

5817

8th December 2015

Alisa Huang  
Gus Fares Architects Pty Ltd  
Suite 22, 103 George Street  
Parramatta, NSW, 2150

Dear Alisa

## Re: Proposed Residential Flat Building, 17-23 Goulburn Street, Liverpool – Traffic and Parking Assessment.

### Introduction

MRCagney has been commissioned by Gus Fares Architects Pty Ltd to prepare a Traffic and Parking Assessment for the proposed Residential Flat Building at 17-23 Goulburn Street, Liverpool.

The scope of this commissioning is to review the traffic and parking implications for the proposed development. The report will also provide advice on access issues and the development's internal car park layout.

The issues relevant to the proposal are:

- Assess the impact on the adjoining road network to account for the proposed development's land uses;
- Review the access arrangements for the development;
- Review the internal site layout; and
- Assess any other transport impacts associated with the development.

The objective of this report is to document the traffic impacts of the proposed Residential Flat Building and provide advice on any infrastructure work required as part of the development.

It is noted that on the 29<sup>th</sup> September 2015 Liverpool City Council issued their Pre-lodgement Application Advice for the proposed development. The comments made with respect to traffic and transport were as follows:

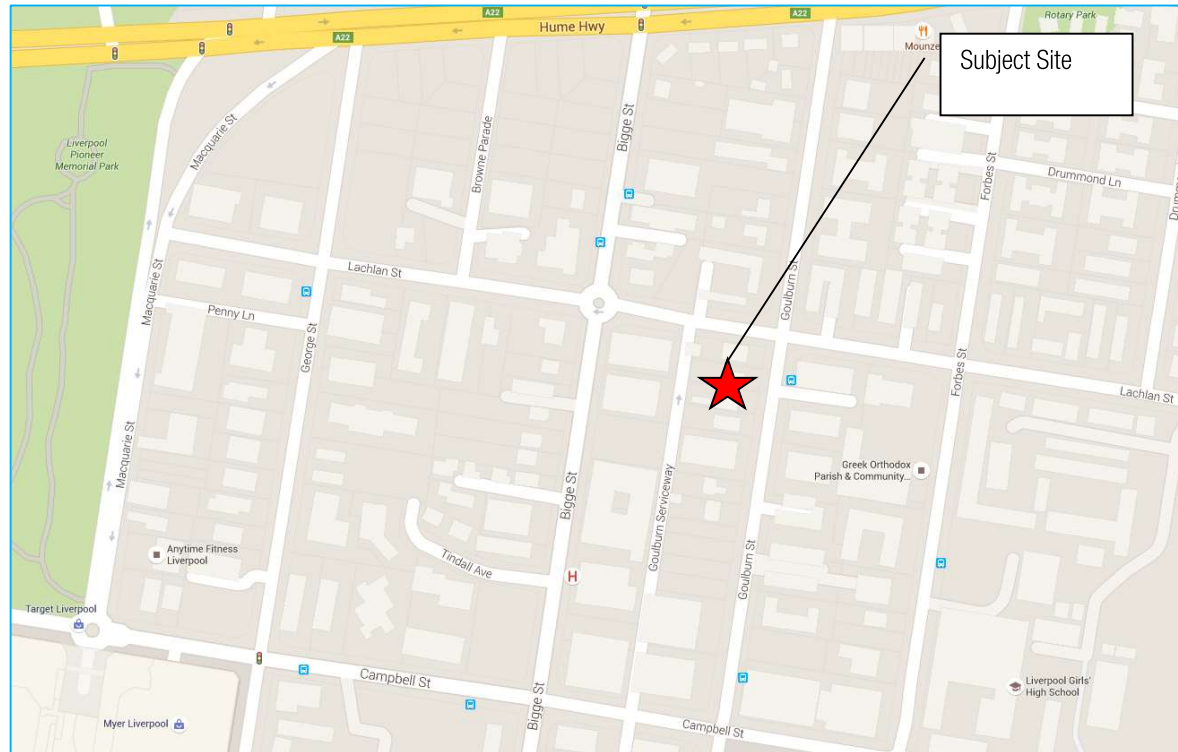
- The application shall be supported by a Traffic Impact Report prepared by a suitably qualified Traffic Consultant;
- Driveway to be located in the Goulburn Lane or the southern boundary in Goulburn Street;
- Car park and driveway provision and design to be in accordance with DCP and AS2890 Parts 1, 2 and 6; and
- Turning path analysis to be provided in accordance with DCP and AS2890 Parts 1, 2 and 6.

This traffic assessment has addressed each of these points.

## Subject Site

The subject site is located at 17-23 Goulburn Street Liverpool, with additional frontage to Lachlan Street and the Goulburn Serviceway. The location of the subject site is displayed below in Figure 1.

Figure 1 – Development Subject Site



The subject site is currently occupied by a small number of low density residential dwellings.

The Liverpool City Centre Local Environmental Plan 2007 zones the site as “R4 – High Density Residential”. Thus the proposed development’s land uses are consistent with this zoning.

Goulburn Street is a local road with a 50km/h speed limit with a single travel lane and parking lane in either direction. Footpaths, kerbs and gutters and street lighting are provided on both verges within the road reserve for Goulburn Street. The overall alignment of the road is good, with straight sections offering good visibility.

Goulburn Serviceway is a rear access lane, with a single travel lane that operates in a south to north direction. It operates as an area of “high pedestrian activity” and operates with a 40km/h speed limits. Access/egress to/from the developments on Goulburn Street is typically provided from the Goulburn Serviceway.

## Public Transport

The subject is located approximately 800m walking distance from Warwick Farm Station.

Warwick Farm Station is located on the following train lines:

- T2 Inner West and South Line;
- T3 Bankstown Line; and
- T5 Cumberland Line.

These lines provide direct access to a large number of population and commercial centres in Greater Sydney, including Liverpool, Cabramatta, Blacktown, Parramatta, Strathfield and the Sydney CBD.

The 823 bus service operates on Goulburn Street and provides a service between Warwick Farm and Liverpool, typically operating with an hourly frequency.

In addition to the train line and Goulburn Street buses, a significant number of bus services operate on Elizabeth Street, approximately 450m to the south of the subject site, these include:

- 801 service – Badgerys Creek to Liverpool via Kemps Creek, Cecil Hills and Bonnyrigg Heights;
- 802 service – Parramatta to Liverpool via Merrylands, Fowler Road (Merrylands West), Fairfield, Thorney Road (Fairfield West), Wakeley, Bonnyrigg, Miller and Cartwright;
- 804 service – Parramatta to Liverpool via Merrylands, Chetwynd Road (Guildford), Fairfield, Hamilton Road (Fairfield West), Greenfield Park, Bonnyrigg, Hinchinbrook, Miller and Sadleir;
- 805 service – Cabramatta to Liverpool via St Johns Road (Cabramatta West), Bonnyrigg, Bonnyrigg Heights, Green Valley, Busby, Heckenberg and Ashcroft;
- 806 service – Parramatta to Liverpool via Merrylands, Greystanes, Wetherill Park, Prairiewood, Abbotsbury, Edensor Park and Bonnyrigg;
- 808 service – Fairfield to Liverpool via Brenan Street (Smithfield), Prairiewood, Bossley Park, Abbotsbury, Edensor Park, Bonnyrigg and Mt Pritchard;
- 823 service – Warwick Farm to Liverpool;
- 827 service – Liverpool to Cecil Hills via Heckenberg, Green Valley and Bonnyrigg Heights;
- 853 service – Carnes Hill to Liverpool via Middleton Grange and Hoxton Park Road;
- 854 service – Carnes Hill to Liverpool via Hoxton Park Road;
- 855 service – Austral to Liverpool via Prestons and Churchill Gardens;
- 857 service – Narellan to Liverpool via Prestons and Churchill Gardens;
- 901 service – Liverpool to Holsworthy via Wattle Grove;
- 902 service – Liverpool to Holsworthy via Moorebank and Hammondville;
- 903 service – Chipping Norton to Liverpool;
- 904 service – Fairfield to Lansvale & Liverpool via Carramar and Lansvale.
- M90 service – Liverpool to Burwood via Moorebank, Milperra, Bankstown, Greenacre, Chullora and Strathfield.

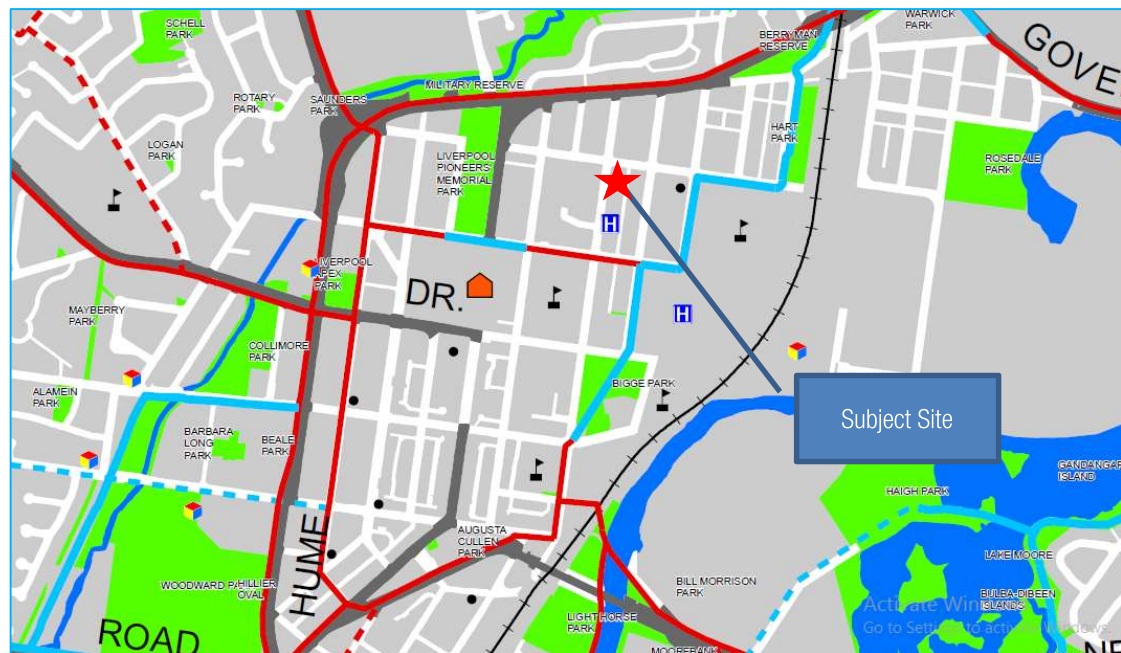
Accordingly, the subject site is very well served by public transport.

#### Active Transport

Footpaths are provided on the roads in proximity to the subject site to facilitate the movement of pedestrians. Pedestrian crossings are located at the intersection of Goulburn Street and Elizabeth Street.

As can be seen in Figure 2 (sourced from the Liverpool City Council Locality Map), a number of existing cycle routes (blue lines) and proposed cycle routes (red lines) are located in proximity to the subject site.

### Figure 2 – Liverpool Council Bicycle Map



## Proposed Development and Impact Assessment

The Residential Flat Building is proposed to consist of 108 dwellings, as follows:

- 24 – one bedroom dwellings;
- 75 – two bedroom dwellings; and
- 9 – three bedroom dwellings.

Trip generation for the proposed development has been undertaken in accordance with the RMS Technical Direction (TDT 2013/04a) Guide to Traffic Generating Developments Updated traffic surveys.

The Technical Direction indicates that based upon surveys conducted in 2012 that the average trip rate for high density residential developments in Sydney is 0.19 trips per unit in AM peak periods and 0.15 trips in PM peak periods.

Based on these rates, the proposed development is expected to generate approximately 18 - 22 peak hour trips. At an average of (approximately) a trip per 3 minutes, the traffic impacts of the proposed Residential Flat Building are expected to be negligible. Therefore, as agreed with a Senior Development Planner from Liverpool City Council (Mr George Nehme) due to the low traffic generation of the proposed development detailed intersection analysis is not warranted.

## Parking Provision

The Liverpool Development Control Plan 2008 Part 1 General Controls for all Development, specifies the following parking requirement for residential developments located in the Liverpool City Centre, as follows:

- 1 space per one bedroom apartments;
- 1 space per two bedroom apartments;
- 1.5 spaces per spaces per three bedroom apartments; and
- 1 visitor space per 10 units.

The parking provision requirements for the proposed Residential Flat Building is presented below in Table 1.

Table 1 – Parking Specifications

Type	Volume	Parking Requirement
1 bedroom dwellings	24	24
2 bedroom dwellings	75	75
3 bedroom dwellings	9	14
Visitor Parking		11
Total	108	124

The data in Table 1 indicates that the proposed Residential Flat Building requires a minimum of 124 parking bays. The proposed development provides 130 parking bays within two basement parking levels and thus complies with DCP specifications. It is noted that proposed development's car park includes 3 parking bays for the mobility impaired and 16 tandem bays.

With respect to the provision of service bays, the DCP specifies that service vehicle bays (including removalist van and car wash bays) should be provided at 1 space per 40 units. The proposed development provides 2 car wash bays and a loading dock capable of accommodating an Australian Standard Small Rigid Vehicle (6.4m) and a small waste collection vehicle, and thus complies with DCP specifications.

The DCP also specifies that motorcycle parking should be provided at a rate of 1 space per 20 car spaces, this corresponds to a requirement for 7 motorcycle parking bays. The proposed development provides 7 motorcycle parking bays on the basement 1 parking level and thus complies with DCP specifications.

The DCP further specifies that bicycle parking should be provided for all developments at a rate of 1 space per 200sqm of leasable floor area. The gross floor area of the development is approximately 9,286sqm, this corresponds to a requirement for 46 bicycle parking bays. The proposed Residential Flat Building provides 46 bicycle parking bays and thus complies with DCP specifications.

### Car Park Assessment

Australian Standard AS 2890.1:2004 Off-street car parking classifies residential car parks as User Class 1A parking facilities. Accordingly the minimum requirements for ninety degree parking spaces are as follows:

- Bay widths of 2.4m;
- Bay lengths of 5.4m; and
- Aisle widths of 5.8m.

The Liverpool DCP specifications for residential car parks are as follows:

- Bay widths of 2.4m;
- Bay lengths of 5.4m; and
- Aisle widths of 6.2m.

As displayed in Figure 2 and Figure 3 of Appendix A, the proposed Residential Flat Building car park provides parking bays with dimensions of 2.4m by 5.4m and aisle widths of 6.5m and thus complies with Australian Standards and DCP specifications.

It is noted however, that for bay 50 on the basement 1 level and bay 120 on the basement 2 level, the curved ramp slightly truncates the bay corners. While an Australian Standard vehicle will be able to stand wholly within these bays, in order to be conservative it is recommended that they be designated as small parking bays. AS2890.1:2004 specifies the minimum dimension for small parking bays as 2.3m by 5.0m and bays 50 and 120 comply with these specifications.

AS2890.1:2004 recommends that the aisle shall be extended a minimum of 1m beyond the last parking space at blind aisles and an additional 0.3m width should be provided to parking bays confined by a wall or other vertical obstructions. The proposed development car park complies with these specifications.

Australian Standards AS2890.6-2009 Off-street parking for people with disabilities specifies that disabled bays should have dimensions of 2.4m by 5.4m, with a shared space with at least equal dimensions to be provided on one side of the parking bay. The proposed development's 3 mobility impaired parking bays (bays 2, 3 and 100) comply with these specifications.

As specified by Council in their Pre-lodgement Application Advice, access to the development will be provided via the Goulburn Serviceway.

AS2890.1:2004 specifies that driveways for residential developments which are accessed from local roads and servicing car parks with 101 – 300 parking bays should be designated as category 2 driveways, and thus provide a width of 6m – 9m. The Liverpool DCP specifies that driveways serving car parks with

greater than 40 spaces should provide a width of 6m – 6.5m. As displayed in Figure 1 and Figure 2 of Appendix A, the access driveway provides a minimum width of 6.5m and thus complies with Australian Standards and also Liverpool DCP specifications.

A loading bay with dimensions of 8m by 4.5m is provided in the basement 1 parking level. This is proposed to service waste collection vehicles and other service vehicles typically of the size of an Australian Standard 6.4m Small Rigid Vehicle (SRV).

With respect to driveway / gradient, it is noted that AS2890.1:2004 specifies that a maximum gradient of 1 in 20 (5%) should be provided for the first 6m from the property boundary. Additionally the maximum gradient of up to 1 in 5 (20%) is permissible for ramps up to 20m in length, however changes in grade greater than 1 in 8 (12.5%) require the provision of transition ramps with a minimum length of 2m. The Liverpool DCP specifies that ramps up to 20m long should provide a maximum gradient of 1 in 5 (20%).

However, AS2890.2:2002 Off-street commercial vehicle facilities specifies the ramp grades for service vehicles up to the size of an SRV should be provided at a maximum gradient of 1 in 6.5 (15.4%) with maximum changes in grade of 1 in 12 (8.3%) over 4m. Additionally a 3.5m height clearance is required.

As displayed in Figure 1 - Figure 3 of Appendix A, the proposed development ramps comply with AS2890.1:2004 and AS2890.1:2002 specifications and are also consistent with Liverpool DCP 2008 specifications.

As displayed in Figure 16 of Appendix A, a ground clearance and height clearance analysis indicates an SRV could access / egress the basement 1 level and a 99th percentile motor vehicle could access / egress the basement 2 level without scraping their undersides.

As displayed in Figure 4 and Figure 5 of Appendix A, an SRV can enter the site, manoeuvre into the designated loading bay and exit the site in a forward direction. It is noted that small waste collection vehicles are typically used when there is a requirement for basement access (in the order of 6.3m – 7m in length). Accordingly the swept path analysis for the SRV is indicative of the expected site's waste collection vehicle. Based on our analysis, it is expected that the proposed Residential Flat Building's car park will operate in a safe and efficient manner.



## Summary of Findings

MRCagney has been commissioned to undertake an assessment of the traffic and parking impacts of the proposed Residential Flat Building located at 17-23 Goulburn Street, Liverpool:

- The proposed development consists of 108 dwellings;
- The subject site is located in close proximity to Warwick Farm Station and a large number of bus services and is very well served by public transport;
- Using RMS trip rates the proposed development is expected to generate approximately 18 - 22 peak hour trips. At an average of (approximately) a trip per 3 minutes, the traffic impacts of the proposed Residential Flat Building are expected to be negligible;
- The proposed development provides 130 parking bays within two basement parking levels and thus complies with DCP parking provision specifications; and
- The proposed development car park typically complies with Australian Standards and Liverpool DCP specifications.

In summary, based on the traffic engineering assessment undertaken provided the recommendations included in this assessment are adopted there appears to be no traffic engineering reason to preclude approval of the proposed development. Additionally it is considered that this report addresses the comments/queries raised by Liverpool City Council in their Pre-lodgement Application Advice (issued 29th September 2015).

Yours sincerely,

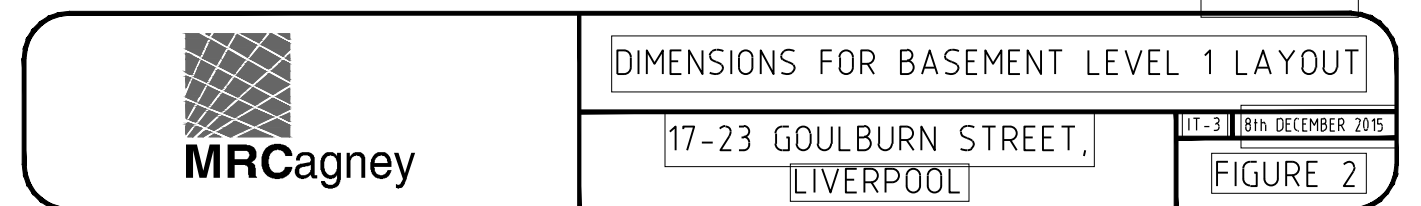
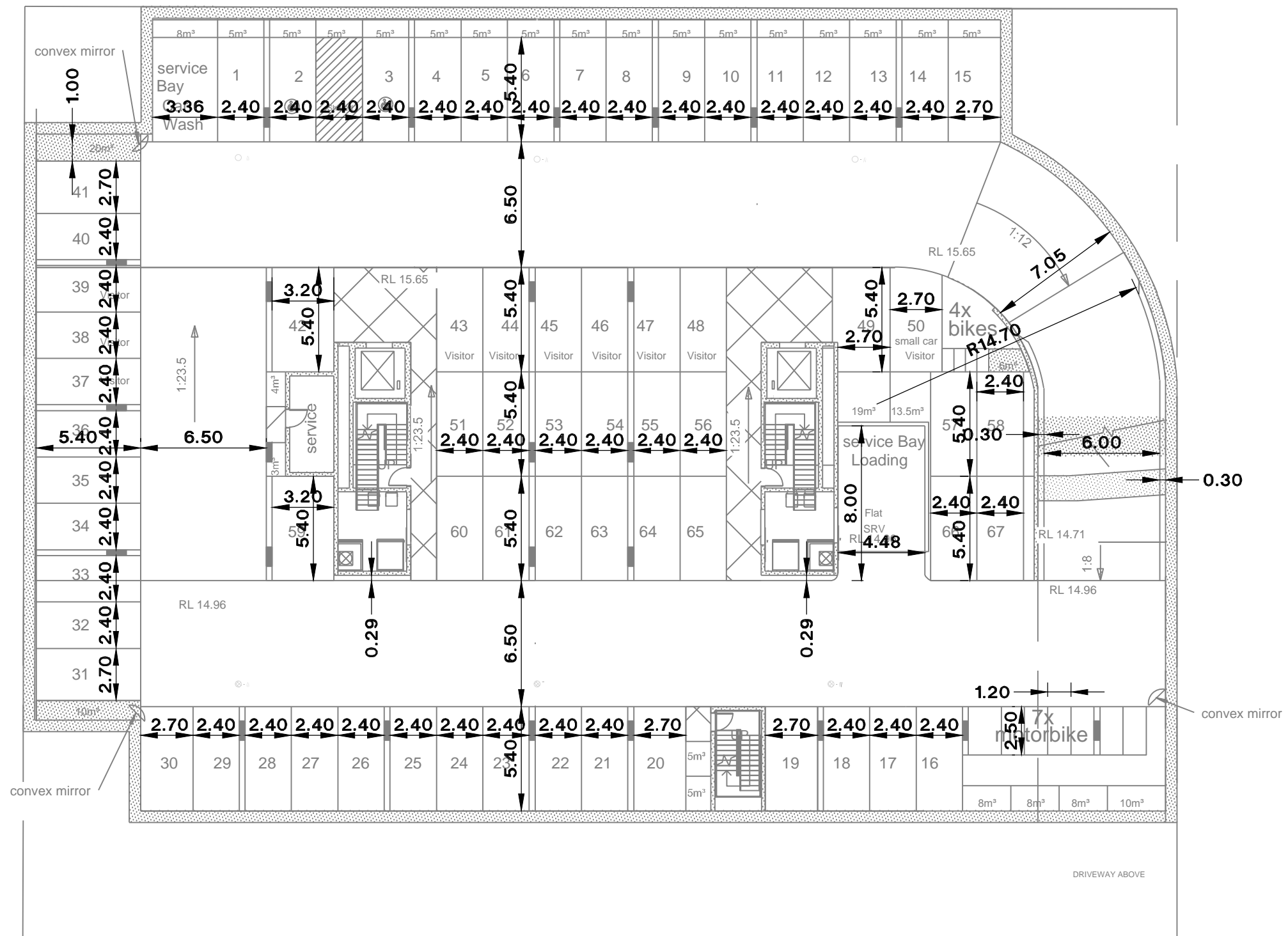
A handwritten signature in black ink that reads "Mark Lucas". The signature is written in a cursive, slightly stylized font.

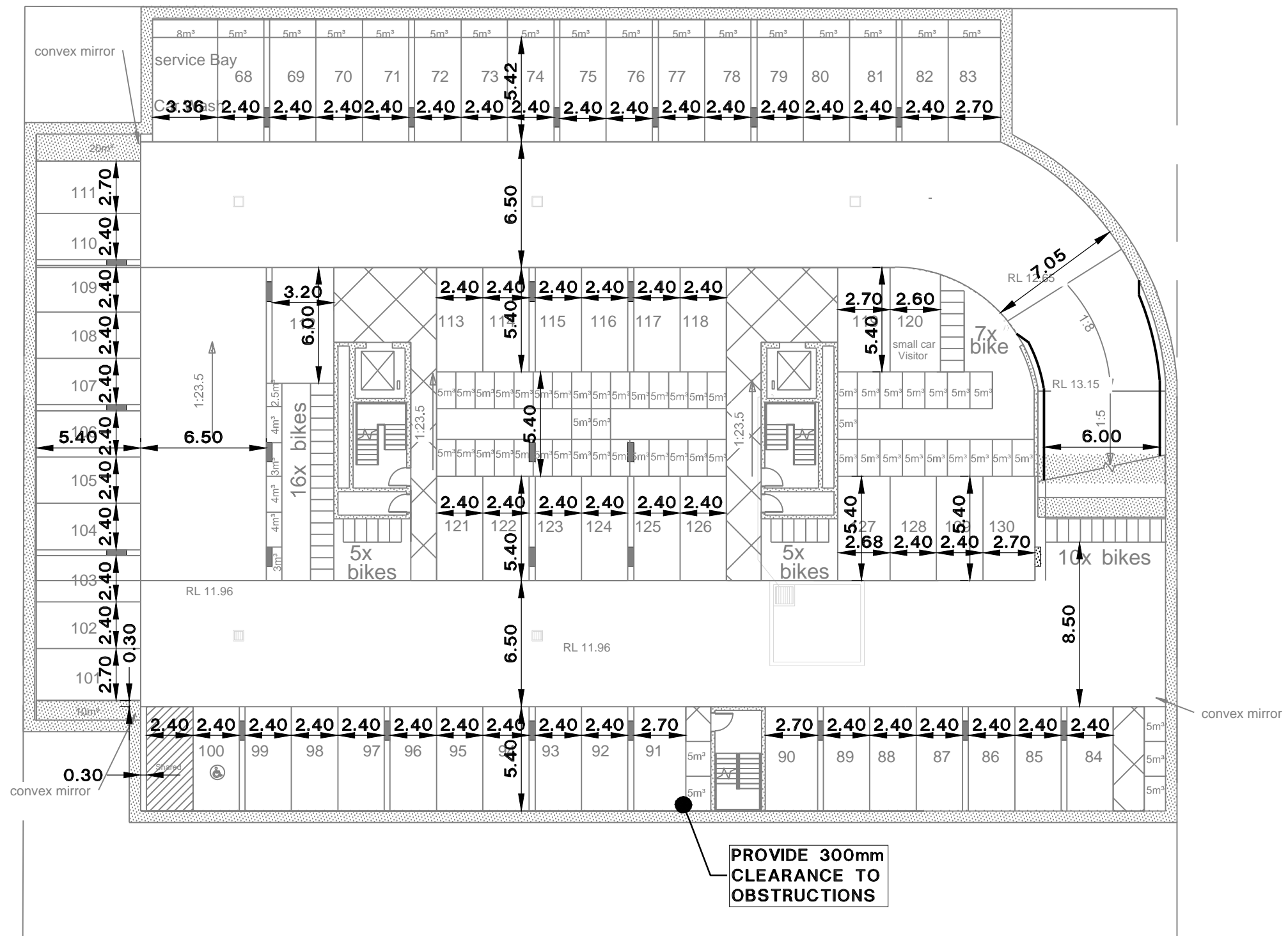
Mark Lucas  
Senior Consultant  
MRCagney



# Appendix A – Car Park Assessment

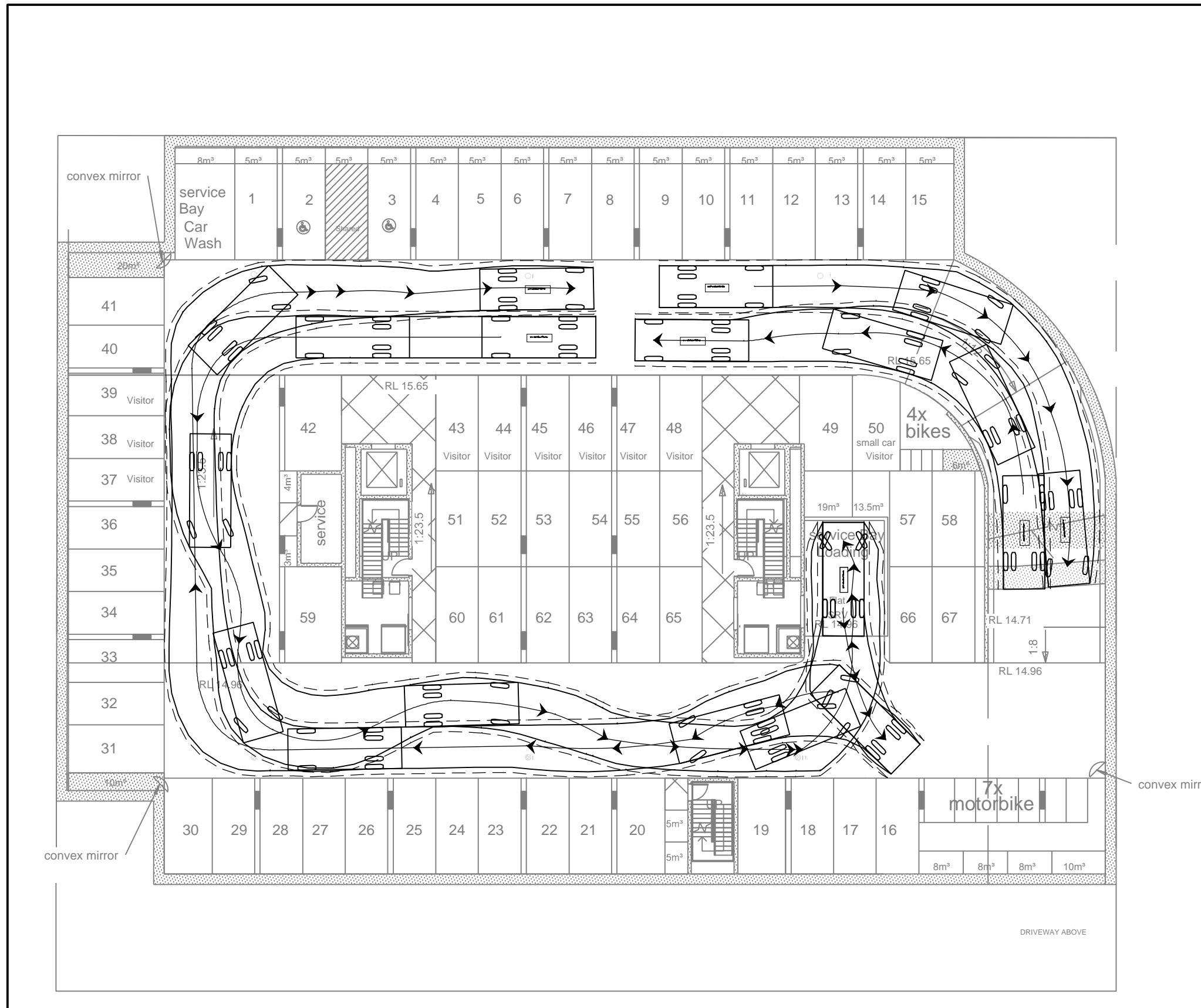




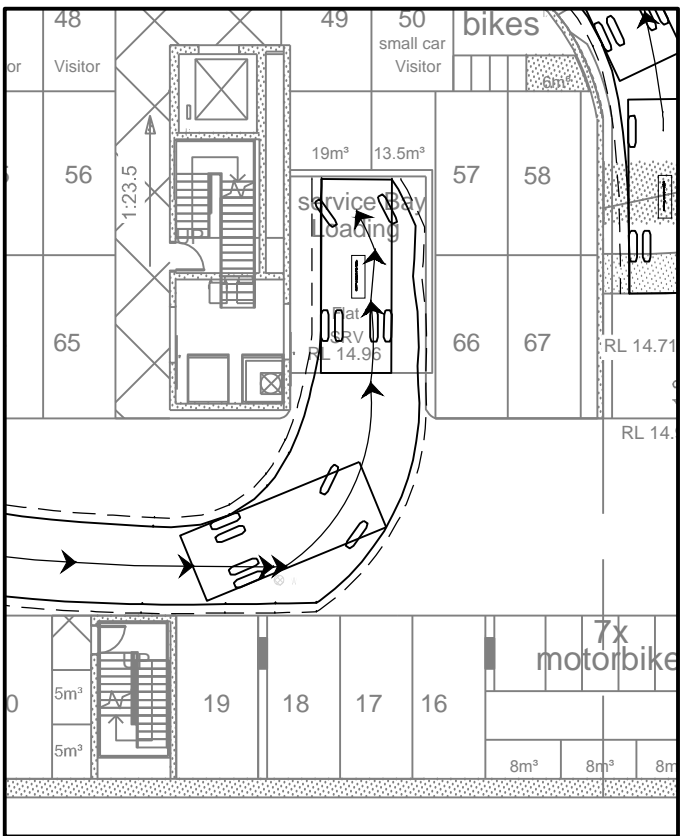


Architectural site plan of a residential development. The plan shows a central 'UNIT BLOCK DWY' with five units (A001, A002, A003, A004, A005) and their respective areas (101m², 81m², 75m², 83m², 75m²). Surrounding the block are 'Common Landscapes' (249m²) and 'Minimal Open Space' (428m²). The plan includes a 'GATED DWY' with a 'convex mirror' and a 'TIMBER FENCE'. A 'CAR PARK' is located at the bottom right, with a 'CAR PARK EXIT' and a 'ONE-WAY (NORTH)' lane. The plan also shows 'VERANDAH' areas and 'Multiple Storey Brick Units'. A scale bar at the bottom indicates 0, 5, 10, 15, 20m, and a north arrow is present.

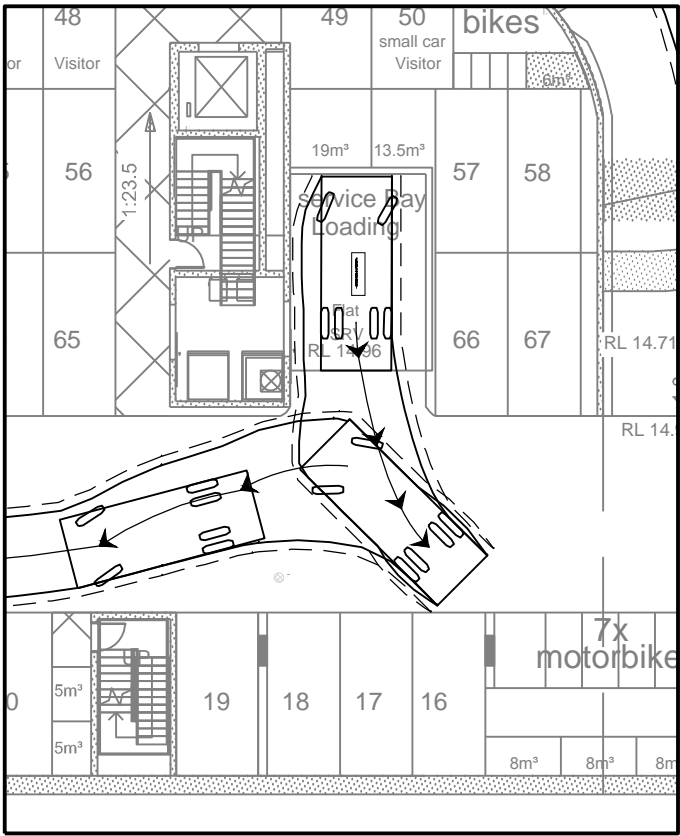
FIGURE 4



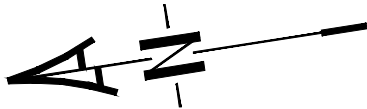
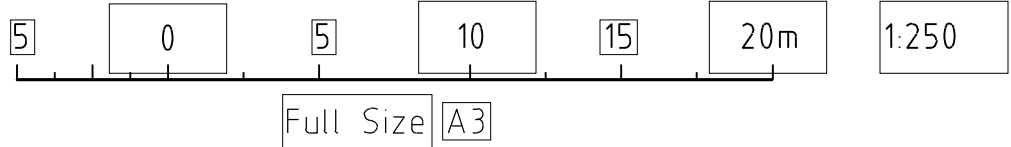
**COMBINED MANOEUVRING  
(REFER INSERTS FOR LOADING BAY)**



**BAY INGRESS MANOEUVRE**

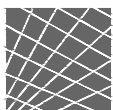


**BAY EGRESS MANOEUVRE**



Full Size ☐ A4 ☒

5817-04.DWG



**MRCagney**

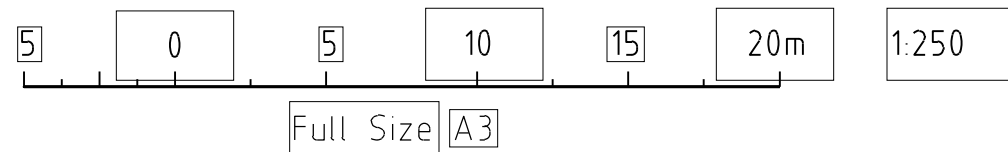
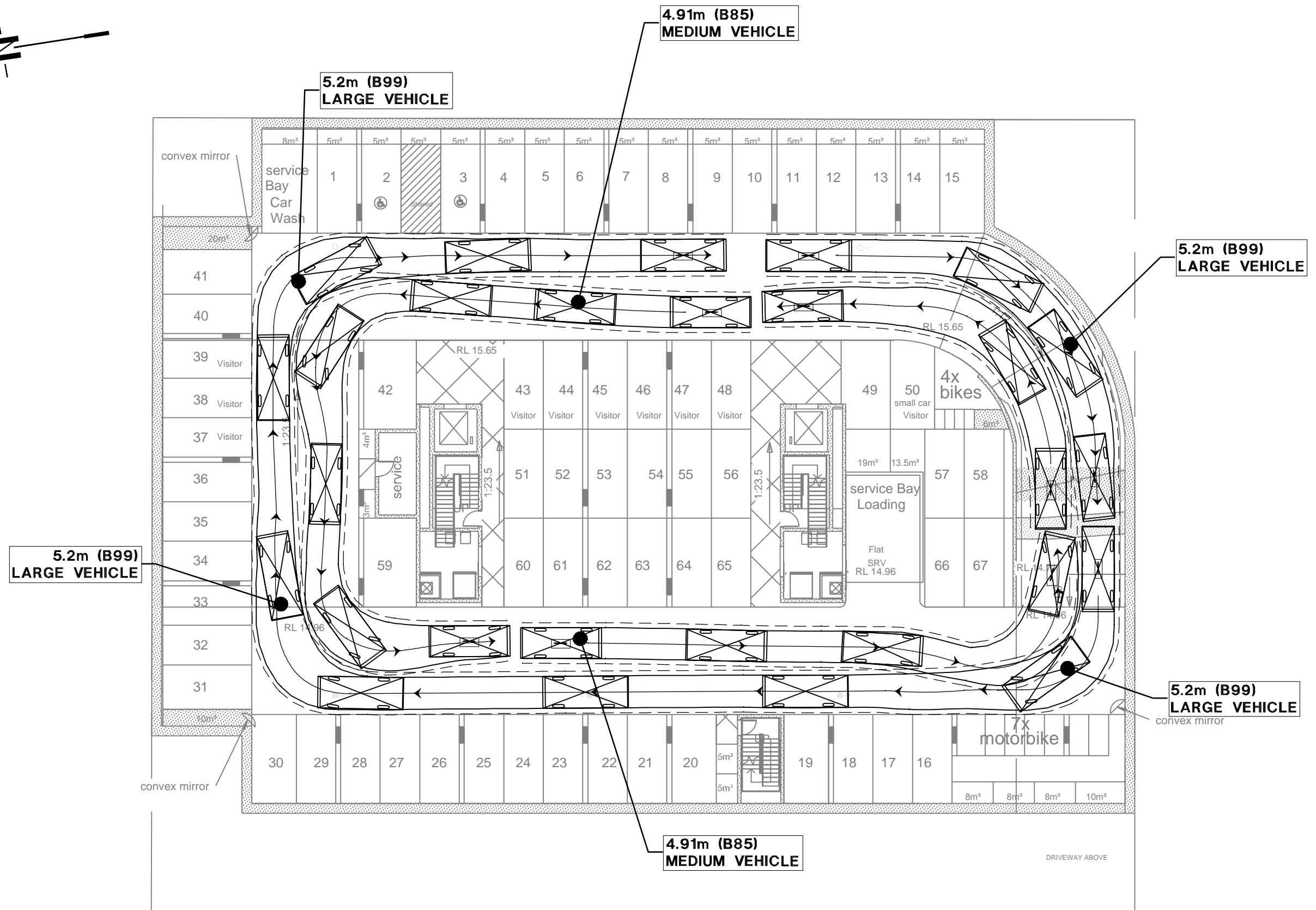
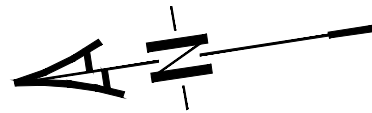
5.2m (B99) LARGE CAR MANOEUVRING REQUIREMENT TO PASS
4.91m (B85) MEDIUM CAR AT GOULBURN SERVICEWAY TO ACCESS SITE

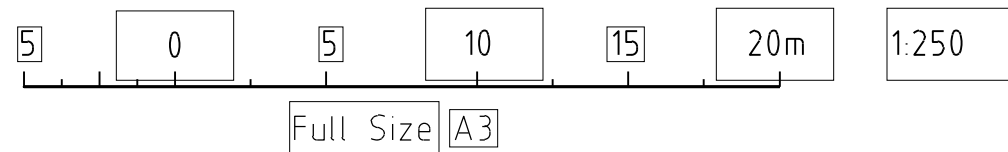
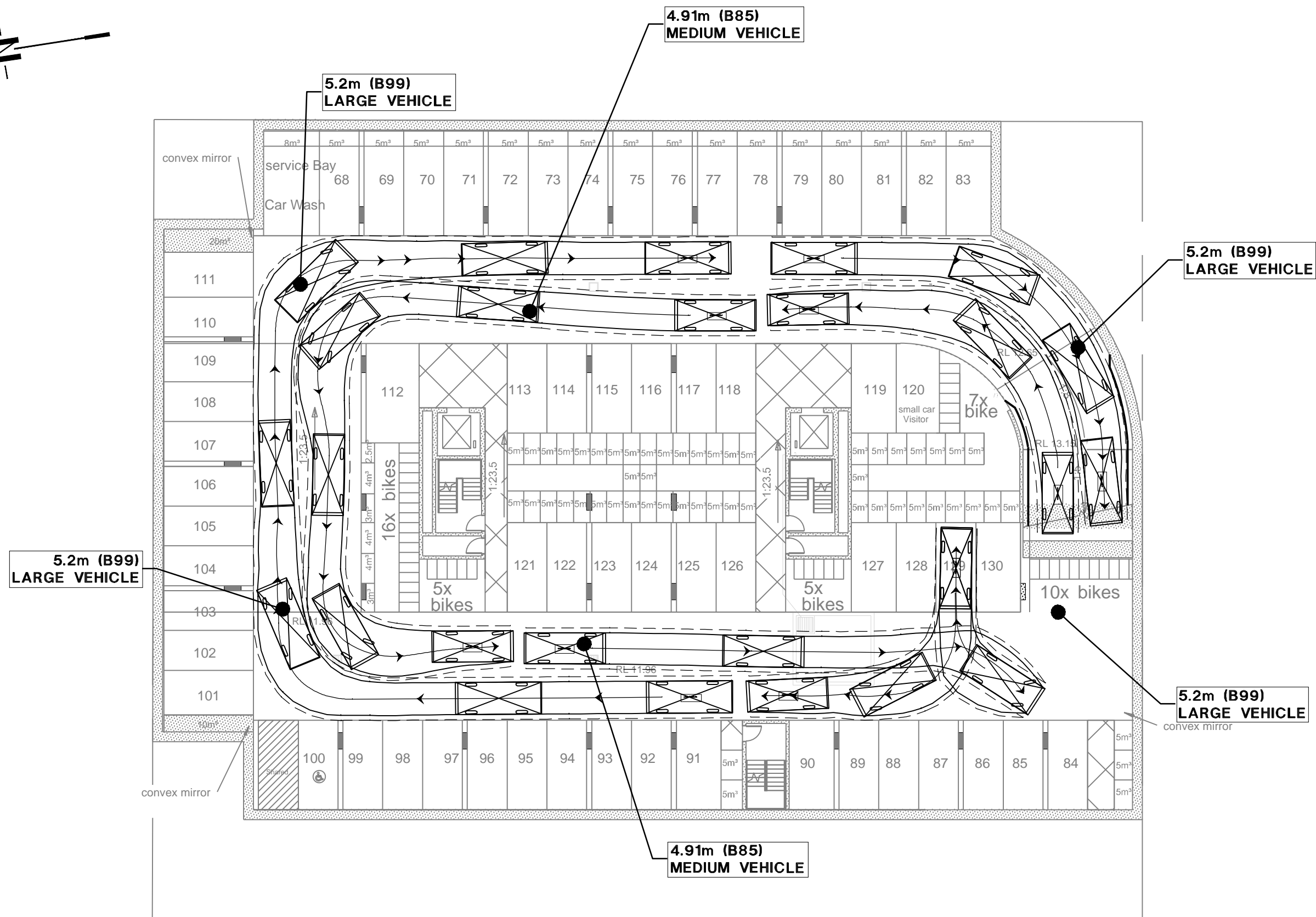
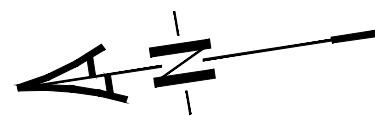
17-23 GOULBURN STREET,  
LIVERPOOL

IT-3 8th DECEMBER 2015

FIGURE 6







5817-04.DWG

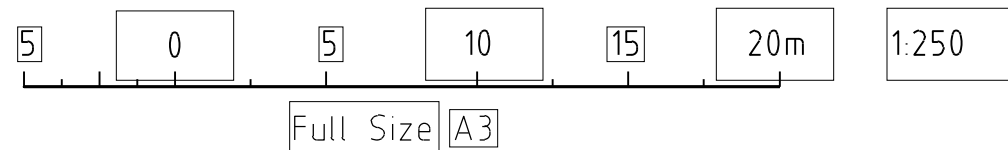
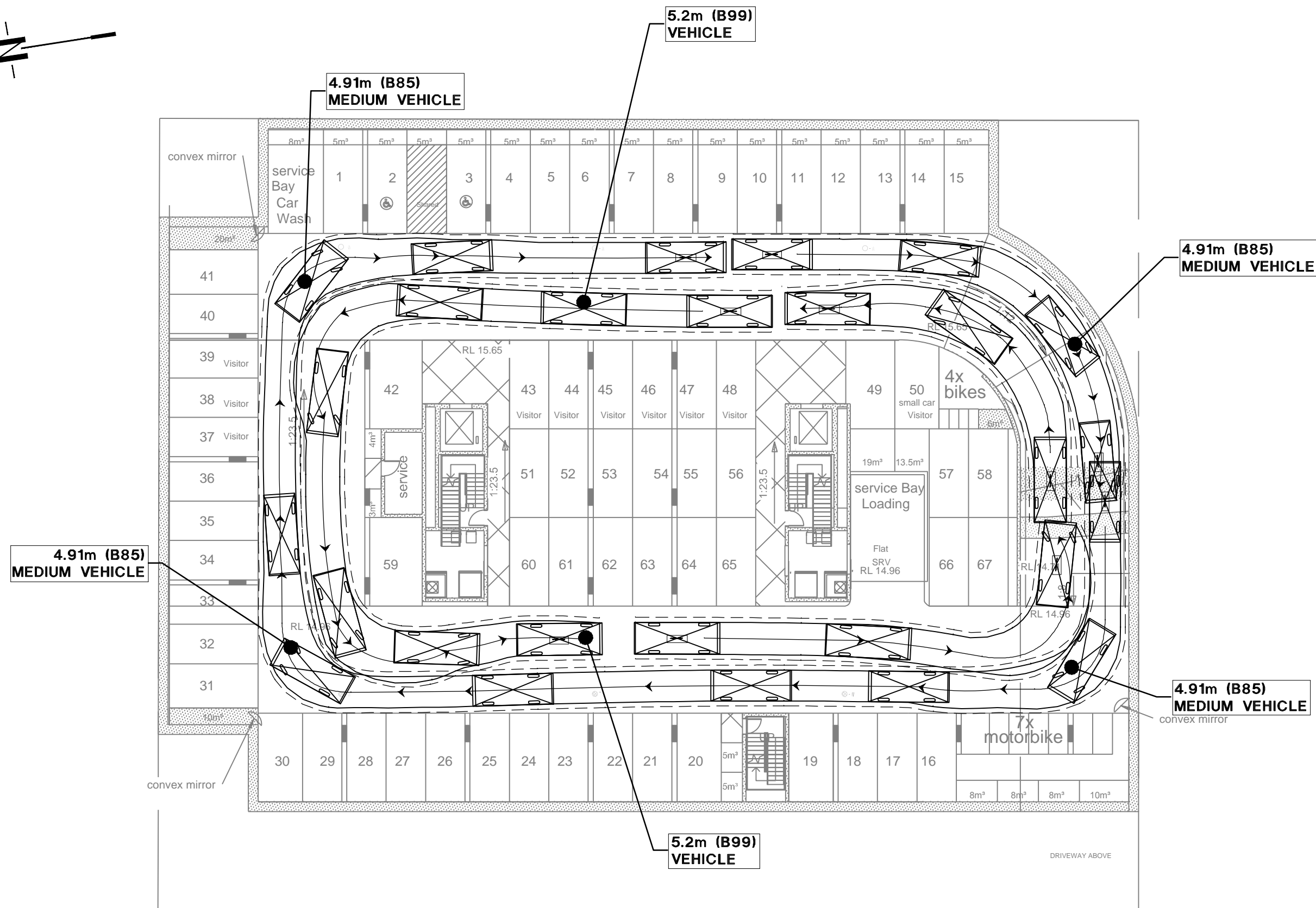
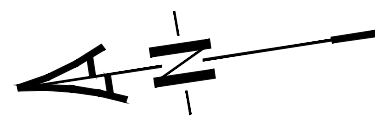
5.2m (B99) LARGE CAR MANOEUVRING REQUIREMENT TO PASS  
4.91m (B85) MEDIUM CAR FOR BASEMENT 2 LAYOUT

17-23 GOULBURN STREET,  
LIVERPOOL

11-3 18th DECEMBER 2015

FIGURE 8





4.91m (B85) MEDIUM CAR MANOEUVRING REQUIREMENT TO PASS

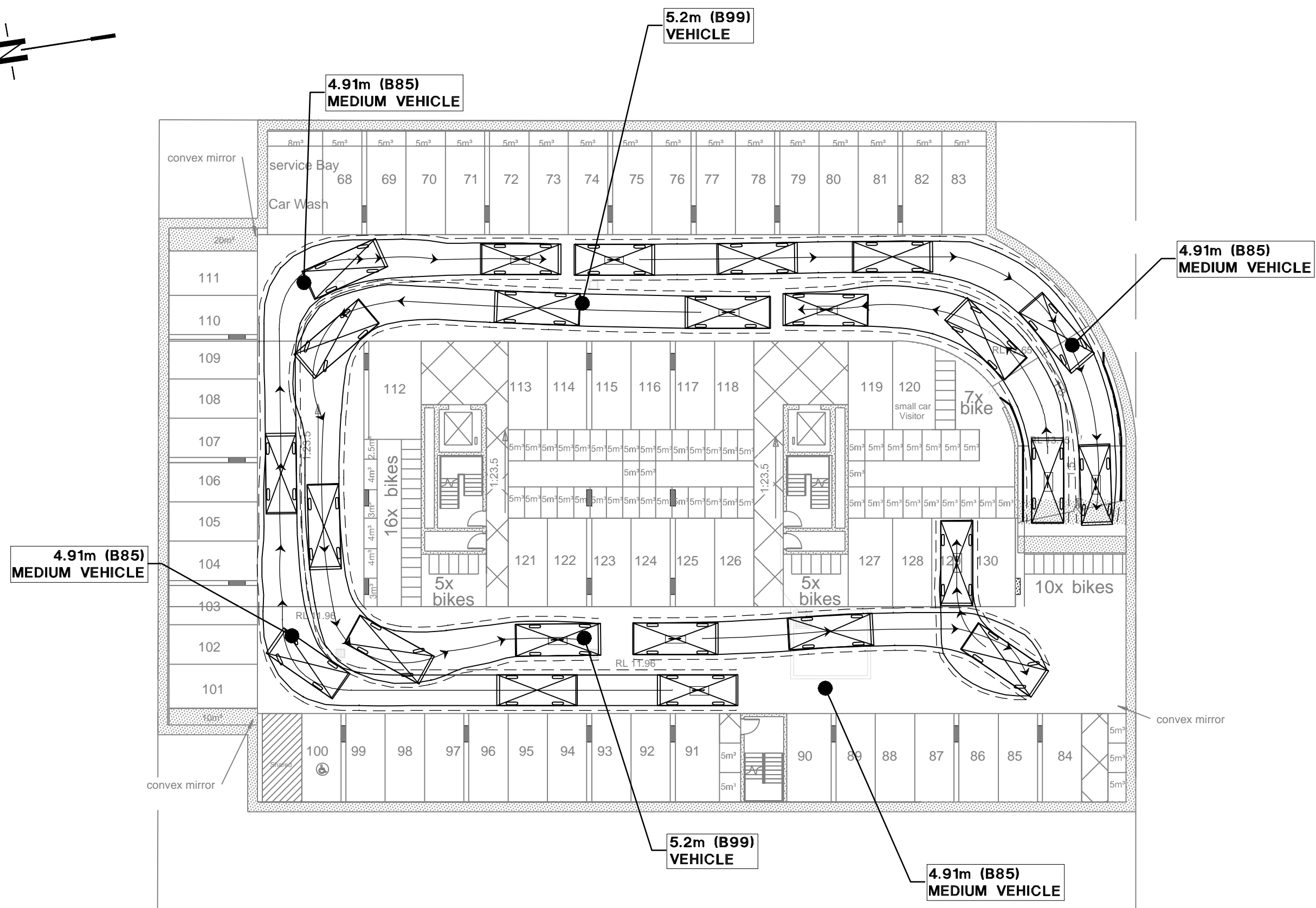
5.2m (B99) LARGE CAR FOR BASEMENT 1 LAYOUT

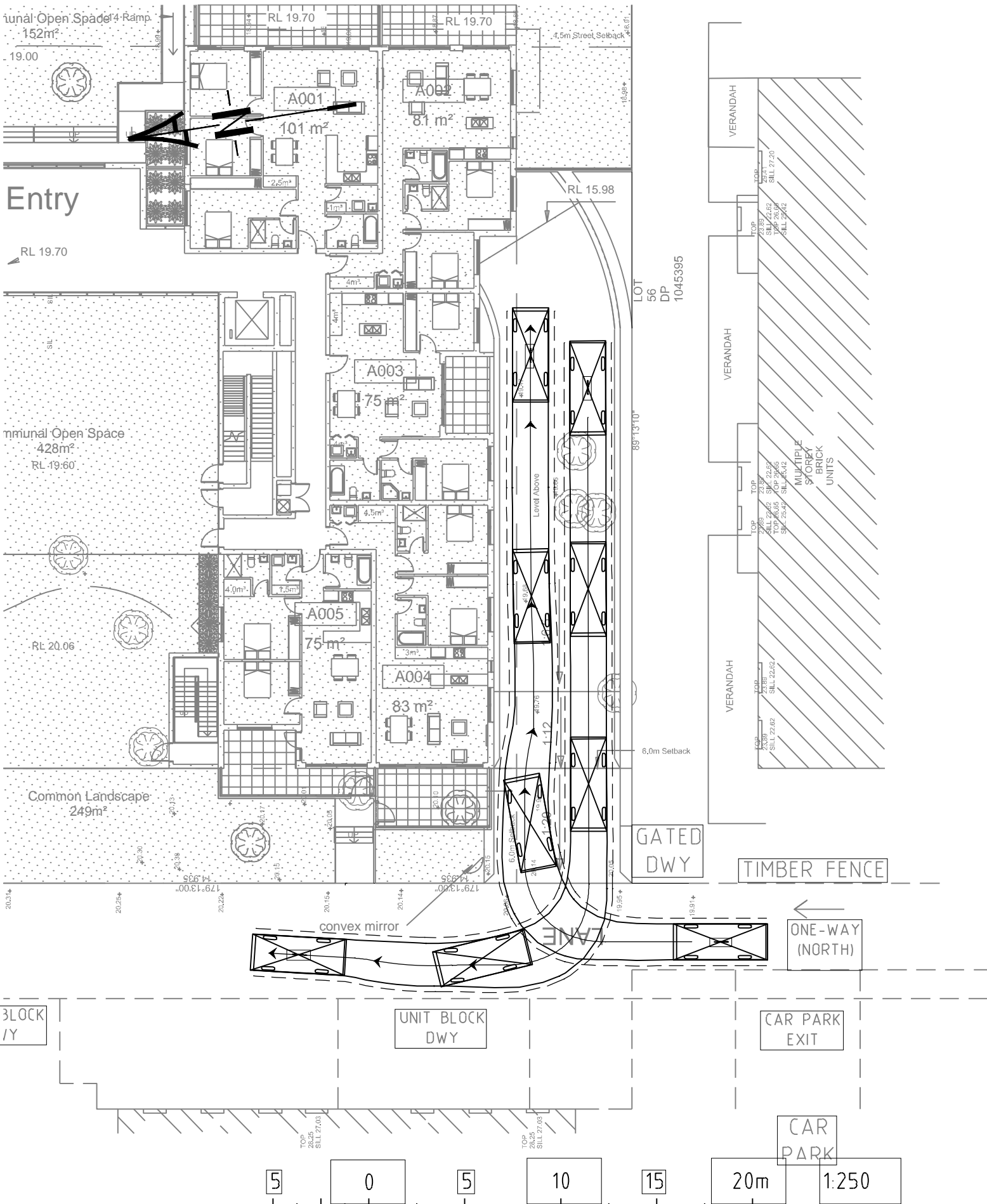
17-23 GOULBURN STREET,  
LIVERPOOL

5817-04.DWG

11-3 18th DECEMBER 2015

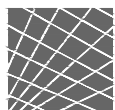
FIGURE 10





Full Size A4

5817-04.DWG



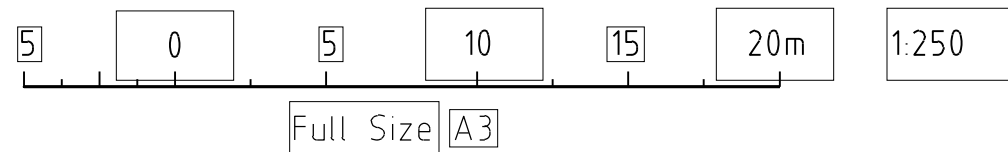
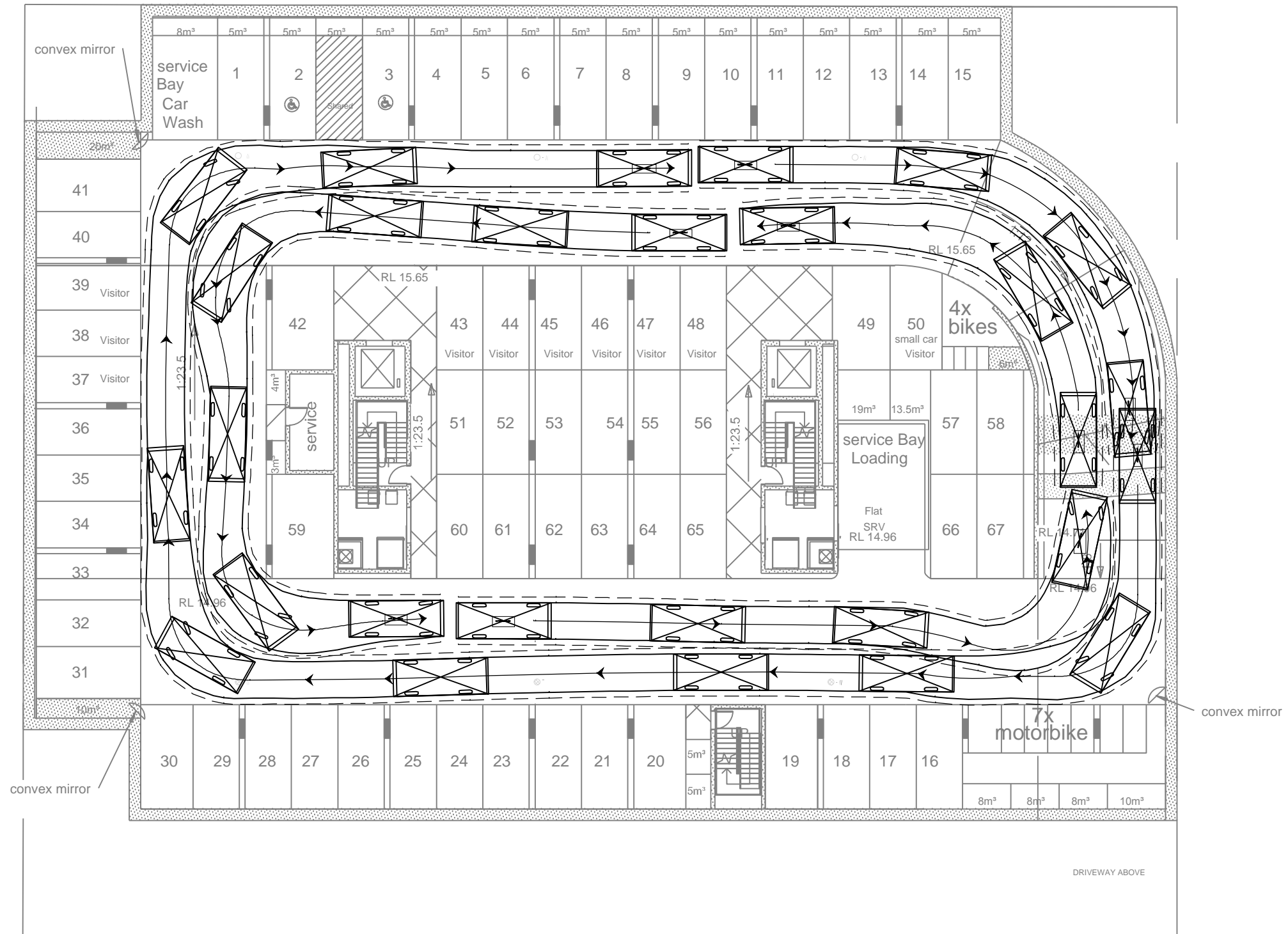
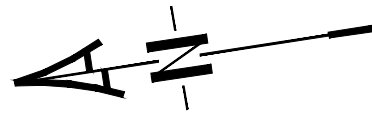
**MRCagney**

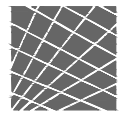
4.91m (B85) MEDIUM CAR MANOEUVRING REQUIREMENT  
TO CIRCULATE GOULBURN SERVICEWAY TO ACCESS SITE

17-23 GOULBURN STREET,  
LIVERPOOL

IT-31 8th DECEMBER 2015

FIGURE 12



**MRCagney**

5817-04.DWG

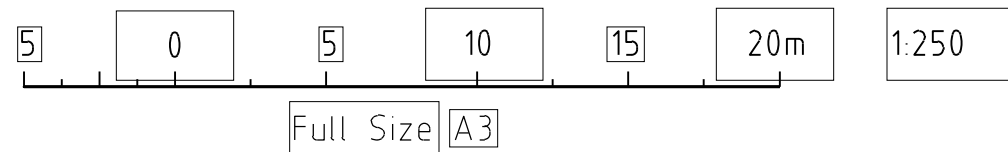
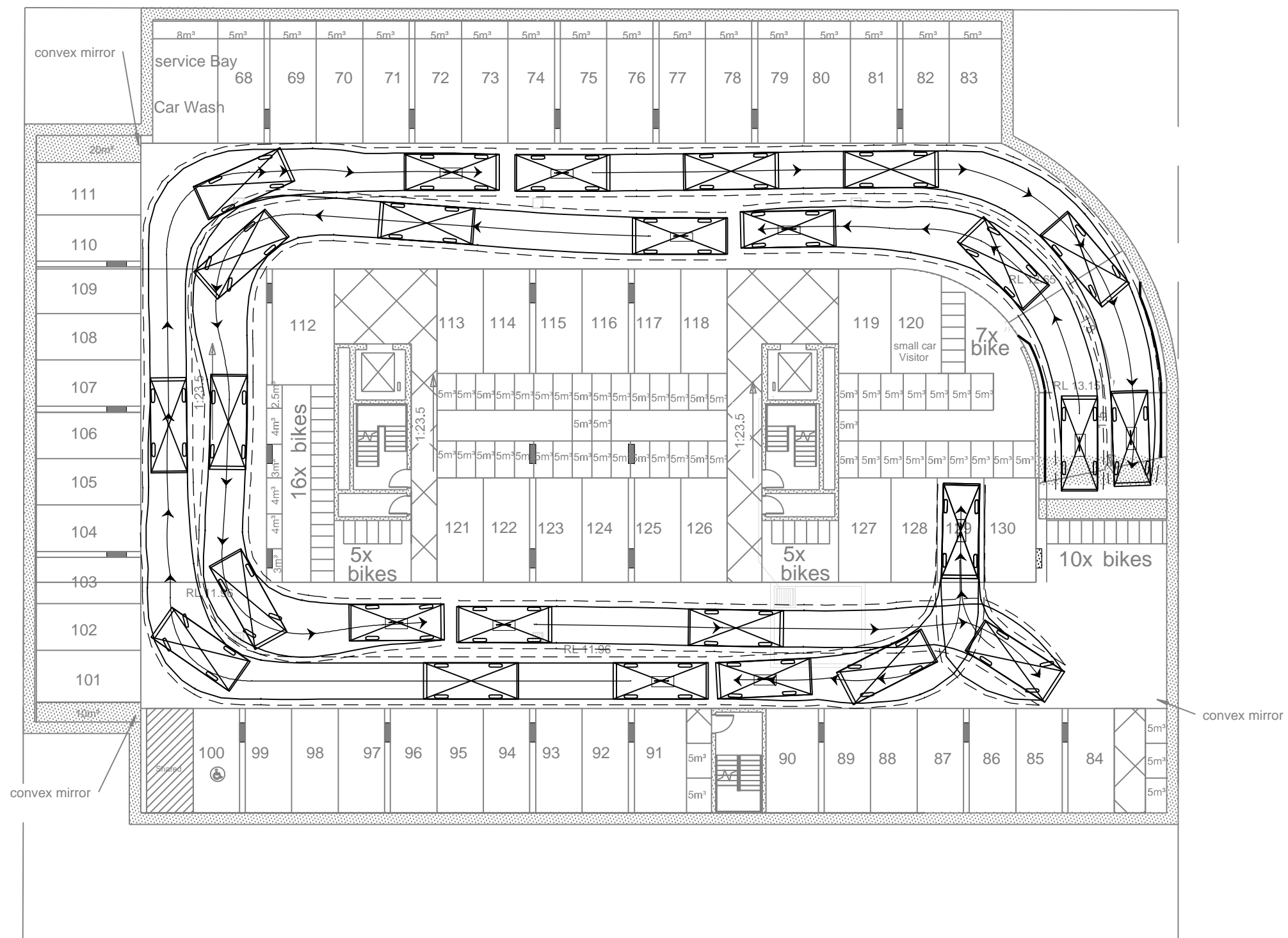
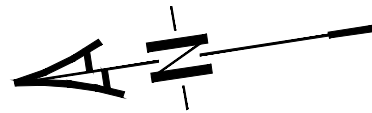
4.91m (B85) MEDIUM CAR MANOEUVRING REQUIREMENT  
TO CIRCULATE BASEMENT LEVEL 1 LAYOUT

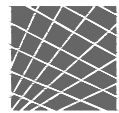
17-23 GOULBURN STREET,  
LIVERPOOL

IT-3 18th DECEMBER 2015

**FIGURE 13**





**MRCagney**

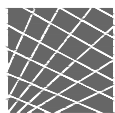
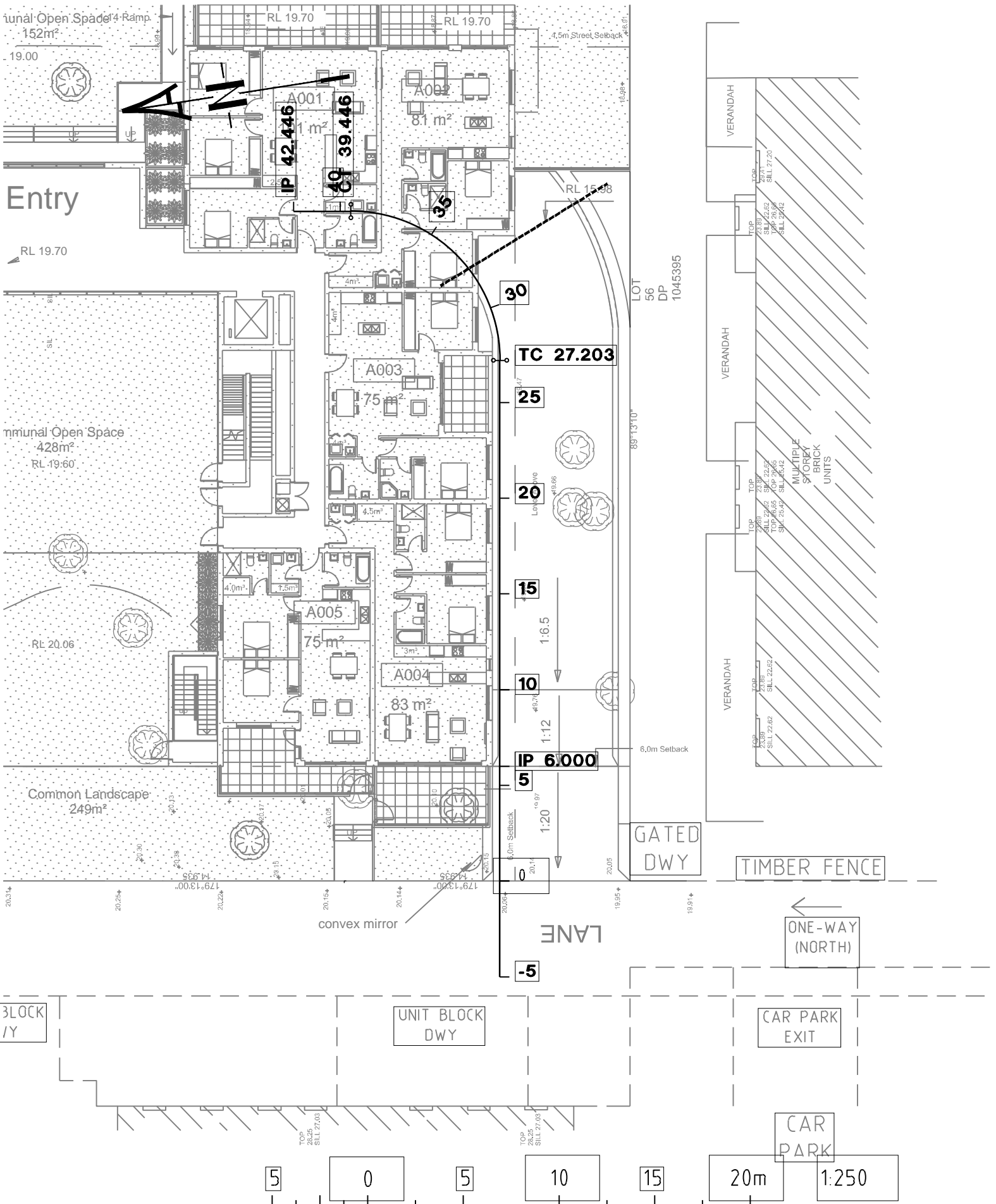
5817-04.DWG

4.91m (B85) MEDIUM CAR MANOEUVRING REQUIREMENT  
TO CIRCULATE BASEMENT LEVEL 2 LAYOUT

17-23 GOULBURN STREET,  
LIVERPOOL

IT-3 18th DECEMBER 2015

FIGURE 14



**MRCagney**

LEVEL 0 LAYOUT ACCESS RAMP  
(GRADE LINE DETAILS)

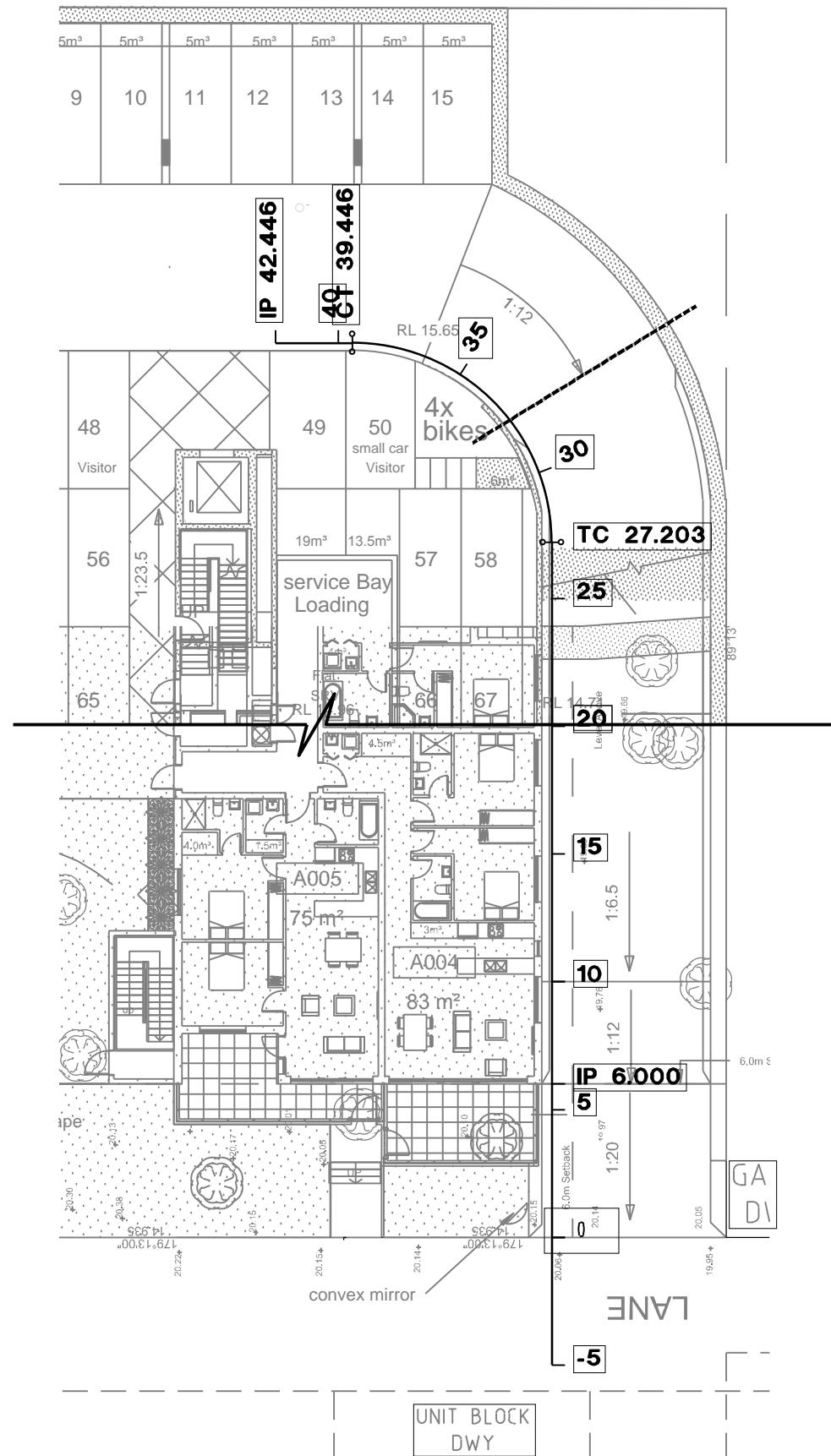
17-23 GOULBURN STREET,  
LIVERPOOL

IT-31 8th DECEMBER 2015

FIGURE 15

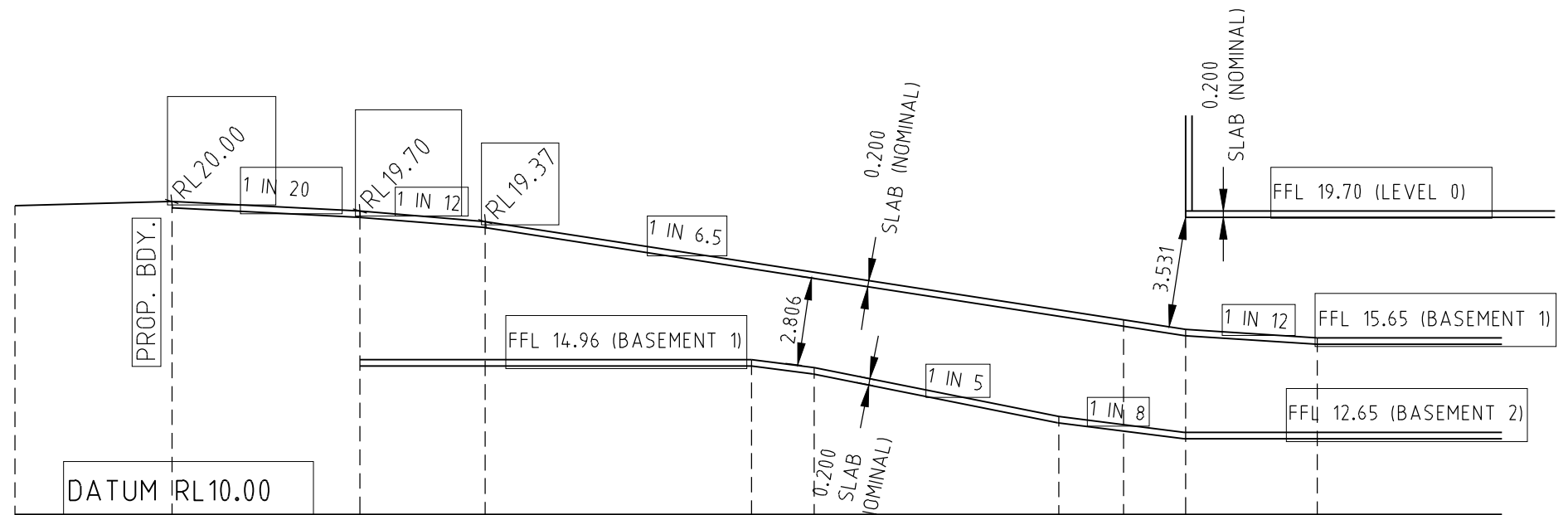
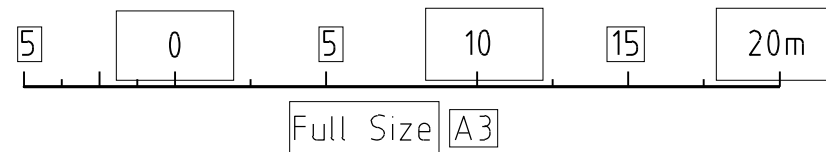
5817-04.DWG

Full Size A4



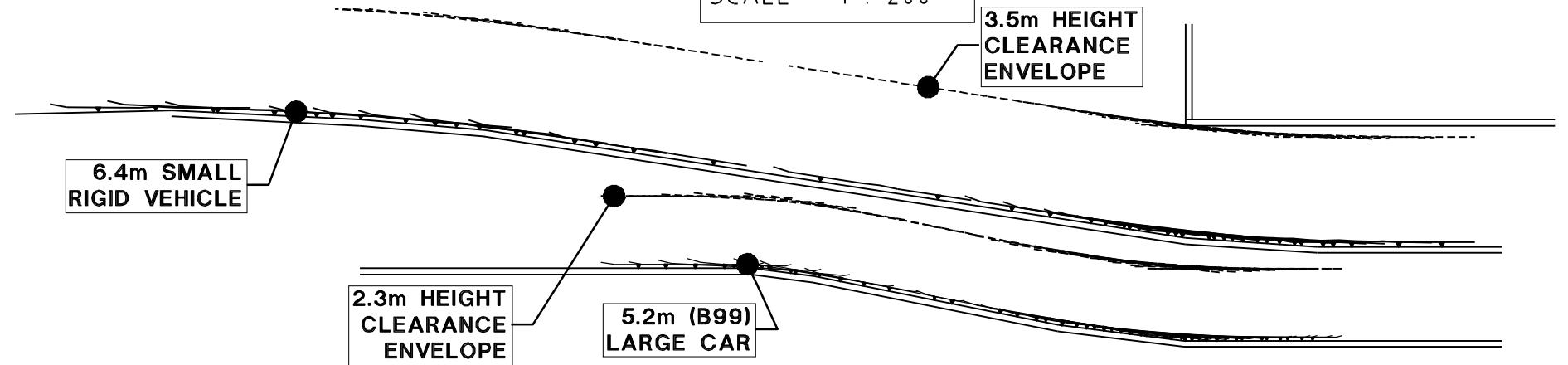
**LAYOUT PLAN (UPPER)**

SCALE - 1 : 250



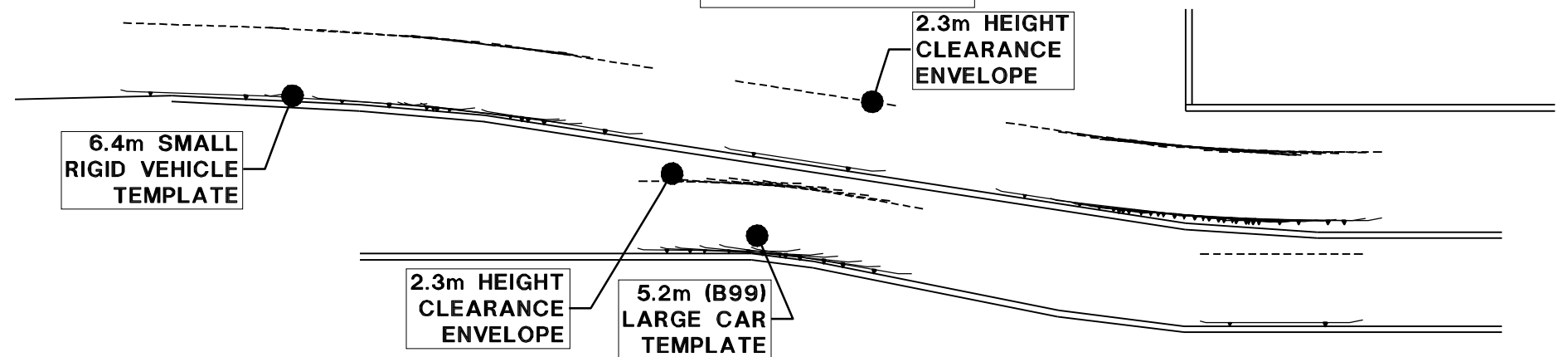
**RAMP SECTION**

SCALE - 1 : 200



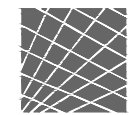
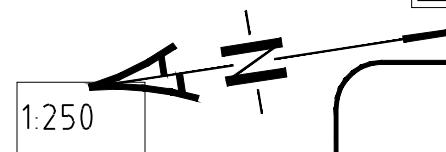
**INGRESS GROUND CLEARANCE TEMPLATES**

SCALE - 1 : 200



**INGRESS GROUND CLEARANCE TEMPLATES**

SCALE - 1 : 200



**MRCagney**

RAMPS LONGITUDINAL SECTION FOR HEIGHT CLEARANCE  
AND GROUND CLEARANCE TEMPLATE OVERLAY

17-23 GOULBURN STREET,  
LIVERPOOL

5817-04.DWG

IT-3 18th DECEMBER 2015

FIGURE 16