Residential Development
Stage 1 Schofields Aerodrome
Transport Impact Assessment

Client // Defence Housing Australia
Office // NSW
Reference // N122850
Date // 14/06/17
Residential Development
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Transport Impact Assessment

Issue: C   14/06/17

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Quality Record

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<th>Issue</th>
<th>Date</th>
<th>Description</th>
<th>Prepared By</th>
<th>Checked By</th>
<th>Approved By</th>
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<td>Final</td>
<td>Okka Maw</td>
<td>Karen McNatty</td>
<td>Rhys Hazell</td>
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<td>B</td>
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GTA consultants
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1. Introduction

1.1 Background

In line with the North West Growth Strategy (NWGS) as planned by Department of Planning, Schofields has been identified as a key precinct for growth in terms of employment and housing. Defence Housing Australia (DHA) has proposed a multi-stage residential development of the site at the former Schofields Aerodrome in the suburb of Schofields.

It is understood that a development application (DA) is to be lodged with Blacktown City Council for a proposed staged development on land located at the Schofields Aerodrome in the suburb of Schofields. This development application is for Stage 1 (Stage 1A and 1B) of the development located immediately south of the proposed Burdekin Road continuation.

Stage 1A of the development will encompass 112 residential lots and three “super lots” to incorporate future integrated housing development applications. The total lot area for Stage 1A is 3.3173ha.

Stage 1B is envisaged to encompass a single “super lot” which in turn will be four lots of various sizes. The total lot area for Stage 1B will be 5.96ha.

DHA engaged GTA Consultants in March 2017 to complete a transport impact assessment for the proposed Stage 1 development. The site has been approved for low to medium density development by NSW Department of Planning and Blacktown City Council as shown in the Blacktown City Council Development Control Plan Schedule 5 approved development plans illustrated in Figure 1.1.
Figure 1.1: Approved development plan

Source: Department of Planning and Environment (2016) Blacktown City Council Development Control Plan Schedule 5
1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

i existing traffic and parking conditions surrounding the site
ii suitability of the proposed parking in terms of supply (quantum) and layout
iii service vehicle requirements
iv pedestrian and bicycle requirements
v the traffic generating characteristics of the proposed development
vi suitability of the proposed access arrangements for the site
vii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- Blacktown City Council Development Control Plan (DCP) 2015
- Blacktown City Council Development Control Plan (DCP) Schedule 5 – Schofields Precinct
- plans for the proposed development prepared by Craig & Rhodes Drawing Number 1784G L02 [03], Dated 22/5/2017
- road cross sections prepared by Craig & Rhodes Drawing Number 1784C-DA-S1-0151 Rev. B, Dated 12/5/2017
- Schofields Precinct Transport and Access Strategy (2011) as prepared by AECOM
- other documents and data as referenced in this report.
2. Existing Conditions

2.1 Location

The subject site is located off the future proposed Mustang Drive (which is a proposed extension of Veron Road) in the suburb of Schofields. The site of approximately 10.2 ha of land is connected to the proposed Mustang Drive by a proposed internal road network. The site is currently vacant land that forms part of the Schofields Aerodrome and RAAF Station Schofields. Areas directly north of the subject site are currently a mix of agriculture use, residential and planned residential developments. Directly to the south of the site is an education precinct on which the Western Sydney University, Niimba Precinct is located.

As part of the North-West Growth Centre and land releases, Roads and Maritime Services (Roads and Maritime) are currently undertaking major works for the Schofields Road extension.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

![Figure 2.1: Subject Site and Its Environos](image)

2.2 Road Network

The proposed development site is to be accessed via a proposed road (Mustang Drive) that is yet to be constructed. Mustang Drive will connect to Veron Road to the north and Quakers Road to the south.
2.2.1 Surrounding Road Network

Quakers Hill Parkway

Quakers Hill Parkway functions as a sub-arterial road. Quakers Hill Parkway runs in a predominantly east-west direction from the intersection with Richmond Road to Sunnyholt Road. It connects the Quakers Hill region with Richmond Road and the Westlink M7 Motorway. It is a two-way road, with two lanes in each direction. The carriageway is around 18 metres wide and is separated by a wide raised median. Quakers Hill Parkway carries around 27,600 vehicles per day.

Hambledon Road

Hambledon Road functions as sub arterial road and is aligned in a north-south direction. It is a two-way road, with two lanes in each direction for the southern section (between Quakers Hill Parkway and Burdekin Road), with a carriageway width of approximately 6.5 metres each direction separated by a median.

The northern section of Hambledon Road between Burdekin Road and Schofields Road narrows to a single lane in each direction with no median and a carriageway width of approximately 6.5 metres.

Burdekin Road

Burdekin Road functions as a sub-arterial road and is a continuation of Railway Terrace, connecting Railway Terrace with Hambledon Road and ultimately Quakers Hill Parkway and beyond. Burdekin Road runs east-west, is two-way, with two-lanes in each direction. The carriageway is approximately 12.5 metres wide. Burdekin Road provides several connections through roundabouts with local and residential collector roads.

Railway Terrace

Railway Terrace functions as a sub-arterial road and links areas north of Schofields Train Station with Burdekin Road and beyond. Railway Terrace runs north-south with two-way and one lane in each direction. The carriageway width varies along Railway Terrace. Along Railway Terrace are a series of intersections with residential collector and local streets. There is also kerbside parking along Railway Terrace close to Schofields Train Station as well as access to the commuter car associated with the station.

2.3 Travel Modes

The Census Journey to Work (JTW) data 2011 is regarded as the most robust picture of existing travel patterns to/from surrounding areas. The smallest geographical area for which JTW data is available is a Travel Zone (TZ). JTW data was analysed for the broader area to better understand current travel patterns for people who live around the proposed development.

The analysed catchment area is shown in Figure 2.2.

---

1 Blacktown City Council (2007) Road Hierarchy - WARD 1
2 AECOM (2011) Transport and Access Strategy
The travel zones were selected based on similar land uses to the proposed residential development as well as location in the context of the Greater Sydney Region. Travel zones within which the proposed Schofields Aerodrome Stage 1 development are located were not selected due to their largely agricultural use in 2011.

The JTW Data indicates that in 2011, approximately 4480 people resided in the selected travel zones. Of those travelling to work daily, roughly 79 per cent drove to work with an additional six per cent as vehicle passenger/carpooling and 20 per cent using public transport (bus or train). These statistics are summarised in Figure 2.3.

The JTW data also indicated the most common work places for residents within these travel zones. Approximately 28 per cent worked in the Blacktown area, followed by 11 per cent in
Parramatta and ten per cent in Sydney CBD. Only four per cent of residents in the travel zones worked in nearby Rouse Hill and McGraths Hill.

As mentioned above, the existing range of land uses such as agriculture and proposed residential was considered to not provide suitable indication of travel mode choice for the subdivision.

Notwithstanding to the data above, the existing range of land uses such as agriculture as well as proposed residential would not provide a suitable indication of travel mode choice for the proposed subdivision. When considered in the context of the data presented above and given the distance to Schofields Railway Station, there is likely to be a high reliance on private car travel in the first instance, with opportunities for park and ride activity at Schofields Railway Station.

2.4 Public Transport

A review of the public transport available near the site is summarised in Table 2.1.

<table>
<thead>
<tr>
<th>Service</th>
<th>Route #</th>
<th>Route Description</th>
<th>Location of Stop</th>
<th>Distance to Nearest Stop</th>
<th>Frequency On/Off Peak</th>
</tr>
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<tbody>
<tr>
<td>Bus</td>
<td>T74</td>
<td>Blacktown to Riverstone</td>
<td>Schofields Train Station Bus Stop 1</td>
<td>900m</td>
<td>30minutes/60minutes</td>
</tr>
<tr>
<td>Bus</td>
<td>T74</td>
<td>Riverstone to Blacktown</td>
<td>Schofields Train Station Bus Stop 2</td>
<td>900m</td>
<td>30minutes/60minutes</td>
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<tr>
<td>Train</td>
<td>T5</td>
<td>Cumberland Line</td>
<td>Schofields Train Station</td>
<td>900m</td>
<td>Roughly 30 minutes during daytime only</td>
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<tr>
<td>Train</td>
<td>T1</td>
<td>Richmond to City</td>
<td>Schofields Train Station</td>
<td>900m</td>
<td>Roughly 30 minutes</td>
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<tr>
<td>Train</td>
<td>T1</td>
<td>City to Richmond</td>
<td>Schofields Train Station</td>
<td>900m</td>
<td>30 minutes on and off peak</td>
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2.5 Pedestrian Infrastructure

A review of the surrounding area shows that there are currently footpaths located along Veron Road, the proposed Schofields Road upgrade connection and Railway Terrace.

2.6 Cycle Infrastructure

The nearest existing cycleway to the site is located along Quakers Hill Parkway. The cycleway is located south of the site and connects with the broader Blacktown LGA cycling network to link residents with surrounding local suburbs. The cycleway is off-road and links with the Western Highway M7 cycleway which connects to Sydney CBD.

There is an intermittent stretch of cycleway that runs along Railway Terrace and Burdekin Road that switches between off-road cycleway and on-road shared zone. This transitions to a dedicated off-road cycleway at Stanhope Parkway which will link residents with surrounding local suburbs and Westlink M7 and Old Windsor Road cycleways.

As part of the broader master plan, cycling routes are proposed along the full length of the Veron Road, Mustang Drive and Quakers Road proposed route with the goal of connecting with existing cycling infrastructure. The local area existing and future proposed routes are illustrated in Figure 2.4.
Figure 2.4: Surrounding Cycling Infrastructure

Source: Blacktown City Council 2016 Bike Plan Existing and Future Proposed Routes
3. Future Transport Studies

3.1 Schofields Precinct Plan

The Schofields Precinct Plan forms part of the North-West Priority Growth Area and was finalised towards the end of 2012 by the Department of Planning and will comprise the following features:

- 61 hectares of conservation land
- 31 hectares of open space and recreation areas
- Retail space in three neighbourhood centres
- A potential public transport corridor linking Schofields Station to Rouse Hill
- Upgrades to key roads and an internal road network featuring a north-south spine road
- Improved connections to encourage walking and cycling.

The approved Indicative Layout Plan (ILP) for the Schofields Precinct is provided in Figure 1.1.

3.2 Future Road Network

As part of the Schofields Precinct masterplan, Stage 1 of the Schofields Aerodrome development will follow the approved ILP of the Blacktown City Council DCP for the Schofields Precinct Plan. The future road network for the Schofields Precinct can be seen in Figure 3.1.
Schofields Road

Schofields Road will provide a key east-west link through the area north of the site and will connect Windsor Road in the east to Richmond Road in the west. Schofields Road upgrade works aim to increase the capacity to cater for future traffic growth in the area and is currently under construction for Stage 2 of 3 of the proposed Roads and Maritime upgrade scheme. There is a total of ten new signalised intersections proposed between Windsor Road and Richmond Road to improve the accessibility of the North West Growth Centre. The upgrades also seek to integrate cycling, pedestrian and public transport facilities along Schofields Road.
Mustang Drive

Mustang Drive is proposed to continue as an extension from the current Veron Road southbound to Quakers Road and subsequently Quakers Hill Parkway. Mustang Drive will provide a key north-south link through and for the proposed entire Schofields Aerodrome development however will only connect north towards Grange Road for Stage 1 of this development. Mustang Drive is envisaged to ultimately intersect both Schofields Road (after upgrade works) and Burdekin Road (after construction on western side of railway tracks) via signalised intersections as shown in Figure 3.1 in the ultimate development scenario.

This road would be designed in accordance with the Blacktown City Councils Growth Centre Precincts DCP 2016, Schedule 5 – Schofields Precinct.

Burdekin Road

Burdekin Road is proposed to continue from where it currently ends adjoining Railway Terrace and will head eastbound over the rail lines towards Eastern Creek. As such, Burdekin Road is envisaged to intersect with Mustang Drive as per the approved ILP as prepared by the Department of Planning and Schofields Transport and Access Strategy as prepared by AECOM (2011).

Development Stage 1A Access Road

The proposed access road onto Mustang Drive for Stage 1A is intended to be a priority controlled intersection as per the Blacktown City Councils Growth Centre Precincts DCP 2016, Schedule 5 – Schofields Precinct (see Figure 3.1). Signalised intersections are proposed at Mustang Drive / Burdekin Road and Mustang Road / Schofields Road to the north of Stage 1. Based on the proximity of the new access road to the Burdekin Road signalised intersection suitable gaps in traffic would be created for drivers exiting Stage 1A. Furthermore, in the future ultimate development scenario, Mustang Drive will not be the only access for Stage 1A as connection to south will also be provided on the eastern side adjacent to the railway tracks (refer Figure 3.1).

The proposed intersection of the Stage 1A access road and Mustang Drive is proposed to allow all movements. Analysis of this intersection allowing all movements in the ultimate scenario is shown in Section 6.2.

Within the Stage 1A development there is a four-way intersection connecting the access road with a proposed local road that runs north-south. This intersection is proposed to be a priority controlled intersection with control provided on the local road approaches, due to the low volumes of traffic intended to pass through it.

3.3 Public Transport

Both Schofields Road and Burdekin Road have been identified as key bus corridors for future upgrades. These bus services are designed to optimise public transport access to the local area, train stations and town centres. The future proposed public transport network can be seen in Figure 3.2.
Figure 3.2: Blacktown City Council DCP Schedule 5 Future Public Transport Network

Source: Department of Planning and Environment Blacktown City Council Schedule 5 – Schofields Precinct 2016
4. Development Proposal

4.1 Land Uses

The proposal includes the development of 112 lots and four super lots, resulting in approximately 126 residential dwellings across both Stage 1A and 1B. This is shown in Figure 4.1.

Figure 4.1: Proposed Stage 1 residential lot development

The Stage 1A and 1B developments within the Schofield Aerodrome site remain in accordance with the ILP for the Schofields Precinct as prepared by Department of Planning and Blacktown City Council. Furthermore, the internal road layout as well as sub-arterial roads classification for Mustang Drive are also consistent with the ILP which is based on the Schofields Precinct Transport and Access Strategy as prepared by AECOM.

4.2 Road Network

Vehicle access to the proposed Stage 1 development will be via Mustang Drive and proposed internal access roads located immediately north and south of Burdekin Road for Stage 1B and 1A respectively. All traffic generated by Stage 1 of the development would access the greater road network via Grange Road and Schofields Road (upon completion of upgrade works) and will access the road network south of the site upon completion of the Mustang Drive extension (in line with subsequent stages of this development). This access route is consistent with Schofields Precinct ILP as per Blacktown City Council and Department of Planning.
4.3 Car Parking

Car parking will be provided in accordance with the requirements for each residential dwelling. Specific controls are set out in the Blacktown City Council Growth Centre Precincts DCP 2016 with specific reference to Section 4.2.8. As such, dwellings with 1-2 bedrooms will be required to provide at least one car space and dwellings with three or more bedrooms will provide at least two car spaces. Car spaces may include a garage, carport or driveway.

4.4 Pedestrian Facilities

It is assumed that pedestrian paths are proposed along both sides of local roads in accordance with Blacktown City Council Growth Centre DCP 2016. These pedestrian facilities will link the site with the surrounding road network and future facilities along Mustang Drive, Veron Road and further afield.
5. Future Road Network and Layout

5.1 Road Hierarchy

The approved road hierarchy for the Schofields Precinct has been designed to provide direct routes to and from the employment area with minimal impacts on residential areas. In relation to the site, the subdivisional and internal road network has been designed to connect well with the precinct’s road hierarchy. A layout of the approached road hierarchy for the Schofields Precinct can be seen in Figure 3.1.

5.2 New Roads

The DCP 2016 sets out specifications for new roads using principles of street design to ensure safety with a view to ultimately minimise the land area requirements for new roads. These controls are shown in Figure 5.1 to Figure 5.3 and include a variety of different sized road reserves, carriageway widths and footpath and shared path requirements. The need for landscaping within the road reserve is also obvious.

Such details have been considered when designing the local roads that will form a key part of the Stage 1 development, with all requirements being met.

Figure 5.1: Local Street Design Controls Cross-section

Source: Blacktown City Council (2016) Growth Centre Precinct Development Control Plan
5.2.1 Proposed Road Cross Sections

With consideration to the requirements detailed within DCP 2016, detailed cross sections for local roads, collector roads and sub-arterial roads have been developed to ensure a better quality of streetscape whilst remaining in accordance with the DCP 2016. The streetscapes are proposed to include carriageways between nine metres wide for local roads and up to 18 metres wide for sub-arterial roads. Specific details of each streetscape can be found in the following sections however, all roads are proposed to include at least a 1.5-metre-wide footpath and 2.5-metre-wide shared path.
Local Roads

Local roads are proposed to include a 16-metre-wide road reserve. This includes a nine-metre-wide carriageway, together with appropriate capacity for cycling and pedestrian amenity. Where there are localised narrow points proposed, the effective road widths available to vehicles will narrow to seven metres to slow traffic and maintain safety throughout.

A cross section of a local road at a narrow point is illustrated in Figure 5.5 with Figure 5.4 for all other locations.

**Figure 5.4: Local Road Cross-section**

![Local Road Cross-section](source)

**Source:** Craig & Rhodes

**Figure 5.5: Local Road Narrow Point Cross-section**

![Local Road Narrow Point Cross-section](source)

**Source:** Craig & Rhodes

The proposed road cross sections are generally in accordance with DCP 2016 and the inclusion of an off-road cycle path, whilst also maintaining footpaths will add more amenity for non-car users. Reduced carriageways will provide a low speed environment, especially at critical points however the width of road reserve will not be lessened or affected.

Overall, the proposed local road cross section for Stage 1 is considered appropriate for the proposed environment.

Collector Roads

Collector Roads are proposed to include a 20-metre-wide road reserve, including a 11-metre-wide carriageway and cycling and pedestrian amenity. The cross-section of the collector roads is shown in Figure 5.6.
The proposed collector road cross sections are in accordance with DCP 2016 with the carriageway of adequate width to allow for a parking lane on each side in combination with the two-way movement of through vehicles. There is adequate pedestrian and cyclist amenity in the form of footpaths and shared paths. Overall, the proposed collector road cross section for Stage 1 is considered appropriate for the proposed environment.

Sub-arterial Roads

Sub-arterial roads are proposed to include a 26-metre-wide road reserve including two seven metre wide carriageways (for each direction of travel) and a central raised median to separate the carriageways. Each carriageway is proposed to include two travel lanes with the median to be four metres wide.

The proposed road cross section for sub-arterial roads throughout the development are in accordance with DCP 2016 and thus considered appropriate for the proposed environment. There is adequate pedestrian and cyclist amenity in the form of footpaths and shared paths.

5.3 Local Area Traffic Management

To ensure appropriate design and to maintain vehicle speed, local area traffic management (LATM) treatments are recommended as part of the detailed road design and construction. Measures may include the following:
- Speed humps
- Kerb extensions/ blisters
- Raised pavements
- Pedestrian refuge islands
- Speed cushions
- Single lane slow points, narrow road widths with tree pits
- Raised intersection treatments.

5.4 Site Layout Review

The proposed road layout has been reviewed against the requirements of the Blacktown City Council Growth Centre Precincts DCP 2016 and Blacktown City Council DCP 2015. The assessment reviewed the adequacy of the proposed road network. It was found that the proposed layout and road network were generally compliant with the relevant DCP controls and as such should be acceptable for garbage collection and emergency services access.
6. Traffic Impact Assessment

6.1 Traffic Generation

6.1.1 Design Rates

Traffic generation estimates for the proposed development have been sourced from Guide to Traffic Generating Developments – Updated Traffic Surveys (Roads and Maritime, 2013) using rates associated with dwellings in Sydney.

Estimates of peak hour and daily traffic volumes resulting from the proposal are set out in Table 6.1.

Vehicle distribution to and from the site have been based on the following assumptions for residential dwellings:

- 80 per cent would depart, and 20 per cent would arrive in the AM peak
- 60 per cent would arrive, and 40 per cent depart in the PM peak.

Table 6.1: Traffic Generation Estimates

<table>
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<tr>
<th>Period</th>
<th>Proposed Dwellings</th>
<th>RMS Traffic Generation Rate (Movements/Dwelling)</th>
<th>Vehicle Movements</th>
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<tr>
<td></td>
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<td></td>
<td>In</td>
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<tr>
<td>AM Peak</td>
<td>126</td>
<td>0.95</td>
<td>24/hr</td>
</tr>
<tr>
<td>PM Peak</td>
<td></td>
<td>0.99</td>
<td>75/hr</td>
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Table 6.1 indicates that the site could potentially generate up to 125 vehicle movements in any peak hour.

6.2 Traffic Impact

Future traffic volumes near the site as estimated by AECOM\(^3\), include traffic proposed from the Stage 1 development. The traffic generated by the proposed development could not be expected to compromise the safety or function of the surrounding road network.

The intersection of the proposed Mustang Drive and Stage 1A access road was modelled in SIDRA Intersection 7.0 to assess that the proposed priority control arrangement is suitable. Traffic volumes are based on the AECOM Schofields Transport and Access Strategy (2011). The traffic volumes, as modelled by AECOM, are based on a 2036-year scenario where all development has been completed. The traffic distribution of traffic from the Stage 1A development has been assumed to be 80 per cent to the south and 20 per cent to the north in the AM peak. The results are summarised in Table 6.2.

---

\(^3\) AECOM (2011) Schofields Precinct Transport and Access Strategy
Table 6.2: AM Peak SIDRA Modelling Results (2036)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Degree of Saturation</th>
<th>Worst Delay (seconds)</th>
<th>Level of Service</th>
<th>95% Back of Queue Distance (m)</th>
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<td>Mustang Drive (Southbound)</td>
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<td>0</td>
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<td>Stage 1A Access Road</td>
<td>0.252</td>
<td>29</td>
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Table 6.2 indicates that in 2036 under full development conditions the intersection would operate at a satisfactorily level of service under a priority control arrangement.

Furthermore, the signalised intersection to the north of the proposed intersection would assist in providing gaps for right turn movements out of the proposed Stage 1A access road. Finally, the use of Veron Road/ Mustang Drive, Grange Road and Schofields Road by vehicles accessing residential uses which abut them is entirely appropriate and consistent with their functional role in the road network. Given that the intersection of Veron Road/ Schofields Road intersection will be ultimately signalised as part of the Schofields Road upgrade works, the surrounding road network will be more than capable of catering for the traffic generated by the site. As mentioned in Section 4.1, the development is in line with the approved ILP for the precinct which considers land use and generated traffic.

6.3 Construction Traffic Impact

A construction traffic management plan should be prepared prior to works commencing on-site.
7. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i. The proposed development includes a provision for 126 residential lots via a future proposed connecting road (Mustang Drive) and internal access roads.

ii. The site is expected to generate up to 130 and 1348 vehicle movements in any peak hour and daily respectively.

iii. There is adequate capacity in the proposed surrounding road network to cater for the traffic generated by the proposed development which are in line with previously prepared and approved transport studies.

iv. The appropriate provision for garbage collection arrangements and emergency services has been made through the road hierarchy and associated road widths to facilitate access.

v. The proposed development is consistent with the residential land zoning and therefore the traffic modelling completed as part of the planning for the North West Growth Centre which has demonstrated that there will be adequate capacity in the surrounding road network to cater for the traffic generated by the proposal.

vi. A construction management plan should be prepared for the development prior to commencement of work.
Appendix A

Stage 1 Subdivision Plan
**Schedule of Lines**

<table>
<thead>
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<th>No.</th>
<th>Distance (m)</th>
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<td>10.7</td>
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**Notes:**
- PRELIMINARY PLAN ONLY. LOT DIMENSIONS AND AREAS SUBJECT TO DA APPROVALS, DESIGNS SURVEY & REGISTRATION OF THE FINAL PLAN AT LPI NSW.