

LCI PARTNERS

TRAFFIC REPORT FOR
PROPOSED REDEVELOPMENT OF
KINGSWAY PLAZA, KURRI KURRI

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ATTACHMENT A – VEHICLE TURN PATHS

I. INTRODUCTION

- I.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by LCI Partners to prepare a traffic report to support the development application for the redevelopment of Kingsway Plaza at 178 Lang Road Kurri Kurri. The location of the site is shown in Figure 1.
- I.2 The proposed development is for a supermarket and specialty shops, with undercroft and upper level parking. Access will be via Barton Street and the service lane connecting Barton Street and Victoria Street. In association with the proposed development, part of this service lane will be relocated to the western boundary of the site (some 50 metres).
- I.3 This DA traffic report assesses the implications of the proposed development through the following chapters:
- Chapter 2 - describing existing conditions; and
 - Chapter 3 - assessing the traffic implications of the proposed development.

2. EXISTING CONDITIONS

Site Location

- 2.1 Kingsway Plaza is located within the Kurri Kurri town centre. It has frontage to Lang Street, Barton Street and the service lane that connects Barton Street and Victoria Street. Kingsway Plaza is located on the western part of the site and comprises specialty shops (some 1,400m²) and a supermarket (some 1,800m²). The supermarket is currently vacant (previously an IGA supermarket) as are some specialty shops. Parking for Kingsway Plaza (some 92 spaces) is located in an at grade car park on the eastern part of the site. Access to the car park is provided from Barton Street and the service lane.
- 2.2 The eastern and western parts of the site are separated by the service lane. In addition to providing access to the car park, this lane provides access to the rear of the commercial premises with frontage to Lang Street. Surrounding land use is commercial development within Kurri Kurri town centre and includes a KFC to the east, Aldi to the south and Kurri Kurri hotel to the west.

Road Network

- 2.3 The road network in the vicinity of the site comprises Barton Street, Hampden Street, Victoria Street, Lang Street and the service lane connecting Barton Street and Victoria Street. Adjacent to the site, Barton Street provides one traffic lane in each direction, with 90 degree parking on the northern side of the road and 45 degree parking on the southern side of the road. The on street parking on the
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northern side of Barton Street has generally been used by Kingsway Plaza customers.

- 2.4 Victoria Street is located to the east of the site. It forms part of Route B68 that connects Cessnock with the M1 Motorway at Beresfield. It provides two traffic lanes in each direction within a dual carriageway. The intersection, of Barton Street and Victoria Street is a priority controlled t-intersection with a separate right turn bay on Victoria Street and no right turn out of Barton Street. Pedestrian signals are located on Victoria Street between Lang Street and the service lane.
- 2.5 Hampden Street is located west of the site. It provides one traffic lane in each direction, with bus stops located on either side of the road in the section between Barton Street and Lang Street. South of Barton Street, 90 degree parking is located on the western side of the road. The intersection of Barton Street and Hampden Street is priority controlled intersection, with Hampden Street the major road.
- 2.6 Lang Street is located to the north of the site and is 'Main Street' through Kurri Kurri town centre. It provides one traffic lane in each direction, with angled parking either side of the road and centrally between the traffic lanes. The intersections of Lang Street with Victoria Street and Hampden Street are roundabout controlled. Some customers to Kingsway Plaza use the on street parking in Lang Street.
- 2.7 The service lane connects Barton Street with Victoria Street. It has a variable width (generally some six metres wide) and caters for two way traffic. It provides access to the plaza at grade car park and to the rear of properties with frontage to

Lang Street. Traffic movements at the intersection of the lane with Victoria Street are limited to left in/left out by the median in Victoria Street.

2.8 The 2018 Cessnock LGA Traffic and Transport Strategy and the Kurri Kurri district strategy identify a number of future road network upgrades in the area. These include:

- upgrade the roundabout at the intersection of Lang Street/Victoria Street to traffic signals to improve capacity and cater for pedestrians (no timing or funding). This includes removal of the existing pedestrian signals on Victoria Street;
- work with landowners to provide a pedestrian link between Barton Street and Lang Street, west of Hampden Street; and
- streetscape improvements to Barton Street (between Hampden Street and Victoria Street).

Traffic Flows

2.9 Traffic generated by the proposed development will have its greatest effects during weekday afternoon peak period when it combines with other traffic on the surrounding road network. In order to gauge traffic conditions, counts were undertaken on Wednesday 7 December (between 4.00pm and 6.00pm) at the following intersections:

- Barton Street/Hampden Street;
 - Barton Street/Victoria Street;
 - Barton Street/Service Lane;
 - Barton Street/car park accesses; and
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- Victoria Street

2.10 The results of the surveys are summarised in Table 2.1 and displayed in Figures 2 and 3.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows	
Road	Weekday Afternoon
Barton Street	
– west of Hampden Street	490
– east of Hampden Street	255
– east of Victoria Street	336
Hampden Street	
– north of Barton Street	290
– south of Barton Street	201
Victoria Street	
– north of Barton Street	808
– south of Barton Street	942
Plaza Car Park	
– north of Barton Street	43
Service Lane	
– north of Barton Street	3
– west of Victoria Street	10

2.11 Table 2.1 reveals that:

- Barton Street carried some 250 to 500 vehicles per hour two-way during the weekday afternoon peak hour;
- Hampden Street carried some 200 to 300 vehicles per hour two-way during the weekday afternoon peak hour;
- Victoria Street carried some 800 to 950 vehicles per hour two-way during the weekday afternoon peak hour;

- the service lane carried some 10 vehicles per hour two-way during the weekday afternoon peak hour; and
- the plaza car park generated some 45 vehicles per hour two-way during the weekday afternoon peak hour.

Intersection Operations

- 2.12 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using a SIDRA Network Model for the traffic flows shown in Figures 2 and 3.
- 2.13 SIDRA Network provides a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.
- 2.14 Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):
- 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, stop signs and roundabouts, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to 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

2.15 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.

2.16 The analysis found that the:

- the intersection of Barton Street and Victoria Street operates with average delays of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B, a good level of service; and
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- the intersection of Barton Street and Hampden Street operates with average delays of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B, a good level of service;

Public Transport

2.17 The site is adjacent to bus services which operate along Barton Street and Hampden Street. Services are provided by Transport NSW. Bus stops are located on Barton Street (west of Victoria Street) and Hampden Street (north of Barton Street). Services include:

- Route 160: Cessnock to Newcastle;
- Route 163: Cessnock to Morisset via Kurri Kurri;
- Route 164: Cessnock to Maitland via Kurri Kurri;
- Route 166: Kurri Kurri to Maitland;
- Route 171: Kurri Kurri to Weston; and
- Route 172: Kurri Kurri Rotary Park to Deakin Street.

2.18 The site therefore has access to public transport services.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 This chapter assesses the implications of the proposed development through the following sections.

- proposed development;
- public transport;
- parking provision;
- access, parking layout and servicing;
- traffic effects;
- pre-DA matters raised by Council; and
- summary.

Proposed Development

3.2 The proposed development would replace the existing retail (some 3,200m²) on the site with a new supermarket (some 3,522m²) and specialty shops (some 650m²). 154 parking spaces will be provided in a new upper level (32 spaces) and undercroft (122 spaces) parking areas. Access to the site will be provided from the service lane and Barton Street. In association with the proposed development, part of this service lane will be relocated to the western boundary of the site (some 50 metres). The proposed development will provide pedestrian access between Barton Street and Lang Street.

Public Transport

3.3 As previously discussed, a number of bus services run along Barton Street and Hampden Street adjacent to the site. The site therefore has access to public

transport. The proposed development will increase retail and employment densities close to public transport services. The proposal would therefore strengthen the existing demand for these services.

3.4 The proposed development is therefore consistent with government objectives and the planning principles of:

- (a) improving accessibility to employment and services by walking, cycling, and public transport;
- (b) improving the choice of transport and reducing dependence solely on cars for travel purposes;
- (c) moderating growth in the demand for travel and the distances travelled, especially by car; and
- (d) supporting the efficient and viable operation of public transport services.

Parking Provision

3.5 Council parking requirements are set out in Part C of the Cessnock DCP 2010. For shops and general business the DCP suggests the following rates:

- shops less than 1,000m² – 1 space per 20m²;
- shops greater than 1,000m² – 1 space per 15m².

3.6 The new supermarket includes office space and a direct to boot (DTB), which are not retail space. For the office space (232m²), the DCP office rate (1/30m²) has

been applied. For the DTB (112m²) the DCP industrial rate has been applied (1/75m²).

- 3.7 The existing Kingsway Plaza is some 3,200m², comprising 1,400m² specialty shops (all less than 1,000m²) and a 1,800m² supermarket. The proposed development is some 3,829m², comprising 650m² specialty shops and 3,179m² supermarket plus the DTB and office space.
- 3.8 The DTB (six spaces) would be used by some 30 vehicles per hour, which normally would have parked in the car park. The shopper spaces in the car parking have turnover of some 30 minutes duration. Hence the 30 vehicles per hour using the DTB reduce the required parking provision by 15 spaces.
- 3.9 The additional parking required for the proposed development is set out below in Table 3.1. This includes the 15 space discount resulting from the DTB.

Table 3.1	Summary of Additional Parking Required (DCP)				
Component	Existing Area	DA Area	Additional Area	Rate	Parking Required
Supermarket	1,800m ²	3,179m ²	+ 1,379m ²	1/15m ²	+ 92
Specialty shops	1,400m ²	650m ²	- 750m ²	1/20m ²	- 38
Office	0	232m ²	+ 232m ²	1/30m ²	+ 8
DTB	0	112m ²	+ 112m ²	1/75m ²	+ 2
				Sub-Total	+ 64
Discount to retail parking as a result of DTB					- 15
				Total	+ 49 spaces

- 3.10 Examination of Table 3.1 shows a requirement for an additional 49 parking spaces. The existing plaza car park provides 92 spaces and the new car park 154 spaces. This is an increase of 62 spaces, which is the equivalent to a surplus of 13 spaces.

- 3.11 To accommodate the relocated service lane and car park/loading dock accesses, the on street parking along the northern side of Barton Street has been reconfigured. This results in a loss of four on street spaces. The loss of four on street spaces is offset by the surplus of 13 spaces in the car park.
- 3.12 Parking requirements have also been assessed using TfNSW rates which are based on extensive surveys. When the retail uses are known within a shopping centre, the following rates are suggested:
- 4.2 spaces per 100m² for supermarkets; and
 - 4.5 spaces per 100m² for specialty shops; and
 - 0.9 spaces per 100m² for ancillary office.
- 3.13 Applying these rates, parking for the proposed development is set out in Table 3.2.

Table 3.2	Parking Required (TfNSW)		
Component	DA Area	Rate	Parking Required
Supermarket	3,179m ²	4.2/100m ²	133
Specialty shops	650m ²	4.5/100m ²	29
Office	232m ²	0.9/100m ²	2
DTB	112m ²	1/75m ²	2
		Sub-Total	166
Discount to retail parking as a result of DTB			- 15
		Total	151

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- 3.14 Examination of Table 3.2 show a requirement for 151 spaces. Including the four lots on-street spaces, the requirement is 155 spaces.
- 3.15 The on street parking in Lang Street and the northern side of Barton Street has generally been used by Kingsway Plaza customers. Noting this, the proposed parking provision is appropriate.
- 3.16 With regards to motorcycle and bicycle parking the DCP does not include specific rates. An appropriate provision would be one motorcycle and one bicycle space per 20 car parking spaces. This would result in a provision of 8 motorcycle and 8 bicycle spaces.

Access, Parking Layout and Servicing

- 3.17 Access to parking areas will be provided by a combined entry and exit driveway to the upper level car park from the service lane, a combined entry/exit driveway to the undercroft car park (western access) from Barton Street, an exit driveway from the undercroft car park (eastern access) to Barton Street. Loading dock access will be from Barton Street. The upper level car park will provide 32 spaces. The undercroft car park will provide 122 spaces (including six pick-up spaces) with one way clockwise circulation.
- 3.18 The new car parks will be designed to comply with the requirements of AS2890.1-2004 and AS2890.6-2009 with respect to parking space dimensions, provision of shared zones for accessible spaces and aisle widths. A one-way ramp will allow for cars in the upper level car park to access the undercroft car park.
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- 3.19 Service arrangements will be provided in accordance with AS2890.2:2018. Service vehicles will access the site from Barton Street, entering and departing the dock in a forward direction. The largest truck that will access the site will be a 14.4 metre long articulated truck.
- 3.20 The loading dock will provide four service bays:
- two service bays for the supermarket (one accessible by a 14.4 metre long articulated truck and the other by an 8.8 metre rigid truck);
 - a waste compactor (accessible by a 10.7 metre long waste truck); and
 - a service bay for the specialty shops (accessible by a 6.4 metre long small rigid truck).
- 3.21 Vehicle swept paths are provided in Attachment A.
- 3.22 Following DA approval, access arrangements, parking layout, servicing and vehicle swept paths should be reviewed and confirmed for compliance certification.

Traffic Effects

- 3.23 Traffic generated by the proposed development will have its greatest effects during the weekday afternoon peak period when it combines with other traffic on the surrounding road network.
- 3.24 Estimates of traffic generated by the proposed alterations and additions have been based on the TfNSW rates as set out below:
- supermarket – 15.5 vehicles per hour per 100m²;
-

- specialty retail - 4.6 vehicles per hour per 100m²;

3.25 Applying these rates, the proposed development would therefore generate some 580 vehicles per hour (two way) in the weekday afternoon peak hour. TfNSW Guidelines suggest that some 25% of the traffic generated would be passing trade.

3.26 The additional traffic has been assigned to the road network as shown in Figure 2 and summarized in Table 3.2. This is a conservative approach as no discount for the existing uses on the site has been applied. Based on the above rates, the previous supermarket (some 1,800m²), and other retail (some 1,400m² - vacant and operational) generated some 340 vehicles per hour (two way) in the weekday afternoon peak hour.

Table 3.2: Existing + Development Two-Way (Sum of Both Directions) Peak Hour Traffic Flows		
Road	Weekday Afternoon	
Barton Street		
– west of Hampden Street	490	+180
– east of Hampden Street	255	+280
– west of Victoria Street	336	+265
Hampden Street		
– north of Barton Street	290	+40
– south of Barton Street	201	+60
Victoria Street		
– north of Barton Street	808	+140
– south of Barton Street	942	+45
Plaza Car Park		
– north of Barton Street	43	+460
Service Lane		
– north of Barton Street	3	+100
– west of Victoria Street	10	+20

3.27 Table 3.2 shows the following additional traffic flows during the weekday afternoon peak hour:

- some 180 to 280 additional vehicles (two way) on Barton Street;
- some 45 to 140 additional vehicles (two way) on Victoria Street;
- some 40 to 60 additional vehicles per hour (two way) on Hampden Street;
and
- some 20 to 100 additional vehicles per hour (two way) on the service lane.
The higher increase is in the short section between Barton Street and the car park access.

3.28 The intersections analysed in Chapter 2 have been reanalysed with the development traffic in place using SIDRA. The results of the analyses are summarised below:

- the intersection of Barton Street and Victoria Street would continue to operate with average delays of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B, a good level of service;
 - the intersection of Barton Street and Hampden Street would continue to operate with average delays of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B, a good level of service; and
 - the intersections of the Barton Street with the site accesses and the service lane would operate with average delays of less than 15 seconds per vehicle in
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the weekday afternoon peak hour. This represents level of service A/B, a good level of service.

- 3.29 As noted previously the western section of the existing service lane will be relocated to the western boundary of the site. This allows the site to be consolidated into one block. The relocated lane will have a minimum width of six metres (as per the existing situation). Relocation of the lane will have no impact on accessibility to the rear of the properties with frontage to Lang Street (as existing access is maintained). Two way traffic flow in the lane will remain the same as today.
- 3.30 In pre-DA advice, Council indicated that it would prefer traffic flow to be one way. While not considered necessary, if one way flow was provided, it is suggested that it should be one way clockwise and access to the upper level car park should be entry only.
- 3.31 Thus, in summary, the adjacent road network will be able to accommodate the traffic generated by the proposed development.

Response to Pre-DA Matters Raised by Council

- 3.32 Council raised the following general traffic matters in pre-DA:

Traffic

- *A traffic impact assessment. Any intersection and external road impact;*
 - *Impacts of the proposed development on the Kurri Kurri masterplan and infrastructure upgraded within the immediate area*
-

- 3.33 This report assesses the traffic impacts of the proposed development on the external road network.

Roads

- *a plan indicating road network compliance with DCP;*
- *sight distance at intersections;*
- *waste collection;*
- *new laneway width to be consistent with existing laneway width. Concept plans showing adequate details;*
- *Council prefers the laneway to operate one-way;*
- *consideration should also be given to the potential interaction of pedestrians and vehicles/trucks.*

- 3.34 With regards to the above matters:

- the proposed development provides a pedestrian link between Lang Street and Barton Street as per the DCP;
 - sight distance at access driveways will comply with AS2890.1-2004 with provision of 2.0m x 2.5m splays. Sight lines at existing intersections are unchanged. Sight lines at relocated laneway intersection will be designed comply with Austroads;
 - waste collection provided with loading dock with trucks entering and departing in a forward direction;
 - the relocated lane will have a minimum width of six metres (as per the existing situation). Detailed plans are being prepared by others;
 - two way traffic flow in the lane will remain the same as today. While not considered necessary, if one way flow was provided, it is suggested that it
-

should be one way clockwise and access to the upper level car park should be entry only;

- trucks will enter and depart the loading dock in a forward direction with adequate sight lines for trucks to see pedestrians on entry/exit (and vice versa). If required additional measures such as a warning light could be provided to advise pedestrians when a truck is exiting the site.

Access

- *to comply with AS2890. Turning paths to show compliance.*

3.35 Swept paths are shown in Attachment A. The new car parks will be designed to comply with the requirements of AS2890.1-2004 and AS2890.6-2009 with respect to parking space dimensions, provision of shared zones for accessible spaces and aisle widths.

Parking

- *In accordance with parking rates outlined in Council's DCP. On road parking not included in parking requirements. Parking plans in accordance with As2890. Where parking is inconsistent with the requirements of the DCP, detailed justification to be provided. This will be considered by Council in its assessment of the application.*

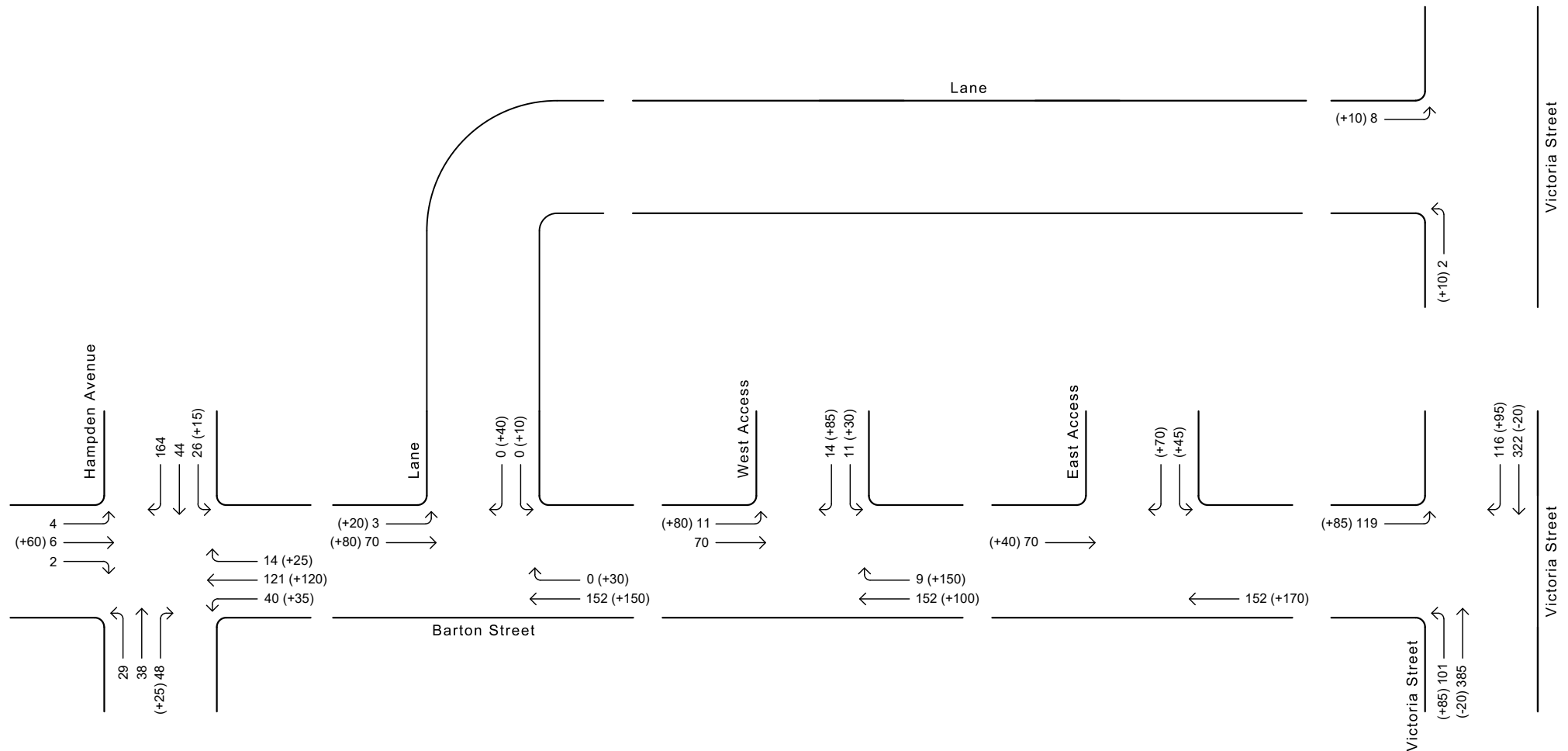
3.36 Parking requirements have been assessed as follows:

- using DCP rates (based on additional floor area) and found to comply; and
 - using TfNSW rates (based on proposed floor area) and found to comply.
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Summary

- 3.37 In summary, the main points relating to the traffic implications of the proposed development are:
- i) the proposed development is for a supermarket and specialty shops;
 - ii) the site has access to public transport services;
 - iii) the proposed parking provision is appropriate;
 - iv) access, parking layout and servicing are appropriate;
 - v) following DA approval, access arrangements, parking layout, servicing and vehicle swept paths should be reviewed and confirmed for compliance certification;
 - vi) the adjacent road network will be able to accommodate the traffic generated by the proposed development; and
 - vii) the pre DA traffic matters raised by Council have been addressed.
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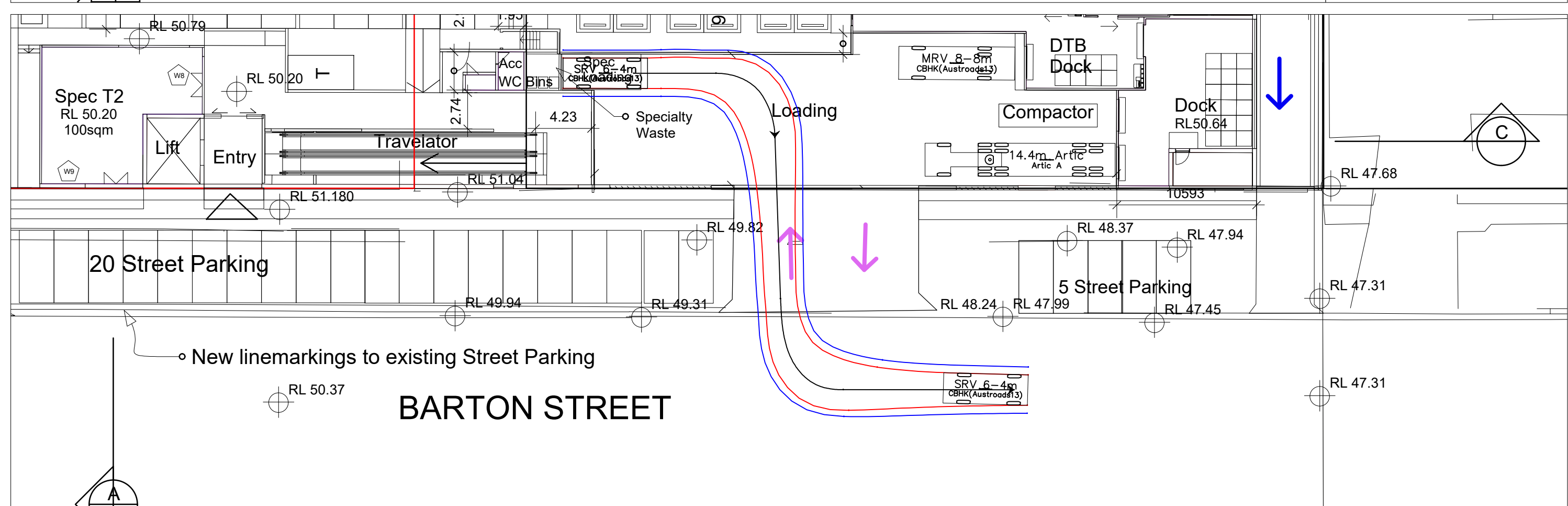
Figure 1



**Existing weekday afternoon
peak hour traffic flows plus
development traffic
Figure 2**

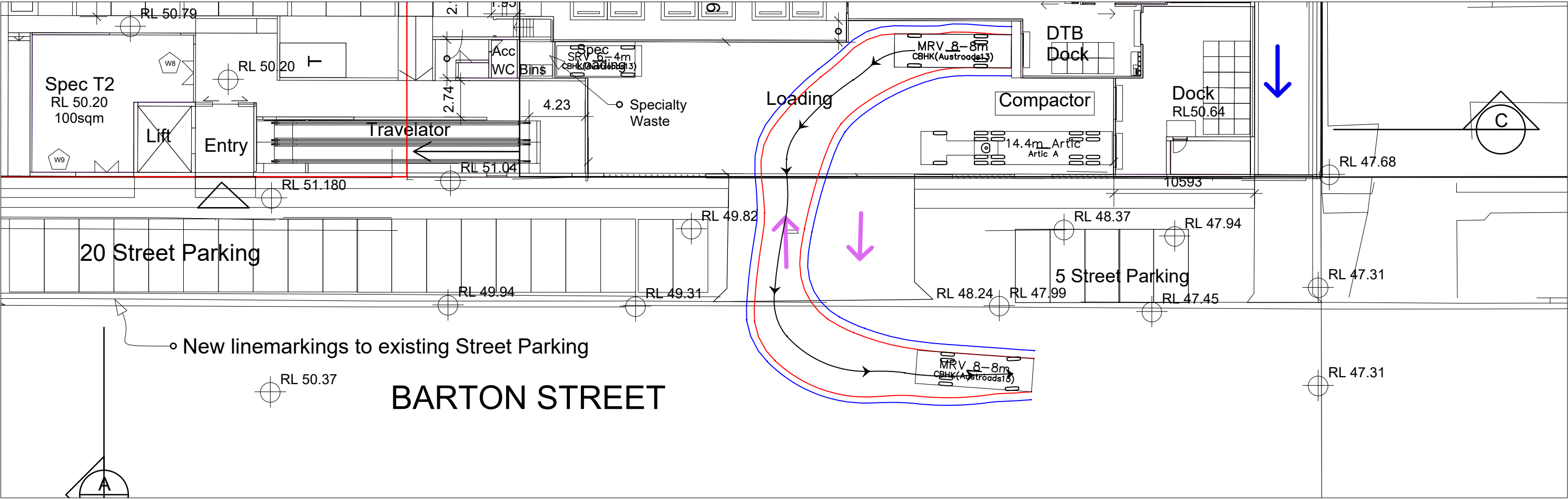
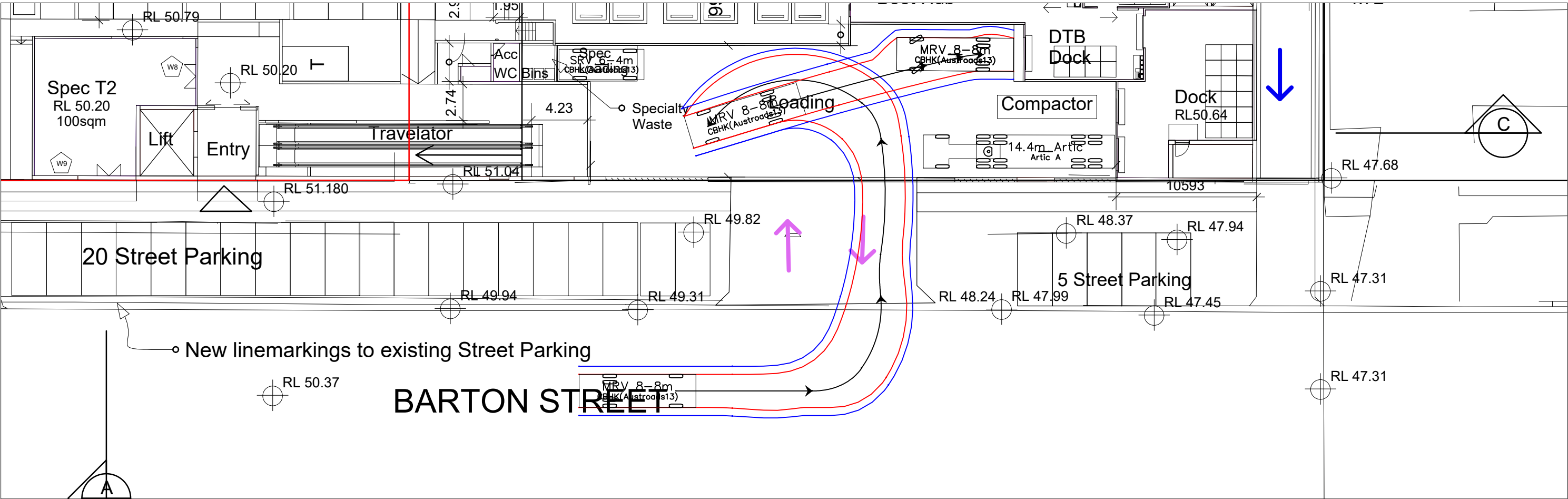
ATTACHMENT A

VEHICLE TURN PATHS



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

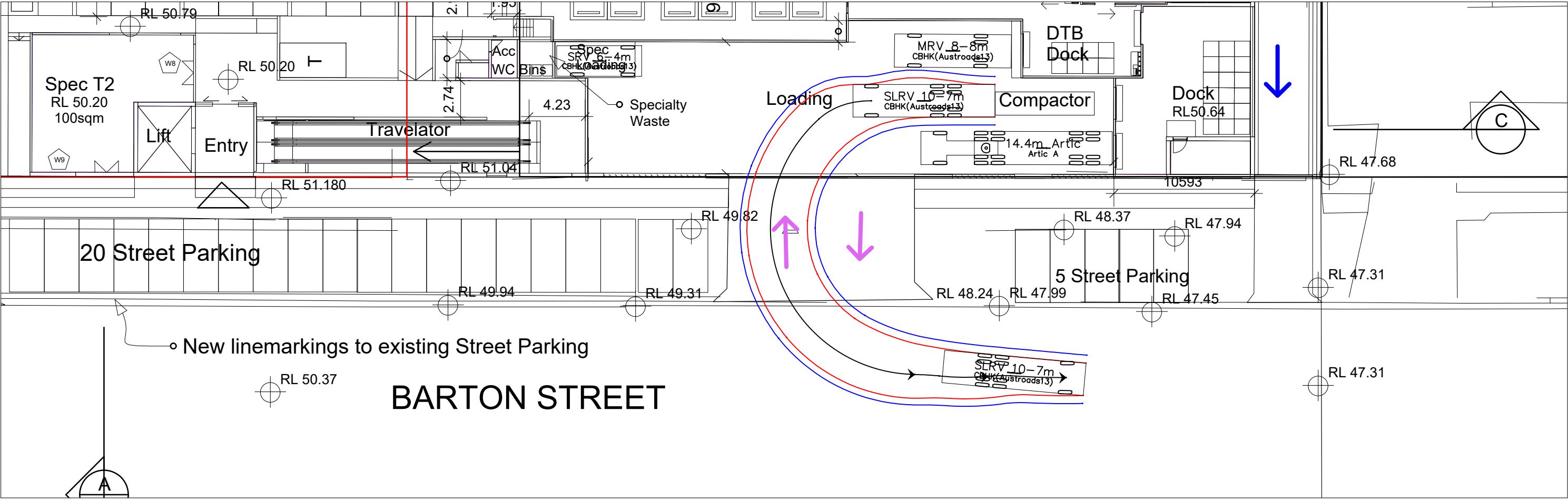
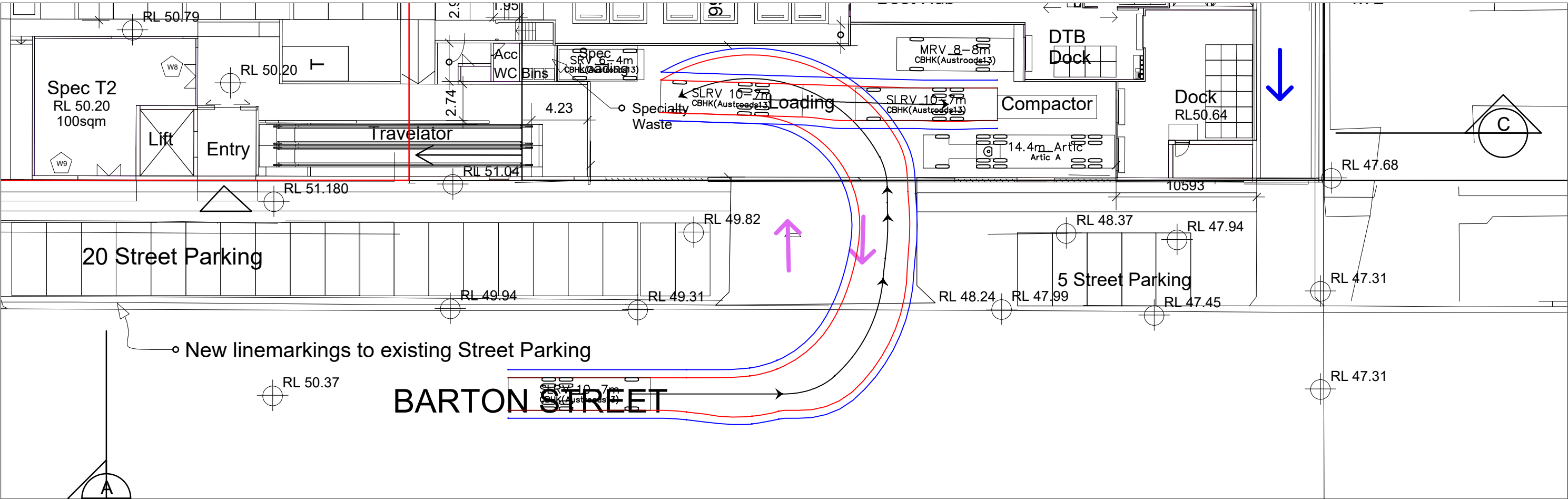
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NOTE:
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SURVEY AND FINAL DESIGN. TRAFFIC MEASURES
PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND
ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

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

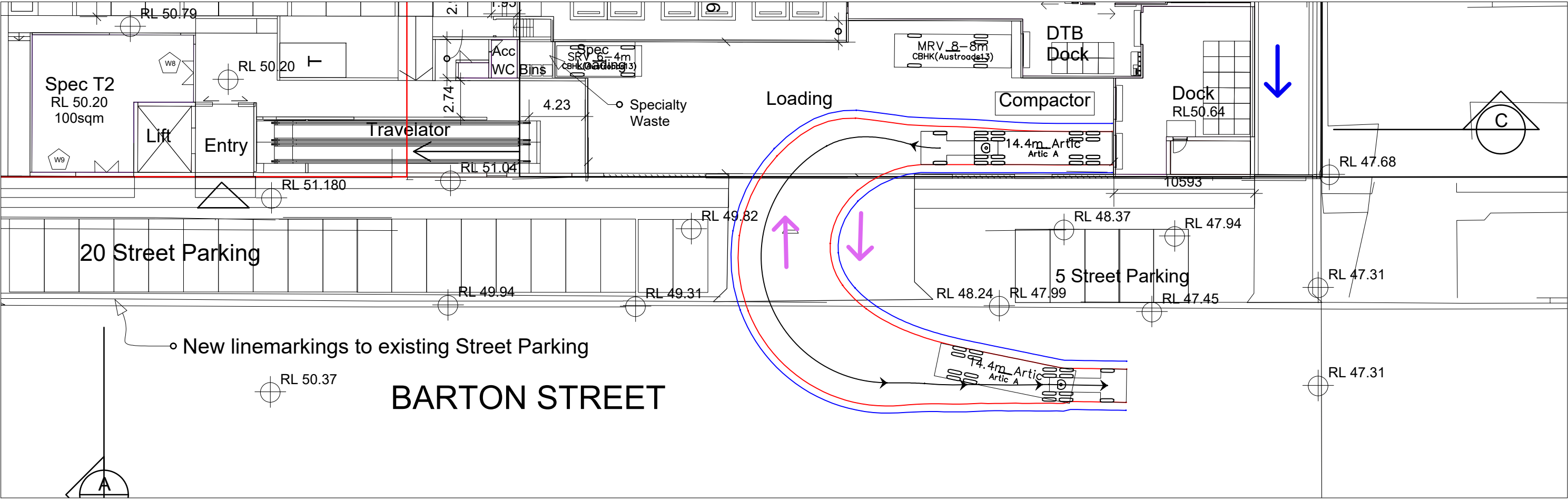
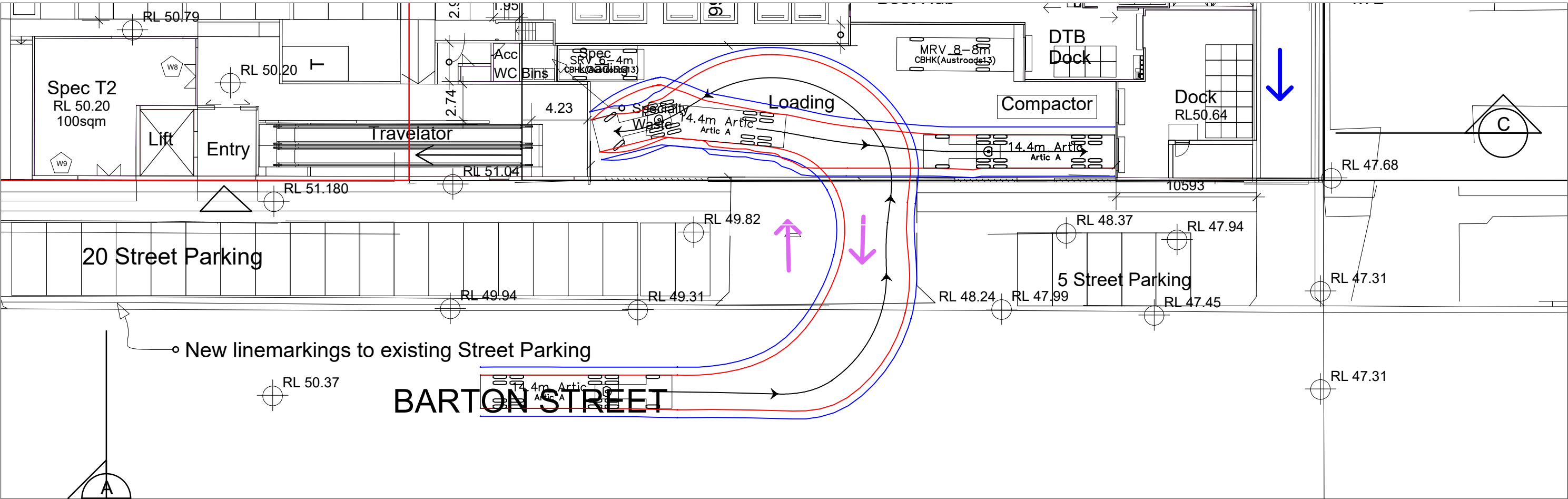
8.8m MEDIUM RIGID VEHICLE
SWEPT PATHS



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

10.7m LARGE RIGID VEHICLE
SWEPT PATHS



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

14.4m ARTICULATED
VEHICLE SWEEP PATHS