	ASSISTANT REGISTRAR OF TITLES
LOT 645		TRANSFER TO CROWN	G788484			2	MLB
LOTS 28 & 29		RECTIFICATION	SB12159B			2	MLB
LOTS 59 & 60		EASEMENT REMOVED	AP 2008/SEC. 73			2	MLB
LOTS 646 & 647		TRANSFER TO CROWN	B412330			2	MLB

AnC Planning Consultants

21-23 Aristoc Road, GlenWaverley
www.ancplanning.com.au
admin@ancplanning.com.au
Phone: 03 9550 1838

Planning Submission

Construction of an additional dwelling

16 Riversdale Road

Broadmeadows

September 2022

Prepared for: **JARI Building Design**

Our Ref: **119/2022**

AnC Planning Consultants Pty Ltd

Disclaimer:

Neither AnC Planning Consultants Pty Ltd nor any employees of AnC Planning Consultants Pty Ltd take responsibility in any way whatsoever to any person or organisation, other than that for which this planning report is being prepared, in respect of the information set out in this report, including any errors or omissions therein. AnC Planning Consultants Pty Ltd is not liable for errors in plans and any documents or advice not prepared by AnC Planning Consultants Pty Ltd.

Application Summary	
Address	16 Riversdale Street, Craigieburn
Title Details	Lot 530 LP54592
Planning Scheme	Hume Planning Scheme
Zoning	General Residential Zone - Schedule 1
Overlays	N/A
Proposal	Construction of an additional, two storey dwelling
Permit Trigger	Clause 32.08-6 Construction of two or more dwellings
Applicable Planning Policy Framework	➢ Clause 11 – Settlement ➢ Clause 15.01-1R – Urban Design (Melbourne Metropolitan) ➢ Clause 15.01-4R – Healthy Neighbourhood (Melbourne Metropolitan) ➢ Clause 15.01-5S - Neighbourhood character ➢ Clause 15.02-1S – Energy and resource efficiency ➢ Clause 16.01-1R – Housing supply (Metropolitan Melbourne) ➢ Clause 22.21 – Environmentally Sustainable Development
Particular provisions	Clause 52.06 – Car Parking Clause 55 – Two or more dwellings on a lot
General Provisions	Clause 65 – Decision Guidelines

1.0 Introduction

This planning submission has been prepared by AnC Planning Consultants Pty Ltd in support of a planning application to develop the land at 16 Riversdale Street, Craigieburn, with an additional two-storey dwelling to the rear of the existing dwelling. The land is included in a General Residential Zone Schedule 1, and the proposal requires planning permission from the responsible authority, Hume City Council, pursuant to Clause 32.08-6 of the Hume Planning Scheme.

The planning submission describes the subject site and surrounding context, details of the proposed buildings and works, and provides an assessment of the proposal against the relevant planning provisions contained within the Hume Planning Scheme.

The planning submission concludes that the development is of high architectural quality and is suitable for the site and neighbourhood context. In particular, the proposal represents a contemporary built-form, which is respectful of the diverse neighbourhood character in the locality and is also consistent with the emerging character with modern infill development in the locality. In addition, the built-form design incorporates setbacks in direct response to adjoining interfaces and facilitates landscaping opportunities within the front and side setbacks, which will assist with the screening of built-form and the integration of the site with the streetscape.

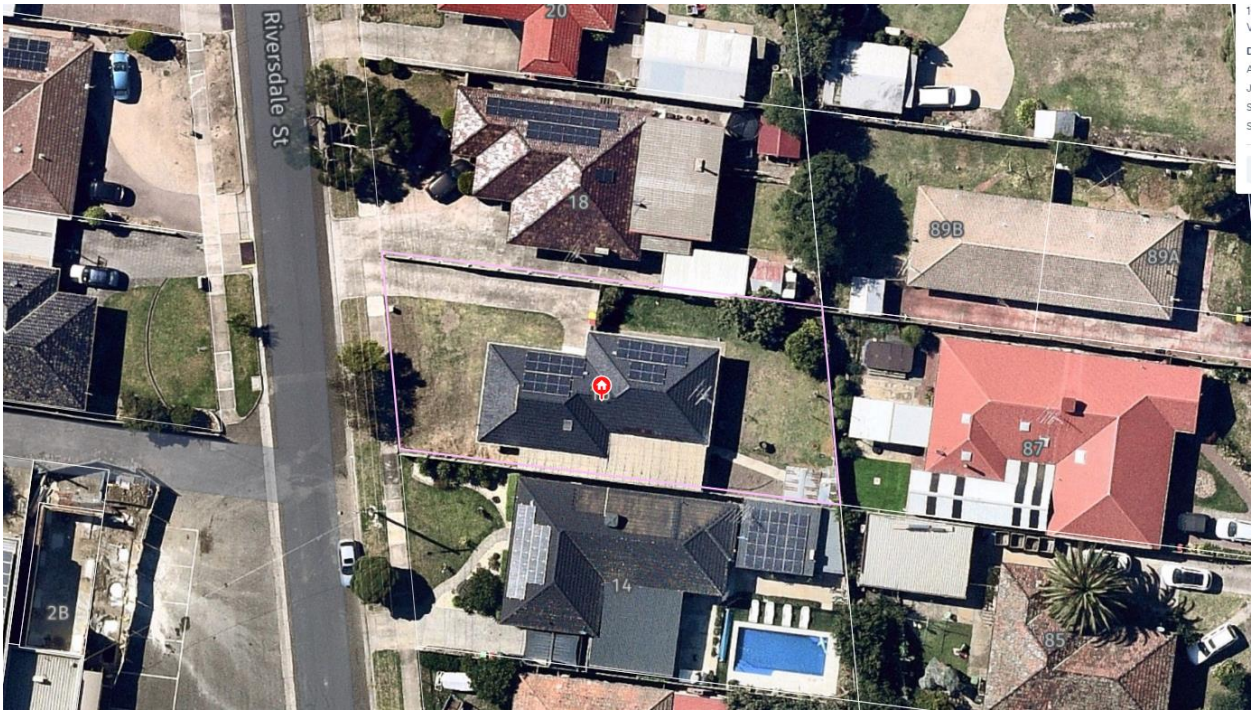
The proposal is an appropriately sited infill development that is well supported by the Hume Planning Strategy and Planning Policy Frameworks through its location in proximity to services and facilities, including public transport and open space.

The report should be read in conjunction with the architectural drawings prepared by JARI Building Design and other documents.

1. Subject Site and Surrounds

The development site is on the eastern side of Riversdale Road in an established residential area, 500 west of Hume Highway.

Figure 1: The location of the subject site

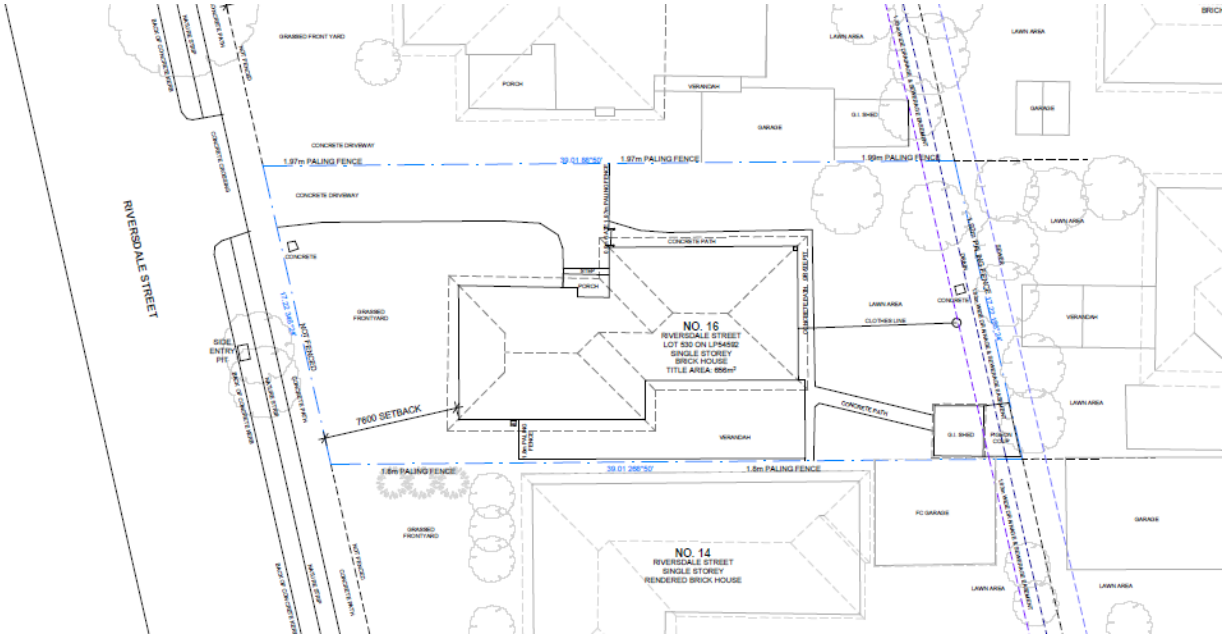


The subject site has a frontage of 17m and a depth of 39m resulting in a land area of 656sqm. It is occupied by a single storey brick dwelling, which is set back 7.6m from the street. A concrete driveway has been constructed at the north-western corner of the site to provide access to the site.

The land to the north, at 18 Riversdale Street, is occupied by a single storey brick dwelling and is setback approximately 3m from the boundary shared with the subject site. Its garage and garden shed are located on the shared boundary. The land to the south, at 14 Riverdale Street, is also occupied by a single storey brick dwelling and is set back approximately 1.2m from the boundary shared with the subject site. The double garage associated with the dwelling is located on the shared boundary at the north-eastern corner

of the site. The land to the east, at 87 Hanson Road, is occupied by a single storey brick dwelling and its secluded private area is located between the boundary shared with the subject site and the dwelling. The land to the west is Riversdale Road which contains a 4.5m wide carriageway, street parking (parallel), channel, curb, nature strip and concrete footpath. Diagonally to the south-west is a small shopping centre.

Figure 2: Subject site and surrounds



Overall, the site is within an established residential area where single dwellings are a predominant character and is a larger contributor to the housing stock in Craigieburn. From recent aerial images, it appears that intensive housing growth and a variety of housing types are occurring and establishing an emerging contemporary neighbourhood character and contributing to the increasing demand.

Further details of the adjoining and adjacent properties are shown in the attached neighbourhood and site description. As many properties have open style low front fences, dwellings are exposed to the public realm. The narrow front gardens in the street exhibit a wide horticultural diversity and are well planted and maintained. In many cases, they

obscure the architecture of the buildings. In some properties, there are large trees and shrubs both in the front and rear gardens.

Figure 3: Street view of the site

2. The Proposal

The proposal is to construct a double storey dwelling behind the existing dwelling. It would set back 3.5m from the eastern boundary, 4.2m from the southern boundary and 2.6m from the northern walls. The ground floor layout contains an open plan living, meals and kitchen, bathroom, toilet, laundry and a single garage. The secluded private open space is located on the southern side of the dwelling. The upper floor is well recessed from the ground floor and is set aside for two bedrooms, retreat, rumpus and ensuite.

In addition, a carport, tandem car space and a 16sqm pergola would be constructed to facilitate the existing dwelling. As car space requires widened driveway, the crossover might require to be widened for convenient vehicle entry and exit.

The maximum building height is less than 6m, and contemporary design forms is proposed with a hipped concrete tile roof. External materials include face brick, render, and feature vertical cladding. The development details indicate a garden area in excess of 35%, site coverage of 48.93% and a permeability of 38.84%.

Figure 4: Site plan

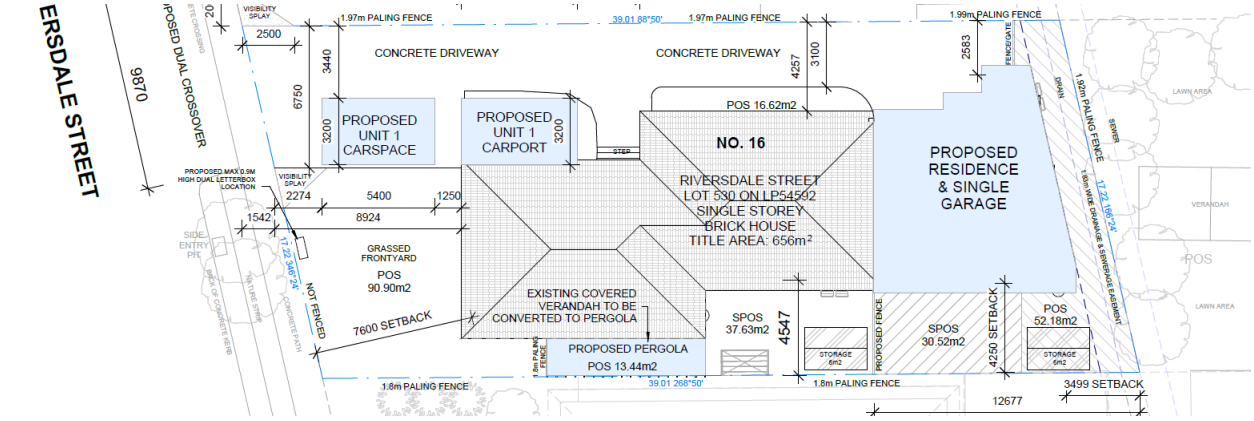


Figure 5: Ground floor plan

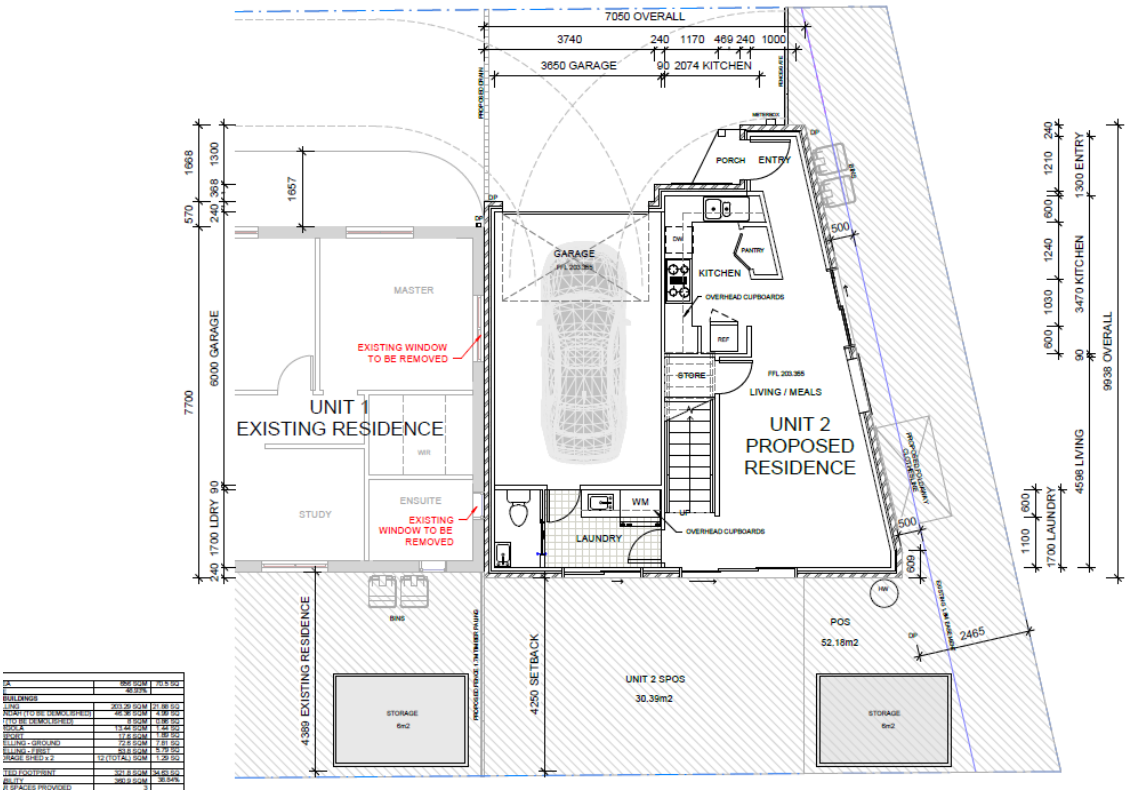


Figure 6: Upper floor plan

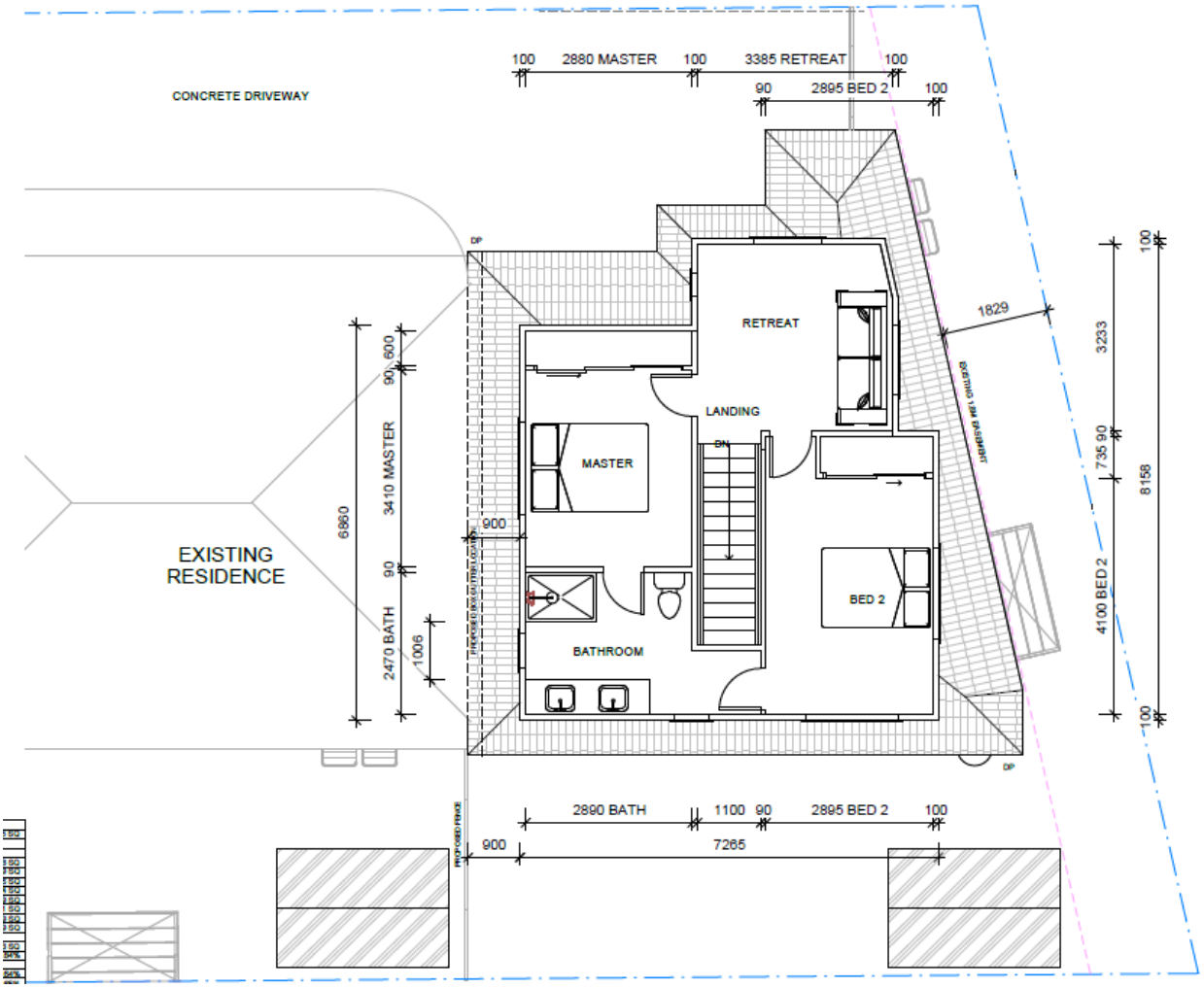


Figure 7: South elevation

Figure 8: East elevations

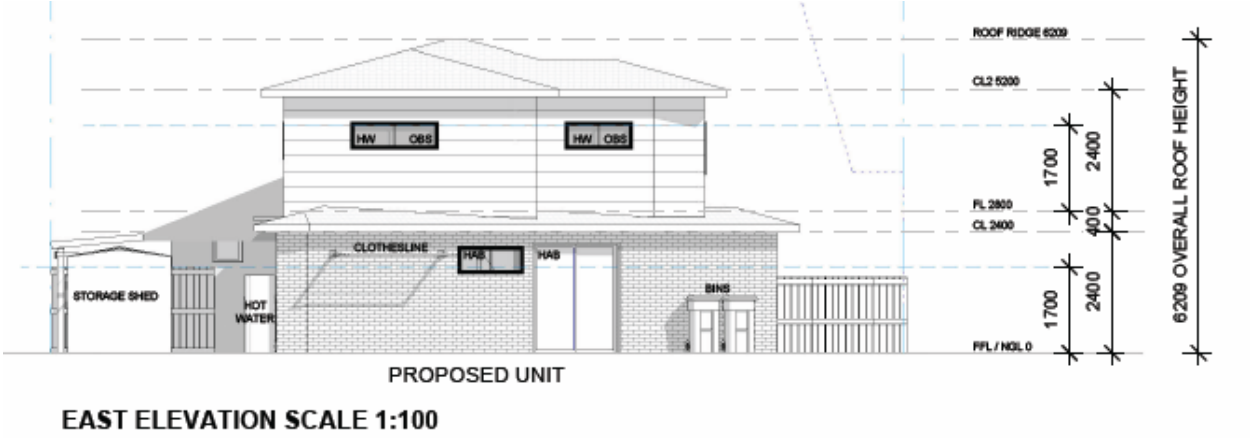


Figure 9: West elevations

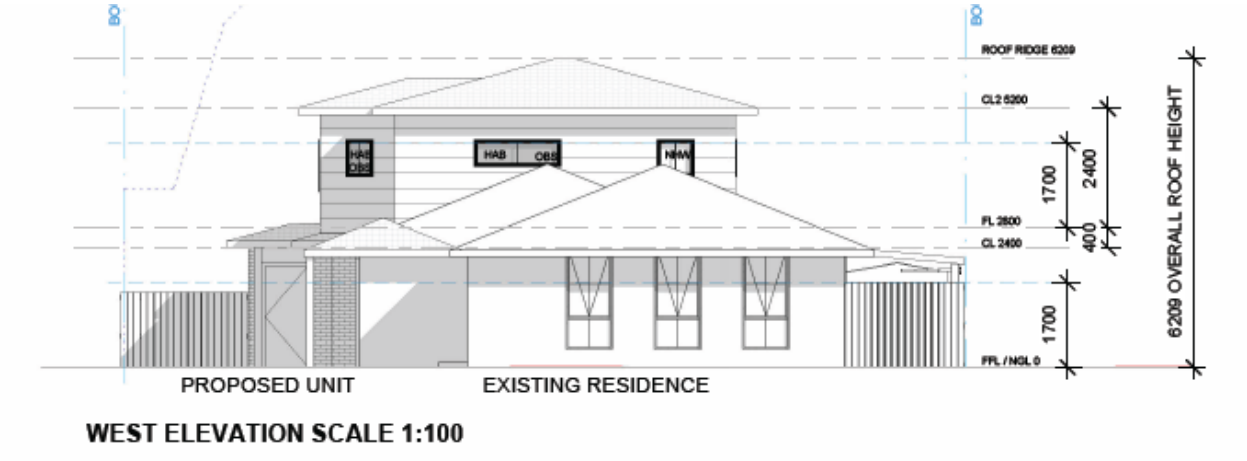


Figure 10: North elevation

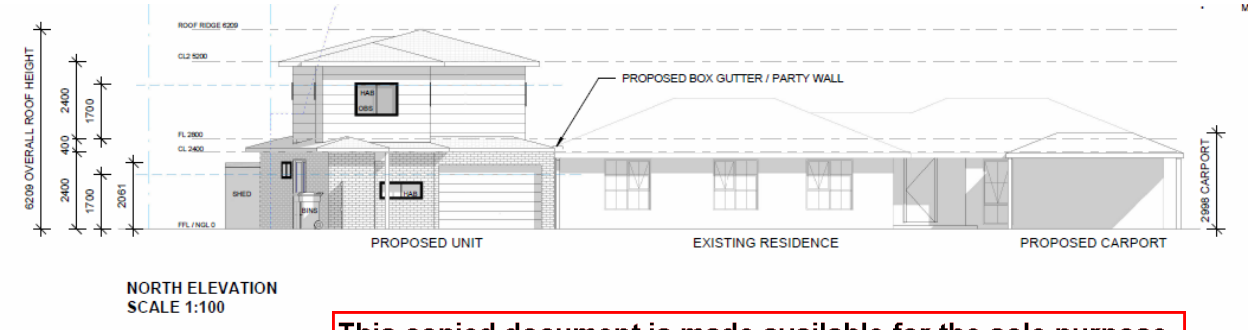
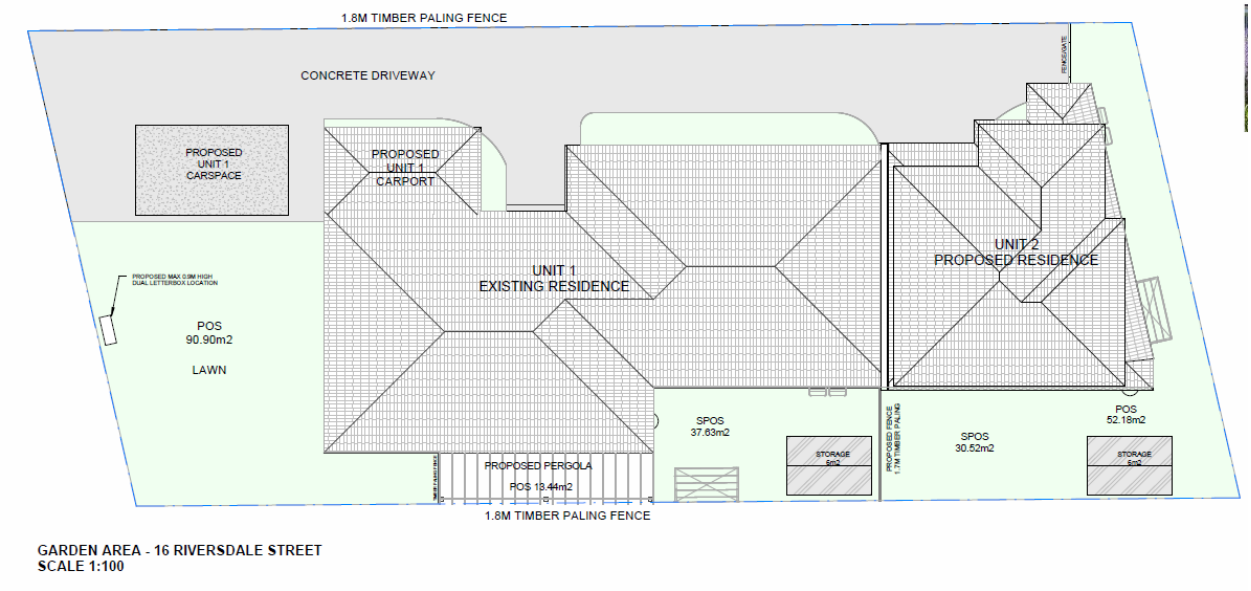


Figure 11: Garden area plan



4. Planning Consideration

4.1 Compliance with GRZ1

The subject site is within a General Residential Zone (GRZ), and Schedule 1 to the GRZ apply. The purpose of the GRZ is:

- To implement the Municipal Planning Strategy and the Planning Policy Framework.
- To encourage development that respects the neighbourhood character of the area.
- To encourage a diversity of housing types and housing growth, particularly in locations offering good access to services and transport.
- To allow the educational, recreational, religious, community, and a limited range of other non-residential uses to serve local community needs in appropriate locations.

Figure 12: Zoning Map

Land use 'dwelling' is a Section 1 use that does not require planning permission. However, pursuant to Clause 32.08-6, a planning permit is required to construct two or more dwellings on a lot. In this case, as the proposal is to construct a second dwelling, a permit is required.

The proposal's aim is to increase the provision of medium density housing which is an expectation within an established residential area close to infrastructure as envisaged in the planning policy.

The design and architectural elements are sympathetic to the recent building styles and forms found within the locality, and the development will represent both the existing and desired future character for the area. The selected colours, materials, window forms, balconies, and flat roof styles provide a clear identity for the development whilst providing variation in façade design to ensure dwellings are slightly different across the development.

The southern side of the driveway can incorporate a featured landscape to balance between the built and natural space, and there are no on-site trees worth of retention.

Also, a landscaping plan will include large canopy trees following the requirements of Standard B13 (Landscaping).

The proposed development has also been designed so as to limit unreasonable amenity impacts upon adjoining properties, in particular, to limit overlooking and overshadowing. The building is incorporated with obscured glazing without compromising the internal amenities of the future residents in habitable rooms.

Under the GRZ, mandatory provisions limit the building height to 11 metres (or up to three storeys) and require a minimum garden area of 35% for the construction of a dwelling on a lot of more than 650 square metres. The proposal meets these requirements by proposing a maximum building height of 5.7 metres and a garden area well above 35%.

For the above reasons and those discussed under the other provisions in this submission and attached Clause 55 assessment, it is considered that the proposal provides a satisfactory site and neighbourhood responsive and meets the purpose of the GRZ.

4.2 Compliance with the Planning Policy

The Municipal Planning Strategy (MPS) and Planning Policy Framework (PPF) contain general guiding principles in relation to policies and appropriate practices for land use and development. In particular, the PPF contains many policies that are relevant to the consideration of the application in an overarching sense. Regarding this development, the following policies are noted:

- Clause 11 (Settlement) states that planning is to 'anticipate and respond to the needs of existing and future communities, recognise the need for 'diversity of choice, economic viability, a high standard of urban design and amenity, land use and transport integration, and facilitate 'sustainable growth that takes full

advantage of existing settlement patterns and investment in commercial infrastructure and services.

- Clause 15.01-1R (Urban Design-Metropolitan Melbourne) aims 'to create a distinctive and liveable city with quality design and amenity.' This objective is to be achieved by way of supporting the creation of well-designed places that are memorable, distinctive and liveable and integrating place-making practices into road space management.

- Clause 15.01-2S (Building Design) aims to achieve building design outcomes that contribute positively to the local context and enhances the public realm through ensuring the site analysis provides the basis for the consideration of height, scale, and massing of new development, ensuring development response and contributes to the strategic context of its location, minimising the detrimental impact of development on neighbouring properties, ensure the form, scale, and appearance of development enhances the function and amenity of the public realm.

- Aims of Clause 15.014R – Healthy Neighbourhood (Melbourne Metropolitan) is to create a city of 20-minute neighbourhoods that give people the ability to mee the most of their everyday needs within a 20-minute walk, cycle or local public transport trip from their home.

- Clause 15.01-5S (Neighbourhood character) objective is to recognise, support, and protect neighbourhood character, cultural identity, and sense of place.

- The objective of Clause 15.021S is to encourage land use and development that is energy and resource-efficient. It supports a cooler environment and minimizes greenhouse gas emissions.

- Clause 16.01-1R prescribes the need to manage the supply of new housing to meet population growth and create a sustainable city by developing housing and mixed-use development opportunities in locations that are, among others, areas for residential growth and have good access to public transport connections.

- Clause 22.21 encourage the developments to achieve best practice in environmentally sustainable development from the design stage through to construction operation.

Overall, the construction of a two-storey dwelling is acceptable under the PPF, which encourages higher density development within walking distance of shops, recreation facilities and public transport. While increasing the density, the proposal will respond to the anticipated needs of the existing and future communities, including their diversity of housing choices. In particular, the following is noted:

- The site is located within 20-minute walking distance and cycling from public transport enforcing healthy neighbourhoods.
- The development is well designed, distinctive, and liveable within an area subject to housing insurgence.
- The development respects the existing character and contributes to the preferred character, and reinforces a sense of place.
- The development is well designed so as to improve the energy, water and waste performance of buildings based on environmentally sustainable development principles.
- The development promotes the consolidation of urban development and integration with public transport.
- It supports low energy forms of transport such as walking and cycling as the site is located within 20 minutes of public transport.

- It reduces the urban heat island effect by providing open space and vegetation around buildings.
- The buildings have been designed so as to achieve environmentally sustainable development objectives.
- The location and the overall built form have sufficiently responded to the strategic context of this neighbourhood which is subject to incremental changes due to proximity to transport and other services. It is a development that contributes positively to the local context's height, scale, and massing.

4.3 Internal amenity

The dwellings are sited and designed to ensure the future occupants of the dwellings will be provided with a high level of internal amenity. Each dwelling is provided with a SPOS in excess of the minimum required (25 sqm) with convenient access from a living room in accordance with Standard B28. More than half of the habitable room windows are provided with direct access to sunlight with maximised windows. Secure garages, storage, clotheslines, etc., are provided with direct and convenient access from each dwelling.

4.4 External amenity

All upper floor windows with outlooks towards habitable room windows or secluded private open space of adjoining dwellings will be screened/obscured up to 1.7m above the finished floor level to minimise overlooking and comply with Standard B22 of the ResCode.

The shadow diagrams demonstrate that the proposal is in accordance with the objectives of Standard B21, whereby the proposed buildings will not cause detrimental impacts by way of unreasonable overshadowing to the existing secluded private open space associated with an adjoining dwelling.

4.5 Compliance with Particular Provisions

4.5.1 Clause 52.06 Car Parking

The purpose of the above clause is to ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality.

The standard parking space requirement, pursuant to Clause 52.06-5, is one space to each one or two bedrooms dwelling plus two spaces to each three or more-bedroom dwelling. The provision of car parking space to each dwelling meets the requirements of Clause 52.06-2 as in the below table.

Car parking provision and standard

Dwelling	Bedrooms/ dwellings	Standard spaces	Provided spaces	Complies?
Proposed dwelling	2	1	1	Yes
Existing dwelling	3	2	2	Yes

As demonstrated in the above table, it is considered that the development meets the objectives of Clause 52.06 as it warrants the provision of an appropriate number of car parking spaces to each dwelling having regard to the demand likely to be generated. Also, it is noted that the car parking spaces and accessways have been designed as per the design standards of Clause 52.06-8 of the Hume Planning Scheme.

4.5.2 Clause 55 Two or more dwellings on a lot

The purpose of the above clause is to achieve residential development that respects the existing neighbourhood character, or which contributes to a preferred neighbourhood character, to encourage residential development that provides reasonable standards of amenity for existing and new residents, and to encourage residential development that is responsive to the site and neighbourhood.

According to Clause 55.01, this application is accompanied by a neighbourhood and site description and a design response including Clause 55 assessment which demonstrates the proposal's compliance with all the objectives, standards and decision guidelines of Clause 55. An assessment of the development against Clause 55 is attached.

4.5.3 Decision Guidelines

It is considered that the proposal appropriately responds to all decision guidelines by proposing a development that is consistent with the zoning and planning policy provision affecting the site, as well as being consistent with the overall planning of the area.

5. Conclusion

The proposed design response is reflective of adequate consideration of the site in its context, as expressed in the enclosed documentation. The proposed development is appropriate and worthy of support on the following grounds:

- As the site is located within a 20-minute neighbourhood, it is a good candidate for housing development with increased density.

- The provision of a multi-dwelling on the subject site is appropriate in built-form scale in the context of the area, which contributes to increasing of housing density and diversity, is supported by Municipal Planning Strategy and Planning Policy Framework.

- The proposal represents a contemporary form that is respectful of the mixed built-form character of the area and also consistent with the emerging character associated with modern infill development.

- The development provides a high level of articulation using various quality construction materials and finishes, including variation between floor levels to provide further breaks in building mass, specifically to the north and east, where there are residential abuttals.

- The built form design incorporates appropriate setbacks in direct response to adjoining interfaces and to facilitate landscaping opportunities which will assist with a screening of the built form and the integration of the site with the streetscape and reduce the heat-island effect.

- The development provides for a high level of internal amenity for future residents, including the provision of direct daylight access to habitable rooms and a generous provision of private open space.

Clause 55 Assessment - 16 Riversdale Street, Craigieburn

STANDARD	OBJECTIVES & STANDARDS	COMMENTS
55.02 NEIGHBOURHOOD CHARACTER AND INFRASTRUCTURE		
Clause 55.02-1 ***Standard B1*** ***Neighbourhood character***	***Objectives*** • *To ensure that the design respects the existing neighbourhood character or contributes to a preferred neighbourhood character.* • *To ensure that development responds to the features of the site and the surrounding area.* ***Standard B1*** • *The design response must be appropriate to the neighbourhood and the site.* • *The proposed design must respect the existing or preferred neighbourhood character and respond to the features of the site.* ***Decision Guidelines*** *Before deciding on an application, the responsible authority must consider:* • *Any relevant neighbourhood character objective, policy or statement set out in this scheme.* • *The neighbourhood and site description.* • *The design response.*	✓ **Complies** One additional dwelling on this lot of 656sqm with an average frontage of 17m to Riversdale Street and an average depth of 39m is appropriate in this development context and will form part of the preferred character. In particular, the proposed double storey-built form with varying roof forms to each dwelling is also respectful of the existing built form. With that, it is considered that the proposal will blend with the architectural character of this residential precinct and offer a positive contribution to the wider area. There will be no visual bulk to the street and adjoining properties, as it provides a site-responsive built-form, reasonable setbacks, adequate landscaping, increased articulation in the elevations, and other design features such as windows placement, diverse materiality, entry porch and general surface treatments. The garage is a single garage and it provides additional benefits to the streetscape as it will eliminate the typical garage dominated streetscape presentation usually resulting from garages. While one additional dwelling is proposed, the lot will maintain space for gardening with the capability of accommodating high-quality canopy trees and other vegetation.
Clause 55.02-2 ***Standard B2*** ***Residential policy***	***Objectives*** • *To ensure that residential development is provided in accordance with any policy for housing in the Municipal Panning Strategy (MSS) and the Planning Policy Framework (PPF).* • *To support medium densities in areas where development can take advantage of public transport and community infrastructure and services.* ***Standard B2*** • *An application must be accompanied by a written statement to the satisfaction of the responsible authority that describes how the development is consistent with any relevant policy for housing in the Municipal Planning Strategy and the Planning Policy Framework.* ***Decision Guidelines*** Before deciding on an application, the responsible authority must consider: • *The Municipal Planning Strategy and the Planning Policy Framework.* • *The design response.*	✓ **Complies** The PPF aims to assist in achieving the overarching objectives of planning in the State of Victoria through appropriate land use and development policies and guidelines. In particular, the site is located within a 20-minute neighbourhood where increased housing is promoted by the state planning policies. Refer to the attached planning submission, which demonstrates how the development is consistent with housing policy in the MSS and PPF.

Clause 52.02-3 ***Standard B3*** ***Dwelling diversity***	***Objective*** • *To encourage a range of dwelling sizes and types in developments of ten or more dwellings.* ***Standard B3*** *Developments of ten or more dwellings should provide a range of dwelling sizes and types, including:* • *Dwellings with a different number of bedrooms.* • *At least one dwelling that contains a kitchen, bath or shower, and a toilet and wash basin at ground floor level.*	✓ **Not applicable** Only two dwellings, including the existing are proposed.
Clause 55.02-4 ***Standard B4*** ***Infrastructure***	**Objectives** • *To ensure development is provided with appropriate utility services and infrastructure.* • *To ensure development does not unreasonably overload the capacity of utility services and infrastructure.* **Standard B4** • *Development should be connected to reticulated services, including reticulated sewerage, drainage, electricity and gas, if available.* • *Development should not unreasonably exceed the capacity of utility services and infrastructure, including reticulated services and roads.* • *In areas where utility services or infrastructure have little or no spare capacity, developments should provide for the upgrading of or mitigation of the impact on services or infrastructure.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The capacity 55.02-5 of the existing infrastructure.* • *In the absence of reticulated sewerage, the capacity of the development to treat and retain all wastewater in accordance with the State Environment Protection Policy (Waters of Victoria) under the Environment Protection Act 1970.* • *If the drainage system has little or no spare capacity, the capacity of the development to provide for stormwater drainage mitigation or upgrading of the local drainage system.*	✓ **Complies** The development will be connected to relevant utility services and infrastructure to the satisfaction of relevant authorities, including the Council. As the proposal is in an already established residential area, there is no evidence that the development will unreasonably exceed the capacity of utility services and infrastructure.
Clause 55.02-5 ***Standard B5*** ***Integration with the street***	***Objective*** • *To integrate the layout of development with the street.* ***Standard B5*** • *Developments should provide adequate vehicle and pedestrian links that maintain or enhance local accessibility.* • *Development should be oriented to front existing and proposed streets.* • *High fencing in front of dwellings should be avoided if practicable.* • *Development next to existing public open space should be laid out to complement the open space.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *Any relevant neighbourhood character objective, policy or statement set out in this scheme.* • *The design response.*	✓ **Complies** The front entrance of the dwelling is a prominent element and accentuated by an entry porch. The development has provided adequate vehicle and pedestrian links to ensure local accessibility.
55.03 SITE LAYOUT AND BUILDING MASSING		
Clause 55.03-1 ***Standard B6*** ***Streetscape***	***Objective*** • *To ensure that the setbacks of buildings from a street respect the existing or preferred neighbourhood character and make efficient use of the site.* ***Standard*** • *Walls of buildings should be set back from streets:* - *At least the distance specified in the schedule to the zone, or* - *If no distance is specified in the schedule to the zone, the distance specified in Table B1.* *Porches, pergolas and verandahs that are less than 3.6 metres high and eaves may encroach not more than 2.5 metres into the setbacks of this standard.*	✓ **N/A** The proposed dwelling is sitting behind the existing dwelling and the current front setback remains unchanged.

	<table><tr><th>Development context</th><th>Minimum setback from front street (metres)</th><th>Minimum setback from a sid street (metres)</th></tr><tr><td>There is an existing building on both the abutting allotments facing the same street, and the site is not on a corner.</td><td>The average distance of the setbacks of the front walls of the existing buildings on the abutting allotments facing the front street or 9 metres, whichever is the lesser.</td><td>Not applicable</td></tr><tr><td>There is an existing building on one abutting allotment facing the same street and no existing building on the other abutting allotment facing the same street, and the site is not on a corner.</td><td>The same distance as the setback of the front wall of the existing building on the abutting allotment facing the front street or 9 metres, whichever is the lesser.</td><td>Not applicable</td></tr><tr><td>There is no existing building on either of the abutting allotments facing the same street, and the site is not on a corner.</td><td>6 metres for streets in a Road Zone, Category 1, and 4 metres for other streets.</td><td>Not applicable</td></tr><tr><td>The site is on a corner.</td><td>If there is a building on the abutting allotment facing the front street, the same distance as the setback of the front wall of the existing building on the abutting allotment facing the front street or 9 metres, whichever is the lesser. If there is no building on the abutting allotment facing the front street, 6 metres for streets in a Road Zone, Category 1, and 4 metres for other streets.</td><td>Front walls of new developme fronting the side street of a corner site should be setback least the same distance as the setback of the front wall of any existing building on the abuttir allotment facing the side stree or 3 metres, whichever is the lesser. Side walls of new developmer on a corner site should be setback the same distance as t setback of the front wall of any existing building on the abuttir allotment facing the side stree or 2 metres, whichever is the lesser.</td></tr></table> ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *Any relevant neighbourhood character objective, policy or statement set out in this scheme.* • *The design response.* *Whether a different setback would be more appropriate taking into account the prevailing setbacks of existing buildings on nearby lots.* • *The visual impact of the building when viewed from the street and from adjoining properties.* • *The value of retaining vegetation within the front setback.*	
Clause 55.03-2 ***Standard B7*** ***Building height***	***Objective*** • *To ensure that the height of buildings respects the existing or preferred neighbourhood character.* ***Standard B7*** • *The maximum building height should not exceed the maximum height specified in the schedule to the zone.* • *If no maximum height is specified in the schedule to the zone, the maximum building height should not exceed 9 metres, unless the slope of the natural ground level at any cross section wider than 8 metres of the site of the building is 2.5 degrees or more, in which case the maximum building height should not exceed 10 metres.* • *Changes of building height between existing buildings and new buildings should be graduated.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *Any relevant neighbourhood character objective, policy or statement set out in this scheme.* • *Any maximum building height specified in the zone, a schedule to the zone or an overlay applying to the land.* • *The design response.* • *The effect of the slope of the site on the height of the building.* • *The relationship between the proposed building height and the height of existing adjacent buildings.* • *The visual impact of the building when viewed from the street and from adjoining properties.*	✓ **Complies** Clause 32.08-10 replaces the maximum building height specified in this standard and prescribes a maximum building height of 11m. The proposed building height of 6.2 metres satisfies 32.08-10 and more comfortably fits within the streetscape and is reflective of the predominant building height in the locality.

Clause 55.03-3 ***Standard B8*** ***Site coverage***	***Objective*** • *To ensure that the site coverage respects the existing or preferred neighbourhood character and responds to the features of the site.* ***Standard B8*** *The site area covered by buildings should not exceed:* • *The maximum site coverage specified in the schedule to the zone, or* • *If no maximum site coverage is specified in the schedule to the zone, 60 per cent.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *Any relevant neighbourhood character objective, policy or statement set out in this scheme.* • *The design response.* • *The existing site coverage and any constraints imposed by existing development or the features of the site.* • *The site coverage of adjacent properties.* • *The effect of the visual bulk of the building and whether this is acceptable in the neighbourhood.*	✓ **Complies** The proposed site coverage (48.9%) is below the 60% nominated in this standard and is reflective of generous open space throughout the site and planning opportunities.
Clause 55.03-4 ***Standard B9*** ***Permeability***	***Objection*** • *To reduce the impact of increased stormwater run-off on the drainage system.* • *To facilitate on-site stormwater infiltration.* • *At least 20 per cent of the site should not be covered by impervious surfaces.* ***Standard B9*** *The site area covered by the pervious surfaces should be at least:* • *The minimum area specified in a schedule to the zone, or* • *If no minimum is specified in a schedule to the zone, 20 percent of the site.* *The stormwater management system should be designed to:* • *Meet the current best practice performance objectives for stormwater quality as contained in the Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999).* • *Contribute to cooling, improving local habitat and providing attractive and enjoyable spaces.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *The capacity of the site to incorporate stormwater retention and reuse.* • *The existing site coverage and any constraints imposed by existing development.* • *The capacity of the drainage network to accommodate additional stormwater.* • *The capacity of the site to absorb run-off.* • *The practicality of achieving the minimum site coverage of pervious surfaces, particularly on lots of less than 300 square metres.* • *Whether the owner has entered into an agreement to contribute to off-site stormwater management in lieu of providing an on-site stormwater management system.*	✓ **Complies** The proposed permeability (38.9%) is well above the 20% minimum permeability nominated in this standard.
Clause 55.03-5 ***Standard B10*** ***Energy efficiency***	***Objectives*** • *To achieve and protect energy efficient dwellings and residential buildings.* • *To ensure the orientation and layout of development reduce fossil fuel energy use and make appropriate use of daylight and solar energy.* ***Standard*** *Buildings should be:* • *Oriented to make appropriate use of solar energy.* • *Sited and designed to ensure that the energy efficiency of existing dwellings on adjoining lots is not unreasonably reduced.* • *Sited and designed to ensure that the performance of existing rooftop solar energy systems on dwellings on adjoining lots in a General Residential Zone, Neighbourhood Residential Zone or Township Zone are not unreasonably reduced. The existing rooftop solar energy system must exist at the date the application is lodged.*	✓ **Complies** The living room the dwelling has reasonably access to sunlight. The open plan floor layout of the living, dining and kitchen area also promote the penetration of sunlight throughout the dwelling. The proposal does not overshadow existing solar energy facilities on adjoining lots.

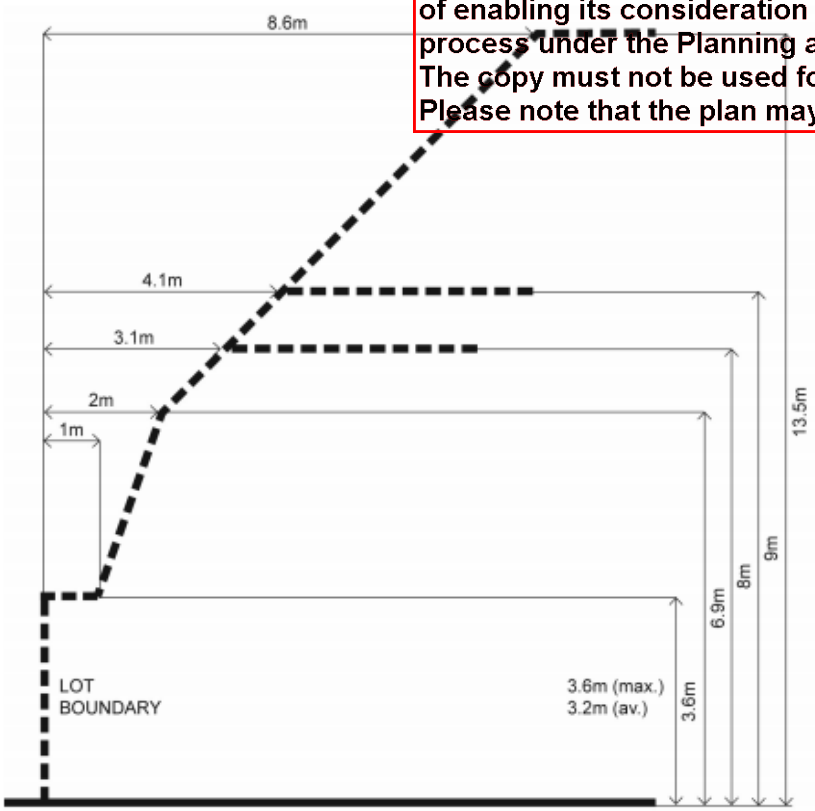
	Living areas and private open space should be located on the north side of the development, if practicable. *Developments should be designed so that solar access to north-facing windows is maximised.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *The size, orientation and slope of the lot.* • *The existing amount of solar access to abutting properties.* • *The availability of solar access to north-facing windows on the site.* • *The extent to which an existing rooftop solar energy system on an adjoining lot is overshadowed* • *by existing buildings or other permanent structures.* • *Whether the existing rooftop solar energy system on an adjoining lot is appropriately located.* • *The effect of overshadowing on an existing rooftop solar energy system on an adjoining lot.*	
Clause 55.03-6 ***Standard B11*** ***Open space***	***Objective*** *To integrate the layout of development with any public and communal open space provided in or adjacent to the development.* ***Standard B11*** *If any public or communal open space is provided on site, it should:* • *Be substantially fronted by dwellings, where appropriate.* • *Provide outlook for as many dwellings as practicable.* • *Be designed to protect any natural features on the site.* • *Be accessible and useable.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *Any relevant plan or policy for open space in the Municipal Planning Strategy and the Planning Policy Framework.* • *The design response.*	✓ **Not applicable** No communal open space is proposed.
Clause 55.03-7 ***Standard B12*** ***Safety***	***Objective*** • *To ensure the layout of development provides for the safety and security of residents and property.* ***Standard B12*** • *Entrances to dwellings and residential buildings should not be obscured or isolated from the street and internal access ways.* • *Planting which creates unsafe spaces along streets and access ways should be avoided.* • *Developments should be designed to provide good lighting, visibility and surveillance of car parks and internal access ways.* • *Private spaces within developments should be protected from inappropriate use as public thoroughfares.* ***Decision guideline*** *Before deciding on an application, the responsible authority must consider the design response.*	✓ **Complies** The dwelling has a good sense of address. The landscape plan should make it clear that planting would not create unsafe along the driveway, and the SPOS to the dwellings are protected through a fence and associated landscaping.

Clause 55.03-8
Standard B13
Landscaping
	Objectives
	• *To encourage development that respects the landscape character of the neighbourhood.*
	• *To encourage development that maintains and enhances habitat for plants and animals in locations of habitat importance.*
	• *To provide appropriate landscaping.*
	• *To encourage the retention of mature vegetation on the site.*
	Standard 13
	• *The landscape layout and design should:*
	  • *Protect any predominant landscape features of the neighbourhood.*
	  • *Take into account the soil type and drainage patterns of the site.*
	  • *Allow for intended vegetation growth and structural protection of buildings.*
	  • *In locations of habitat importance, maintain existing habitat and provide for new habitat for plants and animals.*
	  • *Provide a safe, attractive and functional environment for residents.*
	• *Development should provide for the retention or planting of trees, where these are part of the character of the neighbourhood.*
	• *Development should provide for the replacement of any significant trees that have been removed in the 12 months prior to the application being made.*
	• *The landscape design should specify landscape themes, vegetation (location and species), paving and lighting.*
	• *Development should meet any additional landscape requirements specified in a schedule to the zone.*
	Decision guidelines
	Before deciding on an application, the responsible authority must consider:
	• *Any relevant neighbourhood character objective, policy or statement set out in this scheme.*
	• *Any relevant plan or policy for landscape design in the Municipal Planning Strategy and the Planning Policy Framework.*
	• *The design response.*
	• *The location and size of gardens and the predominant plant types in the neighbourhood.*
	• *The health of any trees to be removed.*
	• *Whether a tree was removed to gain a development advantage.*
		✓ **Complies**
		Although a landscape plan is not accompanied by this application, the ground floor plan demonstrates that the site has the capability to provide sufficient landscaping in accordance with Standard B13 that will respect the character of the neighbourhood and reduce the visual bulk of the development.

Clause 55.03-9
Standard B14
Access
	Objective
	• *To ensure the number and design of vehicle crossovers respects the neighbourhood character.*
	Standard
	• *The width of accessways or car spaces should not exceed:*
	  • *33 per cent of the street frontage, or*
	  • *if the width of the street frontage is less than 20 metres, 40 per cent of the street frontage.*
	• *No more than one single-width crossover should be provided for each dwelling fronting a street.*
	• *The location of crossovers should maximise the retention of on-street car parking spaces.*
	• *The number of access points to a road in a Road Zone should be minimised.*
	• *Developments must provide for access for service, emergency and delivery vehicles.*
	Decision guidelines
	Before deciding on an application, the responsible authority must consider:
	• *The design response.*
	• *The impact on the neighbourhood character.*
	• *The reduction of on-street car parking spaces.*
	• *The effect on any significant vegetation on the site and footpath.*
		✓ **Complies**
		The existing crossover constructed within the Riversdale Street road reserve remains unchanged. The crossover's percentage of the front street frontage taken up satisfies the standard. The width of the crossovers is 3.4m on the street frontage of 17m which is 19% and is well below the allowable 40%.

Clause 55.03-10
Standard B15
Parking location
	Objective
	• *To provide convenient parking for resident and visitor vehicles.*
	• *To protect residents from vehicular noise within developments.*
	Standard B15
	• *Car parking facilities should:*
	  • *Be reasonably close and convenient to dwellings and residential buildings.*
	  • *Be secure.*
	  • *Be well ventilated if enclosed.*
		✓ **Complies**
		Car parking space for the proposed dwelling is provided in the form of a single garage to meet the requirements of Clause 52.06.
		The second car space for the existing dwelling is provided in front of the existing carport.

	• *Shared accessways or car parks of other dwellings and residential buildings should be located at least 1.5 metres from the windows of habitable rooms. This setback may be reduced to 1 metre where there is a fence at least 1.5 metres high or where window sills are at least 1.4 metres above the accessway.* ***Decision guideline*** • *Before deciding on an application, the responsible authority must consider the design response.*	
Standard B16 **Parking**	**DELETED**	
55.04	**AMENITY IMPACTS**	

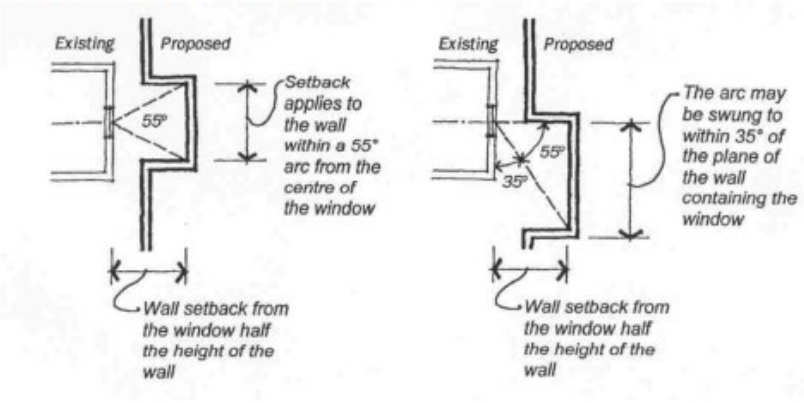
Clause 55.04-1
 	
Standard B17
 	
Side and rear setbacks
	Objective
	• *To ensure that the height and setback of a building from a boundary respects the existing or preferred neighbourhood character and limits the impact on the amenity of existing dwellings.*
	
	Standard B17
	• *A new building not on or within 200mm of a boundary should be set back from side or rear boundaries:*
	  • *At least the distance specified in the schedule to the zone, or*
	  • *If no distance is specified in the schedule to the zone, 1 metre, plus 0.3 metres for every metre of height over 3.6 metres up to 6.9 metres, plus 1 metre for every metre of height over 6.9 metres.*
	• *Sunblinds, verandahs, porches, eaves, fascias, gutters, masonry chimneys, flues, pipes, domestic fuel or water tanks, and heating or cooling equipment or other services may encroach not more than 0.5 metres into the setbacks of this standard.*
	• *Landings having an area of not more than 2 square metres and less than 1 metre high, stairways, ramps, pergolas, shade sails and carports may encroach into the setbacks of this standard.*
	Diagram B1 Side and rear setbacks
	 
	
	Decision guidelines
	• *Before deciding on an application, the responsible authority must consider:*
	• *Any relevant neighbourhood character objective, policy or statement set out in this scheme.*
	• *The impact on the amenity of the habitable room windows and secluded private open space of existing dwellings.*
		✓ **Complies**
		The side and rear setbacks meet this standard and will contribute to the preferred neighbourhood character and limit impacts on the amenity of adjoining dwellings.
		
		The domestic services and apparatus to the building appear to be within the allowable distance of encroachment in this standard.

	• *Whether the wall is opposite an existing or simultaneously constructed wall built to the boundary.* • *Whether the wall abuts a side or rear lane*	

Clause 55.04-2
 	
Standard B18
 	
Walls on boundaries
	Objective
	• *To ensure that the location, length and height of a wall on a boundary respects the existing or preferred neighbourhood character and limits the impact on the amenity of existing dwellings.*
	
	Standards 18
	• *A new wall constructed on or within 200mm of a side or rear boundary of a lot or a carport constructed on or within 1 metre of a side or rear boundary of lot should not abut the boundary for a length of more than:*
	  • *10 metres plus 25 per cent of the remaining length of the boundary of an adjoining lot, or*
	  • *Where there are existing or simultaneously constructed walls or carports abutting the boundary on an abutting lot, the length of the existing or simultaneously constructed walls or carports, whichever is the greater.*
	• *A new wall or carport may fully abut a side or rear boundary where slope and retaining walls or fences would result in the effective height of the wall or carport being less than 2 metres on the abutting property boundary.*
	• *A building on a boundary includes a building set back up to 200mm from a boundary.*
	• *The height of a new wall constructed on or within 200mm of a side or rear boundary or a carport constructed on or within 1 metre of a side or rear boundary should not exceed an average of 3.2 metres with no part higher than 3.6 metres unless abutting a higher existing or simultaneously constructed wall.*
	
	Decision guidelines
	
	Before deciding on an application, the responsible authority must consider:
	• *Any relevant neighbourhood character objective, policy or statement set out in this scheme.*
	• *The design response.*
	• *The extent to which walls on boundaries are part of the neighbourhood character.*
	• *The impact on the amenity of existing dwellings.*
	• *The opportunity to minimise the length of walls on boundaries by aligning a new wall on a boundary with an existing wall on a lot of an adjoining property.*
	• *The orientation of the boundary that the wall is being built on.*
	• *The width of the lot.*
	• *The extent to which the slope and retaining walls or fences reduce the effective height of the wall.*
	• *Whether the wall abuts a side or rear lane.*
	• *The need to increase the wall height to screen a box gutter*
		✓ **Complies**
		Only one garage wall is proposed on boundaries that complies with this standard.

Clause 55.04-3 ***Standard B19*** ***Daylight to existing windows***	***Objective*** • *To allow adequate daylight into existing habitable room windows.* ***Standard*** • *Buildings opposite an existing habitable room window should provide for a light court to the existing window that has a minimum area of 3 square metres and minimum dimension of 1 metre clear to the sky. The calculation of the area may include land on the abutting lot.* • *Walls or carports more than 3 metres in height opposite an existing habitable room window should be set back from the window at least 50 per cent of the height of the new wall if the wall is within a 55 degree arc from the centre of the existing window. The arc may be swung to within 35 degrees of the plane of the wall containing the existing window.* • *Where the existing window is above ground floor level, the wall height is measured from the floor level of the room containing the window.*	✓ **Complies** The proposed building is well set back from the shared boundaries so that there will have no daylight impacts to any existing habitable room windows of the dwellings on the adjoining land.

Diagram B2 Daylight to existing windows



Decision guidelines

Before deciding on an application, the responsible authority must consider:

- *The design response.*
- *The extent to which the existing dwelling has provided for reasonable daylight access to its habitable rooms through the siting and orientation of its habitable room windows.*
- *The impact on the amenity of existing dwellings.*

Clause 55.04-4

Standard B20

North-facing windows

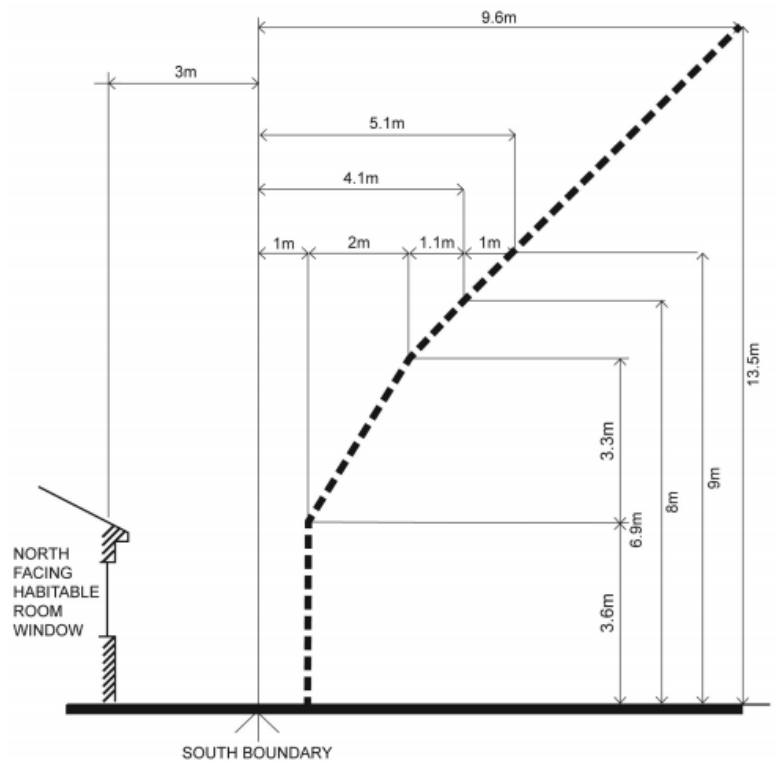
Objective

- *To allow adequate solar access to existing north-facing habitable room windows.*

Standard B20

- *If a north-facing habitable room window of an existing dwelling is within 3 metres of a boundary on an abutting lot, a building should be setback from the boundary 1 metre, plus 0.6 metres for every metre of height over 3.6 metres up to 6.9 metres, plus 1 metre for every metre of height over 6.9 metres, for a distance of 3 metres from the edge of each side of the window. A north-facing window is a window with an axis perpendicular to its surface oriented north 20 degrees west to north 30 degrees east.*

Diagram B3 North-facing windows



Decision guidelines

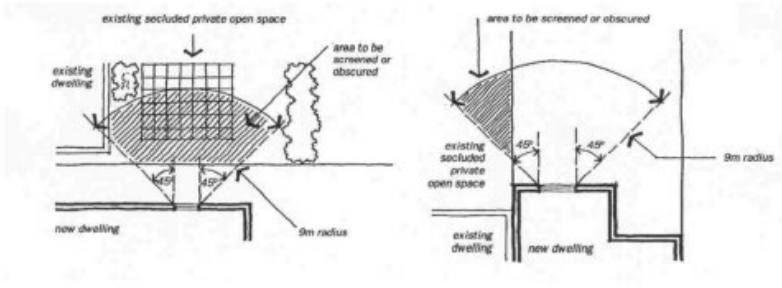
Before deciding on an application, the responsible authority must consider:

✓ **Complies**

There are no north facing windows of the adjoining dwelling to the south.

	• *The design response.* • *Existing sunlight to the north-facing habitable room window of the existing dwelling.* • *The impact on the amenity of existing dwellings.*	
Clause 55.04-5 ***Standard B21*** ***Overshadowing open space***	***Objective*** • *To ensure buildings do not significantly overshadow existing secluded private open space.* ***Standard B21*** • *Where sunlight to the secluded private open space of an existing dwelling is reduced, at least 75 per cent, or 40 square metres with minimum dimension of 3 metres, whichever is the lesser area, of the secluded private open space should receive a minimum of five hours of sunlight between 9 am and 3 pm on 22 September.* • *If existing sunlight to the secluded private open space of an existing dwelling is less than the requirements of this standard, the amount of sunlight should not be further reduced.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *The impact on the amenity of existing dwellings.* • *Existing sunlight penetration to the secluded private open space of the existing dwelling.* • *The time of day that sunlight will be available to the secluded private open space of the existing dwelling.* • *The effect of a reduction in sunlight on the existing use of the existing secluded private open space.*	✓ **Complies** The generous setbacks from the boundaries allow this standard to be met. The shadow diagrams show that there will have no unreasonable shadow cast into the secluded private open space on adjoining land to the west.

Clause 55.04-6
Standard B22
Overlooking
	Objective
	• *To limit views into existing secluded private open space and habitable room windows.*
	Standard
	• *A habitable room window, balcony, terrace, deck or patio should be located and designed to avoid direct views into the secluded private open space of an existing dwelling within a horizontal distance of 9 metres (measured at ground level) of the window, balcony, terrace, deck or patio. Views should be measured within a 45 degree angle from the plane of the window or perimeter of the balcony, terrace, deck or patio, and from a height of 1.7 metres above floor level.*
	• *A habitable room window, balcony, terrace, deck or patio with a direct view into a habitable room window of existing dwelling within a horizontal distance of 9 metres (measured at ground level) of the window, balcony, terrace, deck or patio should be either:*
	  • *Offset a minimum of 1.5 metres from the edge of one window to the edge of the other.*
	  • *Have sill heights of at least 1.7 metres above floor level.*
	  • *Have fixed, obscure glazing in any part of the window below 1.7 metre above floor level.*
	  • *Have permanently fixed external screens to at least 1.7 metres above floor level and be no more than 25 per cent transparent.*
	• *Obscure glazing in any part of the window below 1.7 metres above floor level may be openable provided that there are no direct views as specified in this standard.*
	• *Screens used to obscure a view should be:*
		✓ **Complies**
		The combination of boundary fences obscured, and highlight windows limit unreasonable views into existing SPOS and habitable windows of adjoining dwellings on the north, south and east.

	• *Perforated panels or trellis with a maximum of 25 per cent openings or solid translucent panels.* • *Permanent, fixed and durable.* • *Designed and coloured to blend in with the development.* • *This standard does not apply to a new habitable room window, balcony, terrace, deck or patio which faces a property boundary where there is a visual barrier at least 1.8 metres high and the floor level of the habitable room, balcony, terrace, deck or patio is less than 0.8 metres above ground level at the boundary.* **Diagram B4 Overlooking open space**  ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *The impact on the amenity of the secluded private open space or habitable room window.* • *The existing extent of overlooking into the secluded private open space and habitable room windows of existing dwellings.* • *The internal daylight to and amenity of the proposed dwelling or residential building.*	
Clause 55.04-7 ***Standard B23*** **Internal views**	***Objective*** • *To limit views into the secluded private open space and habitable room windows of dwellings and residential buildings within a development.* ***Standard B23*** • *Windows and balconies should be designed to prevent overlooking of more than 50 per cent of the secluded private open space of a lower-level dwelling or residential building directly below and within the same development.* ***Decision guideline*** • *Before deciding on an application, the responsible authority must consider the design response*	✓ **Complies** The use of 1.7-metre high dividing fences will limit views into the secluded private open space and habitable room windows of the existing dwelling within the development.
Clause 55.04-8 ***Standard B24*** ***Noise impacts objectives***	***Objective*** • *To contain noise sources in developments that may affect existing dwellings.* • *To protect residents from external noise.* ***Standard B24*** • *Noise sources, such as mechanical plant, should not be located near bedrooms of immediately adjacent existing dwellings.* • *Noise sensitive rooms and secluded private open spaces of new dwellings and residential buildings should take account of noise sources on immediately adjacent properties.* • *Dwellings and residential buildings close to busy roads, railway lines or*	✓ **Complies** Nonetheless, there are no noise sources proposed in the development, all equipment will require meeting relevant Australian Standards, and any noise emanating in residential areas must comply with relevant regulations of the EPA.

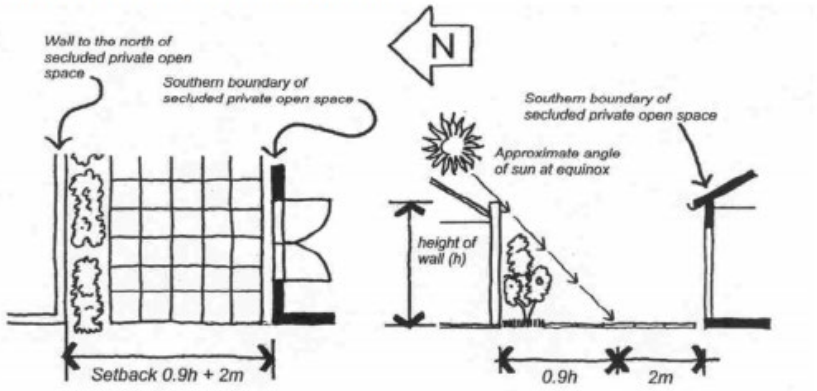
	industry should be designed to limit noise levels in habitable rooms. ***Decision guideline*** • *Before deciding on an application, the responsible authority must consider the design response.*	

55.05 ON-SITE AMENITY AND FACILITIES		
Clause 55.05-1 ***Standard B25*** ***Accessibility***	***Objective*** • *To encourage the consideration of the needs of people with limited mobility in the design of developments.* ***Decision guideline*** • *The dwelling entries of the ground floor of dwellings and residential buildings should be accessible or able to be easily made accessible to people with limited mobility.*	✓ **Complies** This development is suitable for people with limited mobility.

Clause 55.05-2
 	
Standard B26
 	
Dwelling entry
	Objective
	• *To provide each dwelling or residential building with its own sense of identity.*
	
	Standard
	
	• *Entries to dwellings and residential buildings should:*
	
	  • *Be visible and easily identifiable from streets and other public areas.*
	
	  • *Provide shelter, a sense of personal address and a transitional space around the entry.*
		✓ **Complies**
		The dwelling is clearly visible from the street, and the use of entry porch creates shelter for waiting.

Clause 55.05-3 ***Standard B27*** ***Daylight to new windows***	***Objective*** • *To allow adequate daylight into new habitable room windows.* ***Standard B27*** • *A window in a habitable room should be located to face:* • *An outdoor space clear to the sky or a light court with a minimum area of 3 square metres and minimum dimension of 1 metre clear to the sky, not including land on an abutting lot, or* • *A verandah provided it is open for at least one third of its perimeter, or* • *A carport provided it has two or more open sides and is open for at least one third of its perimeter.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *Whether there are other windows in the habitable room which have access to daylight.*	✓ **Complies** All windows in habitable rooms are positioned to achieve a good level of daylight.

Clause 55.05-4
 	
Standard B28
 	
Private open space
	Objective
	
	• *To provide adequate private open space for the reasonable recreation and service needs of residents.*
	
	Standard B26
	
	• *A dwelling or residential building should have private open space of an area and dimensions specified in the schedule to the zone.*
	
	• *If no area or dimensions are specified in the schedule to the zone, a dwelling or residential building should have private open space consisting of:*
	
	  • *An area of 40 square metres, with one part of the private open space to consist of secluded private open space at the side or rear of the dwelling or residential building with a minimum area of 25 square metres, a minimum dimension of 3 metres and convenient access from a living room, or*
	
	  • *A balcony of 8 square metres with a minimum width of 1.6 metres*
		✓ **Complies**
		A SPOS area in excess of 25 sqm with a minimum dimension of 3 metres is located to the rear of each dwelling with convenient access from a living room.

	and convenient access from a living room, or • *A roof-top area of 10 square metres with a minimum width of 2 metres and convenient access from a living room.* ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *The useability of the private open space, including its size and accessibility.* • *The availability of and access to public or communal open space.* • *The orientation of the lot to the street and the sun.*	
Clause 55.05-5 ***Standard B29*** ***Solar access to open space***	***Objective*** • *To allow solar access into the secluded private open space of new dwellings and residential buildings.* ***Standard B29*** • *The private open space should be located on the north side of the dwelling or residential building, if appropriate.* • *The southern boundary of secluded private open space should be set back from any wall on the north of the space at least (2 + 0.9h) metres, where 'h' is the height of the wall.* **Diagram B5 Solar access to open space**  ***Decision guidelines*** *Before deciding on an application, the responsible authority must consider:* • *The design response.* • *The useability and amenity of the secluded private open space based on the sunlight it will receive.*	✓ **Complies** The private open space associated with the dwelling is located with a reasonable level of solar orientation, thus satisfying this standard.
Clause 55.05-6 ***Standard B30*** ***Storage***	**Objective** • *To provide adequate storage facilities for each dwelling.* ***Standard*** • *Each dwelling should have convenient access to at least 6 cubic metres of externally accessible, secure storage space.*	✓ **Complies** Storage area is proposed behind the garage.

55.06 DETAILED DESIGN		

Clause 55.06-1
 	
Standard B31
 	
Design detail
	Objective
	
	• *To encourage design detail that respects the existing or preferred neighbourhood character.*
	
	Standard B31
	
	• *The design of buildings, including:*
	
	  • *Facade articulation and detailing,*
	
	  • *Window and door proportions,*
	
	  • *Roof form, and*
	
	  • *Verandahs, eaves and parapets,*
	
	  should respect the existing or preferred neighbourhood character.
	
	• *Garages and carports should be visually compatible with the development and the existing or preferred neighbourhood character.*
	
	Decision guidelines
	
	Before deciding on an application, the responsible authority must consider:
	
	• *Any relevant neighbourhood character objective, policy or statement set out in this scheme.*
	
	• *The design response.*
	
	• *The effect on the visual bulk of the building and whether this is acceptable in the neighbourhood setting.*
	
	• *Whether the design is innovative and of a high architectural standard.*
		✓ **Complies**
		The use of varying roof forms, a mix of vertically and horizontally oriented windows, large porches, staggered walls and a mix of varying cladding, colours and glazing reflects design details found on recent residential buildings in the locality.

Clause 55.06-2
 	
Standard B32
 	
Front fences
	Objective
	
	• *To encourage front fence design that respects the existing or preferred neighbourhood character.*
	
	Decision guidelines
	
	• *The design of front fences should complement the design of the dwelling or residential building and any front fences on adjoining properties.*
	
	• *A front fence within 3 metres of a street should not exceed:*
	  • The maximum height specified in the schedule to the zone, or
	  • If no maximum height is specified in the schedule to the zone, the maximum height specified in Table B3.
	
	Table B3 Maximum front fence height
	
	| Street Context
		Maximum front fence height |
		|---|---|
		| Streets in a Road Zone, Category 1 | 2 metres |
		| Other streets | 1.5 metres |
		
		Decision guidelines
		
		Before deciding on an application, the responsible authority must consider:
		
		• *Any relevant neighbourhood character objective, policy or statement set out in this scheme.*
		
		• *The design response.*
		
		• *The setback, height and appearance of front fences on adjacent properties.*
		
		• *The extent to which slope and retaining walls reduce the effective height of*
			✓ **N/A**
			Not fenced.

	the front fence. • *Whether the fence is needed to minimise noise intrusion.*	
Clause 55.06-3 ***Standard B33*** ***Common property***	***Objectives*** • *To ensure that communal open space, car parking, access areas and site facilities are practical, attractive and easily maintained.* • *To avoid future management difficulties in areas of common ownership.* ***Standard B33*** • *Developments should clearly delineate public, communal and private areas.* • *Common property, where provided, should be functional and capable of efficient management.*	✓ **N/A** No common property is proposed under this application.
Clause 55.06-4 ***Standard B34*** ***Site services***	***Objectives*** • *To ensure that site services can be installed and easily maintained.* • *To ensure that site facilities are accessible, adequate and attractive.* ***Standard B34*** • *The design and layout of dwellings and residential buildings should provide sufficient space (including easements where required) and facilities for services to be installed and maintained efficiently and economically.* • *Bin and recycling enclosures, mailboxes and other site facilities should be adequate in size, durable, waterproof and blend in with the development.* • *Bin and recycling enclosures should be located for convenient access by residents.* • *Mailboxes should be provided and located for convenient access as required by Australia Post.* ***Decision guideline*** *Before deciding on an application, the responsible authority must consider the design response.*	✓ **Complies** Each dwelling is allocated bin storage areas, clotheslines and mailboxes complying with this standard.

Assessed: on 14/09/2022

JARI
BUILDING DESIGN

PROPOSED SECOND DWELLING

16 RIVERSDALE ST CRAIGIEBURN

DRAWING LIST:

01 COVER PAGE
02 GENERAL BCA NOTES
03 GENERAL NCC NOTES
04 DESIGN RESPONSE
05 EXISTING SITE PLAN
06 PROPOSED SITE PLAN
07 UNIT 1 & 2 PROPOSED FLOOR PLAN
08 PROPOSED UNIT 1 GROUND FLOOR
09 PROPOSED FIRST FLOOR
10 PROPOSED ELEVATIONS
11 PROPOSED ROOF PLAN
12 SHADOW PLANS - 9AM
13 SHADOW PLAN - 12 NOON
14 SHADOW PLAN - 3PM
15 STREETSCAPE / GARDEN SPACE

ISSUE PRELIMINARY
ARCHITECTURAL DOCUMENTATION

17/08/2022

JARI BUILDING DESIGN

ABN 84 417 474 244

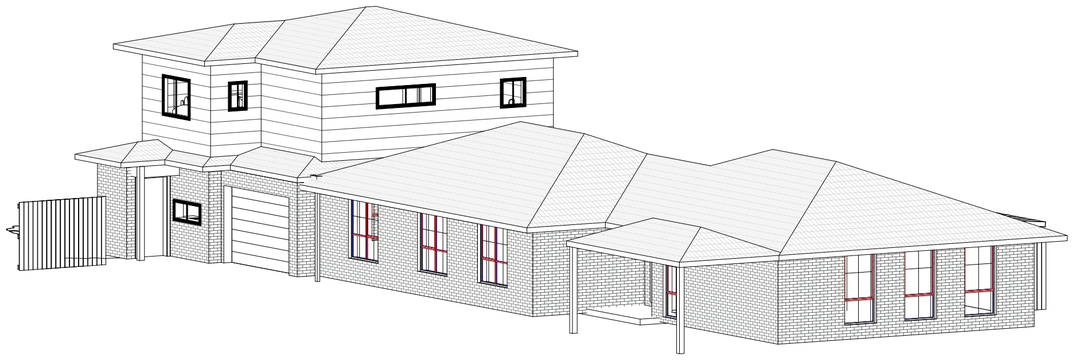
NAJLA EL-JARI
DPAD 59312

0405 504 051

info@jaribuildingdesign.com.au

www.jaribuildingdesign.com.au

SCORESBY | FRANKSTON



GENERAL BCA NOTES

ALL MATERIALS AND WORK PRACTICES SHALL COMPLY WITH, BUT NOT LIMITED TO, THE BUILDING REGULATIONS 2018, THE NATIONAL CONSTRUCTION CODE SERIES 2019 BUILDING CODE OF AUSTRALIA VOL 2 AND ALL RELEVANT CURRENT AUSTRALIAN STANDARDS (AS AMENDED) REFERRED TO THEREIN.

THESE SPECIFICATIONS SPECIFY ONLY THE MINIMUM STANDARD OF WORK FOR THE DEMOLITION WORKS ON RESIDENTIAL PROJECTS, AND ALL WORKMANSHIP AND PRECAUTIONS SHALL BE TO BEST TRADE PRACTICE.

- PRECAUTIONS MUST BE TAKEN BEFORE AND DURING DEMOLITION IN ACCORDANCE WITH AS 2601-2001: THE DEMOLITION OF STRUCTURES.
- DURING THE PROGRESS OF THE DEMOLITION THE WORKS SHALL BE UNDER THE CONTINUOUS SUPERVISION OF THE DEMOLISHER OR OF AN EXPERIENCED FOREMAN, AND DEMOLITION SHALL BE EXECUTED STOREY BY STOREY COMMENCING AT THE ROOF AND WORKING DOWNWARDS.
- THE DEMOLITION MUST NOT BE COMMENCED UNTIL THE PRECAUTIONARY MEASURES HAVE BEEN INSPECTED AND APPROVED BY THE RELEVANT BUILDING SURVEYOR.
- THE DEMOLISHER SHALL CONSTRUCT A TEMPORARY CROSSING PLACED OVER THE FOOTPATH, AS REQUIRED BY THE COUNCIL.
- NO PART OF ANY EXTERNAL WALL ON OR WITHIN 3.00M OF A STREET ALIGNMENT MAY BE PULLED DOWN, EXCEPT DURING THE HOURS THAT THE RELEVANT BUILDING SURVEYOR DIRECTS.
- PROTECTIVE OUTRIGGERS, FENCES, AWNINGS, HOARDING, BARRICADES AND THE LIKE MUST BE INSTALLED WHERE NECESSARY TO GUARD AGAINST DANGER TO LIFE OR PROPERTY OR WHEN REQUIRED BY THE RELEVANT BUILDING SURVEYOR.
- DUST CREATING MATERIAL, UNLESS THOROUGHLY DAMPENED DOWN, SHALL NOT BE THROWN OR DROPPED FROM THE BUILDING BUT SHALL BE LOWERED BY HOISTING APPARATUS OR REMOVED BY MATERIAL CHUTES. ALL CHUTES SHALL BE COMPLETELY ENCLOSED AND A DANGER SIGN SHALL BE AT THE DISCHARGE END OF EVERY CHUTE.
- ALL PRACTICABLE PRECAUTIONS SHALL BE TAKEN TO AVOID DANGER FROM COLLAPSE OF A BUILDING WHEN ANY PART OF A FRAMED OR PARTLY FRAMED BUILDING IS REMOVED.
- DEMOLISHED MATERIAL SHALL NOT BE ALLOWED TO REMAIN ON ANY FLOOR OR STRUCTURE IF THE WEIGHT OF THE MATERIAL EXCEEDS THE SAFE CARRYING CAPACITY OF THE FLOOR OR STRUCTURE, AND SUCH MATERIAL SHALL NOT BE SO PILED OR STACKED THAT IT WILL ENDANGER WORKMEN OR OTHER PERSONS, AND SHALL BE REMOVED AS SOON AS PRACTICABLE FROM THE SITE.
- NO WALL, CHIMNEY OR OTHER STRUCTURE OR PART OF A STRUCTURE SHALL BE LEFT UNATTENDED OR UNSUPPORTED IN SUCH A CONDITION THAT IT MAY COLLAPSE DUE TO WIND OR VIBRATION OR OTHER-WISE BECOME DANGEROUS.
- BEFORE DEMOLITION IS COMMENCED, AND ALSO DURING THE PROGRESS OF SUCH WORKS, ALL ELECTRICAL CABLE OR APPARATUS WHICH ARE LIABLE TO BE A SOURCE OF DANGER - OTHER THAN CABLE OR APPARATUS USED FOR THE DEMOLITION WORKS - SHALL BE DISCONNECTED.

ARRANGEMENTS SHALL BE MADE WITH THE RELEVANT ELECTRICAL SUPPLY AUTHORITY FOR THE DISCONNECTION OF ELECTRICAL MAINS SUPPLY EXCEPT THAT, WHERE PARTIAL DEMOLITION IS PROPOSED, THE LICENSED ELECTRICAL CONTRACTOR SHALL SATISFY THE RELEVANT ELECTRICAL SUPPLY AUTHORITY THAT THE PORTION OF THE BUILDING TO BE DEMOLISHED HAS BEEN ISOLATED.

- THE DEMOLISHER SHALL BE RESPONSIBLE FOR THE DISCONNECTION OF ALL TELECOMMUNICATION SUPPLIES.
- THE DEMOLISHER SHALL BE RESPONSIBLE TO CUT AND SEAL ANY STORM WATER, SEWER PIPES, WATER SERVICES, GAS SERVICES AND THE LIKE.
- THE POSITION OF CAPPED SEWER AND STORM WATER DRAINS, SEALED-OFF WATER SUPPLY LINES, GAS SUPPLY LINES AND THE LIKE ARE TO BE CLEARLY MARKED ON THE SITE.
- ANY SEPTIC TANK(S) ON THE DEMOLITION SITE SHALL BE EMPTIED AND FILLED WITH CLEAN SAND, OR REMOVED ENTIRELY, AND ANY SOAK WELLS, LEACH DRAINS OR SIMILAR APPARATUS SHALL BE REMOVED OR FILLED WITH CLEAN SAND.
- ANY SWIMMING POOLS, PONDS OR THE LIKE EITHER ON THE DEMOLITION SITE OR ON THE NEIGHBOURING ALLOTMENTS WHERE AFFECTED BY THE DEMOLITION WORKS SHALL BE ADEQUATELY FENCED AND MADE SAFE, SO AS TO COMPLY WITH 'AS 1926 SWIMMING POOL SAFETY' PARTS 1 & 2 PRIOR TO COMMENCEMENT OF ANY DEMOLITION WORKS.
- MATERIALS REMOVED OR DISPLACED FROM THE BUILDING SHALL NOT BE PLACED IN ANY STREET, ROAD OR RIGHT OF WAY AND, BEFORE COMMENCING, WHERE REQUIRED, SHALL BE KEPT SPRAYED WITH WATER SO AS TO PREVENT ANY NUISANCE FROM DUST.
- MATERIALS REMOVED OR DISPLACED FROM THE BUILDING BEING DEMOLISHED OR MATERIALS LEFT STANDING SHALL NOT BE BURNED ON THE DEMOLITION SITE.
- REMOVAL OF BUILDINGS BY ROAD MUST BE APPROVED BY RELEVANT COUNCILS TRAFFIC ENGINEER.
- A SITE MANAGEMENT PLAN IS TO BE IMPLEMENTED DURING DEMOLITION WORKS TO CONTROL SEDIMENT RUN-OFF IN ACCORDANCE WITH EPA VICTORIA PUBLICATION #275: CONSTRUCTION TECHNIQUES FOR SEDIMENT POLLUTION CONTROL. PROVIDE 'PROPEX' OR EQUIVALENT SILT FENCES TO THE LOW SIDE OF THE ALLOTMENT AND AROUND ALL SOIL STOCKPILES AND STORM WATER INLET PITS/SUMPS AND INSTALL 'SILT STOP' FILTER BAGS OVER ALL STORM WATER ENTRY PITS DURING DEMOLITION WORKS. 'SUPERGRO' OR EQUIVALENT EROSION CONTROL FABRIC TO BE PLACED OVER GARDEN BEDS TO PREVENT SURFACE EROSION DURING REVEGITATION PERIOD.
- IT IS THE BUILDER'S RESPONSIBILITY TO CARRY OUT AN AUDIT PRIOR TO THE COMMENCEMENT OF ANY WORKS TO DETERMINE IF ASBESTOS IS PRESENT IN THE EXISTING WORKS. WHERE ANY ASBESTOS PRODUCT IS FOUND IN THE PROPOSED WORKS AREA DURING INITIAL INSPECTION OR DURING THE COURSE OF THE DEMOLITION WORKS THE BUILDER SHALL ENGAGE AN AUTHORISED AND REGISTERED CONTRACTOR FOR SAFE REMOVAL AND LAWFUL DISPOSAL.
- A BUILDING PERMIT IS REQUIRED PRIOR TO THE COMMENCEMENT OF THESE WORKS. THE RELEASE OF THE DOCUMENTS IS CONDITIONAL TO THE OWNER OBTAINING THE REQUIRED BUILDING PERMIT.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

No.	Description	Date

JARI BUILDING DESIGN

Proposal: PROPOSED SECOND DWELLING
Project Address: 16 RIVERSDALE ST CRAIGIEBURN
Drawing: GENERAL BCA NOTES
Client: ELYAS
Drawn: CS
Checked: NJ
Scale:
Date: 17/08/2022
Issue: PRELIMINARY
Sheet : 02

GENERAL NCC NOTES

ALL MATERIALS AND WORK PRACTICES SHALL COMPLY WITH, BUT NOT LIMITED TO THE BUILDING REGULATIONS 2018, NATIONAL CONSTRUCTION CODE SERIES 2019 BUILDING CODE OF AUSTRALIA VOL 2 AND ALL RELEVANT CURRENT AUSTRALIAN STANDARDS (AS AMENDED) REFERRED TO THEREIN.

UNLESS OTHERWISE SPECIFIED, THE TERM BCA SHALL REFER TO NATIONAL CONSTRUCTION CODE SERIES 2019 BUILDING CODE OF AUSTRALIA VOLUME 2.

ALL MATERIALS AND CONSTRUCTION PRACTICE SHALL MEET THE PERFORMANCE REQUIREMENTS OF THE BCA. WHERE A PERFORMANCE SOLUTION IS PROPOSED THEN, PRIOR TO IMPLEMENTATION OR INSTALLATION, IT FIRST MUST BE ASSESSED AND APPROVED BY THE RELEVANT BUILDING SURVEYOR AS MEETING THE PERFORMANCE REQUIREMENTS OF THE BCA.

ALL WORKS SHALL COMPLY TO THE FOLLOWING AUSTRALIAN STANDARDS;

- AS 1288 - GLASS IN BUILDINGS: SELECTION AND INSTALLATION
- AS 1562 - DESIGN AND INSTALLATION OF SHEET ROOF AND WALL CLADDING
- AS 1684 - NATIONAL TIMBER FRAMING CODE
- AS 1860 - INSTALLATION OF PARTICLEBOARD FLOORING
- AS 2049 - ROOF TILES
- AS 2050 - FIXING OF ROOF TILES
- AS 2870 - RESIDENTIAL SLABS AND FOOTINGS
- AS 2904 - DAMP PROOF COURSES AND FLASHINGS
- AS 3600 - CONCRETE STRUCTURES
- AS 3660.1 - CODE OF PRACTICE FOR PHYSICAL BARRIERS USED IN THE PROTECTION OF BUILDINGS AGAINST SUBTERRANEAN TERMITES
- AS 3700 - MASONRY IN BUILDINGS
- AS 3786 - SMOKE ALARMS
- AS 4055 - WIND LOADINGS FOR HOUSING
- AS 4100 - STEEL STRUCTURES

GLAZING:
GLAZING, INCLUDING SAFETY GLAZING, SHALL BE INSTALLED TO A SIZE, TYPE AND THICKNESS SO AS TO COMPLY WITH:

- BCA PART 3.6 FOR CLASS 1 AND 10 BUILDINGS WITHIN A DESIGN WIND SPEED OF NOT MORE THAN N3; AND
- BCA VOL 1 PART B1.4 FOR CLASS 2 AND 9 BUILDINGS.
- WINDOW SIZES NOMINATED ARE NOMINAL ONLY. ACTUAL SIZE MAY VARY ACCORDING TO MANUFACTURER. WINDOWS TO BE FLASHED ALL AROUND.

WET AREAS :
WATERPROOFING OF WET AREAS, BEING BATHROOMS, SHOWERS, SHOWER ROOMS, LAUNDRIES, SANITARY COMPARTMENTS AND THE LIKE SHALL BE PROVIDED IN ACCORDANCE WITH AS 3740-2010: WATERPROOFING OF DOMESTIC WET AREAS
PROVIDE IMPERVIOUS FLOOR & WALL FINISHES TO ALL WET AREAS IN ACCORDANCE WITH BCA PART 3.8.1.2.

ENERGY RATING REPORT:
THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ANY HOUSE ENERGY RATING (HERS) REPORT AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STAMPED PLANS ENDORSED BY THE ACCREDITED THERMAL PERFORMANCE ASSESSOR WITHOUT ALTERATION.

STAIRS & BARRIERS:
STEP SIZES (OTHER THAN FOR SPIRAL STAIRS) TO BE:

- RISERS (R) 190MM MAXIMUM AND 115MM MINIMUM
- GOING (G) 355MM MAXIMUM AND 240MM MINIMUM
- 2R + 1G = 700MM MAXIMUM AND 550MM MINIMUM
  WITH LESS THAN 125MM GAP BETWEEN OPEN TREADS.

ALL TREADS, LANDINGS AND THE LIKE TO HAVE A SLIP-RESISTANCE CLASSIFICATION OF P3 OR R10 FOR DRY SURFACE CONDITIONS AND P4 OR R11 FOR WET SURFACE CONDITIONS, OR A NOSING STRIP WITH A SLIP-RESISTANCE CLASSIFICATION OF P3 FOR DRY SURFACE CONDITIONS AND P4 FOR WET SURFACE CONDITIONS.

PROVIDE BARRIERS WHERE CHANGE IN LEVEL EXCEEDS 1000MM ABOVE THE SURFACE BENEATH LANDINGS, RAMPS AND/OR TREADS. BARRIERS (OTHER THAN TENSIONED WIRE BARRIERS) TO BE:

- 1000MM MIN. ABOVE FINISHED SURFACE LEVEL OF BALCONIES, LANDINGS OR THE LIKE, AND
- 865MM MIN. ABOVE FINISHED SURFACE LEVEL OF STAIR NOSING OR RAMP, AND
- VERTICAL WITH LESS THAN 125MM GAP BETWEEN, AND
- ANY HORIZONTAL ELEMENT WITHIN THE BARRIER BETWEEN 150MM AND 760MM ABOVE THE
- FLOOR MUST NOT FACILITATE CLIMBING WHERE CHANGES IN LEVEL EXCEEDS 4000MM ABOVE THE SURFACE BENEATH LANDINGS, RAMPS AND/OR TREADS.

WIRE BARRIER CONSTRUCTION TO COMPLY WITH NCC 2019 BCA PART 3.9.2.3 FOR CLASS 1 AND 10 BUILDINGS AND NCC 2019 BCA VOLUME 1 PART D2.16 FOR OTHER CLASSES OF BUILDINGS.
TOP OF HAND RAILS TO BE MINIMUM 865MM VERTICALLY ABOVE STAIR NOSING AND FLOOR SURFACE OF RAMPS.

TERMITE PROTECTION:
WHERE THE BUILDING (EXCLUDES A DETACHED CLASS 10) IS LOCATED IN A TERMITE PRONE AREA THE BUILDING IS TO BE PROVIDED WITH A TERMITE MANAGEMENT SYSTEM.

CONCRETE STUMPS:
- UP TO 1400MM LONG TO BE 100MM X 100MM(1 NO. H.D. WIRE)
- 1401MM TO 1800MM LONG TO BE 100MM X 100MM(2 NO. H.D. WIRES)
- 1801MM TO 3000MM LONG TO BE 125MM X 125MM(2 NO. H.D. WIRES)

100MM X 100MM STUMPS EXCEEDING 1200MM ABOVE GROUND LEVEL TO BE BRACED WHERE NO PERIMETER BASE BRICKWORK PROVIDED.

TOILET DOORS:
TOILET DOORS ARE TO BE FITTED WITH REMOVABLE HINGES, OR ARE TO SWING OUT, OR BE SLIDING WHERE THE HINGE SIDE OF DOORWAY IS WITHIN 1200MM OF THE PAN.

SMOKE ALARMS:
SMOKE ALARMS TO BE INSTALLED IN ACCORDANCE WITH B.C.A PART 3.7.2. SMOKE ALARMS MUST BE CONNECTED DIRECTLY TO MAINS POWERS AND INTERCONNECTED

MECHANICAL VENTILATION:
MECHANICAL VENTILATION MUST BE DUCTED TO THE EXHAUST TO THE OUTSIDE OF THE BUILDING TO COMPLY WITH PART 3.8.5 OF THE BCA & AS1668.2

UNDER PART 3.8.7 CONDENSATION MANAGEMENT OF THE CURRENT BCA 2019, MECHANICAL VENTILATION MUST BE INSTALLED TO A KITCHEN, BATHROOM, SANITARY COMPARTMENT OR LAUNDRY AND HAVE A MINIMUM FLOW RATE OF

- 25L/S FOR A BATHROOM OR SANITARY COMPARTMENT; AND
- 40L/S FOR KITCHEN OR LAUNDRY.
- EXHAUST FROM A BATHROOM, SANITARY COMPARTMENT OR LAUNDRY MUST BE DISCHARGED
- DIRECTLY OR VIA A SHAFT OR DUCT TO OUTSIDE AIR, OR
- TO A ROOF SPACE THAT IS VENTILATED IN ACCORDANCE WITH PART 3.8.7.4.

MASONRY:
BUILDINGS IN MARINE OR OTHER EXPOSURE ENVIRONMENTS SHALL HAVE MASONRY UNITS, MORTAR AND ALL BUILT-IN COMPONENTS AND THE LIKE COMPLYING WITH THE DURABILITY REQUIREMENTS OF TABLE 4.1 OF AS 4773.1-2010 'MASONRY IN SMALL BUILDINGS' PART 1: DESIGN.

STORMWATER:
ALL STORMWATER TO BE TAKEN TO THE LEGAL POINT OF DISCHARGE TO THE RELEVANT AUTHORITIES APPROVAL.

CLASS 6 UPVC STORMWATER LINE LAID TO A MINIMUM GRADE OF 1:100 AND CONNECTED TO THE LEGAL POINT OF STORMWATER DISCHARGE. PROVIDE INSPECTION OPENINGS AT 9000MM C/C AND AT EACH CHANGE OF DIRECTION.THE COVER TO UNDERGROUND STORMWATER DRAINS SHALL BE NOT LESS THAN:

- 100MM UNDER SOIL
- 50MM UNDER PAVED OR CONCRETE AREAS
- 100MM UNDER UNREINFORCED CONCRETE OR PAVED DRIVEWAYS
- 75MM UNDER REINFORCED CONCRETE DRIVEWAYS

THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ALL OTHER CONSULTANTS' DRAWINGS/DETAILS AND WITH ANY OTHER WRITTEN INSTRUCTIONS ISSUED IN THE COURSE OF THE CONTRACT.

BAL (BUSHFIRE ATTACK LEVEL):
SITE BUSHFIRE ATTACK ASSESSMENT (SIMPLIFIED METHOD) REFERENCE DOCUMENT 'AS 3959-2018 CONSTRUCTION OF BUILDINGS IN BUSH FIRE PRONE AREAS', CLASSIFICATION = BUSHFIRE ATTACK LEVEL TO BE DETERMINED BY BUSHFIRE ASSESSMENT REPORT

DESIGN GUST WIND SPEED / WIND CLASSIFICATION:
BUILDING TIE-DOWNS TO BE PROVIDED IN ACCORDANCE WITH AS1684-2015 FOR AN ASSUMED DESIGN GUST WIND SPEED/WIND CLASSIFICATION TO BE CONFIRMED ON SITE BY RELEVANT BUILDING SURVEYOR AT FIRST INSPECTION. REFER TO AS1684 FOR CONSTRUCTION REQUIREMENTS.

CORROSION PROTECTION OF BUILT-IN STRUCTURAL MEMBERS:
PROVIDE CORROSION PROTECTION OF BUILT-IN STRUCTURAL STEEL MEMBERS SUCH AS STEEL LINTELS, SHELF ANGLES, CONNECTORS, ACCESSORIES (OTHER THAN WALL TIES) IN ACCORDANCE WITH TABLE 4.1 OF AS4773.1-2015 MASONRY IN SMALL BUILDINGS PART 1: DESIGN SUITABLE FOR THE ENVIRONMENT CLASSIFICATION.

CORROSION PROTECTION FOR SHEET ROOFING:
PROVIDE CORROSION PROTECTION FOR SHEET ROOFING IN ACCORDANCE WITH BCA TABLE 3.5.1.1A SUITABLE FOR THE ENVIRONMENT CLASSIFICATION OF

SITE CLASSIFICATION:
REFER TO SOIL REPORT PROVIDED BY LICENSED SOIL ENGINEER FOR SITE CLASSIFICATION.
SITE PLAN MEASUREMENTS IN METRES - ALL OTHER MEASUREMENTS IN MILLIMETRES UNLESS NOTED OTHERWISE.

FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.

THE BUILDER SHALL TAKE ALL STEPS NECESSARY TO ENSURE THE STABILITY AND GENERAL WATER TIGHTNESS OF ALL NEW AND/OR EXISTING STRUCTURES DURING ALL WORKS.

THE BUILDER AND SUBCONTRACTORS SHALL CHECK AND VERIFY ALL DIMENSIONS, SETBACKS, LEVELS AND SPECIFICATIONS AND ALL OTHER RELEVANT DOCUMENTATION PRIOR TO THE COMMENCEMENT OF ANY WORKS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

INSTALLATION OF ALL SERVICES SHALL COMPLY WITH THE RESPECTIVE SUPPLY AUTHORITY REQUIREMENTS.

THE BUILDER AND SUBCONTRACTOR SHALL ENSURE THAT ALL STORMWATER DRAINS, SEWER PIPES AND THE LIKE ARE LOCATED AT A SUFFICIENT DISTANCE FROM ANY BUILDINGS FOOTING AND/OR SLAB EDGE BEAMS SO AS TO PREVENT GENERAL MOISTURE PENETRATION, DAMPNESS, WEAKENING AND UNDERMINING OF ANY BUILDING AND ITS FOOTING SYSTEM.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

No.	Description	Date

JARI BUILDING DESIGN

Proposal :
PROPOSED SECOND DWELLING

Client
[redacted]

Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn CS | Scale
Checked NJ | Date 17/08/2022

Drawing:
GENERAL NCC NOTES

Issue:
PRELIMINARY

Sheet :
03

SURROUNDING NEIGHBOURHOOD FACILITIES

Primary Schools		
Craigieburn Primary School	↑	1.5km
Willmott Park Primary School	←	1.9km
Aitken Creek Primary School	←	4.1km
Craigieburn South Primary School	↓	2.9km
Roxburgh Rise Primary School	↓	3.7km
Secondary Colleges		
Craigieburn Secondary College	↓	2.9km
Elevation Secondary College	←	5.4km
Greenvale Secondary College	↓	10.7km
Kolbe Catholic College	←	6.1km
Roxburgh College	↓	5.4km
Mount Ridley College	↑	3.4km
Edgars Creek Secondary College	←	10km
Tertiary Institutions		
Kangan Institute	↓	7.2km
Global Business College of Australia	↓	42.8km
Whittlesea Tech School	↘	16km
Shopping Centres		
Craigieburn Central	←	3.2km
Highlands Shopping Centre	↑	3.4km
Broadmeadows Central	↓	12.3km
Medical Facilities		
Highlands Medical Centre	↑	3.3km
Craigieburn Central Medical Centre	←	3.2km
Modern Medical Craigieburn	←	2.6km
Craigieburn Medical and Dental Centre	←	3.7km
Family Health Medical Centre	←	1.2km
Leisure Facilities		
Splash Aqua Park and Leisure Centre	←	3.7km
Keilor East Leisure Centre	↓	32.6km
Eltham Leisure Centre	↘	33.8km
Fawkner Leisure Centre	↓	13.9km
Coburg Leisure Centre	↓	17.8km
Greenvale Recreation Centre	↓	10.4km
Craigieburn Sports Stadium	↓	1.3km
Parks		
Central Park, Trillium	↖	5.8km
Volcano Park	←	4.5km
Trillium Children's Park	↖	6km
Craigieburn Fenced Dog Park	↓	1.5km
Craigieburn Gardens	↓	1.8km
Botanical Park	↖	11.9km
Arena Recreation Reserve	↓	4.8km
Public Transport		
Craigieburn Train Station	↓	3.1km
Donnybrook Railway Station	↑	9.1km
Airport City Transfer	←	500m
Harfield Ave Bus Interchange	↑	10.3km

DESIGN RESPONSE

The proposed development is situated within an underutilised portion of urban land where appropriate infrastructure is available. The site has good access to commercial and community services, public transport, public space, and major artilleries. The dwelling layout is consistent with the mixed pattern of development in the neighbourhood, with existing examples of multiple dwellings per lot in the area.

The proposal will enable NDSS accessible housing to meet the needs of more vulnerable members of the community, and add to existing housing stock that is limited in this sphere as a valuable addition to the community. The proposed development is in compliance with Clause 55 and the BCA. The proposal seeks to encourage vegetation that is easily maintained by a resident living with assisted living requirements.

Materials already in use locally have been integrated into the design of the proposal so as to blend with the existing neighbourhood character and streetscape.
Private open spaces have been provided to ensure sufficient space for meaningful landscaping and residents enjoyment outside. It is also designed to avoid any overshadowing impact on the adjoining properties.

In summary, the proposal is designed in a manner which will make efficient use of the site and will impact positively on the surrounding neighbourhood.

NEIGHBOURHOOD CHARACTER

The subject site is located at 16 Riversdale Street Craigieburn.

The site is rectangular in shape, with a frontage of about 17m and a depth of 39m with an area of 655 square metres.

The site is occupied with a single-story dwelling.
Usual services are available, and the site is constrained by a 1.8m easement at the rear

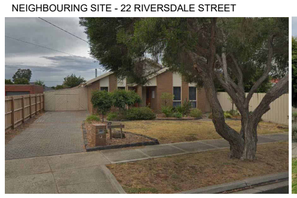
Solar access to the site and surrounding properties is excellent.

Riversdale Street features a mix of single-story dwellings and the subject site is close to a local shopping strip with take-away food, laundromat, hairdresser and other small retail businesses.

Predominant character features of dwellings include a mix of hip roofs and gable roofs built on face brick wall with residential window forms.

The site has convenient access into Melbourne CBD via the Hume Highway.

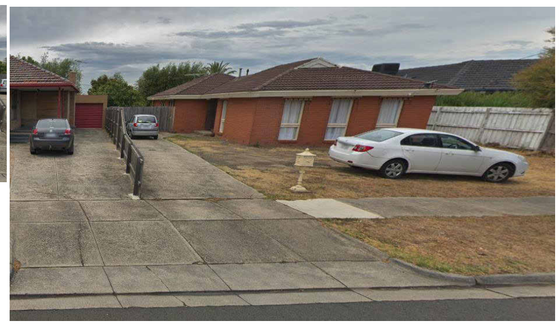
NEIGHBOURING SITE - 22 RIVERSDALE STREET



NEIGHBOURING SITE - 20 RIVERSDALE STREET

NEIGHBOURING SITE - 18 RIVERSDALE STREET

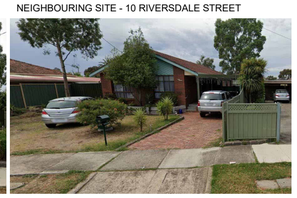
SUBJECT SITE - 16 RIVERSDALE STREET



NEIGHBOURING SITE - 14 RIVERSDALE STREET

NEIGHBOURING SITE - 12 RIVERSDALE STREET

NEIGHBOURING SITE - 10 RIVERSDALE STREET



Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

No.	Description	Date

JARI BUILDING DESIGN

Proposal: PROPOSED SECOND DWELLING

Client: [redacted]

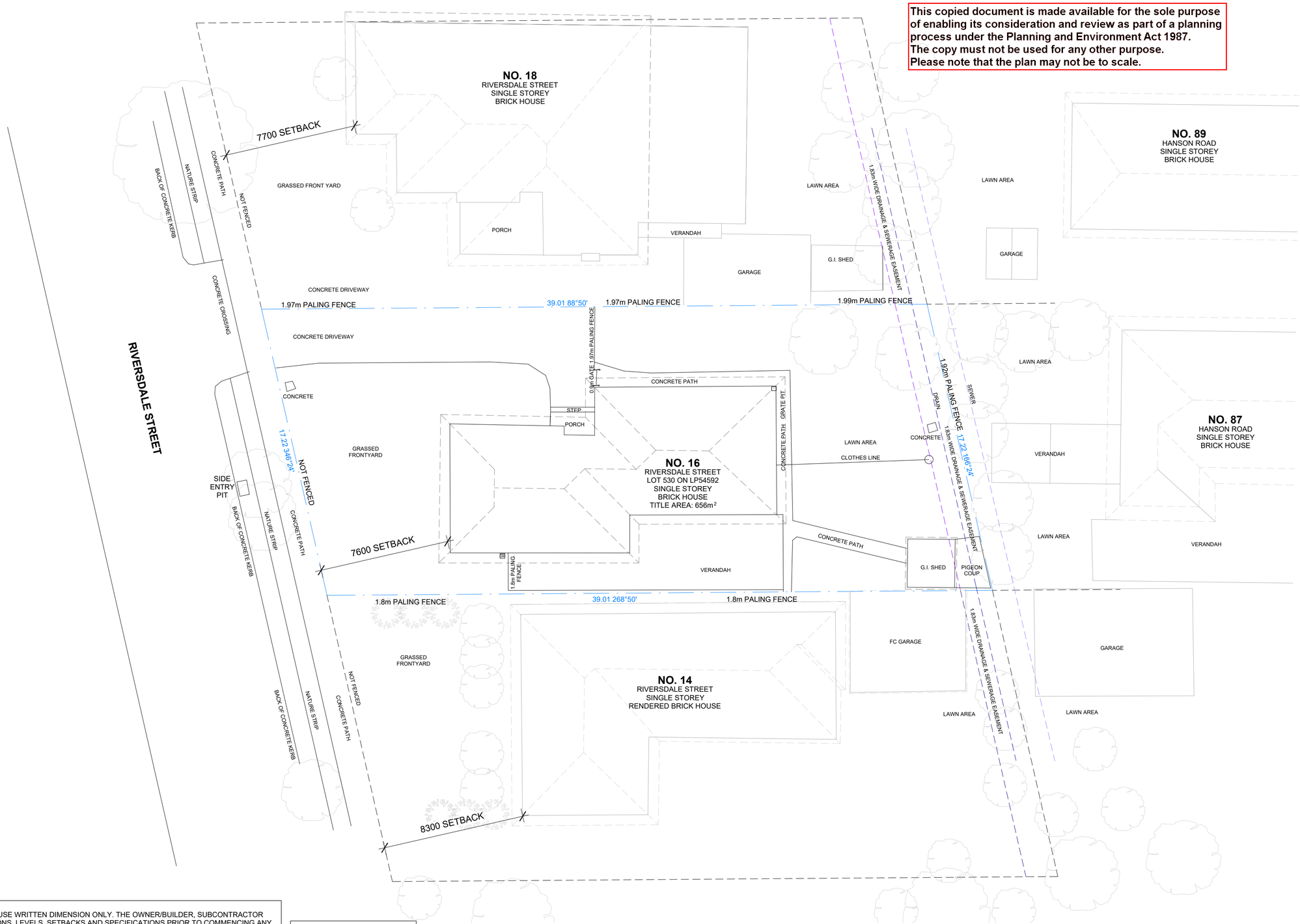
Project Address: 16 RIVERSDALE ST CRAIGIEBURN

Drawn: Author | Checked: Checker | Scale: 1 : 1 | Date: 17/08/2022

Layout: DESIGN RESPONSE

Issue: PRELIMINARY

Sheet : 04



DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

NOTE: LOCATION OF SERVICES IS APPROXIMATE ONLY AND MUST BE VERIFIED ON SITE.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal
PROPOSED SECOND DWELLING

Client
[redacted]

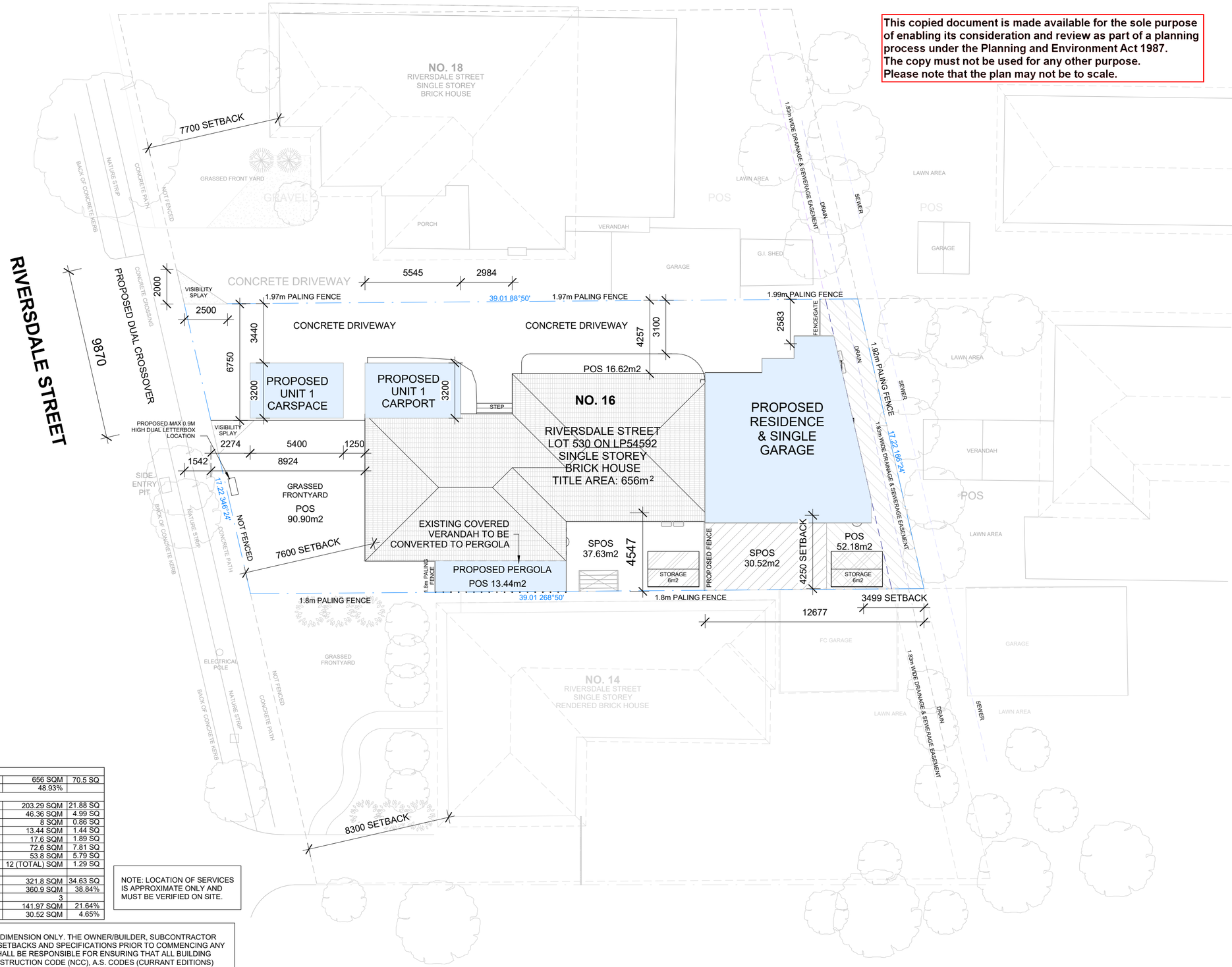
Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn CS
Checked NJ
Scale
Date 17/08/2025

Layout:
EXISTING SITE PLAN

Issue:
PRELIMINARY

Sheet :
05



SITE AREA		
TOTAL SITE AREA	656 SQM	70.5 SQ
SITE COVERAGE	48.93%	
FLOOR AREA - BUILDINGS		
EXISTING DWELLING	203.29 SQM	21.88 SQ
EXISTING VERANDAH (TO BE DEMOLISHED)	46.36 SQM	4.99 SQ
EXISTING SHED (TO BE DEMOLISHED)	8 SQM	0.86 SQ
PROPOSED PERGOLA	13.44 SQM	1.44 SQ
PROPOSED CARPORT	17.6 SQM	1.89 SQ
PROPOSED DWELLING - GROUND	72.6 SQM	7.81 SQ
PROPOSED DWELLING - FIRST	53.8 SQM	5.79 SQ
PROPOSED STORAGE SHED x 2	12 (TOTAL) SQM	1.29 SQ
TOTAL COMPLETED FOOTPRINT	321.8 SQM	34.63 SQ
TOTAL PERMEABILITY	360.9 SQM	38.84%
NUMBER OF CAR SPACES PROVIDED	3	
TOTAL SPOS/POS PROVIDED UNIT 1	141.97 SQM	21.64%
TOTAL SPOS/POS PROVIDED UNIT 2	30.52 SQM	4.65%

NOTE: LOCATION OF SERVICES IS APPROXIMATE ONLY AND MUST BE VERIFIED ON SITE.

DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal
PROPOSED SECOND DWELLING

Client
[redacted]

Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn CS | Scale 1:100
Checked NJ | Date 17/08/2022

Layout:
PROPOSED SITE PLAN

Issue:
PRELIMINARY

Sheet :
06

CONCRETE DRIVEWAY
VISIBILITY SPLAY
2000
1.97m PALING FENCE
39.01 88°50'
1.97m PALING FENCE
1.99m PALING FENCE
2500
CONCRETE DRIVEWAY
CONCRETE DRIVEWAY
3440
5545
4772
3100
1657
PROPOSED DRAIN
2583
FENCE/GATE
PROPOSED BOX GUTTER LOCATION
PROPOSED UNIT 1 CARSPACE
3200
PROPOSED UNIT 1 CARPORT
3620
STEP
BED 3 3.3x3.3M
BED 2 3.3x3.3M
MASTER 3.3x3.3M
BINS
DRAIN
1.92m PALING FENCE
SEWER
KITCHEN 2.4x3.4M
VISIBILITY SPLAY
2274
5400
1250
8924
UNIT 1 EXISTING RESIDENCE
LIVING 3.9x6.4M
WIR
UNIT 2 PROPOSED RESIDENCE
LIVING 3.7x4.6M
CLOTHESLINE
GRASSED FRONTYARD
LAUNDRY 3.9x1.8M
WC
BATH 1.9x2.4M
STUDY 3.0x2.4M
ENSUITE 2.3x1.7M
UP
WC
LAUNDRY 2.5x1.7M
17 22 346°24'
PROPOSED MAX 0.9M HIGH DUAL LETTERBOX LOCATION
NOT FENCED
DINING 3.1x3.3M
KITCHEN 3.9x4.6M
HW
BINS
3499 SETBACK
NATURE STRIP
CONCRETE PATH
7600 SETBACK
SPOS 37.63m2
PROPOSED FENCE
SPOS 30.52m2
4250 SETBACK
POS 52.18m2
17 22 166°24'
1.83m WIDE DRAINAGE & SEWERAGE EASEMENT
1.8m PALING FENCE
PROPOSED PERGOLA POS 13.44m2
CLOTHESLINE
STORAGE 6m2
STORAGE 6m2
39.01 268°50'
1.8m PALING FENCE
12677
NATURE STRIP
BACK OF CONCRETE KERB
ELECTRICAL POLE
CONCRETE PATH
NOT FENCED
GRASSED FRONTYARD
FC GARAGE
NO. 14
RIVERSDALE STREET
SINGLE STOREY
RENDERED BRICK HOUSE
LAWN AREA

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal
PROPOSED SECOND DWELLING

Client
[redacted]

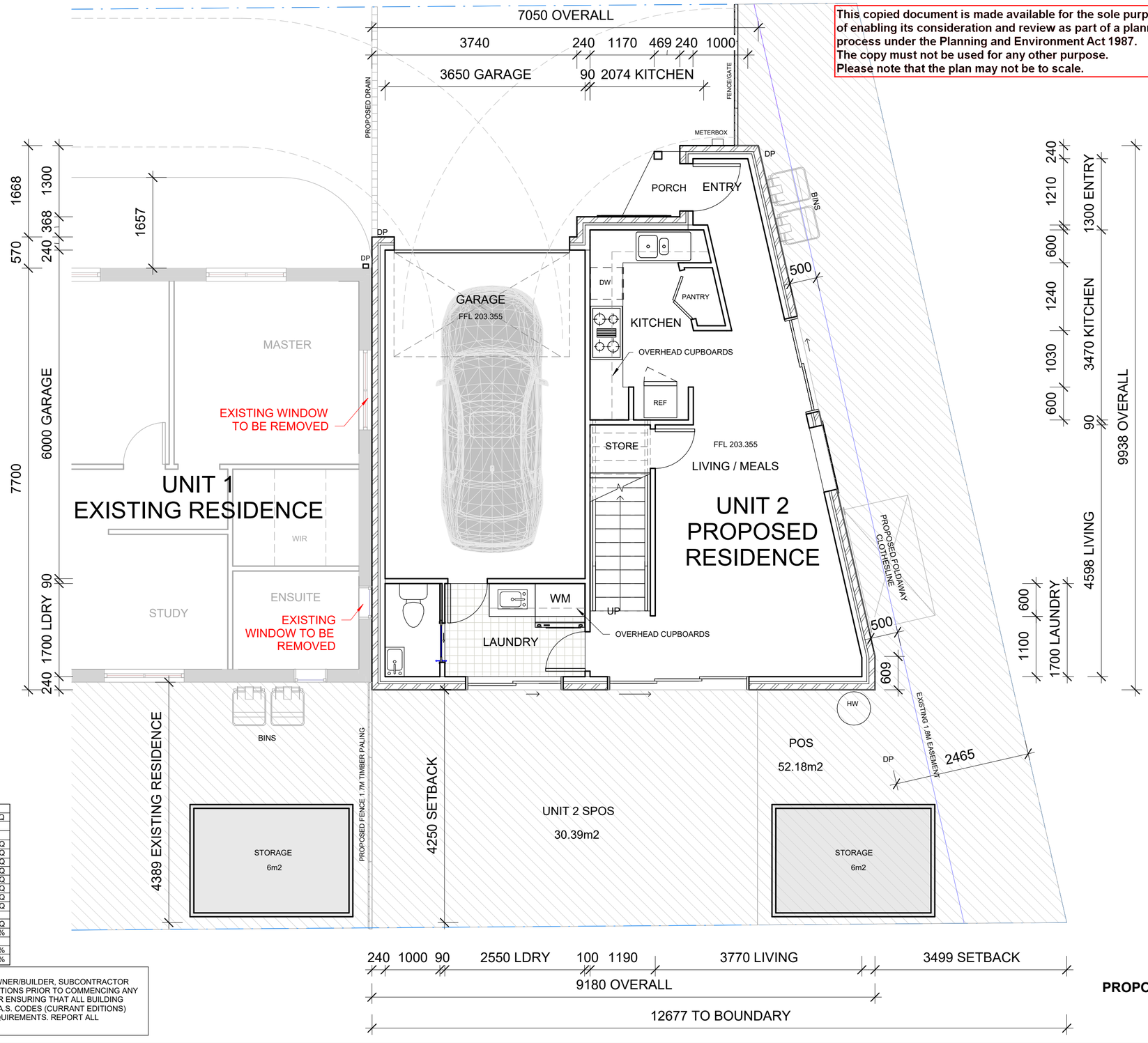
Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn	CS	Scale	1:75
Checked	NJ	Date	17/08/2022

Layout:
UNIT 1 & 2 PROPOSED FLOOR PLAN

Issue:
PRELIMINARY

Sheet :
07



SITE AREA		
TOTAL SITE AREA	656 SQM	70.5 SQ
SITE COVERAGE	48.93%	
FLOOR AREA - BUILDINGS		
EXISTING DWELLING	203.29 SQM	21.88 SQ
EXISTING VERANDAH (TO BE DEMOLISHED)	46.36 SQM	4.99 SQ
EXISTING SHED (TO BE DEMOLISHED)	8 SQM	0.86 SQ
PROPOSED PERGOLA	13.44 SQM	1.44 SQ
PROPOSED CARPORT	17.6 SQM	1.89 SQ
PROPOSED DWELLING - GROUND	72.6 SQM	7.81 SQ
PROPOSED DWELLING - FIRST	53.8 SQM	5.79 SQ
PROPOSED STORAGE SHED x 2	12 (TOTAL) SQM	1.29 SQ
TOTAL COMPLETED FOOTPRINT	321.8 SQM	34.63 SQ
TOTAL PERMEABILITY	360.9 SQM	38.84%
NUMBER OF CAR SPACES PROVIDED	3	
TOTAL SPOS/POS PROVIDED UNIT 1	141.97 SQM	21.64%
TOTAL SPOS/POS PROVIDED UNIT 2	30.52 SQM	4.65%

DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

PROPOSED GROUND FLOOR

Design Matters National
The peak body for the building design profession
Member

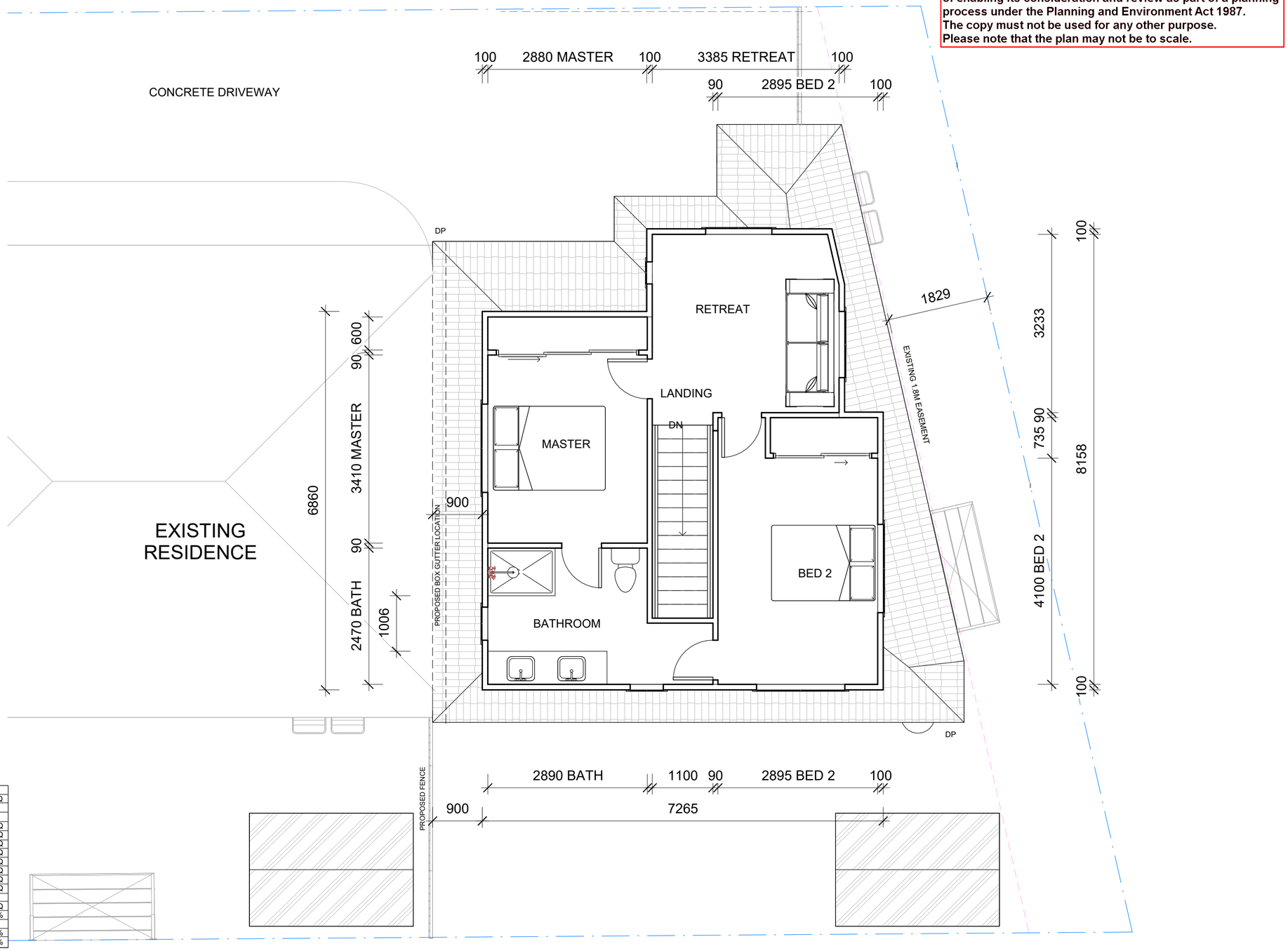
Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal: PROPOSED SECOND DWELLING
Client: [redacted]
Project Address: 16 RIVERSDALE ST CRAIGIEBURN
Drawn: CS | Scale: 1:50
Checked: NJ | Date: 17/08/2022
Layout: PROPOSED UNIT 1 GROUND FLOOR
Issue: PRELIMINARY
Sheet : 08



SITE AREA		
TOTAL SITE AREA	656 SQM	70.5 SQ
SITE COVERAGE	48.93%	
FLOOR AREA - BUILDINGS		
EXISTING DWELLING	203.29 SQM	21.88 SQ
EXISTING VERANDAH (TO BE DEMOLISHED)	46.36 SQM	4.99 SQ
EXISTING SHED (TO BE DEMOLISHED)	8 SQM	0.86 SQ
PROPOSED PERGOLA	13.44 SQM	1.44 SQ
PROPOSED CARPORT	17.6 SQM	1.89 SQ
PROPOSED DWELLING - GROUND	72.6 SQM	7.81 SQ
PROPOSED DWELLING - FIRST	53.8 SQM	5.79 SQ
PROPOSED STORAGE SHED x 2	12 (TOTAL) SQM	1.29 SQ
TOTAL COMPLETED FOOTPRINT	321.8 SQM	34.63 SQ
TOTAL PERMEABILITY	360.9 SQM	38.84%
NUMBER OF CAR SPACES PROVIDED	3	
TOTAL SPOS/POS PROVIDED UNIT 1	141.97 SQM	21.64%
TOTAL SPOS/POS PROVIDED UNIT 2	30.52 SQM	4.65%

DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

PROPOSED FIRST FLOOR

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

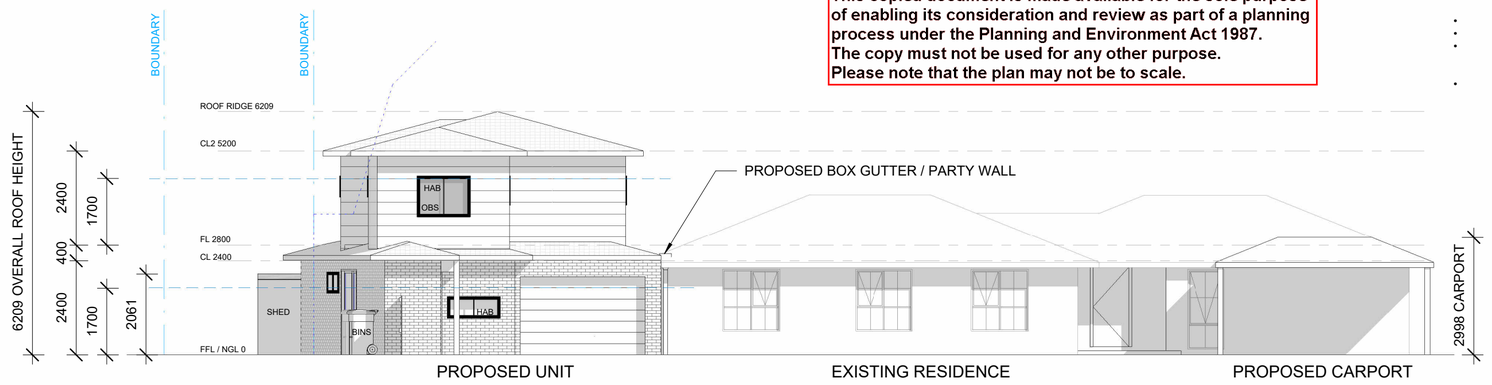
No.	Description	Date

JARI BUILDING DESIGN

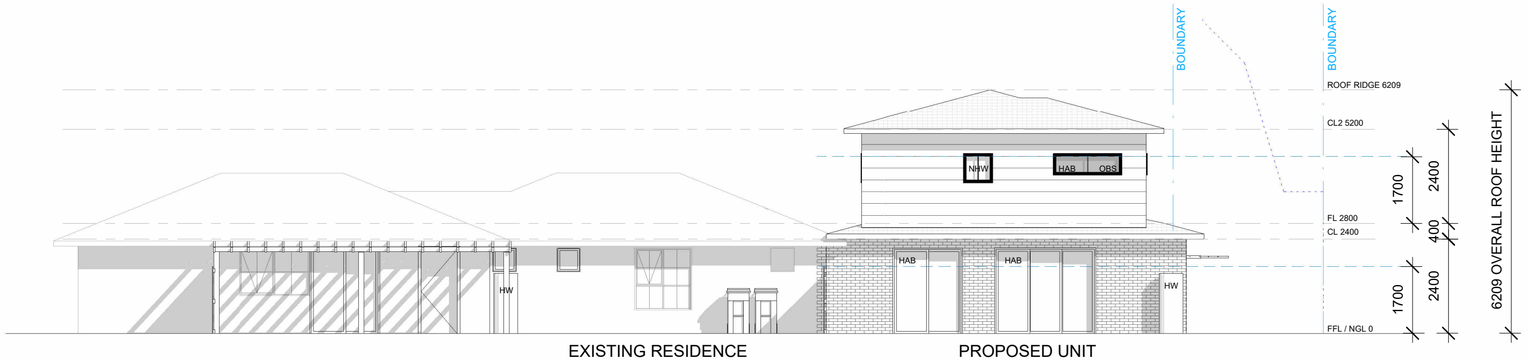
Proposal: PROPOSED SECOND DWELLING
Client: [redacted]
Project Address: 16 RIVERSDALE ST CRAIGIEBURN
Drawn: CS | Scale: 1:50
Checked: NJ | Date: 17/08/2022
Layout: PROPOSED FIRST FLOOR
Issue: PRELIMINARY
Sheet : 09

CONSTRUCTION NOTES:

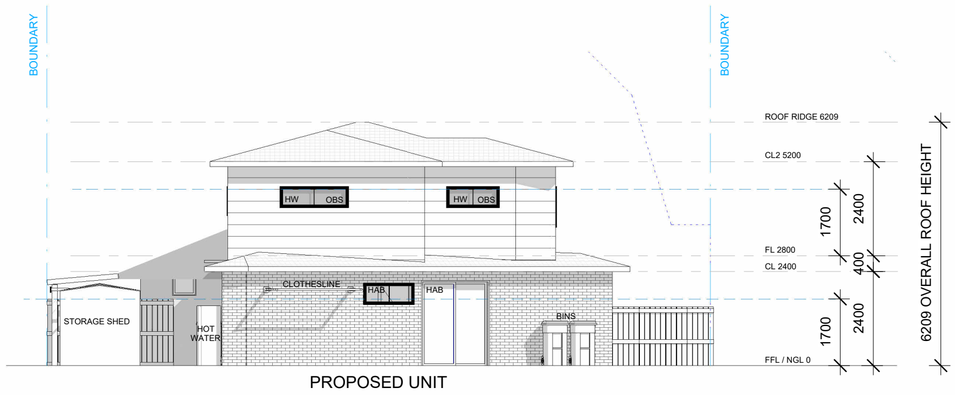
- WINDOWS TO BE PROVIDED WITH LOCKS
- DOOR HANDLES TO INSTALLED BETWEEN 900MM AND 1100MM ABOVE FFL
- SOLID 75MM WIDTH NON TRANSLUCENT CONTRASTING GLAZING STRIP TO BE INSTALLED 900MM TO 1000MM ABOVE FFL ON ANY GLAZED AREA WHICH COULD BE MISTAKEN FOR AN OPENING
- MINIMUM VERTICAL CLEARANCE ALONG ALL PATHS OF TRAVEL TO BE 2000MM FROM NGL



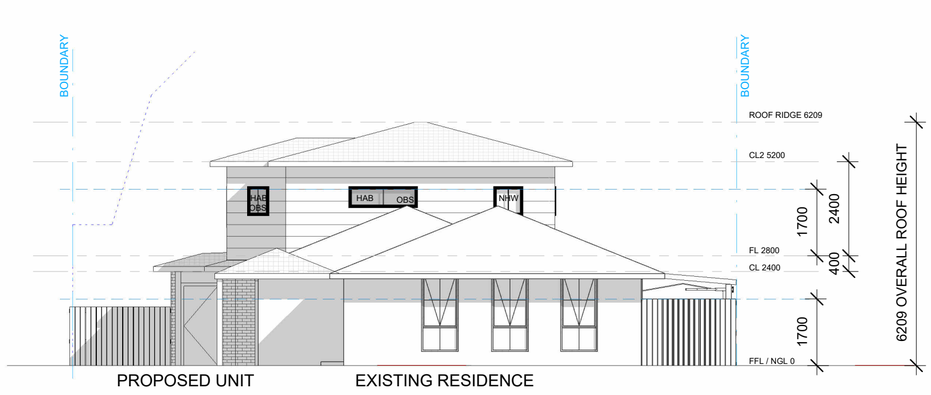
NORTH ELEVATION
SCALE 1:100



SOUTH ELEVATION
SCALE 1:100

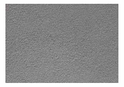


EAST ELEVATION SCALE 1:100



WEST ELEVATION SCALE 1:100

MATERIAL LEGEND



LEVEL 1 - WALLS
RENDERED POLYSTYRENE
FOAM PANELS - CHARCOAL GREY

GROUND FLOOR WALLS -
BRICK VENEER - CHARCOAL GREY

CONCRETE ROOF TILE - BLACK

GUTTERS & FASCIAS -
COLORBOND - CHARCOAL

WINDOW FRAMES - ALUMINUM - BLACK

GARAGE DOOR - COLORBOND - BLACK

CONCRETE SLAB ON GROUND

COLORBOND FENCING - CHARCOAL

DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

No.	Description	Date

JARI BUILDING DESIGN

Proposal
PROPOSED SECOND DWELLING

Client
[redacted]

Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn CS | Scale As indicated
Checked NJ | Date 17/08/2022

Layout:
PROPOSED ELEVATIONS

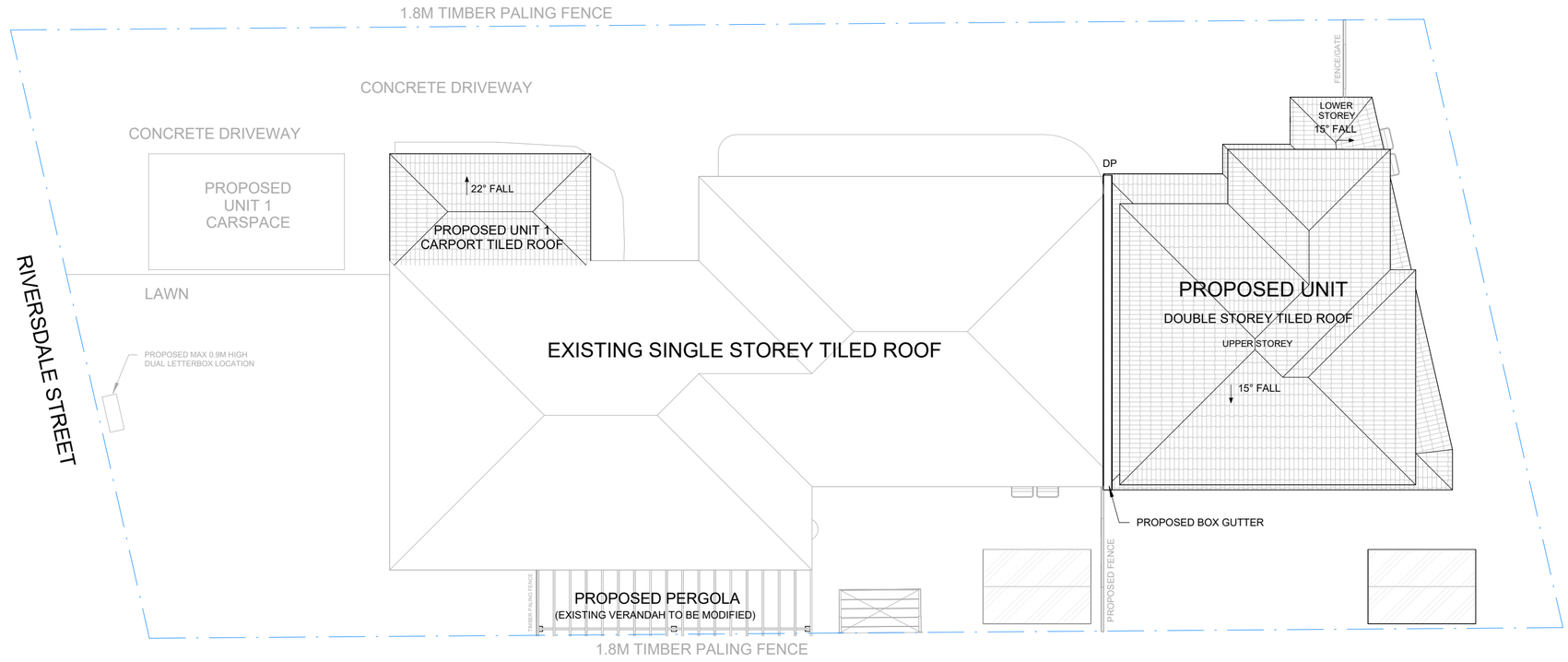
Issue:
PRELIMINARY

Sheet :
10

CONCRETE ROOF TILE - BLACK

GUTTERS & FASCIAS - COLORBOND - CHARCOAL

(DP) - DOWNPIPES - COLORBOND - CHARCOAL



DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal
PROPOSED SECOND DWELLING

Client
[redacted]

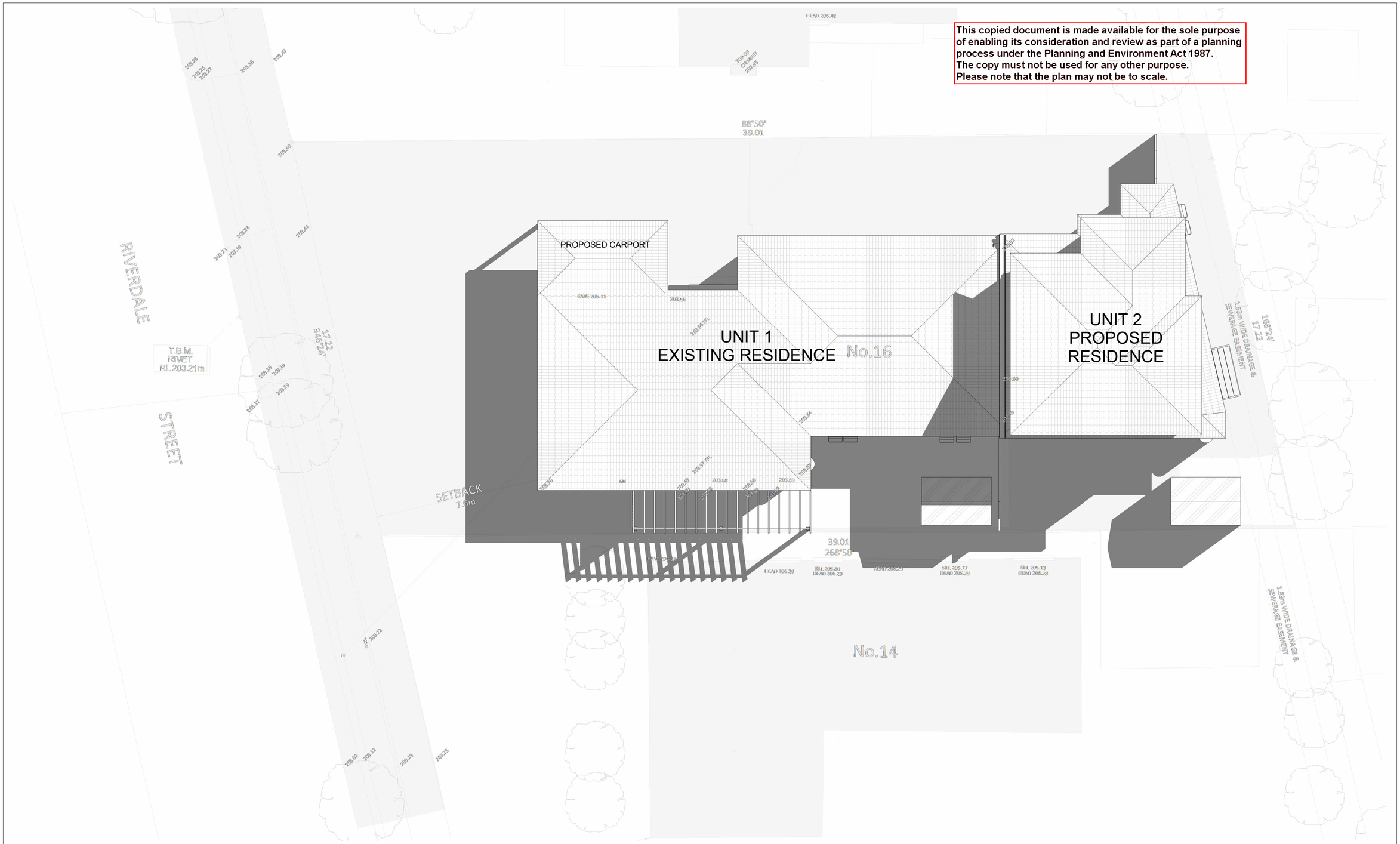
Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn CS
Checked NJ
Scale
Date 17/08/2022

Layout:
PROPOSED ROOF PLAN

Issue:
PRELIMINARY

Sheet :
11



DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

SHADOW PLAN - 22ND SEPTEMBER 9 AM

Design Matters National
The peak body for the building design profession
Member

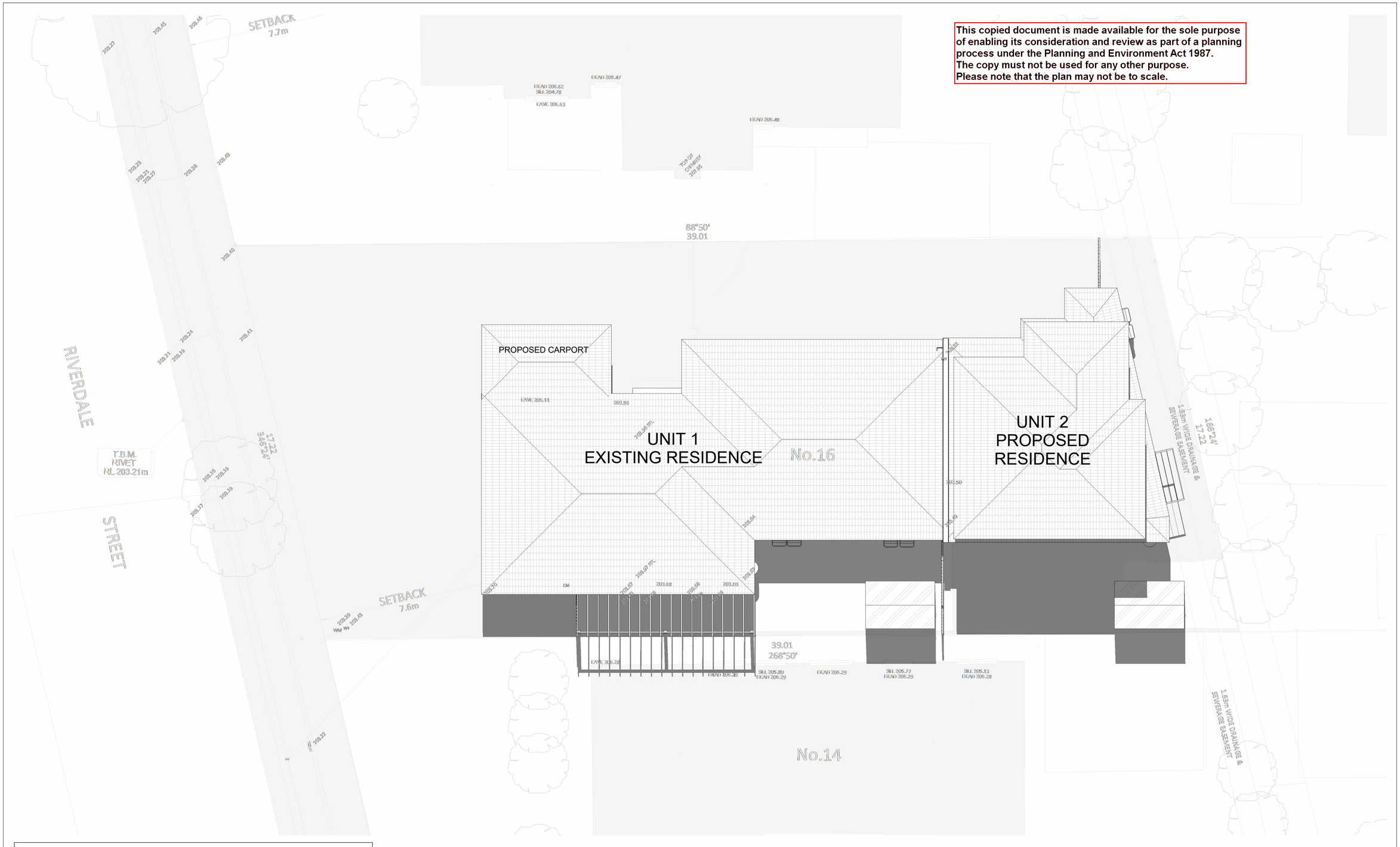
Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal: PROPOSED SECOND DWELLING	Project Address: 16 RIVERSDALE ST CRAIGIEBURN			Layout: SHADOW PLANS - 9AM	
Client: [redacted]	Drawn: CS	Scale:		Issue: PRELIMINARY	Sheet: 12
	Checked: NJ	Date: 17/08/2022			



DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

SHADOW PLAN - 22ND SEPTEMBER 12 NOON

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal
PROPOSED SECOND DWELLING

Client
[redacted]

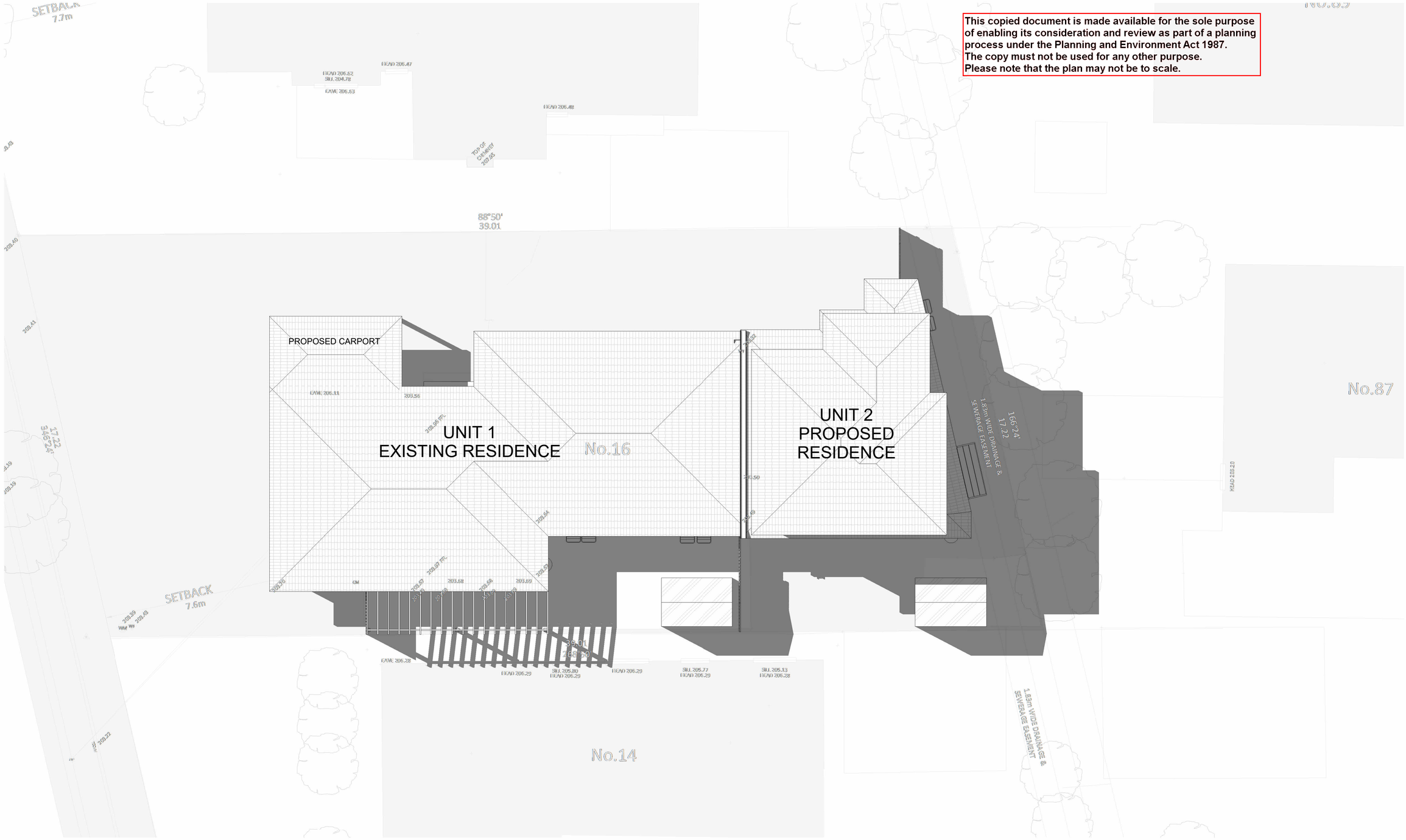
Project Address:
16 RIVERSDALE ST CRAIGIEBURN

Drawn CS | Scale
Checked NJ | Date 17/08/2022

Layout:
SHADOW PLAN - 12 NOON

Issue:
PRELIMINARY

Sheet :
13



DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

SHADOW PLAN - 22ND SEPTEMBER 3 PM

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

N

No.	Description	Date

JARI BUILDING DESIGN

Proposal: PROPOSED SECOND DWELLING

Client: [redacted]

Project Address: 16 RIVERSDALE ST CRAIGIEBURN

Drawn: CS | Scale:

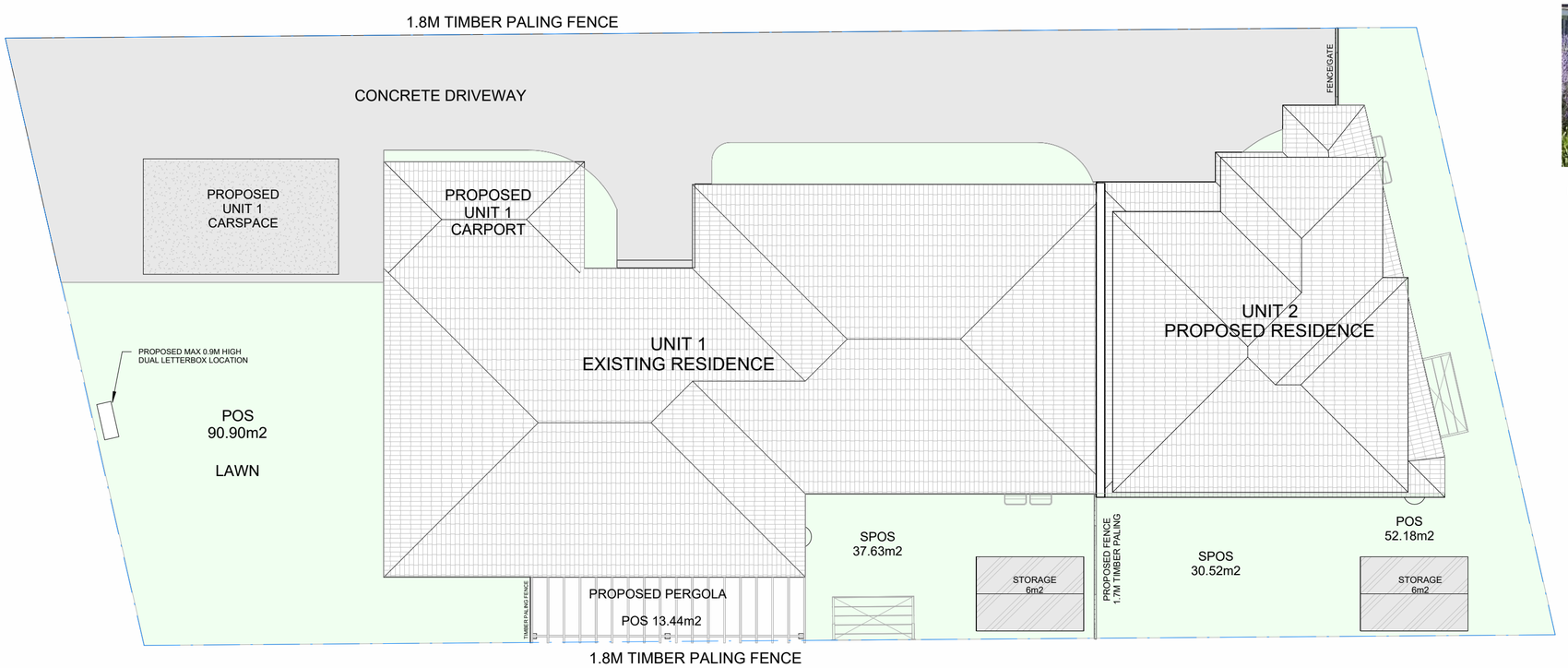
Checked: NJ | Date: 17/08/2022

Layout: SHADOW PLAN - 3PM

Issue: PRELIMINARY

Sheet : 14

STREETSCAPE ELEVATION - RIVERSDALE STREET
SCALE 1:100



EXAMPLE OF LETTERBOXES IN LANDSCAPED LAWN

NORTHCOTE POTTERY GREY METRO PILLAR LETTERBOX
SUPPLIER: BUNNINGS

WIDTH: 350 MM
HEIGHT: 900 MM
DEPTH: 300 MM

SITE AREA		
TOTAL SITE AREA	656 SQM	70.5 SQ
SITE COVERAGE	48.93%	
GARDEN AREA		
GARDEN SPACE REQUIRED 35%	229.60 SQM	24.71 SQ
GARDEN SPACE PROVIDED	240.39 SQM	25.87 SQ

GARDEN AREA - 16 RIVERSDALE STREET
SCALE 1:100

DO NOT SCALE DRAWINGS, USE WRITTEN DIMENSION ONLY. THE OWNER/BUILDER, SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, SETBACKS AND SPECIFICATIONS PRIOR TO COMMENCING ANY WORKS OR ORDERING MATERIALS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL BUILDING WORKS CONFORM TO THE NATIONAL CONSTRUCTION CODE (NCC), A.S. CODES (CURRANT EDITIONS) BUILDING REGULATIONS, LOCAL BYLAWS AND TOWN PLANNING REQUIREMENTS. REPORT ALL DISCREPANCIES TO THIS OFFICE FOR CLARIFICATION.

Design Matters National
The peak body for the building design profession
Member

Builder / Contractor shall verify all dimensions before any work commences. Dimensions shown are nominal, written dimensions shall take precedence over scale dimensions. Any discrepancies are to be made known to Jari Building Design's office. All drawings to be read accordance with engineering, detail drawings, specifications and any relevant schedules.

No.	Description	Date

JARI BUILDING DESIGN

Proposal: PROPOSED SECOND DWELLING
Client: [redacted]
Project Address: 16 RIVERSDALE ST CRAIGIEBURN
Layout: STREETSCAPE / GARDEN SPACE
Drawn: CS | Scale: As indicated
Checked: NJ | Date: 17/08/2022
Issue: PRELIMINARY
Sheet : 15

Job Details	
Date:	14th July 2022
Project:	Sustainable Design Assessment for Proposed dual occupancy
Client:	Elyas
Address:	16 Riverdale Street, Craigieburn VIC 3064
Planning No:	TBC
Assessor:	Rob Iacono
Job Number:	220652

Revision		
A:	29th June 2022	Preliminary SDA Report
B:	14th July 2022	SDA Report

w: www.passivenergy.com.au **e**: info@passivenergy.com.au
p: 1300 248 348 **a:** Suite 9, 214 Bay Street, Brighton 3186

Introduction

The Subject site is located at 16 Riverdale Street, Craigieburn. The plans prepared by JARI Building Design propose a dwelling at the rear. The site has a total area of 656m2 and is orientated west to east and has minimal wall on boundary construction. The driveway is proposed to the north-west of the development. This report is prepared against the requirements of Clause 22.21 (Environmentally Sustainable Development) and any other relevant sections of the Hume Planning Scheme.

The following report is to be read in conjunction with the following documents.

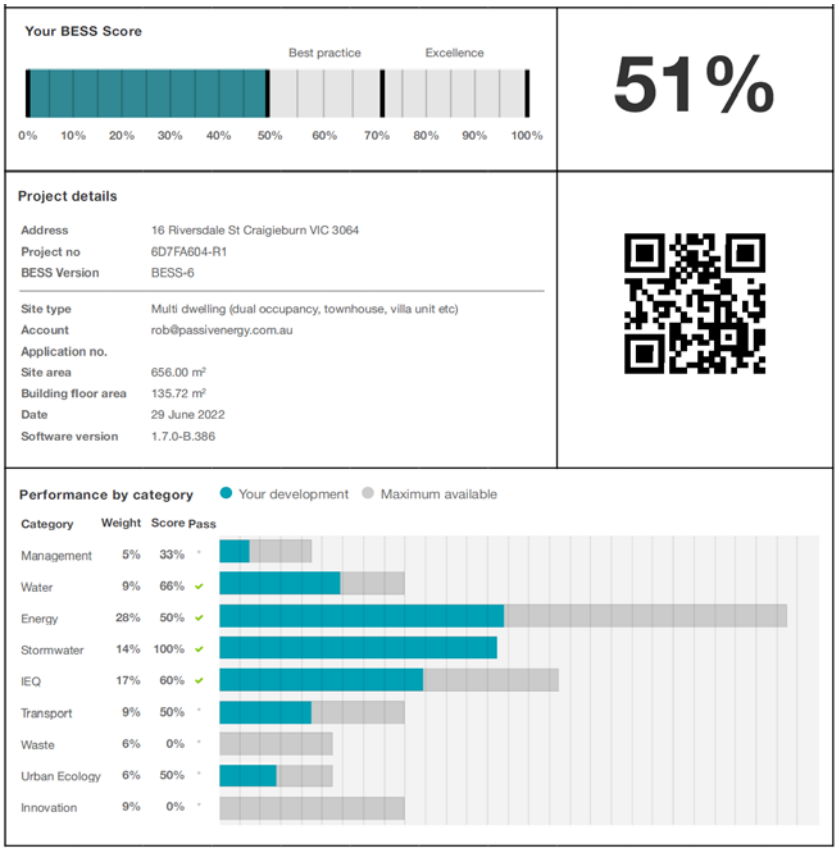
- BESS assessment
- NatHERs ratings
- STORM assessment
- Walk score

BESS Assessment (Project number **6D7FA604**)

The BESS (Built Environment Sustainable Scorecard) V3, 1.7 was used to assess

- Water
- Energy
- Stormwater
- Indoor Environment Quality (IEQ)
- Transport
- Waste
- Urban Ecology &
- Innovation

Following is a list of initiatives inputted into the scorecard to achieve a best practice score of 51%



Water requirements

Objectives

- To improve water efficiency.
- To reduce total operating potable water use.
- To encourage the collection and reuse of stormwater.
- To encourage the appropriate use of alternative water sources (eg. Grey water)

Initiatives

- 3000L water tank connect to each unit roof area.
- Rainwater tanks connected to toilet flushing, laundry taps.
- Water efficient landscaping. A landscape plan prepared by a suitable landscape architect to nominate water efficient vegetation throughout the development.
- For outdoor water reductions, plants, shrubs and lawn which require low amounts of water (drought-resistance) should be chosen. Native plants will be selected as they use less water and are more resistant to local plant diseases. Plant slopes with plants that will retain water and help reduce runoff.
- Group plants according to their watering needs.
- Mulch will slow evaporation of moisture while discouraging weed growth. Adding 2 - 4 inches of organic material such as compost or bark mulch will increase the ability of the soil to retain moisture.
- Shower heads to be 4 Star WELS rating(>6.0L/min but <= 7.5L/min).
- Kitchen taps to be 5 Star WELS rating.
- Bathroom taps to be 5 Star WELS rating.
- Toilets to be 4 Star WELS rating.

Energy

Objectives

- To improve the efficient use of energy, by ensuring development demonstrates design potential for ESD initiatives.

Initiatives

- The dwelling will achieve a minimum 6 star energy rating.
- Internal lighting will achieve a maximum 4watts/m2.
- LED lighting fixtures will be considered for alternatives to fluorescent fittings to reduce energy consumption.
- External lighting will be controlled by motion sensors.
- Nominated heating and cooling systems will be 4 stars or within 1 star of the best relevant system in the market.
- Nominated electric instantaneous hot water system to be at least 4 star rating.
- A minimum 3.0kW system to be installed to the proposed unit.

Stormwater

Objectives

- To reduce the impact of stormwater run-off.
- To improve the water quality of the water run-off.
- To achieve best practice stormwater quality outcomes.
- To incorporate the use of water sensitive urban design, including storm water re-use.

Initiatives

A Stormwater Treatment Objective- Relative Measure (STORM) calculator was used to produce a 102% outcome.

- Common driveway will be left untreated.
- Existing roof area will require:
  - 3000 litre water tanks connected to 130.6m2 of roof space.
  - 1.2m2 rain garden (300mm) connected to 60m2 of roof space each.
- Proposed roof area will require:
  - 3000 litre water tanks connected to 73.2m2 of roof space.
  - 1m2 rain garden (300mm) connected to 50m2 of roof space each.
- Each unit will be connected to water tanks, which will be connected to toilet flushing and laundry taps.

Note: See the WSUD report prepared by PassivEnergy (Job No:220652) for more information on the stormwater management of the development.

Indoor Environment Quality (IEQ)

Objectives

- To achieve a healthy indoor environment quality for the wellbeing of building occupants, including the provision of fresh air intake, cross ventilation, and natural daylight.
- To achieve thermal comfort levels with minimised need for mechanical heating, ventilation and cooling.
- To reduce indoor air pollutants by encouraging use of materials with low toxic chemicals.
- To reduce reliance on mechanical heating, ventilation, cooling and lighting systems.
- To minimise noise levels and noise transfer within and between buildings and associated external areas.

Initiatives

- All habitable rooms will allow for natural cross ventilation.
- Double glazed windows have been nominated to all living areas and bedrooms to assist with the thermal comfort.
- All carpets, internal paints and all finishes and flooring will be selected for their low VOC properties.
- Engineered wood products will be E1 – E0 grade.
- Where artificial lighting is required, only sealed energy efficient LED light fixtures should be selected or CFL's for common areas like kitchens.
- All kitchen rangehoods to be externally ducted.

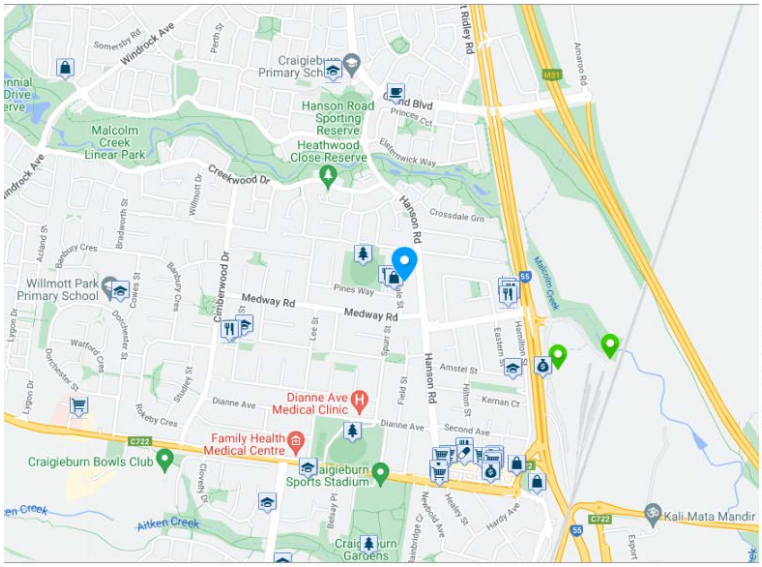
Transport

Objectives

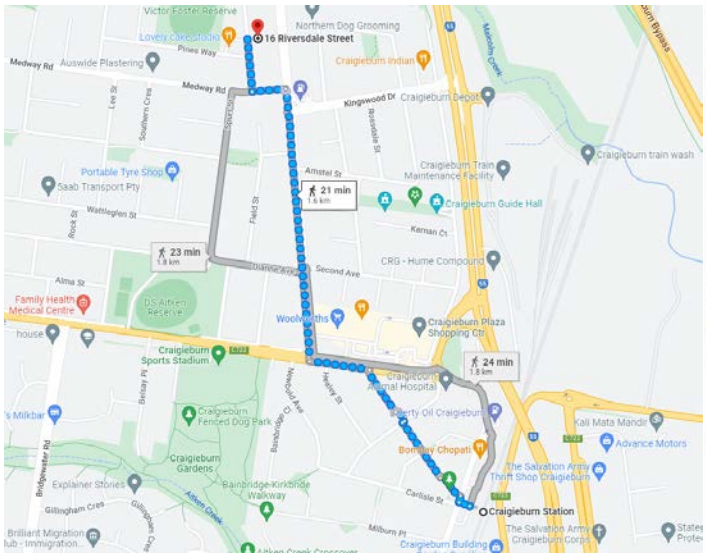
- To ensure that the built environment is designed to promote the use of walking, cycling and public transport, in that order and to minimise car dependency.
- To promote the use of low emissions vehicle technologies and supporting infrastructure.
- The Walk Score is a number between 0 and 100 that measures the walkability of any address to shops, restaurant, parks, entertainment etc.

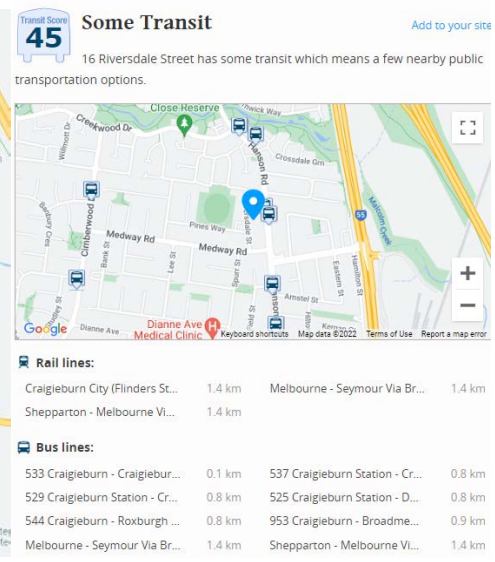
Initiatives

- There is 1 parking spot for bicycles per unit.
- 16 Riversdale Street has a Walk Score of 64 out of 100. This location is Somewhat Walkable so some errands can be accomplished on foot..
- This location is in the Craigieburn neighborhood in Melbourne. Nearby parks include Vic Foster Reserve, D.S. Aitken Reserve and Craigieburn Gardens..
- The site is situated 1.6km to Craigieburn train station.



Restaurants: Sharky's Seafood .08km
Coffee: Grand Boulevard Cafe .8km
Bars: Rivervale Wines 8.4km
Groceries: Craigieburn Fruit & Vegetalbe 8km
Parks: Vic Foster Reserve .2km
Schools: Branca Taekwondo - craigiebur... .6km
Shopping: Essential Clothing .05km
Entertainment: Hoyts Broadmeadows 9.8km
Errands: Mt Ridley Pharmacy .5km





Waste management

Objectives

- To promote waste avoidance, reuse and recycling during the design construction and operation stages of the development.
- To ensure durability and long term reusability of building materials.
- To ensure sufficient space is allocated for future change in waste management needs, including (where possible) composting and green waste facilities.

Initiatives

- Recycling and waste receptacles to be installed in the kitchen cabinetry.
- The development is to recycle or reuse a minimum of 80% of construction demolition waste.
- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used in landscaping either on-site or off-site;
- Bricks, tiles, concrete recycled off-site and plasterboard returned to supplier for recycling;
- Framing timber to be recycled elsewhere;
- Windows, doors, joinery, plumbing, fittings and metal elements recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with Workcover Authority and EPA requirements;
- Locations of on-site storage facilities for material to be reused on-site, or separated for recycling off-site

Materials

Objectives

- To reduce the environmental impact of materials by recycling of existing material or use of environmentally friendly materials and materials with low embodied energy.

Initiatives

- The development will use sustainable timber, where it meets the Australian Forestry Standard(AFS) or Forest Stewardship Council(FSC) standard and will use E1 or E0-grade engineered wood products.
- The development will use 20-35% supplementary cementitious materials(SCM) as a partial cement alternative, subject to the structural engineer's approval.
- Using recyclable and long lifecycle materials, such as steel, concrete and bricks.
- Materials proposed are local and readily available reducing embodied energy from transportation.
- Industry accepted benchmarks and/or third party certified low VOC and non-toxic products will be used for the development.

Urban ecology

Objectives

- To protect and enhance biodiversity with the municipality
- To provide environmentally sustainable landscapes and natural habitats, and minimise the urban heat island effect.
- To encourage the retention of significant trees and the planting of indigenous vegetation,
- To encourage the provision of space for productive gardens.

Initiatives

- The vegetation percentage area to be at least 35%.
- The development will include native/indigenous plants.
- Landscape architect to prepare water efficient landscape design.
- Light/medium coloured roofing and/or paving will be used to minimise UHI effect.

NatHERs Ratings

- Energy ratings were modelled in First Rate 5 software version 5.3.2a (3.21).

	Heating	Cooling	Total	Rating
Unit 1	114.9MJ/m2	21.8MJ/m2	136.7MJ/m2	6.0 Stars

Preliminary Energy Rating Assumptions:

Insulation:	Value	
Floor	**R2.5**	**R2.5** insulation installed between all posi-trusses/floor joists.
External Walls	**R2.5**	**R2.5** insulation installed between all external stud walls with anti-glare foil (excluding garage).
Internal Walls	**R2.5**	**R2.5** insulation installed between all party walls, garage, laundry and bathroom internal stud walls.
Roof	**R5.0**	**R5.0** insulation installed between all roof trusses (excluding garage).

Glazing – Unit 1	Type -
	Aluminium framed double-glazed **Hinged Door/Awning** U-Value: 3.1 SHGC: 0.39 **Sliding Door/Fixed** U-Value: 4.10 SHGC: 0.52
	Location -
	All proposed windows and glazed doors.

Exhaust Fans:	Location – As per working drawings
	Kitchen, ensuite and bathroom. Note: All exhaust fans to be installed with self closing dampers
Weather Protection:	Note -
	Weatherstrip draft protection device to be installed to the bottom of all external doors

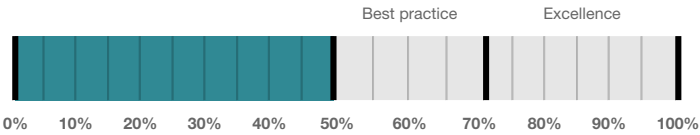
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 16 Riversdale St Craigieburn VIC 3064. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Hume City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

Your BESS Score

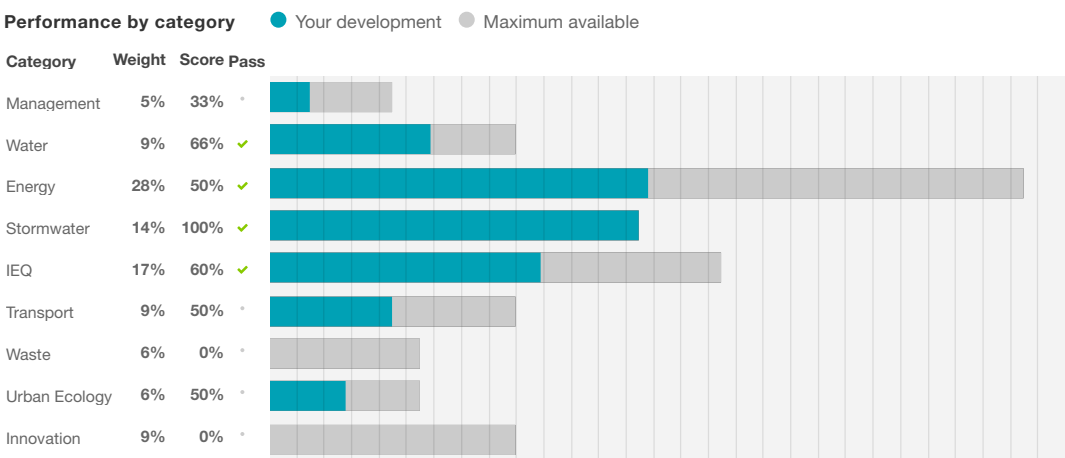


51%

Project details

Address	16 Riversdale St Craigieburn VIC 3064
Project no	6D7FA604-R1
BESS Version	BESS-6
Site type	Multi dwelling (dual occupancy, townhouse, villa unit etc)
Account	rob@passivenergy.com.au
Application no.	
Site area	656.00 m²
Building floor area	135.72 m²
Date	29 June 2022
Software version	1.7.0-B.386

Performance by category



Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	% of total area
Townhouse			
Unit 1	1	136 m²	100%
Total	**1**	**135 m²**	**100%**

Supporting information

Floorplans & elevation notes

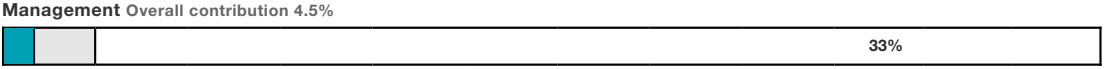
Credit	Requirement	Response	Status
Water 3.1	Water efficient garden annotated		-
Energy 3.3	External lighting sensors annotated		-
Energy 3.4	Clothes line annotated (if proposed)		-
Energy 4.5	Floor plans showing location of photovoltaic panels as described.		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
IEQ 2.2	Dwellings meeting the requirements for having 'natural cross flow ventilation'		-
IEQ 3.1	Glazing specification to be annotated		-
Transport 1.1	All nominated residential bicycle parking spaces		-
Urban Ecology 2.1	Vegetated areas		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Energy 3.5	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Energy 4.5	Specifications of the solar photovoltaic system(s).		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 2.2	A list of dwellings with natural cross flow ventilation		-
IEQ 3.1	Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)		-

Credit summary

Management Overall contribution 4.5%



1.1 Pre-Application Meeting	0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
4.1 Building Users Guide	0%

Water Overall contribution 9.0%

	Minimum required 50%	66%	Pass
1.1 Potable water use reduction		60%	
3.1 Water Efficient Landscaping		100%	

Energy Overall contribution 27.5%

	Minimum required 50%	50%	Pass
1.2 Thermal Performance Rating - Residential		0%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		0%	
2.3 Electricity Consumption		100%	
2.4 Gas Consumption		0%	
2.5 Wood Consumption		N/A	Scoped Out
		No wood heating system present	
3.2 Hot Water		100%	
3.3 External Lighting		100%	
3.4 Clothes Drying		100%	
3.5 Internal Lighting - Residential Single Dwelling		100%	
4.4 Renewable Energy Systems - Other		N/A	Disabled
		No other (non-solar PV) renewable energy is in use.	
4.5 Solar PV - Houses and Townhouses		100%	

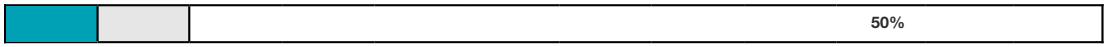
Stormwater Overall contribution 13.5%

	Minimum required 100%	100%	Pass
1.1 Stormwater Treatment		100%	

IEQ Overall contribution 16.5%

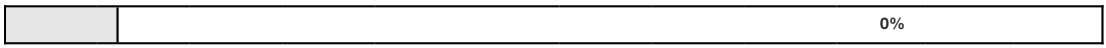
	Minimum required 50%	60%	Pass
2.2 Cross Flow Ventilation		100%	
3.1 Thermal comfort - Double Glazing		100%	
3.2 Thermal Comfort - External Shading		0%	
3.3 Thermal Comfort - Orientation		0%	

Transport Overall contribution 9.0%



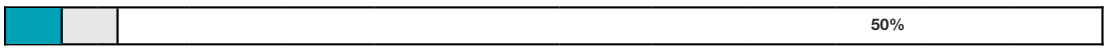
1.1 Bicycle Parking - Residential	100%	
1.2 Bicycle Parking - Residential Visitor	N/A	Scoped Out
		Not enough dwellings.
2.1 Electric Vehicle Infrastructure	0%	

Waste Overall contribution 5.5%



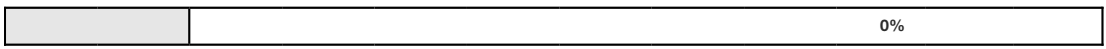
1.1 - Construction Waste - Building Re-Use	0%
2.1 - Operational Waste - Food & Garden Waste	0%

Urban Ecology Overall contribution 5.5%



2.1 Vegetation	100%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
2.4 Private Open Space - Balcony / Courtyard Ecology	0%
3.1 Food Production - Residential	0%

Innovation Overall contribution 9.0%



1.1 Innovation	0%

Credit breakdown

Management Overall contribution 1%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?	
Question	Criteria Achieved ?	
Townhouse	Yes	
4.1 Building Users Guide		0%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	No	

Water Overall contribution 6% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Medium Sized Contemporary Bath
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 5 Star WELS rating
Dishwashers:	Default or unrated
WC:	>= 4 Star WELS rating
Urinals:	Scope out
Washing Machine Water Efficiency:	Occupant to Install
Which non-potable water source is the dwelling/space connected to?:	RWT
Non-potable water source connected to Toilets:	Yes
Non-potable water source connected to Laundry (washing machine):	Yes
Non-potable water source connected to Hot Water System:	No
Rainwater Tank	
What is the total roof area connected to the rainwater tank?: RWT	123 m²
Tank Size: RWT	3,000 Litres
Irrigation area connected to tank: RWT	-
Is connected irrigation area a water efficient garden?: RWT	-
Other external water demand connected to tank?: RWT	-

1.1 Potable water use reduction	60%
Score Contribution	This credit contributes 83.3% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	193 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	161 kL
Output	Proposed (including rainwater and recycled water use)
Project	114 kL
Output	% Reduction in Potable Water Consumption
Project	41 %
Output	% of connected demand met by rainwater
Project	100 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	41 kL

3.1 Water Efficient Landscaping	100%
Score Contribution	This credit contributes 16.7% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes

Energy Overall contribution 14% Minimum required 50%

Dwellings Energy Approach	
What approach do you want to use for Energy?:	Use the built in calculation tools
Project Energy Profile Question	
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Gas supplied into building:	Natural Gas
Dwelling Energy Profile	
Below the floor is:	Ground or Carpark
Above the ceiling is:	Outside
Exposed sides:	3
NatHERS Annual Energy Loads - Heat:	115 MJ/sqm
NatHERS Annual Energy Loads - Cool:	21.8 MJ/sqm
NatHERS star rating:	6.0
Type of Heating System:	G Electric space
Heating System Efficiency:	4 Star
Type of Cooling System:	Refrigerative space
Cooling System Efficiency:	4 Stars
Type of Hot Water System:	B Electric Instantaneous
% Contribution from solar hot water system:	60 %
Is the hot water system shared by multiple dwellings?:	No
Clothes Line:	D Private outdoor clothesline
Clothes Dryer:	Occupant to Install
Solar Photovoltaic system	
System Size (lesser of inverter and panel capacity): Solar panel	3.0 kW peak
Orientation (which way is the system facing)?: Solar panel	North
Inclination (angle from horizontal): Solar panel	15.0 Angle (degrees)

1.2 Thermal Performance Rating - Residential 0%

Score Contribution	This credit contributes 30.0% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Townhouse	6.0 Stars

2.1 Greenhouse Gas Emissions	100%
Score Contribution	This credit contributes 10.0% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Townhouse	11,081 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Townhouse	7,266 kg CO2
Output	% Reduction in GHG Emissions
Townhouse	34 %

2.2 Peak Demand	0%
Score Contribution	This credit contributes 5.0% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?
Output	Peak Thermal Cooling Load - Baseline
Townhouse	13.0 kW
Output	Peak Thermal Cooling Load - Proposed
Townhouse	13.0 kW
Output	Peak Thermal Cooling Load - % Reduction
Townhouse	0 %

2.3 Electricity Consumption	100%
Score Contribution	This credit contributes 10.0% towards the category score.
Criteria	What is the % reduction in annual electricity consumption against the benchmark?
Output	Reference
Townhouse	10,864 kWh
Output	Proposed
Townhouse	7,124 kWh
Output	Improvement
Townhouse	34 %

2.4 Gas Consumption	0%
Score Contribution	This credit contributes 10.0% towards the category score.
Criteria	What is the % reduction in annual gas consumption against the benchmark?

2.5 Wood Consumption	N/A ✣ Scoped Out
This credit was scoped out	No wood heating system present

3.2 Hot Water		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?		
Output	Reference		
Townhouse	3,891 kWh		
Output	Proposed		
Townhouse	1,107 kWh		
Output	Improvement		
Townhouse	71 %		
3.3 External Lighting		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	Is the external lighting controlled by a motion detector?		
Question	Criteria Achieved ?		
Townhouse	Yes		
3.4 Clothes Drying		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?		
Output	Reference		
Townhouse	644 kWh		
Output	Proposed		
Townhouse	129 kWh		
Output	Improvement		
Townhouse	80 %		
3.5 Internal Lighting - Residential Single Dwelling		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	Does the development achieve a maximum illumination power density of 4W/sqm or less?		
Question	Criteria Achieved?		
Townhouse	Yes		
4.4 Renewable Energy Systems - Other		N/A	⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

4.5 Solar PV - Houses and Townhouses	100%
Score Contribution	This credit contributes 10.0% towards the category score.
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?
Output	Solar Power - Energy Generation per year
Townhouse	3,733 kWh
Output	% of Building's Energy
Townhouse	52 %

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	Melbourne Water STORM tool
1.1 Stormwater Treatment	100%
Score Contribution	This credit contributes 100.0% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Question	STORM score achieved
Project	102
Output	Min STORM Score
Project	100

IEQ

Overall contribution 10% Minimum required 50%

2.2 Cross Flow Ventilation	100%
Score Contribution	This credit contributes 20.0% towards the category score.
Criteria	Are all habitable rooms designed to achieve natural cross flow ventilation?
Question	Criteria Achieved ?
Townhouse	Yes

3.1 Thermal comfort - Double Glazing	100%
Score Contribution	This credit contributes 40.0% towards the category score.
Criteria	Is double glazing (or better) used to all habitable areas?
Question	Criteria Achieved ?
Townhouse	Yes

3.2 Thermal Comfort - External Shading	0%
Score Contribution	This credit contributes 20.0% towards the category score.
Criteria	Is appropriate external shading provided to east, west and north facing glazing?
Question	Criteria Achieved ?
Townhouse	No

3.3 Thermal Comfort - Orientation	0%
Score Contribution	This credit contributes 20.0% towards the category score.
Criteria	Are at least 50% of living areas orientated to the north?
Question	Criteria Achieved ?
Townhouse	No

Transport

Overall contribution 4%

1.1 Bicycle Parking - Residential	100%
Score Contribution	This credit contributes 50.0% towards the category score.
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?
Question	Bicycle Spaces Provided ?
Townhouse	1
Output	Min Bicycle Spaces Required
Townhouse	1

1.2 Bicycle Parking - Residential Visitor	N/A	Scoped Out
This credit was scoped out	Not enough dwellings.	

2.1 Electric Vehicle Infrastructure	0%
Score Contribution	This credit contributes 50.0% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	No

Waste Overall contribution 0%

1.1 - Construction Waste - Building Re-Use	0%
Score Contribution	This credit contributes 50.0% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	No

2.1 - Operational Waste - Food & Garden Waste	0%
Score Contribution	This credit contributes 50.0% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	No

Urban Ecology

Overall contribution 3%

2.1 Vegetation		0%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	35 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	
2.4 Private Open Space - Balcony / Courtyard Ecology		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?	
Question	Criteria Achieved ?	
Townhouse	No	
3.1 Food Production - Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Townhouse	-	
Output	Min Food Production Area	
Townhouse	1 m^2	

Innovation

Overall contribution 0%

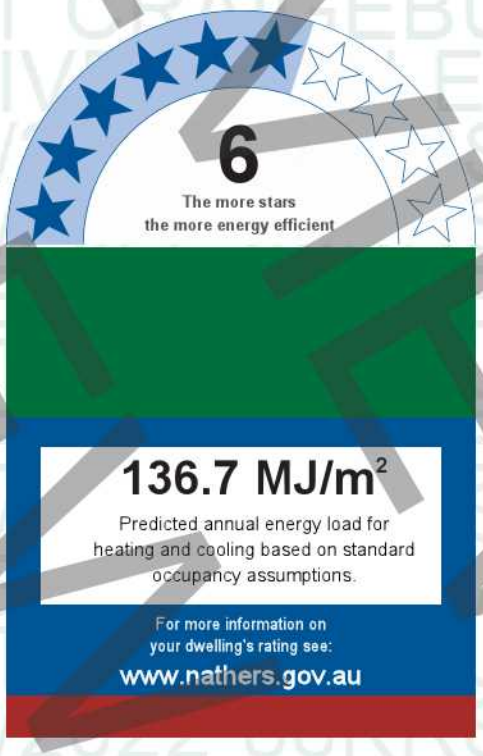
1.1 Innovation		0%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

Disclaimer

The Built Environment Sustainability Scorecard (BESS) has been provided for the purpose of information and communication. While we make every effort to ensure that material is accurate and up to date (except where denoted as 'archival'), this material does in no way constitute the provision of professional or specific advice. You should seek appropriate, independent, professional advice before acting on any of the areas covered by BESS.

Nationwide House Energy Rating Scheme
NatHERS Certificate No. 86KRSSILT7

Generated on 29 Jun 2022 using FirstRate5: 5.3.2a (3.21)



Property

Address	16 Riversdale Street, Craigeburn, VIC, 3064
Lot/DP	-
NCC Class*	Class 1a
Type	New Home

Plans

Main plan	03/02/2022
Prepared by	Jari Building Design

Construction and environment

Assessed floor area (m²)*	
Conditioned*	109.8
Unconditioned*	26.6
Total	136.4
Garage	17.1

Exposure type
suburban

NatHERS climate zone
60 Tullamarine

Thermal performance

Heating	Cooling
114.9 MJ/m²	21.8 MJ/m²

About the rating
NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

Accredited assessor

Name	Rob Iacono
Business name	PassivEnergy
Email	rob@passivenergy.com.au
Phone	0401 248 348
Accreditation No.	DMN/11/1259
Assessor Accrediting Organisation	Design Matters National
Declaration of interest	Declaration completed: no conflicts

Verification

To verify this certificate, scan the QR code or visit When using either link, ensure you are visiting www.FR5.com.au.

National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.

State and territory variations and additions to the NCC may also apply.

* Refer to glossary.

STORM Rating Report

TransactionID: 1397552
Municipality: HUME
Rainfall Station: HUME
Address: 16 Riversdale Street

Craigieburn
VIC 3064

Assessor:
Development Type: Residential - Multiunit
Allotment Site (m2): 656.00
STORM Rating %: 102

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Existing RWT roof area	130.60	Rainwater Tank	3,000.00	5	148.50	85.00
Proposed dwelling RWT roof area	73.20	Rainwater Tank	3,000.00	3	163.00	84.40
Existing roof - raingarden	60.00	Raingarden 300mm	1.20	0	130.20	0.00
Proposed dwelling - Raingarden	50.00	Raingarden 300mm	1.00	0	130.20	0.00
Common Driveway	135.00	None	0.00	0	0.00	0.00

Date Generated: 23-Jun-2022 Program Version: 1.0.0

INSTRUCTION SHEET

Building a planter box raingarden (lined)

healthy waterways
Raingardens

What is a planter box raingarden?

Building a raingarden is a simple way to help the environment and the health of our local waterways while providing a self-watering garden for your backyard.

A raingarden is a specially prepared garden designed to receive and filter rain run-off from roofs or hard surfaces such as driveways or paving. You can even create a raingarden in a planter box, positioning it to collect water from a diverted downpipe or rainwater tank overflow.

Featuring layers of soil for filtration, gravel for drainage, and plants that can tolerate periods without rain, a raingarden helps to protect our streams and rivers from stormwater pollutants.

With a slotted pipe beneath the soil to take away the filtered rainwater and an overflow pipe on the surface to prevent flooding, raingardens are designed to collect water from a diverted downpipe, rainwater tank overflow or pavement runoff.

Please note: A certified plumber must be used for stormwater connections and modifications.

Did you know that a raingarden is only wet during and immediately after rain, leaving it dry most of the time? This is due to the drainage and filtration properties of the soil combination used in the raingarden.

State Government Victoria

Melbourne Water

Building your raingarden

Step 1 – getting started

Location

Build your planter box as close as possible to the water source whether it be a downpipe or rainwater tank overflow. This will help minimise the additional plumbing needed to bring water to the raingarden. Your raingarden needs to sit at least 300mm away from your house.

Having decided on a location, it is important to determine the proximity of the existing stormwater pipe to make sure your raingarden is connected properly. Your local plumber can help with this and also how and when to divert your downpipe so that the area doesn't flood during construction.

Stormwater reconnection

All connections or modifications to existing stormwater pipes need to be done by a licensed plumber. The plumber should ensure that pipes are reconnected into the property's stormwater and not another services such as the sewer.

Underground services

Be aware of any underground services (gas, electricity, water) that run near your house as this may determine where you can build your raingarden. Raingardens should not be built over or in close proximity to a septic system.

Materials

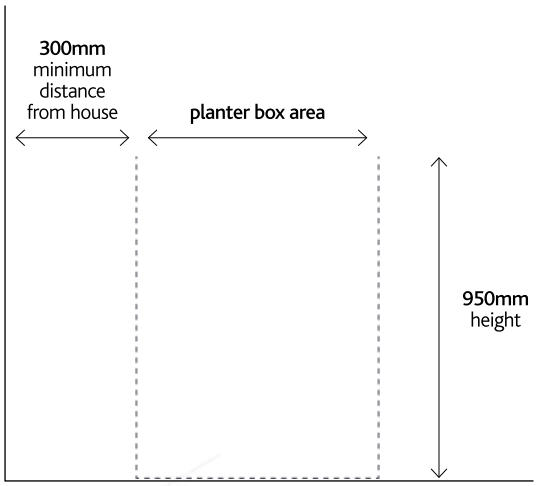
See *Materials List* for information about what you need to build a raingarden.

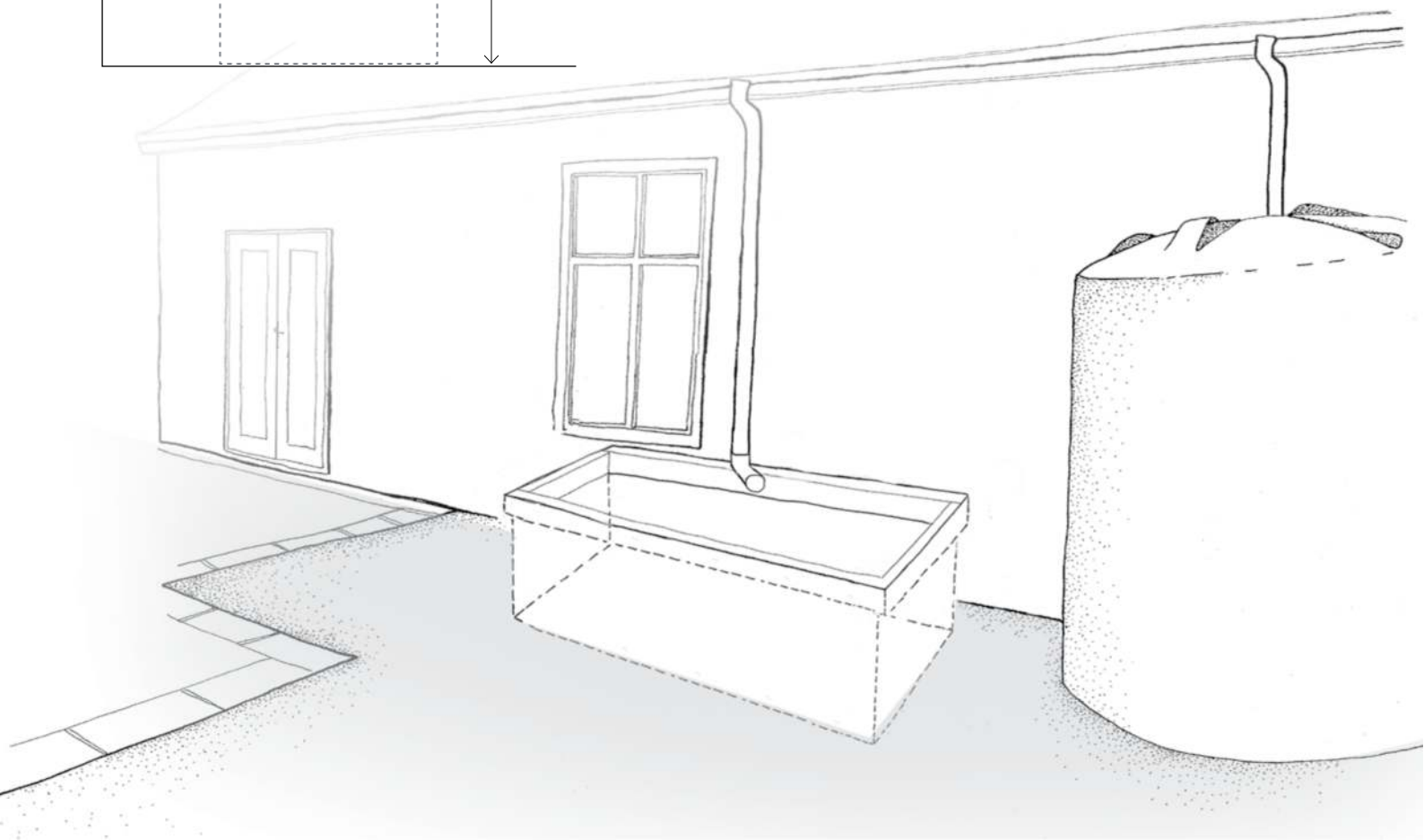
Size

You need to make sure that your raingarden is large enough to manage the amount of stormwater it will receive. If your raingarden is going to capture run-off from the roof via a downpipe, measure the area of roof that drains to that downpipe. Generally, the size of the raingarden should be approximately 2% of the run-off area. Table 1 will help you work out the correct size.

Table 1 – Raingarden sizing chart

AREA OF RUN-OFF (m²)	RAINGARDEN SIZE (m²)
50	1
100	2
150	3
200	4
250	5
300	6
350	7
400	8
450	9





Step 2 - planter box and pipe infrastructure

Preparing your planter box

You can create a planter box out of any material as long as it is strong enough to hold soil. This could be a corrugated iron 'tank', an old wine barrel, or you could build your own planter box using plantation hardwood or similar.

Line your planter box (sides and base) with a PVC liner. Overlap the sheets by 200mm and seal the joins with PVC tape.

Place the 7mm screenings (gravel) to a depth of 50mm. This will form a base for the slotted drainage pipe. Make sure the screenings are washed and cleaned of excess dirt as this can create blockages in the raingardens drainage.

Use the screenings to create a gentle slope towards the stormwater outlet (where the water will exit your planter box).

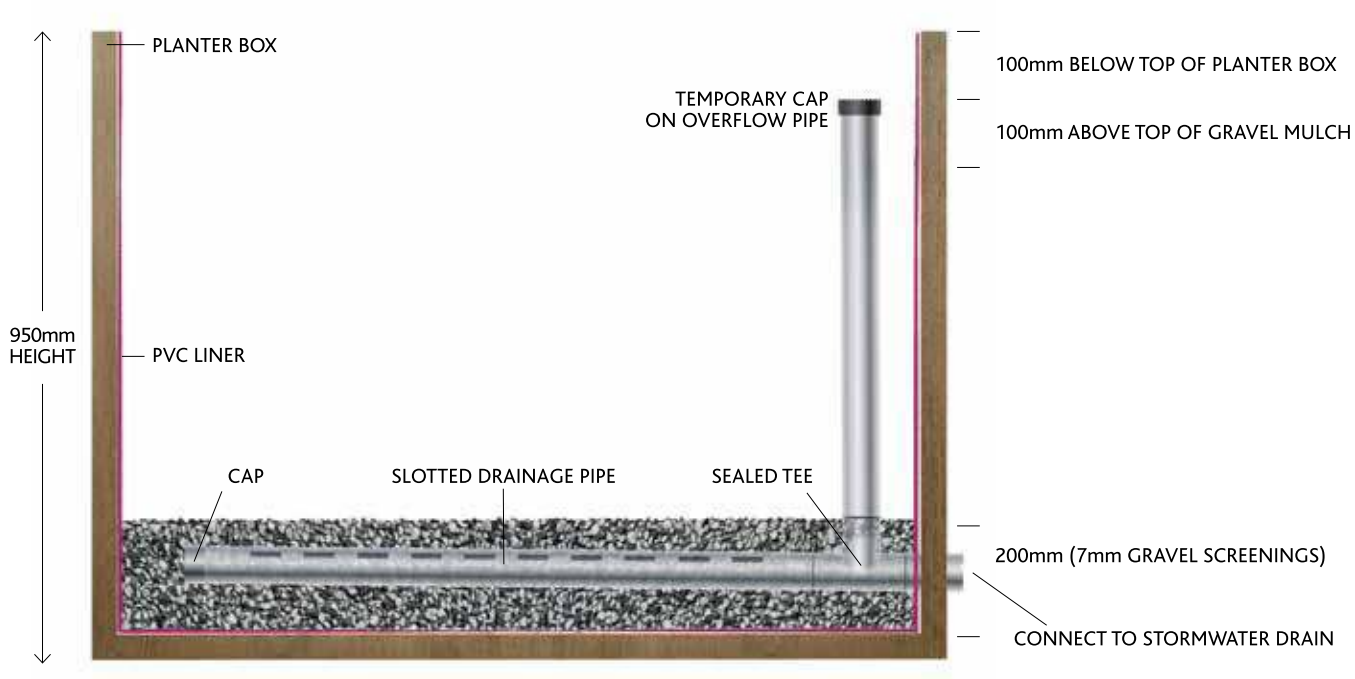
Pipe infrastructure

Lay a 90mm diametre slotted drainage pipe horizontally along the centre of the planter box base and cap one end of the slotted drainage pipe. Call your plumber to connect the drainage pipe back into the property's existing stormwater.

Handy Hint – If your raingarden is greater than 4m wide, you will need to install two slotted drainage pipes and two overflow pipes. These need to be evenly spaced across the planter box base to provide adequate drainage.

Connect the vertical 90mm diameter overflow pipe into the slotted drainage pipe using a 90 degree elbow pipe. When the raingarden is finished, the top of the overflow pipe should sit 100mm above the gravel mulch and 100mm below the top edge of the planter box.

Install a temporary cap on top of the overflow pipe to prevent materials dropping into it during construction. Some plastic taped across the top of the pipe will work fine.



Building your raingarden

Step 3 - soil layers

Screenings layer

Add 7mm screenings (gravel) to a depth of 150mm over the slotted drainage pipe in the base of your raingarden. This brings to total depth of screenings (gravel) to 200mm. Be careful when not to dislodge or damage the slotted drainage pipe when adding the additional screenings.

Sand layer

Place white washed sand to a depth of 100mm over the screenings (gravel) layer.

Sand/soil mix layer

Mix 4 parts white washed sand with 1 part topsoil. Add this mix to the raingarden to a depth of 400mm.

Handy Hint - Ensure you firmly pat down each layer of soil when building your raingarden to help reduce the layers from sinking.

Step 4 -pipe adjustments, plants and mulch

Pipe adjustments

Redirect your downpipe into the raingarden using pipe bends where required. If possible, use two 45 degree bends connected together as this will provide a much gentler and more even flow of water, reducing the risk of erosion and prevent blockages within the downpipe. A 90 degree elbow pipe will do as an alternative.

Plants

In general, plants that grow well in a raingarden:

- like dry conditions but can tolerate temporary wet periods
- are perennial rather than annual
- have an extensive fibrous root system.

A wide range of plants are suitable for raingardens and your local nursery will be able to guide you on what is right for your area.

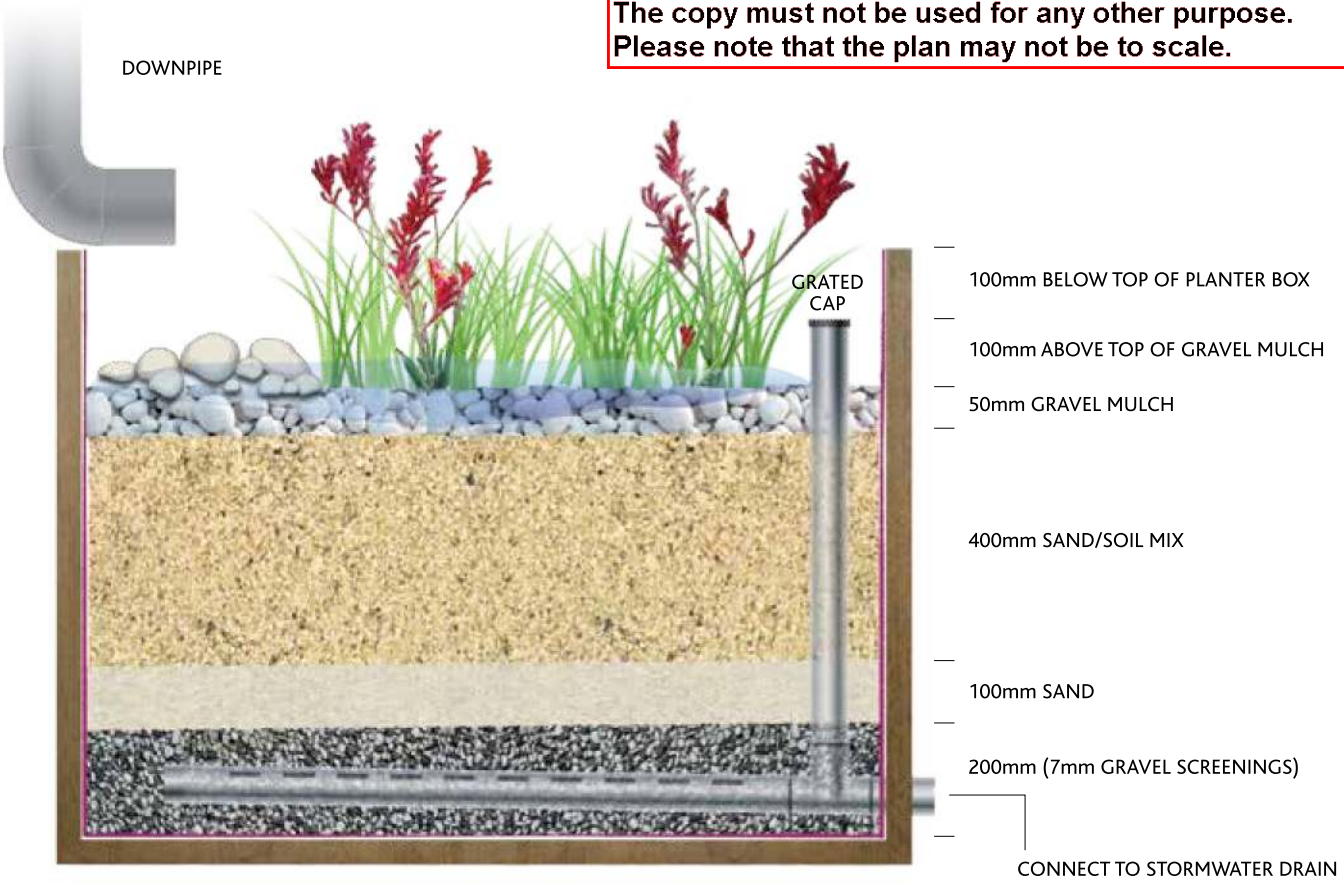
There are also particular plants that are really good at removing pollutants from stormwater. These include:

- *Carex appressa*
- *Lomandra longifolia*
- *Juncus flavidus*
- *Melaleuca ericifolia*
- *Goodenia ovate*.

50% of your raingarden should be planted with these species, the other 50% can be made up of plants that like a dry environment with intermittent wet periods. It is important that the plants you select are suitable for the amount of sun and shade on your raingarden. See the *Plant List* for a suggested list of suitable raingarden plants.

Regardless of the type of plants you select, it is important to plant densely to cover the raingarden. Set your plants out at roughly 6 plants per m². So for a 2m² raingarden, you will need to buy 12 plants. Now start planting.

(continued on next page)



Looking after your raingarden

Mulch

To allow the spread of water gently over the raingarden, place some large flat rocks where water flows from the downpipe. Place smaller rocks in between the large rocks to fill the gaps and help prevent erosion. Alternatively a flow spreading device can be fitted to the downpipe.

Spread gravel mulch to a depth of 50mm around the plants.

Remove the temporary end cap from overflow pipe and replace with a 90mm PVC finishing collar and domed pipe grate.

Water the plants in – complying with your local water restrictions.

Once established, raingardens are low maintenance especially when planted with native plant species. They don't need to be watered, mowed or fertilised. However, a few simple tips can help your raingarden mature and function well.

- Gravel mulch will help retain moisture in your raingarden and prevent weeds from growing.
- Ensure that the overflow is never blocked.
- Remove any sediment or build up from the downpipe.
- Some weeding may need to take place until plants have matured.
- Evenly distribute water flow into your garden to limit erosion from heavy rainfall. Strategically placed rocks may help with this.
- Inspect your garden regularly – replace plants and repair erosion when necessary.

Note – If necessary, water your raingarden until your plants have established in compliance with your local water restrictions.

Need help?
If you have questions about building a raingarden, your landscape gardener or local plumber may be able to help. For more information visit melbournewater.com.au/raingardens

Materials List – what you need to build your raingarden

Table 2 details the materials required to create a 2m² raingarden. While item prices may vary depending on the materials you select, building a 2m² raingarden is likely to cost between $400 and $500 (plus the cost of a planter box and plumber).

QUANTITY	MATERIAL
2 l/m	90mm diameter slotted drainage pipe (Ag Pipe)
2 l/m	90mm diameter uPVC pipe*
0.4m³	7mm screenings
0.85m³	Sand (white washed)
0.15m³	Topsoil
12	Plants (150mm pots)
0.1m³	Gravel mulch
1	90mm diameter uPVC 90 degree bend or 2x 45 degree bends
1	PVC grate 90mm finishing collar
1	PVC 90mm diameter domed pipe grate
1	PVC 90mm tee
1	PVC 90mm cap
10m²	PVC liner
	PVC tape

**Costs per square meter will depend on the length of connections back to the existing stormwater drain.*

l/m = lineal metres m² = square metres m³ = cubic metres mm = millimetres

Plant List – the best plants for your raingarden

The following plants grow well in raingardens.

BOTANICAL NAME	COMMON NAME	CONDITIONS	SIZE (H x W) (cm)
Anigozanthos sp.	Kangaroo paw	Full sun	30-90 x 100-120
Blechnum nudum	Fishbone Water-fern	Full sun to partial shade	50-100 x 40-80
Calocephalus lacteus	Milky Beauty-heads	Full sun to partial shade	15-30 x 10-30
Carex Appressa	Tall Sedge	Full sun to partial shade	80-100 x 120
Carpobrotus modestus	Pigface	Full sun	20cm high and spreading
Chrysocephalum apiculatum	Common Everlasting	Full sun	30-90 x 10-30
Derwentia perfoliata	Digger's Speedwell	Full sun to partial shade	20-40 x 30-60
Dianella species		Full sun to partial shade	60-120 x 40-150
Ficinia nodosa	Knobby Club-rush	Full sun	50-150 x 60-200
Juncas amabilis	Hollow Rush	Full sun to partial shade	20-120 x 20-50
Juncas flavidus	Yellow Rush	Full sun to partial shade	40-120 x 20-100
Leucaphyta brownii	Cushion Bush	Full sun, salt tolerant	100 x 200
Lomandra species		Full sun to partial shade	60-120 x 50-100
Melaleuca ericifolia	Swamp paperback	Full sun to partial shade	4m high x 3m wide
Myoporum parvifolium	Creeping Boobialla	Full sun	20-30 x 300
Patersonia occidentalis	Native iris	Sun to partial shade	20-40 x 30-60
Pratia perdunculata	Matter Pratia	Partial shade	50-150 x 1.8-5
Wahlenbergia communis	Tufted Bluebell	Full sun	15-50 x 15

Melbourne Water
990 La Trobe Street
Docklands VIC 3008

PO Box 4342
Melbourne Victoria 3001

Telephone 131 722
melbournewater.com.au/raingardens

ISBN 978-1-921603-51-8 (print)

ISBN 978-1-921603-52-5 (web)

Version 7, December 2013

2.4 INSPECTION AND MAINTENANCE SCHEDULE

This is an example schedule to guide the timing of your inspection and maintenance activities. This schedule outlines the average service the assets require, but you can adjust these timings to suit your assets. This schedule and the "Inspection and Maintenance form" (see over page) have been designed to be copied and used on site.

Responsibility of assets

Example:
Regular inspections should be carried out every 3 months. The inspection and maintenance of the raingarden including all civil and landscape components is the responsibility of Council/contractor.

The operation and maintenance of adjacent stormwater infrastructure, parklands, garden beds, recreational assets, pathways and road surfaces is the responsibility of Council.

Item	What to check for	Action	Frequency
Civil components – Raingarden			
Inlet	No evidence of erosion, blockage, damage or standing water.	Clear inlet of accumulated sediment or debris. Eroded areas should be locally re-profiled or reinforced, and re-planted if necessary. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if the erosion is either recurring or severe.	Storm events 3 months
Outlet	No evidence of erosion, blockage, damage or standing water Outlet freely draining.	Clear outlet of accumulated sediment or debris. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if standing (backwatering into the raingarden) is present.	Storm events 3 months
Other structures	No evidence of erosion and damage to other structures, e.g. pits, pipes, access ramps, walls and rock protection.	Repair minor damage to structures. Eroded areas should be repaired (reinforced). This may involve minor re-profiling or re-planting works. For severe damage, i.e. where flows have scoured down the side of a structure refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Batters and bunds	No evidence of erosion.	Eroded areas should be locally re-profiled or reinforced, and re-planted if necessary.	Annually
Hydraulic conductivity	Filter media is draining freely. No water ponded on the surface of the raingarden for more than 12 hours after rainfall.	If water is ponded on the surface of the raingarden for more than 12 hours after rainfall, refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*. Note: the disposal of raingarden filter material must comply with EPA Victoria guidelines for the disposal of contaminated soil (Appendix C).	Storm events
Sediment accumulation	Sediment forebay less than 75% full. No major sediment accumulation on surface of the raingarden.	Clean out accumulated sediment from the sediment forebay. Accumulated sediment to be removed from the surface of the raingarden and the system replanted as required.	Annually
Filter media surface	No surface scour, depressions.	Filter surface to be repaired. This may involve evening out the surface, importing additional filter media and replanting.	3 months
Fine sediment surface crust	No impermeable or clayey surface on the filter media. No major surface crusting (<3mm depth across less than 10% of the filter area is permissible).	Repair surface layer by scarify filter media surface, re-profiling and re-establishing vegetation, if required. If the problem persists refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Mulch layer	Even depth and distribution of the mulch layer. Surface of the mulch layer is at least 100 mm below the top of the outflow pit. Mulch is not touching the plant stems	Re-distribute or replace mulch that has been washed out or displaced. This may involve retaining mulch using jute mats or nets. Remove mulch that is touching plant stems.	3 months
Algal or moss growth	No major algal growth (less than 10% of raingarden area is permissible). No moss growth.	If significant patches of algal growth or moss persist across the surface of the raingarden (i.e. greater than 10% of the surface) then refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Inspection opening	Water level is below filter media layer. No sediment accumulation in underdrain system.	Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if standing water is present in the filter media layer. Flush the underdrain system using low pressure water jet to remove accumulated sediment.	Annually

Item	What to check for	Action	Frequency
Landscape components – Raingarden			
Vegetation cover – filter media	Greater than 90% vegetation cover. Plants healthy, free from disease and vigorously growing.	Remove any dead or diseased vegetation. Replant individual bare patches (greater than 5% of the area) using either new plants or by dividing and translocating existing plants. If bare areas represent greater than 30% of the raingarden area, refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Vegetation cover – batters	Continuous vegetation cover along the lower batter. Greater than 90% vegetation cover. Plants healthy, free from disease and vigorously growing.		Annually
Weeds – filter media – batters	Less than 10% of the filter media surface area and batters covered in weeds.	Physically remove weeds from filter media surface and batters. Do not use herbicides as these may harm the desirable raingarden vegetation and contaminate the filter media. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if weed ingress is a persistent problem (i.e. weed coverage is persistently greater than 30%).	3 months
Litter	Filter media surface and batters free of litter (i.e. less than 1 piece litter per 4m^2).	Remove all litter and excessive debris	3 months
Pests	No damage by pest animals and insects.	Seek specialist advice if persistent insect damage is observed. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if there is evidence of pest animal damage.	3 months

Rainwater Tanks

How does a rainwater tank help protect our local streams?

Stormwater Sensitive Homes

Most people install a rainwater tank primarily to harvest stormwater from their roof and conserve their mains water use. In addition to conserving water, a rainwater tank also helps treat stormwater and protect local streams from high storm flows by reducing the volume of stormwater and quantity of pollutants coming from a house block that would otherwise be delivered to the local stream.

What do I use my tank water for?

Garden irrigation, laundry and toilet flushing consume much of our home water use. In most cases these uses do not require the water to be of drinking quality standard that is provided by mains water. By plumbing your rainwater tank to your toilet or laundry and substituting these mains water needs with the rainwater harvested from your roof, you can conserve mains water whilst reducing the amount of stormwater that enters our streams.

A typical home uses approximately 250,000 litres of water each year.

MelbourneWater®

Melbourne Water 131772
Melbourne Water Corporation, PO Box 4342, Melbourne Victoria 3001

Rainwater Tanks

Stormwater Sensitive Homes

Why can't I use my rainwater tank for my garden alone?

So that your tank is not too full to collect rainwater when it rains, you need to be consistently using your tank water all year round.

If tank water is used for your garden alone, your tank will remain full and unused during the winter months when your garden does not require watering. With a full tank, your capacity to capture and store the regular winter rainfall and thus benefit the local waterway is significantly reduced.

By plumbing your rainwater tank to your toilet or laundry, your tank water is used consistently all year round allowing rainfall to refill the tank more often especially in winter. This ultimately reduces the volume of stormwater that is delivered to the stream and the quantity of pollutants that are washed with it.

The Victorian Government has recognised the importance of plumbing your tank to your toilet and offers a cash rebate for the installation of connected rainwater tanks (www.dse.vic.gov.au). In addition, a 5 star energy standard has been introduced that requires a connected 2000Lt rainwater tank or solar hot water service to be installed in all new houses and apartments (class 1 and 2 buildings). (www.buildingcommission.com.au).

How do I choose a rainwater tank?

The most important thing to consider when choosing a rainwater tank is to first identify what you want from your rainwater tank. The size and type of rainwater tank you choose will vary depending on your homes water needs and the reliability you seek from your rainwater tank supply. There are a number of factors that may influence this and the following questions should be considered when planning your tank installation:

- what is the water demand of your home?
- how many people are living in your home?
- what is your intended use of rainwater?
- what reliability do you want from your tank?
- what is the total area of roof draining into your tank?
- what is average rainfall of your area?
- do you need extras like a pressure pump, the ability to top up your tank with drinking water, a backflow prevention device or a first flush device?
- are the materials used on your roof suitable to collect rainwater?
- are there physical constraints of your property that may influence the type of rainwater tank you need?

Once you know how much water you can collect and how much water you are going to use then a tank size can be selected to provide the reliability of water supply that you need.

Types of rainwater tanks

Rainwater tanks come in a variety of materials, shapes and sizes and can be incorporated into building design so they don't impact on the aesthetics of the development. They can be located above ground, underground, under the house or can even be incorporated into fences or walls.

There are three main tank systems to consider and a variety of materials to choose from. Features of these are outlined below and in the pictures above:

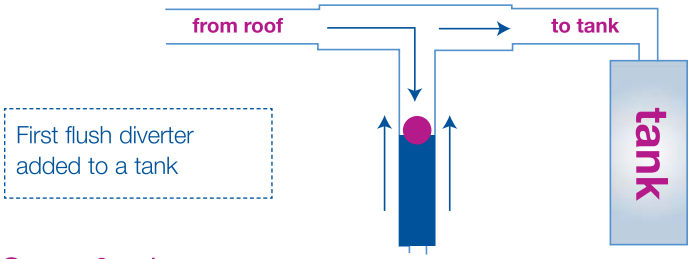
Tank systems:

Gravity Systems - rely on gravity to supply rainwater to the household and the garden by placing the tank on a stand at height.

Dual Supply Systems - top your rainwater tank with mains water when tank level is low ensuring reliable water supply.

Pressure Systems - use a pump to deliver rainwater to household and garden fixtures.

To reduce the amount of sediment and debris entering a tank, mesh screens and 'first flush diverters' can be fitted. A screen will filter large debris such as leaves and sticks while 'first flush diverters' store the 'first flush' of the rainfall that carries the sediment and other pollutants initially washed from your roof (see figure below).



Costs & rebates

Costs of installing a tank vary however a standard 2000Lt tank or bladder will cost around $1000.

Additional plumbing and/ or.....

- Above ground tanks cost approximately $250 for a 500 litre tank.
- Below ground tanks cost between $300-$600 per 1000 litres of storage
- The costs of pumps start from $200.

Additional plumbing and/or excavation costs vary on intended use, pipe layout, materials and site accessibility.

The Victorian Government offers a total rebate of $300 for the installation of a rainwater tank that is plumbed to toilet and connected by a licensed plumber. For further details refer to the Department of Sustainability and Environment website www.dse.vic.gov.au.

For more information:

Melbourne Water's Water Sensitive Urban Design Website:
www.melbournewater.com.au/wsud

Municipal Association of Victoria Clear Water Program:
www.clearwater.asn.au

Water Sensitive Urban Design in the Sydney Region: www.wsud.org

Urban Stormwater Best Practice Environmental Management Guidelines, Victorian Stormwater Committee, CSIRO publishing, 1999.

WSUD Engineering Procedures: Stormwater, Melbourne Water, 2005.

Delivering Water Sensitive Urban Design: Final Report of Clean Stormwater – a planning framework, ABM, 2004.

Water Sensitive Urban Design Report

Job details	
Date:	14th July 2022
Project:	Proposed dual occupancy
Client:	Elyas
Address:	16 Riverdale Street, Craigieburn VIC 3064
Planning No:	TBC
Assessor:	Rob Iacono
Job Number:	220652

Revision		
A:	29th June 2022	Preliminary WSUD Report
B:	14th July 2022	WSUD Report

Please Note

The purpose of this report is to demonstrate that the development will achieve the minimum 100% result using the industry accepted STORM rating scorecard. The calculation of the rainfall, discharge and flow rate must be calculated and designed by a suitable civil/building services engineer.

w: www.passivenergy.com.au **e**: info@passivenergy.com.au
p: 1300 248 348 **a:** Suite 9, 214 Bay Street, Brighton 3186

WSUD Objectives

This report has been prepared to satisfy Hume City Council Stormwater management (Water Sensitive Urban Design) Clause 53.18.
This policy applies to applications for:

- New Buildings
- Extensions to existing buildings which are 50m2 in floor area or greater
- A subdivision in a commercial zone

This policy does not apply to an application for:

- A subdivision of an existing building.

The objective of the policy is to achieve best practice water quality performance objectives set out in the Urban Storm Water Best Practice Environment Management Guidelines, CSIRO 1999 (or as amended).
Currently, these water quality performances objectives are:

- Suspended Solids – 80% retention of typical urban annual load.
- Total Nitrogen – 45% retention of typical urban annual load
- Total Phosphorus – 45% retention of typical urban load
- Litter – 70% reduction of typical urban annual load

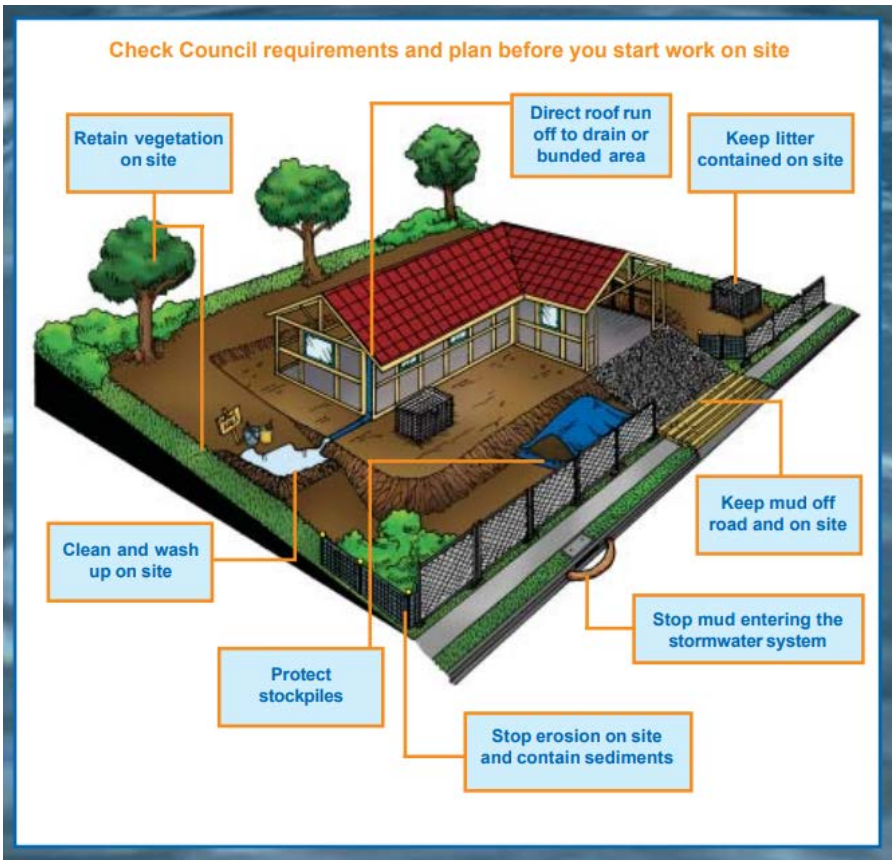
- To promote the use of water sensitive urban design, including stormwater re-use.
- To mitigate the detrimental effect of development on downstream waterways, by the application of best practice stormwater management through water sensitive urban design for new development.
- To minimise peak stormwater flows and stormwater pollutants to improve the health of water bodies, including creeks, rivers and bays.

WSUD Policy

It is policy to:
Require that the development applications provide for the achievement of the best practice performance objectives for suspended solids, total phosphorus and total nitrogen, as set out in the Urban Storm Water Bes Practice Environment Management Guidelines, CSIRO 1999 (or as amended).

- Requires the use of stormwater treatment measures that improve the quality and reduce the flow of water discharged to waterways. This can include but not limited to:
  - Collections and reuse of rainwater and stormwater on site
  - Vegetated swales and buffer strips
  - Rain gardens
  - Installation of water recycling systems
  - Multiple use of water within a single manufacturing site
  - Direction of flow from impervious ground surfaces to landscape areas.
- Encourage the use of measures to prevent litter being carried off-site in stormwater flows, including;
  - Appropriately designed waster enclosures and storage bins, and
  - The use of litter traps for developments with the potential to generate significant amounts of litter.
- Encourage the use of green roofs, walls and facades on buildings where practicable (to be irrigated with rainwater/stormwater) to enhance the role of vegetation on buildings in managing the quality and quantity of stormwater.

Stormwater Site Management Initiatives



Sourced from: Keeping our Stormwater Clean – A Builder's Guide, Melbourne Water.

6 Site Rules To Keep The Stormwater Clean:

1. Check council requirements and plan before you start work on site.
2. Stop erosion onsite and contain sediments.
3. Protect stockpiles.
4. Keep mud off road and on site.
5. Keep litter contained on site.
6. Clean and wash up on site.

The methods and processes specified in "Keeping our Stormwater Clean – A Builder's Guide, developed by Melbourne Water will be adhered to by the builder/developer for managing the construction site.

Excavation & Sediment & Dust Control

No excavation will be required near the footpath or public land, except authorities (Telstra etc) except the driveway. Footpath to be fences as stated. Site water retention will not cause structural damage to excavations or retaining walls

Drainage of the site to the legal point of discharge throughout construction
Prevention of stormwater entering adjoining properties into the sewerage system
Capture and filtering stormwater in sediment control points before entering the legal point of discharge.
Natural rainwater run-off must be controlled to prevent sediment draining into stormwater system. Upslope water must be diverted to prevent it from travelling through the site. Downpipes must be connected as soon as a roof is installed on the site.

Pump out any water collected at the bottom of excavation sites.

Activities on construction sites need to consider permanent water saving measures regulated in Victoria. All hoses must be in good condition and fitted with a trigger nozzle. A high-pressure water cleaning unit is to be used for all washdown activities.

Sediment control barriers around all stormwater drains to be in place and maintained daily.

Rumble grids to be used and must be cleaned daily with consideration given to water saving measures including recycling, furthermore the existing gravel driveway to be maintained in good condition throughout the building works to ensure minimal clay or earth contamination to vehicle wheels.

For activities that may induce excess dust which is unlikely as the soil is of clay nature, hose down measures will be employed. This is unlikely during construction, or excavation.

Sediment barriers & rubble grids will be maintained during construction phase by the builder and undergo regular checking and maintenance when required.

Development Details

The Subject site is located at 16 Riverdale Street, Craigieburn. The plans prepared by JARI Building Design propose 2 double storey units with a proposed dwelling at the rear.

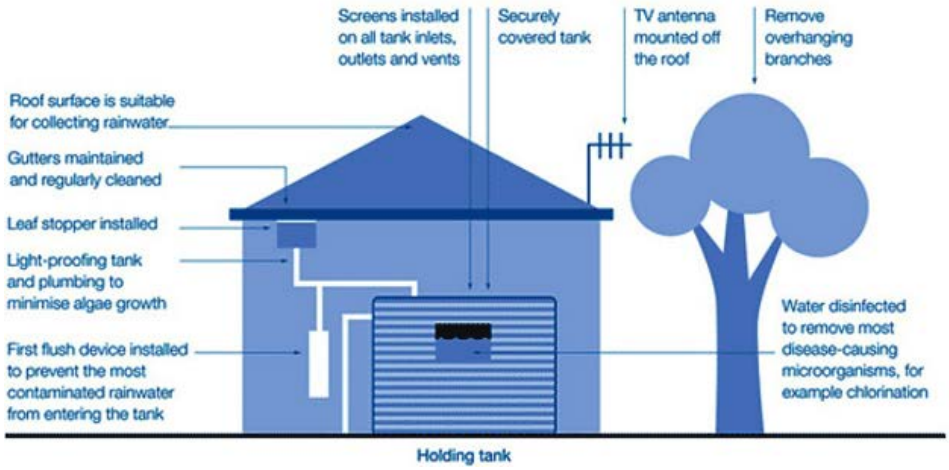
The site has a total area of 656m2 and the hard surfaces

- Existing Dwelling includes proposed new carport: 190.6m2
- Proposed Dwelling: 123.2m2
- Common Driveway: 135m2

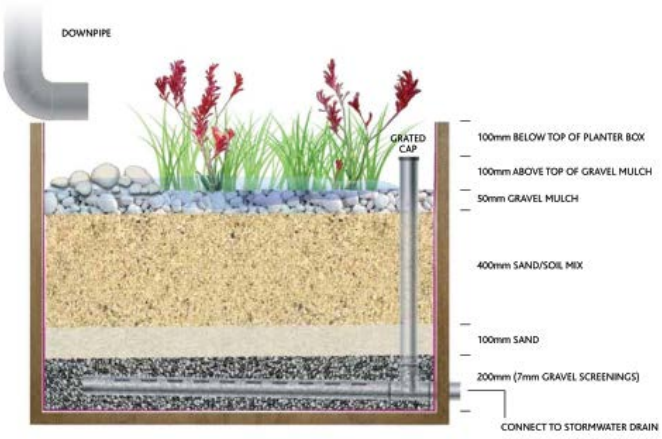
STORM Assessment

A Stormwater Treatment Objective- Relative Measure (STORM) calculator was used to produce a 102% outcome.

- Common driveway will be left untreated.
- Existing roof area will require:
  - 3000 litre water tanks connected to 130.6m2 of roof space.
  - 1.2m2 rain garden (300mm) connected to 60m2 of roof space each.
- Proposed roof area will require:
  - 3000 litre water tanks connected to 73.2m2 of roof space.
  - 1m2 rain garden (300mm) connected to 50m2 of roof space each.
- Each unit will be connected to water tanks, which will be connected to toilet flushing and laundry taps.



For information regarding the installation of rain gardens, including plant list, refer to **Appendix A**



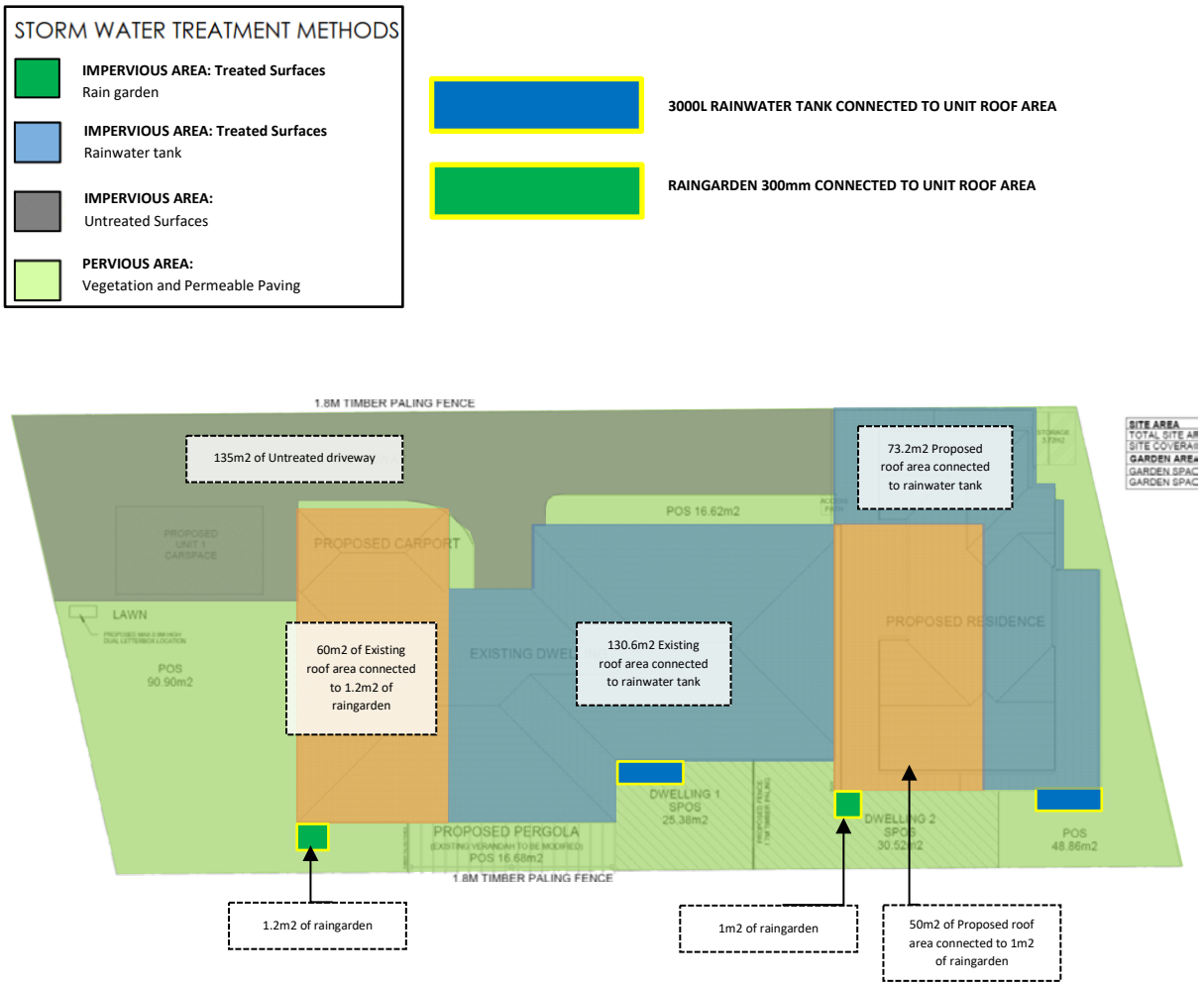
STORM Rating Report

STORM Rating Report

TransactionID:	1397552
Municipality:	HUME
Rainfall Station:	HUME
Address:	16 Riversdale Street
	Craigieburn
	VIC 3064
Assessor:	
Development Type:	Residential - Multiunit
Allotment Site (m2):	656.00
STORM Rating %:	102

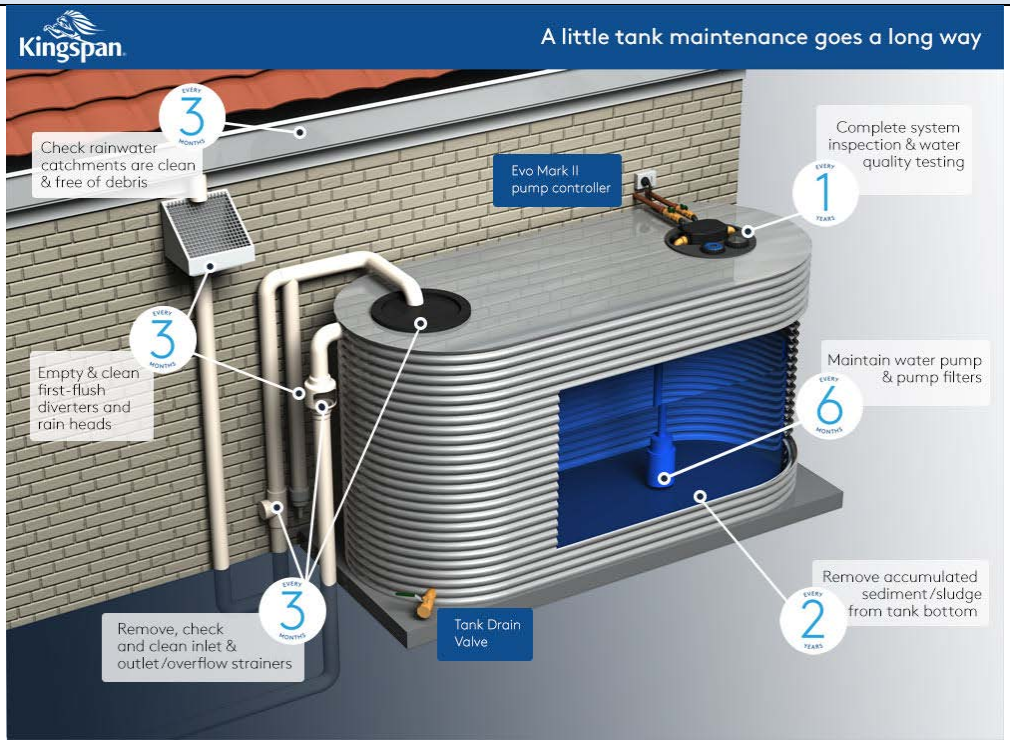
Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Existing RWT roof area	130.60	Rainwater Tank	3,000.00	5	148.50	85.00
Proposed dwelling RWT roof area	73.20	Rainwater Tank	3,000.00	3	163.00	84.40
Existing roof - raingarden	60.00	Raingarden 300mm	1.20	0	130.20	0.00
Proposed dwelling - Raingarden	50.00	Raingarden 300mm	1.00	0	130.20	0.00
Common Driveway	135.00	None	0.00	0	0.00	0.00

Stormwater Treatment Plan



Note: Plan is indicative only and final locations of treatment systems and roof catchment area is subject to civil engineering.

Water Tank Maintenance Schedule



Raingarden Maintenance

- To operate successfully, the plants in a rain garden system need to be well-established and dense.
- The plants need to be grouped close together so any runoff water will flood or seep through, rather than establishing little flow channels (known as rills) which may erode the surface. Mulch should prevent erosion.
- Maintaining the health and density of vegetation is vital, particularly in the early stages. High density planting will also ensure a uniform root zone in rain garden systems.
- New planting will need to be maintained for at least 6 months. Tasks include regular watering, weeding, replacing dead plants, monitoring and controlling pests, and removing rubbish.
- Any scour at inlets needs to be monitored closely. Litter, debris and sediment can build up at inlet points. Litter and debris also need to be removed from surcharge pits.
- Check overflow pits for structural faults. Check the pits are functioning properly.
- If the filtration capacity is reduced significantly, the filter material should be replaced, along with new plans and mulch.

Source: EPA Victoria: Maintaining water sensitive urban design elements

Raingarden Schedule

Component	Key activities	Typical frequency
Filter Media	– Remove leaf litter and gross pollutants – Check for biofilms (algal biofilms may develop on the surface of the filter media leading to clogging issues) – Monitor ponding of water following rainfall events – Check for permanently boggy/pooled areas	3 months & following storm events
	– Remove sediment (or scarify filter media surface if required)	Annually
Erosion	– Check for erosion/scouring – Check for evidence of preferential flow paths – Replace filter media in eroded areas – Add rock protection around inlets (if required)	3 months
Mulch	– Check depth and even distribution of mulch – Check mulch is not touching plant stems – Check for sediment/silt accumulation in mulch layer – Replace mulch (if required) – Retain mulch using jute mats or nets (if required)	3 months
Vegetation	– Inspect plant health and cover – Replace dead plants (maintain a consistent vegetation density of 6–10 plants per square metre across the raingarden filter media) – Remove weeds (avoid use of herbicides) – Prune plants (where applicable) – Water plants (if required during establishment phase)	3 months
Civil components	– Check infrastructure for damage and repair as required – Ensure inlet and outlet points are clear of sediment, litter and debris	3 months & following storm events
	– Inspection opening for underdrain (slotted drainage pipe): – Check water level – Check for sediment accumulation – Flush the underdrain system (if required)	Annually

For additional inspection and maintenance schedule for building managers, refer **Appendix B**

NCC. Volume 2 – Gutters and Downpipe Minimum Requirements

2 3.5.2.3 Selection of guttering

The size of the guttering must –

(a) For eaves gutters, be in accordance with Table 3.5.2.2 an
(b) For box gutters, be in accordance with AS/NZ 3500.3 or section 5 of AS/NZ 3500.5; And
(c) Be suitable to remove rainwater falling at the appropriate 5 minute duration rainfall intensity listed in Table 3.5.2.1 as follows –
    (i) For eaves gutters – 20 year average recurrence interval; and
    (ii) For eaves gutter overflow measures – 100 year average recurrence interval; and
    (iii) For box and valley gutters – 100 years recurrence interval.

3.5.2.4 Installation of gutters

(a) Gutters must be installed with a fall of not less than –
    (i) 1:500 for eaves gutters, unless fixed to metal fascia's; and
    (ii) 1:100 for box gutters.
(b) Eaves gutters must be –
    (i) Supported by brackets securely fixed at stop ends and at not more than 1.2m centres; and
    (ii) Be capable of removing the overflow volume specified in Table 3.5.2.3.
(c) Overflow measures in accordance with Table 3.5.2.4 are deemed to be capable of removing the overflow volume specified in that Table.
(d) Valley gutters on a roof with a pitch –
    (i) More than 12.5 degrees – must have width of not less than 400mm and be wide enough to allow the roof covering to overhang not less than 150mm each side of the gutter; or
    (ii) Not more than 12.5 degrees – must be designed as a box gutter.
(e) The requirement of (b)(ii) does not apply to eaves gutters fixed to a verandah or an eave that is greater than 450mm in width, which –
    (i) Has no lining; or
    (ii) Is a raked verandah or a raked eave with a lining sloping away from the building.

3.5.2.5 Downpipes – Size and installation

Downpipes must –

(a) Not serve more than 12m of gutter length for each downpipe; and
(b) Be located as close as possible to valley gutters; and
(c) Be selected in accordance with the appropriate eaves gutter section in Table 3.5.2.2.

INSTRUCTION SHEET

Building a planter box raingarden (lined)

healthy waterways
Raingardens

What is a planter box raingarden?

Building a raingarden is a simple way to help the environment and the health of our local waterways while providing a self-watering garden for your backyard.

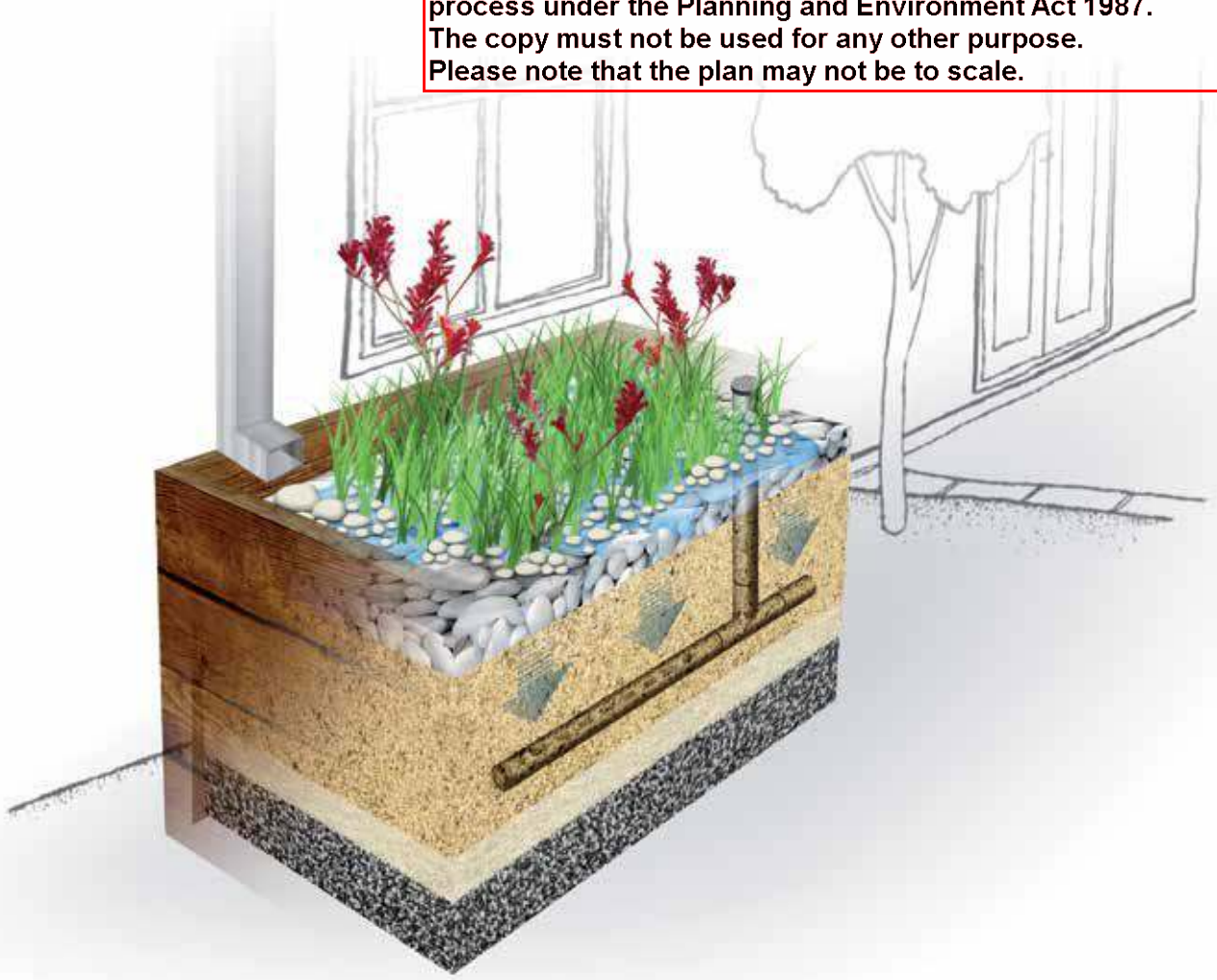
A raingarden is a specially prepared garden designed to receive and filter rain run-off from roofs or hard surfaces such as driveways or paving. You can even create a raingarden in a planter box, positioning it to collect water from a diverted downpipe or rainwater tank overflow.

Featuring layers of soil for filtration, gravel for drainage, and plants that can tolerate periods without rain, a raingarden helps to protect our streams and rivers from stormwater pollutants.

With a slotted pipe beneath the soil to take away the filtered rainwater and an overflow pipe on the surface to prevent flooding, raingardens are designed to collect water from a diverted downpipe, rainwater tank overflow or pavement runoff.

Please note: A certified plumber must be used for stormwater connections and modifications.

Did you know that a raingarden is only wet during and immediately after rain, leaving it dry most of the time? This is due to the drainage and filtration properties of the soil combination used in the raingarden.



State Government Victoria

Melbourne Water

Building your raingarden

Step 1 – getting started

Location

Build your planter box as close as possible to the water source whether it be a downpipe or rainwater tank overflow. This will help minimise the additional plumbing needed to bring water to the raingarden. Your raingarden needs to sit at least 300mm away from your house.

Having decided on a location, it is important to determine the proximity of the existing stormwater pipe to make sure your raingarden is connected properly. Your local plumber can help with this and also how and when to divert your downpipe so that the area doesn't flood during construction.

Stormwater reconnection

All connections or modifications to existing stormwater pipes need to be done by a licensed plumber. The plumber should ensure that pipes are reconnected into the property's stormwater and not another services such as the sewer.

Underground services

Be aware of any underground services (gas, electricity, water) that run near your house as this may determine where you can build your raingarden. Raingardens should not be built over or in close proximity to a septic system.

Materials

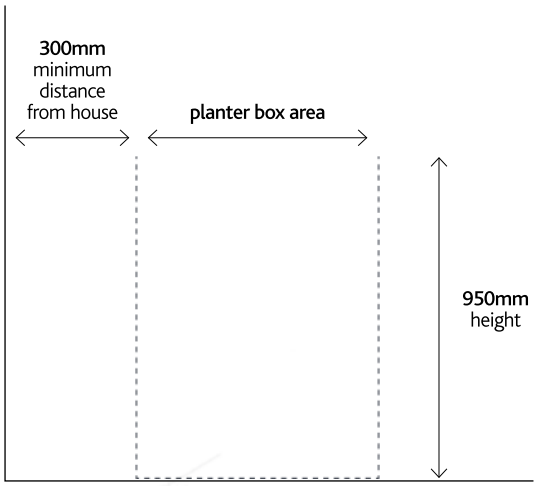
See *Materials List* for information about what you need to build a raingarden.

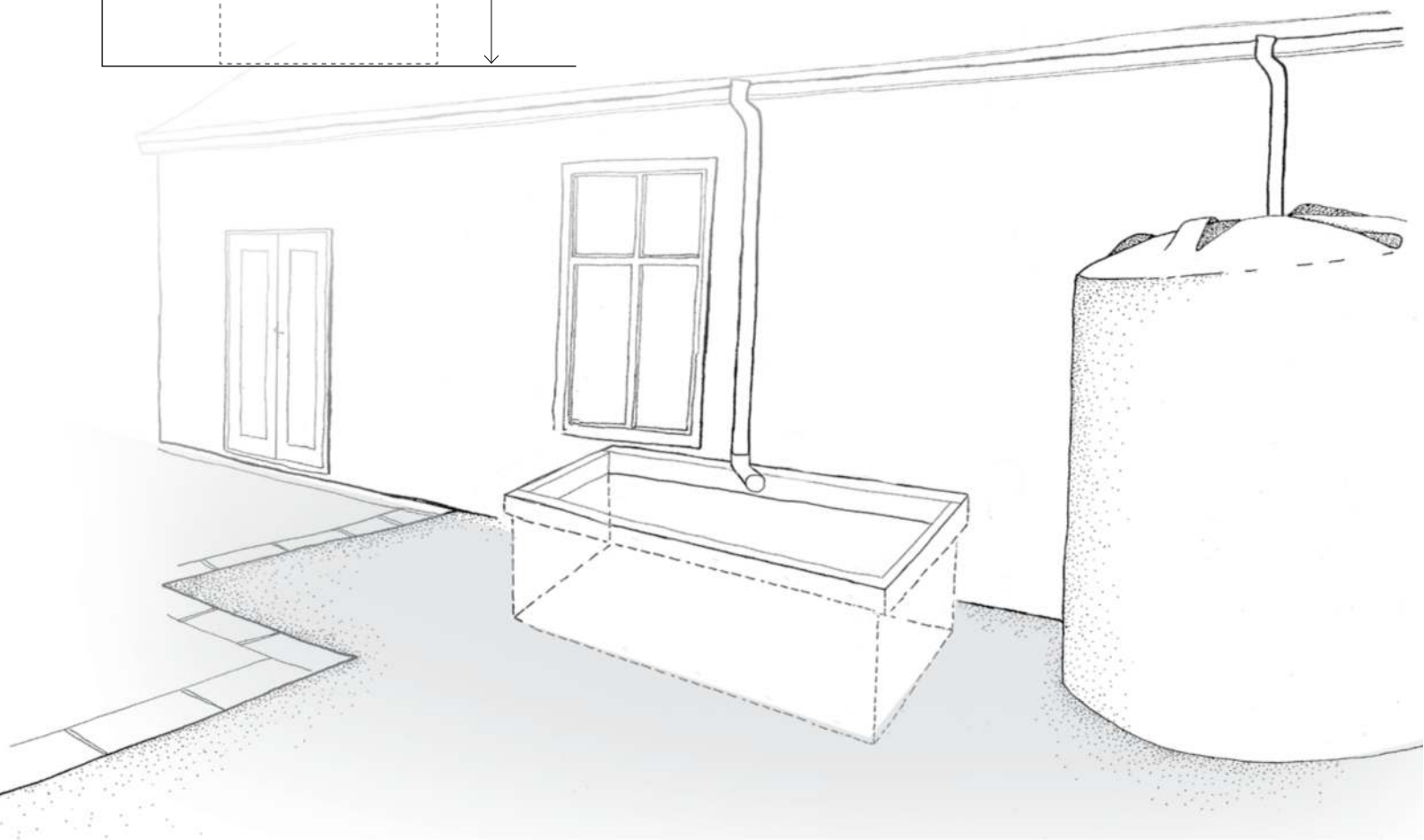
Size

You need to make sure that your raingarden is large enough to manage the amount of stormwater it will receive. If your raingarden is going to capture run-off from the roof via a downpipe, measure the area of roof that drains to that downpipe. Generally, the size of the raingarden should be approximately 2% of the run-off area. Table 1 will help you work out the correct size.

Table 1 – Raingarden sizing chart

AREA OF RUN-OFF (m²)	RAINGARDEN SIZE (m²)
50	1
100	2
150	3
200	4
250	5
300	6
350	7
400	8
450	9





Step 2 - planter box and pipe infrastructure

Preparing your planter box

You can create a planter box out of any material as long as it is strong enough to hold soil. This could be a corrugated iron 'tank', an old wine barrel, or you could build your own planter box using plantation hardwood or similar.

Line your planter box (sides and base) with a PVC liner. Overlap the sheets by 200mm and seal the joins with PVC tape.

Place the 7mm screenings (gravel) to a depth of 50mm. This will form a base for the slotted drainage pipe. Make sure the screenings are washed and cleaned of excess dirt as this can create blockages in the raingardens drainage.

Use the screenings to create a gentle slope towards the stormwater outlet (where the water will exit your planter box).

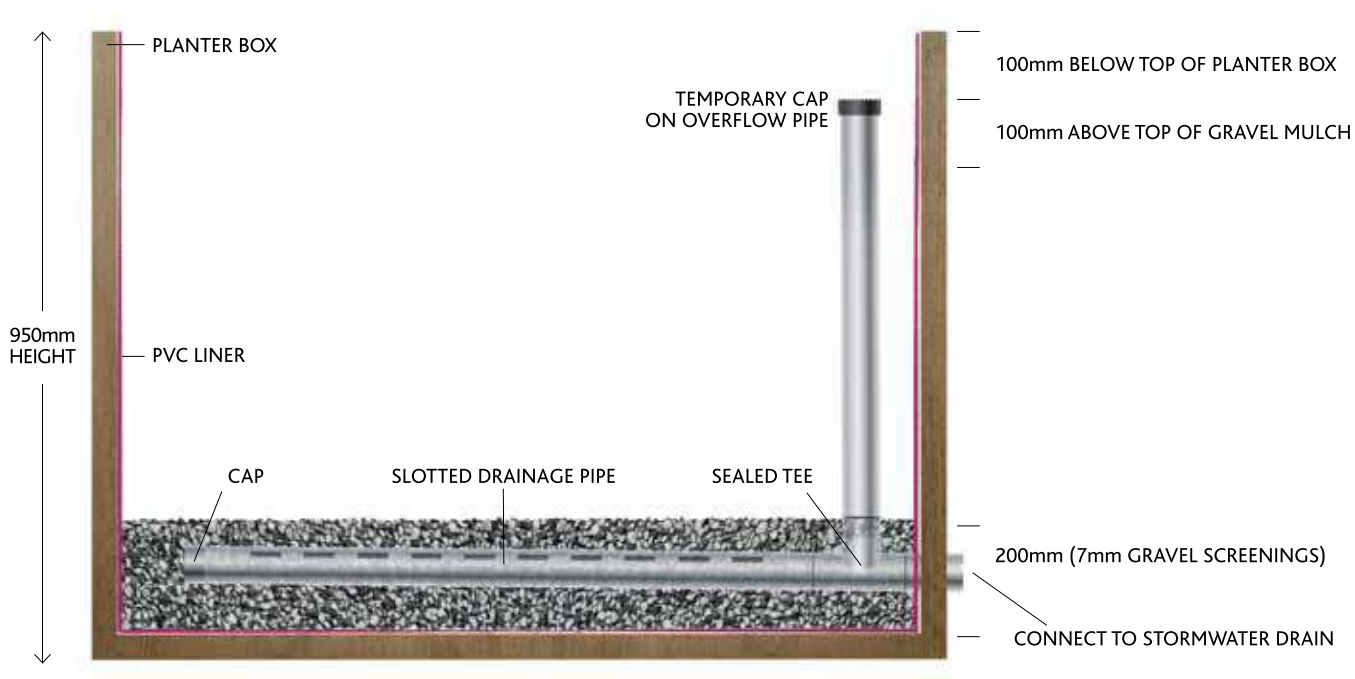
Pipe infrastructure

Lay a 90mm diametre slotted drainage pipe horizontally along the centre of the planter box base and cap one end of the slotted drainage pipe. Call your plumber to connect the drainage pipe back into the property's existing stormwater.

Handy Hint – If your raingarden is greater than 4m wide, you will need to install two slotted drainage pipes and two overflow pipes. These need to be evenly spaced across the planter box base to provide adequate drainage.

Connect the vertical 90mm diameter overflow pipe into the slotted drainage pipe using a 90 degree elbow pipe. When the raingarden is finished, the top of the overflow pipe should sit 100mm above the gravel mulch and 100mm below the top edge of the planter box.

Install a temporary cap on top of the overflow pipe to prevent materials dropping into it during construction. Some plastic taped across the top of the pipe will work fine.



Building your raingarden

Step 3 - soil layers

Screenings layer

Add 7mm screenings (gravel) to a depth of 150mm over the slotted drainage pipe in the base of your raingarden. This brings to total depth of screenings (gravel) to 200mm. Be careful when not to dislodge or damage the slotted drainage pipe when adding the additional screenings.

Sand layer

Place white washed sand to a depth of 100mm over the screenings (gravel) layer.

Sand/soil mix layer

Mix 4 parts white washed sand with 1 part topsoil. Add this mix to the raingarden to a depth of 400mm.

Handy Hint - Ensure you firmly pat down each layer of soil when building your raingarden to help reduce the layers from sinking.

Step 4 -pipe adjustments, plants and mulch

Pipe adjustments

Redirect your downpipe into the raingarden using pipe bends where required. If possible, use two 45 degree bends connected together as this will provide a much gentler and more even flow of water, reducing the risk of erosion and prevent blockages within the downpipe. A 90 degree elbow pipe will do as an alternative.

Plants

In general, plants that grow well in a raingarden:

- like dry conditions but can tolerate temporary wet periods
- are perennial rather than annual
- have an extensive fibrous root system.

A wide range of plants are suitable for raingardens and your local nursery will be able to guide you on what is right for your area.

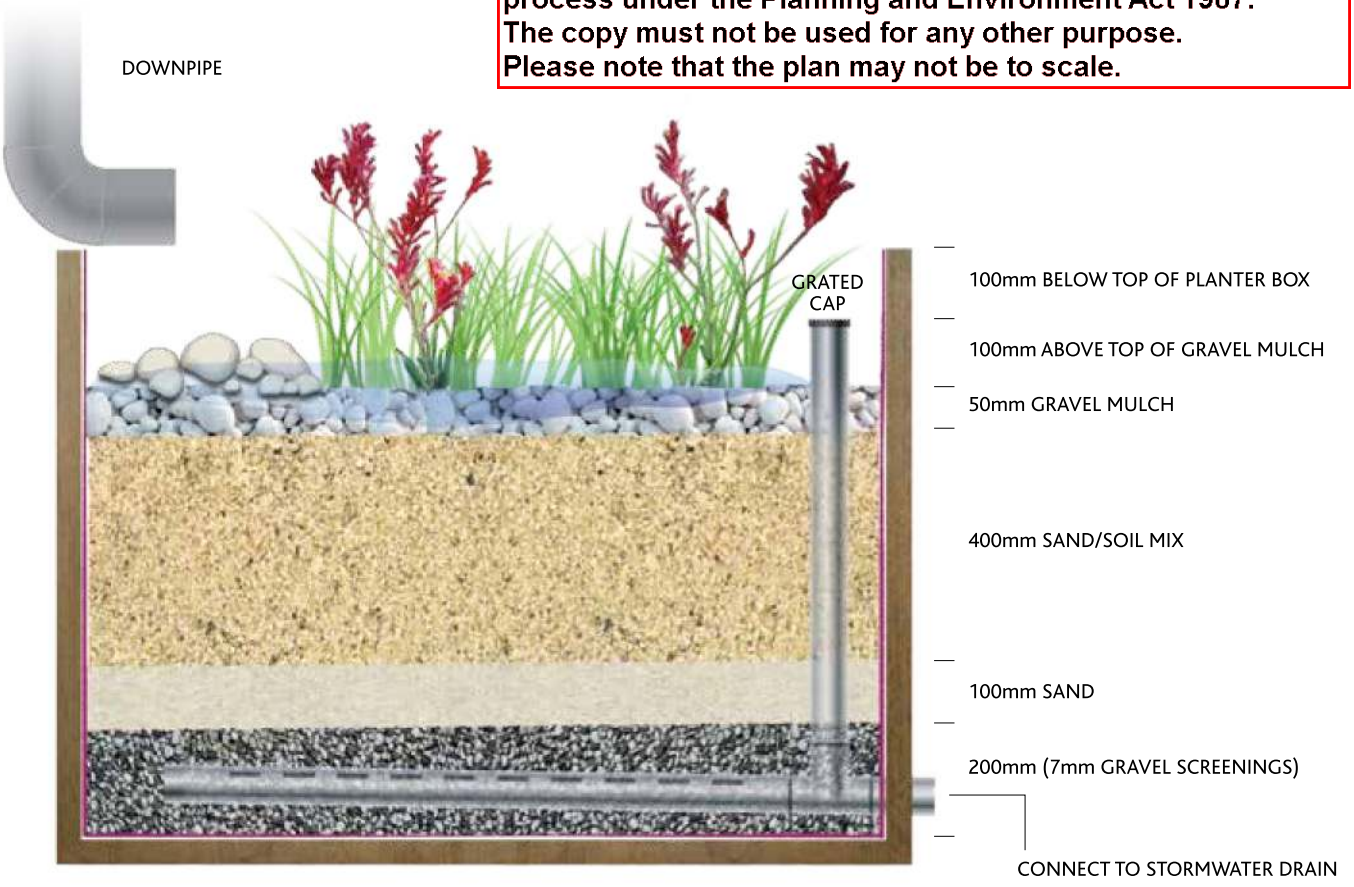
There are also particular plants that are really good at removing pollutants from stormwater. These include:

- *Carex appressa*
- *Lomandra longifolia*
- *Juncus flavidus*
- *Melaleuca ericifolia*
- *Goodenia ovate*.

50% of your raingarden should be planted with these species, the other 50% can be made up of plants that like a dry environment with intermittent wet periods. It is important that the plants you select are suitable for the amount of sun and shade on your raingarden. See the *Plant List* for a suggested list of suitable raingarden plants.

Regardless of the type of plants you select, it is important to plant densely to cover the raingarden. Set your plants out at roughly 6 plants per m². So for a 2m² raingarden, you will need to buy 12 plants. Now start planting.

(continued on next page)



Looking after your raingarden

Mulch

To allow the spread of water gently over the raingarden, place some large flat rocks where water flows from the downpipe. Place smaller rocks in between the large rocks to fill the gaps and help prevent erosion. Alternatively a flow spreading device can be fitted to the downpipe.

Spread gravel mulch to a depth of 50mm around the plants.

Remove the temporary end cap from overflow pipe and replace with a 90mm PVC finishing collar and domed pipe grate.

Water the plants in – complying with your local water restrictions.

Once established, raingardens are low maintenance especially when planted with native plant species. They don't need to be watered, mowed or fertilised. However, a few simple tips can help your raingarden mature and function well.

- Gravel mulch will help retain moisture in your raingarden and prevent weeds from growing.
- Ensure that the overflow is never blocked.
- Remove any sediment or build up from the downpipe.
- Some weeding may need to take place until plants have matured.
- Evenly distribute water flow into your garden to limit erosion from heavy rainfall. Strategically placed rocks may help with this.
- Inspect your garden regularly – replace plants and repair erosion when necessary.

Note – If necessary, water your raingarden until your plants have established in compliance with your local water restrictions.

Need help?
If you have questions about building a raingarden, your landscape gardener or local plumber may be able to help. For more information visit melbournewater.com.au/raingardens

Materials List – what you need to build your raingarden

Table 2 details the materials required to create a 2m² raingarden. While item prices may vary depending on the materials you select, building a 2m² raingarden is likely to cost between $400 and $500 (plus the cost of a planter box and plumber).

QUANTITY	MATERIAL
2 l/m	90mm diameter slotted drainage pipe (Ag Pipe)
2 l/m	90mm diameter uPVC pipe*
0.4m³	7mm screenings
0.85m³	Sand (white washed)
0.15m³	Topsoil
12	Plants (150mm pots)
0.1m³	Gravel mulch
1	90mm diameter uPVC 90 degree bend or 2x 45 degree bends
1	PVC grate 90mm finishing collar
1	PVC 90mm diameter domed pipe grate
1	PVC 90mm tee
1	PVC 90mm cap
10m²	PVC liner
	PVC tape

**Costs per square meter will depend on the length of connections back to the existing stormwater drain.*

l/m = lineal metres m² = square metres m³ = cubic metres mm = millimetres

Plant List – the best plants for your raingarden

The following plants grow well in raingardens.

BOTANICAL NAME	COMMON NAME	CONDITIONS	SIZE (H x W) (cm)
Anigozanthos sp.	Kangaroo paw	Full sun	30-90 x 100-120
Blechnum nudum	Fishbone Water-fern	Full sun to partial shade	50-100 x 40-80
Calocephalus lacteus	Milky Beauty-heads	Full sun to partial shade	15-30 x 10-30
Carex Appressa	Tall Sedge	Full sun to partial shade	80-100 x 120
Carpobrotus modestus	Pigface	Full sun	20cm high and spreading
Chrysocephalum apiculatum	Common Everlasting	Full sun	30-90 x 10-30
Derwentia perfoliata	Digger's Speedwell	Full sun to partial shade	20-40 x 30-60
Dianella species		Full sun to partial shade	60-120 x 40-150
Ficinia nodosa	Knobby Club-rush	Full sun	50-150 x 60-200
Juncas amabilis	Hollow Rush	Full sun to partial shade	20-120 x 20-50
Juncas flavidus	Yellow Rush	Full sun to partial shade	40-120 x 20-100
Leucaphyta brownii	Cushion Bush	Full sun, salt tolerant	100 x 200
Lomandra species		Full sun to partial shade	60-120 x 50-100
Melaleuca ericifolia	Swamp paperback	Full sun to partial shade	4m high x 3m wide
Myoporum parvifolium	Creeping Boobialla	Full sun	20-30 x 300
Patersonia occidentalis	Native iris	Sun to partial shade	20-40 x 30-60
Pratia perdunculata	Matter Pratia	Partial shade	50-150 x 1.8-5
Wahlenbergia communis	Tufted Bluebell	Full sun	15-50 x 15

Melbourne Water
990 La Trobe Street
Docklands VIC 3008

PO Box 4342
Melbourne Victoria 3001

Telephone 131 722
melbournewater.com.au/raingardens

ISBN 978-1-921603-51-8 (print)

ISBN 978-1-921603-52-5 (web)

Version 7, December 2013

2.4 INSPECTION AND MAINTENANCE SCHEDULE

This is an example schedule to guide the timing of your inspection and maintenance activities. This schedule outlines the average service the assets require, but you can adjust these timings to suit your assets. This schedule and the "Inspection and Maintenance form" (see over page) have been designed to be copied and used on site.

Responsibility of assets

Example:
Regular inspections should be carried out every 3 months. The inspection and maintenance of the raingarden including all civil and landscape components is the responsibility of Council/contractor.

The operation and maintenance of adjacent stormwater infrastructure, parklands, garden beds, recreational assets, pathways and road surfaces is the responsibility of Council.

Item	What to check for	Action	Frequency
Civil components – Raingarden			
Inlet	No evidence of erosion, blockage, damage or standing water.	Clear inlet of accumulated sediment or debris. Eroded areas should be locally re-profiled or reinforced, and re-planted if necessary. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if the erosion is either recurring or severe.	Storm events 3 months
Outlet	No evidence of erosion, blockage, damage or standing water Outlet freely draining.	Clear outlet of accumulated sediment or debris. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if standing (backwatering into the raingarden) is present.	Storm events 3 months
Other structures	No evidence of erosion and damage to other structures, e.g. pits, pipes, access ramps, walls and rock protection.	Repair minor damage to structures. Eroded areas should be repaired (reinforced). This may involve minor re-profiling or re-planting works. For severe damage, i.e. where flows have scoured down the side of a structure refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Batters and bunds	No evidence of erosion.	Eroded areas should be locally re-profiled or reinforced, and re-planted if necessary.	Annually
Hydraulic conductivity	Filter media is draining freely. No water ponded on the surface of the raingarden for more than 12 hours after rainfall.	If water is ponded on the surface of the raingarden for more than 12 hours after rainfall, refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*. Note: the disposal of raingarden filter material must comply with EPA Victoria guidelines for the disposal of contaminated soil (Appendix C).	Storm events
Sediment accumulation	Sediment forebay less than 75% full. No major sediment accumulation on surface of the raingarden.	Clean out accumulated sediment from the sediment forebay. Accumulated sediment to be removed from the surface of the raingarden and the system replanted as required.	Annually
Filter media surface	No surface scour, depressions.	Filter surface to be repaired. This may involve evening out the surface, importing additional filter media and replanting.	3 months
Fine sediment surface crust	No impermeable or clayey surface on the filter media. No major surface crusting (<3mm depth across less than 10% of the filter area is permissible).	Repair surface layer by scarify filter media surface, re-profiling and re-establishing vegetation, if required. If the problem persists refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Mulch layer	Even depth and distribution of the mulch layer. Surface of the mulch layer is at least 100 mm below the top of the outflow pit. Mulch is not touching the plant stems	Re-distribute or replace mulch that has been washed out or displaced. This may involve retaining mulch using jute mats or nets. Remove mulch that is touching plant stems.	3 months
Algal or moss growth	No major algal growth (less than 10% of raingarden area is permissible). No moss growth.	If significant patches of algal growth or moss persist across the surface of the raingarden (i.e. greater than 10% of the surface) then refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Inspection opening	Water level is below filter media layer. No sediment accumulation in underdrain system.	Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if standing water is present in the filter media layer. Flush the underdrain system using low pressure water jet to remove accumulated sediment.	Annually

Item	What to check for	Action	Frequency
Landscape components – Raingarden			
Vegetation cover – filter media	Greater than 90% vegetation cover. Plants healthy, free from disease and vigorously growing.	Remove any dead or diseased vegetation. Replant individual bare patches (greater than 5% of the area) using either new plants or by dividing and translocating existing plants. If bare areas represent greater than 30% of the raingarden area, refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Vegetation cover – batters	Continuous vegetation cover along the lower batter. Greater than 90% vegetation cover. Plants healthy, free from disease and vigorously growing.		Annually
Weeds – filter media – batters	Less than 10% of the filter media surface area and batters covered in weeds.	Physically remove weeds from filter media surface and batters. Do not use herbicides as these may harm the desirable raingarden vegetation and contaminate the filter media. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if weed ingress is a persistent problem (i.e. weed coverage is persistently greater than 30%).	3 months
Litter	Filter media surface and batters free of litter (i.e. less than 1 piece litter per 4m^2).	Remove all litter and excessive debris	3 months
Pests	No damage by pest animals and insects.	Seek specialist advice if persistent insect damage is observed. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if there is evidence of pest animal damage.	3 months

Rainwater Tanks

Stormwater Sensitive Homes

How does a rainwater tank help protect our local streams?

Most people install a rainwater tank primarily to harvest stormwater from their roof and conserve their mains water use. In addition to conserving water, a rainwater tank also helps treat stormwater and protect local streams from high storm flows by reducing the volume of stormwater and quantity of pollutants coming from a house block that would otherwise be delivered to the local stream.

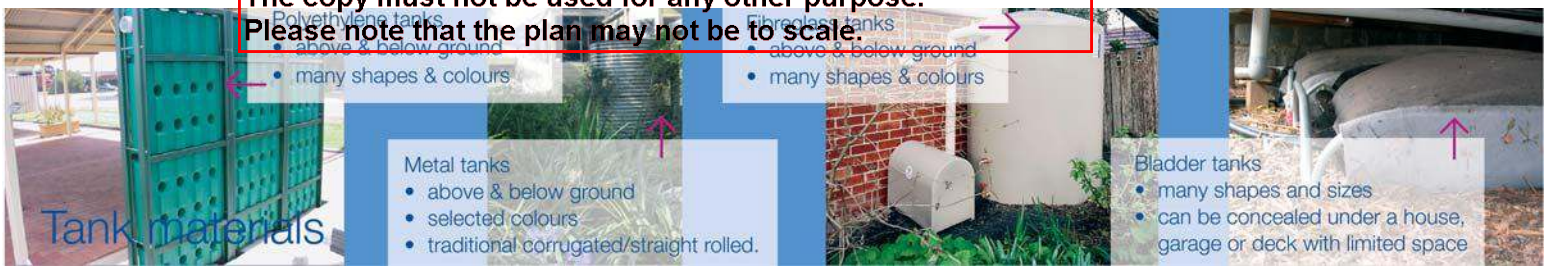
What do I use my tank water for?

Garden irrigation, laundry and toilet flushing consume much of our home water use. In most cases these uses do not require the water to be of drinking quality standard that is provided by mains water. By plumbing your rainwater tank to your toilet or laundry and substituting these mains water needs with the rainwater harvested from your roof, you can conserve mains water whilst reducing the amount of stormwater that enters our streams.

A typical home uses approximately 250,000 litres of water each year.

MelbourneWater

Melbourne Water 131772
Melbourne Water Corporation, PO Box 4342, Melbourne Victoria 3001



Why can't I use my rainwater tank for my garden alone?

So that your tank is not too full to collect rainwater when it rains, you need to be consistently using your tank water all year round.

If tank water is used for your garden alone, your tank will remain full and unused during the winter months when your garden does not require watering. With a full tank, your capacity to capture and store the regular winter rainfall and thus benefit the local waterway is significantly reduced.

By plumbing your rainwater tank to your toilet or laundry, your tank water is used consistently all year round allowing rainfall to refill the tank more often especially in winter. This ultimately reduces the volume of stormwater that is delivered to the stream and the quantity of pollutants that are washed with it.

The Victorian Government has recognised the importance of plumbing your tank to your toilet and offers a cash rebate for the installation of connected rainwater tanks (www.dse.vic.gov.au). In addition, a 5 star energy standard has been introduced that requires a connected 2000Lt rainwater tank or solar hot water service to be installed in all new houses and apartments (class 1 and 2 buildings). (www.buildingcommission.com.au).

How do I choose a rainwater tank?

The most important thing to consider when choosing a rainwater tank is to first identify what you want from your rainwater tank. The size and type of rainwater tank you choose will vary depending on your homes water needs and the reliability you seek from your rainwater tank supply. There are a number of factors that may influence this and the following questions should be considered when planning your tank installation:

- what is the water demand of your home?
- how many people are living in your home?
- what is your intended use of rainwater?
- what reliability do you want from your tank?
- what is the total area of roof draining into your tank?
- what is average rainfall of your area?
- do you need extras like a pressure pump, the ability to top up your tank with drinking water, a backflow prevention device or a first flush device?
- are the materials used on your roof suitable to collect rainwater?
- are there physical constraints of your property that may influence the type of rainwater tank you need?

Once you know how much water you can collect and how much water you are going to use then a tank size can be selected to provide the reliability of water supply that you need.

Types of rainwater tanks

Rainwater tanks come in a variety of materials, shapes and sizes and can be incorporated into building design so they don't impact on the aesthetics of the development. They can be located above ground, underground, under the house or can even be incorporated into fences or walls.

There are three main tank systems to consider and a variety of materials to choose from. Features of these are outlined below and in the pictures above:

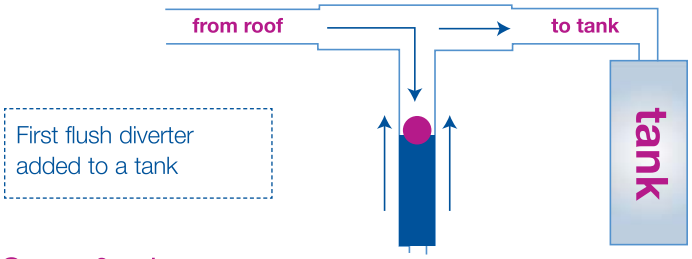
Tank systems:

Gravity Systems - rely on gravity to supply rainwater to the household and the garden by placing the tank on a stand at height.

Dual Supply Systems - top your rainwater tank with mains water when tank level is low ensuring reliable water supply.

Pressure Systems - use a pump to deliver rainwater to household and garden fixtures.

To reduce the amount of sediment and debris entering a tank, mesh screens and 'first flush diverters' can be fitted. A screen will filter large debris such as leaves and sticks while 'first flush diverters' store the 'first flush' of the rainfall that carries the sediment and other pollutants initially washed from your roof (see figure below).



Costs & rebates

Costs of installing a tank vary however a standard 2000Lt tank or bladder will cost around $1000.

Additional plumbing and/ or.....

- Above ground tanks cost approximately $250 for a 500 litre tank.
- Below ground tanks cost between $300-$600 per 1000 litres of storage
- The costs of pumps start from $200.

Additional plumbing and/or excavation costs vary on intended use, pipe layout, materials and site accessibility.

The Victorian Government offers a total rebate of $300 for the installation of a rainwater tank that is plumbed to toilet and connected by a licensed plumber. For further details refer to the Department of Sustainability and Environment website www.dse.vic.gov.au.

For more information:

Melbourne Water's Water Sensitive Urban Design Website: www.wsud.melbournewater.com.au

Municipal Association of Victoria Clearwater Program: www.clearwater.asn.au

Water Sensitive Urban Design in the Sydney Region: www.wsud.org

Urban Stormwater Best Practice Environmental Management Guidelines, Victorian Stormwater Committee, CSIRO publishing, 1999.

WSUD Engineering Procedures: Stormwater, Melbourne Water, 2005.

Delivering Water Sensitive Urban Design: Final Report of Clean Stormwater – a planning framework, ABM, 2004.