PENRITH
CITY COUNCIL

MAJOR ASSESSMENT REPORT

Application number:	DA20/0729
Proposed development:	Torrens Title Subdivision of 2 into 3 lots and Construction of Three x Two Storey Boarding House with Associated Fencing, Car Parking, Tree Removal, Landscaping and Drainage Works
Property address:	32 Park Avenue, KINGSWOOD NSW 2747 31 Park Avenue, KINGSWOOD NSW 2747
Property description:	Lot 16 DP 29528 Lot 15 DP 29528
Date received:	5 November 2020
Assessing officer	Lucy Goldstein
Zoning:	SEPP WSA - Affected by Obstacle Limitation SEPP WSA - Affected by Wildlife Buffer Zone Zone R3 Medium Density Residential - LEP 2010
Class of building:	Class 1b
Recommendations:	Refuse

Executive Summary

Council is in receipt of a development application for Torrens Title Subdivision of 2 into 3 lots and Construction of Three x Two Storey Boarding House with Associated Fencing at 31, 32 Park Avenue, Kingswood NSW 2747.

The development is defined as a boarding house and is a permissible land use in the R3 Medium Density Residential zone under Penrith Local Environmental Plan 2010 (LEP). The development proposal is also permissible within the R3 Medium Density Residential zone under State Environmental Planning Policy (Affordable Rental Housing)2009.(SEPP ARH).

Key issues identified in the assessment of the application include:

- The proposal is non-compliant with the minimum subdivision lot size of 450sqm required under Clause 4.1 of Penrith LEP 2010 for the site. Proposed Lot 2 and Lot 3 are undersized, having a total land area of 407sqm and 371sqm respectively, representing a variation to development standard of 9.6% and 17.6% respectively. The application was supported by a written request to vary the minimum lot size standard under the provisions of Clause 4.6 of Penrith LEP 2010. However, the written request has failed to demonstrate that the proposal will result in a better outcome for the site. The proposal's non-compliance with the minimum lot size standard reflects that the scale of the development is inappropriate for the site, being an overdevelopment of the site. Compliance with the standard is considered both reasonable and necessary in this instance.
- The proposal is non-compliant with key controls under the SEPP ARH, specifically relating to character, solar access requirements and provision of car parking;
- The proposal is non-compliant with key built form, character and amenity controls under Penrith Development Control Plan (DCP) 2014. Notably, the proposal provides inadequate landscaped rear setbacks with car parking areas encroaching upon the rear setback area, insufficient building separation, and provides poor internal layouts;
- The design of the car parking areas is inadequate, proving insufficient vehicle maneuvering, and being non-compliant with Penrith DCP and Australian Standard AS2890.1.
- The proposed stormwater management design and onsite detention systems are non-compliant with Penrith DCP 2014.

The application has been notified to adjoining properties and land owners and exhibited and advertised between 23 November 2020 and 7 December 2020 in accordance with relevant legislation. Council received a total of 4x unique submissions. The submissions received raised various matters including impacts on amenity, local character, traffic and parking, safety and security, noise, and the cumulative impacts of boarding house developments in the vicinity. A response to the matters raised by the submissions is provided within this report.

As the application proposes a variation to a development standard of greater than 10% (being 17.6%), the application has been referred to the Local Planning Panel for determination.

An assessment under Section 4.15 of the Environmental Planning and Assessment Act 1979 has been undertaken and the application is recommended for refusal.

Site & Surrounds

The subject site is legally described as Lot 15 and Lot 16 DP 29528, commonly referred to as 31 and 32 Park Avenue Kingswood, respectively.

Location: The site is located on the northern side of Park Avenue, approximately 230sqm from its intersection with Walter Street. The site is situated east of Kingswood Railway Station, being approximately 700m walking distance from the Railway Station.

Site Context: The surrounding area consists of predominately residential development, comprising a mix of low density (single cottages) and medium density development (townhouses, dual occupancies). The site is located within a pocket of land zoned R3 Medium Density Residential, which acts as a transition area from higher density development located around the Kingswood Railway Station. To the immediate north, north-east and east of the site are townhouse developments. Adjoining the site to the west is a Council owned public park, and to the south of the site is the Railway line.

Site Properties: The site is irregular in shape with a total land area of 1466sqm. The site has a 31m frontage to Park Avenue, lot depth of 52m (western boundary) and 44m (eastern boundary), and rear width of 30m. The site slopes from the rear to the front (north to south) with a total cross fall of approximately 2.5m. The land is partially affected by overland flooding.

Proposal

The application seeks development consent for the following works:

- Consolidation of Lot 15 and Lot 16 DP 2952, and Torrens Title Subdivision to create 3x Lots;
- Construction of 3x 2-Storey Boarding House on each lot (3 buildings in total). Each proposed Boarding House contains 7x boarding rooms and 1x manager's room.
- Associated car parking, fencing, tree removal, landscaping and drainage works.

Plans that apply

- Local Environmental Plan 2010 (Amendment 4)
- Development Control Plan 2014
- State Environmental Planning Policy (Affordable Rental Housing) 2009
- State Environmental Planning Policy (Western Sydney Aerotropolis) 2020
- Sydney Regional Environmental Plan No.20 - Hawkesbury Nepean River

Planning Assessment

- ## Section 4.15 - Evaluation

  The development has been assessed in accordance with the matters for consideration under Section 4.15 of the Environmental Planning and Assessment Act 1979, and having regard to those matters, the following issues have been identified for further consideration:

Section 4.15(1)(a)(i) The provisions of any environmental planning instrument

State Environmental Planning Policy (Affordable Rental Housing) 2009

An assessment of the development application has been undertaken with regard to the relevant provisions of SEPP ARH and the proposal is found to be non-compliant, as detailed in the table below:

State Environmental Planning Policy (Affordable Rental Housing) 2009 **Division 3 Boarding Houses**		
Requirement	***Comment***	***Compliance***
Clause 26– Land to which Division applies	This Division applies to land within any of the specified zones (or equivalent); including: (c) Zone R3 Medium Density Residential High	**Yes**
Clause 27- Development to which Division Applies	Clause applies to land within R2 Low Density Residential zone.	**N/A**
Clause 28 –Development may be carried out with consent	Development to which this Division applies may be carried out with consent.	Noted
Clause 29 – Standards that cannot be used to refuse consent	(1) A consent authority must not refuse consent to development to which this Division applies on the grounds of density or scale if the density and scale of the buildings when expressed as a floor space ratio are not more than: (a) the existing maximum floor space ration for any form of residential accommodation permitted on the land. (2) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds: (a) building height – if the building height of all proposed buildings is not more than the maximum building height permitted under another environmental planning instrument for any building on the land. (b) landscaped area – if the landscape treatment of the front setback is compatible with the streetscape in which the building is located. (c) solar access – where the development provides for one or more communal living rooms, if at least one of those rooms receives a minimum of 3 hours direct sunlight between 9am and 3pm in mid-winter. (d) private open space – if at least the following private open space areas are provided (other than the front setback area): (i) one area of at least 20sqm with a minimum dimension of 3 metres is provided for the use of the lodgers. (e) parking if: (iia) - in the case of development not carried out by or on behalf of a social housing provider – at least 0.5 parking spaces are provided for each boarding room; and (iii) in the case of any development—not more than 1 parking space is provided for each person employed in	(1a) **FSR: Not applicable** as there is no FSR requirement, as per PLEP, for the subject site or area. (2a) **Building Height**: **Complies**. The proposal complies with the Maximum Building Height control of 8.5m. (2b) **Landscaped Area: Non-Compliant.** Penrith DCP requires that a front setback that is the average front setback distance of the two adjoining properties, or a minimum 5.5m whichever is the greater distance be provided. The adjoining property to the east of the site provides a front setback of approximately 6m (30 Park Ave). To the west of the site is a Council owned park (no building). As such, the front setback control has been considered on merit. The properties further along Park Avenue to both the east and west of the site (with the exception of 30 Park Ave) provide deep, landscaped front setbacks containing canopy trees. The proposed building sits forward of the adjoining property to the east, providing a varied setback of a minimum 5.6m. Whilst the encroachment to the front setback is minor in nature, in conjunction with the development's overall scale and bulky built form, the front setback treatment is not considered compatible with the streetscape. (2c) **Solar Access: Non-Compliant.** The proposal has not satisfactorily demonstrated that the communal living areas will achieve sufficient solar access.

	connection with the development and who is resident on site, (f) accommodation size – if each boarding room has a gross floor area (excluding any area used for the purposes of private kitchen or bathroom facilities) of at least: (i) 12 square metres in the case of a boarding room intended to be used by a single lodger, or (ii) 16 square metres in any other case.	Particularly in regards to Lot 1, given the orientation of the communal living area and positioning of windows, the communal living area is unlikely to achieve the minimum solar access requirements. (2d) **Private Open Space: Complies.** The minimum private open space requirement (area and width) has been provided along the western and rear boundaries. (2e) **Parking: Non-Compliant.** Each boarding house contains 7x boarding rooms and 1x managers room. Using the calculation under the SEPP of 0.5 parking spaces per boarding room, each lot is required to have a total of 4x spaces. In addition to this, 1x car space (but not more than 1x space) should be provided per manager's room, as the rooms are set up for the manager's to reside in. Resulting in a total requirement for 5x car spaces per lot. The proposal provides 4x car spaces per lot, inclusive of 1x accessible space, and additional 2x motorcycle spaces. Therefore, the proposal provides a shortfall of car parking. (2f) **Accommodation Size: Compliant.** **T**he accommodation sizes meet the minimum room sizes.

Clause 30 – Standards for boarding houses	(1) A consent authority must not consent to development to which this Division applies unless it is satisfied of each of the following: (a) if a boarding house has 5 or more boarding rooms, at least one communal living room will be provided. (b) no boarding room will have a gross floor area (excluding any area use for the purposes of private kitchen or bathroom facilities) of more than 25 square metres. (c) no boarding room will be occupied by more than 2 adult lodgers. (d) adequate bathroom and kitchen facilities will be available within the boarding house for the use of each lodger. (e) if the boarding house has capacity to accommodate 20 or more lodgers, a boarding room or on-site dwelling will be provided for a boarding house manager. (f) (Repealed). (g) if the boarding house is on land zoned primarily for commercial purposes, no part of the ground floor of the boarding house that fronts a street will be used for residential purposes unless another environmental planning instrument permits such a use. (h) at least one parking space will be provided for a bicycle, and one will be provided for a motorcycle, for every 5 boarding rooms.	(1a) **Communal Living Room: Compliant.** Communal living spaces are provided per building. (1b) **Room Size: Complies.** Each room is no more than 25m² in gross floor area. (1c) **Number of Lodgers:** Complies. No room is proposed to be occupied by more than 2 lodgers. (1d) **Facilities:** Complies. Each boarding room is provided with its own bathroom and kitchen facilities. (1e) **Manager's Room:** Each boarding house (per lot) includes 1x manager's room. (1g) N/A (1h) **Bicycle Parking: Capable of complying.** A sufficient number of bicycle car parking spaces have been provided, however these spaces are exposed and should be undercover.

30A – Character of local area	A consent authority must not consent to development to which this Division applies unless it has taken into consideration whether the design of the development is compatible with the character of the local area.	**Non-Compliant-** Whilst the surrounding area is in transition to higher densities permissible within the R3 Medium Density Residential zone, the scale and spatial arrangement of the development is not considered compatible with the current character and future desired character of the area. The surrounding area is characterised by landscaped front and rear setbacks containing canopy trees. Lots 1, 2 and 3 provide insufficient rear setbacks, and include encroachment of car parking areas (hard stand) within each rear setback area. Noting that a landscaped rear setback of 4m at ground floor, and setback of 6m for upper stories is required per lot, given that subdivision is proposed. In relation to Lot 3, the location of the car parking area in the rear setback results in an unacceptable edge treatment with the adjoining property. The proposed density of the development, resulting in excessive hard stand area, and a bulky built form does not allow for an open and well landscaped site. In terms of built form, the development does not complement the existing built for qualities to define the character of the local area. The proposal provides inadequate building separation between the buildings on Lot 1 and 2, noting Penrith DCP requires that "open space corridors" between buildings of at least 5m wide be provided for sites that adjoin a park. Little opportunity is provided for substantial landscaping around the development, specially along the northern and eastern boundaries given the hard stand areas, which is considered to exacerbate the bulk and scale of the development and result in poor residential amenity.

State Environmental Planning Policy (Western Sydney Aerotropolis) 2020

Obstacle Limitation Surface Map

The site is identified on the Obstacle Limitation Surface Map under the State Environmental Planning Policy (Western Sydney Aerotropolis) 2020. Accordingly, the provisions under Clause 24 'Airspace Operations' have been considered. The objectives of Clause 24 are "To provide for the effective and ongoing operation of the Airport by ensuring that its operation is not comprised by development that penetrates the prescribed airspace for the Airport", and "To protect the community from undue risk from the operation of the Airport".

Clause 24(2) states that "The clause applies to development on land shown on the Obstacle Limitation Surface Map that is a controlled activity within the meaning of Part 12, Division 4 of the Airports Act 1996."

The proposal is not a controlled activity, noting the proposed structure will not result in any penetration or intrusion into the prescribed airspace by way of the physical height of the structure, intense light, reflection, or emission of smoke/dust/other particulate matters. As such, the provisions under Clause 24 are not relevant and do not apply to the proposal.

Wildlife Buffer Zone

The site is mapped as affected by the Wildlife Buffer Zone. Accordingly, the proposal has been assessed against the provisions under Clause 21. Clause 21(2) requires that development consent must not be granted to relevant development on land in the 13 km wildlife buffer zone unless the consent authority has considered several matters (as listed a-c). In accordance with Clause 21(4) the proposal is not defined as relevant development for the purpose of the clause. As such, the provisions under Clause 21 are not relevant and do not apply to the proposal.

Given the above, the proposal is considered satisfactory in regards to the requirements under the State Environmental Planning Policy (Western Sydney Aerotropolis) 2020.

Sydney Regional Environmental Plan No.20 - Hawkesbury Nepean River

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 -1997) (SREP 20) integrates planning with catchment management to protect the Hawkesbury-Nepean river system, requiring the impact of future land use to be considered in a regional context. The application has been assessed against relevant criteria of SREP 20, and is found to be inconsistent with the objectives of SREP 20. The proposed stormwater system and onsite detention system (OSD) are non-compliant with Council requirements, noting Council's Development Engineer does not support the application.

In this regard, the Drainage Plan shows stormwater lines traversing between lots and OSD systems encroaching between lots. Given that Torrens Title Subdivision is proposed, all private drainages lines are required to be wholly contained within each lot, with a single inter-allotment drainage line and easement for drainage discharging to the street where required. In addition, a separate OSD system is required to be provided per lot, wholly contained within the lot. OSD storage cannot be split or stored between lots.

As such, the proposal has not been designed to suitably mitigate stormwater impacts, and therefore the proposal is considered inconsistent with the objectives of SREP 20.

Local Environmental Plan 2010 (Amendment 4)

Provision	Compliance
Clause 2.3 Permissibility	Complies - See discussion
Clause 2.3 Zone objectives	Does not comply - See discussion
Clause 4.1 - Minimum subdivision lot size	Does not comply - See discussion
Clause 4.3 Height of buildings	Complies - See discussion
Clause 4.4 Floor Space Ratio	N/A
Clause 4.6 Exceptions to development standards	Does not comply - See discussion
Clause 7.2 Flood planning	Complies

Clause 2.3 Permissibility
Under Penrith LEP 2010, the subject site is zoned R3 Medium Density Residential. The proposal is defined as a 'Boarding House' which is a permissible land use in the R3 Medium Density Residential zone with consent.

Clause 2.3 Zone objectives
The proposal is not considered consistent with the objectives of the R3 Medium Density zone, specifically:

- *To enhance the essential character and identity of established residential areas.*
- *To ensure that development reflects the desired future character and dwelling densities of the area.*
  The proposed subdivision arrangement is not compatible with the established subdivision pattern, is non-compliant with the minimum lot size required under Penrith LEP 2010, and exceeds the maximum number of lots permitted within a battle-axe arrangement (of two lots) under Penrith DCP. In terms of built form, the development does not enhance the character and identity of the surrounding area. In this regard, the proposal provides insufficient rear setbacks, inadequate building separation, and excessive hardstand areas, including the encroachment of car parking area within rear setback area.

- *To ensure that a high level of residential amenity is achieved and maintained.*
  The ground floor layout of the development is poor and does not achieve a high level of residential amenity for future occupants. Pedestrian movements are generally convoluted and entrances to buildings are not easily legible and accessible (Lot 2 & 3). The building on Lot 1 locates the front entrance immediately adjacent to the entrance of the common bin room, providing poor amenity. In terms of maintaining residential amenity of neighboring properties, the location of car parking areas and driveway along the northern and eastern side boundaries results in a poor edge treatment to adjoining properties, and minimises opportunity to provide suitable screening landscaping.

Clause 4.1 - Minimum subdivision lot size

The proposal has been assessed against relevant criteria under Clause 4.1- *Minimum subdivision lot size.* Overall, the proposal does not meet the minimum subdivision lot size required under Clause 4.1(4B) for battle-axe lots on land in the R3 Medium Density Residential zone. Noting the application was accompanied by a 4.6 Request to Vary Development Standard (see discussion in this report under Clause 4.6 for further detail).

Clause 4.1(2) specifies the type of development to which Clause 4.1 applies. Clause 4.1(2) states that '*This clause applies to a subdivision of any land shown on the Lot Size Map that requires development consent and that is carried out after the commencement of this Plan.'* In this instance, the application seeks Torrens Title Subdivision of land that is shown on the Lot Size Map, the proposal requires development consent, and the application was lodged following the commencement of the LEP 2010. Therefore, Clause 4.1 applies to the proposal.

Clause 4.1(3) requires that *'The size of any lot resulting from a subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land.'* The land is identified on Council's Lot Size Map as requiring a minimum lot size of 400sqm.

It is noted that Clause 4.1(4) specifies that the Clause does not apply in relation to the subdivision of land in relation to a strata plan, or by kind of subdivision under the Community Land Development Act 1989, which is not relevant to the application.

However, Clause 4.1(4B) further states that:
'Despite subclause (3), development consent must not be granted for the subdivision of land in Zone R3 Medium Density Residential unless each lot to be created by the subdivision would have-
(a) if it is a standard lot—a minimum width of 12 metres, or
(b) if it is a battle-axe lot—a minimum width of 15 metres and a minimum area of 450 square metres.

As the subject site is zoned R3 Medium Density Residential, and the proposal seeks to create a battle-axe arrangement the requirements of Clause 4.1(4B)(b) apply. In this regard, a minimum width of 15m and a minimum area of 450sqm is required.

The proposal seeks to create 3x Torrens Title lots within a battle-axe arrangement, comprising:

Proposed Lot	Required Lot Size	Required Lot Width	Proposed Lot Size	Proposed Lot Width	Complies
1	450sqm	15m	496sqm	31m	Yes
2	450sqm	15m	407sqm	30m	**No-** lot area
3	450sqm	15m	371sqm	30m	**No**- lot area

In calculating lot sizes, Clause 4.1(4C) clarifies that **'***For the purposes of this clause, if a lot is a battle-axe lot or other lot with an access handle, the area of the access handle is not to be included in calculating the lot size.'* The calculations as shown above exclude the access handle in accordance with Clause 4.1(4C).

Clause 4.3 Height of buildings
A Maximum Building Height of 8.5m is permitted on the site. The three proposed buildings are two-storey and vary in height due to the slope of the land. All buildings comply with the height control, having a Maximum Building Height of 7.67m (ridge level of 46.57AHD).

Clause 4.6 Exceptions to development standards
Clause 4.6 of Penrith LEP allows the applicant to make a written request to vary the applicable development standard that is contravened. In this case, the proposal seeks to vary the development standard relating to the minimum subdivision lot size contained within Clause 4.1. Clause 4.1 is a principal development standard, and can therefore be varied pursuant to Clause 4.6. Noting that Clause 4.6(2) refers to "a development standard imposed by this or any other environmental planning instrument". In addition, Clause 4.6(8) does not exclude the operation of Clause 4.6 from the minimum subdivision lot size standard.

The objective of Clause 4.6 is contained at Sub-Clause (1) and is, "to provide an appropriate degree of flexibility in applying certain standards to particular development"; and "to achieve a better outcome for and from the development by allowing flexibility in particular circumstances".

Proposed Variation:

The subject site is identified on Council's Lot Size Map as requiring a minimum lot size of 400sqm. However, pursuant to Clause 4.1(4B), as the subdivision relates to a battle-axe arrangement and is on land zoned R3 Medium Density Residential, a minimum lot area of 450sqm and minimum lot width of 15m is required under Penrith LEP 2010. The proposal seeks to create 3x Torrens Title lots within a battle-axe arrangement, of which two of the proposed lots do not meet the required minimum lot size (area). Lot 2 and Lot 3 are undersized, having a total land area of 407sqm and 371sqm respectively. These calculations exclude the area of the access handle in accordance with the requirements under Clause 4.1(4C). This represents a departure of the development standard of 9.6% (Lot 2) and 17.6% (Lot 3).

It is noted that Lot 1 is fully compliant with the minimum lot width and lot area, and Lot 2 and 3 comply with the minimum lot width requirement of 15m, but not the total land area.

Written Request to Vary Development Standard:

The Development Application was supported by a written request to seek to allow variation to the minimum subdivision lot size. The written request has been considered against relevant criteria under Clause 4.6, as detailed below.

Clause 4.6(3) requires the consent authority to consider a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating the following:
(a) That compliance with the development standard is unreasonable or unnecessary in the circumstances of the case; and
(b) That there are sufficient environmental planning grounds to justify contravening the development standard.

Whilst the written request contains the appropriate information, the arguments put forward in the request are not supported. The written request states that a variation to development standard should be permitted in this instance for the following main reasons. Please note, the written request in its entirety has been provided to the Local Planning Panel as an attachment to this report, and the following points have been summarised.

- *strict compliance with the development standard is unnecessary and unreasonable in the circumstances of the case, given there are sufficient environmental planning grounds, and the objectives of the standard are achieved;*
- *The proposed variations relate to the paper plan subdivision lot boundaries only and would not be visually discernible given the proposed building siting and design, bulk and scale, landscaping, private open space, access, car parking and fencing would remain unchanged*
- *the proposed subdivision facilitates the provision of new residential accommodation of a significantly lesser scale and intensity of development that could otherwise be achieved on an unsubdivided site*
- *The proposal complies with relevant development controls including setbacks, building height, landscaping, private open space, solar access, visual privacy, car parking, access, stormwater and waste management.*
- *The proposed lot sizes ranging from 407sqm (excluding the access handle) and 497sqm are compatible with the environmental capabilities of the R3 medium density zoned land being subdivided.*
- *The proposal is consistent with the existing pattern of development and desired future character of this section of the street and the local area*

Clause 4.6, Sub-Clause (4) states that development consent must not be granted for development that contravenes a development standard unless the consent authority is satisfied of the following:

(i) The applicant's written request has adequately addressed the matters required to be demonstrated by subclause (3); and
(ii) The proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out.

The written request has not demonstrated that the variation to the minimum subdivision lot size standard will result in a better outcome for and from the development. As a result of the non-compliance, the development will adversely impact the amenity of surrounding residences, and provide a poor level of amenity for future occupants.

Further, the proposal does not meet the objectives of the R3 Medium Density Residential zone, specifically:
- 'to enhance the essential character and identity of established residential areas',
- 'to ensure that development reflects the desired future character and dwelling densities of the area' and
- 'to ensure that a high level of residential amenity is achieved and maintained.'

In this regard, the proposed subdivision arrangement is not compatible with the established subdivision pattern, and exceeds the maximum number of lots permitted within a battle-axe arrangement (of two lots) under Penrith DCP.

In terms of built form, the development does not enhance the character and identity of the surrounding area, noting the proposal provides insufficient rear setbacks, inadequate building separation, and excessive hardstand areas, including the encroachment of car parking area within rear setback area.

The proposal's non-compliance with the standard reflects that the scale of the development is inappropriate for the site, being an overdevelopment of the site. The current proposal is not considered to be in the public interest, and compliance with the standard is considered both reasonable and necessary in this instance. Therefore, the request to vary the standard is not supported.

Section 4.15(1)(a)(iii) The provisions of any development control plan

Development Control Plan 2014

Provision	Compliance
C1 Site Planning and Design Principles	Does not comply - see Appendix - Development Control Plan Compliance
C2 Vegetation Management	Complies
C3 Water Management	Does not comply - see Appendix - Development Control Plan Compliance
C4 Land Management	Complies
C5 Waste Management	Does not comply - see Appendix - Development Control Plan Compliance
C6 Landscape Design	Does not comply - see Appendix - Development Control Plan Compliance
C7 Culture and Heritage	N/A
C8 Public Domain	N/A
C9 Advertising and Signage	N/A
C10 Transport, Access and Parking	Does not comply - see Appendix - Development Control Plan Compliance
C11 Subdivision	Does not comply - see Appendix - Development Control Plan Compliance
C12 Noise and Vibration	Does not comply - see Appendix - Development Control Plan Compliance
C13 Infrastructure and Services	Does not comply - see Appendix - Development Control Plan Compliance
D2.1 Single Dwellings	N/A
D2.2. Dual Occupancies	N/A
D2.3 Secondary Dwellings	N/A
D2.4 Multi Dwelling Housing	Does not comply - see Appendix - Development Control Plan Compliance
D2.5 Residential Flat Buildings	N/A
D2.6 Non Residential Developments	N/A
D5.1. Application of Certification System	N/A
D5.2. Child Care Centres	N/A
D5.3. Health Consulting Rooms	N/A
D5.4. Educational Establishments	N/A
D5.5 Parent Friendly Amenities	N/A
D5.6. Places of Public Worship	N/A
D5.7. Vehicle Repair Stations	N/A
D5.8. Cemeteries, Crematoria and Funeral Homes	N/A
D5.9. Extractive Industries	N/A
D5.10 Telecommunication Facilities	N/A
D5.11 Boarding Houses	Does not comply - see Appendix - Development Control Plan Compliance

Section 4.15(1)(a)(iiia) The provisions of any planning agreement

No planning agreements apply to the site.

Section 4.15(1)(a)(iv) The provisions of the regulations

The proposal is considered capable of complying with the requirements under the Environmental Planning and Assessment Regulation 2000, subject to conditions that enforce the development to comply with all relevant requirements under the Building Code of Australia. Notwithstanding this, the proposal is recommended for refusal on other planning grounds.

Section 4.15(1)(b)The likely impacts of the development

Streetscape and Local Character

Whilst the surrounding area is in transition to higher densities permissible within the R3 Medium Density Residential zone, the scale and spatial arrangement of the development is not considered compatible with the current character or future desired character of the area. The surrounding area is characterised by landscaped front and rear setbacks containing canopy trees.

Noting that Torrens Title Subdivision is proposed, Penrith DCP requires that a landscaped rear setback of 4m at ground floor, and setback of 6m for upper storeys be provided per lot. Lots 1 and 2 provide insufficient rear setbacks (providing setback of 900m and 2.4m respectively) and include encroachment of car parking areas (hard stand) within each rear setback area, leaving insufficient space to plant suitable landscaping to provide a buffer between lots. Whilst the building on Lot 3 provides a 4m rear setback, the rear setback area is encroached by car parking area located hard against the rear boundary, resulting in an unacceptable edge treatment with the adjoining property.

The proposed density of the development, resulting in excessive hard stand area, and a bulky built form does not allow for an open and well landscaped site.

In terms of building siting, Penrith DCP requires that a front setback that is the average front setback distance of the two adjoining properties, or a minimum 5.5m whichever is the greater distance be provided. The adjoining property to the east of the site provides a front setback of approximately 6m (30 Park Ave). To the west of the site is a Council owned park (no building). As such, the front setback control has been considered on merit. The properties further along Park Avenue to both the east and west of the site (with the exception of 30 Park Ave) provide deep, landscaped front setbacks containing canopy trees.

The proposed building sits forward of the adjoining property to the east, providing a varied setback of a minimum 5.6m. Whilst the encroachment to the front setback is relatively minor in nature, in conjunction with the development's overall scale, and bulky built form, and noting that the proposal has a shortfall of 3x car spaces and would require further hardstand area to comply with the SEPP ARH car parking requirements, the front setback treatment is not considered compatible with the streetscape.

Built Form

The development does not complement the existing built for qualities to define the character of the local area. The proposal provides inadequate building separation between the buildings on Lot 1 and 2, noting Penrith DCP requires that "open space corridors" between buildings of at least 5m wide be provided for sites that adjoin a park (Chapter D2, Section 2.4.11). Little opportunity is provided for substantial landscaping around the development, specially along the northern and eastern boundaries given the hard stand areas, which is considered to exacerbate the bulk and scale of the development and result in poor residential amenity.

Stormwater Management

The Drainage Plan shows stormwater lines traversing between lots and Onsite Detention (OSD) systems encroaching between lots. Given that Torrens Title Subdivision is proposed, all private drainages lines are required to be wholly contained within each lot, with a single inter-allotment drainage line and easement for drainage discharging to the street where required. In addition, a separate OSD system is required to be provided per lot, wholly contained within the lot. OSD storage cannot be split or stored between lots. OSD calculations shall be demonstrated for each lot, including SSR, PSD and bypass area specific to each lot.

Traffic, Access and Manvouering

The proposed car parking and access arrangement is not supported by Council's Development Engineer for the following reasons:

- Parking spaces are required to be a minimum width of 2.5m for residential development to allow full opening of vehicle doors, in accordance with Penrith DCP 2014 and AS2890.1.
- All parking spaces are to be designed so vehicles can enter and exit the space without the need to make more than three combined turning manoeuvres, in accordance with Penrith DCP 2014 (i.e. enter in one manoeuvre and reverse out in two or vice versa).
- The vehicular crossover shall be sited perpendicular to the kerb, in accordance with Council's Driveway Standards and Specifications.
- The proposed driveway encroaches an existing Telstra pit and electricity box. Services are required to be located a minimum of 1.0m clear of the driveway, in accordance with Council's Driveway Standards and Specifications. There is also an existing power pole adjacent to the driveway within the property that encroaches the driveway.
- Missing Information: The swept path diagrams provided are illegible and cannot be properly assessed. The dimensions of the carports are not shown on the plans.

Acoustic Impacts

The proposal was accompanied by an Acoustic Assessment addressing potential noise impacts on surrounding residences, and future occupants of the development. The Acoustic Assessment was reviewed by Council's Environmental Health Officer, and was found to provide insufficient information. Specifically relating to noise associated with the use of the carpark/driveway, and communal area, noting the report did not calculate these noise levels.

The acoustic assessment should include the noise levels anticipated to be produced by each of these noise sources and the predicted levels that may be experienced by the neighboring sensitive receivers (ie. properties to the north and east, and residents of the development). The report needs to clearly demonstrate that that the criteria can be achieved, and has formed a reason for refusal of the application.

Crime Prevention Through Environmental Design

The ground floor layout of the development is poor and has not been designed to incorporate the principals of Crime Prevention Through Environmental Design. On Lot 1 (fronting the street), minimal passive surveillance is provided on ground floor. The building entrances on Lot 2 and 3 are convoluted and not clearly legible.

Section 4.15(1)(c)The suitability of the site for the development

The site is considered unsuitable for the development for the following reasons:

- The subdivision arrangement is not compatible with the established subdivision pattern, is non-compliant with the minimum lot size required under Penrith LEP 2010, and exceeds the maximum number of lots permitted within a battle-axe arrangement (of two lots) under Penrith DCP.
- The scale of the development on the site is excessive in that inadequate setbacks and building separation is provided.
- The proposal does not adequately demonstrate that impacts related to bulk, scale, and amenity are adequately mitigated against or addressed in the design of the building.

Section 4.15(1)(d) Any Submissions

Community Consultation

In accordance with Appendix F4 of Penrith Development Control Plan 2014, the proposed development was notified to nearby and adjoining residents. The proposal was also advertised in the local newspaper on 19 November 2020.

Council notified forty-six residences in the area and the exhibition period occurred between 23 November 2020 and 7 December 2020. Council received a total of 5x submissions comprising 4x unique submissions.

The following issues were raised in the submissions received and have formed part of the assessment.

Issue Raised	*Comments*
Local character	Concerns agreed. The proposal is not considered compatible with the surrounding local character, and has been included as a reasons for refusal. Refer to discussion in this report under 'SEPP ARH' and 'Likely Impacts'.
Objection to Development Type	A Boarding House is a permissible land use on the site. Notwithstanding, the site is considered unsuitable for the proposed development. Refer to discussion under 'Site Suitability' in this report.
Car Parking Impacts	Concerns noted. The rate of car parking required for the development is determined by the SEPP ARH. Under the SEPP ARH, the proposal has a shortfall of 3x car parking spaces, as no onsite car parking has been provided for each of the proposed manager's rooms on Lots 1-3. Non-compliance with the ARH SEPP car parking provisions has been included as a reason for refusal. Refer to discussion under 'SEPP ARH' in this report.
Increased traffic congestion	The proposal is considered capable of being accommodated by the local road network. Notwithstanding, the proposal is recommended for refusal on other grounds, as detailed in this report.
Acoustic Impacts	Concerns noted. The proposal was accompanied by an Acoustic Assessment addressing potential noise impacts on surrounding residences, and future occupants of the development. The Acoustic Assessment was found to provide insufficient information. Specifically, the Acoustic Assessment did not calculate noise levels associated with the use of the carpark/driveway and communal areas of the development. These noise levels and its impact on sensitive receivers (adjoining properties to the north and east, and residents of the development) should be calculated and assessed. Insufficient information regarding acoustic impacts has formed a reason for refusal of the application.
Proximity of development to a school	There are no planning controls requiring boarding houses to be a certain distance from schools.
Perceived Social Impacts due to nature of development	Boarding houses are a permissible land use in the zone and provide a type of residential accommodation within the community. Notwithstanding, the design is not considered to have factored in the principals of Crime Prevention Through Environmental Design (CTEP). Minimal passive surveillance is provided on ground floor for Lot 1, and the general layout of the development is poor, with entrances to buildings being not clearly legible. These considerations have contributed to the recommendation to refuse the application.

Referrals

The application was referred to the following stakeholders and their comments have formed part of the assessment:

Referral Body	Comments Received
Building Surveyor	No objections - subject to conditions
Development Engineer	Not supported
Environmental - Environmental management	Not supported
Environmental - Public Health	No objections - subject to conditions
Waste Services	Not supported
Traffic Engineer	Not supported
Community Safety Officer	No objections - subject to conditions
Social Planning	No objections

Section 4.15(1)(e)The public interest

The proposal is not considered in the public interest, as the application is non-compliant with key objectives and controls under SEPP ARH, Penrith LEP 2010, and Penrith DCP 2014.

Section 94 - Developer Contributions Plans

Penrith City Council's Section 7.11 Contribution Plan applies to the proposal. However, given the application is recommended for refusal on other grounds, contribution fees have not applied in this instance.

Conclusion

In assessing this application against the relevant environmental planning policies, being State Environmental Planning Policy Affordable Rental Housing 2009, Penrith Local Environmental Plan 2010, and Penrith Development Control Plan 2014, the proposal does not satisfy the aims, objectives and provisions of these policies.

The proposed design does not comply with key development standard, is not site responsive, and is not in the public interest.

In its current form, the proposal will have a negative impact on the surrounding character of the area, and there is likely to be negative impacts arising from the proposed development.

Therefore, the application is recommended for approval, for the attached reasons:

Recommendation

1. That Development Application DA20/0729 for Torrens Title Subdivision of 2x Lots into 3x Lots and Construction of Three x Two Storey Boarding House at 31-32 Park Avenue Kingswood be refused for the following reasons;
2. That the submitted variation to a development standard under clause 4.6 of the standard instrument not be supported; and
3. That those making submissions are notified of the determination.

Refusal

1 X Special 02 (Refusal under Section 4.15(1)(a)(i) of EPA Act 1979)
The application is not satisfactory for the purpose of Section 4.15(1)(a)(i) of the Environmental Planning and Assessment Act 1979 as the proposal is inconsistent with the provisions of Penrith Local Environmental Plan 2010 as follows:

- **Clause 2.3 Zone objective:** The proposal is inconsistent with the following objectives of the R3 Medium Density Residential zone:
  - To enhance the essential character and identity of established residential areas.
  - To ensure that a high level of residential amenity is achieved and maintained.
  - To ensure that development reflects the desired future character and dwelling densities of the area.

- **Clause 4.1 Minimum subdivision lot size:** The proposal is non-compliant with the minimum subdivision lot size required for the site.

- **Clause 4.6 Exceptions to development standards:** The proposal has not satisfactorily demonstrated that a variation to the minimum lot size as required by Clause 4.1 will achieve a better planning outcome for and from the development.

2 X Special 03 (Refusal under Section 4.15(1)(a)(ii) of EPA Act 1979)
The application is not satisfactory for the purpose of Section 4.15(1)(a)(i) of the Environmental Planning and Assessment Act 1979 as the proposal is inconsistent with the provisions of State Environmental Planning Policy (Affordable Rental Housing) 2009 as follows:

- Part 2, Division 3, Clause 29 (2)(b) Landscaped area
- Part 2 Division 3, Clause 29 (2)(c) Solar Access
- Part 2, Division 3, Clause 29(2)(e) Parking
- Part 2, Division 3, Clause 30A Character of local area

3 X Special 04 (Refusal under Section 4.15(1)(a)(iii) of EPA Act 1979)
The development application is not satisfactory for the purpose of Section 4.15(1)(a)(iii) of the Environmental Planning and Assessment Act 1979, as the proposal is inconsistent with the following provisions of Penrith Development Control Plan 2014:

- Chapter C1 Planning and Design Principles
- Chapter C3 Water Management
- Chapter C5 Waste Management and accompanying Waste Management Guideline
- Chapter C10 Transport, Access and Parking
- Chapter C11 Subdivision
- Chapter C12 Noise and Vibration
- Chapter D2 Residential Development
- Chapter D4 Other Land Uses

4 X Special 07 (Refusal under Section 4.15(1)(b) of EPA Act 1979)
The application is not satisfactory for the purpose of Section 4.15(1)(b) of the Environmental Planning and Assessment Act in terms of the likely impacts of the development, including:

- The proposed subdivision is not consistent with the established subdivision pattern.
- The design and scale of the proposed development is not compatible with the existing and desired future character of the immediate locality.
- The proposal provides inadequate front and rear setbacks to suitably integrate the development into the existing local character, maintain surrounding residential amenity, and provide appropriate landscape treatment of the site.
- The proposal does not provide a suitability level of internal amenity stemming from the ground floor layout and location of infrastructure (waste rooms, car parking).
- The proposal provides an insufficient number of car parking spaces to service the development, and the design of the car parking areas/driveway is inadequate, providing not enough room for proper and safe maneuvering within the development site.
- The development is considered to be an over-development of the site.
- The stormwater drainage design is inadequate, noting drainage infrastructure is proposed to traverse between each lot. Stormwater infrastructure is required to be wholly contained within each Torrens Title lot, and be designed in accordance with Council requirements.
- The accompanying Acoustic Assessment report provides insufficient information, as the report does not calculate expected noise levels generated by the use of car parking, driveway and communal areas of the development. As such, Council is unable to be satisfied that the noise levels associated with the use of these areas will comply with relevant noise criteria.

5 X Special 08 (Refusal under Section 4.15(1)(c) of EPA Act 1979)
The application is not satisfactory for the purpose of Section 4.15(1)(c) of the Environmental Planning and Assessment Act 1979 as the site is not suitable for the proposed development.

6 X Special 10 (Refusal under Section 4.15(1)(e) of EPA Act 1979)
The application is not satisfactory for the purpose of Section 4.15(1)(e) of the Environmental Planning and Assessment Act as the proposal is not in the public interest.

7 X Special 9 (Refusal under Section 4.15(1)(d) of EPA Act 1979)
The application is not satisfactory for the purpose of Section 4.15(1)(d) of the Environmental Planning and Assessment Act due to matters raised in submissions which include:

- Compatibility of the development with the surrounding local character
- Amenity and acoustic impacts
- Car parking impacts
- Design of development should reflect principles of Crime Prevention Through Environmental Design

Appendix - Development Control Plan Compliance

Development Control Plan 2014

Part C - City-wide Controls

The proposal does not meet the objectives and controls under Part C of Penrith Development Control Plan, including:

C1 Site Planning and Design Principles
The ground floor layout of the development is poor, does not provide a high level of amenity for residents, and does not incorporate the principals of Crime Prevention Through Environmental Design. On Lot 1 (fronting the street) provides minimal passive surveillance on ground floor, as a laundry and waste room fronts the street. The building entrances on Lot 2 and 3 are convoluted and not clearly legible.

C3 Water Management
The Drainage Plan shows stormwater infrastructure traversing between lots. Given that Torrens Title Subdivision is proposed, all drainage infrastructure is required to be wholly contained within each lot. Refer to discussion in this report under 'Likely Impacts'.

C5 Waste Management
The proposal was reviewed by Council's Waste Officer, and found to be unsatisfactory, as the proposal is non-compliant with Chapter C5 of Penrith DCP and the accompanying 'Multi-Unit Dwelling Waste Management Guideline.' In this regard, Penrith DCP requires that the proposal provide communal waste storage area within each boarding house, whilst also providing an integrated centralised collection area accessible from Park Avenue. The proposal does not provide or nominate a collection area accessible from street. In addition, a common bulky waste area of a minimum 5.02sqm in area, should be provided to cater for the boarding houses to permit a designated collection area for Council's contractor to perform scheduled collections.

From a planning perspective, the proposed locations of the waste rooms are poorly considered, particularly Lot 1 which locates the bin room immediately adjacent to the front entrance, providing a poor level of residential amenity.

C6 Landscape Design
The density and spatial arrangement of the development provides little opportunity for the provision of quality landscaped areas, particularly along the rear (northern) and side (eastern) boundary, providing poor edge treatments to neighbouring properties. Screening landscaping should be provided along the rear and side boundaries to mitigate privacy and amenity impacts on adjoining properties.

C10 Transport, Access and Parking
The proposed car parking area has not been designed in accordance with the requirements of Penrith DCP. Car parking spaces are required to be a minimum width of 2.5m for residential development to allow full opening of vehicle doors, in accordance with Penrith DCP 2014 and AS2890.1. All parking spaces are to be designed so vehicles can enter and exit the space without the need to make more than three combined turning manoeuvres, in accordance with Penrith DCP 2014 (i.e. enter in one manoeuvre and reverse out in two or vice versa). The vehicular crossover is also required to be perpendicular to the kerb, in accordance with Council's Driveway Standards and Specifications.

C11 Subdivision
Section 11.3.3 requires that no more than 2 allotments are to be served by a shared corridor. The proposed subdivision is non-compliant with this requirement, as the shared corridor services 3x lots. The proposed density and subdivision layout is not considered consistent with the established subdivision pattern.

Notwithstanding the above, application has provided insufficient information regarding the subdivision component, in that no easements have been proposed to service the subdivision. Such as Right of Ways, easements relating to drainage etc.

C12 Noise and Vibration

The application was supported by an Acoustic Assessment Report, which has been reviewed by Council's Environmental Health Officer. Based on this review, the Acoustic Assessment provides insufficient information, as the report does not calculate expected noise levels generated by the use of car parking and communal areas of the development. As such, Council is unable to be satisfied that the noise levels associated with the use of these areas will comply with relevant criteria. Refer to discussion under 'Likely Impacts' on this report for further detail.

C13 Infrastructure and Services

The proposed driveway encroaches an existing Telstra pit and electricity box. Services are required to be located a minimum of 1.0m clear of the driveway, in accordance with Council's Driveway Standards and Specifications. There is also an existing power pole adjacent to the driveway within the property that encroaches the driveway.

D2 Residential Development

An assessment of the built form of the development has been undertaken having regard to comparative built form controls applying to multi dwelling housing development within the R3 Medium Density Residential zone, as is required by the boarding house objectives and controls of section 5.11 (Boarding Houses) of Section D5 Other Land Uses of the DCP.

The anticipated built form for the area within the vicinity of the site (applicable to boarding houses and multi dwelling housing developments) is detailed within this section of the DCP and includes controls requiring articulation of the built form and the inclusion of deep external side setbacks with an upper storey surrounded by a larger ground floor plan.

2.4.3 Development Site
The site is approximately 30m wide, which is compliant with the 22m lot width control. However, the proposed lots are small in area (being 496sqm, 407sqm, and 371sqm) which is small for this form of development. The proposal represents an over development of the site in proportion to the site area, with a large building mass and inadequate room for landscaping, suitable design car parking area, and storm water drainage infrastructure.

2.4.5 Front and Rear Setbacks
The proposal provides an insufficient front setback, being forward of the adjoining property to the east, and forward of the established setback pattern along the street to the west and east of the site. Whilst the encroachment in the front setback is relatively minor in nature, when considering in conjunction the development's overall scale and bulky built form, and overall shortfall of suitable landscaped area to integrated the development into the local character, the proposed front setback is not supported. Refer to discussion under 'ARH SEPP, Clause 29' in this report for full discussion.

Lots 1, 2 and 3 provide inadequate rear setbacks, and include encroachment of car parking areas (hard stand) within each rear setback area limiting opportunity for suitable landscape and canopy trees to provide buffers between lots and adjoining properties. Further, the location of the car parking area in the rear setback on Lot 3 results in an unacceptable interface with the adjoining property to the north. Refer to discussion under 'Likely Impacts' in this report.

2.4.6 Building Envelope and Side Setbacks
This section states under clause 2.4.6(7)(a) and (b) that a minimum side setback of 2m is permissible, however, for only 50% of any boundary and the proposal complies. The proposal complies with the numerical control relating to the side setbacks. However, the density of the development and the requirement under the State Policy to provide 0.5 car parking spaces per boarding room is also considered to result in the large amount of hardstand area relative to a small site area

The proposal provides inadequate building separation between the buildings on Lot 1 and 2, noting Penrith DCP requires that "open space corridors" between buildings of at least 5m wide be provided for sites that adjoin a park.

2.4.8 Landscaped Area
The proposal does not meet the minimum landscaped area required by clause 2.4.8 in Part D2 of the DCP, which is 40% of the site area. In calculating the landscaped area, using the Landscape Plan provided the proposal provides a total landscaped area of 340sqm (across all three sites), representing a total of 23.1% of the site as landscaped area. This has been calculated based on areas that are 2m or more wide, as specified in the definition of calculable landscape area under Penrith DCP. The insufficient landscaped area, built form and required car parking area for the scale of development limit the opportunity for suitable landscaped area to contribute and enhance the landscape quality of the site and broader area. Furthermore, the landscape plan does not provide for suitable screening along the rear and eastern boundaries to maintain adjoining residential amenity.

D5 Other Land Uses

D5.11 Boarding Houses

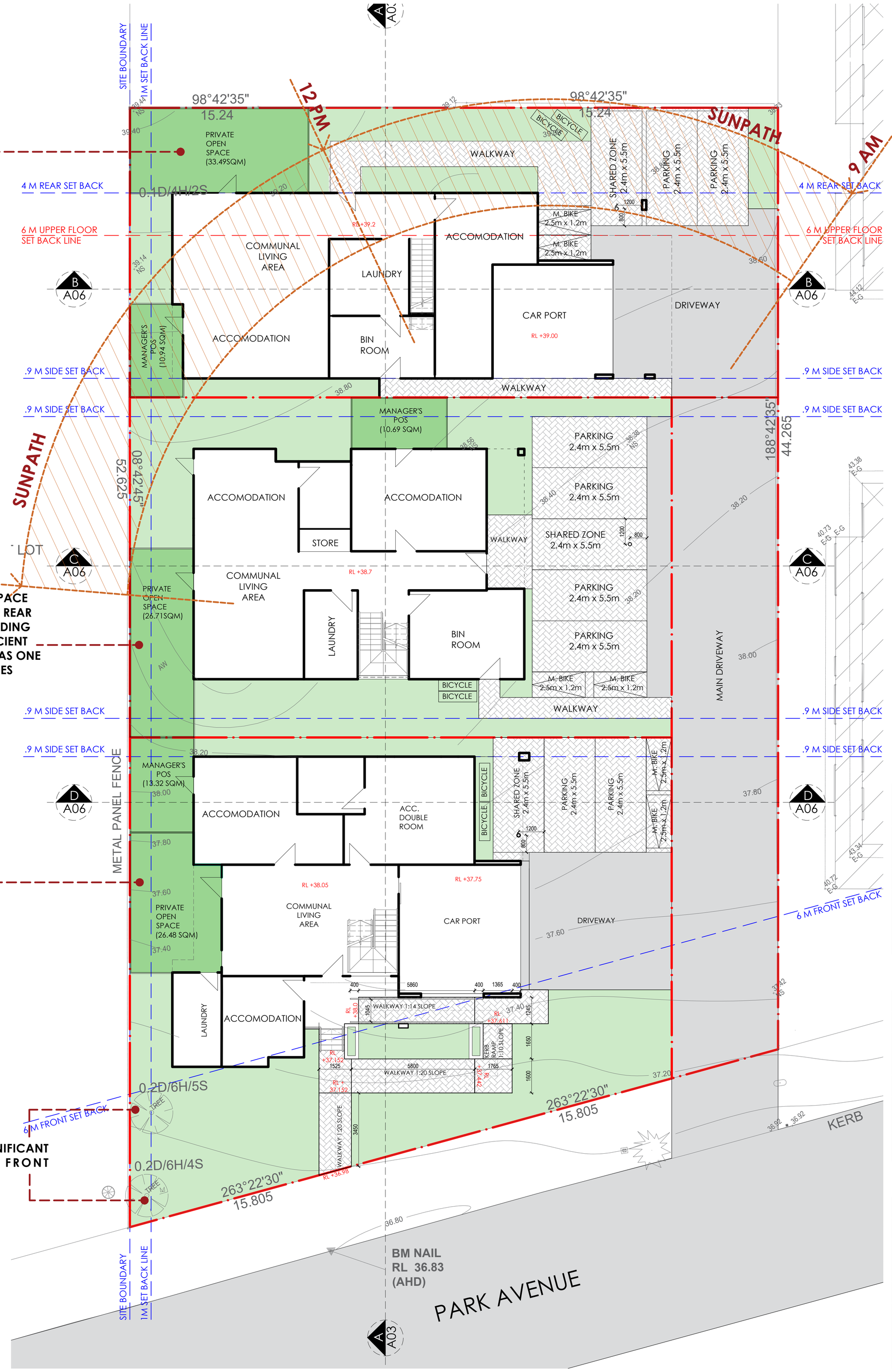
The proposal does not meet the following objectives relating to Boarding House developments:

(a) To ensure that boarding houses fit the local character or desired future local character of the area.
(b) To minimise negative impacts on neighbourhood amenity.
(d) To respond to increasing neighbourhood densities resulting from boarding house development.
(e) To ensure that boarding houses operate in a manner which maintains a high level of amenity, health and safety for residents.

The scale of the development does not adequately respond to the existing or desired future character of the area in the vicinity of the site, as discussed within this report (refer to the local character discussion under the SEPP ARH). The building design and landscaping concept does not respond sufficiently in regard to site analysis. The proposed setbacks and landscaping do not ameliorate the negative and unacceptable impacts on residential amenity.

KEY AMENITIES:

1. EACH BOARDING HOUSE IS UNDER 300 SQ.M. THEREFORE A SMALL FOOTPRINT.
2. SITE ALLOWS FOR 400 SQ.M. WITH UNDERCROFT PARKING.
3. THE PROPOSED DWELLING HAS FACADE IN LINE WITH DESIRED CHARACTER OF THE LOCALITY WITH CONTEMPORARY ARCHITECTURAL STYLE, USING BOLD FORMS & A PLAY OF MASS & VOIDS.
4. THE PROPOSED BUILDING IS ORIENTED TO HAVE THE CORRIDORS / PASSAGE WAYS ENCLOSED INSIDE THE BUILDING ENVELOPE IN LOT 1 AND LOT 2 AND FACING INTERNAL SETBACK AREAS TOWARDS LOT 2, AWAY FROM THE NEIGHBOURS IN LOT 3.
5. ADJOINING NEIGHBOURS ARE TO BE FACING ONLY HIGH WINDOWS WHICH SECURES PRIVACY ISSUES.
6. THE PRIVATE OPEN SPACE IS BEHIND THE FRONT BUILDING LINE. IT HAS MORE THAN REQUIRED 20 SQM AREA WITH THE MINIMUM OF 3M WIDTH AND SUFFICIENT SOLAR ACCESS AS ALL LOTS HAVE POS FACING NORTH - WEST WHICH IS OPEN THROUGHOUT.
7. LANDSCAPE AREAS ARE MAXIMIZED WHERE POSSIBLE TO CREATE BUFFERS FROM NEIGHBOURS AND INTERNAL ORIENTATION AS WELL.
8. ACCESSIBILITY PROVIDED FOR DOUBLE ACCOMMODATION ROOM AT THE GROUND FLOOR WITH AN ACCESSIBLE PARKING.
9. WASTE ROOM IS EASILY ACCESSED AT GROUND FLOOR FOR RESIDENTS AND CLOSE TO STREET FOR PICK UP.



LOT 01	
SITE AREA	497.50 SQ.M
GFA GROUND FLOOR(A)	127.51 SQ.M
FIRST FLOOR(B)	151.79 SQ.M
TOTAL GFA(A+B)	279.3 SQ.M
NO.OF CARK PARK	2
NO.OF BIKE PARK	2
NO.OF BICYCLE PARK	2

LOT 02	
SITE AREA	407.31 SQ.M
GFA GROUND FLOOR(A)	145.61 SQ.M
FIRST FLOOR(B)	133.14 SQ.M
TOTAL GFA(A+B)	278.75 SQ.M
NO.OF CARK PARK	4
NO.OF BIKE PARK	2
NO.OF BICYCLE PARK	2

LOT 03	
SITE AREA	415.07 SQ.M
GFA GROUND FLOOR(A)	128 SQ.M
FIRST FLOOR(B)	116.98 SQ.M
TOTAL GFA(A+B)	244.98 SQ.M
NO.OF CARK PARK	2
NO.OF BIKE PARK	2
NO.OF BICYCLE PARK	2

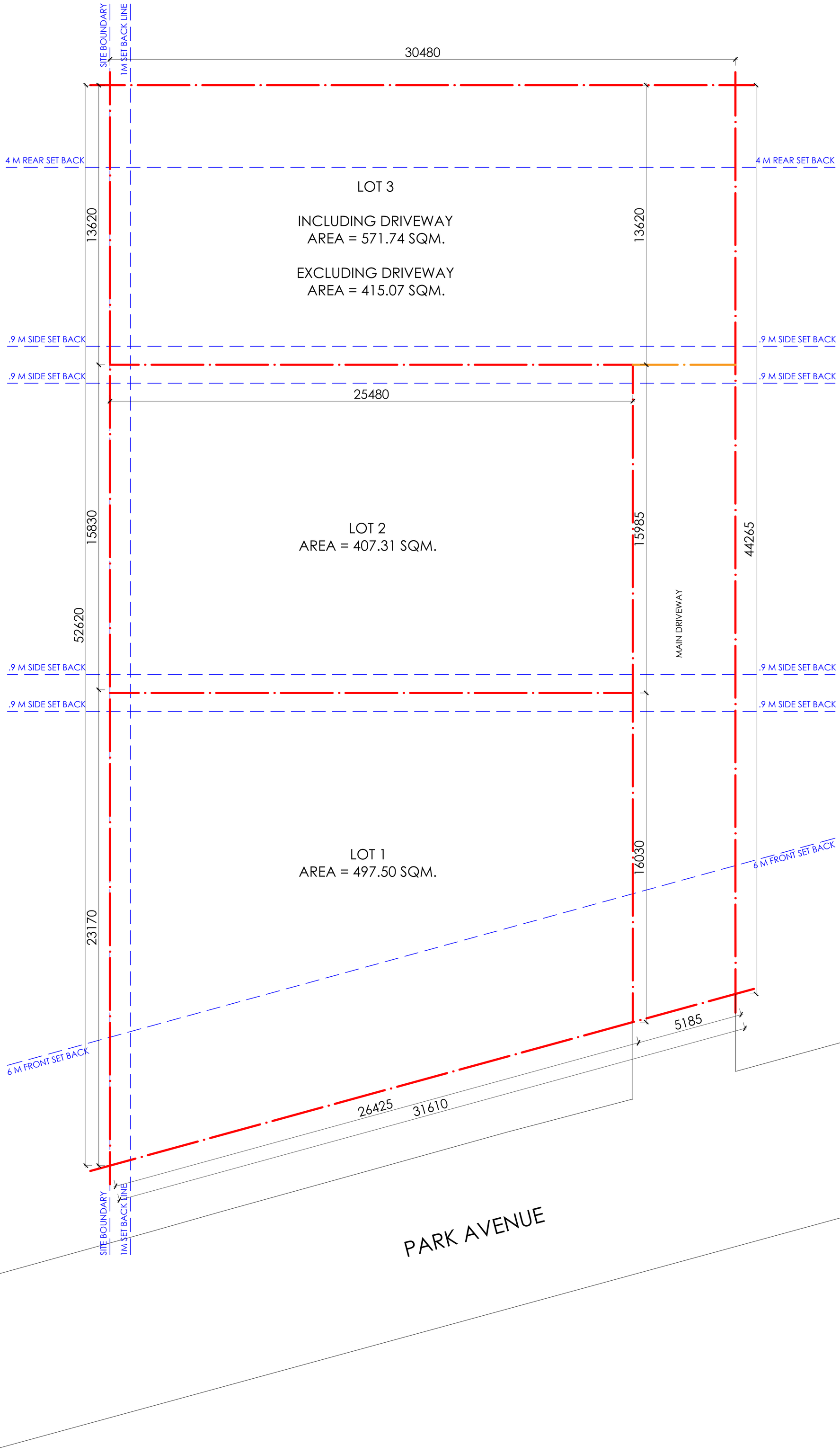
PROPOSED BOARDING HOUSE
SITE ANALYSIS

0 1 5

ARCHIDROME
601, 90 GEORGE STREET, HORNSBY, N.S.W 2077 TARUNCHADHA@ARCHIDROME.NET ARCHITECT'S REG. NO. 8777

DRWG. NO. **A00** R-01

SCALE 1:100@A1, 1:200@A3 | 31-32 PARK AVENUE, KINGSWOOD | 03/11/2020



PROPOSED BOARDING HOUSE
SUB-DIVISION PLAN

0 1 5

N

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DRWG. NO.
A01_1
R-01

SCALE 1:100@A1, 1:200@A3

23/10/2020

PROPOSED BOARDING HOUSE
SITE AND GROUND FLOOR PLAN

0 1 5

N

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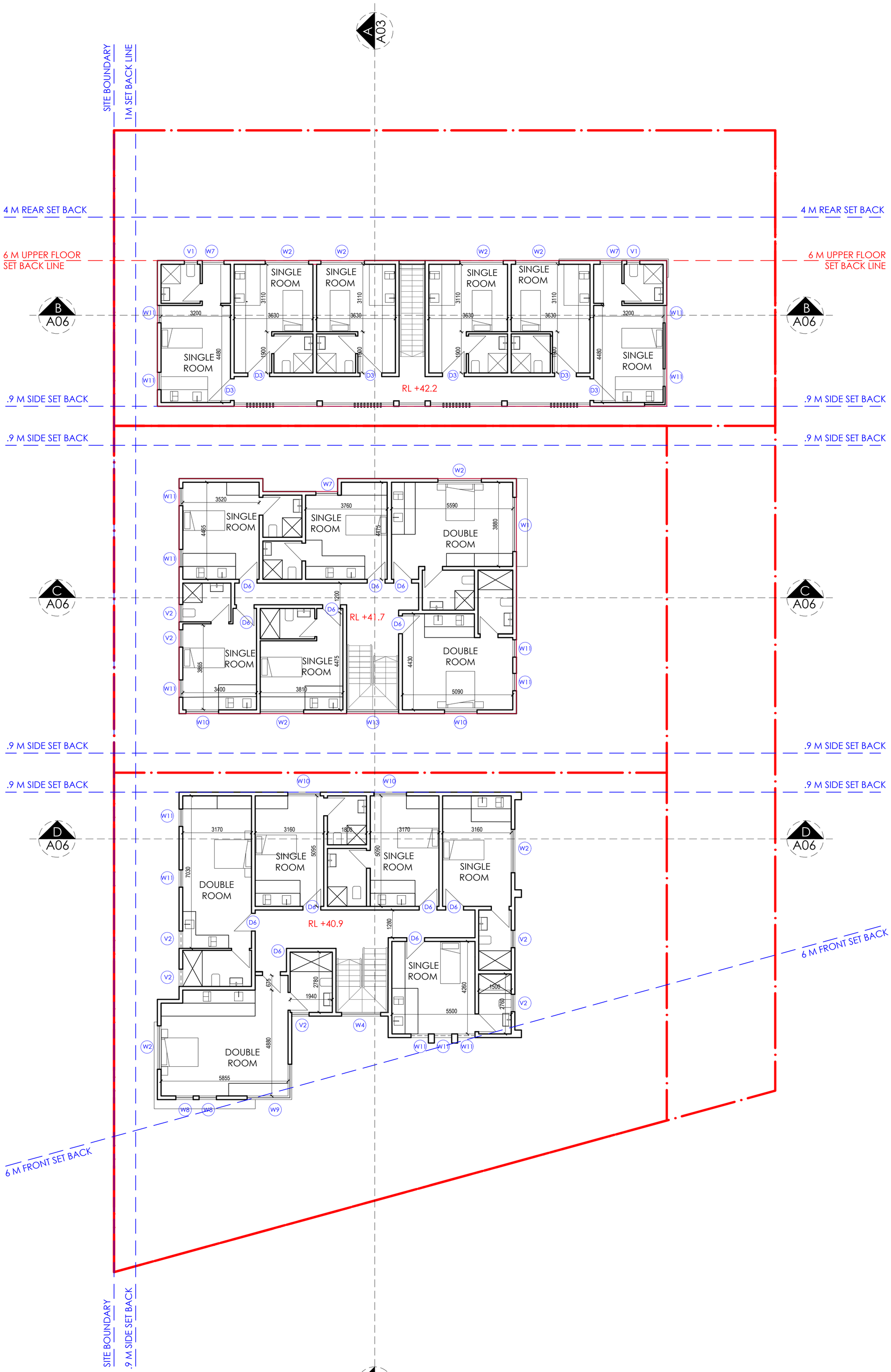
DRWG. NO. **A01** R-02

SCALE 1:100@A1, 1:200@A3 | 31-32 **PARK AVENUE, KINGSWOOD** | 03/11/2020



PROPOSED BOARDING HOUSE
FIRST FLOOR PLAN

0 1 5

N

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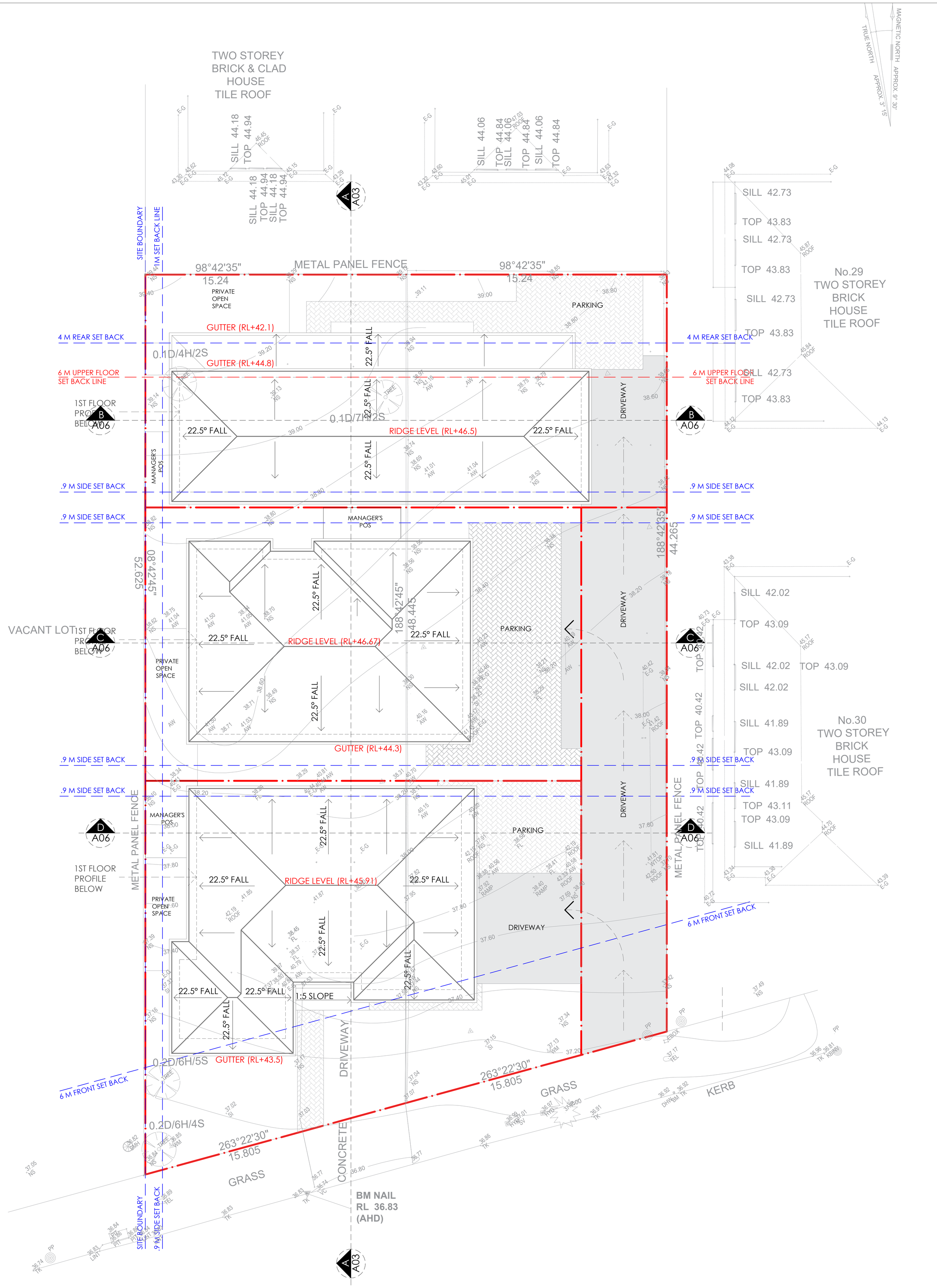
DRWG. NO. **A02** R-01

SCALE 1:100@A1, 1:200@A3 | 31-32 **PARK AVENUE, KINGSWOOD** | 23/10/2020



PROPOSED BOARDING HOUSE
ROOF PLAN

0 1 5

N

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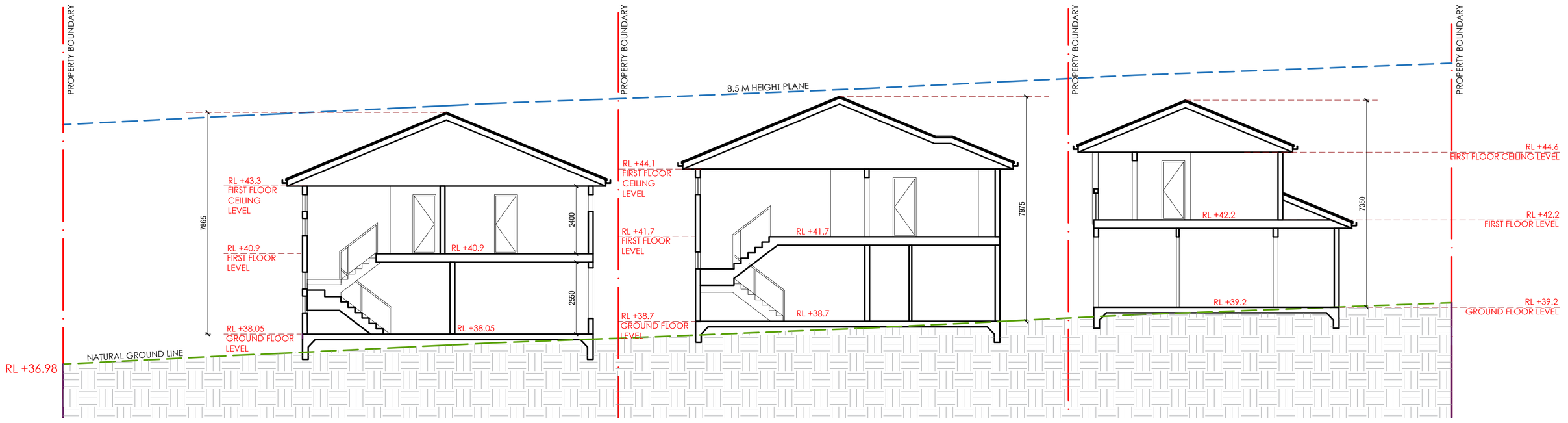
DRWG. NO. **A03** R-02

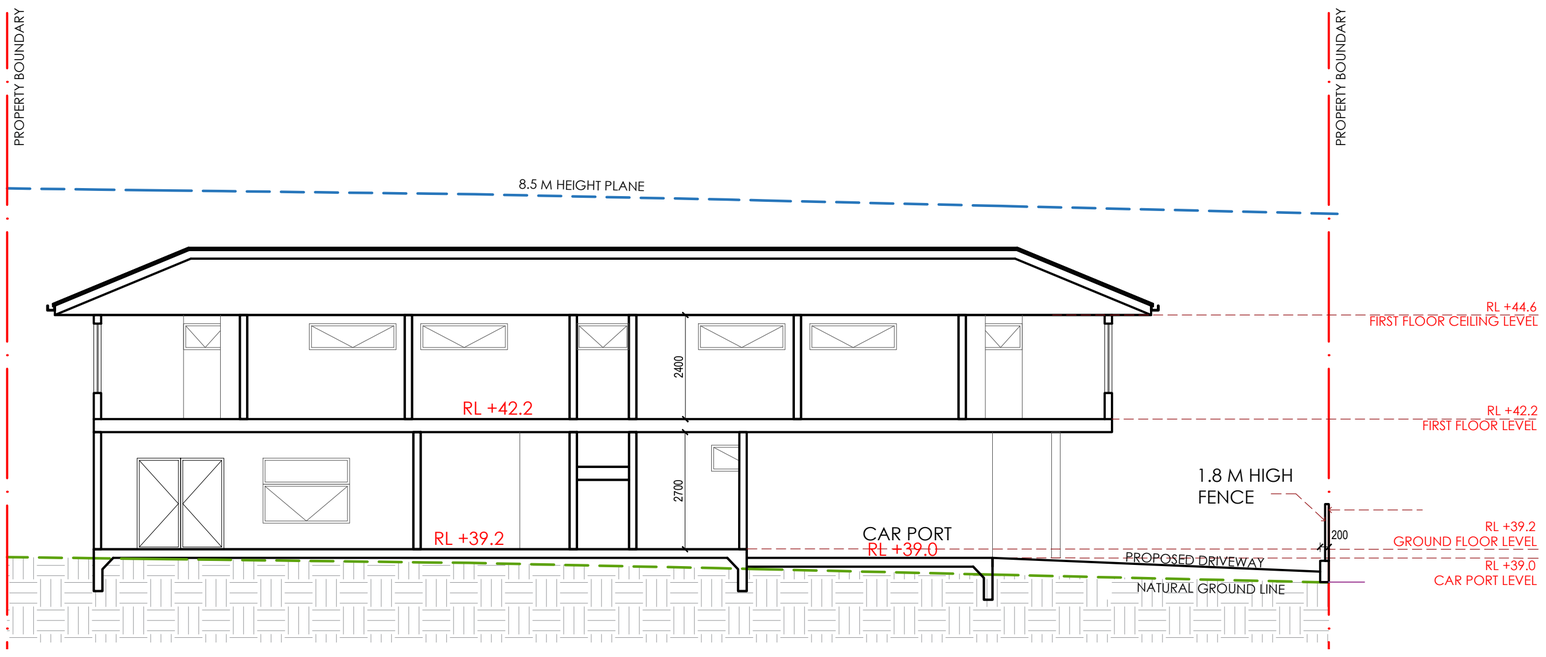
SCALE 1:100@A1, 1:200@A3

31-32 **PARK AVENUE, KINGSWOOD**

03/11/2020



SECTION AA



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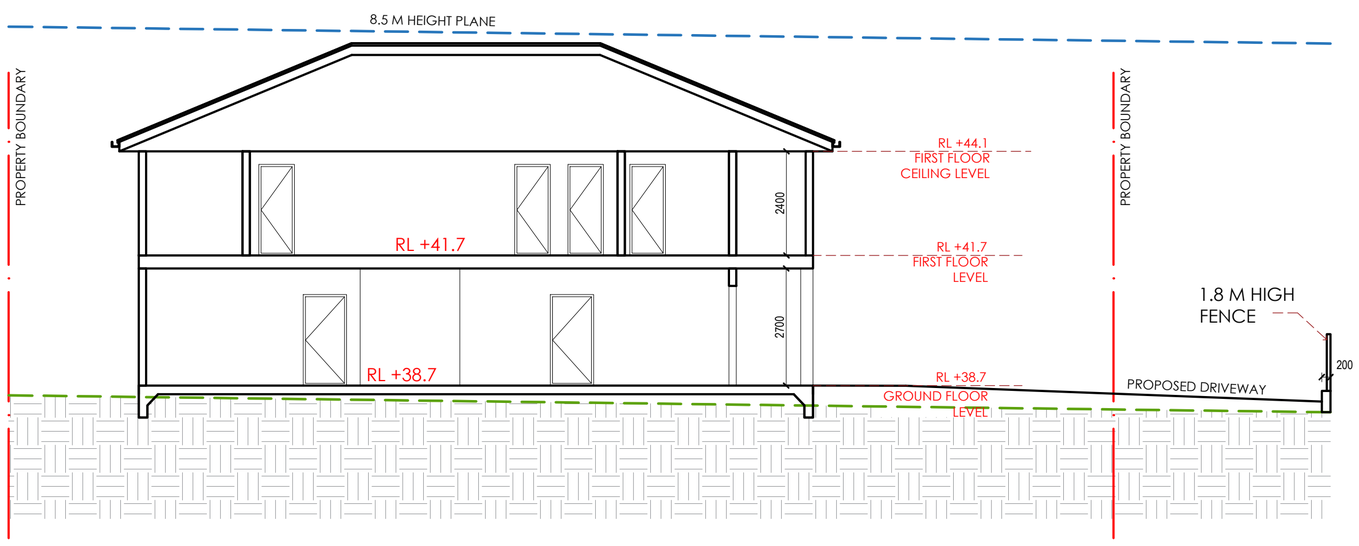

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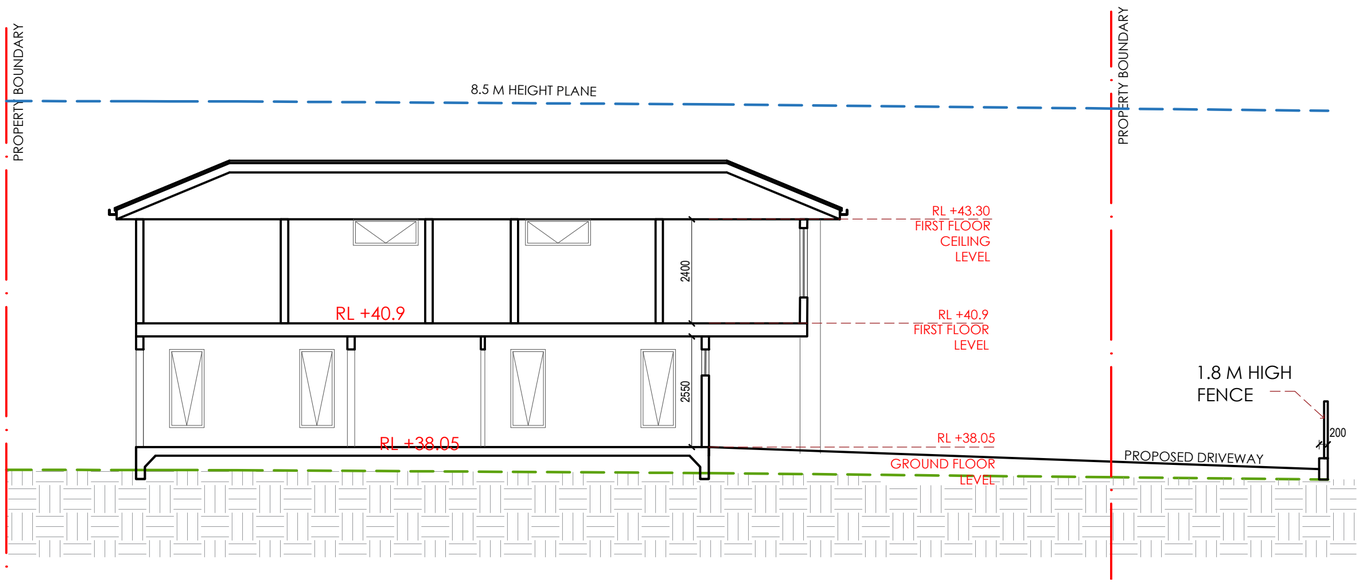

SECTION DD

PROPOSED BOARDING HOUSE
SECTIONS

0 1 5

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DRWG. NO. **A04** R-02

SCALE 1:100@A1, 1:200@A3

03/11/2020

FRONT (SOUTH) ELEVATION

EAST ELEVATION

REAR (NORTH) ELEVATION

WEST ELEVATION

PROPOSED BOARDING HOUSE

ELEVATIONS _ LOT 1

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DRWG. NO.
A05
R-01

SCALE 1:100@A1, 1:200@A3

31-32 PARK AVENUE, KINGSWOOD

03/11/2020

FRONT (EAST) ELEVATION

REAR (WEST) ELEVATION

SIDE (NORTH) ELEVATION

SIDE (SOUTH) ELEVATION

PROPOSED BOARDING HOUSE

ELEVATIONS _ LOT 2

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DRWG. NO.
A06
R-00

SCALE 1:100@A1, 1:200@A3

31-32 PARK AVENUE, KINGSWOOD

22/10/2020

FRONT (NORTH) ELEVATION

REAR (SOUTH) ELEVATION

SIDE (EAST) ELEVATION

SIDE (WEST) ELEVATION

PROPOSED BOARDING HOUSE

ELEVATIONS _ LOT 3

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DRWG. NO.
A07
R-00

SCALE 1:100@A1, 1:200@A3

31-32 PARK AVENUE, KINGSWOOD

22/10/2020

WINDOW SCHEDULE

LOT 03

GROUND FLOOR

ID.NO	WIDTH	HEIGHT	SILL	NOS	TYPE
W2	2000	600	1800	2	AWNING
W3	2000	1800	600	1	AWNING
W11	800	1800	600	1	AWNING, PARTLY FIXED
W7	1000	800	1600	1	AWNING
V1	600	600	1800	2	AWNING

FIRST FLOOR

ID.NO	WIDTH	HEIGHT	SILL	NOS	TYPE
W2	2000	600	1800	4	AWNING
W11	800	1800	400	4	AWNING, PARTLY FIXED
W7	1000	800	1400	2	AWNING
V1	600	600	1600	2	AWNING

LOT 02

GROUND FLOOR

ID.NO	WIDTH	HEIGHT	SILL	NOS	TYPE
W2	2000	600	1800	1	AWNING
W7	1000	800	1600	1	AWNING
W11	800	1800	600	4	AWNING, PARTLY FIXED
W13	2400	600	1800	1	AWNING

FIRST FLOOR

ID.NO	WIDTH	HEIGHT	SILL	NOS	TYPE
W1	2500	600	1600	1	AWNING
W2	2000	600	1600	2	AWNING
W7	1000	800	1400	1	AWNING
W10	1500	800	1400	2	AWNING, PARTLY FIXED
W11	800	1800	400	5	AWNING, PARTLY FIXED
W13	2400	600	1600	1	AWNING

LOT 01

GROUND FLOOR

ID.NO	WIDTH	HEIGHT	SILL	NOS	TYPE
W2	2000	600	1800	1	AWNING
W4	1800	600	900	2	AWNING
W6	1200	450	1450	2	AWNING
W11	800	1800	600	6	AWNING, PARTLY FIXED

FIRST FLOOR

ID.NO	WIDTH	HEIGHT	SILL	NOS	TYPE
W8	800	1200	1000	2	AWNING
W9	1880+1450 (CORNER WINDOW)	1200	1000	1	AWNING, PARTLY FIXED
W4	1800	600	750	2	AWNING
V2	800	600	1600	4	AWNING
W11	800	1800	400	5	AWNING, PARTLY FIXED
W2	2000	600	750	3	AWNING
W10	1500	800	1400	2	AWNING

DOOR SCHEDULE

LOT 03

GROUND FLOOR

ID.NO	WIDTH	HEIGHT	NOS	TYPE
D2	850	2400	1	HINGED
D3	1000	2400	2	HINGED
D4	2000	2400	1	SLIDING DOOR

FIRST FLOOR

ID.NO	WIDTH	HEIGHT	NOS	TYPE
D1	1000	2200	6	HINGED

LOT 02

GROUND FLOOR

ID.NO	WIDTH	HEIGHT	NOS	TYPE
D2	850	2400	1	HINGED
D3	1000	2400	2	HINGED
D4	2000	2400	1	SLIDING DOOR

FIRST FLOOR

ID.NO	WIDTH	HEIGHT	NOS	TYPE
D6	820	2200	6	HINGED

LOT 01

GROUND FLOOR

ID.NO	WIDTH	HEIGHT	NOS	TYPE
D1	800	2400	1	SLIDING
D2	850	2400	1	HINGED
D3	1000	2400	3	HINGED
D4	2000	2400	1	SLIDING DOOR

FIRST FLOOR

ID.NO	WIDTH	HEIGHT	NOS	TYPE
D6	820	2200	6	HINGED

PROPOSED BOARDING HOUSE
EXTERNAL DOOR & WINDOW SCHEDULE

0 1 5

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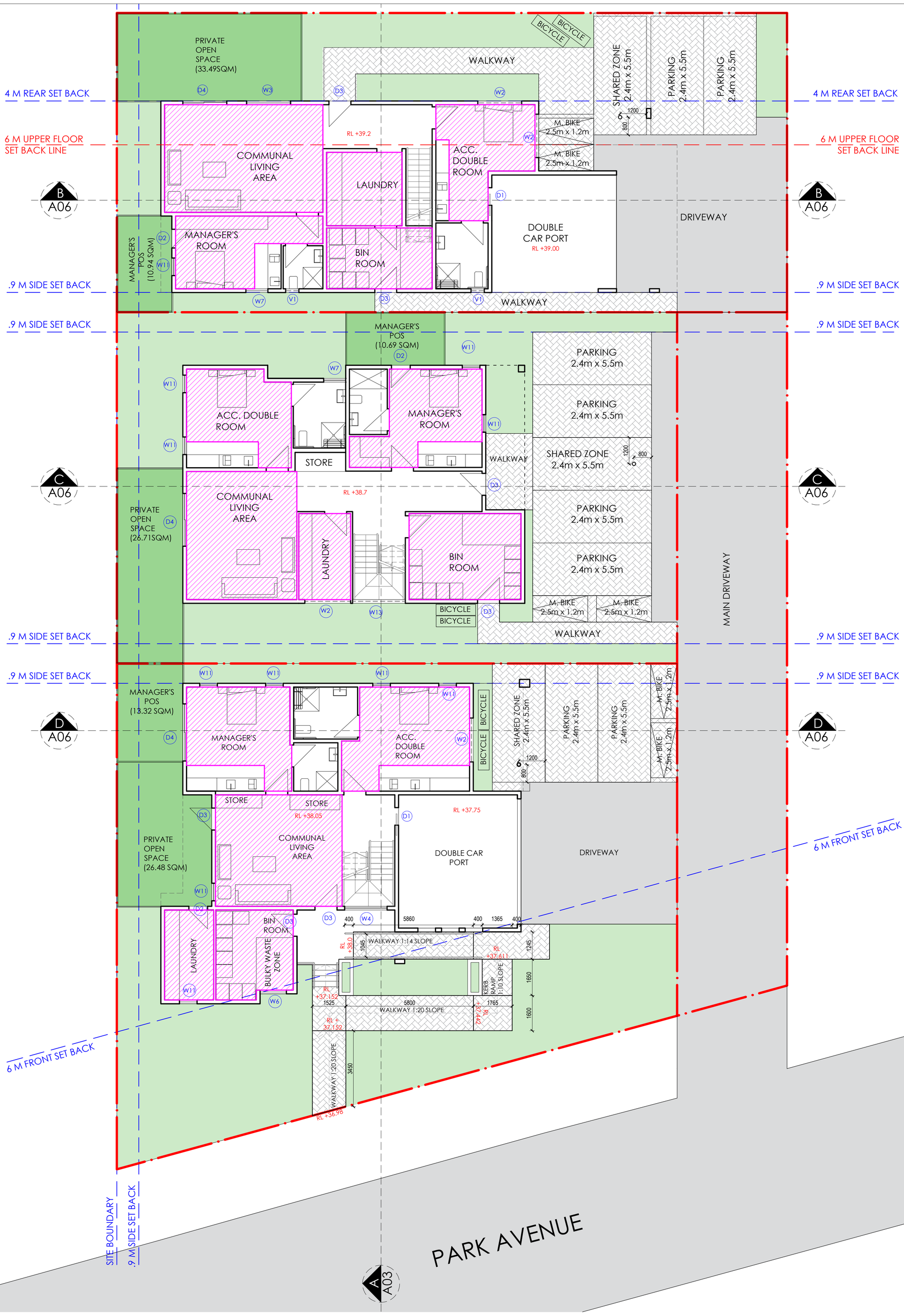
DRWG. NO. A08 R-01

SCALE 1:100@A1, 1:200@A3

31-32 PARK AVENUE, KINGSWOOD

23/10/2020



LOT 01

GROUND FLOOR

COMMUNAL LIVING AREA	29.16 SQ.M.
MANAGER'S ROOM	18.30 SQ.M.
ACC. DOUBLE ROOM	20.73 SQ.M.
BIN ROOM	13.66 SQ.M.
LAUNDRY	9.14 SQ.M.
TOTAL	**90.99 SQ.M.**

FIRST FLOOR

DOUBLE ROOM - 01	24.96 SQ.M.
DOUBLE ROOM - 02	20.33 SQ.M.
SINGLE ROOM - 01	13.61 SQ.M.
SINGLE ROOM - 02	13.65 SQ.M.
SINGLE ROOM - 03	13.89 SQ.M.
SINGLE ROOM - 04	13.79 SQ.M.
TOTAL	**100.23 SQ.M.**

LOT 02

GROUND FLOOR

COMMUNAL LIVING AREA	29.23 SQ.M.
MANAGER'S ROOM	18.01 SQ.M.
ACC. DOUBLE ROOM	16.82 SQ.M.
BIN ROOM	19.91 SQ.M.
LAUNDRY	9.21 SQ.M.
TOTAL	**93.18 SQ.M.**

FIRST FLOOR

DOUBLE ROOM - 01	19.80 SQ.M.
DOUBLE ROOM - 02	18.07 SQ.M.
SINGLE ROOM - 01	12.00 SQ.M.
SINGLE ROOM - 02	12.24 SQ.M.
SINGLE ROOM - 03	12.83 SQ.M.
SINGLE ROOM - 04	12.33 SQ.M.
TOTAL	**87.27 SQ.M.**

LOT 03

GROUND FLOOR

COMMUNAL LIVING AREA	35.27 SQ.M.
MANAGER'S ROOM	15.79 SQ.M.
ACC. DOUBLE ROOM	16.77 SQ.M.
BIN ROOM	13.29 SQ.M.
LAUNDRY	11.45 SQ.M.
TOTAL	**92.57 SQ.M.**

FIRST FLOOR

SINGLE ROOM - 01	14.17 SQ.M.
SINGLE ROOM - 02	12.29 SQ.M.
SINGLE ROOM - 03	12.29 SQ.M.
SINGLE ROOM - 04	12.29 SQ.M.
SINGLE ROOM - 05	12.29 SQ.M.
SINGLE ROOM - 06	14.11 SQ.M.
TOTAL	**77.44 SQ.M.**

** INTERNAL AREA CALCULATION EXCLUDES PRIVATE KITCHEN AND BATHROOM FACILITY AREA

PROPOSED BOARDING HOUSE
GROUND FLOOR PLAN
AREA SCHEDULE

SCALE 1:100@A1, 1:200@A3

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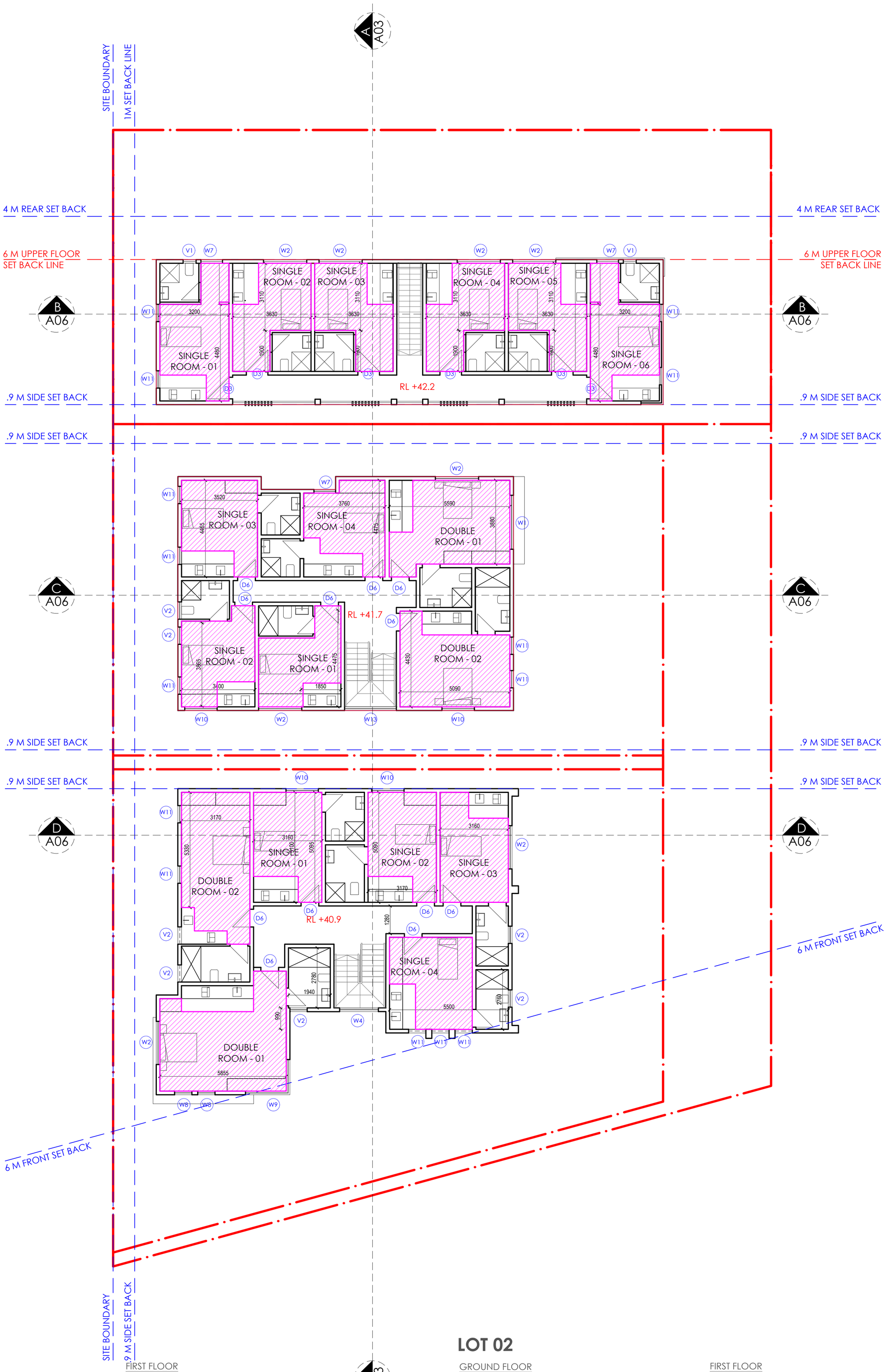
DRWG. NO. **A09** R-02

03/11/2020



LOT 01

GROUND FLOOR

COMMUNAL LIVING AREA	29.16 SQ.M.
MANAGER'S ROOM	18.30 SQ.M.
ACC. DOUBLE ROOM	20.73 SQ.M.
BIN ROOM	13.66 SQ.M.
LAUNDRY	9.14 SQ.M.
TOTAL	**90.99 SQ.M.**

FIRST FLOOR

DOUBLE ROOM - 01	24.96 SQ.M.
DOUBLE ROOM - 02	20.33 SQ.M.
SINGLE ROOM - 01	13.61 SQ.M.
SINGLE ROOM - 02	13.65 SQ.M.
SINGLE ROOM - 03	13.89 SQ.M.
SINGLE ROOM - 04	13.79 SQ.M.
TOTAL	**100.23 SQ.M.**

LOT 02

GROUND FLOOR

COMMUNAL LIVING AREA	29.23 SQ.M.
MANAGER'S ROOM	18.01 SQ.M.
ACC. DOUBLE ROOM	16.82 SQ.M.
BIN ROOM	19.91 SQ.M.
LAUNDRY	9.21 SQ.M.
TOTAL	**93.18 SQ.M.**

FIRST FLOOR

DOUBLE ROOM - 01	19.80 SQ.M.
DOUBLE ROOM - 02	18.07 SQ.M.
SINGLE ROOM - 01	12.00 SQ.M.
SINGLE ROOM - 02	12.24 SQ.M.
SINGLE ROOM - 03	12.83 SQ.M.
SINGLE ROOM - 04	12.33 SQ.M.
TOTAL	**87.27 SQ.M.**

LOT 03

GROUND FLOOR

COMMUNAL LIVING AREA	35.27 SQ.M.
MANAGER'S ROOM	15.79 SQ.M.
ACC. DOUBLE ROOM	16.77 SQ.M.
BIN ROOM	13.29 SQ.M.
LAUNDRY	11.45 SQ.M.
TOTAL	**92.57 SQ.M.**

FIRST FLOOR

SINGLE ROOM - 01	14.17 SQ.M.
SINGLE ROOM - 02	12.29 SQ.M.
SINGLE ROOM - 03	12.29 SQ.M.
SINGLE ROOM - 04	12.29 SQ.M.
SINGLE ROOM - 05	12.29 SQ.M.
SINGLE ROOM - 06	14.11 SQ.M.
TOTAL	**77.44 SQ.M.**

** INTERNAL AREA CALCULATION EXCLUDES PRIVATE KITCHEN AND BATHROOM FACILITY AREA

PROPOSED BOARDING HOUSE
FIRST FLOOR PLAN
AREA SCHEDULE

SCALE 1:100@A1, 1:200@A3

0 1 5

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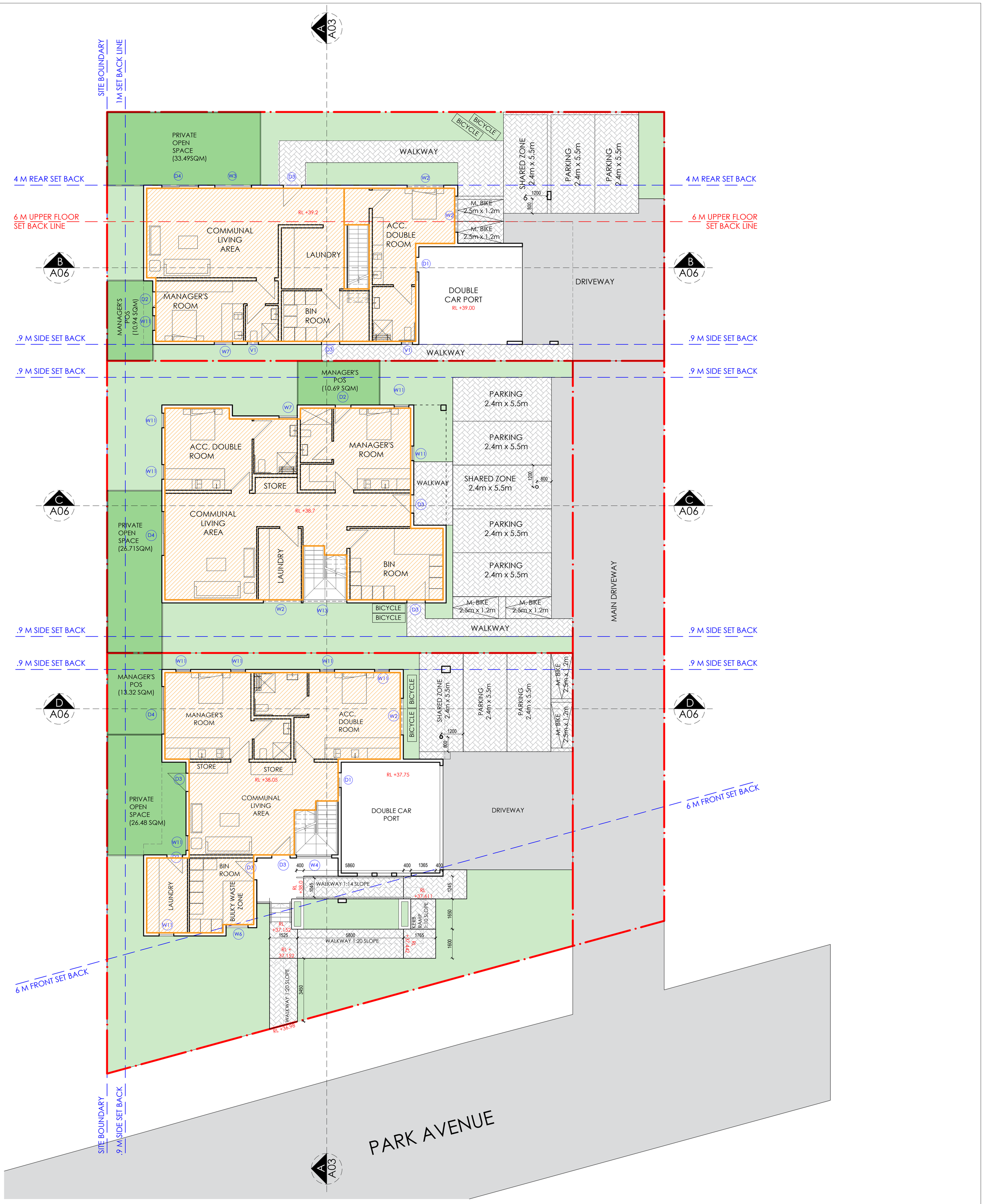
DRWG. NO. **A10** R-01

23/10/2020



AREA CALCULATION

	SITE AREA	GROUND FLOOR(A)	FIRST FLOOR(B)	TOTAL A+B	ALLOWABLE GFA
LOT 01	497.50 SQ.M	121.96 SQ.M	171.46 SQ.M	293.42 SQ.M	348.25 SQ.M
LOT 02	407.31 SQ.M	139.14 SQ.M	139.14 SQ.M	278.28 SQ.M	285.11 SQ.M
LOT 03	415.07 SQ.M	121.02 SQ.M	116.98 SQ.M	234 SQ.M	290.54 SQ.M

** INTERNAL AREA CALCULATION EXCLUDES PRIVATE KITCHEN AND BATHROOM FACILITY AREA

PROPOSED BOARDING HOUSE
GROUND FLOOR PLAN
GFA CALCULATION

0 1 5

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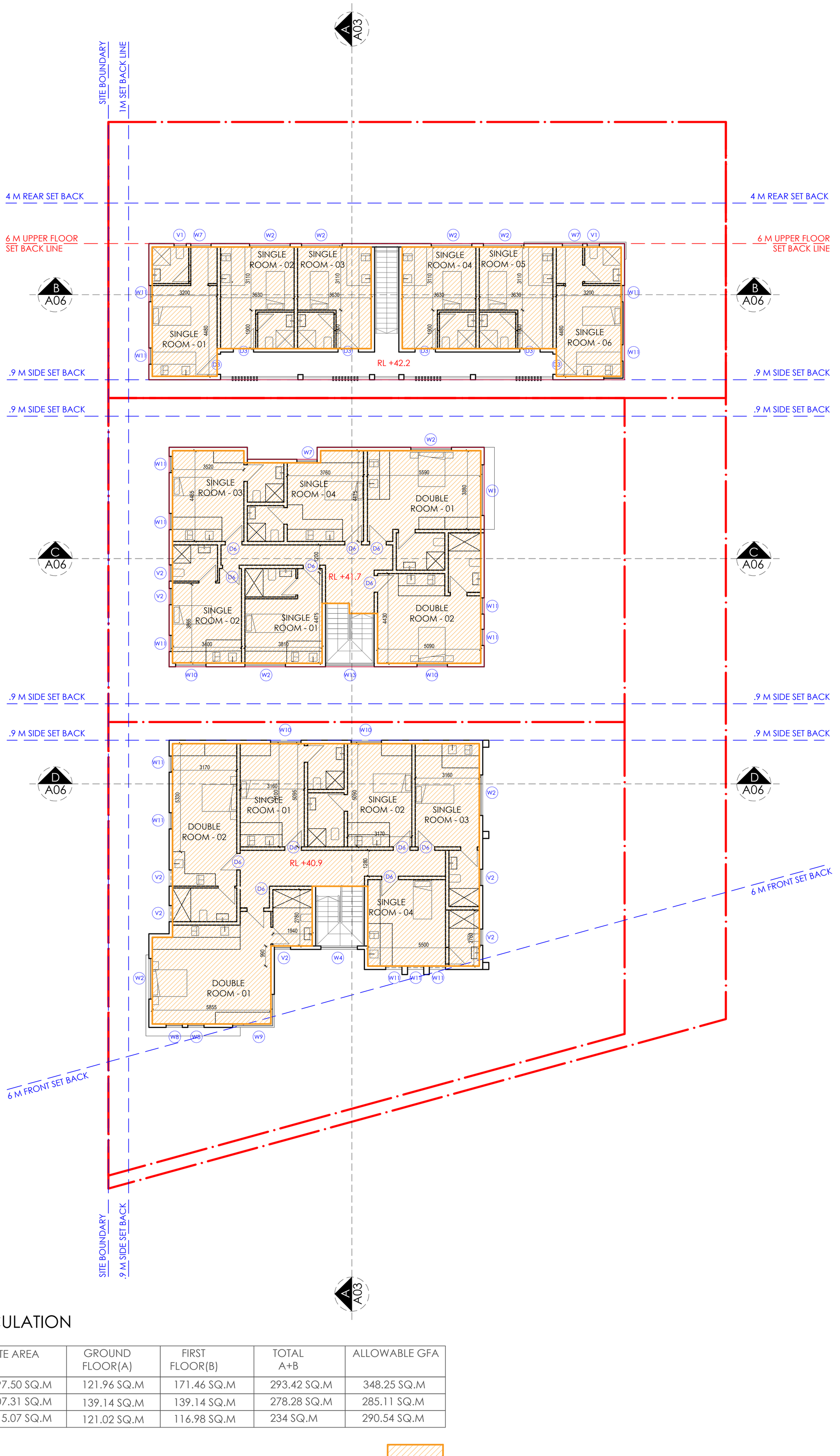
DRWG. NO. A11 R-02

SCALE 1:100@A1, 1:200@A3

03/11/2020



AREA CALCULATION

	SITE AREA	GROUND FLOOR(A)	FIRST FLOOR(B)	TOTAL A+B	ALLOWABLE GFA
LOT 01	497.50 SQ.M	121.96 SQ.M	171.46 SQ.M	293.42 SQ.M	348.25 SQ.M
LOT 02	407.31 SQ.M	139.14 SQ.M	139.14 SQ.M	278.28 SQ.M	285.11 SQ.M
LOT 03	415.07 SQ.M	121.02 SQ.M	116.98 SQ.M	234 SQ.M	290.54 SQ.M

** INTERNAL AREA CALCULATION EXCLUDES PRIVATE KITCHEN AND BATHROOM FACILITY AREA

PROPOSED BOARDING HOUSE
FIRST FLOOR PLAN
GFA CALCULATION

SCALE 1:100@A1, 1:200@A3

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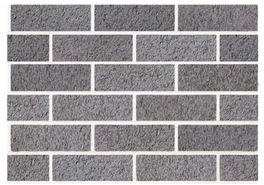
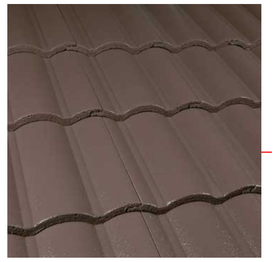
DRWG. NO. A12 R-01

23/10/2020

BORAL MACQUARIE TWILIGHT
DARK GREY COLOUR
CONCRETE ROOF TILE



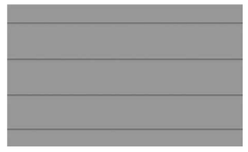
AUSTRAL BRICKS METALIX
GUNMETAL BLUE FACE BRICK



BORAL MACQUARIE WALNUT BROWN
COLOUR CONCRETE ROOF TILE

AUSTRAL BRICKS COASTAL
WHITEHEAVEN FACE BRICK

PERFORATED METAL BALUSTRADE WITH
TOP RAIL

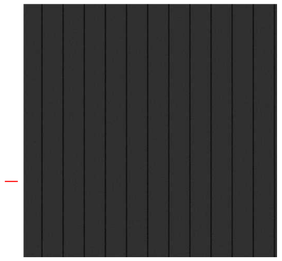


JAMES HARDIE STRIA SCYON GREY
WEATHERBOARD CLADDING

LOT 1
FRONT (SOUTH) ELEVATION

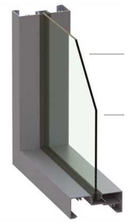
LOT 2
FRONT (EAST) ELEVATION

LOT 3
REAR (SOUTH) ELEVATION



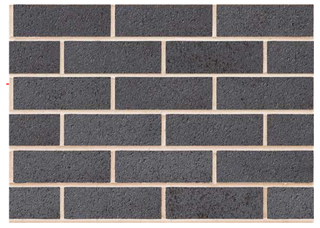
JAMES HARDIE AXON DARK GREY
WEATHERBOARD CLADDING

JAMES HARDIE STRIA SCYON LIGHT GREY
WEATHERBOARD CLADDING



CLEAR GLASS WITH BLACK POWDER
COATED ALUMINIUM FRAME

LIGHT COLOURED TIMBER
CLADDING WITH VERTICAL
GROOVES



AUSTRAL BRICKS METALIX LITHIUM
FACE BRICK

TIMBER LOOK ALUMINIUM LOUVER

PROPOSED BOARDING HOUSE

MATERIAL SCHEDULE

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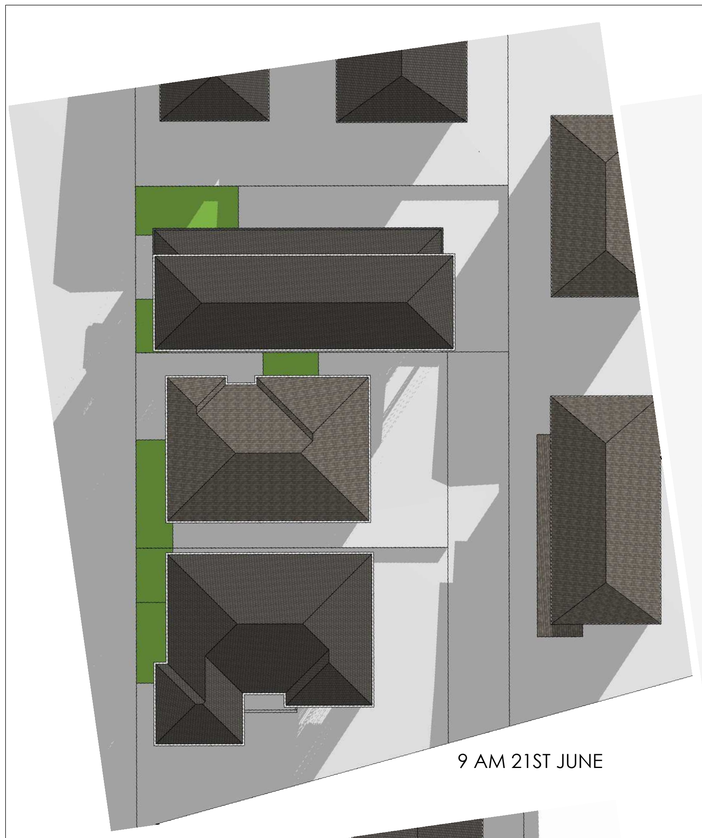
DRWG. NO. A13 R-00

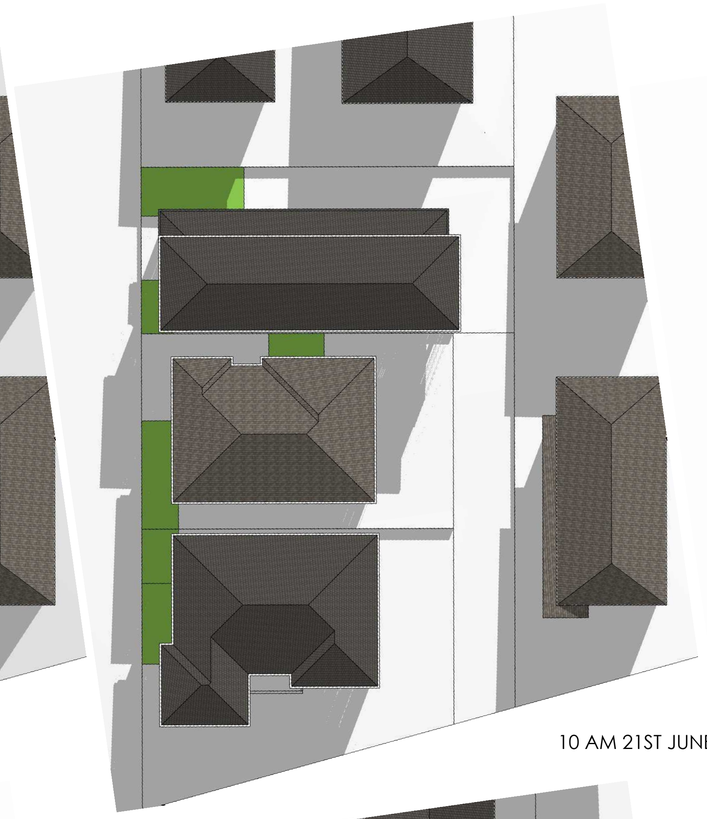
SCALE 1:100@A1, 1:200@A3

31-32 PARK AVENUE KINGSWOOD

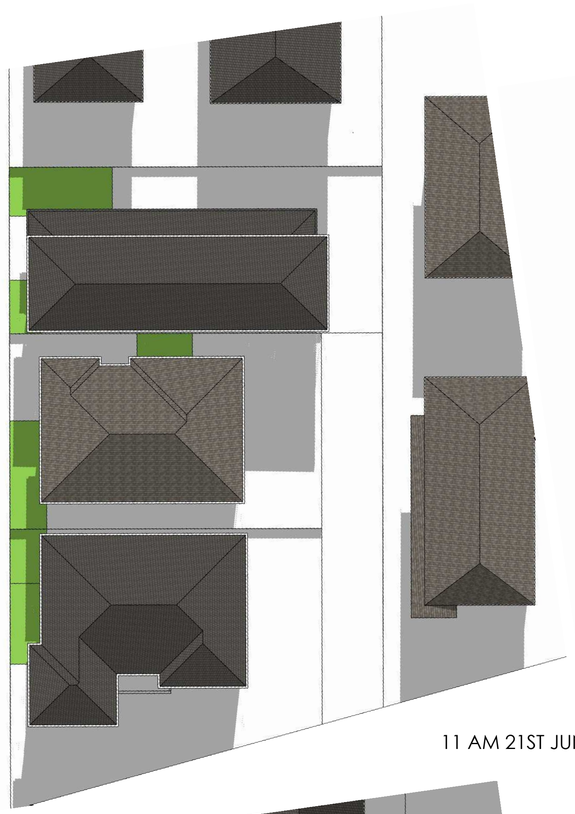
27/10/2020



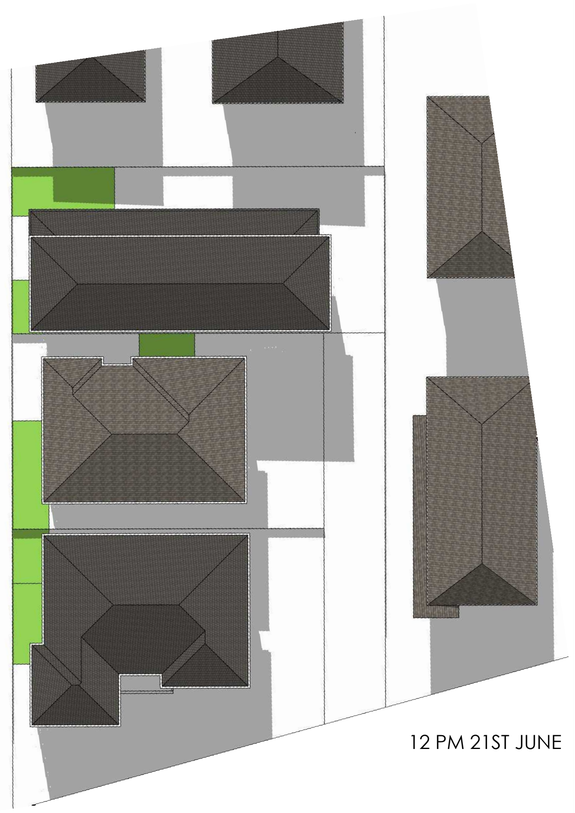
9 AM 21ST JUNE



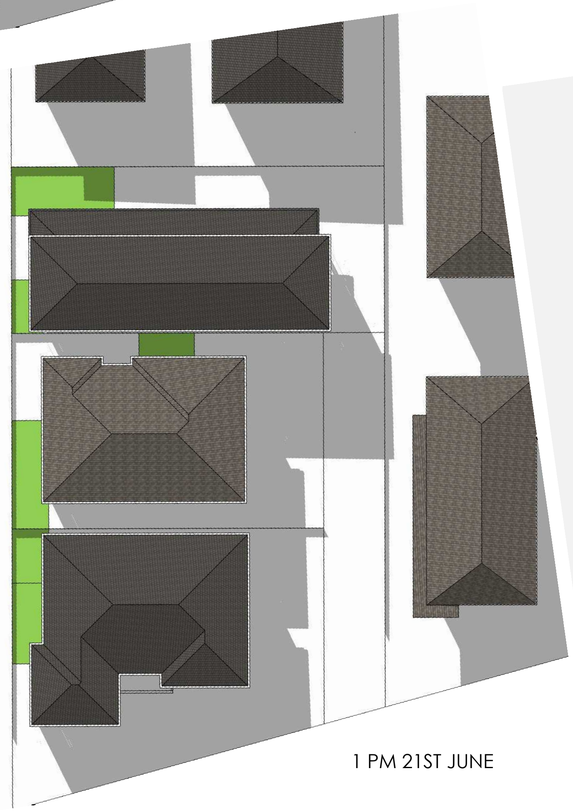
10 AM 21ST JUNE



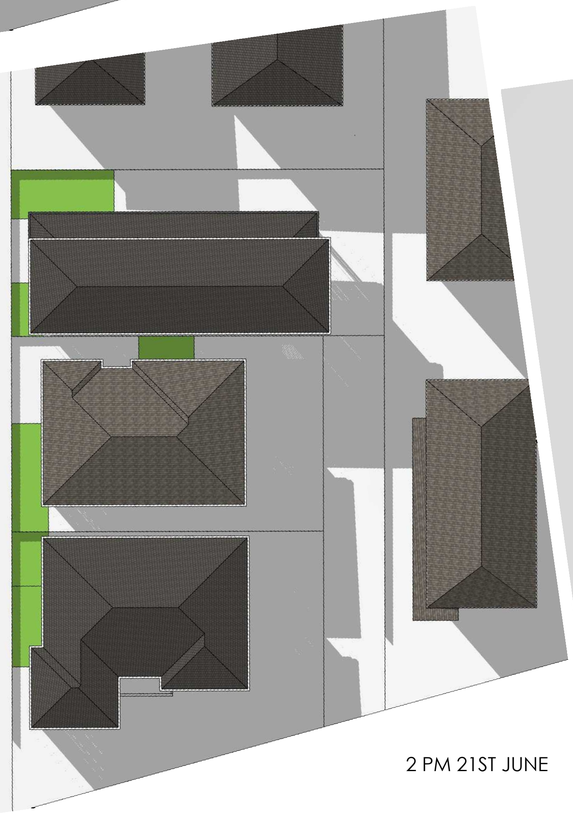
11 AM 21ST JUNE



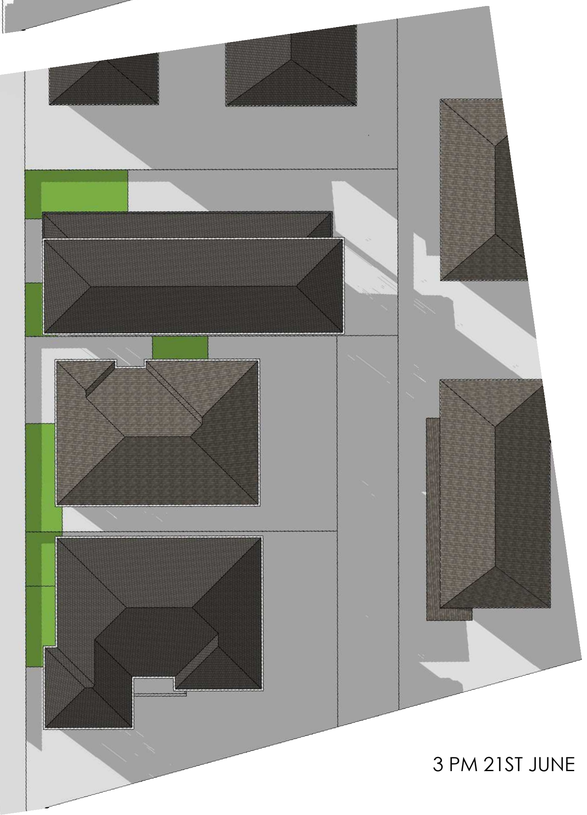
12 PM 21ST JUNE



1 PM 21ST JUNE



2 PM 21ST JUNE



3 PM 21ST JUNE

THE ABOVE DIAGRAMS CLEARLY SHOW THAT THE PRIVATE OPEN SPACES ACHIEVE SUFFICIENT SOLAR ACCESS OF 3 HOURS ON 21ST JUNE, THE WINTER SOLSTICE STARTING FROM 11 AM AND ONWARDS.

THERE IS NO OVERSHADOWING IMPACT GENERATED BY THE PROPOSED PROJECT ON THE NEIGHBOURING PROPERTIES .

RATHER THE EXISTING NEIGHBOURING PROPERTIES HAVE AN OVERSHADOWING IMPACT ON THE PROPOSED PROJECT.

PROPOSED BOARDING HOUSE

SHADOW DIAGRAMS

ARCHIDROME
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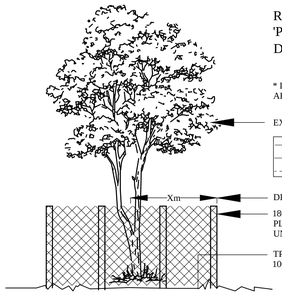
DRWG. NO. A14 R-00

SCALE 1:100@A1, 1:200@A3

31-32 PARK AVENUE, KINGSWOOD

27/10/2020



REFER TO AS 4970-2009 - 'PROTECTION OF TREES ON DEVELOPMENT SITES'

* IRRIGATION WITHIN TPZ AT ARBORIST OR COUNCIL DISCRETION

EXISTING TREE SPECIES

TPZ BARRIER
TPZ
SRZ

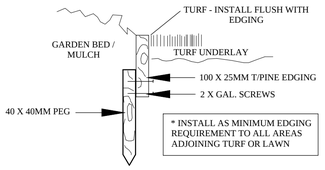
DISTANCE AS SHOWN ON PLAN

1800MM TEMPORARY FENCE HIRE WITH PLASTIC FEET - NO STAKES IN GROUND UNLESS SPECIFIED

TPZ TO BE MULCHED WITH A MINIMUM 100MM RECYCLED LEAF LITTER MULCH

TYPICAL TREE PROTECTION DETAIL - (NTS)

(IF NO ARBORIST REPORT REQUIRED)



TYPICAL EDGING (NTS)

PLANT SCHEDULE

BOTANIC NAME	KEY	QTY	POT SIZE	HT (M)
TREES				
BACKHOUSIA MYRTIFOLIA (GREY MYRTLE)*	BM	1	45L	5-10
ELEAOCARPUS RETICULATUS (BLUEBERRY ASH)*	ER	3	45L	5-10
LAGERSTROEMIA 'TUSCARORA' (CREPE MYRTLE)	LT	1	45L	5-10
SAPIUM SEBIFERUM (CHINESE TALLOWOOD)	SS	2	45L	10+
SHRUBS				
ACMENA 'SUBLIME' (LILLY PILLY)*	AS	23	200MM	TRIM
BERGENIA CORDIFOLIA (ELEPHANTS EARS)	BC	24	150MM	0.3
CALLISTEMON 'CAPTAIN COOK' (BOTTLEBRUSH)*	CC	8	200MM	1
CALLISTEMON 'HANNAH RAY' (BOTTLEBRUSH)*	CH	5	200MM	3
CAMELLIA SASANQUA (CAMELLIA)	CS	9	200MM	3
DIANELLA 'TASRED' (FLAX LILY)*	DT	13	150MM	0.3
LIRIOPE 'EVERGREEN GIANT' (LIRIOPE)	LE	17	150MM	0.5
PHILOTHECA MYOPOROIDES (WAXFLOWER)*	PM	5	200MM	1-2
PITTOSPORUM 'JAMES STIRLING' (PITTOSPORUM)	PJ	2	200MM	3
STOBILANTHES 'GOLDFUSSIA'	SG	16	200MM	1-5
SYZYGIUM 'AUSSIE SOUTHERN COMPACT' (LILLY PILLY)*	SA	16	200MM	3
SYZYGIUM 'ELITE' (LILLY PILLY)*	SE	21	200MM	TRIM

* = NATIVE SPECIES

ALL LEVELS / LOCATION OF RETAINING WALLS AS SPECIFIED BY OTHERS

REFER TO HYDRAULICS ENGINEERS PLAN FOR OSD / DWARF WALL DETAILS - MULCH OSD WITH NON FLOATABLE DECORATIVE GRAVEL. ALL FINISHED GROUND LEVELS AS PER HYDRAULICS ENGINEERS DETAILS.

TYPICAL PLANT SELECTION CRITERIA - AS2303-2015 'TREE STOCK FOR LANDSCAPE USE' FOR FULL SPEC.

ENSURE GOOD HEALTH AND VIGOUR. ENSURE FREEDOM FROM PESTS, DISEASES AND INJURY.

SPECIMENS SHOULD BE SELF SUPPORTING AT TIME OF PLANTING - STAKING ONLY TO BE USED WHEN NECESSARY- 1 GROWING SEASON MAX.

ENSURE EVIDENCE OF STEM TAPER - (INCREASE IN CALIPER DOWN THE STEM).

PRUNING:-
*ENSURE CLEAN STEM HEIGHT DOES NOT EXCEED 40% OF PLANT HEIGHT.
*ENSURE CUTS ARE AT BRANCH COLLAR ARE CLEAN WITH NO TEARS.

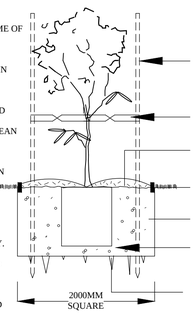
ENSURE APICAL DOMINANCE FOR TREES WITH TYPICAL EXCURRENT FORM - LEADER DEVIATION <15%.

ENSURE GOOD CROWN SYMMETRY AND SOUND STEM JUNCTIONS - NO INCLUDED BARK.

ENSURE SPECIMENS / BATCHES ARE CLEARLY LABELED - NOTING SPECIES CULTIVAR / VARIETY.

ENSURE SPECIMENS ARE FREE OF GIRDLING AND SUCKERING ROOTS.

ENSURE TRUNK POSITION IS WITHIN 10% OF POT CENTRE. IF TREE IS GRAFTED ENSURE SCION AND ROOTSTOCK ARE SOUND.



TYPICAL PLANTING CRITERIA

*SEEK ADVICE BEFORE SUBSTITUTING SPECIES
*REPLACEMENTS TO BE MADE WITHIN 12 MONTHS

3 x 40MM HARDWOOD STAKES AS REQUIRED. DON'T PIERCE ROOT BALL

(NOTE:- ONLY REQUIRED IN WINDY ENVIRONMENTS, VERY SANDY SOIL AND VERY WET CLAY - IF STAKING REQUIRED - REMOVE AS SOON AS PRACTICALLY POSSIBLE).

50MM WIDE JUTE WEBBING - TWIST ONCE AND GAL. STAPLE TO OUTSIDE OF STAKE. ENSURE TREE HAS AMPLE MOVEMENT

75 - 100MM SELECTED MULCH - DISH AROUND BASE OF TRUNK. TOP OF ROOT BALL TO FINISH FLUSH WITH TOP OF SOIL

SELECTED EDGING - REFER TO DETAIL

EXCAVATE HOLE AND INCORPORATE SOIL AMENDMENTS TO 30% MAX. IF REQUIRED.

TAMP SOIL GENTLY AROUND AND BENEATH ROOT BALL SO ROOT BALL DOES NOT MOVE - WATER WEEKLY FOR MINIMUM 4 WEEKS TO ESTABLISH.

SCARIFY SUB SOIL AND SIDES TO 100MM MINIMUM IN HEAVY CLAY SOILS. MAY BE REQUIRED TO MOUND PLANT.

45-75LTR TYPICAL PLANTING (NTS)

GENERAL NOTES:-

* LANDSCAPE CONTRACTOR TO CHECK DA CONDITIONS AND STAMPED LANDSCAPE PLAN BEFORE COMMENCING WORKS TO ENSURE NO ADDITIONS / AMENDMENTS TO PLAN.
* GARDEN BEDS IN OSD BASIN TO CONSIST OF NON FLOATABLE DECORATIVE GRAVEL.
* REFER TO HYDRAULICS ENGINEERS PLAN FOR OSD DETAILS / FINAL LEVELS.
* MULCHED PLANTING BEDS TO BE A MINIMUM DEPTH OF 75MM AS SELECTED.
* CONTRACTORS RESPONSIBILITY TO CHECK AND ADJUST SOIL pH AS REQUIRED.
* PROVIDE TIMBER EDGE AS A MINIMUM BENEATH FENCING / GATES TO DEFINE TURF AND GARDEN BEDS / PATHWAYS. EDGING TO BE PROVIDED TO ALL AREAS WHERE DIFFERING MATERIALS MEET, ie TURF / GARDEN, TURF / GRAVEL PATH ETC.
* WEED MAT BENEATH GRAVEL PATHWAYS REQUIRED TO LIMIT MUD TRACKING.
* PREMIUM ORGANIC GARDEN MIX TO BE USED.
* ALL PLANTS TO BE HEALTHY AND VIGOROUS.
* CONTRACTOR TO MAKE GOOD TURF ON NATURE STRIP POST CONSTRUCTION.
* DO NOT SCALE ARCHITECTURAL SETOUT FROM LANDSCAPE DRAWING.
* EXISTING TREE SPREAD APPROXIMATE ONLY. REFER TO TREE REPORT WHEN APPLICABLE.
* SITE SURVEY PROVIDED BY OTHERS.
* BUFFALO TURF PREFERRED OVER KIKUYU.

PLANTING AND MAINTENANCE NOTES:-

* GLAZED OR POLISHED PLANTING HOLES, PARTICULARLY IN CLAY SOILS SHOULD BE AVOIDED. PLANTS TO BE MOUNDED WITHIN THESE SOIL TYPES.
* PLANTS SHOULD BE PLANTED STRAIGHT, WITH THE TOP OF THE ROOT BALL LEVEL WITH OR SLIGHTLY LOWER THAN THE SOIL SURFACE.
* PLANTS SHOULD BE WATERED AS SOON AS POSSIBLE AFTER PLANTING.
* PLANTING SHOULD BE AVOIDED AT THE HEIGHT OF SUMMER (DECEMBER - JANUARY)
* PLANTS SHOULD BE WATERED AT LEAST WEEKLY FOR SIX WEEKS TO AID ESTABLISHMENT. WATER CRYSTALS MAY BE USED TO REDUCE THE AMOUNT OF WATER REQUIRED.
*IF A FERTILISER IS TO BE APPLIED, A SLOW RELEASE 8 - 9 MONTH PLANT FOOD PREFERRED.
* ONLY SPECIES WITHIN THE LANDSCAPE PLAN SHOULD BE PLANTED. PERMISSION SHOULD BE SOUGHT BEFORE ALTERING THE PLANT SPECIES LIST (ON MOST OCCASIONS NURSERIES CAN SUBSTITUTE).
* STOCK SHOULD BE FREE OF PESTS, DISEASE AND WEEDS AND NOT POT BOUND.
* REPLACEMENT PLANTS SHOULD BE MADE AVAILABLE FOR ANY LOSSES OF PLANT STOCK THAT MAY OCCUR FOR A MINIMUM 12 MONTH PERIOD.
* WEEDS SHOULD BE REMOVED ON A FORTNIGHTLY BASIS.
* PEST OR DISEASE SAMPLES TO THE LOCAL NURSERY FOR IDENTIFICATION AND APPROPRIATE REMEDY.

NOTE:- MONACO DESIGNS PL RESERVES THE RIGHT NOT TO UNDERTAKE NOR SUPPLY CERTIFICATION FOR OCCUPATION CERTIFICATE.
NOTE:- TO AID COMPLIANCE WITH BASIX LEGISLATION, PLANTS (WHERE APPLICABLE) HAVE BEEN SELECTED FROM THE LOCAL CITY COUNCIL / SHIRE PLANT LISTS.
NOTE:- LOCATION OF SEWER MAINS / LINES, WATER PIPES, UNDERGROUND ELECTRICITY AND OTHER SERVICES MUST BE OBTAINED PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. DIAL BEFORE YOU DIG 1100.

DIAL 1100 BEFORE YOU DIG

MONACO
DESIGNS PL
14 York Street, Glenbrook NSW, 2773
ph & fax: 0247395136 mb: 0409123200
email: paul@monaco.net.au

PROJECT:
PROPOSED DWELLINGS

ADDRESS:
31-32 PARK AVENUE
KINGSWOOD

CLIENT:
MR MILETIC

TITLE: DA
LANDSCAPE CONCEPT

DATE:	SCALE:	SHEET No:
28 OCT 2020 - A	1 : 200 - A1	1 OF 1
JOB No.	DRAWN:	
5626	CJ / PM	

LANDSCAPE PLANS
ARBORICULTURAL REPORTS
VEGETATION MANAGEMENT PLANS

12.0 APPENDIX D – Clause 4.6 request to vary battle-axe lot size standard

1.0 Introduction

This is a written request to seek an exception to a development standard pursuant to clause 4.6 in respect of the minimum 450sqm battle-axe lot size development standard for a proposed residential development at 31-32 Park Avenue Kingswood. Relevantly, clause 4.1(4B) of Penrith Local Environmental Plan 2010 provides that:

4.1 Minimum subdivision lot size

(1) The objectives of this clause are as follows—

(a) to ensure that lot sizes are compatible with the environmental capabilities of the land being subdivided,

(b) to minimise any likely impact of subdivision and development on the amenity of neighbouring properties,

(c) to ensure that lot sizes and dimensions allow developments to be sited to protect natural or cultural features including heritage items and retain special features such as trees and views,

(d) to regulate the density of development and ensure that there is not an unreasonable increase in the demand for public services or public facilities,

(e) to ensure that lot sizes and dimensions are able to accommodate development consistent with relevant development controls.

(2) This clause applies to a subdivision of any land shown on the Lot Size Map that requires development consent and that is carried out after the commencement of this Plan.

(3) The size of any lot resulting from a subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land.

…

(4B) Despite subclause (3), development consent must not be granted for the subdivision of land in Zone R3 Medium Density Residential unless each lot to be created by the subdivision would have—

(a) if it is a standard lot—a minimum width of 12 metres, or

(b) if it is a battle-axe lot—a minimum width of 15 metres and a minimum area of 450 square metres.

(4C) For the purposes of this clause, if a lot is a battle-axe lot or other lot with an access handle, the area of the access handle is not to be included in calculating the lot size.

Clause 4.1(4B) requires subdivision in the R3 zone to provide a minimum width of 12m for standard lots and a minimum width of 15m and minimum area of 450sqm for battle-axe lots. In this instance, whilst the proposed lots comply with the minimum width requirements for standard and battle-axe lots, variations of 43sqm (9.48%) and 35sqm (7.78%) are proposed to the minimum battle-axe lot area requirements for Lot 2 and Lot 3, respectively.

Accordingly, this Clause 4.6 request to vary the maximum height of building development standard has been prepared having regard to *Four2Five Pty Ltd v Ashfield Council [2015]* and *Wehbe v Pittwater Council 120071.*In this regard, it is noted that Wehbe sets out five ways of demonstrating that compliance is unreasonable or unnecessary, one of which is that the objectives of the standard are achieved. Noting the requirements of Clause 4.6 as opposed to SEPP No. 1, it is also necessary to demonstrate that there are sufficient environmental planning grounds to justify contravening the standard and that the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development in the zone.

It is contended that compliance with the minimum 450sqm battle-axe lot size standard is unreasonable and unnecessary in the circumstances of the case given there are sufficient environmental planning grounds and the objectives of the standard are achieved nonetheless as follows:

- The proposed variations relate to the paper plan subdivision lot boundaries only and would not be visually discernible given the proposed building siting and design, bulk and scale, landscaping, private open space, access, car parking and fencing would remain unchanged.
- Notwithstanding the above, the proposed subdivision facilitates the provision of new residential accommodation of a significantly lesser scale and intensity of development that could otherwise be achieved on an unsubdivided site noting Council's approval of a 28 room boarding house at 45 Park Avenue under D16/0374.
- The proposed lot layout results in a better planning outcome than an otherwise strictly compliant lot layout given the proposal minimises bulk and scale and overshadowing impacts to adjoining properties to the rear by providing for additional building area within Lot 1 facing the street, whereas a reduction in the size of Lot 1 and increase to the size of battle-axe Lots 2 and 3 would result in additional building area and bulk and scale at the rear of the site and additional visual bulk and overshadowing impacts to adjoining properties.
- The proposed battle-axe lot area variations are numerically minor variations of 43sqm (9.48%) and 35sqm (7.78%) for Lot 2 and Lot 3, respectively.
- Proposed Lot 1 is 97.5sqm larger than the minimum lot size requirement of 400sqm for a standard lot, which offsets the sum of the shortfall of 88sqm on battle-axe Lots 2 and 3, and as such, the proposed subdivision complies on an overall average lot size basis.
- The proposal is not an overdevelopment of the site given an overall yield of 3 lots in the form of two battle-axe lots of at least 450sqm excluding the access handle and one standard lot of 400sqm could otherwise be accommodated on the site.
- The proposed lot sizes ranging from 407sqm (excluding the access handle) and 497sqm are compatible with the environmental capabilities of the R3 medium density zoned land being subdivided.
- The proposed subdivision layout and building design and layout does minimise any likely adverse amenity impacts on adjoining properties in relation to bulk and scale, overshadowing, visual privacy and acoustic amenity.
- The proposed lot sizes and dimensions allow for the proposed building design and layout and detailed landscaping with additional canopy tree coverage to be suitably accommodated within the site in accordance with relevant development controls and do not result in any adverse heritage, tree or view impacts.

- The proposed lot sizes are wholly consistent with the planned residential density of the R3 zoned land given the yield is equivalent to an otherwise strictly compliant lot layout comprising 3 lots, but results in a better planning outcome in terms of reduced bulk and scale and overshadowing impacts to adjoining properties at the rear, and will ensure that there is not any unreasonable increase in demand for public services or public facilities.
- The variations do not result in additional floor area or an overdevelopment of the site.
- The proposal complies with relevant development controls including setbacks, building height, landscaping, private open space, solar access, visual privacy, car parking, access, stormwater and waste management.
- The proposal is in harmony with the bulk and scale of surrounding buildings and the streetscape and minimises the impacts of new development on adjoining or nearby properties from loss of privacy or acoustic amenity, overshadowing or visual intrusion.
- The proposal results in an improvement to the existing streetscape and park frontage and ensures a high visual quality of the development when viewed from adjoining properties, the adjoining public reserve to the west and the street frontage
- The proposal is consistent with the existing pattern of development and desired future character of this section of the street and the local area as shown in the aerial photo below.
- The proposal is a permitted form of development in the R3 zone and consistent with the relevant zone objectives to provide for the housing needs of the community and a variety of housing types within the medium density residential environment with excellent access to services and facilities and maintains a high level of residential amenity consistent with the existing and desired future character of the local area.
- The proposal is consistent with, and of a lesser scale and intensity of, residential development that could otherwise be reasonably accommodated noting Council has approved a total of 10 x 3-5 bedroom dwellings on the adjoining property to the east at 29-30 Park Avenue under DA15/0171 and 4 x 2-3 bedroom dwellings at 32 Joseph Street under DA18/0428.

2.0 Penrith Local Environmental Plan 2010

2.1 Clause 4.6(1) – Flexibility and Better Outcomes

Subclause 4.6(1) states the objectives of the clause as follows:

> *"(a) to provide an appropriate degree of flexibility in applying certain development standards to particular development, and*
>
> *(b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances."*

The proposal is considered to be compatible with these objectives and a response to the objectives is contained within this submission.

2.2 Subclause 4.6(2) – Consent may be granted

Subclause 4.6(2) provides that:

> *(2) Development consent may, subject to this clause, be granted for development even though the development would contravene a development standard imposed by this or any other environmental planning instrument. However, this clause does not apply to a development standard that is expressly excluded from the operation of this clause.*

The minimum battle-axe lot size development standard is not expressly excluded from the operation of clause 4.6 and accordingly, consent may be granted.

2.3 Subclause 4.6(3) – Written Request

Subclause 4.6(3) relates to the making of a written request to justify an exception to a development standard and states:

> *"(3) Consent must not be granted for development that contravenes a development standard unless the consent authority has considered a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating:*
>
> *(a) that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and*
>
> *(b) that there are sufficient environmental planning grounds to justify contravening the development standard."*

The proposed development does not comply with the minimum battle-axe lot size development standard. However, strict compliance is considered to be unreasonable and unnecessary in the circumstances of this case as justified in this written variation request.

2.4 Subclause 4.6(4) – Written Request

Subclause 4.6(4) provides that consent must not be granted for development that contravenes a development standard unless:

> *"(a) the consent authority is satisfied that:*
>
> *(i) the applicant's written request has adequately addressed the matters required to be demonstrated by subclause (3), and*
> *(ii) the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out, and*
>
> *(b) the concurrence of the Director-General has been obtained."*

The remainder of this written request for exception to the development standard addresses the matters required under subclause 4.6(4) the LEP, as follows.

Furthermore, subclause 4.6(5) provides that in deciding whether to grant concurrence, the Director General must consider:

> *"(a) whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and*
>
> *(b) the public benefit of maintaining the development standard, and (c) any other matters required to be taken into consideration by the Director-General before granting concurrence."*

It is contended that the proposed development is a form of development that is most appropriate for this R3 medium density residential site as it will have minimal, if any, detrimental impacts on the surrounding amenity or the long term development potential of the neighbouring lands. As part of any consideration of this matter the Director-General can accept that the variation of the battle-axe lot size standard is a local matter, given the minor extent and overall compliance with the requirements of SEPP Affordable Rental Housing 2009, Penrith Local Environmental Plan 2010 and Penrith DCP 2014.

2.5 The Nature of the Variation

Clause 4.1(4B) requires subdivision in the R3 zone to provide a minimum area of 450sqm for battle-axe lots. In this instance, proposed Lot 2 is 407sqm and proposed Lot 3 is 415sqm, equating to variations of 43sqm (9.48%) and 35sqm (7.78%) are proposed to the minimum battle-axe lot area requirements for Lot 2 and Lot 3, respectively.

It is argued in this request that this variation is unlikely to result in any significant environmental impacts but does assist in achieving a higher quality building design and a yield that is entirely consistent with the density projections for this site and the desired future character of the locality.

To require strict compliance would result in a building form with additional bulk and scale to the rear and increased visual bulk and overshadowing impacts to adjoining properties compared to the proposed scheme. In this way the underlying objectives of the development standard are achieved by the proposal to an equivalent or better degree than a development that complied with the standard and strict compliance would be unreasonable or unnecessary in these circumstances.

Further, the proposal provides public benefits arising through employment during the construction phase and ongoing employment opportunities upon completion. The proposal represents an appropriate increase and replenishment of the available housing stock that is wholly in keeping with the desired future character of the locality, noting the need to provide housing choice and affordability for a growing population in close proximity to local train and bus services, major regional road networks, access to areas of employment, educational facilities, entertainment and open space.

2.6 The Objectives of the Development Standard

(1) The objectives of this clause are as follows:

(a) to ensure that lot sizes are compatible with the environmental capabilities of the land being subdivided,

(b) to minimise any likely impact of subdivision and development on the amenity of neighbouring properties,

(c) to ensure that lot sizes and dimensions allow developments to be sited to protect natural or cultural features including heritage items and retain special features such as trees and views,

(d) to regulate the density of development and ensure that there is not an unreasonable increase in the demand for public services or public facilities,

(e) to ensure that lot sizes and dimensions are able to accommodate development consistent with relevant development controls.

The proposed development is considered to achieve the above objectives as follows:

- The proposed variations relate to the paper plan subdivision lot boundaries only and would not be visually discernible given the proposed building siting and design, bulk and scale, landscaping, private open space, access, car parking and fencing would remain unchanged.
- Notwithstanding the above, the proposed subdivision facilitates the provision of new residential accommodation of a significantly lesser scale and intensity of development that could otherwise be achieved on an unsubdivided site noting Council's approval of a 28 room boarding house at 45 Park Avenue under D16/0374.
- The proposed lot layout results in a better planning outcome than an otherwise strictly compliant lot layout given the proposal minimises bulk and scale and overshadowing impacts to adjoining properties to the rear by providing for additional building area within Lot 1 facing the street, whereas a reduction in the size of Lot 1 and increase to the size of battle-axe Lots 2 and 3 would result in additional building area and bulk and scale at the rear of the site and additional visual bulk and overshadowing impacts to adjoining properties.

- The proposed battle-axe lot area variations are numerically minor variations of 43sqm (9.48%) and 35sqm (7.78%) for Lot 2 and Lot 3, respectively.
- Proposed Lot 1 is 97.5sqm larger than the minimum lot size requirement of 400sqm for a standard lot, which offsets the sum of the shortfall of 88sqm on battle-axe Lots 2 and 3, and as such, the proposed subdivision complies on an overall average lot size basis.
- The proposal is not an overdevelopment of the site given an overall yield of 3 lots in the form of two battle-axe lots of at least 450sqm excluding the access handle and one standard lot of 400sqm could otherwise be accommodated on the site.
- The proposed lot sizes ranging from 407sqm (excluding the access handle) and 497sqm are compatible with the environmental capabilities of the R3 medium density zoned land being subdivided.
- The proposed subdivision layout and building design and layout does minimise any likely adverse amenity impacts on adjoining properties in relation to bulk and scale, overshadowing, visual privacy and acoustic amenity.
- The proposed lot sizes and dimensions allow for the proposed building design and layout and detailed landscaping with additional canopy tree coverage to be suitably accommodated within the site in accordance with relevant development controls and do not result in any adverse heritage, tree or view impacts.
- The proposed lot sizes are wholly consistent with the planned residential density of the R3 zoned land given the yield is equivalent to an otherwise strictly compliant lot layout comprising 3 lots, but results in a better planning outcome in terms of reduced bulk and scale and overshadowing impacts to adjoining properties at the rear, and will ensure that there is not any unreasonable increase in demand for public services or public facilities.
- The variations do not result in additional floor area or an overdevelopment of the site.
- The proposal complies with relevant development controls including setbacks, building height, landscaping, private open space, solar access, visual privacy, car parking, access, stormwater and waste management.
- The proposal is in harmony with the bulk and scale of surrounding buildings and the streetscape and minimises the impacts of new development on adjoining or nearby properties from loss of privacy or acoustic amenity, overshadowing or visual intrusion.
- The proposal results in an improvement to the existing streetscape and park frontage and ensures a high visual quality of the development when viewed from adjoining properties, the adjoining public reserve to the west and the street frontage
- The proposal is consistent with the existing pattern of development and desired future character of this section of the street and the local area as shown in the aerial photo below.
- The proposal is a permitted form of development in the R3 zone and consistent with the relevant zone objectives to provide for the housing needs of the community and a variety of housing types within the medium density residential environment with excellent access to services and facilities and maintains a high level of residential amenity consistent with the existing and desired future character of the local area.
- The proposal is consistent with, and of a lesser scale and intensity of, residential development that could otherwise be reasonably accommodated noting Council has approved a total of 10 x 3-5 bedroom dwellings on the adjoining property to the east at 29-

30 Park Avenue under DA15/0171 and 4 x 2-3 bedroom dwellings at 32 Joseph Street under DA18/0428.

2.7 The Objectives of the Zone

The land use table states the objectives of the Zone as follows:

- *To provide for the housing needs of the community within a medium density residential environment.*
- *To provide a variety of housing types within a medium density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*
- *To provide for a concentration of housing with access to services and facilities.*
- *To enhance the essential character and identity of established residential areas.*
- *To ensure that a high level of residential amenity is achieved and maintained.*
- *To ensure that development reflects the desired future character and dwelling densities of the area.*

As the proposal is for residential development of the land, the first, second, fourth, fifth, sixth and seventh objectives are relevant. The proposed development provides for housing choice and variety consistent with the medium density residential environment with excellent access to services and facilities and maintains a high level of residential amenity consistent with the existing and desired future character of the local area.

The proposal provides for the housing needs of the community within a medium density residential environment and represents a significant improvement to the existing streetscape and local context.

The proposal will cater for the expected traffic generation through off-street parking and will be adequately serviced in accordance with authority requirements. The proposed development is located in an area well serviced by public transport, roads, services, amenities, employment and entertainment areas, educational facilities and open space.

It is considered that the proposal is consistent with the objectives of the zone, complies with the requirements of SEPP Affordable Rental Housing and is generally compliant with the requirements of Penrith LEP and DCP. In this regard, it is noted that the proposal represents a carefully considered design outcome having regard to the existing streetscape and the desired future character of the streetscape. Overall, the proposal provides a residential form of development that minimises any potential adverse amenity or streetscape impacts and maximises internal residential amenity, which is entirely in keeping with the objectives of the zone and the desired future character of the locality.

2.8 The Grounds of the Objection

The proposed variation to the development standard has been considered in light of the abovementioned objectives and potential environmental impacts and hence, strict compliance with the Battle-axe Lot Site Control in this particular instance is considered to be unreasonable and unnecessary for the following reasons:

- The proposed variations relate to the paper plan subdivision lot boundaries only and would not be visually discernible given the proposed building siting and design, bulk and scale, landscaping, private open space, access, car parking and fencing would remain unchanged.
- Notwithstanding the above, the proposed subdivision facilitates the provision of new residential accommodation of a significantly lesser scale and intensity of development that could otherwise be achieved on an unsubdivided site noting Council's approval of a 28 room boarding house at 45 Park Avenue under D16/0374.
- The proposed lot layout results in a better planning outcome than an otherwise strictly compliant lot layout given the proposal minimises bulk and scale and overshadowing impacts to adjoining properties to the rear by providing for additional building area within Lot 1 facing the street, whereas a reduction in the size of Lot 1 and increase to the size of battle-axe Lots 2 and 3 would result in additional building area and bulk and scale at the rear of the site and additional visual bulk and overshadowing impacts to adjoining properties.
- The proposed battle-axe lot area variations are numerically minor variations of 43sqm (9.48%) and 35sqm (7.78%) for Lot 2 and Lot 3, respectively.
- Proposed Lot 1 is 97.5sqm larger than the minimum lot size requirement of 400sqm for a standard lot, which offsets the sum of the shortfall of 88sqm on battle-axe Lots 2 and 3, and as such, the proposed subdivision complies on an overall average lot size basis.
- The proposal is not an overdevelopment of the site given an overall yield of 3 lots in the form of two battle-axe lots of at least 450sqm excluding the access handle and one standard lot of 400sqm could otherwise be accommodated on the site.
- The proposed lot sizes ranging from 407sqm (excluding the access handle) and 497sqm are compatible with the environmental capabilities of the R3 medium density zoned land being subdivided.

- The proposed subdivision layout and building design and layout does minimise any likely adverse amenity impacts on adjoining properties in relation to bulk and scale, overshadowing, visual privacy and acoustic amenity.
- The proposed lot sizes and dimensions allow for the proposed building design and layout and detailed landscaping with additional canopy tree coverage to be suitably accommodated within the site in accordance with relevant development controls and do not result in any adverse heritage, tree or view impacts.
- The proposed lot sizes are wholly consistent with the planned residential density of the R3 zoned land given the yield is equivalent to an otherwise strictly compliant lot layout comprising 3 lots, but results in a better planning outcome in terms of reduced bulk and scale and overshadowing impacts to adjoining properties at the rear, and will ensure that there is not any unreasonable increase in demand for public services or public facilities.
- The variations do not result in additional floor area or an overdevelopment of the site.
- The proposal complies with relevant development controls including setbacks, building height, landscaping, private open space, solar access, visual privacy, car parking, access, stormwater and waste management.
- The proposal is in harmony with the bulk and scale of surrounding buildings and the streetscape and minimises the impacts of new development on adjoining or nearby properties from loss of privacy or acoustic amenity, overshadowing or visual intrusion.
- The proposal results in an improvement to the existing streetscape and park frontage and ensures a high visual quality of the development when viewed from adjoining properties, the adjoining public reserve to the west and the street frontage
- The proposal is consistent with the existing pattern of development and desired future character of this section of the street and the local area as shown in the aerial photo below.
- The proposal is a permitted form of development in the R3 zone and consistent with the relevant zone objectives to provide for the housing needs of the community and a variety of housing types within the medium density residential environment with excellent access to services and facilities and maintains a high level of residential amenity consistent with the existing and desired future character of the local area.
- The proposal is consistent with, and of a lesser scale and intensity of, residential development that could otherwise be reasonably accommodated noting Council has approved a total of 10 x 3-5 bedroom dwellings on the adjoining property to the east at 29-30 Park Avenue under DA15/0171 and 4 x 2-3 bedroom dwellings at 32 Joseph Street under DA18/0428.

The proposal promotes the objects of the Act in terms of the orderly and economic use and development of land in an ecologically sustainable manner and promotes the social and economic welfare of the community and a better urban environment. It is considered that compliance with the development standard is unreasonable in this instance in light of these similar applicable circumstances.

2.9 Director-General's Considerations

As indicated above, subclause 4.6(5) of the LEP also requires the Director-General, in deciding whether to grant concurrence, to consider the following:

> *"(a) whether contravention of the development standard raises any matter of significance for State or regional environmental planning,"*

The breach of height of building limit is not a matter of state or regional significance.

> *"(b) the public benefit of maintaining the development standard,"*

There is a public benefit in allowing the development to proceed. The proposed development would be consistent with anticipated development for the site, comparable in character with the scale of new built form for this locality, provides a high quality design outcome and would result in an appropriate housing yield for this site and adds to housing choice.

> *"(c) any other matters required to be taken into consideration by the Director-General before granting concurrence."*

Approval will result in a better planning outcome and would be in the public interest.

3.0 Conclusion and Recommendations

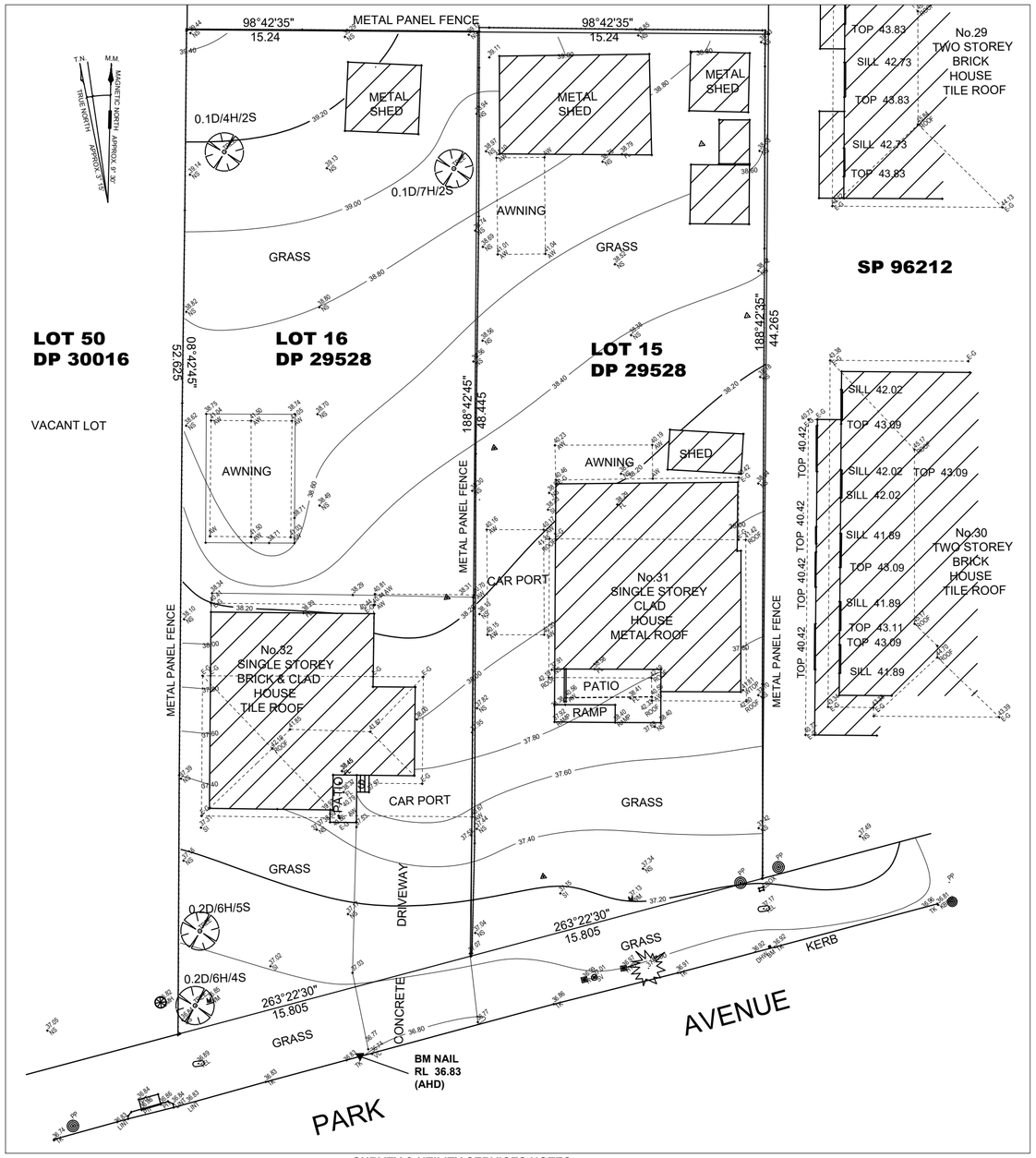
The proposed residential development has been assessed against the relevant statutory provisions of clause 4.6 and this written request has provided justification that compliance with the site width development standard is unreasonable or unnecessary in the circumstances of this particular case.

Further, the proposal provides public benefits arising through employment during the construction phase and at completion and is entirely in keeping with the desired future character of the locality. The proposal represents an appropriate increase in the available housing stock that is wholly consistent with the desired medium density outcome of the locality, noting the close proximity to local train and bus services, major regional road networks, access to areas of employment, services, amenities, educational facilities, entertainment and open space. Accordingly, the justification within this written request is considered to be well founded.

A2

STORMWATER MANAGEMENT PLAN

SITE - LOTS 15-16 DP 29528 - 31-32 PARK AVENUE, KINGSWOOD



LOCALITY PLAN

GOOGLE MAP - NOT TO SCALE

STORMWATER DRAWING SCHEDULE		
SHEET No.	**DRAWING NUMBER**	**TITLE**
01	SW-2011A-DA-01	SURVEY, LOCALITY PLAN & DRAWING SCHEDULE
02	SW-2011A-DA-02	CONCEPT STORMWATER DRAINAGE PLAN
03	SW-2011A-DA-03	STORMWATER CATCHMENT PLAN
04	SW-2011A-DA-04	OSD DETAILS & CALCULATIONS
05	SW-2011A-DA-05	RAINWATER TANK AND DRAINAGE DETAILS
06	SW-2011A-DA-06	EROSION AND SEDIMENT CONTROL PLAN

SURVEY PLAN

SCALE 1:150 [SURVEY BY OTHERS]

SCALES

1 0.5 0 1 2 3 4 5m 1 : 100 @ A2

2 1 0 2 4 6 8 10m 1 : 200 @ A3

SURVEY & UTILITY SERVICES NOTES:

1. SURVEY DATA PROVIDED BY OTHERS. MPC TAKES NO RESPONSIBILITY ON THE ACCURACY OF THE LEVELS & DETAILS SHOWN.
2. ALL SERVICES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY BY SURVEY. EXACT LOCATION SHALL BE ACCURATELY LOCATED BY CONTACTING DIAL BEFORE YOU DIG OR THE RELEVANT UTILITY PROVIDER BEFORE COMMENCING ANY EXCAVATION OR BUILDING WORKS.
3. ALL WORKS UNDERTAKEN WITHIN THE ROAD RESERVE / CARRIAGEWAY SHALL HAVE PRIOR APPROVAL FROM THE RELEVANT ROAD AUTHORITY, PRIOR TO COMMENCING WORKS.
4. ALL SURVEY LEVELS TO AUSTRALIAN HEIGHT DATUM - mAHD

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

PENRITH CITY COUNCIL

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APPROVED BY:
ZULFIQAR KHAN
MIEAust, NER (# 2500471)
Accredited Certifier
(Civil & Structural) (BPB2925)

SIGNED:

PROJECT :	31-32 PARK AVENUE, KINGSWOOD	APPLICANT/CLIENT:	ARCHIDROME
TITLE :	SURVEY, LOCALITY PLAN & DRAWING SCHEDULE	ARCHITECT:	ARCHIDROME
DESIGN BY: MPC	SCALE: 1:100 or As Shown	FILE: JOB 20-165	
CHECKED BY: Z KHAN	SHEET: 1 OF 6	DATE: 30 OCTOBER 2020	

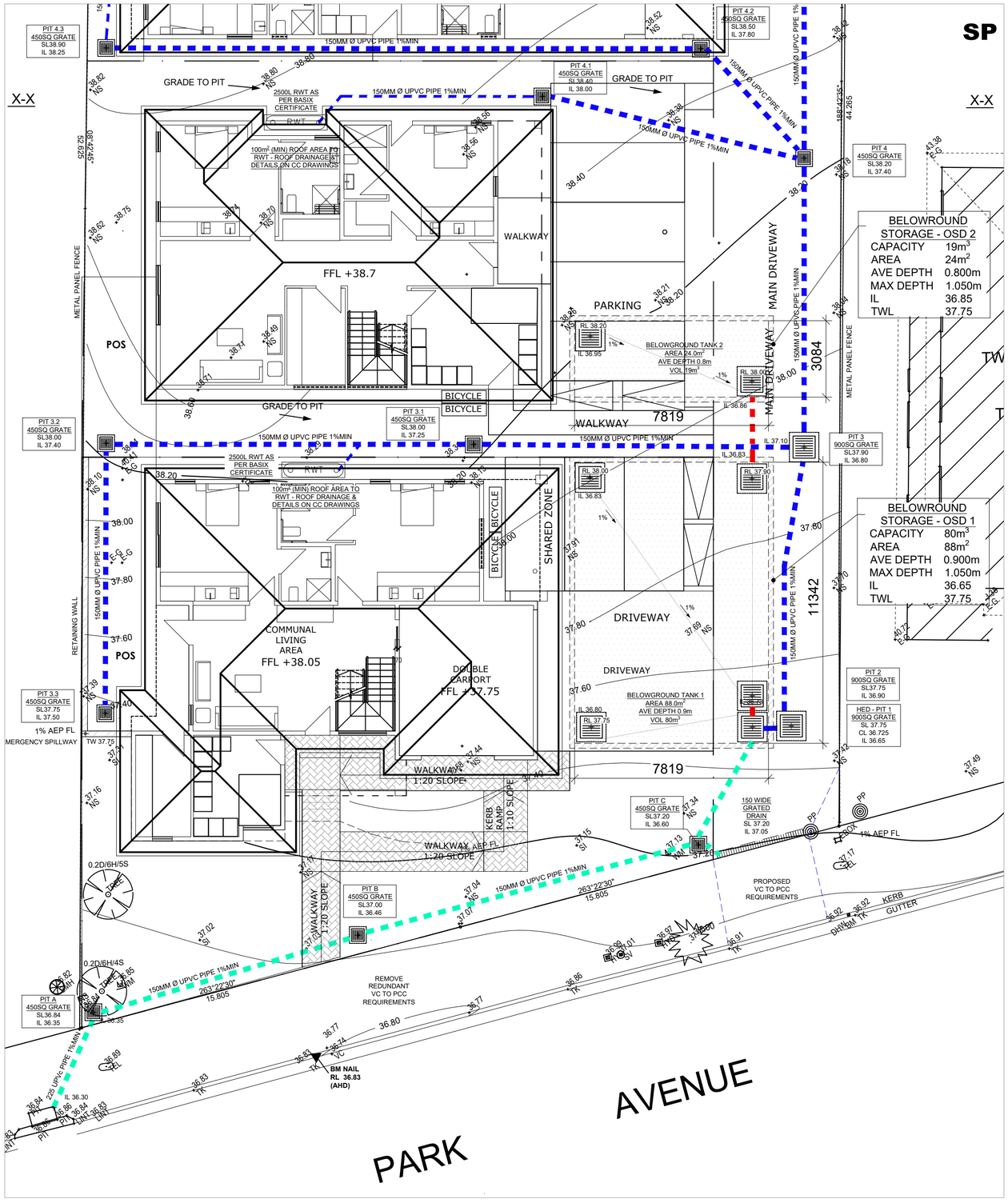
DATE	ISSUE	AMENDMENTS	DESIGNER
		NOT FOR CONSTRUCTION	
30/10/20	A	FOR COUNCIL APPROVAL - DEVELOPMENT APPLICATION	MPC01

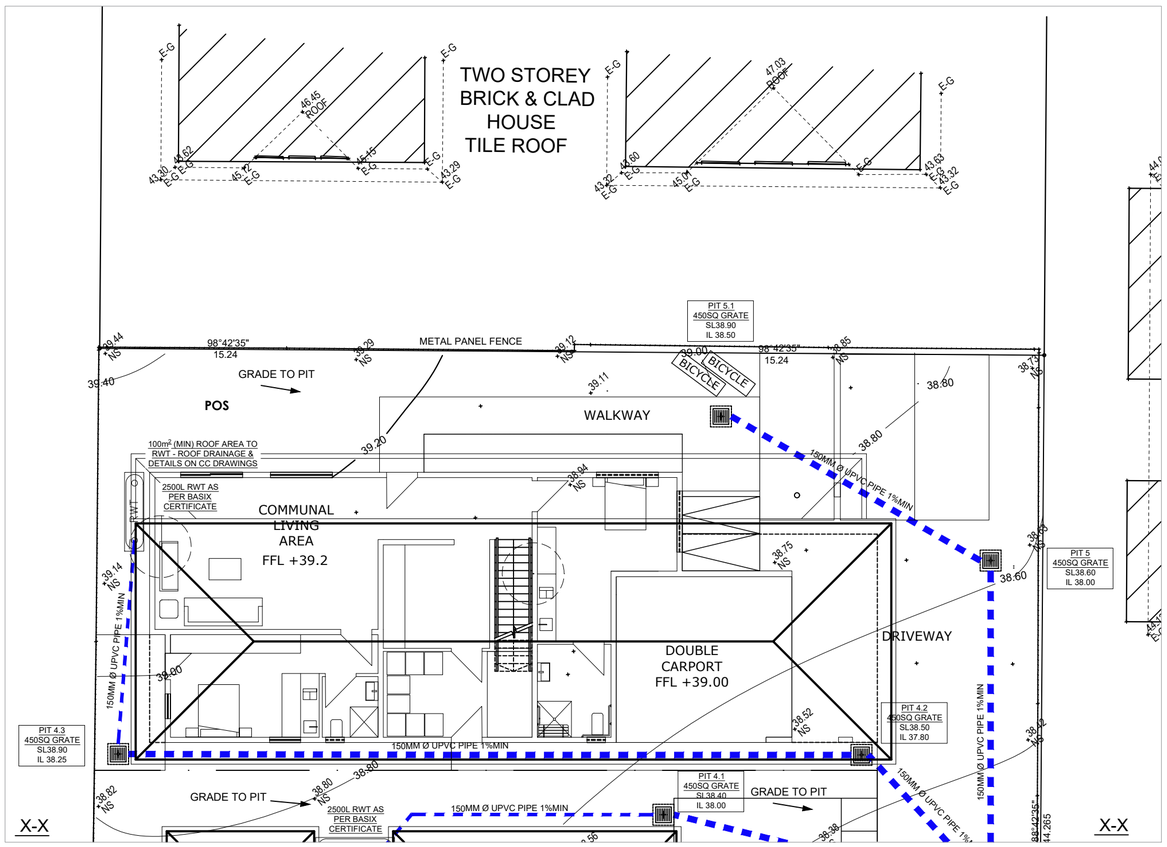
DRAWING NUMBER: SW-2011A-DA-01

SHEET SIZE: A2

A2

SITE PLAN CONTINUATION AT X-X





SITE PLAN CONTINUATION AT X-X

SCALES

1 0.5 0 1 2 3 4 5m 1 : 100 @ A2

2 1 0 2 4 6 8 10m 1 : 200 @ A3

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APPROVED BY:
ZULFIQAR KHAN
MIEAust, NER (# 2500471)
Accredited Certifier
(Civil & Structural) (BPB2925)
SIGNED:

PROJECT: 31-32 PARK AVENUE, KINGSWOOD
TITLE: CONCEPT STORMWATER DRAINAGE PLAN
DESIGN BY: MPC
CHECKED BY: Z KHAN
SCALE: 1:100 or As Shown
SHEET: 2 OF 6
FILE: JOB 20-165
DATE: 30 OCTOBER 2020

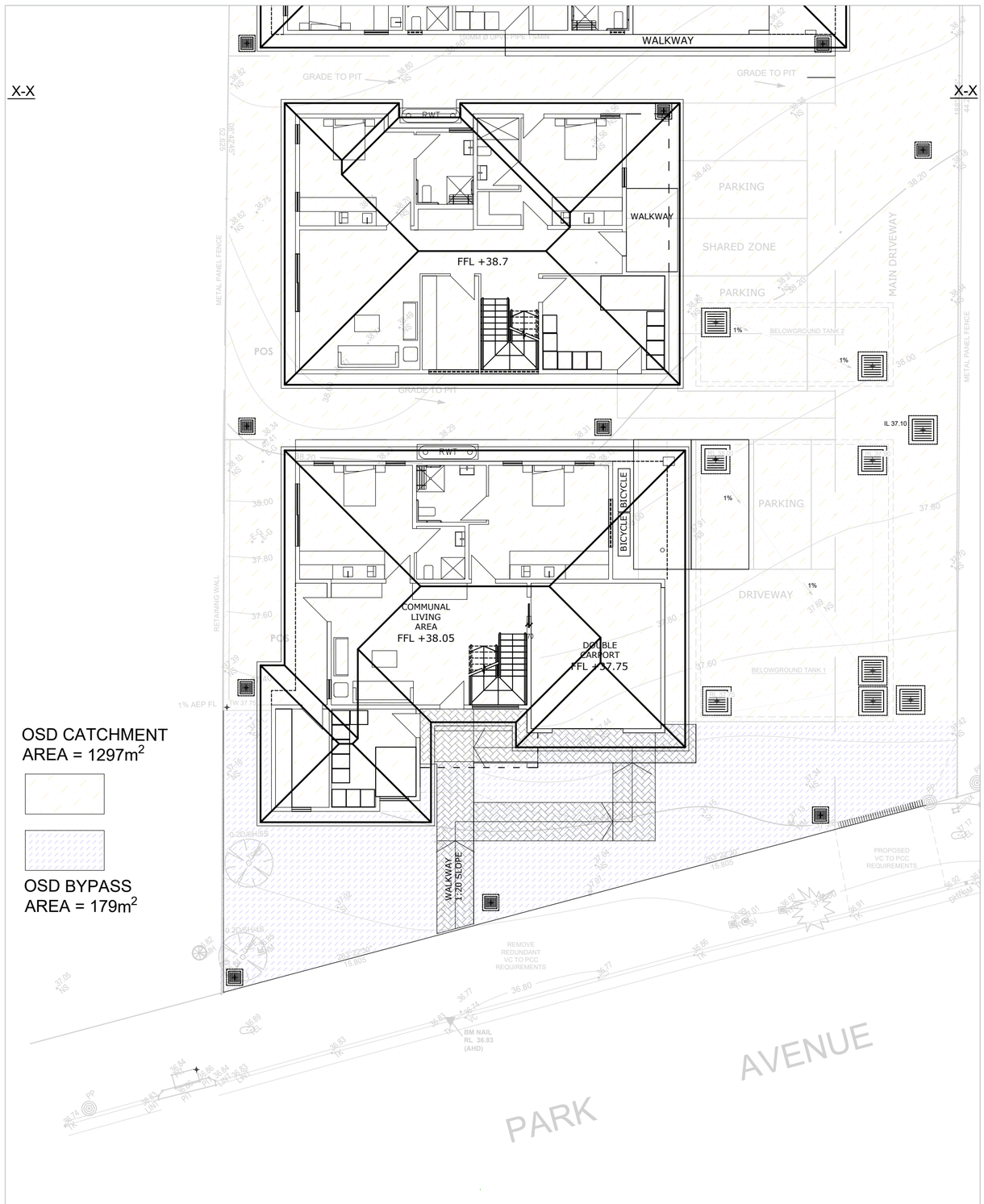
APPLICANT/CLIENT: ARCHIDROME
ARCHITECT: ARCHIDROME

DATE	ISSUE	AMENDMENTS	DESIGNER
		NOT FOR CONSTRUCTION	
30/10/20	A	FOR COUNCIL APPROVAL - DEVELOPMENT APPLICATION	MPC01

DRAWING NUMBER: SW-2011A-DA-02
SHEET SIZE: A2

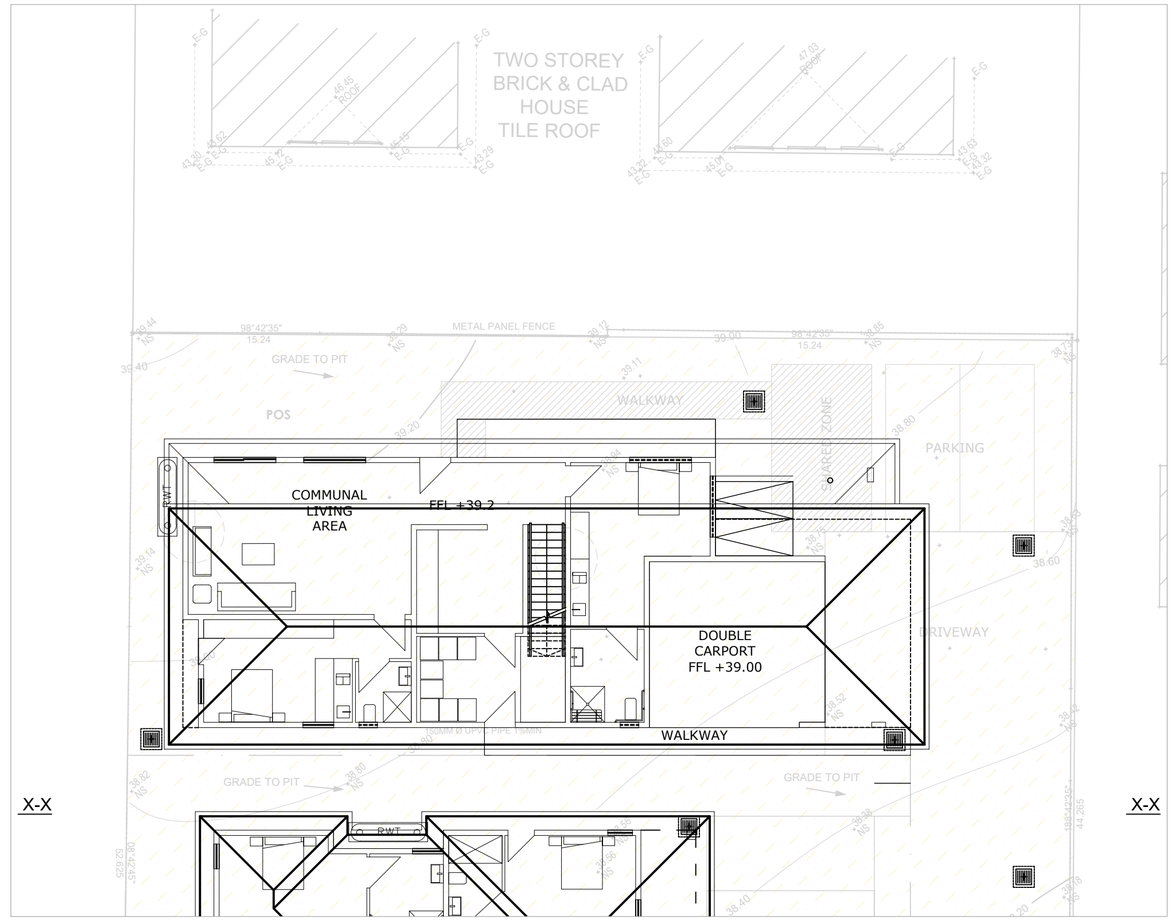
A2

SITE PLAN CONTINUATION AT X-X



OSD CATCHMENT AREA = 1297m^2

OSD BYPASS AREA = 179m^2



SITE PLAN CONTINUATION AT X-X

SCALES

1 0.5 0 1 2 3 4 5m 1 : 100 @ A2

2 1 0 2 4 6 8 10m 1 : 200 @ A3

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APPROVED BY:
ZULFIQAR KHAN
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Accredited Certifier
(Civil & Structural) (BPB2925)

SIGNED:

PROJECT: 31-32 PARK AVENUE, KINGSWOOD
TITLE: STORMWATER CATCHMENT PLAN

DESIGN BY: MPC	SCALE: 1:100 or As Shown	FILE: JOB 20-165	
CHECKED BY: Z KHAN	SHEET: 3 OF 6	DATE: 30 OCTOBER 2020	

APPLICANT/CLIENT: ARCHIDROME

ARCHITECT: ARCHIDROME

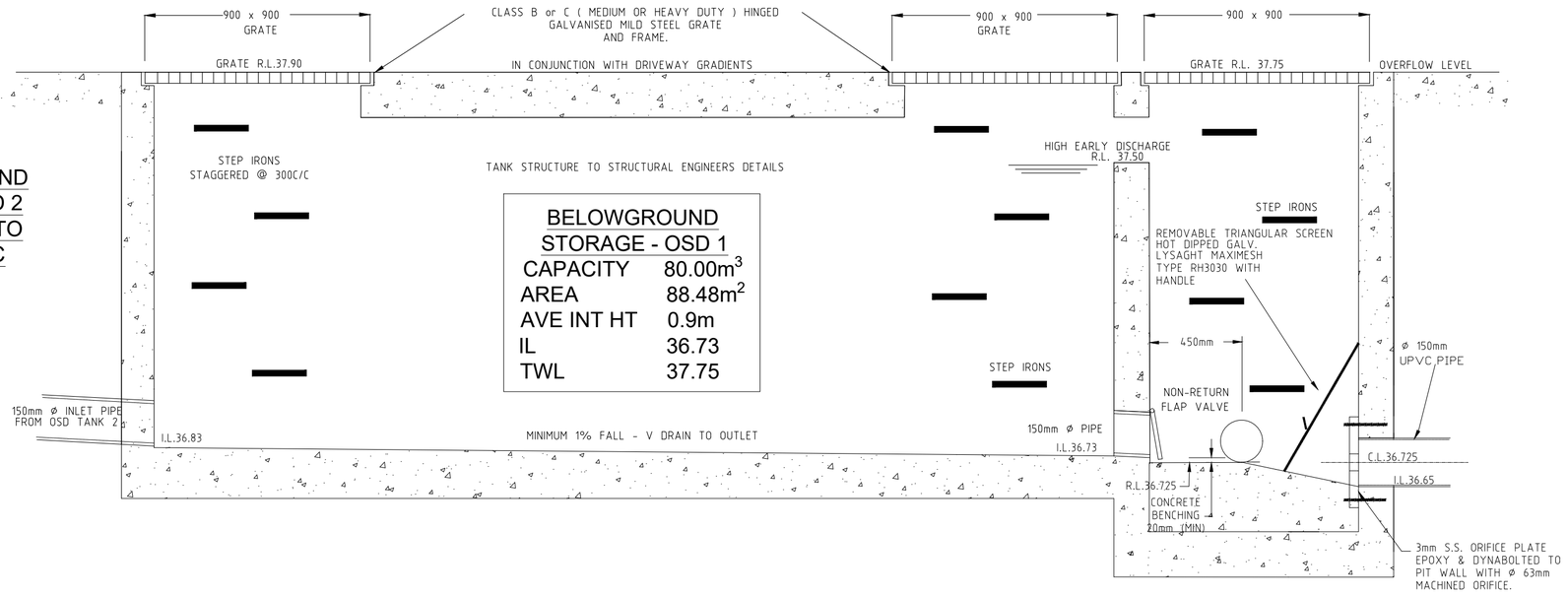
DATE	ISSUE	AMENDMENTS	DESIGNER
		NOT FOR CONSTRUCTION	
30/10/20	A	FOR COUNCIL APPROVAL - DEVELOPMENT APPLICATION	MPC01

DRAWING NUMBER: SW-2011A-DA-03

SHEET SIZE: A2

A2

NOTE:BELOWGROUND STORAGE FOR OSD 2 SECTION DETAILS TO BE SHOWN ON CC DRAWINGS



BELOWGROUND STORAGE - OSD 1	
CAPACITY	80.00m^3
AREA	88.48m^2
AVE INT HT	0.9m
IL	36.73
TWL	37.75

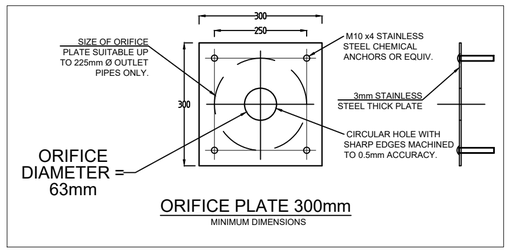
OSD BELOWGROUND DETENTION TANK 1

SECTION VIEW NTS

On-Site Detention Calculation Sheet

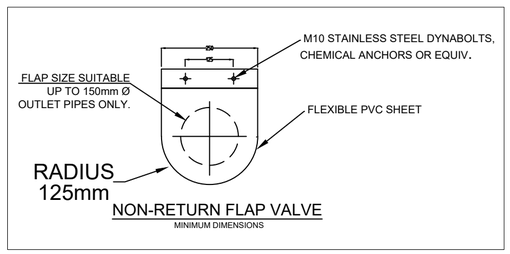
Project:	Proposed Boarding House x3	Lot No.	15-16
Location:	31-32 Park Avenue, Kingswood	DP No.	29528
Designer:	MultiPro Consultants	OSD No	1

OSD Area:			Drowned	
Site Area	0.148		0.148	
Basic Storage Volume	69.40		69.40	
Basic Discharge	6.91		11.81	
Area of Site to Storage	0.130	88%	0.130	88%
Percentage of Site	87.84		87.84	
Storage per ha of contributing area	535.04		535.04	
Volume/PSD Adjustment	67.05		67.05	
PSD for site	8.70		8.70	
Maximum Head to Orifice Centre	1.025		0.550	
Calculated Orifice Diameter	0.063		0.063	
Maximum discharge	8.695		6.373	
Head for high early discharge	0.775		0.300	
High Early Discharge	7.561	87%	4.707	54%
Mean Discharge	8.128		5.540	
Average Discharge per Hectare	62.659		42.709	
Final Site Storage Ratio	566		748	
Site Storage Volume	73.37		97.09	
Volume Provided	99.00	135%	99.000	102%



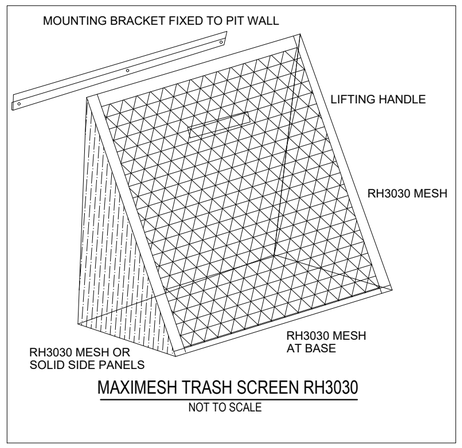
ORIFICE PLATE 300mm

MINIMUM DIMENSIONS



NON-RETURN FLAP VALVE

MINIMUM DIMENSIONS



MAXIMESH TRASH SCREEN RH3030

NOT TO SCALE

INSTALL SIGN NEAR OSD TANK

OSD PLATE

GENERAL NOTES

1. ALL WORKS SHALL GENERALLY BE UNDERTAKEN IN ACCORDANCE WITH AS/NZ 3500.3.2:1998 AND COUNCIL'S SPECIFICATIONS &/OR ENGINEERING GUIDELINES;
2. THIS STORMWATER PLAN SHALL BE READ IN CONJUNCTION WITH THE APPROVED ARCHITECTURAL, LANDSCAPE, SURVEY, AND SITE PLANS;
3. ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO **MULTIPRO** CONSULTANTS TO RESOLVE.
4. ALL DRAINAGE LINES SHALL BE AS FOLLOWS -
   - 90mm DIAMETER WHERE THE LINE ONLY RECEIVES ROOF WATER;
   - 100mm DIAMETER WHERE THE LINE RECEIVES SURFACE RUNOFF OR IF THE LINE IS PART OF AN OSD SYSTEM;
   - A MINIMUM PIPELINE GRADE OF 1% FOR PIPES WITH A DIAMETER LESS THAN 150mm AND 0.5% FOR PIPES OF GREATER DIAMETER;
3. ALL DRAINAGE LINES SHALL HAVE A MINIMUM COVER OF 100mm FOR PRIVATE PIPELINES AND 300mm FOR PUBLIC PIPELINES;
4. ALL PITS WITHIN TRAFFICABLE AREAS (I.E DRIVEWAYS) SHALL BE HEAVY DUTY. ALL SURFACE AREAS SHALL BE GRADED TO THE SURFACE INLET PITS/DRAINS.
5. LOCATION OF DOWN PIPES & FLOOR WASTES ARE INDICATIVE ONLY. DOWNPIPE & FLOOR WASTE SIZE, LOCATION & QUANTITY IS TO BE DETERMINED AT CC STAGE AND PRIOR TO CONSTRUCTION IN ACCORDANCE WITH THE RELEVANT STANDARDS.

UTILITY SERVICES

1. ALL SERVICES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. EXACT LOCATION SHALL BE ACCURATELY LOCATED BY CONTACTING DIAL BEFORE YOU DIG OR THE RELEVANT UTILITY PROVIDER BEFORE COMMENCING ANY EXCAVATION OR BUILDING WORKS.
2. ALL WORKS UNDERTAKEN WITHIN THE ROAD RESERVE / CARRIAGEWAY SHALL HAVE PRIOR APPROVAL FROM THE RELEVANT AUTHORITY, PRIOR TO COMMENCING WORKS.

ONSITE DETENTION NOTES

1. ALL WALLS FORMING PART OF THE DETENTION BASIN SHALL BE OF MASONRY CONSTRUCTION AN WHOLLY WITHIN THE PROPERTY BOUNDARY;
2. ALL MULCH WITHIN THE ABOVE GROUND DETENTION BASIN (IF PROPOSED) SHALL BE NON-FLOATABLE;
3. ALL GRATES TO BE FITTED WITH CHILD PROOF J-LOCKS;
4. THE CERTIFYING ENGINEER OR COUNCIL'S ENGINEER SHALL INSPECT THE OSD WORKS AT THE CRITICAL STAGES -
   a. PRIOR TO COMMENCING WORK TO DISCUSS SITE CONSTRAINTS;
   b. PRIOR TO LANDSCAPING THE DETENTION BASIN & POURING THE ROOF OF THE DETENTION TANK;
   c. PRIOR TO INSTALLING THE FITTINGS TO THE DISCHARGE CONTROL UNIT;
   d. PRELIMINARY INSPECTION - PRIOR TO CERTIFICATION
   e. FINAL INSPECTION - FOR CERTIFICATION. WORK-AS-EXECUTED [WAE] SHALL BE PREPARED BY A REGISTERED SURVEYOR PRIOR TO FINAL INSPECTION.
3. ALL MAINTENANCE WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE MAINTENANCE SCHEDULE APPROVED BY COUNCIL;
4. DRAINAGE PIPE LINES ARE TO AVOID EXISTING TREES WHEREVER POSSIBLE - GENERALLY OUTSIDE THE DRIP LINE / CANOPY OF THE EXISTING TREE;

SCALES

1 : 100 @ A2

1 : 200 @ A3

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APPROVED BY:
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MIEAust, NER (# 2500471)
Accredited Certifier
(Civil & Structural) (BPB2925)

SIGNED:

PROJECT: 31-32 PARK AVENUE, KINGSWOOD
TITLE: OSD DETAILS & CALCULATIONS

DESIGN BY: MPC | SCALE: 1:100 or As Shown | FILE: JOB 20-165
CHECKED BY: Z KHAN | SHEET: 4 OF 6 | DATE: 30 OCTOBER 2020

APPLICANT/CLIENT: ARCHIDROME
ARCHITECT: ARCHIDROME

NOT FOR CONSTRUCTION

DATE	ISSUE	AMENDMENTS	DESIGNER
30/10/20	A	FOR COUNCIL APPROVAL - DEVELOPMENT APPLICATION	MPC01

DRAWING NUMBER: SW-2011A-DA-04
SHEET SIZE: A2

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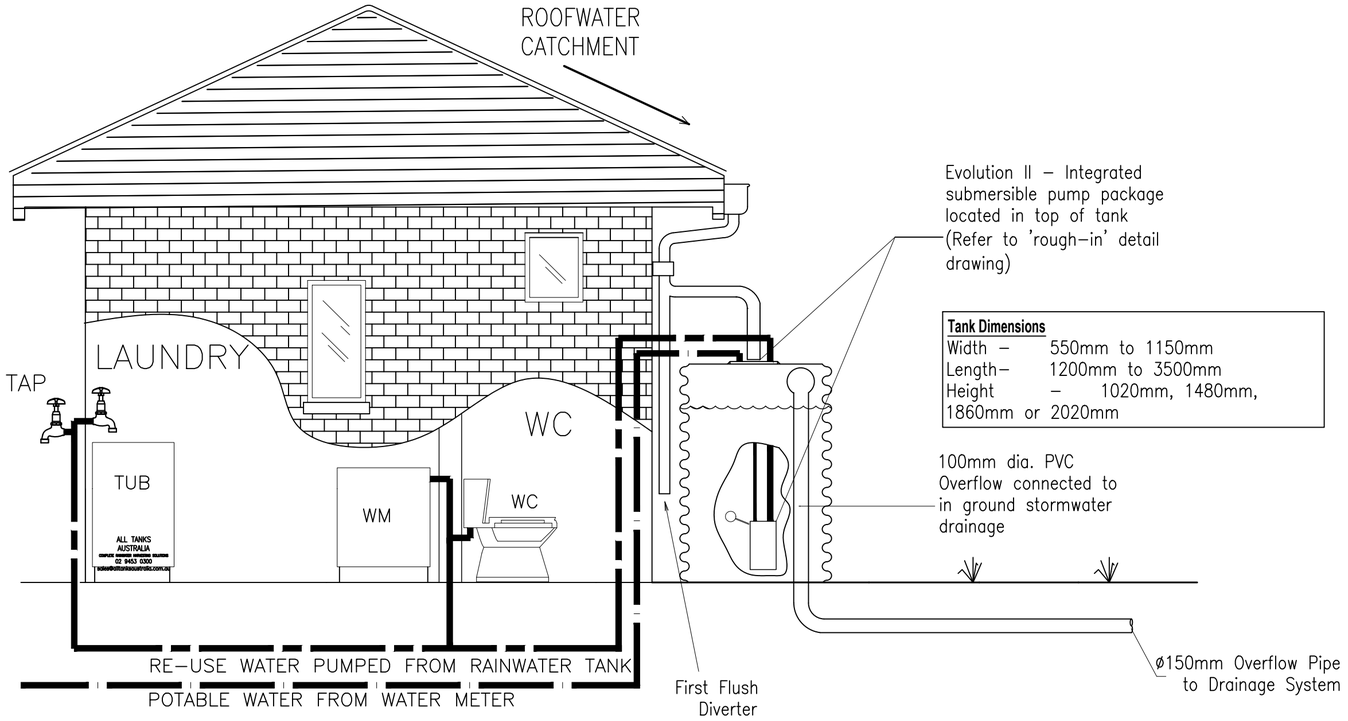
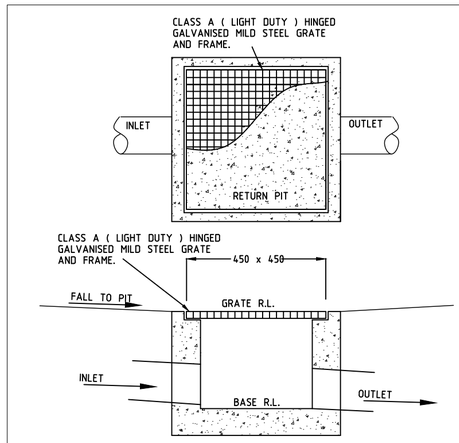
A2



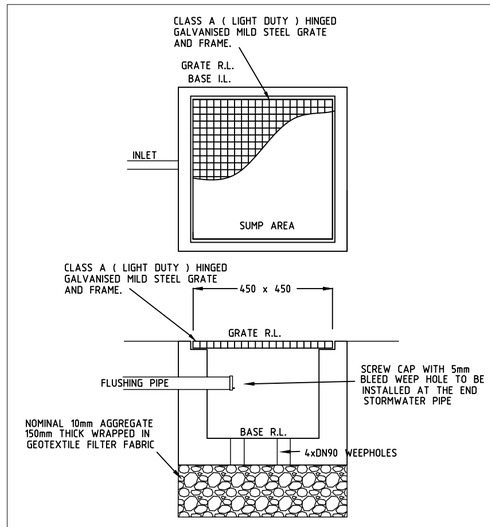
TYPICAL RAINWATER TANK DETAIL

NOT TO SCALE



TYPICAL SURFACE INLET PIT DETAIL

NOT TO SCALE

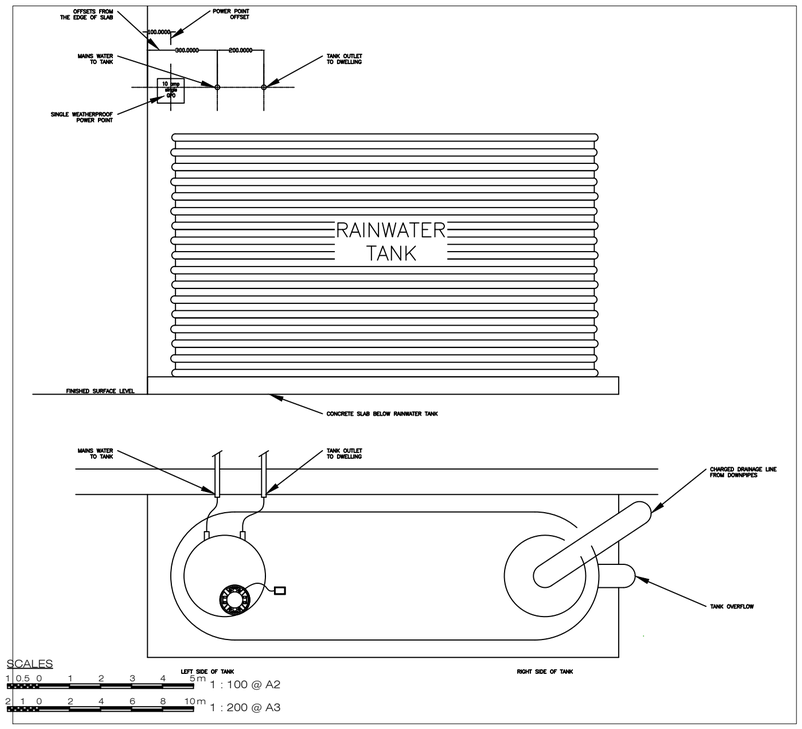


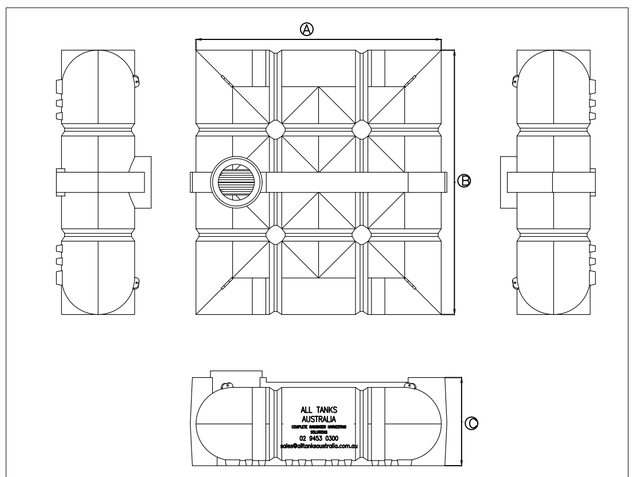
CHARGED LINE CLEANING PIT DETAIL [CP]

NOT TO SCALE

RAINWATER TANK & REUSE NOTES:

1. ALL FIXTURES AND DEVICES INSTALLED FOR THE PURPOSE OF RECYCLE WATER SUPPLY MUST BE NOTED WITH PLAQUE/SIGNAGE FOR IDENTIFICATION AND MARKED WITH "NOT FOR HUMAN CONSUMPTION" OR "NON-POTABLE WATER".
2. THE OVERFLOW FROM THE RAINWATER TANK SHALL BE CONNECTED TO THE INTERNAL STORMWATER DRAINAGE SYSTEM.
3. GARDEN TAPS OR CARWASH TAPS CONNECTED TO THE RECYCLE SYSTEM MUST BE LOCATED 1.5m MIN ABOVE THE SURFACE.
4. ALL RECYCLE WATER PIPES TO BE COLOUR CODED FOR IDENTIFICATION.
5. SYDNEY WATER MUST BE CONTACTED REGARDING RECYCLED WATER ON BUILDINGS AND FOR THE BACKFLOW PREVENTION REQUIREMENTS AND TOP UP SYSTEMS.
6. FOR PERIODS OF LOW WATER LEVELS WITHIN THE RAINWATER TANK, A CONNECTION TO THE WATER MAIN IS NEEDED AND TO BE PROVIDED IN ACCORDANCE WITH SYDNEY WATER'S REQUIREMENTS.
7. ALL FITTINGS AND PUMPS TO BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
8. THE POSITION OF THE RAINWATER TANKS SHALL BE IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S REQUIREMENTS.





	A	B	C
Volume - Ltrs	Length - mm	Width -mm	Depth - mm
3000	2520	2420	900
5000	3500	2780	950

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APPROVED BY:
ZULFIQAR KHAN
MIEAust, NER (# 2500471)
Accredited Certifier
(Civil & Structural) (BPB2925)
SIGNED:

PROJECT: 31-32 PARK AVENUE, KINGSWOOD
TITLE: RAINWATER TANK AND DRAINAGE DETAILS

DESIGN BY: MPC
CHECKED BY: Z KHAN
SCALE: 1:100 or As Shown
SHEET: 5 OF 6
FILE: JOB 20-165
DATE: 30 OCTOBER 2020

APPLICANT/CLIENT: ARCHIDROME
ARCHITECT: ARCHIDROME

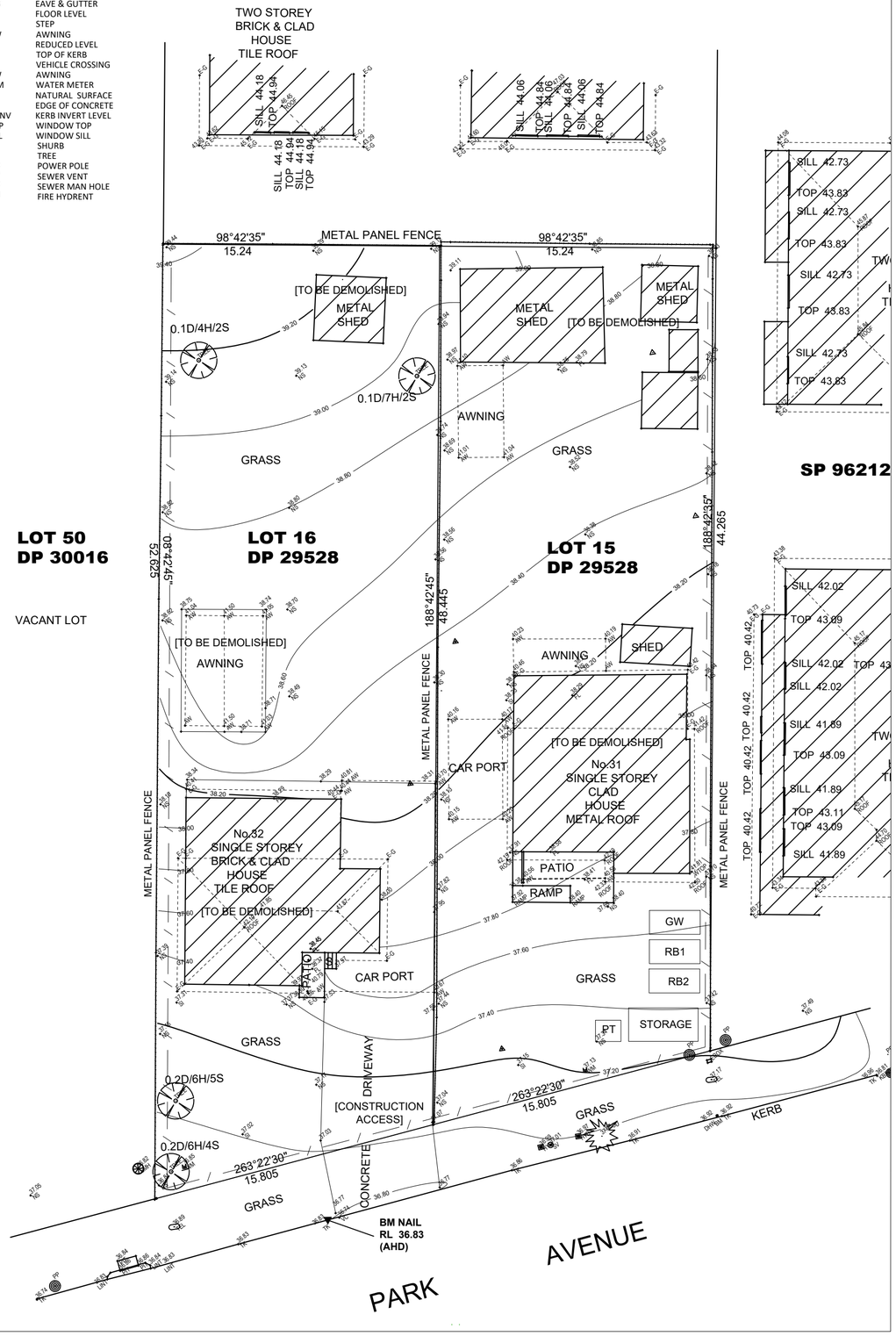
DATE	ISSUE	AMENDMENTS	DESIGNER
		NOT FOR CONSTRUCTION	
30/10/20	A	FOR COUNCIL APPROVAL - DEVELOPMENT APPLICATION	MPC01

DRAWING NUMBER: SW-2011A-DA-05
SHEET SIZE: A2

A2

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM
BM	BENCH MARK
TEL	COMMUNICATION PIT
E-G	EAVE & GUTTER
FL	FLOOR LEVEL
S	STEP
AW	AWNING
RL	REDUCED LEVEL
TK	TOP OF KERB
VC	VEHICLE CROSSING
AW	AWNING
WM	WATER METER
NS	NATURAL SURFACE
EC	EDGE OF CONCRETE
KBINV	KERB INVERT LEVEL
TOP	WINDOW TOP
SILL	WINDOW SILL
	SHURB
	TREE
	POWER POLE
	SEWER VENT
	SEWER MAN HOLE
	FIRE HYDRENT



SCALES

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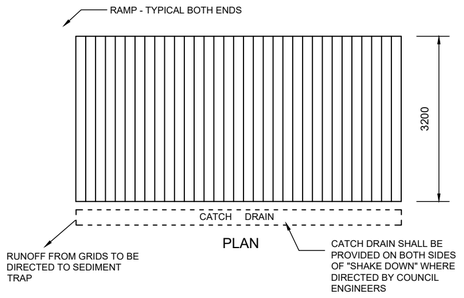
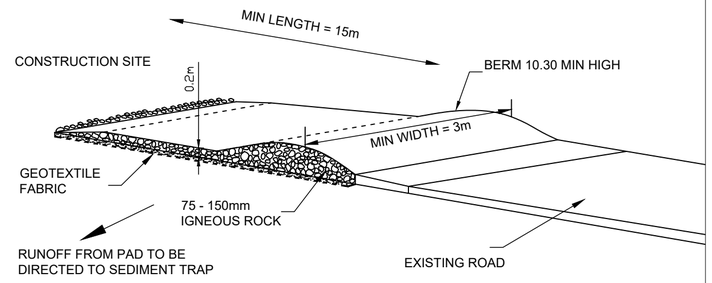
2 1 0 2 4 6 8 10m 1 : 200 @ A3



CATTLE GRID ALTERNATIVE

NOT TO SCALE

CONSTRUCTION ACCESS OPTIONS

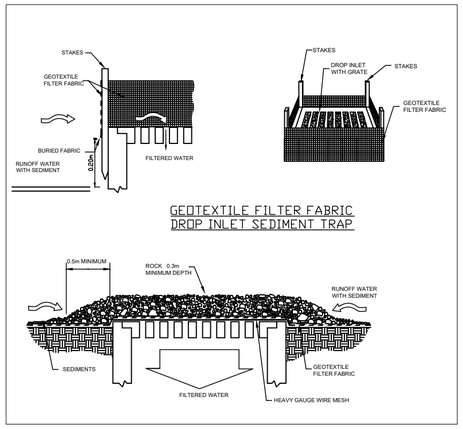


RUBBLE ALTERNATIVE

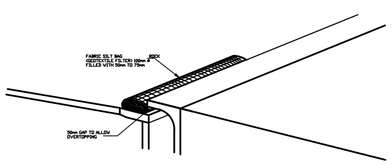
NOT TO SCALE

NOTES

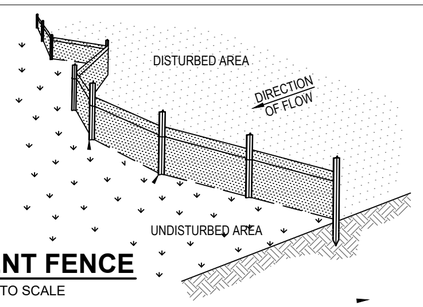
1. EXCAVATE AREA APPROX. 3.3m WIDE BY 2.2m LENGTH. THE FLOOR OF THE EXCAVATION MUST BE FLAT, WITHOUT HIGH POINTS. AN EXCAVATED DEPTH OF 100mm ACCOMMODATES A BEDDING LAYER 50mm THICK AND GRID SET DOWN OF 50mm PER UNIT.
2. BEDDING MATERIAL SHALL BE SAND OR OTHER SUITABLE APPROVED MATERIAL. BEDDING MATERIAL SHALL BE EVENLY RAKED OVER FLOOR OF EXCAVATION TO A DEPTH SLIGHTLY MORE THAN 50mm. ENSURE BEDDING IS LEVEL IN BOTH DIRECTIONS.
3. LOWER CATTLE GRID ONTO THE PREPARED BASE. ENSURE THAT NO PART OF THE UNIT IS SITTING ON ANY HIGH POINT.
4. BACKFILL AND COMPACT AROUND GRID. GRADE EXCAVATED MATERIAL UP TO GRID ON EACH SIDE TO FORM A RAMP. IF DEPRESSIONS OCCUR ON THESE RAMPS WITH USE, ADD ADDITIONAL MATERIAL.
5. MAINTAIN SHAKER GRIDS IN CLEAN AND SERVICEABLE CONDITION DURING TOTAL TIME OF USAGE.
6. MINIMUM LENGTH OF SHAKER PAD = 5 UNITS.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP

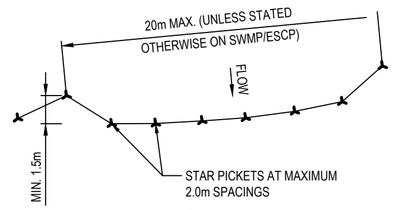


PORTABLE ROCK KERB INLET SEDIMENT TRAP

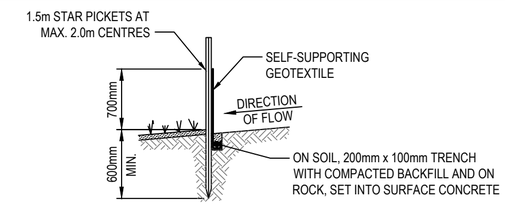


SEDIMENT FENCE

NOT TO SCALE



PLAN



SECTION DETAIL

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APPROVED BY:
ZULFIQAR KHAN
MIEAust, NER (# 2500471)
Accredited Certifier
(Civil & Structural) (BPB2925)

SIGNED:

PROJECT: 31-32 PARK AVENUE, KINGSWOOD
TITLE: EROSION & SEDIMENT CONTROL PLAN

DESIGN BY: MPC	SCALE: 1:100 or As Shown	FILE: JOB 20-165
CHECKED BY: Z KHAN	SHEET: 6 OF 6	DATE: 30 OCTOBER 2020

APPLICANT/CLIENT: ARCHIDROME

ARCHITECT: ARCHIDROME

DATE	ISSUE	AMENDMENTS	DESIGNER
		NOT FOR CONSTRUCTION	
30/10/20	A	FOR COUNCIL APPROVAL - DEVELOPMENT APPLICATION	MPC01

DRAWING NUMBER: SW-2011A-DA-06

SHEET SIZE: A2

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM
BM	BENCH MARK
TEL	COMMUNICATION PIT
E-G	EAVE & GUTTER
FL	FLOOR LEVEL
S	STEP
AW	AWNING
RL	REDUCED LEVEL
TK	TOP OF KERB
VC	VEHICLE CROSSING
AW	AWNING
WM	WATER METER
NS	NATURAL SURFACE
EC	EDGE OF CONCRETE
KBINV	KERB INVERT LEVEL
TOP	WINDOW TOP
SILL	WINDOW SILL
	SHURB
	TREE
	POWER POLE
	SEWER VENT
	SEWER MAN HOLE
	FIRE HYDRENT

T.N. TRUE NORTH
M.M. MAGNETIC NORTH
APPROX. 3° 15'
APPROX. 9° 30'

TWO STOREY BRICK & CLAD HOUSE TILE ROOF

SILL 44.18 TOP 44.94 ROOF 46.45
SILL 44.18 TOP 44.94 SILL 44.18 TOP 44.94

SILL 44.06 TOP 44.84 SILL 44.06 ROOF 47.03 TOP 44.84 SILL 44.06 TOP 44.84

SP 94790

METAL PANEL FENCE

98°42'35" 15.24

98°42'35" 15.24

METAL SHED
METAL SHED
METAL SHED
0.1D/4H/2S
0.1D/7H/2S
TREE
TREE
AWNING
GRASS
AREA 770.2 m² BY CALCULATION
AREA 765.0 m² BY TITLE
AREA 706.5 BY CALCULATION
AREA 701.8 BY TITLE

LOT 50 DP 30016

VACANT LOT

LOT 16 DP 29528

LOT 15 DP 29528

08°42'45" 52.625

188°42'35" 44.265

188°42'45" 48.445

METAL PANEL FENCE

AWNING
SHED
PATIO
RAMP
CAR PORT
CAR PORT
GRASS

No.32 SINGLE STOREY BRICK & CLAD HOUSE TILE ROOF

No.31 SINGLE STOREY CLAD HOUSE METAL ROOF

METAL PANEL FENCE

SILL 42.73 TOP 43.83 SILL 42.73 ROOF 45.87 TOP 43.83

No.29 TWO STOREY BRICK HOUSE TILE ROOF

SILL 42.73 TOP 43.83 SILL 42.73 ROOF 45.84 TOP 43.83

SP 96212

SILL 42.02 TOP 43.09 SILL 42.02 ROOF 45.17 TOP 43.09

TOP 40.42 TOP 40.42 TOP 40.42

SILL 41.89 TOP 43.09 SILL 41.89 TOP 43.11 TOP 43.09 SILL 41.89 ROOF 45.17 ROOF 44.70

No.30 TWO STOREY BRICK HOUSE TILE ROOF

DRIVEWAY

CONCRETE

GRASS

0.2D/6H/5S
0.2D/6H/4S
TREE
TREE

263°22'30" 15.805

263°22'30" 15.805

GRASS

KERB

BM NAIL RL 36.83 (AHD)

PARK AVENUE

NOTE : Bearings, distances and area are by title and Plans only available at the LRS and may be subjected to redefinition. No boundary investigation has been carried out or marked

NOTE :CONTOUR INTERVAL : 0.2

Details and level shown on this plan are for general desing works only any critical dimensions required should be requested independantly of this plan.Prior to any demolition, excavation or construction on this site the relevant Authorities should be contacted to detailed locations of all existing services and the possible location of future services.

GEOFFREY GALLEN
REGISTERED SURVEYOR
No: 1083

EAST WEST SURVEYORS PTY LTD

Ph: 02 83862318 MOB 0403 818 643
ABN: 52 615 075 119
Suite 2 Ground Floor, 123 Midson Road Epping NSW 2121
Email: info@eastwestsurveyors.com.au
www.eastwestsurveyors.com.au

DETAIL SURVEY OF LOT 15 IN DP 29528
No 31-32 PARK AVENUE KINGSWOOD
NSW 2747

SCALE
0 2.5 5
LENGTHS ARE IN METRES

ORIGINAL

SCALE	SHEET SIZE
1:100	A1

THE LAND IN THE SURVEY IS SHOWN ENCLOSED BY CONTINUOUS THICK LINES

SURVEYED : GIM	DATE:07.09.2020
DRAWN : TJ	DATE:11.09.2020
REFERENCE: 20/2611 - DET	DATUM :AHD
SHEET 1 OF 1 SHEETS	SSM 42319 RL33.091

ACOUSTIC ASSESSMENT

Proposed Subdivision & Boarding House Development

31-32 Park Avenue Kingswood NSW

Proposal for the Provision of Professional Services To:

Mr Eltin Miletic

Miletic-Mieler Development Consultants Pty Ltd

Proposal By:

NG Child & Associates

2 November 2020

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DOCUMENT CONTROL REGISTER

Project Reference	CA/20/172/2001
Project Name	Acoustic Assessment for the Proposed Subdivision and Boarding House Development at 31-32 Park Avenue Kingswood NSW
Document Title	Proposal to Undertake Acoustic Assessment: Subdivision & Boarding House Development 31-32 Park Avenue Kingswood NSW (Version 1: March 24th, 2020)
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Attention	Eltin Miletic

Version	Date	Document Reference	Prepared By	Checked By	Approved By
1	6 October 2020	Park Avenue – Acoustic Assessment Proposal (Version 1) – 061020.docx	NGC	HMC	NGC

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EXECUTIVE SUMMARY

This report presents an updated acoustic assessment of a proposed boarding house development in four buildings at 31-32 Park Avenue Kingswood NSW, taking into account the latest design, plans and drawings for the proposed development.

The assessment has been undertaken in accordance with relevant acoustic requirements, standards and guidelines.

KEY FINDINGS

The key findings of this assessment are that:

- In relation to acoustic matters, it is our professional opinion, based on a consideration of the various plans and drawings describing the project; subject to the adoption and implementation of the various recommendations presented in this report, and summarised below, that indoor sound levels associated with the proposed development will comply with the most stringent applicable internal noise guidelines, namely that background sound levels no greater than 35 dBA will be achievable in all bedrooms during the 10:00pm to 7:00am night-time period, and background sound levels no greater than 40 dBA will be achievable in all other habitable rooms within the development, at all times; and

- The development as proposed, once again subject to the adoption and implementation of the various recommendations presented in this report and summarised below, will have no inappropriate or non-compliant acoustic impact on any potentially affected receivers, including in particular nearby residential receivers.

RECOMMENDATIONS

The following recommendations, which are identified in the text of this report, are made to ensure the compliance of internal acoustics with the relevant guidelines and requirements:

1. **External Glazing - Windows:** Glass with a minimum acoustic rating equivalent to 6.38mm laminated glass is used in all external window and door systems on the southern or Park Avenue building facades. All other external glazing to involve glass with a minimum acoustic rating equivalent to 6 mm float glass.

2. **External Glazing – Acoustic Sealing:** External window and door frames should be sealed into façade openings using a polyurethane sealant such as “Bostik Fireban One”, or equivalent, and acoustic seals (such as Schlegel Q-Lon or equivalent) should be used to provide additional acoustic protection.

3. **Internal Walls:** Internal walls, including inter tenancy walls, should be constructed and installed in accordance with the summary details included in this report, and in accordance with relevant BCA acoustic guidelines. Inter-tenancy walls are required by relevant BCA guidelines to have an Rw + Ctr rating of at least 50 Rw dBA, and structural materials offering an Rw + Ctr greater than 50 Rw are recommended.

4. **Floors:** Floor slab construction to be of minimum 200 mm reinforced concrete with density greater than 2200 kg/m^3 with suspended plasterboard ceiling below, to achieve an Rw+Ctr in excess of 50. The use of resilient hung ceilings is recommended where hard floor finishes are proposed above the slab. For carpet floor coverings within all living spaces and bedrooms, the use of standard carpet underlay is expected to meet floor impact isolation requirements. Hard floor coverings are proposed for wet areas such as kitchens, bathrooms, and laundries. It is recommended that any ceramic tiles included in the development are laid on top of 10 mm thick “Embelton ImpactaMat” acoustic underlay (or equivalent), in order to ensure that the required floor impact isolation requirements are achieved.

5. **Services:** Internal services should be fitted with acoustic insulation as detailed in this report, and in accordance with relevant BCA requirements.

6. **BCA Requirements:** Standard BCA and other internal acoustic design and construction considerations, including but not limited to those summarised in Section 5.5.7 and Appendix A of this report, are applied to all aspects of the construction of the various residential units within the proposed development;

7. **Plant & Equipment:** Any mechanical plant and equipment required for the development will be specified and/or designed and installed such that acoustic noise emissions are consistent with the internal acoustic environments required, and that any penetrations from ductwork and/or pipework will not reduce the acoustic performance of other building design features;

8. **Noise Emissions from Plant & Equipment:** Plant and equipment used in association with the development should be selected, sited and installed so that acoustic impacts do not exceed the measured background LA90 noise level by more than 5 dBA at any property boundary.

9. **Acoustic Certification:** Appropriate certification and validation of the acoustic performance of any plant and equipment associated with the proposed development is provided prior to construction, and prior to occupation, as reasonably required;

10. **Boundary Fencing & Landscaping:** Boundary fencing with an Rw rating of 20 (minimum), such as solid form metal panel fencing, is installed on the eastern and northern property boundaries, to ensure that any noise emissions from the proposed development will not exceed existing measured background LA90 sound levels by more than 5 dBA at any residential property boundary. No specific acoustic performance is required from the fencing along the western property boundary, but a continuation of the type of fencing used on other property boundaries may be considered;

11. **Noise Management Plan – Construction:** A noise management and control plan will need to be developed and applied to the construction phase of the proposed development, in accordance with established procedures and practices; and

12. **Facility Management Plan – Ongoing Operation:** The overall management plan for the facility should include specific reference to practical and achievable noise management controls, including guidelines regarding noise management and minimisation in any communal areas associated with the proposed development.

All materials or material types mentioned in this report have been suggested solely on the basis of acoustic performance. Any other properties of these materials, including fire rating and chemical properties should be checked with the suppliers or other specialised bodies to ensure fitness for non-acoustic purposes. Any specific material brands or types mentioned in this report have been mentioned as a guide to acoustic properties, and not as a recommendation, and that a range of products may be available that can deliver the acoustic performance required.

Noel Child BSc (Hons), PhD, MIEA, MRACI
Visiting Fellow, Engineering
University of Technology, Sydney
Principal, NG Child & Associates
2 November 2020

1 INTRODUCTION

Miletic-Mieler Development Consultants Pty Ltd (Miletic-Mieler) is involved in a prospective sub-division and boarding house development at 31-32 Park Avenue Kingswood NSW.

Miletic-Mieler has engaged NG Child & Associates undertake the acoustic assessment required for the Development Application submission associated with the project.

NG Child & Associates has considerable experience in the evaluation and assessment of residential developments

Noel Child of NG Child & Associates is a suitably qualified and experienced person to undertake the various assessments required. His CV has been included for reference at Appendix E.

This document describes the acoustic assessment undertaken and presents its findings and recommendations.

2 SITE & ASSESSMENT DETAILS

2.1 LOCATION

The location of 31-32 Park Avenue Kingswood is shown highlighted in blue in Figure 2.1 below. The direction of north is towards the top of the diagram, and an approximate indication of scale is included below.

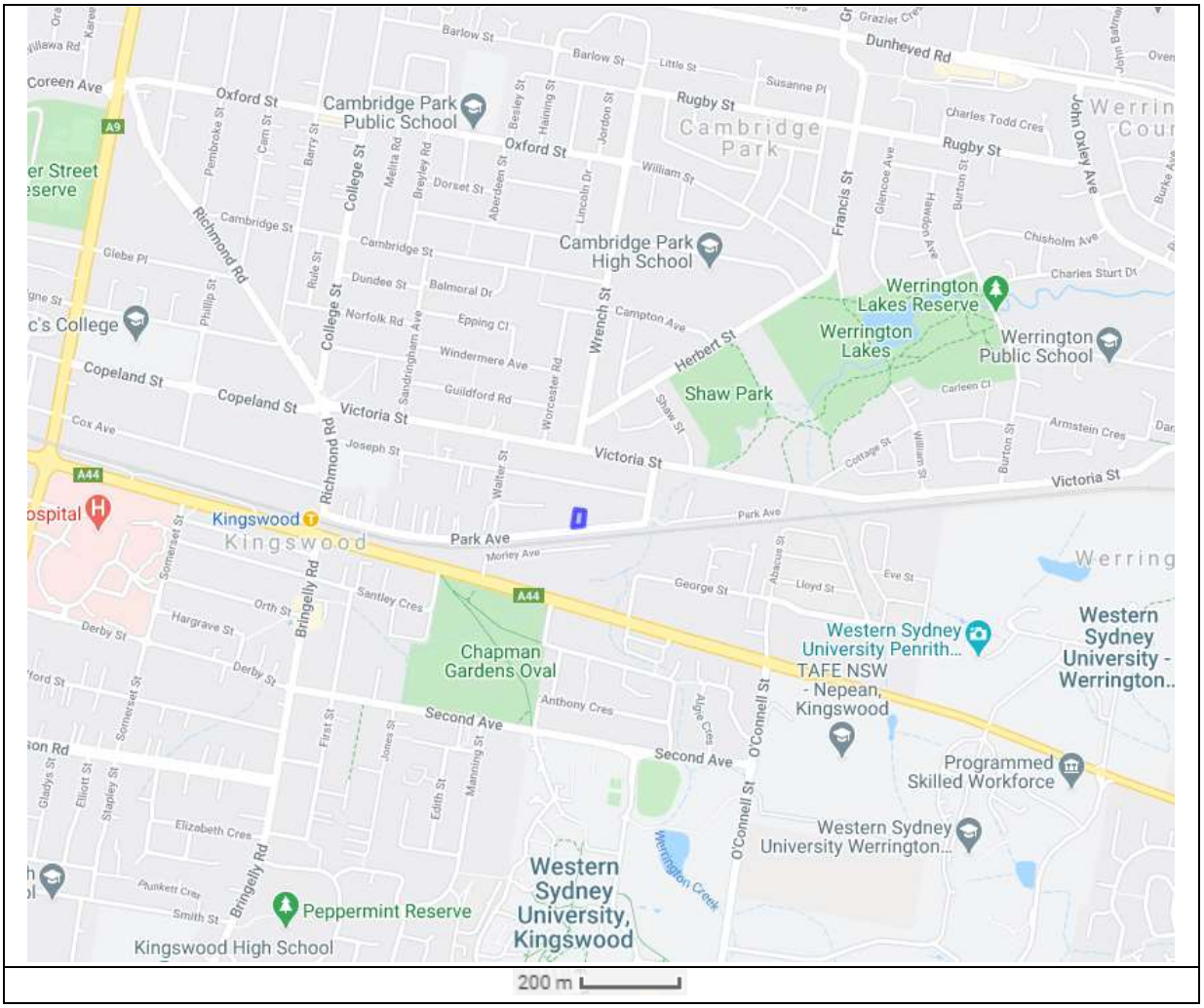

Figure 2.1 – Location of 31-32 Park Avenue Kingswood

A recent (October 1st, 2020) satellite photograph of the site is provided in Figure 2.2, below.

Figure 2.2 – Satellite Photograph of 31-32 Park Avenue Kingswood (October 1st, 2020)

The site comprises land of approximate area 1430 square metres with frontage to Park Avenue. The nearest significant thoroughfare is Park Avenue. The Great Western Highway is some 200 metres to the south.

2.2 LAND DETAILS & ZONING

The proposed site falls within the local government area of Penrith City Council, and relevant local government consents and approvals regarding site and the proposed development reside with that Council.

Zoning details applicable to the site and nearby areas are provided in Figure 2.3, below, based on information available from the current Penrith Local Environment Plan.

The site is shown at the centre of the diagram. The site is zoned “R3 – Medium Density Residential”. Adjoining and nearby properties are similarly zoned.

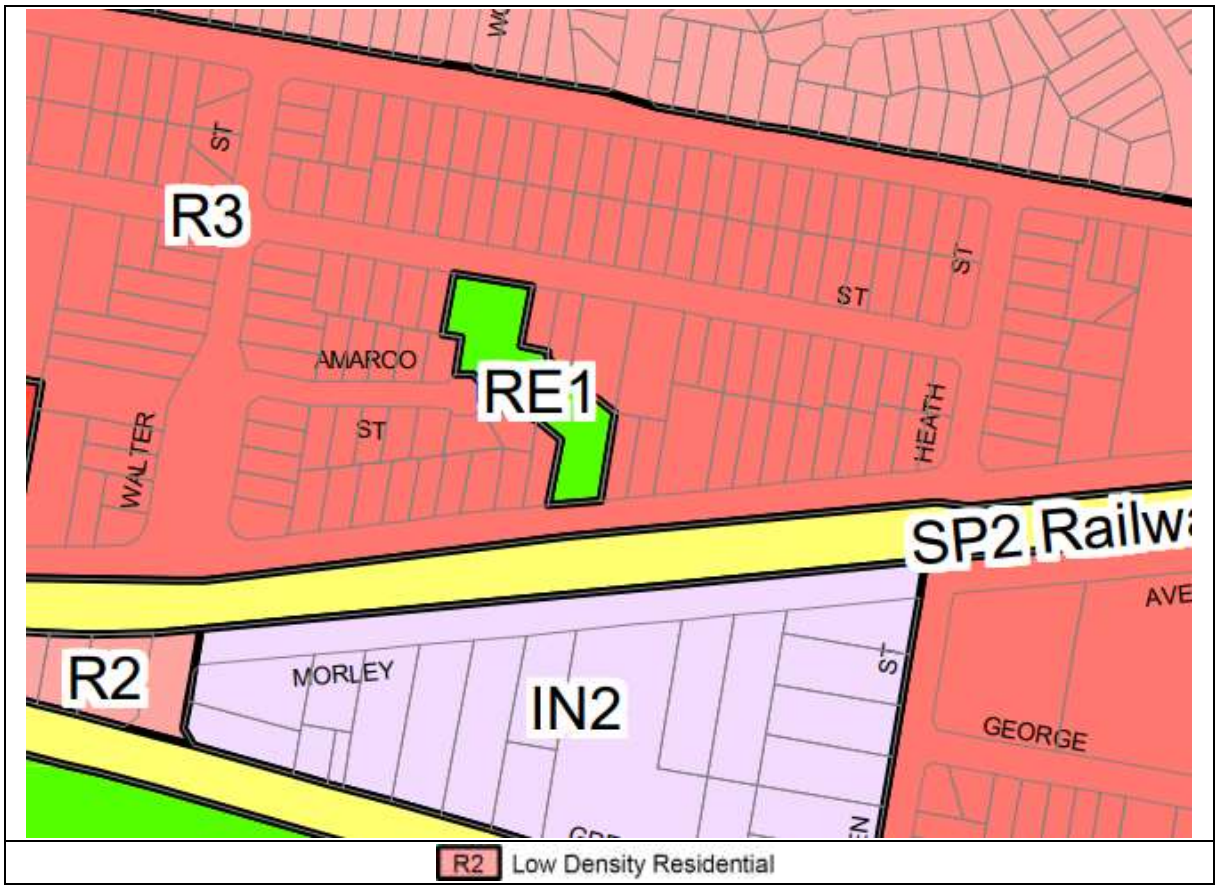

Figure 2.3 – Zoning Details

A photograph of the existing residential dwelling at the site is shown in Figure 2.4, below.

Figure 2.4 – View of the Site from Park Avenue

3 PROPOSED DEVELOPMENT

The proposed development involves the subdivision of the existing land parcel into three lots, and the development of a boarding house on each of the three proposed lots, in accordance with the plans and drawings provided in Figures 3.1 to 3.4 on subsequent pages, as follows:

Figure 3.1 Site Plan

Figure 3.2 Floor Plan Lot 1

Figure 3.3 Floor Plan Lot 2

Figure 3.4 Floor Plan Lot 3

Figure 3.1 – Site Plan

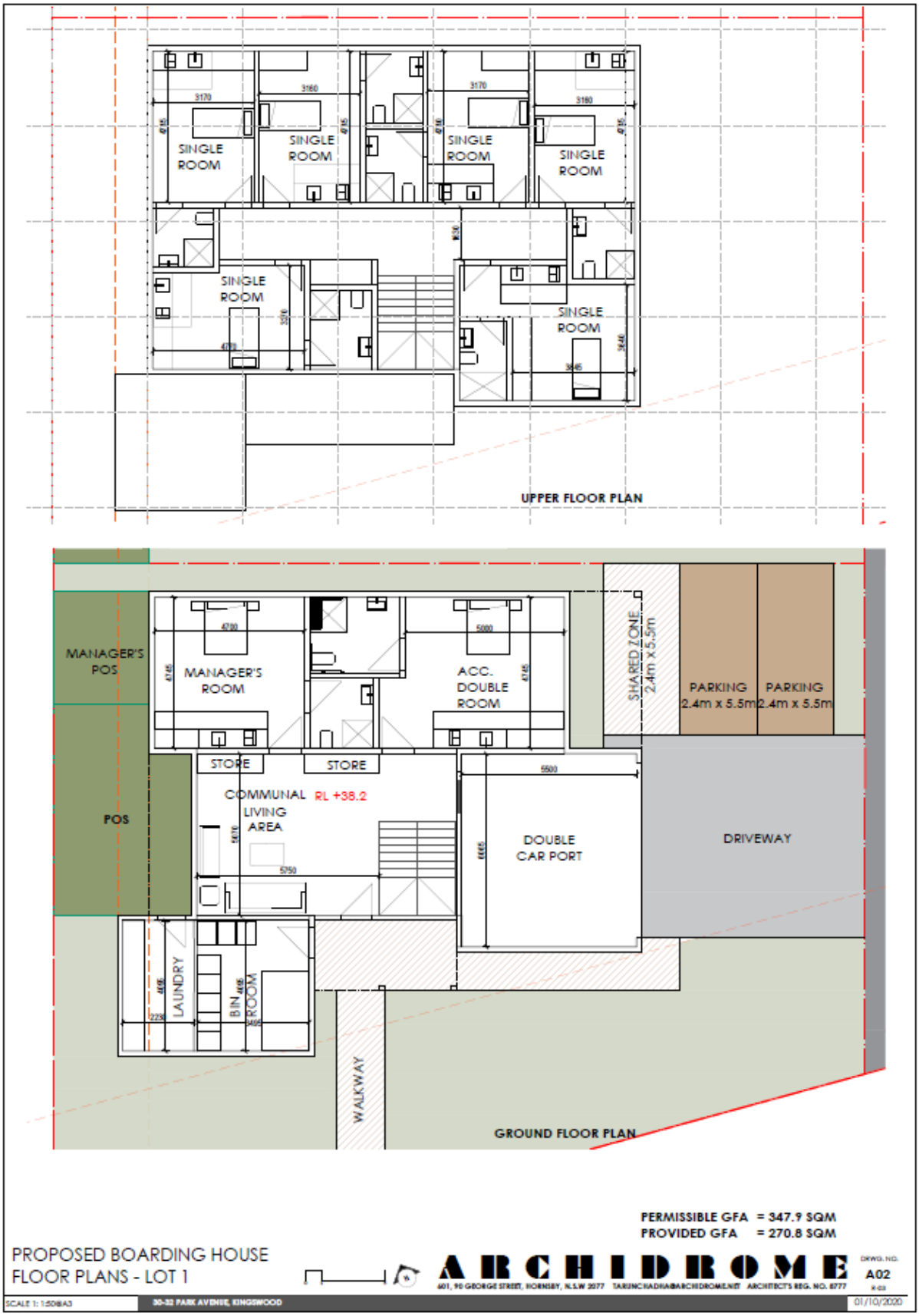

Figure 3.2 – Floor Plan Lot 1

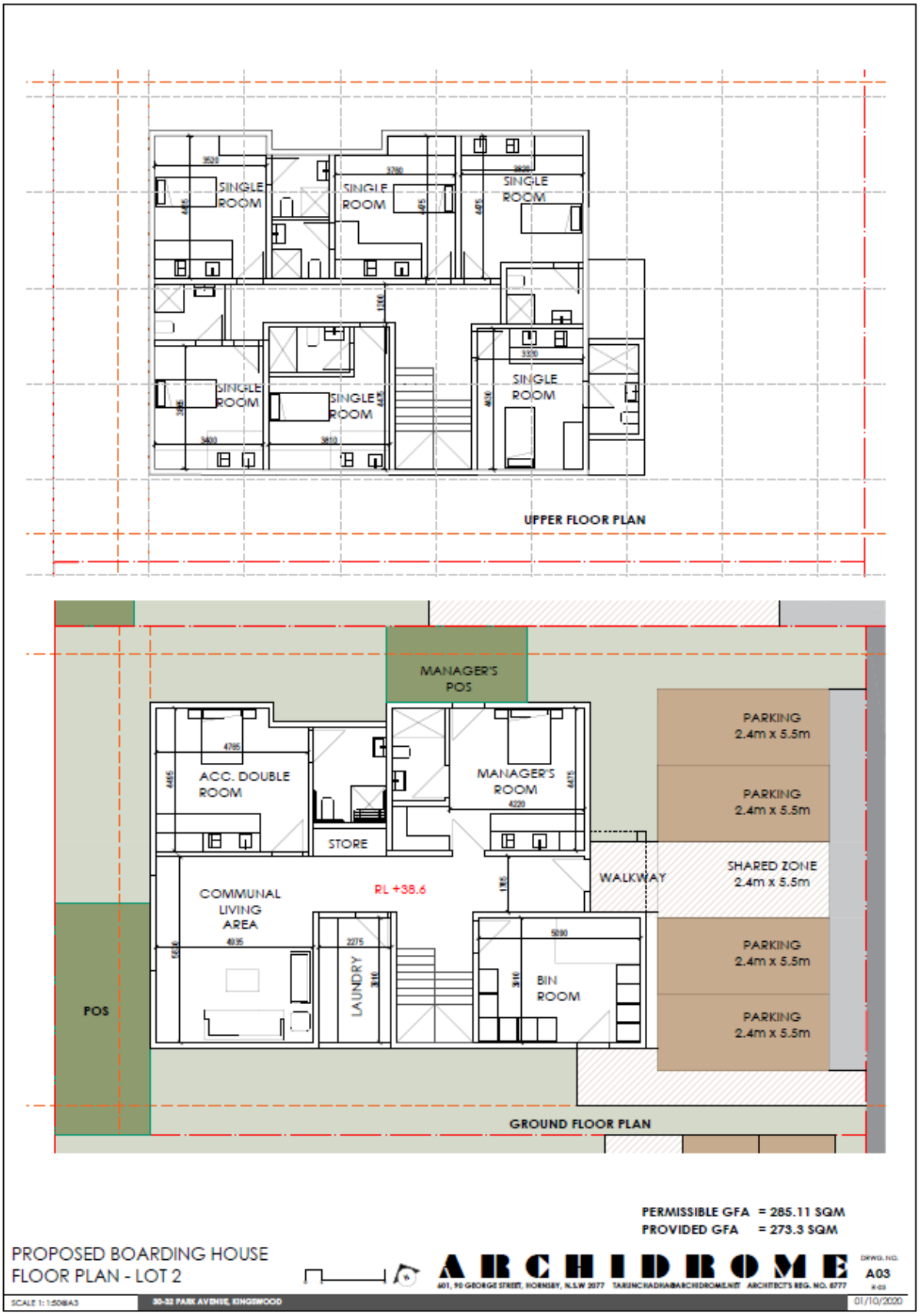

Figure 3.3 – Floor Plan Lot 2

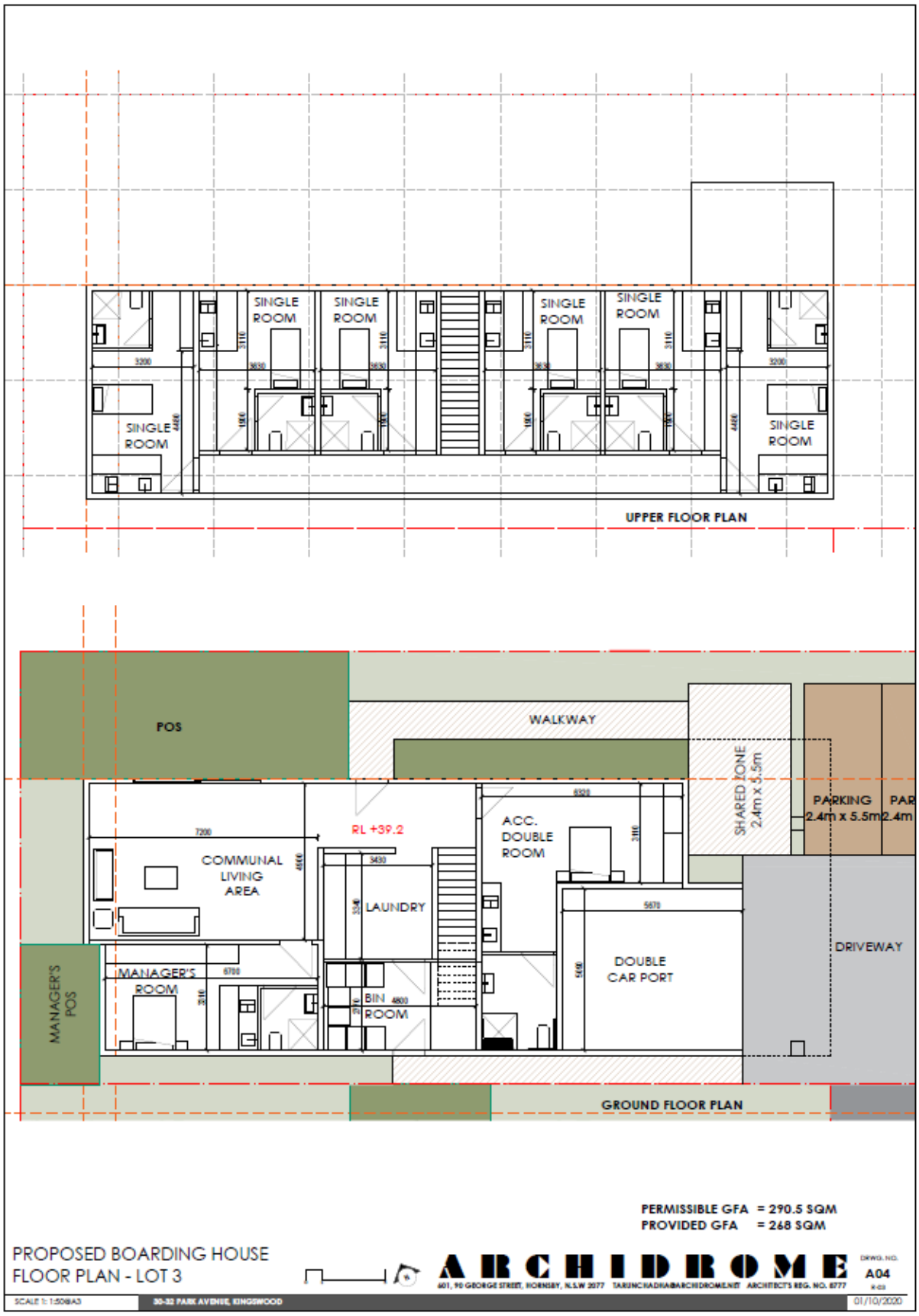

Figure 3.4 – Floor Plan Lot 3

4 ACOUSTIC ASSESSMENT GUIDELINES

4.1 GENERAL GUIDELINES

A summary of relevant acoustic assessment and reporting guidelines has been included below, for reference.

Noise Guide for Local Government (2009), NSW Office of Environment & Heritage (OEH);
Australian Building Codes Board (ABCB) Regulation Impact Statement (August 2012);
NSW Government Department of Planning Infrastructure SEPP 2007; and
NSW Noise Policy for Industry (2017), NSW Office of Environment & Heritage (OEH).
AS 3671 Road Traffic Noise Intrusion
AS 1055 Parts 1, 2 and 3 - 1997 Acoustics - Description and Measurement of Environmental Noise
AS 2107 - 1987 Acoustics - Recommended design sound levels and reverberation times for building interiors
State Environmental Planning Policy (Infrastructure) 2007

The requirements of these guidelines have been taken into account in the assessment presented in this document.

4.2 PENRITH CITY COUNCIL

Penrith City Council guidelines in relation to boarding house developments are provided in Part D5 “Other Land Uses”, Section 5-11 “Boarding Houses” of the Penrith Development Control Plan (PDCP) 2014.

Specific requirements identified in the PDCP 2014 in relation to acoustic performance include:

(2) Built Form, Street Impact and Appearance

d) proposals must demonstrate that neighbourhood amenity will not be adversely impacted by factors such as noise and privacy.

and:

(5) Visual and Acoustic Amenity Impacts

Boarding houses are to provide:

a) Bedrooms separate from significant noise sources;
b) Sound insulation between bedrooms to provide reasonable amenity;
c) Communal areas and bedroom windows away from the main living area or bedroom windows of any adjacent buildings; and
d) Screen fencing, plantings, and acoustic barriers in appropriate locations.

These guidelines have been taken into account in the assessment presented in this document.

4.3 NOISE POLICY FOR INDUSTRY (2017)

It has been assumed as a basis for this assessment that appropriate noise criteria for the proposed development are specified in the Noise Policy for Industry (NPI) 2017 (formerly the NSW Industrial Noise Policy 2000). The noise criterion set out in the INP depends on whether existing noise levels in a given area are close to recommended amenity levels for different types of residential receiver, for example whether the receivers in question are urban, rural, near existing roads and so on. In this case, the potential receivers in question appear to be primarily residential in nature. The NPI requires that the following actions or circumstances be taken into account in the acoustic assessment of a development of the type proposed:

- Identify the existing level of noise, or noise background
- Determine what weather conditions should be used when predicting noise background
- Assess noise levels that will be involved with the various aspects of the proposed development
- Assess noise from the proposed development at residential receivers
- Assess noise from the proposed development at industrial/commercial receivers
- Apply the urban/industrial interface amenity category, if required
- Identify the appropriate receiver amenity category
- Apply amenity criteria in high traffic noise areas
- Take into account any cumulative noise from multiple developments
- Identify which of the amenity or intrusive criteria apply
- Take into account maximum noise levels during shoulder periods
- Consider the tonality - sliding scale test
- Apply duration correction, if required
- Sleep disturbance
- Present the results of the acoustic assessment in appropriate report form

Further comments on some of these assessment criteria are included in Sections 4.4 to 4.7, below.

4.4 INTRUSIVENESS CRITERION

As set out in the various reference guidelines listed above, where existing noise levels are low, noise levels from a proposed new (or changed) operation are limited by the intrusiveness criterion.

In such cases, the L_{Aeq} noise level resulting from the impact of any new or substantially changed operation should not exceed the Rating Background Level (RBL) applicable to the residential receivers in question by more than 5dBA.

4.5 AMENITY CRITERION

The amenity criterion sets an upper limit to control the L_{Aeq} noise level from all industrial sources for daytime, evening and nighttime periods, respectively. In accordance with the relevant acoustic criteria and guidelines listed, “maximum” recommended incremental noise levels for these periods are all 5 dBA higher than the “acceptable” levels mentioned in the various NSW acoustic guidelines.

4.6 INTERPRETATION OF CRITERIA

Where noise levels from industrial sources are close to or above the 5dBA maximum increment over the existing Rating Background Level, as recommended in the NSW Industrial Noise Policy, then the amenity criterion, which incorporates a sliding scale to set limits, becomes relevant.

The sliding scale prevents the overall noise level exceeding the acceptable level as a result of a new noise source.

The amenity criterion also needs to consider the possibility of other developments which may affect aggregate noise levels in any given situation.

4.7 SLEEP DISTURBANCE

Intermittent noises such as trucks and loading dock activities during the nighttime period are not directly addressed by the Industrial Noise Policy. In order to minimise any risk of sleep disturbance to affected residential receivers as a consequence of operations that occur during the nighttime period (10:00pm – 7:00am), the NSW Office of Environment & Heritage (OEH) recommends that:

> *Sleep disturbance is assessed as the emergence of the $L_{A\ (1\ minute)}$ level above the $L_{A90\ (15\ minute)}$ level at the time. Appropriate screening criteria for sleep disturbance are determined to be an $LA1_{\ (I\ minute)}$ level 5dBA above the Rating Background Level (RBL) for the nighttime period.*

This approach to the assessment of sleep disturbance has been discussed with the NSW OEH by the author of this assessment proposal.

The NSW OEH has confirmed that this is the correct and accepted way to undertake the assessment of sleep disturbance.

4.8 NOISE FROM PLANT & EQUIPMENT

Council requires that noise from plant and equipment associated with the development will not exceed measured background sound levels at any property boundary by more than 5 dBA. This requirement has been addressed in the acoustic assessment presented in this document.

4.9 SUMMARY OF ACOUSTIC GUIDELINES & REQUIREMENTS

Taking into account all relevant guidelines, the acoustic conditions that will be required to be demonstrated in relation to the proposed development are as follows:

The effect of noise from external sources on the boarding house development:

Type of Occupancy	Noise Level dBA	Applicable Time Period
Sleeping Areas (Bedrooms)	35	Night (10 pm to 7 am)
Other Habitable Rooms (excluding garages, kitchens, bathrooms and hallways)	40	At any time

The principal sources of external noise appear to be road traffic on Park Avenue and rail traffic in the nearby western rail corridor.

However, all other potential noise sources have been considered as part of the assessment.

The effect of noise from the boarding house development on nearby receivers:

Type of Receiver	Noise Level dBA	Applicable Time Period
Nearby Residential Properties	+ 5dBA (max)	At any time
Nearby Commercial Properties	65 dBA (max)	At any time

The requirement in relation to the impact of noise associated with the apartment development on nearby residential properties is that such noise is not permitted to result in an increase of more than 5 dBA at the boundary between the apartment development and the nearest residence.

The requirement in relation to the impact of noise associated with the boarding house development on nearby commercial properties is that such noise is not permitted to result in a noise level of greater than 65 dBA at the boundary between the apartment development and any nearby commercial property.

These requirements regarding the acoustic or noise impact of the proposed residential development on nearby properties have been carefully considered as part of this acoustic assessment.

5 ACOUSTIC MEASUREMENTS

5.1 BACKGROUND SOUND LEVEL MEASUREMENTS

Unattended noise monitoring was conducted at the site between Monday 19th and Sunday 25th October 2020. Background sound monitoring for the 31 and 32 Park Avenue sites was undertaken was undertaken together.

An unattended noise monitor was installed in the rear of the 31 Park Avenue property, to measure the lower LA90 background sound levels against which acoustic impacts on the adjoining residential property at 32 Park Avenue are required to be assessed, in order to protect the acoustic amenity of residential neighbours. Attended sound level measurements were recorded at the Park Avenue site boundary in order to assess the anticipated increase in the background Leq sound measure at this location, in turn to ensure that building design and structure is appropriate to ensure that the required indoor sound levels are achieved. The two monitoring locations are indicated by “A” and “B” in Figure 5.1, below.

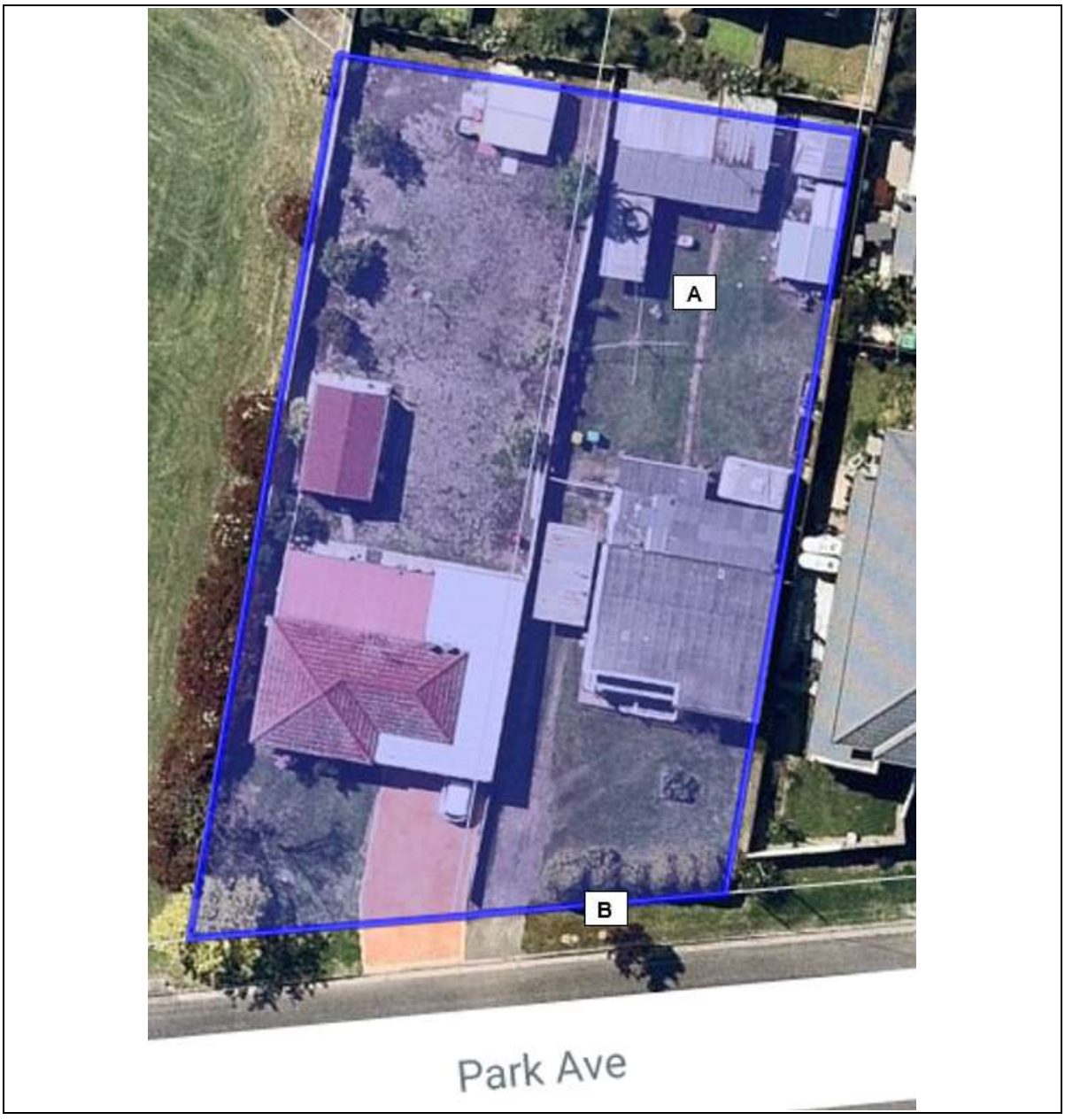

Figure 5.1 – Background Acoustic Monitoring Locations

Recording microphones were located approximately 1000 mm above ground level, in free field conditions.

5.2 INSTRUMENTATION

The noise monitoring equipment used for these measurements was a Brüel & Kjaer 2238 noise monitoring terminal, incorporating a Brüel & Kjaer 2238 sound level meter.

The instrument was set to A-weighted, fast response, and was programmed to monitor on a continuous basis over 15-minute sampling periods, and to store sound level descriptors for later detailed analysis. The equipment calibration was checked before and after the survey and no significant drift was noted.

Attended measurements were recorded using the sound level meter without the weatherproof housing used for unattended measurements.

A photograph of the unattended sound monitor in place at the site is provided in Figure 5.2, below.

Figure 5.2 – Acoustic Monitor in Position at Site

5.3 ACOUSTIC PARAMETERS

5.3.1 Location A

The logger was set to measure the Lmax, LAmin, LA1, LA10, LA50, LA90, LA99 and LAeq levels of the existing sound or noise environment. The LAmax measure reflects the highest noise level recorded during each monitoring period and is indicative of maximum noise levels due to individual noise events, including road traffic on Park Avenue and other local roads, and the nearby main western rail corridor.

The LA90 level is generally adopted as the background noise level, excluding road and rail traffic noise influences. The LAeq level is the Equivalent Continuous Sound Level and has the same sound energy over the sampling period as the actual noise environment with its fluctuating sound levels. The LAeq is accepted for acoustic assessment purposes as the standard descriptor for environmental noise that is noise including influences such as road and rail traffic. The LAeq measure has been used for that purpose in this assessment. Weather during the measurement period was generally fine, and no adjustments to the measured data (to adjust for extreme meteorological conditions) were considered necessary or applied. Detailed reports of sound level measurements have been included for reference at Appendices B and C. Summaries of the key LA90 and LAeq descriptors for the seven days of the monitoring period are shown in Table 5.1, on the following page.

Table 5.1 – Background Sound Level Measurement Results (Location A)

	Mean logarithmic LA90 Daytime (7:00am to 6:00pm) *	Mean logarithmic LA90 Evening (6:00pm to 10:00pm)	Mean logarithmic LA90 Night-time (10:00pm to 7:00am)
Mon 19 October 2020	44.2042	40.2938	34.6906
Tue 20 October 2020	44.0795	43.3875	35.2417
Wed 21 October 2020	44.5063	43.7375	36.0969
Thu 22 October 2020	46.3864	43.8750	38.5028
Fri 23 October 2020	44.4292	45.2000	37.9563
5 Working Days	**44.7211**	**43.2988**	**36.4976**
Sat 24 October 2020	43.2604	45.3438	37.0375
Sun 25 October 2020	44.1667	43.4375	43.9031
2 Day Weekend	**43.7135**	**44.3906**	**40.4703**
	Mean logarithmic LAeq Day-time (7:00am to 6:00pm) *	**Mean logarithmic LAeq Evening (6:00pm to 10:00pm)**	**Mean logarithmic LAeq Night-time (10:00pm to 7:00am)**
Mon 19 October 2020	49.7604	45.7688	39.3875
Tue 20 October 2020	49.5841	46.9750	40.0000
Wed 21 October 2020	50.7875	47.3375	40.3844
Thu 22 October 2020	51.9795	48.8188	41.9750
Fri 23 October 2020	50.0313	50.8813	42.4188
5 Working Days	**50.4286**	**47.9563**	**40.8331**
Sat 24 October 2020	48.5104	49.9500	41.3000
Sun 25 October 2020	47.5479	44.9813	47.1094
2 Day Weekend	**48.0292**	**47.4656**	**44.2047**

* Sundays and Public Holidays daytime commences 8:00am

A summary of the LA90 and LAeq noise measures for the 2-day weekend and 5-day working week periods is presented in Table 5.2, below.

Table 5.2 – Noise Monitoring Summary (Location A)

	Mean logarithmic LA90 Daytime (7:00am to 6:00pm) *	Mean logarithmic LA90 Evening (6:00pm to 10:00pm)	Mean logarithmic LA90 Night-time (10:00pm to 7:00am)
5 Working Days	**44.7211**	**43.2988**	**36.4976**
2 Day Weekend	**43.7135**	**44.3906**	**40.4703**
	Mean logarithmic LAeq Day-time (7:00am to 6:00pm) *	**Mean logarithmic LAeq Evening (6:00pm to 10:00pm)**	**Mean logarithmic LAeq Night-time (10:00pm to 7:00am)**
5 Working Days	**50.4286**	**47.9563**	**40.8331**
2 Day Weekend	**48.0292**	**47.4656**	**44.2047**

* Sundays and Public Holidays daytime commences 8:00am

5.3.2 Location B

As indicated in 5.1 above, 15-minute attended sound level measurements were recorded at Location B, on the Park Avenue site boundary, to measure the higher anticipated sound levels at this location.

These comparative measurements were carried out on the morning and afternoon of Thursday and Friday October 22nd and 23rd, 2020.

Based on an average of these Location B measurements, the following sound level differential was established between Location A and Location B:

Table 5.3 – Sound Level Difference between Locations "A" and "B"

	Location "A"	Location "B"
LAeq 15-min; Daytime	X dBA	X + 6 dBA
L90 15-min, Daytime	Y dBA	X + 3 dBA

In other words, the LAeq measure was found to be 6 dBA higher at Location "B" than at "Location "A", and the LA90 measure 3 dBA higher.

5.4 REFERENCE & DESIGN BACKGROUND SOUND LEVELS (RBL'S)

The acoustic measurements described in Section 5.3 above effectively quantify external noise with the potential to impact on the proposed development, with the general acoustic background without road traffic identified by the LA90 measure, and existing road traffic noise included in the LAeq measure. In this case, daytime, evening and night-time background sound levels are all potentially relevant to the assessment.

Daytime external sound levels are relevant to the requirement to achieve a maximum sound level of 40 dBA in any habitable room within the development, at any time. The daytime Rated Background Sound Level (RBL) adopted is the highest measured at either location for any time period, and therefore conditions that achieve required indoor sound levels in the case of daytime external noise levels will also achieve these outcomes in other periods, when external sound levels are lower.

Night-time external sound levels are relevant to the requirement to achieve a maximum sound level of 35 dBA in any bedroom within the development during the night-time (10:00pm – 7:00am) period.

RBL's for this assessment project, based on the data presented in Section 5.3, are identified in Table 5.4, below.

To ensure a conservative and reliable assessment, the lower L90 sound level recorded at Location "B" has been adopted as the background criterion used to protect the acoustic amenity of neighbouring residential and other receivers.

Table 5.4 – Rated Background & Design Sound Levels

Rated Background Sound Levels for Assessment Purposes	
Daytime:	
LA90	44
LAeq	56
Evening	
LA90	44
LAeq	54
Night-time:	
LA90	36
LAeq	50

6 ACOUSTIC ASSESSMENT

6.1 INTRODUCTION

The acoustic assessment of the proposed development requires consideration of both the impacts that existing environmental sound and noise levels might have on the proposed development and its future residents and occupants, and also the likely acoustic impacts that the development and its associated activities might have on potentially affected individuals, residences and activities.

ACOUSTIC IMPACTS ON THE DEVELOPMENT

Existing external noise that will impact on the development will include:

- Human activity in the vicinity of the development;
- Operation of mechanical devices near the development;
- Noise generated by traffic on Park Avenue and other nearby roads;
- Noise generated by rail traffic operating within the nearby western rail corridor; and
- Any other existing environmental noise.

Preliminary consideration of the proposed development, and the development site, has suggested that noise generated by road and rail traffic is the primary external acoustic factor.

Consideration of the impacts of external noise on the proposed development, including actions necessary to ensure that relevant internal sound levels are achieved, is presented in Section 6.4, below.

ACOUSTIC IMPACTS OF THE DEVELOPMENT

Noise generated by the development itself will include:

- Human activity associated with the development;
- Traffic noise associated with the development; and
- Operation of any mechanical plant associated with the development.

Consideration of the acoustic impacts that the proposed development will have on neighbouring premises is presented in Section 6.6, below.

6.2 RATED BACKGROUND SOUND LEVELS

The acoustic measurements described in Section 5 of this report effectively quantify external noise with the potential to impact on the proposed development, with the general acoustic background without road traffic identified by the LA90 measure, and background noise including existing road traffic noise indicated by the LAeq measure.

In this case, daytime, evening, and night-time background sound levels are relevant.

Daytime external sound levels are relevant to the requirement to achieve a maximum sound level of 40 dBA in any habitable room within the development, at any time.

Daytime external sound levels adopted for assessment purposes are the highest measured (refer Section 5), and therefore conditions that achieve required indoor sound levels in the case of daytime external noise levels will also achieve these outcomes in other periods, when external sound levels are lower.

Night-time external sound levels are relevant to the requirement to achieve a maximum sound level of 35 dBA in any bedroom within the development during the night-time (10:00pm – 7:00am) period.

Based on the background data described in Section 5, the rated background sound levels adopted for this assessment, in accordance with relevant acoustic assessment guidelines, are as shown in Table 6.1, on the following page.

Table 6.1 – Rated Background & Design Sound Levels

Rated Background Sound Levels for Assessment Purposes	
Daytime:	
LA90	44
LAeq	56
Evening	
LA90	44
LAeq	54
Night-time:	
LA90	36
LAeq	50

These rated background levels have been rounded to the nearest whole decibel, in accordance with accepted acoustic assessment practice. The adopted Leq measures are the highest recorded during the seven-day period of continuous monitoring, on the basis that guideline criteria for sound levels within habitable rooms at the proposed residential development are required to be achieved at all times, and therefore need to take into account the highest background sound levels measured. The adopted L90 measures are the lowest recorded, in order to ensure that the acoustic amenity of neighbouring residential receivers is protected.

6.3 SOUND TRANSMISSION RATINGS

The Building Code of Australia (BCA) requires that building elements have certain levels of insulation from airborne noise and impact sound. Regulatory guidelines require that certain maximum sound or noise levels be achieved, or achievable, within the internal spaces of boarding houses and other residential structures.

The weighted sound reduction index (Rw) is the measure used to describe the acoustic performance of the various building elements making up a construction system. Rw is a single number quantity for the airborne sound insulation rating of building elements.

As the acoustic performance of a material or construction improves, the higher the Rw value will be.

Rw ratings are determined by laboratory tests of a specimen of the construction system. The specimen is fixed within a frame to form the wall between two test chambers. A high noise level is generated in one room and the difference in sound level between the source room and the receiver room represents the transmission loss through the test specimen. The measurements are conducted over a range of sound frequencies. The Rw rating is then determined by comparing the results with reference curves.

Correction factors (C and Ctr) can be added to Rw to take into account the characteristics of particular sound spectra and indicate the performance drop of the wall in the corresponding sound frequency range.

The correction factor C relates to mainly mid to high frequency noise. The correction factor Ctr relates to lower to medium frequency noise.

The weighted sound reduction index is quoted as Rw (C, Ctr), where C and Ctr are correction factors representing different noise sources.

For example, if a wall is measured as Rw 54(-1, -4) the value of the index when the lower frequency correction factor (Ctr) is applied is:

$$Rw + Ctr = 54 + (-4)$$
$$Rw + Ctr = 50$$

In practice, small gaps and cracks which permit even minor air leakage will provide a means for sound transmission, leading to lower field performance.

This degradation in acoustic performance should be recognised, and an appropriate allowance made when selecting a tested system to achieve a particular Rw rating when installed.

The sound transmission class (STC) was the method that was used previously to measure acoustic performance.

The requirements of the BCA have changed to comply with international regulations and Rw is now used.

The STC was based on different criteria and did not include any correction factors.

6.4 ACOUSTIC IMPACTS ON THE PROPOSED DEVELOPMENT

6.4.1 General Considerations

The proposed development will be subject to the impact of noise generated by a range of external activities, as previously described.

An important part of this assessment is to consider those potential impacts, and to ensure that acoustic amenity consistent with relevant guidelines can be achieved in the various habitable rooms and bedrooms throughout the proposed development.

6.4.2 Acoustic Implications of Design & Layout

The layout and design of the proposed development has the following acoustic implications:

- The proposed residential units will be exposed to existing and future external ambient noise through external windows and doors, but will otherwise enjoy the acoustic protection provided by the solid structural elements of the proposed buildings; and

- The proposed residential units will be acoustically shielded by current and future road traffic noise from Park Avenue and other local roads, and from rail traffic noise from the nearby western rail corridor, by a combination of building bulk; distance and the acoustic attenuation provided by external building elements including solid form external walls, and associated glazed windows and doors.

6.5 BUILDING DESIGN CONSIDERATIONS & RECOMMENDATIONS

6.5.1 Basic Construction & Noise Intrusion

The external walls of the proposed building will comprise masonry or masonry clad material.

External masonry or masonry clad walls building elements provide very effective acoustic insulation and, noise intrusion will be mainly through lighter elements such as glazed doors and windows, and potentially through the roof structure. The solid masonry external wall sections, whether solid or clad, will provide an acoustic reduction, or attenuation of at least 40 dBA (refer Appendix A), based on the known acoustic characteristics of such materials.

This in turn means that the worst case rated external environmental noise levels of 56 dBA (daytime), 54 dBA (evening) and 50 dBA (night-time) as summarised in Table 6.1 will be reduced by these structural elements to levels well below the most stringent internal noise requirement, which is in the most demanding case 35 dBA in bedrooms at night, and more typically 40 dBA in bedrooms at any time. Quite clearly, any future increases in road traffic and other external noise will be very comfortably accommodated in terms of noise levels in the internal spaces of the proposed development by any reasonable masonry based external wall systems.

The remaining building elements that will influence indoor noise levels within the residential development are the external (glazed) window and doors.

6.5.2 Projected Acoustic Impact at the External Building Facades

The acoustic implications of the proposed development design and layout are summarised in 6.5.1 above.

These implications can be quantified, and the measured rated background sound levels adjusted as appropriate, to estimate the actual acoustic impact at the exterior of the proposed development.

This information can in turn be used to determine whether the external windows and doors can deliver the required internal noise levels, and what acoustic characteristics of the windows and doors will be required to achieve that outcome.

The various acoustic adjustments involved are summarised below.

- **Distance from Park Avenue and the Rail Corridor:** Road traffic on Park Avenue and rail traffic in the nearby western rail corridor are the principal identifiable noise sources in this case, and a reduction in rated background sound levels can be expected with increased distance from these noise sources. In this case, background sound levels have been measured at two locations directly relevant to the development itself, which in turn take account of noise reduction with distance from source.

- **Acoustic Shielding from Building Bulk:** Internal spaces, including bedrooms, will enjoy a varying degree of acoustic shielding from the bulk of the proposed buildings themselves. A conservative noise reduction of 0 - 10 dBA is estimated, based on experience with similar projects, and the data presented in Appendix A. The quantum of this attenuation due to building bulk will depend on the distance of the affected residential units from the front or Park Avenue site boundary, and the associated road and rail noise sources. Once again, to ensure a conservative assessment, a conservative approach to the acoustic attenuation involved has been adopted.

- **Reflected Traffic Noise:** The roof structure and upper floor ceilings of the three proposed buildings will provide a degree of acoustic shielding to the accommodation units within. A conservative noise reduction of 6 – 12 dBA is estimated, based on experience with similar projects. To ensure a conservative assessment, the lower range has been adopted.

- **Internal Attenuation:** No noise reduction due to internal attenuation has been allowed, as the sleeping rooms and other habitable spaces are typically bounded on at least one side by an external building wall.

6.5.3 Acoustic Attenuation Required from Glazed Elements

As indicated previously, relevant acoustic guidelines require that a maximum sound level of 40 dBA is achievable in all habitable rooms within the proposed residential development at all times, and a maximum sound level of 35 dBA (the most stringent possible requirement) or 40 dBA (more typically) is achievable in all bedrooms within the proposed residential development during designated night-time hours, that is between 10:00pm and 7:00am (refer Section 4).

Achieving the relevant indoor noise levels, as previously summarised, will require appropriate levels of sound attenuation from the external windows and doors of the building.

This attenuation will rely on the use of building materials and in particular glazing materials with the acoustic properties needed to reduce or attenuate the external noise levels impacting on the building to the required extent.

The acoustic attenuation characteristics of typical glazing options are summarised in Table 6.2, on the following page.

Table 6.2 – Typical Noise Reduction from Various Glazing Options

Glazing Option	Typical Rw Rating
Single	
3mm float glass	25
5mm float glass	26 - 27
6mm float glass	27 - 29
10 mm float glass	33 - 35
6.38 mm laminated glass	30 - 33
10.38 mm laminated glass	34 - 36
Double	
Double glazed mm – 12 mm gap – mm	30 - 35
Double glazed 6.38 mm lam – 8 mm gap – mm	35 - 40
Double window set up with 100 mm air gap	40 - 45

Sources: Pilkington's; Technical Specifications
Australian Building Codes Board (2007), *Building Codes of Australia Volume 1 and 2*, AGPS Canberra

6.5.4 Recommended Glazing Requirements

The external structural walls of the proposed building will provide more than adequate acoustic attenuation to achieve the sound levels required in the various internal building spaces, as previously indicated.

The acoustic "vulnerability" of the building is provided by the various external windows and doors, where attenuation characteristics are quite naturally lower than those that apply to the solid external walls.

Based on the analysis presented above, and to ensure that required sound internal sound levels are always achieved under all circumstances and , it is recommended that glass with acoustic qualities as a minimum equivalent to 6.38mm laminated glass is fitted to all external windows and doors on the southern or Park Avenue facades of the three proposed boarding house buildings, and that glass with minimum acoustic qualities equivalent to 6 mm float glass is used in external glazed elements on all other building facades.

The use of appropriately specified aluminium framed glazed doors, aluminium framed windows and aluminium sliding doors can provide the reduction in sound levels required.

To achieve this outcome, window frames will need to be sealed into the façade opening using a polyurethane sealant such as "Bostik Fireban One", or equivalent. The use of appropriate acoustic seals (Schlegel Q-Lon or equivalent) is essential to achieve the acoustic performance and attenuation in sound levels required.

6.5.5 Mechanical Ventilation or Air Conditioning

If windows are required to be closed to meet the internal noise criteria, consideration would need to be given to achieving compliance with the natural ventilation provisions of Australian Standard 1668.2 *The use of ventilation and air-conditioning in buildings- Ventilation design for indoor air contaminant control*, and any associated Penrith City Council requirements.

In this case, however, the relatively low measured external sound levels (refer Tables 5.1 to 5.4) indicate that these circumstances will not apply in this case.

In general, in occupancies/spaces where the use of acoustic seals is required, mechanical ventilation or air conditioning will also be involved.

Any mechanical ventilation or air conditioning system should be designed such that any penetrations from ductwork and/or pipework will not reduce the acoustic performance of external building constructions.

6.5.6 Roof or Ceiling Insulation

The recommendations set out in 6.5.4 above relate to the glazing detail required to achieve the attenuation or reduction in noise from external sources, including local road traffic, considered necessary to achieve the sound levels required in the various habitable rooms within the proposed development.

In this case, it has been assumed that roof structures associated with the three proposed buildings appear to be solid form concrete, with suspended internal ceiling below.

In these circumstances, the solid form masonry/concrete roof structure will provide all the acoustic protection required from any reflected external noise sources, and additional acoustic insulation is not required.

If framed roof structures clad with tiles or metal are used, then the type of insultation typically specified for energy management reasons will also provide the relatively low degree of acoustic insultation required.

6.5.7 Internal Acoustics for Residential Spaces

The following considerations are included for reference in relation to internal design and acoustic aspects of the various residential spaces within the proposed development:

WALLS

- All inter-tenancy walls and corridor walls to be constructed to full height to underside of floor slab and/or roof.
- Inter-tenancy wall construction to be two rows of 4mG metal studs with a minimum 20cm gap, 2 layers of 75 mm thick 11-14kg/m^3 glass wool insulation (or acoustic equivalent), within the cavity, and one layer of 13 mm thick fire rated plasterboard on the one side and 2 layers of 13 mm thick fire rated plasterboard on the other side.
- Corridor wall construction to be staggered 4mG metal studs on a 92 mm track with 1 layer of 16 mm thick fire rated plasterboard fixed to each side of the track and 110 mm thick 11- 14kg/m^3 glass wool insulation (or similar) within the cavity. Internal wall construction around bathrooms to be 13 mm fire rated plasterboard on either side of a 4mG stud.
- Lift shaft wall construction (if applicable) to be a single leaf of 150 mm thick reinforced concrete and a layer of 13 mm thick fire rated plasterboard on a 4mG metal stud with minimum 20cm air gap between studwork and concrete and 75 mm thick 11-14kg/m3 glass wool insulation (or similar) within cavity.

FLOORS

- Floor slab construction to be of minimum 200 mm reinforced concrete with density greater than 2500kg/m^3 with suspended plasterboard ceiling below, to achieve an Rw+Ctr in excess of 50.
- The use of resilient hung ceilings is recommended where hard floor finishes are proposed above the slab.
- For carpet floor coverings within all living spaces and bedrooms, the use of standard carpet underlay is expected to meet floor impact isolation requirements.
- Hard floor coverings are proposed for wet areas such as kitchens, bathrooms, and laundries. It is recommended that tiles are laid on top of 10 mm thick “Embelton ImpactaMat” acoustic underlay (or equivalent) to help ensure that floor impact isolation requirements are satisfied.

DOORS

- Entry doors to the apartments shall be a 38-40 mm solid core fire rated door with full perimeter acoustic seals, achieving Rw 30 and above. Acoustic seals shall be equivalent to “Raven PM10” for the sides and the top and equivalent to “Raven R38” drop seal at the bottom.

6.5.8 Sound Insulation Rating of Services

Ceilings over wet areas containing hydraulic piping to be constructed from a layer of 13 mmm thick plasterboard with ceiling cavity filled with 75 mm thick 11-14kg/m^3 glass wool insulation.

All penetrations in the ceilings to be acoustically sealed, including any recessed light fittings in the ceiling.

Hydraulic piping contained in ceilings above dry areas to be lagged with “Soundlag 4525C” (or equivalent).

Ceilings to be constructed from a layer of 13 mm thick plasterboard with a 75 mm thick 11-4G/m^3 glass wool insulation blanket for 500 mm either side of pipe work.

Riser construction within habitable areas to be constructed from 2 layers of 13 mm thick fire rated plasterboard on inner layer of a 4mG metal stud and 1 layer of 13 mm thick fire rated plasterboard on outer layer, with 75 mm thick 11-14kg/m^3 glass wool insulation within riser and wall cavities, with all plasterboard joints to be sealed, and the system to be appropriately reviewed to ensure compliance with fire rating requirements.

Riser construction within wet areas to be constructed from a layer of 13 mm thick fire rated plasterboard with 75 mm thick 11-14kg/m^3 glass wool insulation within riser cavity. All plasterboard joints to be sealed and the system reviewed to ensure compliance with fire rating requirements.

6.5.9 Sound Isolation of Pumps

Any point of connection between the service pipes in a building and any pumps (circulation or other) will require a flexible coupling at the point of connection.

6.6 ACOUSTIC IMPACTS OF THE PROPOSED DEVELOPMENT

The proposed development will involve a range of activities that involve the generation of noise, and that therefore have the potential to impact on nearby individuals and activities.

6.6.1 Human Activity

Human activity within the development will result in noise generation, but within normal and reasonable boundaries the magnitude of the resulting sound levels is not considered likely to have a significant impact on neighbouring receivers.

Noise generated by individual residents of the proposed development will be subject to existing regulatory limits and constraints, and any individual issues will be controlled through these mechanisms, as is the case in the community generally.

In a general sense, it is our professional opinion that noise generated by human activity within the proposed development will be secondary in acoustic impact to the dominant noise source, which is road and rail traffic.

6.6.2 Traffic Noise Generation with Development

A driveway from Park Avenue, and associated parking spaces for each of the three boarding house buildings, is proposed, as shown in the ground floor plan provided in Figure 3.1.

This driveway is proposed for the eastern boundary of the property, adjacent to an existing residential property. The proposed development will involve a total of eight car parking spaces.

The anticipated increase in vehicle movements from the subject site is not forecast to be of acoustic concern in comparison with the effect of existing and projected road traffic noise at neighbouring receivers, including residential receivers.

Noise from traffic movements on the proposed driveway and associated car parking spaces will be contained by a proposed 1800 mm acoustic fence along the eastern property boundary.

6.6.3 Mechanical Plant

Mechanical plant associated with the proposed development can have the potential to impact on neighbouring properties.

At this stage of the project, the selection of the type and location of mechanical plant associated with the proposed development has not yet been finalised. At the detailed design stage of the project the selected plant noise levels will be assessed with respect to established noise criteria.

Should any exceedances of established noise criteria be indicated, it is envisaged that standard noise control measures will be adopted to ensure that the acoustic amenity of nearby residences is maintained. Indicative engineering treatment methods that can be adopted in such circumstances include:

- Appropriate and judicious positioning of plant and equipment behind built elements to provide acoustic shielding;
- The use of acoustic screens/enclosures if required;
- The use of silencers; and
- The use of acoustically lined ductwork.

The following summary of strategies for the management of noise emissions from typical mechanical plant items associated with residential buildings of the type proposed is provided as a general guideline, based on previous professional experience.

> **Kitchen supply and exhaust fans:** These fans will be located in bulkheads ducted horizontally to the façade and will incorporate typical acoustic treatment including duct lining to the intake and discharge, use of silencers and/or acoustic louvres.
>
> **Toilet exhaust fans:** These fans will also be located in bulkhead ducted horizontally to the façade and will incorporate typical acoustic treatment including duct lining to the intake and discharge, use of silencers and/or acoustic louvres.

Accordingly, it our conclusion that with appropriate acoustic treatment, if required, items of mechanical plant as detailed above can be designed to comply with relevant mechanical plant noise objectives.

It is noted that the control and management of noise associated with mechanical plant will be required to consider potential impacts on both potential receivers external to the proposed development, and on the of the residential spaces within the proposed development itself.

6.6.4 Communal Areas

The plans of the development provide for shared communal areas. Prospective noise generated by “normal and reasonable” human activity in those spaces is considered very unlikely to impact on nearby receivers, firstly because existing external noise levels are considered likley to be the dominant acoustic influence; secondly because of the effect of the attenuation or reduction of noise with the distance from the proposed communal areas to property boundaries, and thirdly because of the acoustic attenuation that will be provided by building bulk.

However, to ensure that noise generated within any of these communal areas does not unduly impact on neighbouring balconies and other residential units within the proposed development, it is recommended that guidelines for appropriate behaviour in communal areas including the requirement for effective noise management and a 10:00 pm access limit as required by the PDCP 2014 (refer Section 4) is included in the Management Plan for the facility.

6.6.5 Facility Management Plan

It is anticipated that an overall Management Plan will be established and implemented for the proposed boarding house development, and that this Plan will provide guidelines that will in turn inform resident behaviour.

It is recommended that this Plan include appropriate reference to the need for appropriate noise management and control as part of a “good neighbour” policy, including the reference to behaviour in communal areas mentioned in 6.6.4 above.

6.6.6 Impacts at Nearby Residential Receivers

The proposed development adjoins existing residential properties along its eastern and northern boundaries.

The location of the development in relation to neighbouring residential properties is shown in Figure 6.1, below.

Figure 6.1 – Nearby Residential Receivers

Properties 1 and 2 are situated on the northern or rear side of the proposed development, and properties 3 and 4 on the eastern side, as indicated.

It is required that any noise generated by activities within the proposed development will not result in an increase of greater than 5dBA in the existing background LA90 measure (the existing background in the absence of road and rail traffic noise). In our professional opinion, the measures described in detail above that are required to ensure that indoor noise levels no greater than 35 dBA in bedroom at night, and no greater than 40 dBA in other habitable rooms at any time, will also provide an acoustic environment that will ensure that no adverse noise emissions are imposed on neighbouring residential properties. Noise generated within the various residential units will be contained by the external wall and window systems detailed above.

Noise generated by activities in any communal areas will be subject to the controls indicated in 6.6.4 and 6.6.5 above.

6.6.8 Impacts at Industrial and Commercial Boundaries

The NSW Industrial Noise Policy requires that new developments do not have an acoustic impact greater than 65 dBA at any affected industrial and commercial properties.

In this case, no commercial receivers are present in the immediate vicinity of the proposed development.

6.7 CONSTRUCTION NOISE

This assessment deals with the acoustic impacts that will apply to the proposed residential development in an ongoing sense.

It deals with the sound levels that are required to be achieved in the bedrooms and other habitable rooms within the development; indicates what measures are required to ensure that these sound levels can be achieved and confirms that these required sound levels can be achieved.

The assessment also considers the noise or acoustic impacts that the development will have on neighboring receivers and confirms that these impacts will comply with relevant acoustic guidelines.

The proposed development, if approved, will also involve a construction phase, which will be required to comply with appropriate noise control guidelines.

While construction noise falls outside the strict scope of this assessment, appropriate noise management plans and controls, in accordance with relevant local government and other guidelines, will need to be developed and applied, and this requirement can be expected to be a condition of the approval of the prospective Development Application.

6.8 STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007

State Environment Planning Policy (Infrastructure) 2007, the so called “Infrastructure SEPP” requires, in the case of a residential development adjacent to a road accommodating average daily traffic volumes of 40,000 or more, that sound levels no greater than 35 dBA will be achieved in all bedrooms during the 10:00pm to 7:00am night-time period, and sound levels no greater than 40 dBA will be achieved in all other habitable rooms within the development, at all times.

This requirement does not apply in this case, as Park Avenue does not carry this level of traffic.

However, as the site is located in relatively close proximity to a major rail corridor, internal sound levels consistent with the requirements of the Infrastructure SEPP have been adopted for this assessment.

6.9 EXTERNAL FENCING & LANDSCAPING

External fencing is proposed for the development as indicated by the red and blue lines in in Figure 6.2, on the following page.

Based on the overall findings of this assessment, no undue or non-compliant noise impacts are anticipated at any adjoining residential property boundaries.

However, to assist in providing additional surety in this regard, it is recommended that solid form boundary fencing with a minimum Rw rating of 20 is installed on the perimeter boundaries marked in red, to provide acoustic protection to neighbouring residential properties to the north and east.

1800 mm solid form metal panel fencing will deliver the acoustic outcome required.

No specific acoustic performance is required from fencing along the western property boundary (marked in blue), which adjoins recreational land, however a continuation of the style of 1800 mm fencing recommended for the northern and eastern property boundaries may be considered.

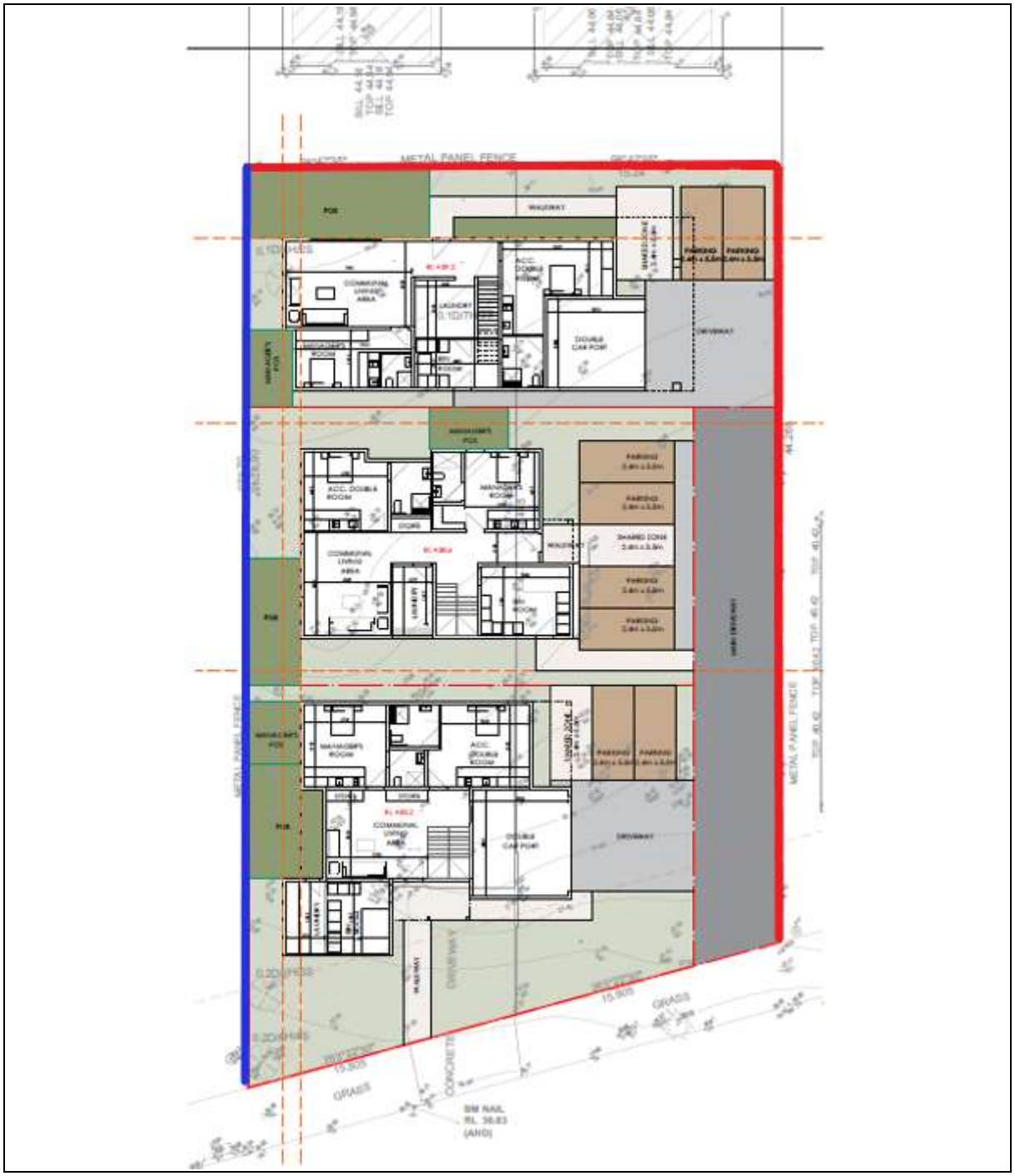

Figure 6.2 – Proposed Boundary Fencing

6.10 KEY FINDING

The key finding of this acoustic assessment is that, subject to the implementation of the various recommendations included in this report, including recommendations regarding external window and door systems, sound levels within the various residential spaces associated with the proposed development will comply with the strictest relevant acoustic guidelines and requirements, in that sound levels no greater than 35 dBA will be achieved in all bedrooms during the 10:00pm to 7:00am night-time period; sound levels no greater than 40 dBA will be achieved in all other habitable rooms within the development, at all times, and no undue or non-compliant acoustic impacts will be imposed on any neighbouring residential properties.

7 FINDINGS & RECOMMENDATIONS

This report presents an acoustic assessment of a proposed boarding house development at 30-31 Park Avenue Kingswood NSW. The assessment has been undertaken in accordance with relevant acoustic assessment protocols, standards and guidelines.

7.1 KEY FINDINGS

In relation to acoustic matters, it is our professional opinion, based on a consideration of the various plans and drawings describing the project; subject to the adoption and implementation of the various recommendations presented in this report, and summarised below, that:

- In relation to acoustic matters, it is our professional opinion, based on a consideration of the various plans and drawings describing the project; subject to the adoption and implementation of the various recommendations presented in this report, and summarised below, that indoor sound levels associated with the proposed development will comply with the most stringent applicable internal noise guidelines, namely that background sound levels no greater than 35 dBA will be achievable in all bedrooms during the 10:00pm to 7:00am night-time period, and background sound levels no greater than 40 dBA will be achievable in all other habitable rooms within the development, at all times; and

- The development as proposed, once again subject to the adoption and implementation of the various recommendations presented in this report and summarised below, will have no inappropriate or non-compliant acoustic impact on any potentially affected receivers, including in particular nearby residential receivers.

7.2 RECOMMENDATIONS

The following recommendations, which are identified in the text of this report, are made to ensure the compliance of internal acoustics with the relevant guidelines and requirements:

1. **External Glazing - Windows:** Glass with a minimum acoustic rating equivalent to 6.38mm laminated glass is used in all external window and door systems on the southern or Park Avenue building facades. All other external glazing to involve glass with a minimum acoustic rating equivalent to 6 mm float glass.

2. **External Glazing – Acoustic Sealing:** External window and door frames should be sealed into façade openings using a polyurethane sealant such as “Bostik Fireban One”, or equivalent, and acoustic seals (such as Schlegel Q-Lon or equivalent) should be used to provide additional acoustic protection.

3. **Internal Walls:** Internal walls, including inter tenancy walls, should be constructed and installed in accordance with the summary details included in this report, and in accordance with relevant BCA acoustic guidelines. Inter-tenancy walls are required by relevant BCA guidelines to have an Rw + Ctr rating of at least 50 Rw dBA, and structural materials offering an Rw + Ctr greater than 50 Rw are recommended.

4. **Floors:** Floor slab construction to be of minimum 200 mm reinforced concrete with density greater than 2200 kg/m^3 with suspended plasterboard ceiling below, to achieve an Rw+Ctr in excess of 50. The use of resilient hung ceilings is recommended where hard floor finishes are proposed above the slab. For carpet floor coverings within all living spaces and bedrooms, the use of standard carpet underlay is expected to meet floor impact isolation requirements. Hard floor coverings are proposed for wet areas such as kitchens, bathrooms, and laundries. It is recommended that any ceramic tiles included in the development are laid on top of 10 mm thick “Embelton ImpactaMat” acoustic underlay (or equivalent), in order to ensure that the required floor impact isolation requirements are achieved.

5. **Services:** Internal services should be fitted with acoustic insulation as detailed in this report, and in accordance with relevant BCA requirements.

6. **BCA Requirements:** Standard BCA and other internal acoustic design and construction considerations, including but not limited to those summarised in Section 5.5.7 and Appendix A of this report, are applied to all aspects of the construction of the various residential units within the proposed development;

7. **Plant & Equipment:** Any mechanical plant and equipment required for the development will be specified and/or designed and installed such that acoustic noise emissions are consistent with the internal acoustic environments required, and that any penetrations from ductwork and/or pipework will not reduce the acoustic performance of other building design features;

8. **Noise Emissions from Plant & Equipment:** Plant and equipment used in association with the development should be selected, sited and installed so that acoustic impacts do not exceed the measured background LA90 noise level by more than 5 dBA at any property boundary.

9. **Acoustic Certification:** Appropriate certification and validation of the acoustic performance of any plant and equipment associated with the proposed development is provided prior to construction, and prior to occupation, as reasonably required;

10. **Boundary Fencing & Landscaping:** Boundary fencing with an Rw rating of 20 (minimum), such as solid form metal panel fencing, is installed on the eastern and northern property boundaries, to ensure that any noise emissions from the proposed development will not exceed existing measured background LA90 sound levels by more than 5 dBA at any residential property boundary. No specific acoustic performance is required from the fencing along the western property boundary, but a continuation of the type of fencing used on other property boundaries may be considered;

11. **Noise Management Plan – Construction:** A noise management and control plan will need to be developed and applied to the construction phase of the proposed development, in accordance with established procedures and practices; and

12. **Facility Management Plan – Ongoing Operation:** The overall management plan for the facility should include specific reference to practical and achievable noise management controls, including guidelines regarding noise management and minimisation in any communal areas associated with the proposed development.

It should be noted that all materials or material types mentioned in this report have been suggested solely on the basis of acoustic performance.

Any other properties of these materials, including fire rating and chemical properties should be checked with the suppliers or other specialised bodies to ensure fitness for non-acoustic purposes.

It should also be noted that any specific material brands or types mentioned in this report have been mentioned as a guide to acoustic properties, and not as a recommendation, and that a range of products may be available that can deliver the acoustic performance required.

8 AUTHORISATION & LIMITATIONS

NG Child & Associates has based this report on the data, methods and sources described herein.

Subject to the limitations described within the report, it is the view of NG Child & Associates that this report presents an accurate and reliable assessment of the acoustic environment applicable at and in the immediate vicinity of the boarding house development proposed for 30-31 Park Avenue Kingswood NSW, as described in this document.

The information presented in this document has been prepared by NG Child & Associates exclusively for the use of Miletic-Mieler and its clients, and for submission to the local government consent authority or certifying authority at interest as required in relation to the proposed development.

This document should not be used for any purposes other than those of Miletic-Mieler and its clients in relation to the development described in this report.

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Principal, NG Child & Associates

2 November 2020

GLOSSARY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph overleaf, are here defined.

Maximum Noise Level (LAmax) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

LA1 – The LA1 level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the LA1 level for 99% of the time.

LA10 – The LA10 level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the LA10 level for 90% of the time. The LA10 is a common noise descriptor for environmental noise and road traffic noise.

LAeq – The equivalent continuous sound level (LAeq) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

LA50 – The LA50 level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the LA50 level for 50% of the time.

LA90 – The LA90 level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the LA90 level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening, and night-time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (LA90) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all the days measured. There is therefore an RBL value for each period – daytime, evening, and night-time.

APPENDIX A

Building Code of Australia (BCA)
Summary of Internal Acoustic Requirements

Building Code of Australia (BCA)
Summary of Internal Acoustic Requirements

The Building Code of Australia (BCA) nominates various ratings for airborne noise isolation and impact noise isolation. The ratings and abbreviations used are as follows:

Rw – Weighted sound reduction index. The Rw is a typical measure for the sound insulation performance for a wall or floor system in a laboratory. The Rw in the BCA is used for the selection of appropriate construction systems.

Rw+Ctr – Weighted sound reduction index with spectrum adaptation term. The Rw+Ctr is the weighted sound reduction index with a correction factor Ctr added that helps to quantify the low frequency performance. The Rw+Ctr in the BCA is used for the selection of appropriate construction systems.

DnT, w – Weighted standardised level difference. The DnT, w is a typical measure for the sound insulation performance for a wall or floor system in a laboratory. The DnT, w in the BCA is used for the determination of airborne noise in the field.

DnT, Rw+Ctr – Weighted standardised level difference with spectrum adaptation term. The DnT, Rw+Ctr is the weighted standardised level difference with a correction factor Ctr added that helps to quantify the low frequency performance. The DnT, Rw+Ctr in the BCA is used for the determination of airborne noise in the field.

Ln, win – Weighted normalised impact sound pressure level with spectrum adaptation term. The Ln, win is a typical measure of the impact/structure borne noise between two spaces in a laboratory. A reduction in the Ln, win corresponds to an improvement in impact isolation. The Ln, win in the BCA is used for the selection of appropriate impact isolation systems.

Lent, win – Weighted standardised impact sound pressure level with spectrum adaptation term. The Lent, win is a typical measure of the impact/structure borne noise between two spaces in the field. A reduction in the Lent, win corresponds to an improvement in impact isolation. The Lent, win in the BCA is used for the determination of impact noise in the field.

The ratings used for airborne noise isolation and impact noise isolation are here defined:

FSTC – Field sound transmission class. The FSTC is a typical measure for the sound insulation performance for a wall or floor system in a building.

IIC – Impact isolation class. The IIC is a typical measure of the impact/structure borne noise between two spaces in a laboratory.

BCA sound insulation ratings applicable to this project are listed in Tables A-1 and A-2 below.

Table A-1 Sound Insulation Ratings of Walls and Floors – Class 2 or 3

Situation	Lab	Field	Impact
Apartment wall separating different sole occupancies (Same room-type each side, e.g. habitable adjoin habitable)	50 RW +Ctr	45 DnT,w+Ctr	No
Apartment wall separating a habitable room (not a kitchen) from a bathroom, sanitary compartment, laundry, or kitchen in another sole occupancy	50 RW +Ctr	45 DnT,w+Ctr	Yes
Apartment wall separating a stairway, public corridor, public lobby, or the like; or part of a different classification	50 RW	45 DnT,w	No
Apartment wall separating a plant room or lift shaft	50 RW	45 DnT,w	Yes
Apartment door to a stairway, public corridor, public lobby, or the like	30 RW	25 DnT,w	NA
Apartment floor separating different sole occupancies or a plant room, lift shaft, stairway, public corridor, public lobby, or the like; or parts of a different classification	50 RW + Ctr	45 DnT,w+Ctr	-
	62 Ln,w+Cl	62 LnT,w+Cl	-

Table A-2 Sound Insulation Ratings of Walls Services: Class 1, 2, 3 & 9c

Situation	Lab	Field	Impact
Duct, soil, waste, or water supply pipe serving or passing through more than one sole occupancy to a habitable room (not a kitchen)	40 Rw+Ctr	NA	NA
Duct, soil, waste, or water supply pipe serving or passing through more than one sole occupancy to a kitchen or non-habitable room	25 Rw+Ctr	NA	NA
Storm water pipe passing through a sole occupancy to a habitable room (not a kitchen)	40 Rw+Ctr	NA	NA
Storm water pipe passing through a sole occupancy to a kitchen or non-habitable room	25 Rw+Ctr	NA	NA

Note: Part F5.6 of the BCA requires a flexible coupling to be used at the point of connection between the service pipes in a building and any pump (not applicable to Class 1 buildings).

The City of Sydney DCP sound insulation ratings applicable to this project are listed in Table A-3 below.

Table A-3 Sound Insulation Ratings of Walls and Floors

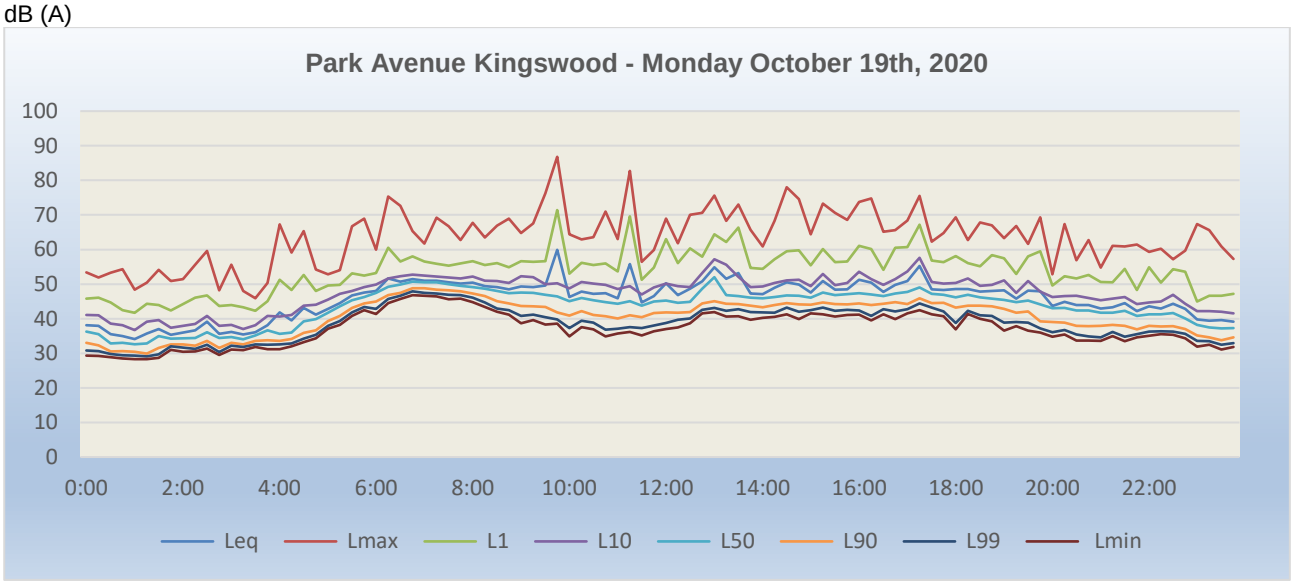
Situation	Lab	Field	Impact
Apartment wall separating different sole occupancies (Same room-type each side, e.g. habitable adjoin habitable)	NA	50 FSTC	No
Apartment wall separating a habitable room (not a kitchen) from a bathroom, sanitary compartment, laundry, or kitchen in another sole occupancy	NA	55 FSTC	Yes
Apartment wall separating a stairway, public corridor, public lobby, or the like; or part of a different classification	NA	50 FSTC	No
Apartment floor separating different sole occupancies (Same room-type each side, e.g. habitable adjoin habitable)	NA	50 IIC	
	NA	50 FSTC	
Apartment floor separating a habitable room (not a kitchen) from a bathroom, sanitary compartment, laundry, or kitchen in another sole occupancy	NA	55 FSTC	NA
Apartment floor separating different sole occupancies or a plant room, stairway, public corridor, hallway, or the like	NA	50 IIC	-

APPENDIX B

Background Noise Monitoring Data - Location A

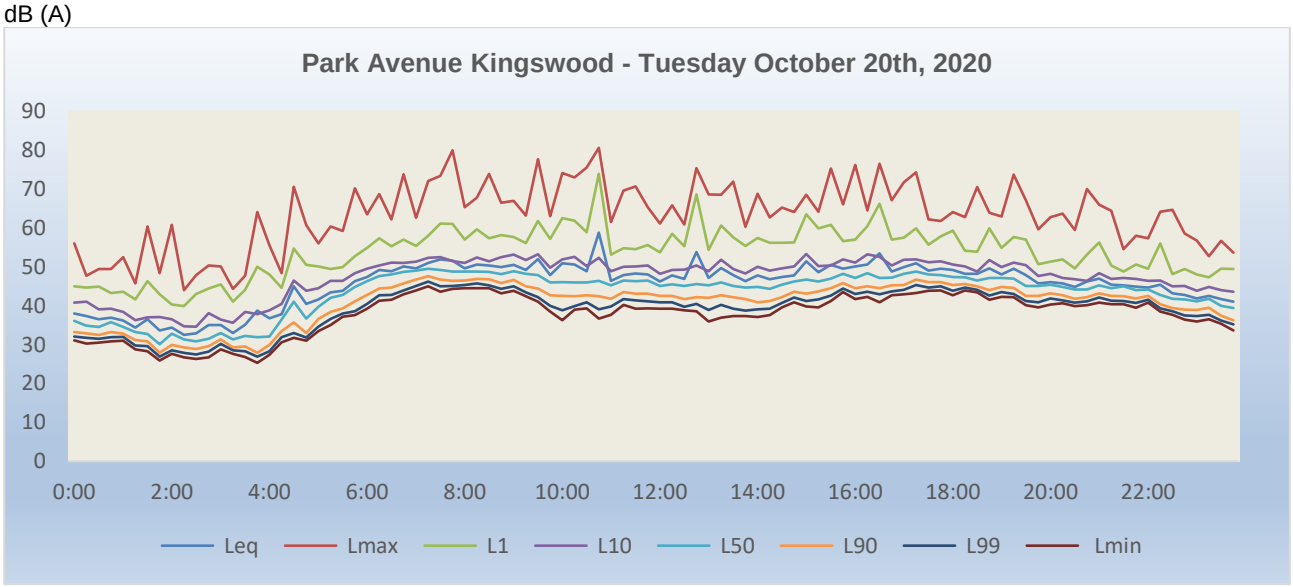
Monday October 19th, 2020

dB (A)



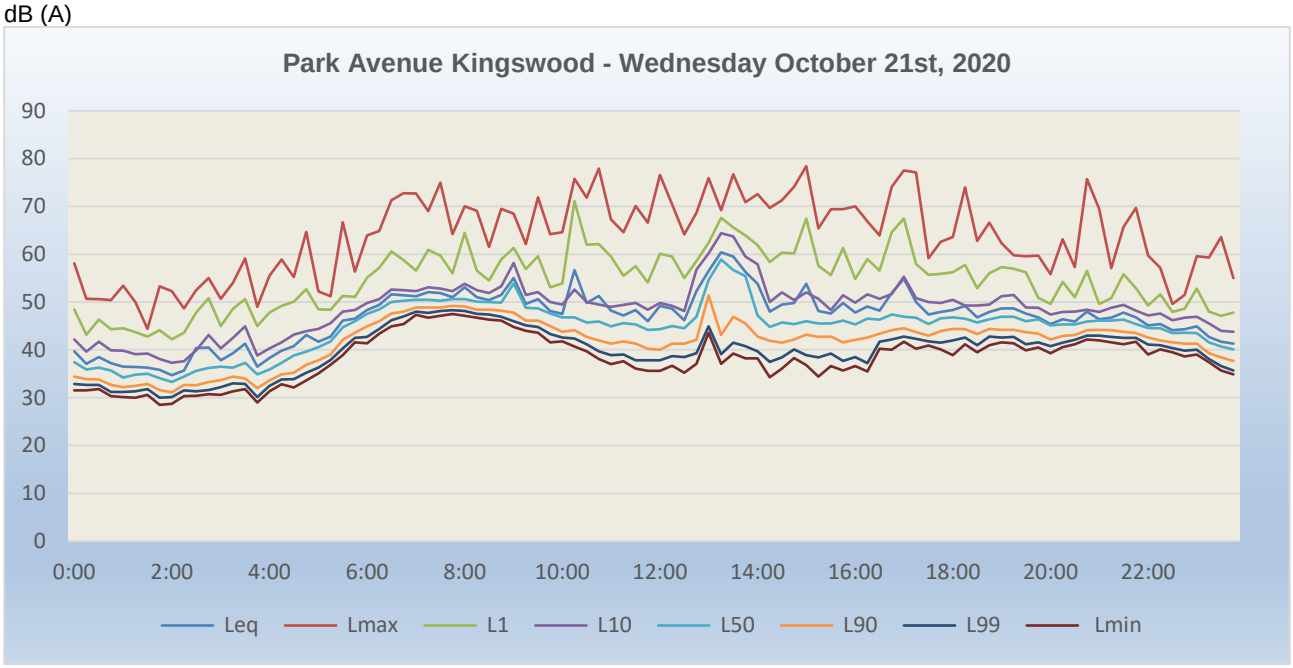
Tuesday October 20th, 2020

dB (A)



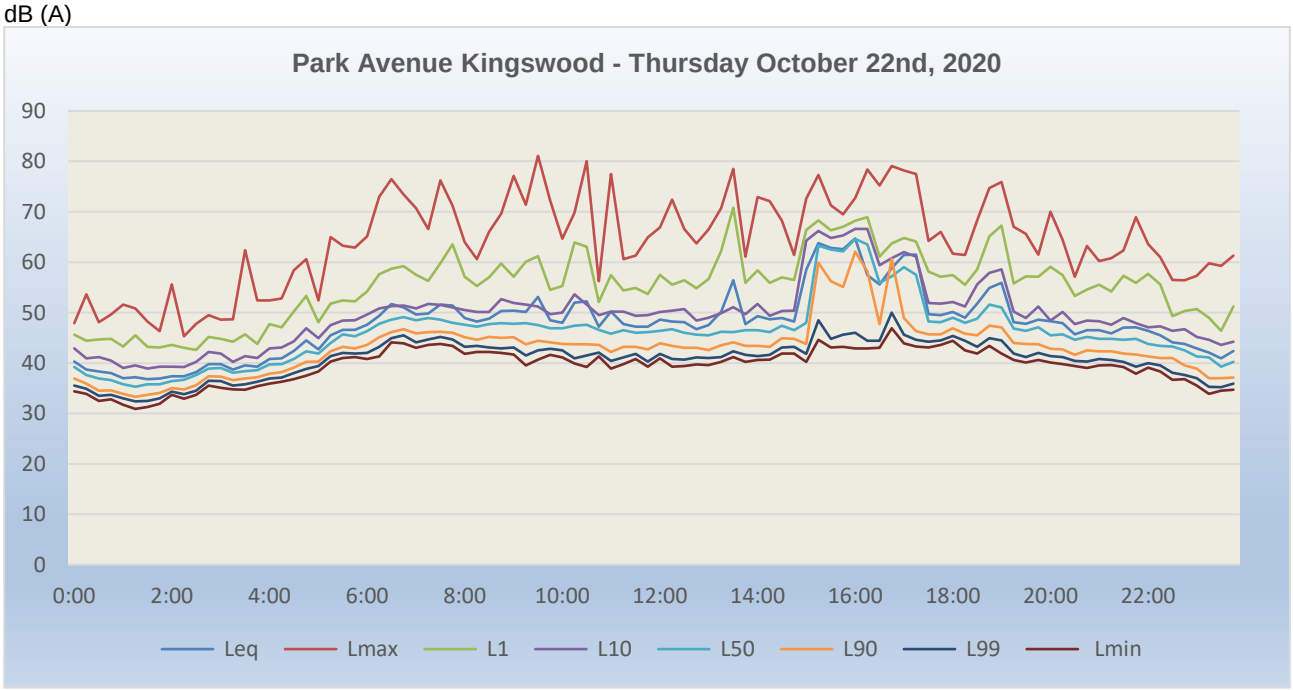
Wednesday October 21st, 2020

dB (A)



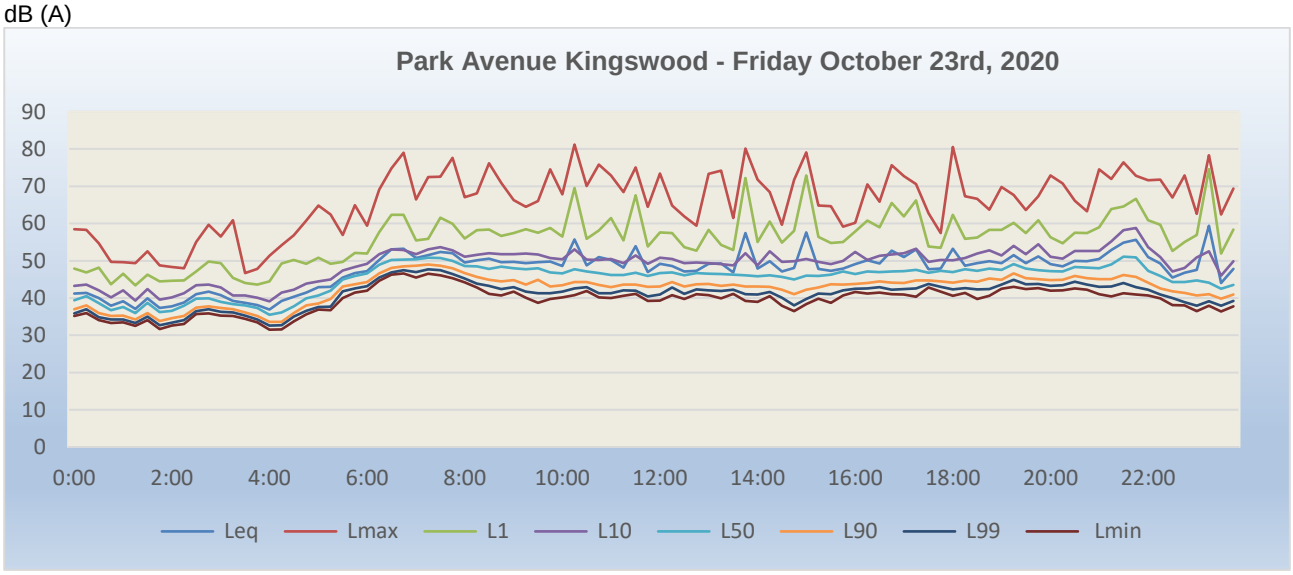
Thursday October 22nd, 2020

dB (A)



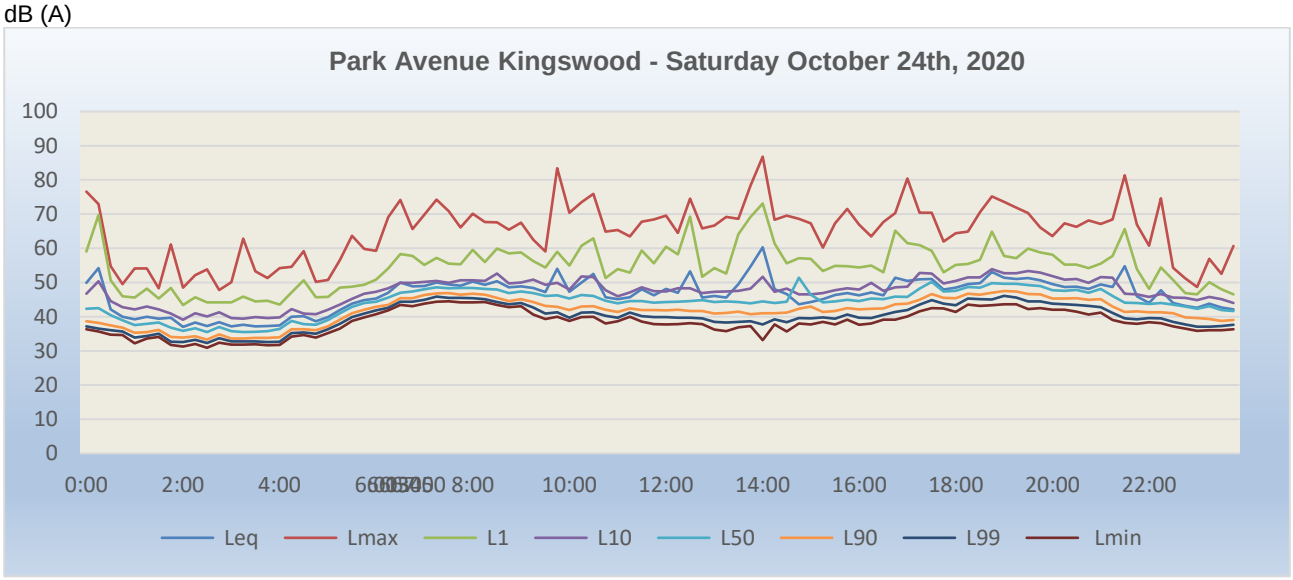
Friday October 23rd, 2020

dB (A)



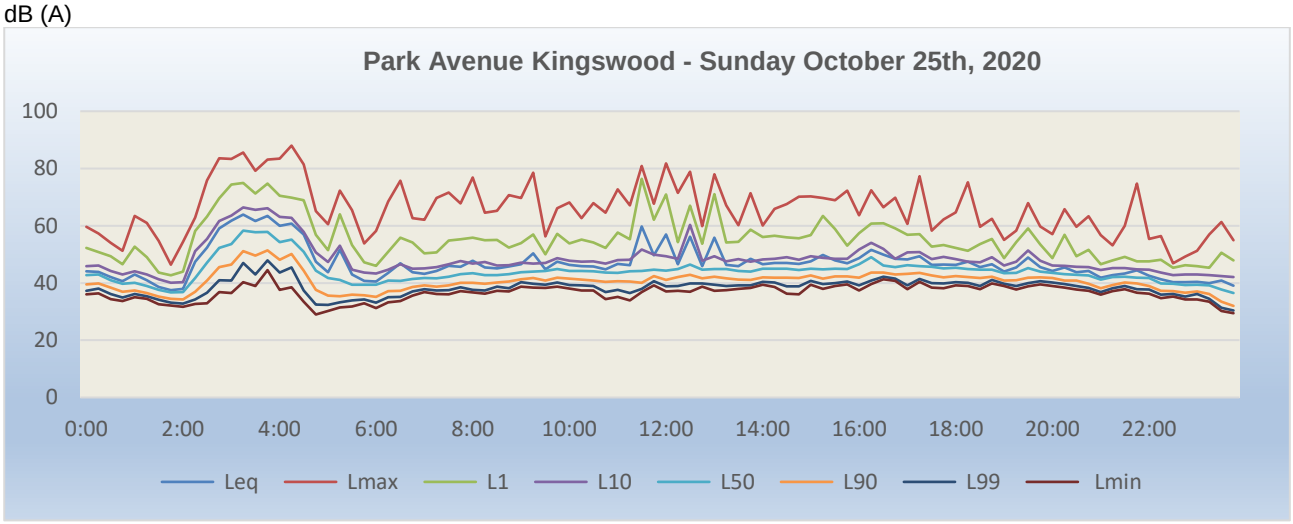
Saturday October 24th, 2020

dB (A)



Sunday October 25th, 2020

dB (A)



30-31 Park Avenue Kingswood NSW
Summary of Background Noise Monitoring Data – Location A

	Leq			Lmax			L1			L10		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Monday 19 October 2020	49.7604	45.7688	39.3875	68.3854	62.8625	56.4750	58.0625	54.0938	47.2031	51.1500	47.8438	41.5281
Tuesday 20 October 2020	49.5841	46.9750	40.0000	68.7386	63.9688	56.4583	58.5955	53.7125	47.8361	50.9614	48.6250	42.1500
Wednesday 21 October 2020	50.7875	47.3375	40.3844	69.6542	63.8938	54.6406	59.4500	54.0438	47.6000	52.3271	49.0625	42.7250
Thursday 22 October 2020	51.9795	48.8188	41.9750	70.1068	65.1875	56.5944	59.6705	57.5813	48.6167	53.6068	50.8125	43.9528
Friday 23 October 2020	50.0313	50.8813	42.4188	69.2646	69.7125	58.5156	58.5896	59.3438	50.0313	50.9563	53.0500	44.2656
Weekday Average	**50.4286**	**47.9563**	**40.8331**	**69.2299**	**65.1250**	**56.5368**	**58.8736**	**55.7550**	**48.2574**	**51.8003**	**49.8788**	**42.9243**
	Leq			Lmax			L1			L10		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Saturday 24 October 2020	48.5104	49.9500	41.3000	68.9708	69.1375	56.2406	57.6583	57.5688	48.1313	48.9708	51.1813	43.0250
Sunday 25 October 2020	47.5479	44.9813	47.1094	68.3396	62.0813	64.3125	56.6583	51.6063	55.5063	56.6583	51.6063	55.5063
Weekend Average	**48.0292**	**47.4656**	**44.2047**	**68.6552**	**65.6094**	**60.2766**	**57.1583**	**54.5875**	**51.8188**	**52.8146**	**51.3938**	**49.2656**

	L50			L90			L99			Lmin		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Monday 19 October 2020	47.2021	43.8750	37.3125	44.2042	40.2938	34.6906	42.1500	37.5688	33.4344	40.6063	36.1625	32.3688
Tuesday 20 October 2020	46.9250	45.6188	37.9278	44.0795	43.3875	35.2417	42.2136	42.1438	33.8194	40.7023	41.1063	32.6722
Wednesday 21 October 2020	48.0542	46.0688	38.5844	44.5063	43.7375	36.0969	42.0708	42.1625	34.7375	40.3917	40.8625	33.5500
Thursday 22 October 2020	49.8364	46.7938	40.6361	46.3864	43.8750	38.5028	43.0909	41.9813	37.2583	41.6386	40.6188	36.1694
Friday 23 October 2020	47.3146	48.2375	40.3156	44.4292	45.2000	37.9563	42.6854	43.3375	36.6469	41.2542	41.5875	35.5875
Weekday Average	**47.8664**	**46.1188**	**38.9553**	**44.7211**	**43.2988**	**36.4976**	**42.4422**	**41.4388**	**35.1793**	**40.9186**	**40.0675**	**34.0696**
	L50			L90			L99			Lmin		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Saturday 24 October 2020	45.9813	47.7750	39.4688	43.2604	45.3438	37.0375	41.4167	43.5000	35.6844	39.8104	41.6063	34.5531
Sunday 25 October 2020	48.3354	46.7375	49.5344	44.1667	43.4375	43.9031	41.0979	40.9250	39.5594	37.3875	38.1563	34.4375
Weekend Average	**47.1583**	**47.2563**	**44.5016**	**43.7135**	**44.3906**	**40.4703**	**41.2573**	**42.2125**	**37.6219**	**38.5990**	**39.8813**	**34.4953**

APPENDIX C

Unattended Background Sound Level Monitoring
Raw Data

Table B1 – Raw Noise Monitoring Data (19-25 October 2020)

Date	Time	Leq	Lmax	L1	L10	L50	L90	L99	Lmin
19/10/2020	0:00	49.9	76.6	59.1	46.7	42.3	38.7	37.2	36.3
		54.2	72.9	69.7	50.4	42.5	38.2	36.5	35.7
		42.1	54.8	50.6	44.6	40.4	37.4	36	34.7
		40	49.5	46	42.8	38.9	36.8	35.7	34.6
		39.2	54.1	45.6	42.1	37.5	35.3	33.9	32.2
		40	54.1	48.2	43	37.9	35.5	34.4	33.6
		39.4	48.3	45.3	42.1	38.3	36.1	35	34.1
		39.7	61.1	48.4	40.9	36.8	34.1	32.7	31.7
	2:00	37	48.5	43.4	39.1	35.9	33.9	32.6	31.3
		38.3	52.1	45.7	41	36.6	34.3	33.2	32
		37.3	53.8	44.2	40.1	35.5	33.3	32.3	30.9
		38.4	47.8	44.2	41.3	37	34.8	33.7	32.4
		37.2	50.1	44.2	39.6	35.8	33.6	32.8	31.8
		37.6	62.8	45.9	39.4	35.5	33.6	32.8	31.8
		37.2	53.3	44.5	39.9	35.6	33.8	32.8	31.9
		37.3	51.3	44.7	39.6	35.8	33.8	32.6	31.6
	4:00	37.4	54.2	43.5	39.8	36.4	34	32.7	31.7
		40	54.6	47.1	42.2	38.8	36.3	35.2	34.2
		40.2	59.2	50.6	40.9	37.8	36.3	35.4	34.6
		38.7	50.2	45.7	40.7	37.6	36	35	33.9
		39.9	50.7	45.8	42	39	37.2	36.3	35.2
		41.9	56.5	48.5	43.5	41	39.1	37.9	36.5
		43.8	63.7	48.8	45.2	42.9	41	39.9	38.8
		44.8	59.8	49.3	46.7	44	42	40.9	39.8
	6:00	45.3	59.3	50.8	47.3	44.4	42.9	41.8	40.7
		47	69.1	54.1	48.3	45.6	43.4	42.6	41.8
		50	74.1	58.3	49.9	47	45.4	44.4	43.4
		48.9	65.6	57.8	49.9	47.4	45.4	44.4	43.1
		49	69.8	55.1	50.2	48	46.3	44.9	43.8
		50	74.2	57.2	50.5	48.6	46.8	45.9	44.4
		49.4	70.9	55.5	49.9	48.3	46.9	45.5	44.5
		49.1	66.1	55.3	50.6	48.4	46.4	45.5	44.2
	8:00	50.3	70.1	59.5	50.6	48.4	46.7	45.4	44.2
		49.3	67.7	56	50.5	48.1	46.4	45.1	44.3
		50.4	67.6	59.9	52.6	47.9	45.5	44.3	43.4
		48.6	65.4	58.5	49.7	46.9	44.6	43.6	42.8
		48.9	67.5	58.8	50	47.4	45.1	44	43.1
		48.4	62.5	56.3	50.8	46.9	44.3	42.7	40.6
		47.2	59.1	54.4	49.3	46.1	43.2	40.9	39.3
		54	83.4	59	49.9	46.2	42.9	41.3	40
	10:00	47.3	70.4	55	47.9	45.3	41.9	39.7	38.8
		50	73.5	60.8	51.8	46.3	43	41.2	39.9
		52.5	75.9	62.9	51.6	46.1	43.1	41.3	40
		45.7	64.9	51.3	47.7	44.7	42	40.3	38
		45.1	65.3	53.9	46	43.9	41.4	39.7	38.7
		45.7	63.5	52.9	47.1	44.6	42.4	41.2	40
		48	67.8	59.4	48.6	44.6	41.9	40.2	38.6
		46.2	68.4	55.6	47.5	44.1	41.9	39.9	37.8
	12:00	48.1	69.6	60.5	47.4	44.3	41.8	39.9	37.7
		47	64.5	58.2	48.3	44.4	42	39.7	37.8
		53.3	74.5	69.3	48.3	44.6	41.7	39.7	38.1
		45.6	65.8	51.7	46.9	44.8	41.7	39.5	37.8
		46.1	66.7	54.2	47.3	44.3	40.9	38.5	36.2

		45.6	69.2	52.6	47.4	44.5	41.1	38.3	35.8
		49.5	68.6	64.1	47.6	44.3	41.5	38.5	36.9
		54.7	78.4	69.2	48.2	43.9	40.7	38.7	37.3
	14:00	60.3	86.8	73.1	51.7	44.5	41	37.7	33.1
		48	68.3	61.4	47.3	44	41	39.2	37.7
		46.6	69.6	55.6	48.2	44.4	41.2	38.4	35.7
		43.6	68.6	57.1	46.5	51.4	42.3	39.6	38
		44.3	67.3	56.9	46.5	46.4	43	39.5	37.7
		45.1	60.2	53.4	46.9	44.2	41.4	39.8	38.5
		46.3	67.3	54.9	47.7	44.5	41.7	39.4	37.7
		46.9	71.5	54.8	48.3	44.9	42.5	40.6	39.1
	16:00	46.2	66.9	54.4	47.9	44.6	42.1	39.7	37.6
		47.1	63.5	55	49.9	45.3	42.3	39.6	38
		46.2	67.7	53	47.6	45.1	42.4	40.5	39.1
		51.4	70.3	65.2	48.6	45.9	43.6	41.4	39.1
		50.5	80.4	61.5	48.8	45.8	43.8	41.9	40.1
		50.9	70.4	60.9	52.8	48.2	44.9	43.5	41.6
		51	70.4	59.3	52.6	50.2	46.6	44.8	42.5
		47.9	62	53	49.7	47.4	45.5	43.8	42.4
	18:00	48.5	64.4	55.1	50.5	47.6	45.4	43.3	41.4
		49.5	64.9	55.4	51.5	48.7	46.7	45.3	43.5
		49.8	70.6	56.6	51.5	48.5	46.4	45.1	43.2
		53.1	75.2	64.9	53.9	49.8	47	45	43.3
		51.4	73.6	57.8	52.7	49.6	47.5	46.1	43.6
		51	71.9	57.1	52.7	49.6	47.4	45.6	43.6
		51.3	70.3	59.9	53.4	49.2	46.6	44.5	42.2
		50.6	66.1	58.8	52.9	49	46.5	44.5	42.5
	20:00	49.5	63.6	58.1	51.9	47.7	45.3	43.8	42
		48.7	67.3	55.2	50.8	47.6	45.3	43.6	42
		48.8	66.3	55.2	51	47.8	45.4	43.4	41.5
		48.1	68.2	54.2	49.9	47	44.9	43.2	40.6
		49.4	67.1	55.5	51.6	48.1	45.1	42.8	41.2
		48.7	68.4	57.8	51.4	46.1	43	41.1	39
		54.8	81.4	65.6	46.7	44.1	41.4	39.5	38.2
		46	66.9	53.9	46.5	44	41.6	39.2	37.9
	22:00	44	60.8	48.1	45.8	43.7	41.3	39.6	38.4
		47.7	74.6	54.4	46.6	44	41.3	39.5	38.1
		44	54.3	50.7	45.6	43.5	41	38.5	37.2
		43.2	51.2	46.9	45.5	43	39.8	37.7	36.5
		42.6	48.7	46.5	44.8	42.3	39.6	37.1	35.9
		43.8	56.9	50.1	45.8	43.1	39.3	37.1	36
		42.7	52.5	48	45.1	41.9	38.8	37.3	36
		42.1	60.7	46.5	44	41.7	39	37.6	36.3
20/10/2020	0:00	44.1	59.6	52.3	45.9	42.7	39.5	37.3	36
		43.9	57.3	50.8	46.1	43	39.9	38	36.4
		42.1	54	49.3	44.2	41	38.4	36.1	34.4
		40.6	51.3	46.6	43	39.7	36.9	34.9	33.7
		43	63.4	52.7	44.1	40.1	37.4	36.1	35
		41	61	49	43	39	36.5	35.4	34.5
		38.6	54.7	43.6	41.3	37.6	35.3	34.1	32.6
		37.5	46.4	42.7	40.1	36.7	34.5	33.1	32.1
	2:00	37.9	54.4	44	40.3	36.8	34.2	32.8	31.7
		47.4	62.9	58.2	51.1	41.8	36.9	34.3	32.7
		52.4	75.8	63.2	55.4	47.1	40.9	36.6	32.9
		59.1	83.6	69.6	61.7	52.2	45.6	41	36.8
		61.8	83.3	74.4	63.5	53.6	46.4	40.9	36.5

		63.9	85.6	74.9	66.4	58.3	51.1	47	40.3
		61.7	79.2	71.3	65.6	57.7	49.6	43	38.9
		63.4	83.1	74.7	66.1	57.8	51.4	47.9	44.5
	4:00	60	83.5	70.5	63.1	54.3	48.1	43.7	37.6
		60.7	88	69.8	62.8	55.2	50.1	45.4	38.5
		57	81.4	68.9	57.9	50.9	44.3	37.4	33.5
		47.5	65.1	56.8	50.7	44.3	37.6	32.5	29
		43.8	60.5	51.5	47.3	41.7	35.6	32.3	30.2
		51.6	72.3	64	53	41.1	35.4	33.3	31.5
		43	65.5	53.3	44.6	39.4	35.9	33.9	31.8
		40.7	53.8	47.2	43.7	39.4	35.7	34.3	32.9
	6:00	40.5	58.2	46	43.3	39.4	35.1	33.1	31.2
		43.5	68.5	50.9	44.6	40.9	37.2	35	33.2
		46.9	75.7	55.8	46.6	40.7	37.3	35.1	33.7
		43.8	62.6	54.2	45	41.4	38.6	37	35.6
		43.2	62.1	50.4	45.1	41.8	39.2	37.8	36.8
		44.2	69.7	50.7	45.5	41.6	38.7	37.4	36.2
		46	71.6	54.8	46.5	42.2	39.2	37.5	36
		45.7	67.8	55.3	47.7	43.1	40.1	38.5	37.2
	8:00	47.8	76.8	55.8	46.8	43.4	40.1	37.6	36.7
		45.4	64.5	54.9	47.3	42.8	39.7	37.4	36.3
		45.1	65.2	55.1	46.1	42.7	40.2	38.7	37.3
		45.8	70.7	52.4	46.2	43.1	40.5	38.2	37.1
		46.5	69.7	53.9	47.1	43.8	41.3	40.3	38.7
		50.3	78.5	57	46.8	44	41.7	39.7	38.4
		44.8	56.3	50	47	44.2	40.8	39.4	38.3
		47.4	66.1	57.2	48.7	44.9	41.9	40.2	38.7
	10:00	46.3	68.1	53.8	47.8	44.2	41.5	39.3	38.1
		45.9	62.7	55.2	47.5	44.2	41.2	39.2	37.4
		45.8	67.9	54.2	47.6	44.1	40.9	39	37.4
		44.8	64.6	52.3	46.8	43.6	40.4	36.8	34.4
		46.7	72.7	57.6	48	43.5	40.6	37.6	35.2
		46.2	67.1	55.3	48.1	44.1	40.5	36.5	33.9
		59.8	80.9	76.4	51.7	44.2	40.1	37.9	36.8
		49.7	67.7	62.1	49.9	44.6	42.4	40.6	39.2
	12:00	56.9	81.8	70.9	49.4	44.3	41.1	38.8	37
		46.5	71.5	54.3	48.4	44.9	42.1	38.9	37.3
		56.2	78.9	67	60.3	46.4	42.9	39.8	36.9
		45.9	59.9	53.7	47.8	44.7	41.6	39.8	38.7
		55.8	78	71	49.3	44.9	42.2	39.4	37.3
		46.3	67.1	54.2	47.6	44.9	41.6	38.9	37.5
		45.9	60.2	54.4	48.3	44.2	41.2	39.2	37.9
		48.4	71.4	58.6	47.5	44	41.1	39.2	38.3
	14:00	46.6	60.1	56.1	48.2	45	42	40.4	39.4
		47	65.9	56.5	48.4	45	41.9	40.2	38.6
		47	67.6	56	49	45	41.9	38.8	36.3
		46.7	70.2	55.6	48.1	44.5	41.8	38.8	36
		47.6	70.3	56.7	49.4	45	42.6	40.7	39.4
		49.8	69.7	63.4	48.8	44.8	41.5	39.6	37.9
		47.9	68.9	58.9	48.5	45	42.3	40	39
		46.9	72.3	53	48.4	44.9	42.3	40.5	39.5
	16:00	48.7	63.7	57.4	51.7	46.5	41.9	39.2	37.4
		51.6	72.4	60.7	54	49	43.6	40.8	39.6
		49.9	66.5	60.9	51.9	46.1	43.6	42.2	41.3
		48.4	69.8	59.1	48.5	45.5	43	41.5	40.7
		48.2	60.6	56.8	50.7	46.2	43.2	39.2	37.8

		49.3	77.3	57.1	50.8	45.9	43.5	41.4	40.4
		46.3	58.3	52.7	48.3	45.7	42.6	40	38.4
		46.4	62.2	53.3	49.1	45.1	42	39.8	38.2
	18:00	46.3	64.7	52.3	48.3	45.3	42.4	40.3	39.2
		47.4	75.2	51.2	47.5	44.9	42.1	40.1	38.9
		45.6	59.6	53.6	47.2	44.6	41.7	38.9	37.8
		46.5	62.4	55.4	49	44.6	42.2	41.1	39.9
		44	55.1	48.7	46.1	43.4	40.9	39.7	38.9
		45.4	58.3	54.3	47.5	43.5	41	39	37.7
		48.9	67.9	59.1	51.4	45.2	41.9	40	38.8
		45.6	59.8	53.5	47.8	44	42	40.6	39.5
	20:00	44.2	57.1	48.7	46.1	43.5	41.7	40.2	38.9
		45.4	65.8	56.8	46	43.1	40.9	39.6	38.4
		43.8	59.6	49.4	45.7	42.9	40.8	38.9	37.7
		44.2	63.3	51.6	45.5	42.6	39.7	38.3	37.3
		41.9	56.7	46.5	44.5	41.2	38.2	36.8	35.9
		42.8	53.1	47.9	45.2	42.1	39.3	38.2	37.2
		43.3	60	49.1	45.2	42.2	40.2	39	37.8
		44.4	74.7	47.6	44.8	41.9	39.8	37.8	36.6
	22:00	42.5	55.4	47.6	44.7	41.8	39	37.7	36.3
		41.3	56.4	48.1	43.6	39.9	37.3	35.9	34.7
		40.3	46.9	45.3	42.7	39.7	37.2	36.1	35.3
		40.3	49.2	46.2	43	39.3	36.6	35.3	34.2
		40.4	51.3	45.9	43	39.4	37	36.1	34.3
		40	56.9	45.3	42.7	39.2	36.1	34.5	33.5
		40.9	61.3	50.6	42.4	37.7	33.5	31.3	30.2
		39.1	54.9	47.9	42.1	36.5	32	30.4	29.5
21/10/2020	0:00	38.1	53.4	45.8	41.1	36.3	33	30.8	29.3
		37.9	51.9	46.1	41	35.5	32.3	30.6	29.2
		35.5	53.3	44.7	38.6	32.8	30.5	29.8	28.9
		35	54.3	42.5	38.1	33	30.6	29.4	28.5
		34.1	48.4	41.7	36.7	32.6	30.4	29.3	28.3
		35.7	50.4	44.3	39.1	32.8	29.9	29.1	28.3
		37	54.1	43.9	39.6	35	31.5	29.7	28.7
		35.3	50.9	42.4	37.4	34.2	32.6	32	31
	2:00	36	51.4	44.2	37.9	34.3	32.6	31.6	30.4
		36.6	55.6	46.1	38.5	34.4	32.2	31.3	30.5
		39.1	59.6	46.7	40.8	36.1	33.6	32.5	31.4
		35.6	48.2	43.7	37.9	34.4	31.5	30.3	29.5
		36.2	55.6	43.9	38.2	34.7	33	32.2	31.1
		35.4	48	43.3	37	34	32.6	31.8	30.9
		36.1	45.9	42.3	38.1	35.2	33.6	32.6	31.8
		38.1	50.3	45.1	40.8	36.6	33.8	32.5	31.2
	4:00	41.8	67.3	51.3	40.6	35.6	33.6	32.6	31.2
		39.5	59.1	48.3	41.1	36	34.1	32.8	32
		43.1	65.3	52.6	43.8	39.2	35.9	34.2	33.2
		41.2	54.2	48	44	39.9	36.6	35.3	34.3
		42.8	52.8	49.6	45.5	41.7	39.3	37.9	37.1
		44.5	54	49.8	47.2	43.6	40.8	39.3	38.2
		46.7	66.7	53.1	48	45.3	43.1	41.8	40.8
		47.6	68.9	52.5	49.1	46.3	44.4	43.4	42.5
	6:00	48	60	53.2	49.9	47.5	45	42.8	41.4
		51.6	75.3	60.5	51.6	49.2	46.8	45.7	44.5
		50.7	72.6	56.5	52.3	49.9	47.5	46.6	45.7
		51.4	65.3	58	52.7	50.7	48.8	47.9	46.8
		51	61.7	56.5	52.5	50.5	48.8	47.5	46.6

		51	69.2	55.9	52.2	50.5	48.4	47.3	46.4
		50.5	66.7	55.3	51.9	50	48.2	46.9	45.6
		50.1	62.7	56	51.6	49.5	47.9	46.8	45.8
	8:00	50.4	67.7	56.6	52.2	49.1	47.3	46.1	44.8
		49.4	63.5	55.5	51	48.7	46.5	44.7	43.4
		49.1	66.9	56.1	50.9	48	45.1	42.9	42
		48.5	68.9	54.9	50.3	47.4	44.4	42.5	41.2
		49.3	64.8	56.6	52.3	47.6	43.7	40.8	38.7
		49.1	67.5	56.4	52	47.5	43.6	41.2	39.6
		49.6	76.2	56.6	50	46.9	43.4	40.4	38.3
		59.9	86.8	71.4	50.2	46.4	41.8	39.8	38.6
	10:00	46.3	64.4	53	48.8	45.1	40.9	37.3	34.9
		47.8	62.9	56.2	50.6	46	42.2	39.4	37.6
		47.2	63.6	55.5	50.1	45.3	41.1	38.9	36.9
		47.4	71	56	49.8	44.8	40.7	36.8	34.9
		45.9	63	53.7	48.6	44.3	40.1	37.1	35.7
		55.8	82.7	69.6	49.4	45.1	41	37.6	36.2
		44.7	56.4	51.3	47	43.8	40.4	37.3	35.2
		46.5	59.9	54.8	49	45	41.6	38	36.4
	12:00	50.2	68.9	63	50.1	45.2	41.8	38.8	37
		46.8	61.8	56.1	49.4	44.6	41.7	39.7	37.5
		48.7	70	60.3	49.1	44.9	41.9	40.1	38.7
		50.8	70.6	57.9	53.2	48.7	44.4	42.6	41.5
		54.9	75.6	64.4	57.2	52	45.1	43.1	41.9
		51.5	68.3	62.2	55.6	46.8	44.3	42.3	40.6
		53.2	73	66.3	52.1	46.5	44.2	42.7	40.7
		47.3	65.7	54.7	49.1	46.1	43.8	41.9	39.7
	14:00	47.1	60.9	54.4	49.3	45.9	43.3	41.8	40.2
		48.9	68.3	57.2	50.3	46.3	43.9	41.7	40.5
		50.5	78	59.5	51.1	46.7	44.5	43.2	41.3
		49.9	74.6	59.8	51.3	46.6	44.1	42	39.9
		47.6	64.4	55.4	49.4	46.1	44	42.5	41.5
		50.9	73.3	60.1	52.9	47.6	44.7	43.2	41.3
		48.4	70.6	56.3	49.7	46.8	44.2	42.3	40.6
		48.5	68.6	56.5	50.3	47.1	44.1	42.6	41.1
	16:00	51.3	73.7	61.1	53.6	47.4	44.4	42.4	41.2
		50.4	74.8	60.1	51.4	47	43.9	40.8	39.5
		47.7	65.1	54.1	49.8	46.5	44.3	42.7	41.3
		49.8	65.6	60.5	51.4	47.3	44.8	42.1	39.9
		50.9	68.4	60.7	53.7	47.7	44.2	42.7	41.5
		55.2	75.5	67.2	57.6	49	45.9	44.4	42.5
		48.5	62.3	56.8	50.6	47.2	44.5	43.2	41.3
		48.3	64.8	56.3	50.1	46.9	44.6	42.1	40.7
	18:00	48.6	69.3	58.1	50.3	46.2	43.2	38.8	36.9
		48.6	62.7	56.1	51.6	46.9	43.8	42.3	41.4
		47.8	67.8	55.1	49.5	46.2	43.8	41	40
		48	67	58.4	49.8	45.8	43.6	40.8	39.2
		48.2	63.3	57.5	51.1	45.4	42.8	38.9	36.5
		45.8	66.8	52.9	47.5	44.8	41.7	39	37.8
		48.1	61.6	58	50.9	45.2	42.1	38.9	36.5
		47.9	69.3	59.5	47.8	44.1	39.2	37.2	36
	20:00	43.7	52.8	49.6	46.3	43	39	36.1	34.8
		44.9	67.4	52.3	46.5	43.1	38.9	36.7	35.4
		43.9	56.9	51.6	46.6	42.4	37.9	35.4	33.7
		43.9	62.7	52.6	46	42.4	37.8	34.9	33.7
		42.9	54.8	50.6	45.3	41.7	37.9	34.6	33.6

		43.3	61.1	50.5	45.8	41.7	38.2	36.2	35
		44.5	60.9	54.4	46.3	42.3	37.9	34.8	33.5
		42.2	61.4	48.3	44.2	40.8	36.9	35.5	34.6
	22:00	43.6	59.3	54.9	44.7	41.3	37.9	36.3	35.1
		42.9	60.2	50.4	45	41.3	37.7	36.4	35.5
		44.3	57.2	54.3	46.9	41.6	37.8	36.3	35.3
		42.8	59.7	53.6	44.3	40.1	37	35.6	34.3
		39.8	67.4	45	42.2	38.2	35.2	33.6	31.9
		39.4	65.6	46.6	42.2	37.5	34.6	33.5	32.5
		39.6	60.9	46.6	42	37.2	33.8	32.5	31.1
		39.1	57.3	47.2	41.5	37.3	34.6	32.9	31.8
22/10/2020	0:00	38	56	45	40.8	36.1	33.2	32.1	31.1
		37.3	47.7	44.7	41	34.9	32.9	31.7	30.3
		36.5	49.4	44.9	39.1	34.5	32.5	31.5	30.5
		36.9	49.4	43.3	39.2	35.8	33.2	31.9	30.8
		36.2	52.5	43.6	38.4	34.5	32.8	32	31
		34.4	45.7	41.6	36.3	33.2	31.2	29.8	28.8
		36.5	60.4	46.3	37	32.7	30.8	29.6	28.3
		33.6	48.4	42.9	37.1	30.1	27.9	26.9	25.9
	2:00	34.4	60.8	40.3	36.5	32.8	29.9	28.5	27.6
		32.5	44	39.9	34.7	31.3	29.3	27.9	26.7
		32.9	47.9	43	34.6	30.8	28.9	27.5	26.3
		35	50.3	44.4	38.1	31.5	29.6	28.2	26.7
		35	50.1	45.5	36.4	33	31.3	30.2	28.8
		33	44.3	41	35.6	31.3	29.3	28.5	27.6
		35.1	47.7	44.1	38.4	32.2	29.5	28.3	26.8
		38.7	64.1	50	37.8	31.9	27.9	26.9	25.3
	4:00	36.8	55.5	48	38.8	32.1	29.9	28.3	27.4
		37.8	48.4	44.6	40.5	36.4	33.5	31.9	30.6
		45	70.6	54.7	46.5	41	35.7	33	31.7
		40.5	60.7	50.5	43.8	36.7	33	31.8	31
		41.6	56	50.1	44.5	39.7	36.6	34.6	33.5
		43.4	60.4	49.4	46.4	42	38.4	36.6	35
		43.8	59.2	49.9	46.4	42.8	39.3	38	37.2
		46.3	70.2	52.7	48.4	44.8	41.1	38.6	37.6
	6:00	47.4	63.5	54.9	49.5	46.3	42.8	40.5	39.2
		49.2	68.7	57.3	50.3	47.6	44.4	42.7	41.3
		48.9	62.2	55.3	51.1	48	44.7	42.8	41.5
		50.1	73.8	57	51	48.7	45.7	43.9	42.9
		49.6	62.6	55.4	51.3	49	46.7	45.1	43.9
		51	72.1	58	52.3	49.5	47.6	46.2	45
		51.9	73.4	61.1	52.5	49.2	46.7	45	43.6
		51.6	80	61	51.5	48.8	46.4	45.1	44.3
	8:00	49.6	65.3	57	51	48.8	46.5	45.3	44.5
		50.6	67.8	59.6	52.4	48.8	46.9	45.7	44.5
		50.3	73.9	57.3	51.4	48.7	46.8	45.2	44.5
		49.9	66.5	58.2	52.5	48.1	45.8	44.3	43.2
		50.5	67	57.7	53.1	48.9	46.6	45	43.8
		49.2	63.2	56.1	51.7	48.2	45	43.4	42.4
		52	77.7	61.8	53.2	47.9	44.4	42.2	41
		47.9	63	57.2	49.8	46	42.7	40	38.5
	10:00	50.9	74.1	62.5	51.9	46.1	42.5	38.8	36.3
		50.6	73	61.9	52.6	46	42.4	39.9	39
		48.9	75.5	58.9	50.2	46	42.7	40.9	39.3
		58.8	80.6	73.9	52.3	46.4	42.4	39.1	36.7
		46.4	61.5	53.1	48.9	45.2	41.8	39.8	37.7

		47.9	69.6	54.8	50	46.5	43.5	41.7	40.2
		48.3	70.7	54.5	50.1	46.3	43.1	41.4	39.2
		48	65.3	55.6	50.3	46.5	43.1	41.1	39.3
	12:00	46.2	61.1	53.7	48.2	45.1	42.5	40.9	39.2
		47.8	65.8	58.5	49.2	45.5	42.5	40.9	39.2
		46.9	60.9	55.3	49.3	45.1	41.7	39.7	38.8
		53.8	75.4	68.6	50.3	45.6	42.2	40.5	38.6
		47.1	68.6	54.4	48.9	45.2	42	38.9	35.9
		49.7	68.5	60.6	51.8	46	42.7	40.2	36.9
		47.9	71.9	57.6	49.4	45.1	42.2	39.2	37.3
		46.3	60.3	55.4	48.3	44.7	41.7	38.7	37.3
	14:00	47.8	68.8	57.4	50	44.8	40.9	39.1	37.1
		46.8	62.7	56.2	49	44.3	41.2	39.2	37.6
		47.4	65.2	56.2	49.6	45.4	42.2	40.7	39.6
		47.8	64.1	56.3	50.1	46.2	43.6	42.1	40.9
		51.4	68.5	63.5	53.3	46.7	43.1	41.2	39.8
		48.6	64.2	59.9	50.2	46.2	43.7	41.6	39.6
		50.5	75.3	60.8	50.3	47	44.5	42.6	41.2
		49.5	66.1	56.6	51.9	48.2	45.8	44.4	43.5
	16:00	50.1	76.2	57	51.1	47.1	44.5	43	41.7
		50.6	64.5	60.5	53.2	48.4	45	43.6	42.3
		53.5	76.5	66.2	52.6	47.1	44.5	42.9	40.9
		48.8	67.1	57	50.3	47.2	45.2	43.7	42.7
		49.9	71.7	57.5	51.8	48.2	45.3	44.1	42.9
		50.9	74.3	59.9	51.9	48.8	46.7	45.3	43.3
		49	62.2	55.7	51.2	48	46.1	44.7	43.8
		49.5	61.8	57.8	51.4	47.9	46.1	45	43.9
	18:00	49.2	64.1	59.3	50.6	47.4	45.3	43.8	42.7
		48.2	62.8	54.1	50.1	47.3	45.6	44.7	43.9
		48.2	70.5	53.9	48.8	46.5	45	44.1	43.4
		49.6	63.9	59.9	51.7	47.1	44	42.6	41.5
		48	62.9	54.9	49.9	47.1	44.8	43.5	42.3
		49.5	73.7	57.7	51.1	47	44.6	43	42.2
		47.9	67.1	57	50.4	45.1	42.5	41.2	40.1
		45.7	59.6	50.7	47.6	45.1	42.5	40.9	39.6
	20:00	46.1	62.8	51.3	48.2	45.4	43.2	41.9	40.3
		45.7	63.7	51.9	47.1	44.8	42.7	41.4	40.6
		44.8	59.5	49.6	46.8	44.2	41.8	40.8	39.9
		46.2	70	53.1	46.4	44.2	42.2	41.1	40.1
		47	66	56.3	48.4	45.2	43.2	42.1	40.8
		45.4	64.4	50.3	46.9	44.5	42.5	41.3	40.4
		45.2	54.5	48.8	47.1	45	42.4	41.2	40.4
		44.9	58	50.6	46.9	44	41.9	40.7	39.5
	22:00	44.7	57.3	49.5	46.4	44.2	42.5	41.5	40.8
		45.4	64.2	56	46.5	42.8	40.4	39.3	38.5
		43.2	64.7	48.1	45	41.8	39.4	38.6	37.7
		42.8	58.6	49.4	45.1	41.6	39	37.5	36.4
		41.9	56.8	48	43.8	41.1	38.9	37.3	35.9
		42.5	52.7	47.3	44.8	41.8	39.5	37.7	36.5
		41.7	56.7	49.5	44	40	37.4	36.2	35.4
		41	53.6	49.4	43.6	39.4	36.3	35.2	33.6
23/10/2020	0:00	41.2	58.5	47.9	43.3	39.4	37	35.9	35.2
		41.4	58.3	46.9	43.6	40.5	38	37	36
		40	54.7	48.2	42.1	38.6	36	34.8	34.1
		37.9	49.7	43.7	40.2	36.7	35.2	34.2	33.3
		39.1	49.6	46.5	42.1	37.6	35.3	34.2	33.5

		37.1	49.4	43.4	39.3	36	34.2	33.3	32.5
		39.9	52.5	46.3	42.4	38.7	36	35	34.1
		37.3	48.8	44.5	39.6	36.2	33.8	32.7	31.7
	2:00	37.8	48.3	44.6	40.2	36.6	34.6	33.4	32.6
		38.8	48	44.7	41.3	37.9	35.2	34.1	33
		41	55	47.1	43.4	39.8	37.4	36.5	35.7
		41.7	59.7	49.8	43.6	39.9	37.8	37	35.9
		40.8	56.5	49.4	42.8	39	37.3	36.3	35.3
		39.2	60.9	45.4	40.7	38.4	37	36.1	35.2
		38.7	46.7	44	40.7	38	36.1	35.3	34.4
		38.1	47.8	43.6	40.1	37.3	35.2	34.2	33.5
	4:00	36.9	51.3	44.5	39.1	35.5	33.6	32.6	31.5
		39.2	54.2	49.3	41.5	36.1	33.6	32.7	31.6
		40.3	56.8	50.2	42.2	37.8	36	35	33.7
		41.5	60.8	49.2	43.9	39.9	38	36.6	35.6
		42.9	64.8	50.8	44.5	40.7	38.5	37.6	36.9
		43	62.4	49.2	45	42	39.7	37.7	36.7
		45.5	56.9	49.7	47.4	45	43.1	41.8	40
		46.7	64.9	52.1	48.3	45.9	43.7	42.6	41.5
	6:00	47.2	59.4	51.9	49.2	46.6	44.3	43.2	42
		50.2	69.1	57.7	51.8	48.9	46.6	45.5	44.6
		53.1	74.8	62.3	53.1	50.2	48.1	46.9	46.3
		53.2	79	62.3	52.9	50.3	48.5	47.5	46.6
		50.7	66.5	55.5	51.8	50.4	48.7	47	45.5
		51.5	72.5	55.9	53.1	50.8	49	47.7	46.5
		52.4	72.6	61.6	53.7	50.7	48.7	47.5	46.1
		52	77.6	59.9	52.8	50	48	46.4	45.3
	8:00	49.5	67.1	56	51.1	48.6	46.7	45.2	44.2
		50.1	68.1	58.2	51.6	48.5	45.7	43.9	42.8
		50.6	76.2	58.4	52	47.8	44.9	43.3	41.1
		49.6	70.9	56.7	51.8	48.4	44.5	42.4	40.7
		49.7	66.3	57.4	51.8	48	44.8	42.9	41.7
		49.4	64.5	58.5	51.9	47.7	43.6	41.7	40.1
		49.6	66	57.5	51.7	48	44.9	41.3	38.7
		49.8	74.5	58.8	50.7	46.9	43.1	41.3	39.7
	10:00	48.6	67.8	56.5	50.4	46.6	43.4	41.7	40.2
		55.7	81.2	69.6	53.1	47.7	44.3	42.6	40.8
		48.8	70.1	55.9	50.3	47.1	44.3	42.9	41.9
		51	75.8	58.1	50.2	46.7	43.5	41.3	40.2
		50.2	72.9	61.5	50.5	46.2	42.9	41.3	40
		48.2	68.4	55.5	49.4	46.2	43.6	42.1	40.6
		53.9	75.1	67.6	51.4	46.8	43.6	42	41.1
		47	64.5	53.8	49.2	45.9	43	40.4	39.2
	12:00	49.2	73.4	57.6	50.8	46.7	43.1	40.9	39.3
		48.6	64.8	57.4	50.5	46.9	44.3	42.8	40.8
		47.1	61.9	53.7	49.4	46.1	43.1	41.1	39.7
		47.3	59.4	52.7	49.5	46.7	43.7	42.3	41
		49.2	73.3	58.3	49.4	46.5	43.8	42.1	40.8
		49.3	74.2	54.3	49.1	46.4	43.3	41.9	39.9
		46.9	61.5	52.9	48.8	46.3	43.6	42.2	41.1
		57.4	80.1	72.2	52	46.1	43.1	41	39.2
	14:00	47.9	71.8	55	48.8	45.8	43.1	40.9	39
		49.9	68.4	60.5	52.5	46.1	43	41.6	40.5
		47.1	59.7	54.9	49.7	45.7	42.2	40.1	37.9
		48.1	71.7	58	49.9	45	41	38	36.5
		57.6	79.1	72.9	50.5	46	42.2	39.7	38.4

		47.8	64.8	56.4	49.7	45.9	42.8	41.2	39.8
		47.3	64.7	54.8	49.1	46.3	43.7	41	38.7
		47.9	59.2	55	50	47.1	43.6	42.1	40.7
	16:00	49.1	60.2	57.9	52.4	46.4	43.8	42.5	41.6
		50.1	70.5	60.8	50.2	47.1	44	42.6	41.2
		49.3	65.9	59	51.3	47	44.5	42.9	41.5
		52.7	75.7	65.5	51.7	47.1	44.1	42.2	41
		51	72.7	61.9	52	47.2	44	42.4	40.9
		53.1	70.6	66.2	53.2	47.6	44.7	42.6	40.3
		47.7	62.8	53.8	49.7	46.8	44.7	43.8	42.8
		47.9	57.4	53.5	50.2	47.3	44.5	43	41.7
	18:00	53.2	80.6	62.3	50.1	47	44.1	42.3	40.6
		48.7	67.3	55.9	50.7	47.7	44.6	42.7	41.4
		49.4	66.6	56.2	51.9	47.3	44.4	42.3	39.7
		49.9	63.7	58.3	52.8	47.9	45.2	42.4	40.6
		49.4	69.8	58.3	51.4	47.6	44.9	43.6	42.5
		51.5	67.7	60.2	54	49.1	46.6	44.9	43
		49.4	63.6	57.4	51.8	47.9	45.3	43.7	42.4
		51.2	67.3	60.9	54.4	47.5	45.1	43.8	42.7
	20:00	49.1	72.9	56.3	51.1	47.2	44.8	43.3	42
		48.5	70.8	54.7	50.6	47.1	44.9	43.4	42.1
		50	66.1	57.5	52.6	48.3	45.9	44.4	42.6
		49.9	63.3	57.4	52.6	48.2	45.3	43.6	42.2
		50.5	74.5	59	52.6	48	45.1	43	41
		52.9	72	63.9	55.2	49	45.1	43.1	40.4
		54.9	76.4	64.6	58.2	51.1	46.2	44	41.3
		55.6	72.8	66.6	58.8	50.9	45.7	42.9	40.9
	22:00	51	71.6	60.9	53.7	47.3	44.1	42.2	40.7
		49.3	71.8	59.7	51	45.9	42.6	40.9	39.9
		45.5	67	52.6	47.1	44.3	41.8	40	38.1
		46.8	72.9	55	48.1	44.3	41.4	38.9	38
		47.6	62.6	56.9	50.9	44.7	40.7	37.9	36.5
		59.4	78.3	74.6	52.5	44.1	41	39.1	37.9
		44	62.4	51.9	46	42.5	39.8	37.9	36.4
		47.8	69.4	58.4	49.9	43.5	40.9	39.2	37.8
24/10/2020	0:00	39.7	58.1	48.5	42.2	37.4	34.4	32.9	31.5
		37.1	50.7	43.2	39.6	35.9	33.9	32.7	31.5
		38.5	50.6	46.3	41.7	36.3	33.8	32.7	31.8
		37.2	50.4	44.3	39.9	35.7	32.7	31.2	30.3
		36.5	53.4	44.5	39.8	34.2	32.2	31.2	30.1
		36.4	50	43.7	39.1	34.8	32.5	31.3	30
		36.3	44.4	42.8	39.2	35	32.9	31.8	30.6
		35.8	53.3	44.1	38.1	34.1	31.6	30	28.5
	2:00	34.7	52.3	42.2	37.3	33.3	31.1	30.1	28.7
		35.7	48.7	43.6	37.6	34.4	32.7	31.5	30.3
		40.4	52.5	47.8	39.9	35.6	32.6	31.3	30.4
		40.5	55	50.8	43.1	36.2	33.3	31.6	30.7
		37.8	50.7	45	40.3	36.5	33.7	32.2	30.6
		39.3	54	48.6	42.5	36.3	34.4	33	31.3
		41.3	59.1	50.6	44.9	37.3	34	32.9	31.8
		36.5	49	45	38.8	34.9	32	30.1	29
	4:00	38.3	55.5	47.8	40.3	35.9	33.6	32.5	31.3
		39.8	58.9	49.2	41.6	37.3	34.9	33.8	32.8
		40.8	55.2	50.1	43.2	38.8	35.2	33.9	32.1
		43.1	64.7	52.7	43.9	39.6	36.9	35.2	33.6
		41.7	52.2	48.5	44.4	40.6	37.8	36.3	35.1

		42.8	51.2	48.4	45.6	41.8	39	37.9	36.9
		46.1	66.7	51.3	48	44.7	42.1	40.3	38.9
		46.5	56.4	51.1	48.3	46	43.6	42.5	41.6
	6:00	48.3	63.9	55.1	49.8	47.5	44.9	42.7	41.4
		49.4	64.9	57.2	50.6	48.5	46	44.4	43.4
		51.6	71.3	60.6	52.6	50	47.6	46.2	44.9
		51.4	72.8	58.8	52.5	50.3	48	47	45.4
		51.2	72.7	56.6	52.3	50.5	48.9	48	47.3
		52.1	69	60.9	53.1	50.5	48.9	47.7	46.7
		51.9	75	59.7	52.8	50.3	48.9	48.1	47.1
		51	64.2	56	52.3	50.6	49.2	48.3	47.5
	8:00	53.1	70	64.5	53.8	50.6	49.1	48.1	47.1
		51	69.1	56.6	52.5	50.1	48.4	47.5	46.7
		50.4	61.5	54.5	51.9	50	48.4	47.4	46.3
		51.5	69.5	58.9	53.3	49.9	48.2	46.9	46.1
		55	68.5	61.3	58.2	53.9	47.8	46	44.8
		49.6	62.1	56.9	51.5	48.8	46.1	45.1	44
		50.6	71.9	59.6	52.1	48.7	46.1	44.8	43.6
		48.1	64.2	53.1	50	47.6	45	43.3	41.6
	10:00	47.5	64.6	53.9	49.5	46.8	43.8	42.6	41.8
		56.7	75.8	71.1	52.6	46.8	44.1	42.4	40.7
		49.8	71.8	62	50	45.7	42.7	41.2	39.7
		51.3	77.9	62.1	49.5	45.9	42	39.7	38.1
		48.2	67.3	59.5	49	44.9	41.3	38.9	37
		47.2	64.6	55.5	49.4	45.6	41.8	39	37.6
		48.3	70.1	57.5	49.8	45.3	41.3	37.8	36.1
		46	66.6	54.1	48.4	44.2	40.2	37.8	35.6
	12:00	49.2	76.6	60.1	49.8	44.3	40	37.8	35.6
		48.6	70.4	59.5	49.2	45	41.3	38.7	36.7
		46.2	64.1	55	48.1	44.5	41.3	38.5	35.2
		52.3	68.7	58.6	56.8	46.9	42.1	39.3	37.1
		56.5	75.9	62.4	60.2	54.6	51.4	44.9	43.6
		60.4	69.2	67.6	64.4	58.9	43.1	39.1	37.1
		59.5	76.7	65.6	63.7	56.7	46.9	41.5	39.2
		56.3	70.9	63.9	59.5	55.4	45.5	40.8	38.2
	14:00	53.8	72.6	61.9	57.9	47.2	42.8	39.7	38.2
		48	69.7	58.4	50	44.8	41.9	37.5	34.3
		49.5	71.3	60.3	52	45.7	41.5	38.4	36.1
		49.8	74.1	60.2	50.4	45.4	42.2	40.1	38.3
		53.8	78.4	67.5	52	46	43.2	38.9	36.8
		48.1	65.4	57.6	50.7	45.5	42.7	38.4	34.4
		47.6	69.4	55.6	48.3	45.5	42.8	39.2	36.6
		49.8	69.4	61.3	51.4	46.1	41.6	37.7	35.7
	16:00	47.8	70	54.8	49.9	45.3	42.1	38.5	36.6
		49.1	66.9	59	51.6	46.5	42.6	37.2	35.5
		48.2	63.9	56.6	50.7	46.3	43.4	41.7	40.2
		51.9	74.1	64.6	51.7	47.4	44.1	42.2	40
		54.9	77.5	67.5	55.3	46.9	44.5	42.8	41.7
		50	77.1	58	50.8	46.7	43.7	42.3	40.2
		47.4	59.2	55.7	50	45.4	43	41.8	40.9
		47.9	62.6	55.9	49.8	46.6	43.9	41.5	40.1
	18:00	48.3	63.6	56.2	50.5	46.8	44.4	42	38.9
		49.2	74	57.8	49.3	46.5	44.3	42.6	41.2
		46.8	62.8	52.9	49.3	45.7	43.3	41	39.5
		47.9	66.6	56	49.5	46.4	44.4	42.8	41
		48.7	62.3	57.3	51.2	46.9	44.2	42.6	41.6

		48.7	59.8	57	51.5	46.9	44.2	42.7	41.4
		47.6	59.6	56.2	48.9	46	43.7	41.2	39.9
		46.8	59.7	50.9	48.8	46.4	43.4	41.6	40.5
	20:00	45.4	55.8	49.6	47.4	45.1	42.2	40.8	39.3
		46.4	63.1	54.2	47.9	45.3	42.9	41.5	40.6
		45.9	57.3	51	48	45.3	43.1	42.1	41.2
		48	75.7	56.5	48.4	45.9	44.1	43	42.2
		46.4	69.5	49.6	47.9	46.1	44.2	43	42
		46.7	57.1	50.8	48.8	46.1	44.1	42.7	41.6
		47.8	65.7	55.8	49.4	46.3	43.8	42.5	41.2
		46.8	69.7	52.9	48.2	45.4	43.5	42.5	41.7
	22:00	45.1	59.7	49.3	47.2	44.6	42.6	41.1	39
		45.4	57.2	51.6	47.6	44.5	42	41	40.1
		44.1	49.6	47.9	46.2	43.5	41.6	40.4	39.5
		44.3	51.5	48.6	46.7	43.6	41.3	39.8	38.6
		44.9	59.6	52.8	46.9	43.5	41.3	40	39
		42.7	59.3	48	45.5	41.6	39.3	38.1	37.4
		41.7	63.6	47.1	44	40.7	38.4	36.6	35.7
		41.3	55	47.8	43.8	40.1	37.7	35.7	34.9
25/10/2020	0:00	40.3	47.9	45.6	42.9	39.2	36.9	35.5	34.4
		38.7	53.6	44.4	40.9	37.6	35.9	34.9	33.9
		38.3	48.1	44.7	41.2	36.9	34.5	33.5	32.5
		38	49.6	44.8	40.5	36.6	34.6	33.7	32.8
		37	51.6	43.3	39	35.8	33.9	33	31.7
		37.2	50.8	45.5	39.5	35.3	33.3	32.4	30.9
		36.8	48.2	43.2	38.9	35.8	33.7	32.5	31.3
		36.9	46.3	43.1	39.3	35.8	34.1	33	31.9
	2:00	37.4	55.6	43.6	39.3	36.4	35	34.3	33.7
		37.4	45.3	43	39.2	36.7	34.8	33.8	32.9
		38.2	47.8	42.6	40.2	37.6	35.6	34.5	33.7
		39.8	49.5	45.2	42.2	38.9	37.4	36.5	35.5
		39.8	48.6	44.8	41.9	39	37.3	36.4	35.1
		38.7	48.7	44.2	40.2	38.1	36.6	35.5	34.8
		39.5	62.4	45.7	41.4	38.4	36.9	35.8	34.7
		39.3	52.4	43.8	41	38.6	37.2	36.3	35.4
	4:00	40.8	52.4	47.7	42.9	39.7	37.9	36.9	35.9
		40.9	52.8	47.1	43.1	39.8	38.2	37.1	36.3
		42.4	58.4	50.2	44.3	40.8	39.1	38	36.8
		44.5	60.6	53.3	46.9	42.3	40.2	38.8	37.5
		42.7	52.4	48.1	44.9	41.9	40.3	39.4	38.3
		45.5	65	51.8	47.5	44	42.3	41.4	40.3
		46.6	63.3	52.4	48.4	45.7	43.2	42	41
		46.6	62.9	52.2	48.5	45.3	42.9	41.9	41.2
	6:00	47.6	65.1	54.2	49.6	46.3	43.6	42	40.8
		49.4	73	57.6	50.8	47.8	45.1	43.2	41.3
		51.7	76.5	58.7	51.3	48.6	46.1	44.9	44.1
		51	73.4	59.2	51.4	49.1	46.7	45.5	43.9
		49.6	70.7	57.5	50.8	48.5	45.9	44.1	43
		49.8	66.6	56.3	51.7	48.9	46.1	44.7	43.6
		51.6	76.2	59.8	51.5	48.6	46.2	45.2	43.8
		51.4	71.2	63.5	51	48	46	44.7	43.4
	8:00	48.9	64	57.1	50.5	47.6	45.1	43.2	41.8
		48.2	60.6	55.3	50.1	47.2	44.6	43.4	42.2
		48.8	66	57	50.1	47.7	45.2	43.1	42.2
		50.3	69.6	59.7	52.7	47.9	45	42.9	42
		50.4	77.1	57.1	51.9	47.8	45.1	43.1	41.7

		50.1	71.4	60.1	51.6	47.9	43.7	41.5	39.5
		53.1	81.1	61.2	51.2	47.5	44.4	42.5	40.7
		48.5	72.2	54.5	49.7	46.9	44.1	42.8	41.6
	10:00	48	64.7	55.3	50	46.9	43.8	42.5	41.1
		52	69.8	63.9	53.6	47.4	43.7	40.9	39.9
		52.2	80	63.1	51.6	47.6	43.7	41.5	39.2
		47.2	56.2	52.1	49.5	46.6	43.6	42.1	41.3
		50.2	77.5	57.4	50.2	45.8	42.2	40.4	38.9
		47.7	60.6	54.4	50.2	46.5	43.2	41.1	39.8
		47.2	61.3	54.9	49.4	46	43.2	41.8	40.8
		47.2	64.9	53.7	49.5	46.1	42.7	40.3	39.3
	12:00	48.6	66.9	57.5	50.1	46.4	43.9	41.8	40.9
		48.2	72.4	55.5	50.4	46.7	43.4	40.8	39.3
		48.1	66.6	56.4	50.7	46	43	40.7	39.4
		46.7	63.7	54.8	48.4	45.6	43	41.1	39.7
		47.5	66.5	56.7	49	45.5	42.6	41	39.6
		50.1	70.7	62.2	49.9	46.2	43.5	41.2	40.2
		56.4	78.5	70.8	51.1	46.1	44.1	42.3	41.2
		47.7	61.1	55.9	49.7	46.5	43.4	41.6	40.2
	14:00	49.3	72.9	58.4	51.7	46.5	43.4	41.4	40.6
		48.7	72.1	55.9	49.4	46.1	43.2	41.6	40.7
		48.9	68.2	57	50.3	47.4	44.9	43.1	41.9
		48.2	61.4	56.5	50.4	46.5	44.8	43.2	41.9
		58.5	72.6	66.4	64.3	48	43.8	41.8	40.2
		63.8	77.3	68.3	66.2	63.3	59.9	48.5	44.6
		62.8	71.3	66.3	64.8	62.5	56.2	44.8	43.1
		62.6	69.5	67	65.3	62.1	55.1	45.6	43.2
	16:00	64.7	72.7	68.2	66.6	64.6	62.1	46	42.9
		57.4	78.4	68.9	66.6	63.5	58.2	44.4	42.9
		55.6	75.2	61.1	59.4	55.9	47.7	44.4	43
		58.8	79.1	63.7	60.8	57.2	60.7	50	46.9
		61.4	78.2	64.8	62	59	48.9	45.6	43.9
		61.5	77.5	64.1	61.1	57.5	46.3	44.6	43.3
		49.7	64.2	58.1	51.9	48.2	45.7	44.2	43.1
		49.5	66	57.1	51.8	48.1	45.7	44.5	43.6
	18:00	50.1	61.7	57.4	52.1	49	46.9	45.4	44.4
		49	61.4	55.5	51.2	48	45.8	44.4	42.5
		51.8	68.3	58.6	55.6	48.8	45.5	43.2	41.9
		54.9	74.7	65.1	57.9	51.6	47.4	44.9	43.4
		55.9	75.9	67.3	58.6	51	47.1	44.5	41.9
		48.1	67	55.8	50.2	46.8	44	41.9	40.6
		47.8	65.6	57.2	48.9	46.4	43.8	41.2	40.1
		48.6	61.5	57.1	51.2	47.1	43.7	42	40.6
	20:00	48.3	70	59.1	48.4	45.5	42.8	41.4	40.1
		47.9	64.4	57.4	50.1	45.7	42.7	41.2	39.8
		45.7	57.1	53.3	47.7	44.6	41.6	40.4	39.4
		46.5	63.2	54.6	48.4	45.2	42.5	40.3	39
		46.5	60.2	55.5	48.3	44.8	42.3	40.8	39.5
		45.9	60.8	54.2	47.6	44.8	42.3	40.6	39.6
		47	62.3	57.3	48.9	44.6	41.9	40.2	39.2
		47.1	68.9	55.9	47.9	44.8	41.7	39.3	37.9
	22:00	46.4	63.6	57.7	47.1	43.8	41.3	40	39.1
		45.5	61	55.6	47.3	43.4	41	39.5	38.3
		44.1	56.5	49.3	46.4	43.3	41	38.1	36.7
		43.8	56.4	50.3	46.7	42.5	39.5	37.6	36.8
		42.9	57.3	50.7	45.2	41.3	38.9	37	35.5

		42.1	59.8	49	44.6	41.1	37	35.3	33.9
		40.9	59.3	46.4	43.6	39.3	37	35.2	34.5
		42.4	61.3	51.2	44.2	40.2	37.1	35.9	34.7

APPENDIX D

Acoustic Comparisons

30-31 Park Avenue Kingswood NSW

Projected Sound Levels Compared to Common Noise Events

NOISE LEVEL (dB)		THE LEVEL OF COMMON SOUNDS	PROJECTED SITE NOISE	
			OUTDOOR	INDOOR
	Threshold of Pain			
140		Jet Engine (25 metre distance) – 140 dB		
130				
120		Jet Take-Off (100 metre distance) – 120 dB		
	Extreme			
110		Rock Band		
		Chainsaws at 25 metres (104 dB – 107 dB) Jet Flyover at 400 metres - 105 dB		
100				
	Very Noisy			
90		Pneumatic Drill		
		Heavy Truck, 40km/h, 7a distance (87dBA - 90 dB) Motor Car at 7 (80dBA) Motor Bikes (2-Wheel) 70dBA – 92dBA)		
80				
	Noisy	Average Street Traffic (40km/h, 7 metre distance)		
70				
		Lawn Mower at 30 metres 70dBA Vacuum Cleaner at 3 metres - 67 dB Normal Speech at 1 metre - 65 dB Business Office (60 dB – 65 dB)		
60		Inside an Average Residence- 60 dB		
	Moderate	Large Business Office 60 dB (55 dB – 65 dB)		
50		Dishwasher – Next Room 50 dB		
		Typical Living Room at Night (40 dB – 45 dB)		
40				
	Quiet			
		Library (30 dB – 34 dB) Soft Whisper at 2 metres 30 dB		
30				
		Typical Bedroom at Night (25 dB – 30 dB) Concert Hall Background 4D Slight Rustling of Leaves 20 dB		
20				
	Almost Silent	Broadcast & recording Studio 16 dB		
10				
0	***Silent***	Threshold of Human Hearing		

External Sound Levels (dBA, LAeq) | Internal Sound Levels (dBA, LAeq)

(Source: Australian Acoustic Association; NG Child & Associates)

APPENDIX E

Noel Child
Summary of Qualifications, Capability & Experience

1 PERSONAL DETAILS

Full Name: Noel George CHILD
Profession: Consultant in Environmental Assessment and Management
Date of Birth: 6th December 1946
Nationality: Australian
Experience: > 30 Years
Address: 22 Britannia Road, Castle Hill, NSW, 2154
Contact: **Phone**: 61 2 9899 1968 **Fax**: 61 2 9899 1797 **Mobile:** 0409 393024

2 CAPABILITY AND EXPERIENCE - SHORT SUMMARY

Noel Child is a successful and experienced commercial and technical professional with over 30 years' experience in a variety of senior level appointments and assignments, within both the corporate and private sectors, with a particular focus on strategic, infrastructure and environmental applications.

Noel's experience includes senior management at both the State and National levels in the Australian petroleum industry, and a number of senior consultancies for both government and corporate clients. His record reflects the ability to develop and achieve positive commercial outcomes through effective planning and communication; critical and objective analysis; and quality task completion and delivery at both the personal and team level.

His management responsibilities have included transport, environmental, safety, and general operational activities at a national level, while his formal professional training includes strategic management, environmental, engineering and business disciplines. He has undertaken a number of senior corporate appointments with distinction and been successfully involved in the ownership and operation of a major petroleum distribution and marketing company in regional Australia. More recently, working through his own businesses Environment Australia and NG Child & Associates, he has applied his knowledge and experience in the areas of strategic management, infrastructure development, energy and the environment on a consultancy and contractual basis to a number of private and public-sector clients, both nationally and internationally.

Noel has had post-graduate training in several technical and commercial disciplines, and provides specialised teaching input, by invitation, to post graduate engineering and business management courses conducted by the Faculties of Business and Engineering at Sydney's University of Technology. He has strong affiliations with a number of international corporations and agencies and has worked closely with both the regulators and the regulated in a number of aspects of environmental management, assessment and performance. He has also been recognised as an independent expert on engineering, and environmental issues by the Land and Environment Court of NSW.

Noel has a detailed understanding of environmental engineering and associated processes and has specific experience and expertise in the fields of acoustics, air quality, electromagnetic field assessment, electrolysis and stray current assessment, contaminated site assessment, and liquid and solid waste management. He also provides post graduate teaching input on environmental engineering issues to post graduate courses at the University of Technology, Sydney, and La Trobe and Monash Universities in Melbourne.

3 EDUCATION, QUALIFICATIONS AND AFFILIATIONS

BE, PhD (Chemical Engineering), UNSW, Sydney
Master of Business Studies, University of New South Wales, Sydney
B.Sc. (Hons) Applied Chemistry (Environmental), University of Technology, Sydney
Graduate Diploma (Environmental Engineering and Management), UNSW, Sydney
Qualified Environmental Auditor, Standards Australia
Member, Royal Australian Chemical Institute, 1972/2020
Member, Institution of Engineers, Australia, 1972/2020
Member, Clean Air Society of Australia and New Zealand, 1992/2020
Member, Australian Natural Gas Vehicle Council, 1996/2004
Executive Director, Australasian Natural Gas Vehicles Council, 2003/2004
Visiting Fellow, Institute for Sustainable Futures, UTS, 1995/2002
Research Fellow, Faculty of Civil & Environmental Engineering, UTS, 1996/2020
Research Associate, New York Academy of Sciences, 2000/2020

4 RECENT ASSIGNMENTS & EXPERIENCE

Bathla Group & Universal Property (2018 & Previous) – Site investigation; preparation of Construction management Plans and provision of specialist technical advice for a wide range of residential subdivisions and development throughout the Sydney area.

Mostyn Copper Group & Australian Turf Club (2018) – Site assessment and validation; Coopers Paddock, Warwick Farm NSW.

Dedico Developments (2018 & Previous) – Site investigations, acoustic and vibration assessments and management strategies for industrial unit and self-storage unit developments at various locations throughout Sydney.

Lodestone HQ (2018 & Previous) – Site investigation, acoustic, air quality and electromagnetic field assessments for a childcare centre development, Princes Highway and Oak Road, Kirrawee NSW, including work required to achieve a Site Audit Statement conforming the suitability of the site for the proposed childcare centre use.

Lodestone HQ (2018 & Previous) – Preparation of Remedial Action Plan and Site Validation Report for a childcare centre development in College Street Gladesville NSW.

Kaunitz Yeung Architecture (2018 & Previous) – Electromagnetic field and air quality assessments of a childcare centre development project at 60 Dickson Avenue Artarmon NSW.

Australian Consulting Architects (2018 & Previous) – Electromagnetic, stray current and electrolysis assessments of development projects a Field Place Telopea; Windsor Road Vineyard; Camden Valley way Horningsea Park and others.

Futurespace/Renascent (2018 & Previous) – Environmental assessment of proposed childcare centre development at Waterloo Road Macquarie park and Cleveland Street Strawberry Hills, including general environmental, acoustic assessment, air quality and electromagnetic field assessment.

Thyssen Transrapid Australia (Current) – Adviser on technical and operational issues associated with the development and construction of a high-speed magnetic levitation train systems within the People's Republic of China, and elsewhere, including electrolysis, electromagnetic and stray field effects.

Trumen Corporation (2018 & Previous) – Environmental assessment, including acoustic and contamination assessment and certification, of mixed use and childcare centre development projects at Waine Street Freshwater, Fitzroy Street Marrickville, and at Huntley Street Alexandria, NSW.

Commonwealth Bank (Current) – Environmental assessment, including general, acoustic, air quality, electromagnetic field and wind impact assessment, of a new childcare centre development to be located on Level 2 of Darling Park Power 2, Sussex Street, Sydney.

LEDA Holdings (2018 & Previous) – Environmental Assessment of a proposed childcare centre at 32 Cawarra Road Caringbah NSW, including general environmental, acoustic, air quality and electromagnetic field assessments.

Gundagai Meat Processors (Current) – Review and enhancement of solid and liquid waste processing and management systems at GMP's Gundagai abattoir, including the on-site treatment of waste streams from meat processing and other operations.

Campbelltown City Council (Current) – Peer review of acoustic assessments submitted to Campbelltown City Council regarding assessment of the acoustic impacts of proposed developments including a major truck maintenance facility and the expansion of Macarthur Square shopping centre, including the conduct of noise measurements.

Brenchley Architects (2009 - Current) – Acoustic assessments of proposed residential and commercial developments at Elizabeth Street Sydney; Spit Road Mosman, Botany Road Waterloo, Cranbrook Street, Botany and Bellevue Hill Road, Bellevue Hill NSW.

BJB Design (2009 - Current) – Acoustic, air quality and odour assessments of residential and commercial developments at Botany Road, Botany and Cranbrook Street Botany.

Bovis Lend Lease (Current) – Environmental assessment of a major development site at Darling Walk, Darling Harbour NSW, including a detailed review of air quality, electromagnetic field and acoustic issues for review by the NSW Department of Planning.

Penrith City Council (2012/13) – Preparation of the Penrith City Council response to the NSW Government Long Term Transport Plan, including consideration of transport and associated environmental issues affecting the Penrith Local Government Area.

Harry Azoulay & Michael Bell Architects (2012) – Assessment of the environmental impacts on and from a proposed childcare and early learning centre at Chatswood, NSW. Assessments lodged with and adopted by Willoughby City Council.

Wollondilly Shire Council (2012) – Preliminary environmental assessment and review of the proposed development of a second Sydney airport at Wilton, including a preliminary assessment of acoustic impacts.

White Horse Coffee (2011) – Air quality and odour assessment regarding a boutique coffee roasting and drying operation at 7/3-11 Flora Street, Kirrawee, and NSW.

Sydney Skips & Galaxy Waste (Current) – Environmental assessment of a proposed waste recycling facility to be located on a potentially contaminated site at Stephen Road, Botany, NSW, including a detailed review of all relevant engineering and environmental issues, and the preparation of relevant documentation including assessment reports for review by Botany City Council.

Michael Bell Architects & Clients (2004 to Current) – Assessment of the environmental impacts, including acoustic impacts, associated with various childcare centre applications in suburban Sydney, and the Sydney CBD, including the development of plans for the management and control of such impacts.

NSW Roads & Traffic Authority (2004 to Current) – Review of international technologies, systems & applications in relation to the treatment of motor vehicle exhaust emissions and associated air pollution within and discharged from road tunnels, in accordance with the conditions of approval for the M5 East Motorway

Federal Airports Corporation (1995/1996) – Preliminary environmental and ground transport studies for the proposed Sydney West Airport, including consideration of all relevant environmental issues.

Isuzu-GM (2003 to Current) – Representations to Environment Australia and the Department of Transport and regional Services regarding the emission performance standards of Japanese sourced medium and heavy natural gas trucks, with the aim of having the current Japanese emission standard accepted within the Australian design Rule 80 series of vehicle emission standards.

City of Sydney (2005 - 2007) – Assessment of air quality and odour issues associated with a proposed redevelopment of craft studios and associated facilities at Fox Studios, Moore Park, Sydney, and review of air quality monitoring stations in the Sydney CBD area, in part as a basis for monitoring the air quality and potential health cost impacts of transport congestion and modes.

Warren Centre for Advanced Engineering, University of Sydney (2000 to 2003) – Contribution to the report "Sustainable Transport for Sustainable Cities", a major government and private enterprise funded study into the future sustainability of transport in Sydney and adjoining regions, including in particular a review of associated environmental issues. Study received the 2003 Bradfield Award for Engineering Excellence from the Australian Institute of Engineers.

United Kingdom Department of the Environment (1994) – Contribution to the development of revised environmental guidelines for air, soil and groundwater water quality.

United States Environmental Protection Agency (1994) - Contribution to an international team developing strategies for the control and management of air pollution in seven major US cities.

5 CORPORATE EXPERIENCE

NG Child & Associates

- **1992--Present**, Managing Principal - Responsible for all aspects of the conduct of a private engineering and environmental consultancy, including administration, marketing, team coordination and technical and professional delivery.

Western Fuel Distributions Pty Limited, Australia

- **1984-92** Managing Principal. - Responsible for all aspects of the management and development of one of the largest private petroleum distributorships then operating in Australia, with a peak annual sales volume of 70 million litres, turnover of $30 million per annum, a direct staff of thirty, and a network of some 40 retail and wholesale agency outlets. This position included direct personal accountability for all aspects of storage, distribution and environmental performance.

Caltex Oil Australia Limited

- **1982-84** General Manager, Marketing and Operations. Responsible for the management and operation of Caltex Australia's marketing, storage, warehousing, distribution, environmental and safety functions, including seaboard terminal and marine operations.
- **1980-82** National Consumer Marketing Manager. Responsible for Caltex Australia's national consumer, industrial and distributor marketing activities.

Golden Fleece Petroleum Limited

- **1977 - 1980** Manager Operations, NSW. Responsible for the overall management of the distribution, warehousing, seaboard terminal and lubricant production activities of Golden Fleece Petroleum in New South Wales, including environmental, occupational health and safety matters.

Esso Australia Limited

- **1976-77** SA Manager, Marketing and Operations. Responsible for all aspects of the management of Esso's petroleum, lubricant and LPG storage, distribution and marketing throughout South Australia.
- **1975-76** Refinery Manager. Responsible for all engineering, operational and environmental aspects of the joint Esso/Mobil refinery at Port Stanvac in South Australia.
- **1975** Manager, Process Operations, Port Dixon Refinery, Malaysia. Six-month special assignment at the Esso Petroleum Refinery, Port Dixon, Malaysia.
- **1971-75** Senior Analyst, Logistics and Corporate Strategy Departments, Esso Sydney Head office.

6 SOME REPORTS & PUBLICATIONS

- **High Speed Rail – Benefits for the Nation,** Keynote address at the UNSW Institute of Environmental and Urban Studies International High-Speed Rail Seminar, August 2013.
- **High Speed Trains in Australia: Connecting Cities and Energising Regions**; with the Hon Peter Nixon AO, October 2010.
- **Sydney's High Residential Growth Areas: Averting the Risk of a Transportation Underclass**, World Transport & Environmental Forum, Reims France, June 2006.
- **The M5 East Road Tunnel: Implications for Ventilation, Air Quality and Emission Treatment Systems**, International Road Transport and Tunneling Forum, Graz Austria, May 2006.
- **Transport Fuels in Australia: The Folly of Australia's Increasing Reliance on Imported Crude Oil**, Submission to the Australian Senate Rural and Regional Affairs and Transport Committee Inquiry into Australia's Future Oil Supply and Alternative Transport Fuels, February 2006.
- **The Japan 2003 CNG Emission Standard & the Emission Performance of the Isuzu 4HF-1-CNG: The Case for Acceptance under ADR80**. Submission on behalf of Isuzu GM Australia to the Commonwealth Department of Transport and Regional Services, June 2004.
- **M5 East Freeway: A Review of Emission Treatment Technologies, Systems and Applications**, NSW RTA and NSW Department of Planning, April 2004.
- **Future Directions: Challenges & Opportunities in the Australian CNG Vehicle Industry**, ANGVC, December 2002
- **High Speed Rail in Australia: Beyond 2000** (with the Hon Peter Nixon), November 2000
- **Review of Options for the Treatment or "Filtration" of Tunnel Gases and Stack Emissions**, City of Sydney. January 2003
- **A Comparative Analysis of Energy and Greenhouse Performance: Austrans Ultras Light Rail System**, Bishop Austrans Limited, January 2003
- **Engineering and Environmental Aspects of Enclosing the Cahill Expressway Cutting**, City of Sydney, May 2001.
- **M5 East Motorway: Proposed Single Emission Stack at Turrella – Review of Air Quality Impacts and Consideration of Alternative Strategies**, Canterbury City Council, February 1999

7 PERSONAL & PROFESSIONAL REFERENCES

- The Hon Peter Nixon AO, Former Federal Transport Minister
- John Black, Professor Emeritus of Civil & Transport Engineering, University of NSW
- Mr Stephen Lye, Development Manager, Trumen Corporation, Sydney.
- Mr Peter Han, Project Director, Commonwealth Bank, Sydney
- Mr Michael Bell, Principal, Michael Bell Architects, Sydney.
- Mr Steven Schlederer, Lodestone HQ
- Mr Sean Mostyn, Partner, Mostyn Copper Group
- Mr Luke Johnson, General Manager, Wollondilly Shire Council
- Mr Bernie Clark, Chief Executive, Thyssen Australia
- Mr Alan Ezzy, Former Chairperson, NSW Flood Mitigation Authority.
- Professor Vigid Vigneswaran, Faculty of Civil & Environmental Engineering, University of Technology, Sydney.
- Mr Merv Ismay, General Manager, Holroyd City Council, Sydney NSW
- Dr Jack Mundey, Past Chairman Historic Houses Trust, Environmentalist
- Alex Mitchell, Journalist

Noel G Child
2 November 2020

ATTACHMENT A
Client Reference List

Acre Woods Childcare Pty Ltd
Australian Commonwealth Environmental Protection Agency
Australian Consulting Architects
Australian Federal Airports Corporation
Australian Federal Department of Transport and Regional Development
Bovis Lend Lease
Brenchley Architects
Campbelltown City Council
Canterbury City Council, Sydney, NSW
Commonwealth Banking Corporation
Environment Protection Authority of NSW
Exxon Chemical
Fairfield City Council, Sydney, NSW
First Impressions Property
FreightCorp, Sydney, NSW
Futurespace
GM - Isuzu
Guangxi Environment Protection Bureau
Gundagai Meat Processors
Hong Kong Department of the Environment
Hornsby and Ku-ring-gai Councils, Sydney, NSW
Kaunitz Yeung Architecture
LEDA Holdings
Lodestone HQ
Michael Bell Architects
Minter Ellison
Mobil Oil Australia
Mostyn Copper Group
NSW Roads & Traffic Authority
Ove Arup & Partners
Qantas Airways
Queensland Ports Corporation
Renascent
Salibeau Pty Ltd
Shell Australia
Sinclair Knight Merz
Skouras and Mabrokardatos
Southern Sydney Regional Organisation of Councils (SSROC)
State Rail Authority of NSW
Stephen Davidson Property Investments
Sydney Skips & Galaxy Waste
The City of Sydney
The Western Sydney Alliance of Mayors
Thyssen Krup Transrapid Australia
Tom Howard QC
Trumen Corporation
UK Department of the Environment
United States Environment Protection Agency
University of Technology, Sydney
Warren Centre for Advanced Engineering, University of Sydney
Waverley Council, Sydney, NSW
Western Sydney Parklands Trust
Wollondilly Shire Council

MONACO
DESIGNS PL

BASIC TREE ASSESSMENT

For:
Mr Miletic

Site Address:
31-32 Park Avenue,
Kingswood

Site Inspection Date:
06th October 2020

Report Issue Date:
16th October 2020 - DA Issue

Job No:
5626

1. Introduction

1.1 This basic tree assessment has been commissioned by Mr Miletic to assess the health, condition and impact of the subject trees, as part of a proposed subdivision and Boarding House Development

1.2 This report was not written with the intention of being used in a court of law.

2. Method

2.1 Observations and recordings of the trees were made using the Visual Tree Assessment (VTA) at ground level. Access was not available to the property, however trees were viewed from adjacent Park. Complete VTA not undertaken.

2.2 Survey by East West Surveys PL – dated 07 09 2020 identified trees.

2.3 Pdf set or Architecturals (R-03) - prepared by Archidrome was provided for reference.

2.4 Photographs included within this report were taken at time of initial inspection, unless noted otherwise.

2.5 Construction will be concrete slab and brick veneer.

2.6 Crown spreads are taken as an average of the radii, unless the crown is severely distorted or the issue requires more accurate dimensioning.

3. The Site

3.1 The site currently supports a single storey brick and clad residences, with predominately large expanses of lawn.

4. Tree Assessment

	TREE ASSESSMENT													
No	**Scientific Name**	**Age Class**	**Health**	**Condition**	**Height (m)**	**Spread (m)**	**D BH (mm)**	**(On / Off Site)**	**Disease**	**Retention Value**	**Proposed to be removed or retained**	**TPZ – AS 4970 (rad. m)**	**SRZ – AS4970 (rad. m)**	**Encroach TPZ / SRZ**
1	*Robinia 'Frisia'*	S	G	A	5	8	350	On	Y	Mod	Removed	-	-	-
2	*Jacaranda mimosifolia*	M	G	G	5	8	Tri	On	Y	Mod	Removed	-	-	-
3	*Brachychiton acerifolius*	S	G	G	4	4	300 App	On	-	Mod	Removed	-	-	-
4	*Liquidamber styraciflua*	S/ M	G	?	6	6	200 App	On	?	Mod	Removed	-	-	-

5. Discussion

5.1 Tree 1 is typical of the cultivar. The specimen is dual trunked, which appeared to be included. Proposed removal is of minor consequence to the Landscape.

5.2 Tree 2 is a tri trunked Jacaranda that is being constantly lopped beneath powerlines.

5.3 Tree 3 is an Illawarra Flame. An immature specimen that can easily be replaced.

5.4 Tree 4 is a common specimen in the Landscape that can easily be replaced.

6. Recommendations

6.1 The trees proposed to be removed are common within the landscape and can easily be replaced. The Landscape Plan undertaken by Monaco Designs, will ensure canopy is replenished at minimum 2:1 as compensation.

Regards
Paul Monaco

[redacted]

Paul Monaco, Bach. Hort. Sc. (AQF 7), Arboriculture, Bushland Regeneration.
Landscape and Horticultural Consultant, Consulting Arborist.
Quantified Tree Risk Assessment (QTRA) - 3923

Copyright Release

7. Limitation of Liability

7.1 This report has been prepared by the arborist and must be accepted on the basis that all reasonable attempts have been made to identify factors and features relevant to the tree(s) specified. Unless otherwise stated, observations have been made by eye from ground level (VTA). No Resistographs, root mapping or other diagnostic tools / methods used unless noted otherwise.

8. References / Bibliography

8.1 Australian Standard AS 4970-2009 'Protection of Trees on Development Sites'.

8.2 Harris, R.W. et al (2004) 'Arboriculture – 4th Ed.', Prentice Hall.

8.3 Mattheck, C., et al (2015) 'The Body Language of Trees – Encyclopaedia of Visual Tee Assessment', Karlsruhe Institute of Technology – Campus North.

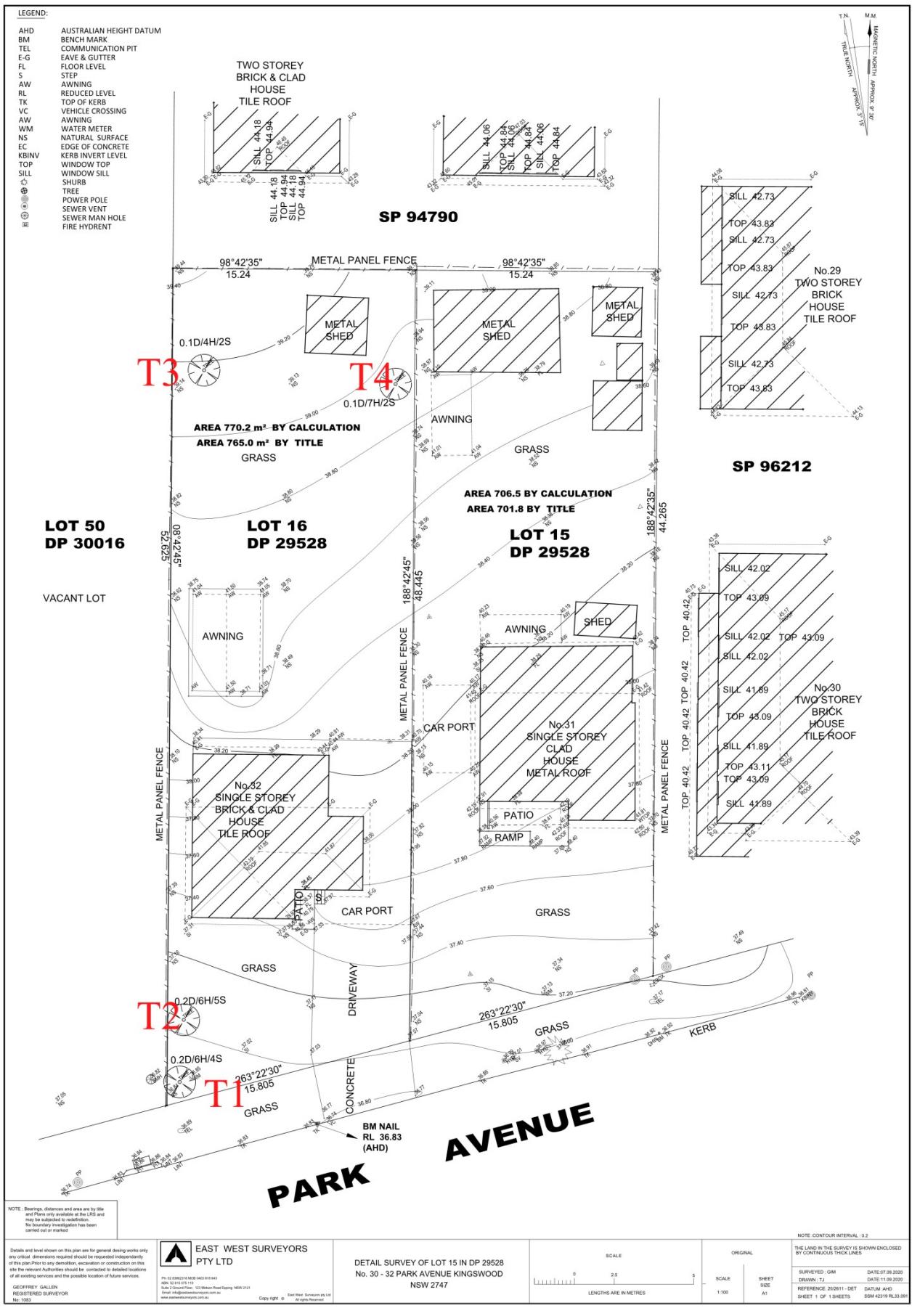
8.4 Raven, P.H., et al, (1986) 'Biology of Plants – 4th Ed.', Worth Publishers.

8.5 Roberts, J., Jackson, N., and Smith, M., (2013) 'Tree Roots in the Built Environment', Arboricultural Association – Research for Amenity Trees No. 8.

8.6 Shigo, A. (1997) 'A New Tree Biology', Shigo and Trees Associates.

8.7 Shigo, A. (2008) 'Modern Arboriculture', Shigo and Trees Associates.

9. Survey – NTS



10. Photos

Plate 1 – Front Setback

Plate 2 – Rear Setback

TRAFFIC AND PARKING IMPACT ASSESSMENT FOR A PROPOSED BOARDING HOUSING

31-32 Park Avenue Kingswood

Prepared for: MIM Property Pty Ltd

N206378A (Version 1a)

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1. INTRODUCTION

Motion Traffic Engineers was commissioned by MIM Property Pty Ltd to undertake a traffic and parking impact assessment of proposed boarding housing development at 31-32 Park Avenue in Kingswood. Currently the site is comprised of two single residential dwellings.

The proposed boarding house will have vehicle access and egress via Park Avenue.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED LOCATION

2.1 Location and Land Use

The proposed Boarding housing development is located on the northern side of Great Western Highway and north of Chapman Gardens. The Kingswood Railway Station is located within 800 metres of walking distance west of the proposed site. the surrounding land uses are mainly residential with some commercial premises. The land zoning of the site is *Medium Density Residential R3.*

Currently the site is composed of two residential dwellings.

Figures 1 and 2 show the location of the development site from the aerial and street map perspective respectively.

Figure 3a and 3b shows photographs of the development site, 31 and 32 Park Avenue respectively. The site has an upward gradient from Park Avenue.

Figure 1: Location of the Subject Site on Aerial

Figure 2: Street Map of the Location of the Proposed Boarding House in relation to surveyed intersections

Figure 3a: Photograph of 31 Park Avenue

Figure 3b: Photograph of 32 Park Avenue

2.2 Road Network

This section discusses the road network adjacent to the site.

Park Avenue is a local road with one lane each way. The default speed limit is 50km/hr. Time unrestricted on-street parking is permitted on both sides of the road. Figure 4a shows a photograph of Park Avenue.

Heath Street is a local road with one lane each way. The default speed limit is 50km/hr. Time unrestricted on-street parking is permitted on both sides of the road. Figure 4b shows a photograph of Heath Street

Victoria Street is a collector road with one lane each way. The sign-posted speed limit is 50km/hr. Time unrestricted on-street parking is permitted on both sides of the road within designated parking lanes. Figure 4c shows a photograph of Victoria Street.

Richmond Road near the proposed site is a collector road with one lane each way. Within the vicinity of the site, the sign-posted speed limit on Richmond Road is 50km/hr except for the section between Victoria Street and Park Avenue, which is subjected to School Zone Restrictions during school time. Unrestricted on-street parking is permitted on both sides of the road. Figure 4d shows a photograph of Richmond Road looking south.

Copeland Street is a collector road with one lane each way. The sign-posted speed limit is 50km/hr. Unrestricted on-street parking is permitted on both sides of the road within designated parking lanes. Figure 4e shows a photograph of Copeland Street looking west.

Figure 4a: Park Avenue looking east from the Development Site

Figure 4b: Victoria Street looking west

Figure 4c: Heath Street looking South

Figure 4d: Richmond Road looking south at the roundabout intersection of Richmond Road with Copeland Street and Victoria Street

Figure 4d: Copeland Street looking west at the roundabout intersection of Richmond Road with Copeland Street and Victoria Street

2.3 Intersection Description

As part of this traffic impact assessment three intersections are assessed for the traffic generation and impacts:

- The roundabout intersection of Victoria Street with Copeland Street and Richmond Road
- The priority intersection of Victoria Street and Heath Street

External traffic to and from the proposed boarding house will need to travel through at least one of the above intersections.

The roundabout intersection of Victoria Street with Copeland Street and Richmond Road is a four-leg intersection with one circulating lane. Figure 5 shows a layout of the intersection using SIDRA (9)- an industry standard intersection assessment software. The number on the lane represents the diameter in metres of the island.

The priority intersection of Victoria Street with Heath Street is a three-leg intersection with all turn movement permitted. Drivers travelling from Heath Street must give-way to vehicles travelling on Victoria Road. Figure 6 shows a layout of

the intersection using SIDRA (9). The numbers on the lanes refer to the length of short lanes in metres.

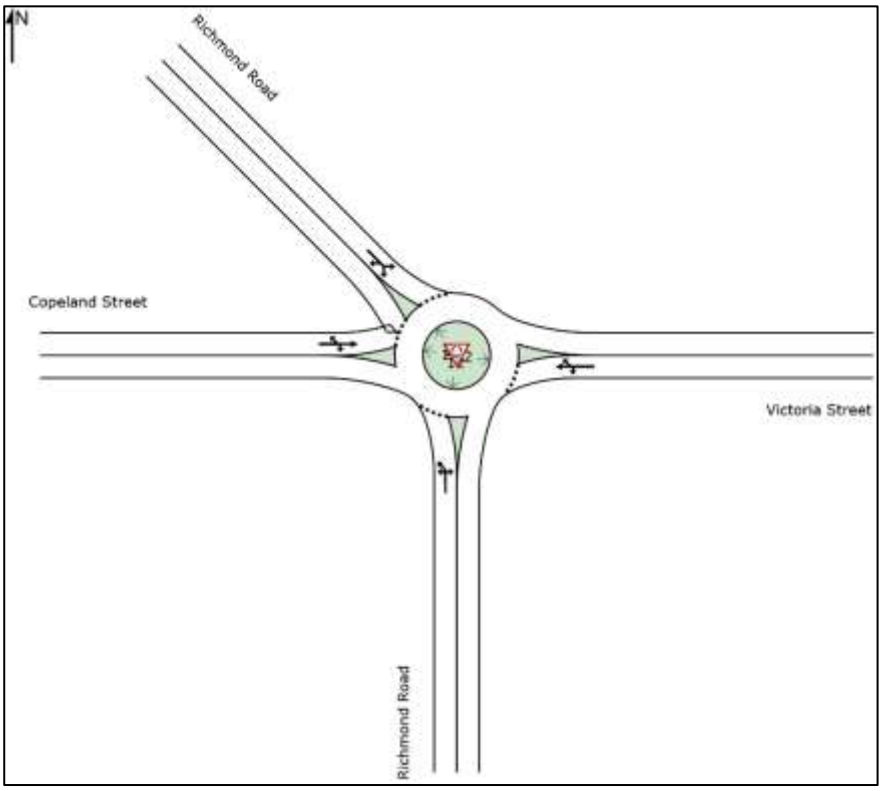


Figure 5: Roundabout intersection of Victoria Street with Copeland Street and Richmond Road (SIDRA)

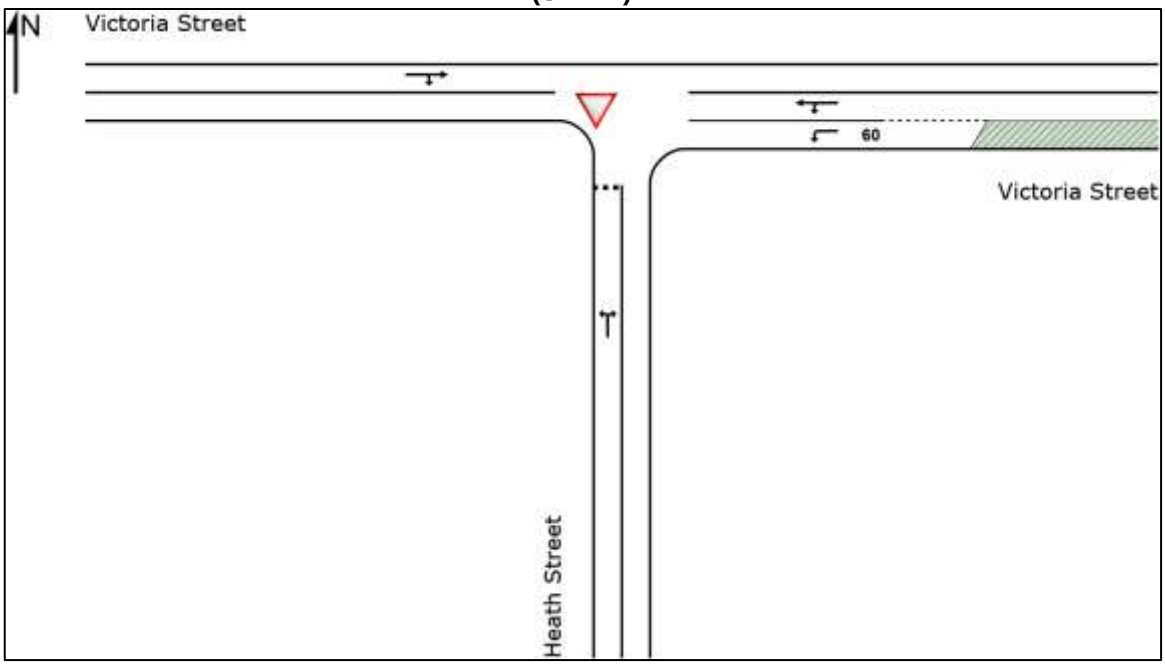


Figure 6: Priority Intersection Layout of Victoria Street with Heath Street(SIDRA)

2.4 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the two intersections for the weekday AM and PM peak period. The peak hours were 8:00am to 9:00am and 5pm to 6pm for the weekday AM and PM peak hours respectively. The traffic surveys were undertaken on the October 2020.

The following Figures present the traffic volumes in vehicles for the weekday peak hours.

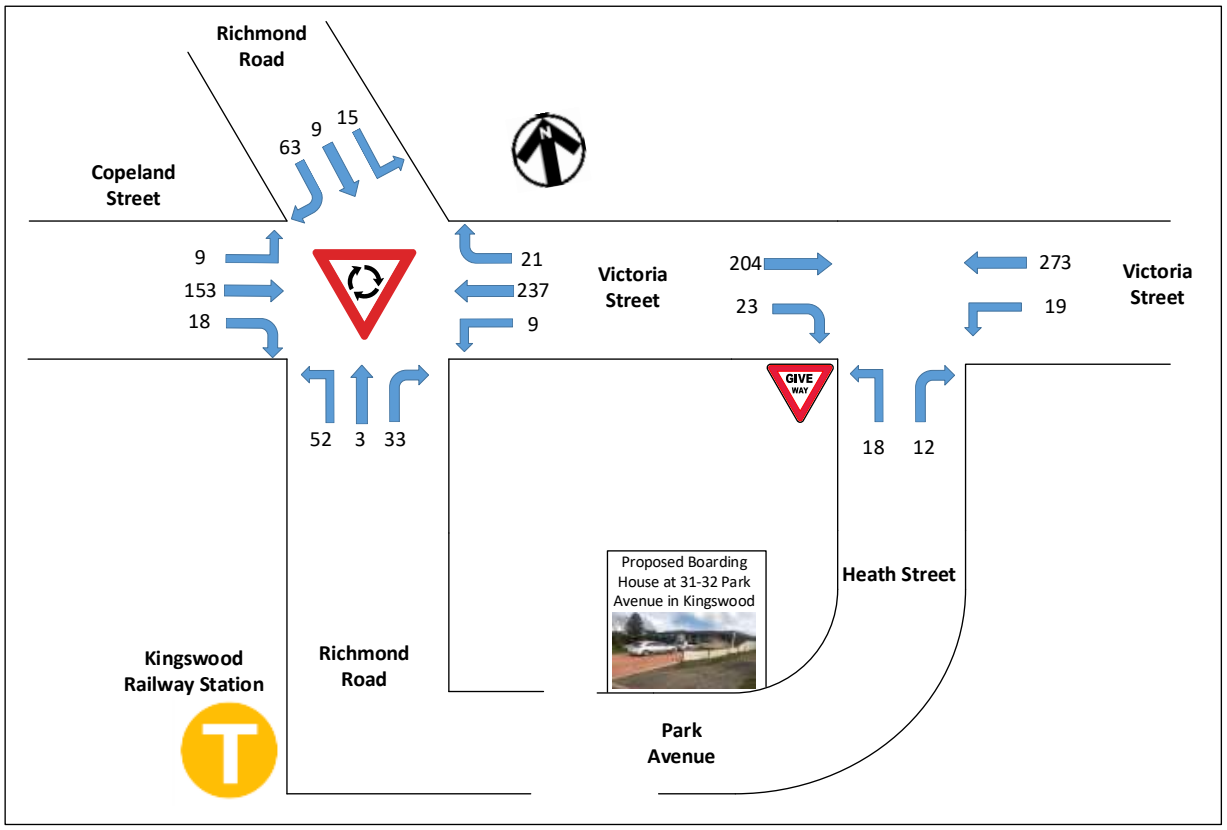


Figure 7: Existing Weekday Traffic Volumes AM Peak Hour

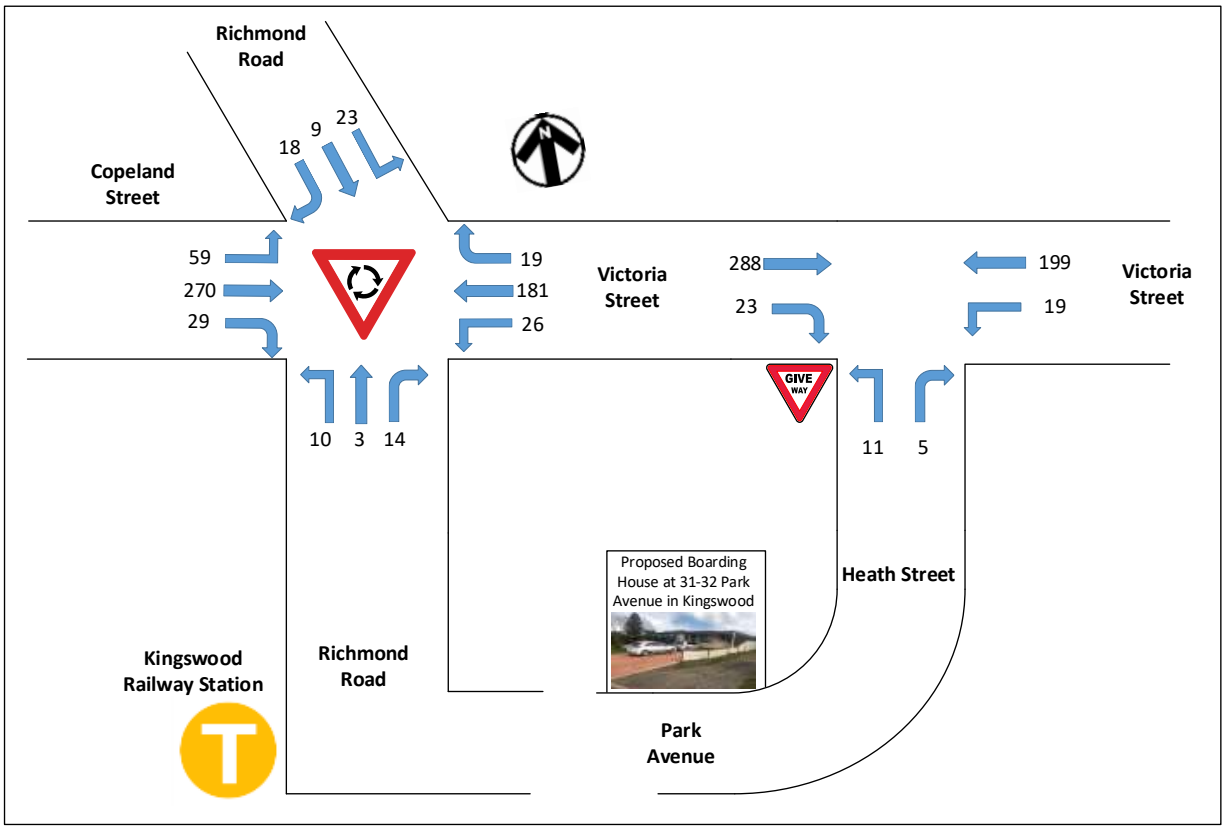


Figure 8: Existing Weekday Traffic Volumes PM Peak Hour

2.5 Intersection Assessment

An intersection assessment has been undertaken for the two surveyed intersections.

The existing intersection operating performance was assessed using the SIDRA software package (version 9) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner-city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as follows:

Roundabout Intersection of Victoria Street with Copeland Street and Richmond Road

- The intersection has an overall LoS A for the AM and PM peak hours
- There is spare capacity at this intersection

Priority Intersection of Victoria Street with Heath Street

- All turn movements have a LoS A or B for AM and PM peak hours
- There is spare capacity at this intersection

The full Sidra results are presented in Appendix A.

2.6 Public Parking Opportunities

Unrestricted on-street parking is permitted on Park Avenue (in selective sections). Site investigation shows that there are ample parking spaces on Park Avenue. Figure 9 shows a photo of the vacant on-street parking spaces on Park Avenue.

Figure 9: On Street Parking on Park Avenue

2.7 Public Transport

Bus Services

The closest bus station near the development site is located 400 metres walking distance away on Victoria Street. This bus stop is serviced by bus route 785. This provides transport to the suburbs including Werrington, Cambridge Park and Penrith.

Railway

Kingswood Railway Station is located within walking distance, approximately 800 metres away from the proposed site. The railway station is frequently serviced by T1: Penrith via Parramatta and Gordon via Central.

Overall, the site has good access to public transport.

Figure 10 presents the public transport map.

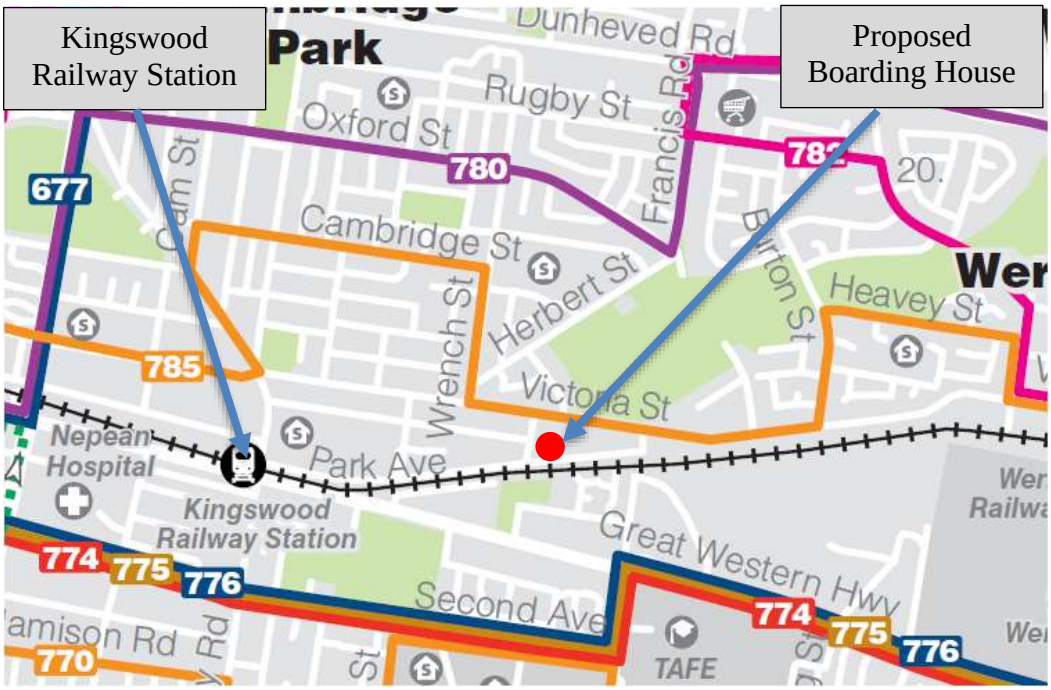


Figure 10: Local Public Transport Services

2.8 Conclusions on the Existing Conditions

The proposed boarding house is located in an area where there is reasonable number of vacant public parking is available.

The nearby intersection overall performs well with sufficient spare capacity to accommodate additional traffic.

The site has good access to public transport.

3. PROPOSED BOARDING HOUSE

The land-uses for the proposed boarding house is comprising of three attached lot and the details are as follows:

Lot 1

- One double room and one managers' room on ground floor
- Six single rooms on upper floor
- One double car port and two car spaces

Total of seven boarding rooms, one manager's room and four car spaces

Lot 2

- One double room and one manager's room on ground floor
- Six single rooms on upper floor
- Four car spaces

Total of seven boarding rooms, one manager's room and four car spaces

Lot 3

- One double room and one manager's room on ground floor
- Six single rooms on upper floor
- One double car port and two car spaces

Total of seven boarding rooms, one manager's room and four car spaces

Total of 21 boarding rooms and three manager's room and twelve car spaces

Vehicle access and egress to the car spaces and carports on each lot is via main driveway running of Park Avenue.

A full scaled plan of the proposed boarding house is provided as part of the Development Application.

4. CAR PARKING CONSIDERATIONS

4.1 State Environmental Planning Policy (Affordable Rental Housing) 2009

The car parking requirements for affordable rental housing are presented in *State Environmental Planning Policy (Affordable Rental Housing) 2009 and State Environmental Planning Policy (Affordable Rental Housing) Amendment (Parking for Boarding Houses) 2018* with the car parking rates as follows as it applies to the proposed development:

Boarding house

- 0.5 parking spaces provided for each boarding room
- Not more than 1 parking space provided for each person employed in connection with the development and who is resident on site
- At least one parking space will be provided for a bicycle, and one will be provided for a motorcycle, for every 5 boarding rooms.

Table 3 summarises the car parking requirements for the boarding house development.

Land Use	Lot Number	Number of Rooms	Car Parking Rate	Car Spaces Required	Car Spaces Provided
Boarding Room	1	7	0.5 spaces per boarding room	4	4
Manager		1	1 space per employee	0	
Boarding Room	2	7	0.5 spaces per boarding room	4	4
Manager		1	1 space per employee	0	
Boarding Room	3	7	0.5 spaces per boarding room	4	4
Manager		1	1 space per employee	0	
Total		**21**		**12**	**12**

Table 3: Car Parking Requirements and Provisions

Table 4 summarises the bicycle and motorcycle parking requirements for the proposed boarding house.

Vehicle	Number of Rooms	Parking Rate	Spaces Required	Spaces Provided
Bicycle	21	1 space per 5 boarding rooms	4	4
Motorcycle			4	4

Table 4: Bicycle and Motorcycle Parking Requirements and Provisions

The proposed boarding house provides compliant number of car, motorcycle and motorbike spaces.

The proposed boarding house is not required to provide parking for visitors. Visitors can find vacant car spaces in Park Avenue and nearby residential roads.

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

5.1 Traffic Generation

The RTA Guide to Traffic Generating Developments 2002 and the *Updated Traffic Surveys August 2013* do not publish trip generation rates for a boarding house but it does for motel rooms as follows:

- 0.4 trips per unit for the weekday AM and PM peak hour
  - This is comparable to the car parking rate of 0.5 per

For the purposes of the traffic assessment **only**, the above trip rate is used for the boarding house traffic assessment. The rate above coincides with the rate used to calculate the car parking demand.

Table 5 summarises the estimated trip generation for the proposed boarding house.

Proposed				
Peak Hour	**Use**	**Number of Rooms**	**Trip Generation Rate**	**Trips Generated**
AM	Boarding Room	21	0.4 trips per room	9
PM			0.4 trips per room	9

Table 5: Estimated Trip Generation for the Proposed Boarding House

Table 6 summarises the trip distribution for both AM and PM peak hours.

The proposed boarding house will generate a low number of additional trips in the AM and PM peak hours.

Peak Hour	Origin	Destination	Total
AM	7	2	9
PM	2	7	9

Table 6: Trip Distribution.

5.2 Forecast Traffic Volumes

The following figures present the existing and with boarding house traffic volumes for the two peak hours distributed onto the three intersections with the boarding house traffic.

The additional boarding house traffic is in red for origin trips and blue for destination trips. The additional boarding house traffic represents a small proportion of the existing traffic.

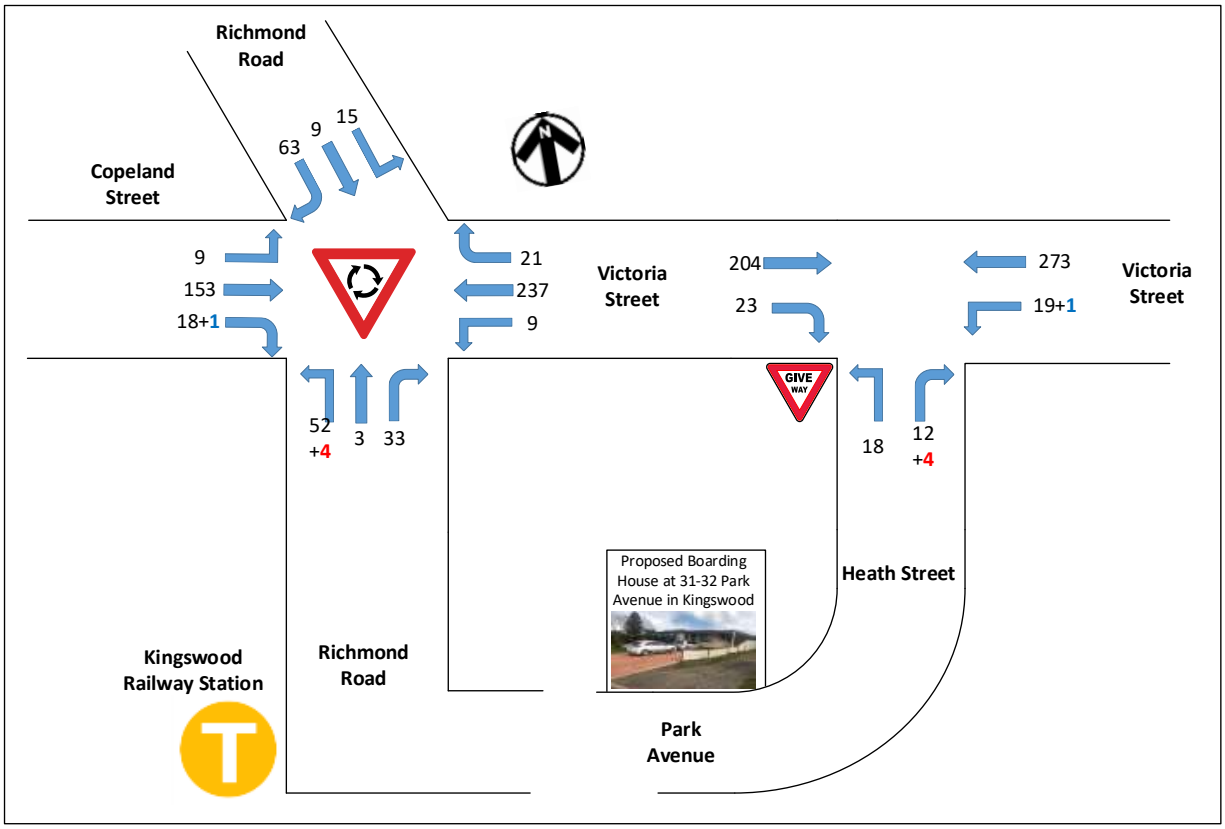


Figure 11: Existing Weekday AM Peak Hour Traffic Volumes with boarding house traffic

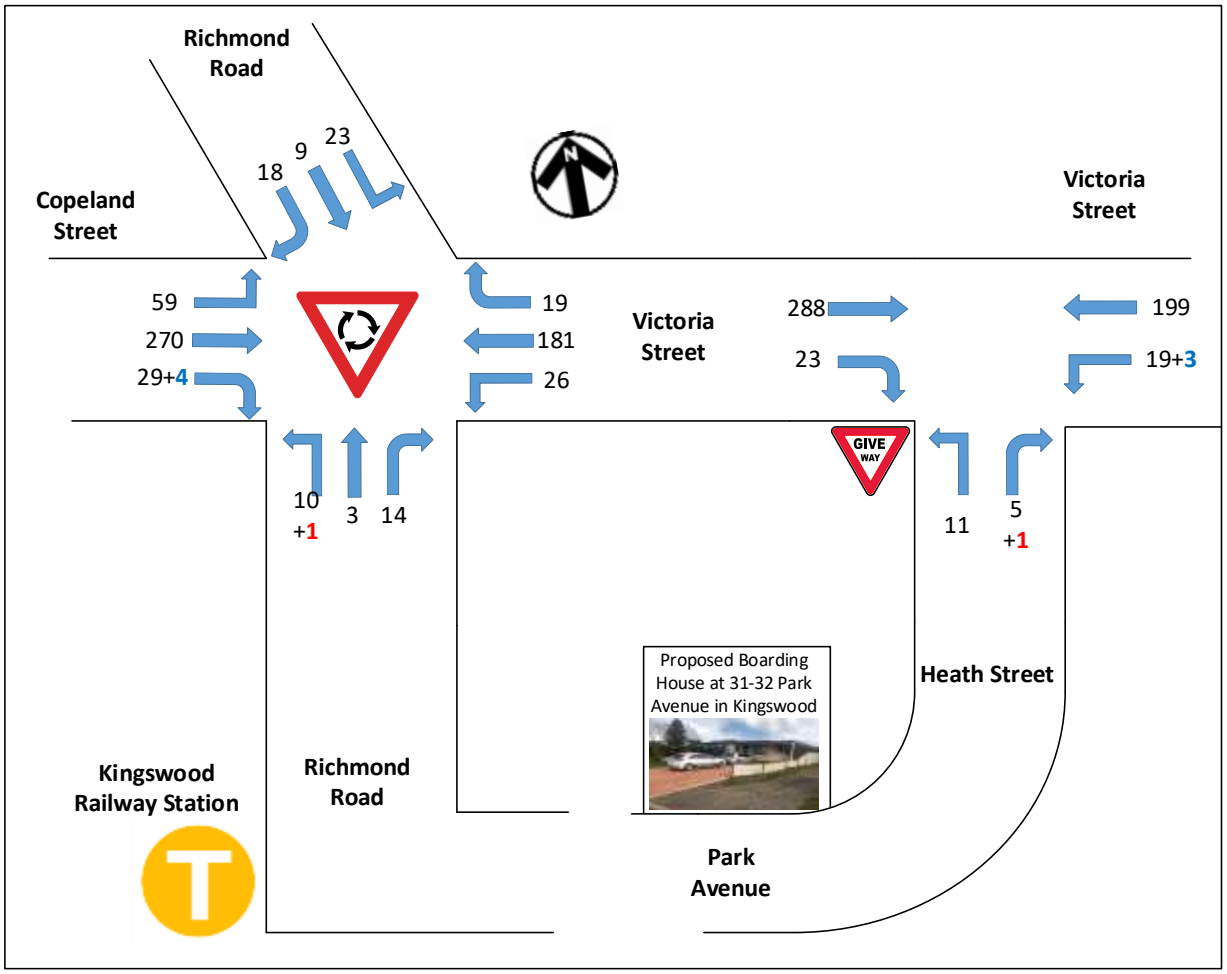


Figure 12: Existing Weekday PM Peak Hour Traffic Volumes with boarding house traffic

5.3 Intersection Assessment

This section assesses the following intersections for the existing traffic with the school traffic. The results of the intersection assessment are as follows:

Priority Intersection of Victoria Street with Heath Street

- The intersection has an overall LoS A for both AM and PM peak hours
- The additional trips do not change the overall LoS or for any turn movement

Roundabout Intersection of Victoria Street with Copeland Street and Richmond Road

- All turn movements have a LoS A for both AM and PM Peak hours
- The additional trips do not change the LoS for the overall intersection or for any turn movement

The full SIDRA results are presented in Appendix B for the existing conditions with the school traffic. The full SIDRA results are presented in Appendix A for the existing conditions.

6. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

Parking

- The proposed boarding house complies with the car, bicycle and motorbike parking requirements of the State Environmental Planning Policy

Traffic

- The proposed boarding house is a low net trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed boarding house can be accommodated at the nearby intersection without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning permit for the proposed boarding housing development at 31-32 Park Avenue in Kingswood, should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Richmond Road														
1	L2	52	0.0	55	0.0	0.092	5.1	LOS A	0.5	3.3	0.48	0.61	0.48	44.6
1a	L1	3	0.0	3	0.0	0.092	4.8	LOS A	0.5	3.3	0.48	0.61	0.48	45.3
3	R2	33	0.0	35	0.0	0.092	8.7	LOS A	0.5	3.3	0.48	0.61	0.48	45.5
Approach		88	0.0	93	0.0	0.092	6.5	LOS A	0.5	3.3	0.48	0.61	0.48	44.9
East: Victoria Street														
4	L2	9	0.0	9	0.0	0.217	3.9	LOS A	1.3	8.9	0.28	0.43	0.28	45.6
5	T1	237	0.0	249	0.0	0.217	3.9	LOS A	1.3	8.9	0.28	0.43	0.28	47.3
6a	R1	21	0.0	22	0.0	0.217	6.7	LOS A	1.3	8.9	0.28	0.43	0.28	46.9
Approach		267	0.0	281	0.0	0.217	4.2	LOS A	1.3	8.9	0.28	0.43	0.28	47.2
NorthWest: Richmond Road														
27a	L1	15	0.0	16	0.0	0.082	4.2	LOS A	0.4	2.9	0.38	0.61	0.38	45.2
29a	R1	9	0.0	9	0.0	0.082	7.3	LOS A	0.4	2.9	0.38	0.61	0.38	44.1
29b	R3	63	0.0	66	0.0	0.082	8.9	LOS A	0.4	2.9	0.38	0.61	0.38	45.7
Approach		87	0.0	92	0.0	0.082	7.9	LOS A	0.4	2.9	0.38	0.61	0.38	45.5
West: Copeland Street														
10b	L3	9	0.0	9	0.0	0.141	4.0	LOS A	0.8	5.4	0.20	0.42	0.20	46.3
11	T1	153	0.0	161	0.0	0.141	3.7	LOS A	0.8	5.4	0.20	0.42	0.20	47.5
12	R2	18	0.0	19	0.0	0.141	7.3	LOS A	0.8	5.4	0.20	0.42	0.20	46.7
Approach		180	0.0	189	0.0	0.141	4.1	LOS A	0.8	5.4	0.20	0.42	0.20	47.3
All Vehicles		622	0.0	655	0.0	0.217	5.0	LOS A	1.3	8.9	0.30	0.48	0.30	46.7

Table A1: Intersection Performance of Victoria Street with Copeland Street and Richmond Road Weekday AM Peak Hour Existing Conditions

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Richmond Road														
1	L2	52	0.0	55	0.0	0.092	5.1	LOS A	0.5	3.3	0.48	0.61	0.48	44.6
1a	L1	3	0.0	3	0.0	0.092	4.8	LOS A	0.5	3.3	0.48	0.61	0.48	45.3
3	R2	33	0.0	35	0.0	0.092	8.7	LOS A	0.5	3.3	0.48	0.61	0.48	45.5
Approach		88	0.0	93	0.0	0.092	6.5	LOS A	0.5	3.3	0.48	0.61	0.48	44.9
East: Victoria Street														
4	L2	9	0.0	9	0.0	0.217	3.9	LOS A	1.3	8.9	0.28	0.43	0.28	45.6
5	T1	237	0.0	249	0.0	0.217	3.9	LOS A	1.3	8.9	0.28	0.43	0.28	47.3
6a	R1	21	0.0	22	0.0	0.217	6.7	LOS A	1.3	8.9	0.28	0.43	0.28	46.9
Approach		267	0.0	281	0.0	0.217	4.2	LOS A	1.3	8.9	0.28	0.43	0.28	47.2
NorthWest: Richmond Road														
27a	L1	15	0.0	16	0.0	0.082	4.2	LOS A	0.4	2.9	0.38	0.61	0.38	45.2
29a	R1	9	0.0	9	0.0	0.082	7.3	LOS A	0.4	2.9	0.38	0.61	0.38	44.1
29b	R3	63	0.0	66	0.0	0.082	8.9	LOS A	0.4	2.9	0.38	0.61	0.38	45.7
Approach		87	0.0	92	0.0	0.082	7.9	LOS A	0.4	2.9	0.38	0.61	0.38	45.5
West: Copeland Street														
10b	L3	9	0.0	9	0.0	0.141	4.0	LOS A	0.8	5.4	0.20	0.42	0.20	46.3
11	T1	153	0.0	161	0.0	0.141	3.7	LOS A	0.8	5.4	0.20	0.42	0.20	47.5
12	R2	18	0.0	19	0.0	0.141	7.3	LOS A	0.8	5.4	0.20	0.42	0.20	46.7
Approach		180	0.0	189	0.0	0.141	4.1	LOS A	0.8	5.4	0.20	0.42	0.20	47.3
All Vehicles		622	0.0	655	0.0	0.217	5.0	LOS A	1.3	8.9	0.30	0.48	0.30	46.7

Table A2: Intersection Performance of Victoria Street with Heath Street Weekday AM Peak Hour Existing Conditions

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Richmond Road														
1	L2	10	0.0	11	0.0	0.026	4.4	LOS A	0.1	0.9	0.37	0.55	0.37	44.6
1a	L1	3	0.0	3	0.0	0.026	4.2	LOS A	0.1	0.9	0.37	0.55	0.37	45.3
3	R2	14	0.0	15	0.0	0.026	8.1	LOS A	0.1	0.9	0.37	0.55	0.37	45.5
Approach		27	0.0	28	0.0	0.026	6.3	LOS A	0.1	0.9	0.37	0.55	0.37	45.1
East: Victoria Street														
4	L2	26	0.0	27	0.0	0.175	3.7	LOS A	1.0	6.7	0.20	0.42	0.20	45.9
5	T1	181	0.0	191	0.0	0.175	3.7	LOS A	1.0	6.7	0.20	0.42	0.20	47.5
6a	R1	19	0.0	20	0.0	0.175	6.5	LOS A	1.0	6.7	0.20	0.42	0.20	47.1
Approach		226	0.0	238	0.0	0.175	4.0	LOS A	1.0	6.7	0.20	0.42	0.20	47.3
NorthWest: Richmond Road														
27a	L1	23	0.0	24	0.0	0.052	4.7	LOS A	0.3	1.8	0.45	0.60	0.45	45.8
29a	R1	9	0.0	9	0.0	0.052	7.8	LOS A	0.3	1.8	0.45	0.60	0.45	44.7
29b	R3	18	0.0	19	0.0	0.052	9.4	LOS A	0.3	1.8	0.45	0.60	0.45	46.3
Approach		50	0.0	53	0.0	0.052	7.0	LOS A	0.3	1.8	0.45	0.60	0.45	45.8
West: Copeland Street														
10b	L3	59	0.0	62	0.0	0.257	3.9	LOS A	1.5	10.7	0.16	0.42	0.16	46.5
11	T1	270	0.0	284	0.0	0.257	3.6	LOS A	1.5	10.7	0.16	0.42	0.16	47.6
12	R2	29	0.0	31	0.0	0.257	7.2	LOS A	1.5	10.7	0.16	0.42	0.16	46.9
Approach		358	0.0	377	0.0	0.257	4.0	LOS A	1.5	10.7	0.16	0.42	0.16	47.4
All Vehicles		661	0.0	696	0.0	0.257	4.3	LOS A	1.5	10.7	0.21	0.44	0.21	47.2

Table A3: Intersection Performance of Victoria Street with Copeland Street and Richmond Road Weekday PM Peak Hour Existing Conditions

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heath Street														
1	L2	11	0.0	12	0.0	0.017	4.0	LOS A	0.1	0.4	0.34	0.50	0.34	35.7
3	R2	5	0.0	5	0.0	0.017	7.2	LOS A	0.1	0.4	0.34	0.50	0.34	36.5
Approach		16	0.0	17	0.0	0.017	5.0	LOS A	0.1	0.4	0.34	0.50	0.34	36.0
East: Victoria Street														
4	L2	19	0.0	20	0.0	0.011	3.4	LOS A	0.0	0.0	0.00	0.45	0.00	37.8
5	T1	199	0.0	209	0.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		218	0.0	229	0.0	0.107	0.3	NA	0.0	0.0	0.00	0.04	0.00	39.8
West: Victoria Street														
11	T1	288	0.0	303	0.0	0.177	0.1	LOS A	0.2	1.6	0.07	0.04	0.07	39.6
12	R2	23	0.0	24	0.0	0.177	4.6	LOS A	0.2	1.6	0.07	0.04	0.07	39.0
Approach		311	0.0	327	0.0	0.177	0.5	NA	0.2	1.6	0.07	0.04	0.07	39.6
All Vehicles		545	0.0	574	0.0	0.177	0.5	NA	0.2	1.6	0.05	0.05	0.05	39.6

Table A4: Intersection Performance of Victoria Street with Heath Street Weekday PM Peak Hour Existing Conditions

APPENDIX B

SIDRA Intersection Results for Existing Traffic Conditions with boarding house traffic

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Richmond Road														
1	L2	56	0.0	59	0.0	0.096	5.1	LOS A	0.5	3.5	0.48	0.61	0.48	44.6
1a	L1	3	0.0	3	0.0	0.096	4.8	LOS A	0.5	3.5	0.48	0.61	0.48	45.3
3	R2	33	0.0	35	0.0	0.096	8.7	LOS A	0.5	3.5	0.48	0.61	0.48	45.5
Approach		92	0.0	97	0.0	0.096	6.4	LOS A	0.5	3.5	0.48	0.61	0.48	45.0
East: Victoria Street														
4	L2	9	0.0	9	0.0	0.217	3.9	LOS A	1.3	8.9	0.28	0.43	0.28	45.6
5	T1	237	0.0	249	0.0	0.217	3.9	LOS A	1.3	8.9	0.28	0.43	0.28	47.3
6a	R1	21	0.0	22	0.0	0.217	6.7	LOS A	1.3	8.9	0.28	0.43	0.28	46.9
Approach		267	0.0	281	0.0	0.217	4.2	LOS A	1.3	8.9	0.28	0.43	0.28	47.2
NorthWest: Richmond Road														
27a	L1	15	0.0	16	0.0	0.082	4.2	LOS A	0.4	2.9	0.38	0.62	0.38	45.2
29a	R1	9	0.0	9	0.0	0.082	7.3	LOS A	0.4	2.9	0.38	0.62	0.38	44.1
29b	R3	63	0.0	66	0.0	0.082	8.9	LOS A	0.4	2.9	0.38	0.62	0.38	45.7
Approach		87	0.0	92	0.0	0.082	7.9	LOS A	0.4	2.9	0.38	0.62	0.38	45.5
West: Copeland Street														
10b	L3	9	0.0	9	0.0	0.142	4.0	LOS A	0.8	5.4	0.20	0.42	0.20	46.3
11	T1	153	0.0	161	0.0	0.142	3.7	LOS A	0.8	5.4	0.20	0.42	0.20	47.4
12	R2	19	0.0	20	0.0	0.142	7.3	LOS A	0.8	5.4	0.20	0.42	0.20	46.7
Approach		181	0.0	191	0.0	0.142	4.1	LOS A	0.8	5.4	0.20	0.42	0.20	47.3
All Vehicles		627	0.0	660	0.0	0.217	5.0	LOS A	1.3	8.9	0.30	0.48	0.30	46.7

Table B1: Intersection Performance of Victoria Street with Copeland Street and Richmond Road Weekday AM Peak Hour with boarding house traffic

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heath Street														
1	L2	18	0.0	19	0.0	0.041	4.3	LOS A	0.2	1.1	0.43	0.57	0.43	35.2
3	R2	16	0.0	17	0.0	0.041	6.9	LOS A	0.2	1.1	0.43	0.57	0.43	36.1
Approach		34	0.0	36	0.0	0.041	5.6	LOS A	0.2	1.1	0.43	0.57	0.43	35.7
East: Victoria Street														
4	L2	18	0.0	19	0.0	0.010	3.4	LOS A	0.0	0.0	0.00	0.45	0.00	37.8
5	T1	273	0.0	287	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		291	0.0	306	0.0	0.147	0.2	NA	0.0	0.0	0.00	0.03	0.00	39.8
West: Victoria Street														
11	T1	204	0.0	215	0.0	0.113	0.0	LOS A	0.0	0.2	0.02	0.01	0.02	39.9
12	R2	3	0.0	3	0.0	0.113	5.0	LOS A	0.0	0.2	0.02	0.01	0.02	39.4
Approach		207	0.0	218	0.0	0.113	0.1	NA	0.0	0.2	0.02	0.01	0.02	39.9
All Vehicles		532	0.0	560	0.0	0.147	0.5	NA	0.2	1.1	0.03	0.05	0.03	39.6

B2: Intersection Performance of Victoria Street with Heath Street Weekday AM Peak Hour with boarding house traffic

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Richmond Road														
1	L2	11	0.0	12	0.0	0.027	4.4	LOS A	0.1	0.9	0.37	0.55	0.37	44.6
1a	L1	3	0.0	3	0.0	0.027	4.2	LOS A	0.1	0.9	0.37	0.55	0.37	45.3
3	R2	14	0.0	15	0.0	0.027	8.1	LOS A	0.1	0.9	0.37	0.55	0.37	45.5
Approach		28	0.0	29	0.0	0.027	6.2	LOS A	0.1	0.9	0.37	0.55	0.37	45.1
East: Victoria Street														
4	L2	26	0.0	27	0.0	0.175	3.7	LOS A	1.0	6.7	0.20	0.42	0.20	45.9
5	T1	181	0.0	191	0.0	0.175	3.7	LOS A	1.0	6.7	0.20	0.42	0.20	47.5
6a	R1	19	0.0	20	0.0	0.175	6.5	LOS A	1.0	6.7	0.20	0.42	0.20	47.1
Approach		226	0.0	238	0.0	0.175	4.0	LOS A	1.0	6.7	0.20	0.42	0.20	47.3
NorthWest: Richmond Road														
27a	L1	23	0.0	24	0.0	0.052	4.7	LOS A	0.3	1.8	0.45	0.60	0.45	45.8
29a	R1	9	0.0	9	0.0	0.052	7.8	LOS A	0.3	1.8	0.45	0.60	0.45	44.7
29b	R3	18	0.0	19	0.0	0.052	9.4	LOS A	0.3	1.8	0.45	0.60	0.45	46.3
Approach		50	0.0	53	0.0	0.052	7.0	LOS A	0.3	1.8	0.45	0.60	0.45	45.8
West: Copeland Street														
10b	L3	59	0.0	62	0.0	0.257	3.9	LOS A	1.5	10.7	0.16	0.42	0.16	46.5
11	T1	270	0.0	284	0.0	0.257	3.6	LOS A	1.5	10.7	0.16	0.42	0.16	47.6
12	R2	29	0.0	31	0.0	0.257	7.2	LOS A	1.5	10.7	0.16	0.42	0.16	46.9
Approach		358	0.0	377	0.0	0.257	4.0	LOS A	1.5	10.7	0.16	0.42	0.16	47.4
All Vehicles		662	0.0	697	0.0	0.257	4.3	LOS A	1.5	10.7	0.21	0.44	0.21	47.2

Table B3: Intersection Performance of Victoria Street with Copeland Street and Richmond Road Weekday PM Peak Hour with boarding house traffic

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heath Street														
1	L2	11	0.0	12	0.0	0.019	4.0	LOS A	0.1	0.5	0.35	0.51	0.35	35.5
3	R2	6	0.0	6	0.0	0.019	7.2	LOS A	0.1	0.5	0.35	0.51	0.35	36.4
Approach		17	0.0	18	0.0	0.019	5.1	LOS A	0.1	0.5	0.35	0.51	0.35	35.9
East: Victoria Street														
4	L2	22	0.0	23	0.0	0.012	3.4	LOS A	0.0	0.0	0.00	0.45	0.00	37.8
5	T1	199	0.0	209	0.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		221	0.0	233	0.0	0.107	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.8
West: Victoria Street														
11	T1	288	0.0	303	0.0	0.177	0.1	LOS A	0.2	1.6	0.07	0.04	0.07	39.6
12	R2	23	0.0	24	0.0	0.177	4.7	LOS A	0.2	1.6	0.07	0.04	0.07	39.0
Approach		311	0.0	327	0.0	0.177	0.5	NA	0.2	1.6	0.07	0.04	0.07	39.6
All Vehicles		549	0.0	578	0.0	0.177	0.6	NA	0.2	1.6	0.05	0.06	0.05	39.6

Table B4: Intersection Performance of Victoria Street with Heath Street Weekday PM Peak Hour with boarding house traffic

BCA REPORT

Proposed BOARDING HOUSE at
LOT 15 & LOT 16
31-32 PARK AVE, KINGSWOOD
NSW 2747

ARCHIDROME
ARCHITECTURE
INTERIOR DESIGN

REGISTERED ARCHITECT: TARUN CHADHA: 8777 ABN: 39274159604 TARUNCHADHA@ARCHIDROME.NET 0433 901 701

Table of Contents

1. BASIS OF ASSESSMENT

1.1 Location and Description

The building development, the subject of this report, is located at 31-32 Park Ave, Kingswood 2747. The proposed works involve the construction of three boarding house with on-site car parking.

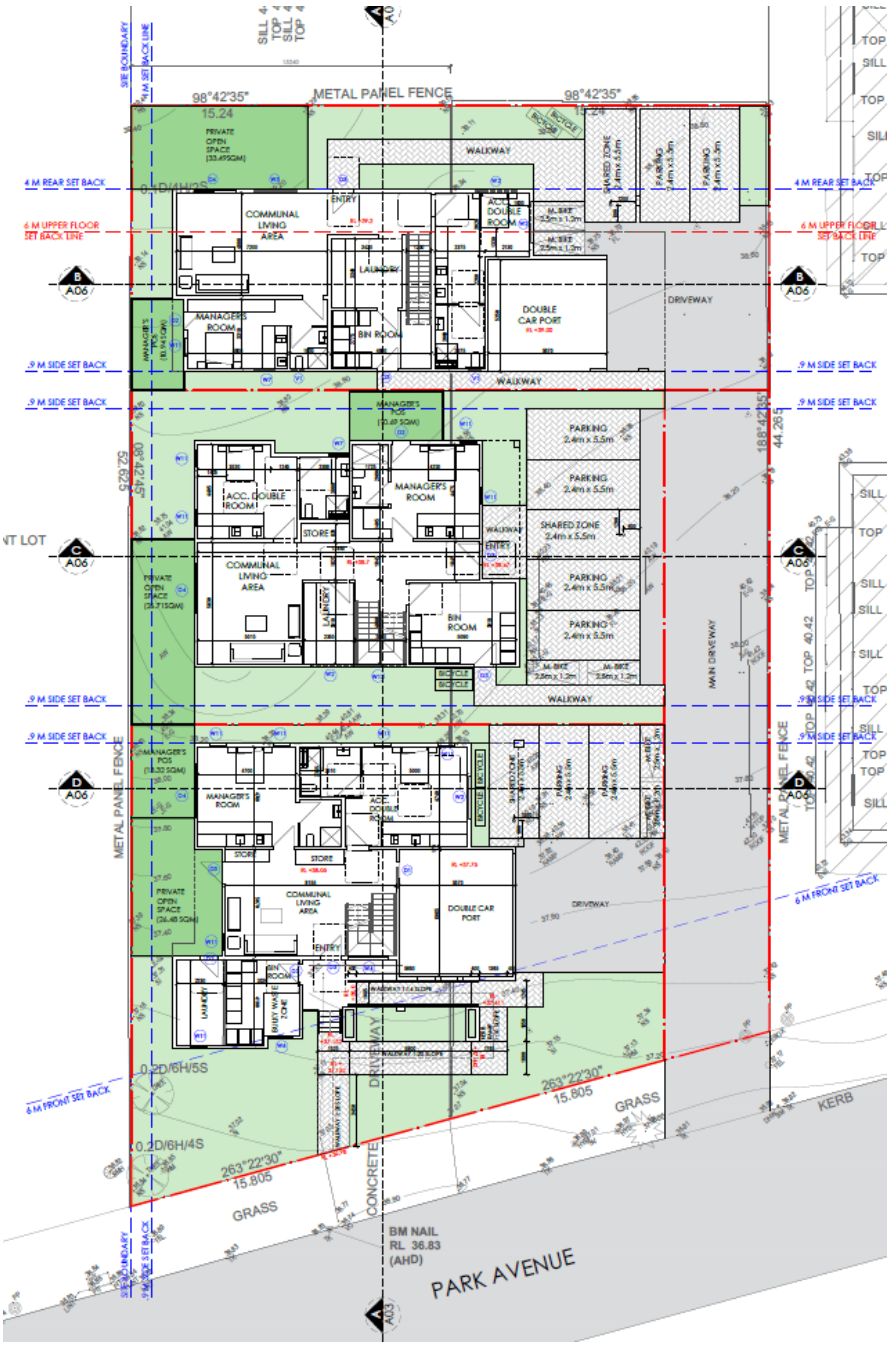


Figure 1: Ground Floor plan

1.2 Purpose

The purpose of this report is to assess the current design proposal against the Deemed-to-Satisfy Provisions of BCA 2019. The report will clearly outline those areas (if any) where compliance is not achieved, where areas may warrant redesign to achieve strict BCA compliance or where areas may be able to be assessed against the relevant performance criteria of BCA2019.

1.3 Building Code of Australia

This report is based on the Deemed-to-Satisfy Provisions of the National Construction Code Series Volume 2 - Building Code of Australia, 2019 Edition (BCA) incorporating the State variations where applicable. Please note that the version of the BCA applicable to new building works is the version applicable at the time of the lodgement of the Construction Certificate application to the Accredited Certifying Authority. The BCA is updated generally on a three-yearly cycle, starting from the 1st of May 2016.
For the purposes of the Building Code of Australia (BCA) each building may be classified as follows.

Table 1. Building Classification

Class	Description
1b	Boarding House

1.4 Limitations

This report does not include nor imply any detailed assessment for design, compliance or upgrading for: the structural adequacy or design of the building; the inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and the design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.
This report does not include or imply compliance with : the National Construction Code – Plumbing Code of Australia Volume 3 the BCA provisions relevant to access for people with a disability. Note: Access requirements for people with disabilities in Class 1b buildings are contained in Part D3 of NCC Volume One – Refer to separate Access Report. the requirements for Construction of Buildings in Bushfire Areas as outlined in AS3959. Demolition Standards not referred to by the BCA; Work Health and Safety Act 2011; Requirements of other Regulatory Authorities including, but not limited to, Telstra, Sydney Water, Electricity Supply Authority, WorkCover, Roads and Maritime Services (RMS), Roads and Transport Authority, Local Council, ARTC, Department of planning and the like; and Conditions of Development Consent issued by the Local Consent Authority.

1.5 Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

2 STATEMENT OF COMPLIANCE

The architectural design documentation as referred to in this report has been assessed against the applicable provisions of the Building Code of Australia, (BCA2019) and it is considered that such documentation complies or is capable of complying (as outlined in Annexure B) with that Code.

ANNEXURE A - DESIGN DOCUMENTATION

This report has been based on the following design documentation.

Architectural Plans Prepared by Archidrome Pty Ltd			
Drawing Number	**Revision**	**Date**	**Title**
A00	R-00	03.11.2020	SITE ANALYSIS
A01_1	R-01	23.10.2020	SUB-DIVISION PLAN
A01	R-01	03.11.2020	SITE & GROUND FLOOR PLAN
A02	R-02	23.10.2020	FIRST FLOOR PLAN
A03	R-02	03.11.2020	ROOF PLAN
A04	R-02	03.11.2020	SECTIONS
A05	R-01	03.11.2020	ELEVATIONS_LOT 1
A06	R-00	22.10.2020	ELEVATIONS_LOT 2
A07	R-00	22.10.2020	ELEVATIONS_LOT 3
A08	R-01	23.10.2020	EXTERNAL DOOR & WINDOW SCHEDULE
A09	R-02	03.11.2020	GROUND FLOOR PLAN AREA SCHEDULE
A10	R-01	23.10.2020	FIRST FLOOR PLAN AREA SCHEDULE
A11	R-02	03.11.2020	GROUND FLOOR PLAN GFA CALCULATION
A12	R-01	23.10.2020	FIRST FLOOR PLAN GFA CALCULATION
A13	R-00	27.10.2020	MATERIAL SCHEDULE
A14	R-00	27.10.2020	SHADOW DIAGRAMS
A15	R-00	27.10.2020	STREETSCAPE ELEVATION
A15_1	R-00	28.10.2020	PARKSIDE FRONTAGE (WEST) ELEVATIONS FOR LOT 1, 2 & 3
A16	R-00	27.10.2020	3D VIEWS
A17	R-00	27.10.2020	3D VIEWS

A18	R-00	27.10.2020	3D VIEWS
A19	R-00	27.10.2020	NOTIFICATION PLAN LOT 1
A20	R-00	27.10.2020	NOTIFICATION PLAN LOT 2
A21	R-00	27.10.2020	NOTIFICATION PLAN LOT 3

ANNEXURE B – DETAILED BCA 2019 BUILDING ASSESSMENT

Outlined below is a detailed assessment of the Deemed-to-Satisfy Provisions of the Building Code of Australia (BCA) including the State variations where applicable.

Volume 2 of the BCA2019 specifies the Deemed-to-Satisfy (DtS) provisions as being in the form of either Acceptable construction manuals or Acceptable construction practice.

Where an Acceptable construction manual and an Acceptable construction practice contained in the same Part of Section 3 are deemed to satisfy the same component of a Performance Requirement, in order to comply with the Deemed-to-Satisfy Provisions it is only necessary to satisfy—

1. the appropriate Acceptable construction manual; or
2. the appropriate Acceptable construction practice.

Where an Acceptable construction manual and an Acceptable construction practice are deemed to satisfy different components of a Performance Requirement, compliance with the Deemed-to-Satisfy Provisions may require satisfying both the listed Acceptable construction manual and the Acceptable construction practice for their specific components.

All Deemed-to-Satisfy clauses that are applicable to the subject building have been referred to below, including a comment adjacent to each clause of the proposal's ability to satisfy each respective clause.

The abbreviations outlined below have been used in the following table.

NA	Not Applicable. The Deemed-to-Satisfy clause is not applicable to the proposed design.
Complies	The relevant provisions of the Deemed-to-Satisfy clause have been satisfied by the proposed design.
COMPLIES*	Complies at DA stage BCA review to be done at Construction Certificate stage plans
FI	Further Information is necessary to determine the compliance potential of the building design.
PS	Performance Solution with respect to this Deemed-to-Satisfy Provision is necessary to satisfy the relevant Performance Requirements.
DNC	Does Not Comply.

Noted	BCA Clause simply provides a statement not requiring specific design comment or confirmation

DEEMED TO SATISFY CLAUSE ASSESSMENT

Table 3. Deemed to Satisfy Clause Assessment

Clause	Comment	Status
Part 3.0 Structural provisions	Structural engineer to provide structural drawings/details and accompanying structural design certificate at CC stage to demonstrate that all building elements will comply with Part 3.0 of the BCA.	COMPLIES*
Part 3.1.2 Earth retaining structures	Not applicable	NA
Part 3.1.3 Drainage	Drainage must comply with Part 3.1.2 of the BCA, AS/NZS 3500.3-2018 or AS/NZS 3500.3-2018.	COMPLIES*
Part 3.1.4 Termite risk management	• Termite risk management is required to be provided to any primary building elements that are subject to termite attack. • Where a termite management system is required it must— (a) be selected appropriate to BCA Table 3.1.4.1; and (b) comply with— (i) AS 3660.1-2014; or (ii) have been tested and passed the tests required by Section 5 of AS 3660.3-2014; and (c) have a durable notice installed in accordance with 3.1.4.4; and (d) where a chemical termite management system is used, the chemical must be included on the appropriate authority's pesticides register. • A durable notice must be permanently fixed to the building in a prominent location, such as in a meter box or the like, indicating— (a) the termite management system used; and (b) the date of installation of the system; and (c) where a chemical is used, its life expectancy as listed on the appropriate authority's register label; and (d) the installer's or manufacturer's recommendations for the scope and frequency of future inspections of termite activity.	COMPLIES*
Part 3.2 Footings and slabs	Footings and slabs are to be constructed in accordance with Part 3.2 of the BCA or AS 2870-2011 except that for the purposes of Clause 5.3.3.1 of AS 2870-2011 a damp-proofing membrane is required to be provided. Any proposed piled footings must be designed in accordance with AS 2159-2009.	COMPLIES*
Part 3.3 Masonry	Masonry elements must be designed and constructed in accordance with AS 3700-2018 and AS 4773 Parts 1 & 2-2015.	COMPLIES*

Clause 3.4.0.2 Structural software	Structural software used in the design must be in accordance with Clause 3.4.0.2 of the BCA.	COMPLIES*
Part 3.4.1 Subfloor ventilation	Not applicable	NA
Part 3.4.2 Steel framing	The criteria for steel framing are satisfied if it is designed and constructed in accordance with one of the following: • NASH Standard Residential and Low-Rise Steel Framing Part 1 & 2. • AS 4100-1998 Steel Structures and • AS/NZS 4600-2018 Cold-formed steel structures.	COMPLIES*
Part 3.4.3 Timber framing	Timber framing must be designed and constructed in accordance with AS 1684.2-2010 Residential timber-framed construction Non-cyclonic areas or AS 1684.4-2010.	COMPLIES*
Part 3.4.4 Structural steel members	Structural steel members must be designed and constructed in accordance with AS 4100-1998, AS/NZS 4600-2018 or Part 3.4.4 of the BCA.	COMPLIES*
Part 3.5.1 Sheet roofing	Metal sheet roofing must comply with AS 1562.1-2018.	COMPLIES*
Part 3.5.3 Gutters and downpipes	Gutters and downpipes must be designed and installed in accordance with Part 3.5.3 of the BCA or AS/NZS 3500.3-2018 Stormwater Drainage.	COMPLIES*
Part 3.5.4 Wall cladding	Wall cladding: must be installed in accordance with NCC 3.5.4 and its sub clauses.	COMPLIES*
Part 3.5.5 Metal wall cladding	Metal wall cladding must be designed and constructed in accordance with AS 1562.1.	COMPLIES*
Part 3.6 Glazing	Glazing in the external wall must be designed and constructed in accordance with AS 2047-2014. Glazed assemblies not in an external wall must be designed and constructed in accordance with AS 1288-2006.	COMPLIES*
Clause 3.7.1.1 General concession – non-combustible materials	The following materials, though combustible or containing combustible fibres, may be used wherever a non-combustible material is required in the Housing Provisions: (a) Plasterboard. (b) Perforated gypsum lath with a normal paper finish. (c) Fibrous-plaster sheet. (d) Fibre-reinforced cement sheeting. (e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thick and where the Spreadof-Flame Index of the product is not more than 0. (f) Sarking-type materials that do not exceed 1 mm in thickness and have a flammability index not greater than 5. (g) Bonded laminated materials where— (i) each lamina, including any core, is non-combustible; and (ii) each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2 mm; and	Note

	(iii) the Spread-of-Flame Index and the Smoke-Developed Index of the bonded laminated material as a whole do not exceed 0 and 3 respectively.	
Clause 3.7.1.2 Fire hazard properties	Sarking-type materials used in the roof must have a flammability index not greater than 5 when tested to AS 1530.2. Flexible ductwork used for the transfer of products initiating from a heat source that contains a flame must comply with the fire hazard properties set out in AS 4254.1.	COMPLIES*
Clause 3.7.2.7 Allowable encroachments	Encroachments allowed within 900 mm of an allotment boundary are— (i) non-combustible fascias, gutters and downpipes; and (ii) light fittings, electricity or gas meters, aerials or antennas; and (iii) pergolas, sun blinds or water tanks (see Figure 3.7.2.9); and (iv) unroofed terraces, landings, steps and ramps, not more than 1 m in height. Encroachments allowed up to but not closer than 450 mm from an allotment boundary are— (i) combustible fascias, gutters and downpipes (see Figure 3.7.2.9); and (ii) eaves with non-combustible roof cladding and non-combustible lining; and (iii) flues, chimneys, pipes, domestic fuel tanks, cooling or heating appliances or other services.	COMPLIES*
Part 3.7.3 Fire protection of separating walls and floors	Not applicable	NA
Part 3.7.4 Fire separation of garage top dwellings	Not applicable	NA
Clause 3.7.5.2 Requirements for smoke alarms	Smoke alarms must— • Comply with AS 3786-2014; and • be connected to the consumer mains power where consumer power is supplied to the building; and • be interconnected where there is more than one alarm.	COMPLIES*
Clause 3.7.5.4 Location – Class 1b buildings	In a Class 1b building, smoke alarms must be located — (a) in every bedroom; and (b) in every corridor or hallway associated with a bedroom, or if there is no corridor or hallway, in an area between the bedrooms and the remainder of the building; and (c) on each other storey.	COMPLIES*

Clause 3.7.5.5 Installation of smoke alarms	Smoke alarms required by 3.7.5.3 and 3.7.5.4 must be installed on or near the ceiling, in accordance with the following: (a) Where a smoke alarm is located on the ceiling it must be— (i) a minimum of 300 mm away from the corner junction of the wall and ceiling; and(ii) between 500 mm and 1500 mm away from the high point and apexes of the ceiling, if the room has a sloping ceiling. (b) Where (a) is not possible, the smoke alarm may be installed on the wall, and located a minimum of 300 mm and a maximum of 500 mm off the ceiling at the junction with the wall	COMPLIES*
Clause 3.7.5.6 Lighting to assist evacuation – Class 1b buildings	In a Class 1b building, a system of lighting must be installed to assist evacuation of occupants in the event of a fire, and— (a) be activated by the smoke alarm required by 3.7.5.4(b); and (b) consist of— (i) a light incorporated within the smoke alarm; or (ii) the lighting located in the corridor, hallway or area served by the smoke alarm.	COMPLIES*
Clause 3.8.1.2 Wet areas	Building elements in wet areas within a building must— (a) be waterproof or water resistant in accordance with Table 3.8.1.1; and (b) comply with AS 3740-2010.	COMPLIES*
Clause 3.8.1.3 External above ground membranes	Waterproofing membranes for external above ground use must comply with AS 4654-2012 Parts 1 and 2.	COMPLIES*
Part 3.8.2 Room heights	Heights of rooms and other spaces (see Figure 3.8.2.1) ust be not less than– (a) in a habitable room excluding a kitchen — 2.4 m; and (b) in a kitchen — 2.1 m; and (c) in a corridor, passageway or the like — 2.1 m; and (d) in a bathroom, shower room, laundry, sanitary compartment, airlock, pantry, storeroom, garage, car parking area or the like — 2.1 m; and (e) in a room or space with a sloping ceiling or projections below the ceiling line within— (i) a habitable room - a height of not less than 2.4 m over two-thirds of the floor area of the room or space; and (ii) a non-habitable room — a height of not less than 2.1 m for at least two-thirds of the floor area of the room or space, and when calculating the floor area of a room or space, any part that has a ceiling height of less than 1.5 m is not included; and (f) in a stairway, ramp, landing, or the like — 2.0 m measured vertically above the nosing line of the stairway treads or the floor surface of a ramp, landing or the like.	Complies
Clause 3.8.3.2 Facilities	A Class 1 building must be provided with a kitchen sink and facility for preparation of cooking food, a bath or shower, a closet pan and washbasin and clothes washing facilities comprising of at least one washtub and space for a washing machine.	Complies
Clause 3.8.3.3 Construction of sanitary compartments	The door to a fully enclosed sanitary compartment must— (a) open outwards; or (b) slide; or (c) be readily removable from the outside of the compartment,	COMPLIES*

	unless there is a clear space of at least 1.2 m between the closet pan within the sanitary compartment and the doorway.	
Clause 3.8.4.2 Natural light	Natural lighting must be provided in a Class 1 building to all habitable rooms, in accordance with the following: a) Natural lighting must be provided by— (i) windows, excluding roof lights that— (A) have an aggregate light transmitting area measured exclusive of framing members, glazing bars or other obstructions of not less than 10% of the floor area of the room; and (B) are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like; or (ii) roof lights that— (A) have an aggregate light transmitting area measured exclusive of framing members, glazing bars or other obstructions of not less than 3% of the floor area of the room; and (B) are open to the sky; or (iii) a proportional combination of windows and roof lights required by (i) and (ii). b) A window required to provide natural light that faces a boundary of an adjoining allotment must not be less than a horizontal distance of 900 mm from that boundary. c) Natural lighting to a room in a Class 1 building may come through a glazed panel or opening from an adjoining room (including an enclosed verandah) if— (i) the glazed panel or opening has an area of not less than 10% of the floor area of the room to which it provides light; and (ii) the adjoining room has— (A) windows, excluding roof lights that— (aa) have an aggregate light transmitting area of not less than 10% of the combined floor area of both rooms; and (bb) are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like; or (B) roof lights that— (aa) have an aggregate light transmitting area of not less than 3% of the combined floor area of both rooms; and (bb) are open to the sky; or (C) a proportional combination of windows and roof lights required by (A) and (B). (iii) the areas specified in (i) and (ii) may be reduced as appropriate if direct natural light is provided from another source.	COMPLIES
Clause 3.8.4.3 Artificial lighting	Sanitary compartments, bathrooms, shower rooms, airlocks and laundries must be provided with artificial light if natural lighting in accordance with the relevant provisions of 3.8.4.2 is not available— (a) at a rate of not less than one light fitting per 16 m2 of floor area; or (b) in accordance with AS/NZS 1680.0-2009.	COMPLIES*

Clause 3.8.5.2 Ventilation requirements	Ventilation must be provided to a habitable room, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose by any of the following means: (a) Openings, windows, doors or other devices which can be opened— (i) with a ventilating area not less than 5% of the floor area of the room required to be ventilated; and (ii) open to— (A) a suitably sized court, or space open to the sky; or (B) an open verandah, carport, or the like; or (C) an adjoining room in accordance with (b) (ii) open to— (A) a suitably sized court, or space open to the sky; or (B) an open verandah, carport, or the like; or (C) an adjoining room in accordance with (b). (b) Natural ventilation to a room may come through a window, opening, door or other device from an adjoining room (including an enclosed verandah) if— (i) the room to be ventilated or the adjoining room is not a sanitary compartment; and (ii) the window, opening, door or other device has a ventilating area of not less than 5% of the floor area of the room to be ventilated; and (iii) the adjoining room has a window, opening, door or other device with a ventilating area of not less than 5% of the combined floor areas of both rooms; and (iv) the ventilating areas specified may be reduced as appropriate if direct natural ventilation is provided from another source. (See Figure 3.8.5.1) (c) An exhaust fan or other means of mechanical ventilation may be used to ventilate a sanitary compartment, laundry or bathroom, or where mechanical ventilation is provided in accordance with 3.8.5.3(b), provided contaminated air exhausts— (i) directly to outside the building by way of ducts; or (ii) into a roof space that— (A) is adequately ventilated by open eaves, and/or roof vents; or (B) is covered by roof tiles without sarking or similar materials which would prevent venting through gaps between the tiles.	COMPLIES*
Clause 3.8.5.3 Location of sanitary compartments	Sanitary compartments must not open directly into a kitchen or pantry unless— (a) access is by an airlock, hallway or other room, (see Figure 3.8.5.2); or (b) the sanitary compartment is provided with an exhaust fan or other means of mechanical exhaust ventilation	COMPLIES*
Part 3.8.6 Sound insulation	Not applicable	NA

Clause 3.8.7.2 Pliable building membrane	(a) Where a pliable building membrane is installed in an external wall, it must— (i) comply with AS/NZS 4200.1; and (ii) be installed in accordance with AS 4200.2; and (iii) be a vapour permeable membrane for climate zones 6, 7 and 8; and (iv) be located on the exterior side of the primary insulation layer of wall assemblies that form the external envelope of a building. (b) Except for single skin masonry or single skin concrete, where a pliable building membrane is not installed in an external wall, the primary water control layer must be separated from water sensitive materials by a drained cavity.	COMPLIES*
Clause 3.8.7.3 Flow rate and discharge of exhaust systems	(a) An exhaust system installed in a kitchen, bathroom, sanitary compartment or laundry must have a minimum flow rate of— (i) 25 L/s for a bathroom or sanitary compartment; and (ii) 40 L/s for a kitchen or laundry. (b) Exhaust from a bathroom, sanitary compartment, or laundry must be discharged— (i) directly or via a shaft or duct to outdoor air; or (ii) to a roof space that is ventilated in accordance with 3.8.7.4.	COMPLIES*
3.8.7.4 Ventilation of roof spaces	(a) Where an exhaust system covered by 3.8.7.3 discharges into a roof space, the roof space must be ventilated to outdoor air through evenly distributed openings. (b) Openings required by (a) must have a total unobstructed area of 1/300 of the respective ceiling area if the roof pitch is more than 22°, or 1/150 of the respective ceiling area if the roof pitch is not more than 22°. (c) 30% of the total unobstructed area required by (b) must be located not more than 900 mm below the ridge or highest point of the roof space, measured vertically, with the remaining required area provided by eave vents.	COMPLIES*
Clause 3.9.1.2 Stairway construction	(a) The stairways must be designed to take loading forces in accordance with AS/NZS 1170.1 and must have— (ii) goings (G), risers (R) and a slope relationship quantity (2R + G) in accordance with Table 3.9.1.1, except; and (iii) constant goings and risers throughout each flight, and the dimensions of goings (G) and risers (R) are considered constant if the variation between— (A) adjacent risers, or between adjacent goings, is no greater than 5 mm; and (B) the largest and smallest riser within a flight, or the largest and smallest going within a flight, does not exceed 10 mm; and (iv) risers which do not have any openings that would allow a 125 mm sphere to pass through between the treads.	COMPLIES*
Clause 3.9.1.3 Ramps	To comply with AS1428.1	COMPLIES*

Clause 3.9.1.4 Slip-resistance	(a) Treads must have— (i) a surface with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586; or (ii) a nosing strip with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586. (c) Landings, where the edge leads to the flight below, must have— (i) a surface with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586, for not less than 190 mm from the stair nosing; or (ii) a nosing strip with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586.	COMPLIES*
Clause 3.9.1.5 Landings	Landings must have a gradient not steeper than 1:50.	Complies
Clause 3.9.1.6 Thresholds	To comply with AS1428.1	COMPLIES*
Clause 3.9.2.3 Construction of barriers to prevent falls	Not applicable	NA
Clause 3.9.2.4 Handrails	Handrails to the stairways must— (i) be located along at least one side of the flight; and (ii) be located along the full length of the flight; and (iii) have the top surface of the handrail not less than 865 mm vertically above the nosings of the stair treads; and (iv) have no obstruction on or above them that will tend to break a handhold, except for newel posts, ball type stanchions, or the like.	COMPLIES*
Clause 3.9.2.5 Construction of wire barriers	Not applicable	NA
Clause 3.9.2.6 Protection of openable windows - bedrooms	a) Windows must be provided with protection if the floor below the window in a bedroom is 2m or more above the surface beneath. b) Where the lowest level of the window opening is less than 1.7m above the floor, a window opening covered by (a) must comply with the following: (i) The openable portion of the window must be protected with– A. a device to restrict the window opening; or B. a screen with secure fittings. (ii) A device or screen required by (i) must– A. not permit a 125 mm sphere to pass through the window opening or screen; and B. resist an outward horizontal action of 250 N against the– aa. window restrained by a device; or bb. screen protecting the opening; and C. have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden. c) A barrier with a height not less than 865 mm above the floor is required to an openable window– (i) in addition to window protection, when a child resistant screen release mechanism is required by (b)(ii)(C). d) A barrier covered by (c) must not– (i) permit a 125 mm sphere to pass through it; and	COMPLIES*

	(ii) have any horizontal or near horizontal elements between 150 mm and 760 mm above the floor that facilitate climbing.	
Clause 3.9.2.7 Protection of openable windows — rooms other than bedrooms	Not applicable	NA
Part 3.10.1 Swimming pools	Not applicable	NA
Part 3.10.2 Earthquake areas	Not applicable	NA
Part 3.10.3 Flood hazard areas	Not applicable	NA
Part 3.10.4 Construction in alpine areas	Not applicable	NA
Part 3.10.5 Construction in bushfire prone areas	Not applicable	NA
Part 3.10.6.2 Fixing decks and balconies to external walls	Not applicable	NA
Clause 3.10.6.3 Flashings to the junction of the walling plate and the external wall	Not applicable	NA
3.10.6.4 Bracing	Not applicable	NA
Part 3.10.7 Boilers, pressure vessels, heating appliances, fireplaces, chimneys and flues	Not applicable	NA
NSW Part 1.1 Garage top dwellings acceptable construction practice	Not applicable	NA
NSW 3.12.1 Application of NSW Part 3.12.1	(b) NSW PART 3.12.1 only applies to thermal insulation in a Class 1 or 10 building where a development consent specifies that the insulation is to be provided as part of the development. (c) In (b), the term development consent has the meaning given by the Environmental Planning and Assessment Act 1979. (d) The Deemed-to-Satisfy Provisions of this Part for thermal breaks apply to all Class 1 buildings with a conditioned space.	Note

NSW 3.12.1.1 (a) Thermal insulation	Thermal insulation in a building must comply with the national BCA provisions of 3.12.1.1, as follows: (a) Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it— (i) abuts or overlaps adjoining insulation other than at supporting members such as columns, studs, noggings, joists, furring channels and the like where the insulation must butt against the member; and (ii) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and (iii) does not affect the safe or effective operation of a domestic service or fitting. (b) Where required, reflective insulation must be installed with— (i) the necessary airspace, to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and (ii) the reflective insulation closely fitted against any penetration, door or window opening; and (iii) the reflective insulation adequately supported by framing members; and (iv) each adjoining sheet of roll membrane being— (A) overlapped greater than or equal to 150 mm; or (B) taped together. (c) Where required, bulk insulation must be installed so that— (i) it maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like; and (ii) in a ceiling, where there is no bulk insulation or reflective insulation in the external wall beneath, it overlaps the external wall by greater than or equal to 50 mm.	COMPLIES*
NSW 3.12.1.1 (b) Thermal breaks	A thermal break must be provided between the external cladding and framing in accordance with the following: Metal framed roof A roof that— (i) is required to achieve a minimum Total R-Value; and (ii) has metal sheet roofing directly fixed to metal purlins, metal rafters or metal battens; and (iii) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see Figure 3.12.1.1(b)), must have a thermal break, consisting of a material with an R-Value of greater than or equal to 0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters, or metal battens. Metal framed wall A wall that— (i) has lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to the metal frame; and (ii) does not have a wall lining or has a wall lining that is fixed directly to the metal frame (see Figure 3.12.1.3(a) and (b)), must have a thermal break, consisting of a material with an R-Value greater than or equal to 0.2,	COMPLIES*

	installed between the external cladding and the metal frame	
NSW 3.12.1.1 (c) Compensation for reduction in ceiling insulation	Compensation for reduction in ceiling insulation must comply with the national BCA provisions of 3.12.1.2(e), as follows: (e) Where, for operational or safety reasons associated with exhaust fans, flues or recessed downlights, the area of required ceiling insulation is reduced, the loss of insulation must be compensated for by increasing the R-Value of insulation in the remainder of the ceiling in accordance with Table 3.12.1.1h.	COMPLIES*
NSW 3.12.1.1 (d) Floor heating and cooling systems	A floor with an in-slab or in-screed heating or cooling system must comply with the national BCA provisions of— (i) 3.12.1.5(a)(ii), (iii) and (e) for a suspended floor; or (ii) 3.12.1.5(c), (d) and (e) for a concrete slab-on-ground.	COMPLIES*
NSW Part 3.12.3 Building sealing	• A seal to restrict air infiltration must be fitted to each edge of any external door, openable window or other such opening when serving a conditioned space or habitable room. NB: Windows and doors complying with the maximum air infiltration rates specified in AS 2047 need not comply. • An exhaust fan must be fitted with a sealing device such as a self-closing damper, filter or the like when serving a conditioned space or habitable room. • Roofs, external walls, external floors and any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage when forming part of the external fabric of a conditioned space or habitable room. • Any evaporative cooler must be fitted with a self-closing damper or the like when serving a heated space or habitable room.	COMPLIES*
NSW Part 3.12.5 Building services	• A heated water supply system must be designed and installed in accordance with Part B2 of NCC Volume Three – Plumbing Code of Australia. • Thermal insulation for central heating water piping and heating and cooling ductwork must— (a) be protected against the effects of weather and sunlight; and (b) be able to withstand the temperatures within the piping or ductwork; and (c) use thermal insulation material in accordance with AS/NZS 4859.1 • Central heating water piping must comply with the National provisions of BCA Clause 3.12.5.2. • Heating and cooling ductwork must– (i) achieve the material R-Value in 3.12.5.3(d); and (ii) be sealed against air loss— (A) by closing all openings in the surface, joints and seams of ductwork with adhesives, mastics, sealants or gaskets in accordance with AS 4254.1 and AS 4254.2 for a Class C seal; or (B) for flexible ductwork, with a draw band in conjunction with a sealant or adhesive tape.	COMPLIES*

COMPLIES* - Complies at DA stage BCA review to be done at Construction Certificate stage plans

Tarun Chadha

Architects Registration #8777

ACCESS COMPLIANCE REPORT

Proposed Boarding Houses at
LOT 15 & LOT 16
31-32 PARK AVE, KINGSWOOD
NSW 2747

ARCHIDROME
ARCHITECTURE
INTERIOR DESIGN
REGISTERED ARCHITECT: TARUN CHADHA: 8777 ABN: 39274159604 TARUNCHADHA@ARCHIDROME.NET 0433 901 701

Development Application

This report is for 3 proposed Boarding Houses on 3 different lots. The development is a building which is classified as:

- **Class 1B**

This report is based on the relevant components of;

- Building Code of Australia (BCA) 2016, Volume 1- Performance requirements of DP1, DP2, DP8, DP9,
- AS1428.1-2009 Part 1: General requirements for access, including any amendments
- AS1428.2-1992 Part 2: Enhanced and additional requirements- Building and facilities
- AS1428.4.1-2009 Part 4.1: TGSIs (Tactile ground surface indicators), including any amendments
- AS2890.6-2009 Part 6: Off-street parking for people with disabilities.
- Disability (Access to Premises-Building) Standards 2010 (henceforth referred to as APS)

The assessment of the proposed development has been undertaken to the extent necessary to issue DA (Development application) consent under the Environmental Planning and Assessment Act. The proposal achieves the spatial requirements to provide access for people with a disability and it is assumed that assessment of the detailed requirements such as assessment of internal fit-out, details of stairs, ramps and other features will occur at CC (Construction Certificate) stage.

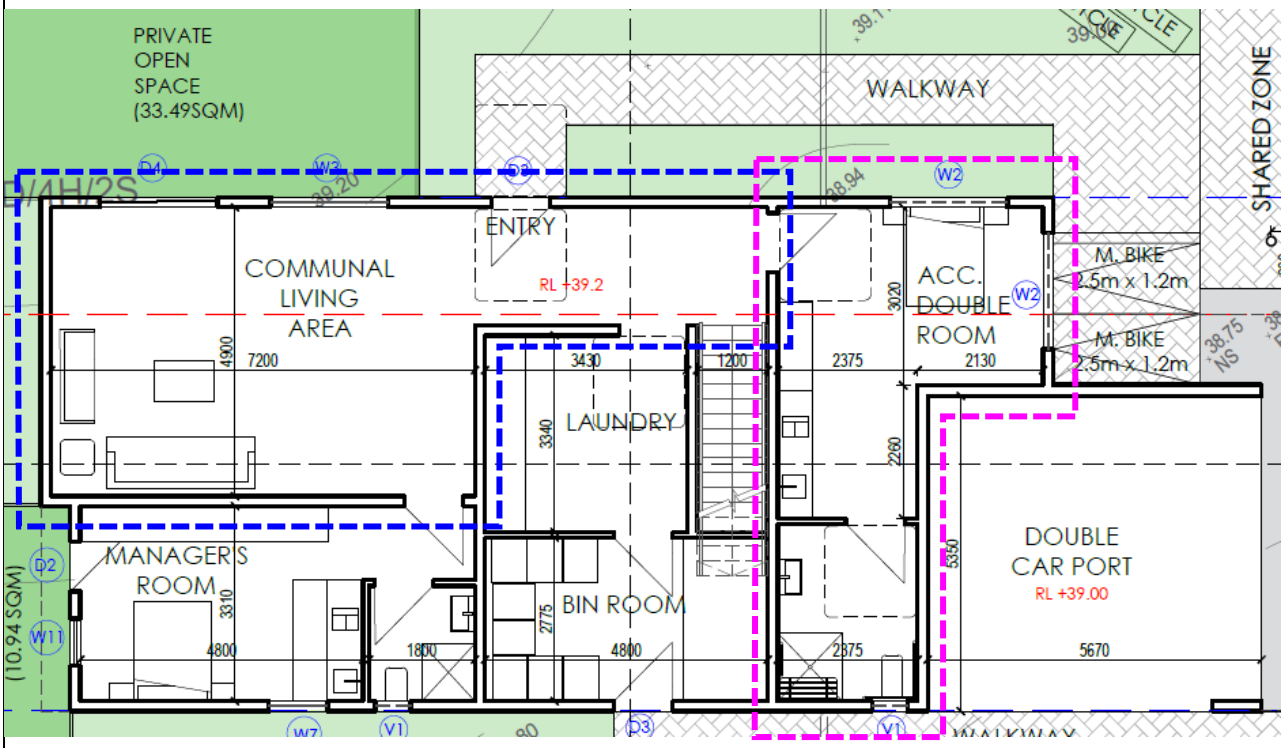
By compliance with the recommendation in this report, the development complies with the requirements of Access Code of Disability (Access to Premises-Building) Standards 2010, the Disability Access relevant sections of Building Code of Australia 2016,.

Summary

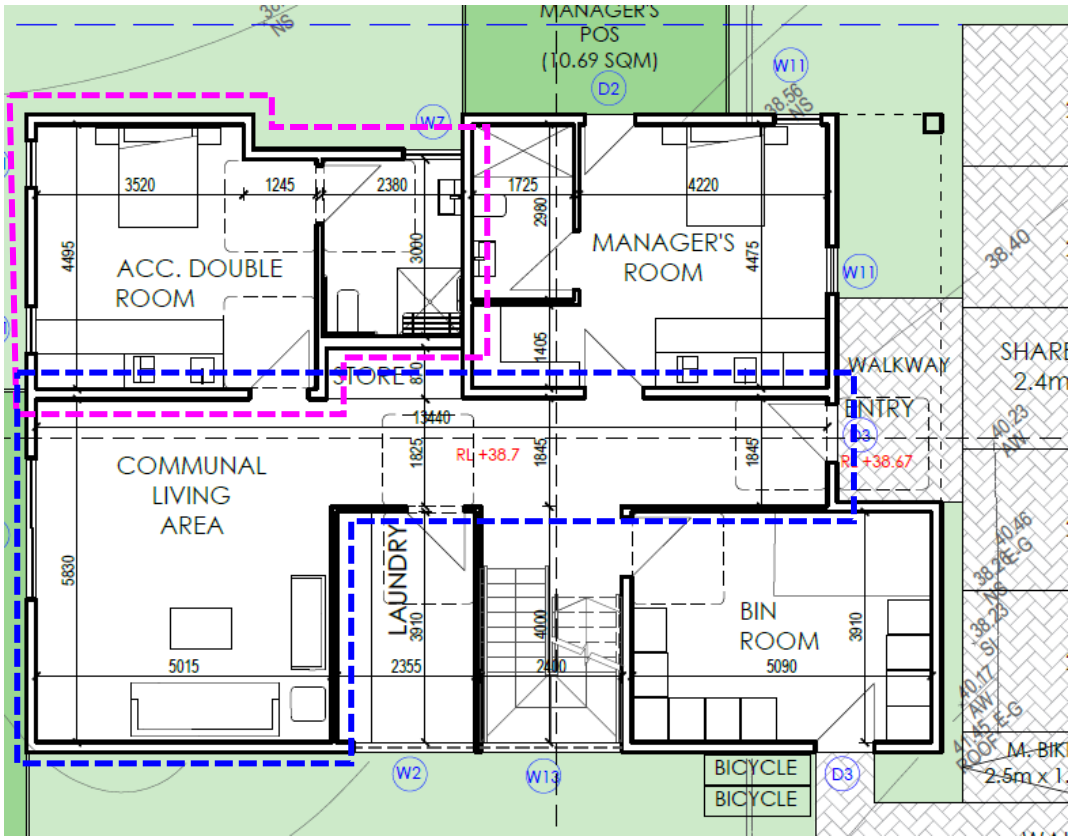
Wheelchair access is available to all areas where general access is available. It includes parking area, private open space, indoor communal living area, laundry room, bin room etc. & all the rooms connected through corridors. This is achieved through provision of complying walkways and ramps.

Compliance assessment with Access related requirements of BCA and Disability (Access to Premises-Building) Standards 2010 (APS)	
BCA Part D3 Access for People with a Disability	
BCA D3.1 General building Access requirements	
Requirement	CLASS 1B Boarding houses: 1 bedroom and associated sanitary facilities and not less than 1 of each type of room or space for use in common by the residents or guests including basic amenities on a floor to which access by way of a ramp complying with AS 1428.1 or a passenger lift is provided.
Compliance Comments	Capable of compliance - Access to all the spaces within the boarding houses has been provided by the means of walkways & ramps that complies with AS 1428.1. - An accessible room with associated accessible toilet and sanitary facilities has been provided at ground floor level. - A communal living area with basic amenities and the laundry room are accessible by a way of ramp complying with AS 1428.1.

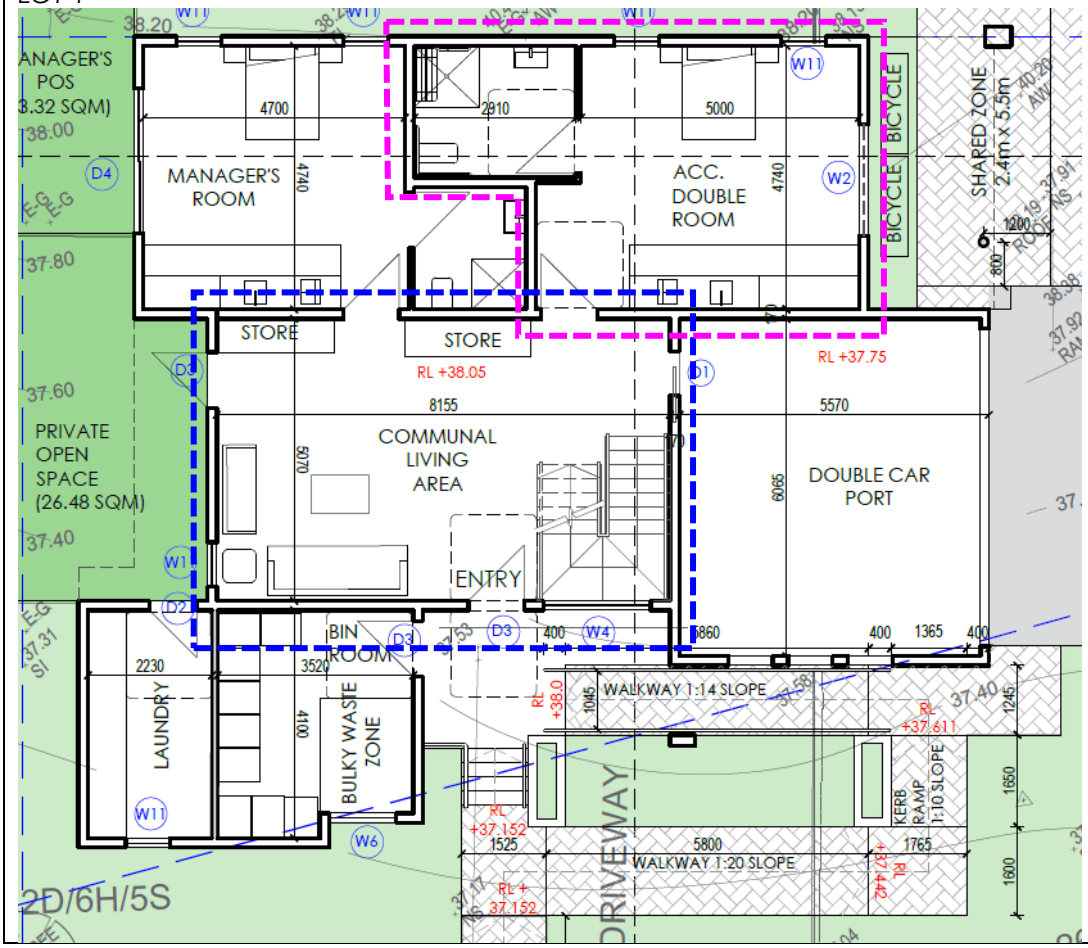
LOT 3



LOT 2



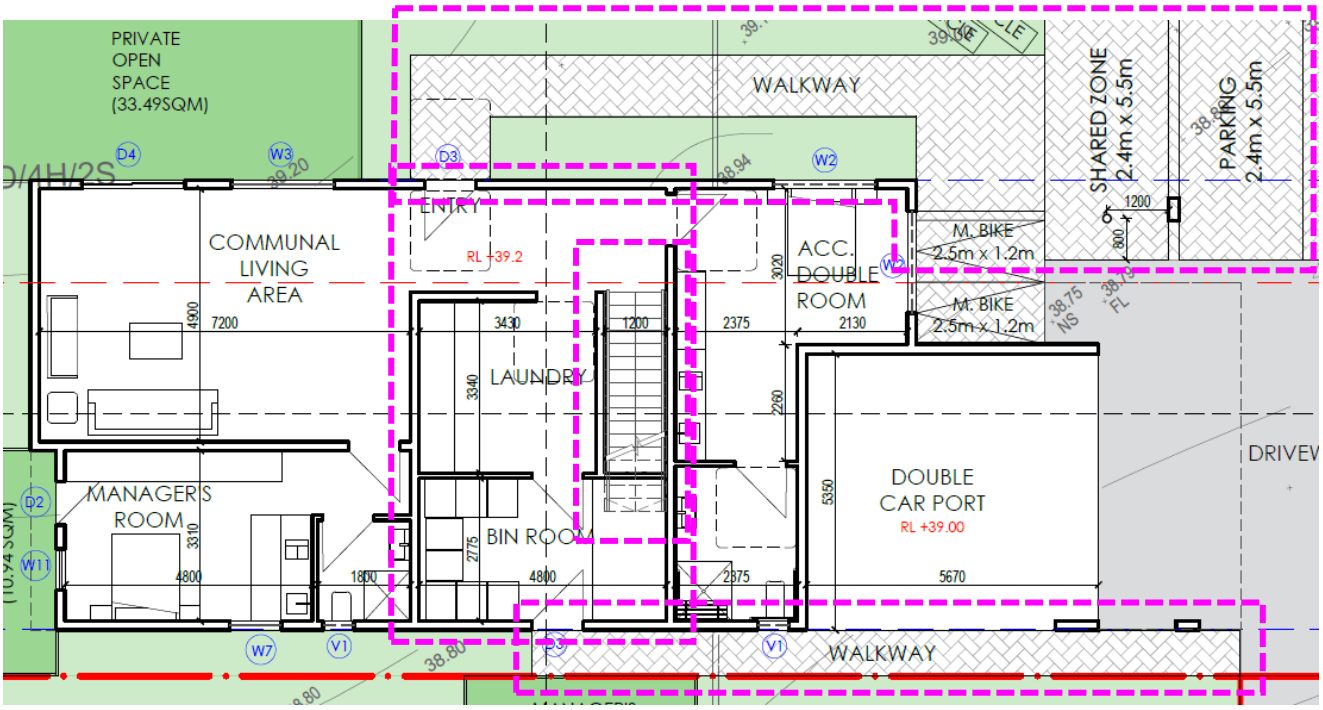
LOT 1



BCA Part D3.2 Access to buildings

Requirement	Accessway is required from; - Main pedestrian entry at the site boundary for new buildings. - Main pedestrian entry door for existing buildings (as per APS). - Any other accessible building connected by a pedestrian link. - Accessible car parking spaces.
Compliance Comments	Capable of compliance -Access has been provided to each boarding house by means of accessible pathways. - Equitable Access from respective accessible parking area to the buildings is through the communal living areas. -The access from main door of the boarding houses to the rooms on ground floor level through corridors with AA 1428.1 compliant ramps and on upper levels by means of stairs. - Equitable access is available from bin storage areas to street by a pathway. - Equitable access is available to common living area and outdoor communal areas on ground level . - All Walkway / Pedestrian Access ramps comply with requirements of AS1428-2009

LOT 3



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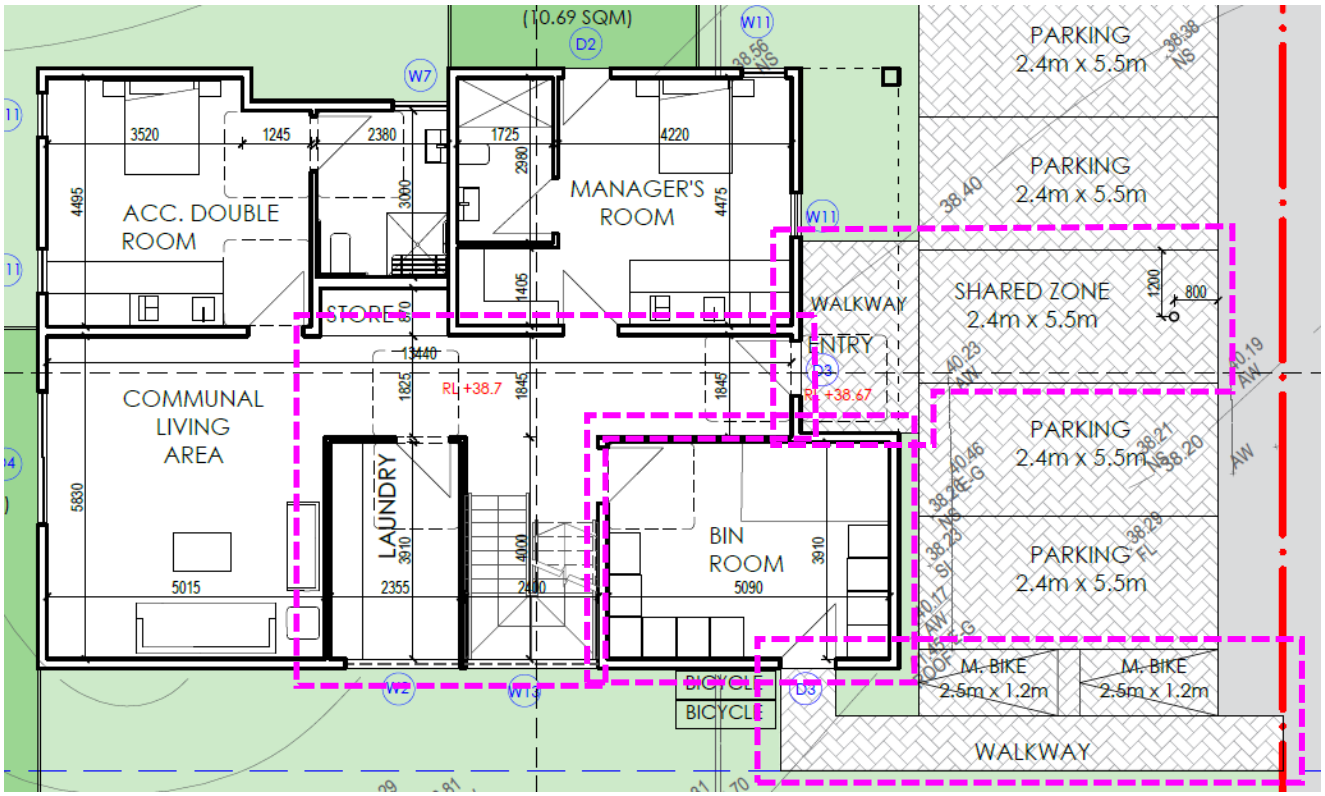

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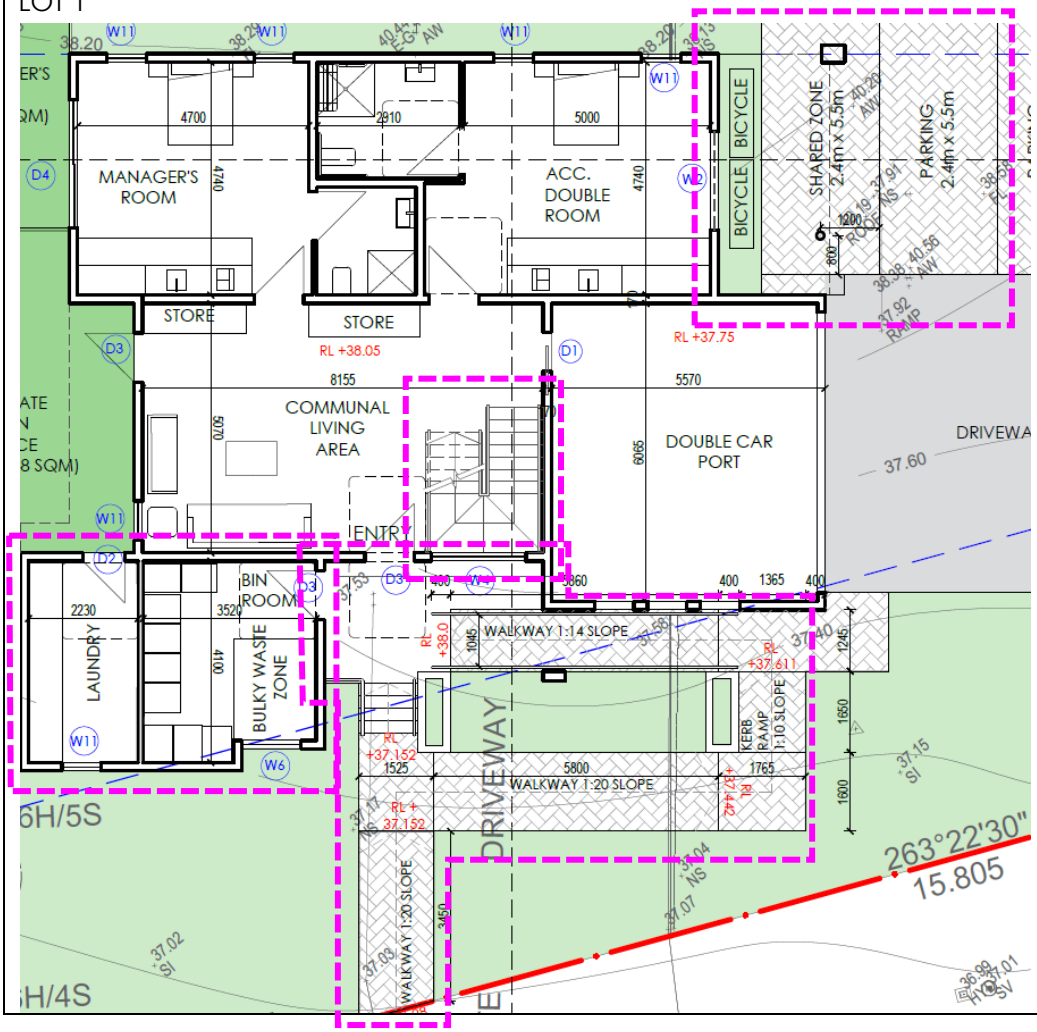
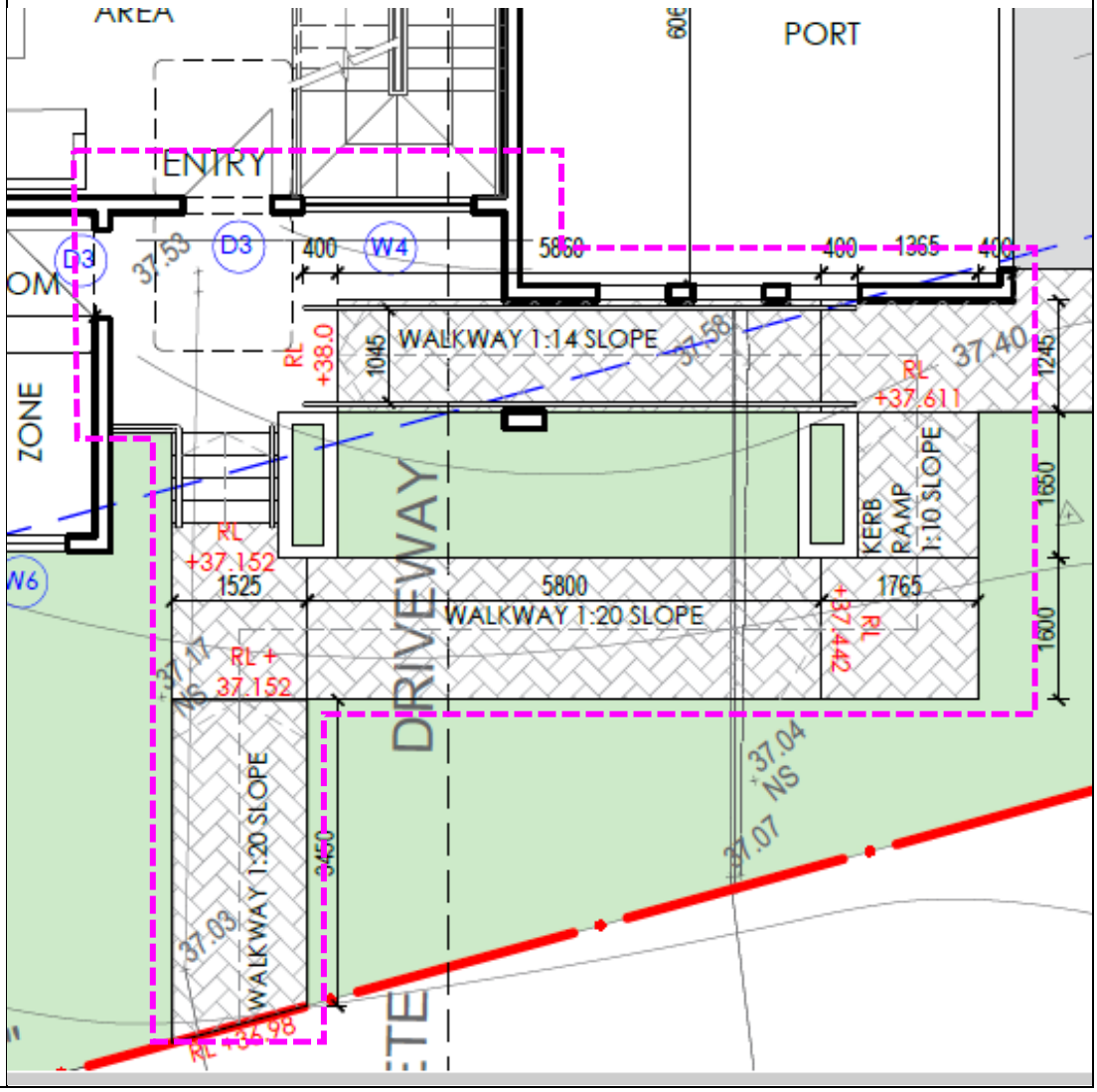
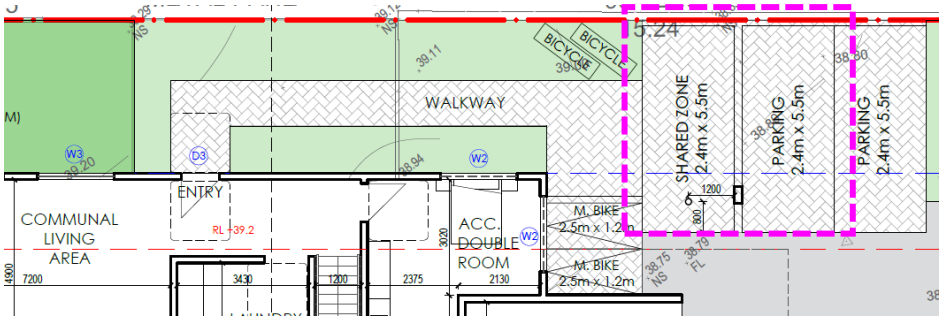


BCA Part D3.3 Parts of buildings required to be accessible	
Requirement	Every Ramp with grades steeper than 1:20 and less than or equal to 1:14 (excluding fire isolated ramp) is to be compliant with : - AS1428.1-2009 (including but not limited to - maximum grade of 1:14 with appropriate landings at a maximum of 9M of a flight of ramp). - Handrails and kerbs to be provided on both sides with appropriate handrails extensions. - 1M clear width to be provided between handrails / kerb / kerbrails. - Every Fire-isolated Stairway is to be compliant with AS1428 - Slip resistance of ramp and landings to comply with BCA as per AS4299
Compliance Comments	Capable of Compliance -There are walkways and ramps in outdoor or indoor areas with a 1:20 Gradient. These comply with AS1428.1. - Access to parking, waste disposal areas, store room, community space, entry to each room achieved through walkways or ramps not more than 1:20 slope as noted on plans. - There is one kerb ramp and one 1:14 ramp with handrails in the LOT 1 development. No step ramp , kerb ramp have been identified in the LOT 2 & LOT 3 development. - Every Stairway, Slip resistance requirements as per AS4299, turning spaces requirement, carpet specifications are capable of compliance. Details to be verified at CC stage of works.



BCA Part D3.4 Exemption	
Requirement	Access is not required to be provided in the following areas : - Where access would be inappropriate because of the use of the area - Where area would pose a health and safety risk - Any path which exclusively provides access to an exempted area
Compliance Comments	No such areas identified
BCA Part D3.5 Accessible Carparking	
Requirement	To be calculated by multiplying the total number of car parking spaces by the % of - accessible rooms by total rooms
Compliance Comments	- 1 accessible parking space with a shared zone has been provided to comply with the requirement for all 3 boarding houses. - The entry from parking space to the building is through the Communal living area and foyer.

LOT 3



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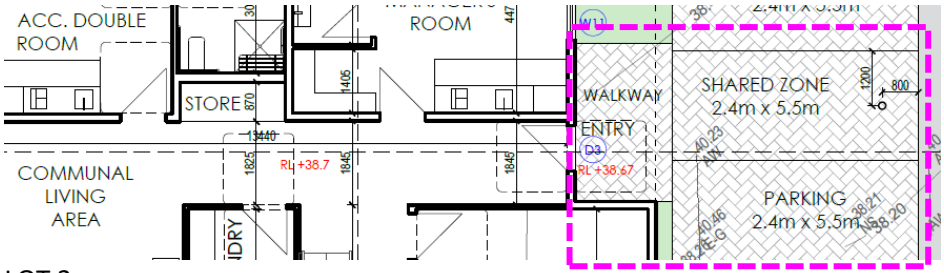
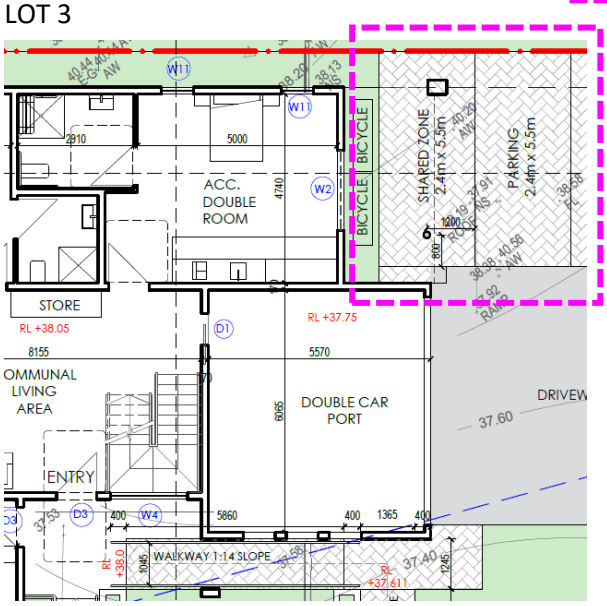


LOT 3



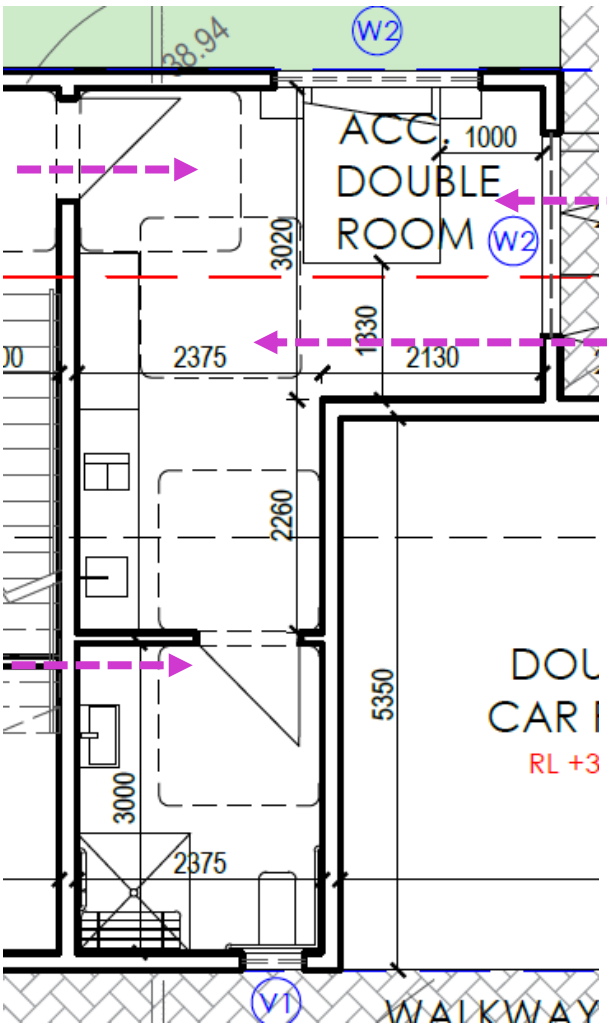
AS2890.6-2009 requirements for Accessible car parking space	
Requirement	- Dedicated space, slip resistant flooring surface, central Bollard, pavement marking in dedicated space, minimum headroom at entrances.
Compliance Comments	Capable of compliance. Parking has a shared zone and meets minimum width length and height requirements. Detailed review has been undertaken by Motion Traffic Engineers (Traffic engineer's Report)
BCA Part D3.6 Signage	
Requirement	Braille and Tactile signage is required to identify Accessible Sanitary facilities, Hearing Augmentation, a Fire exit door.
Compliance Comments	- Capable of compliance. - Signages provided at sanitary facilities, all the common area and exit doors etc - Details of selected signage to be verified at CC stage of works.
BCA Part D3.8 Tactile indicators (TGSIs)	
Requirement	TGSIs are required when approaching: - Stairways other than fire-isolated stairways. - Escalators / passenger conveyor / moving walk. - Ramp (other than fire-isolated ramps / kerb or step or swimming pool ramps). - Under an overhead obstruction of <2M if no barrier is provided. - When accessway meets a vehicular way adjacent to a pedestrian entry (if no kerb / kerb ramp provided at the location). Compliance is required with AS1428.4.1 including Luminance contrast and slip resistance requirements for all TGSIs.
Compliance Comments	Capable of compliance. TGSI selections generally take place at CC stage of works. Selection of TGSIs as specified will lead to compliance and these selection details are to be verified at CC stage of works.
BCA Part D3.11 Limitations on Ramps	
Requirement	On an accessway: - A series of connected ramps must not have a combined vertical rise of more than 3.6M; - a landing for a step ramp must not overlap a landing for another step ramp or ramp.
Compliance Comments	Complies. No such instances are noted on plans.
BCA Part D3.12 Glazing on Accessways	
Requirement	Glazing strips requirements: Where any glazing capable of being mistaken for a doorway or opening are required to have a glazing strip as per requirements of AS1428.1
Compliance Comments	Capable of compliance Glazing strip selections generally take place at CC stage of works. Selection of glazing strips as specified above will lead to compliance and these selection details are to be verified at CC stage of works.
BCA Part E Lift Installations	
BCA E3.6 Passenger lift	
Requirement	In an accessible building, Every Passenger Lift (excluding electric passenger lift, electrohydraulic passenger lift, inclined lift) must be subject to limitations on use and must comply with Tables E3.6a and E3.6b
Compliance Comments	No lift has been provided.

BCA Part D3 Access for People with a Disability	
BCA D3.1 General building Access requirements	
Requirement	CLASS 1B Boarding houses: 1 bedroom and associated sanitary facilities and not less that 1 of each type of room or space for use in common by the residents or guests including basic amenities on a floor to which access by way of a ramp complying with AS 1428.1 or a passenger lift is provided.
Compliance Comments	Each boarding house comprises of 1 double Accessible room with attached accessible toilet and an accessible car parking with a shared zone in the parking area.

LOT 3

1550 x 1550 mm circulation space on either side of 900 mm access.

1550 x 1550 mm circulation space on toilet doors.



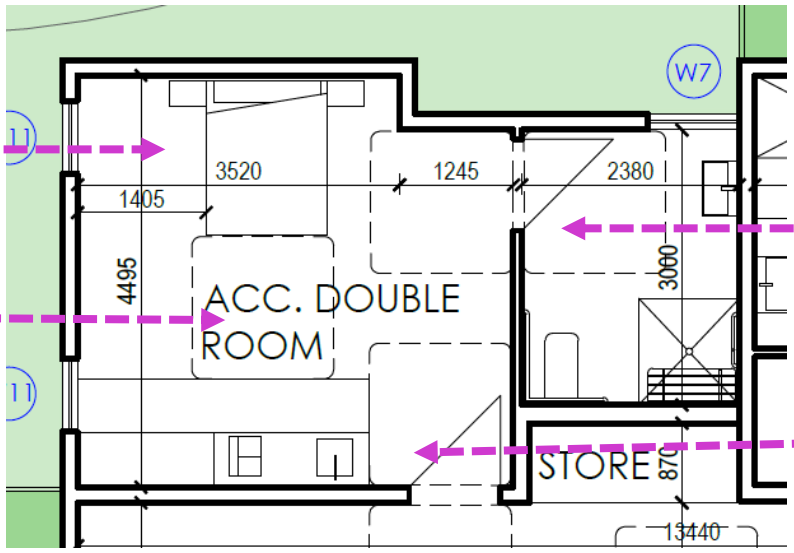
1000 mm on either side of the bed

1550 mm in front of the robe more than 1000 mm in front of bed

LOT 2

1000 mm on either side of the bed

1550 mm in front of the bed and the robe



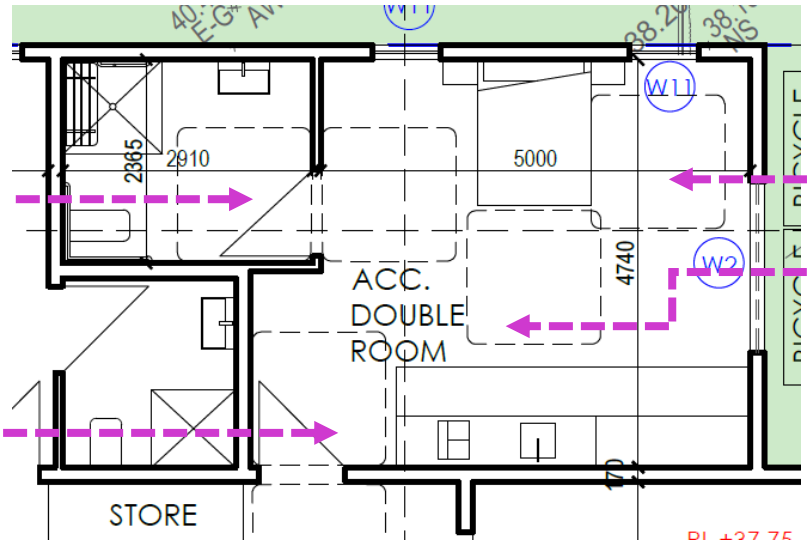
1550 x 1550 mm circulation space on toilet doors

1550 x 1550 mm circulation space on either side of 900 mm access

LOT 1

1550 x 1550 mm circulation space on toilet doors.

1550 x 1550 mm circulation space on either side of 900 mm



1550 mm in front of the bed and the robe

CONCLUSION:

IN LOT 1, ONLY ONE PART OF THE RAMP IS 1:14 WHERE HANDRAILS ARE PROVIDED, NONE OF THE OTHER GRADIENT ON THE SITE ARE STEEPER THAN 1:20. ENTIRE SITE IS AN ACCESS COMPLIANT 'DEEMED TO SATISFY' SOLUTION.

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