6. Road Network Performance

6.1. Surveyed Traffic Volumes

TTM have obtained traffic volumes at the Campbell Street / Walden Lane intersection from 2012. These traffic volumes indicate Walden Lane carries a maximum of 116vph in the peak hour. This traffic volume is relatively low and consistent with existing commercial uses on Walden Lane and its road type.

6.2. Estimated Development Traffic Movements

In terms of traffic generated by this proposed multi-unit residential development, the Department of Transport and Main Roads *Road Planning and Design Manual* and *RTA Guide to Traffic Generating Developments* recommends, for planning purposes, adopting a peak hour traffic generation rate of 0.29 trips/unit dwelling for high density residential developments in Metropolitan Sub-Regional Centres or 0.24 trips/unit dwelling in CBD Centres (in both AM and PM peak hours). TTM consider that the lower of these two values is more appropriate to adopt in this instance, given the close proximity of the site to significant public transport (resulting in less commuter peak hour private vehicle trips to/from the site) and also given the reduced parking provision of approximately 0.74 spaces/unit.

Therefore, based on yield of 81 units the proposed development is expected to generate 19vhp in the AM and PM peak hours.

This total development traffic would then be distributed based on inwards/outwards trips, and access routes to from the site. Based on the proposed interim modifications to the surrounding road network, it is expected that most development traffic will enter the site from the Campbell Street end of Walden Lane, and exit to the O'Connell Terrace end. Assuming an inwards/outwards split of 25%/75% in the AM peak hour, and 75%/25% in the PM peak hour it is expected that the peak increase in link traffic volumes attributed to the development will be in the order of 13vph.

6.3. Analysis of Walden Lane

The development is expected to increase the volume of traffic using Walden Lane by at most 13vph in the peak hour periods, equivalent to one extra vehicle every 5 minutes. In addition, this traffic volume increase is unlikely to significantly impact on the operation of the road given it services primarily one-way southbound traffic. The proposed development will therefore have negligible impacts on the surrounding road network.

7. Service Vehicle Arrangements

7.1. Expected Service Vehicle Demands

It is expected that the service vehicle demands of the development will be limited to the following:

- Daily deliveries of small goods and consumables for the small amount of retail space on the ground floor, generally in vehicles no larger than VANs.
- Occasional residential furniture/removalist delivery trucks. Based on the size of the units (no greater than 2 bedrooms and are less than 75m²) it is expected that these vehicles will be limited to no greater than an 8.8m long Medium Rigid Vehicle (MRV).
- Refuse collection vehicles related to the retail/refuse uses (expected to be once a week). These vehicles will generally be rear-loading trucks, with the largest possible variant of these trucks operated by BCC Waste Services being 9.8m long.

7.2. Proposed Service Vehicle Arrangements and Their Adequacy

The development plans provide the ability for service vehicles to stand on one side of the access driveway when performing on-site servicing activities (i.e. delivering goods, collecting refuse). Given the low turnover nature of the car park, and infrequency of servicing for the site (at most a few times a day) TTM consider this is a suitable arrangement; with car park traffic able to drive around the vehicles when entering/exiting the car parking area.

7.3. Height Restrictions

As shown on the development plans included in Appendix A, the vertical height clearance provided at ground level is 3.6m

7.3.1. Case Studies

TTM has researched similar developments where clearance height concessions have been implemented:

Case Study 1 - 113 Commercial Road, Newstead (Mixed-Use Development)

This development comprising 111 apartments and 387m² GFA of speciality retail, has recently been granted approval by BCC, has a maximum vertical height clearance of 3.5m within the servicing area. The operation of this particular development also necessitates servicing by MRV's and RCV's.

Case Study 2 - 27 Russell Street, South Brisbane (Residential Development)

This development comprises 42 apartments, was granted approval by BCC (and has been since been constructed), has a maximum vertical height clearance of 3.5m within the servicing area. The operation of this particular development also necessitates servicing by MRV's and RCV's.

7.3.2. Waste Collection:

Information provided by John Love of BCC City Waste Services and SITA, (included in Appendix D), confirms that the refuse collection function of the development can be accommodated with the 3.6m vertical height clearance provided at ground level.

7.3.3. Signage:

The restricted vertical height clearance within the servicing area will be suitably sign posted at the driveway on Walden Lane. Furthermore the Building Manager will instruct tenants of the restricted vertical height clearance within the servicing area in order for appropriate arrangements to be made with furniture removal companies when moving in/out of the development

7.4. Vehicle Manoeuvrability

TTM has undertaken a swept path assessment for the largest design service vehicle (that being the 9.8m long rear-loading refuse collection vehicle) accessing the site, to confirm that adequate driveway/road space is provided for manoeuvring. A copy of this assessment is included in TTM Drawing 13BRT0587-SK1 included in Appendix E. The drawing shows that it is possible for the vehicle to reverse into the site off Walden Lane and stand on the driveway. Given the low order function of Walden Lane, and low traffic volumes, TTM consider it is appropriate to allow these larger service vehicles to perform one reversing movement when entering/exiting the site. With respect to the smaller VAN deliveries, it is expected these vehicles will be able to drive further into the site and perform a turnaround movement (using either a vacant parking bay on the ground floor or manoeuvring area provided for accessing the lifts) ensuring forward entry and exit from site.

Based on the above information, TTM consider the proposed servicing arrangements for the development are acceptable.

8. Public Transport, Pedestrian and Bicycle Facilities

TTM considers that the proposed development is located ideally with a high level of accessibility to the significant volume of established public transport infrastructure and potential future infrastructure.

The future widening of footpaths surrounding the site, in addition to existing footpaths and road crossing locations is also considered acceptable.

With respect to bicycle parking, the Bowen Hills UDA Development Scheme details a minimum provision of 1 secured bicycle parking space per unit for residential uses and 1 space per 400m². For retail uses, a minimum of 1 space per 200m² NLA for employee/staff and 1 space per 1000m² NLA for visitors. For the proposed development, providing a total of 81 residential units (~6,000m²) and 90m² retail, this equates to a bicycle parking requirement of 98 spaces. As such, it is recommended that a minimum of 98 bicycle parking spaces are provided on-site.

9. Recommendations

9.1. Car Parking Arrangements

The development provides 59 car spaces and 1 motorcycle space which is consistent with other residential developments in the Bowen Hills UDA. The car park layout is generally designed in accordance with the requirements of AS2890.1. Car lifts are proposed to transport cars between the basement and ground floor car park levels given the physical constraints of the site, which will operate with sufficient capacity to cater for the anticipated demand/traffic generation of the site.

9.2. Development Access

The development provides a 6.2m wide Category 2 combined entry/exit driveway crossover onto Walden Lane servicing all movements. The access design and location generally meets the requirements detailed in AS2890.1.

9.3. Impact on Surrounding Road Network

The proposed development is expected to generate up to 19vph in the AM and PM peak hour periods. Once distributed between inbound/outbound movements, it is expected that the impact of the traffic volume increases on the surrounding roads will be negligible.

9.4. Service Vehicle Arrangements

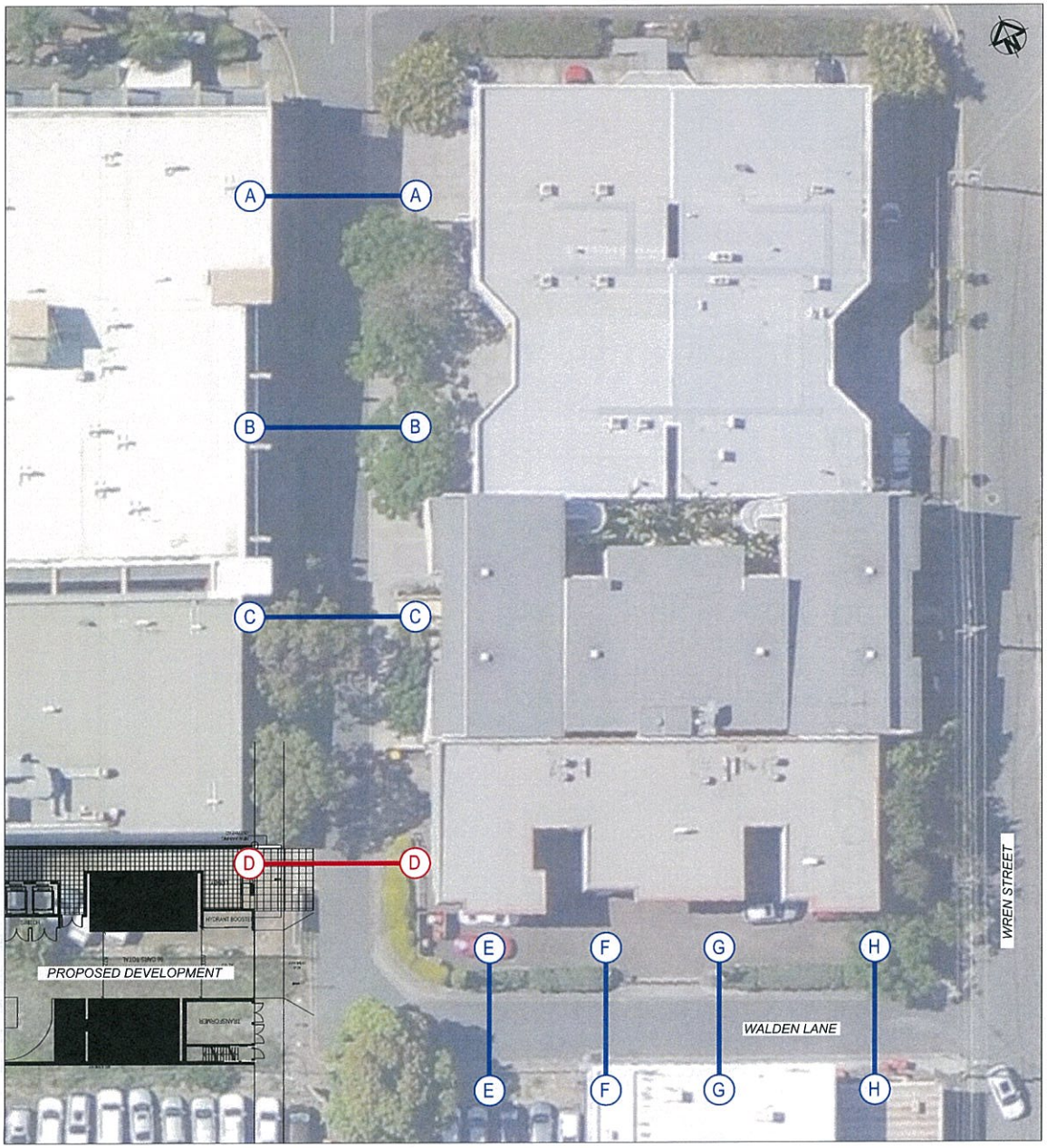
The development is expected to generate regular VAN deliveries and occasional larger furniture removals/refuse collection vehicles. All service vehicles are able to stand on the driveway fully within the site when performing the respective activities; whilst still allowing continued access to the car parking area. The larger vehicles are required to reverse into the site off Walden Lane (local/minor road), which is considered acceptable given the infrequent nature of the vehicles.

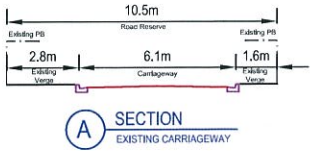
9.5. Public Transport and Bicycle / Pedestrian Facilities

The site is located in close proximity to an exceptional level of public transport facilities. Footpath widening accommodated in the development design and existing facilities are considered acceptable. It is also recommended that a minimum of 98 bicycle parking spaces are provided on-site to satisfy the requirements of the Bowen Hills UDA Development Scheme.

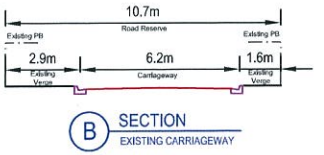
Appendix A Development Plans

Appendix B Road Cross-Section Analysis

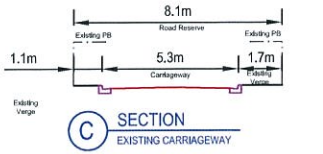




A SECTION
EXISTING CARRIAGEWAY

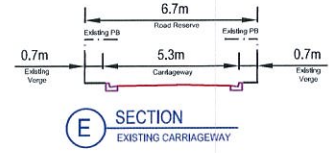


B SECTION
EXISTING CARRIAGEWAY

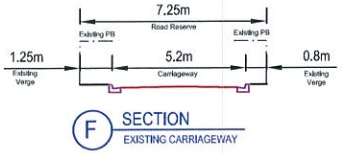


C SECTION
EXISTING CARRIAGEWAY

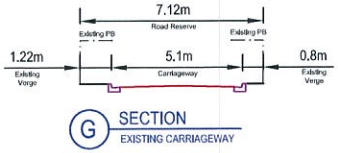
D SECTION
EXISTING CARRIAGEWAY



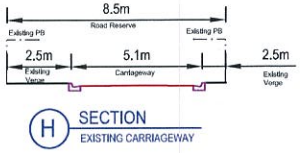
E SECTION
EXISTING CARRIAGEWAY



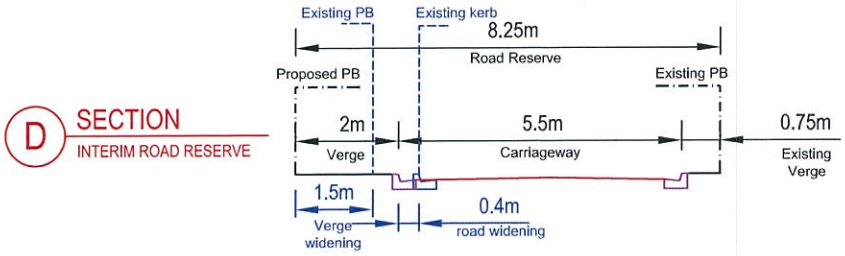
F SECTION
EXISTING CARRIAGEWAY



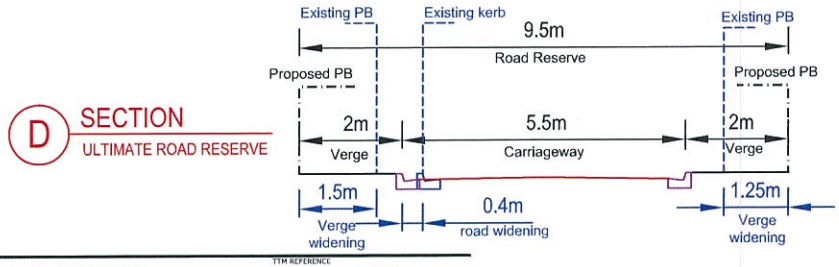
G SECTION
EXISTING CARRIAGEWAY



H SECTION
EXISTING CARRIAGEWAY



D SECTION
INTERIM ROAD RESERVE



D SECTION
ULTIMATE ROAD RESERVE

SECTIONS
SCALE 1:200 AT ORIGINAL SIZE

PLAN
SCALE 1:500 AT ORIGINAL SIZE

ttm
TRAFFIC • PARKING • ACOUSTICS

TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 1, 129 LOGAN ROAD, WOOLLOONGABBA, QLD, 4102
P.O. BOX 1310, COORPAROO BC, QLD, 4151
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

9 & 11 BOWEN BRIDGE ROAD, HERSTON

ROAD CROSS SECTION ANALYSIS

TTM REFERENCE
13BRT0578-SK2

DRAWN	CHECKED	REVISION
BW	AR	A

DATE
05 DEC 2013

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW

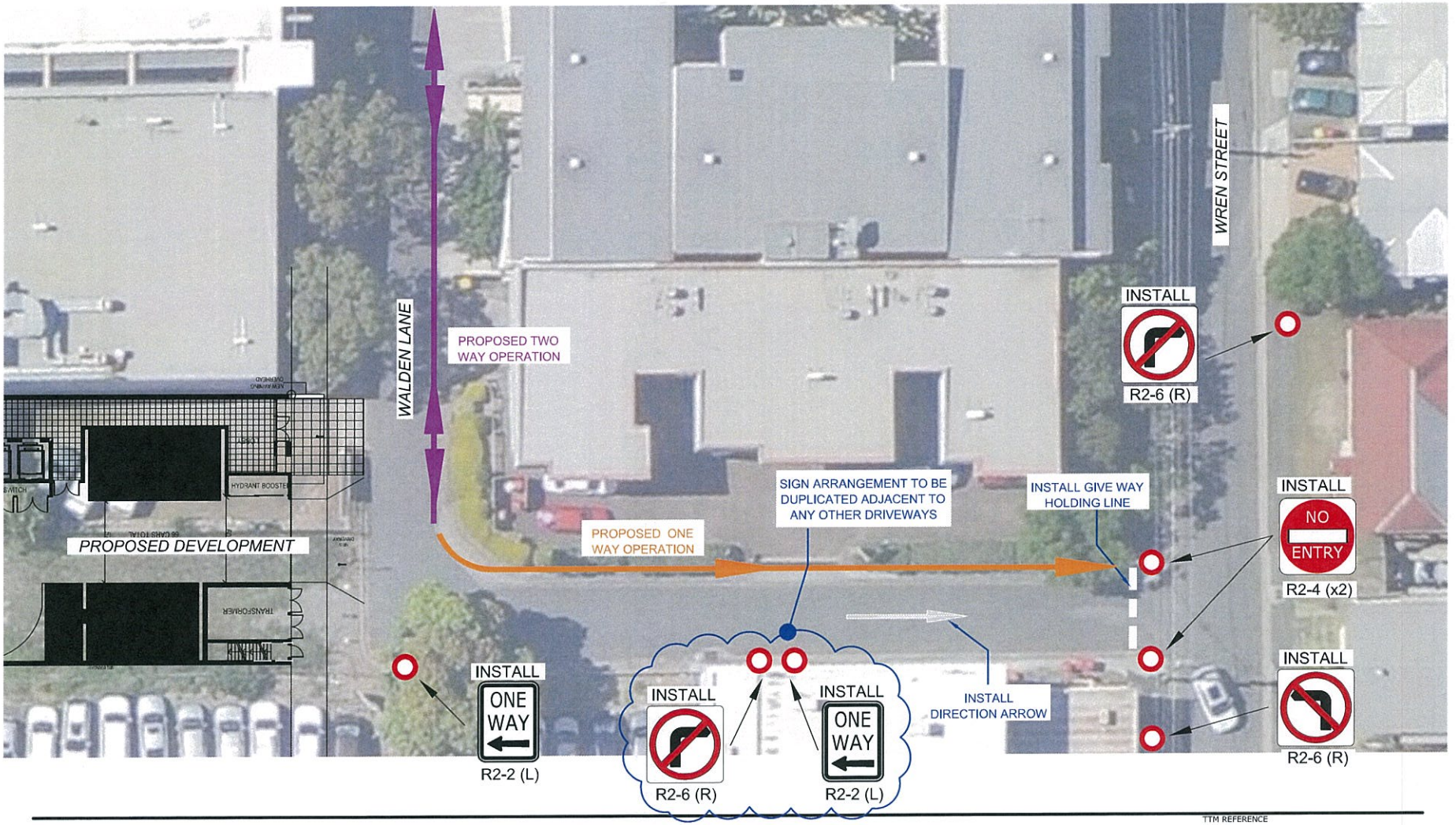
Appendix C Existing Road Re-Configuration - Signs & Line Marking Plans

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW

NOTES

1. THIS IS A PRELIMINARY DESIGN THAT IS FOR DISCUSSION PURPOSES ONLY AND NOT FOR CONSTRUCTION.
2. PROPOSED ROAD LINE MARKINGS AND SIGNAGE IS TO BE INSTALLED AS PER MUTCD GUIDELINES - *Part 2 (Traffic Control Devices) - Section 5.*

0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE



TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 1, 129 LOGAN ROAD, WOOLLOONGABBA, QLD, 4102
P.O. BOX 1310, COORPAROO BC, QLD, 4151
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

9 & 11 BOWEN BRIDGE ROAD, HERSTON

EXISTING ROAD RE-CONFIGIRATON
SIGNS & LINES

TTM REFERENCE
13BRT0578-SK3

DRAWN	CHECKED	REVISION
BW	AR	A

DATE
05 DEC 2013

Appendix D Correspondence from CityWaste & SITA

Andrew Riddles

From: John Love <John.Love@brisbane.qld.gov.au>
Sent: Tuesday, 22 March 2011 12:43 PM
To: Riddles, Andrew
Subject: Re: Height Restrictions

Andrew,

With the rearlift WASTE truck it is no issue.

However the recycling truck requires 3.6m.

I would have thought for a mixed use development 4.6 would be required anyway, or has the TAPS policy been changed?

Regards

John Love
Brisbane City Council
Green Square South Tower
505 St. Pauls Terrace
Fortitude Valley Q4006
City Waste Services'
Phone 3027 4669
Email johnlove@brisbane.qld.gov.au

>>> "Andrew Riddles" <ariddles@ttmgroup.com.au> 22/03/2011 10:47 am >>>
Mr Love,

We are currently assessing the servicing requirements of a proposed mixed-use development at Commercial Road, Teneriffe.

Refuse collection vehicles will access the subject site via an existing opening, which is 3.5m in height. As such we would be grateful if you could confirm if this acceptable to facilitate RCV access/egress.

Should you require further information or clarification, please do not hesitate to contact us.

Kind Regards,

Andrew Riddles
Address: Level 1 129 Logan Road Woolloongabba QLD 4102
Postal: PO Box 1310 Coorparoo BC Qld 4151
Phone: 07 3327 9500 **Facsimile:** 07 3327 9501
www.ttmgroup.com.au

ttm GROUP

TRAFFIC • PARKING • ACOUSTICS

WE DARE YOU TO CHECK IT OUT!
ttmgroup.com.au

This message has passed through an insecure network.
Please direct all enquiries to the message author.

SITA VEHICLES

Vehicles

	No.	Size	Capacity	Type	Width	Height	Length	Lift Height	GVM
FL	5	25m3	9t	Waste	2.9m	3.9m	10.6m	6.5m	24.5t
RL	3	15m3	4.2t	Waste	2.5m	3.6m	8.8m	3.5m	16.5t
FL Recy	1	25m3	9t	Recycle	2.9m	5.5m	10.6m	6.5m	24.5t
RL Recy	1	15m3	4.2t	Recycle	2.5m	3.6m	8.8m	3.5m	16.5t

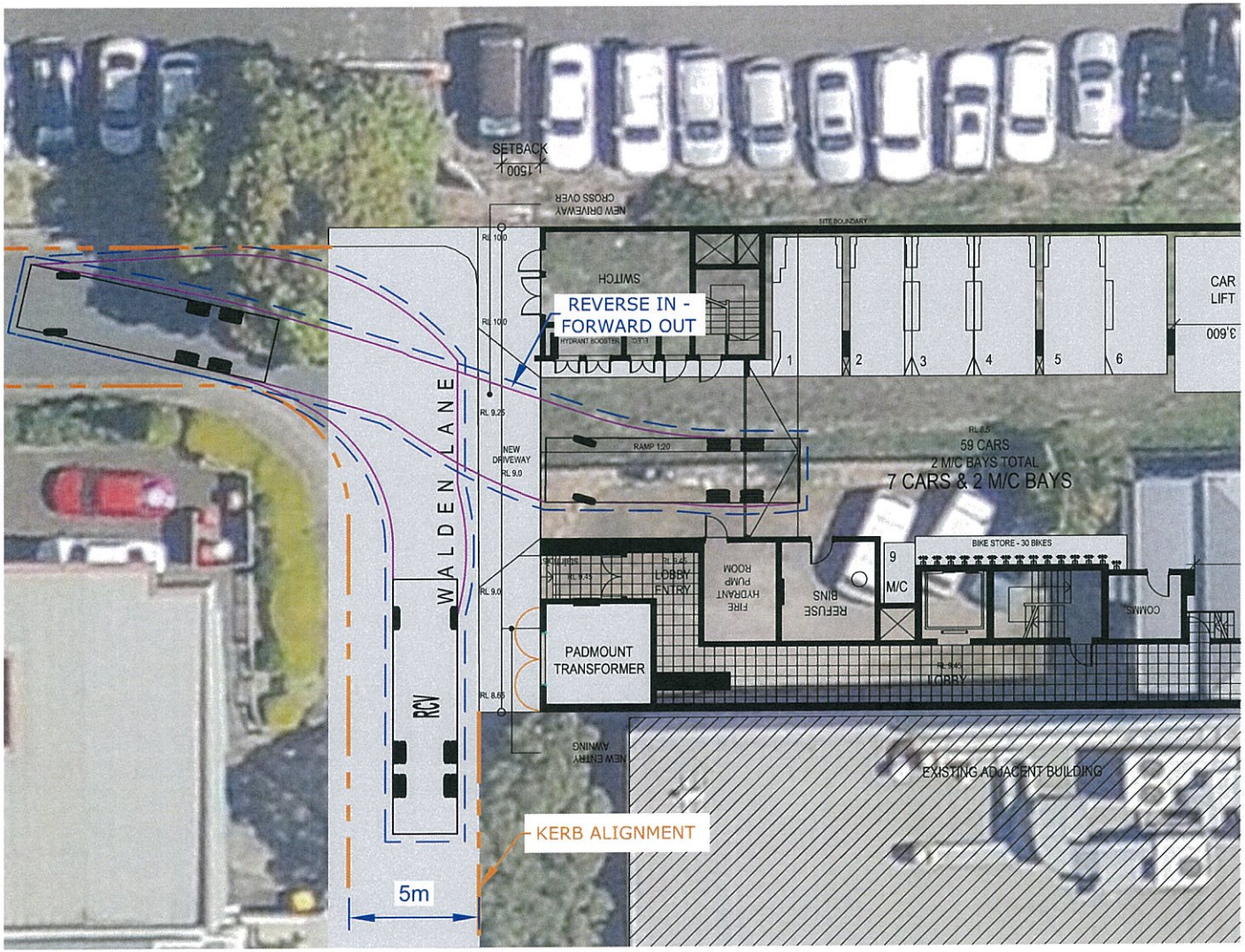
Turning Circle

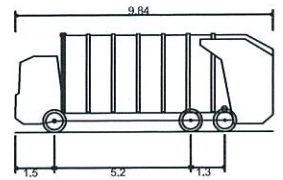
FL	24m
RL	20m

Driveway Width

FL	5.5m
RL	5.5m

Appendix E Service Vehicle Manoeuvrability





Acco 2350 Rear Loader Refuse Truck	
Overall Length	9.840m
Overall Width	2.480m
Overall Body Height	3.748m
Min Body Ground Clearance	0.300m
Track Width	2.480m
Lock to Lock Time	6.00s
Wall to Wall Turning Radius	11.500m

SCALE 1:250 AT ORIGINAL SIZE

TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 1, 129 LOGAN ROAD, WOOLLOONGABBA, QLD, 4102
P.O. BOX 1310, COORPAROO BC, QLD, 4151

T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbrls@ttmgroup.com.au W: www.ttmgroup.com.au

TRAFFIC • PARKING • ACOUSTICS

9 & 11 BOWEN BRIDGE ROAD, HERSTON

RCV LOADING ACCESS
DESIGN CHECK

TTM REFERENCE	REVISION
13BRT0578-SK1	C
DRAWN	CHECKED
BW	AR
DATE	
29 JAN 2013	