LAHC Wagga Wagga Multi-Unit Housing Development

48-56 South Parade

304100940

Prepared for
NSW Land and Housing Corporation

3 November 2023

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Document Information

Prepared for	NSW Land and Housing Corporation
Project Name	48-56 South Parade
File Reference	Draft Duke of Kent Development Wagga Wagga - 48-56 - South Pde V2.docx
Job Reference	304100940
Date	3 November 2023
Version Number	4

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Effective Date 3/11/2023

Approved By:

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Date Approved 3/11/2023

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
1.0	26/07/2023	For DA	TM	JS
2.0	6/10/2023	For DA	TM	JS
3.0	17/10/2023	For DA	TM	JS
4.0	03/11/2023	For DA	TM	JS

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1 Introduction

Cardno have been engaged by the Land and Housing Corporation (LAHC) to undertake the engineering work, project management services and development application documentation for the proposed redevelopment of Lots 20,21, & 22 DP21074, Wagga Wagga, herein referred to as the 'Subject Site'. **Figure 1-1** below shows a locality plan of the surrounding area with the Subject Site highlighted in yellow.

Currently, the Subject Site contains a single storey residential property on each of the three lots. Lot 20 is 602.5m^2, Lots 21 and 22 are 568.5m^2 each for a total area of 1739.5m^2 for the Subject Site. The site is currently zoned as R1: General Residential in accordance with the Wagga Wagga City Council's (WWCC) Intramaps (refer to **Figure 1-2**).

The purpose of this report is to investigate and assess the current conditions and the suitability of the site for development into a multi-unit development. This report identifies opportunities, constraints, and the required works, on and off the site, for the proposed development of the Subject Site.

A detailed scope of works is listed in **Section 2**.

Figure 1-1 Locality Plan

Figure 1-2 WWCC Zoning Map

2 Investigation Scope

This report has been undertaken in accordance with the scope of services detailed below.

A preliminary risk assessment and advice in terms of feasibility of the site's developability has been completed within this report, focusing on risks, scope of further investigation including specialist studies and qualitative advice on opinion of cost to unencumber the Subject Site.

Subsequent to the findings of the preliminary risk assessment, detailed site investigation of the following scope has been completed:

- Investigations of the following existing and proposed services/arrangements:
  - Sewerage
  - Water Supply
  - Stormwater Drainage
  - Overland Flows
  - Telecommunications
  - Gas
  - Electrical and Streetlighting
  - Site Topography
  - Easements and Setbacks
  - Verge Works
  - Heritage
  - Ecological Listing/Vegetation
  - Environmental (excluding any subsurface analyses)
  - Geotechnical
  - Traffic, Parking and Access
  - Public Transportation
- Proposed Site Servicing

3 Proposed Development

It is understood that the three existing dwellings and all other structures and trees within the Subject Site are to be demolished/removed. A new 3-storey structure is to be constructed, containing 11 x 1-bedrrom units and eight 2-bedroom units for a total of 19 units within the site. The proposed ground, first and second floor layout of the proposed development is shown in **Figure 3-1, 3-2, and 3-3 below**. The development will include provisions for off-street parking.

Figure 3-1 Proposed First floor Layout

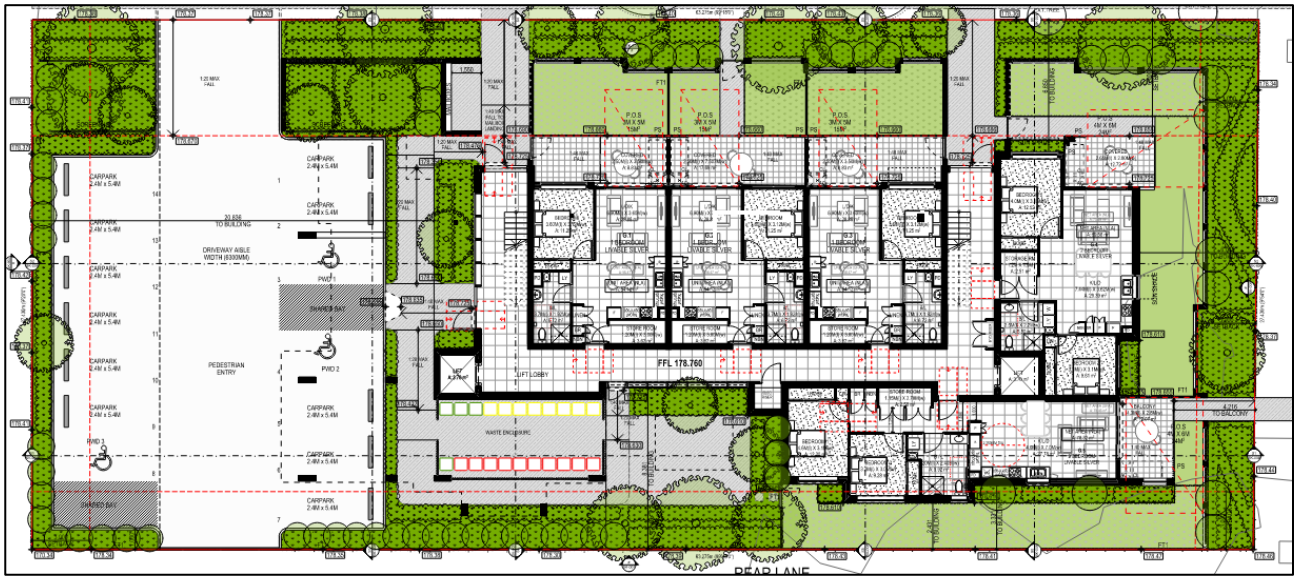


Figure 3-2 Proposed First floor Layout

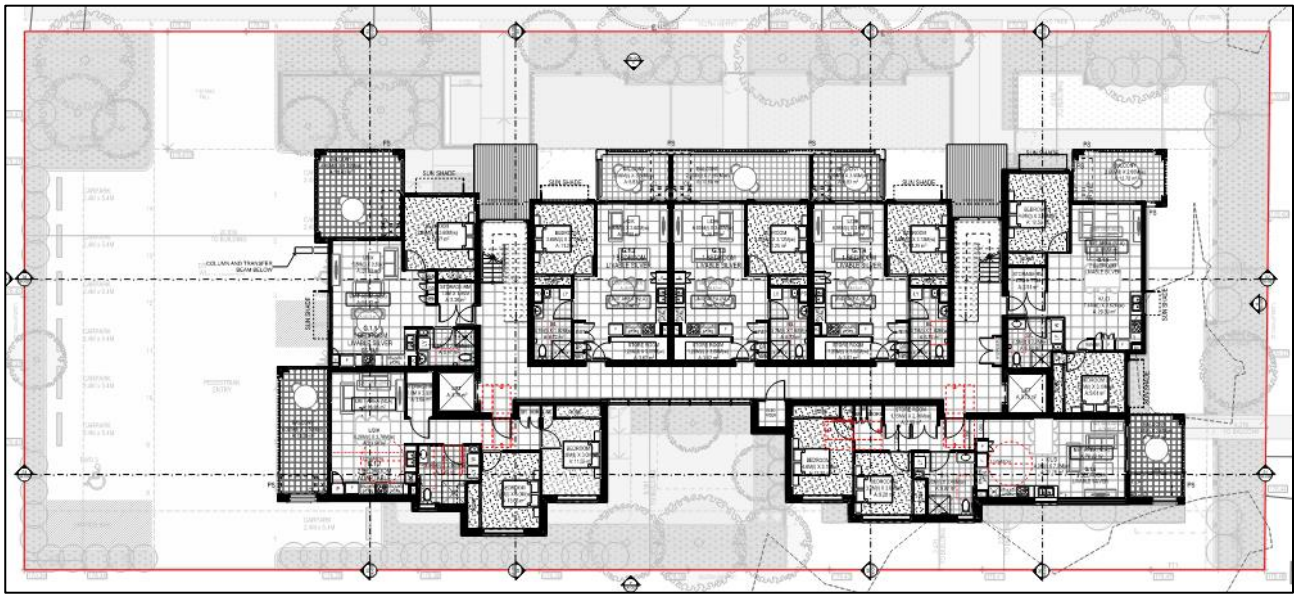
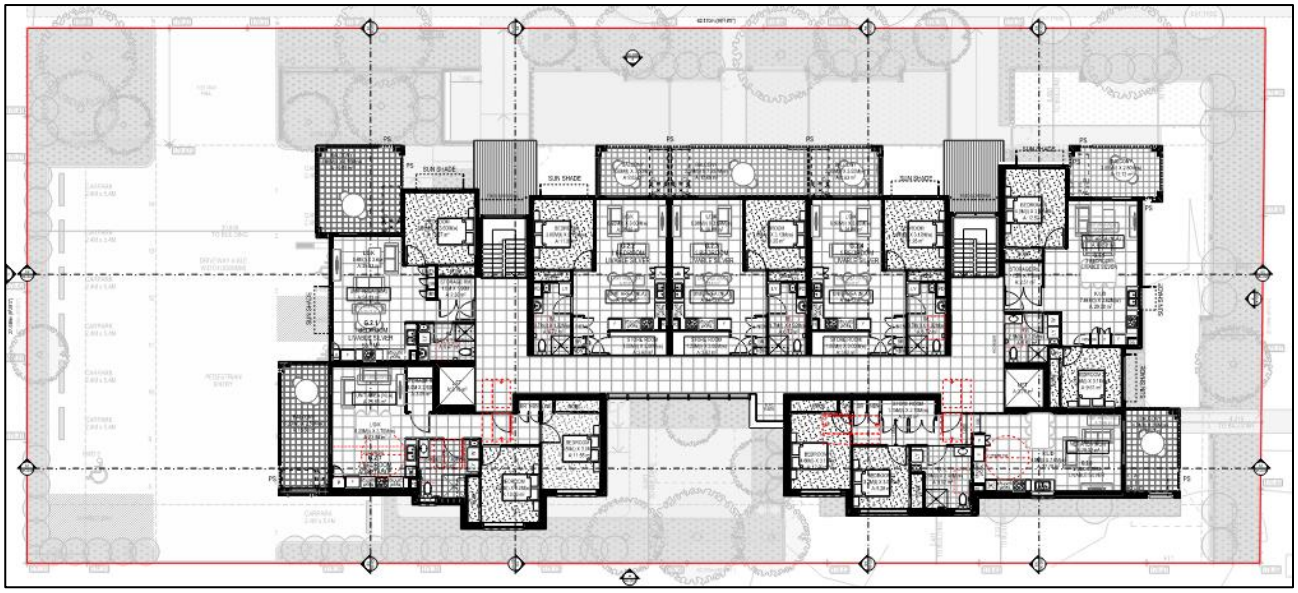


Figure 3-3 Proposed Second floor Layout



4 Existing Site Servicing

4.1 General

In order to get an understanding of the opportunities relating to the use of existing services for the proposed development and to identify constraints and opportunities within the site, a detailed preliminary examination had been completed for the Subject Site. This detailed analysis includes 'Dial Before You Dig' (DBYD) information, Work as Executed (WAE) records, Wagga Wagga City Council data, a survey conducted by Premise in March 2022, and consultation and coordination with local service authorities.

The existing services information has been compiled from available documentation obtained from site investigations, service providers and previous surveys completed. The details, dimensions, and alignments of existing services included in the report should be treated as indicative only and the accuracy of the information cannot be warranted. All services must be accurately located on site prior to any development proceeding.

4.2 Traffic Conditions

South Parade is a minor through street with a park on the north side and 18 houses on the south side. There are no current traffic counts for South Parade, or the surrounding road network, however based on the above, it is anticipated that traffic volumes are relatively minor.

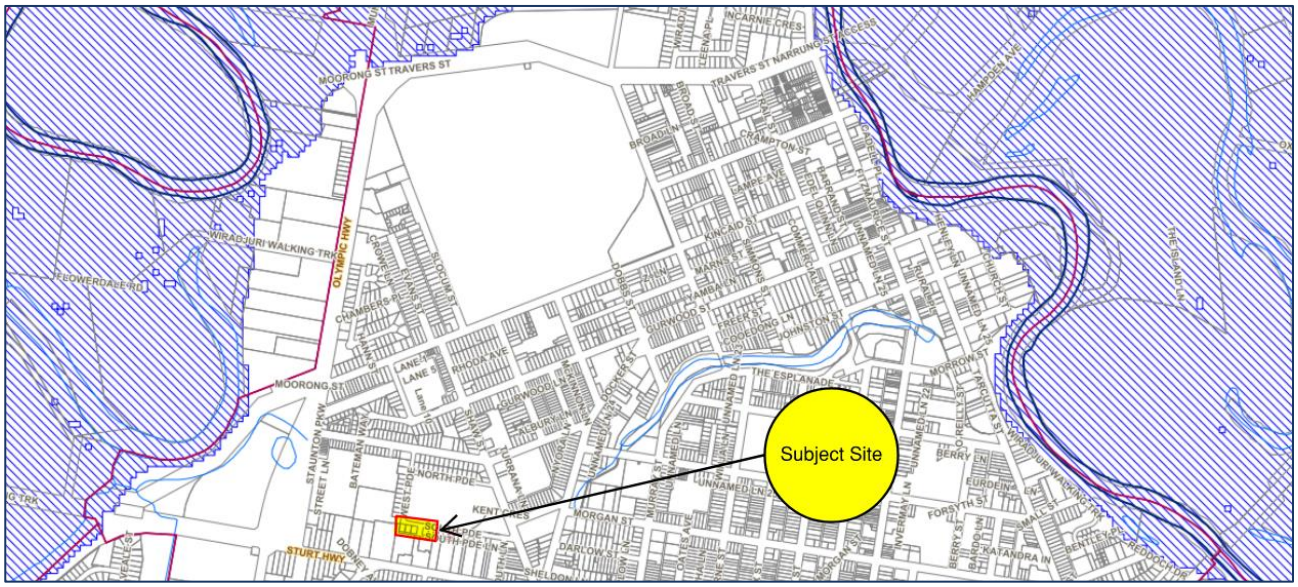
4.3 Driveaway and Pedestrian Access

The site is currently serviced by four driveways, three from South Parade, two servicing Lot 22 (one on either side of the lot) and one on the eastern side of Lot 21, and one from South Parade Lane servicing the rear of Lot 20. From a review of aerial photography and Google Street View, there is no existing pedestrian footpath in the South Parade.

4.4 Flood Risk

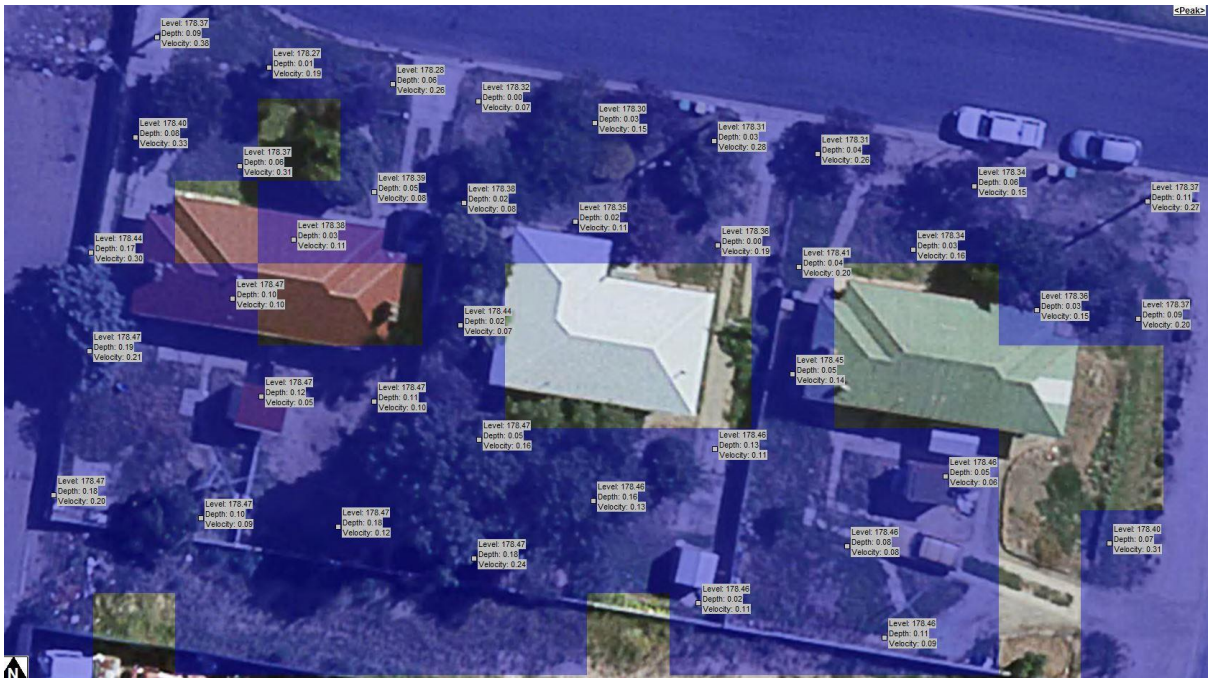
Based upon flood mapping information provided by the Wagga Wagga City Council, the Subject Site is not expected to experience riverine flooding during major rainfall events, up to and including 1% AEP storm events. **Figure 4-1** shows the Flood Planning Area surrounding the site, based on the 2017 Riverine Model.

Figure 4-1 1-in-100-year Riverine Flooding Map



While the Subject Site is not impacted by 1% AEP riverine flooding, it is impacted by Major Overland Flow Flooding (MOFFS) during 1% AEP storm events which will dictate the required Finished Floor Level (FFL) of the proposed development. The maximum level of the MOFFS across the Subject Site is AHD 178.47, and from the design, the OSD storage's maximum design water surface level is 178.62. Therefore, in accordance with WWCC's guidelines, the minimum required FFL of the proposed development will be AHD 178.92. Refer to **Figure 4-2** below for MOFFS data supplied by WWCC.

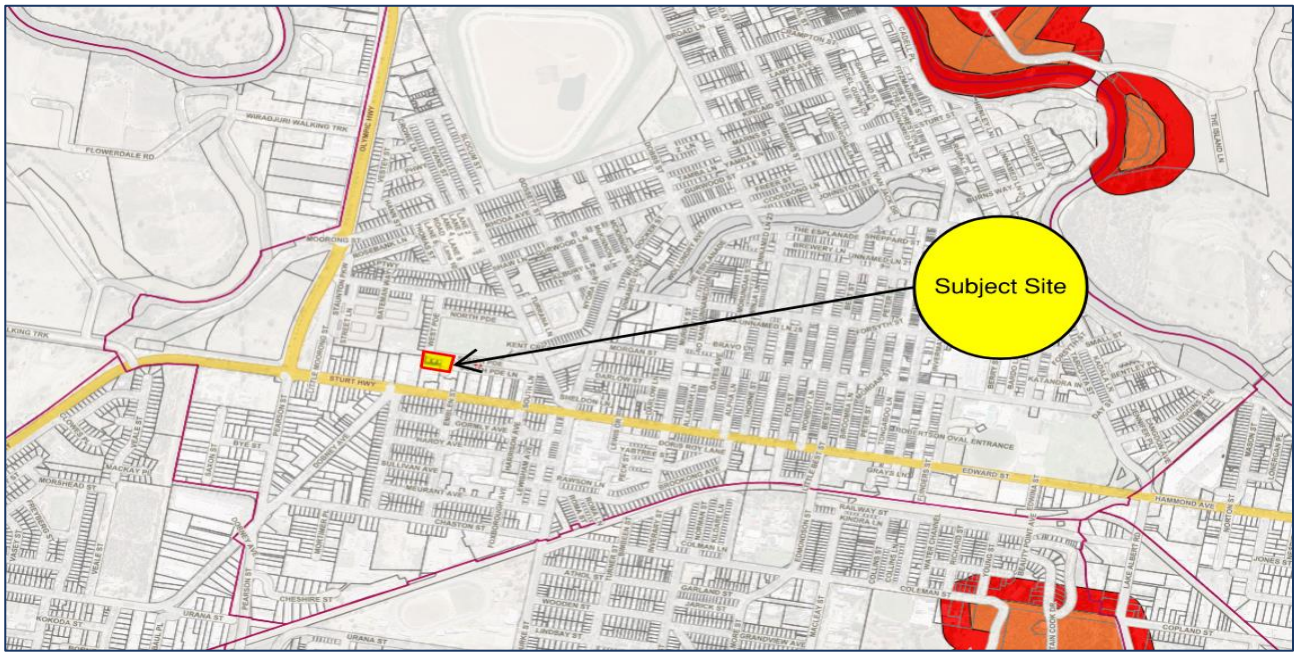
Figure 4-2 WWCC MOFFS Data



4.5 Bushfires

Based upon bushfire mapping information provided by Wagga Wagga City Council, the closest bushfire prone land to the Subject Site is over 2km away. Therefore, it is unlikely that the proposed development will be at risk or impacted by bushfires. Refer to **Figure 4-3** below for a map of bushfire prone land around the site.

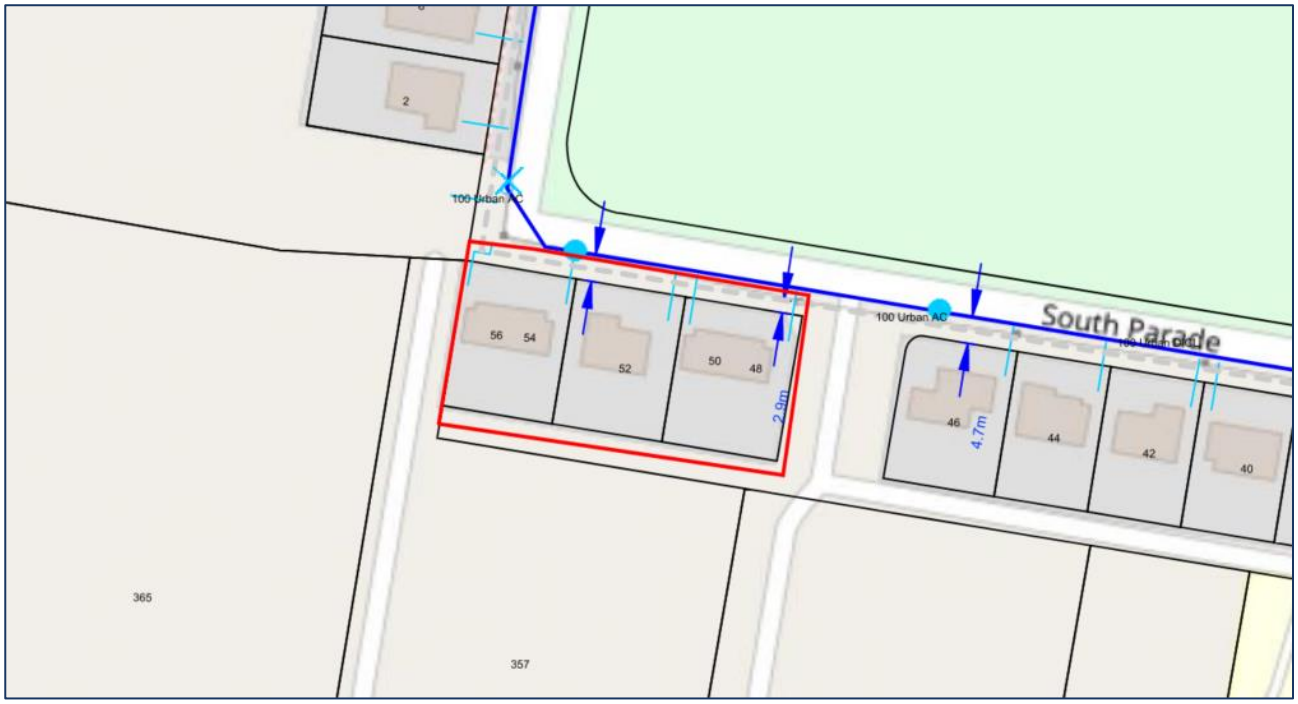
Figure 4-3 WWCC Intramaps Bushfire Map



4.6 Potable Water

From Riverina Water DBYD Data as well as the survey of the site conducted by Premise, there is a DN100 Ductile Iron potable water main within the southern verge of South Parade, out the front of the Subject Site. There is also a hydrant in front of Lots 21/22. Currently there are existing ties on the eastern side of each Lots 21 & 22 and both sides of Lot 20 which will need to be consolidated into a single tie as part of the proposed development. For further information regarding service authority correspondence and indicative service location, refer to **Figure 4-4** below and **Appendix XX**

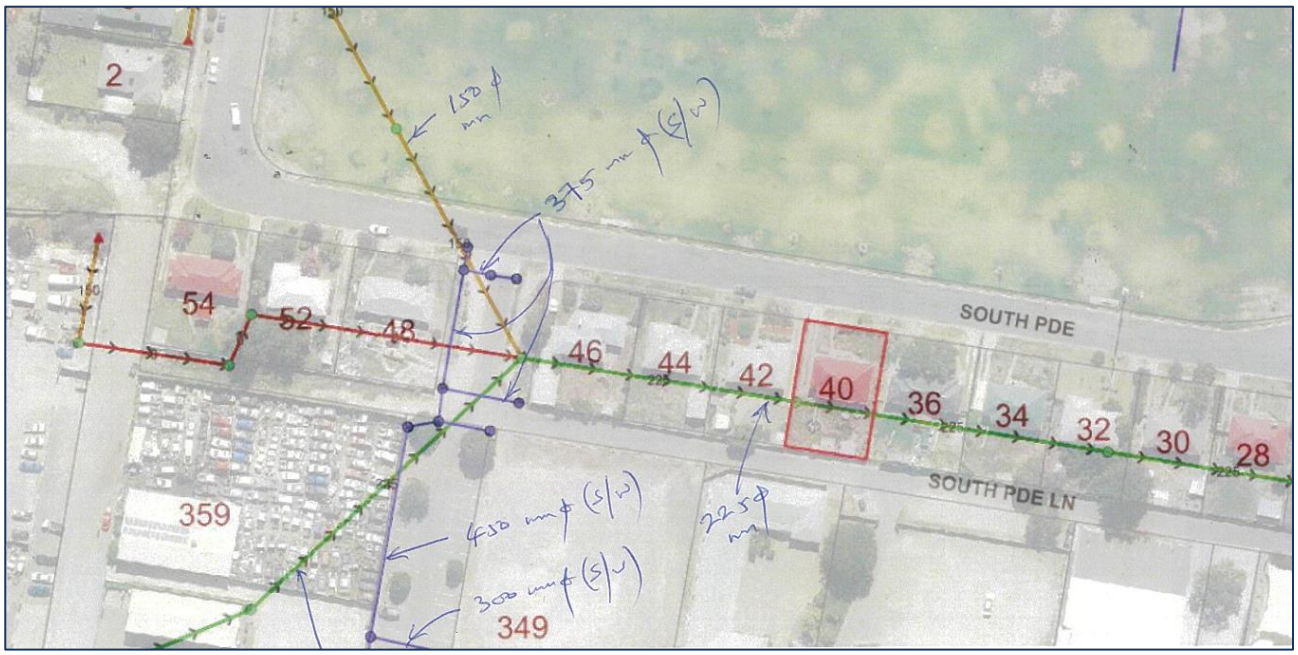
Figure 4-4 Riverina Water Assets at Subject Site



4.7 Sewerage

From information provided by WWCC, as well as the survey conducted by Premise, there is an existing DN150 sewer main, draining west to east within the rear section of the Subject Site, approximately 9-9.5m from the site boundary, including a sewer manhole to the rear of Lot 21. Initial calculations estimate that the existing sewer pipe has the sufficient capacity of approximately 17L/s. For further information regarding service authority correspondence and indicative service location, refer to **Figure 4-5** below.

Figure 4-5 Sewer Infrastructure at Subject Site

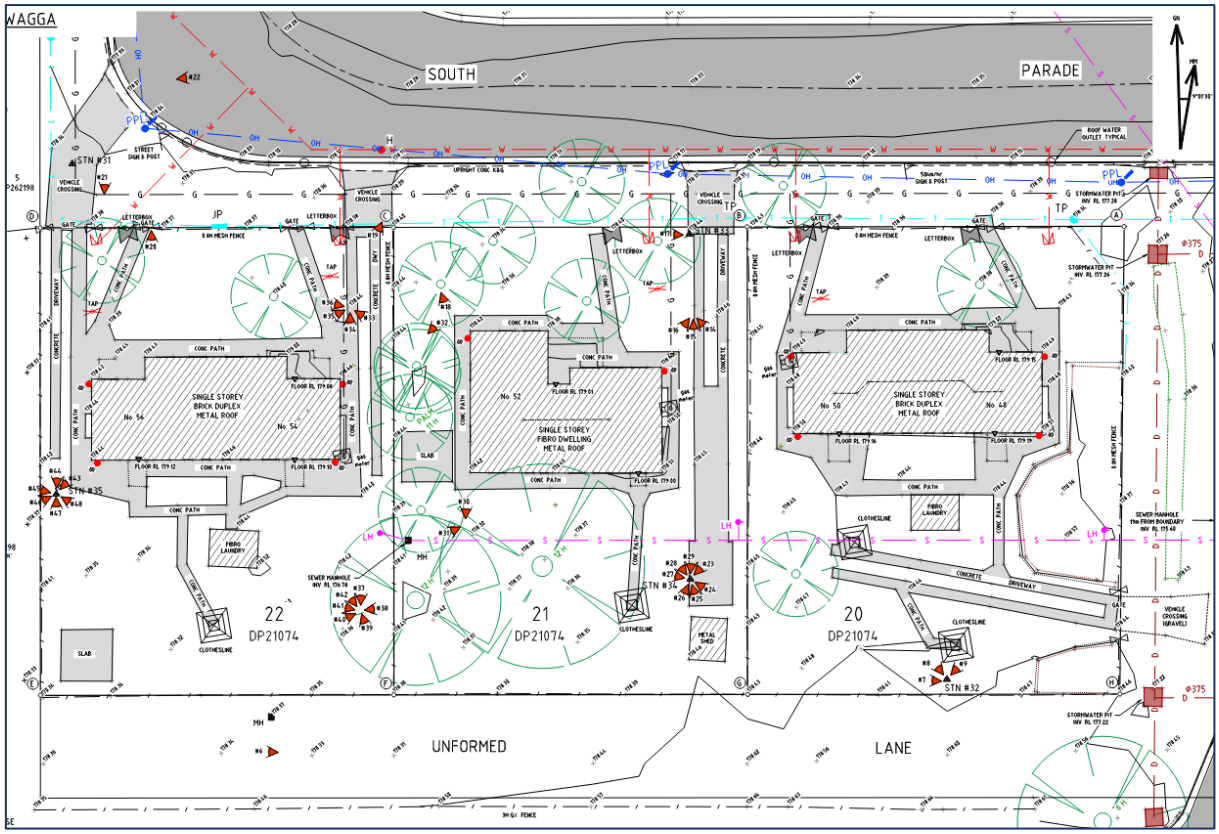


4.8 Stormwater Infrastructure

From information supplied by WWCC, as well as the survey performed by Premise, there is an existing DN375 stormwater pipe along the southern verge of South Parade that is connected to a series of SW pipes on South Parade Lane. The current properties within the Subject Site discharge stormwater directly to the kerb on South Parade

Information provided by WWCC can be seen in **Figure 4-5** above. For the Premise Survey, refer to **Figure 4-6** below.

Figure 4-6 Premise Survey of Subject Site



4.9 Electrical and Street lightning

From DBYD information supplied by Essential Energy, there is existing overhead electrical infrastructure within the South Pde which currently services the existing properties within the Subject Site. This overhead power line has power poles out the front of the eastern side of Lots 20 & 21 and western side for Lot 22.

For further information regarding service authority correspondence and indicative service location, refer to **Figure 4-7** below and **Appendix A**.

Figure 4-7 Electrical Infrastructure at Subject Site

4.10 Telecommunications Services

The following telecommunication infrastructure information has been compiled from DBYD information and initial advice from service providers.

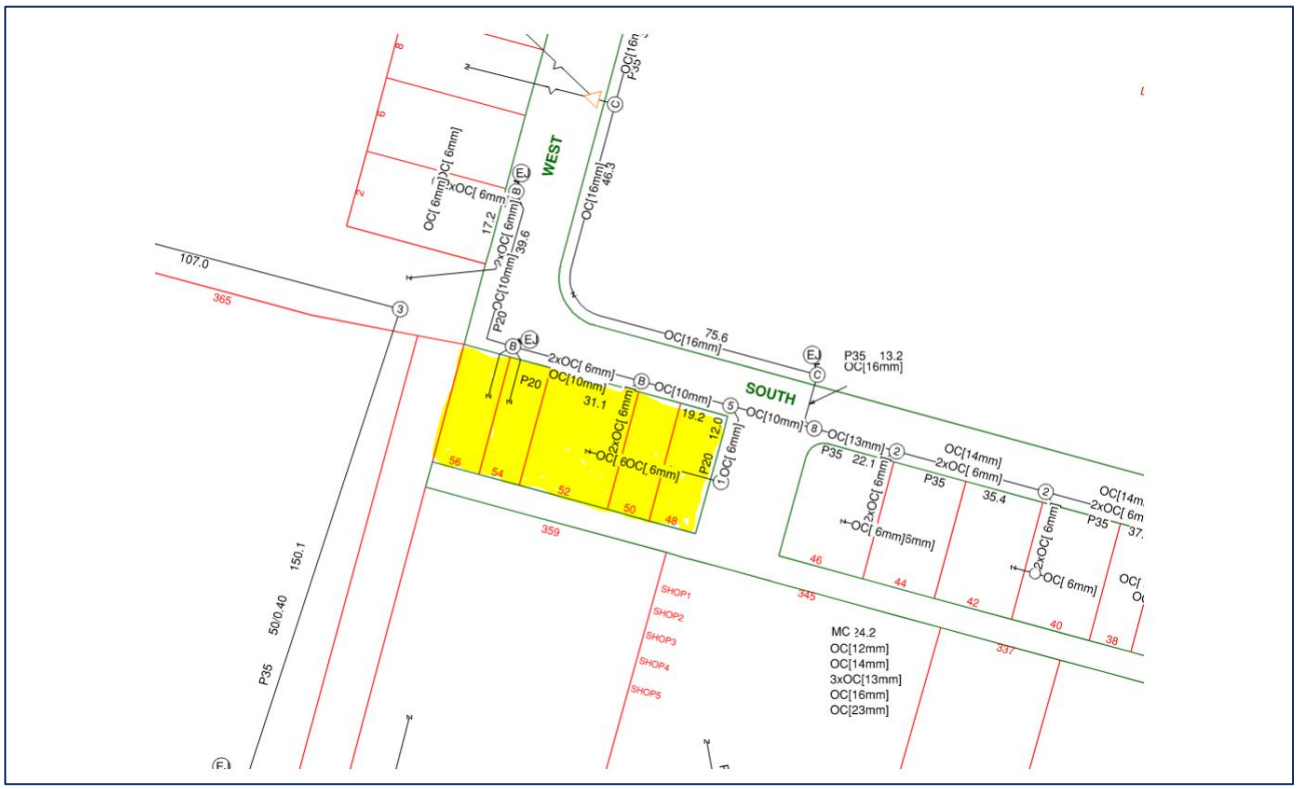
4.10.1 Telstra

- The Subject Site is currently serviced by two 6mm Telstra ties in lots 21, 22 and one tie in Lot 20.
- It is assumed that the existing network will have sufficient capacity for the proposed development, however this should be confirmed with Telstra during detailed design.
- For further information regarding service authority correspondence and indicative service location, refer to **Figure 4-8** below and **Appendix A**.

4.10.2 NBN

- There is existing NBN infrastructure in the same conduits as the Telstra infrastructure, servicing Lots 20,21 & 22.

Figure 4-8 Telstra Infrastructure at Subject Site

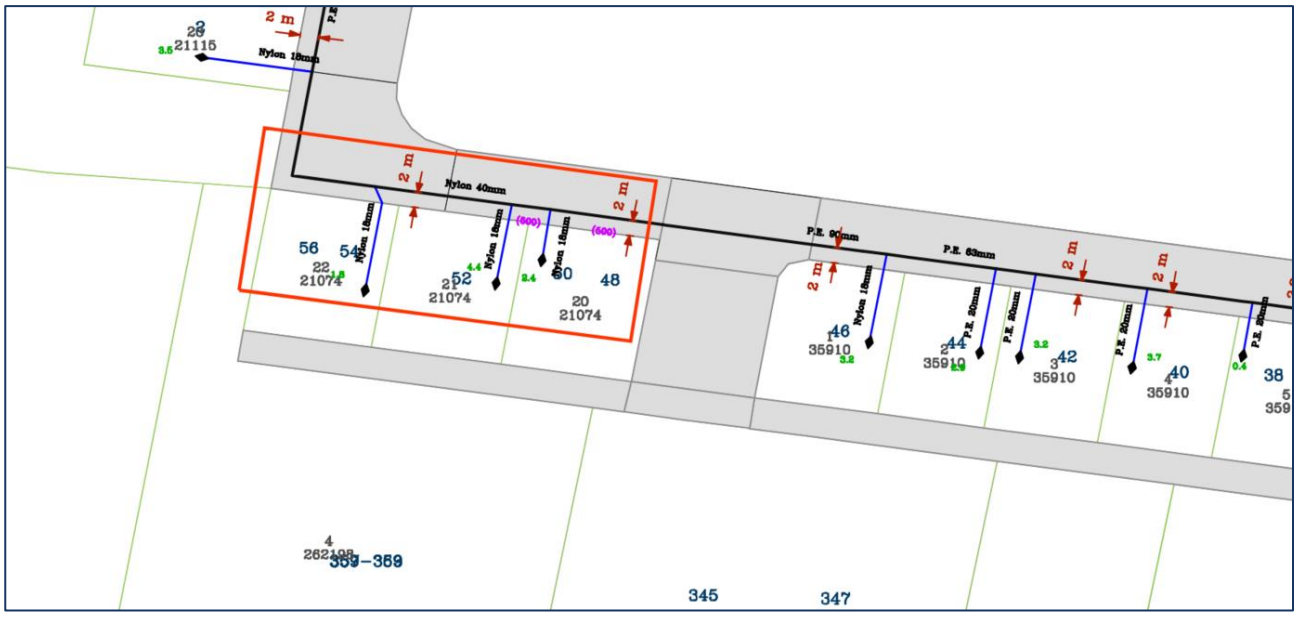


4.11 Gas

From DBYD information supplied by APA Gas, there is an existing DN40 nylon gas main within the southern verge of South Parade, 2m from the property boundary. There is a nylon DN18 tie on the eastern side of Lots 21 & 22 and one on western side of Lot 20. It is likely the ties will need to be consolidated into one tie for the proposed development.

For additional information regarding service authority correspondence and indicative service location, refer to **Figure 4-9** below and **Appendix A**.

Figure 4-9 Gas Infrastructure at Subject Site



4.12 Easement and Setbacks

From the survey conducted by Premise, there is an existing sewer pipe running through the rear of Lot 20 & 21 approximately 9 - 9.5 m from the boundary. Due to this, it is expected there would be a 2 m wide easement on top of the pipe.

4.13 Verge Works

South Parade is located to the north of the Subject Site. The main features of South Pde are as follows:

- The road carriageway is approximately 8.5m wide and it is classified as a local road in accordance with TfNSW's road hierarchy.
- The verge width adjacent to the subject site is approximately 4m wide.
- There are three driveways within the verge adjacent to the Subject Site that services two of the lots within the site.

South Parade Lane is located to the east of the Subject Site. The main features of South Parade Lane are as follows:

- The road carriageway is approximately 5m wide and it is classified as a local road in accordance with TfNSW's road hierarchy.
- The verge width adjacent to the subject site is approximately 8m wide.
- There is one driveway within the verge adjacent to the Subject Site that services Lot 20.

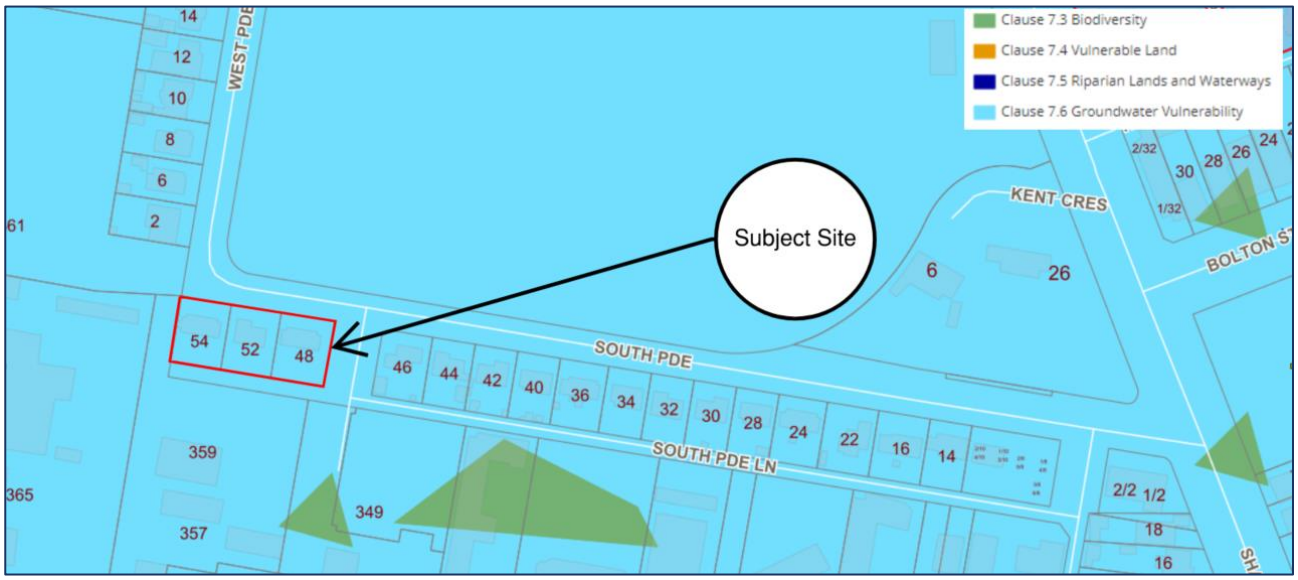
4.14 Heritage

There are no heritage constraints associated with the site shown on the WWCC's Intramaps.

4.15 Ecological

According to information from WWCC's Intramaps, the Subject Site is identified as having groundwater vulnerability due to salinity problems in the Wagga Wagga area. Refer to **Figure 4-10** below for WWCC's natural resource sensitivity map of the site.

Figure 4-10 WWCC Intramaps Ecological Mapping

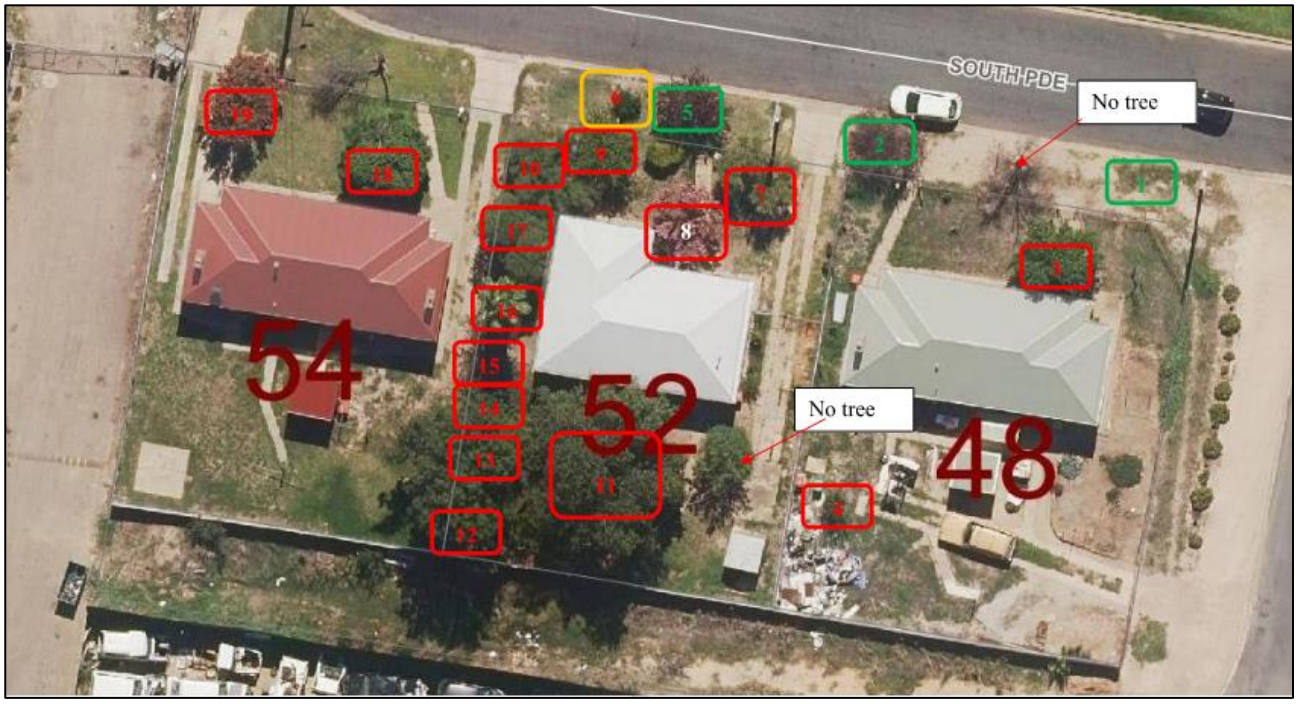


5 Special Investigations

5.1 Arboricultural Assessment

In October 2021, LAHC engaged Wade Ryan Contracting to undertake a preliminary tree assessment of the Subject Site to determine what trees are on site, analysis of the condition and significance of existing trees, and recommendations for the retention or removal of the trees. Refer to **Figure 5-1** below for an overview of trees within the subject site.

Figure 5-1 Trees Within Subject Site



The results and recommendations of the preliminary tree assessment are as follows:

- Trees 1, 2, 5 and 6 are WWCC Trees located on the nature strip:
  - These trees are all in fair to poor condition – with lower retention values.
  - These trees are to be retained and simple fencing needs to be erected at the relevant TPZs as per the arboricultural assessment.
- There are a total of 15 trees within the development site:
  - None of these trees are significant and all are recommended for removal.
  - All 15 are exempt species or exempt height under the WWCC DCP.
  - There are no notable trees that might be considered as worth of retention within the new landscape.
- For the full Arboricultural investigation report, refer to **Appendix B**.

5.2 Geotechnical Investigations

In January 2022, LAHC engaged STS Geotechnics to undertake a geotechnical investigation of the Subject Site for the proposed development. the purpose of the investigation was to investigate:

- Site conditions and regional geology;
- Subsurface conditions, including groundwater levels;
- Site soil classification;
- Foundation design parameters; and

> Site exposure classification / soil aggressiveness.

The investigation involved drilling six boreholes across the site to collect and test soil samples. A summary of the findings of the investigation is provided below. For the full report, refer to **Appendix C**.

> The Subject Site is underlain with Quaternary Age Alluvium soils, materials within this formation typically comprise of gravel, sand, silt, and clay.

> Subsurface conditions generally consist of topsoil overlying silty clays which became stiff and very stiff with depth. Groundwater was not observed during drilling works.

> Due to abnormal moisture conditions (AMC) present within the subject site, the site was classified as a Problem Site (P). However, with appropriate remedial works, the site could be reclassified as Highly Reactive (H1).

> The site is considered suitable for slab on ground construction, provided due regard is given to the ground surface slope. The report also recommends not founding structural loads within the topsoil layer found within the site.

In accordance with AS2159-2009, the soil aggressiveness of the site was found to be non-aggressive to steel and concrete. Refer to **Figure 5-2** below for boreholes test locations of the site.

Figure 5-2 Borehole Locations

5.3 Contamination Assessment

In December 2022, McMahon Earth Science undertook a Preliminary Site Investigation (PSI) of the Subject Site for the proposed residential development to assess any potential contamination issues associate with the site. for the full report, refer to **Appendix D**.

The PSI involved the identification and assessment of the following potential contamination sources:

- Contaminants that could have accumulated in the natural soil from:
    - Persistent agricultural chemicals from historical land use.
    - Fill from an unknown source.
    - Fuel and oil that may have leaked from parked cars.
    - Asbestos that may have been used in components from parked cars and has been deposited on the soil surface.

- Hazardous building materials in any dumped rubbish.

From sampling and testing undertaken, it was determined that there is no gross soil contamination across the site, and it is suitable for the proposed development.

6 Proposed Site Servicing

6.1 Traffic

In accordance with the RMS Guide to Traffic Generating Developments, the proposed development will result in approximately 10 additional trips during peak times. Given the assumed relatively low existing traffic volumes on South Parade and its close access to the broader traffic network and higher order roads, it is anticipated that the proposed development will have a negligible impact of the existing traffic network. For further information on the traffic analysis, refer to the Traffic Impact Assessment prepared by Cardno now Stantec.

6.2 Driveaway and Pedestrian Access

It is proposed that the four existing concrete driveways will be removed and a new 6.3m wide driveway will be constructed on the western side of the site, to service the carpark on the western side of the Subject Site.

Pedestrian access will remain untouched as part of the proposed development.

6.3 Parking

In accordance with the NSW Housing SEPP, the following parking provisions are required for social housing developments:

- 0.5 spaces per 1-bedroom unit
- 1 space per 2-bedroom units

Therefore, for the proposed development of 11 x 1-bedroom units and eight 2-bedroom units, a total of 14 parking spaces are required. The proposed layout of the development has 11 regular parking spaces and three disability access parking spaces, for a total of 14 parking spaces.

6.4 Potable Water

Based on Table 3.2.3 from AS 3500.1:2018, the probable simultaneous potable water demand for a 19-unit development is approximately 2.6 L/s. Based on information provided by Riverina Water for the available water pressure at the Subject Site, it can be inferred that there is sufficient capacity within the existing network to service the proposed development.

Calculations show that a new water tie with a minimum diameter of 50mm will be needed to service the proposed development with the required flow rate.

Refer to **Appendix E** for the relevant calculations.

6.5 Sewerage

Prior to the commencement of the residential developments, works are being undertaken to relocate the existing DN150 sewer from within the Subject Site, to within the unformed lane to the south of the Subject Site. As such, it is proposed to connect the internal sewer network of the development into the new DN150 sewer tie that will be provided as part of the sewer relocation works.

From calculations provided in **Appendix E**, the expected design flow from the proposed development is approximately 1.5L/s, or 8.8% of the pipe's capacity. It is unknown what the current loading of the existing pipe is, however, considering the subject site is at the very beginning of this sewer pipe, it is not expected that the development will exceed the capacity of the pipe. It is unknown what the current loading of the sewer system is downstream of the development, however due to the relatively minor additional loading added from the proposed development, it is not expected the capacity will be exceeded.

6.6 Stormwater

The stormwater for the proposed development will be designed to discharge to the kerb as the existing dwellings are currently doing, this will be achieved using a DN100 uPVC pipe. Refer to the Stormwater Masterplan for further details.

6.7 Electrical

It is proposed that the development will connect to the existing overhead electrical infrastructure along South Parade. Initial calculations based on AS 3000:2007 suggest that the development will require approximately 418.5kVA from the overhead electrical infrastructure. This loading, along with determination if the existing network has sufficient capacity for the development will be confirmed with Essential Energy during detailed design.

6.8 Telecommunications

It is intended that all Telstra/ NBN ties will be upgraded to service the proposed development, if required. Consultation with Telstra and NBN will be required to discuss if an upgrade of the existing tie will be required to service the development as well as confirm if the existing network has sufficient capacity for the development.

6.9 Gas

It is proposed the existing gas ties will be decommissioned and consolidated into a single tie to service the proposed development. The size and nature of the required tie will be determined in consultation with APA Gas during the detailed design of the proposed development.

6.10 Flooding and Overlands Flows

As discussed previously, the site is not likely to experience any Riverine flooding in storm events up to and including the 1% AEP storm event. However, due to the impact of the 100yr MOFFS on the site, there will be a minimum required FFL of the development. For the site, the MOFFS has a level of AHD 178.47, and from the design, the OSD storage's maximum design water surface level is 178.62, meaning the required minimum FFL of the proposed development is AHD 178.92.

It is anticipated that the proposed development will behave in much the same way as the existing properties. There will be surface inlet pits to intercept some of the overland flows before it reaches the street. Furthermore, the stormwater collected on the development's rooftop will drain into the internal drainage network via down pipes.

6.11 Easements and Setbacks

Due to the sewer within the site being relocated to be within South Parade Lane prior to the construction of the proposed development, no easements will be within the Subject Site. Boundary setbacks for the buildings have been adopted from the relevant regulations, including the Housing SEPP and Wagga Wagga DCP.

6.12 Water Sensitive Urban Design

Due to the proposed development resulting in an increase in the impervious area of the Subject Site, the stormwater runoff of the proposed development will need to be restricted to the current runoff flows. To achieve this, the pipe that discharges to the kerb will be restricted in size to restrict the outflow from the site to current rates.

In addition to this, on site detention (OSD) will be provided within the carpark to detain the additional stormwater generated by the site. The OSD will be in the form of controlled ponding within the carpark with a maximum depth of 200mm and has been designed to have a volume of at least $3m^3$, enough to detain up to a 1% ARI event, in accordance with the WWCC Engineering Guidelines. When the volume of the OSD is exceeded, it will overflow down the driveway, to the street.

Refer to **Appendix E** for the relevant engineering calculations.