



STANBURY
TRAFFIC PLANNING

TRAFFIC, PARKING & TRANSPORT CONSULTANTS

TRAFFIC & PARKING IMPACT ASSESSMENT

**PROPOSED MANUFACTURED HOUSING ESTATE
SPRING FLAT ROAD
MUDGEE**

**PREPARED FOR LINCOLN PLACE
OUR REF: 21-114**



JUNE 2021

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1. INTRODUCTION

1.1 Background

On 21 April 2010, Mid-Western Regional Council granted development consent for DA 0370/2009 at Lot B DP 162225 and Lot 41 DP 756894 pertaining to a parcel of land providing a primary frontage to Spring Flat Road, Spring Flat (herein referred to as “the subject site”).

The approved development granted consent for the construction of a seniors living development comprising 206 serviced self-care dwellings. The development was approved to be serviced by an internal road network, connecting with Spring Flat Road, approximately 300m to the south of Castlereagh Highway.

Further to the above consent, an amended development consent No. MA0001/2018 was granted on 18 October 2017 pertaining to modification to the Seniors Living Development to reflect current the status of subject and burdened lands and various administrative changes to the consent format. Condition of Consent No. 52 of this approval required the upgrading of Spring Flat Road for the full frontage of the site and extending to the north to Castlereagh Highway, to incorporate a pavement and footpath width of 8m and 4m, respectively.

Works on the subject property have substantially commenced such that the abovementioned consent remains active and valid.

1.2 Scope of Assessment

Stanbury Traffic Planning has been commissioned by Lincoln Place to prepare a Traffic & Parking Impact Assessment to accompany a Development Application with Mid-Western Regional Council. The Development Application seeks consent for the establishment of a manufactured housing estate within the subject site, provided in accordance with NSW Government’s *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Movable Dwellings) Regulation 2005*.

This Practice has been advised that the estate is to accommodate seniors living.

The housing estate is to be constructed in stages to accommodate a total of 206 dwelling sites in conjunction with a community centre and recreation facilities. The estate is proposed to be serviced by an internal road network, connecting with Spring Flat Road via a single access driveway, some 300 metres to the south of the junction of Castlereagh Highway and Spring Flat Road.

A further access is also proposed between the estate and Lions Drive, however this access is to be closed under normal conditions, being solely provided for emergency vehicles if so required.

This aim of this assessment is to investigate and report upon the potential traffic and parking consequences of the development application and to recommend

appropriate ameliorative measures where required. This report provides the following scope of assessment:

- Section 1 provides a summary of the site location, details, existing and surrounding land-uses;
- Section 2 describes the proposed development;
- Section 3 assesses the adequacy of the proposed site access arrangements, parking provision, internal circulation and servicing arrangements with reference to relevant specifications;
- Section 4 assesses the existing traffic, parking and transport conditions surrounding and servicing the subject development site including a description of the surrounding road network, traffic demands, operational performance and available public transport infrastructure; and
- Section 5 estimates the projected traffic generating ability of the proposed development and assesses the ability or otherwise of the surrounding road network to be capable of accommodating the altered demand in a safe and efficient manner.

The report has been prepared pursuant to State Environmental Planning Policy (Infrastructure) 2007.

1.3 Reference Documents

Reference is made to the following documents throughout this report:

- Transport for NSW' *Guide to Traffic Generating Developments*;
- NSW Government's *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Movable Dwellings) Regulation 2005*;
- Austroads' *Guide to Road Design Part 4a: Unsignalised and Signalised Intersections*;
- Mid-western Regional Council's *Development Control Plan 2013* (DCP 2013);
- Mid-Western Regional Council's *Pedestrian Access and Mobility Plan 2016*;
- Australian Standard for *Parking Facilities Part 1: Off-Street Car Parking* (AS2890.1:2004);
- Australian Standard for *Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities* (AS2890.2:2018); and
- Australian Standard for *Parking Facilities Part 6: Off-Street Parking for People with Disabilities* (AS2890.6:2009).

Architectural plans have been prepared by Russell Prescott Architects and should be read in conjunction with this report, reduced copies of a selection of which are included as **Appendix 1** for reference.

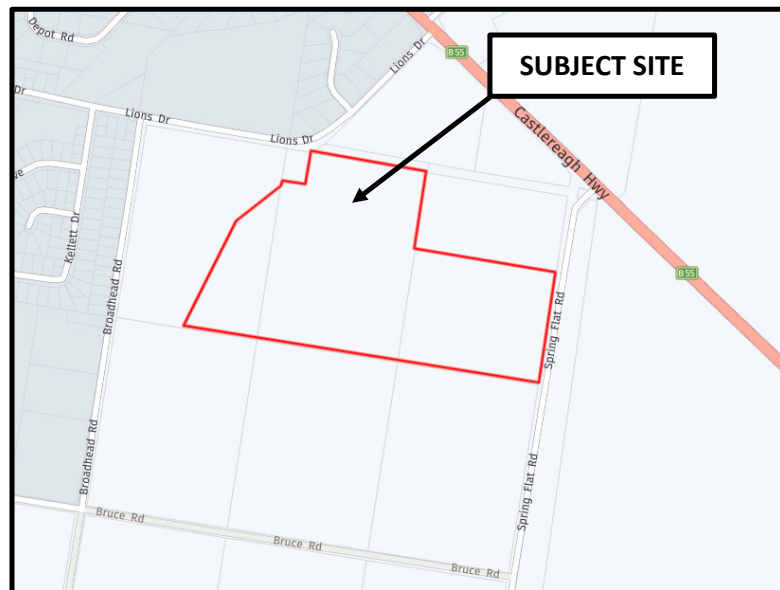
1.4 Site Details

1.4.1 Site Location

The primary frontage of the subject site is located on the western side of Spring Flat Road. A minor frontage to Lions Drive is also provided in the north-western corner of the site.

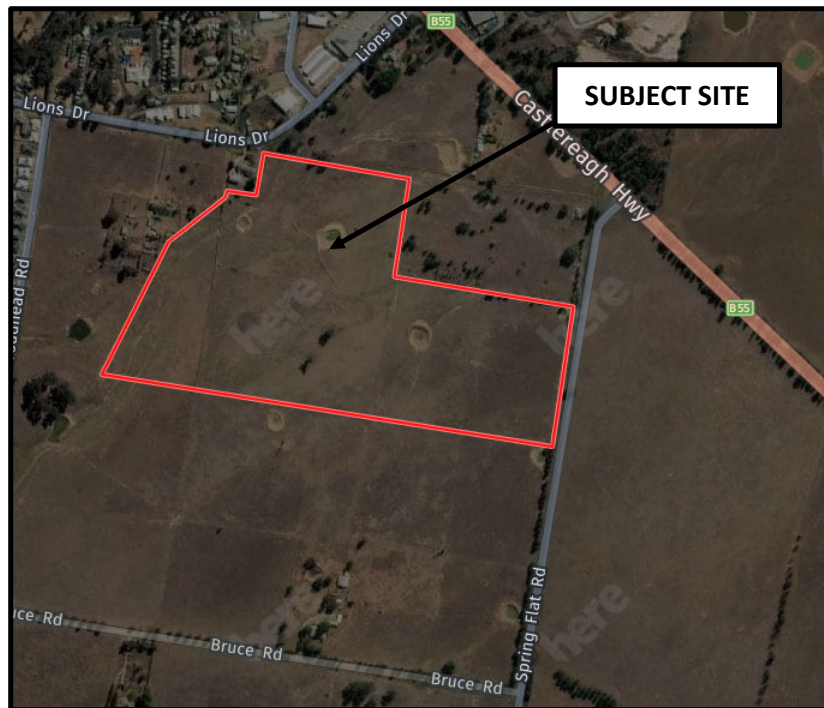
The site location is illustrated within a local and aerial context below and overleaf by **Figure 1** and **Figure 2**, respectively.

FIGURE 1
SITE LOCATION WITHIN A LOCAL CONTEXT



Source: Near Map (accessed 17/06/2021)

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT



Source: Near Map (accessed 17/06/2021)

1.4.2 Site Description

The subject site provides a real property description of DA 0370/2009 at Lot B DP 162225 and Lot 41 DP 756894, Spring Flat Road, Mudgee. The site provides a predominantly trapezoidal shaped parcel of land providing a primary frontage of some 240m to Spring Flat Road. The total site area is approximately 22.6 hectares.

1.4.3 Existing Site Use

The subject site is largely undeveloped primarily accommodating open pasture land.

1.4.4 Surrounding Uses

The site is situated south-eastern periphery Mudgee, being adjoined by the following:

- Rural residential dwellings, primarily contained within large lots, are situated immediately to the north of the site, fronting and being serviced by Lions Drive and Castlereagh Highway;

- Bunnings Warehouse is located further to the north, on the opposite side of Castlereagh Highway;
- A mix of commercial and small-scale industrial developments occupy land to the north-west, fronting and being serviced by Lions Drive and Wilks Crescent;
- Rural residential dwellings are contained within large lots immediately to the west of the site, fronting and being serviced by Lions Drive and Broadhead Road;
- Rural land is situated to the east, on the opposite side of Spring Flat Road; and
- Construction works have commenced for a new secondary school campus for St Matthews Catholic Secondary School Mudgee, fronting and serviced by Bruce Road.

2. PROPOSED DEVELOPMENT

2.1 Built Form

The subject application seeks consent for the development of a manufactured housing estate fronting and serviced by Spring Flat Road.

The manufactured housing estate is proposed to be constructed in stages, as shown in **Table 1** below.

TABLE 1 SUMMARY OF STAGED VISITOR PARKING PROVISION			
Stage	Dwelling sites provided	Visitor parking spaces provided	Ancillary Amenities Provided
1	12	53	Internal access road connecting with Spring Flat Road and ancillary community amenities*
2	24	-	Internal access road
3	13	-	Internal access road
4	14	-	Internal access road
5	13	-	Internal access road
6	14	-	Internal access road
7	11	-	Internal access road
8	14	6	Internal access road
9	9	4	Internal access road
10	13	4	Internal access road, outdoor BBQ area and open space
11	10	4	Internal access road and open space
12	10	9	Internal access road and open space
13	11	-	Internal access road and open space
14	13	4	Internal access road
15	14	-	Internal access road
16	11	-	Internal access road
TOTAL:	206	84	

* Ancillary amenities proposed to be provided in Stage 1 include a private recreation facility including a community centre, tennis court, bowling green, covered BBQ area, pool and gymnasium with associated amenities.

The manufactured housing estate is accordingly proposed to comprise a total of 206 dwelling sites. Each dwelling site is proposed to provide minimum dimensions of 13m x 20m, being capable of accommodating a dwelling containing two bedrooms plus a study, being serviced by a garage or car port.

The recreation facilities and community centre are proposed for the sole use of the estate residents, thereby not being open to the public.

The estate is proposed to be serviced by a series of internal access roads, providing direct connectivity to the housing sites, the community and recreation facilities and visitor parking areas.

Vehicular connectivity between the estate and the adjoining public road network is proposed via a single roadway junction intersecting with Spring Flat Road approximately 300 metres to the south of the junction of Spring Flat Road and Castlereagh Highway. In addition, access for emergency vehicles only is proposed to be provided between the estate and Lions Drive in the north-western corner of the site.

2.2 Public Domain Works

It is expected that the previously approved upgrading measures within Spring Flat Road associated with the previously approved seniors living development of the site (comprising a widening of the existing road pavement to 8m and the provision of a footpath along the site frontage and extending to the north towards Castlereagh Highway) will continue to apply to the subject application.

3. SITE ACCESS & INTERNAL CIRCULATION

3.1 Vehicular Access

Vehicular connectivity between the estate and the adjoining public road network is proposed via a single roadway junction intersecting with Spring Flat Road approximately 300 metres to the south of the junction of Spring Flat Road and Castlereagh Highway.

The following subsections of this report provide an assessment of the suitability or otherwise of the proposed vehicular access arrangements with respect to access design and the provision of sight distance.

3.1.1 Access Design

The development is to be serviced by an 8.5m wide combined ingress / egress road connecting with Spring Flat Road. The access driveway is proposed to provide direct connectivity to an east-west aligned internal roadway, approximately 50m in length. The access roadway gradually widens to 10.6m to provide 5m wide ingress and egress travel lanes, separated by a 0.6m wide median, to accommodate an entry gate with intercom, facilitating visitor access to the estate. Resident access through the entry gate is proposed to be facilitated via in-vehicle remotes.

Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 provides subdivision standards for roads relevant to the subject estate. Clause 20 of the Regulation provides the following:

- (1) *A road that forms an entrance to or exit from a manufactured home estate must be at least 8 metres wide.*
- (2) *In the case of a divided road, the width of the sealed portion of the road on either side of the median strip must be at least 5 metres.*

The proposed 8.5m wide access driveway and 10.6m wide entry road therefore suitably complies with *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005* and is therefore considered satisfactory.

3.1.2 Sight Distance

Spring Flat Road provides a consistent horizontal and vertical alignment within the vicinity of the proposed site access roadway, resulting in sight distance more than 200m between approaching traffic within the frontage road and the access roadway, exceeding minimum specifications of AS2890.1:2004 with respect to a frontage roadway being governed by a speed limit of 100km/h. This situation is anticipated to result in vehicles being able to undertake entry and egress movements between the site and Spring Flat Road in a safe manner.

3.2 Pedestrian Access

The estate design provides for a dedicated internal east-west aligned pedestrian access pathway, which provides connectivity to the adjoining public road network, separate from and to the north of the previously presented vehicular access roadway.

3.3 Internal Road Design

Clause 21 of *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005* provides the following standards for widths of roads relevant to the subject estate:

- (1) *The width of the road reserve must be:*
 - (a) *At least 8.5 metres for a major access road, and*
 - (b) *At least 6 metres for a minor access road.*

- (2) *The width of a sealed portion of an access road must be:*
 - (a) *At least 6 metres for a major access road, and*
 - (b) *At least 4 metres for a minor access road.*

- (3) *If a minor access road exceeds 80 metres in length, a passing bay or bays must be provided within the road reserve.*

- (4) *Passing bays must be provided at intervals of not more than 100 metres.*

The previously presented estate access road is proposed to provide connectivity to an internal private road network, providing as series of differing designs depending on their functional order, as follows:

- Major internal access roads are proposed to provide a minimum 6m wide pavement within a minimum 8m wide road reservation; and
- Minor internal access roads are proposed to provide a minimum 4m wide pavement within a minimum 6m wide reservation, not exceeding 80m in length.

The proposed internal road widths are considered to be satisfactorily compliant with *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005*.

It is acknowledged that the estate is proposed to be developed in stages, whereby some roads are required to provide temporary road terminations providing adequate arrangements for internal vehicular turnaround as required.

3.4 Parking Provision

The estate is proposed to provide the following visitor parking infrastructure:

- The provision of visitor parking spaces in an indented arrangement throughout the internal roads; and
- The provision of two dedicated off-street visitor parking areas, one area containing 8 visitor parking spaces situated adjacent to the estate site entry and a second area containing 41 spaces, adjacent to the recreation building.

Formalised resident parking is proposed to be contained within the dwelling sites via the provision of enclosed garages or car ports.

Further to the above, a potential future dedicated off-street caravan and recreational vehicle parking area is possible within the north-western corner of the site. It is expected that these spaces will service residents as required.

The following sub-sections of this report provide an assessment of the proposed visitor and resident parking provision with respect to the relevant established requirements.

3.4.1 Visitor Parking

A total of 84 visitor parking spaces are proposed to be provided as follows:

- 53 spaces within Stage 1, comprising four indented parking spaces, a dedicated angled parking area containing 41 spaces and a second dedicated parking area containing eight spaces;
- Six indented spaces within Stage 8;
- Four indented spaces within Stage 9;
- Four indented spaces within Stage 10;
- Four indented spaces within Stage 11;
- Nine indented spaces within Stage 12; and
- Four indented spaces within Stage 14.

No formalised visitor parking is proposed to be provided during Stages 2 – 7, 13, 15 or 16.

Clause 23 of *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005* provides the following standards for visitor parking relevant to the subject estate:

- (1) *A manufactured home estate must contain no fewer visitor parking spaces than the following:*

- (a) 8 spaces for a manufactured home estate containing not more than 35 sites;
- (b) 12 spaces for a manufactured home estate containing more than 35 sites but not more than 70 sites;
- (c) 16 spaces for a manufactured home estate containing more than 70 sites but not more than 105 sites;
- (d) 20 spaces for a manufactured home estate containing more than 105 sites, plus one additional space for each additional 7 sites (or part of a site) over 140.

Table 2 below provides a summary staged visitor parking provision and requirements with respect to *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005*.

TABLE 2 SUMMARY OF STAGED VISITOR PARKING REQUIREMENTS / PROVISION				
Stage	Dwellings Provided (Cumulative)	Spaces Required (Cumulative)	Spaces Provided (Cumulative)	Compliance
1	12	8	53	Yes
2	36	12	53	Yes
3	49	12	53	Yes
4	63	12	53	Yes
5	76	16	53	Yes
6	90	16	53	Yes
7	101	16	53	Yes
8	115	20	59	Yes
9	124	20	63	Yes
10	137	20	67	Yes
11	147	21	71	Yes
12	157	23	80	Yes
13	168	24	80	Yes
14	181	26	84	Yes
15	195	28	84	Yes
16	206	30	84	Yes
TOTAL	206	30	84	Yes

Table 2 illustrates that the total visitor parking provision provides an oversupply of some 54 spaces and thus suitably accords with the relevant requirements of *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005*. The staged visitor parking requirements are accordingly considered to be satisfactory.

3.4.2 Resident Parking

Formalised resident parking is proposed to be contained within the dwelling sites via the provision of enclosed garages and / or car ports. Eight indicative dwelling type designs have been provided by Russell Prescott Architects, indicating that each dwelling, containing two bedrooms plus a study, is proposed to be serviced by a single or double enclosed garage or car port. Each dwelling type provides two resident parking spaces either within a double garage / car port or a single space provided in a stacked arrangement in front of a single garage.

Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 does not provide minimum parking requirements for residents within manufactured housing estates. It would therefore appear that the control with respect to resident parking for the estate is contained within DCP 2013. DCP 2013 however also does not specifically provide residential parking rates for manufactured housing estates. In the subject instance it is therefore deemed most appropriate to apply the rates for residential dwellings. DCP 2013 provides the following locally sensitive parking requirements for residential dwellings:

2 spaces per dwelling – 1 space to be a garage, 1 space may be provided in a stacked arrangement in front of the garage provided that the space is contained wholly within the site.

The indicative dwelling type designs are therefore capable of complying with the above DCP 2013 resident parking requirements.

3.5 Internal Circulation

3.5.1 Visitor Parking

Clause 23 of *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005* provides the following design standards for visitor parking relevant to the subject estate:

- (2) *Each parking is to have, at minimum, dimensions of:*
- (a) *5.4 metres by 2.5 metres, in the case of angle parking, and*
 - (b) *6.1 metres by 2.5 metres, in any other case*

The visitor parking spaces are proposed to provide the following dimensions:

- 6.0 metres by 2.5 metres, in the case of 90-degree angle parking;
- 6.3 metres by 2.5 metres, in the case of centrally located unobstructed indented parallel parking; and
- 6.6 meters by 2.5 meters, in the case of obstructed end indented parallel parking spaces.

The angled parking arrangements are accordingly compliant with *The Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005*, whilst also readily complying with the relevant requirements of AS2890.1:2004.

Further to the above dimensional requirements for visitor parking spaces, Clause 24 of *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005* specifies the following relevant to the subject estate:

- (1) *A manufactured home estate must contain at least one visitor parking space for people with disabilities.*
- (2) *A manufactured home estate that contains more than 100 sites must contain at least one visitor parking space for people with disabilities for each 100 sites or fraction of 100 sites.*
- (3) *Such parking is to be provided in accordance with AS/NZS 2890.1:2004...*

The housing estate is accordingly required to provide a total of three disabled parking spaces for visitors, comprised of one space provided each during Stages 1, 7 and 16.

It is accordingly recommended that three disabled parking spaces be provided for visitors during Stage 1. These spaces should be comprised of two spaces provided within the dedicated off-street visitor parking space adjacent to the recreation facilities and one space provided within the visitor parking area adjacent to the estate site entry. These spaces should be provided with the following design specifications in accordance with AS2890.6:2009 (being the relevant Standard pertaining to disabled parking):

- 5.4 metres long; and
- 2.4 metres wide (plus a 2.4-metre-wide adjoining shared area).

It is acknowledged that the implementation of the abovementioned disabled parking spaces may result in the loss of two visitor parking spaces. However, compliance with the relevant visitor parking provision requirements of the *Local Government (Manufactured Housing Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005* can still be maintained, given the previously reported oversupply of visitor parking spaces.

3.5.2 Resident Parking

The indicative housing type designs prepared by Russell Prescott Architects, provide the following minimum resident parking dimensions:

- Single garage door opening width = 2.4 metres;
- Single garage width = 3 metres;
- Double garage width = 5.8 metres;
- Garage length = 5.8 metres;
- External double car port space width = 5.8 metres;
- External or car port space length = 5 metres covered, however 6.7m in length provided within the lot boundary; and
- Enclosed parking space clearance = 2.4 metres.

The abovementioned resident parking space dimensions comply with the relevant requirements of AS2890.1:2004 and accordingly are considered satisfactory.

3.5.3 Site Servicing

It is expected that the housing estate will generate a requirement for regular refuse collection and minor deliveries associated with the community and recreation infrastructure. It is expected that such activity will be undertaken by private contractors, who will utilise vehicles which can negotiate the internal road network. If considered necessary, Council may wish to impose a condition of consent which limits the size of such service vehicles to ensure that unreasonable internal conflicts do not occur.

Given the staged nature of the development, it is also recommended that temporary turning heads be provided within each stage to ensure waste collection vehicles can manoeuvre throughout the development as the internal road network is provided.

4. EXISTING TRAFFIC CONDITIONS

4.1 Surrounding Road Network

The following provides a description of the road network surrounding the subject site:

- **Spring Flat Road** performs a collector road function under the care and control of Mid-Western Regional Council. It provides a connection between Queens Pinch Road, Mullamuddy in the south and Castlereagh Highway in the vicinity of the site in the north.

In the vicinity of the subject site, Spring Flat Road provides a 6m wide pavement within a 20m wide road reservation, providing one through travel lane in each direction. Double barrier centre lines separate directional travel lanes for a length of approximately 100m south from Castlereagh Highway.

Traffic flow within Spring Flat Road is primarily governed by a sign posted speed limit of 100km/h, reducing to 80km/h on immediate approach to Castlereagh Highway.

North of the subject site, Spring Flat Road intersects with Castlereagh Highway under give way conditions, with all movements permitted.

- **Castlereagh Highway** performs a State Road function under the care and control of TfNSW, extending between Great Western Highway at Marrangaroo in the south-east, through north-western NSW where it crosses the NSW / QLD border at Hebel and continues north into Queensland.

In the vicinity of the site, Castlereagh Highway primarily provides a 9m wide pavement within a 26m wide road reservation, providing one through lane of traffic in each direction. Traffic flow within Castlereagh Highway to the south-east is primarily governed by a sign posted speed limit of 100km/h, prior to reducing to 80km/h on approach to Spring Flat Road and thence reducing further to 50km/h on approach to Lions Drive and the Mudgee commercial and industrial precinct.

The Castlereagh Highway pavement widens to approximately 15m on approach to and departure from Spring Flat Road, facilitating the provision of a dedicated right turn lane servicing turning movements into Spring Flat Road.

To the north-west, further pavement widening facilitates the provision of a section of raised concrete median restricting turning movements between the Bunnings Warehouse to left in / left out and thence exclusive left and right turn lanes on approach to the intersection of the Highway with Lions Drive and Burrandulla Road.

West of Lions Drive, Castlereagh Highway provides a 20m wide pavement with one through lane of traffic in each direction, a wide median turning lane and marked parking lanes along both kerb alignments.

- **Lions Drive** performs a minor collector function under the care and control of Mid-Western Regional Council. Lions Drive provides an east-west alignment connecting Robertson Street in the west, with Castlereagh Highway in the east intersecting with both under give way conditions, with all movements permitted.

Lions Drive provides a 10m wide pavement with one through lane of traffic in each direction. The western kerb alignment provides a sealed rolled kerb, whereas pavement is unsealed along the eastern side.

Traffic flow is governed by a speed limit of 50km/h.

4.2 Existing Traffic Volumes

Staff of this Practice have undertaken peak hour traffic surveys of the intersection of Spring Flat Road and Castlereagh Highway to accurately ascertain traffic existing demands within the immediate precinct.

Surveys were undertaken between 7:00am – 9:00am and 4:00pm – 6:00pm on Friday 30th April 2021.

Figure 3 below provides summaries of the surveyed peak hour (8:00am – 9:00am and 4:00pm – 5:00pm) traffic flows at the subject intersections, whilst full details are available upon request.

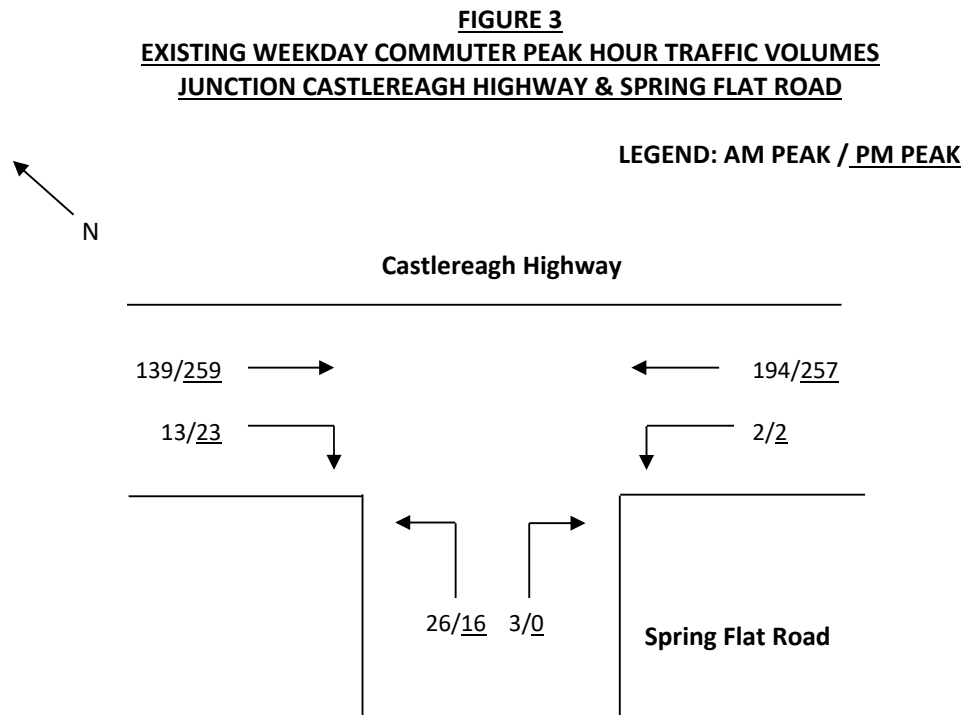


Figure 3 indicates the following approximate weekday commuter peak hour traffic demands:

- Directional traffic demands within Castlereagh Highway are between 140 – 220 vehicles during the AM peak and between 250 – 280 vehicles during the PM peak; and
- Directional traffic demands within Spring Flat Road are less than 30 vehicles.

4.3 Existing Road Network Operation

4.3.1 Intersection Performance

The surveyed public road intersections have been analysed utilising the SIDRA computer intersection analysis program to objectively assess the operation of the nearby public road network.

SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 3** (being the RMS NSW method of calculation of Level of Service).

TABLE 3 LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS PRIORITY CONTROLLED INTERSECTIONS		
Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
A	Less than 14	Good
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**.

Table 4 below provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix 2**.

TABLE 4		
SIDRA OUTPUT – EXISTING WEEKDAY PEAK HOUR PERFORMANCE JUNCTION OF CASTLEREAGH HIGHWAY & SPRING FLAT ROAD		
	AM	PM
Spring Flat Road		
Delay	7.7	9.4
Degree of Saturation	0.02	0.01
Level of Service	A	A
Castlereagh Road (East)		
Delay	5.6	5.6
Degree of Saturation	0.10	0.14
Level of Service	A	A
Castlereagh Road (West)		
Delay	6.1	6.4
Degree of Saturation	0.07	0.14
Level of Service	A	A
Total Intersection		
Delay	7.7	9.4
Degree of Saturation	0.10	0.14
Level of Service	A	A

Table 4 indicates that the junction of Castlereagh Highway and Spring Flat Road provides motorists with a level of service of 'A' during weekday morning and evening commuter peak periods, representing good conditions with spare capacity.

4.3.2 Mid-Block Road Performance

The previous traffic surveys indicate that directional traffic demands within Castlereagh Highway and Spring Flat Road are less than 280 vehicles and 30 vehicles per hour respectively during weekday commuter peak periods.

Reference is made to TfNSW's *Guide to Traffic Generating Developments* in order to undertake an assessment of the operational performance of the surrounding local road network. This publication indicates that a single lane of traffic accommodating peak hour traffic demands of less than 200 vehicles, such as that surveyed within Spring Flat Road, provides a level of service 'A'. Such a level service indicates free flow where drivers are virtually unaffected by other vehicles and have freedom to select their desired speed and to manoeuvre within the traffic stream.

The slightly higher traffic demands within Castlereagh Highway facilitates a level of service 'B'. TfNSW defines such service level as still being in the stable zone of flow whereby drivers still have reasonable freedom to select desired speed and to manoeuvre within the traffic stream.

4.4 Public Transport

4.4.1 Buses

Ogden's Coaches operates the following route in the vicinity of the site:

- Route 560 between Mudgee and Mudgee East, along Sydney Road.

Route 560 provides four weekday services between 10:00am and 4:00pm.

The closest bus stop is situated within Lions Drive, to the south of Castlereagh Highway, approximately 300m to the north of the site.

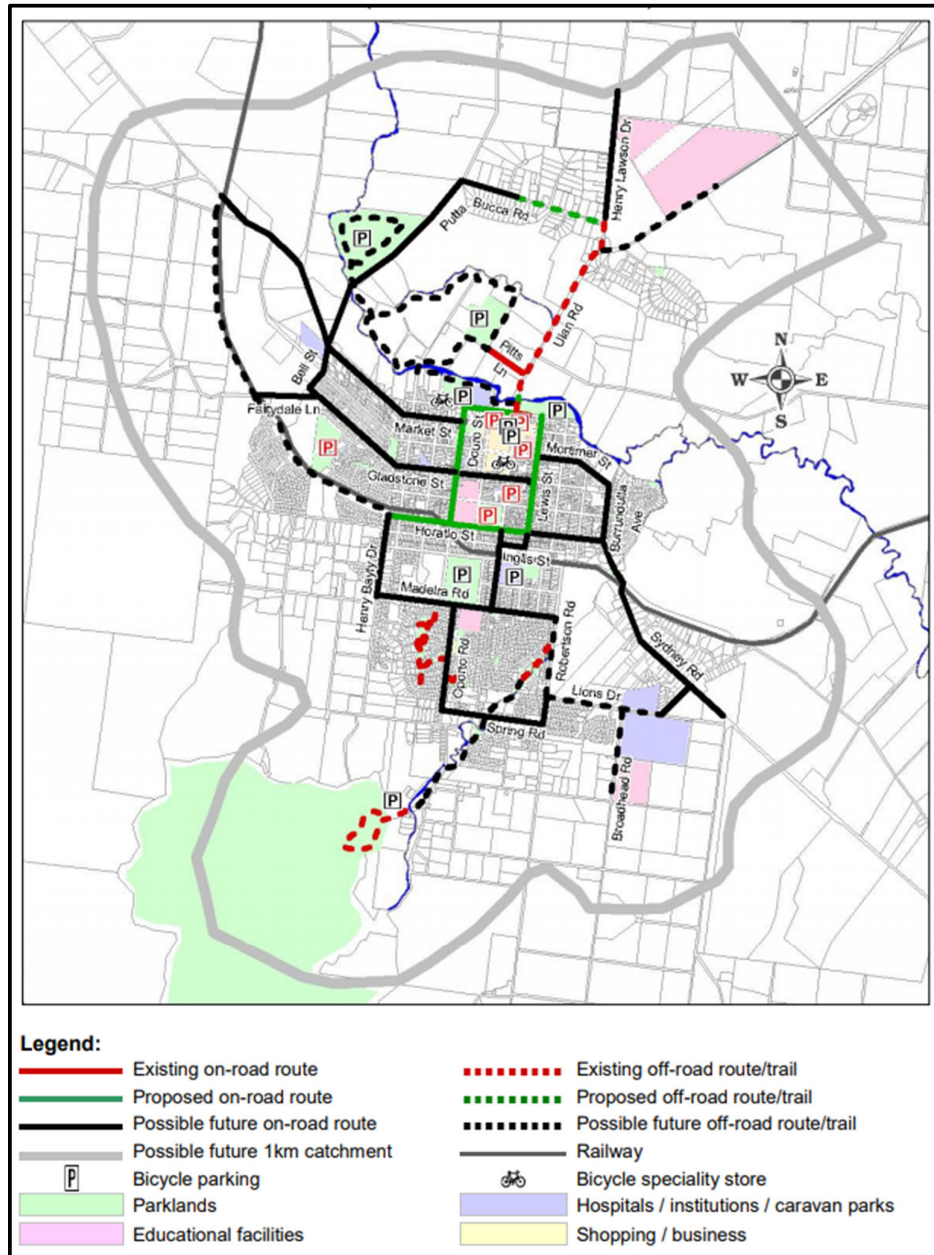
4.4.2 Pedestrians / Cyclists

Pedestrians / cyclists are provided with limited access and mobility infrastructure within the immediate vicinity of the subject site, being limited to unsealed road reserves along both sides of Spring Flat Road and Castlereagh Highway.

Notwithstanding the above, **figure 4** overleaf provides for the following planned infrastructure in the vicinity of the site:

- A possible on-road cycle route along Castlereagh Highway / Sydney Road; and
- A possible off-road cycle route / trail along Lions Drive.

FIGURE 4
PROPOSED BICYCLE NETWORK - MUDGEE



(Source: Mid-Western Regional Council's PAMP 2016)

4.5 Parking Demand

On-street parking demand within Spring Flat Road and Castlereagh Highway has been observed to be negligible.

A minor level of on-street parking demand was observed within Lions Drive, in the immediate vicinity of Castlereagh Road, associated with the abutting commercial / industrial developments.

5. PROJECTED TRAFFIC CONDITIONS

5.1 Traffic Generation

5.1.1 Approved Development

It has previously been presented that the most recent consent (MA0001/2018) involves the provision of 206 self-care seniors living dwellings.

Traffic generation rates for various land-uses have been established through extensive surveys undertaken throughout NSW and published within TfNSW's *Guide to Traffic Generating Developments* and *Guide to Traffic Generating Developments Updated Traffic Surveys Technical Direction TDT 2013/04a*. TfNSW's *Technical Direction TDT 2013/04a* specifies the following average peak hour traffic generation rates for housing for seniors:

Weekday peak hour vehicle trips = 0.4 per dwelling.

Based on the above traffic generation rates and the approved development comprising of 206 dwellings, the following calculation is provided:

$206 \times 0.4 = 82.4$ (adopt 83) trips

The approved development within the subject site therefore provides a traffic generating potential of 83 peak hour vehicle trips.

5.1.2 Proposed Development

The Development Application seeks consent for the establishment of a manufactured housing estate within the subject site, containing 206 dwelling sites, intended for the occupation of seniors.

Based on the previously presented seniors living traffic generation rates and the proposed development comprising 206 dwellings, a traffic generating potential of 83 peak hour vehicle trips is retained for the proposed development.

5.2 Trip Distribution and Projected Traffic Volumes

The proposed development has been projected to generate up to 83 hourly vehicle movements to and from the site. The seniors nature of the development is such that the abovementioned peak site generation periods don't necessarily coincide with the adjoining public road network commuter peak periods, particularly during the weekday morning peak period.

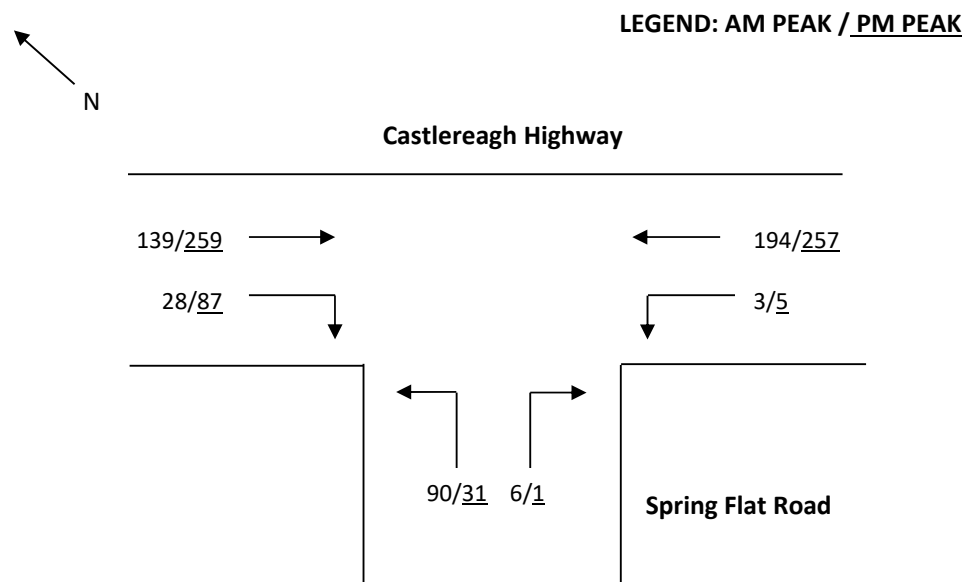
Whilst peak traffic generation periods of the proposed development are unlikely to coincide with the public road network morning peak period of between 8:00 – 9:00am, in order to generate a worst-case scenario, this has been assumed for the purposes of this assessment. The development generated trips are likely to primarily comprise egress movements during the morning peak periods and ingress movements during the evening periods. In this regard, the development

is therefore projected to generate 16 ingress and 67 egress movements during the morning peak hour and 67 ingress and 16 egress movements during the evening peak hour.

A significant majority (95%) of the abovementioned trips are expected to travel between the site and Mudgee town centre, thereby travelling via Castlereagh Highway to the north-west of the site. The remaining (5%) of trips are expected to travel to / from destinations from / to the south-east via Castlereagh Highway.

The projected peak hour traffic volumes at the Spring Flat Road intersection with Castlereagh Highway have been formulated by adding the abovementioned traffic generation and trip assignment to the existing demands presented within **Figure 3**. **Figure 5** provides an estimation of the future traffic demands at the nearby public road intersection.

FIGURE 5
PROJECTED WEEKDAY COMMUTER PEAK HOUR TRAFFIC VOLUMES
JUNCTION OF CASTLREAGH HIGHWAY AND SPRING FLAT ROAD



5.3 Traffic Impacts

5.3.1 Projected Intersection Performance

The junction of Castlereagh Highway and Spring Flat Road has been modelled in order to estimate the likely impact on traffic safety and efficiency utilising the projected traffic volumes illustrated within **Figure 5**. A summary of the most pertinent results are indicated within **Table 5** overleaf whilst more detailed summaries are provided within **Appendix 3**.

TABLE 5				
SIDRA OUTPUT – WEEKDAY PEAK HOUR PERFORMANCE				
JUNCTION OF CASTLEREAGH HIGHWAY & SPRING FLAT ROAD				
	Existing Conditions		Projected Conditions	
	AM	PM	AM	PM
Spring Flat Road				
Delay	7.7	9.4	8.0	10.2
Degree of Saturation	0.02	0.01	0.08	0.03
Level of Service	A	A	A	A
Castlereagh Road (East)				
Delay	5.6	5.6	5.6	5.6
Degree of Saturation	0.10	0.14	0.10	0.14
Level of Service	A	A	A	A
Castlereagh Road (West)				
Delay	6.1	6.4	6.1	6.4
Degree of Saturation	0.07	0.14	0.07	0.14
Level of Service	A	A	A	A
Total Intersection				
Delay	7.7	9.4	8.0	10.2
Degree of Saturation	0.10	0.14	0.10	0.14
Level of Service	A	A	A	A

Table 5 indicates that the additional traffic generated by the proposed development is not projected to have noticeable impacts on the operation of the Spring Flat Road junction with Castlereagh Highway, with only minor alterations projected with respect to delay and degree of saturation. In this regard, the current intersection level of service is projected to remain unaltered, representing acceptable operation with spare capacity.

5.3.2 Overall Road Network Performance

The proposed development has been assessed to generate up to 83 additional peak hour trips to and from the site. This equates to less than two vehicle movements every minute during peak hours. Such a level of additional traffic is not projected to, in itself, result in any unreasonable impacts on the existing operational performance of the surrounding local road network.

The previous assessment contained within this report has revealed that traffic demands within the surrounding local road network are reasonably low. Whilst it is acknowledged that the adjoining Mudgee Growth Area is in the process of redevelopment, which is expected to generate additional traffic demands to / from the precinct, the surrounding road network has however been assessed to provide notable capacity to accommodate additional traffic demands in a safe and efficient manner.

Further to the above, it should be acknowledged that the expected traffic generating capacity of the proposed development is significantly comparable to that previously approved for the subject site. The proposed development is accordingly not expected to result in any measurable impacts over and above that previously assessed and approved.

In consideration of the above, the impact of the development is most likely to be a result of the safety and efficiency with which motorists are capable of entering and exiting the development. The low traffic demands within Spring Flat Road combined with the good sight distance provisions is such that it is envisaged that motorists will be capable of entering and exiting the site in a safe and efficient manner. Further, and as previously presented, it is expected that the previously approved upgrading measures within Spring Flat Road (comprising a widening of the existing road pavement to 8m and the provision of a footpath along the site frontage and extending to the north towards Castlereagh Highway), will continue to apply to the subject application.

5.5 Transport Impacts

The subject site is located within walking distance of bus services along Lions Drive. It is accordingly expected that a portion of the future residents within the subject development will utilise the surrounding public transport infrastructure to access local and regional destinations throughout the area. The capacity of the existing public transport system is however not envisaged to be measurably affected by any additional demand associated with the development, given its limited scale.

6. CONCLUSION

This report assesses the potential traffic and parking implications associated with a proposal the establishment of a manufactured housing estate within a parcel of land providing a primary frontage to Spring Flat Road, Mudgee. Based on this assessment, the following conclusions are now made:

- The housing estate is to be developed in stages to accommodate a total of 206 dwelling sites to be occupied by seniors, in conjunction with a community centre and recreation facilities;
- It is expected that the previously approved upgrading measures within Spring Flat Road (comprising a widening of the existing road pavement to 8m and the provision of a footpath along the site frontage and extending to the north towards Castlereagh Highway), will continue to apply to the subject application;
- The estate is proposed to be serviced by an internal road network, connecting with Spring Flat Road via a single access driveway, approximately 300m to the south of the junction of Spring Flat Road and Castlereagh Highway;
- The proposed site access arrangements are considerably consistent with that approved and projected to result in motorists being capable of entering and exiting the subject site in a safe and efficient manner;
- The proposed visitor parking provision is considered to be satisfactory with respect to the relevant requirements of *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Movable Dwellings) Regulation 2005*;
- The dwelling sites are capable of accommodating adequate resident parking provision in accordance with the relevant requirements of DCP 2013;
- The internal vehicle circulation arrangements are capable of providing for safe and efficient internal manoeuvring;
- The surrounding road network operates with a good level of service during peak periods;
- The subject development has been assessed to generate up to 83 additional peak hour vehicle trips to and from the subject site, being consistent with that previously approved for the subject site; and
- It is considered that the adjoining road network is capable of accommodating the traffic projected to be generated by the subject development.

Based on the contents of this report and the conclusions contained herein, the following recommendations are made:

- Three visitor spaces be specifically allocated to disabled persons and designed in accordance with AS2890.6:2009; and
- Temporary turning heads be provided within each development stage to ensure waste collection vehicles can manoeuvre throughout the development as the internal road network is provided.

Incorporating the above recommendations, there are no traffic or parking related issues that should prevent approval of the subject application.

APPENDIX 1

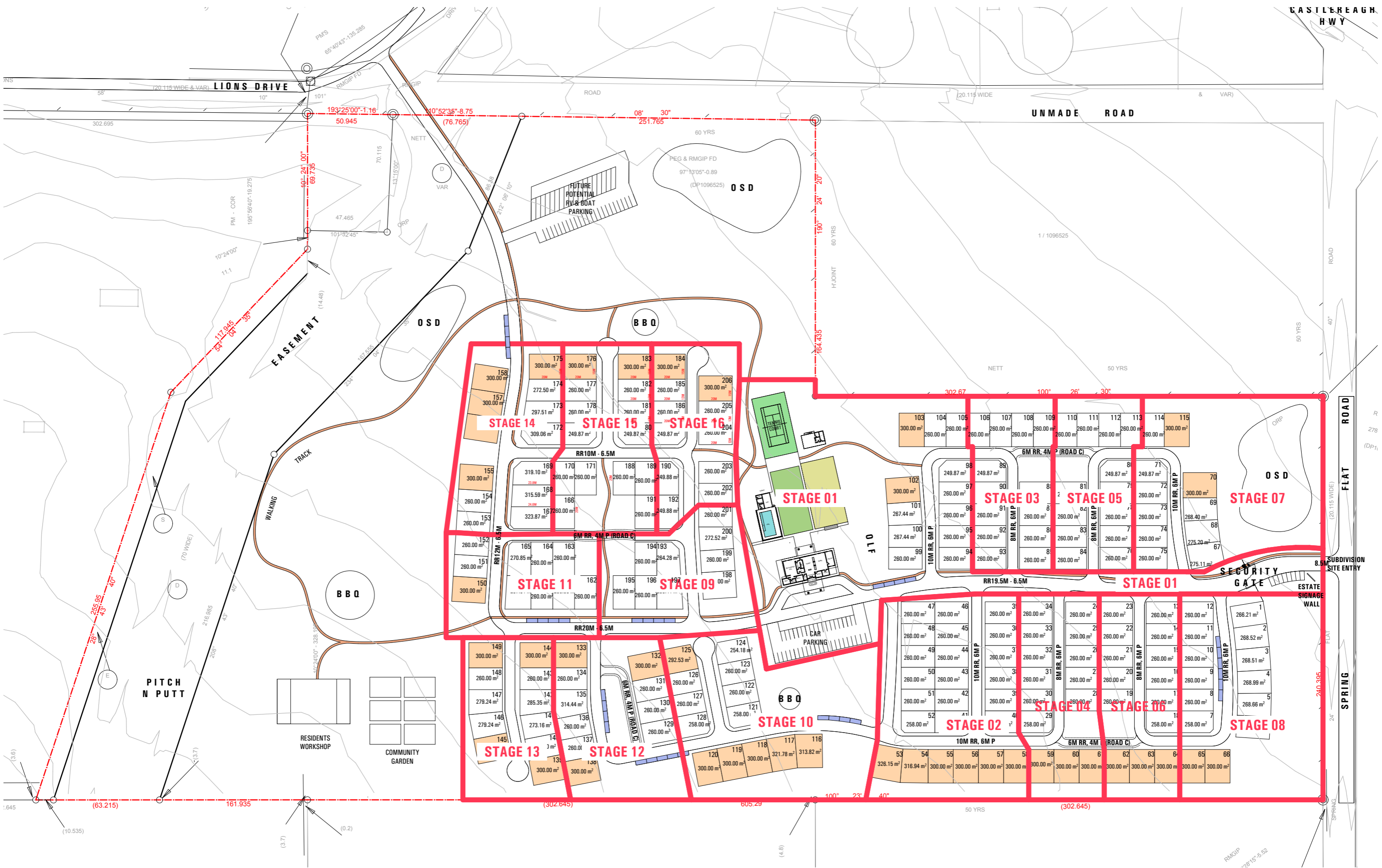


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LEGEND	DESCRIPTION
	15M X 20M LOTS
	13M X 20M LOTS
	OVERLAND FLOW
	PROPOSED TREE
	RAISED PLATFORM SPEED RESTRICTION
	KERB PARKING TOTAL 35 SPACES
XXM RR, XXM P	RR = ROAD RESERVE, P = PAVEMENT
TOTAL: 206 LOTS	

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 1:1,000 @ A1
 project no 2_21_07 drawing no A0002 issue C drawing
 MUDGEE
 MASTER PLAN



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LEGEND

15M X 20M LOTS

13M X 20M LOTS

TOTAL: 206 LOTS

XXM RR, XXM P RR = ROAD RESERVE, P = PAVEMENT

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 1:1,000 @ A1 MUDGEE

project no 2_21_07 drawing no A0003 issue C drawing STAGING PLAN



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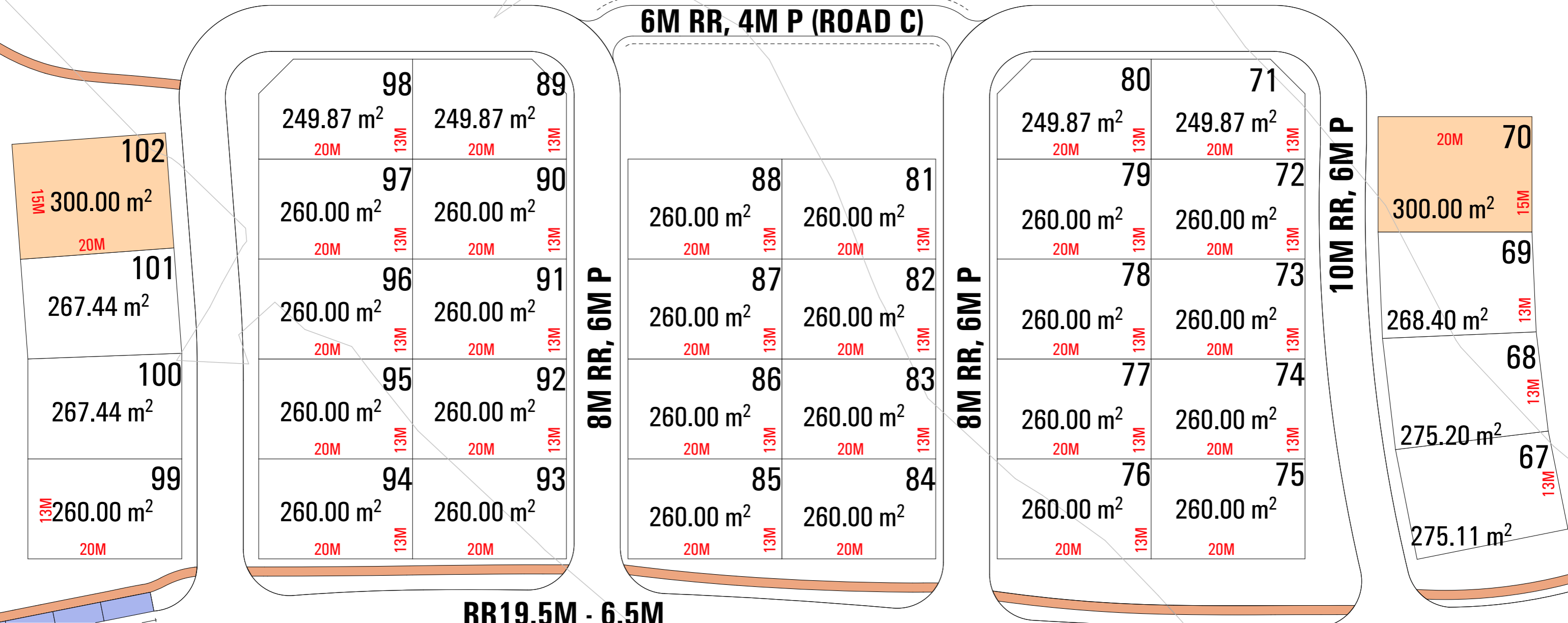
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- 15M X 20M LOTS
- 13M X 20M LOTS
- TOTAL: 206 LOTS
- XXM RR, XXM P RR = ROAD RESERVE, P = PAVEMENT
- TYPICAL ROAD REFUSE TRUCK ROUTE
- BIN COLLECTION KERB HARDSTAND

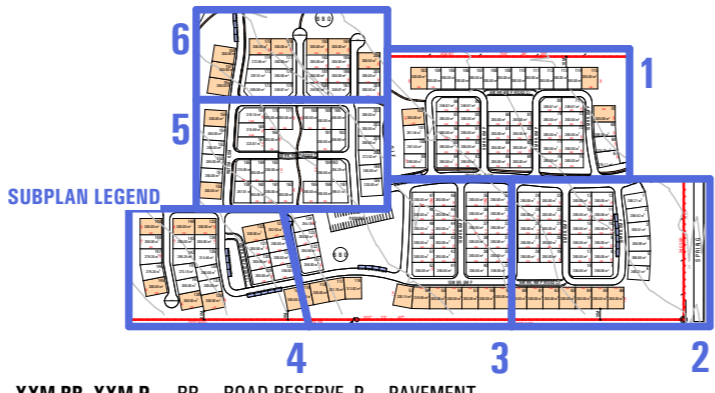
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 project no 2_21_07 drawing no A0004 issue C drawing
 MUDGEE
 REFUSE PLAN

103	104	105	106	107	108	109	110	111	112	113	114	115
300.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	260.00 m ²	300.00 m ²
15M	13M											15M



SUBPLAN 1



ISSUE	AMENDMENT	DATE	ISSUE	AMENDMENT	DATE
A	ISSUE A	11.03.2021			
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LEGEND

	15M X 20M LOTS
	13M X 20M LOTS

TOTAL: 206 LOTS

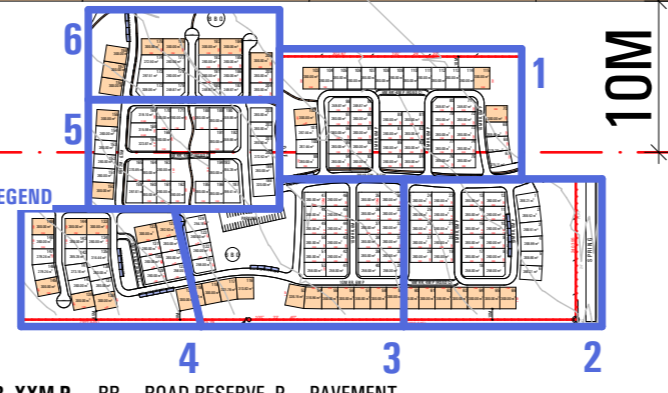
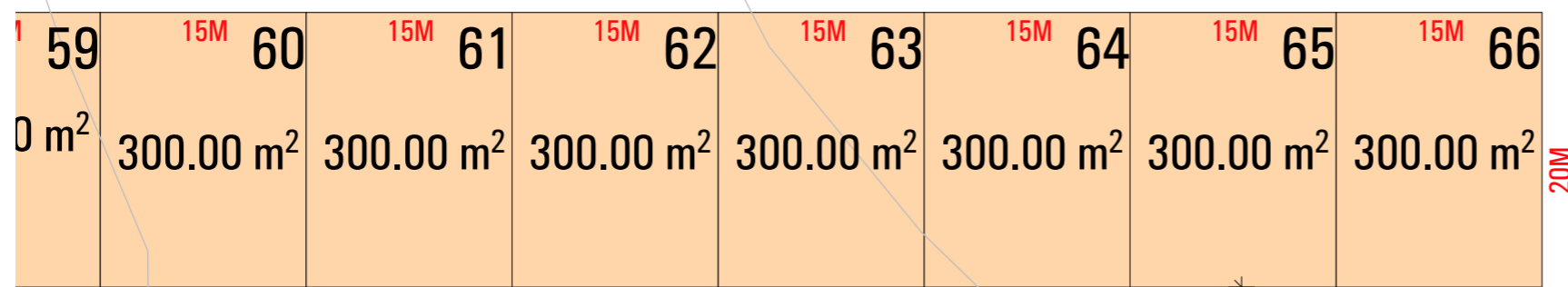
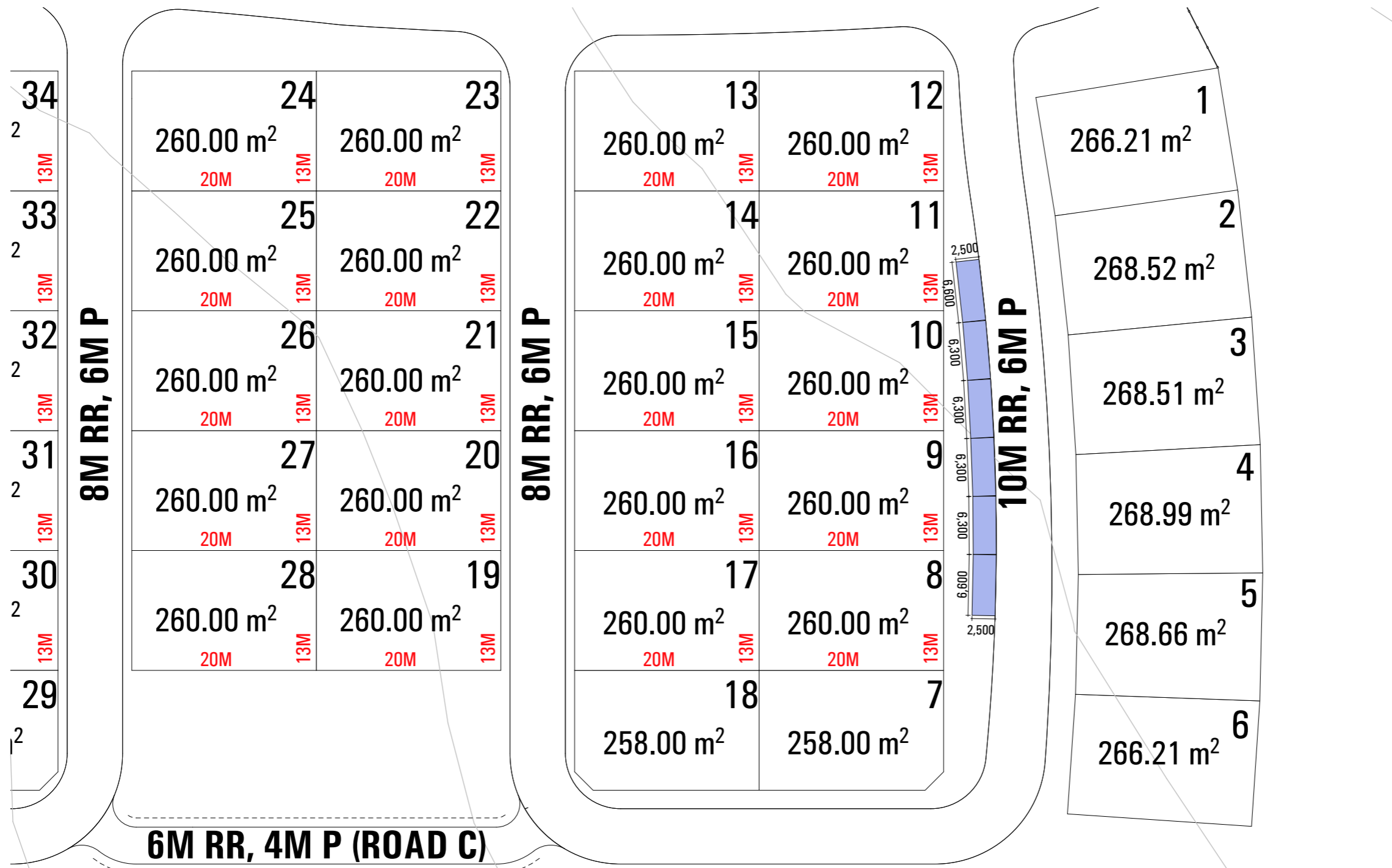
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SUBPLAN 2

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	13M X 20M LOTS

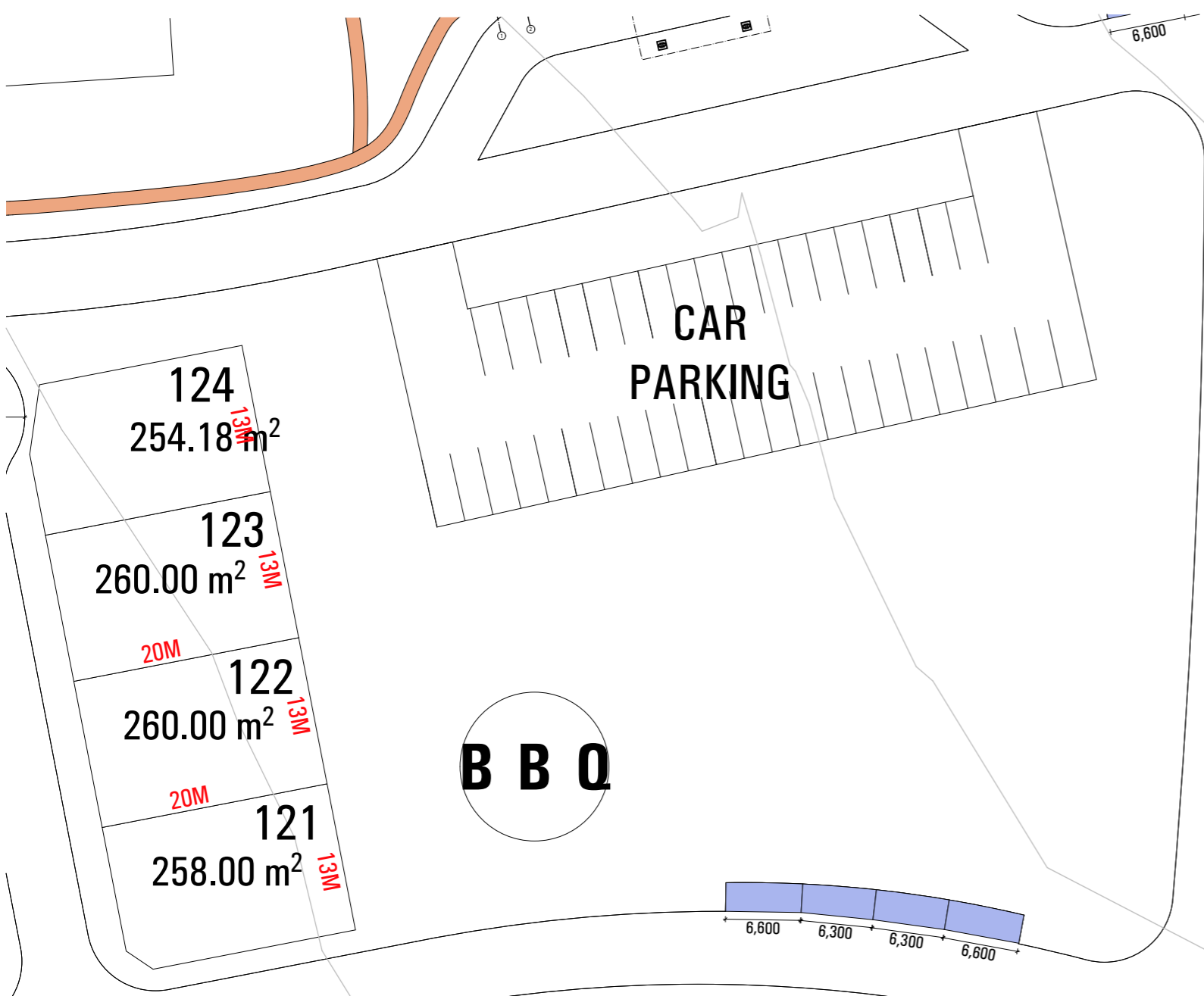
TOTAL: 206 LOTS

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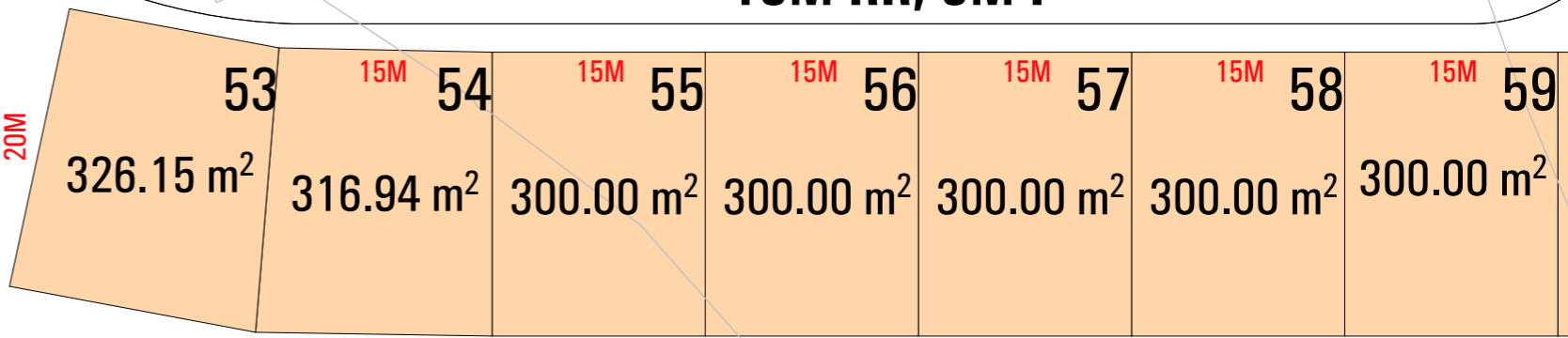
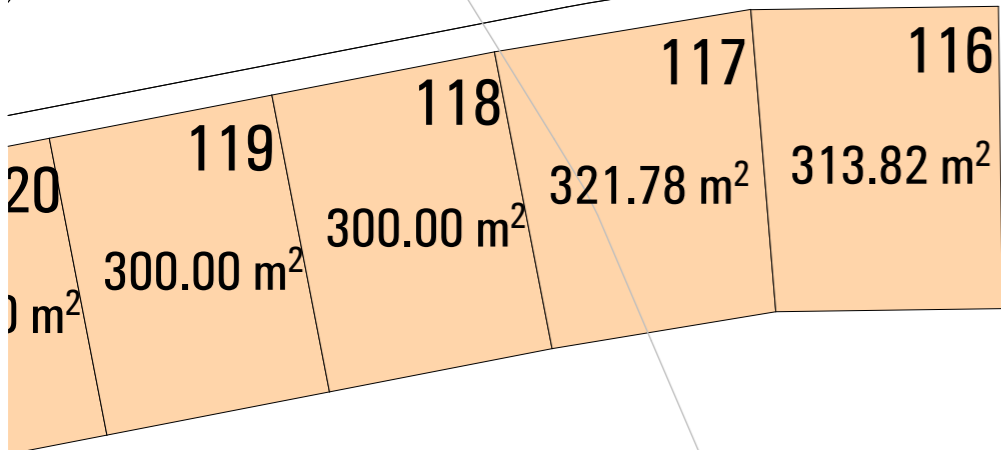
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260.00 m ² 20M 13M	47	260.00 m ² 20M 13M	46
260.00 m ² 20M 13M	48	260.00 m ² 20M 13M	45
260.00 m ² 20M 13M	49	260.00 m ² 20M 13M	44
260.00 m ² 20M 13M	50	260.00 m ² 20M 13M	43
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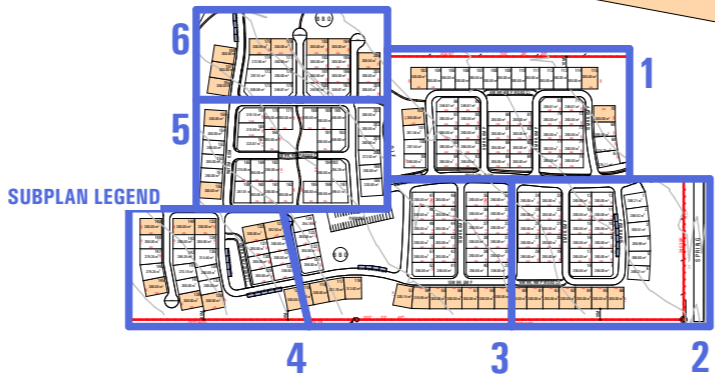
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260.00 m ² 20M 13M	39	260.00 m ² 20M 13M	30
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10M RR, 6M P



10M RR, 6M P

SUBPLAN 3



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	13M X 20M LOTS

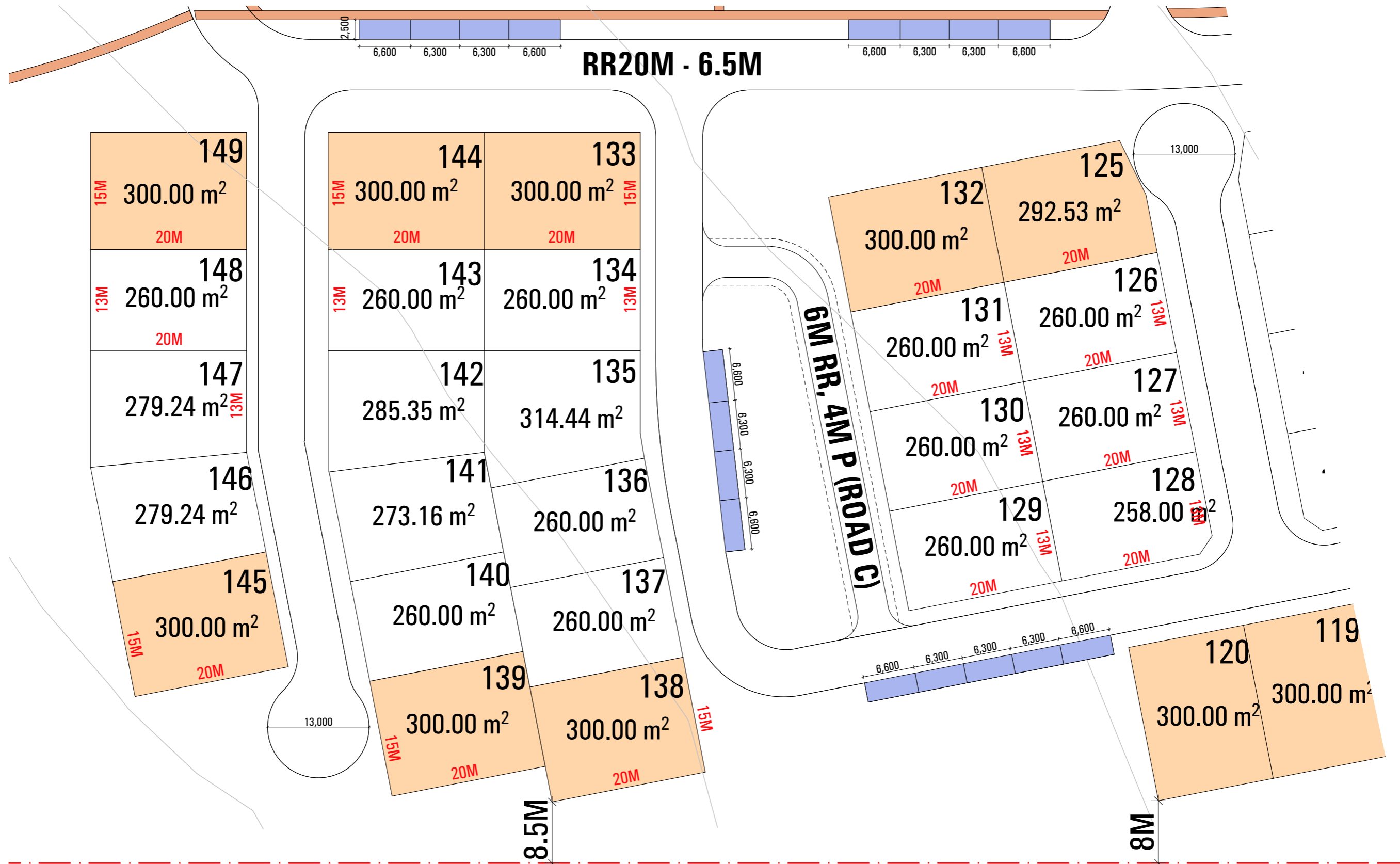
TOTAL: 206 LOTS

XXM RR, XXM P RR - ROAD RESERVE, P - PAVEMENT

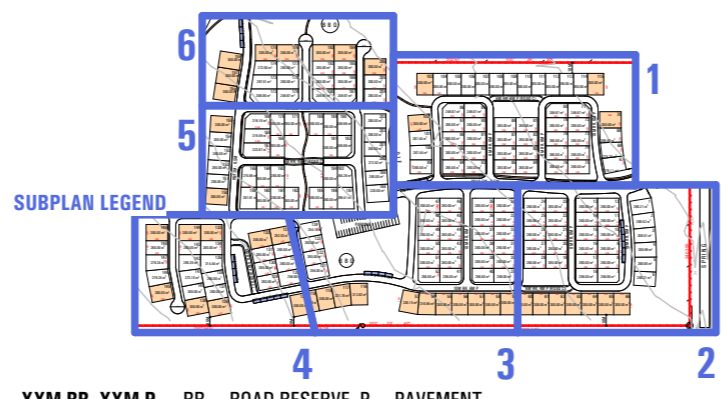
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SUBPLAN 4



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C	ISSUE C	W.I.P.

ISSUE	AMENDMENT	DATE

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15M X 20M LOTS

13M X 20M LOTS

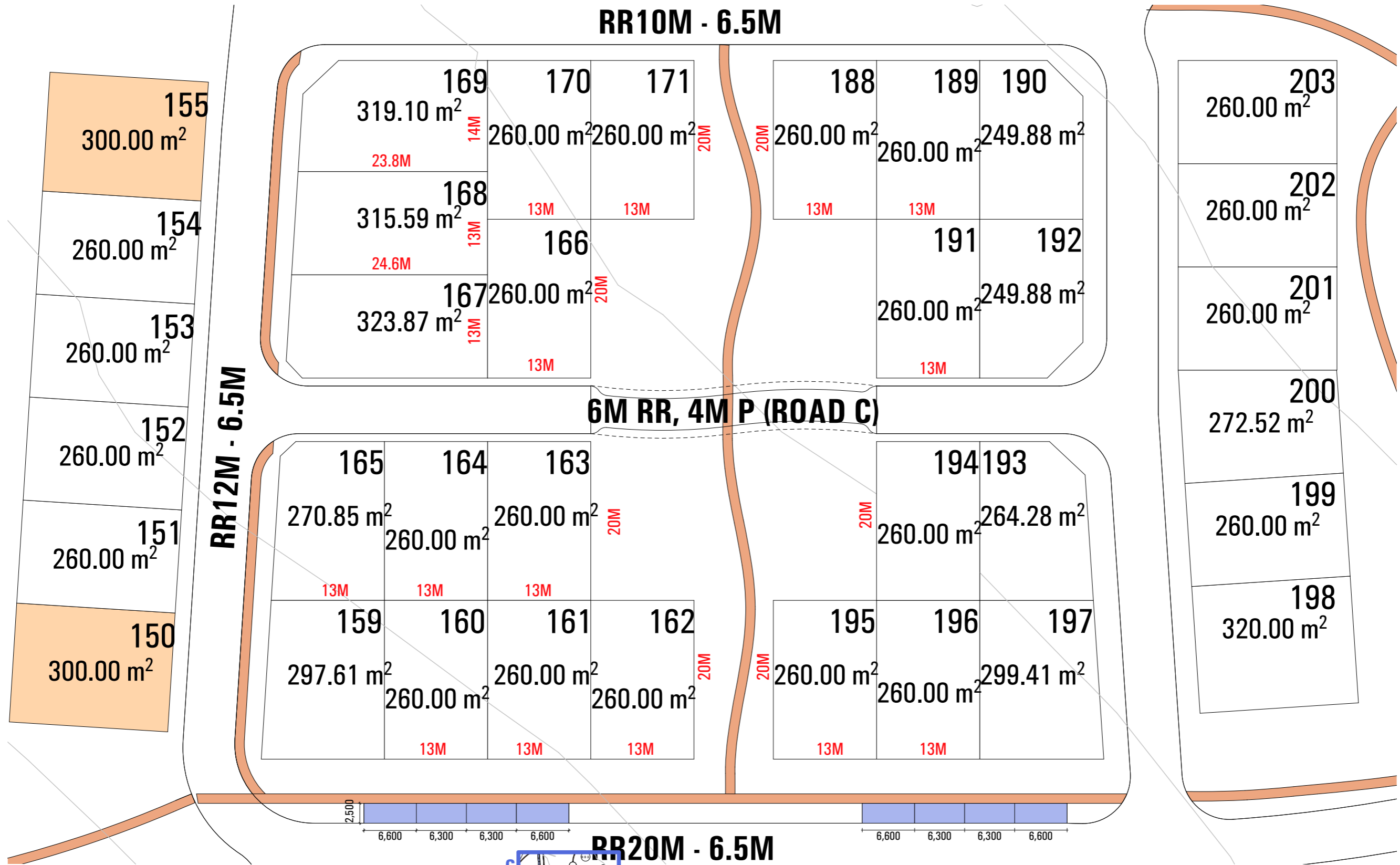
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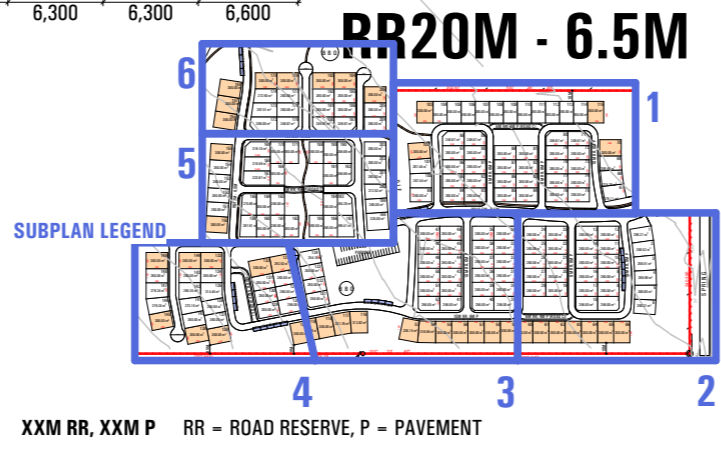
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SUBPLAN 5



LEGEND

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TOTAL: 206 LOTS	

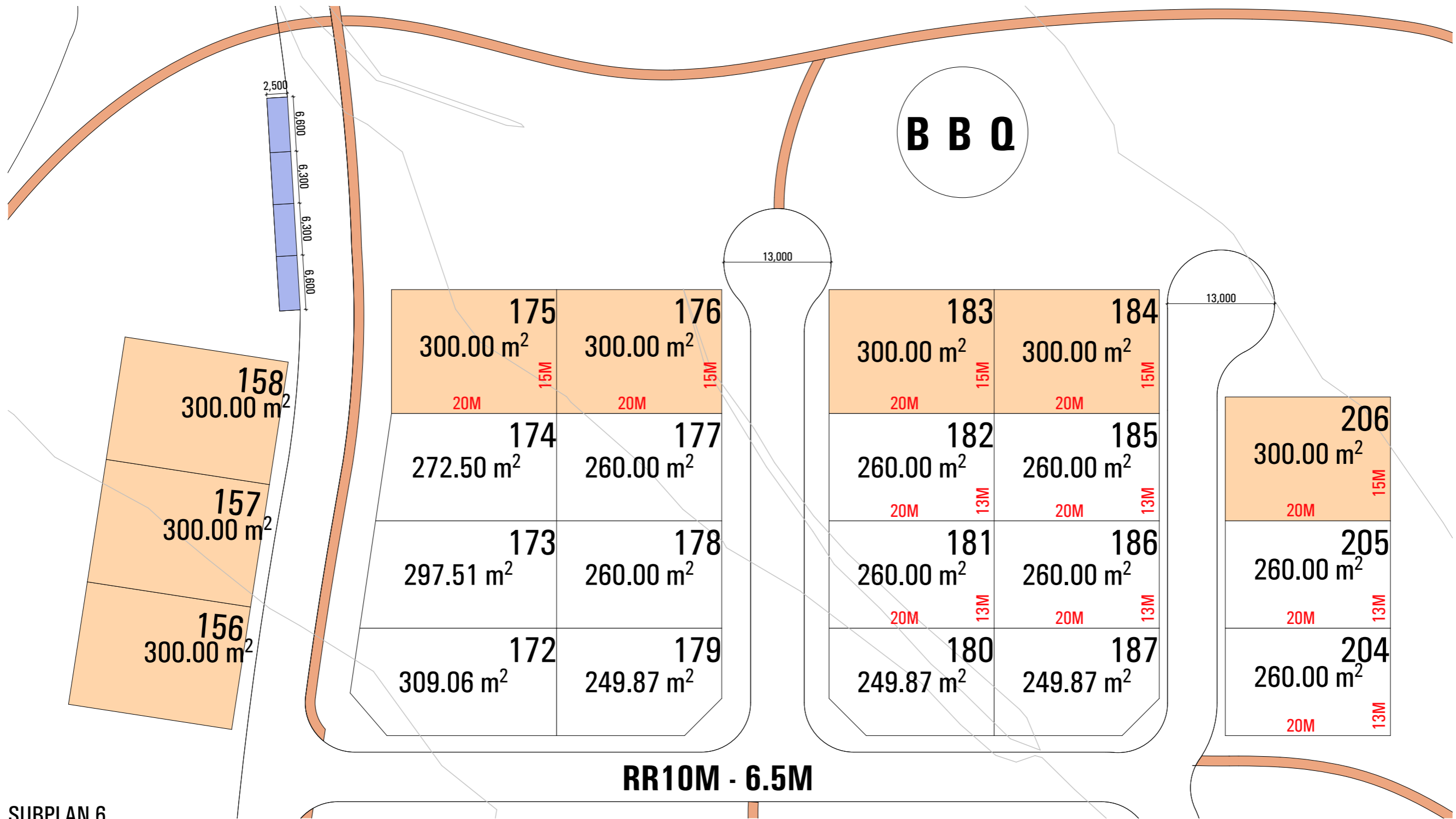
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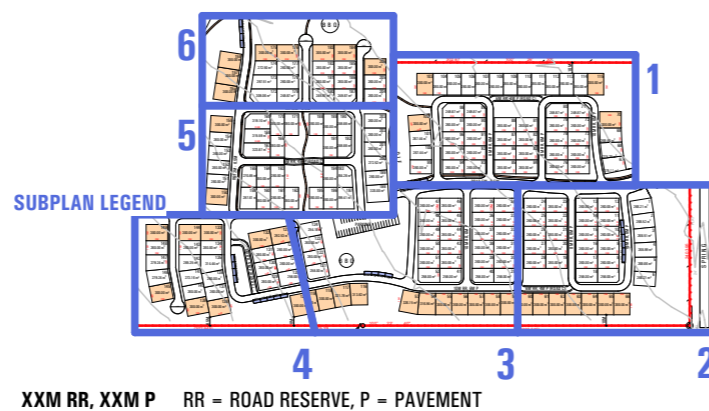
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 drawing DIMENSION MASTER PLAN 5/6



SUBPLAN 6



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project no 2_21_07	drawing no A0010	issue C	drawing DIMENSION MASTER PLAN 6/6



MASTER PLAN COMMUNITY CENTRE
1:500

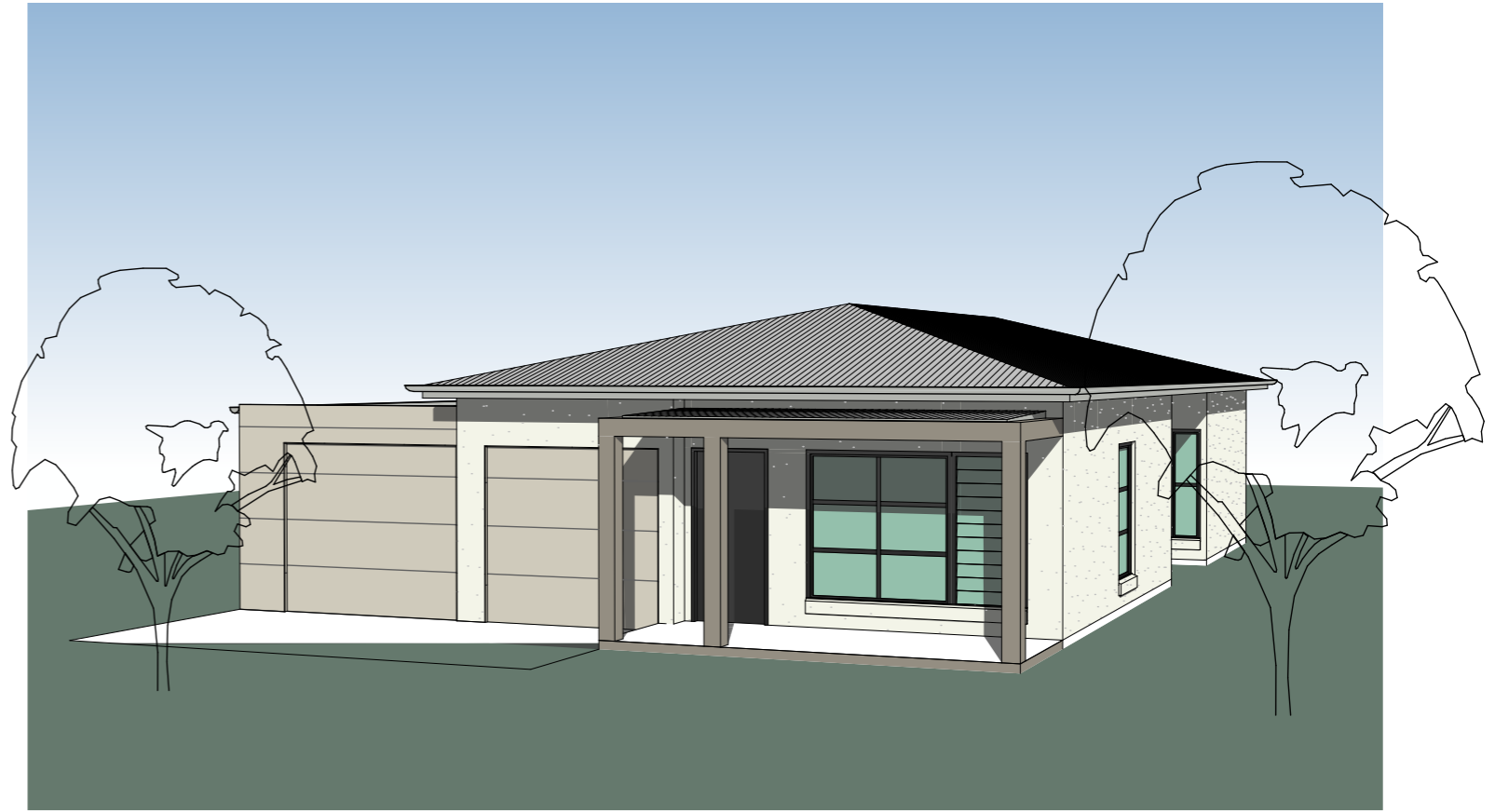
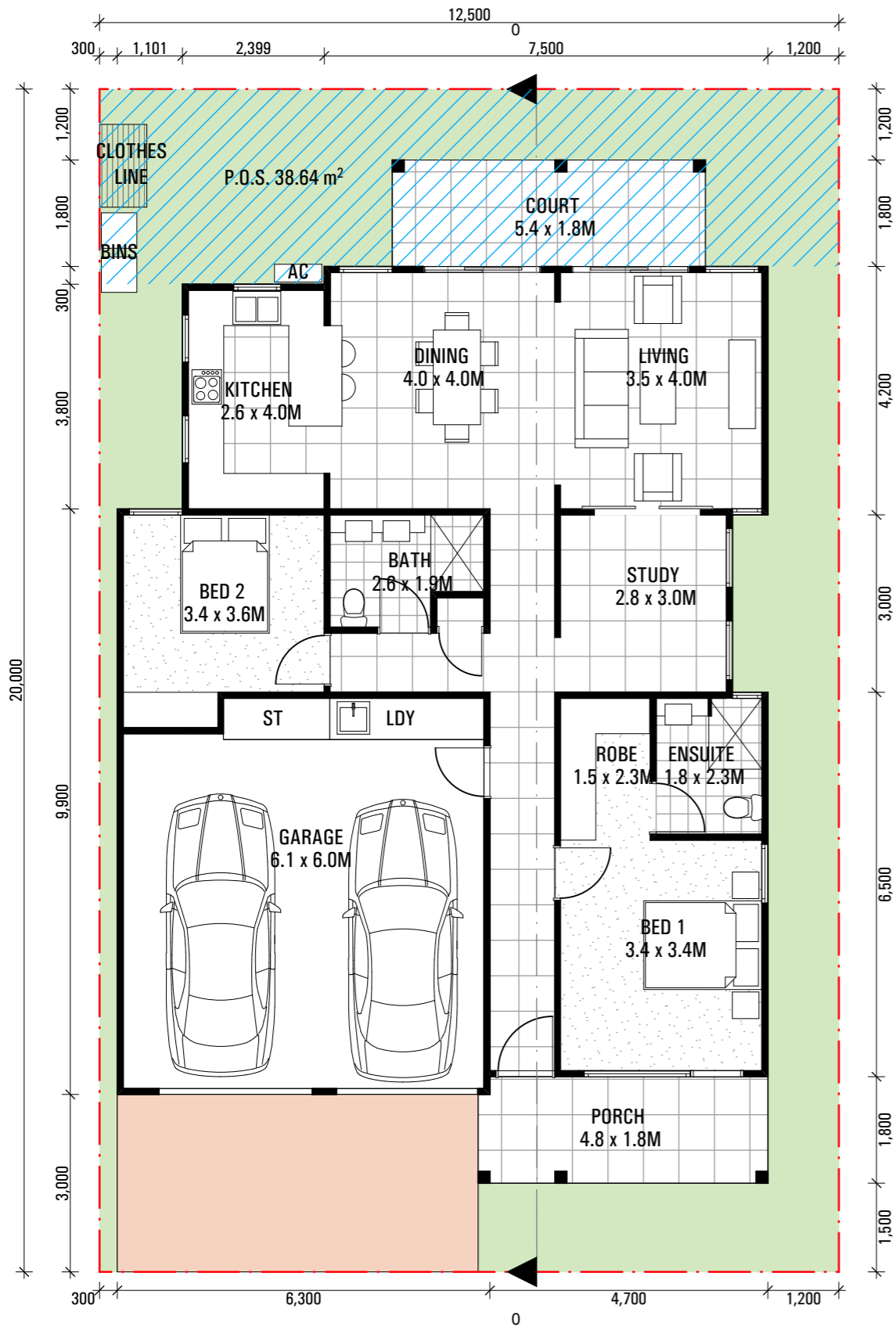
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project no 2_21_07	drawing no A1100	issue C	drawing MASTER PLAN - COMMUNITY CENTRE




TYPE A1

1 STOREY
2 BED + STUDY
2 BATH
DOUBLE GARAGE

AREAS

DWELLING AREA: 103.59 m²
GARAGE: 38.16 m²
EXTERNAL COVERED AREA: 18.29 m²
TOTAL = 160.04 m²

 P.O.S. 38.64 m²

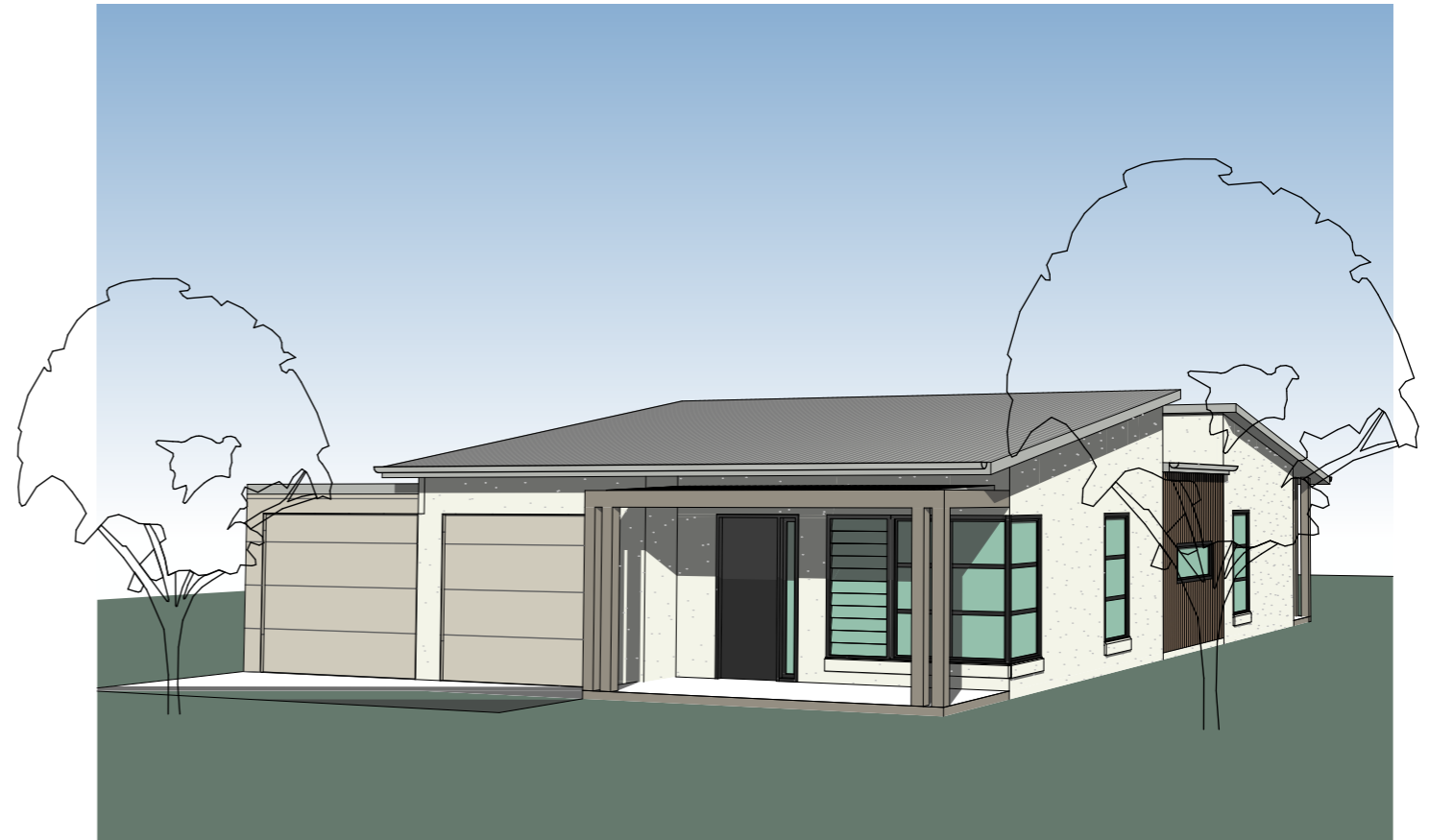
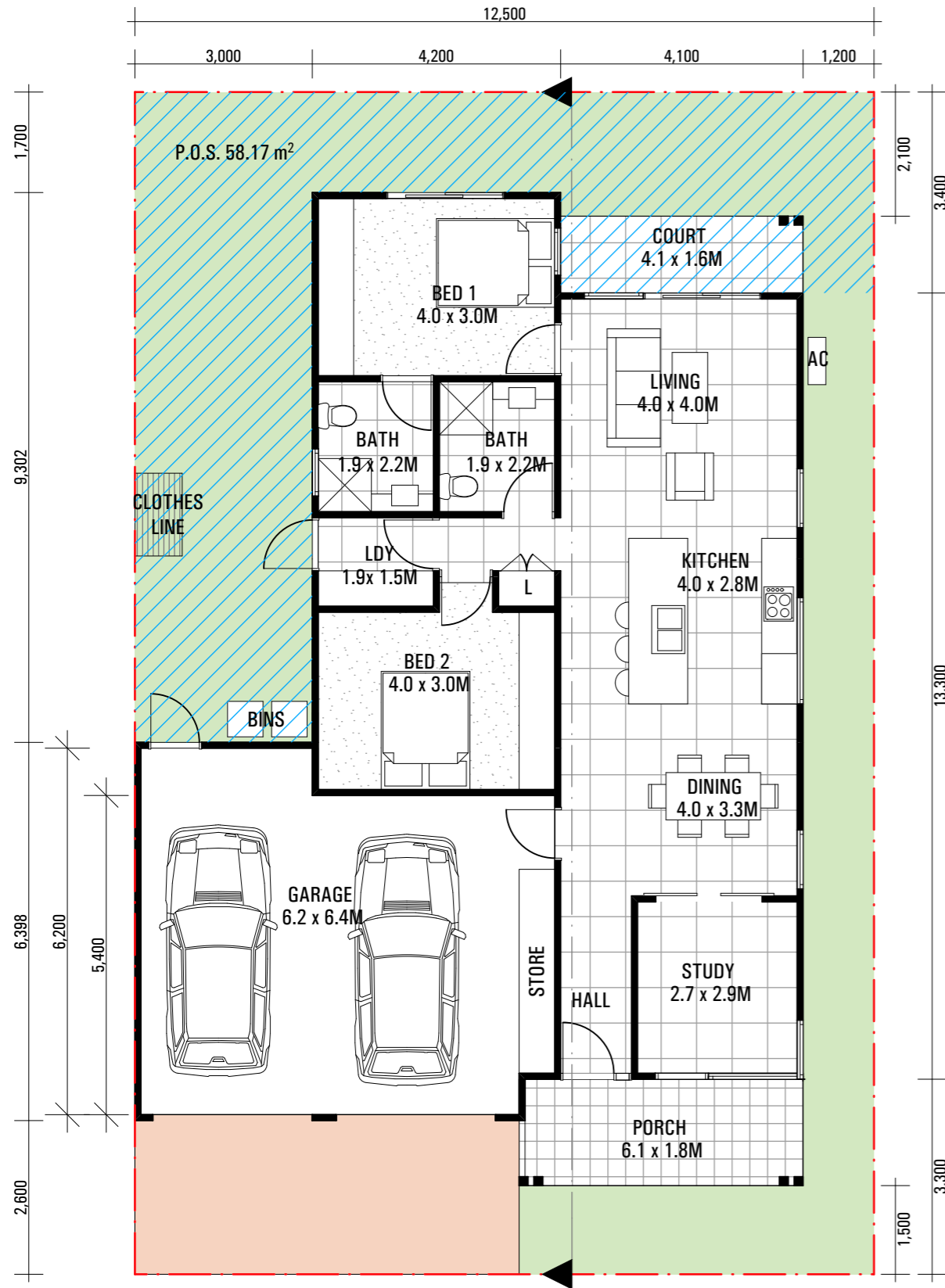
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 project no 2_21_07 drawing no AA2000 issue C drawing
 MUDGEE
 HOUSE TYPE A1



TYPE B1

- 1 STOREY
- 2 BED + STUDY
- 2 BATH
- DOUBLE GARAGE

AREAS

- DWELLING AREA: 94.11 m²
- GARAGE: 39.78 m²
- EXTERNAL COVERED AREA: 13.79 m²
- TOTAL = 147.68 m²

P.O.S. 58.17 m²

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C	ISSUE C	W.I.P.			

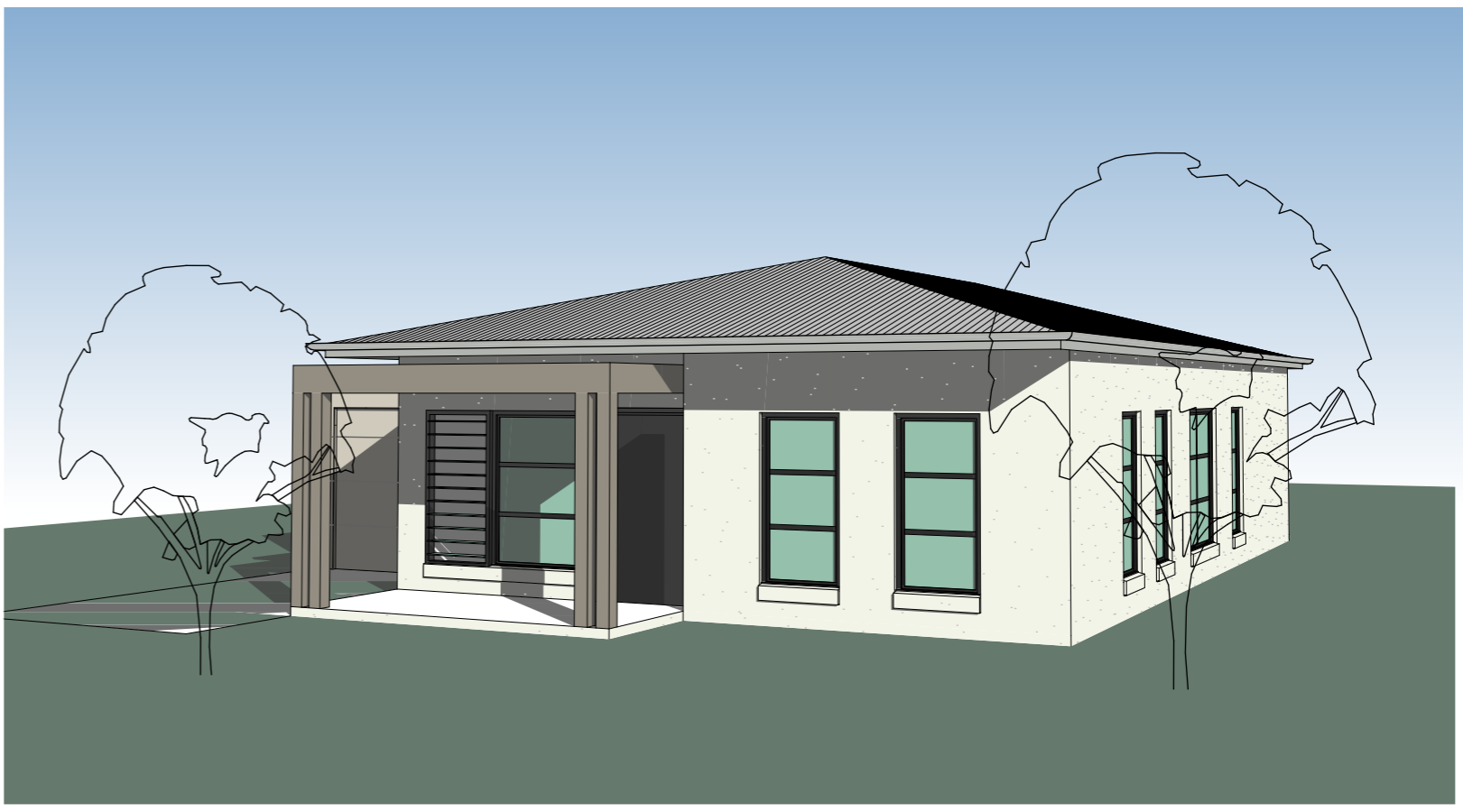
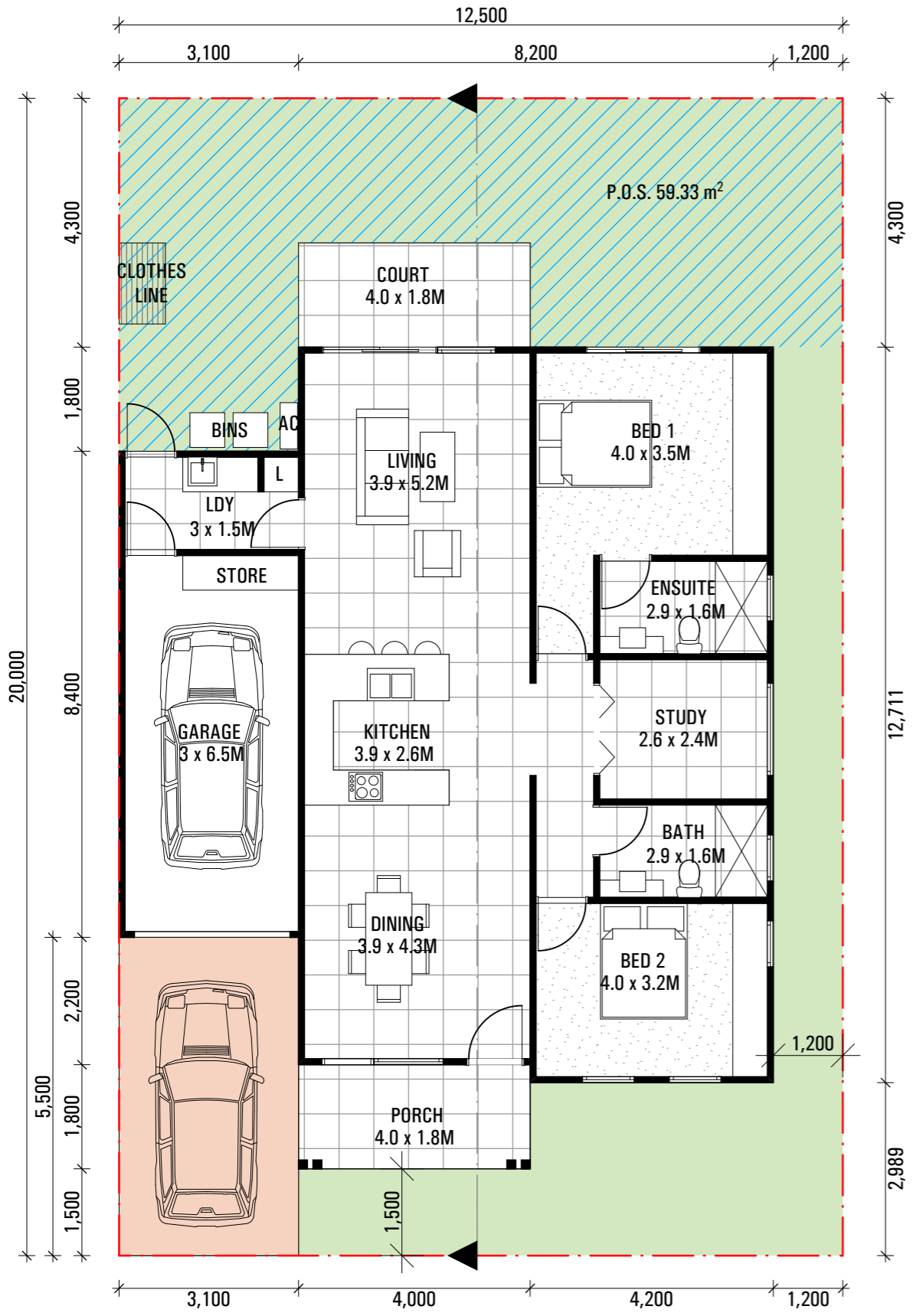
Do not scale drawings
Verify all dimensions on site

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drawn GF/EH	checked MA/RP	project	SITE ADDRESS
date 25.05.2021	scale 1:100 @ A3		MUDGE
project no 2_21_07	drawing no AB2000	issue C	drawing

HOUSE TYPE B1



TYPE C1

- 1 STOREY
- 2 BED + STUDY
- 2 BATH
- SINGLE GARAGE

AREAS

- DWELLING AREA: 103.81M²
- GARAGE: 19.50M²
- EXTERNAL COVERED AREA: 7.2M²
- TOTAL = 130.51M²

NOMINAL POS 30M²

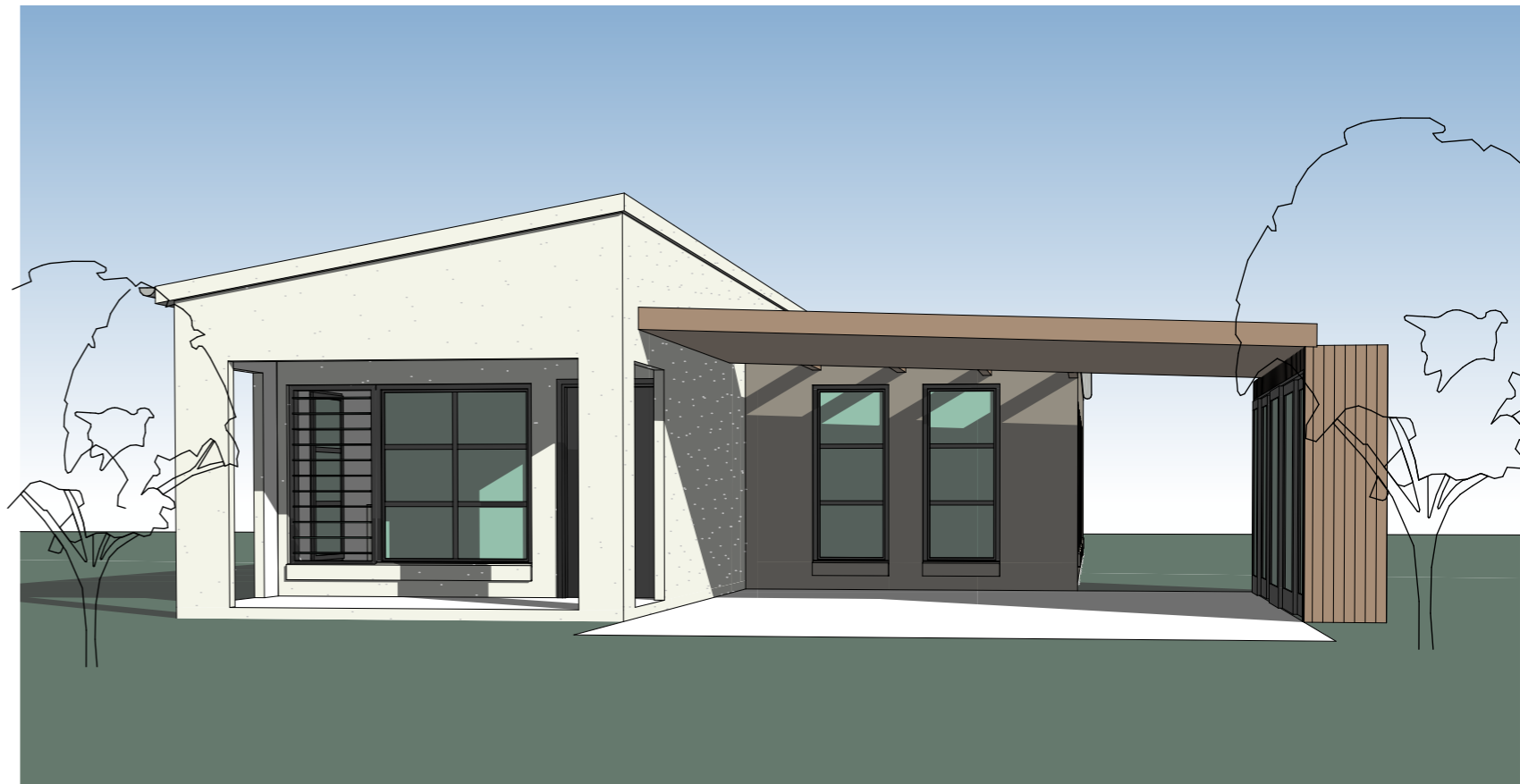
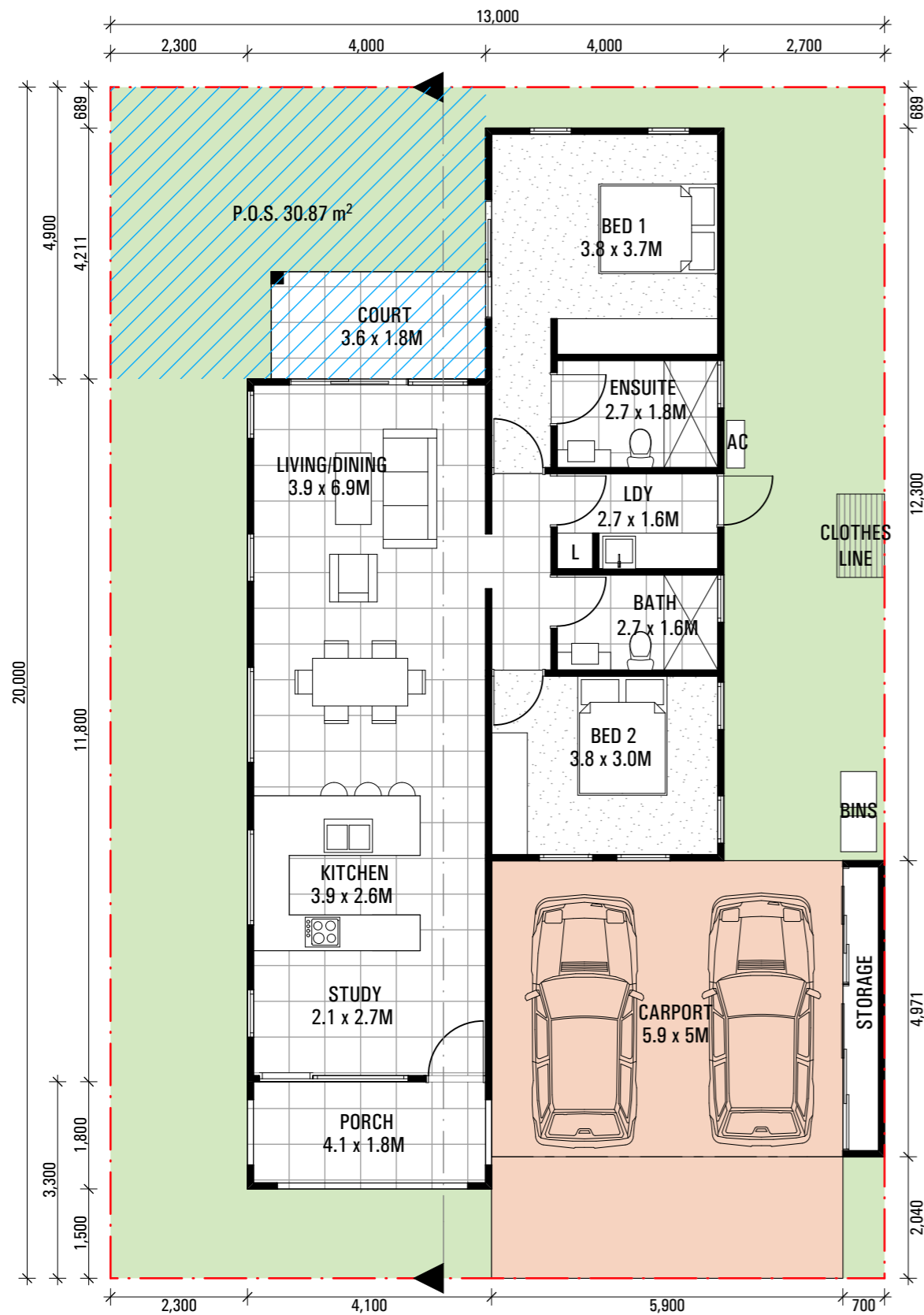
ISSUE	AMENDMENT	DATE	ISSUE	AMENDMENT	DATE
A	ISSUE A	11.03.2021			
B	ISSUE B	17.05.2021			
C	ISSUE C	W.I.P.			

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drawn GF/EH	checked MA/RP	project	SITE ADDRESS
date 25.05.2021	scale 1:100 @ A3		MUDGE
project no 2_21_07	drawing no AC2000	issue C	drawing
			HOUSE TYPE C1



TYPE D1

1 STOREY
 2 BED + STUDY
 2 BATH
 CARPORT

AREAS

DWELLING AREA: 92.01 m²
 CARPORT: 29.33 m²
 EXTERNAL COVERED AREA: 13.11 m²
 TOTAL = 134.45 m²

P.O.S. 30.87 m²

ISSUE	AMENDMENT	DATE	ISSUE	AMENDMENT	DATE
A	ISSUE A	11.03.2021			
B	ISSUE B	17.05.2021			
C	ISSUE C	W.I.P.			

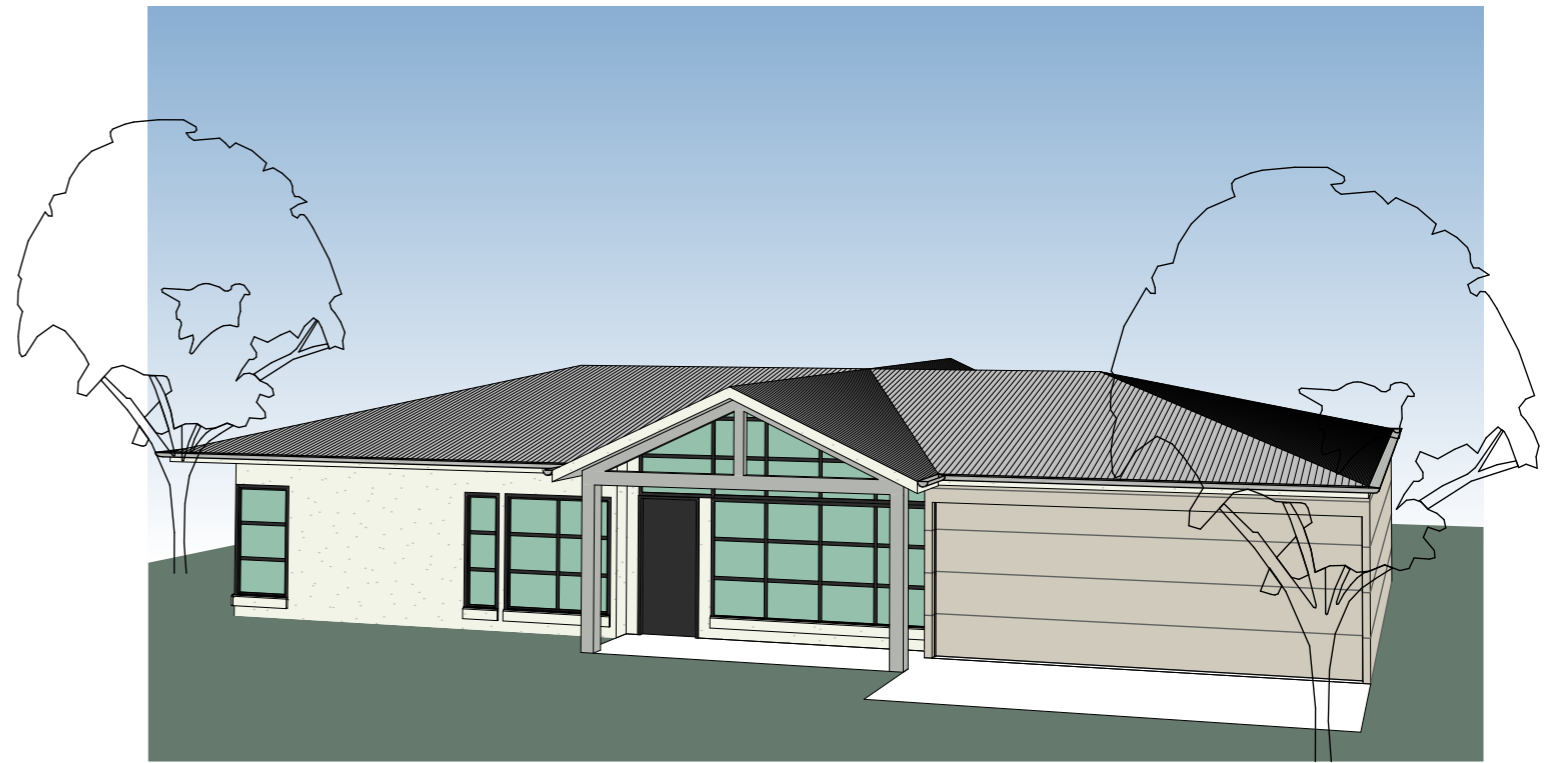
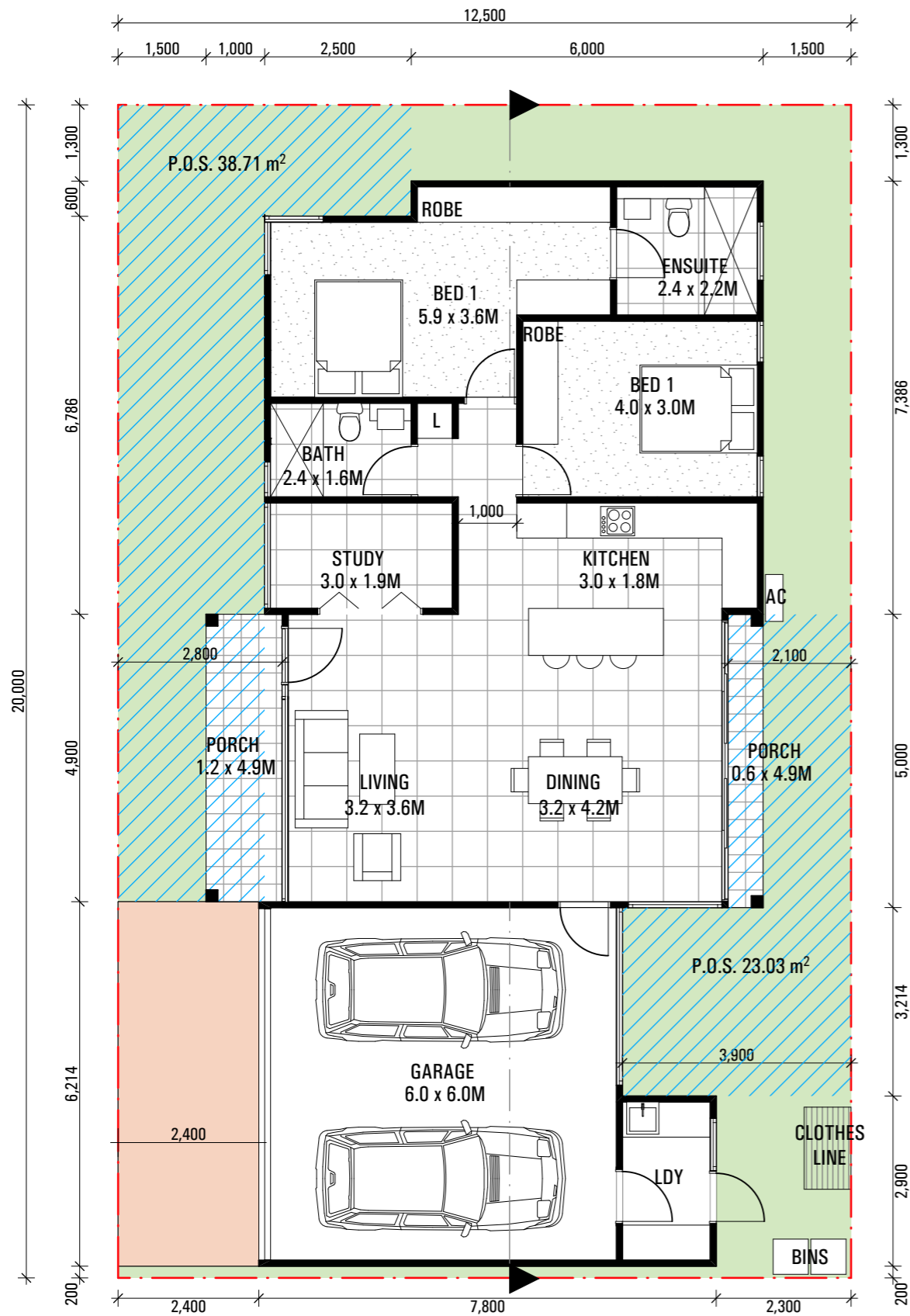
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drawn GF/EH	checked MA/RP	project	SITE ADDRESS
date 25.05.2021	scale 1:100 @ A3		MUDGEES
project no 2_21_07	drawing no AD2000	issue C	drawing

HOUSE TYPE D1



TYPE E1

1 STOREY
 2 BED + STUDY
 2 BATH
 DOUBLE GARAGE

AREAS

DWELLING AREA: 102.19 m²
 GARAGE: 36.08 m²
 EXTERNAL COVERED AREA: 8.82 m²
 TOTAL = 147.09 m²

 NOMINAL POS 62.74 m²

ISSUE AMENDMENT	DATE	ISSUE AMENDMENT	DATE
A	ISSUE A	11.03.2021	
B	ISSUE B	17.05.2021	
C	ISSUE C	W.I.P.	

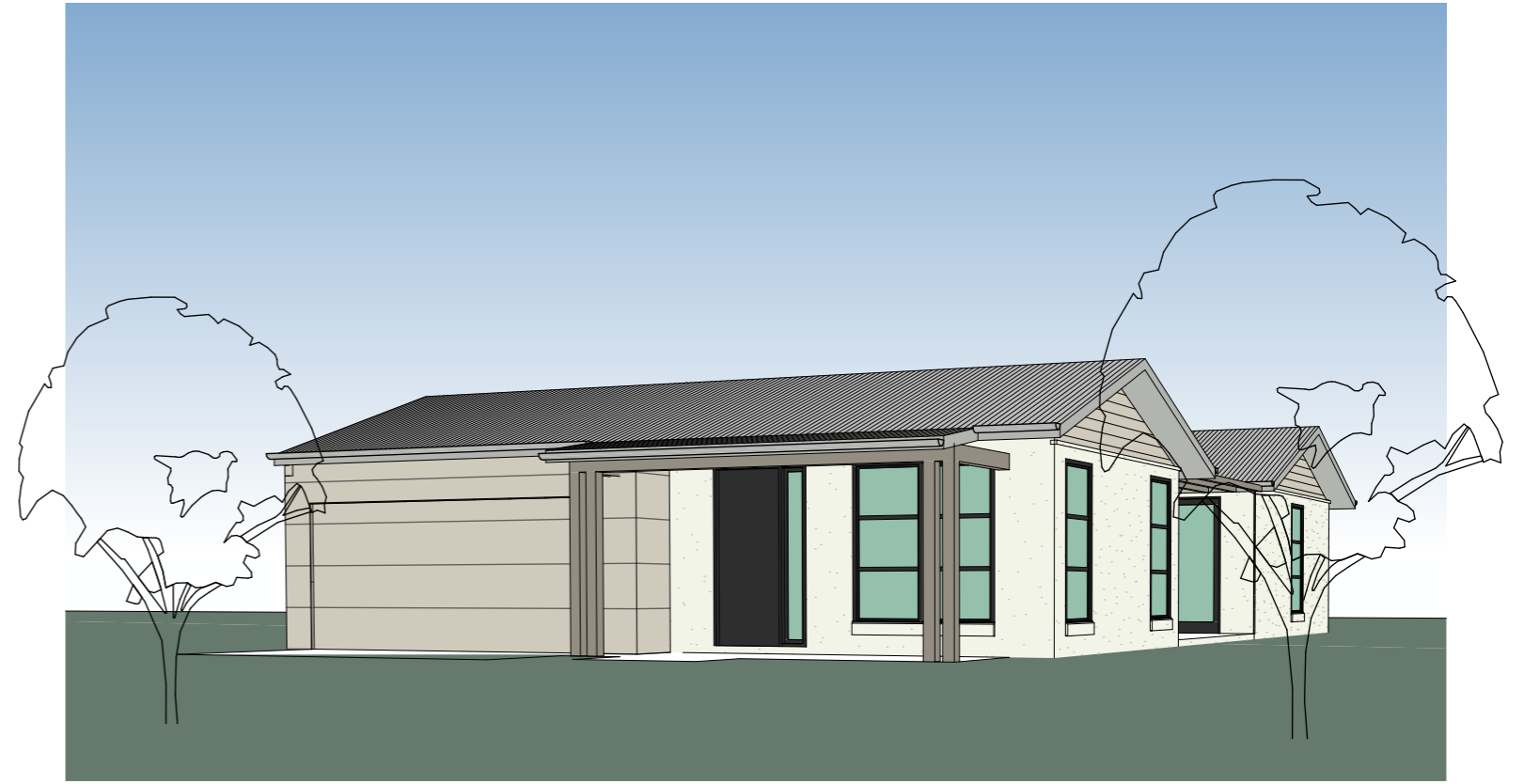
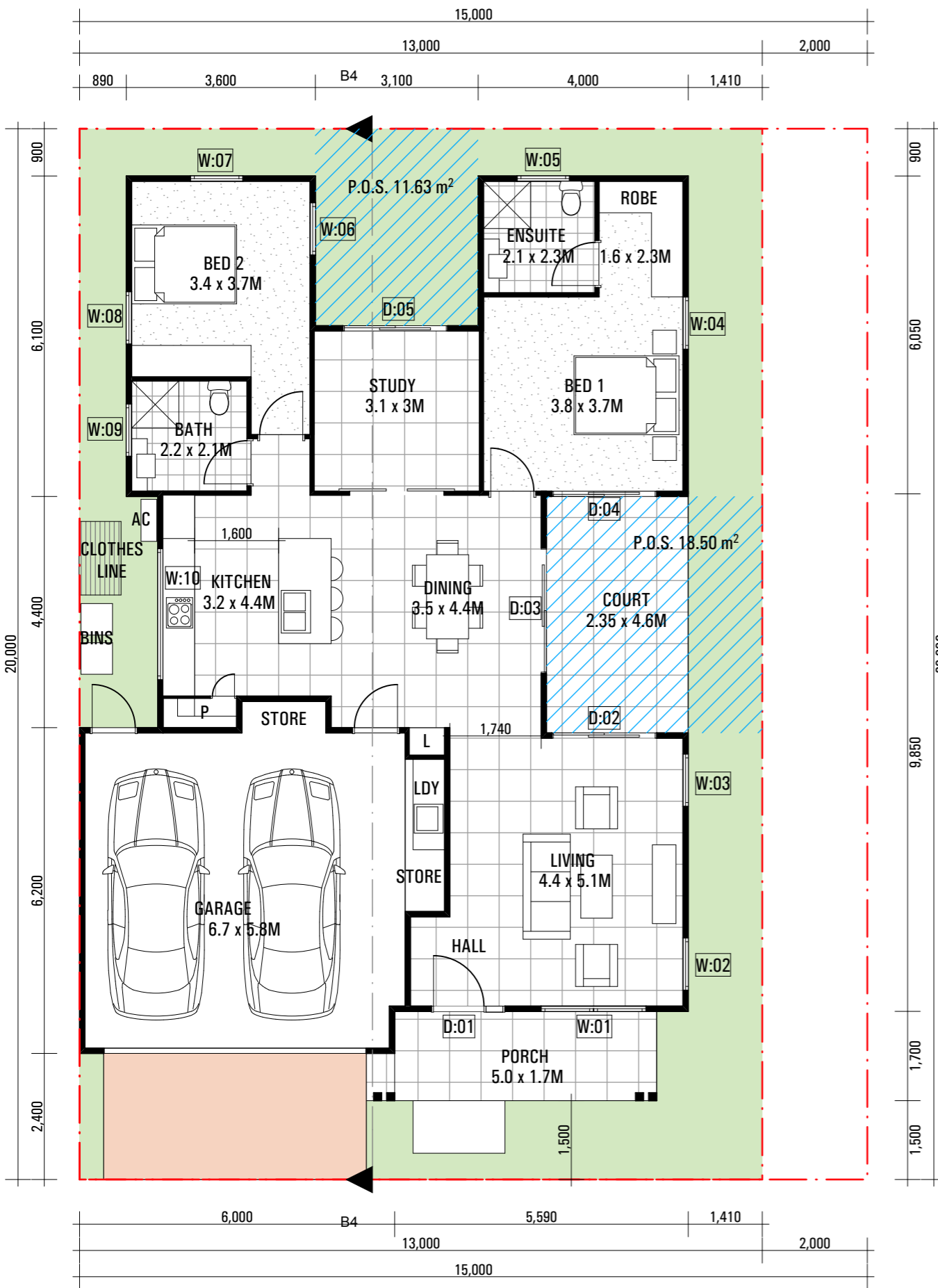
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date 25.05.2021	scale 1:100 @ A3		MUDGE
project no 2_21_07	drawing no AE2000	issue C	drawing

HOUSE TYPE E1



TYPE F

1 STOREY
 3 BED + STUDY
 2 BATH
 DOUBLE GARAGE

AREAS

DWELLING AREA: 111.77 m²
 GARAGE: 37.32 m²
 EXTERNAL COVERED AREA: 20.63 m²
 TOTAL = 169.72 m²

P.O.S. 30.13 m²

ISSUE AMENDMENT	DATE	ISSUE AMENDMENT	DATE
A ISSUE A	11.03.2021		
B ISSUE B	17.05.2021		
C ISSUE C	W.I.P.		

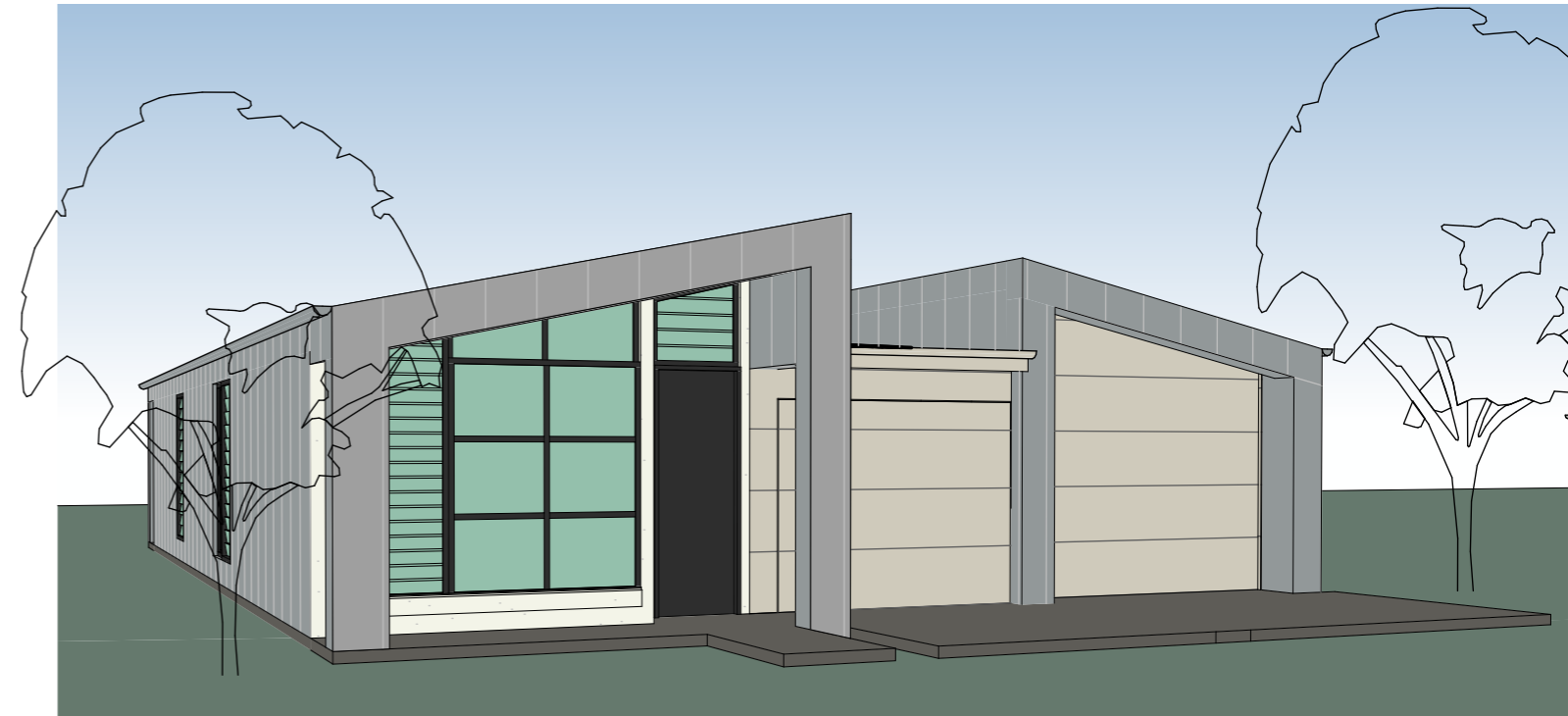
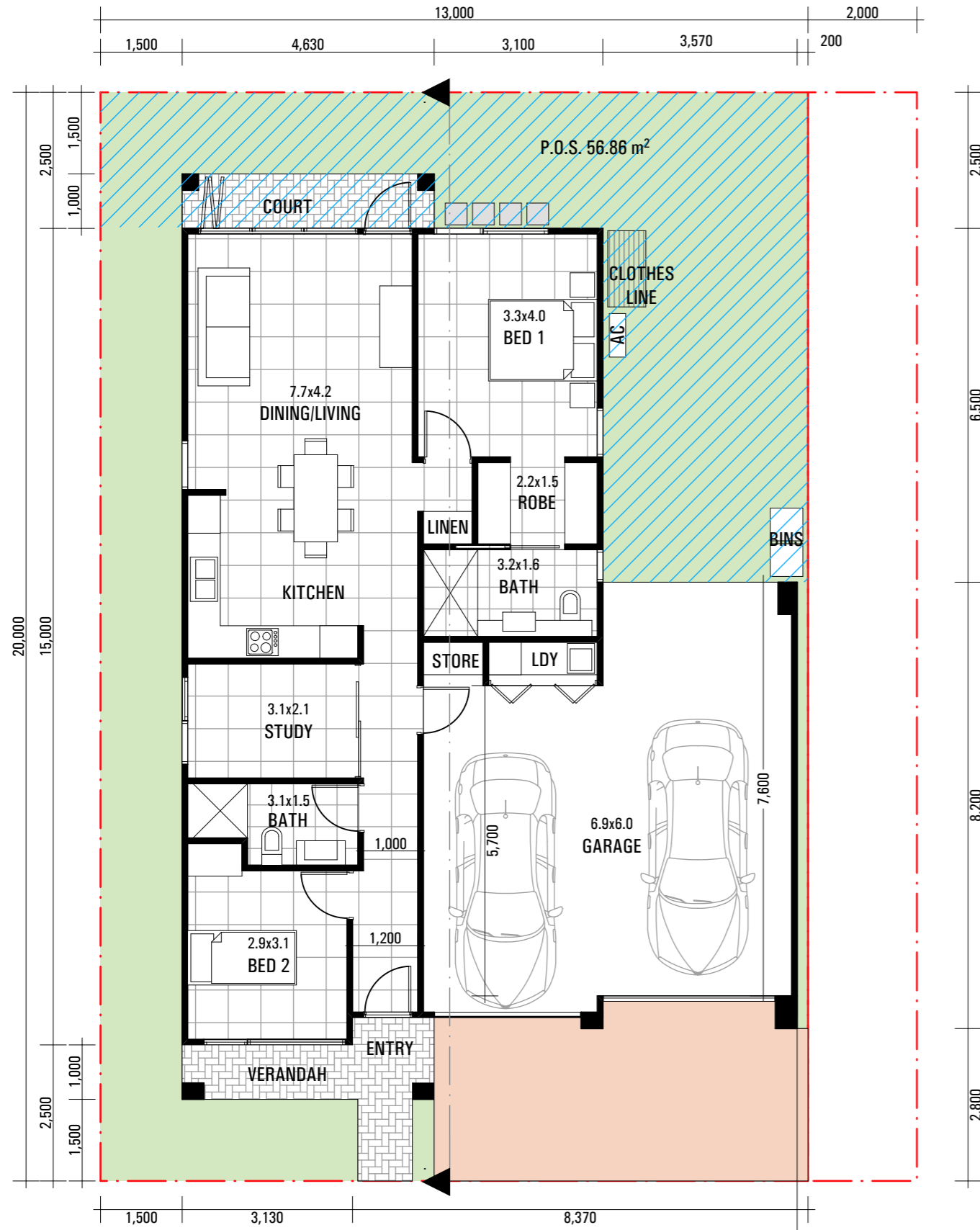
Do not scale drawings
 Verify all dimensions on site

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drawn GF/EH	checked MA/RP	project	SITE ADDRESS
date 25.05.2021	scale 1:100 @ A3		MUDGE
project no 2_21_07	drawing no AF1000	issue C	drawing

HOUSE TYPE F



TYPE G

1 STOREY
2 BED + STUDY
2 BATH
2 GARAGE

AREAS

DWELLING AREA: 89.25 m²
GARAGE: 46.87 m²
EXTERNAL COVERED AREA: 9.59 m²
TOTAL = 145.71 m²

 P.O.S. 56.86 m²

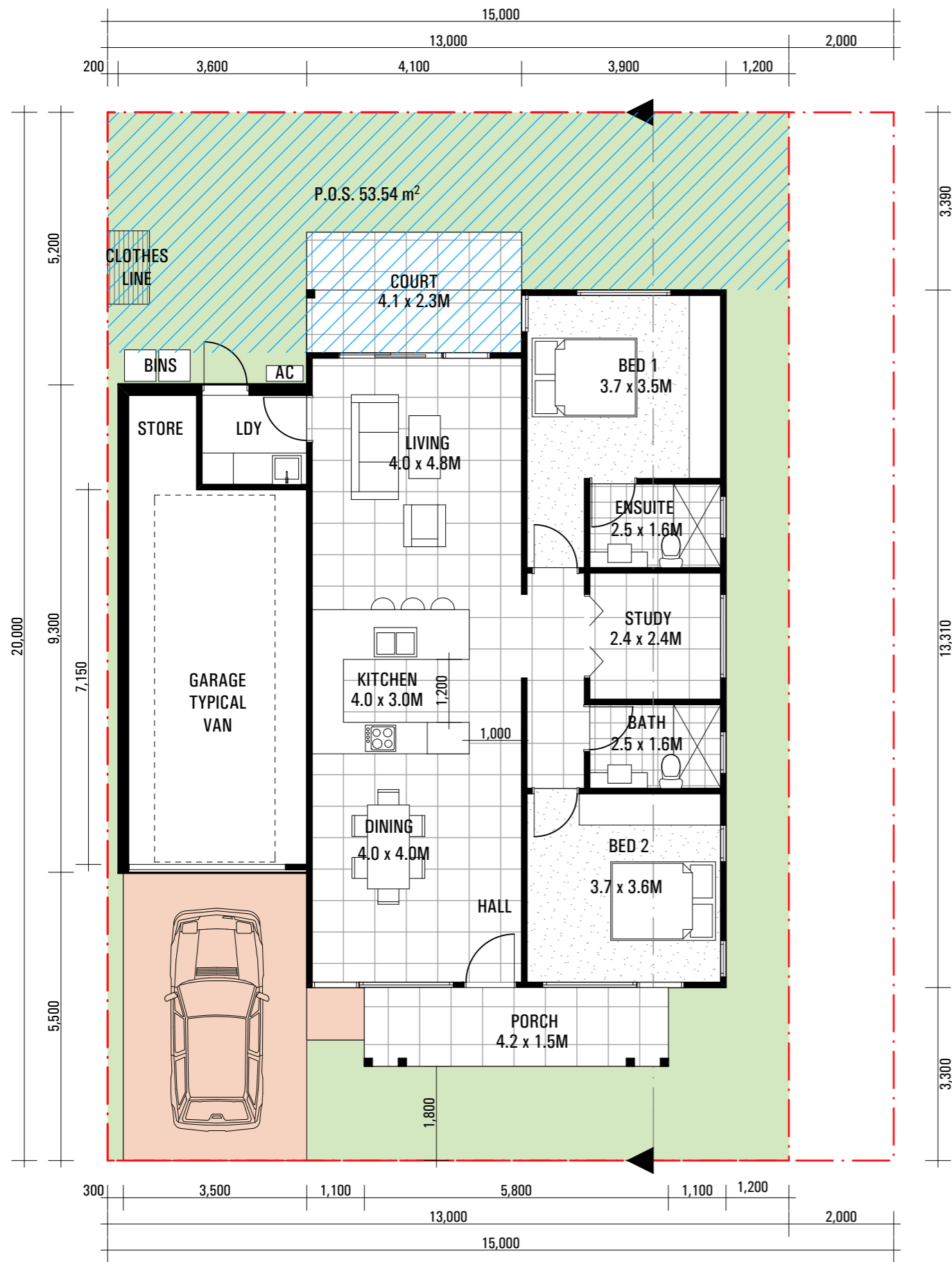
ISSUE AMENDMENT	DATE	ISSUE AMENDMENT	DATE
A ISSUE A	11.03.2021		
B ISSUE B	17.05.2021		
C ISSUE C	W.I.P.		

Do not scale drawings
Verify all dimensions on site

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drawn	checked	project	SITE ADDRESS
GF/EH	MA/RP		MUDGEE
date 25.05.2021	scale 1:100 @ A3		drawing
project no 2_21_07	drawing no AG1000	issue C	HOUSE TYPE G



ISSUE	AMENDMENT	DATE	ISSUE	AMENDMENT	DATE
A	ISSUE A	11.03.2021			
B	ISSUE B	17.05.2021			
C	ISSUE C	W.I.P.			

Do not scale drawings
Verify all dimensions on site

TYPE H

- 1 STOREY
- 2 BED + STUDY
- 2 BATH
- 1 GARAGE

AREAS

- DWELLING AREA: 101.3 m²
- GARAGE: 26.65 m²
- EXTERNAL COVERED AREA: 13.62 m²
- TOTAL = 141.57 m²

P.O.S. 53.54 m²

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drawn GF/EH checked MA/RP project SITE ADDRESS
 date 25.05.2021 scale 1:100 @ A3
 project no 2_21_07 drawing no AH1000 issue C drawing
MUDGEES
 HOUSE TYPE H

APPENDIX 2

MOVEMENT SUMMARY

Site: [Castlereagh Hwy & Springflat Rd (Site Folder: General)]

Existing AM
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Springflat Rd														
1	L2	26	5.0	26	5.0	0.023	6.2	LOS A	0.1	0.7	0.30	0.56	0.30	52.5
3	R2	3	5.0	3	5.0	0.023	7.7	LOS A	0.1	0.7	0.30	0.56	0.30	52.0
Approach		29	5.0	29	5.0	0.023	6.4	LOS A	0.1	0.7	0.30	0.56	0.30	52.4
East: Castlereagh Hwy East														
4	L2	2	5.0	2	5.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.0
5	T1	194	5.0	194	5.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		196	5.0	196	5.0	0.104	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
West: Castlereagh Hwy West														
11	T1	139	5.0	139	5.0	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	13	5.0	13	5.0	0.009	6.1	LOS A	0.0	0.3	0.30	0.55	0.30	52.1
Approach		152	5.0	152	5.0	0.074	0.5	NA	0.0	0.3	0.03	0.05	0.03	59.2
All Vehicles		377	5.0	377	5.0	0.104	0.7	NA	0.1	0.7	0.03	0.07	0.03	59.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Castlereagh Hwy & Springflat Rd (Site Folder: General)]

Existing PM
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Springflat Rd														
1	L2	16	5.0	16	5.0	0.014	6.4	LOS A	0.1	0.4	0.34	0.57	0.34	52.4
3	R2	1	5.0	1	5.0	0.014	9.4	LOS A	0.1	0.4	0.34	0.57	0.34	51.8
Approach		17	5.0	17	5.0	0.014	6.6	LOS A	0.1	0.4	0.34	0.57	0.34	52.3
East: Castlereagh Hwy East														
4	L2	2	5.0	2	5.0	0.137	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.0
5	T1	257	5.0	257	5.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		259	5.0	259	5.0	0.137	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Castlereagh Hwy West														
11	T1	259	5.0	259	5.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	23	5.0	23	5.0	0.017	6.4	LOS A	0.1	0.5	0.35	0.57	0.35	51.9
Approach		282	5.0	282	5.0	0.138	0.6	NA	0.1	0.5	0.03	0.05	0.03	59.2
All Vehicles		558	5.0	558	5.0	0.138	0.5	NA	0.1	0.5	0.02	0.04	0.02	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX 3

MOVEMENT SUMMARY

Site: [Castlereagh Hwy & Springflat Rd (Site Folder: General)]

Projected AM
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Springflat Rd														
1	L2	90	5.0	90	5.0	0.075	6.3	LOS A	0.3	2.2	0.30	0.58	0.30	52.5
3	R2	6	5.0	6	5.0	0.075	8.0	LOS A	0.3	2.2	0.30	0.58	0.30	52.0
Approach		96	5.0	96	5.0	0.075	6.4	LOS A	0.3	2.2	0.30	0.58	0.30	52.4
East: Castlereagh Hwy East														
4	L2	3	5.0	3	5.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.0
5	T1	194	5.0	194	5.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		197	5.0	197	5.0	0.104	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: Castlereagh Hwy West														
11	T1	139	5.0	139	5.0	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	28	5.0	28	5.0	0.019	6.1	LOS A	0.1	0.6	0.30	0.56	0.30	52.1
Approach		167	5.0	167	5.0	0.074	1.0	NA	0.1	0.6	0.05	0.09	0.05	58.5
All Vehicles		460	5.0	460	5.0	0.104	1.8	NA	0.3	2.2	0.08	0.16	0.08	57.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Castlereagh Hwy & Springflat Rd (Site Folder: General)]

Projected PM
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed	
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m					
South: Springflat Rd															
1	L2	31	5.0	31	5.0	0.027	6.5	LOS A	0.1	0.7	0.34	0.57	0.34	52.4	
3	R2	1	5.0	1	5.0	0.027	10.2	LOS A	0.1	0.7	0.34	0.57	0.34	51.8	
Approach		32	5.0	32	5.0	0.027	6.6	LOS A	0.1	0.7	0.34	0.57	0.34	52.3	
East: Castlereagh Hwy East															
4	L2	5	5.0	5	5.0	0.139	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.0	
5	T1	257	5.0	257	5.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8	
Approach		262	5.0	262	5.0	0.139	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8	
West: Castlereagh Hwy West															
11	T1	259	5.0	259	5.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9	
12	R2	87	5.0	87	5.0	0.064	6.4	LOS A	0.3	2.1	0.37	0.60	0.37	51.9	
Approach		346	5.0	346	5.0	0.138	1.6	NA	0.3	2.1	0.09	0.15	0.09	57.7	
All Vehicles		640	5.0	640	5.0	0.139	1.3	NA	0.3	2.1	0.07	0.12	0.07	58.2	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.