



TRAFFIC & PARKING ASSESSMENT

MIXED USE DEVELOPMENT
PROPOSED LOT 3 OF PART LOT 1 IN DP 1236735
35 HONEYSUCKLE DRIVE, NEWCASTLE

PREPARED FOR: DOMA GROUP

JULY 2018

17/197

**TRAFFIC IMPACT ASSESSMENT
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PROPOSED LOT 3 OF PART LOT 1 IN DP 1236735
35 HONEYSUCKLE DRIVE, NEWCASTLE**

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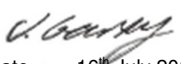
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1.0 INTRODUCTION

Intersect Traffic Pty Ltd was engaged by Doma Group to prepare a Traffic and Parking Assessment Report for a mixed-use development on proposed Lot 3 in a subdivision of Lot 1 in DP 1236735 – 35 Honeysuckle Drive, Newcastle. The development will contain a total of eight (8) above ground levels and two basement levels of on-site car parking (190 spaces) with nine (9) retail tenancies (1,259 m² GLFA total) at ground level and 92 residential apartments over levels 1 to 7. The site is currently vacant land. The development concept plans are shown in **Attachment A**.

Vehicular access to the on-site car parking will be via a combined entry / exit access crossing at Honeysuckle Drive which will operate as a left in and left out only access due to the raised vegetated central median in Honeysuckle Drive that separates flow directions on the road.

This report is required to support a development application to Newcastle City Council and allow the Council to assess the proposal's impact on the local and state road network. This report presents the findings of the traffic assessment and includes the following;

1. An outline of the existing situation near the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
3. Reviews parking, public transport, pedestrian and cycle way requirements for the proposed development, including assessment against Council and Australian Standards.
4. Presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site is shown in **Figure 1** below. It is located on the northern side of Honeysuckle Drive, Newcastle immediately north of the old heavy rail corridor and approximately 600 metres west of Hannell Street and the Wickham Transport Interchange. The site is within the Newcastle City Centre area and adjoins the Honeysuckle entertainment precinct.

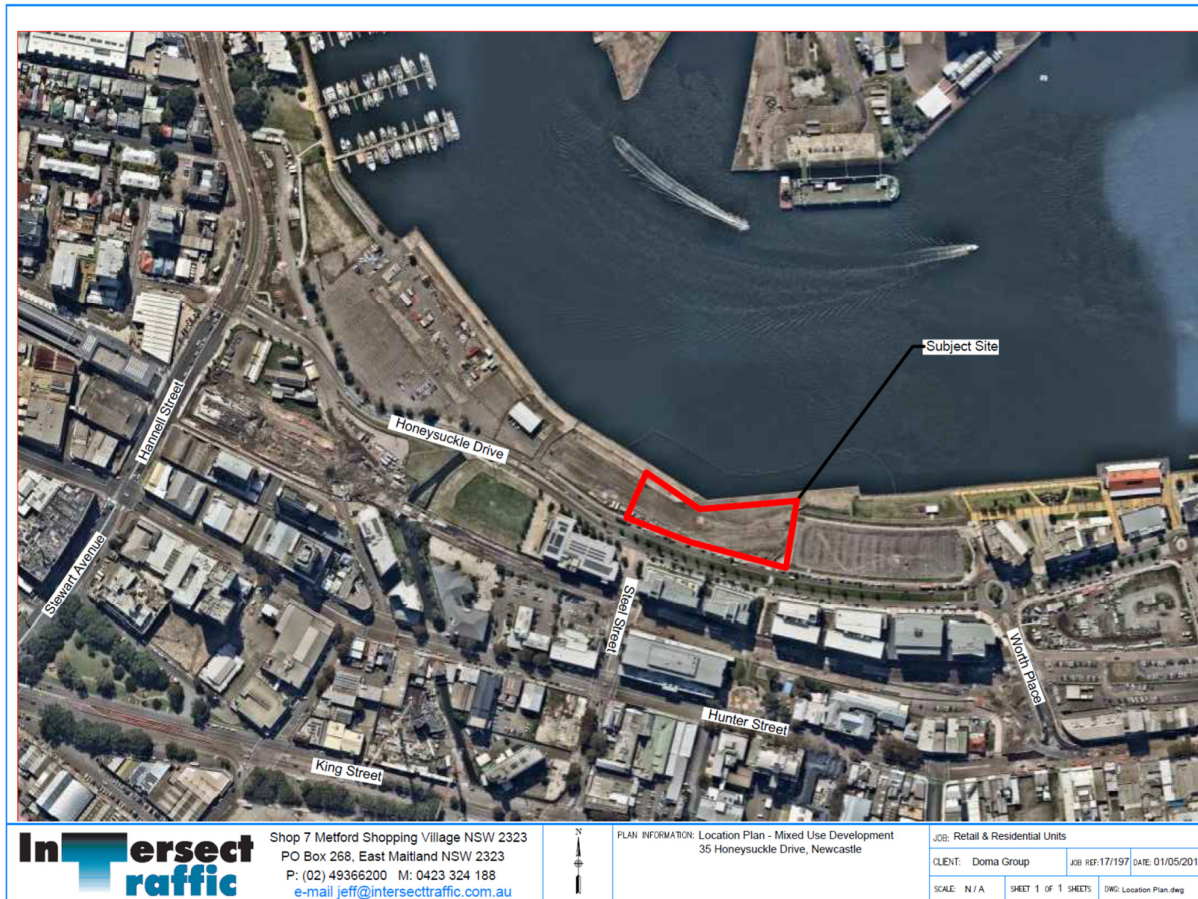


Figure 1 – Site Location

The site has the following property descriptors:

- ◆ Formal land title of part Lot 1 in DP 1236735 being proposed Lot 3 in a subdivision of Lot 1 in DP 1236735;
- ◆ Postal address of 35 Honeysuckle Drive, Newcastle;
- ◆ Site development area of approximately 0.65 ha; and
- ◆ Land zoning of B4 – Mixed Use and RE 1 – Public Recreation pursuant to the Newcastle LEP (2012).

The site is currently vacant land and is being utilised to carry out remediation works to the waterfront wall. The development part of the site has frontage to Honeysuckle Drive only with no formal existing vehicular access to the site. On-street parking along Honeysuckle Drive is paid parking during CBD business hours and time limited as both 4 and 8 hour restricted. **Photograph 1** below shows existing conditions at the site while **Photograph 2** shows the central median within Honeysuckle Drive along the site frontage.



Photograph 1 – Development site



Photograph 2 – Honeysuckle Drive along site frontage

3.0 EXISTING ROAD NETWORK

3.1 Honeysuckle Drive

Honeysuckle Drive under a functional road hierarchy functions as major local collector road in the Newcastle CBD area. It collects and distributes traffic along the harbour front and Newcastle East to connect to the major arterial and sub-arterial road networks being the Pacific Highway (Hunter Street) to the south and Industrial Drive (Hannell Street) to the west. It is under the care and control of Newcastle City Council. In the vicinity of the site Honeysuckle Drive is a two lane two way sealed road with parking lanes and kerb and gutter on both sides and a central raised median separating traffic flow directions. Lane widths are between 3.0 and 3.5 metres and a 50 km/h speed limit applies to the roads. At the time of inspection Honeysuckle Drive (see **Photograph 3**) was observed to be in good condition.

On-street parking in Honeysuckle Drive is both time restricted charged on an hourly basis with a ticket payment scheme in place. Time restrictions vary along the length of Honeysuckle Drive from short term to longer term parking.



Photograph 3 – Honeysuckle Drive near the site

3.2 Hannell Street / Stewart Avenue

Hannell Street and Stewart Avenue near the site are both classified sub-arterial roads under the care and control of NSW Roads and Maritime Services. Their primary function is to connect the Newcastle CBD area to sub-regions to the south (Stewart Avenue) e.g. Charlestown, Belmont, Swansea etc. and to the west and north (Hannell Avenue) e.g. Port Stephens, Raymond Terrace, Maitland and further afield. On-street parking is limited near Honeysuckle Drive. In the vicinity of the site these roads are four lane two way urban roads with kerb and gutter. Lane widths are typically 3 to 3.5 metres and a 50 km/h speed limit applies to these sections of road. At the time of inspection both Stewart Avenue and Hannell Street were observed to be in good condition (see **Photographs 4 & 5**).



Photograph 4 – Hannell Street near the site



Photograph 5 – Stewart Avenue near the site

3.2 Worth Place

Worth Place though generally considered a local urban street provides an important connection to Hunter Street to the south (left in and left out only). This link has only recently been completed across the old heavy rail corridor to ease traffic congestion on Stewart Avenue and Hunter Street to the west and Workshop Way and Merewether Street to the east. It is currently restricted in traffic movement due to construction of the light rail network on Hunter Street. The intersection of Worth Place and Honeysuckle Drive is constructed as a single lane roundabout.

As a local road, Worth Place is under the care and control of Newcastle City Council and is a two-way two-lane road with travel lane widths exceeding 3.5 metres. A 50 km/h speed zoning exists and at the time of inspection Worth Place was observed to be in excellent condition (see **Photograph 6**).



Photograph 6 – Worth Place near the site

4.0 ROAD NETWORK IMPROVEMENTS

The major road network improvement impacting on the site has been the recent removal of the section of heavy rail line between Newcastle and Wickham stations which included the removal of the Merewether Street and Stewart Avenue heavy rail crossings. This increased the capacity of the road network through the removal of the rail crossings.

As part of the light rail construction a new road connection from Hunter Street to Honeysuckle Drive at Steel Street will be constructed with the intersection at Honeysuckle Drive being a signalised T-intersection. This will aid vehicles accessing the site from the east. The provision of light rail along Hunter Street near the site, for which construction has commenced is however likely to result in a reduced two-way mid-block capacity in Hunter Street which overall will likely reduce traffic volumes in Hunter Street but increase traffic volumes on Wharf Road and Honeysuckle Drive thereby reducing available capacity in both Wharf Road and Honeysuckle Drive.

5.0 TRAFFIC VOLUMES

For a previous project in the area Northern Transport Planning Engineering on behalf of Intersect Traffic undertook manual intersection counts on the Stewart Avenue / Hannell Street / Honeysuckle Drive signalised intersections and the Honeysuckle Drive / Worth Place roundabout during the AM and PM peak periods on Thursday 24th August 2017 (prior to the light rail construction in Hunter Street commencing) to gauge existing peak traffic volumes on the local road network. The traffic data collected is provided in **Attachment B**.

This data indicates 2017 peak hour traffic periods to be generally between 7.30 am and 8.30 am and 4.30 pm and 6.00 pm. Peak hour traffic volumes on the local road network during these periods in 2017 are as follows;

- ◆ Hannell Street – 3,023 vtpm in the AM peak and 3,032 vtpm in the PM peak.
- ◆ Stewart Avenue – 2,654 vtpm in the AM peak and 2,607 vtpm in the PM peak.
- ◆ Honeysuckle Drive – 1,515 vtpm in the AM peak and 1,511 vtpm in the PM peak.
- ◆ Worth Place – 156 vtpm in the AM peak and 148 vtpm in the PM peak.

To predict the 2018 mid-block peak hour flows, these volumes are increased by a 3% per annum growth factor for one year. To estimate the 2028 mid-block peak hour flows, these 2018 volumes are increased by a further 3% per annum growth factor for a further 10 years. The 2018 and 2028 mid-block peak hour flows shown in **Table 1** below have been adopted for assessment purposes. The 3 % per annum background traffic growth rate adopted reflects high levels of development in the area, noting the average background traffic growth rate in the lower Hunter area is 1.5% per annum, and is the simplest way to consider the cumulative impacts of other developments in the area.

Table 1 – Mid-block two way traffic volumes (vtpm)

Road	2018 AM	2018 PM	2028 AM	2028 PM
Honeysuckle Drive	1560	1556	2097	2092
Hannell Street	3114	3123	4185	4197
Stewart Avenue	2734	2685	3668	3609
Worth Place	161	152	216	205



6.0 ROAD CAPACITY

The capacity of urban roads is generally determined by the capacity of intersections. However, Tables 4.3 and 4.4 of the RTA's *Guide to Traffic Generating Developments* provides some guidance on mid-block capacities for urban roads and likely levels of service. These tables are reproduced below.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Source: - RTA's *Guide to Traffic Generating Developments* (2002).

Based on these tables and noting that Hannell Street and Stewart Avenue have two lanes per flow direction while Honeysuckle Drive and Worth Place have single lanes per flow direction it is considered that the state and local road network has the following two-way road capacity if a LoS D is considered satisfactory in a CBD area.

- ◆ Hannell Street / Stewart Avenue – up to 5,600 vtpd; and
- ◆ Honeysuckle Drive / Worth Place – up to 2,800 vtpd.

From the traffic data collected in **Section 5** and noting the likely technical road capacity of the local road network exceeds the estimated 2018 and 2028 traffic volumes on the network (Hannell Street peak 4,197 vtpd and Honeysuckle Drive peak 2,097 vtpd) it is considered that the adjacent road network is currently operating within its technical capacity and has scope to cater for additional traffic generated by new development in the area.

7.0 ALTERNATE TRANSPORT MODES

The site is serviced by public transport being within convenient walking distance from bus routes operated by Keolis Downer and Hunter Valley Buses. The bus routes operating along Honeysuckle Drive past the site are route 110 (Keolis Downer) which is a shuttle service running between the new Newcastle Transport Interchange via Queens Wharf and the bus terminal at Watt Street and returns to the new Interchange via King and Stewart Avenue and the Hunter Valley Buses route 138 (Lemon Tree Passage – Williamstown – Newcastle) and route 140 (Raymond Terrace – Hexham – Newcastle). At the time of writing this report some other services were utilising this route as a detour due to Light Rail construction works in Hunter Street.

Bus routes 11, 12, 13, 24 and 47 travel along Hunter Street within 150 metres of the site, whilst routes 22, 23, 24, 26 and 28 are accessed at the Newcastle Interchange. These services provide access to the Newcastle CBD and connections directly, or with other bus services, to John Hunter Hospital, Charlestown Square, the University of Newcastle and the nearby Newcastle Interchange and the Queens Wharf facilitating access to many parts of the Newcastle. Hunter Valley Buses and Port Stephens Buses also provide regular bus services to and from Port Stephens (including the Newcastle Airport), Lake Macquarie and Maitland suburbs from some of these bus interchanges.

The local bus route map is provided in **Figure 2** below. The nearest bus stops are located on Honeysuckle Drive, the closest approximately 30 metres walk west from the site (see **Photograph 7**).

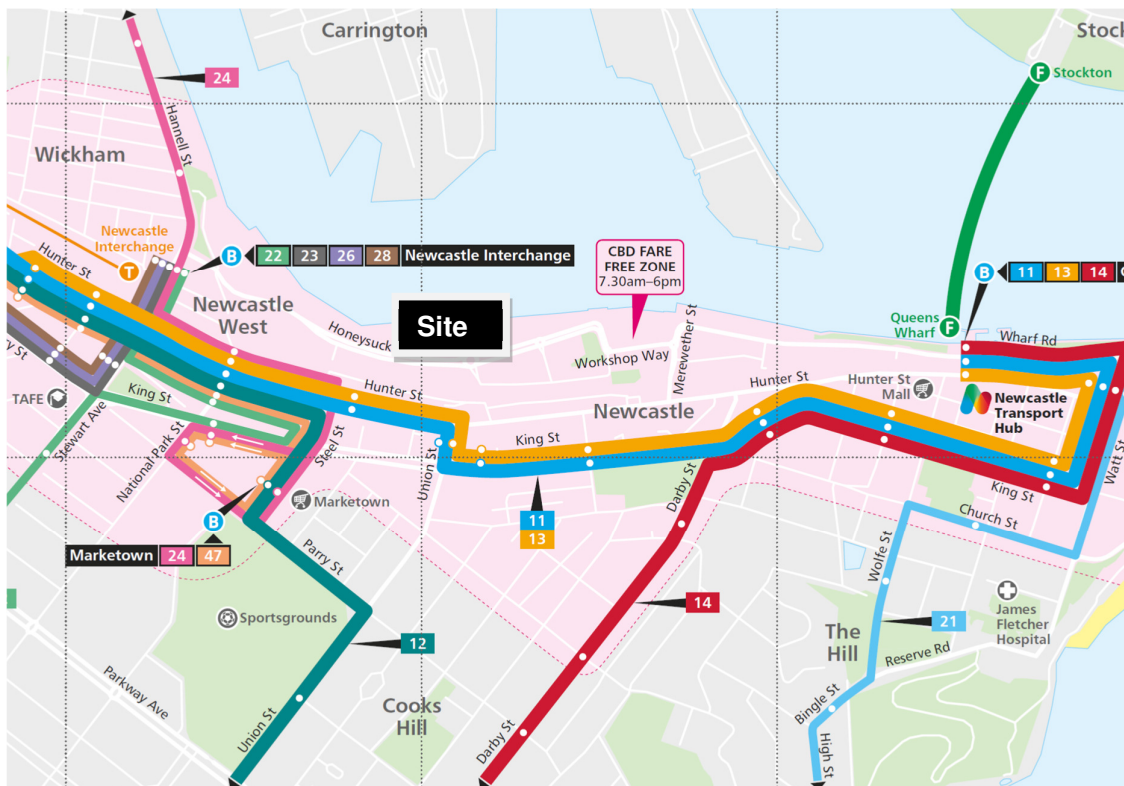


Figure 2 – Keolis Downer ferry & bus routes

The site is surrounded by a suitable pedestrian footpath network made up of mainly reinforced concrete and pavers (see **Photograph 8**) providing suitable connections to the nearby public transport infrastructure and other attractions and services within the CBD, Foreshore and Honeysuckle Precincts.



Photograph 7 – Existing bus stops 30 metres west of site



Photograph 8 – Pedestrian footpath – Honeysuckle Drive

A shared pedestrian path / cycleway, 2.0 metres wide, (see **Photograph 9**) runs along the frontage of the site and connects to an off-road cycleway that runs along the foreshore east and northeast of the site.



Photograph 9 – Honeysuckle Drive shared pathway

The pathways and footpaths are connected via a road crossings and refuge in front of the site (see **Photograph 10**). Cyclist accessing the site would be required to utilise these off-road cycle ways or share travel lanes with other vehicles. Due to the road conditions and traffic volumes in the area on road cycling would only be suitable for experienced cyclists.



Photograph 10– Road Crossing and Refuge

8.0 DEVELOPMENT PROPOSAL

The proposal is to construct a mixed-use development containing two buildings with retail tenancies and residential apartments as well as two basement levels for parking. Retail tenancies at ground level and 92 residential apartments over levels 1 to 7 are proposed. The development plans are provided within **Attachment A**. Specifically, the proposal seeks to undertake the following works;

- ◆ Basement levels 1 and 2 – 190 car parking spaces (21 stacked / tandem), plant and storage areas;
- ◆ Ground level – 9 separate retail tenancies (1,259 m² GLFA) and a combined entry / exit vehicular access to Honeysuckle Drive;
- ◆ Level 1 – 4 one bedroom, 6 two bedroom and 3 three bedroom residential apartments;
- ◆ Level 2 to 6 – 3 one bedroom, 7 two bedroom and 5 three bedroom residential apartments on each level;
- ◆ Level 7 - 4 three bedroom residential apartments;
- ◆ Roof top level solar panels and provision for future solar panels; and
- ◆ Drainage and landscape works to Newcastle City Council requirements.

The proposed combined entry / exit access to the basement level parking area at Honeysuckle Drive operates as a left in and left out only access due to the raised central median in Honeysuckle Drive that separates traffic flow directions on the road. Vehicles wishing to head west will utilise the Honeysuckle Drive / Worth Place roundabout to undertake a U-turn movement while vehicles approaching from the east will utilise the soon to be constructed Steel Street connection between Hunter Street and Honeysuckle Drive to access the site.



9.0 TRAFFIC GENERATION

The RMS' *RTA's Guide to Traffic Generating Development's* provides specific advice on the traffic generation potential of various land uses. However, regarding residential flat buildings, the RMS issued a Technical Direction TDT 2013/04 in May 2013 that provided updated traffic generation rates for certain development types including residential flat buildings.

Therefore, the relevant land uses and traffic generation rates applied in this assessment are;

Retail

- ♦ *Daily vehicle trips – 121 per 100 m² GFA and evening peak hour – 12.5 per 100 m² GFA.*

Note: - due to the location of the site within the Newcastle City Centre area a cross-use and passing traffic concession of 50 % is considered reasonable.

Residential Flat Buildings

Weekday Rates	Sydney Average	Sydney Range	Regional Average	Regional Range
AM peak (1 hour) vehicle trips per unit	0.19	0.07-0.32	0.53	0.39-0.67
AM peak (1 hour) vehicle trips per car space	0.15	0.09-0.29	0.35	0.32-0.37
AM peak (1 hour) vehicle trips per bedroom	0.09	0.03-0.13	0.21	0.20-0.22
PM peak (1 hour) vehicle trips per unit	0.15	0.06-0.41	0.32	0.22-0.42
PM peak (1hour) vehicle trips per car space	0.12	0.05-0.28	0.26	0.11-0.40
PM peak (1 hour) vehicle trips per bedroom	0.07	0.03-0.17	0.15	0.07-0.22
Daily vehicle trips per unit	1.52	0.77-3.14	4.58	4.37-4.78
Daily vehicle trips per car space	1.34	0.56-2.16	3.22	2.26-4.18
Daily vehicle trips per bedroom	0.72	0.35-1.29	1.93	1.59-2.26

Therefore, the following peak hour traffic generation calculations can be undertaken for the proposed development noting traffic impact assessment is based on peak hour traffic volumes and average regional rates are used due to the site being within the Newcastle City Centre area with excellent access to existing and future public transport. For the purposes of this assessment it is assumed the retail tenancies AM peak does not coincide with the road network AM peak.

Retail spaces (PM) = $1,259 \text{ m}^2 / 100 \text{ m}^2 \times 12.5 \text{ vtpH} \times 0.5 = 78.7 \text{ vtpH}$;
 Residential apartments (AM) = $92 \times 0.53 = 48.8 \text{ vtpH}$; and
 Residential apartments (PM) = $92 \times 0.32 = 29.5 \text{ vtpH}$.

Therefore, the total peak hour traffic volumes (rounded up) generated by the proposed development are;

Peak hour traffic generation (AM) = $78.7 + 48.8 = 128 \text{ vtpH}$
 Peak hour traffic generation (PM) = $78.7 + 29.5 = 109 \text{ vtpH}$.

These traffic generation values calculated for the development have been adopted in this report.

10.0 TRIP DISTRIBUTION

Before carrying out any traffic assessment the additional peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making several assumptions as to distribution patterns to and from the complex. In distributing the peak hour traffic through the adjacent road network the existing traffic distribution was used as a basis for distributing the development traffic. Key assumptions made were;

- ◆ For the residential component in the AM peak 80% of traffic is outbound and 20 % inbound. This is mirrored in the PM peak.
- ◆ For the retail section in the AM and PM peak it is assumed length of stay is less than 1 hour therefore 50% of traffic is inbound and 50% of traffic is outbound.
- ◆ All traffic will enter the site from Honeysuckle Drive approaching from the west and exit the site onto Honeysuckle Drive heading east.
- ◆ In the AM and PM peaks 70% of outbound traffic will undertake a U-turn at Worth place, 20% will turn right into Worth Place, and 10% will travel on Honeysuckle Drive east from Worth Place.
- ◆ The 70% AM and PM peak outbound traffic performing the U-turn at Worth Place will be split with 60% turning right onto Hannell Street and 10% turning left into Steel Street.
- ◆ In both the AM and PM peak 60% of inbound traffic will turn left from Hannell Street, 20% will turn right from Stewart Avenue and 20% will turn right from Steel Street.

The resulting predicted AM and PM peak hour trip distributions for traffic generated by the development have therefore been determined as shown below in **Figure 3**.

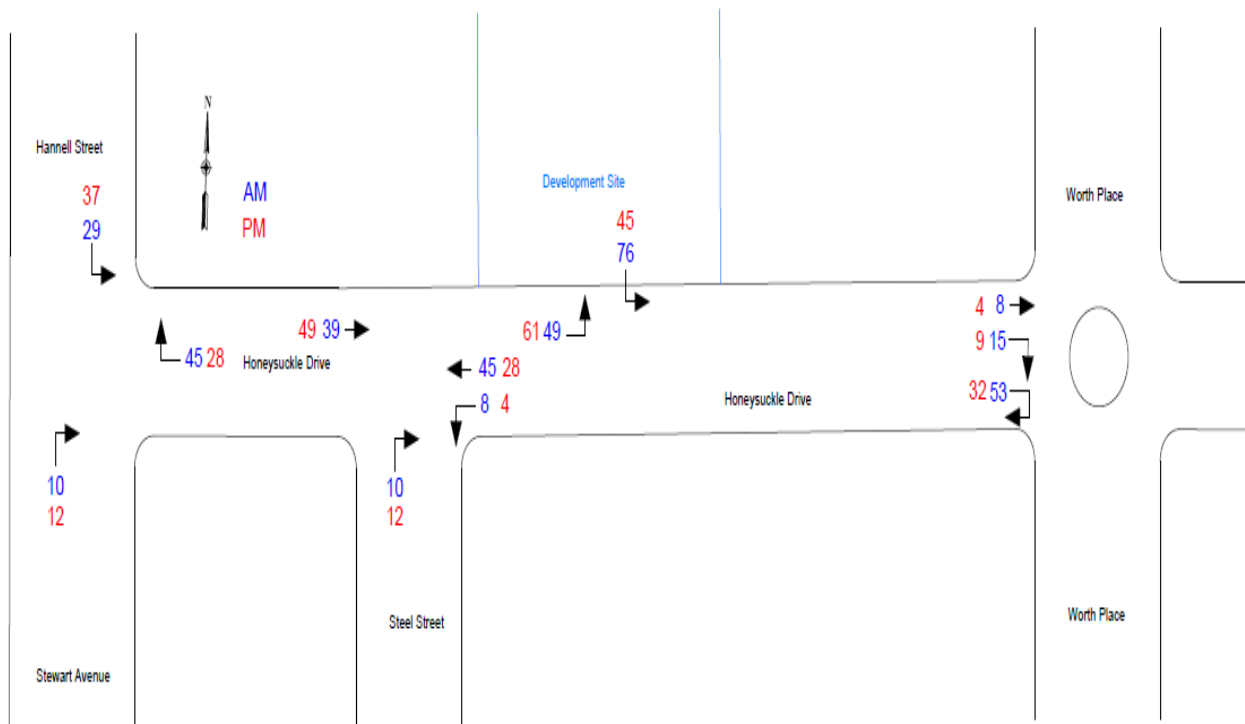


Figure 3 – Development Traffic Trip Distribution

11.0 TRAFFIC IMPACTS OF DEVELOPMENT

11.1 Road Network Capacity

It has previously been shown in **Section 6** of this report that the local road network is currently operating well within its technical capacity. The proposed development will result the following additional two-way traffic flows on any leg of the local road network (see **Figure 3**).

- ◆ Honeysuckle Drive – 128 vtpm in the AM peak and 89 vtpm in the PM peak;
- ◆ Hannell Street – 29 vtpm in the AM peak and 37 vtpm in the PM peak;
- ◆ Stewart Avenue – 10 vtpm in the AM peak and 12 vtpm in the PM peak;
- ◆ Steel Street – 18 vtpm in the AM peak and 16 vtpm in the PM peak; and
- ◆ Worth Place – 15 vtpm in the AM peak and 9 vtpm in the PM peak.

The addition of this traffic generated by the development will not result in the capacity thresholds for these roads being reached as demonstrated below in **Table 2**.

Table 2 – Mid-block two-way capacity assessment

Road	Capacity (vtpm)	Development Traffic (vtpm)		Post - Development traffic (vtpm) @ 3 % p.a. background growth			
		AM	PM	2018 AM	2018 PM	2028 AM	2028 PM
Honeysuckle Drive	2,800	129	89	1689	1645	2226	2181
Hannell Street	5,600	29	37	3143	3160	4214	4234
Stewart Avenue	5,600	10	12	2744	2697	3686	3621
Worth Place	2,800	15	9	176	161	231	214

The peak two-way traffic volumes on the road network on operation of the development within the critical Honeysuckle Drive leg is still only likely to be in the order of less than 1,689 vtpm in 2018 or 2,226 vtpm in 2028 (3% per annum background traffic growth) which are still below the technical mid-block two way capacity of Honeysuckle Drive previously determined as being up to 2,800 vtpm. Further all other roads in the immediate road network also continue to operate below their mid-block two-way capacity. A crossing of the light rail track in Steel Street between Hunter Street and Honeysuckle Drive is currently being constructed as a two lane two way road. It is designed by light rail and is deemed to cater for the traffic proposed for its use and would be expected to operate within its mid-block capacity in 2018 and through to 2028.

It is therefore reasonable to conclude that the state and local road network subject to suitable intersection controls being in place has sufficient spare capacity to cater for the proposed development.

11.2 Intersection Capacity

The intersections likely to be most affected by this development are;

- ◆ Hannell Street / Honeysuckle Drive Signalised T-intersection; and
- ◆ Honeysuckle Drive / Worth Place Roundabout.

To determine the impact of the development on these intersections, the intersections were modelled using the SIDRA 7 traffic modelling software. This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of the RMS shown below;

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Source: - RTA's Guide to Traffic Generating Developments (2002).

Modelling was carried out for the AM and PM peak periods for both the post development (2018) and for ten years background traffic growth at 3% per annum (2028) scenarios. Assumptions made in the modelling were;

- ♦ Intersection layout for Hannell Street / Honeysuckle Drive Signalised T-intersection was as proposed in current 'Revitalising Newcastle' website documents as provided in **Attachment C** and Honeysuckle Drive / Worth Place Roundabout layout is as constructed;
- ♦ Baseline traffic data was as collected by NTPE in August 2017;
- ♦ Development traffic and trip distribution as per **Figure 3**.

The summary results of the modelling for the 'all vehicles' case are shown in the following **Tables 3 & 4** while the Sidra Movement Summary Tables for each scenario modelled are provided in **Attachment C**.

Table 3 – Sidra Results 'all vehicles' – Hannell Street / Honeysuckle Drive signalised intersection

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.906	35.8	C	27.1
2018 PM + development	0.920	25.0	B	16.7
2028 AM – 3 % pa traffic growth	1.089	193.5	F	122.1
2028 PM – 3 % pa traffic growth	0.989	84.3	F	81.2
2028 AM – 1.5 % pa traffic growth	0.947	63.0	E	62.7
2028 PM – 1.5 % pa traffic growth	0.925	32.8	C	28.0

Table 4 – Sidra Results 'all vehicles' – Honeysuckle Drive / Worth Place roundabout.

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.543	5.3	A	5.1
2018 PM + development	0.466	5.0	A	3.4
2028 AM + development	0.709	6.1	A	8.8
2028 PM + development	0.577	5.5	A	4.8

The modelling shows that the Honeysuckle Drive / Worth Place roundabout will continue to operate satisfactorily both post development and through to 2028. The Level of Service (LoS), 95 % back of queue lengths and average delay for all movements fall within the RMS acceptable levels i.e. equivalent to or better than a LoS D in urban areas.

Regarding the Hannell Street / Honeysuckle Drive signalised intersection the modelling shows this intersection is currently operating within capacity in both the AM and PM peak periods. With continued background traffic growth, the intersection approaches capacity in 2028, with and without the development traffic, however, the additional traffic from this development has little impact on the operation of the intersection and will not result in any change in LoS being experienced by motorists on the road network. A sensitivity analysis demonstrates that the background traffic growth rate on the road network determines the failure time with a 1.5 % per annum background traffic growth showing the intersection may just reach capacity by 2028. This is not considered unacceptable nor is it considered sufficient nexus for the further upgrading of the intersection.

A crossing of the light rail track in Steel Street between Hunter Street and Honeysuckle Drive is currently being constructed as a two lane two way road. The design is also shown in **Attachment D** of this report. At Honeysuckle Drive, there is to be a signalised T-intersection with pedestrian crossings with a right turn from Steel Street into Honeysuckle Drive and a left turn from Honeysuckle Drive into Steel Street the only turning movements permitted. As stated previously it is deemed to cater for the traffic proposed for its use and would be expected to operate within capacity limits in 2018 and through to 2028.

It is therefore reasonable to conclude that the proposed development will not adversely impact on the operation of nearby intersections and overall the development will not adversely impact on the local and state road network.

11.3 Access

The development site currently does not have a formal vehicular access. It is proposed to service the basement car parking with a single combined entry / exit at Honeysuckle Drive to be located approximately 100 metres west of the eastern boundary of the site. This access will operate as a left in and left out only access due to the raised central median in Honeysuckle Drive with motorists either adjusting their approach and departure routes to suit their origin / destination or utilising the Honeysuckle Drive / Worth Place roundabout to undertake a U-turn movement when egressing the site. The right turn movement from Steel Street proposed from the intersection at Honeysuckle Drive / Steel Street, currently under construction, will also facilitate ingress to the site.

Suitable pedestrian and vehicular sight lines in accordance with Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* can be provided with the use of a combined entry / exit driveway and appropriate on-street car parking controls around the access.

The access will service a car park of 190 spaces for Class 1A parking (residential, domestic and employee parking). Table 3.1 of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* requires a category 2 access for this size of car park accessing at a local road. A category 2 access requires a 6 - 9 metre wide combined entry / exit vehicular access. The proposed development appears to comply (by scaling) with this requirement.

As the car park will have a control point the car park also needs to provide suitable queuing. For resident parking only a single space queue within the property prior to the security gate is required i.e. 6 metres. The proposed security gate will therefore need to be provided 6 metres inside the boundary which can be accommodated and thus compliant with Newcastle Council and Australian Standard requirements. As all ramps within the development are straight ramps they need to be a minimum 5.5 metres wide however no traffic flow separation median is required (see Table 2.2 of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking*). The proposed car park design is also compliant with this requirement of the Australian Standard.

Overall it is concluded the proposed car park access arrangements at Honeysuckle Drive are satisfactory as they provide a suitable level of pedestrian and road safety as well as serviceability to the development. They have also been designed to comply with the requirements of Newcastle City Council and Australian Standard AS2890.1-2004 *Parking Facilities – Part 1 Off-street car parking*.

11.4 Off-Street Car Parking

On-site parking for this development is to be provided in accordance with *Newcastle City Council's Development Control Plan (DCP) 2012 requirements and Australian Standard AS 2890.1 – 2004 Parking facilities – Part 1: Off-street car parking*. The concept drawings provided would need to be fully dimensioned to confirm the assessment of the suitability of the proposed on-site parking.

11.4.1 Parking Space Numbers

The peak parking demand rates considered relevant within Council's DCP are as follows noting that the site is within the Newcastle City Centre area;

Except for residential development, car parking for development in the City Centre is provided at the rate of one space per 60 m² gross floor area.

For residential development:-

- ◆ *Small (<75m² or 1 bedroom) average 0.6 spaces per dwelling*
- ◆ *Medium (75m² - 100m² or 2 bedrooms) average 0.9 spaces per dwelling*
- ◆ *Large (>100m² or 3 bedrooms) average 1.4 spaces per dwelling*
- ◆ *1 space for the first 3 dwellings plus 1 space for every 5 thereafter or part thereof for visitors.*

On this basis the total car parking requirement (peak parking demand) for the proposed can be calculated as shown (rounded up) below in **Table 5**;

Table 5 – NCC DCP- Car Parking Calculation

Land-Use	GFA (m ²)	Units	Car parks	Visitor carparks
Ground Level - non -residential	1259		21.0	
Residential 1 Bedroom		19	11.4	4.2
Residential 2 Bedrooms		41	36.9	8.2
Residential 3 Bedrooms		32	44.8	6.4
			114.1	18.8

Further the Newcastle DCP would require the following in regard to motorcycle and bicycle parking;

Residential

- ◆ *Bike parking of 1 space per dwelling is required unless separate storage is provided (Council determine the required class of security) plus 1 space per 10 dwellings (Class 3) for visitors.*
- ◆ *1 motorbike space per 20 car spaces.*

Non - Residential

- ◆ *Bicycle Parking - 1 space per 100m² GFA (Class 2)*
- ◆ *Motor Cycle Parking - 1 space per 20 car spaces*

Therefore the development would be required to provide a suitable bicycle locker storage area for 92 bicycles for residents plus bicycle racks - 10 (Class 2) and 12 (Class 3) - for visitors as well as 6 motorcycle spaces.

The site with a total of 190 marked on site car parking spaces including 10 accessible spaces within two levels of resident, visitor and staff car parking as well as a suitable bicycle locker area for residents and 10 motor cycle parking spaces therefore provides in excess of the DCP requirement.

The development provides 22 retail car spaces with 6 tandem spaces assigned to the bigger retail tenancies for staff parking and 21 visitor car parking spaces which are both in excess of the DCP requirements for the proposed development. This leaves 10 accessible spaces for general or resident use with the accessible apartments allocated at least one accessible space as well as an additional 137 spaces allocated for resident parking with the remaining 15 tandem spaces being allocated to 15 of the 34 three bedroom apartments. This is again well in excess of the 94 residential car spaces required by the DCP.

11.4.2 Parking Design Requirements

The layout of the parking within a development would need to comply with *Figure 2.2 - Layouts for Angled Parking Spaces* from the Australian Standard AS 2890.1 – 2004 Parking facilities – Part 1: Off-street car parking. This figure detailing requirements for various parking angles is reproduced below for reference.

Class 1A is the User Class applicable for the off-street car parking facility of this development. For the 90° angled parking proposed, the minimum carpark bay width would therefore be 2.4 metres, the minimum bay length 5.4 metres and the minimum aisle width 5.8 metres, shown in Figure 2 – Layouts for Angled Parking Spaces below. A review of the parking plans indicate these criteria have been achieved (by scaling) though will need to be confirmed at Construction Certificate stage once detailed dimensioning is available.

Section 2.4.2 Angle parking aisles (c) blind aisles or (dead-end) aisles states that the aisle of a car park is to be extended at least 1.0 metre past the last car space and that the last car parking space is to be widened by a minimum of 300 mm if adjacent to a wall. This applies to a number of car spaces for this development. The proposal appears to comply (by scaling).

Given the size of the car park, the constraints of the site and the likely low traffic volumes in the car park it is considered that the proposed car park is satisfactory and would encourage forward entry and exit from the site as convenient turning movements within the car park could be achieved.

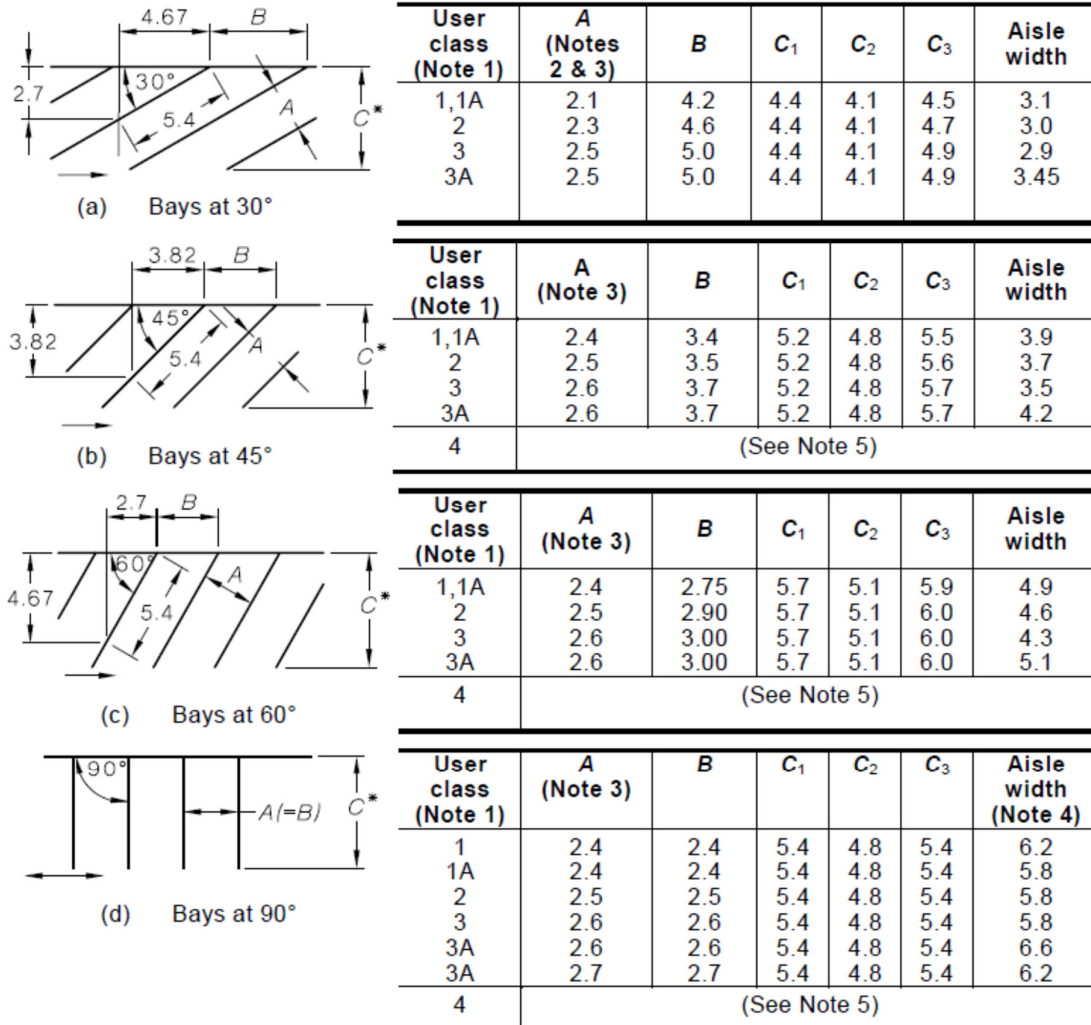
Overall it can be concluded that the proposed onsite layout is satisfactory providing sufficient spaces and suitable manoeuvrability for the likely long term parking demand generated by the operation of the proposed development.

11.5 Servicing

As a residential / retail development, servicing will involve waste collection and deliveries for the retail services and to the apartments. It is considered up to 6 deliveries per day would be the normal servicing frequency. All these deliveries would be made by small to medium rigid vehicles the largest being the waste collection vehicle and the development is designed for servicing from the Honeysuckle Drive kerb requiring provision of a kerbside loading area in the vicinity of the site. Waste would be lifted by hoist from the waste bin areas in the basement car park to the street and wheeled to the kerb by the building manager. Such a facility would need to be approved by Newcastle Council's local traffic committee and based on a normal waste collection vehicle should be approximately 18 metres long resulting in the loss of up to three (3) on-street car parking spaces. The loss of on-street car parking is more than compensated with the proposed on-site car

parking excess within the development providing further justification for Council to support the on-street loading zone in Honeysuckle Drive.

Further most deliveries can be programmed to occur outside the peak AM and PM traffic periods which ensures the servicing of the site does not adversely impact on the local road network. It is concluded that subject to Newcastle Council's local traffic committee supporting a kerb side loading zone in Honeysuckle Drive near the development the proposed servicing arrangements for the development are satisfactory.



Layouts for Angled Parking Spaces - Figure 2.2 - AS 2890.1

11.6 Construction Traffic

The construction of the development will result in additional traffic entering and exiting the site. It is estimated that during the peak construction periods up to 30 construction employees will be on-site at any one time. If a car occupancy rate of 1.2 is assumed for employee traffic this would result in an AM and PM peak traffic flow to the site of in the order of 25 vtp. This will also increase the peak parking demand at the site by a similar number during construction. Construction employee parking has been a major issue with other inner city construction projects with construction employees taking up a significant portion of the long term parking areas in the city at the expense of the CBD business employees. Therefore the applicant will either need to liaise with the Honeysuckle Development Corporation for the use of the currently vacant, unused heavy rail corridor, east of Worth Place for construction employee traffic or negotiate with Newcastle Council

to utilise a nearby recreational facility car park not used during weekday business hours to operate a private bus shuttle (park and ride) service for the construction employees.

Material deliveries will add to this traffic with peak materials delivery traffic expected during the pouring of concrete slabs early on in the construction period. With a large pour and a fleet of concrete trucks sourced from nearby it is likely that a further 10 vph could occur during the AM peak period as a result of this construction activity. Therefore overall it is estimated that the peak construction traffic generation resulting from the construction of the development will be in the order of 35 vph during the AM peak. This assessment has already determined that the additional post development traffic generation from the site as a result of the new development is in the order of up to 129 vph and that this will not adversely impact on the capacity of the local road network. As this is more than double the likely construction traffic generation from the site it would also be reasonable to assume then that the construction traffic associated with the development will not adversely impact on the local road network.

Construction traffic is a short term traffic impact that is best managed through the preparation of a construction traffic management plan prepared and implemented prior to commencement of construction activities. This plan may seek to minimise the impacts of construction activities by designating travel routes, access points, construction employee parking areas, material delivery procedures and times etc. This plan is best prepared, implemented and enforced by the head contractor. It is recommended that a construction traffic management plan be prepared and implemented prior to the commencement of construction activities.

12.0 PEDESTRIAN FACILITIES

Given the location and type of development proposed it is likely to generate additional pedestrian movements as residents seek access to the Newcastle Transport Interchange, Newcastle CBD area, the Foreshore area and the Honeysuckle entertainment precinct. By observation the existing external pedestrian facilities are considered adequate and apart from the upgrading of the pedestrian pathways along the frontage of the site no additional external pedestrian facilities are deemed warranted.

In terms of internal pedestrian linkages within the car park area due to the limited size of the parking areas on each level and the proposed configuration it is unlikely that vehicle speed within the car park will be an issue and nor will there be any necessity to provide designated pedestrian linkages aside from delineating pedestrian waiting areas in the vicinity of the lift access points.

13.0 ALTERNATIVE TRANSPORT MODE FACILITIES

The proposed development is likely to generate additional public transport usage as it is likely many residents will utilise existing bus services, taxi's and the rail service (both light or heavy) to access the site. However the accessibility of the site to existing public transport services is considered excellent and that no new facilities or service amendments will be required as a result of the level of additional public transport usage generated by the development nor will they provide any further benefit in encouraging public transport usage.

Similarly it is likely that the development will increase bicycle traffic to the site however with convenient access to the Foreshore cycleway and onto the wider Newcastle cycle way's network it is concluded that the existing external bicycle infrastructure in the area is suitable for the type of development proposed.

14.0 CONCLUSIONS

This traffic impact assessment for a mixed use development containing retail tenancies (1,271 m² GFA) at ground level and 92 residential apartments over levels 1 to 7 on proposed Lot 3 in part Lot 1 in DP 1236735 – 35 Honeysuckle Drive, Newcastle has determined the following;

- ◆ The local road network in the vicinity of the site as either a four lane two way or a two lane two way road has a likely technical mid-block capacity of up to 5,600 vtp/h and 2,800 vtp/h respectively if a LOS D is considered acceptable. As this is in excess of current traffic volumes the local road network has spare capacity to cater for development in the area.
- ◆ It is expected that the additional traffic generated by the development will be 128 vtp/h in the AM peak period and 109 vtp/h in the PM peak period.
- ◆ The local road network has sufficient spare capacity to cater for the additional development traffic generated by the proposal and other developments in the area without the need for any road upgrading works.
- ◆ SIDRA modelling shows that the Honeysuckle Drive / Worth Place roundabout will continue to operate satisfactorily both post development and through to 2028. The Level of Service (LoS), 95 % back of queue lengths and average delay for all movements fall within the RMS acceptable levels i.e. equivalent to or better than a LoS D in urban areas.
- ◆ SIDRA modelling of the upgraded Hannell Street / Honeysuckle Drive signalised intersection shows this intersection would continue to operate satisfactorily post development though is still likely to be reaching capacity by 2028. The additional traffic from this development has little impact on the operation of the intersection and will not result in any change in LoS being experienced by motorists on the road network.
- ◆ The proposed development will not adversely impact on the operation of nearby intersections and overall the development will not adversely impact on the local and state road network.
- ◆ The proposed car park access arrangements off Honeysuckle Drive are satisfactory as they provide a suitable level of pedestrian and road safety as well as serviceability to the development. They can also be designed to comply with the requirements of Newcastle City Council and Australian Standard AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking.
- ◆ The proposed on-site car parking provision and layout is generally satisfactory providing sufficient spaces, suitable manoeuvrability and serviceability for the likely long term parking demand generated by the operation of the proposed development.
- ◆ Subject to Newcastle Council's local traffic committee supporting a kerb side loading zone in Honeysuckle Drive near the development the proposed servicing arrangements for the development are satisfactory and loss of on-street car parking is more than compensated by the excess of on-site car parking within the development.
- ◆ Construction traffic generated by the development will be less than the additional traffic generated by the operation of the development therefore also will not adversely impact on the local road network. A construction traffic management plan should be prepared and implemented prior to commencement of construction activities on the site to ensure the impacts of the construction activities are minimised during construction.
- ◆ The existing external pedestrian facilities are considered adequate and apart from the upgrading of the pedestrian pathways along the frontage of the site no additional external pedestrian facilities are deemed warranted.
- ◆ Existing and proposed public transport services to the site are considered excellent and no new facilities or service amendments will be required as a result of the level of additional public transport usage generated by the development.
- ◆ The development will increase bicycle traffic to the site however with convenient access to the Foreshore cycleway and onto the wider Newcastle cycle way's network it is concluded that the existing external bicycle infrastructure in the area is suitable for the type of development proposed.

15.0 RECOMMENDATION

Having carried out this traffic impact assessment for a mixed use development containing retail tenancies (1,271 m² GFA) at ground level and 92 residential apartments over levels 1 to 7 on proposed Lot 3 in part Lot 1 in DP 1236735 – 35 Honeysuckle Drive, Newcastle it is recommended that the proposal can be supported from a traffic impact perspective as it will not adversely impact on the local and state road network and complies with all relevant Newcastle City Council, Australian Standard and RMS requirements.



JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd



ATTACHMENT A

DEVELOPMENT PLANS



FOR APPROVAL			By	CHK.
Rev	Date	Revision		
1	04/05/18	Issued to Consultants	M.L.	EW
2	11/05/18	Issued to Consultants	M.L.	EW
3	06/06/18	Issued for Review	M.L.	EW
	09/07/18	Issued Approval	M.L.	AV

Coping/Allocation - By Level	
Basement 2	
Accessible 2400x400	5
Standard 3400x5400	79
Standard 3400x5400 (Tandem)	14
GR	98
Basement 1	
Accessible 2400x400	5
R - Retail 3400x5400	22
R - Retail 3400x5400	33
Standard 3400x5400	37
Standard 3400x5400 (Tandem)	7
V - Visitor Parking 2400x400	20
V - Visitor Accessible 2400x400	1
TOTAL	190



Structural Engineer	Northrop Consulting Engineers
Mechanical / Hydraulic Engineer	
SAB / WPFD	
Electrical Engineer	
SAB	
Fire Engineer	
WPFD	
Access Consultant	
Philip Chun	
Blaze	
David Gradwell	

DOMAGROUP

Project
35 Honeysuckle
35 Honeysuckle Drive
Newcastle, NSW 2300

Drawing Name
Floor Plan - Basement 02

Date	Scale	Sheet Size
09.07.18	1 : 200	@ A1

Region	Unit
All	EW

Job No. **5711** Drawing No. **DA-A-0201 / 04** Revision



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FOR APPROVAL			
Rev	Date	By	CHK
01	09/07/18	Northrop Consulting	NAL
02	09/07/18	Northrop Consulting	NAL
03	09/07/18	Northrop Consulting	NAL
04	09/07/18	Northrop Consulting	NAL

Carparking Allocation - By Level			
Allocation	Standard	Standard	Standard
Allocation 1	Standard 1	Standard 2	Standard 3
Allocation 2	Standard 4	Standard 5	Standard 6
Allocation 3	Standard 7	Standard 8	Standard 9
Allocation 4	Standard 10	Standard 11	Standard 12
Allocation 5	Standard 13	Standard 14	Standard 15
Allocation 6	Standard 16	Standard 17	Standard 18
Allocation 7	Standard 19	Standard 20	Standard 21
Allocation 8	Standard 22	Standard 23	Standard 24
Allocation 9	Standard 25	Standard 26	Standard 27
Allocation 10	Standard 28	Standard 29	Standard 30
Allocation 11	Standard 31	Standard 32	Standard 33
Allocation 12	Standard 34	Standard 35	Standard 36
Allocation 13	Standard 37	Standard 38	Standard 39
Allocation 14	Standard 40	Standard 41	Standard 42
Allocation 15	Standard 43	Standard 44	Standard 45
Allocation 16	Standard 46	Standard 47	Standard 48
Allocation 17	Standard 49	Standard 50	Standard 51
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Allocation 19	Standard 55	Standard 56	Standard 57
Allocation 20	Standard 58	Standard 59	Standard 60
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Allocation 98	Standard 292	Standard 293	Standard 294
Allocation 99	Standard 295	Standard 296	Standard 297
Allocation 100	Standard 298	Standard 299	Standard 300



Northrop Consulting Engineers
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 S48 / WPFED
 Electrical Engineer
 Fire Engineer
 WPFED
 Access Consultant
 Philip Chen
 Access
 David Carabell
 Owner

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Project
 35 Honeysuckle
 35 Honeysuckle Drive
 Newcastle, NSW 2300

Drawing Name
 Floor Plan - Basement 01



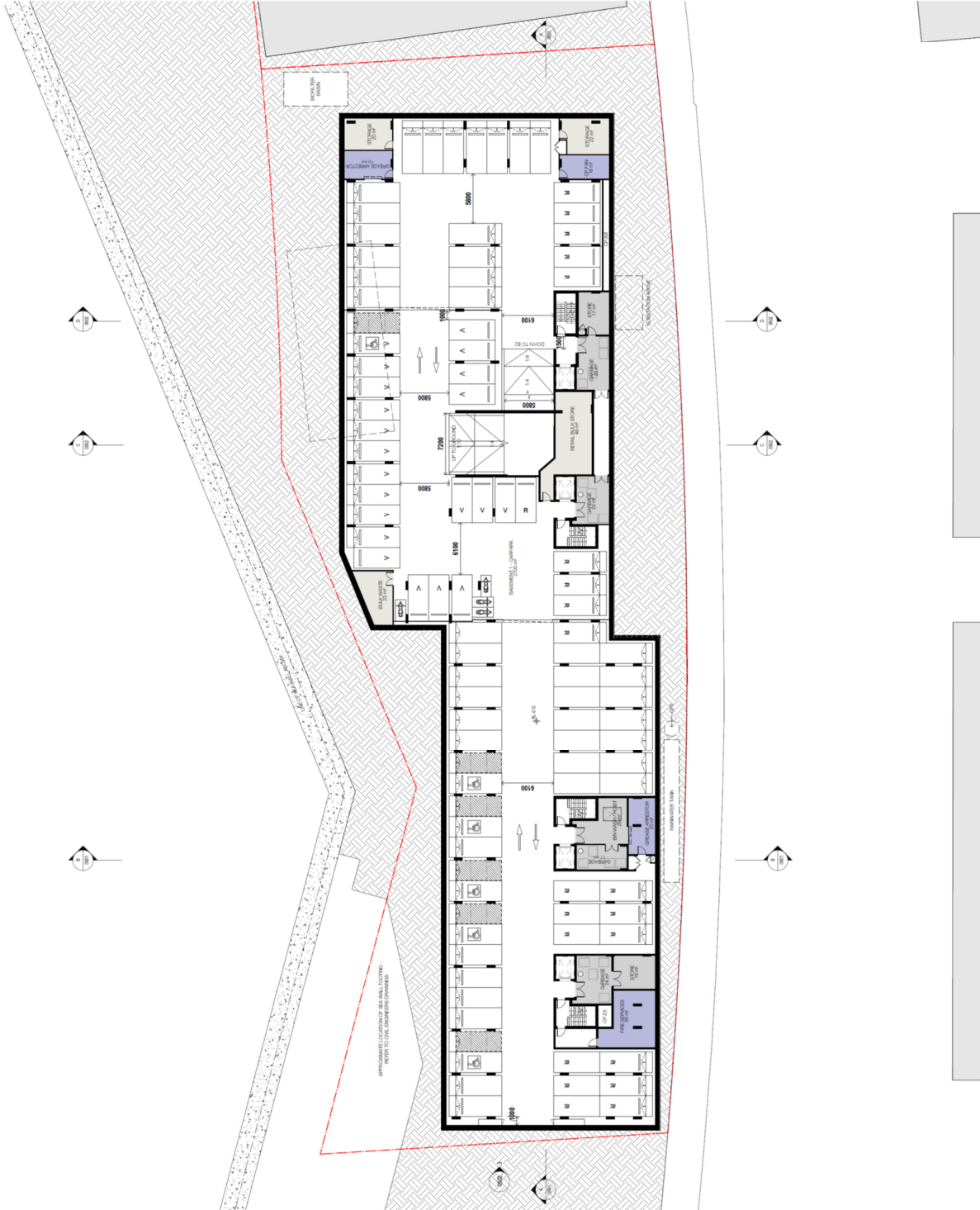
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FOR APPROVAL				
Rev	Date	Revision	By	CHK
1	04/05/18	Issued to Consultants	M.L.	EW
2	11/05/18	Issued to Consultants	M.L.	EW
3	06/06/18	Issued for Review	M.L.	EW
	09/07/18	Issued for Approval	M.L.	AH

REFER TO DWG DA-B

HUNTER RIVER

HONEYSUCKLE DRIVE

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Project
35 Honeysuckle
35 Honeysuckle Drive
Newcastle, NSW 2300

Drawing Name
Floor Plan - Ground Floor

Date	Scale	Sheet Size
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Daymen	Chk	Revision
MUL	EW	5711 DA-A-0203 / 04

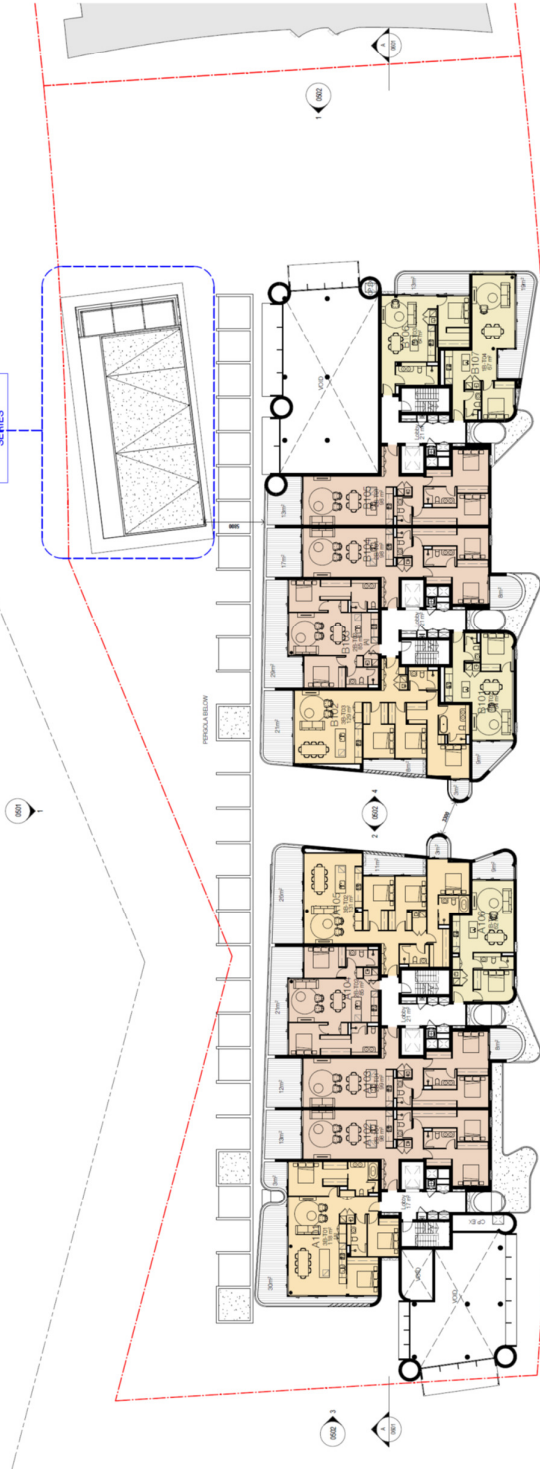
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FOR APPROVAL		
Rev	Date	By
01	09/07/18	Michael J. Condon
02	10/08/18	Michael J. Condon
03	10/08/18	Michael J. Condon
04	09/07/18	Michael J. Condon

REFER TO DWG DA-B1
SERIES



DOMAGROUP

Principal Engineer
Northrop Consulting Engineers
Mechanical / Hydraulic Engineer
SAB / WPTD
Electrical Engineer
SAB
Fire Engineer
WPTD
Access Coordinator
Philip Churn
Basis
David Cardwell
Client

Project
35 Honeysuckle
35 Honeysuckle Drive
Newcastle, NSW 2300

Drawing Name
Floor Plan - Level 01



Date
09/07/18
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Client
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Project No.
5711
Drawing No.
DA-A-0204/04





In accordance with the requirements of the Traffic Impact Assessment Act 2005, the following information is provided for the proposed development. The information is provided for the purpose of the Traffic Impact Assessment and is not intended to be used for any other purpose. The information is provided for the purpose of the Traffic Impact Assessment and is not intended to be used for any other purpose. The information is provided for the purpose of the Traffic Impact Assessment and is not intended to be used for any other purpose.

FOR APPROVAL		
Rev	Date	By
01	09/07/18	Northrop Consulting Engineers
02	09/07/18	Northrop Consulting Engineers
03	09/07/18	Northrop Consulting Engineers
04	09/07/18	Northrop Consulting Engineers



DOMAGROUP

Principal
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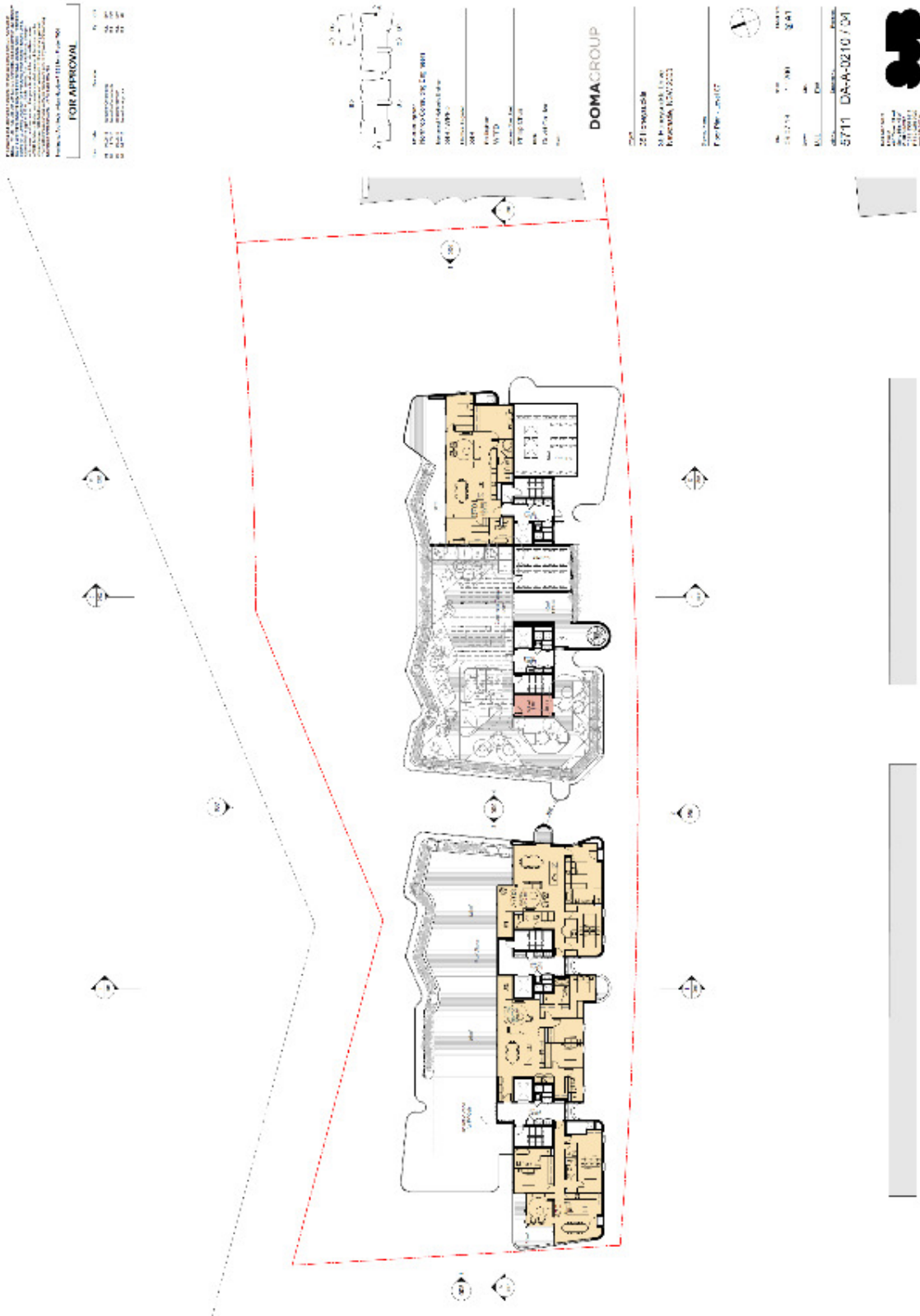
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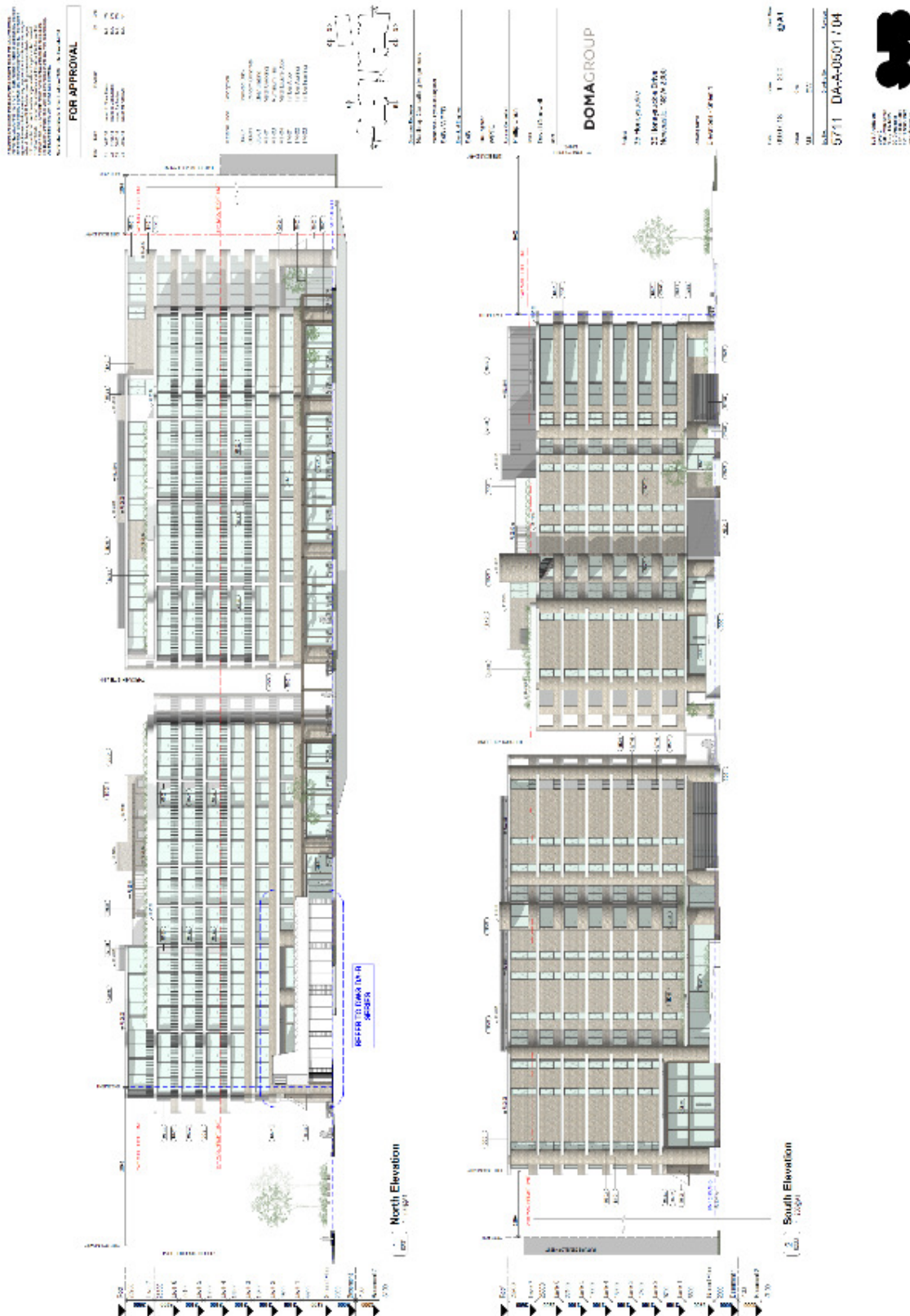


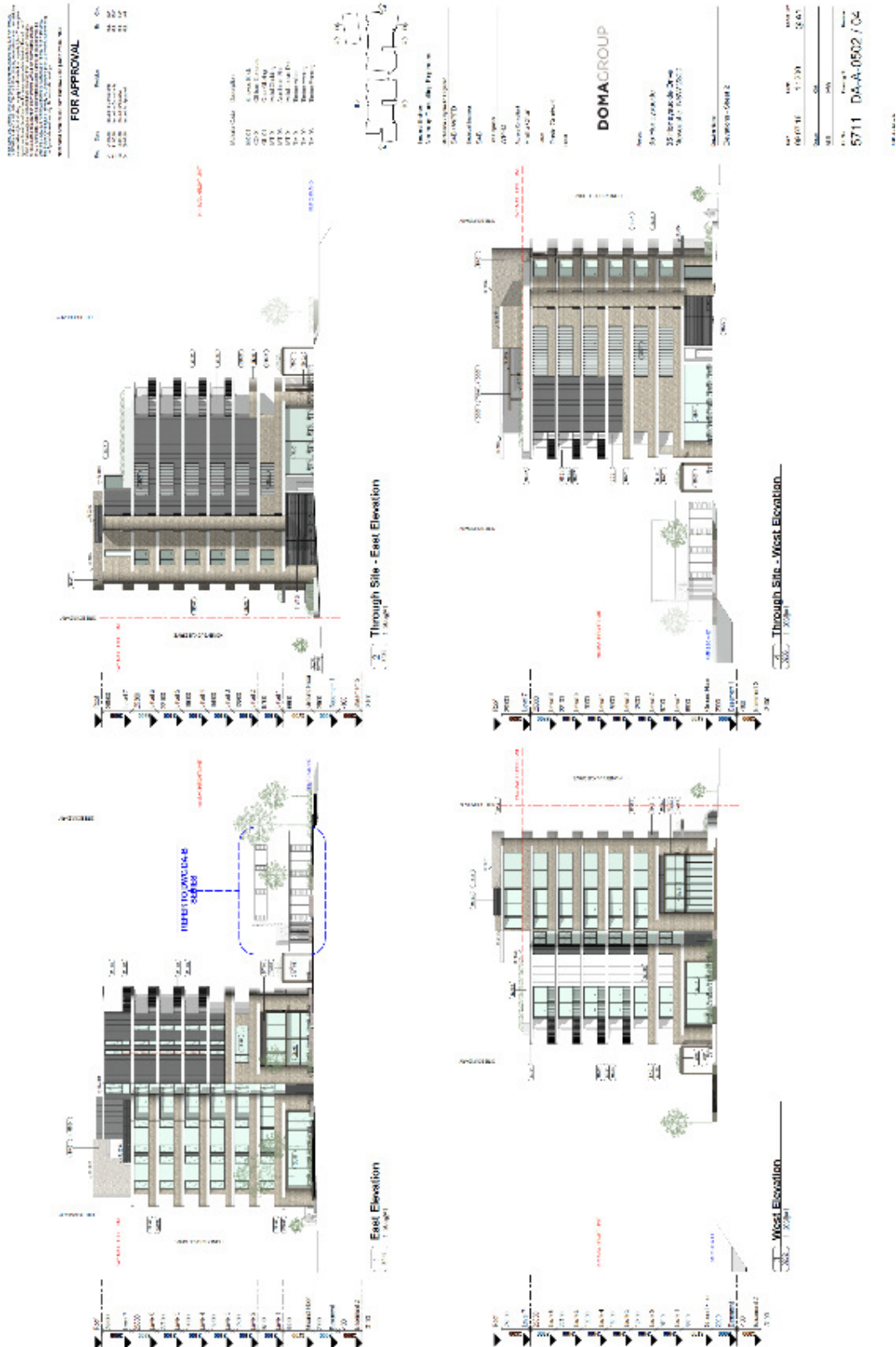
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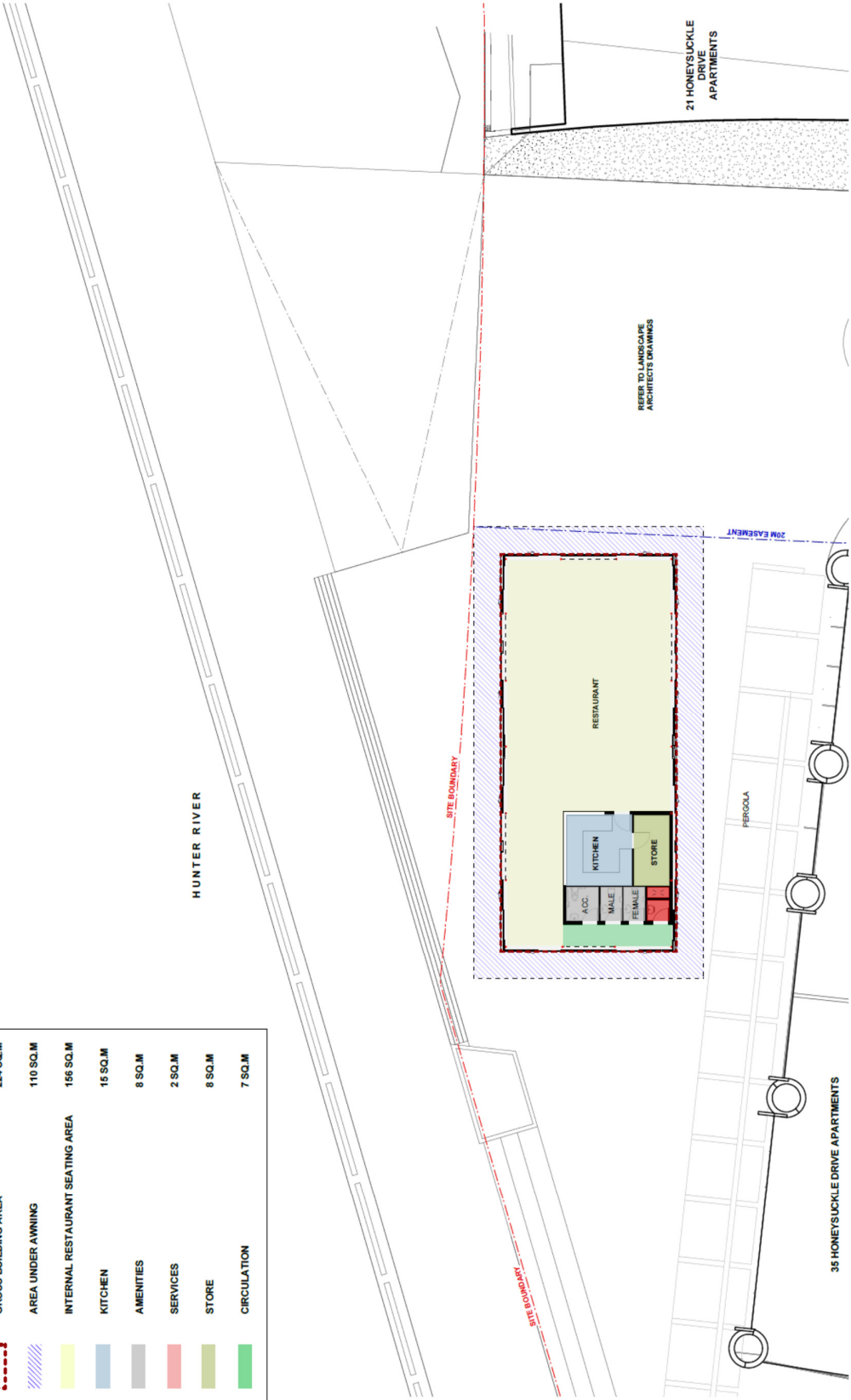








BUILDING AREAS	
	GROSS BUILDING AREA 224 SQ.M
	AREA UNDER AWNING 110 SQ.M
	INTERNAL RESTAURANT SEATING AREA 156 SQ.M
	KITCHEN 15 SQ.M
	AMENITIES 8 SQ.M
	SERVICES 2 SQ.M
	STORE 8 SQ.M
	CIRCULATION 7 SQ.M



DEVELOPMENT APPLICATION

REVISION

FOR APPROVAL

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23-05-18

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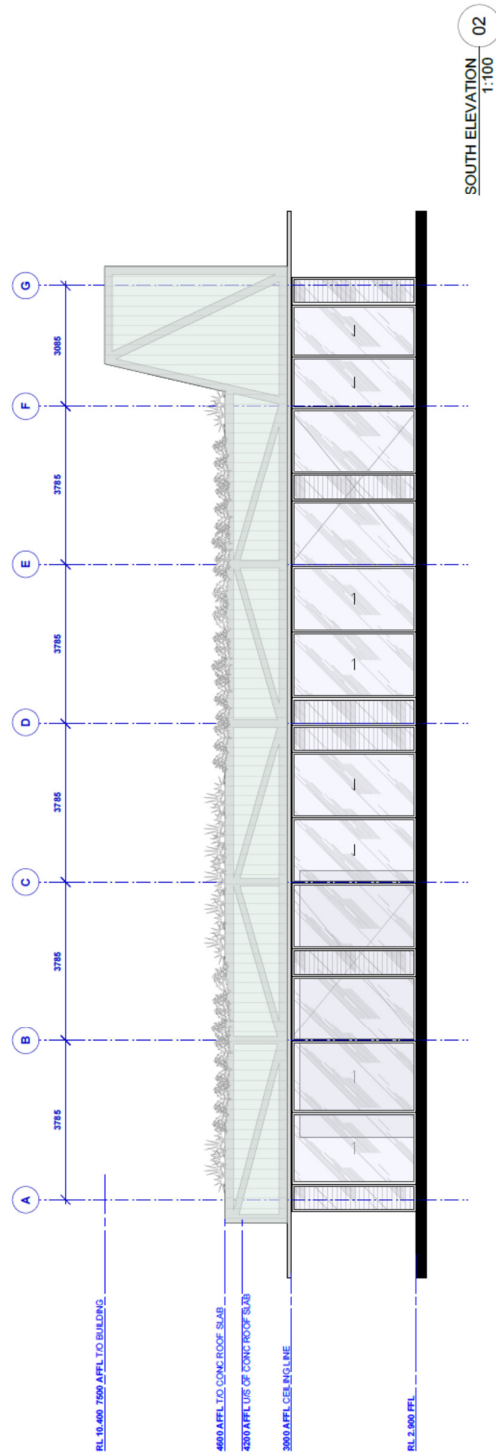
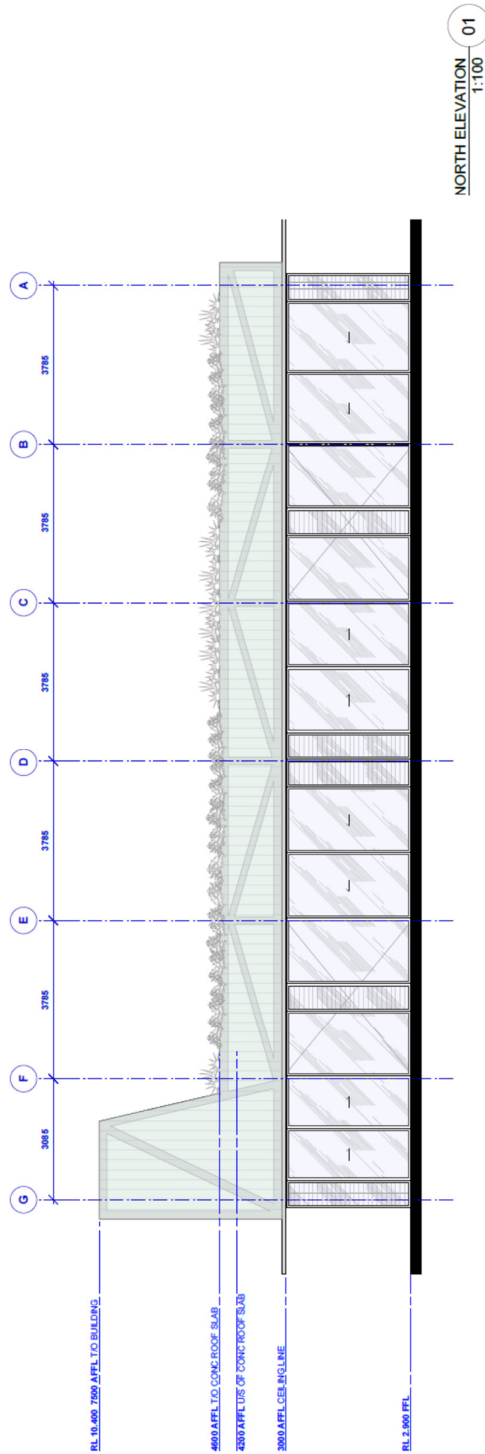
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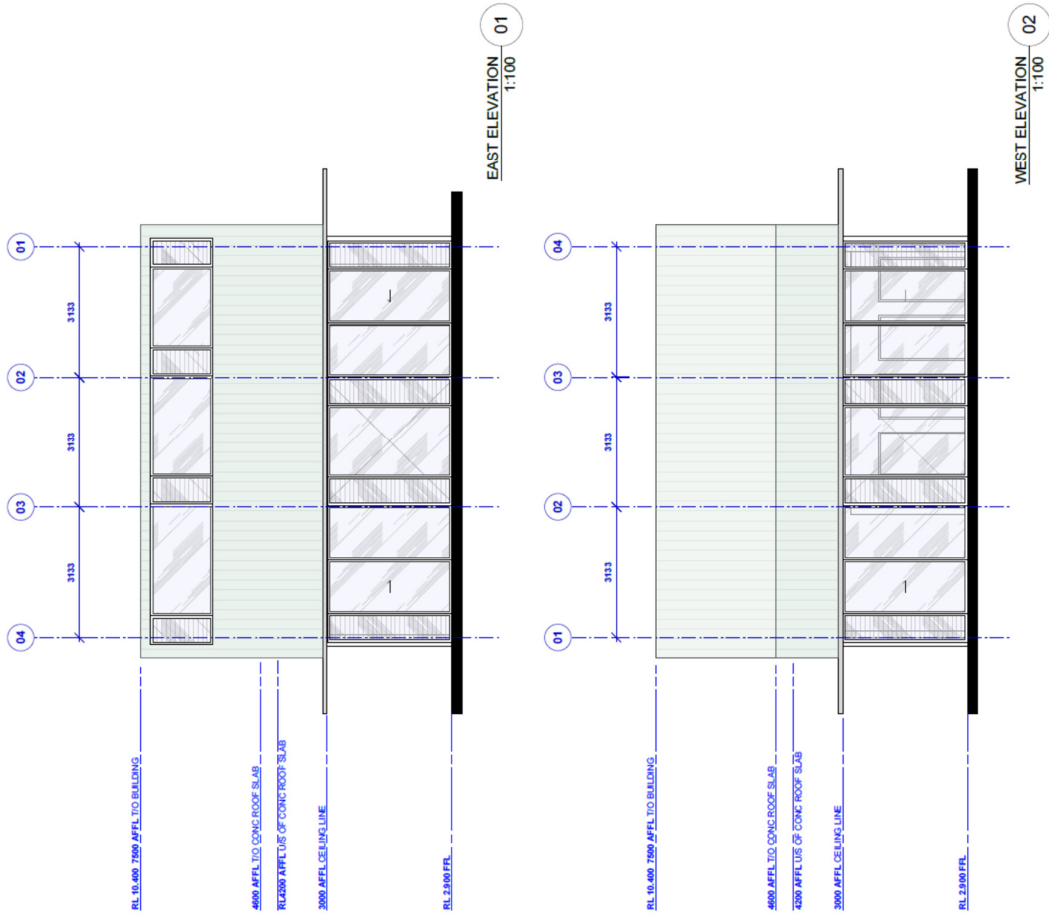
595





DEVELOPMENT APPLICATION

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SUBMITTAL FOR APPROVAL		REV	DATE	DATE	CLIENT		PROJECT		DRAWING TITLE		DRAWING NO		REV	
		1	10/05/18	25/05/18	DOMA GROUP		COMMERCIAL ANCHOR BUILDING		EAST + WEST ELEVATIONS		DA		DA-B-201	
					samcrawfordarchitects		LEE 4, 35 HONEYSUCKLE DRIVE, NEWCASTLE NSW 2300							
					Unit 1/11, 111 Macquarie Street, Newcastle NSW 2300		TEL: 081 551 8800 FAX: 081 551 8807							
					EMAIL: info@samcrawfordarchitects.com.au WEB: www.samcrawfordarchitects.com.au		Arch 105 609 907 Registered Architect (New South Wales)							

DEVELOPMENT APPLICATION

ATTACHMENT B

TRAFFIC COUNT DATA

24/8/2017 - HANNELL ST / HONEYSUCKLE DVE, WICKHAM

8:30 <<< HOUR ENDING

Thursday

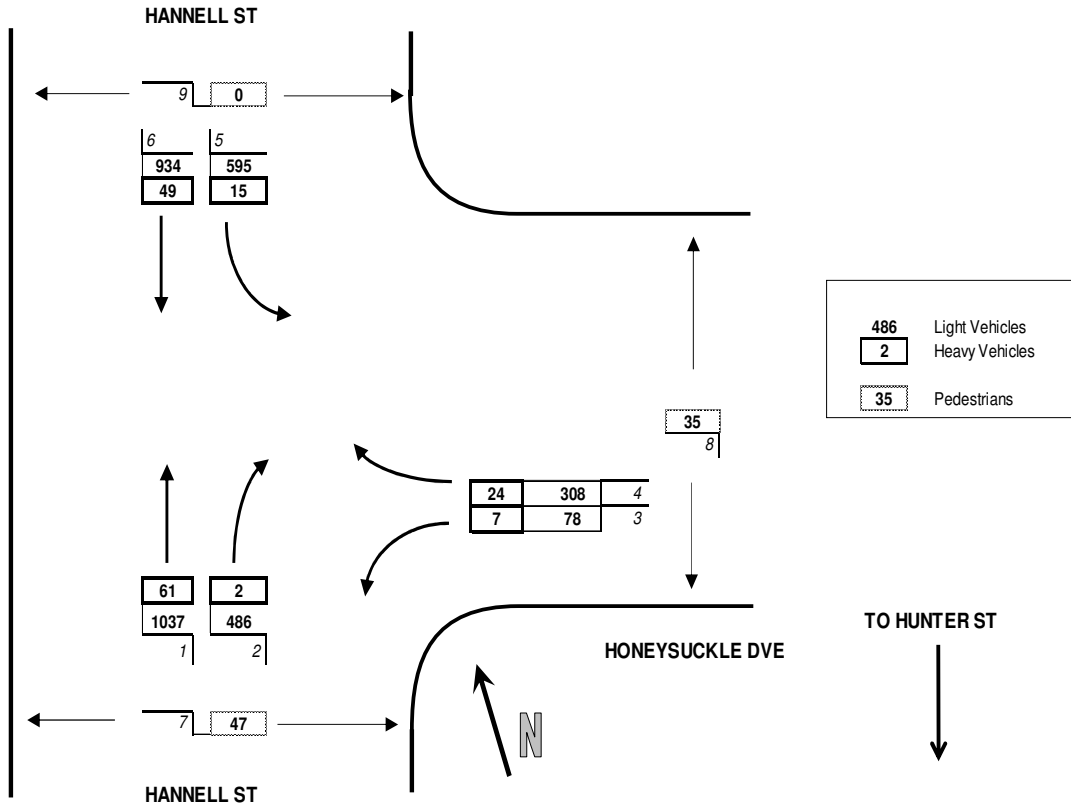
Summary:

HANNELL ST / HONEYSUCKLE DVE

3438 Total Light Vehicles

158 Total Heavy Vehicles

82 Total Pedestrians



23/8/2017 - HANNELL ST / HONEYSUCKLE DVE, WICKHAM

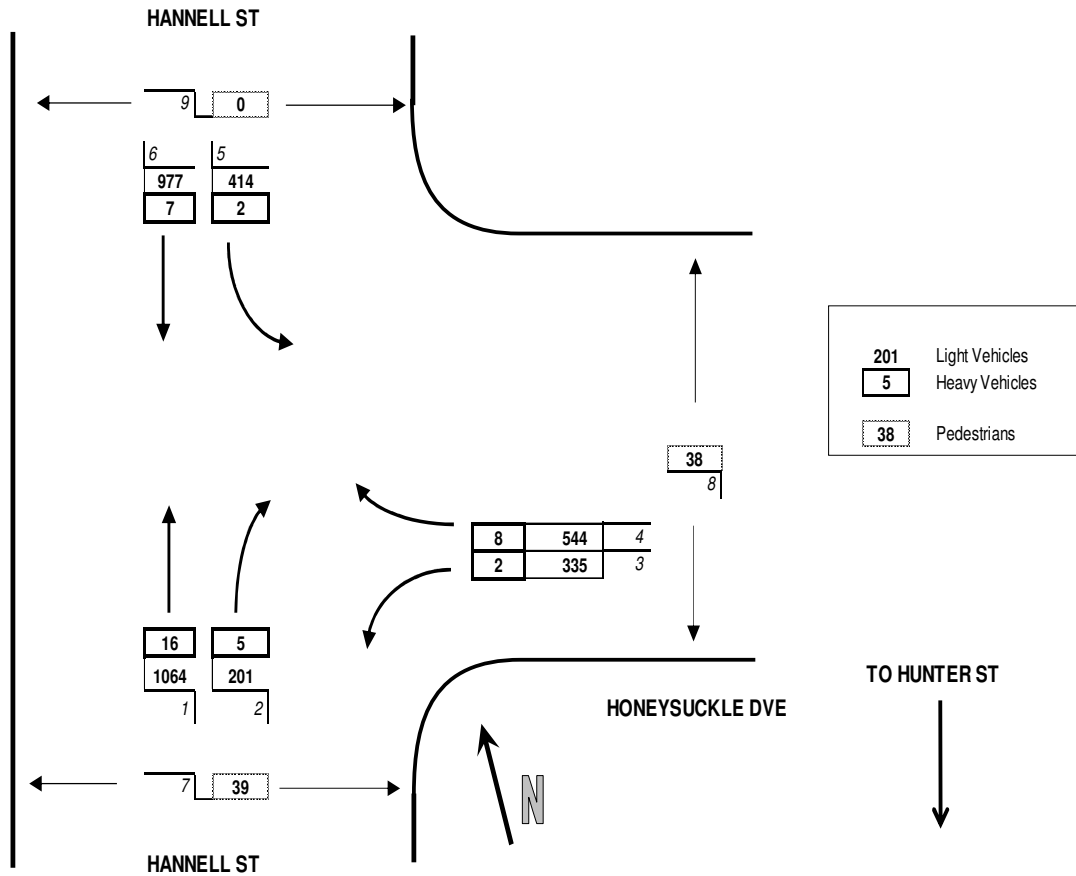
18:00 <<< HOUR ENDING

Wednesday

Summary:

HANNELL ST / HONEYSUCKLE DVE

3535	Total Light Vehicles
40	Total Heavy Vehicles
77	Total Pedestrians



24/8/2017 - WORTH PLACE / HONEYSUCKLE DVE, NEWCASTLE

8:30 <<< HOUR ENDING

Thursday

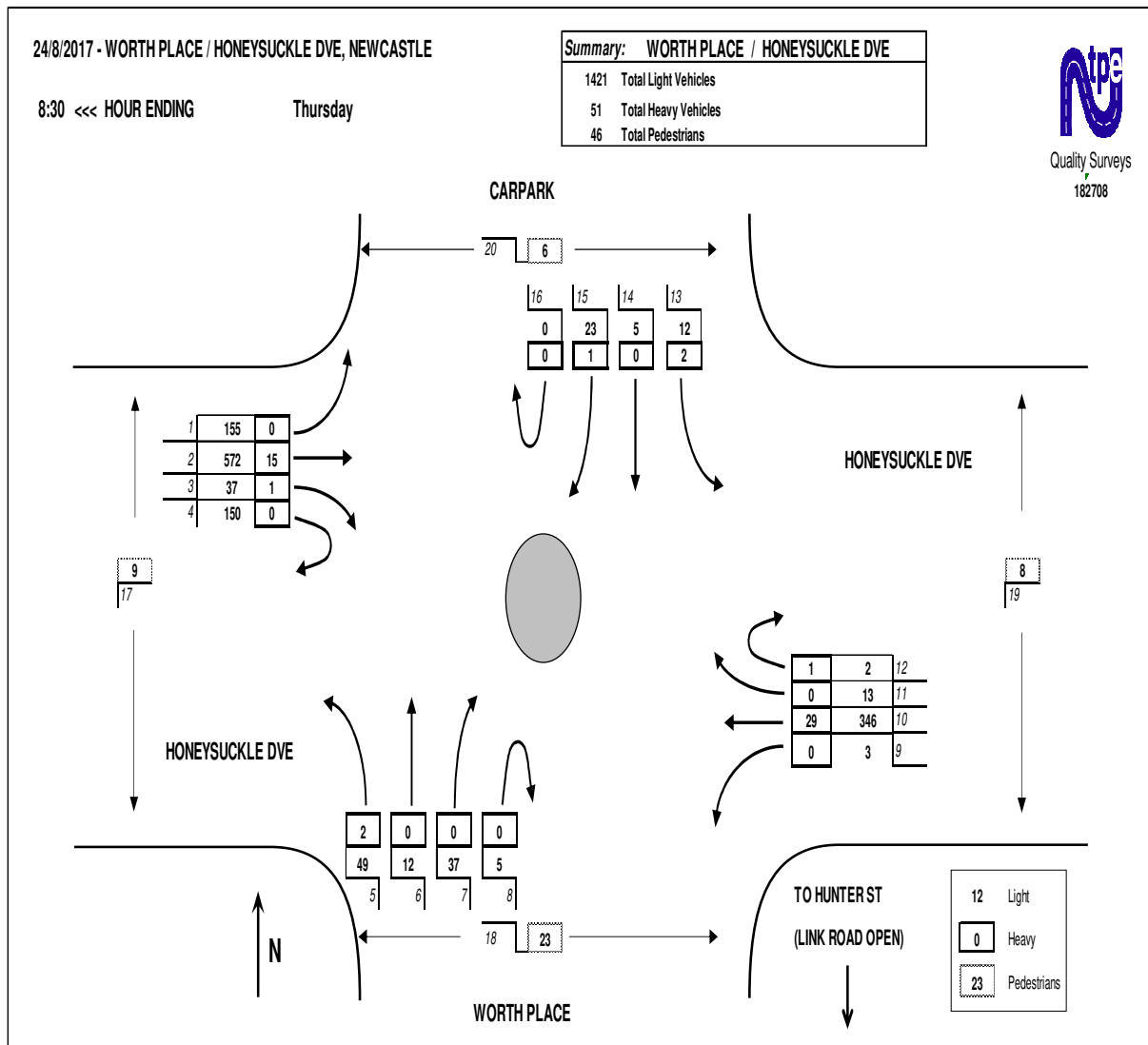
Summary: WORTH PLACE / HONEYSUCKLE DVE

1421 Total Light Vehicles

51 Total Heavy Vehicles

46 Total Pedestrians

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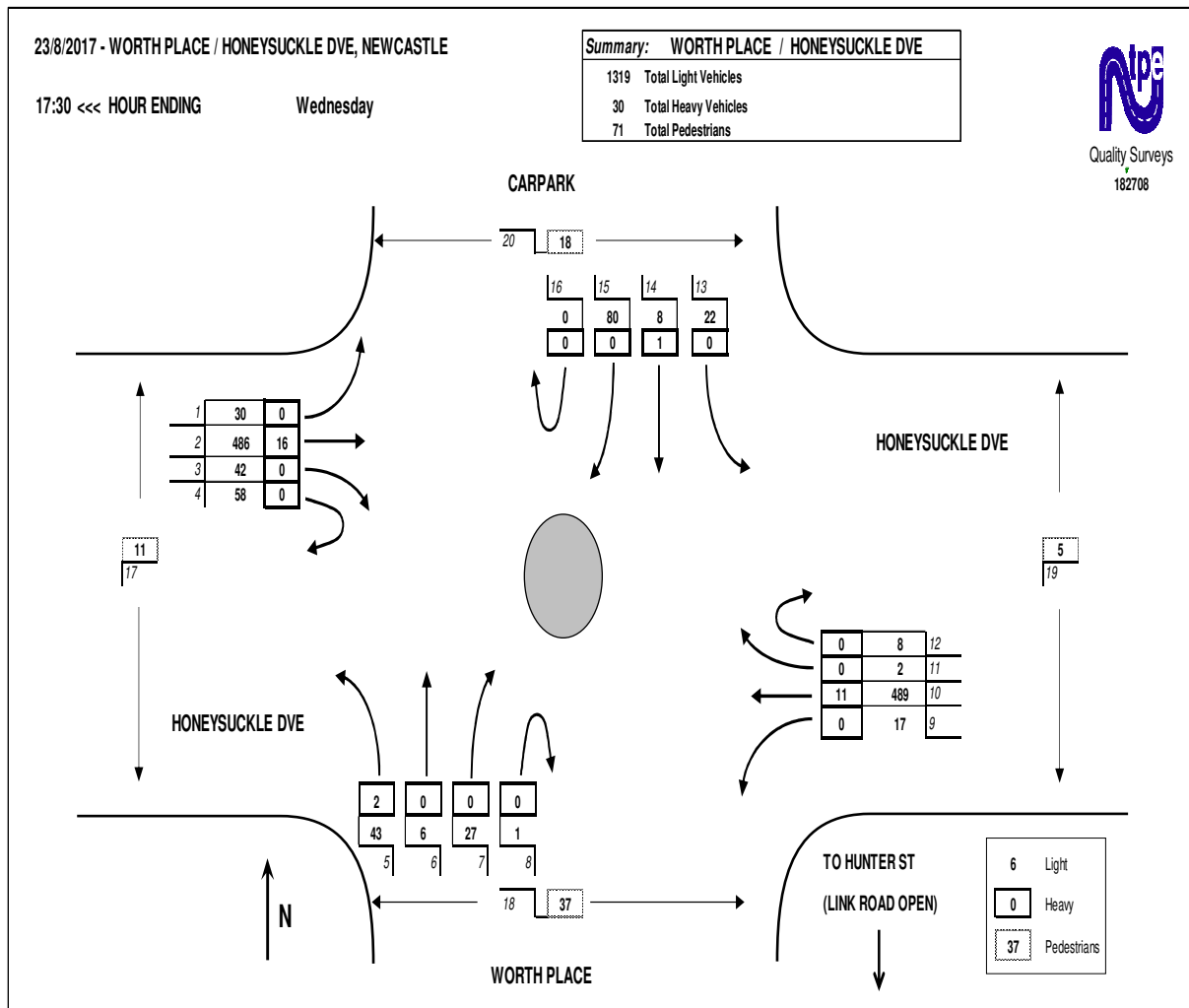
23/8/2017 - WORTH PLACE / HONEYSUCKLE DVE, NEWCASTLE

17:30 <<< HOUR ENDING

Wednesday

Summary: WORTH PLACE / HONEYSUCKLE DVE

1319	Total Light Vehicles
30	Total Heavy Vehicles
71	Total Pedestrians



ATTACHMENT C

SIDRA MOVEMENT SUMMARY TABLES

MOVEMENT SUMMARY

 **Site: 101 [2018AM + development]**

Hannell Street / Honeysuckle Drive signals

Signals - Fixed Time Isolated Cycle Time = 85 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stewart Avenue											
2	T1	1131	5.6	0.881	39.7	LOS C	27.1	198.4	1.00	1.08	24.0
3	R2	513	0.4	0.906	52.0	LOS D	26.4	185.6	1.00	1.04	26.4
Approach		1644	4.0	0.906	43.5	LOS D	27.1	198.4	1.00	1.07	24.9
East: Honeysuckle Drive											
4	L2	87	8.0	0.096	16.7	LOS B	1.8	13.5	0.53	0.69	41.1
6	R2	387	6.5	0.772	48.3	LOS D	8.6	63.2	1.00	0.91	28.4
Approach		474	6.8	0.772	42.5	LOS D	8.6	63.2	0.91	0.87	30.0
North: Hannell Street											
7	L2	658	2.4	0.652	19.8	LOS B	19.0	136.0	0.75	0.82	40.6
8	T1	1013	5.0	0.786	30.3	LOS C	20.4	149.0	0.96	0.91	27.9
Approach		1671	4.0	0.786	26.2	LOS B	20.4	149.0	0.88	0.88	33.4
All Vehicles		3789	4.3	0.906	35.8	LOS C	27.1	198.4	0.94	0.96	29.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	47	36.8	LOS D	0.1	0.1	0.93	0.93	
P2	East Full Crossing	35	29.7	LOS C	0.1	0.1	0.84	0.84	
All Pedestrians		82	33.8	LOS D			0.89	0.89	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: INTERSECT TRAFFIC PTY LTD | Processed: Monday, May 7, 2018 9:44:26 PM

Project: E:\17.197 - 35 Honeysuckle Drive, Newcastle\Sidra\Hannell Street\Hannell_Honeysuckle.sip7

MOVEMENT SUMMARY

 **Site: 101 [2028AM + development]**

Hannell Street / Honeysuckle Drive signals

Signals - Fixed Time Isolated Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stewart Avenue											
2	T1	1470	5.6	1.073	220.5	LOS F	120.6	884.3	1.00	1.83	6.3
3	R2	664	0.4	1.076	233.3	LOS F	104.1	731.1	1.00	1.42	9.0
Approach		2134	4.0	1.076	224.5	LOS F	120.6	884.3	1.00	1.70	7.2
East: Honeysuckle Drive											
4	L2	113	8.0	0.121	23.9	LOS B	4.0	30.1	0.53	0.70	36.8
6	R2	490	5.8	1.089	262.8	LOS F	41.5	304.7	1.00	1.48	8.6
Approach		603	6.2	1.089	218.0	LOS F	41.5	304.7	0.91	1.34	10.0
North: Hannell Street											
7	L2	847	2.3	1.044	178.9	LOS F	122.1	871.9	1.00	1.29	12.0
8	T1	1317	5.0	1.015	141.4	LOS F	90.4	659.9	1.00	1.46	9.4
Approach		2164	4.0	1.044	156.1	LOS F	122.1	871.9	1.00	1.39	10.6
All Vehicles		4901	4.2	1.089	193.5	LOS F	122.1	884.3	0.99	1.52	8.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	47	69.3	LOS F	0.2	0.2	0.96	0.96	
P2	East Full Crossing	35	38.2	LOS D	0.1	0.1	0.71	0.71	
All Pedestrians		82	56.0	LOS E			0.86	0.86	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: E:\17.197 - 35 Honeysuckle Drive, Newcastle\Sidra\Hannell Street\Hannell_Honeysuckle.sip7

MOVEMENT SUMMARY

 **Site: 101 [2028AM + development @1.5%]**

Hannell Street / Honeysuckle Drive signals

Signals - Fixed Time Isolated Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stewart Avenue											
2	T1	1301	5.6	0.947	76.9	LOS F	62.7	460.1	0.99	1.13	15.3
3	R2	588	0.4	0.934	80.8	LOS F	51.7	362.8	1.00	1.01	20.3
Approach		1889	4.0	0.947	78.1	LOS F	62.7	460.1	0.99	1.09	17.1
East: Honeysuckle Drive											
4	L2	100	8.0	0.107	23.8	LOS B	3.5	26.4	0.52	0.70	36.8
6	R2	438	5.8	0.881	84.9	LOS F	19.3	141.4	1.00	0.96	20.6
Approach		538	6.2	0.881	73.5	LOS F	19.3	141.4	0.91	0.91	22.3
North: Hannell Street											
7	L2	752	2.3	0.911	47.5	LOS D	49.4	352.7	0.77	0.90	28.8
8	T1	1165	5.0	0.798	43.7	LOS D	37.6	274.3	0.96	0.86	22.6
Approach		1917	4.0	0.911	45.2	LOS D	49.4	352.7	0.88	0.88	25.5
All Vehicles		4344	4.2	0.947	63.0	LOS E	62.7	460.1	0.94	0.97	20.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	47	67.3	LOS F	0.2	0.2	0.95	0.95	
P2	East Full Crossing	35	38.2	LOS D	0.1	0.1	0.71	0.71	
All Pedestrians		82	54.9	LOS E			0.85	0.85	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: INTERSECT TRAFFIC PTY LTD | Processed: Monday, May 7, 2018 9:57:49 PM

Project: E:\17.197 - 35 Honeysuckle Drive, Newcastle\Sidra\Hannell Street\Hannell_Honeysuckle.sip7

MOVEMENT SUMMARY

Site: 101 [2018PM + development]

Hannell Street / Honeysuckle Drive signals

Signals - Fixed Time Isolated Cycle Time = 51 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stewart Avenue											
2	T1	1113	1.5	0.865	25.8	LOS B	16.7	118.4	1.00	1.09	30.3
3	R2	224	2.2	0.893	39.4	LOS C	7.1	50.8	1.00	1.13	30.4
Approach		1337	1.6	0.893	28.1	LOS B	16.7	118.4	1.00	1.10	30.3
East: Honeysuckle Drive											
4	L2	347	0.6	0.435	16.7	LOS B	6.2	43.5	0.74	0.78	41.6
6	R2	597	1.3	0.920	42.8	LOS D	10.3	72.6	1.00	1.22	30.4
Approach		944	1.1	0.920	33.2	LOS C	10.3	72.6	0.91	1.06	33.5
North: Hannell Street											
7	L2	472	0.4	0.406	10.7	LOS A	5.9	41.6	0.54	0.74	47.1
8	T1	1008	0.7	0.779	20.0	LOS B	12.9	90.8	0.96	0.93	34.1
Approach		1480	0.6	0.779	17.0	LOS B	12.9	90.8	0.82	0.87	38.9
All Vehicles		3761	1.1	0.920	25.0	LOS B	16.7	118.4	0.91	1.00	34.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	47	19.9	LOS B	0.1	0.1	0.88	0.88
P2	East Full Crossing	35	19.9	LOS B	0.0	0.0	0.88	0.88
All Pedestrians		82	19.9	LOS B			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: INTERSECT TRAFFIC PTY LTD | Processed: Monday, May 7, 2018 9:44:32 PM

Project: E:\17.197 - 35 Honeysuckle Drive, Newcastle\Sidra\Hannell Street\Hannell_Honeysuckle.sip7

MOVEMENT SUMMARY

 **Site: 101 [2028PM + development]**

Hannell Street / Honeysuckle Drive signals

Signals - Fixed Time Isolated Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stewart Avenue											
2	T1	1447	1.5	0.989	107.5	LOS F	81.2	576.1	1.00	1.30	11.8
3	R2	288	2.1	0.984	125.2	LOS F	29.8	212.6	1.00	1.14	14.9
Approach		1735	1.6	0.989	110.4	LOS F	81.2	576.1	1.00	1.27	12.4
East: Honeysuckle Drive											
4	L2	451	0.6	0.682	29.0	LOS C	20.2	142.4	0.67	0.78	34.6
6	R2	768	1.3	0.983	120.2	LOS F	45.4	321.5	0.92	1.12	16.3
Approach		1219	1.0	0.983	86.4	LOS F	45.4	321.5	0.83	1.00	20.0
North: Hannell Street											
7	L2	595	0.4	0.423	12.2	LOS A	15.0	105.2	0.38	0.70	45.9
8	T1	1318	0.7	0.955	80.3	LOS F	67.9	478.0	0.97	1.14	14.8
Approach		1913	0.6	0.955	59.1	LOS E	67.9	478.0	0.79	1.00	21.1
All Vehicles		4867	1.1	0.989	84.3	LOS F	81.2	576.1	0.87	1.10	17.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	47	44.9	LOS E	0.2	0.2	0.77	0.77	
P2	East Full Crossing	35	37.5	LOS D	0.1	0.1	0.71	0.71	
All Pedestrians		82	41.8	LOS E			0.75	0.75	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: E:\17.197 - 35 Honeysuckle Drive, Newcastle\Sidra\Hannell Street\Hannell_Honeysuckle.sip7

MOVEMENT SUMMARY

 **Site: 101 [2028PM + development - @ 1.5 %]**

Hannell Street / Honeysuckle Drive signals

Signals - Fixed Time Isolated Cycle Time = 73 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stewart Avenue											
2	T1	1280	1.5	0.896	36.8	LOS C	28.0	198.5	1.00	1.13	25.0
3	R2	256	2.1	0.851	45.7	LOS D	10.5	74.7	1.00	1.00	28.2
Approach		1536	1.6	0.896	38.3	LOS C	28.0	198.5	1.00	1.11	25.7
East: Honeysuckle Drive											
4	L2	399	0.6	0.463	19.9	LOS B	9.7	68.5	0.73	0.79	39.5
6	R2	682	1.3	0.925	55.0	LOS D	17.9	126.4	1.00	1.14	26.8
Approach		1081	1.0	0.925	42.0	LOS C	17.9	126.4	0.90	1.01	30.1
North: Hannell Street											
7	L2	530	0.4	0.426	11.5	LOS A	8.6	60.7	0.50	0.73	46.5
8	T1	1166	0.7	0.812	26.8	LOS B	21.0	147.9	0.97	0.95	29.8
Approach		1696	0.6	0.812	22.0	LOS B	21.0	147.9	0.82	0.88	35.3
All Vehicles		4313	1.1	0.925	32.8	LOS C	28.0	198.5	0.90	0.99	30.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	47	30.8	LOS D	0.1	0.1	0.92	0.92	
P2	East Full Crossing	35	25.5	LOS C	0.1	0.1	0.84	0.84	
All Pedestrians		82	28.6	LOS C			0.88	0.88	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: E:\17.197 - 35 Honeysuckle Drive, Newcastle\Sidra\Hannell Street\Hannell_Honeysuckle.sip7

MOVEMENT SUMMARY

 **Site: 101 [2018AM + development]**

Honeysuckle Drive / Worth Place roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Worth Place											
1	L2	53	3.9	0.137	6.7	LOS A	0.8	5.8	0.69	0.72	42.4
2	T1	13	0.0	0.137	6.5	LOS A	0.8	5.8	0.69	0.72	28.1
3	R2	38	0.0	0.137	11.0	LOS A	0.8	5.8	0.69	0.72	39.0
3u	U	5	0.0	0.137	12.8	LOS A	0.8	5.8	0.69	0.72	34.8
Approach		109	1.9	0.137	8.4	LOS A	0.8	5.8	0.69	0.72	40.2
East: Honeysuckle Drive											
4	L2	3	0.0	0.389	4.7	LOS A	2.6	19.1	0.57	0.56	39.1
5	T1	386	7.7	0.389	4.8	LOS A	2.6	19.1	0.57	0.56	45.8
6	R2	14	0.0	0.389	9.2	LOS A	2.6	19.1	0.57	0.56	32.3
6u	U	3	33.3	0.389	11.9	LOS A	2.6	19.1	0.57	0.56	40.5
Approach		406	7.6	0.389	5.0	LOS A	2.6	19.1	0.57	0.56	45.5
North: Worth Place											
7	L2	15	14.3	0.078	9.2	LOS A	0.5	3.6	0.80	0.78	29.8
8	T1	5	0.0	0.078	8.7	LOS A	0.5	3.6	0.80	0.78	31.0
9	R2	25	4.2	0.078	13.1	LOS A	0.5	3.6	0.80	0.78	40.9
9u	U	1	0.0	0.078	14.8	LOS B	0.5	3.6	0.80	0.78	20.8
Approach		46	6.9	0.078	11.4	LOS A	0.5	3.6	0.80	0.78	37.4
West: Honeysuckle Drive											
10	L2	160	0.0	0.151	3.6	LOS A	0.8	5.9	0.27	0.43	44.1
11	T1	613	2.6	0.543	3.2	LOS A	5.1	36.1	0.35	0.46	45.9
12	R2	54	2.6	0.543	7.8	LOS A	5.1	36.1	0.35	0.46	45.9
12u	U	208	0.0	0.543	9.6	LOS A	5.1	36.1	0.35	0.46	48.3
Approach		1035	1.7	0.543	4.8	LOS A	5.1	36.1	0.33	0.45	46.3
All Vehicles		1596	3.3	0.543	5.3	LOS A	5.1	36.1	0.43	0.51	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 **Site: 101 [2028AM + development]**

Honeysuckle Drive / Worth Place roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Worth Place											
1	L2	69	3.9	0.222	8.7	LOS A	1.5	10.4	0.82	0.83	41.0
2	T1	17	0.0	0.222	8.5	LOS A	1.5	10.4	0.82	0.83	26.2
3	R2	49	0.0	0.222	13.0	LOS A	1.5	10.4	0.82	0.83	36.5
3u	U	7	0.0	0.222	14.8	LOS B	1.5	10.4	0.82	0.83	32.6
Approach		142	1.9	0.222	10.5	LOS A	1.5	10.4	0.82	0.83	38.4
East: Honeysuckle Drive											
4	L2	4	0.0	0.543	6.0	LOS A	4.5	33.3	0.73	0.72	37.9
5	T1	502	7.7	0.543	6.2	LOS A	4.5	33.3	0.73	0.72	45.0
6	R2	18	0.0	0.543	10.5	LOS A	4.5	33.3	0.73	0.72	31.1
6u	U	4	33.3	0.543	13.4	LOS A	4.5	33.3	0.73	0.72	39.3
Approach		528	7.6	0.543	6.4	LOS A	4.5	33.3	0.73	0.72	44.7
North: Worth Place											
7	L2	20	14.3	0.159	15.1	LOS B	1.1	8.3	0.95	0.91	24.9
8	T1	7	0.0	0.159	14.2	LOS A	1.1	8.3	0.95	0.91	25.3
9	R2	33	4.2	0.159	18.8	LOS B	1.1	8.3	0.95	0.91	36.9
9u	U	1	0.0	0.159	20.4	LOS B	1.1	8.3	0.95	0.91	16.8
Approach		61	6.9	0.159	17.1	LOS B	1.1	8.3	0.95	0.91	32.9
West: Honeysuckle Drive											
10	L2	208	0.0	0.201	3.8	LOS A	1.2	8.4	0.33	0.46	43.9
11	T1	795	2.6	0.709	3.6	LOS A	8.8	63.0	0.52	0.48	45.2
12	R2	66	2.6	0.709	8.1	LOS A	8.8	63.0	0.52	0.48	45.2
12u	U	257	0.0	0.709	9.9	LOS A	8.8	63.0	0.52	0.48	47.8
Approach		1326	1.7	0.709	5.1	LOS A	8.8	63.0	0.49	0.47	45.7
All Vehicles		2057	3.4	0.709	6.1	LOS A	8.8	63.0	0.59	0.57	44.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 **Site: 101 [2018PM + development]**

Honeysuckle Drive / Worth Place roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Worth Place											
1	L2	47	4.4	0.112	7.1	LOS A	0.7	4.8	0.72	0.73	42.3
2	T1	6	0.0	0.112	6.8	LOS A	0.7	4.8	0.72	0.73	27.7
3	R2	28	0.0	0.112	11.4	LOS A	0.7	4.8	0.72	0.73	38.7
3u	U	1	100.0	0.112	17.2	LOS B	0.7	4.8	0.72	0.73	32.8
Approach		82	3.8	0.112	8.7	LOS A	0.7	4.8	0.72	0.73	40.7
East: Honeysuckle Drive											
4	L2	18	0.0	0.466	4.5	LOS A	3.4	24.1	0.55	0.51	39.4
5	T1	515	2.2	0.466	4.5	LOS A	3.4	24.1	0.55	0.51	46.0
6	R2	2	0.0	0.466	8.9	LOS A	3.4	24.1	0.55	0.51	32.5
6u	U	8	0.0	0.466	10.8	LOS A	3.4	24.1	0.55	0.51	45.3
Approach		543	2.1	0.466	4.6	LOS A	3.4	24.1	0.55	0.51	45.8
North: Worth Place											
7	L2	23	0.0	0.149	6.5	LOS A	0.9	6.2	0.70	0.76	32.2
8	T1	10	11.1	0.149	6.9	LOS A	0.9	6.2	0.70	0.76	32.5
9	R2	83	0.0	0.149	10.8	LOS A	0.9	6.2	0.70	0.76	42.5
9u	U	1	0.0	0.149	12.7	LOS A	0.9	6.2	0.70	0.76	18.6
Approach		117	0.9	0.149	9.7	LOS A	0.9	6.2	0.70	0.76	40.6
West: Honeysuckle Drive											
10	L2	31	0.0	0.029	3.4	LOS A	0.1	1.0	0.19	0.41	44.5
11	T1	521	3.2	0.402	3.0	LOS A	3.2	22.8	0.23	0.41	46.8
12	R2	52	0.0	0.402	7.5	LOS A	3.2	22.8	0.23	0.41	47.0
12u	U	92	0.0	0.402	9.3	LOS A	3.2	22.8	0.23	0.41	49.0
Approach		696	2.4	0.402	4.2	LOS A	3.2	22.8	0.23	0.41	47.1
All Vehicles		1438	2.2	0.466	5.0	LOS A	3.4	24.1	0.41	0.49	45.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 101 [2028PM + development]

Honeysuckle Drive / Worth Place roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Worth Place											
1	L2	56	2.8	0.157	8.5	LOS A	1.0	7.3	0.81	0.80	41.2
2	T1	7	0.0	0.157	8.3	LOS A	1.0	7.3	0.81	0.80	26.3
3	R2	34	0.0	0.157	12.8	LOS A	1.0	7.3	0.81	0.80	36.8
3u	U	1	100.0	0.157	19.6	LOS B	1.0	7.3	0.81	0.80	31.4
Approach		98	2.6	0.157	10.1	LOS A	1.0	7.3	0.81	0.80	39.5
East: Honeysuckle Drive											
4	L2	22	0.0	0.577	5.1	LOS A	4.8	33.8	0.66	0.58	38.5
5	T1	618	1.7	0.577	5.1	LOS A	4.8	33.8	0.66	0.58	45.4
6	R2	2	0.0	0.577	9.5	LOS A	4.8	33.8	0.66	0.58	31.7
6u	U	10	0.0	0.577	11.4	LOS A	4.8	33.8	0.66	0.58	44.2
Approach		652	1.6	0.577	5.2	LOS A	4.8	33.8	0.66	0.58	45.3
North: Worth Place											
7	L2	28	0.0	0.205	8.0	LOS A	1.3	9.1	0.79	0.83	30.5
8	T1	12	8.3	0.205	8.4	LOS A	1.3	9.1	0.79	0.83	30.8
9	R2	100	0.0	0.205	12.4	LOS A	1.3	9.1	0.79	0.83	41.2
9u	U	1	0.0	0.205	14.2	LOS A	1.3	9.1	0.79	0.83	17.6
Approach		141	0.7	0.205	11.2	LOS A	1.3	9.1	0.79	0.83	39.2
West: Honeysuckle Drive											
10	L2	37	0.0	0.035	3.5	LOS A	0.2	1.3	0.21	0.41	44.4
11	T1	624	2.5	0.481	3.1	LOS A	4.3	30.6	0.28	0.41	46.6
12	R2	61	0.0	0.481	7.6	LOS A	4.3	30.6	0.28	0.41	46.8
12u	U	104	0.0	0.481	9.4	LOS A	4.3	30.6	0.28	0.41	48.8
Approach		826	1.9	0.481	4.2	LOS A	4.3	30.6	0.28	0.41	46.9
All Vehicles		1717	1.7	0.577	5.5	LOS A	4.8	33.8	0.50	0.53	45.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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ATTACHMENT D

CONCEPT PLAN – HONEYSUCKLE DRIVE / STEEL STREET INTERSECTION

