WESTFIELD

TRAFFIC IMPACT STUDY AND TRAFFIC MANAGEMENT AND ACCESSIBILITY PLAN FOLLOWING ROA FOR PART 3A APPLICATION FOR PROPOSED EXTENSIONS TO WESTFIELD PARRAMATTA SHOPPING CENTRE

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1. INTRODUCTION

1.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Westfield to prepare a traffic impact study and traffic management and accessibility plan for the Part 3A application for the proposed extensions to Westfield Parramatta Shopping Centre. The proposed extensions include 31,495m^2 GFA (24,504m^2 GLA) of additional retail area, additional 30,392m^2 GFA offices, provision of an additional 573 parking spaces, and modifications to the loading docks, parking layout and access driveways to accommodate the additional development. The site location is shown in Figure 1.

1.2 This report covers traffic matters raised by the ROA regarding our previous report dated September 2012.[1] These maters relate to access arrangements and parking provision during construction. These matters are addressed in Chapter 3 of this report.

1.3 The shopping centre is located in the southern section of Parramatta CBD, south of the railway and is generally bounded by Church Street, Argyle Street, O'Connell Street and Campbell Street (with the exception of the cinema precinct which is located on the south eastern corner of Church Street and Argyle Street). The centre is some 135,000m^2 GLA comprising retail, commercial and cinemas with parking for some 4,450 cars in multi-deck car parks. Access is provided from Campbell Street, Aird Street and Marsden Street.

1.4 The Director-General's requirements with regards to transport and accessibility are as follows:

[1] *"Traffic Impact Study and Traffic Management and Accessibility Plan, for Part 3A Application for Proposed Extensions to Westfield Parramatta Shopping Centre", September 2012.*

"4. Transport and Accessibility

- ***Prepare a traffic impact study in accordance with the RMS's Guide to Traffic Generating Developments considering traffic generation, any intersection upgrades, access, loading docks and car parking arrangements.***
- ***Prepare a Traffic Management and Accessibility Plan to assess the implications of the development for non- car travel modes which addresses the following:***
  - ***Measures to promote public transport usage and pedestrian and bicycle linkages;***
  - ***An assessment of the impact of increased patronage demand on the existing public transport system;***
  - ***Pedestrian safety and accessibility;***
  - ***Identification of traffic and transport infrastructure measures required to support the development.***

"5. Parking

The EA must demonstrate the adequate provision of on-site parking for the proposal having regard to local EPI controls and RMS Guidelines (Note: the department supports reduced car parking rates in areas well serviced by public transport).

1.5 In its response to the DGRs, RMS (previously RTA) in its letter dated 2 September 2010, suggested use of Council's PARAMICS model of the Parramatta CBD to assess the traffic impacts of the proposed extensions and the consideration of a number of changes to the road network adjacent to the centre. On 25 May 2012 we met with Council and RMS officers to review the appropriate methodology to assess the traffic effects of the proposed extensions. The following matters were agreed at the meeting:

1. The road network changes suggested in Paragraph 3 of the RTA's letter of 2 September 2010 are no longer required to be assessed.
2. The improvements identified by Council at the intersections of Great Western Highway with Church Street, O'Connell Street and Marsden Street should be considered (copies of plans showing these improvements were provided by Council);
3. Weekday morning and Thursday afternoon peak periods traffic conditions to be assessed. An assessment of the Saturday midday peak period is not required.
4. A PARAMICS model is to be used to assess the traffic impacts of the proposed development; and
5. Intersections identified in Paragraph 2 of the RMS letter of 2 September 2010 are still appropriate.

1.6 Subsequent to the meeting, RMS advised that the current PARAMICS model for the Parramatta CBD is not appropriate (not fit for use) to assess the proposed extensions to Westfield Parramatta. It was agreed that Westfield would build a new PARAMICS model for the area covering the intersections in Paragraph 2 of the RMS letter of 2 September 2010.

1.7 The traffic assessment for the proposed extensions to Westfield Parramatta has been undertaken based on the agreed methodology set out in paragraphs 1.4 and 1.5.

1.8 Our assessment of the proposed extensions to the shopping centre is set down through the following chapters:-

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - setting down the traffic impact study and traffic management and accessibility plan, including addressing the Director-General's requirements.

2. EXISTING CONDITIONS

2.1 Westfield Parramatta is a large regional shopping centre located within the southern section of Parramatta CBD, south of the railway. It is generally bounded by Church Street, Argyle Street, O'Connell Street and Campbell Street. Aird Street and Marsden Street bisect the centre in east/west and north/south directions respectively. The cinema precinct is located on the south eastern corner of Church Street and Argyle Street. It is some 135,000m^2 in size (comprising retail, commercial and cinemas) with parking provided for some 4,450 cars in multideck parking areas. The car park has multiple access points to the surrounding road network (to Campbell Street, Marsden Street and Aird Street). Loading docks are provided on Aird Street, Church Street, Campbell Street and Marsden Street. The loading docks cater for vehicles up to 19 metre articulated trucks.

2.2 Surrounding land use is a mix of retail, commercial and residential development within Parramatta CBD. The main western rail line is north of the site with Parramatta bus/rail interchange to the northeast, which has direct connections to Westfield Parramatta. To the east is a mix of commercial/residential development, while to the south there is predominantly residential development. To the west there is commercial development.

Road Network

2.3 The road network in the vicinity of the shopping centre includes the Great Western Highway, Pitt Street, O'Connell Street, Marsden Street, Church Street, Campbell Street, Aird Street, Argyle Street and Macquarie Street. The Great Western Highway is located south of site and travels in an east-west direction. It provides a dual carriageway with generally three travel lanes in each direction,

clear of intersections. Clearways operate during peak periods. Major intersections with Church Street, Marsden Street, O'Connell Street and Pitt Street are signalised with additional lanes for turning traffic. These roads also provide access to adjacent commercial, industrial, retail and residential land uses. Marsden Street provides direct access to the shopping centre.

2.4 Pitt Street, O'Connell Street, Marsden Street and Church Street provide the main north-south roads through the Parramatta CBD. West of the site, Pitt Street combines with sections of Macquarie Street and O'Connell Street to provide a one-way northbound traffic route between the Great Western Highway in the south and Victoria Road in the north. Pitt Street provides two northbound traffic lanes and one designated bus lane in each direction, clear of intersections. South of the Great Western Highway, Pitt Street provides a two-way four lane undivided carriageway, clear of intersections.

2.5 O'Connell Street is west of the site. South of Macquarie Street, O'Connell Street and Pitt Street form a one way pair. Pitt Street is one way northbound and O'Connell Street is one way southbound. North of Macquarie Street, O'Connell Street provides for two-way traffic, with two traffic lanes in each direction, clear of intersections. The intersections of O'Connell Street with Aird Street, Argyle Street, Hunter Street and Macquarie Street are traffic signal controlled.

2.6 Marsden Street is adjacent to the shopping centre and provides a four lane divided carriageway between the Great Western Highway and Argyle Street. North of Argyle Street, Marsden Street provides an undivided road with one traffic lane and one parking lane in each direction, clear of intersections. The intersections of Campbell Street, Argyle Street, Hunter Street and Macquarie Street with Marsden Street are traffic signal controlled.

2.7 Church Street is adjacent to the eastern boundary of the site and provides a north-south traffic route between Argyle Street and Parramatta Road. North of the Great Western Highway, Church Street provides an undivided road with one traffic lane and one parking lane in each direction, clear of intersections. The intersections of the Great Western Highway, Campbell Street and Argyle Street are traffic signal controlled.

2.8 Campbell Street is adjacent to the southern boundary of the site and provides an east-west connection between O'Connell Street and Church Street. Access to Campbell Street from O'Connell Street is available for eastbound traffic. The balance of the road is two-way with one traffic lane and one parking lane in each direction, clear of intersections. Campbell Street provides access to various car parking areas within the shopping centre.

2.9 Aird Street is adjacent to the site and provides an east-west connection between O'Connell Street and Marsden Street. It provides a two-way undivided road with one traffic lane and one parking lane in each direction, clear of intersections. The intersection of Aird Street with Marsden Street is priority controlled with Marsden Street having priority. A central median in Marsden Street restricts access to and from Aird Street to left in and left out.

2.10 Argyle Street is adjacent to the northern boundary of the site and provides an east-west connection between Church Street and Pitt Street. West of Pitt Street, Argyle Street combines with Park Parade and Alexandria Avenue to connect to Westmead Hospital. Adjacent to the site, Argyle Street provides a bus transit corridor with designated bus lanes in each direction and major bus stops on both sides of the road. General traffic access along Arygle Street, between Church Street and Pitt Street, is restricted to a single westbound traffic lane, clear of

intersections. The intersections of Argyle Street with Church Street and Marsden Street are traffic signal controlled.

2.11 Macquarie Street and George Street are located to the north of the site and form a one-way pair north of the railway line. Macquarie Street provides for westbound traffic and George Street provides for eastbound traffic. Both roads have signalised intersections with O'Connell Street and Marsden Street, and generally provide two traffic lanes with kerbside parking permitted clear of intersections.

2.12 Observations indicated that, during the afternoon peak period, there is some congestion in the road network, particularly along the Great Western Highway. This can result in delays for traffic exiting the CBD and the shopping centre at intersections along Marsden Street, O'Connell Street and Church Street.

Traffic Conditions

2.13 In order to gauge traffic conditions, counts were undertaken during the Wednesday morning and Thursday afternoon peak periods. These are busy periods on the road network when traffic from the shopping centre and commercial development will have its greatest effects and combines with other retail and commuter traffic on the road network. The counts were undertaken at the following intersections on Wednesday 6 June 2012 and Thursday 14 June 2012: -

- Great Western Highway/Pitt Street;
- Great Western Highway/O'Connell Street;
- Great Western Highway/Marsden Street;
- Great Western Highway/Church Street/Parkes Street;

- Campbell Street/Marsden Street;
- Campbell Street/Church Street;
- Aird Street/O'Connell Street;
- Fitzwilliam Street/Church Street;
- Argyle Street/O'Connell Street;
- Argyle Street/Pitt Street;
- Argyle Street/Marsden Street;
- Argyle Street/Church Street;
- Macquarie Street/O'Connell Street; and
- Macquarie Street/Marsden Street.

2.14 These are intersections set out in Paragraph 2 of the RMS letter dated 2 September 2010 and cover the intersections in the southern section of Parramatta CBD in the vicinity of Parramatta Westfield shopping centre.

2.15 The results of the surveys are shown in Figures 2, and 3, and summarised in Table 2.1.

2.16 Table 2.1 shows that the highest flows occurred on Great Western Highway, which carried some 1,900 to 3,200 vehicles per hour two-way during the weekday morning and afternoon peak hours. Flows on Great Western Highway were highest west of O'Connell Street.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows

Road/Location	Weekday Morning (Vehicles/Hour)	Weekday Afternoon (Vehicles/Hour)
Great Western Highway		
- west of Church Street	2025	2055
- west of Marsden Street	1895	2405
- west of O'Connell Street	2325	3240

- west of Pitt Street	2350	3195
Church Street		
- north of Argyle Street	40[1]	90[1]
- north of Fitzwilliam Street	315	545
- north of Campbell Street	460	580
- north of Great Western Highway	850	1365
- south of Great Western Highway	2280	2430
Marsden Street		
- north of Macquarie Street	1270	1380
- north of Argyle Street	1590	1640
- north of Aird Street	1595	1495
- north of Campbell Street	1555	1350
- north of Great Western Highway	1755	1955
- south of Great Western Highway	685	905
O'Connell Street		
- north of Macquarie Street	2920	2740
- north of Argyle Street	1485[1]	2400[1]
- north of Aird Street	1230[1]	2045[1]
- north of Campbell Street	985[1]	1805[1]
- north of Great Western Highway	750[1]	1665[1]
Pitt Street		
- north of Argyle Street	1975[1]	1250[1]
- north of Great Western Highway	1400	980
- south of Great Western Highway	1190	855
Campbell Street		
- west of Church Street	560	1115
- east of Marsden Street	655	955
- west of Marsden Street	300	715
east of O'Connell Street	235[1]	140[1]

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows (Continued)

Road/Location	Weekday Morning (Vehicles/Hour)	Weekday Afternoon (Vehicles/Hour)
Aird Street		
- west of Marsden Street	210	410
- east of O'Connell Street	335	690
Argyle Street		

- east of Church Street	250	325
- east of Marsden Street	460	655
- east of O'Connell Street	395	660
- east of Pitt Street	650	1015
- west of Pitt Street	1295	1305
Macquarie Street		
- east of Marsden Street	365[1]	640[1]
- east of O'Connell Street	405[1]	715[1]
- west of O'Connell Street	1995[1]	1395[1]

[1] One-way traffic flow

2.17 Flows on Church Street (north of Great Western Highway) were some 300 to 1,400 vehicles per hour two-way during the weekday morning and afternoon peak hours. South of Great Western Highway, traffic flows were higher at some 2,200 to 2,500 vehicles per hour two-way.

2.18 Flows on Marsden Street (north of Great Western Highway) were some 1,200 to 2,000 vehicles per hour two-way during the weekday morning and afternoon peak hours. South of Great Western Highway, traffic flows were lower at some 700 to 900 vehicles per hour two-way.

2.19 Flows on O'Connell Street south of Macquarie Street were some 700 to 2,400 vehicles per hour one-way during the weekday morning and afternoon peak hours. North of Macquarie Street flows were higher at some 2,700 to 2,900 vehicles per hour on-way during peak periods.

2.20 Flows on Pitt Street were some 800 to 2,000 vehicles per hour during peak periods. Traffic flows on Macquarie Street were 350 to 2,000 vehicles per hour one-way. Traffic flows were highest on Pitt Street during the morning peak hour and highest on O'Connell Street during the afternoon peak hour. Traffic flows on Macquarie Street were highest west of O'Connell Street.

2.21 Flows on Campbell Street and Aird Street were some 200 to 1,100 vehicles per hour two-way during the weekday morning and afternoon peak hours. Traffic flows on both streets were highest in the afternoon peak hour.

2.22 In addition to the surveyed intersections, traffic counts were undertaken of the number of vehicles entering and exiting Westfield Parramatta shopping centre from the access points on Marsden Street, Aird Street and Campbell Street. The results are summarised in Table 2.2.

Table 2.2: Summary of Traffic Movements in and out of Shopping Centre

Access	**Wednesday Morning (Vehicles/Hour)**			**Thursday Afternoon (Vehicles /Hour)**		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Campbell Street (east)	340	25	365	265	160	425
Campbell Street (central)	175	50	225	215	340	555
Campbell Street (west)	n/a	35	35	n/a	550	550
Marsden Street (north)	n/a	10	10	n/a	230	230
Marsden Street (central)	100	25	125	290	185	415
Marsden Street (south)	300	n/a	300	725	n/a	725
Aird Street (east)	n/a	45	45	n/a	240	240
Aird Street (west)	310	n/a	310	505	n/a	505
Total	**1225**	**190**	**1415**	**2000**	**1705**	**3705**

2.23 The counts found that the shopping centre generated some 1,415 vehicles per hour two-way during the weekday morning peak hour (86% in/14% out), and some 3,705 vehicles per hour two-way during the weekday afternoon peak hour (54% in/46% out).

2.24 Surveys were also undertaken of the proportion of heavy vehicles on the surrounding roads. On non-bus routes the proportion of heavy vehicles was minor (around one to two per cent). On bus routes the proportion was higher with Church Street having 10 per cent heavy vehicles in some sections and Argyle Street over 50% (as would be expected with it forming part of the Parramatta to Liverpool Transitway).

Intersection Operations

2.25 The capacity of the road network is generally determined by the capacity of its intersections to cater for peak period traffic flows. As noted in Chapter 1 a PARAMICS model has been prepared to assess the traffic effects of the proposed extensions. The PARAMICS model has been prepared by Parsons Brinkerhoff (PB) and covers the area bounded by Macquarie Street, Church Street, Great Western Highway and Pitt Street (inclusive of these roads). Westfield Parramatta is located at the centre of this area and it contains the intersections identified by the RMS. A copy of the PARAMICS modelling report is provided in Appendix B.

2.26 The AM and PM peak models were calibrated and validated to RMS criteria. Feedback from RMS and Council officers indicated that the PM model was a reasonable representation of the typical traffic conditions on a Thursday evening peak. The calibrated models identified the following matters:

- apart from the intersections along the Great Western Highway, the road network within the model generally operates satisfactorily;
- the road network is busier in the PM peak period;
- the traffic models indicate traffic congestion on the Great Western Highway in both the AM and PM peaks. During the morning peak, a large volume of traffic enters/leaves Parramatta CBD via the Great Western Highway at the south-eastern corner of the study area. The majority of this traffic is travelling east-west, while some peels off at Marsden Street or joins from O'Connell Street to enter/leave Parramatta CBD. During the PM peak, the reverse flow occurs

but with higher overall volumes. A significant volume of traffic travels south along O'Connell Street to turn west onto Great Western Highway; and

- during the PM peak, traffic congestion occurs along the Great Western Highway. This congestion flows back up into the Parramatta CBD area along streets such as O'Connell Street and Marsden Street. On O'Connell Street, delays getting on to the Great Western Highway contribute to slow-moving traffic and spill-back queues through the model to north of Macquarie Street, affecting the operation of the intersections such as Argyle Street and Macquarie Street. The operation of the intersection of O'Connell Street and Macquarie Street and in particular the southbound movement on O'Connell Street is affected by the slow moving queue on the Great Western Highway. While the southbound movement gets a red-signal, traffic from Macquarie Street fills-up the space left as the downstream queue on O'Connell Street moves south. This reduces the space available for O'Connell Street traffic to move into when it gets a green signal again.

2.27 Once the base model was developed and calibrated, intersection performance was measured against standard criteria. This information has been used as a baseline with which to compare the model forecasts with the additional traffic and car park modifications associated with the proposed extensions.

2.28 Intersection performance is measured by the delay experienced by vehicles. This delay is then associated with a Level of Service (LoS) according to RMS guidelines ranging from A (indicating good intersection performance) to F (indicating conditions with long delays and queues) as set out below:-

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity.

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to the following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode.

2.29 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.30 The intersection analysis found that:

- the intersections along the Great Western Highway (with Church Street, Marsden Street, O'Connell Street and Pitt Street) are operating with average delays of more than 70 seconds per vehicle in the AM and PM peak periods. This represents LOS F, unsatisfactory. As noted above this is due in part to the close proximity of these intersections along the highway, and as result, queuing extends back into Parramatta CBD in the afternoon peak period. This can lead to delays for vehicles exiting the CBD (including from the Westfield car parks);

- in the AM peak period, with the exception of the intersection of Argyle Street/Pitt Street, the balance of intersections within the study area operate with average delays of less than 30 seconds per vehicle. This represents LOS B, a good level of service with spare capacity;

- in the AM peak period, the intersection of Argyle Street/Pitt Street is operating with average delays of less than 50 seconds per vehicle in the peak periods. This represents LOS D, a satisfactory level of intersection operation, but approaching capacity;

- in the PM peak period, the intersections of O'Connell Street/Aird Street, Church Street/Fitzwilliam Street, Argyle Street/Pitt Street, O'Connell Street/Argyle Street, Marsden Street/Argyle Street and Church Street/Argyle Street operate with average delays of less than 40 seconds per vehicle. This represents LOS C, a satisfactory level of service;

- in the PM peak period the intersections of Marsden Street/Campbell Street, Church Street/Campbell Street and Marsden Street/Macquarie Street are operating with average delays of less than 70 seconds per vehicle. This represents LOS E, at capacity. The intersection of Church Street/Argyle Street operates with average delays of more than 70 seconds per vehicle in the in the PM peak period. This represents LOS F, unsatisfactory.

2.31 At the meeting with RMS and Council in May 2012, the authorities tabled some improvements to three intersections along the Great Western Highway. The authorities indicated that there was no timing or funding for these improvements and that their construction could be included as conditions of consent if there was a nexus between the identified works and the proposed extensions. The identified works are:

- Great Western Highway and O'Connell Street: relocated vacant lane in eastbound direction from position alongside median to kerbside to link to changes at Marsden Street;
- Great Western Highway and Marsden Street: remove westbound vacant lane alongside median, shift eastbound through and right turn lane across one lane and create new left-turn lane into Marsden Street, reconstruct median accordingly; and
- Church Street, Great Western Highway and Parkes Street: widen Church Street northbound (from Lansdowne Street to the Great Western Highway) to create a second right-turn lane into Parkes Street.

2.32 The calibrated models were rerun to include the road improvements identified by RMS and Council. The results found improvements to the operation of the modelled road network in the AM and PM peak periods as set out below:

- in the AM peak period, only the intersections of Great Western Highway with Marsden Street and Church Street would continue to operate at LOS F with the a significant decrease in average delay at the intersection with Marsden Street. Overall six intersections would have reduced average delays, three would have no change and three would have minor increase in delay. Overall average network speed would increase from 19 km/h to 25 km/h; and

- in the PM peak period, the intersections along the Great Western Highway would continue to operate at LOS F with a decrease in average delay at the intersection of Church Street and Great Western Highway. Overall two intersections would have reduced average delays, seven would have no change and four would have minor increase in delay. Overall average network speed would increase from 13 km/h to 16 km/h.

Parking Conditions

2.33 The shopping centre provides some 4,450 parking spaces within multi deck parking areas. Access is provided from Marsden Street, Campbell Street and Aird Street. All parking within the centre is linked via connections on the upper levels of each area (Campbell Street East, Campbell Street West and Aird Street). Parking within the centre is monitored by the Park Assist system that provides information of available parking on each level/section of the car park and whether a space is vacant (green light) or occupied (red light). For a car park the size at Westfield Parramatta, the provision of Park Assist has greatly improved circulation within the car park as it has reduced circulation by drivers searching for a space.

2.34 In order to establish parking conditions at the centre, surveys were undertaken on Thursday 19 July 2012 (between 8.00am and 9.00pm) and Saturday 21 July (between 8.00am and 6.00 pm). The surveys counted the number of vehicles parked on-site during these periods within the various parking areas. The results

of the parking surveys are attached to this report in Appendix B. In summary the surveys found that:

- there are some 4,450 spaces provided on site;
- staff parking (some 675 spaces) is provided on the roof;
- valet parking (some 110 spaces) is provided on L4 and L5 within Campbell Street (east);
- peak parking demand on Thursday was at 1.00pm with 3,400 spaces occupied (76% utilisation). A secondary peak occurred at 7.00pm with 3,340 spaces occupied (75% utilisation);
- peak parking demand on Saturday was at 2.00pm with 3,860 spaces occupied (87% utilisation);
- on both Thursday and Saturday the lower levels of the car park were the busiest with most vacant spaces located on levels 7 and 8 of the Campbell Street car park; and
- on Saturday the Aird Street car park reached capacity.

Pedestrians

2.35 Pedestrian access to the shopping centre is provided from Argyle Street, Church Street and Aird Street. In addition there is pedestrian access to the Parramatta bus/rail interchange via a tunnel beneath Argyle Street and from Campbell Street via a defined pedestrian path through the car park. Footpaths are provided along all the frontages of the shopping centre with pedestrian facilities at traffic signal controlled intersections. The footpath along the southern side of Argyle Street, along the frontage of the site, provides additional width, denoting its function as a major pedestrian route with provision of bus stops along the transitway. A raised pedestrian crossing is provided on Aird Street, just west of Marsden Street. This provides access to the Aird Street entry to the shopping centre. The shopping

centre bridges over Aird Street, Marsden Street and Church Street provide upper level pedestrian connections between the various areas of the shopping centre and the car parking areas.

2.36 Pedestrian access is also provided from the car parking areas with most parking areas having designated pedestrian paths through the parking areas to the shopping centre. As noted previously a defined pedestrian path is provided from Campbell Street through the car park to the shopping centre. Pedestrian access is also provided from the Aird Street car park to Aird Street.

Parramatta Civic Improvement Plan

2.37 The Parramatta Civic Improvement Plan (Amendment No 1) was adopted by Council in May 2011. It provides a description of the civic infrastructure needed to support the growth and development of the city centre, and outlines contributions to be made towards the funding and provision of the infrastructure. The public domain projects include a strategy for the public transport network, pedestrian network. These include:

- Integration of public transport services and increased level of service;
- Increased public transport usage and reduced reliance on private transport;
- Improved amenity for public transport users;
- Introduction of a free shuttle bus service within the CBD;
- Prioritise and expand existing pedestrian network;
- Promote connectivity between the CBD and joining areas;
- Promote changes in peoples travel behaviour; and
- Establish a data collection program for specific pedestrian routes.

2.38 The plan identifies a number of special city centre projects with respect to access and transport including:

- city ring road and intersection improvements;
- park and ride facilities on the edge of the CBD;
- potential for George Street and Macquarie Street to be two way; and
- provision of a free CBD shuttle bus.

2.39 Funding of the measures identified in the plan would be through Section 94A contributions.

Public Transport

2.40 The site is south east of and adjacent to Parramatta railway station. Parramatta is on the Western (Emu Plains/Richmond to North Sydney via the City), North Shore (Berowra to Parramatta via Central) and Cumberland (Campbelltown to Blacktown) Lines. Numerous services operate both ways through Parramatta on these lines over the day and all lines on the CityRail network are readily accessible. The station and interchange have recently been upgraded.

2.41 Local bus services are provided by a number of operators, including Sydney Buses, Hillsbus/Westbus, Veolia Transport and Westbus/Hopkinsons. There are major bus/rail interchanges at Parramatta Station in Argyle Street (adjacent to the site) and Smith Street (located on the northern side of the railway).

2.42 Bus services link Parramatta with surrounding areas, including the Hills District, Cherrybrook, Pennant Hills, Fairfield, Liverpool, Lidcombe, Bankstown, Toongabbie, Blacktown, Carlingford and Chatswood. There are existing bus priority measures on a number of roads within the town centre. Bus routes are summarised and attached to this report in Appendix C. Bus stops are provided along the Church Street and Argyle Street frontages of the site.

2.43 There are a number of bus transitways which centre on Parramatta. These include Liverpool to Parramatta and Parramatta to Rouse Hill transitways, which operate along Argyle Street. These transitways are an important measure to cater for future growth within Parramatta CBD and the surrounding areas.

2.44 A number of improvements to public transport services within Parramatta CBD have been approved or are under consideration. These include the Parramatta to Epping Rail Link (extension of the Chatswood to Epping service), Parramatta to CBD metro, Parramatta to Blacktown transitway and light rail services within the Parramatta CBD. At this stage these projects are at the early stages of planning and do not have funding allocated.

2.45 Overall, the site is well serviced by public transport, being located adjacent to a major bus and rail interchange (with direct pedestrian connections from the shopping centre to the interchange) and with bus stops along streets fronting the site.

Mode Split

2.46 A survey of mode split of shoppers to Westfield Parramatta shopping centre was undertaken. The survey found the following:

- Some 54% travelled by car. With a car occupancy of 1.99 this represents a mode split of 27% car driver;
- 30% travelled by public transport (13% train, 15% bus and 2% taxi); and
- 16% walked.

2.47 The mode split reflects the site's high accessibility by public transport and the ability of people already within the CBD (either living or working) to walk to the shopping centre.

3. TRAFFIC IMPACT STUDY AND TRAFFIC MANAGEMENT AND ACCESSIBILITY PLAN

3.1 The proposed extensions include an additional 31,495m^2 GFA (equivalent to 24,504m^2 GLA) of retail area, additional 30,392m^2 GFA offices, provision of an additional 573 parking spaces, and modifications to the loading docks, parking layout and access driveways to accommodate the additional development.

3.2 Our traffic impact study and traffic management and accessibility plan are set down through the following sections:

- policy context;
- public transport, walking and cycling;
- travel access guide;
- parking provision;
- access arrangements;
- internal circulation and car parking arrangements;
- service vehicle arrangements;
- traffic effects;
- principles of construction traffic management;
- access arrangements and parking provision during construction;
- Director-General's requirements; and
- summary.

Policy Context

Metropolitan Transport Plan

3.3 The Metropolitan Transport Plan – Connecting the City of Cities has four key policy objectives:

- commuting to work easily and quickly;
- transport and services accessible to all members of the community;
- an efficient, integrated and customer focused public transport system; and
- revitalized neighbourhoods with improved transport hubs.

3.4 It includes a target of 28 per cent of trips to work in the Sydney Metropolitan Region to be undertaken by public transport by 2016, compared to some 22 per cent in 2006.

3.5 To help achieve these objectives, it identifies, in conjunction with the metropolitan strategy, key areas of future housing and employment growth in Sydney to 2020 and 2036. Additionally, it outlines a 10 year funding program to 2020 for the following transport projects:

- rail line extensions for more platforms at CBD stations;
- rail lines to north west and south west Sydney;
- light rail in the CBD and further extension to the Inner West;
- more air conditioned train carriages;
- 1,000 additional buses;
- completion of the 43 strategic bus corridors across Sydney;
- completion of the highest priority missing links in the Sydney Strategic Cycleway Network.

NSW 2021

3.6 NSW 2021: A Plan to Make NSW Number One sets targets to increase the proportion of commuter trips made by public transport for various areas within Sydney by 2016, including:

- 80 per cent in the Sydney CBD;
- 50 per cent in the Parramatta CBD;
- 20 per cent in the Liverpool CBD; and
- 25 per cent in the Penrith CBD.

3.7 It also has targets to:

- improve road safety and reduce fatalities to 4.3 per 100,000 population by 2016;
- double the mode share of bicycle trips made in the metropolitan area by 2016; and
- increase the proportion of the population living within 30 minutes by public transport of a city or major centre in the metropolitan area.

Integrated Land Use and Transport Policy Package (ILUT)

3.8 These policies aim to ensure that urban structure, building forms, land use locations, development designs, subdivision locations and street layouts help achieve the following planning objectives:

(a) improve accessibility to housing, employment and services by walking, cycling, and public transport;

(b) improve the choice of transport and reducing dependence solely on cars for travel purposes;

(c) moderate growth in the demand for travel and the distances travelled, especially by car; and

(d) support the efficient and viable operation of public transport services.

NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan

3.9 These guidelines provide a walking and cycling focus to the Integrating Land Use and Transport Policy Package. They provide for improved consideration of walking and cycling in land use planning, to assist in creating more opportunities for people to live and work in places with easy walking and cycling access to services and public transport.

3.10 The following sections discuss how the proposed development satisfies these objectives and the measures proposed to achieve them.

Public Transport, Walking and Cycling

3.11 As previously discussed, the site is located within Parramatta CBD, adjacent to the bus/rail interchange and the transitways that operate along Argyle Street adjacent to the site. Thus the site is highly accessible to local and regional public transport services with direct connections to them. The proposed extensions will maintain and enhance these connections with additional retail development integrated into the existing pedestrian network and the proposed office tower being located on the corner of the site adjacent to the bus/rail interchange.

3.12 Public transport services offer viable alternatives to travel by modes other than car. As noted in Chapter 2, the mode split reflects the site's high accessibility by public transport. To support accessibility by bicycles, appropriate bicycle parking is proposed to be provided for employees and shoppers/visitors along with end of trip facilities for retail and office employees (such as change rooms, showers, and secure bicycle parking areas).

3.13 The proposed development will therefore satisfy the objectives of the Metropolitan Transport Plan, NSW 2021 and Integrated Land Use and Transport,

policy package, NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan as follows:

- enabling employees and shoppers to readily access buses and trains close to the site, for journeys to work and other travel (Metropolitan Transport Plan objective);

- providing pedestrian connections within and through the centre (Metropolitan Transport Plan objective, Planning Guidelines for Walking and Cycling);

- providing an appropriate level of on-site parking, with reference to appropriate Council and RMS requirements, to encourage public transport use and increase the proportion of journey to work trips by public transport (Metropolitan Transport Plan objective);
- providing retail/employment development close to residential development and other retail, commercial and transport facilities to reduce the need for external travel (ILUT principle, NSW Planning Guidelines for Walking and Cycling);

- being located close to employment centres in Parramatta CBD, which are readily accessible by public transport (ILUT principle); and

- providing appropriate bicycle parking on the site to increase the proportion of trips made by bicycle (NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan).

Travel Access Guide

3.14 To encourage travel modes other than private vehicle, a travel demand management approach should be adopted, through a travel access guide to meet the specific needs of the site, future shoppers and employees. The specific requirements and needs of the future employees, including access to surrounding retail and residential development, plus local services and facilities, should be incorporated in the travel access guide to support the objectives of encouraging the use of public transport.

3.15 The principles of the travel access guide should be developed in consultation with Council, RMS, public transport providers other stakeholders. Principles would include the following:

- encourage the use of public transport, including bus and train services close to the site;
- identify existing public transport services that operate near the site, including the location of bus stops and pedestrian crossings at signalised intersections;
- work with public transport providers to improve services;
- encourage public transport by employees through the provision of information, maps and timetables in the travel access guide;
- raise awareness of health benefits of walking and cycling (including maps showing walking and cycling routes, including through and adjacent to the site);

- encourage cycling by providing safe and secure bicycle parking, including the provision of lockers and rails for employees and visitors;

- provide appropriate on-site parking provision, consistent with appropriate Council/RMS controls and the objective of reducing traffic generation.

3.16 The travel access guide should be developed in accordance with the principles identified by Transport NSW and RMS, and included on the centre website and in promotional material for the centre. The travel access guide would assist in delivering sustainable transport objectives by considering the means available for reducing dependence solely on cars for travel purposes, encouraging the use of public transport and supporting the efficient and viable operation of public transport services.

Parking Provision

3.17 Parking requirements for new development with Parramatta CBD are set out in the City Centre LEP 2007. Generally Council has applied these rates as a maximum provision in order to reduce traffic within the CBD. LEP 2007 sets out the following rates:

- retail – 1 space per 30m^2 GFA; and
- commercial – 1 space per 100m^2 GFA.

3.18 By comparison, RMS (formerly RTA), in its *"Guide to Traffic Generating Developments"*, suggests the following parking requirements for retail and commercial development:

- retail – 4.1 spaces/100m^2 GLA (for shopping centres over 30,000m^2);
- commercial: – 1 space per 40m^2 GFA.

3.19 However, RMS Guidelines note that where surveys of actual demand are available these will provide a better guide to future parking requirements. The existing centre provides parking at a rate of 3.3 spaces/100m^2 with a peak parking demand of 2.86 spaces/100m^2.

3.20 For commercial development, the RMS parking rate is for unconstrained provision in locations with limited access to public transport. This rate is considered inappropriate for the proposed office tower.

3.21 Taking into account the above rates, the maximum additional parking provision that could be provided is 304 commercial spaces and an additional 1,050 retail spaces. However, consistent with the planning objectives it is proposed to provide a lower parking provision of 100 commercial spaces and an additional 473 retail spaces.

3.22 In addition to car parking, motor cycle and bicycle parking will be provided. It is suggested that one parking space per 100 new spaces be allocated to motor cycle parking (with typically three motor cycle spaces per parking space). With 573 additional spaces and this equates to a provision of some 20 motor cycle spaces.

3.23 AUSTROADS guidelines suggest the following provision for bicycle parking:

- office: 1 space/400m^2 for employees and 1 space/2,000m^2 for visitors;
- retail: 1 space/600m^2 for employees and 1 space/1,000m^2 for visitors.

3.24 Using these rates the proposed extensions would require 110 bicycle spaces for the office tower (90 employee and 20 visitor) and 90 bicycle spaces for the additional retail area (55 employee and 35 visitor). Provision should be made for additional bicycle parking should future demands increase.

3.25 To support accessibility by bicycles, appropriate bicycle parking is proposed to be provided for employees and shoppers/visitors along with end of trip facilities for retail and office employees (such as change rooms, showers and secure bicycle parking areas. Bicycle parking will be provided in accordance with AUSTROADS guidelines and Green Star Spatial Requirements. Bicycle parking and storage be provided as follows:

- office tower -some 164 bicycles (117 staff and 47 visitor bicycles);
- retail - some 90 bicycles (55 staff and 35 visitor bicycles).

Access Arrangements

3.26 Access to the shopping centre will be retained from Campbell Street, Marsden Street and Aird Street. In association with the proposed extensions to the shopping centre, the following changes to access are proposed:

- the existing eastern Campbell Street access driveway and ramp (located between Marsden Street and Church Street) will be reconfigured to provide one entry lane and two exit lanes. The two exit lanes will provide for simultaneous left and right turn movements out of the shopping centre onto Campbell Street;

- the existing western Campbell Street exit driveway and ramp (located between O'Connell Street and Marsden Street) will be reconfigured to

provide two continuous exit lanes from the Level 6 car park exit controls. The exit ramp will be widened to accommodate the two continuous lanes;

- the existing western Aird Street entry driveway (located between O'Connell Street and Marsden Street), providing access to the Aird Street car park, will be reconfigured to close off entry to Level 3 of the car park. This access driveway will be retained solely for the speed ramp to Level 4M;

- a new entry driveway will be provided at the eastern end of Aird Street (located between O'Connell Street and Marsden Street), providing access to Level 2 of the Aird Street car park. This new driveway will be located west of the existing car park exit driveway and will provide two entry lanes; and
- the existing Marsden Street exit driveway and ramp (located between Aird Street and Argyle Street) will be reconfigured to lengthen the southern exit lane by some 10 metres. The proposed lengthening of the lane will increase capacity at the existing exit controls from the car park.

3.27 All new driveways will be designed to comply with the requirements of the Australian Standard for Parking Facilities Part 1: Off-street car parking (AS2890.1-2004) and Part 2: Off-street commercial vehicle facilities (AS2890.2-2002).

3.28 As part of the proposed extensions, the existing on-site car parking will be modified to provide for the additional retail area and new parking levels will be provided on the Aird Street, Campbell Street East and Campbell Street West car parks. Three new levels of parking will be provided and a new extended roof top car park will provide access across Marsden Street and Aird Street to connect all parking areas within the shopping centre. Some existing parking will be lost to

accommodate the additional retail space. These spaces will be replaced in the proposed new parking areas.

3.29 Within the proposed new parking areas, car parking dimensions, aisle widths, ramp grades and transitions will be provided in accordance with the Australian Standard for Parking facilities Part 1: Off-Street car parking (AS2890.1-2004). Parking spaces will be 2.7 metres wide by 5.4 metres long, clear of structure, with circulation aisles of at least 6.2 metre wide. Spaces with adjacent obstructions will be wider. Columns will be set back 750mm from the front edge of spaces. Dead end aisles will extend one metre beyond the last parking space to provide access to the end parking bays. Dead end aisles will be a maximum length of six 90 degree spaces.

3.30 Disabled parking spaces will be 2.4 metres wide by 5.4 metres long with an adjacent shared zone of 2.4 metres wide. Height clearance will be a minimum of 2.5 metres above disabled spaces and a minimum of 2.2 metres elsewhere. These dimensions are considered appropriate, being in accordance with the Australian Standard AS2890.1-2004 and AS2890.6-2009.

3.31 To improve circulation within various areas of the multi-deck car park some modifications will be undertaken. New car parking areas will be connected to existing car parks via new internal ramps. The new parking areas and new expanded roof top car park will provide access across Marsden Street and Aird Street to connect to all parking areas within the shopping centre.

3.32 The existing western Campbell Street exit ramp, providing egress from Level 6 of the car park, will be extended to provide a new express egress ramp from the upper parking levels and the new roof top car park.

3.33 The above modifications will provide appropriate access to new parking areas and improve access and circulation to existing parking areas. The proposed new parking areas are considered appropriate.

Service Vehicle Arrangements

3.34 The existing Aird Street and Campbell Street loading docks will be modified to service the additional retail area. The modified Aird Street loading dock will be extended to service the new supermarket and provide improved manoeuvring area for service vehicles. The modified dock will provide two additional service bays which have been designed to cater for service vehicles ranging from large rigid trucks to articulated vehicles. The improved internal circulation and manoeuvring area will ensure that service vehicles will be able to turn around and enter and exit the loading dock in a forward direction. Access to the loading dock will be maintained to and from the existing service driveway on the southern side of Aird Street.

3.35 The existing Campbell Street loading dock, located between Marsden Street and Church Street, will be modified to provide two additional service bays for a new retail tenancy and a revised upper loading area. This expanded loading dock would service additional specialty shops and a mini major. The loading docks have been designed to cater for service vehicles ranging from large rigid trucks to articulated vehicles. Access to this loading dock will be to and from Campbell Street with all movements permitted and all vehicles entering and departing in a forward direction.

3.36 The existing Aird Street (east) loading dock, accessed off Church will be expanded as part of Stage 2 (commercial tower development). The expansion will accommodate the increased service requirements for the additional commercial floor area and will provide access to internal service corridors.

3.37 Appendix D provides service vehicle swept paths for the new and modified loading docks. The proposed new and modified loading areas are considered appropriate and will be designed to comply with the requirements of AS2890.2-2002.

Traffic Effects

3.38 As agreed with RMS and Council the traffic effects of the proposed extensions during the weekday morning and Thursday afternoon peak periods have been assessed.

3.39 The existing shopping centre, with some 4,450 parking spaces, was found to generate some 1,415 vehicles per hour two-way during the morning peak hour (86% in/14% out), and some 3,705 vehicles per hour two-way during the afternoon peak hour (54% in/46% out).

3.40 As parking for the proposed extensions will be constrained (consistent with government policy to encourage travel by public transport), estimates of additional traffic generation have been undertaken based on generation rates of parking spaces rather than floor area. Based on the surveys the existing shopping centre generated 0.32 trips per space in the morning peak hour and 0.83 trips per space in the afternoon peak hour. With 473 additional retail spaces, the traffic generation would be an additional 150 vehicles per hour (two-way) in the morning

peak hour and an additional 390 vehicles per hour (two-way) in the afternoon peak hour.

3.41 Estimates of the additional retail traffic generation have also been undertaken based on the increase in retail area, taking into account the constrained parking provision and that generation per 100m^2 decreases as shopping centres become larger. We have based our estimates on generation per 100m^2 decreasing by 5 per cent compared to the existing generation rates.

3.42 The proposed extensions increase the existing shopping centre of some 135,000m^2 GLA by some 23,473m^2 GLA. The existing generation is some 1415 and 3705 vehicles per hour during the morning and afternoon peak periods. Based on the 5 per cent reduction in trip generation per 100m^2, the increased traffic generation would be some 170 and 450 vehicles per hour respectively.

3.43 This compares to the estimated 150 and 390 vehicles per hour based on the increased parking provision. We have based our traffic analysis on increases of 170 and 450 vehicles per hour during the morning and afternoon respectively.

3.44 For the office component, generation rates per space vary from some 0.3 trips per space where parking is constrained in CBD locations (with good access to public transport and spaces are generally provided to senior staff and the cost of parking is included in salary packages) to 0.8 trips per space for unconstrained parking (free parking for all staff and limited access to public transport). We have adopted a generation rate of 0.3 trips per space for the office component. Applying this rate, the office tower with 100 spaces would generate 30 vehicles per hour in the morning and afternoon peak hours.

3.45 Thus the proposed extensions would generate some 200 and 480 vehicles per hour (two-way) during morning and afternoon peak hours. The additional traffic has been distributed to the surrounding road network based on existing traffic patterns. It is noted that the proposed extensions result in minimal changes to the existing access arrangements to the shopping centre with additional parking being located on new parking levels above the retail development. The additional traffic at each of the access points is summarised in Table 3.1.

3.46 Examination of Table 3.1 reveals that traffic flows at the shopping centre access points would increase by some 10 to15 per cent.

3.47 When assigned to the surrounding road network the increases in traffic on roads within the southern section of Parramatta CBD would be relatively minor at some 30 to 90 vehicles per hour (two-way) in the morning peak hour and some 60 to 180 vehicles per hour (two-way) in the afternoon peak hour. These increases are typically less than 10% of existing traffic flows. The highest increase would be in the section of Marsden Street between Campbell Street and the Great Western Highway. Traffic flows on the Great Western Highway would increase by some 40 vehicles per hour (two-way) during the morning peak hour and some 80 vehicles per hour (two-way) during the afternoon peak hour.

Table 3.1: Summary of Existing + Development Traffic Movements in and out of Shopping Centre

Access	**Weekday Morning (Vehicles /Hour)**			**Weekday Afternoon (Vehicles/Hour)**		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Campbell Street (east)	340 (+45)	25 (+5)	365 +(50)	265 (+35)	160 (+20)	425 (+55)
Campbell Street (central)	175 (+20)	50 (+10)	225 (+30)	215 (+30)	340 (+45)	555 (+75)
Campbell Street (west)	n/a	35 (+5)	35 (+5)	n/a	550 (+70)	550 (+70)
Marsden Street (north)	n/a	10	10	n/a	230 (+30)	230 (+30)

Marsden Street (central)	100 (+15)	25 (+5)	125 (+20)	290 (+30)	185 (+20)	415 (+50)
Marsden Street (south)	300 (+45)	n/a	300 (+45)	725 (+95)	n/a	725 (+95)
Aird Street (east)	n/a	45 (+5)	45 (+5)	n/a	240 (+35)	240 (+35)
Aird Street (west)	310 (+45)	n/a	310 (+45)	505 (+60)	n/a	505 (+70)
Total	**1225 (+170)**	**190 (+30)**	**1415 (+200)**	**2000 (+260)**	**1705 (+220)**	**3705 (+480)**

3.48 As noted in Chapter 2 the traffic effects of the proposed extensions have been assessed using the PARAMICS micro simulation model prepared by PB. In addition to the road improvements identified by RMS/Council, the following improvements have been identified (in addition to the changes to the access arrangements):

- lengthen the right-turn bay (westbound) on Great Western Highway into Marsden Street (northbound) by 170 metres (almost to Church Street) to avoid the right-turn blocking the through lanes. This has benefit for traffic flow on Parkes Street and Church Street. This upgrade could be readily completed by re-linemarking this section of Great Western Highway;

- extend the two-lane section of Campbell Street in the westbound direction to approximately 70 m west of Church Street (the maximum permitted without the need for road widening). This would allow vehicles to bypass other vehicles turning right into the car park entries, shortening the queue and reducing the risk that Church Street will be affected by congestion in Campbell Street. This change would require additional linemarking and a modification to the parking restrictions on the southern side of Campbell Street. Current restrictions are 'No Parking 8.30 am–6.00 pm Mon–Fri, 8.00 am–9.00 pm Sat'. It is proposed that this be modified to. 8.30 am–6.00 pm Sun–Wed, 8.30 am–9.00 pm Thursday to Saturday;

- reconfiguration of the RMS/Council upgrade of the Church Street (northbound) approach at the intersection with Great Western Highway; and

- modifications to signal timing at the intersections of Great Wester Highway/Marsden Street, Great Western Highway/Church Street and Church Street/Campbell Street;

3.49 With these improvements in place PARAMICS model found the following (compared to the existing situation):

- in the AM peak period, only the intersection of Great Western Highway and Marsden Street would continue to operate at LOS F with a decrease in average delay at the intersection with Marsden Street. Overall seven intersections would have reduced average delays, four would have no change and three would have minor increases in delay. Overall average network speed would increase from 19 km/h to 26 km/h; and

- in the PM peak period, the intersections along the Great Western Highway would continue to operate at LOS F with a decrease in average delay at the intersection with Church Street. Overall seven intersections would have reduced average delays, five would have no change and two would have minor increases in delay. Overall average network speed would increase from 13 km/h to 15 km/h.

3.50 Thus the PARAMICS modelling has found that the identified Council/RMS upgrades and the proposed upgrades will mitigate the impacts of the proposed

extensions. Traffic conditions in the AM and PM peaks would be similar or better than the existing situation.

Principles of Construction Traffic Management

3.51 The construction of the proposed development will be undertaken by Westfield Design and Construction. At this stage the detail of the construction process is yet to be developed, however the key aspect of the construction process will be to ensure that the existing centre and surrounding area remain operational and functional at all times during construction. Westfield will be responsible for the preparation of a traffic management plan, which will be lodged with Council and other relevant authorities for approval prior to the commencement of any construction activity.

3.52 The extensions to the shopping centre will be staged, with construction commencing on the initial enabling works. The shopping centre will trade through the redevelopment, with the staging of construction aimed at minimising disruption to the centre and adjacent areas. This will be achieved through addressing key issues such as local government and development requirements, existing centre operation, identification and management of local community and stakeholder needs and detailed pre-planning of the construction process.

3.53 Separate pedestrian and traffic management plans will be prepared for the various stages of construction at the appropriate time. The overall principles for traffic management during construction will be:

- provide a convenient and appropriate environment for pedestrians;
- minimise effects on pedestrian movements and amenity;

- maintain appropriate capacity for pedestrians at all times along footpaths adjacent to the shopping centre;

- maintain appropriate pedestrian access to the shopping centre to/from the surrounding road network and various car parking areas within the centre;

- maintain convenient access and circulation for public transport;

- manage and control construction traffic movements on the adjacent road network and vehicle movement to and from the construction site;

- the movement of trucks on and off the site to be managed and controlled by traffic controllers;

- trucks to enter and exit the site in a forward direction;

- maintain traffic capacity at intersections and mid-block in the vicinity of the site;

- maintain access to properties located in the vicinity of the site at all times during the construction process;

- maintain access for delivery vehicles associated with the continued operation of the shopping centre;

- restrict construction vehicle activity to designated truck routes through the area;

- construction works will be staged to minimise traffic effects and to maintain the continued operation of the shopping centre;

- on-site and on-street work zones to be provided adjacent to the construction activity;

- construction access driveways and on-street works zones to be managed and controlled by traffic controllers;

- pedestrian movements adjacent to construction activity and across construction access driveways to be managed and controlled by traffic controllers;

- traffic controllers will manage and control traffic movements on the surrounding road network adjacent to the shopping centre to ensure appropriate access to adjacent properties and to maintain two-way access at all times during the construction period;

- B-class hoardings and construction fencing will be erected around the perimeter of the on-site construction zones. Hoardings, scaffolding and overhead protection will be provided where required;

- concrete barriers and containment fencing will be erected adjacent to the construction activity to separate general traffic from the construction work and to protect pedestrians;

- maintain appropriate parking for customers, associated with the on-going operation of the centre;

- pedestrian warning signs and construction safety signs/devices to be utilised in the vicinity of the site and to be provided in accordance with WorkCover requirements; and

- site contractor to be responsible for the management of the site, the movement of trucks on and off the site, signage detail, traffic management and control of pedestrians and management and control of construction vehicles in the vicinity of the site.

Access and Parking during Construction

3.54 In its review of adequacy (ROA), dated 2 October 2012, the Department of Planning & Infrastructure (DPI), raised the following traffic matters:

"2. Traffic Impacts

The Traffic Impact Study and Traffic Management and Accessibility Plan should be revised to:

- ***Identify the staging of construction as it relates to the Stage 1 project application. In particular, details should be provided in relation to:***
    - ***The measures to maximise on-site parking during peak operating periods; and***
    - ***Measures to maximise entry/exit arrangements during construction to ensure that impacts on the operating efficiency of the entry/exit points and the consequential impacts on the surrounding road network are minimised.***

- ***The department acknowledges that the results of the PARAMICS modelling were submitted at the meeting convened on 24 September 2012.***

Furthermore, the Construction Management Plan prepared by Westfield should be revised to include all construction management measures identified in the final Traffic Impact Study and Traffic Management and Accessibility Plan."

3.55 Responses to these matters are set below.

Parking Provision during Construction

3.56 The existing shopping centre provides 4,450 parking spaces with access driveways on Campbell Street, Marsden Street and Aird Street. As set out on in Section 2.31, peak demand occurs on Saturday at around 2.00pm with 3,860 spaces occupied.

3.57 During construction of the expanded shopping, parking supply will be reduced as work is undertaken and areas are set aside for works zones, material handling, site sheds and construction worker parking. Parking demand at the shopping centre will be reduced due to the closure of some existing retail areas (to allow construction) and loss of some customers due to the construction work. The reduction in retail area will vary during the construction period but will be at least 5%. From previous experience at major shopping centre redevelopments there is a reduction in customers of between 5% and 10% due the construction work. Construction worker parking will vary during construction. Given the sites good location to public transport, provision of a maximum of 100 on site construction worker parking spaces is considered appropriate.

3.58 Based on the above, during construction, peak parking demand at the shopping centre (2.00pm on a Saturday afternoon) would be some 3,575 spaces (3,860 x

90%, where a 5% reduction is applied due to reduced retail area and a 5% reduction due to less customers, plus 100 construction worker spaces).

To cater for the peak parking demand of 3,575 spaces, a minimum provision of 3,750 spaces is suggested during construction (this allows for a 5% surplus which is considered appropriate to allow for circulation and locating parking spaces with the provision of the park assist system).

3.59 Thus parking provision at Parramatta Westfield shopping centre, during construction, could be reduced by a maximum of 700 spaces (from 4,450 to 3,750 spaces). The Construction Management Plan prepared by Westfield has been revised to take into account this parking provision.

3.60 It is noted that the majority of parking affected during construction is located on the upper levels/rooftop car parking areas. The lower levels of parking (which have the highest levels of utilisation) would be largely unaffected during construction.

Access during Construction

3.61 With respect to access, the following changes are proposed:

- the existing eastern Campbell Street access driveway and ramp (located between Marsden Street and Church Street) will be reconfigured to provide one entry lane and two exit lanes. The two exit lanes will provide for simultaneous left and right turn movements out of the shopping centre onto Campbell Street;

- the existing western Campbell Street exit driveway and ramp (located between O'Connell Street and Marsden Street) will be reconfigured to

provide two continuous exit lanes from the Level 6 car park exit controls. The exit ramp will be widened to accommodate the two continuous lanes;

- the existing western Aird Street entry driveway (located between O'Connell Street and Marsden Street), providing access to the Aird Street car park, will be reconfigured to close off entry to Level 3 of the car park. This access driveway will be retained solely for the speed ramp to Level 4M;

- a new entry driveway will be provided at the eastern end of Aird Street (located between O'Connell Street and Marsden Street), providing access to Level 2 of the Aird Street car park. This new driveway will be located west of the existing car park exit driveway and will provide two entry lanes; and

- the existing Marsden Street exit driveway and ramp (located between Aird Street and Argyle Street) will be reconfigured to lengthen the southern exit lane by some 10 metres. The proposed lengthening of the lane will increase capacity at the existing exit controls from the car park.

3.62 In order to minimise the effects on the surrounding road network and access to/from the shopping centre, each of these improvements will be staggered (one at time), with the new entry to level 2 of the Aird Street car park opened before the existing western entry is modified. The Construction Management Plan prepared by Westfield has been revised to take into account the staging of the modifications to access.

Director-General's Requirements

- ***Prepare a traffic impact study in accordance with the RMS's Guide to Traffic Generating Developments considering traffic generation, any intersection upgrades, access, loading docks and car parking arrangements.***

3.63 Traffic generation and its effects on the road network, including intersection upgrades, are discussed in paragraphs 3.38 to 3.49. Access arrangements are discussed in paragraphs 3.26 to 3.33. Loading docks and service vehicles are discussed in paragraphs 3.34 to 3.35. Car parking provision is discussed in paragraphs 3.17 to 3.25.

- ***Prepare a Traffic Management and Accessibility Plan to assess the implications of the development for non- car travel modes which addresses the following:***
  - ***Measures to promote public transport usage and pedestrian and bicycle linkages;***

3.64 Public transport, pedestrians and provision for cyclists is discussed in paragraphs 3.11 to 3.13.

  - ***An assessment of the impact of increased patronage demand on the existing public transport system;***

3.65 Public transport accessibility to the centre is discussed in paragraphs 3.11 to 3.13. The development will make appropriate contributions, in accordance with Civic Improvement Pan (Amendment No 1), towards public transport and access improvements in the CBD. As previously noted, the Metropolitan Transport Plan requires developments to utilise public transport and not rely on private cars. It is

anticipated that CityRail and Sydney Buses will make the necessary increases to the services operating to Parramatta in accordance with demands.

- ***Pedestrian safety and accessibility;***

3.66 Pedestrians are discussed in paragraphs 3.11to 3.13.

- ***Identification of traffic and transport infrastructure measures required to support the development.***

3.67 These matters are discussed in paragraphs 3.38 to 3.50 and 3.11 to 3.13.

The EA must demonstrate the adequate provision of on-site parking for the proposal having regard to local EPI controls and RMS Guidelines (Note: the department supports reduced car parking rates in areas well serviced by public transport.

3.68 Parking provision is discussed in paragraphs 3.17 to 3.25.

Summary

3.69 In summary, the main points relating to the traffic impact study and traffic management and accessibility plan for the proposed extension to Westfield Parramatta shopping centre are as follows:

- it is proposed to extend the centre to provide a new retail area (additional 31,495m^2 GFA/24,504m^2 GLA) and offices (additional 30,392m^2);

- the proposed development would increase retail and employment densities close to Parramatta CBD, close to residential areas and close to existing public transport services. It is consistent with government objectives to reduce private car travel and encourage public transport use;

- a transport access guide will be prepared for the centre;

- parking provision is considered appropriate and represents an approach to provide appropriate parking while encouraging travel by means other than private car in an area well serviced by public transport;

- access arrangements, internal circulation and servicing will be provided in accordance with AS2890.1-2004 and AS2890.2-2002;

- modifications to access arrangements are proposed to increase capacity and minimise delays for vehicles entering and departing the centre;

- a PARAMICS micro-simulation model has been prepared and calibrated/validated against RMS criteria. For existing conditions the model found the following:

    - intersections along the Great Western Highway operate at capacity during the AM and PM peak periods;
    - the PM peak period is busier than the AM peak; and
    - generally the balance of intersections within the study area operate at satisfactory of better levels of service during the AM and PM peak periods.

- a number of improvements at intersection along the Great Western Highway have been identified by Council/RMS. The authorities indicated that there is no timing or funding for these improvements, and that their construction could

be included as conditions of consent if there was a nexus between the identified works and the proposed extensions. The identified works are:

- Great Western Highway and O'Connell Street: relocated vacant lane in eastbound direction from position alongside median to kerbside to link to changes at Marsden Street;
- Great Western Highway and Marsden Street: remove westbound vacant lane alongside median, shift eastbound through and right turn lane across one lane and create new left-turn lane into Marsden Street, reconstruct median accordingly; and
- Church Street, Great Western Highway and Parkes Street: widen Church Street northbound (from Lansdowne Street to the Great Western Highway) to create a second right-turn lane into Parkes Street.

- In addition to the road improvements identified by RMS/Council, a number of improvements have been identified (in addition to the changes to the access arrangements). These are:

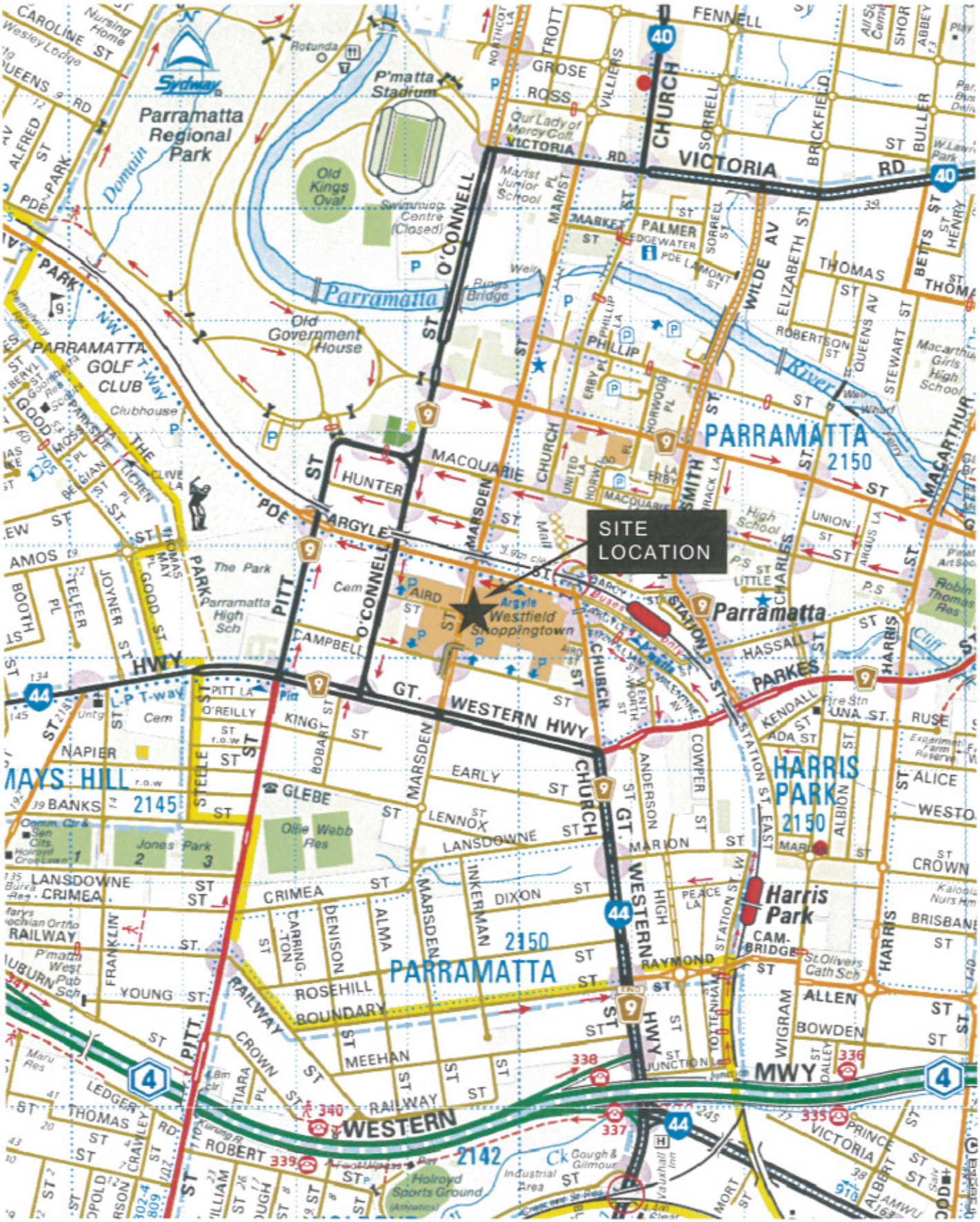
  - lengthen the right-turn bay (westbound) on Great Western Highway into Marsden Street (northbound) by 170 metres (almost to Church Street) to avoid the right-turn blocking the through lanes;

  - extend the two-lane section of Campbell Street in the westbound direction to approximately 70 m west of Church Street (the maximum permitted without the need for road widening);

- reconfiguration of the RMS/Council upgrade of the Church Street (northbound) approach at the intersection with Great Western Highway; and

- modifications to signal timing at the intersections of Great Western Highway/Marsden Street, Great Western Highway/Church Street and Church Street/Campbell Street;

- the PARAMICS modelling has found that the identified Council/RMS upgrades and the proposed upgrades will mitigate the impacts of the proposed extensions. Traffic conditions in the AM and PM peaks would be similar or better than the existing situation.

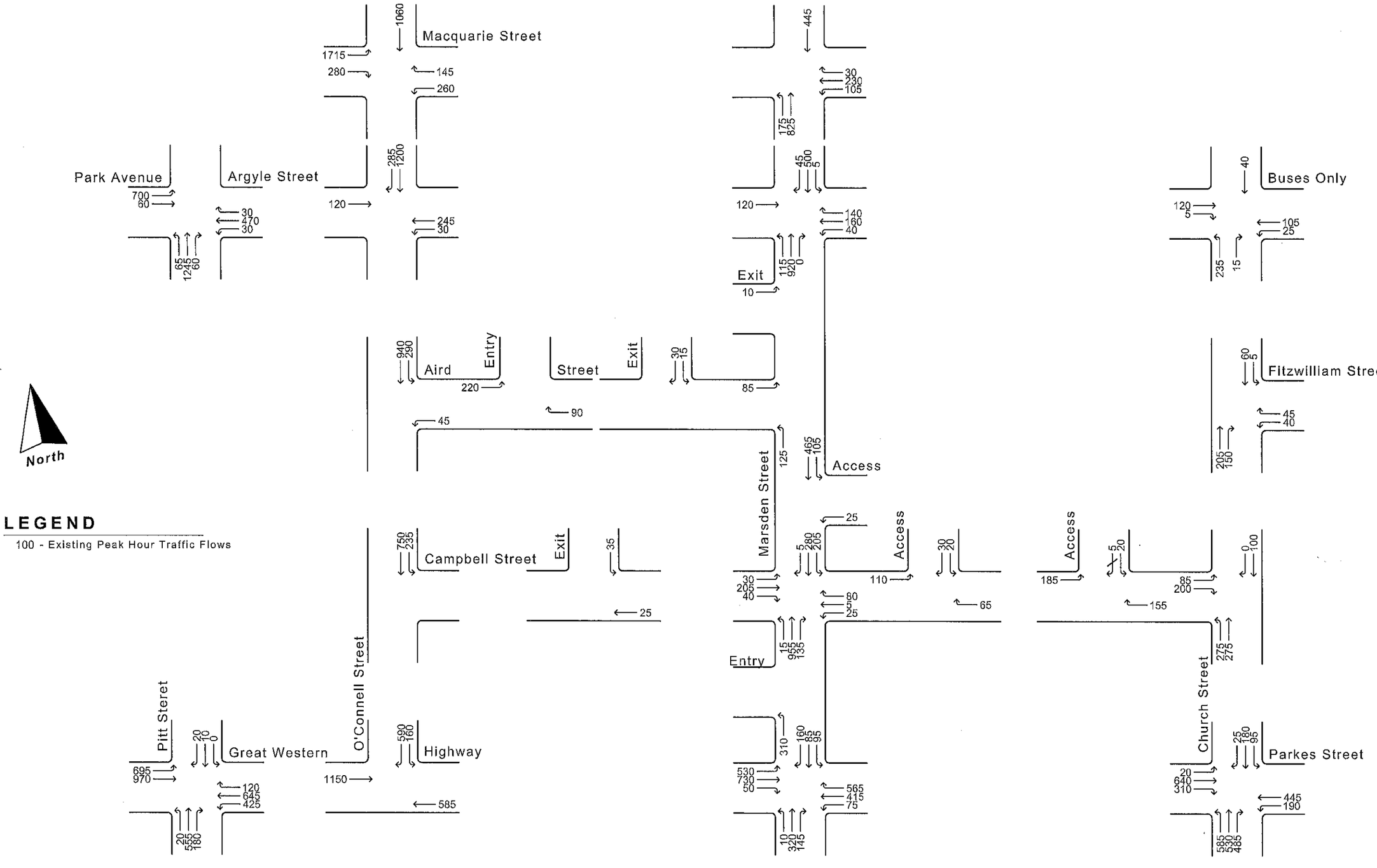


Location Plan

Colston Budd Hunt & Kafes Pty Ltd

DRAWN BY CBHK Pty Ltd_hs Ref: 8659 01 August 2012

Figure 1



LEGEND

100 - Existing Peak Hour Traffic Flows

Existing weekday morning peak hour traffic flows

Colston Budd Hunt & Kafes Pty Ltd

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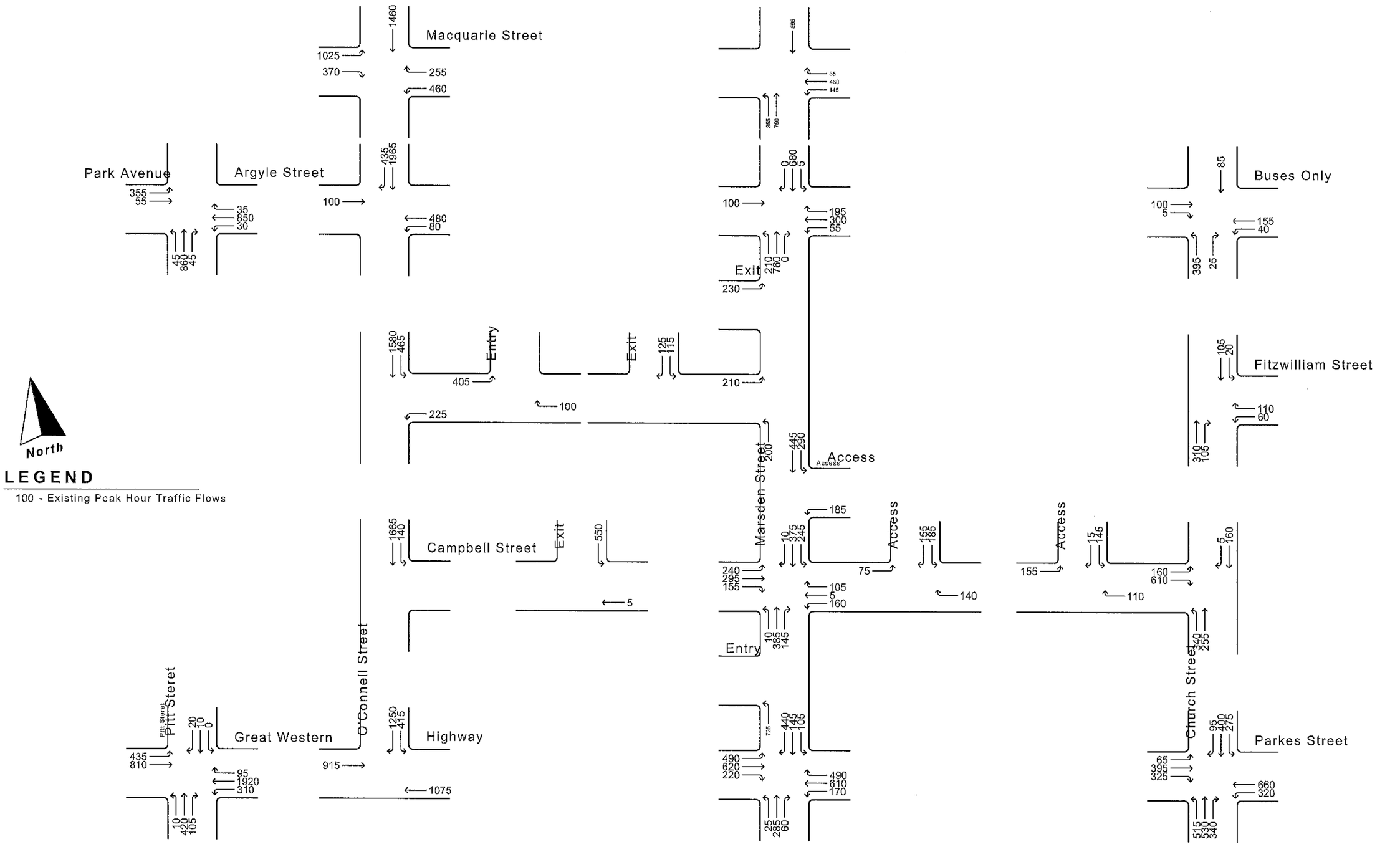
Figure 2



Existing weekday afternoon peak hour traffic flows

Colston Budd Hunt & Kafes Pty Ltd

DRAWN BY CBHK Pty Ltd_hs Ref: 8659 01 August 2012

Figure 3

APPENDIX A

RMS correspondence

Our Reference:	RDC 10M1856 – SYD10/00689
Your Reference:	MP10_0068
Contact:	Edmond Platon
Telephone:	8849 2906

NSW GOVERNMENT | RTA

Team Leader
Metropolitan Projects
Department of Planning
GPO Box 39
Sydney NSW 2001

Attention: Ben Lusher

REQUEST FOR PROVISION OF KEY ISSUES AND ASSESSMENT REQUIREMENTS
MAJOR PROJECT, COMMERCIAL AND RETAIL DEVELOPMENT,
WESTFIELD SHOPPING CENTRE, PARRAMATTA

Dear Sir / Madam,

I refer to your letter of 23 August 2010 (Ref: MP10_0068) requesting the Roads and Traffic Authority (RTA) to provide details of key issues and assessment requirements regarding the abovementioned development for inclusion in the Director General's Environmental Assessment (EA) requirements.

The RTA would like the following issues to be included in the transport and traffic impact assessment of the proposed development:

1. It is noted that the Metropolitan Strategy has designated Parramatta as a Regional City and a major focal point for regional transport connections and jobs growth. It is important that the proposed development takes into consideration, and contributes to the achievement of, transport objectives contained in this and other high-level NSW Government strategies.

   These strategies include the NSW State Plan, the draft West Central Subregional Strategy and the Metropolitan Transport Plan (Connecting the City of Cities). These policies share the aims of increasing the use of walking, cycling and public transport; appropriately co-locating new urban development with existing and improved transport services; and improving the efficiency of the road network.

   By addressing both the supply of transport services and measures to manage demand for car use, the EA report should demonstrate how users of the proposed development, will be able to make travel choices that support the achievement of relevant State Plan targets.

2. Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need / associated funding for upgrading or road improvement works (if required).

   The key intersections to be examined / modelled include:

   - Great Western Highway/Pitt Street;
   - Great Western Highway/O'Connell Street;
   - Great Western Highway/Marsden Street;
   - Great Western Highway/Church Street/Parkes Street
   - Campbell Street/Marsden Street;
   - Campbell Street/Church Street;
   - Aird Street/O'Connell Street;
   - Fitzwilliam Street/Church Street;
   - Argyle Street/Pitt Street;
   - Argyle Street/O'Connell Street;
   - Argyle Street/Marsden Street;
   - Argyle Street/Church Street;
   - Macquarie Street/O'Connell Street;
   - Macquarie Street/Marsden Street.; and
   - Any other surrounding intersections that may be affected by the proposed development

   The abovementioned intersections must be modelled using a microsimulation package and integrated into Parramatta City Council's Paramics model which has been developed for the Parramatta City Centre Integrated Transport Plan. The model should also examine the cumulate traffic impacts of the planned Civic Place development.

3. In consultation with Council and the RTA, the EA report should address the implementation of the following suggested changes:

   - Changing Campbell Street (between O'Connell Street and Marsden Street) to one-way eastbound.
   - Changing Campbell Street (between Church Street and Marsden Street) to one-way westbound.
   - Changing Marsden Street (between Campbell Street and Great Western Hwy) to one-way southbound.
   - Deleting the existing (southern most) Marsden Street entry ramp and redesigning it so that entry to this ramp would occur from Campbell Street (ie: between O'Connell Street and Marsden Street).
   - The implementation of three westbound through lanes along the Great Western Highway starting from (150m east of the Marsden Street intersection) with the third westbound through lane feeding into the right turn bay at the Pitt Street intersection.
   - Implementing a dual right turn facility from the Great Western Highway into Pitt Street northbound.

4. Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc).

5. The proposed number of car parking spaces is to comply with the appropriate parking codes. As this area is serviced well by public transport, it should be ensured the parking provision is kept to the minimum or further reduced where possible.

6. Due to lengthy delays experienced by patrons trying to leave the car park during the Thursday evening / night peak and the Friday evening peak, the EA report will need to investigate and implement appropriate measures to address this problem.

7. The EA report will need to address issues related to the management of adequate parking supply during the construction phase.

8. Details of service vehicle movements (including vehicle type and likely arrival and departure times).

9. Details of road safety issues including measures to improve pedestrian safety and accessibility.

10. The RTA requires the EA report to assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling); the potential for implementing a location-specific sustainable travel plan (e.g. 'Travelsmart' or other travel behaviour change initiative); and the provision of facilities to increase the non-car mode share for travel to and from the site (which could also include options such as remote parking served by regular shuttle buses). This will entail an assessment of the accessibility of the development site by public transport.

    However, an assessment of the impact of increase patronage demand on the existing public transport system as a result of the proposed development and above initiatives would also be required.

11. To ensure that the above requirements are fully addressed, the RTA requests that a Traffic Management and Accessibility Plan (TMAP) be undertaken for the proposed development site to properly ascertain the cumulative regional traffic impacts associated with development. The TMAP process provides an opportunity to identify a package of traffic and transport infrastructure measures required to support future development. Regional and local intersection and road improvements, vehicular access options for adjoining sites, public transport needs, the timing and cost of infrastructure works and the identification of funding responsibilities associated with the development should be identified.

12. The RTA will require in due course the provision of a traffic management plan for all demolition/construction activities, detailing vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures.

13. The EA should address the provision of public benefit, services and infrastructure having regard to Council's Section 94A Contributions Plan, and provide details of any Planning Agreement or other legally binding instrument proposed to facilitate development.

14. The EA must include details regarding the staging of the proposed development including the provision and timing of all required infrastructure works.

Further enquiries on this matter can be directed to the nominated A/Land Use and Transport Planner, Edmond Platon on phone, 8849 2906 or facsimile (02) 8849 2906.

Yours faithfully,

Andrew Popoff
A / Senior Land Use Planner
Transport Planning, Sydney Region

2 September 2010

APPENDIX B

PARAMICS MODELLING REPORT

APPENDIX C

Parking Survey Results

COLSTON BUDD HUNT & KAFES Pty. Ltd.
TRAFFIC & TOWN PLANNERS ABN 27 623 918 759
Ph. 9411 2411
Fax. 9411 2422

COUNTERS NAME	Various
JOB NUMBER	8659
LOCATION	Parramatta
DAY / DATE	Saturday, 21 July 2012
WEATHER	Fine

Location	Parramatta Westfield																		TOTAL	%
Level	L2	L3	L4	L4 Valet	L5	L5 Valet	L5M	L6	L7	L8 (staff)	L2	L3	L3M	L4	L4M	L5	L5M	L6		
Car Park	Campbell Street Car Park										Aird Street Car Park									
8:00	11	18	5	0	5	1	3	40	5	63	20	4	4	1	6	6	1	0	193	4%
9:00	25	64	21	0	74	1	10	225	15	268	43	35	15	16	35	13	9	10	879	20%
10:00	60	210	27	12	247	2	28	432	64	332	53	93	62	50	110	61	43	41	1927	43%
11:00	122	248	29	14	259	3	102	738	151	378	62	112	127	81	149	134	74	85	2868	64%
12:00	180	255	36	30	267	4	135	889	234	402	78	109	145	126	145	139	120	168	3462	78%
13:00	192	258	29	32	261	4	159	963	315	429	72	111	148	146	149	163	142	167	3740	84%
14:00	197	258	29	51	264	10	168	1001	328	417	71	112	157	155	149	164	156	172	3859	87%
15:00	194	259	32	42	262	12	161	962	285	384	75	111	157	155	149	164	156	170	3730	84%
16:00	183	250	30	32	245	7	139	924	230	371	65	110	135	140	163	163	155	170	3512	79%
17:00	122	199	20	21	173	5	60	624	103	324	28	75	96	69	85	85	104	138	2331	52%
18:00	19	53	22	3	139	4	26	390	55	241	15	60	51	34	46	46	50	47	1301	29%
Supply	198	256	39	55	262	61	172	1095	487	676	84	112	157	155	149	165	157	173	4453	

COLSTON BUDD HUNT & KAFES Pty. Ltd.
TRAFFIC & TOWN PLANNERS ABN 27 623 918 759
Ph. 9411 2411
Fax. 9411 2422

COUNTERS NAME	Various
JOB NUMBER	8659
LOCATION	Parramatta
DAY / DATE	Thursday, 19 July 2012
WEATHER	Fine

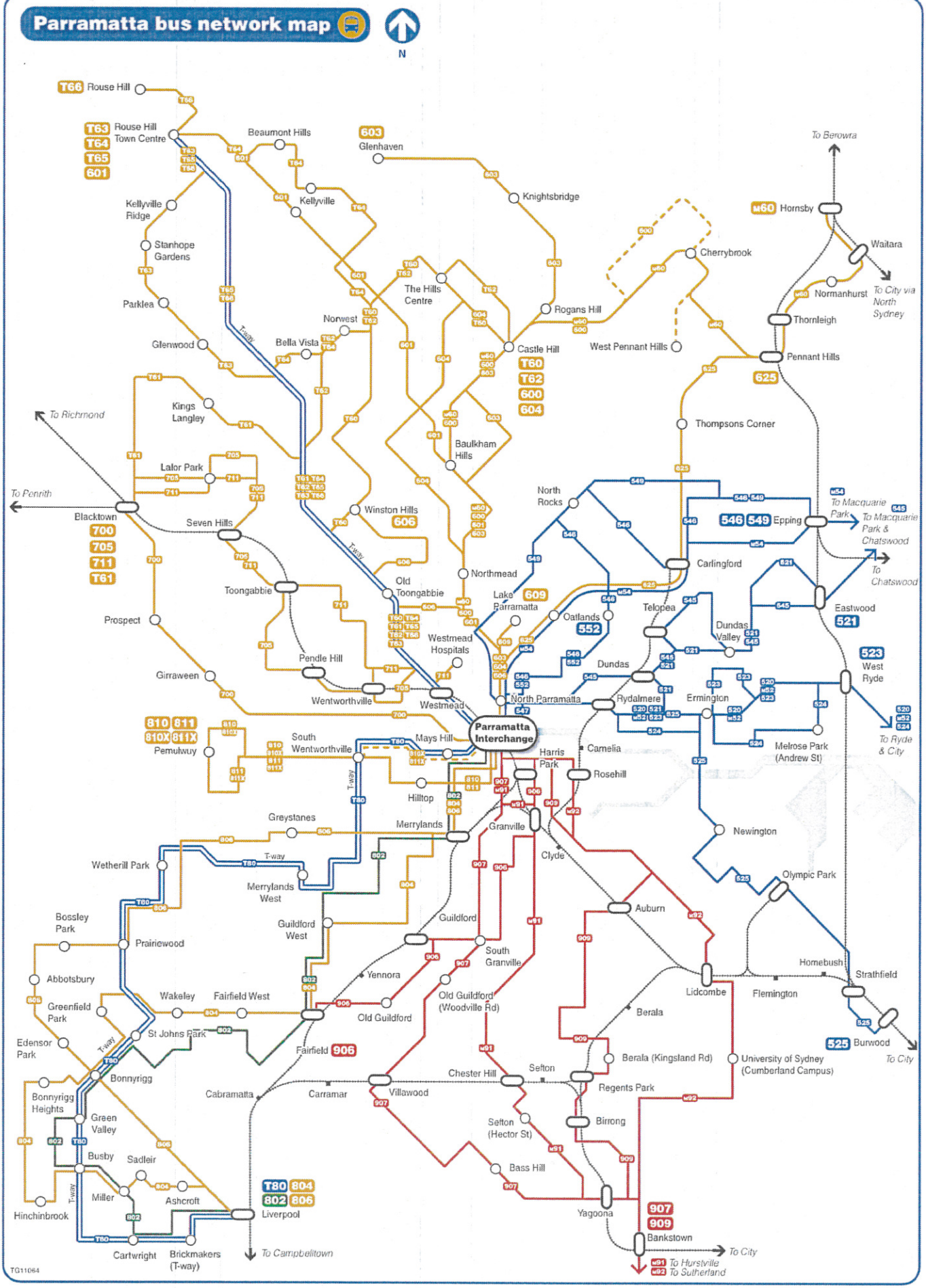
Location	Parramatta Westfield																		TOTAL	%
Level	L2	L3	L4	L4 Valet	L5	L5 Valet	L5M	L6	L7	L8 (staff)	L2	L3	L3M	L4	L4M	L5	L5M	L6		
Car Park	Campbell Street Car Park										Aird Street Car Park									
8:00	20	41	18	0	52	0	4	95	11	256	4	10	2	0	5	5	4	4	531	12%
9:00	49	87	27	0	116	1	11	249	16	427	31	52	12	3	66	31	17	13	1208	27%
10:00	106	135	30	8	209	1	45	505	49	452	65	110	117	61	120	64	46	56	2179	49%
11:00	196	179	36	9	243	2	61	689	68	534	67	111	146	72	140	83	70	85	2791	63%
12:00	193	245	38	10	264	2	59	882	109	565	71	110	146	113	145	85	64	98	3199	72%
13:00	188	254	39	18	265	3	110	858	132	576	68	110	150	116	149	133	87	140	3396	76%
14:00	159	237	32	14	259	4	85	790	148	618	66	84	103	107	149	124	72	132	3183	71%
15:00	142	250	33	9	257	3	65	686	115	621	61	79	85	91	143	121	59	91	2911	65%
16:00	140	240	30	12	261	3	67	602	89	633	49	108	96	51	120	60	56	67	2684	60%
17:00	117	234	31	10	256	3	50	652	76	586	49	101	88	50	97	61	47	74	2582	58%
18:00	111	227	30	16	264	4	80	776	95	519	45	110	105	61	130	90	89	85	2837	64%
19:00	163	254	29	31	262	4	153	953	216	426	55	110	111	86	141	109	95	145	3343	75%
20:00	148	246	30	29	262	3	160	806	287	339	39	101	99	84	141	108	108	150	3140	71%
21:00	115	218	26	22	251	2	102	807	184	282	29	102	77	66	129	69	74	104	2659	60%
Supply	198	256	39	55	262	61	172	1095	487	676	84	112	157	155	149	165	157	173	4453	

APPENDIX D

Public Transport Bus Routes

Service information as at March 2011

Parramatta bus network map

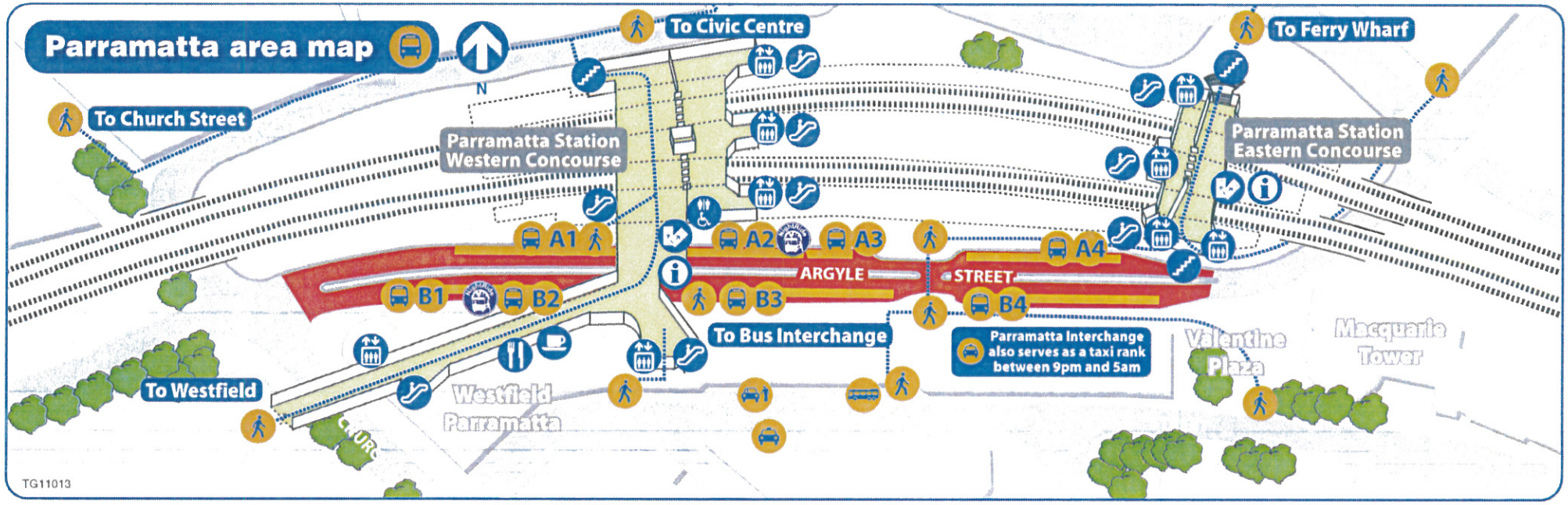


Legend

- Hillsbus/Westbus routes
- Sydney Buses routes
- Veolia Transport routes
- Westbus/Hopkinsons routes
- Rail line
- Railway station
- Bus route/suburb
- Bus/Rail interchange

Diagrammatic Map - Not to Scale

Service information as at March 2011



Legend

Bus Stand	Train Platform	Kiss & Ride	Escalator	Tickets	Toilets	Food	Walking Route
B2 Bus Stand	Taxi Rank	Coach Rank	Lift	Stairs	Information	Refreshments	Bus Zone

TRAVEL FASTER · CHEAPER · EASIER

PREPAY

Bus services at stands A2, A3 and B2 operated by Sydney Buses are **PrePay only between 7am and 7pm on Weekdays.**

For more information visit 131500.com.au

Service information as at March 2011

Bus services at Parramatta

Bus departure information

Please use this listing to find your bus number, route destination and bus stand.
Refer to the Interchange Map to find the bus stand location.

Bus Stand	Route Number	Bus Route Destination	Weekday frequency			Weekend frequency	
			Peak Hours	Off Peak	Night Time	Saturday	Sunday
A2	520	City-Circular Quay via UWS Rydalmere, Ermington, West Ryde, Ryde, Gladesville and Drummoyne	20-30	-	30-60	30	30
A2	521	Eastwood via UWS Rydalmere, Park Road Rydalmere and Mobbs Lane	-	60	-	90	-
A2	523	West Ryde via UWS Rydalmere, Ermington Shops and Cowells Lane Ermington	30	60	-	60	-
A2	524	West Ryde via UWS Rydalmere, South St, Rydalmere, Ermington Shops and Melrose Park	30	60	-	60	120
A2	525	Burwood via UWS Rydalmere, Newington, Olympic Park and Strathfield	20	30	60	30	60
A2	545	Chatswood via Dundas Valley, Eastwood, Macquarie Centre, Macquarie Park and North Ryde	10	15	30-60	20	30
A3	546	Epping via Oatlands, Bettington Rd, Westfield North Rocks, Carlingford Station and Carlingford Court	30	60	-	60	120
A2	547	Macarthur Street Loop - Limited Service	-	(3 trips)	-	-	-
A3	M54	Metrobus to Macquarie Uni via Oatlands, Carlingford and Epping	10	15	20	20	20
A3	549	Epping via North Parramatta, North Rocks Rd, Westfield North Rocks and Ray Rd	30	60	60	60	120
A3	552	Oatlands (Bettington Rd) - Loop Service	-	60	-	-	-
A2	M52	Metrobus to City-Circular Quay Limited Stops via UWS Rydalmere, Ermington, Ryde, Gladesville and Drummoyne	10	15	20	20	20
A4	M60	Metrobus to Hornsby via Castle Hill, Cherrybrook and Pennant Hills	10	15	20	20	20
A4	600	Castle Hill via Northmead and Baulkham Hills	(L)	-	30-60	(L)	(L)
A4	601	Rouse Hill Town Centre via Northmead, Baulkham Hills, Kellyville and Beaumont Hills	20	60	60	60	60
A4	603	Glenhaven via Northmead, Baulkham Hills East, Castle Hill and Knightsbridge	30	60	-	60	-
A4	604	Castle Hill via Northmead, Model Farms and Baulkham Hills Pool	30	60	-	60	-
A4	606	Winston Hills via Northmead and Old Windsor Rd	30	60	60	60	60
A3	609	Lake Parramatta via Northmead	30	60	-	60	120
A3	625	Pennant Hills via Carlingford and Thompsons Corner	30	60	-	60	120
B4	700	Blacktown via Mays Hill, South Wentworthville and Prospect	15	60	60	60	60
B4	705	Blacktown via Wentworthville, Pendle Hill, Girraween, Seven Hills and Lalor Park	30	60	-	60	120
B4	711	Blacktown via Westmead Hospitals, Wentworthville, Toongabbie, Seven Hills and Lalor Park	30	30	30-60	60	60
B2	802	Liverpool via Merrylands, Fowler Rd, Fairfield, Thorney Rd, Bonnyrigg, Miller and Cartwright	30(G)	30	60	30	60
B2	804	Liverpool via Merrylands, Chetwynd Rd, Fairfield, Hamilton Rd, Greenfield Park, Bonnyrigg, Hinchinbrook and Miller	30(P)	30	60	30	60
B2	806	Liverpool via Merrylands, Greystanes, Wetherill Park, Prairiewood, Bossley Park, Abbotsbury and Bonnyrigg	30(M)	30	30-60	30	60
B2	810	Pemulwuy via Hilltop, South Wentworthville and Gozo Rd	(W)	60	60	60	-
B2	810X	Pemulwuy via South Wentworthville and Gozo Rd	30	-	-	-	-
B2	811	Pemulwuy via Hilltop, South Wentworthville and Bathurst St	(W)	60	60	60	60
B2	811X	Pemulwuy via South Wentworthville and Bathurst St	30	-	-	-	-
B1	906	Fairfield via Harris Park, Granville, Excelsior Street South Granville and Old Guildford	30	60	-	60	-
B1	907	Bankstown via Woodville Road, Villawood, Bass Hill Plaza and Yagoona	20	30	60	30	60
B1	909	Bankstown via Harris Park, Parramatta Rd, Auburn Station, Regents Park and Potts Hill	30	30	60	30	60
B1	M91	Metrobus to Hurstville via South Granville, Chester Hill, Bankstown, Padstow and Peakhurst	10	15	10	20	20
A3	M92	Metrobus to Sutherland via Rosehill, Lidcombe, Bankstown, Padstow and Menai	10	15	10	20	20
B2	N60	NightRide - Fairfield via Merrylands	-	-	60(A)	60(A)	60(A)
A2	N60	NightRide - City Town Hall via Granville, Strathfield and Leichhardt	-	-	60(A)	60(A)	60(A)
B2	N70	NightRide - Penrith via Blacktown and Mount Druitt	-	-	60(A)	60(A)	60(A)
A2	N70	NightRide - City Town Hall via Strathfield and Leichhardt	-	-	60(A)	60(A)	60(A)
B4	T60	Castle Hill via Westmead Hospital, NW T-Way, Winston Hills and Baulkham Hills	15-30	60	60	60	60
B4	T61	Blacktown via Westmead Hospital, NW T-Way, Kings Langley and Sunnyholt Rd	20-30	30	60	60	60
B4	T62	Castle Hill via Westmead Hospital, NW T-Way and Bella Vista	20-30	60	60	60	60
B4	T63	Rouse Hill Town Centre via Westmead Hospital, NW T-Way, Glenwood, Stanhope Gardens and Kellyville Ridge	15-30	60	-	-	-
B4	T64	Rouse Hill Town Centre via Westmead Hospital, NW T-Way, Norwest Business Pk, Kellyville and Beaumont Hills	15-30	60	60	60	60
B4	T65	Rouse Hill Town Centre via Westmead Hospital and NW T-Way	20	60	60	60	60
B4	T66	Rouse Hill via Westmead Hospital, NW T-Way and Rouse Hill Town Centre	15-30	60	60	60	60
B2	T80	Liverpool via Transitway	4-5	15	15-30	20	20

Bus Operator Legend

- Sydney Buses routes
- NightRide routes
- Veolia Transport routes
- Westbus/Hopkinsons routes
- Hillsbus/Westbus routes

Notes

(A) Operates 12am-5am.
(C) Limited service also to Cherrybrook.
(G) 15 mins to/from Guildford West.
(M) 15 mins to/from Greystanes.
(P) 15 mins to/from Greenfield Park.
(W) Service provides short-workings to South Wentworthville. Please refer to timetables.
(L) Limited service.

TG11064

APPENDIX E

Service Vehicle Swept Paths

ARGYLE STREET

O'CONNELL STREET

MARSDEN STREET

CHURCH STREET

ARGYLE

AIRD STREET

CAMPBELL STREET

AIRD STREET LEVEL 2 CARPARK
85 CARS

PROPOSED BIKE PARKING

NEW CARPARK ENTRY RAMP

EXISTING DEPARTMENT STORE

LINE OF STAGE 2 COMMERCIAL TOWER ENVELOPE ABOVE LEVEL 5

EXISTING MINI MAJOR

FOOD MARKET/ M.M. GOODS LIFT

KMART GOODS LIFTS

KMART RESERVE AREA

TURNING AREA

COLES RESERVE AREA

NEW WOOLWORTHS RESERVE AREA

SPECIALTY SHOPS RESERVE AREA

TARGET GOODS LIFTS

ALDI GOODS LIFTS

LEVEL 2 CARPARK
193 CARS

RL. 10.98
RL. 11.14
RL. 11.37
RL. 11.58
RL. 12.39
RL. 11.22
RL. 11.77
RL. 3.83
RL. 15.200
RL. 1.95
RL. 16.36
RL. 14.43
RL. 12.53
RL. 14.63
RL. 12.55
RL. 12.140
RL. 15.89
RL. 15.79
RL. 20.74
RL. 20.77
RL. 20.95
RL. 20.57
RL. 19.40
RL. 16.29
RL. 16.85
RL. 14.35
RL. 24.18
RL. 22.91
RL. 12.300

AIRD STREET LOADING DOCK

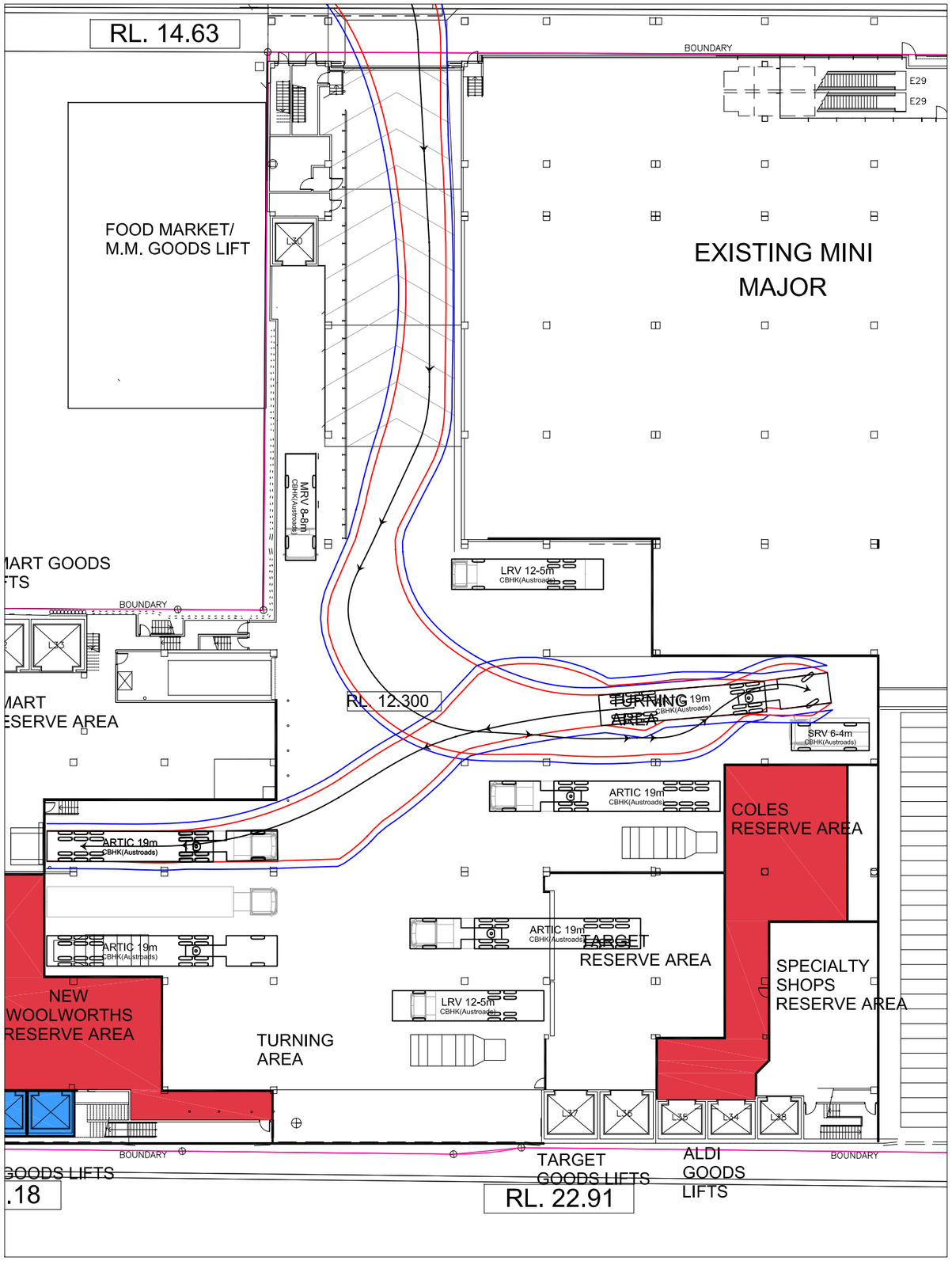
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

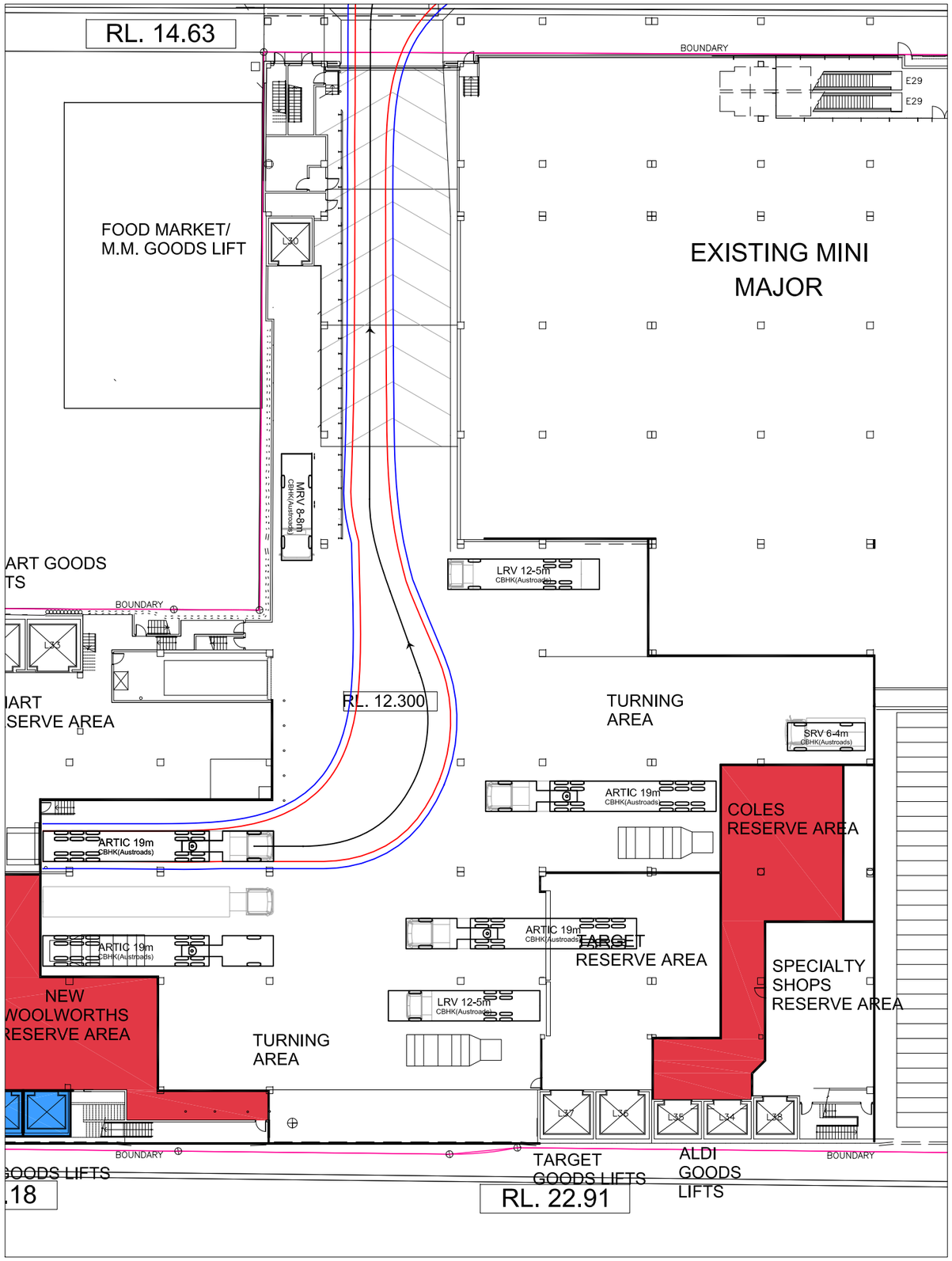
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

WESTFIELD PARRAMATTA, AIRD STREET LOADING DOCK TRUCK SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

1





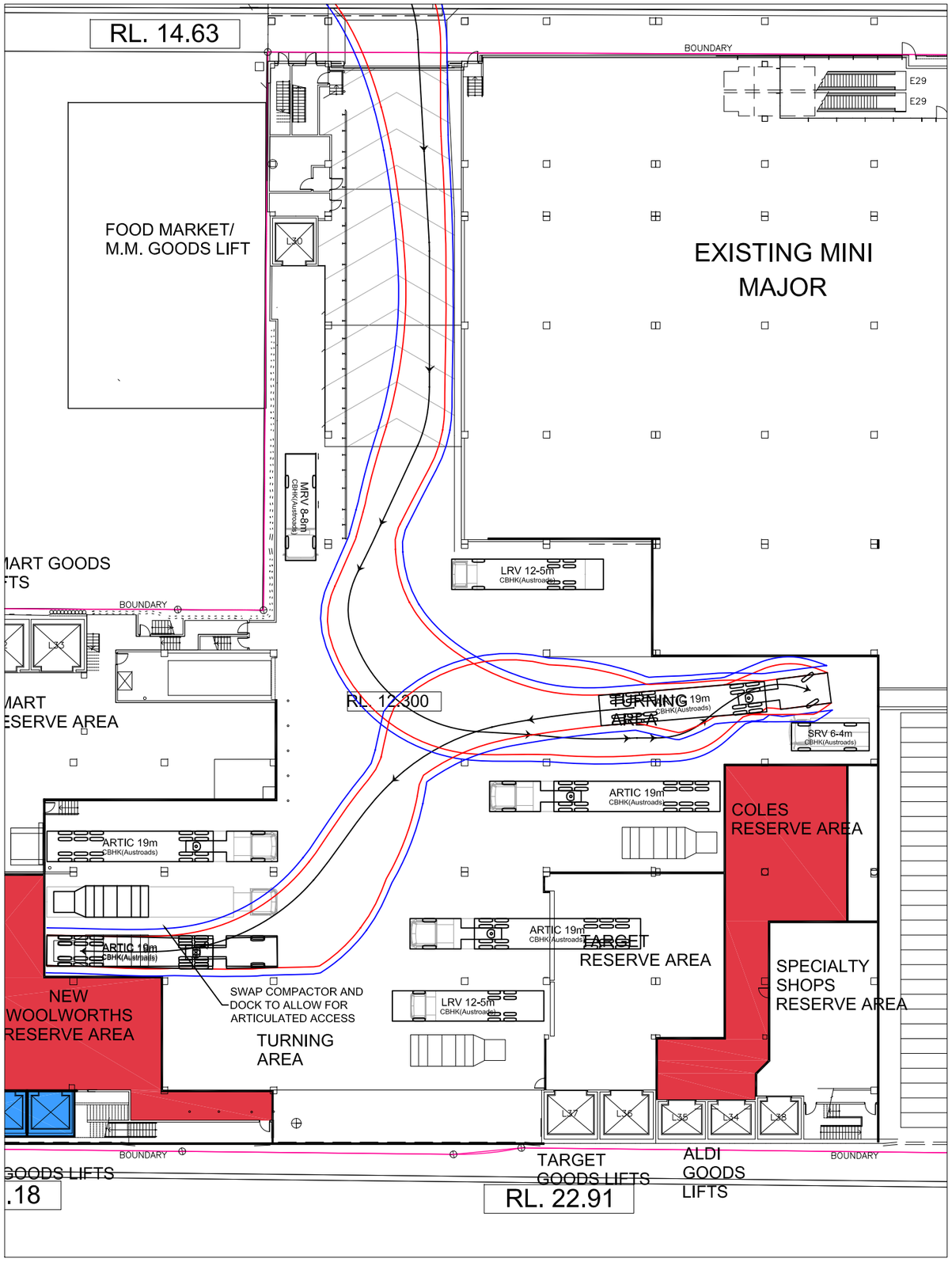
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

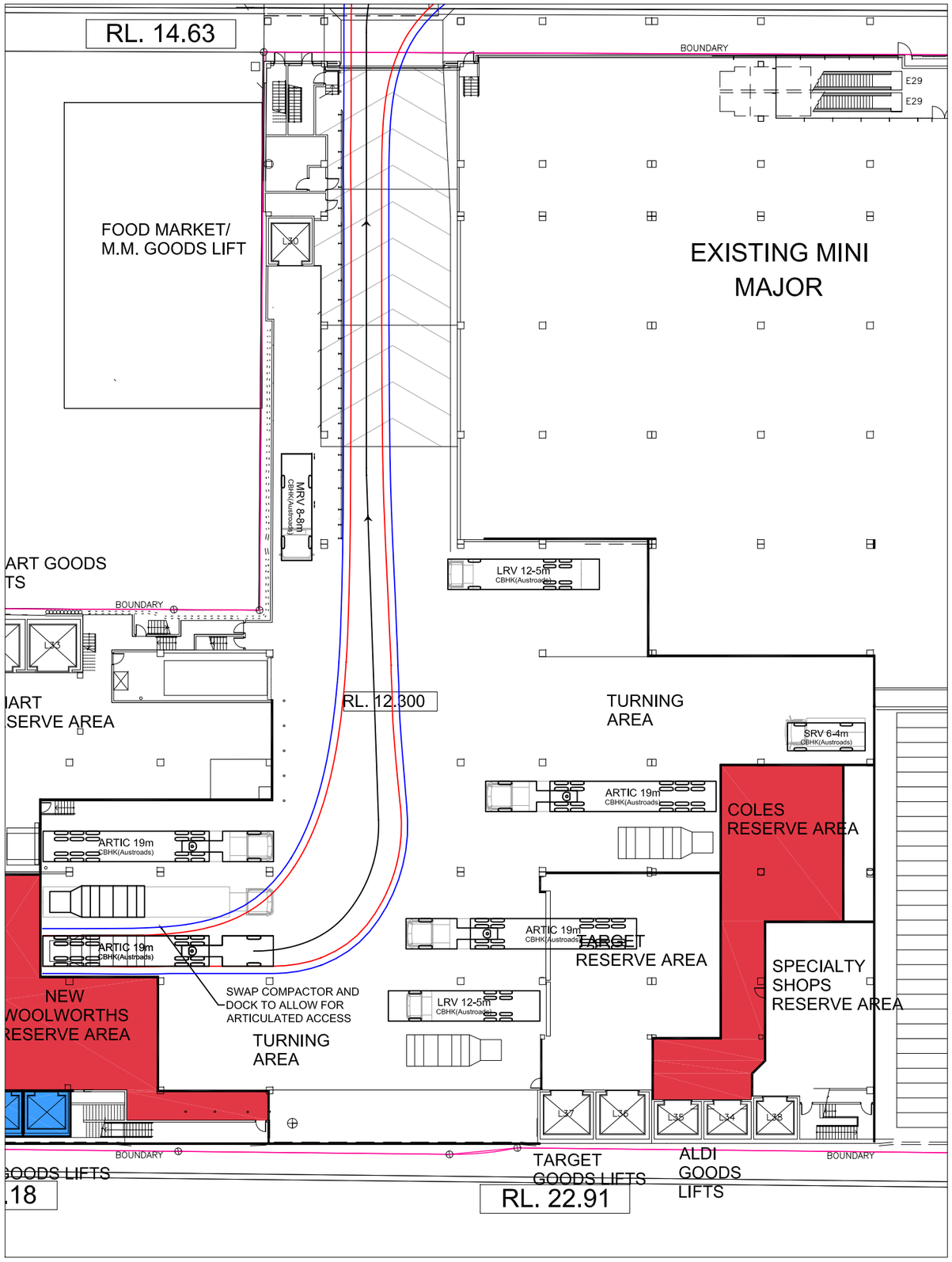
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-19.0m ARTICULATED VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

2





NOTE:
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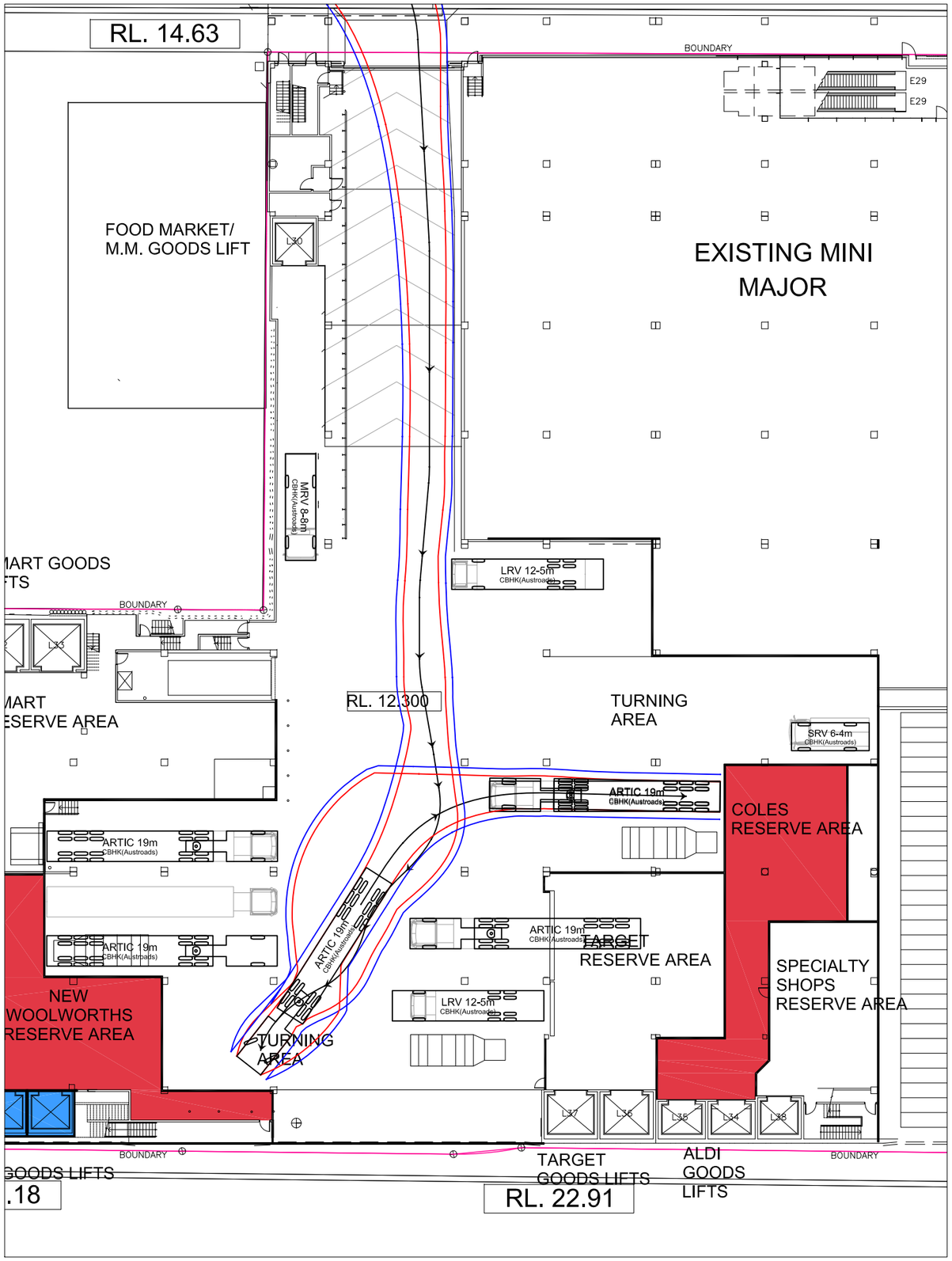
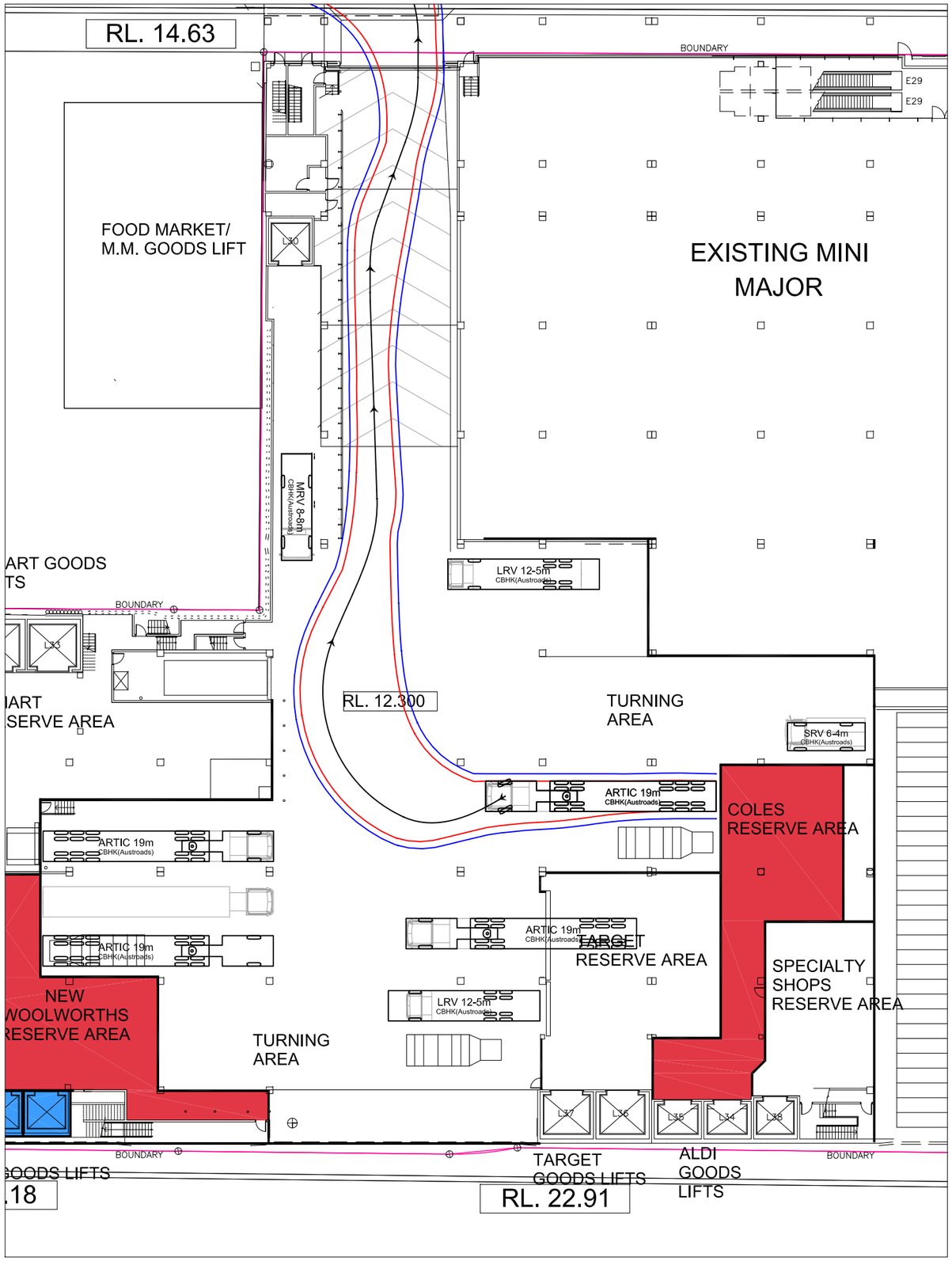
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-19.0m ARTICULATED VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

3





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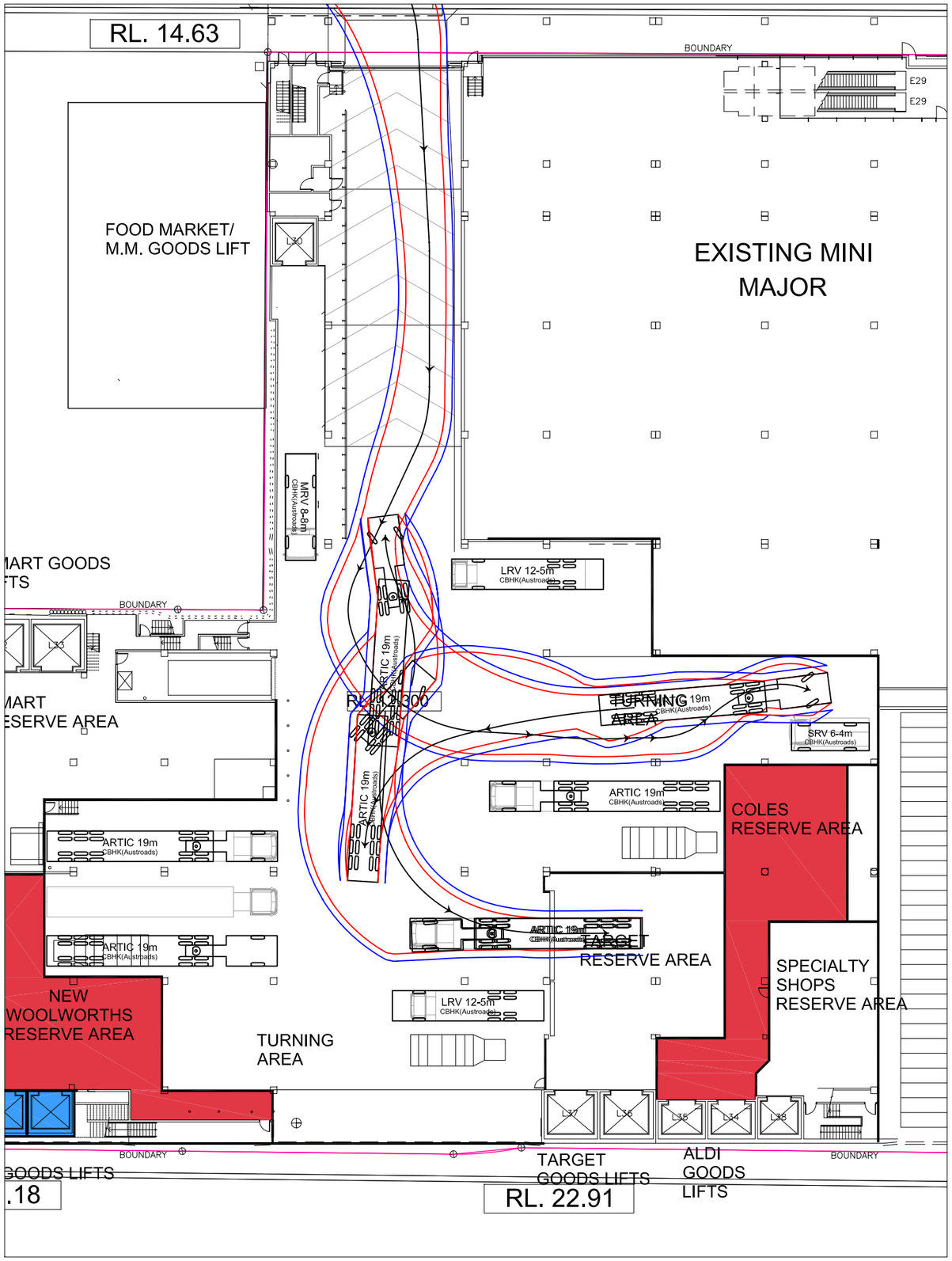
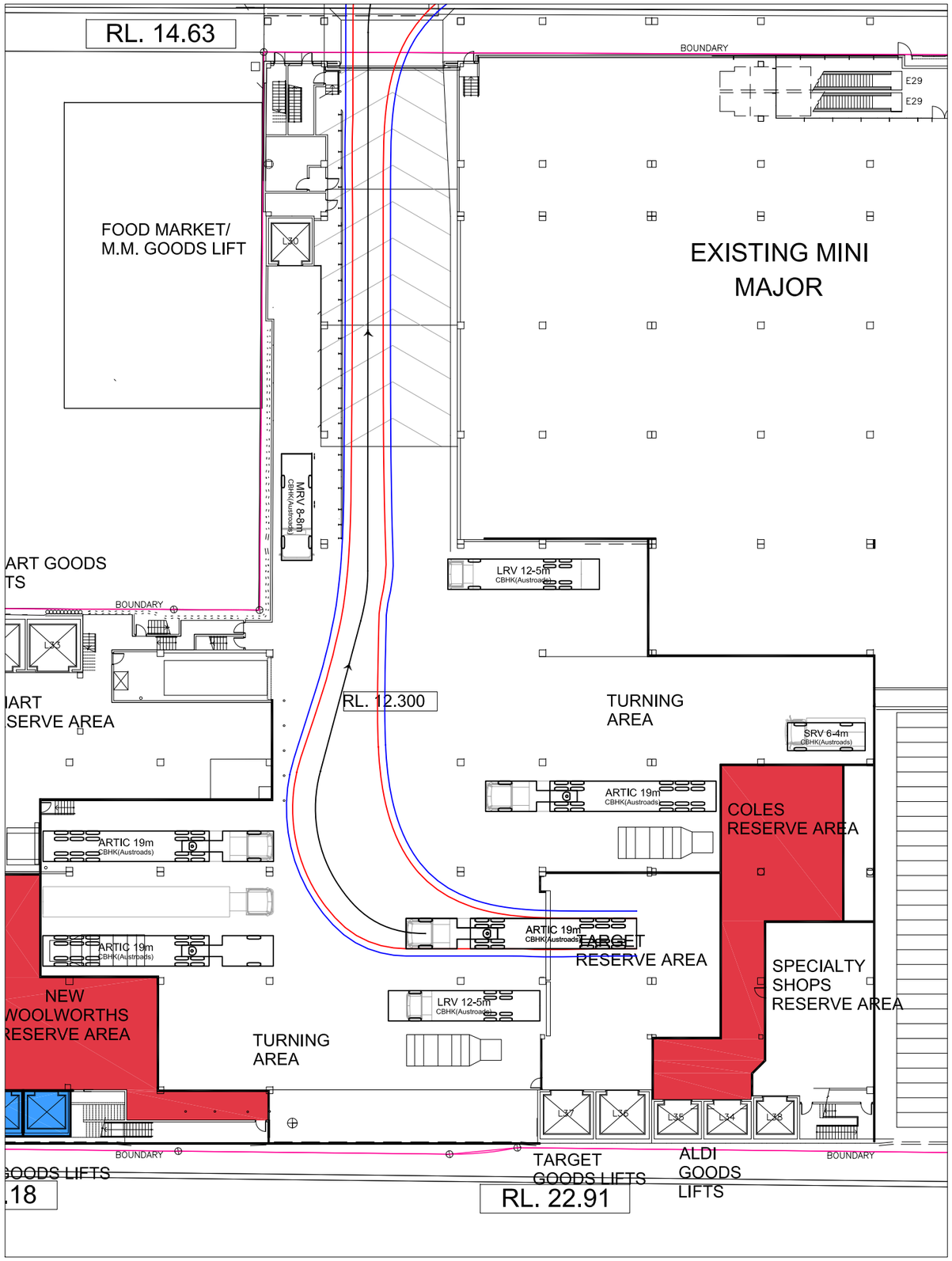
WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-19.0m ARTICULATED VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

4





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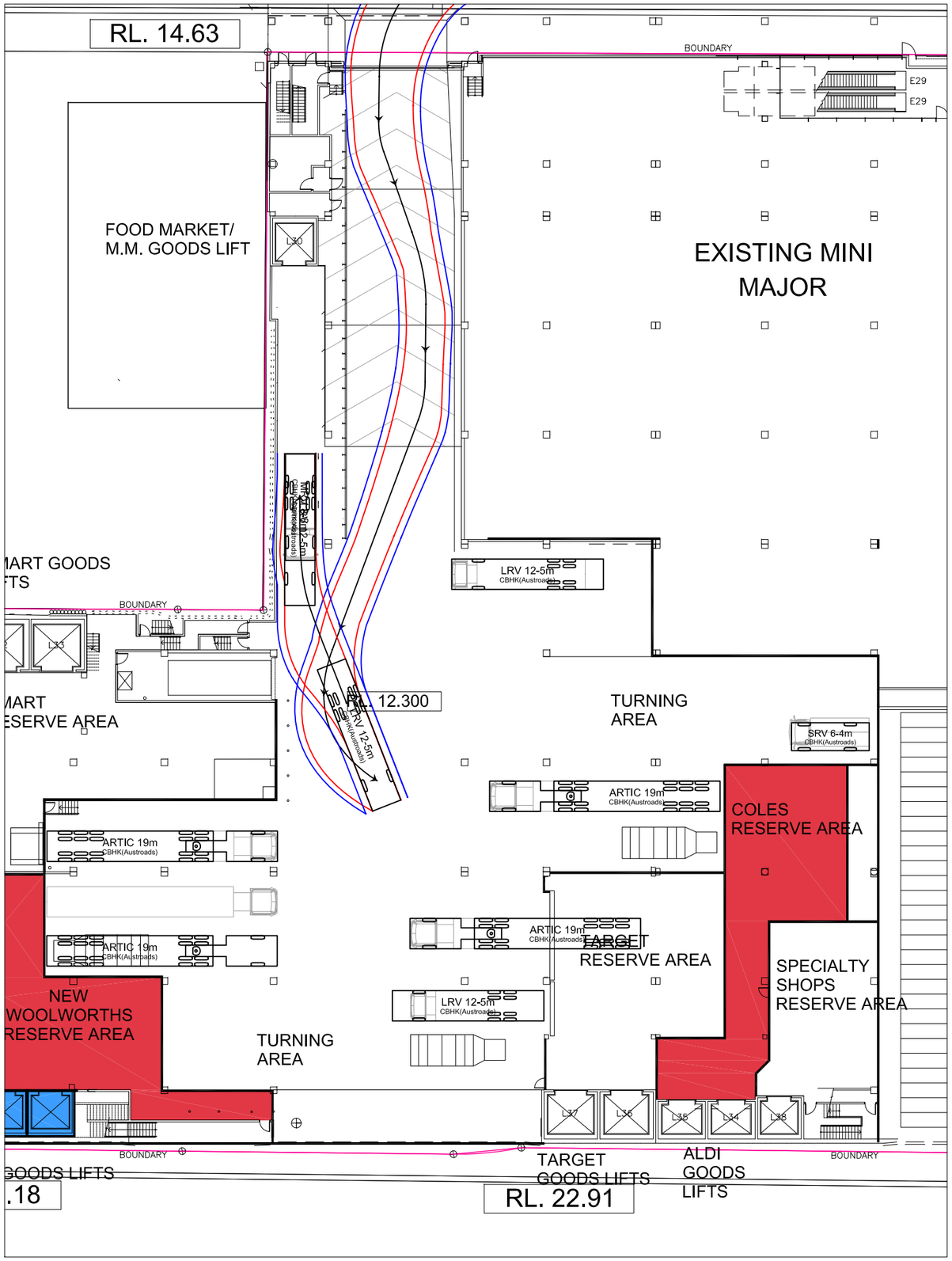
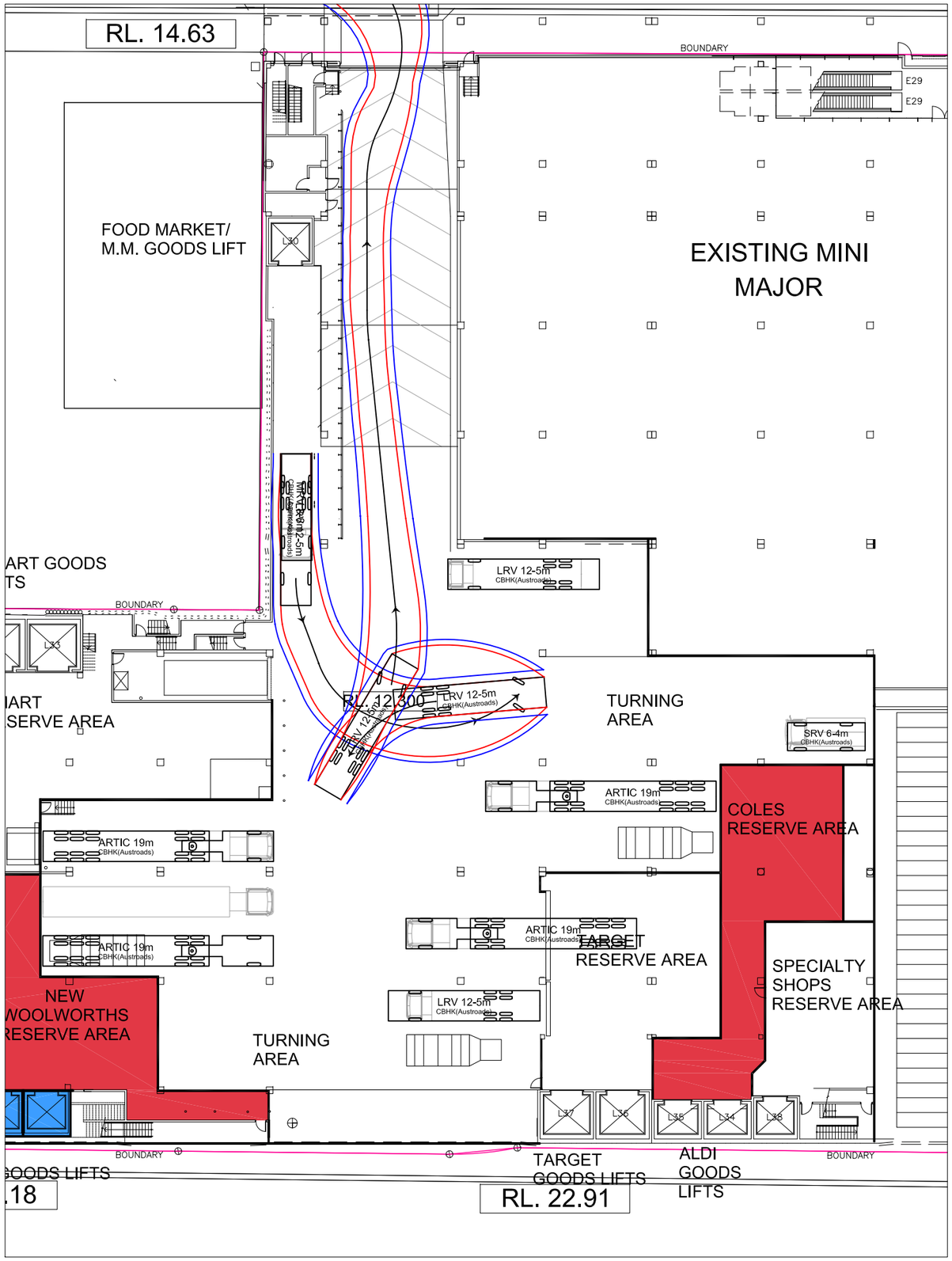
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-19.0m ARTICULATED VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

5





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Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-12.5m LARGE RIGID VEHICLE
SWEPT PATHS

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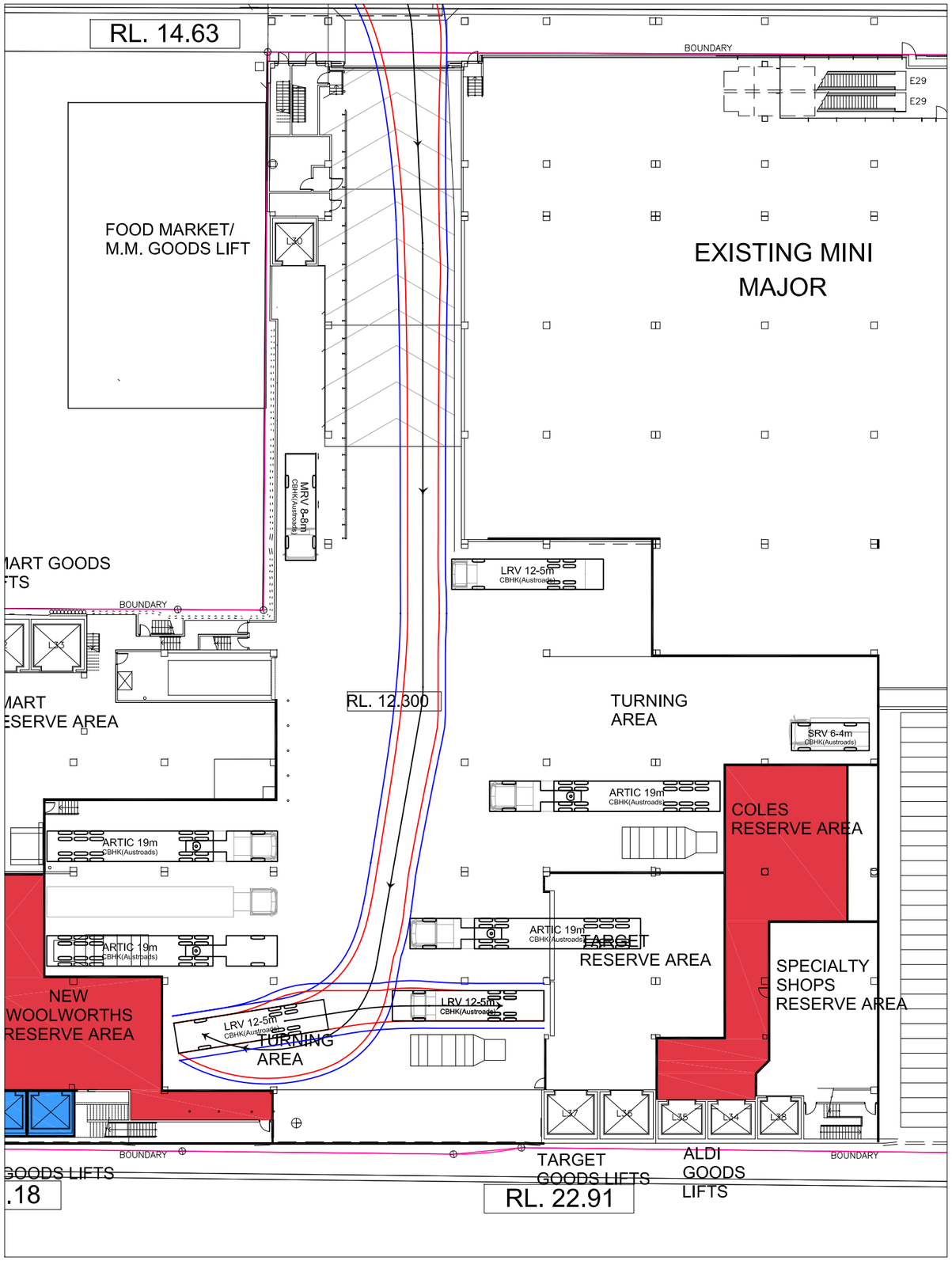
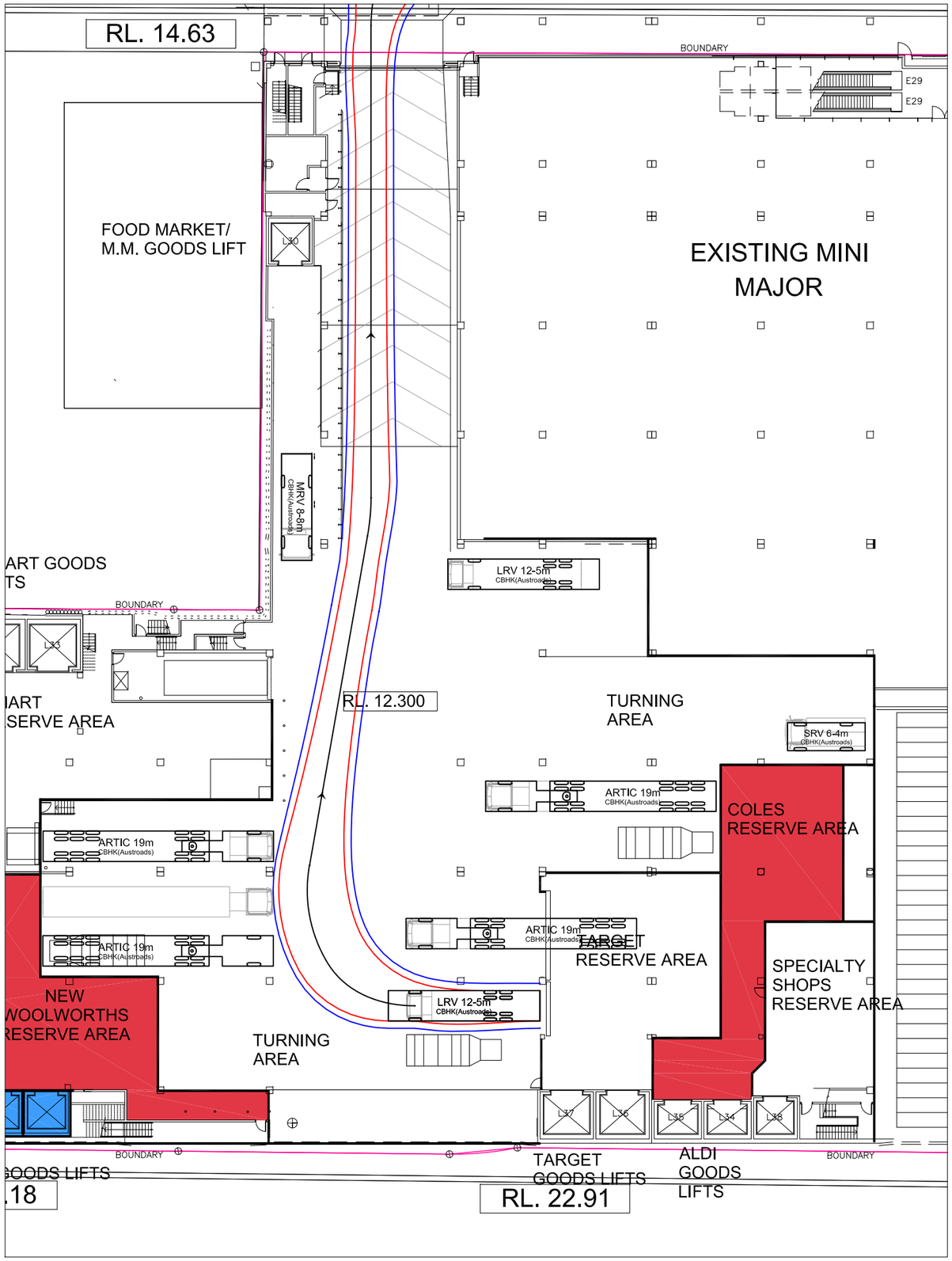
6





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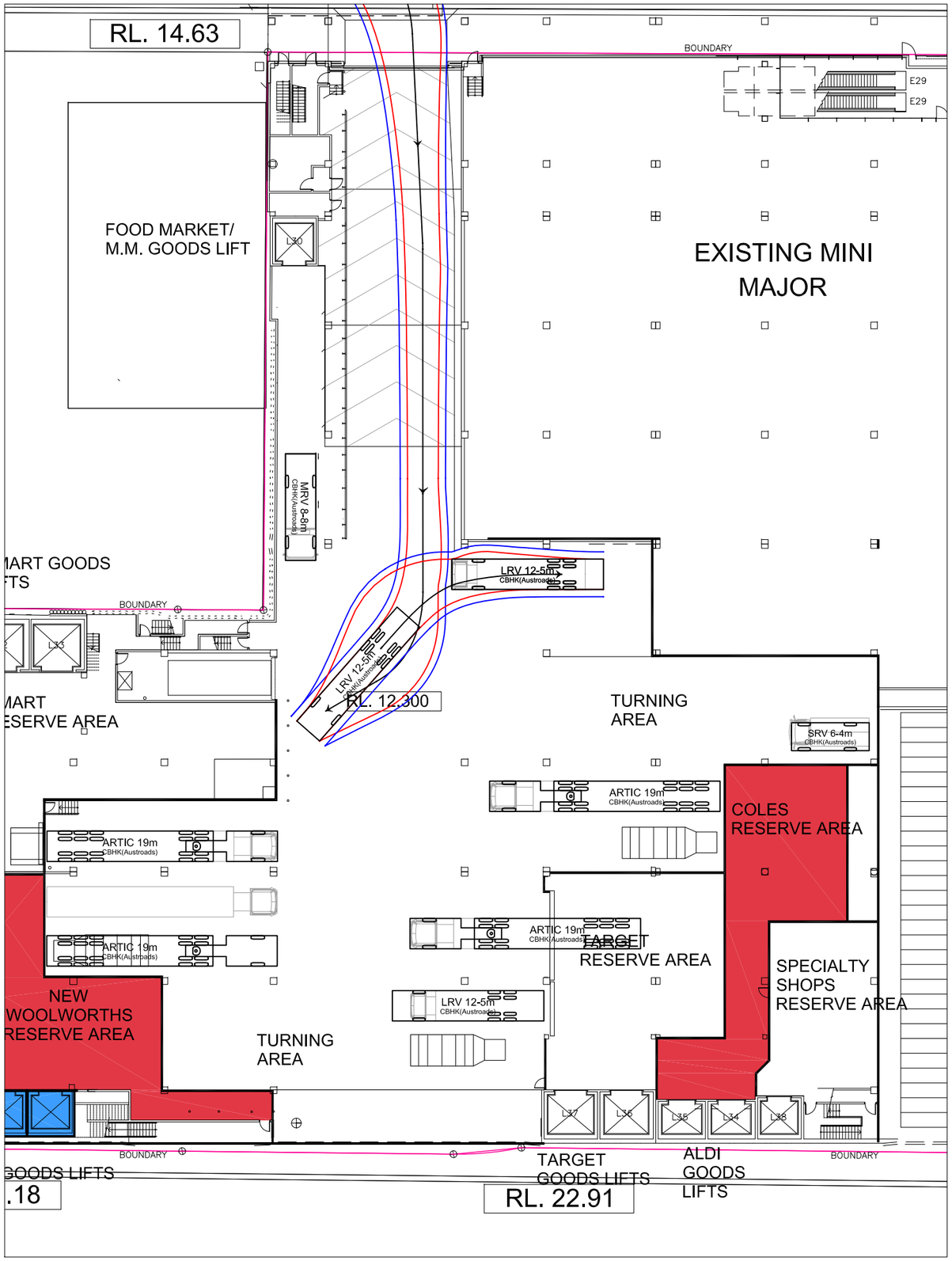
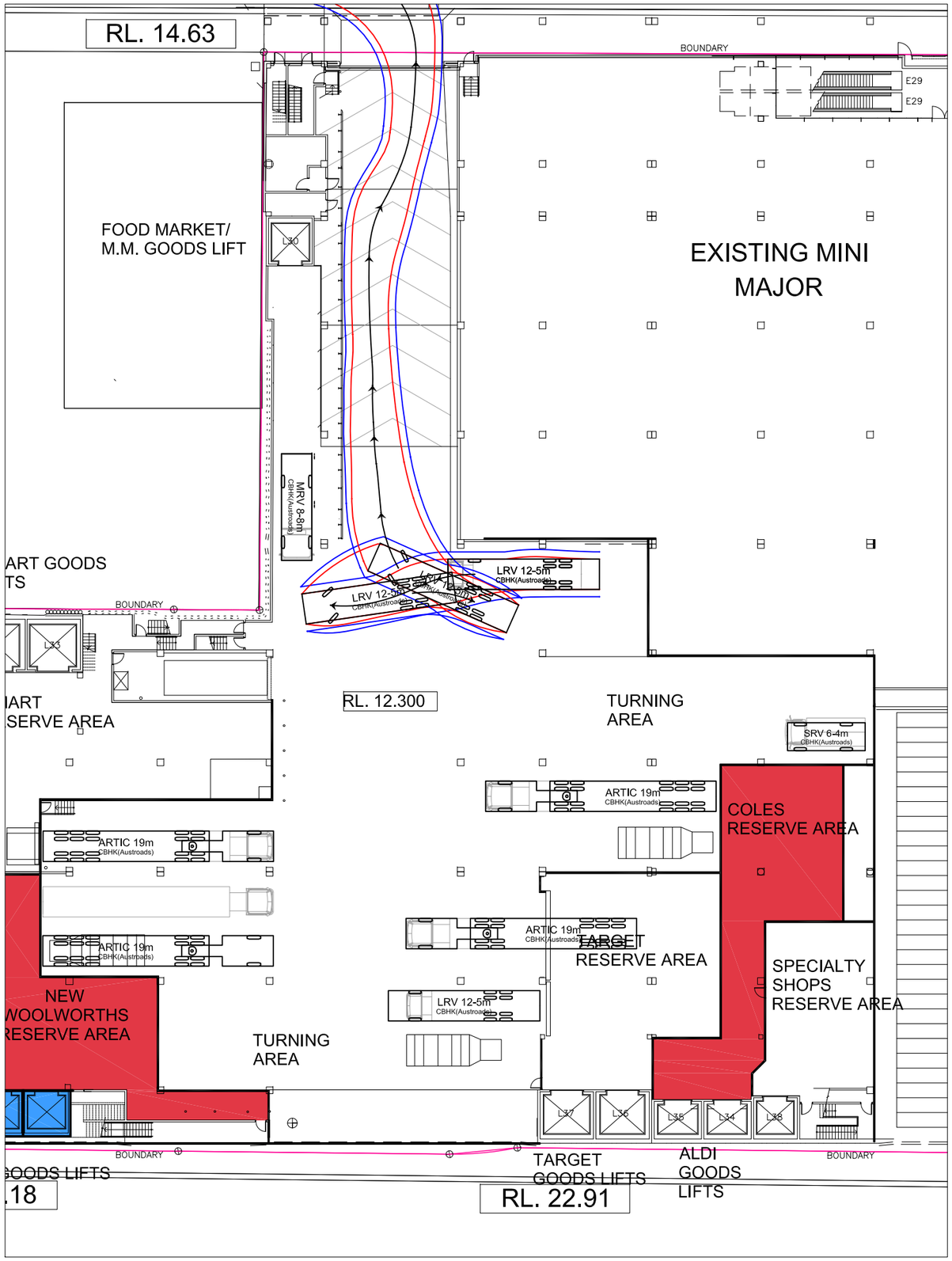
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-12.5m LARGE RIGID VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

7





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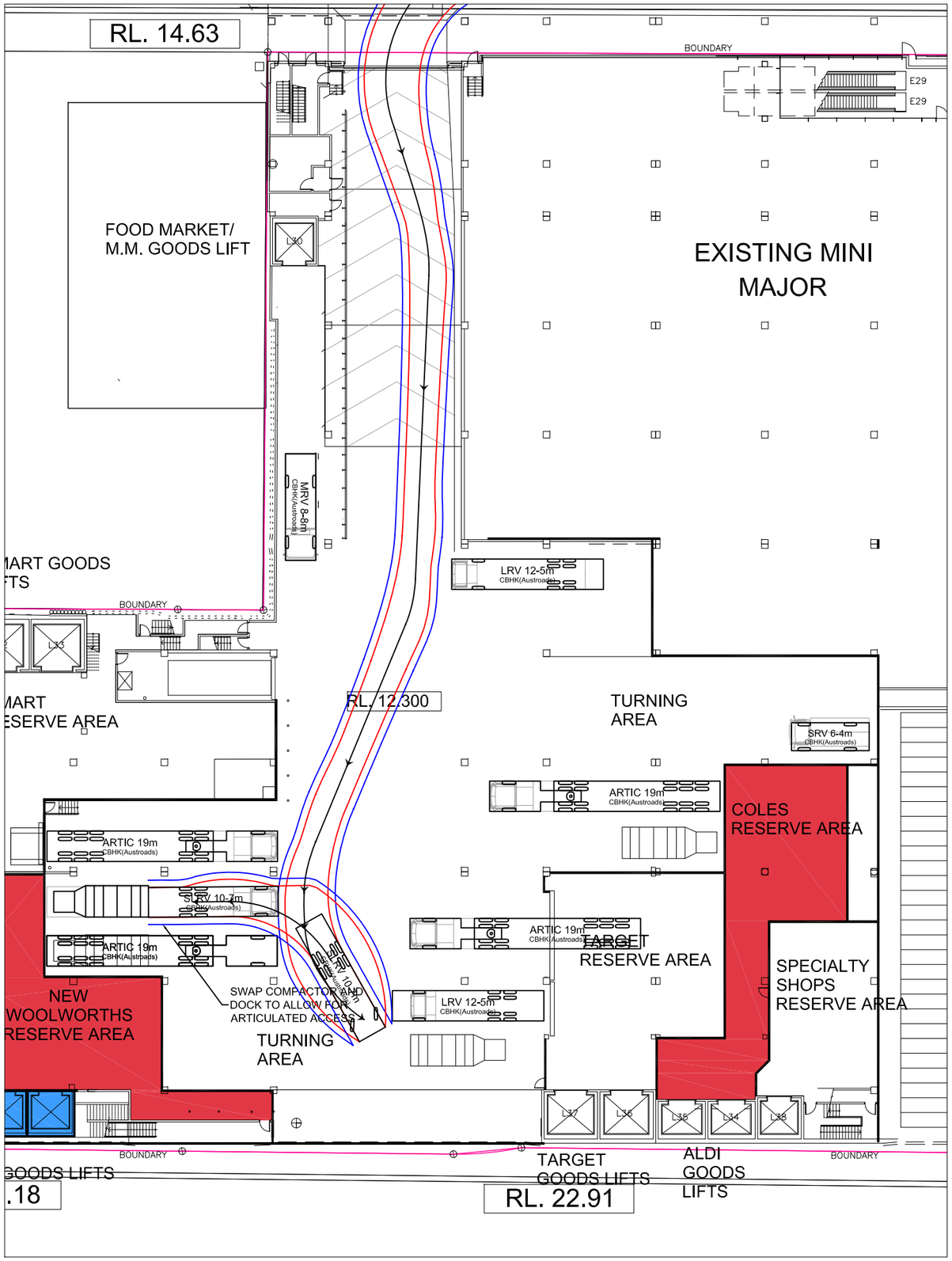
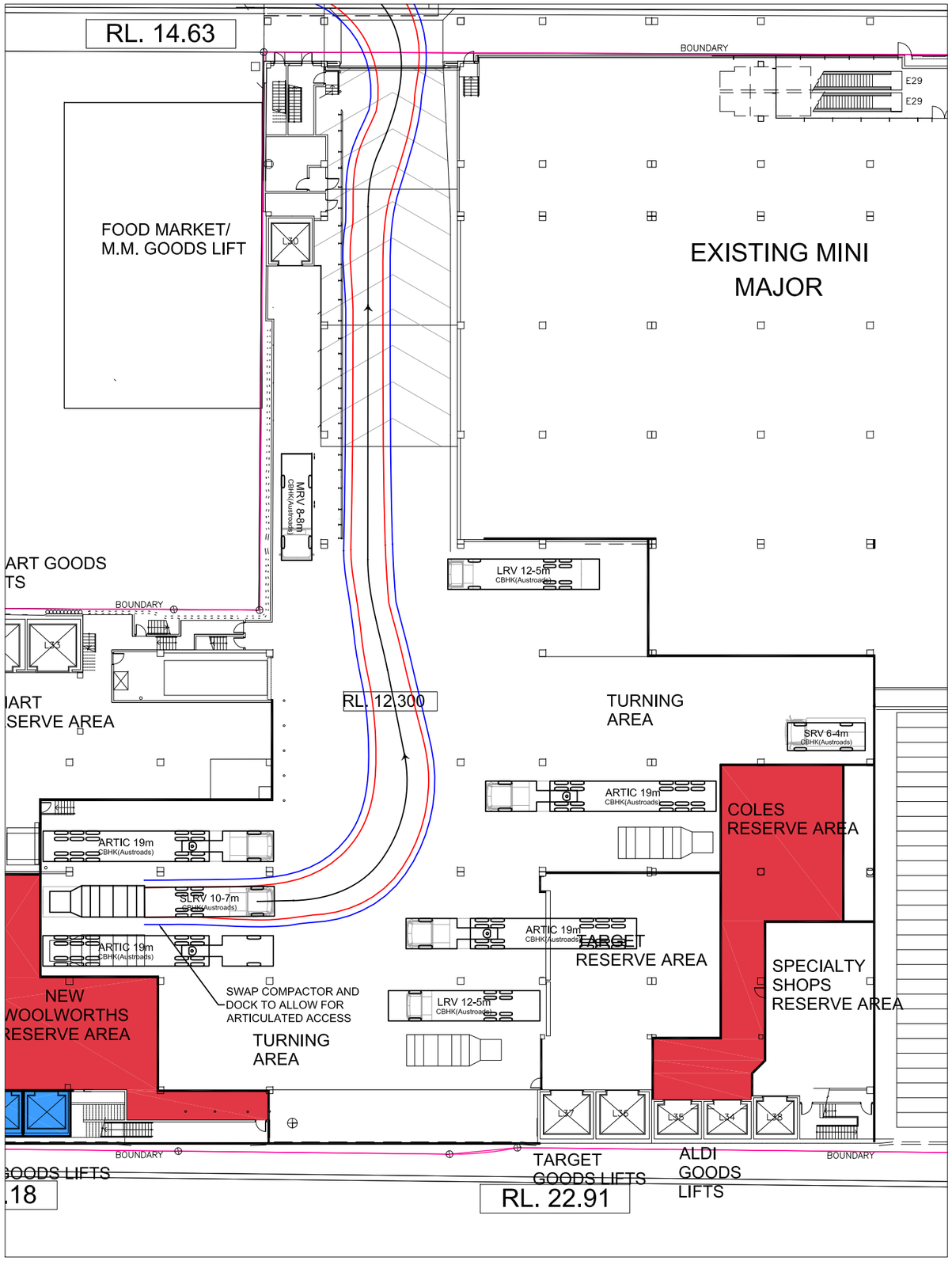
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-12.5m LARGE RIGID VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

8





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Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-10.7m LARGE RIGID VEHICLE
SWEPT PATHS

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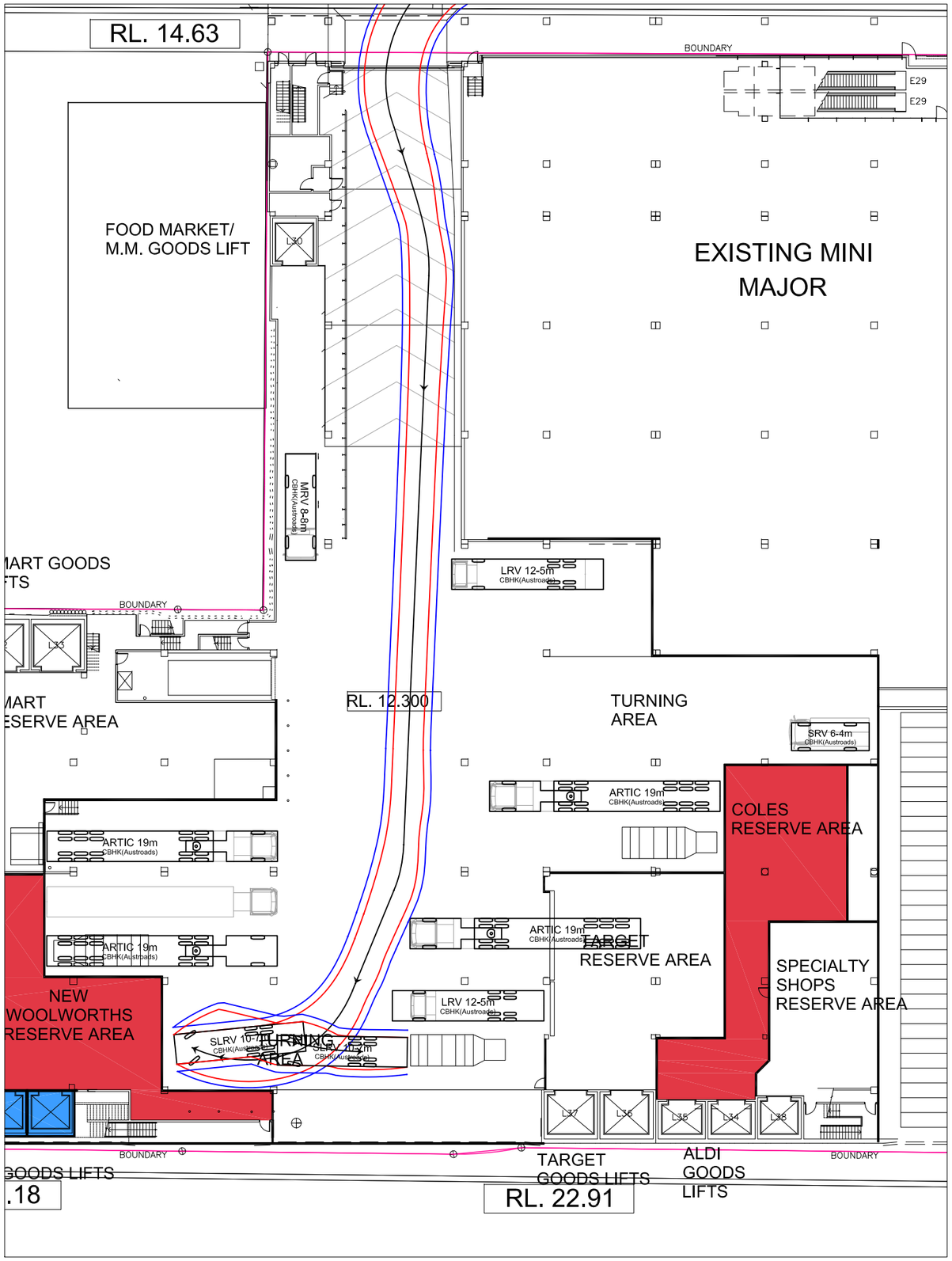
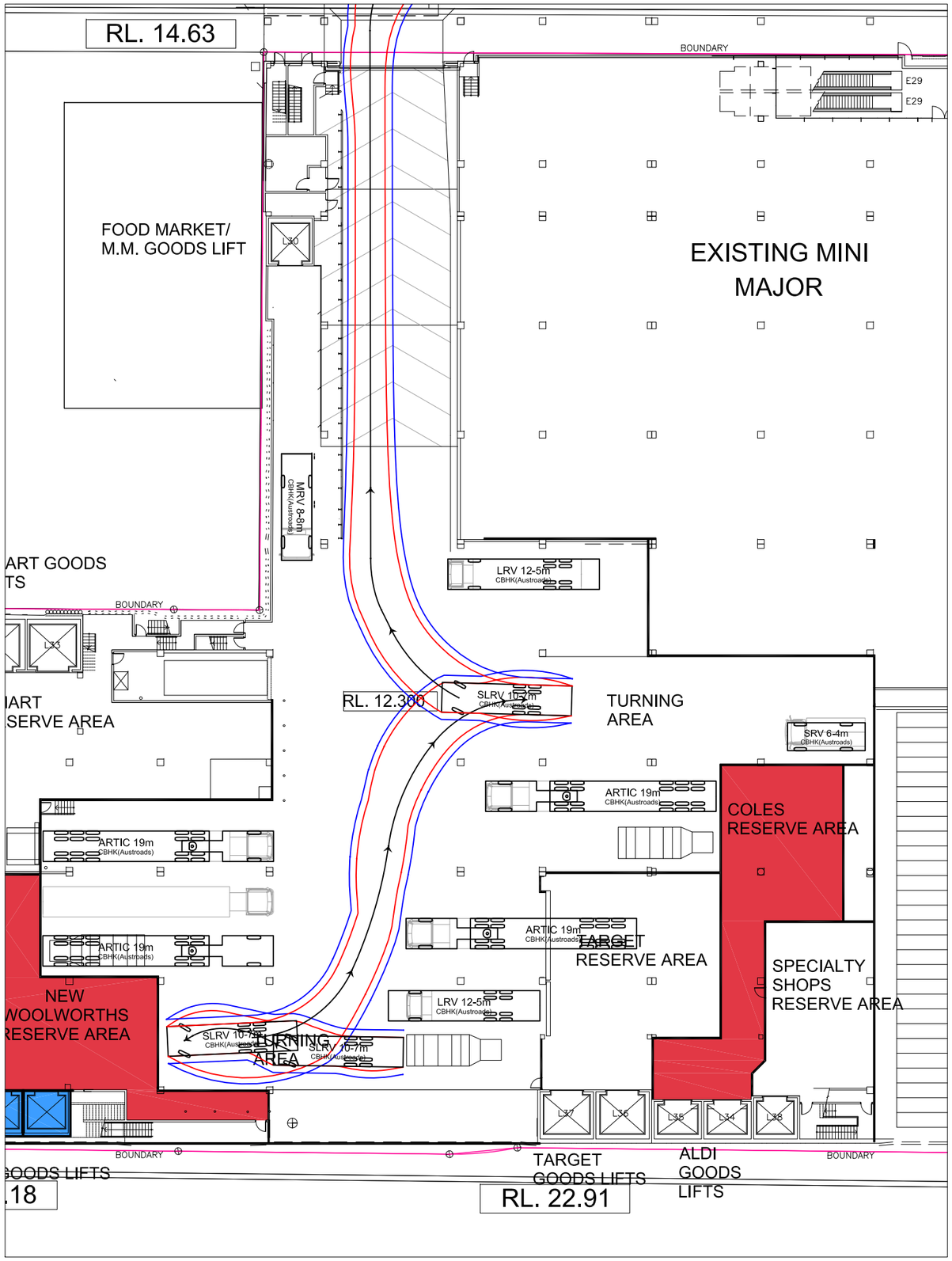
9





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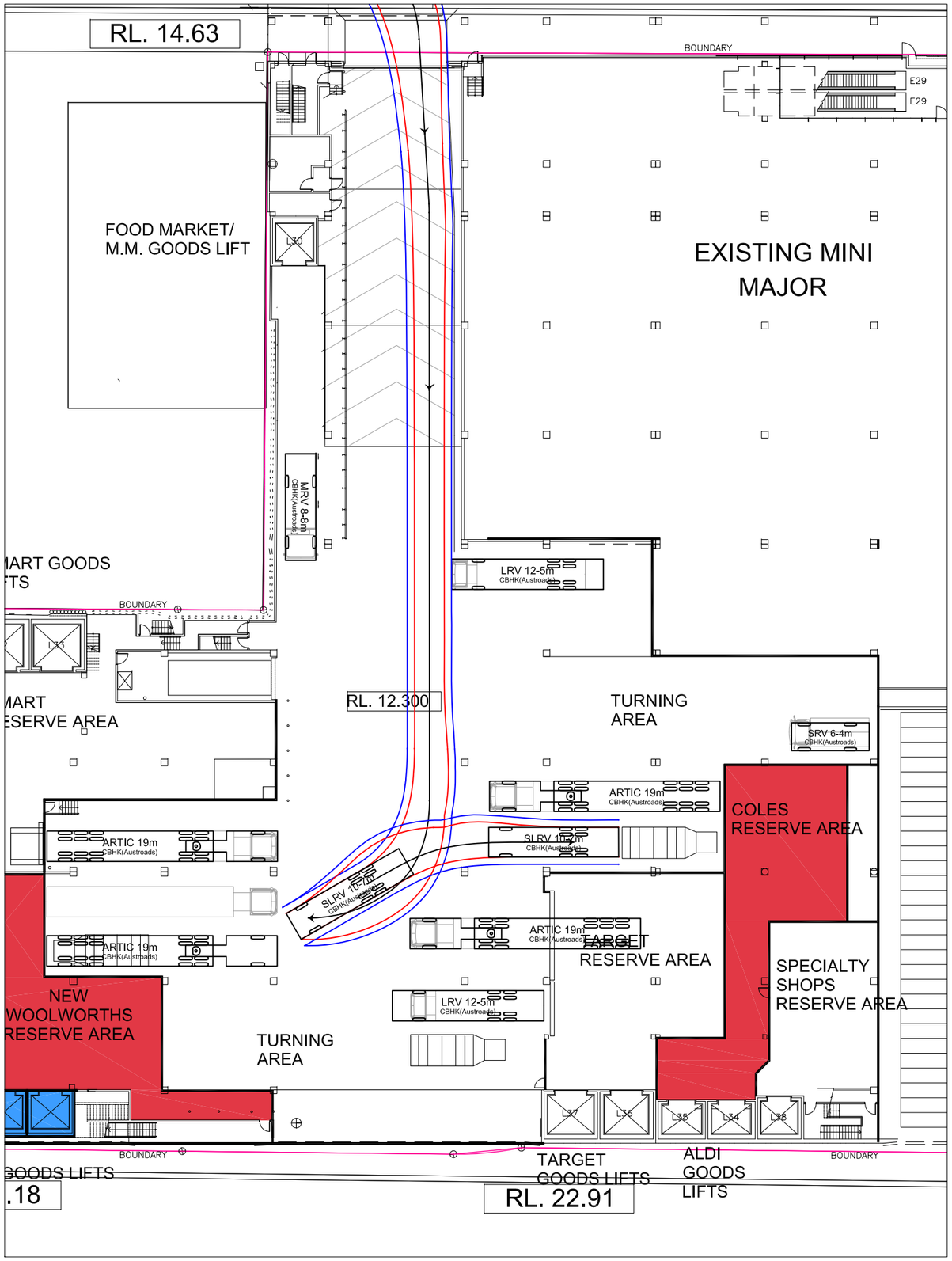
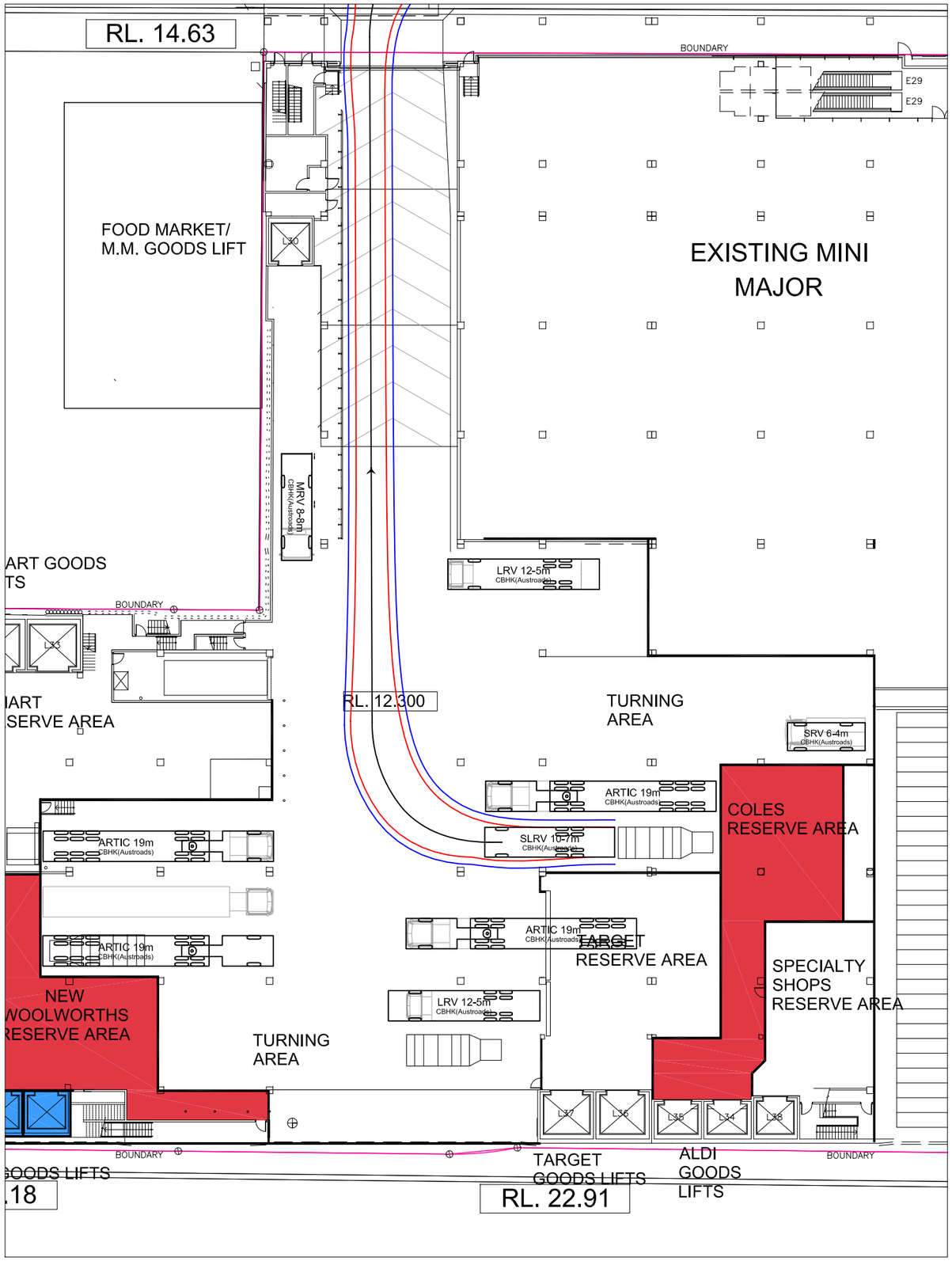
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-10.7m LARGE RIGID VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

10





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Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
AIRD STREET LOADING DOCK.
-10.7m LARGE RIGID VEHICLE
SWEPT PATHS

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11

ARGYLE STREET

MARSDEN STREET

O'CONNELL STREET

AIRD STREET

CAMPBELL STREET

CHURCH STREET

ARGYLE

AIRD STREET LEVEL 4 CARPARK
160 CARS
RL. 23.300

EX. DEPARTMENT STORE

EX. DEPARTMENT STORE

EX. CINEMA

LINE OF STAGE 2 COMMERCIAL TOWER ENVELOPE ABOVE LEVEL 5

RL. 23.300

EX. DISCOUNT DEPARTMENT STORE

RL. 23.300

NEW GOODS LIFTS

RL. 21.410

LEVEL 4 CARPARK
93 CARS
RL. 21.410

SPECIALTY LOADING

NEW GOODS LIFTS

RL. 21.410

EX. MINI MAJOR

L.D.

DEMOLISH EXISTING TENANT

NEW GOODS LIFTS

NEW LOADING DOCK FOR NEW MAJOR AT LEVEL 6

RESERVE AREA FOR THE NEW MAJOR

NEW RETAIL TENANT

FUTURE BIKE PARKING

CAMPBELL STREET LOADING DOCK

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Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA, CAMPBELL STREET LOADING DOCK TRUCK SWEPT PATHS

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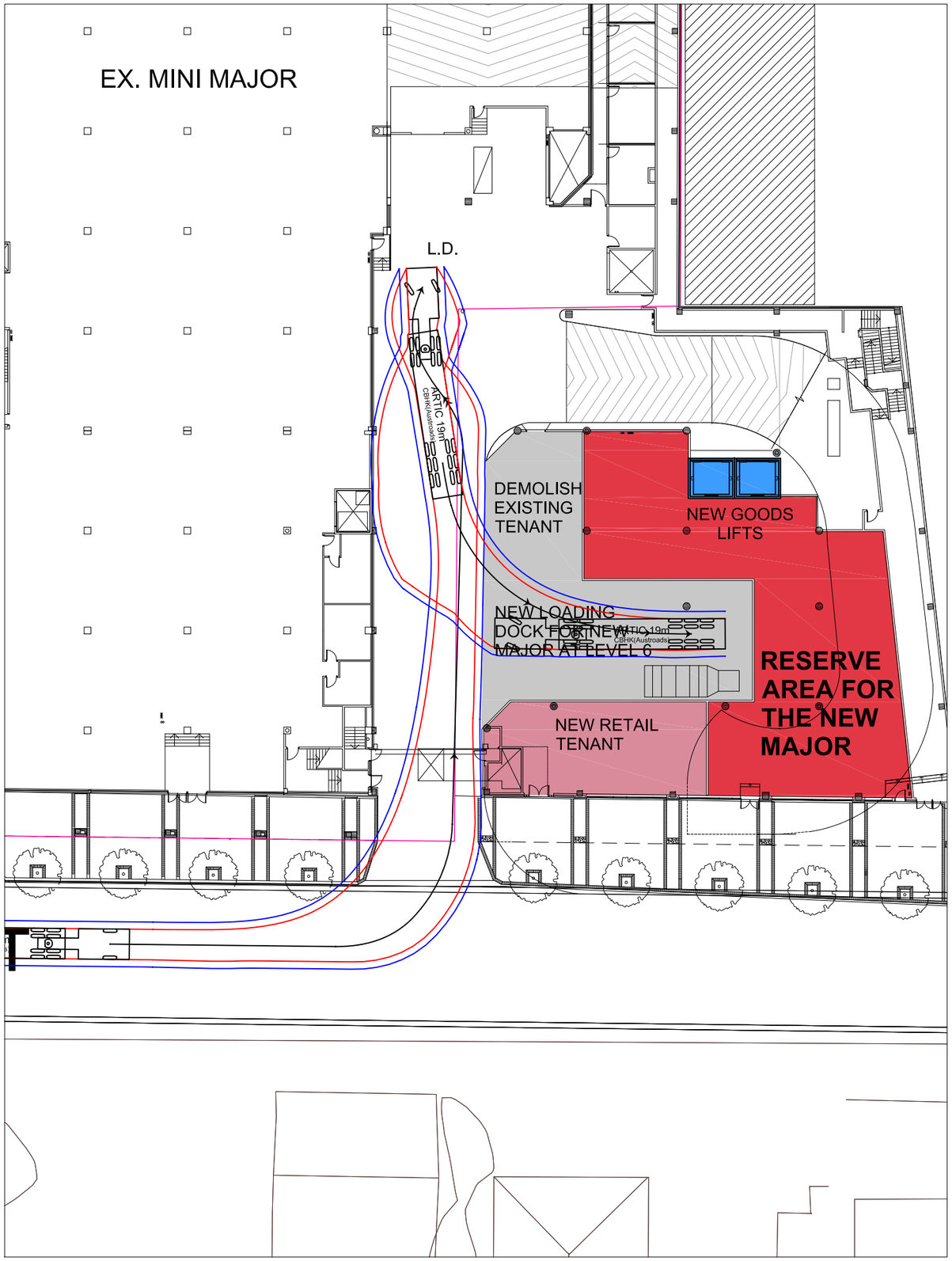
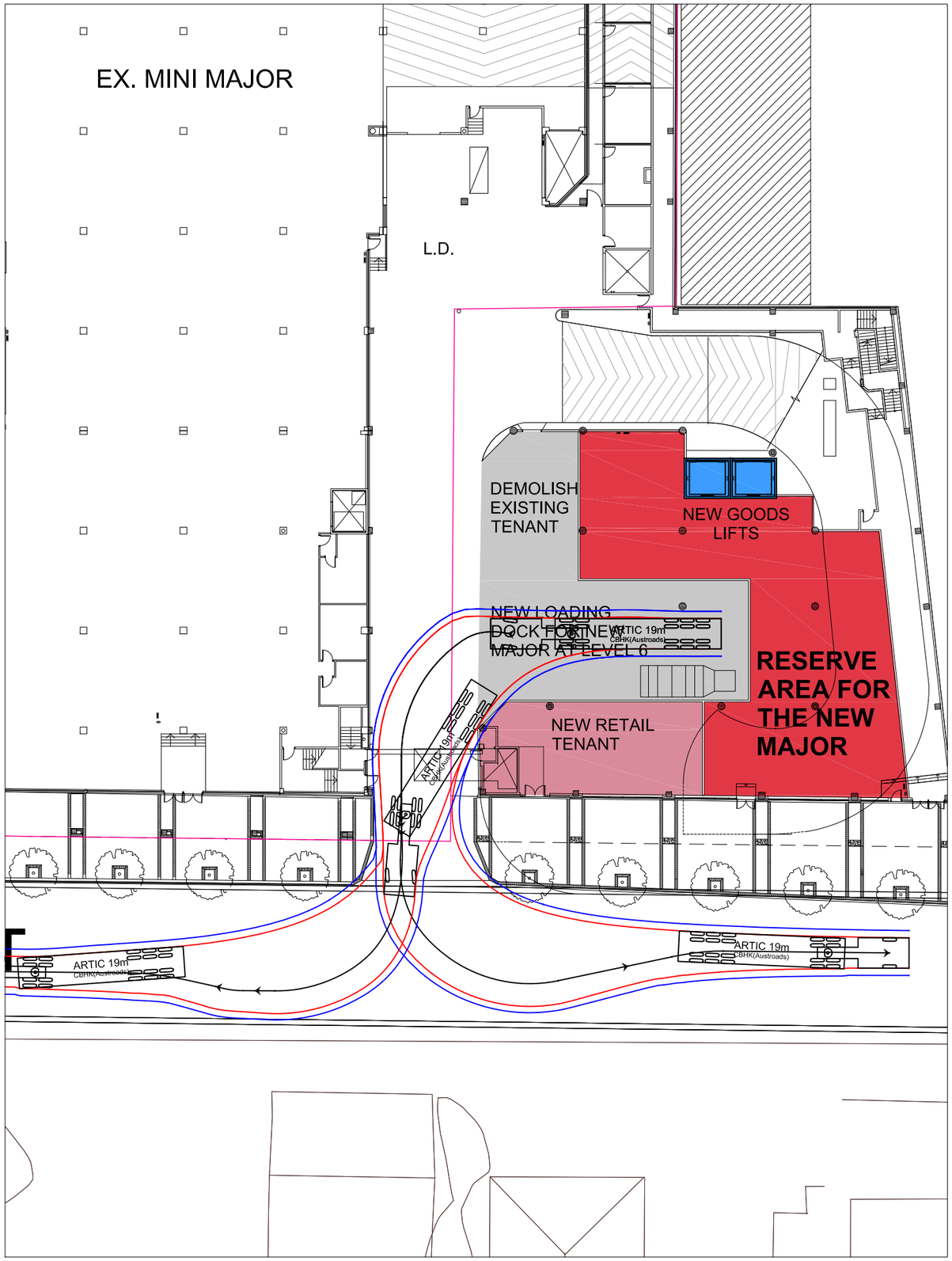
12





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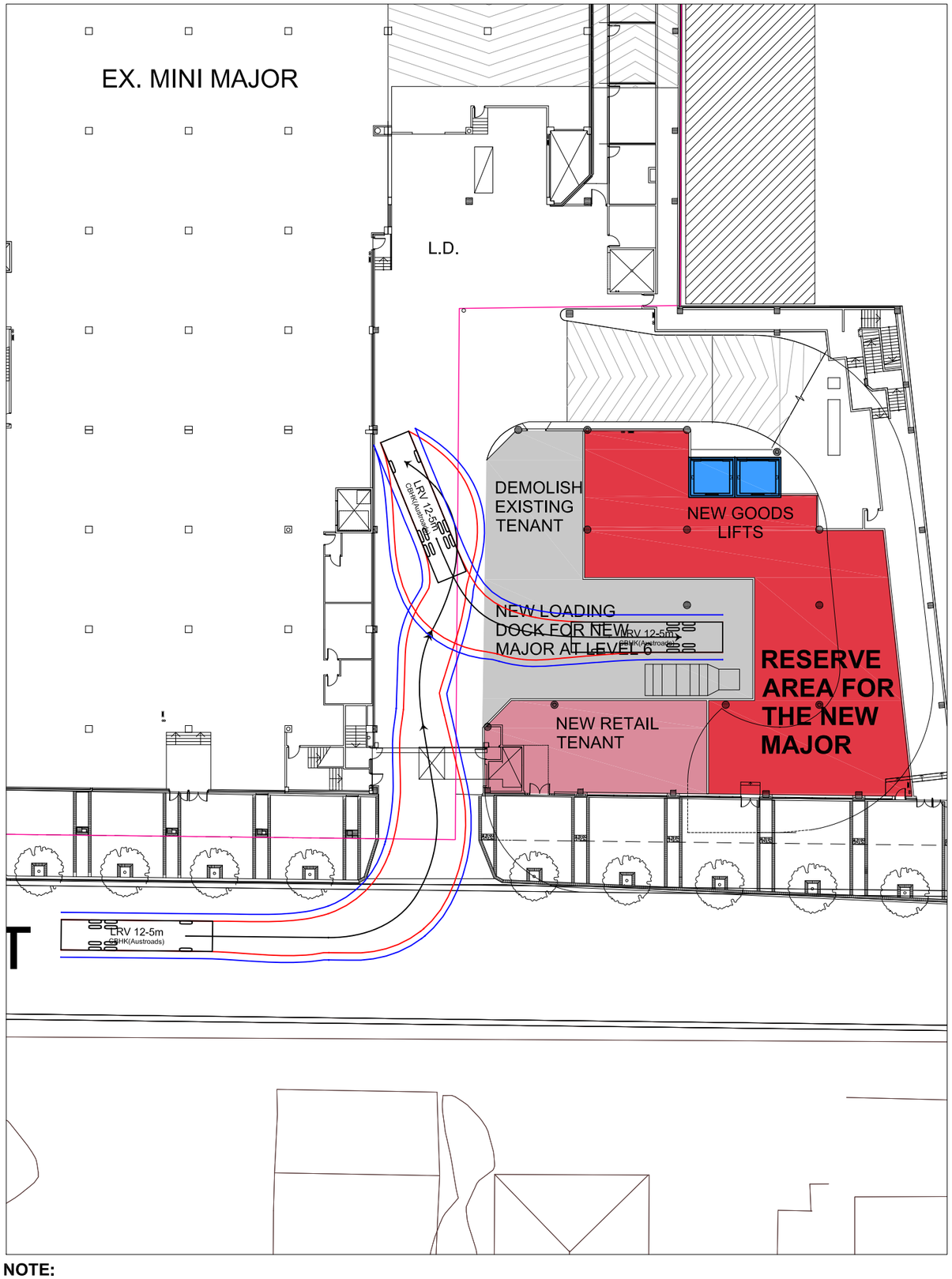
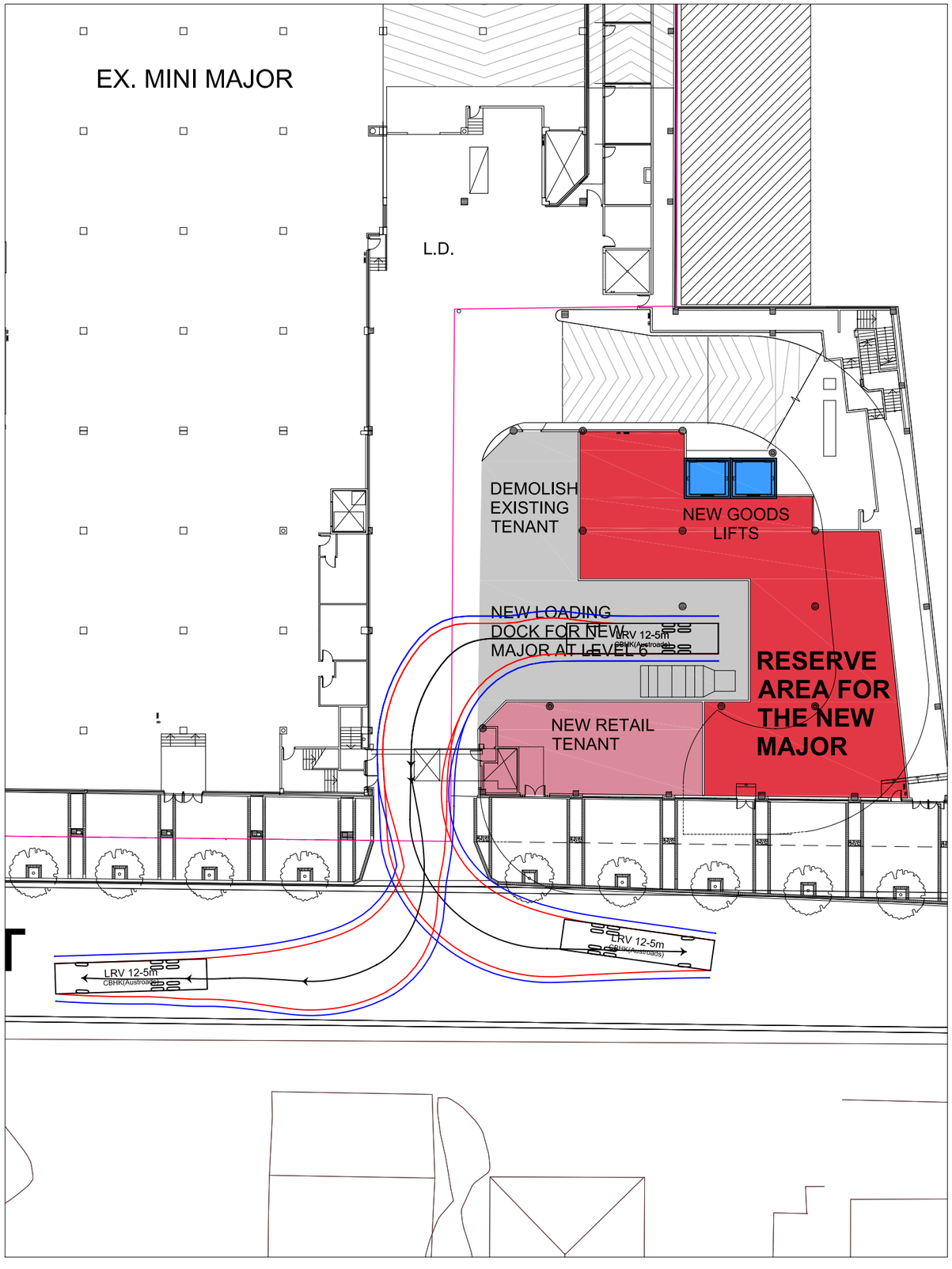
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
CAMPBELL STREET LOADING DOCK.
-19.0m ARTICULATED VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

13





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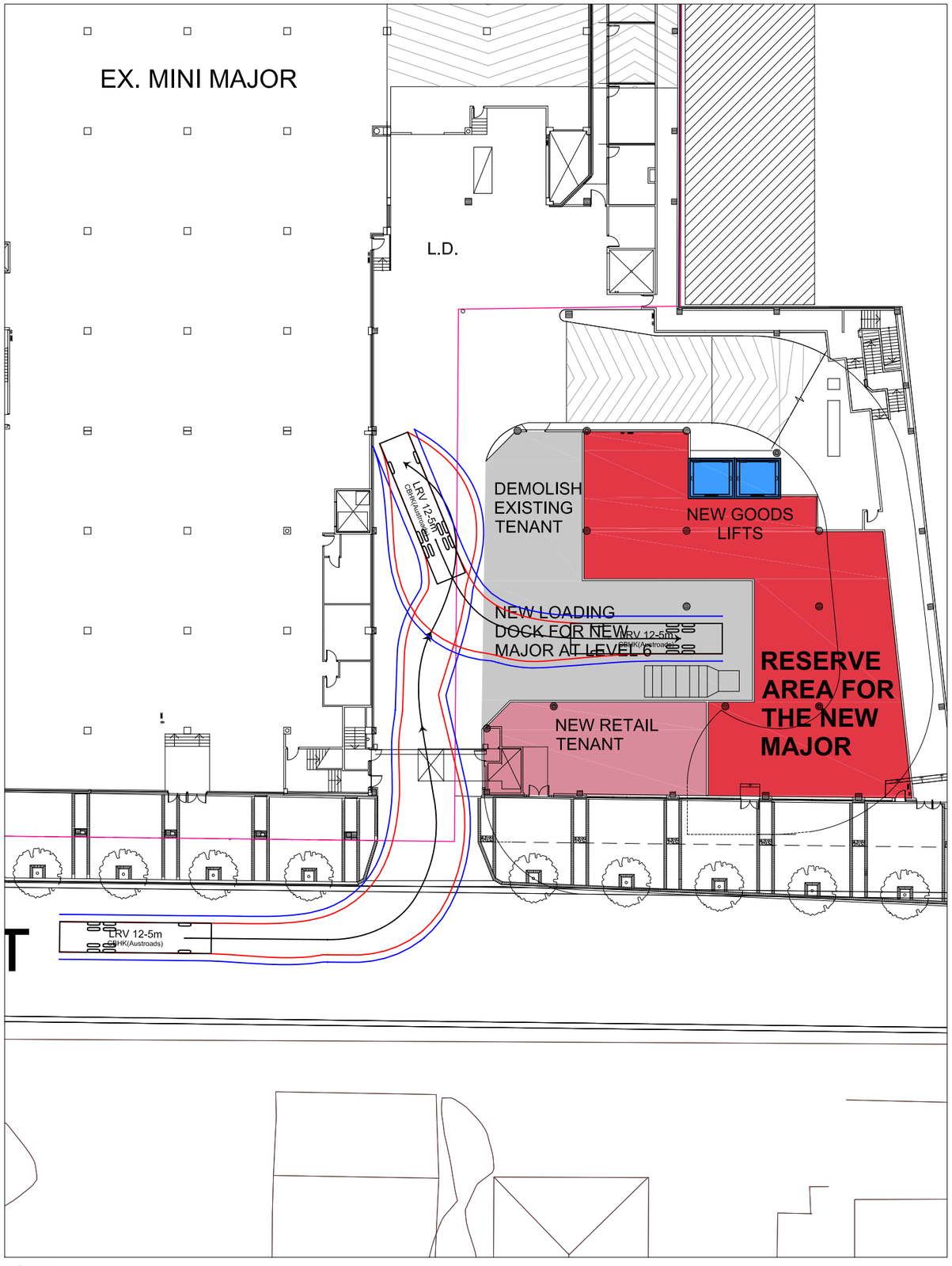
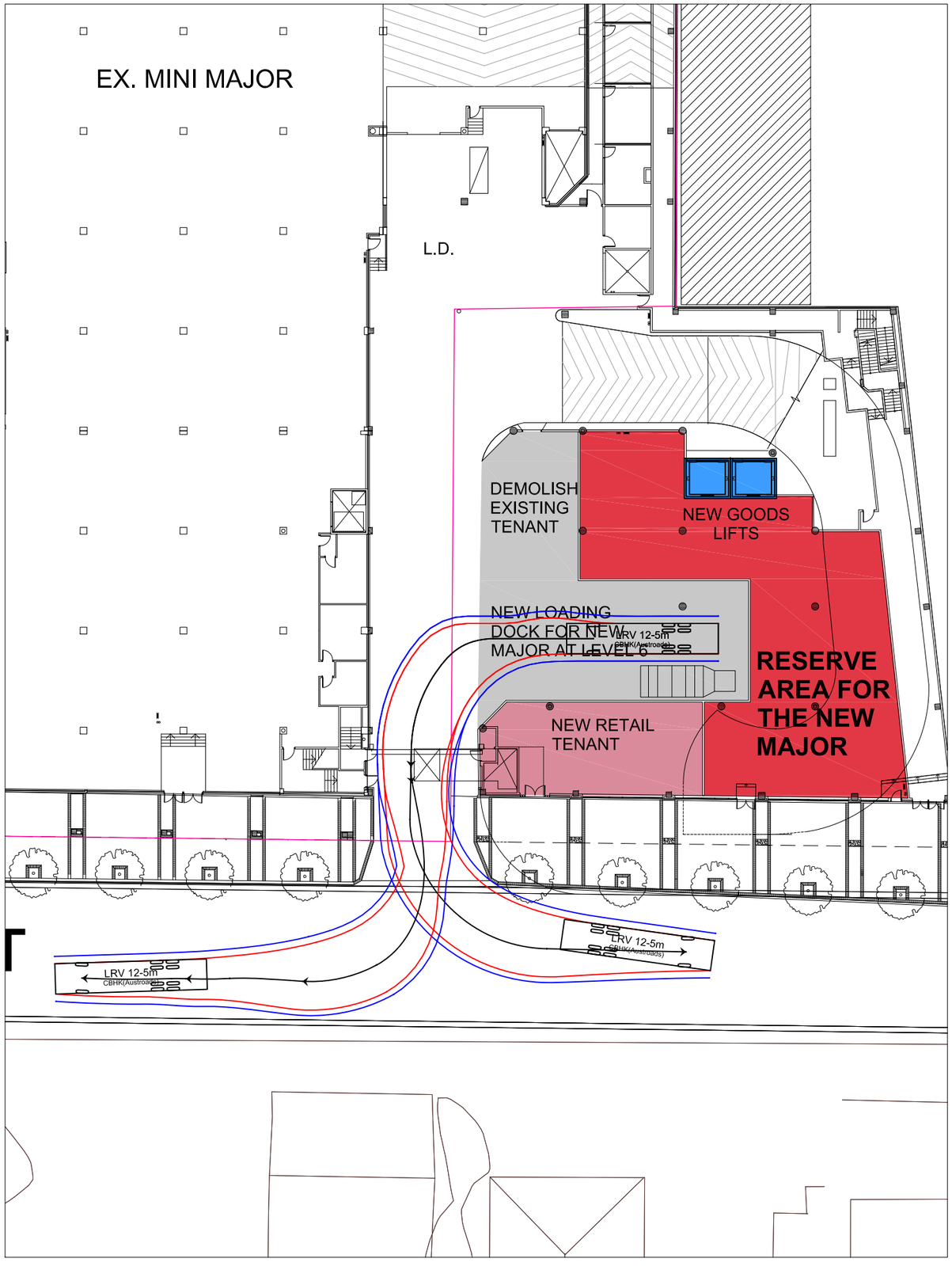
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
CAMPBELL STREET LOADING DOCK.
-12.5m LARGE RIGID VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012





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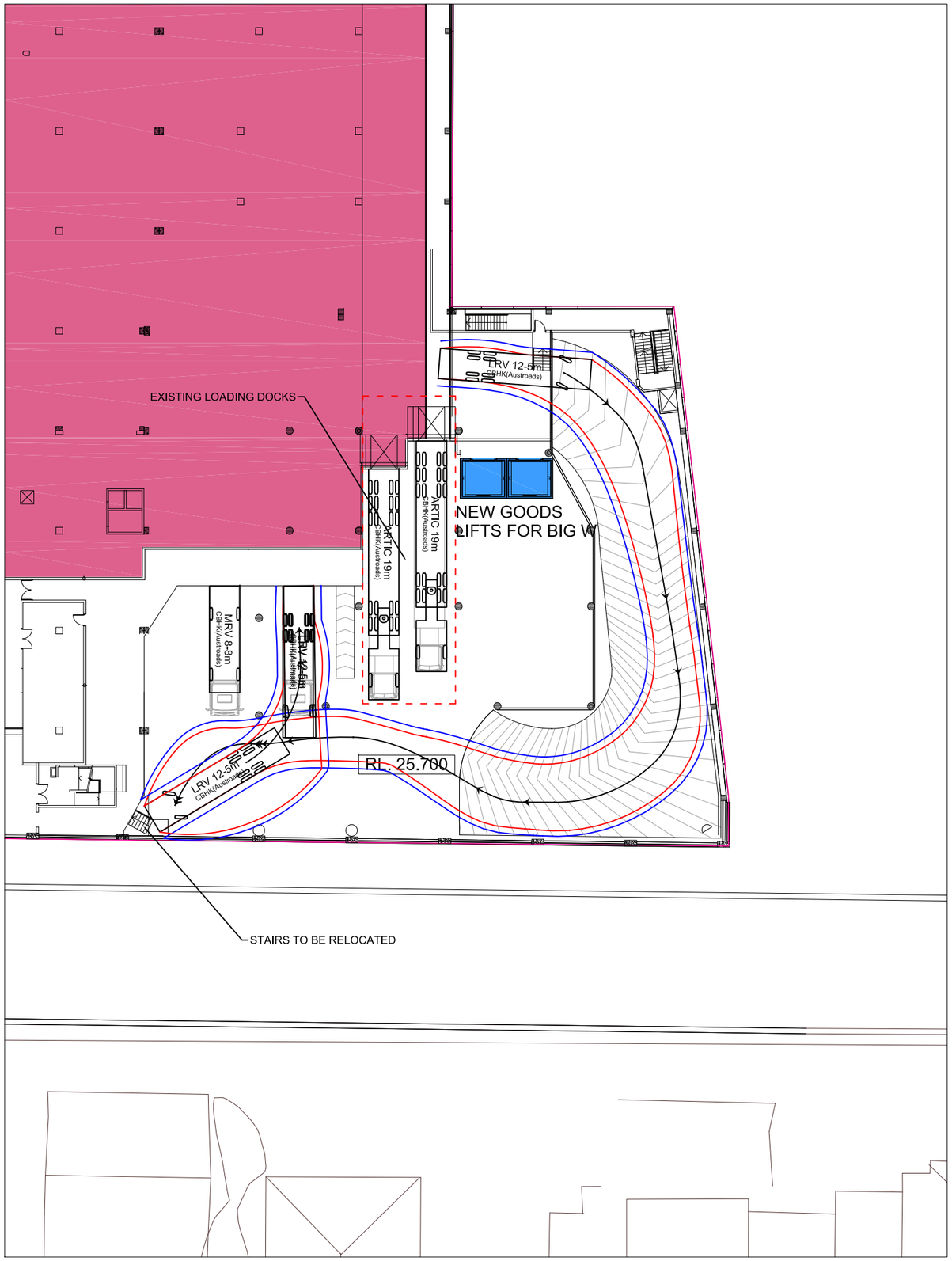
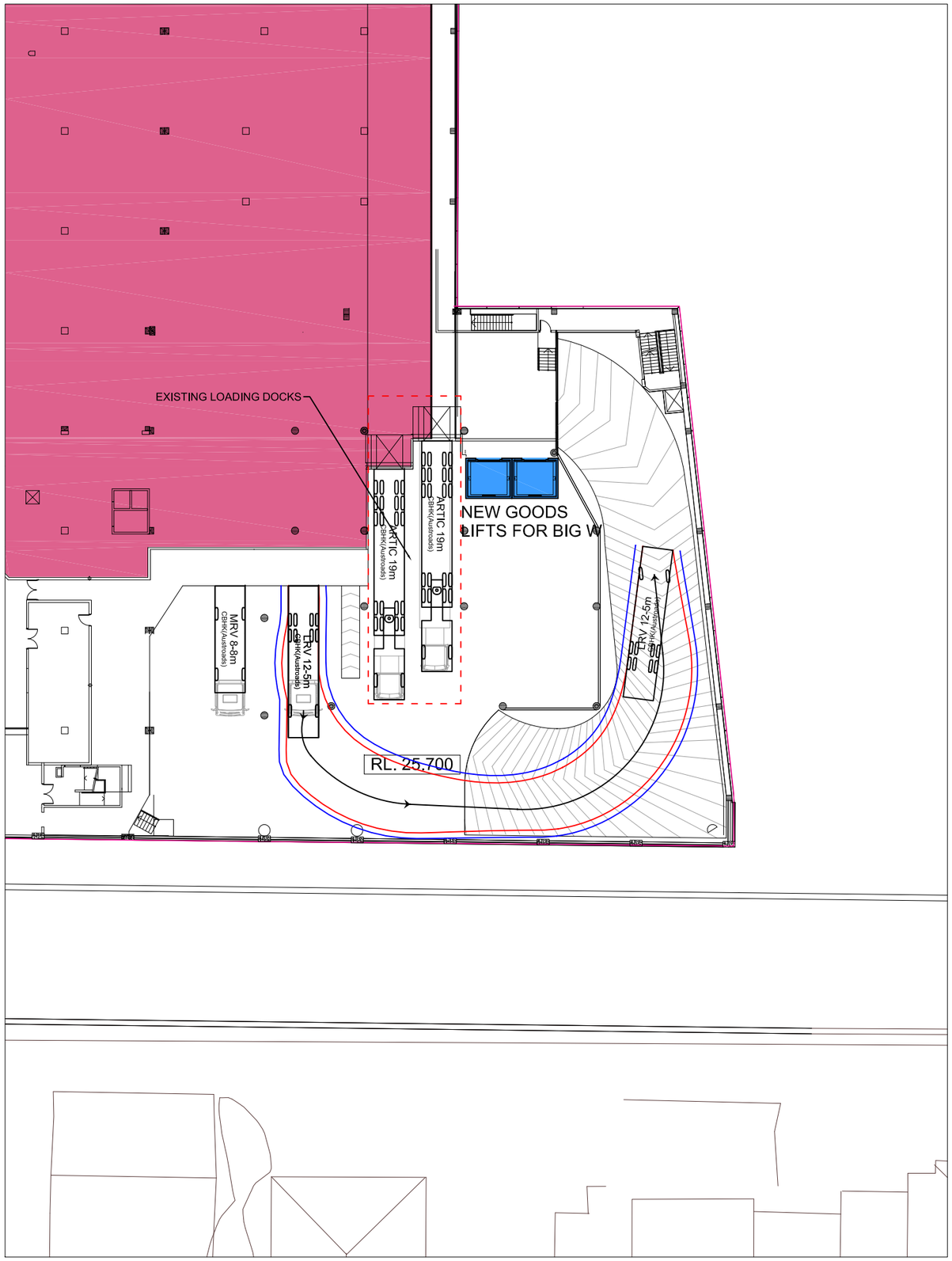
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
CAMPBELL STREET LOADING DOCK.
-10.7m LARGE RIGID VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012





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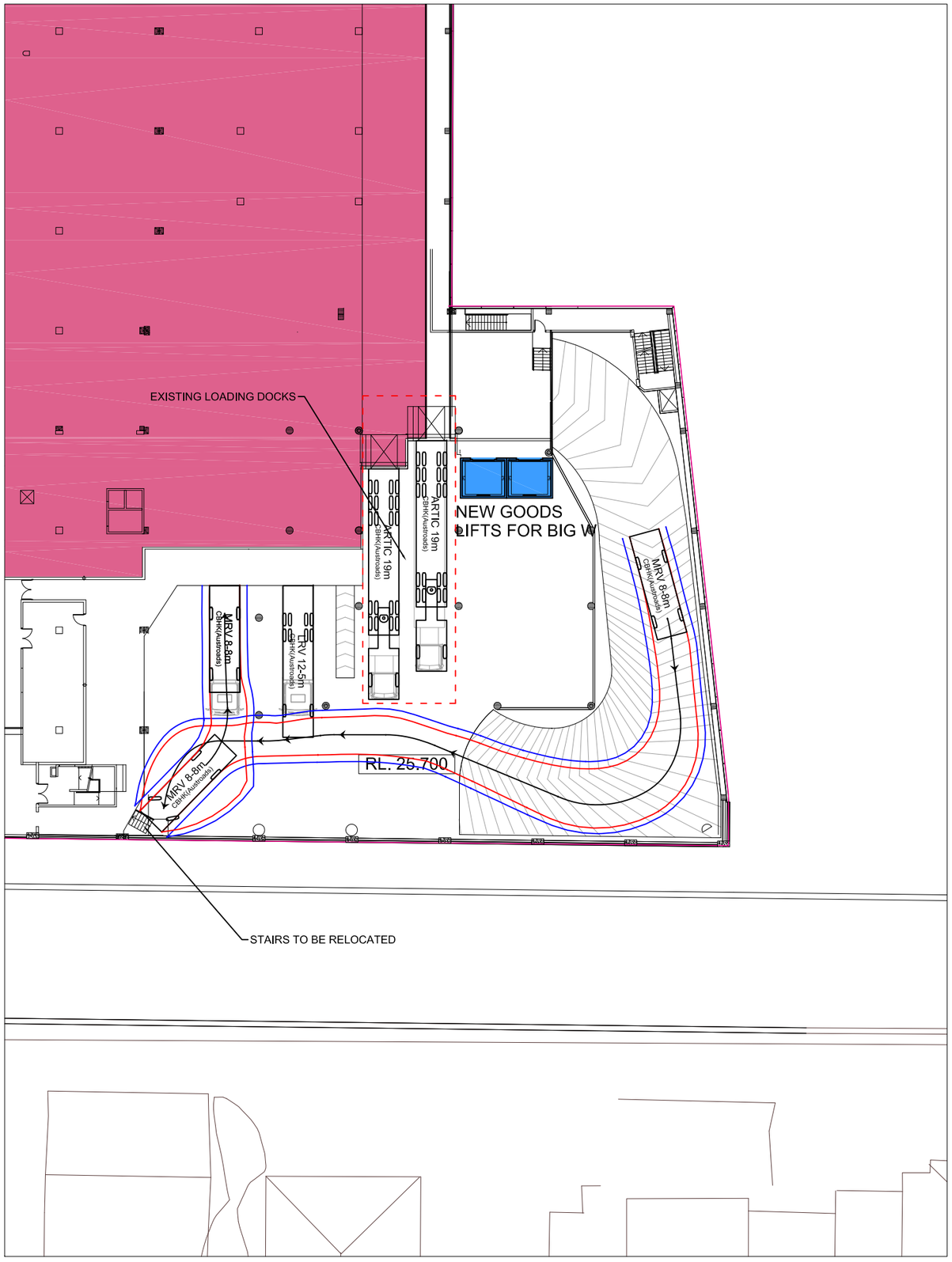
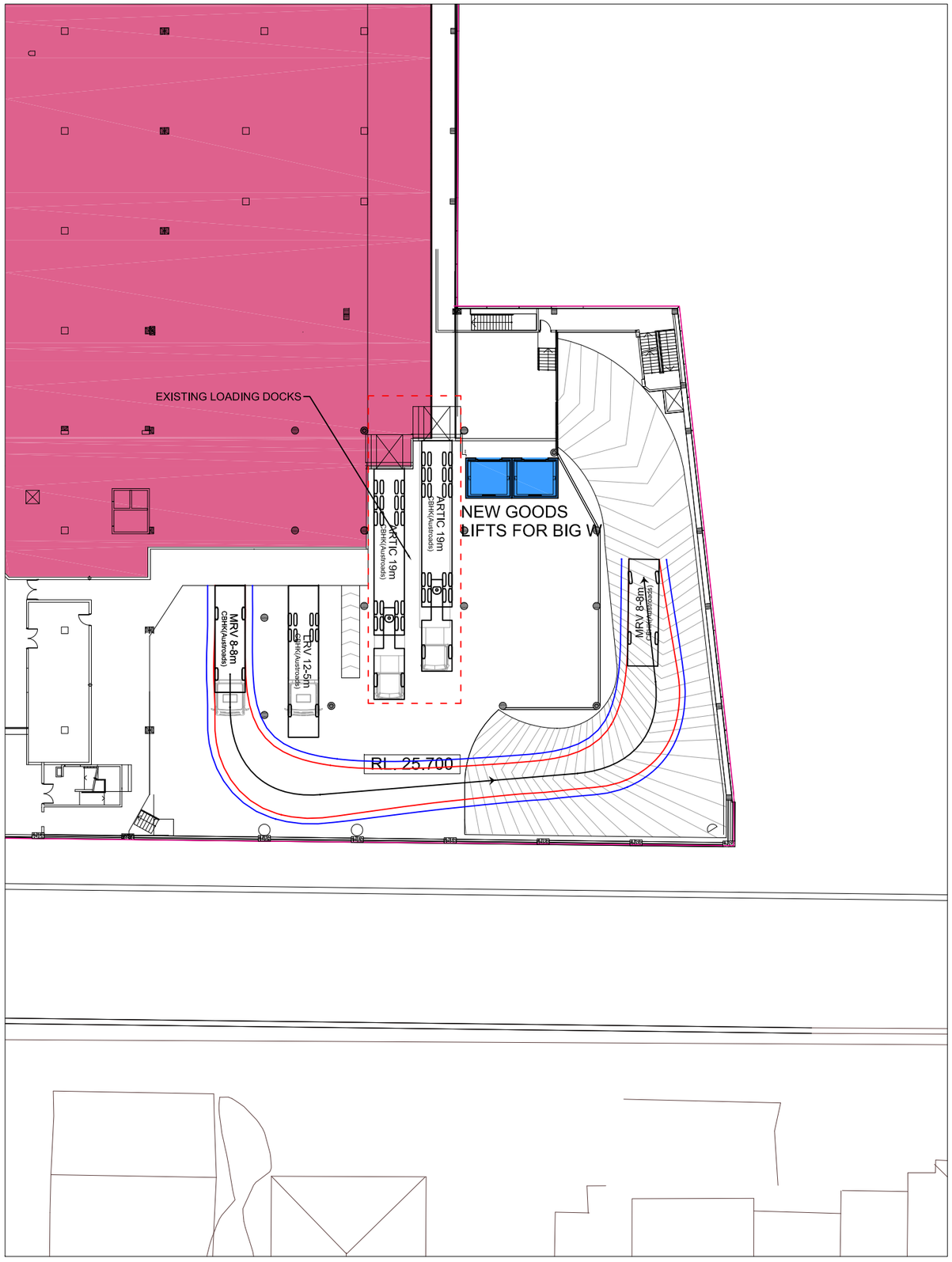
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
CAMPBELL STREET LOADING DOCK.
-12.5m LARGE RIGID VEHICLE
SWEPT PATHS

DRAWN BY CBHK Pty Ltd_ho Ref: 8659 1 AUGUST 2012

16





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Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

WESTFIELD PARRAMATTA,
CAMPBELL STREET LOADING DOCK.
-8.8m MEDIUM RIGID VEHICLE
SWEPT PATHS

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