Issue History

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P3337.001T 17 Deane Street Burwood Traffic Impact Assessment	C. Wills	A. Giyahi	A. Giyahi	13/10/2017	Tracee Lim <tracee.lim@metropoint.com.au>
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17 Deane Street Burwood Traffic Impact Assessment

1. BACKGROUND

Bitzios Consulting have been commissioned by Urbis to assist in the planning and design of traffic access, circulation and parking at a proposed development site at 17 Deane Street, Burwood. The proposed development consists of a 23-storey mixed development including 36 residential units, 101 hotel rooms, 152m^2 retail space and a childcare centre with a capacity of 50 children.

The site is located within the Burwood Town Centre Precinct, approximately 10 kilometres to the west of Sydney CBD. Key boundaries are Burwood Road to the west, which connects Liverpool Road and Parramatta Road as well as containing a large variety of regular bus services, and Inner West Rail Line to the south, on which trains run regularly to Sydney and various locations in Western Sydney. The location of the site is shown in Figure 1.1.

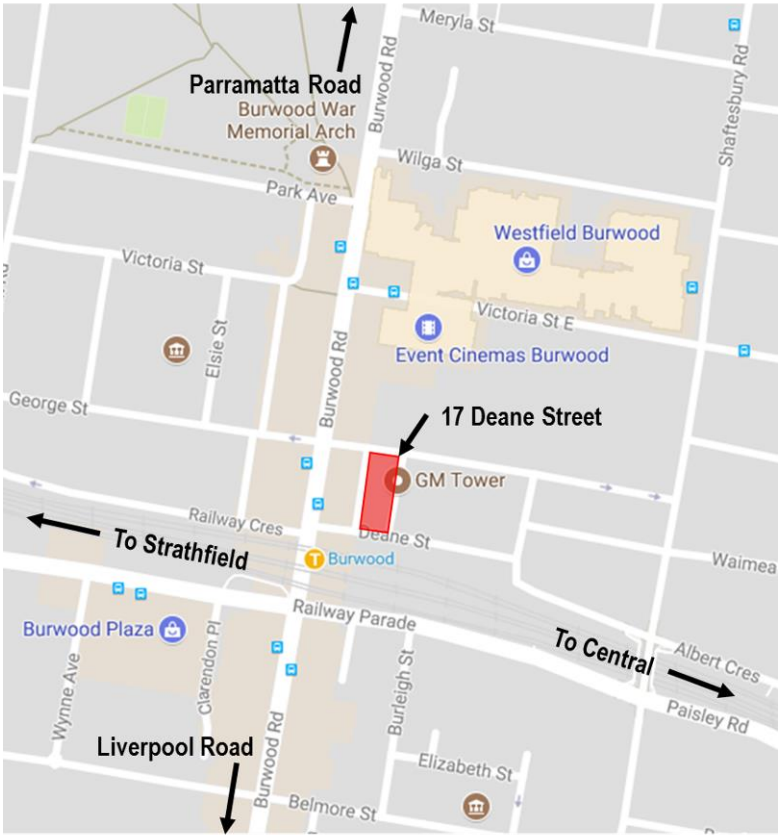


Figure 1.1: Site Location

Burwood Council have reviewed the initial proposal for the development at 17 Deane Street, Burwood, and identified items which require assessment and reporting. The contents of this report address the items outlined by Burwood Council in their meeting with project town planner and following correspondence.

2. PREVIOUS STUDIES

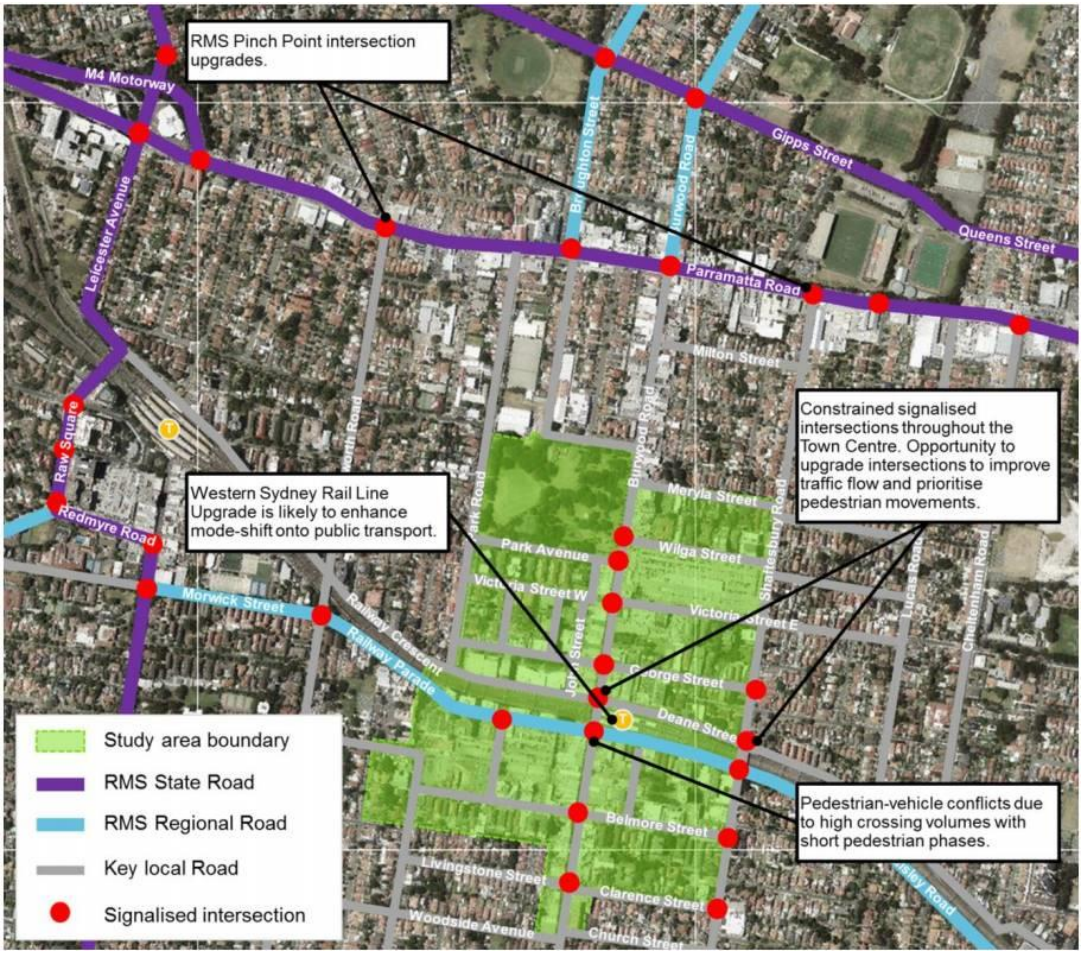
2.1 BURWOOD TOWN CENTRE – TRAFFIC AND TRANSPORT OPPORTUNITIES AND CONSTRAINTS

AECOM conducted an opportunities and constraints study of Burwood Town Centre, within which 17 Deane Street is located. The study included a review of key intersections within the Burwood Town Centre.

Burwood Town Centre, including 17 Deane Street, is zoned as B4 Mixed-Use (except for Burwood Park), allowing it to contain a wide variety of developments in an accessible location. Burwood is located within a key strategic centre, as identified within the NSW Department of Planning and Environment publication, *A Plan for Growing Sydney 2015*. The document outlines for providing additional capacity for mixed-use developments and improved public transport connectivity.

Burwood Town Centre is shown to demonstrate high proportions of public transport use, with 53% of commuters travelling by public transport to and from work. Vehicle use is registered at 36% for commuters, which is below the average of the Burwood LGA and broader Sydney region. Deane Street is a designated bicycle route, connecting two north-south corridors in the east and west, as well as being located within 100m of well-connected bus stops and train stations.

The upgrade of signalised intersections within the town centre, and specifically near 17 Deane Street, was seen as a key opportunity to improve traffic and pedestrian flows of the Town Centre. Connectivity across the train line was listed as a constraint, as limited roadways passing over or under the rail line exist. The construction of WestConnex and the application of the Parramatta Road Clearway Program was outlined as an opportunity for improving vehicle flow and connectivity and recuing rat-running within the area. An overview of the findings is shown in Figure 2.1.



Source: Burwood Town Centre – Opportunities and Constraints; Aecom 2015

Figure 2.1: Burwood Town Centre – Opportunities and Constraints

2.2 TRAFFIC AND PARKING STUDY: RESIDENTIAL / RETAIL / COMMERCIAL DEVELOPMENT 15 DEANE STREET, BURWOOD, REPLY TO COUNCIL & RTA CONCERNS (5 JANUARY 2011)

McLaren Traffic Engineering conducted a traffic and parking impact assessment of a proposed mixed-used development at 15 Deane Street, Burwood. The site is located less than 50m to the east of 17 Deane Street, with only Mary Street between the two sites.

The traffic component of the study focused on the intersections of:

- George Street / Burwood Road;
- Shaftesbury Road / George Street; and
- Burwood Road / Deane Street.

An analysis of the AM peak hour, for February 2011, was conducted in SIDRA. The results showed an overall low level of vehicle use at the George Street / Burwood Road and Burwood Road / Deane Street intersections. A total of 89 vehicles accessed George Street from Burwood Road in the AM peak and 180 vehicles exited Deane Street onto Burwood Road. Approximately 650 vehicles were observed to travel northbound on Burwood Road, with approximately 350 vehicles travelling southbound

Both intersections of Burwood Road with George Street and Deane Street were observed to operate at Los A before and after development traffic was considered. The worst movement at either intersection was found to be a LoS B at Burwood Road / Deane Street. Overall, both intersections were found to operate with very minimal delays and below capacity in the AM peak hour. The results are shown in Figure 2.2.

TABLE 1: WORST CASE INTERSECTION PERFORMANCES (SIDRA INTERSECTION 5.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Control Type
EXISTING PERFORMANCE					
Burwood Rd / George St	7.45-8.45AM	0.23	1.8 (8.9)	A (Worst: A)	Giveway / Yield
Shaftesbury Rd / George St	8-9AM	0.64	3.4 (66.6)	A (Worst: E)	Giveway / Yield
Burwood Rd / Deane St	7.45-8.45AM	0.38	11.0 (22.9)	A (Worst: B)	Signals
FUTURE PERFORMANCE					
Burwood Rd / George St	7.45-8.45AM	0.26	2.2 (9.2)	A (Worst: A)	Giveway / Yield
Shaftesbury Rd / George St	8-9AM	0.74	4.3 (82.5)	A (Worst: F)	Giveway / Yield
Burwood Rd / Deane St	7.45-8.45AM	0.40	11.1 (23.0)	A (Worst: B)	Signals

Source: 15 Deane Street Traffic Impact Assessment; McLaren Traffic Engineering 2011

Figure 2.2: SIDRA Results for Key Intersections Surrounding 15 Deane Street, Burwood

2.3 TRAFFIC AND PARKING ASSESSMENT OF A PROPOSED MIXED-USE DEVELOPMENT (2-8 BURWOOD ROAD, BURWOOD HEIGHTS)

ML Traffic Engineers conducted a traffic and parking impact assessment of a proposed mixed-used development at 2-8 Burwood Road, Burwood Heights. The site is located 1.4km to the south of 17 Deane Street, near Liverpool Road (Hume Highway).

The traffic component of the study focused on the Liverpool Road / Burwood Road intersection, including intersection traffic volume counts and a SIDRA analysis of the site. An analysis of the AM and PM peak hour periods, for October 2014, showed 740 vehicles approach the intersection from Burwood Road in the AM Peak, with 61% approaching from the south, and 708 vehicles approach the intersection on Burwood Road in the PM peak, with 67% approaching from the north.

Burwood Road approaches were found to operate at level of service C (LoS C) for both approaches in both peak periods, with spare capacity available on all movement types allowed.

2.4 SUMMARY

Overall traffic near 17 Deane Street was demonstrated to operate at very good levels of service with very little delays experienced in the AM peak hour. Additional capacity on Deane Street at Burwood Road and Burwood Road at Liverpool Road was outline in separate reports, whilst Parramatta Road and Burwood Road near Parramatta Road experiences congestion. Future developments and strategies are under construction and/or in place to ease congestion on Parramatta Road and Burwood Town Centre, which aims to free up the roads, improve the connectivity of roadways and reduce rat-running.

3. EXISTING CONDITIONS

3.1 BURWOOD TOWN CENTRE PRECINCT

3.1.1 Traffic

The proposed development site is located within the Burwood Town Centre, as shown in Figure 3.1.

Source: Burwood Development Control Plan (2009)

Figure 3.1: Burwood Town Centre Extent

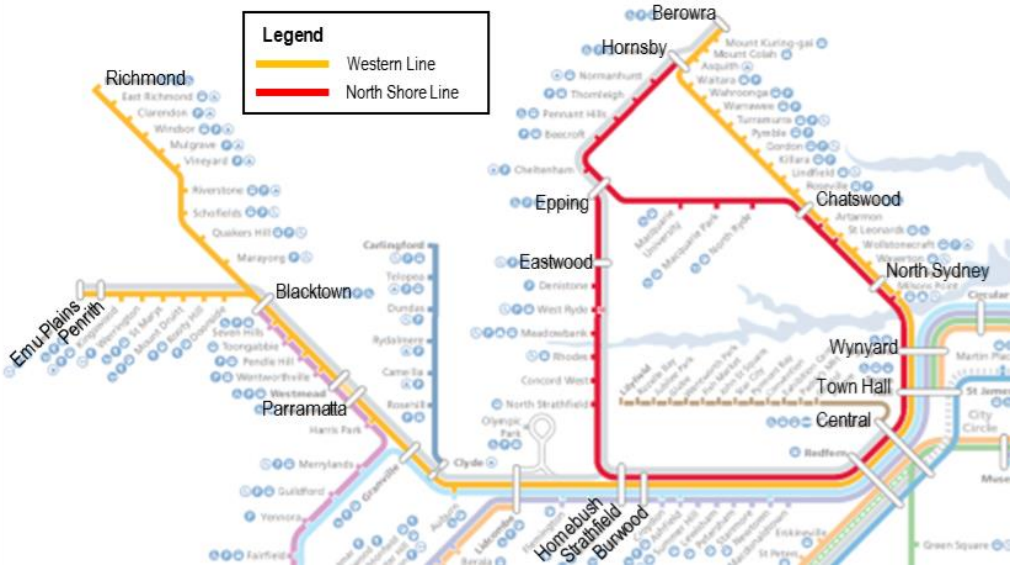
Burwood Road is the major road in Burwood Town Centre, holding through traffic between Liverpool Road and Parramatta Road and local traffic accessing Burwood Town Centre, Burwood Train Station and Westfield Shopping Centre. Burwood Road is also the major bus corridor in Burwood and acts as a collector road for State Roads located to the north and south.

Burwood Road experiences significant congestion in the corridor between Burwood Train Station and Westfield Shopping Centre due to a combination of five (5) signalised intersections in 560m and five (5) bus stops in less than a kilometre. Turning movements can also create additional queueing and delays as vehicles give way to large volumes of pedestrians crossing Burwood Road and side streets. Overall the combination of consecutive signalised intersections and bus stops and high volumes of vehicles and pedestrians lead to extended queueing and delays on Burwood Road in peak hours, midday off-peak and weekends.

3.1.2 Public Transport

Burwood Town Centre, and 17 Deane Street, are well serviced by bus and train services to a variety of locations. The site is located within 100m of both the nearest bus stop and Burwood Train Station.

Train services arrive regularly throughout the day, with 12 services per hour direct to Sydney CBD operating per hour in the AM peak (07:00 to 09:00) and 12 services per hour operating from Sydney CBD to Burwood in the PM peak (16:00 to 19:00). Train services were shown to operate below capacity on the Inner West Line (Homebush to Central) and above capacity on the North Shore, Northern and Western Lines. Shown below in Figure 3.2 is the major train stations which Burwood connects to.

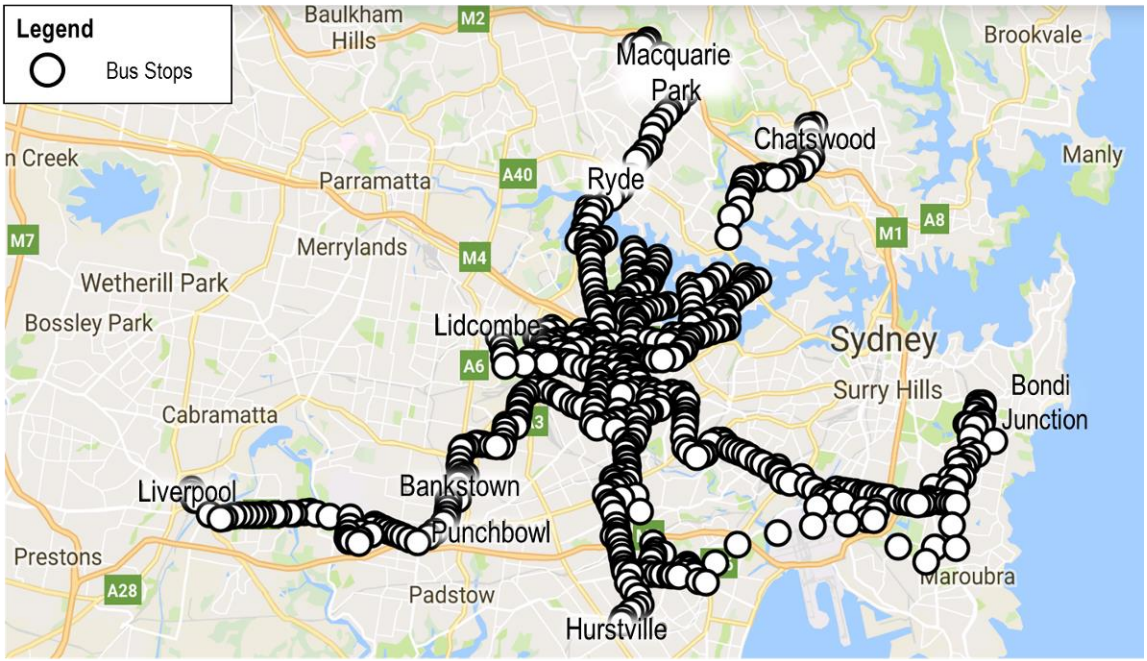


Source: SydneyTrains

Figure 3.2: Rail Connectivity from Burwood Road

Bus services are frequent along Burwood Road and create a large web of connectivity with the Town Centre. Areas the bus services operate to and from, shown in Figure 3.3 include, but are not limited to:

- Bondi Junction via Randwick;
- Chatswood;
- Macquarie Park and Marsfield via Ryde;
- Liverpool via Bankstown;
- Strathfield, Homebush and Lidcombe;
- Rockdale;
- Sydney Domestic and International Airports; and
- Hurstville via Campsie.



Source: TripView Application

Figure 3.3: Bus Connectivity from Burwood Road

3.1.3 Pedestrians

Burwood Town Centre is a hotspot of pedestrian activity with a large number of attractors and generators along the Burwood Road Corridor. The Town Centre contains a diverse spread of businesses, including:

- Restaurants and casual eating premises;
- Office and commercial spaces;
- Specialty stores;
- Supermarkets;
- Shopping plazas;
- Medical facilities;
- Educational facilities;
- Public transport hub; and
- Public parks.

Pedestrian activity along, across and adjacent to Burwood Road is consistently high with well used pedestrian crossing points, both signalised and un-signalised. The connectivity of the areas, aided by multitude of pedestrian crossing locations, and wide and well-maintained footpaths encouraging pedestrian activity.

3.2 PROPOSED DEVELOPMENT SITE

The proposed development at 17 Deane Street is bound by four roads of varying classification, including:

- Deane Street: a one-way, westbound, local street running between Shaftesbury Road and Burwood Road. Provisions for time restricted ticketed parking are provided along the majority of the southern side along with some parking on the northern side between Marmaduke Street and Mary Street. A taxi zone, providing space for three (3) vehicles, bicycle parking and a Kiss and Ride zone are located on the southern side between Mary Street and Burwood Road;
- Mary Street: a one-way, northbound, local street running between Deane Street and George Street. Time restricted ticketed parking exists on both sides of the road, allowing a total of 16 vehicles to park;
- George Street: a one-way, eastbound, local street running between Park Road and Shaftesbury Road. Time restricted ticketed parking exists on the southern side of the road; and
- Youth Lane: a two-way lane, connecting George Street and Deane Street. This laneway is very narrow, only allowing one vehicle to travel at any one time despite both travel directions being allowed. It allows access for deliveries to business fronting Burwood Road and holds the waste compartments for many of these businesses.

3.2.1 Traffic

Traffic volumes and behaviour on the roads surrounding the proposed development site were assessed on Thursday 28 September, between 07:00 and 08:30. Observations made found that low traffic volumes occupy these streets, with less than 50 vehicles per hour travelling along George Street and Mary Street and approximately 100 vehicles per hour on Deane Street. Less than 10 vehicles were observed to travel on Youth Lane, with delivery vehicles arriving and departing between 07:00 and 07:30 and other vehicles arriving to access businesses closer to 08:00.

Traffic was observed to queue on Deane Street to Youth Lane from Burwood Road from 08:00 to 08:30 regularly, although the queue did not extend past Youth Lane, as shown in Figure 3.4. Throughout a period of approximately 20 minutes, between 08:10 and 08:30, not all queued vehicles were observed to move through in the provided green time. Up to three vehicles were not able to clear the intersection from Youth Lane during the provided green time in consecutive phases.

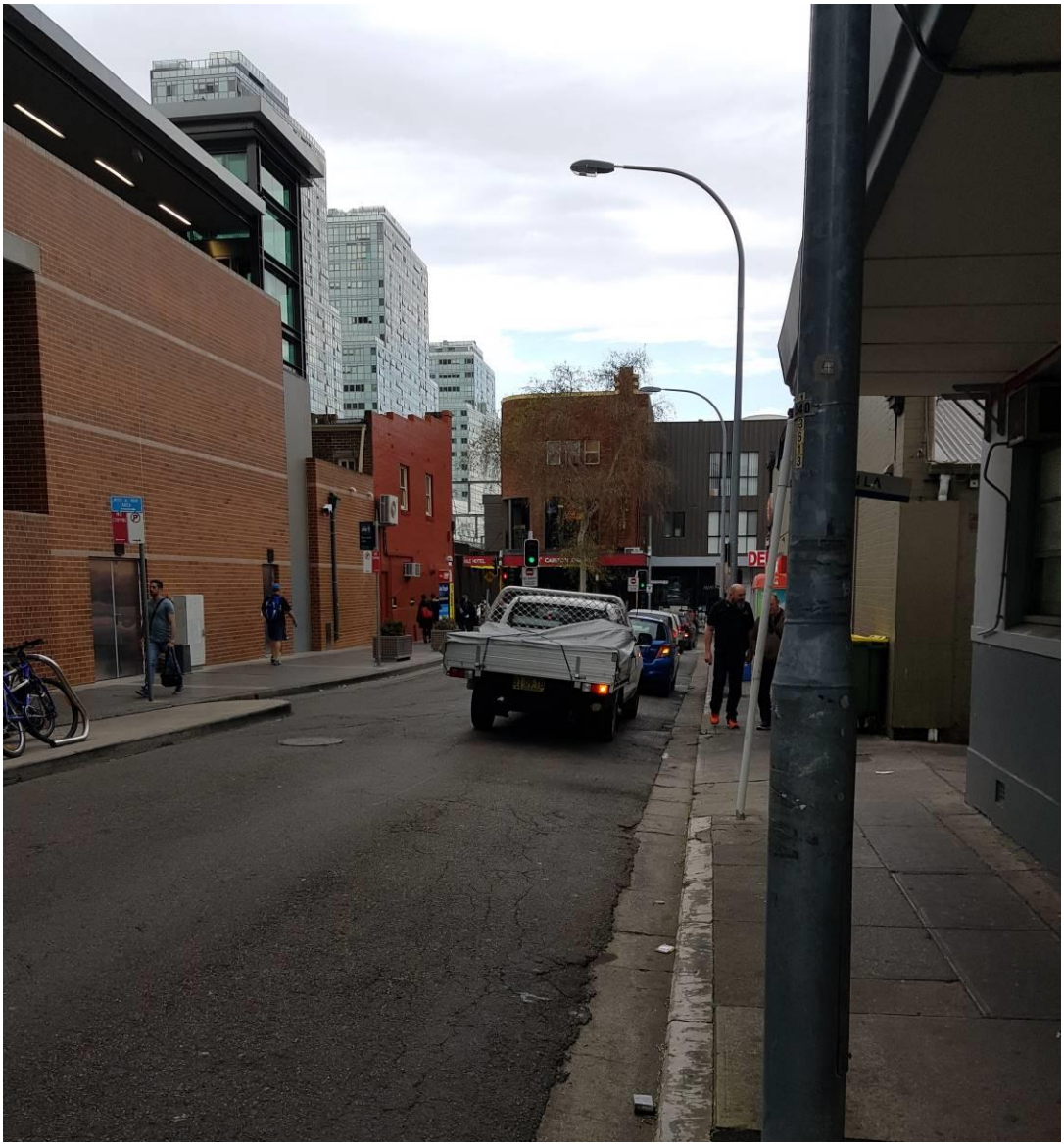


Figure 3.4: Vehicles Queued to Youth Lane from Burwood Road on Deane Street

3.2.2 Parking

Parking occupancy was of a moderate level overall, with parking remaining available on Deane Street, George Street and Mary Street throughout the morning peak in the period assessed on site.

Deane Street has approximately 23 parking spaces available on site with a 2-hour ticketed parking limited between 09:00 and 18:00, Monday to Saturday including Public Holidays. Four parking spaces, on the northern side of the road prior to Mary Street, have a 15-minute parking limit between 06:00 and 09:00 Monday to Saturday including Public Holidays. Parking occupancy rates were consistent throughout the morning peak with 15 parked vehicles regularly observed.

Mary Street has approximately 16 parking spaces available on site with a 2-hour ticketed parking limited between 09:00 and 18:00, Monday to Saturday including Public Holidays. On average five vehicles were observed to occupy parking spaces, as shown in Figure 3.5, during the time observed, with a maximum of seven vehicles parked.

George Street has approximately eight parking spaces available on site with a 2-hour ticketed parking limited between 09:00 and 18:00, Monday to Saturday including Public Holidays. Approximately 50% of parking spaces were observed to be occupied during the period of assessment.

Figure 3.5: Parking Occupancy on Mary Street

3.2.3 Pedestrians

Deane Street and Mary Street act as minor pedestrian connections with low pedestrian volumes in this area. Both streets were observed to be used as a drop-off and pick-up area for commuters and workers accessing Burwood Road and Burwood Train Station. Other pedestrians were observed to walk from parked vehicles in nearby streets before using Deane Street and Mary Street as their chosen route. Pedestrians were also seen to access businesses, the gym and childcare centre located in the high-rise development at 13 Deane Street.

4. PROPOSED DEVELOPMENT PARKING

Parking requirements are outlined in the Burwood Development Control Plan for the varying land uses contained within the proposed mixed development at 17 Deane Street. The parking proposed within the site does not meet the council requirements for all land usage types. The total amount of required parking spaces, the amount of parking spaces provided in the proposed development designs and the recommended rates of parking are shown in Table 4.1.

Table 4.1: Overall Required and Proposed Parking Spaces

Parking	Required Spaces	Proposed Spaces	Recommended Spaces
17 Deane Street	162	55	92

The following sections outline the parking requirements as per the Burwood Council DCP followed by recommended parking rates and configurations based on the specifics and limitations of the site. The proposed mixed-use development meets the recommended parking required based on the analysis detailed below. When developing the recommended parking rates consideration has been given to the:

- Relevant Roads and Maritime Services guidelines;
- Burwood Council DCP;
- Specifics of the land use
- Similar sites; and
- Location of the site.

4.1 RESIDENTIAL

4.1.1 Proposed Parking

The proposed parking rates allow for one parking space per residential unit, a total of 36, and eight (8) visitor parking spaces for a total of 44 parking spaces. Burwood Council DCP specifies a combined total of 39 residential and visitor parking spaces are required, as shown in Table 4.2.

Table 4.2: Proposed Residential Parking Rates

Residential Units	Quantity	Parking Rates	Required Spaces	Proposed Spaces
Studio	6	0.6 spaces per unit	3.6	36
1 Bedroom	12	0.6 spaces per unit	7.2	
2 Bedroom	9	0.9 spaces per unit	8.1	
3 Bedroom	9	1.4 spaces per unit	12.6	
Visitors	-	1 space per 5 units	7.2	8
Total			38.7	44

The parking is to be split between lower basement level 1 and 2 with access from an automated mechanical lift for residential and visitor parking only. 14 residential parking spaces and eight (8) visitor parking spaces are located in basement level 1 car park and 22 residential parking spaces are located in basement level 2 car park.

The mechanical lift is located in the basement level, accessed via a two-way ramp from Youth Lane. The lower basement level 1 and 2 car parks are entirely automated, with vehicles mechanically lowered on a turntable from the basement car park before being moved along a conveyor belt and pushed into their nominated position. Further details on the automated car parking method are provided in Section 4.6.

The parking provided for the residential and visitor component of the proposed development exceed the minimum requirements.

4.2 HOTEL

4.2.1 Proposed Parking

The proposed parking for the hotel component of the proposed development allowed for two (2) parking spaces allocated for staff and no parking spaces for hotel guests. Burwood Council DCP specifies a combined total of 103 parking spaces are required for the Hotel, as shown in Table 4.3.

Table 4.3: Proposed Hotel Parking Rates

Hotel	Quantity	Parking Rates	Required Spaces	Proposed Spaces
Room	101	1 space per room	101	0
Employee	-	2 spaces for employees	2	2
Total			103	2

4.2.2 Recommended Parking

It is recommended that lower level basement level 1 and 2 car parks are utilised to provided increased levels of parking for hotel staff and guests than what was allowed for in the original proposal. New recommended parking rates are outlined in Table 4.4, with justification provided below.

Table 4.4: Recommended Hotel Parking Rates

Hotel	Quantity	Parking Rates	Required Spaces	Proposed Spaces
Room	101	0.3 space per room	30.3	33
Employee	-	2 spaces for employees	2	2
Total			32.3	35

Burwood Council specified, in liaison with Urbis on 7 September 2017, that they would be "*open to a rate of 1 space per 5 rooms"*, provided that evidence of other use by LGA use was provided. Marrickville Council propose a range of between 0.2 parking spaces per unit and 0.5 parking spaces per unit for hotels (as per the 2011 DCP). Marrickville is approximately 7.5km from Sydney CBD, whilst Burwood is approximately 9.5km from Sydney CBD. The connectivity of the site, to Sydney CBD and other areas of Sydney via public transport, has been shown to be very good and well used by commuters. By means of connectivity and proximity to Sydney CBD, Marrickville is a suitable comparative location.

For a conservative approach 0.3 parking spaces per room has been applied, rather than a value approaching 0.2 parking spaces per room. The mechanical lift for access to these parking spaces is shared with retail and childcare staff.

A drop-off zone, with space for one vehicle, is also provided on Youth Lane for Hotel guests.

4.3 RETAIL

The required parking rates for the retail component of the proposed mixed-use development are met as set out in the Burwood Council DCP, shown in Table 4.5. The retail parking spaces are located in the level 2 basement car park. The mechanical lift for access to these parking spaces is shared with childcare staff and hotel guests and staff.

Table 4.5: Proposed Retail Parking Rates

Retail (m^2)	Quantity	Parking Rates	Required Spaces	Proposed Spaces
152m^2	-	1 space for first 400m^2	1	1
Total			1	1

4.4 CHILDCARE

4.4.1 Proposed Parking

The proposed parking requirements for a childcare centre with a capacity of 60 children are 1 parking space per 4 children and 1 parking space per staff member, as shown in Table 4.6.

Table 4.6: Proposed Childcare Parking Rates

Childcare	Quantity	Parking Rates	Required Spaces	Proposed Spaces
Children	60	1 space per 4 children	15	4
Staff	4	1 space per staff member	4	4
Total			19	8

The proposed eight (8) parking spaces are 11 parking spaces short of what the Burwood Council DCP requires.

4.4.2 Recommended Parking

It is recommended that the capacity of the proposed childcare centre is reduced from 60 to 50. By reducing the capacity of the childcare centre, the parking space available in the basement level is allocated for a mix of best practice, with eight (8) parking spaces allocated for the childcare centre and two (2) parking spaces allocated as waiting bays for the mechanical lifts.

The recommended parking requirements for a childcare centre with a capacity of 50 children were taken from a study conducted by the Roads and Traffic Authority (now RMS) in 1992, *RTA Traffic Generation Surveys and Analysis – Child Care Centres 1992*. A total of nine (9) long day care centres were assessed in detail which included the traffic generation from the site, available parking and average parking lengths. The study developed a peak parking rate formula based on the capacity of childcare centre, as follows:

Peak Parking Accumulation (LDC) = 1.198 + 0.205 C

C – capacity of the childcare centre

Based on this formula the recommended parking requirements are shown in Table 4.7.

Table 4.7: Recommended Childcare Parking Rates

Childcare	Quantity	Parking Rates	Required Spaces	Proposed Spaces
Children	50	1.198 + 0.205C	11.5	12
Total			11.5	12

Of the 12 recommended parking spaces, four (4) will be contained within the lower basement level 2 car park and accessible for staff members only. Lower basement level 2 parking is accessible by the mechanical parking system, for which staff members will be provided a card to operate. The mechanical lift will be shared by hotel staff and guests and retail staff.

The remaining eight (8) parking spaces, for pick up and drop off purposes, will be contained within the basement car park. The *RTA Traffic Generation Surveys and Analysis – Child Care Centres 1992* also showed that vehicles for child care centres park for an average of less than 10 minutes, allowing for a capacity of 48 vehicles per hour. Therefore, it is unlikely that vehicles will be required to wait or find alternative parking to access the childcare centre under the recommended parking scheme.

4.5 PARKING LAYOUT

Access to the basement level is provided by a two-way ramp from Youth Lane, where parking for customers of the childcare centre is provided as well as access to two mechanical lifts. The mechanical lifts provide automated access to parking in lower basement level 1 and lower basement level 2 for residents, guests and staff of the hotel, childcare staff and retail staff. The mechanical lift in the upper centre of Figure 4.1 is for residential and visitor access only and the mechanical lift in the upper right corner of Figure 4.1 is for hotel staff and guests, childcare staff and retail staff. Two waiting bays are included in the basement level car park to allow for occurrences where multiple vehicles are looking to access the mechanical lifts.

The layout of the basement level, lower basement level 1 and lower level basement 2 car parks are shown in Figure 4.1 to Figure 4.3.

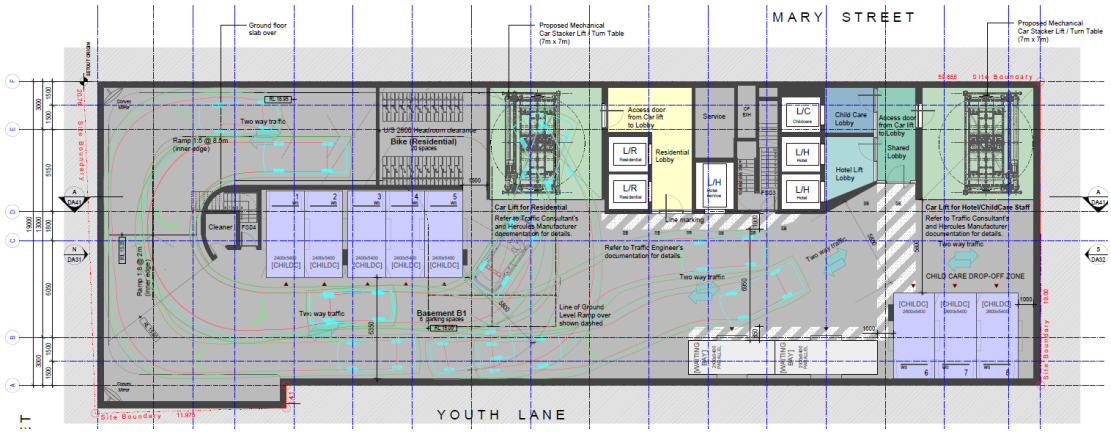


Figure 4.1: 17 Deane Street Basement Car Park Layout

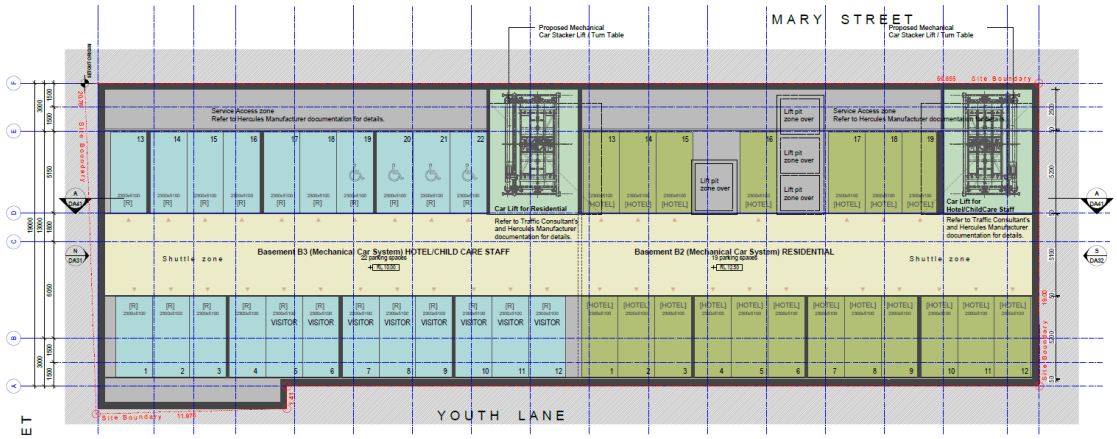


Figure 4.2: 17 Deane Street Lower Level Basement 1 Car Park Layout

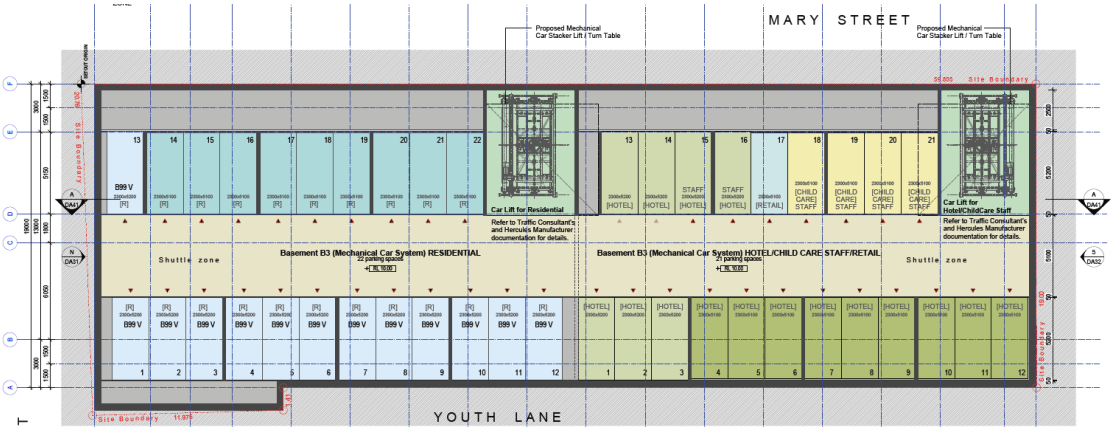


Figure 4.3: 17 Deane Street Lower Level Basement 2 Car Park Layout

4.6 HERCULES SYSTEM

4.6.1 System Operation and Reliability

The Hercules Car Parking System proposed for installation is a highspeed wire rope traction lift, which is similar in design to passenger rated lifts installed worldwide. The wire rope design leads to a smoother operation of the lift in comparison to hydraulic systems, as no physical or mechanical brakes are required to slow the system. A counter weight is used to reduce the energy required from the motor to operate the system, reducing the overall stress on the motor, energy output and cost of running the system whilst increasing the reliability and elongating the lifespan.

The motor selection is made with efficiency and reliability in mind. SEW Euro Drive motors are employed in the system, which have 96% efficiency and a life expectancy of 25 years. Failure of the motor, or the overall system, are very unlikely. There are two examples of fully automated systems which have been in operation for over a decade without failures. These locations are:

- Commonwealth Street, Surry Hills: System was installed in 2004 and still operates with its original motor in place. No failures have occurred in the 13 years of operation; and
- Hampton Court, Kings Cross: System was installed in 2006 and still operates with its original motor in place. No failures have occurred in the 11 years of operation.

Hercules are equipped with fulltime expert technicians who are available on a call out basis, should any malfunctions occur. Their warehouse is stocked with replacement motors, sensors and other key components which are able to be installed on an existing system with a limited turnover time. Maintenance is conducted half yearly, a process which takes between two and three hours. The building manager is liaised with prior to maintenance occurring to determine a suitable time to shut the system down for maintenance. During this time instructions are left at the control panels on how to contact the technician should a car be required to be parked or retrieved.

Further information and design examples can be found in Attachment B.

4.6.2 System Timing

Hercules Car Parking provide detailed timing analysis for each of their parking systems installed. The calculations include time provisions for:

- The opening and closing of lift doors;
- Driving the vehicle into the lift and allowing the driver to get out of the vehicle;
- Turn table operation;
- Lift operation;
- Shuttle operation; and
- Return of the lift.

The calculations show a parking rate of 31 vehicles per hour and a retrieval rate of 36.4 vehicles per hour. As there are proposed to be two lifts in operation, the system will be capable of parking 62 vehicles per hour and retrieving 73 vehicles per hour. The capacity of the combined lower basement level 1 and level 2 car parks is 84. It is unlikely that demand will exceed the parking and retrieval rates of the system. In the unlikely event that the parking rate is exceeded, it is proposed to include two waiting bays in the basement level. The waiting bays will be allocated as the parallel parking bays, opposite the residential lobby.

The detailed system timing calculations are shown in Attachment B.

4.6.3 Usability

Hercules Parking Systems provide users with an easy to use interface from entering their vehicle into the lift, selecting their parking space to retrieving their vehicle. Numerous user types are included in the design for 17 Deane Street, all of whom are afforded an easy to use experience.

Residential

The Hercules Parking System assists users in the process of parking their vehicles by means of LCD screens and prompts. An LCD provides directions to users when parking their vehicle and confirming when the vehicle is in the necessary position and the users can leave their vehicle. Each resident will be provided a unique swipe card with an allocated parking space attached. Once the car is in the lift system the user will swipe their card and select 'in' begins the automated parking procedure. The control panel will also be equipped with a touch screen key pad which users can enter their four (4) digit code into should they lose their swipe card. Instructions will also be posted near the operating panel.

To retrieve the vehicle users will swipe their card, or enter their four (4) digit code, and select 'out' from the touch screen. CCTV footage of the mechanical stacker will be available which shows the operations of the parking system so users can see where their vehicle is. The system rotates the vehicle 180° prior to opening, allowing users to exit the lift in a forward's direction. Further details are provided in Attachment B.

Hotel Staff and Guests

Guests will submit their vehicle registration details either when booking the hotel prior to arrival or at check-in for hotel staff to enter into the parking system. The lift for hotel, childcare and retail use can be fitted with a vehicle recognition sensor which will identify the vehicle specified by the guests prior to or at their check-in. Users enter the lift and park their car in a similar manner to that outlined in the residential section, with an LCD screen confirming when the vehicle is parked correctly and the user is able to exit the vehicle. The user will then walk to the lobby where they will be presented with a ticket or the touch screen will ask where the vehicle is to be parked.

To retrieve the vehicle users will enter the lobby and present their ticket and the system will recognise where the vehicle is parked. If a ticket is not issued or has been lost the user will enter their personal information (room number, name, address etc.) to retrieve their vehicle.

CCTV footage of the mechanical stacker will be available which shows the operations of the parking system so users can see where their vehicle is. The system rotates the vehicle 180° prior to opening, allowing users to exit the lift in a forward's direction. Further details are provided in Attachment B.

Childcare/Retail

The parking system for the childcare and retail staff can be set up either as outlined in the residential section, with swipe cards allocated to relevant management, or as outlined in the hotel section, by vehicle registration identification where staff would enter their vehicle registration into the system. The parking and retrieval processes will be as outlined above. Further details are provided in Attachment B.

5. PROPOSED DEVELOPMENT ACCESS

5.1 ACCESS AND EGRESS

The access and egress points for the proposed development is on Youth Lane. The proposed one-way southbound travel direction of Youth Lane provides access to a two-way access and egress to the basement car park levels, two loading zone spaces for delivery and waste refuse vehicles and a drop off zone space for hotel guests. The layout of the access and egress area is shown in Figure 5.1.

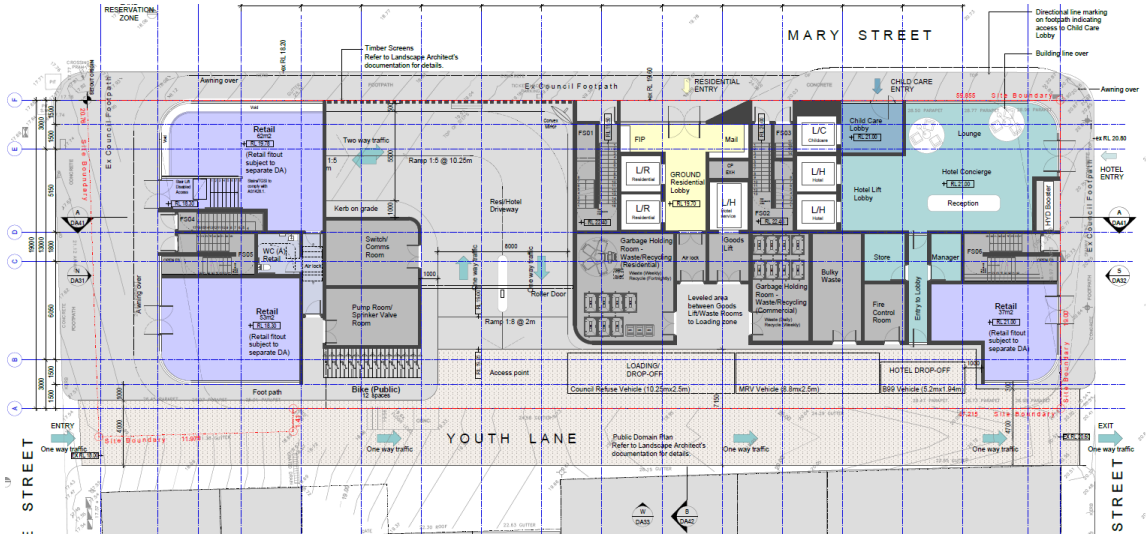


Figure 5.1: Access and Egress Design for 17 Deane Street

Youth Lane is proposed to be widened as part of the design, with greater than 4.0 metres at the George Street end and 4.7m at Deane Street end. The widened laneway allows easier access and manoeuvrability for vehicles accessing and leaving the site.

Space is provided for a 10.25m council refuse vehicle and an 8.8 MRV vehicle for the delivery of goods and removal of waste. Swept paths show the vehicles are able to enter Youth Lane from George Street, access the loading zones and exit Youth Lane onto Deane Street.

5.1.1 Residential / Childcare / Existing Hotel Guests / Retail

The access and egress point for the proposed development car park is to be located on Youth Lane. Vehicles accessing the site will be required to do so from Burwood Road and George Street only due to one-way travel restrictions. Vehicles exiting the site will be required to travel southbound on Youth Lane before turning right onto Deane Street and exiting onto Burwood Road only due to one-way travel restrictions. The access/egress paths to the development are shown in Figure 5.2.

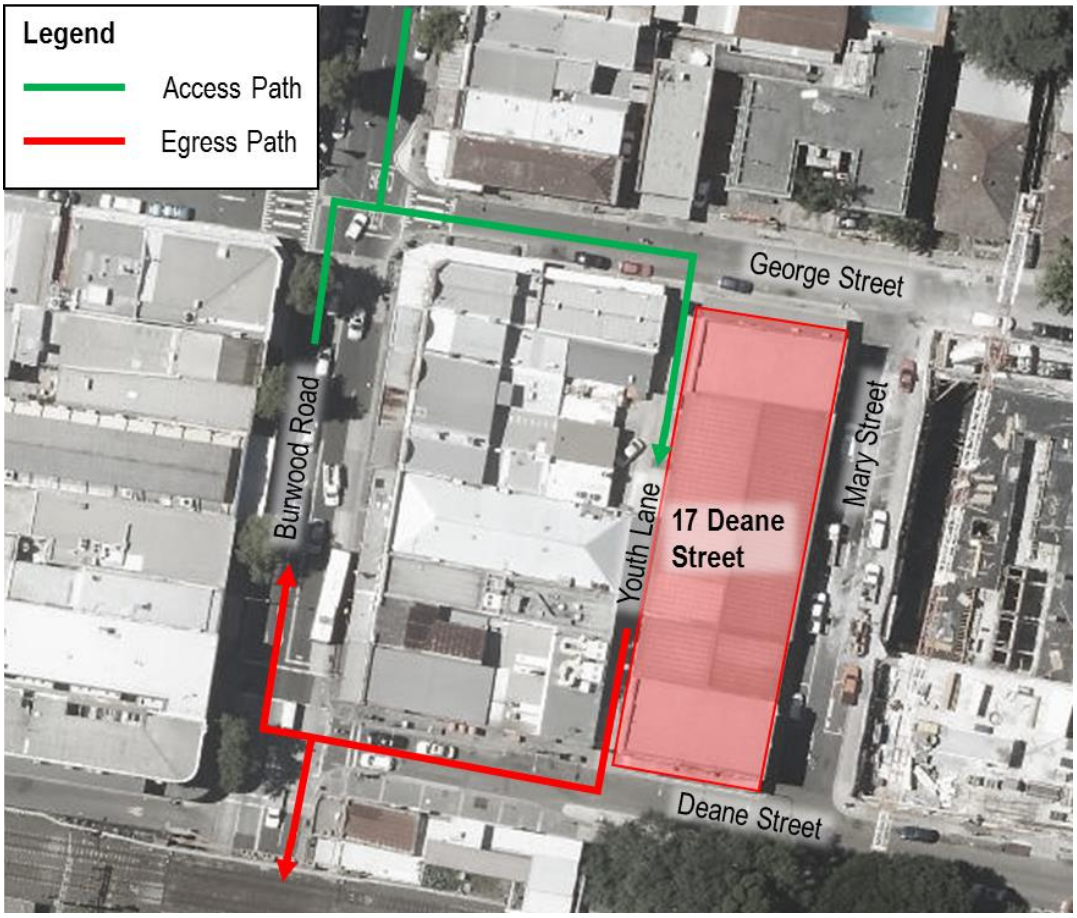


Figure 5.2: Access and Egress Paths

5.1.2 Waste Vehicles / Delivery Vehicles / New Hotel Guests

There is a multi-purpose pick-up, drop-off zone and loading zone (referred to as the Loading Zone and Hotel Drop off/Pick up zone) located on Youth Lane for use by arriving hotel guests and waste/delivery vehicles. Vehicles accessing and egressing from the Loading Zone will be required to take the same paths as those shown in Figure 5.2.

Guests checking into the hotel with a private vehicle will be required to park in the provided hotel drop off/pick up zone whilst checking-in. Post check-in, guests will be required to travel southbound on Youth Lane before turning right onto Deane Street, right onto Burwood Road, right onto George Street and right onto Youth Lane to access the lower basement car park. The required travel path is shown in Figure 5.3.

Figure 5.3: Checking-In Hotel Guest Access to Car Park

5.2 CHALLENGES

5.2.1 Deane Street – Proposed Two-Way between Youth Lane and Mary Street

Deane Street was considered for conversion from one-way westbound to a two-way street between Youth Lane and Mary Street. An assessment of this proposal was conducted via desktop assessment and also on-site observations. The proposal was found to be unsuitable for the following reasons:

- For a circulation path between Youth Lane south and Youth Lane north to be established via Mary Street both George Street and Deane Street would be required to change from one-way streets to two-way between Youth Lane and Mary Street;
- Significant existing infrastructure would be required to be removed and / or relocated, including:
  - Bicycle parking racks for approximately 15 bicycles;
  - Taxi rank with capacity of approximately three (3) vehicles;
  - Kiss and Ride zone with capacity of approximately 2 vehicles; and
  - Approximately three (3) ticketed parking spaces.
- Increased conflict points at the intersection of Deane Street and Mary Street;
- Narrow lane widths and turning paths not suitable for heavy vehicles exiting Youth Lane, particularly turning left onto Deane Street; and
- Vehicles queueing on Deane Street at Burwood Road queued back to and past Youth Lane at times.

Overall the loss of infrastructure in Deane Street, coupled with the loss of parking in George Street, narrow road width for two-way roads and increased conflict points for vehicles and pedestrians renders the proposal of a two-way road unsuitable. As a result, vehicles moving between the Loading Zone and the parking access are required to perform the loop outlined in Figure 5.3.

5.2.2 Youth Lane – Alteration from Two-Way to One-Way (southbound)

Youth Lane is a narrow two-way laneway between the one-way George Street (eastbound) and one-way Deane Street (westbound). It is currently used as access to businesses fronting Burwood Road between George Street and Deane Street. It is undulating in nature and varies in width along its length, including an area near its mid-section which allows two or three vehicles to park at an angle to gain access to businesses fronting Burwood Road. No passing of vehicles is possible within the lane, due to its width of 3.2m at the George Street end and 3.5m at the Deane Street end.

In its current two-way configuration, a number of safety concerns exist on Youth Lane. As a result, it is recommended that Youth Lane be altered from a two-way road to a southbound one-way road. The reasoning includes:

- **Lack of Sight Distance**: Sight distance is limited for vehicles exiting and entering Youth Lane at each end with respect to vehicles and pedestrians. The existing developments on either side and at either end of Youth Lane are built up to within two metres of the roadway, with only the width of the footpath, approximately two metres, separating the buildings from the roadways. As a result, motorists are left with restricted sight distance until they have entered or exited Youth Lane. This increases the risk of vehicle and vehicle/pedestrian crashes. A one-way laneway, with mirrors applied for the southern end to view pedestrians approaching to cross Youth Lane, is recommended to reduce the likelihood of incident. Examples of the lack of sight distance on all approaches between George Street, Youth Lane and Deane Street are shown in Table 5.1;

Table 5.1: Examples of Lack of Sight Distance at Intersections with Youth Lane

Location and Description	Photograph
George Street approach to Youth Lane (North): sight distance is extremely limited for the right turn from George Street to Youth Lane. The image to the right demonstrates that a vehicle approaching Youth Lane will have very limited reaction time if a vehicle were to be exiting Youth Lane. A one-way travel direction will increase the safety of this approach by disallowing vehicles to exit Youth Lane at this location.	
Youth Lane (North) approach to George Street: sight distance is extremely limited for the right turn from Youth Lane (north) to George Street. The image to the right demonstrates that a vehicle exiting Youth Lane will have very limited reaction to a vehicle turning into Youth Lane from George Street, or a pedestrian crossing. A one-way travel direction will increase the safety of this juncture by disallowing vehicles to exit Youth Lane at this location.	

Location and Description	Photograph
Youth Lane (south) approach to Deane Street: sight distance is extremely limited for the right turn from Youth Lane (south) to Deane Street. The image to the right demonstrates that a vehicle exiting Youth Lane will have very limited reaction to a vehicle turning into Youth Lane from Deane Street, or a pedestrian crossing. Vehicles often queue back to Youth Lane from Burwood Road (to the right of this picture), to which sight distance would again be restricted to. There is also a Kiss and Ride Zone and bicycle parking on Deane Street, directly across from Youth Lane, which further increased the conflict points at this location. A one-way travel direction will increase the safety of this juncture by disallowing vehicles to enter Youth Lane at this location. Further safety improvements are required to improve pedestrian and cyclist safety by adding mirrors for motorists to have a view of the footpaths and roadway on approach to Deane Street.	
Deane Street approach to Youth Lane (south): sight distance is extremely limited for the right turn from George Street to Youth Lane. The image to the right demonstrates that a vehicle approaching Youth Lane will have very limited reaction time if a vehicle were to be exiting Youth Lane. A one-way travel direction will increase the safety of this approach by disallowing vehicles to enter Youth Lane at this location.	

- **Narrow Width**: The narrow width of Youth Lane does not allow vehicles travelling in opposite directions to pass each other, with a width of 3.2m at the George Street end and 3.5m at the Deane Street end. Although a wider area exists towards the centre section of Youth Lane, vehicles commonly park in this area to gain access to businesses fronting Burwood Road. If vehicles enter the laneway at the same time, travelling in opposing travel directions, one will be required to reverse out of the laneway with limited sight distance. A one-way orientation removes the risk of vehicles entering the laneway in opposing travel directions reduces the risk of crash incidence;
- **Deliveries and Waste Collection**: Delivery and waste collection vehicles were observed to access Youth Lane, blocking the laneway for periods of up to 20 minutes at a time in some circumstances, as shown in Figure 5.4. Vehicles were also observed to enter Youth Lane in opposite travel directions, increasing the risk of vehicle crashes and the likelihood of a heavy vehicle reversing out of the tight laneway with no sight distance to vehicles or pedestrians. A delivery schedule and waste management plan, in conjunction with the Loading Zone proposed at the development site reduce the risk of Youth Lane becoming blocked, and a one-way orientation increases the safety of drivers, business owners, pedestrians and other road users;

Figure 5.4: Delivery Vehicle Blocking Youth Lane

- **Obstructions**: There are a variety of items located within the laneway which act as obstructions to vehicles moving through the lane. As shown in Figure 5.5. Pedestrians from nearby businesses are also likely to walk through Youth Lane to access items such as waste containers. A one-way configuration, with the addition of regulation regarding allowable contents within the laneway, creates a safer option. Obstructions within the laneway include:
  - Various sizes of waste containers;
  - Trolleys;
  - Milk crates;
  - Power pole; and
  - A variety of other smaller items.

Figure 5.5: Obstructions in Youth Lane

Overall, Youth Lane will operate as a safer and more efficient laneway by eliminating northbound travel movements. Additional measures to improve the safety and function of Youth Lane include implementing a delivery and waste management plan, regulating what can be left in the laneway and installing mirrors to assist vehicles sight distance of pedestrians and other vehicles when existing Youth Lane at Deane Street.

6. DESIGN ADVICE

6.1 PARKING

6.1.1 Parking Compliance

A total of 92 parking spaces and two waiting bays are included in the proposed mixed-use development at 17 Deane Street, Burwood. Of the 92 parking spaces provided only eight (8) are subject to a design assessment as the remaining 84 are included within the Hercules Parking System. The waiting bays are also included in the assessment.

The parking spaces included in the design assessment are located in the basement car park, allocated for access to the childcare centre. The waiting bays are reserved for residents and their visitors, hotel guests, childcare staff and retail staff accessing the mechanical lifts to reduce any possibility of queueing.

The assessment of the design of the basement car park with reference to AS2890.1:2004 Off-street car parking is shown in Table 6.1.

Table 6.1: Parking Design Compliance Check (AS2890.1:2004 Off street car parking)

Item	Requirement (mm) (AS2890 or approved plan)	Provision (mm)	Compliance
Parking Spaces Provided			
Basement Car Park	8 parking spaces + 2 waiting bays	8 parking spaces + 2 waiting bays	Complies
Car Park Space Dimensions			
Childcare Parking Spaces 1-8	2400 x 5400 (min.)	2400 x 5400	Complies
Waiting Bay (Unobstructed End Bay)	2100 x 5400 (min)	2100 x 5400 (min)	Complies
Waiting Bay (Obstructed End Bay)	2100 x 6400 (min)	2100 x 6400 (min)	Complies
Horizontal Clearance			
Horizontal Clearance	300 (min.)	300	Complies
Blind Parking Aisle Clearance			
Blind Parking Aisle Clearance	1000 (min.)	1000	Complies
Aisle and Ramp Width			
Parking Aisle Basement	5800 (min.)	5800	Complies
Ramp	5500 (min.)	5500	Complies
Barriers, including bollards and wheel stops			
Wheel Stops parking spaces 1-8	1100 from front of parking space	1100	Complies

6.1.2 Swept Path Analysis

A swept path analysis of each of the parking spaces allocated for the childcare centre shows a B85 vehicle, as defined in AS2890.1:2004 Appendix B Figure B2, is able to obtain a compliant access and egress path. The swept path for each of the eight (8) parking spaces are shown in Attachment C.

6.2 YOUTH LANE

6.2.1 Widening of Youth Lane

Youth Lane is currently 3.2m wide at its narrowest point, near the access/egress point at George Street. This width, and proximity to an intersection, restricts the size and type of vehicles able to access the proposed development. Due to the type of mixed-use development, including residential and hotel rooms, access to the site by council refuse vehicles is required along Youth Lane. As a result, Youth Lane is required to be widened from its existing width to accommodate a 10.25m refuse vehicle, as used by Burwood Council to collect domestic waste.

The proposed design of the mixed-use development at 17 Deane Street includes significant widening of Youth Lane along its entire length. Youth Lane is proposed to be 4.7m wide at its most narrow point, near the Deane Street egress point, with widths of over 5.0m near the George Street access point.

6.2.2 Waste and Delivery Vehicle Access

Heavy vehicles are required to access the proposed site to deliver goods and remove waste. Burwood Council currently uses a 10.25m refuse vehicle to collect domestic waste. As the designated access point to the proposed site is from Youth Lane, the council refuse vehicle must be able to manoeuvre into and out of Youth Lane and a designated Loading Zone.

A swept path analysis of a 10.25m refuse vehicle and 8.8m MRV was undertaken to assess the design of the widened Youth Lane. The analysis showed both vehicles are able to enter Youth Lane, access the Loading Zone and exit Youth Lane onto Deane Street in a compliant manner. Swept path analysis of both vehicles is provided in Attachment D.

6.2.3 Required Signage

Youth Lane currently has in place No Parking restrictions along both the eastern and western sides, with short No Stopping zones at the northern end near George Street. As Youth Lane is widened, updated and vehicle volumes increase, the parking restrictions and signage layout will also be required to be updated.

New signage is required within Youth Lane to reduce the risk of the lane becoming blocked with vehicles parked illegally and to indicate a new one-way travel direction. The signage areas will include:

- One-Way: At the northern entrance to the street from George Street;
- No Entry: At the southern egress at Dean Street;
- No Stopping;
  - Between George Street and the Basement Car Park Access;
  - Hotel Drop-Off/Pick-Up Area and Deane Street;
  - Deane Street and 152 Burwood Road Southern Property Boundary;
  - 148 Burwood Road Northern Property Boundary and George Street;
- Loading Zone: Between Basement Car Park Access and Hotel Drop-Off/Pick-Up Area; and
- Hotel Drop-Off/Pick-Up Area.

An indicative signage plan is shown in Attachment E. Please note Loading Zone restriction times may be applied pending the outcome of a waste management plan.

7. SUMMARY AND RECOMMENDATIONS

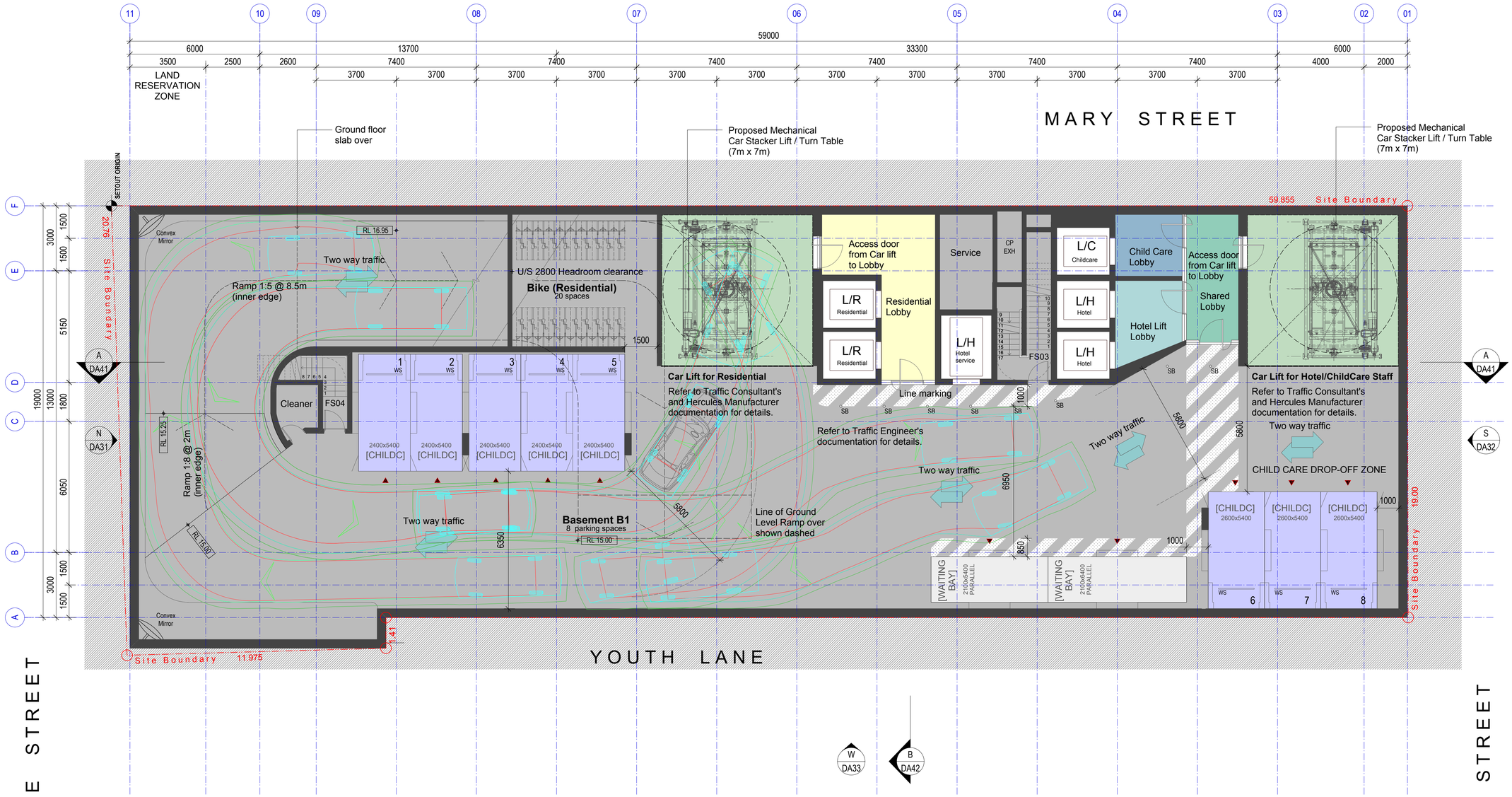
Following the investigation of the proposed design of the development for 17 Deane Street, Burwood, and the assessment of the impact to local traffic, it was found that the site is not likely to have a negative impact on the local traffic network. The proposed alterations to the existing network layout in Youth Lane is likely to have a positive impact with regards to safety and accessibility whilst the adjusted parking rates were found to be appropriate for the characteristics of the site. The following recommendations have been made:

- Lower parking rates than outlined in the Burwood DCP are applicable for this site due to its proximity to well connected, regular and well used public transport services, specifically;
  - Childcare parking rates are calculated using the formula adapted from the *RTA Traffic Generation Surveys and Analysis – Child Care Centres 1992*; and

  Hotel parking rates are taken at 0.3 parking spaces per room. This is a conservative approach to the 0.2 parking spaces per room Burwood Council stated it would consider and is employed by Marrickville Council.
- Parking provisions for each aspect of the mixed-use development are:
  - 44 residential parking spaces, including eight (8) visitor parking spaces;
  - 35 hotel parking spaces, including two (2) for staff;
  - 12 childcare parking spaces, including four (4) for staff;
  - One (1) retail parking spaces; and
  - Two (2) waiting bays in the basement level to allow for queueing for the mechanical lifts.
- The design of, access to and egress from the basement car park and parking spaces are compliant as per AS2890.1:2004;
- Childcare capacity to be reduced from 60 children to 50 children;
- Parking surrounding the site was observed to be at approximately 60% capacity throughout the period observed (07:00 – 08:30 Thursday 28 September), and therefore on-street parking surrounding the site is unlikely to be impacted;
- Youth Lane to be reclassified as a one-way laneway rather than a two-way laneway. A one-way orientation increases the safety of Youth Lane by restricting the quantity of conflicts at either end of the laneway and eliminating the possibility of head-on vehicle crashes;
- Youth Lane to be widened as per designed to assist the safe passage of delivery and waste refuse vehicles. Swept path analysis shows a vehicle up to 10.25m in length can access Youth Lane, park in the Loading Zone and exit onto Deane Street in a compliant manner;
- Management plans for the arrival of delivery vehicles and waste refuse vehicles should be developed to coordinate arrivals with periods of reduced vehicle activity in Youth Lane. Businesses fronting Burwood Road who use Youth Lane as an access should also be consulted during this period;
- Management plan for contents in Youth Lane, such as waste collection bins and trolleys, should be developed in consultation with nearby businesses to ensure Youth Lane remains accessible for all vehicles designed for;
- Deane Street and George Street are not suitable to become two-way streets between Youth Lane and Mary Street due to the potential infrastructure and services loss, increase in vehicle conflicts and queues from Burwood Road reaching Youth Lane on Deane Street; and
- The Hercules Car Parking System is proven to be reliable over long periods and efficient in the parking and retrieval of vehicles. Two mechanical lifts are proposed, one for the residents and visitors and one for the hotel guests and staff, retail staff and childcare staff.

ATTACHMENT A

ACCESS AND PARKING LAYOUT DESIGN

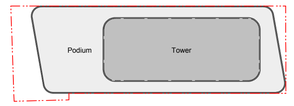


Car Parking Provision

			Proposed spaces
Basement 1	Child Care General		8
Basement 2	Residential	22	(4 adaptable) (8 visitors)
	Hotel	19	(Average 1 space in 4 bedrooms)
Basement 3	Residential	22	
	Hotel	14	
	Hotel Staff	2	
	Child Care Staff	4	
	Retail	1	
TOTAL		92	

Do not scale drawings. Verify all dimensions on site.

KEY PLAN



URBAN LIVING

LEGEND_AREA

- Car parking/ services area
- Hotel rooms
- Residential apartments
- Retail
- Hotel ammenities
- Residential ammenities
- Child care
- Hotel lobby
- Residential lobby
- Child care lobby
- Landscape
- Proposed Commercial/Retail Gross Floor Area (GFA)
- Proposed Residential Gross Floor Area (GFA)

LEGEND_PLANS

(A)	Adaptable	ST PRES	Stair Pressurisation
AWN	Awning Type 1, 2, 3	RD	Roller Door
BY	Balcony	R	Robe
B	Bathroom	RL	Recessed Level
B1, 2, 3	Bedroom 1, 2, 3	WIR	Walk in Robe
BAL	Balustrade Type 1, 2, 3	WS	Wheel Stop
BY	Balcony		
CPE	Car Park Exhaust		
CL	Cladding Type 1, 2, 3		
D	Dining		
E	Entry		
EN	Ensuite		
FH	Fire Hydrant		
FS	Fire Stairs 1, 2, 3		
GBC	Garbage Chute		
GC	Glass Type 1, 2, 3		
HYD	Hydrant		
K	Kitchen		
L	Living Room		
LY	Laundry		
MB	Mail Boxes		
P	Pantry		
PF	Paint Finish Type 1, 2, 3		
(R)	Residential		
(RT)	Retail		
S	Store		
SC	Screen Type 1, 2, 3		

DEVELOPMENT APPLICATION

Rev.	Date	Approved by	Revison Notes
A	07.06.17	TL	Additional Information to Council - Responding to GMU Comments

CLIENT
City Park Properties
Level 3, 479 George Street NSW

STRUCTURAL & CIVIL/STORMWATER ENG
Arcadia Sydney
Level 5, 141 Walker Street, North Sydney NSW
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TRAFFIC ENGINEER
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SURVEYOR
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PROJECT TITLE
MIXED USE DEVELOPMENT - 23 storeys
17 DEANE STREET BURWOOD NSW 2134

DRAWING TITLE
Basement 01_Child Care Parking

SCALE 1:100 @A1, 50%@A3	JOB No. 1607	DRAWN MGA	NORTH
STATUS DA Issue	DWG No. DA13B	REV A	

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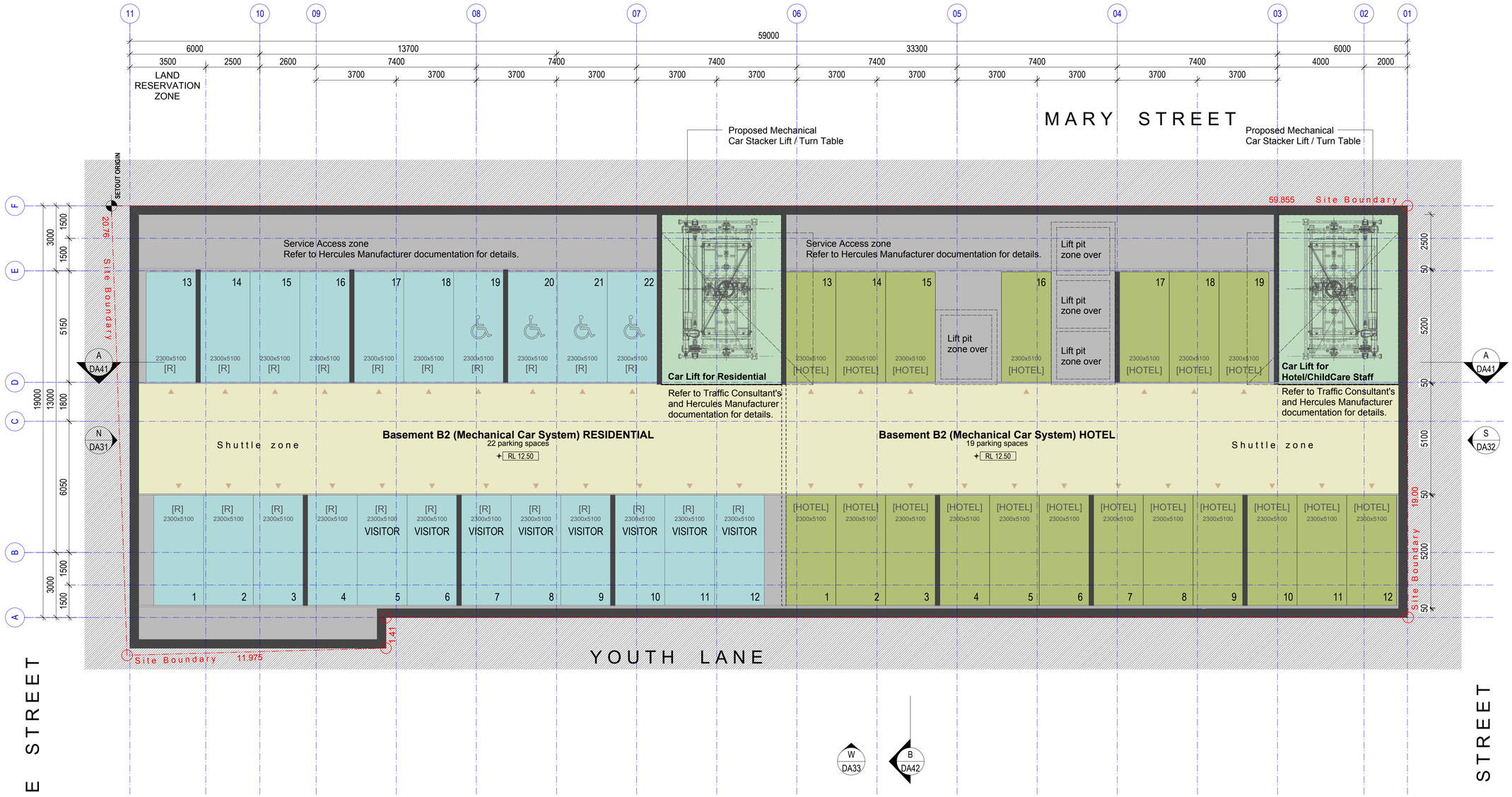
29 Hutchinson Street Surry Hills 2010 Australia
E: info@metropoint.com.au
ABN 84 116 791 229



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MGA Sydney 2012

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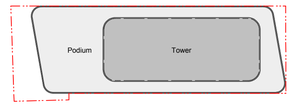

URBAN LIVING

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DEVELOPMENT APPLICATION

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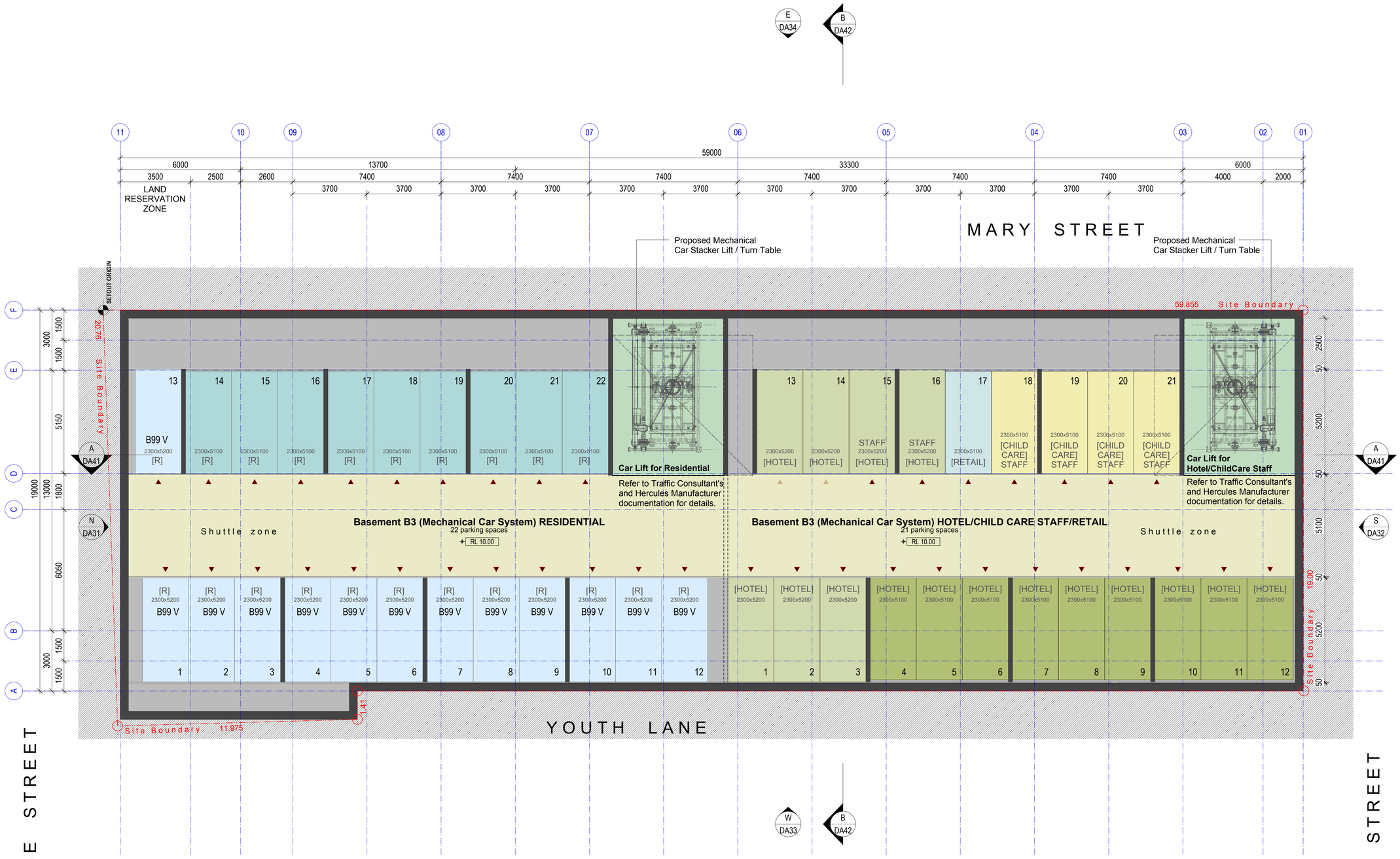

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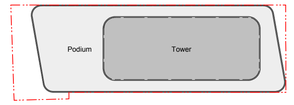
NOTES

MGA Sydney 2012

KEY PLAN



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CL	Cladding Type 1, 2, 3		
D	Dining		
E	Entry		
EN	Ensuite		
FH	Fire Hydrant		
FS	Fire Stairs 1, 2, 3		
GBC	Garbage Chute		
GC	Glass Type 1, 2, 3		
HYD	Hydrant		
K	Kitchen		
L	Living Room		
LY	Laundry		
MB	Mail Boxes		
P	Pantry		
PF	Paint Finish Type 1, 2, 3		
(R)	Residential		
(RT)	Retail		
S	Store		
SC	Screen Type 1, 2, 3		

DEVELOPMENT APPLICATION

Rev.	Date	Approved by	Revison Notes
A	27.02.17	TL	For DA Submission

CLIENT
City Park Properties
Level 3, 478 George Street NSW

STRUCTURAL & CIVIL/STORMWATER ENG
Arcadia Sydney
Level 5, 141 Walker Street, North Sydney NSW
T 02 8907 9000

PLANNER
Urbis
Tower 2, Level 23 Darling Park/201 Sussex Street NSW
T 02 8233 9900

TRAFFIC ENGINEER
Parking & Traffic Consultants
Suite 102, 506 Miller Street Cammeray NSW
T 02 8520 0800

ACOUSTIC
Renzo Tonin and Associates
Level 1, 418A Elizabeth Street Surry Hills NSW
T 02 8218 0500

BCA
MBC Modern Building Certifier
Suite 112-114, 117 Old Pittwater Road Brookvale NSW
T 02 9939 1530

LANDSCAPE ARCHITECT
LSA Design
3/1-7 Probert Street Camperdown NSW
T 02 8542 8483

ACCESSIBILITY
ABE Consulting
Suite 2.02, 92 Norton Street Leichhardt NSW
T 02 8065 0400

WASTE/WIND/BASIX/FACADE
WSP
Level 1, 41 McLaren Street North Sydney NSW
T 02 8907 0900

SURVEYOR
Rygate Surveyors
Suite 904, Level 9, 89 York Street NSW
T 02 9262 6800

PROJECT TITLE

MIXED USE DEVELOPMENT - 23 storeys
17 DEANE STREET BURWOOD NSW 2134

DRAWING TITLE

Basement 03_Mechanical Parking

SCALE 1:100 @A1, 50%@A3		JOB No. 1607	DRAWN MGA		
STATUS DA Issue		DWG No. DA11	REV A	NORTH	

Metropoint Group Architects
29 Hutchinson Street Surry Hills 2010 Australia
E: info@metropoint.com.au
ABN 84 116 791 229

ATTACHMENT B

HERCULES PARKING SYSTEM DOCUMENTS

HERCULES CARPARKING SYSTEMS 2004 PTY LTD

ABN: 67 077 434 452

Unit 1, 87 Reserve Road

Artarmon NSW 2064

Toll Free: 1800 649 603

Hercules Carparking Systems Reliability

17 Deane St, Burwood.

05/09/2017

Reliability of the Car Lift

The main operation of the automated car parking system is the lift and Hercules Car parking systems goes beyond standards to provide innovative system designs with high quality and reliability. The Main lift at 17 Deane St, Burwood is a highspeed wire rope traction lift. This is a very simular design to passenger rated lifts that are commonly employed all over the world. Hercules also provides passenger rated car lifts that share simular designs based off the automated carparking systems main lift. This is due to the high levels of engineering that has been invested into the design of these lifts. With a few modifications such as adding mechanical speed governors and other smaller modifications we can design our automated car lifts to meet passenger rated standards which we have many examples of *(See Figure 3 and 4).*

The high engineering standards that we invest into our lift designs, results in a highly reliable lift. The wire rope traction lift uses a counter weight design, this reduces the amount of energy required from the motor to operate the lift. This reduces stress on the motor, making it last longer and requires less power from the motor to operate. This increases reliability while reducing power consumption and costs to run the system.

The wire rope design also results in a smooth operation as no hydraulic stages are required or physical mechanical brakes to slow down the system. Again, reducing stress and increasing the life of the lift.

The motor is the core of the lift and Hercules spares no expenses when it comes to selection of the driving motor. Hercules selects SEW Euro Drive motors for the driving motor. SEW is a leading manufacturer of drive technology worldwide. The motor is designed to extremely high standards, the parts are manufactured in Germany and assembled all over the world. The SEW motor is known for its efficiency and reliability. These motors have a 96% efficiency which is extremely high resulting in more power saving and offers a long service life increasing reliability. Correctly employed and serviced these motors have a lift expectancy of over 25 years plus minimum before a major service.

To highlight the reliability of these lifts here are two examples of fully automated system which employs a single lift entry/exit room and have been running for a long period of time without any failures of the main lifts. The first fully automated system was installed in 2004 at Commonwealth St, Surry Hills. This project has been operating and still is operating with its original lifting motor. A second reference site is the Hampton Court, Kings Cross Project. Installed in 2006. This Fully automatic stacker has a single lift for its entry/exit room and has also been operating since with its original lifting motor. (*See Figure 1 and Figure 2 for reference drawings)*

The failure of a lift in an automated car parking system is extremely low due to the amount of R&D invested into the designs. Once Hercules installs the automated system we also provide a maintenance agreement where our skilled technicians service the system. The servicing of the system is accomplished with a goal of preventative maintenance to eliminate the chance of a failure and increase the reliability of the system.

SEW has multiple branches in Australia which provide Hercules with support such as instructions to maintain the motors and warehouses that stocks all parts required to rebuild a motor in Australia.

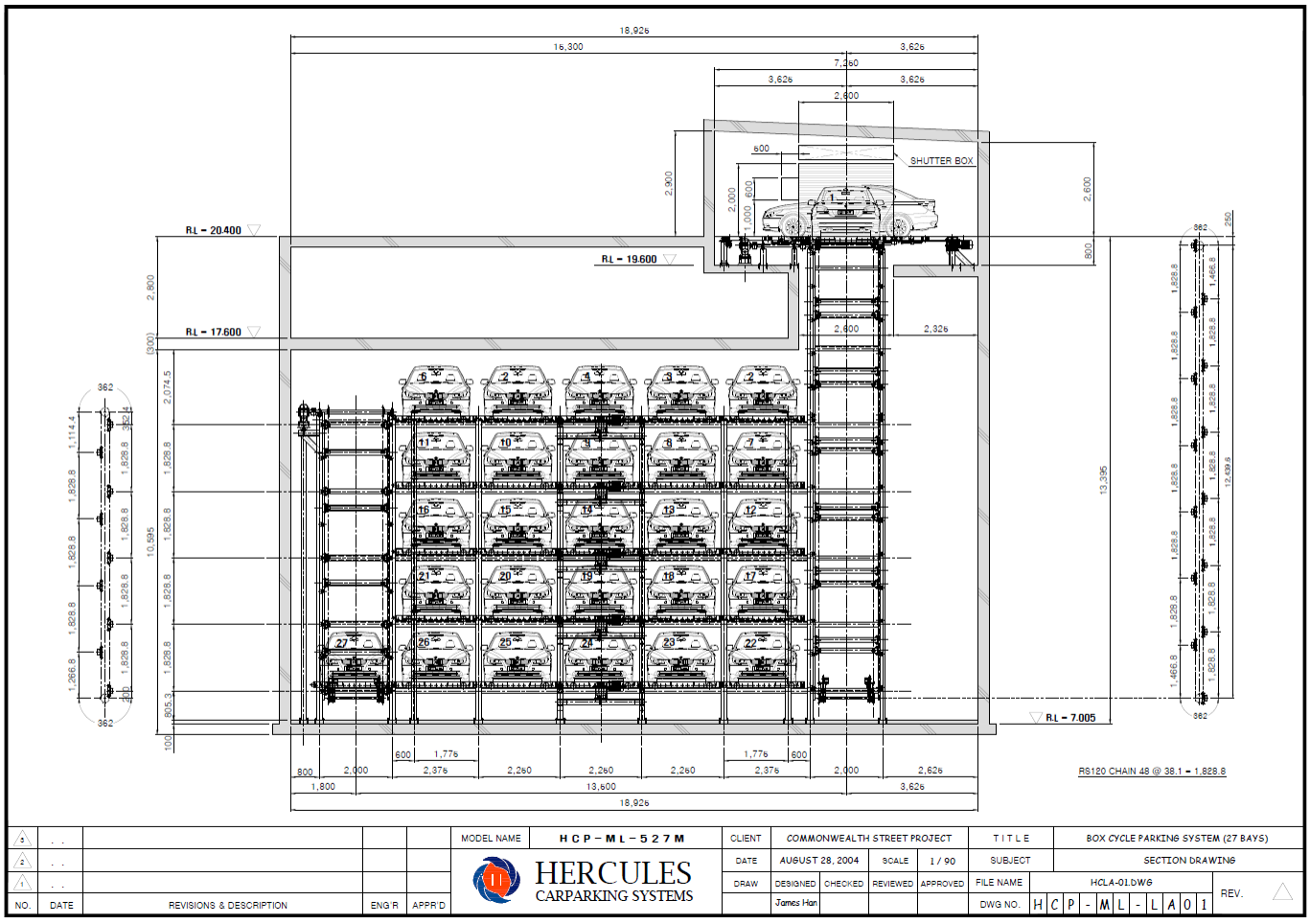
Even though the possibility of a motor failure occurring is extremely low Hercules is always prepare for the worst situation, with its fulltime expert technician team and warehouse stocking spare parts including lift motors and wide range of sensors. If in the case of a failure Hercules are always prepared with little time for turnover when repairing/replacing parts. See *Figure7* is a current photo of the SEW motors we have in stock in our warehouse which is enough to replace any motor in a fully automated system in the event of a motor failure.

If a motor was to fail Hercules has the support, skilled team and machinery to replace a motor in a day. Other components used on the lift such as limit switches, photo sensors and proximity sensors can be easily replaced and fixed on the spot.

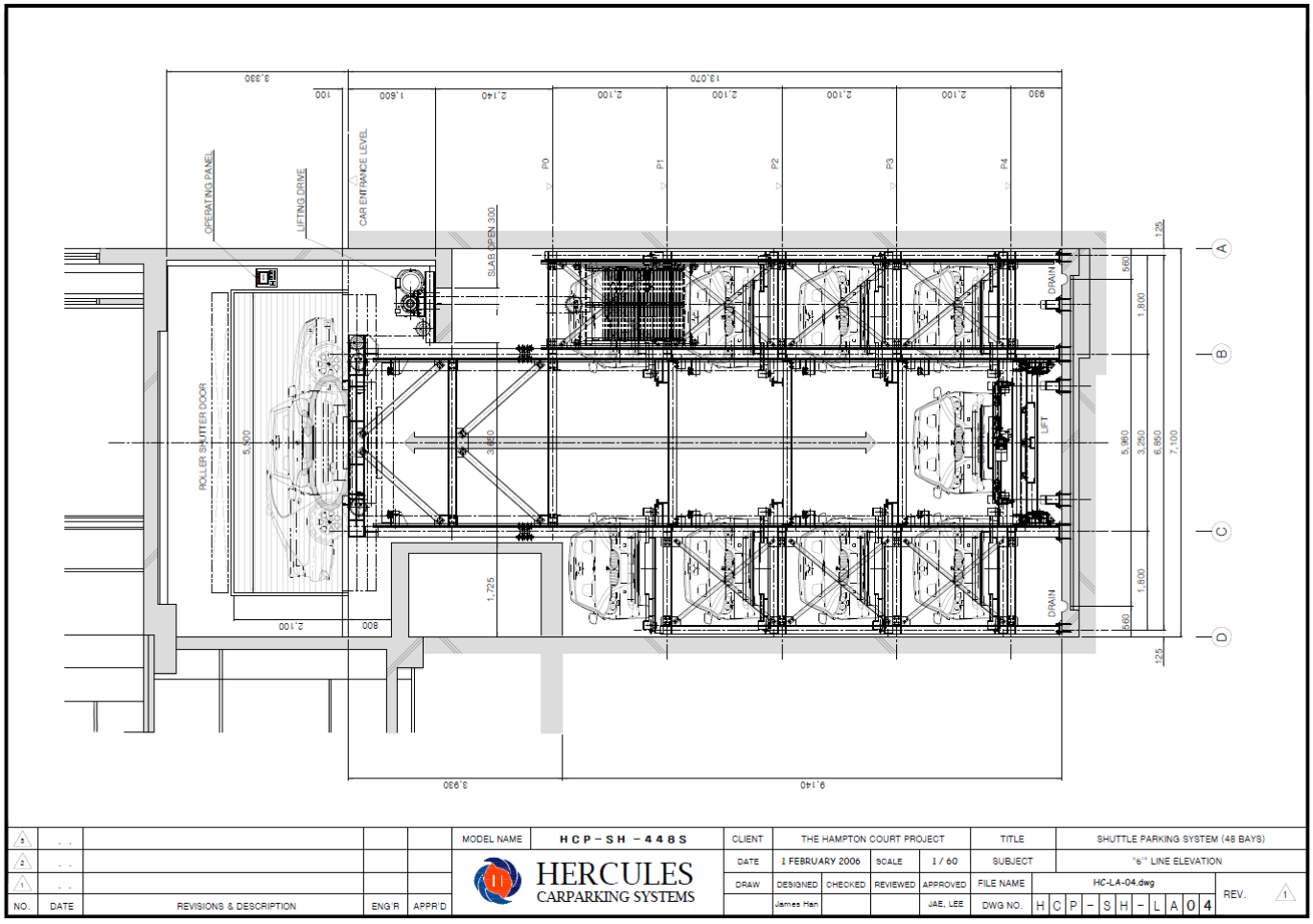
As a qualified engineer specialising in Mechatronics and with the support of a design Engineer/Architect with over 30 years of Mechanical Car Parking experience one lift is extremely reliable and highly supported for the design of 17 Deane St, Burwood Fully Automated Car Parking System.

Regards,

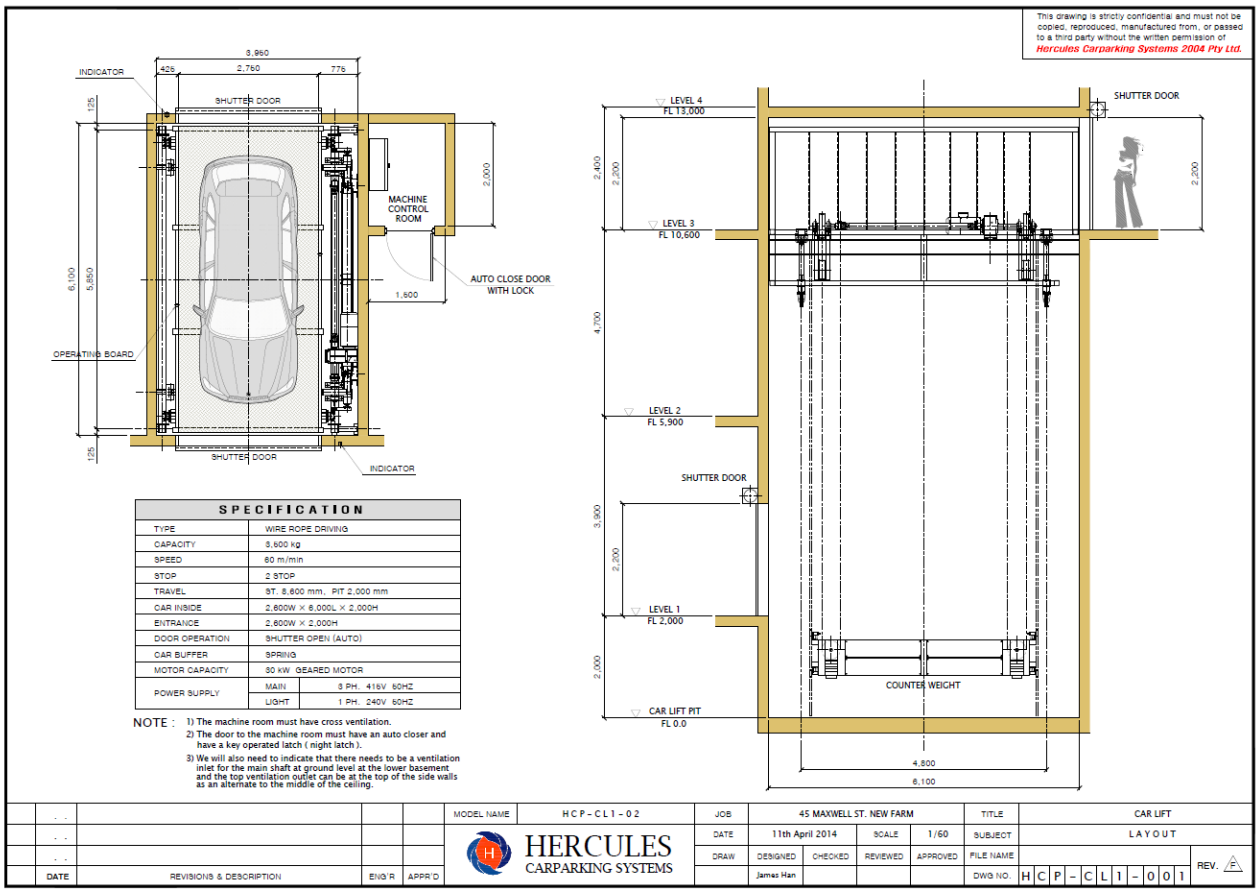
Robert Farrugia



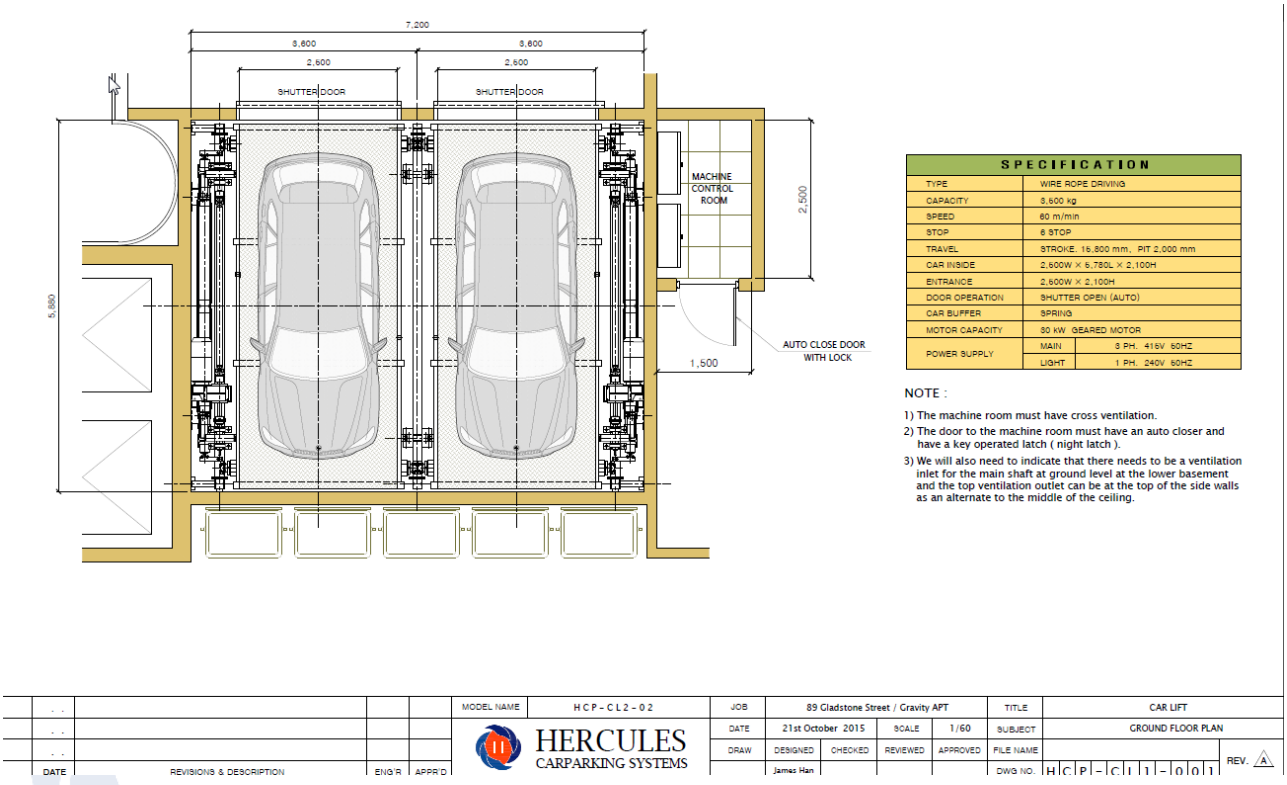
(Figure 1; Commonwealth St, Surry Hills Project. Installed in 2004 has been operational since and still has its original main lift motor)



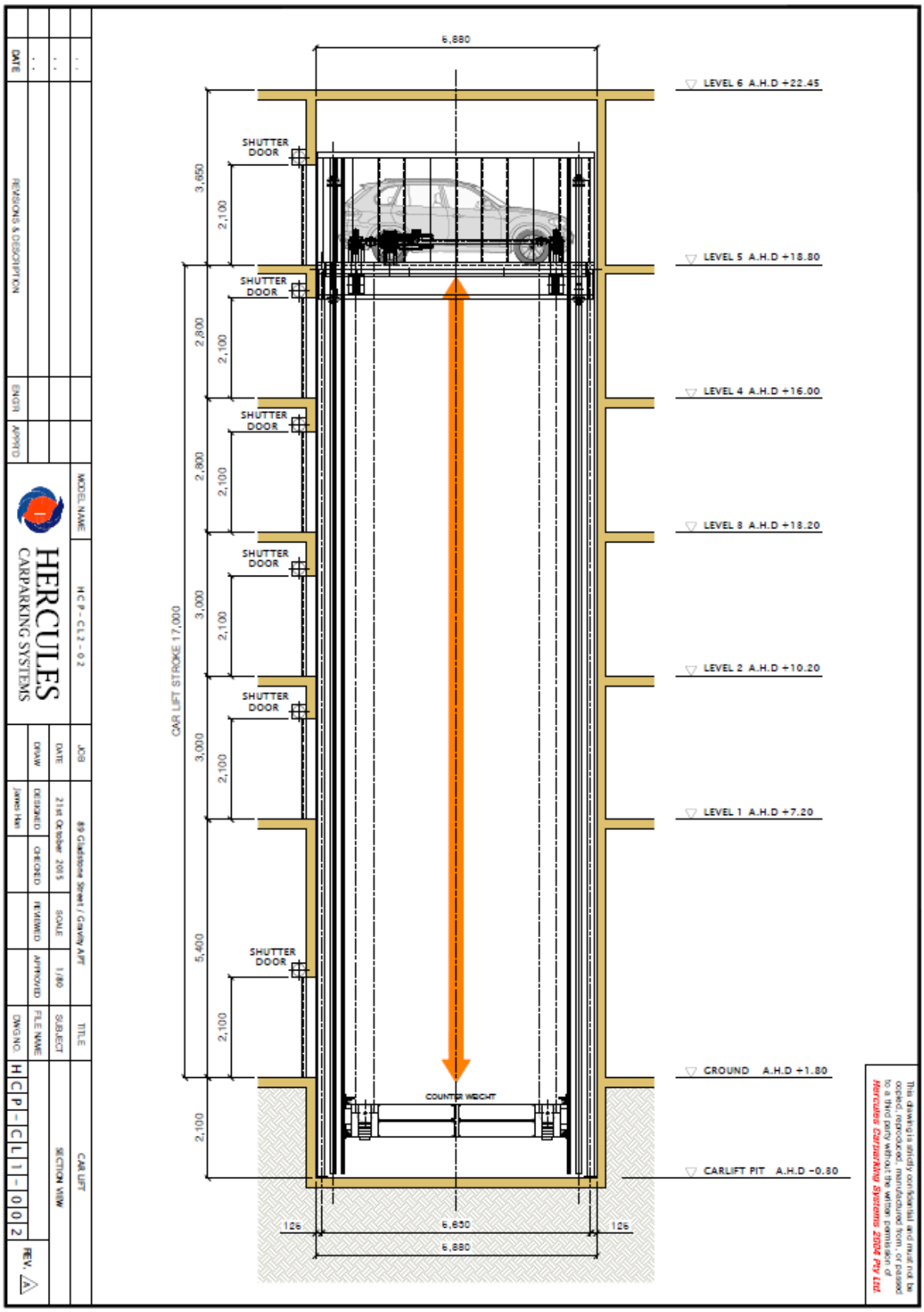
(Figure 2; Hampton Court, Kings Cross Project. Installed in 2006 has been operational since and still has its original main lift motor)



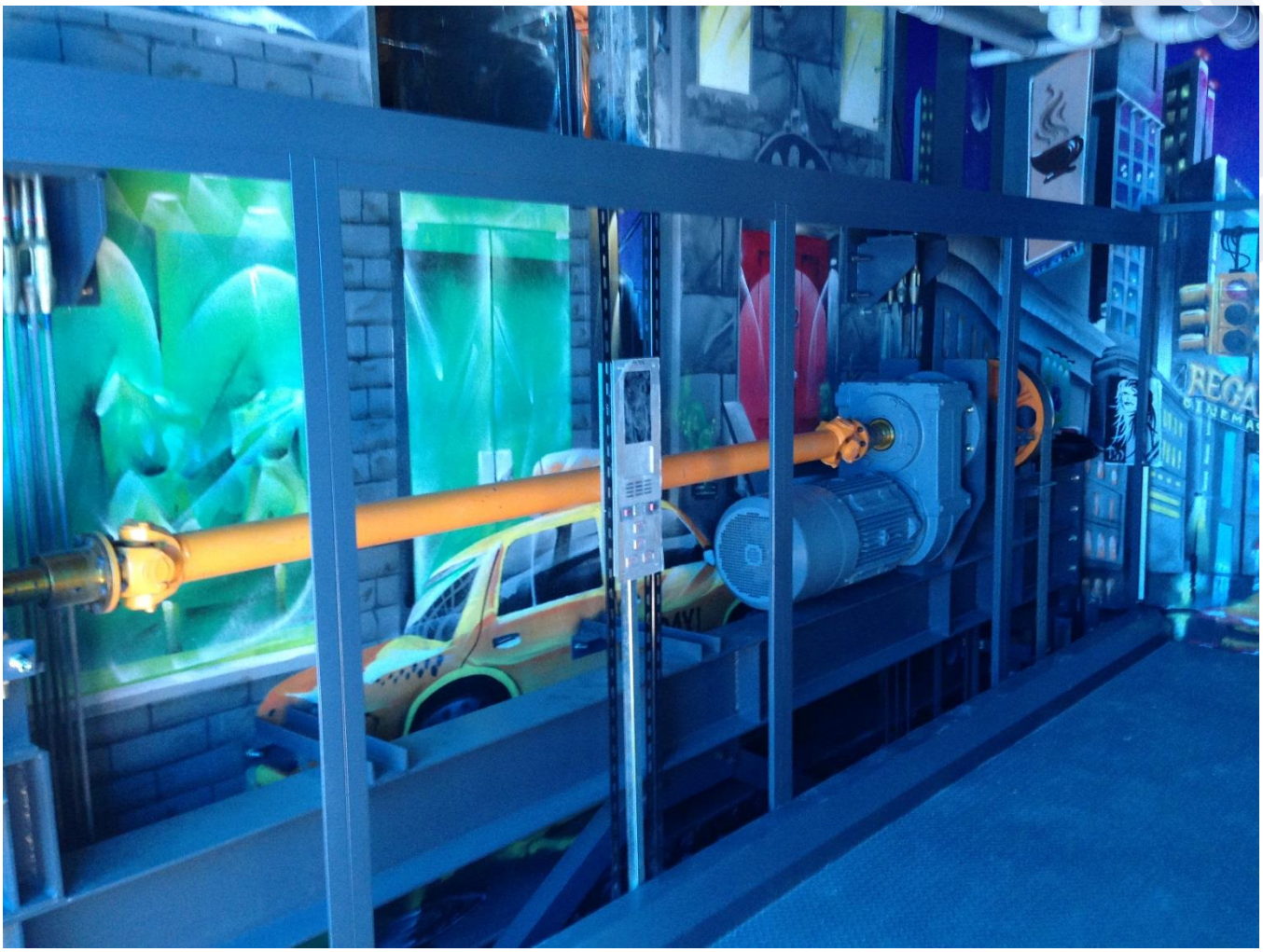
(Figure 3; High Speed Wire Rope Traction Passenger Rated Car Lift based of the fully automated car parking system main lift design. Installed Project 45 Maxwell St, New farm)



(Figure 4; High Speed Wire Rope Traction Passenger Rated Car Lift based of the fully automated car parking system main lift design. Installed Project 89 Gladstone St, Melbourne)



(Figure 5; High Speed Wire Rope Traction Passenger Rated Car Lift based of the fully automated car parking system main lift design. Installed Project 89 Gladstone St, Melbourne)



(Figure 6; 45 Maxwell St, Newfarm. Main lifting motoring and driving mechanism)

(Figure 7; Spare Motors Always kept in stock in Hercules Warehouse, including main lift, shuttle running, shutting picking and turntable motors)

Maintenance

Below is an example maintenance contract which provides routine maintenance and a 24/7 service. All maintenance services will be conducted through the building manager and strata where the maintenance will be completed at agreed times where it limits impact to the users. If required and urgent we can quickly park or retrieve a vehicle is needed during maintenance.

SERVICE AGREEMENT	**CONTACT SERVICE**
(Maintenance, breakdown and support service)	1800 649 603

Parties to the Contract:

Contractor:

Hercules Carparking Systems 2004 Pty Ltd

ABN: 67 077 434 452

Unit 1, 87 Reserve Road,

ARTARMON NSW 2064

AND

The Principal

CONTACT	**SITE ADDRESS**
COMPANY	
ADDRESS	

PHONE	

Equipment to be Serviced:

No. Of:	Equipment Type	Number of Carspaces

Fees

Maintenance Service Program Fee

2 Services per year @ half-yearly intervals	**$#### + GST Per Service** Per Annum $#### + GST (Payable prior to Service being completed)

Breakdown Response Fees*

Response between: 7:30am to 4:30pm, Monday to Friday (excluding public holidays)	$### + GST Service Call Out. $### + GST per 15 mins or part thereof. Minimum 2 hours.
Callouts outside the above hours including Saturdays: (excl. Public Holidays & Sundays)	$### + GST Service Call Out. $###+ GST per 15 minutes thereafter. Minimum 2 hours.
Sunday or Public Holiday callout:	$### + GST Service Call Out. $### + GST per 15 minutes thereafter. Minimum 2 hours.

*I, an authorised representative of the Principal, permit/do not permit the Contractor to attend Breakdown Service calls from the Car Parking Systems users and instruct the Contractor to treat such calls as being made by the Principal or its representatives under the above Terms and Conditions.

Initial_____ Date_____

Commencement Date	

Signed as acceptance of this agreement and its Terms and Conditions* on behalf of the **Principal** by its duly authorised signatory:

Signature

Print Name

Date

Signed as commitment to this agreement and its Terms and Conditions* on behalf of the **Contractor** by its duly authorised signatory:

Signature

Print Name

Date

Terms & Conditions for Car Parking Equipment Services Agreement

The Parties agree to the following terms:

1. General

1.1 Bold terms are defined terms in this Contract and such terms have the meaning given herein.

1.1.1. **Contract** means this contract.

1.1.2. **Parties** mean the Contractor and Principal and **Party** means either one of them.

1.1.3. **Sale Contract Warranty** means the warranty covering the Car Parking Equipment on the terms set out in the contract pursuant to which such equipment was purchased.

1.1.4. **Site** means the location at which the Car Parking Equipment is located.

1.1.5. **Summary Page** means the front page of this Contract executed by the Parties.

1.2 This Agreement and the documents to be entered into pursuant to it shall be governed by, and construed in accordance with, the laws of NSW, Australia.

1.3 Any amendment or modification to this Contract will only be effective if made in writing and signed by both Parties.

2. Commencement and expiration

2.1 This Contract commences on the date it is executed by the Parties (the **Commencement Date**).

2.2 This Contract terminates on the date that is Sixty (60) calendar months following the Commencement Date (the **End Date**) the contract will automatically renew unless either Party give notice to terminate the agreement with 1 month of the end date by written notice. The Parties acknowledge and agree there is no limitation on the number of times they may extend the Contract.

3. Contractor Maintenance Service Program

3.1 The Contractor shall complete the **Maintenance Service Program** (set out in Annexure A) for the **Car Parking Equipment** (listed on the Summary Page) two times a year during the term of this Contract at approximately six monthly intervals in consideration for the Principal paying the **Maintenance Service Program Fee** (set out on the Summary Page) as adjusted in accordance with Clause 7 below.

3.2 The Contractor shall complete the Maintenance Service Program for the Car Parking Equipment between the hours of 7:30am to 4:30pm on weekdays (excluding public holidays and office closures) unless the Parties agree a different time for completion of such program.

3.3 The Principal shall pay the Maintenance Service Program Fee prior to the Contractor completing the relevant Maintenance Service Program for the Car Parking Equipment.

3.4. The Principal acknowledges and agrees that the Maintenance Service Program contains an exhaustive list of the services to be provided by the Maintenance Service Program. The Principal acknowledges and agrees that it will incur additional charges for: (i) any services or repairs not listed in the Maintenance Service Program; and (ii) any

parts or components required to repair the Car Parking Equipment unless such parts or components are covered by the Sale Contract Warranty.

3.5. The Principal undertakes to purchase any parts or components related to the Car Parking Equipment from the Contractor. Refer Clause 9 of these Terms and Conditions of Agreement.

3.6. The Contractor shall keep a record of each Maintenance Service Program completed for the Car Parking Equipment. The Contractor shall provide to the Principal a copy of these records upon the Principal's written request.

4. Contractor Breakdown Service

4.1. For the purposes of this agreement **Breakdown Service** means a visit by the Contractor, at the request of the Principal, the car park operator or user of the Car Parking Equipment, to the Site using reasonable endeavours to fix any breakdown or malfunction of the Car Parking Equipment.

4.2. The Contractor shall provide the Breakdown Service for the Principal twenty-four hours a day during each day of the term of this Contract in consideration for the Principal paying the relevant Breakdown Service Fee (set out in the Summary Page) as adjusted in accordance with Clause 7 below.

4.3. The Contractor shall use reasonable endeavours to provide the Breakdown Service within a reasonable time of receiving a request for the Breakdown Service from the Principal, car park operator or user of the Car Parking Equipment.

4.4. The Principal shall pay the Breakdown Service Fee within five calendar days of the Contractor's completion of the relevant Breakdown Service for the Car Parking Equipment. **For the purposes of clarification, the Principal is obligated to pay the Breakdown Service Fee even if the Principal has not requested the Breakdown Service provided the request for the Breakdown Service was issued by a car park operator or user of the Car Parking Equipment and the Contractor provided the Breakdown Service**.

4.5. The Principal acknowledges and agrees that the Breakdown Service Fee does not include the cost of any parts or components required to repair the Car Parking Equipment. The Principal acknowledges and agrees that it will incur additional charges for any parts or components required to repair the Car Parking Equipment unless such parts or components are covered by the Sale Contract Warranty.

4.6. The Contractor shall keep a record of each Breakdown Service completed for the Car Parking Equipment. The Contractor shall provide to the Principal a copy of these records upon the Principal's written request.

5. Contractor Support Service

In consideration for the Principal entering this Contract, during each 12-month period of the term of this Contract, when requested by the Principal, the Contractor shall provide to the Principal (the **Support Service**):

(a). (*telephone support*) general instruction on how to use the Car Parking Equipment over the telephone during normal business hours on weekdays (excluding public holidays) up to a total of 2 hours for the 12-month period (this support may consist of one phone call for 2 hours or a number of shorter calls totalling 2 hours in duration); and

(b). (*in person support applies only to new machines installed by Hercules*) a one-off attendance at the Site within the first 12-month period during normal business hours on a weekday (excluding public holidays) to give general instruction on how to use the Car Parking Equipment with such attendance duration capped at 1 hour.

6. Additional Services outside the scope of this Contract and force majeure

6.1. **Additional Services** means any services that are not provided as part of the Maintenance Service Program, the Breakdown Service and the Support Service. A non-exhaustive list of Additional Services is set out in Annexure B.

6.2. **Additional Services Fees** means the charge imposed on the Principal by the Contractor for providing Additional Services.

6.3. The Principal may request the Contractor to provide Additional Services. The Contractor shall reasonably consider performing Additional Services requested by the Principal.

6.4. If the Contractor provides Additional Services:

6.4.1. at the time of performing a Maintenance Service Program, the Contractor shall not charge the Principal a fee to visit the Site to complete the Additional Services; or

6.4.2. at any time, other than when performing a Maintenance

Service Program, the Contractor shall charge the Principal the relevant Breakdown Service Fee for visiting the Site to complete the Additional Services.

For the purposes of clarification, the Principal undertakes to pay the relevant Breakdown Service Fee anytime the Contractor visits the Site excluding when the Contractor visits the Site to perform the Maintenance Service Program.

6.5. The Principal authorises the Contractor to complete Additional Services up to the amount of $400.00 + GST. The Contractor undertakes to obtain the Principal's authorisation prior to completing Additional Services that exceed the amount of $400.00 + GST.

6.6. The Contractor is not liable in any way to the Principal for failure to provide services under this Contract if such failure arises from industrial action, acts of God and any other interruptions or circumstances beyond the reasonable control of the Contractor.

7. Indexing of Contractor fees

7.1. The Parties acknowledge and agree that the Maintenance Service Program fee set out on the Summary Page shall be increased by the CPI or 5% whichever is the greatest

(the **Indexing Increase**) every 12 months following the Commencement Date.

7.2. The Indexing Increase shall take effect on the anniversary date of the Commencement Date during the term of this Contract.

8. Contractor insurance obligations and OHS obligations

8.1. For the purposes of this Contract, **Worker** means any employee of the Contractor that provides services under this Contract or any subcontractor or third party the Contractor uses to provide services under this Contract.

8.2. During the term of this Contract, the Contractor shall hold public liability insurance to cover the Contractor and any Worker that provides services under this Contract for

an amount not less than $20,000,000.

8.3. The Contractor shall ensure any Worker it uses to provide services under this Contract complies with legally applicable OH&S requirements when performing such services.

9. Spare Parts

9.1. The Contractor will source and provide spare parts for products which were originally supplied and installed by the Contractor or for which it is the authorised agent or which are freely available.

9.2. The Contractor will provide assistance to the Principal for spare parts where the Contractor was not the supplier of the system and/or is not the agent for the product in Australia and/or the parts are not freely available.

9.2.1. In such circumstances where the Contractor is prevented from procuring spare parts through actions/inactions by others (such as competitors), the Principal will be required to procure the spare parts through placement of orders as written by the Contractor.

9.2.2. The Contractor will provide content for such orders such that the effort of the Principal is minimised.

9.2.3. The Principal may elect to pay the supplier of the procured parts directly.

10. Default and Consequences of Default

10.1. Interest on overdue invoices shall accrue daily from the date when payment becomes due, until the date of payment, at a rate of two and a half percent (2.5%) per calendar month (and at Hercules's sole discretion such interest shall compound monthly at such a rate) after as well as before any judgment.

10.2. If the Principal owes the Contractor any money the Principal shall indemnify the Contractor from and against all costs and disbursements incurred by the Contractor in recovering the debt (including but not limited to internal administration fees, legal costs on a solicitor and own Principal basis, the Contractor's contract default fee, and bank dishonour fees).

10.3. Without prejudice to any other remedies the Contractor may have, if at any time the Principal is in breach of any obligation (including those relating to payment) under these terms and conditions the Contractor may suspend or terminate the supply of Services to the Principal. The Contractor will not be liable to the Principal for any loss or damage the Principal suffers because the Contractor has exercised its rights under this clause.

10.4. Without prejudice to the Contractor's other remedies at law the Contractor shall be entitled to cancel all or any part of any order of the Principal which remains unfulfilled and all amounts owing to the Contractor shall, whether or not due for payment, become immediately payable if:

10.4.1. any money payable to the Contractor becomes overdue, or in the Contractor's opinion the Principal will be unable to make a payment when it falls due;

10.4.2. the Principal becomes insolvent, convenes a meeting with its creditors or proposes or enters into an arrangement with creditors, or makes an assignment for the benefit of its creditors; or

10.4.3. a receiver, manager, liquidator (provisional or otherwise) or similar person is appointed in respect of the Principal or any asset of the Principal.

11. General

11.1. The failure by the Contractor to enforce any provision of these terms and conditions shall not be treated as a waiver of that provision, nor shall it affect the Contractor's right to subsequently enforce that provision. If any provision of these terms and conditions shall be invalid, void, illegal or unenforceable the validity, existence, legality and enforceability of the remaining provisions shall not be affected, prejudiced or impaired.

11.2. These terms and conditions and any contract to which they apply shall be governed by the laws of NSW in which the Contractor has its principal place of business, and are subject to the jurisdiction of the Courts in that state.

11.3. The Contractor shall be under no liability whatsoever to the Principal for any indirect and/or consequential loss and/or expense (including loss of profit) suffered by the Principal arising out of a breach by the Contractor of these terms and conditions (alternatively the Contractor's liability shall be limited to damages which under no circumstances shall exceed the Price of the Goods).

11.4. The Principal shall not be entitled to set off against, or deduct from the Price, any sums owed or claimed to be owed to the Principal by the Contractor nor to withhold payment of any invoice because part of that invoice is in dispute.

11.5. The Contractor may license or sub-contract all or any part of its rights and obligations without the Principal's consent.

11.6. The Principal agrees that the Contractor may amend these terms and conditions at any time. If the Contractor makes a change to these terms and conditions, then that change will take effect from the date on which the Contractor notifies the Principal of such change. The Principal will be taken to have accepted such changes if the Principal makes a further request for the Contractor to provide Goods to the Principal.

11.7. Neither party shall be liable for any default due to any act of God, war, terrorism, strike, lock-out, industrial action, fire, flood, storm or other event beyond the reasonable control of either party.

Annexure A – Maintenance Service Program

The following is an exhaustive list of the services the Contractor provides under the Maintenance Service Program:

1. Lubrication including top up of oil and moving parts as required.
2. Spring tensions checked and adjusted.
3. Rails cleaned and checked for secure and accurate operation.

4. Proximity sensors checked for secure and accurate operation.
5. Mechanical fasteners checked for tightness.
6. Wheels checked for freedom, wear and cracking.
7. Drive wheels checked for wear.
8. Run system and check for correct and normal operation.
9. Check operation of emergency stops and operating controls.
10. Check all safety features of equipment to ensure good working order.

Annexure B – Examples of Additional Services

The following is a non-exhaustive list of examples of Additional Services:

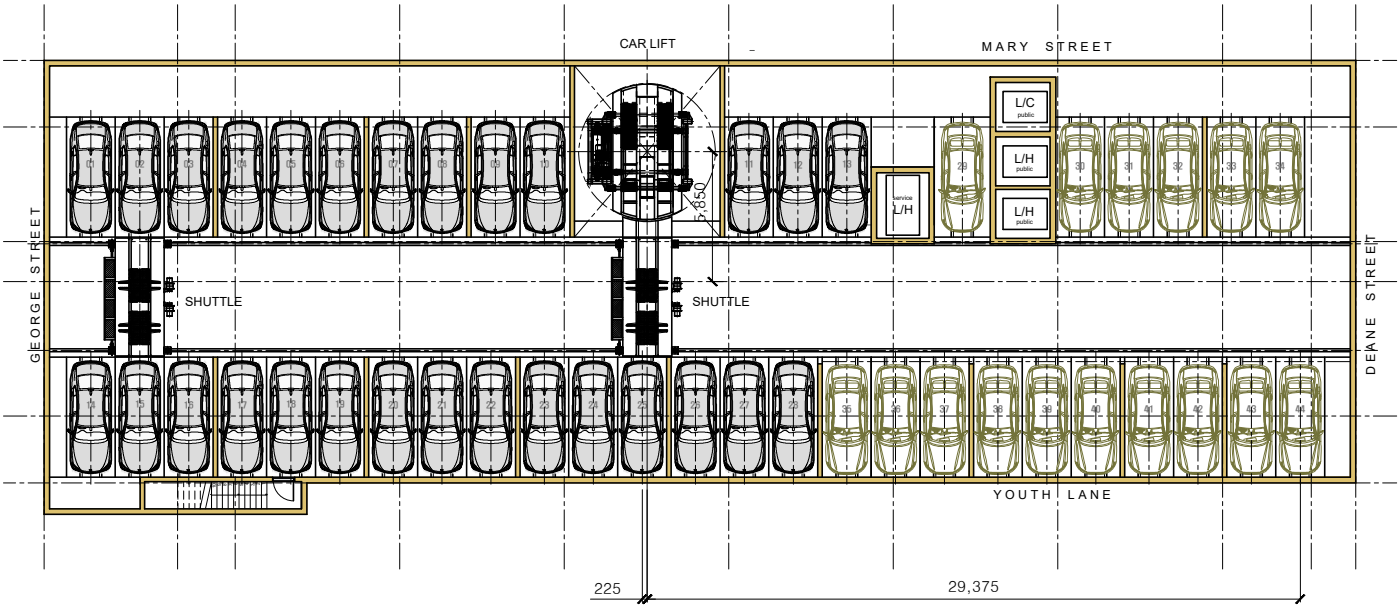
1. Cleaning of car park bays or similar daily domestic maintenance duties.
2. Re-fitting derailed platforms.
3. Full system change of hydraulic oil including filter.
4. Replacement of parts or components not covered by the Sale Contract Warranty.
5. Attaching to car parking equipment signage that details user requirements such as the maximum height and weight of cars that are able to use the equipment.
6. Painting line marking on the ground to provide guidance for cars to drive on to the car parking equipment.

17 Deane Street Burwood NSW

TIMING ANALYSIS

HERCULES
CARPARKING SYSTEMS

1. PLAN



2. Speed

- Car lift lifting : 45.0 m/min = 0.75 m/sec
- Shuttle traveling : 50.0 m/min = 0.83 m/sec
- Car picker traveling : 40.0 m/min = 0.66 m/sec
- Turntable turning : 22.0 m/min = 0.36 m/sec

3. Parking time at Car Lift

3-1. Entrance room door opening time : 5 sec

3-2. Car Drives in time : 10 sec

3-3. Car stops time : 2 sec

3-4. Get out of car time : 5 sec

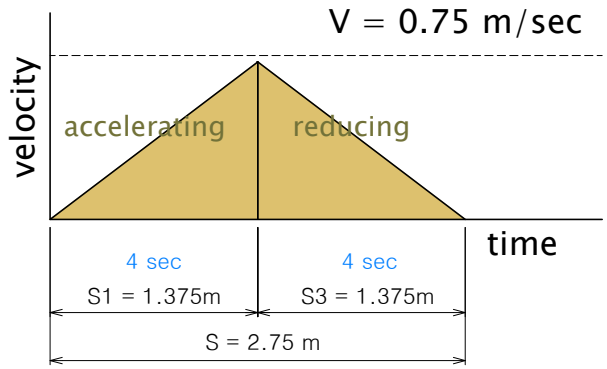
3-5. Driver walks out time : 8 sec

3-6. Swipes card time : 3 sec

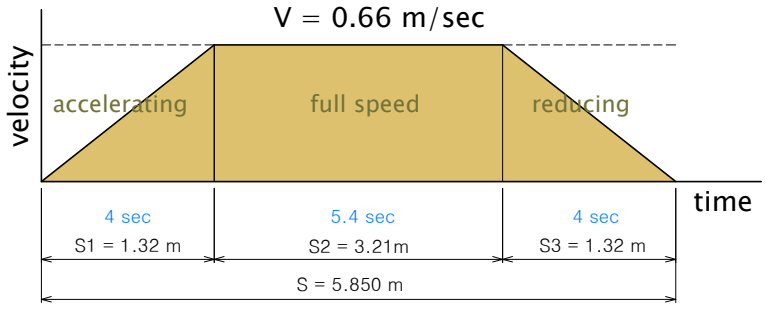
3-7. Entrance room door closing time : 5 sec
(car centering device working)

3-8. Turn table 90° working time : 15 sec

3-9. Car lift lift down time : 8 sec



3-10. car picker traveling time from car lift to shuttle : 13.4 sec



3-11. car picker arms closing (car getting down) time : 5 sec

3-12. car picker travelling time from shuttle to car lift : 13.4 sec

3-13. Car lift traveling time : 8 sec

3-14. Turntable return time : 15 sec

3-15. The car lift parking time : 115.8 sec

4. Parking time of Shuttle

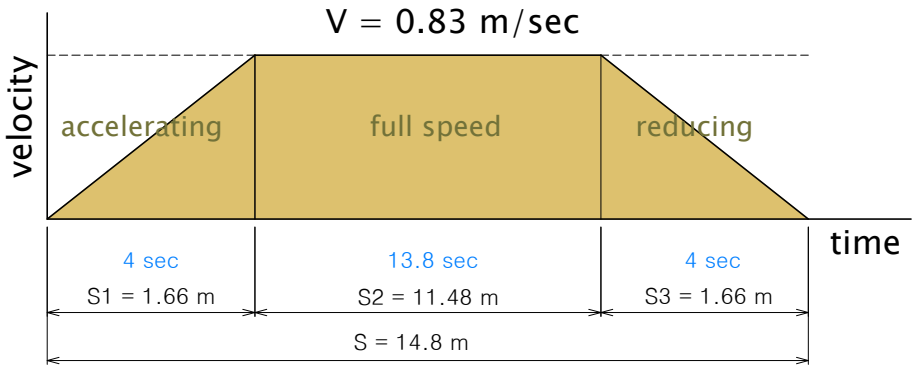
4-1. Car picker traveling time from shuttle to car lift : 13.4 sec

4-2. Car picker arms working for car picking up time : 5 sec

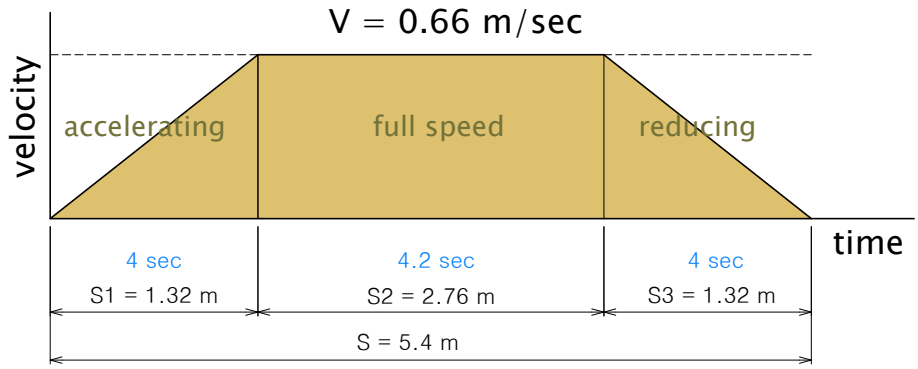
4-3. Car picker traveling time from car lift to shuttle : 13.4 sec

4-4. Shuttle traveling time : 21.8 sec

- average traveling = (shortest 225 + longest 29,375) / 2 = 14,800mm



4-5. Car picker traveling time from shuttle to parking bay : 12.2 sec



4-6. Car picker arms closing (car getting down) time : 5 sec
4-7. Car picker traveling time from parking bay to shuttle : 12.2 sec
4-8. Shuttle return traveling time : 21.8 sec
4-9. A Shuttle parking time : 104.8 sec
4-10. Two shuttles parking time : 52.4 sec

5. Parking time : 115.8 sec (longest time at car lift)
6. Parking rate per hour : 31 cars

7. Retrieving time at car lift
7-1. Turntable 90° turning time : 15 sec
7-2. Car lift traveling time : 8 sec
7-3. Car picker traveling time from car lift to shuttle : 13.4 sec
7-4. Car picker arms working for car picking up time : 5 sec
7-5. Car picker traveling time from shuttle to car lift : 13.4 sec
7-6. Car lift traveling time : 8 sec
7-7. Entrance room door opening time : 5 sec
7-8. Driver walking time in Entrance Room : 4 sec
7-9. Car unlocking time : 3 sec
7-10. Car starting time : 5 sec
7-11. Car driving out time : 4 sec
7-12. Entrance room door closing time : 5 sec
7-13. Turntable 90° returning time : 10 sec
7-14. Retrieving time at a car lift : 98.8 sec

8. Retrieving time at shuttles
   = parking time = 52.4 sec

9. Retrieving time : 98.8 sec (longest time at car lift)

10. Retrieving rate per hour : 36.4 cars

HERCULES CARPARKING SYSTEMS 2004 PTY LTD
ABN: 67 077 434 452
Unit 1, 87 Reserve Road
Artarmon NSW 2064
Toll Free: 1800 649 603
Tel: (02) 9966 5600
Fax: (02) 9966 5622
Email: info@hercules.com.au
Website: www.hercules.com.au

HERCULES
CARPARKING SYSTEMS

Hercules Carparking Systems

17 DEANE ST, BURWOOD

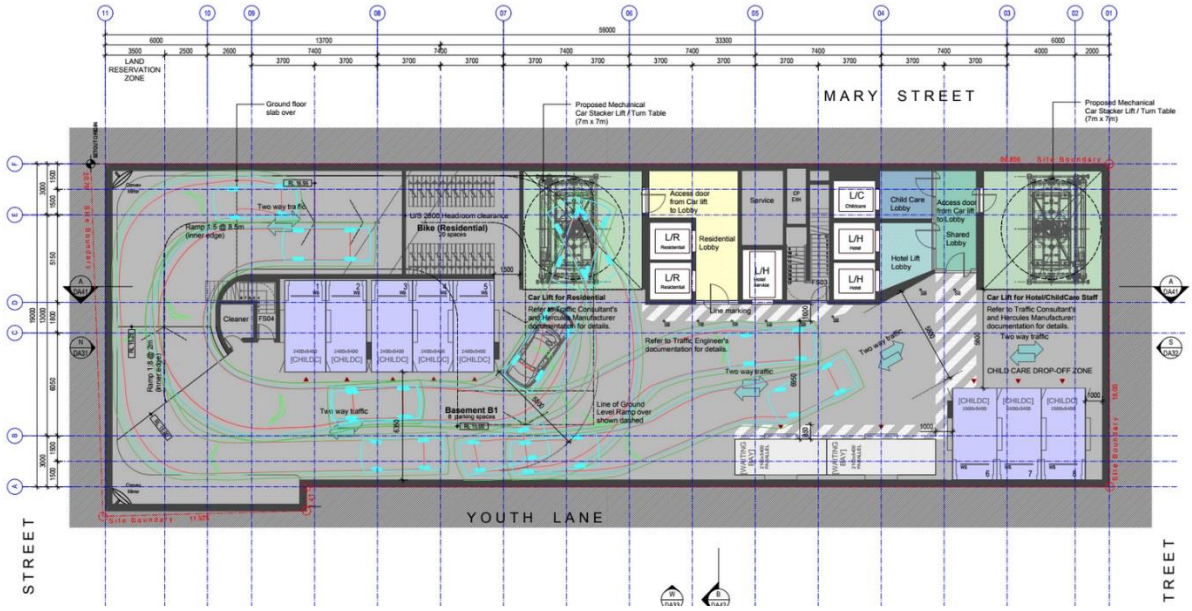
Residents

10/10/2017

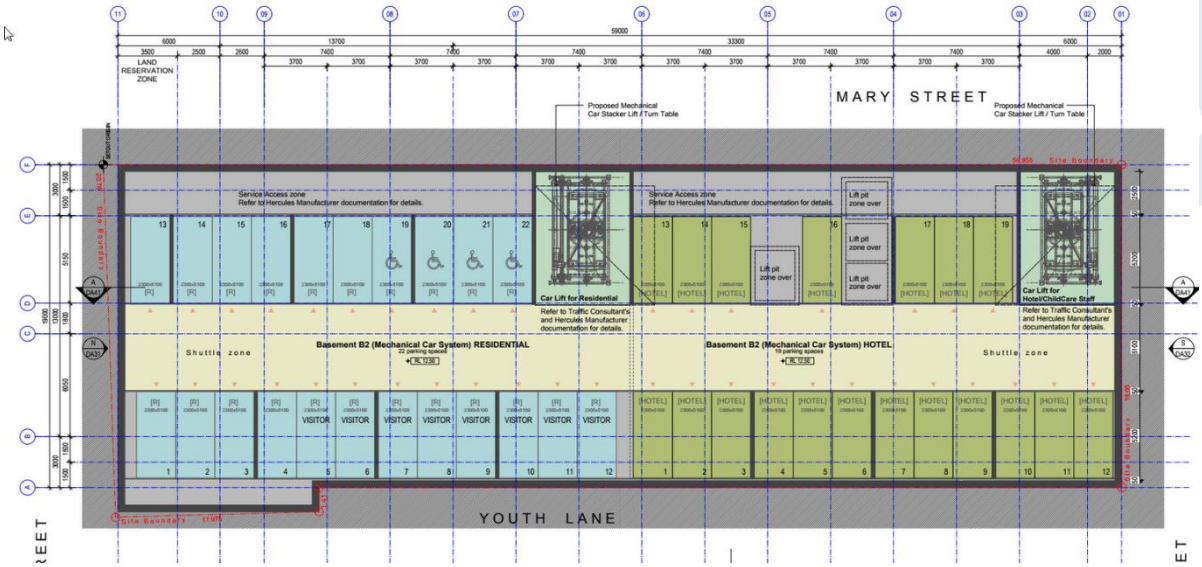
Fully Automated Carparking System for the Residents

The Hercules Fully Automated system provides the luxury of Valet Driving to residential living. The system guides the user into the entry room using sensor and displays directions on a heads up display visible to the driver. Once the driver in in the correct position indicated by the system the user leaves their vehicle and enters the lobby. In the lobby the user swipes their Hercules Smart Parking Card and the system automatically parks their vehicle as they head up to their apartment. To retrieve their vehicle the user swipes the same parking car or enters in their 4 digit parking code, which then the system automatically returns their vehicle and rotates it 180 degrees, so the user doesn't have to reverse.

Layout



(Figure1; Basement 1 Layout (entry room on the left for residents and the right for Hotel/Child Care))



(Figure 1; 17 Deane St, Basement 1 & 2 layout.)

Vehicle Dimensions

- Maximum vehicle height
  - TBA (SUV, Sedans and is also DDA compliant for vehicles with roof mounted wheel chairs)
- Maximum Vehicle Length
  - 5,200 mm
- Maximum Vehicle Width
  - 2,200mm
- Maximum Vehicle Weight
  - 3,000 kg

All Dimensions are flexible.

Quantities

Item	Description	Quantity
1	Entry/Exit Rooms (sensors/controls, 1x traffic light, 1 user panel)	2
2.1	High Speed Lift – (Tier 1 to Tier 2) Vertical transportation	2
3	Shuttle (Horizontal transportation) (1 per tier - 1 per isle)	2
4	Car Picker (Vehicle transportation) (1 per tier - 1 per aisle)	2
5	Aisle Equipment (Drive Rails, Power Feed Rails, Positioning Systems etc..	1

6	Self-Operating Doors	2

Entry/Exit Rooms

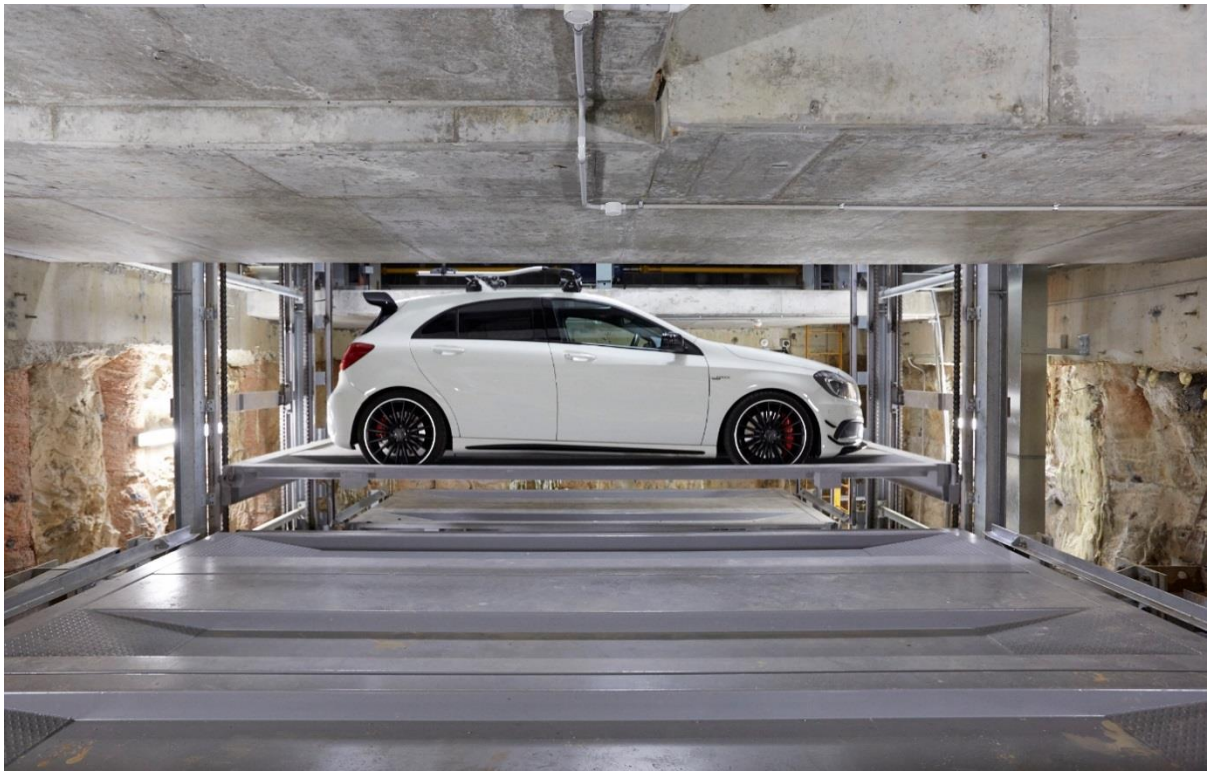
(Figure 6; Hercules example completed project entrance/exit room with built in turntable)

The large entry/exit rooms provide the user with a sense of comfort and luxury of single garage that would be expected in a private home scenario. With large accessibility area around the vehicle the user is free to open doors without any risk of damaging their own or nearby vehicles that would be presented in a conventional car park.

The entry/exit room includes sensor, display and auto self-centering systems. This guides the user into the correct position and once the user has left it can fine tune their parking and perfectly centre the vehicle before parking it into the system.

The built-in turntable rotates the vehicles 180 degrees so the user will never have to reverse out of the system.

High Speed Lift



(Figure 8; Lift)

The highspeed lift travels at a speed of 1 meter per second and vertically transports the vehicles between parking levels, the lift is a wire rope traction lift and has a built-in counterweight. This design provides fast, smooth, energy efficient and quiet operation.

The motor is the core of the lift and Hercules spares no expenses when it comes to selection of the driving motor. Hercules employs SEW Euro Drive motors for the driving motor. SEW is a leading manufacturer of drive technology worldwide. The motor is designed to extremely high standards, the parts are manufactured in Germany and assembled all over the world. The SEW motor is known for its efficiency and reliability. These motors have a 96% efficiency which is extremely high resulting in more power saving and offers a long service life increasing reliability.

Shuttle

(Figure 9 ; Fully Automates Car picker installed by Hercules in Newzealand providing 176 spaces)

The shuttle allows horizontal transportation of the vehicle, the shuttle also houses the car picker for transporting the vehicle. The Shuttle is also provided with a manual control box for maintenance purposes and override operations.

Car Picker

(Figure 10; Car picker)

The car picker is designed to pick up the vehicle only by the base of tired where normal contact would occur on the road, this allows for forwards and backwards movements within the system.

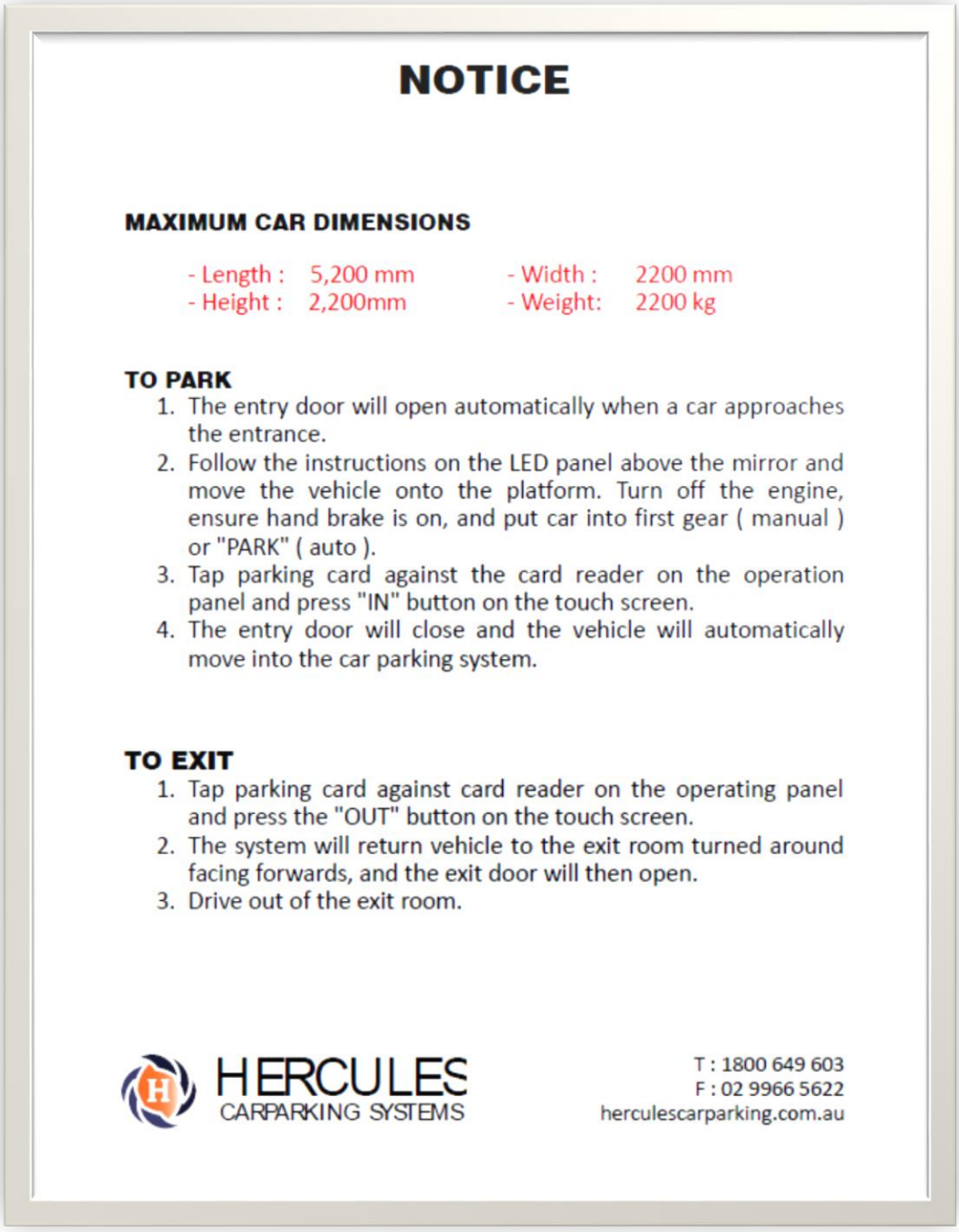
(Figure 11; Car picker)

Parking Procedure

Hercules Automated parking systems are focused on user friendly interface and ease of use. As the user enters the system they are directed with a LCD screen providing direction to park on the platform, Once the user is within the platform the LCD screen will confirm this and the user can now leave their vehicle. Each user will have a unique swipe card and allows the automated system to know where their vehicle is being stored in the system. A simple swipe of the users parking card, followed by pressing “IN” on the touch screen begins the automated parking procedure and no further input from the user is required. *Figure 13* shows an example notice that will be printed near the operating panel which lists the protocols for parking and retrieving a vehicle.

(Figure 12; Hercules Touch Screen Control panel with Swipe card)

The touch screen panel also features a key pad in the case of a swipe card is lost the user can then enter their 4 digit number to store or retrieve a vehicle.



NOTICE

MAXIMUM CAR DIMENSIONS

- Length :	5,200 mm	- Width :	2200 mm
- Height :	2,200mm	- Weight:	2200 kg

TO PARK

1. The entry door will open automatically when a car approaches the entrance.
2. Follow the instructions on the LED panel above the mirror and move the vehicle onto the platform. Turn off the engine, ensure hand brake is on, and put car into first gear (manual) or "PARK" (auto).
3. Tap parking card against the card reader on the operation panel and press "IN" button on the touch screen.
4. The entry door will close and the vehicle will automatically move into the car parking system.

TO EXIT

1. Tap parking card against card reader on the operating panel and press the "OUT" button on the touch screen.
2. The system will return vehicle to the exit room turned around facing forwards, and the exit door will then open.
3. Drive out of the exit room.

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(Figure13; Example parking procedures)

(Figure 14; Waiting room with CCTV)

CCTV located in the waiting room allows live streaming of the operation of the mechanical car stacker which allow the users to see operations of their vehicle being retrieved.

Maintenance

At the bottom of this document is an example maintenance contract which provides routine maintenance and a 24/7 service. All maintenance services will be conducted through the building manager and strata where the maintenance will be completed at agreed times where it limits impact to the users. Hercules has a full-time service department with high skilled technicians who are employees of Hercules.

Hercules warehouse is located at Artarmon where a variety of SEW motors are for all movements within the system is kept is stock, with a variety of sensors, bearing, wheels and wearable parts are all kept in stock. This results in fast responses and quick turnaround in the case of a breakdown.

Maintenance Agreement

SERVICE AGREEMENT **CONTACT SERVICE**
(Maintenance, breakdown and support service) 1800 649 603

Parties to the Contract:

Contractor:
Hercules Carparking Systems 2004 Pty Ltd
ABN: 67 077 434 452
Unit 1, 87 Reserve Road,
ARTARMON NSW 2064

AND

The Principal

CONTACT	**SITE ADDRESS**
COMPANY	
ADDRESS	
PHONE	

Equipment to be Serviced:

No. Of:	Equipment Type	Number of Carspaces

Fees
Maintenance Service Program Fee

2 Services per year @ half-yearly intervals	**$#### + GST Per Service** Per Annum $#### + GST (Payable prior to Service being completed)

Breakdown Response Fees*

Response between: 7:30am to 4:30pm, Monday to Friday (excluding public holidays)	$### + GST Service Call Out. $### + GST per 15 mins or part thereof. Minimum 2 hours.
Callouts outside the above hours including Saturdays: (excl. Public Holidays & Sundays)	$### + GST Service Call Out. $###+ GST per 15 minutes thereafter. Minimum 2 hours.
Sunday or Public Holiday callout:	$### + GST Service Call Out. $### + GST per 15 minutes thereafter. Minimum 2 hours.

*I, an authorised representative of the Principal, permit/do not permit the Contractor to attend Breakdown Service calls from the Car Parking Systems users and instruct the Contractor to treat such calls as being made by the Principal or its representatives under the above Terms and Conditions.

Initial_____ Date_____

Commencement Date	

Signed as acceptance of this agreement and its Terms and Conditions* on behalf of the **Principal** by its duly authorised signatory:	Signed as commitment to this agreement and its Terms and Conditions* on behalf of the **Contractor** by its duly authorised signatory:
Signature	Signature
Print Name	Print Name
Date	Date

Terms & Conditions for Car Parking Equipment Services Agreement

The Parties agree to the following terms:

1. General

1.1 Bold terms are defined terms in this Contract and such terms have the meaning given herein.

1.1.1. **Contract** means this contract.

1.1.2. **Parties** mean the Contractor and Principal and **Party** means either one of them.

1.1.3. **Sale Contract Warranty** means the warranty covering the Car Parking Equipment on the terms set out in the contract pursuant to which such equipment was purchased.

1.1.4. **Site** means the location at which the Car Parking Equipment is located.

1.1.5. **Summary Page** means the front page of this Contract executed by the Parties.

1.2 This Agreement and the documents to be entered into pursuant to it shall be governed by, and construed in accordance with, the laws of NSW, Australia.

1.3 Any amendment or modification to this Contract will only be effective if made in writing and signed by both Parties.

2. Commencement and expiration

2.1 This Contract commences on the date it is executed by the Parties (the **Commencement Date**).

2.2 This Contract terminates on the date that is Sixty (60) calendar months following the Commencement Date (the **End Date**) the contract will automatically renew unless either Party give notice to terminate the agreement with 1 month of the end date by written notice. The Parties acknowledge and agree there is no limitation on the number of times they may extend the Contract.

3. Contractor Maintenance Service Program

3.1 The Contractor shall complete the **Maintenance Service Program** (set out in Annexure A) for the **Car Parking Equipment** (listed on the Summary Page) two times a year during the term of this Contract at approximately six monthly intervals in consideration for the Principal paying the **Maintenance Service Program Fee** (set out on the Summary Page) as adjusted in accordance with Clause 7 below.

3.2 The Contractor shall complete the Maintenance Service Program for the Car Parking Equipment between the hours of 7:30am to 4:30pm on weekdays (excluding public holidays and office closures) unless the Parties agree a different time for completion of such program.

3.3 The Principal shall pay the Maintenance Service Program Fee prior to the Contractor completing the relevant Maintenance Service Program for the Car Parking Equipment.

3.4. The Principal acknowledges and agrees that the Maintenance Service Program contains an exhaustive list of the services to be provided by the Maintenance Service Program. The Principal acknowledges and agrees that it will incur additional charges for: (i) any services or repairs not listed in the Maintenance Service Program; and (ii) any parts or components required to repair the Car Parking Equipment unless such parts or components are covered by the Sale Contract Warranty.

3.5. The Principal undertakes to purchase any parts or components related to the Car Parking Equipment from the Contractor. Refer Clause 9 of these Terms and Conditions of Agreement.

3.6. The Contractor shall keep a record of each Maintenance Service Program completed for the Car Parking Equipment. The Contractor shall provide to the Principal a copy of these records upon the Principal's written request.

4. Contractor Breakdown Service

4.1. For the purposes of this agreement **Breakdown Service** means a visit by the Contractor, at the request of the Principal, the car park operator or user of the Car Parking Equipment, to the Site using reasonable endeavours to fix any breakdown or malfunction of the Car Parking Equipment.

4.2. The Contractor shall provide the Breakdown Service for the Principal twenty-four hours a day during each day of the term of this Contract in consideration for the Principal paying the relevant Breakdown Service Fee (set out in the Summary Page) as adjusted in accordance with Clause 7 below.

4.3. The Contractor shall use reasonable endeavours to provide the Breakdown Service within a reasonable time of receiving a request for the Breakdown Service from the Principal, car park operator or user of the Car Parking Equipment.

4.4. The Principal shall pay the Breakdown Service Fee within five calendar days of the Contractor's completion of the relevant Breakdown Service for the Car Parking Equipment. **For the purposes of clarification, the Principal is obligated to pay the Breakdown Service Fee even if the Principal has not requested the Breakdown Service provided the request for the Breakdown Service was issued by a car park operator or user of the Car Parking Equipment and the Contractor provided the Breakdown Service**.

4.5. The Principal acknowledges and agrees that the Breakdown Service Fee does not include the cost of any parts or components required to repair the Car Parking Equipment. The Principal acknowledges and agrees that it will incur additional charges for any parts or components required to repair the Car Parking Equipment unless such parts or components are covered by the Sale Contract Warranty.

4.6. The Contractor shall keep a record of each Breakdown Service completed for the Car Parking Equipment. The Contractor shall provide to the Principal a copy of these records upon the Principal's written request.

5. Contractor Support Service

In consideration for the Principal entering this Contract, during each 12-month period of the term of this Contract, when requested by the Principal, the Contractor shall provide to the Principal (the **Support Service**):

(a). (*telephone support*) general instruction on how to use the Car Parking Equipment over the telephone during normal business hours on weekdays (excluding public holidays) up to a total of 2 hours for the 12-month period (this support may consist of one phone call for 2 hours or a number of shorter calls totalling 2 hours in duration); and

(b). (*in person support applies only to new machines installed by Hercules*) a one-off attendance at the Site within the first 12-month period during normal business hours on a weekday (excluding public holidays) to give general instruction on how to use the Car Parking Equipment with such attendance duration capped at 1 hour.

6. Additional Services outside the scope of this Contract and force majeure

6.1. **Additional Services** means any services that are not provided as part of the Maintenance Service Program, the Breakdown Service and the Support Service. A

non-exhaustive list of Additional Services is set out in Annexure B.

6.2. **Additional Services Fees** means the charge imposed on the Principal by the Contractor for providing Additional Services.

6.3. The Principal may request the Contractor to provide Additional Services. The Contractor shall reasonably consider performing Additional Services requested by the Principal.

6.4. If the Contractor provides Additional Services:

6.4.1. at the time of performing a Maintenance Service Program, the Contractor shall not charge the Principal a fee to visit the Site to complete the Additional Services; or

6.4.2. at any time, other than when performing a Maintenance Service Program, the Contractor shall charge the Principal the relevant Breakdown Service Fee for visiting the Site to complete the Additional Services.

For the purposes of clarification, the Principal undertakes to pay the relevant Breakdown Service Fee anytime the Contractor visits the Site excluding when the Contractor visits the Site to perform the Maintenance Service Program.

6.5. The Principal authorises the Contractor to complete Additional Services up to the amount of $400.00 + GST. The Contractor undertakes to obtain the Principal's authorisation prior to completing Additional Services that exceed the amount of $400.00 + GST.

6.6. The Contractor is not liable in any way to the Principal for failure to provide services under this Contract if such failure arises from industrial action, acts of God and any other interruptions or circumstances beyond the reasonable control of the Contractor.

7. Indexing of Contractor fees

7.1. The Parties acknowledge and agree that the Maintenance Service Program fee set out on the Summary Page shall be increased by the CPI or 5% whichever is the greatest (the **Indexing Increase**) every 12 months following the Commencement Date.

7.2. The Indexing Increase shall take effect on the anniversary date of the Commencement Date during the term of this Contract.

8. Contractor insurance obligations and OHS obligations

8.1. For the purposes of this Contract, **Worker** means any employee of the Contractor that provides services under this Contract or any subcontractor or third party the Contractor uses to provide services under this Contract.

8.2. During the term of this Contract, the Contractor shall hold public liability insurance to cover the Contractor and any Worker that provides services under this Contract for an amount not less than $20,000,000.

8.3. The Contractor shall ensure any Worker it uses to provide services under this Contract complies with legally applicable OH&S requirements when performing such services.

9. Spare Parts

9.1. The Contractor will source and provide spare parts for products which were originally supplied and installed by the Contractor or for which it is the authorised agent or which are freely available.

9.2. The Contractor will provide assistance to the Principal for spare parts where the Contractor was not the supplier of the system and/or is not the agent for the product in Australia and/or the parts are not freely available.

9.2.1. In such circumstances where the Contractor is prevented from procuring spare parts through actions/inactions by others (such as competitors), the Principal will be required to procure the spare parts through placement of orders as written by the Contractor.

9.2.2. The Contractor will provide content for such orders such that the effort of the Principal is minimised.

9.2.3. The Principal may elect to pay the supplier of the procured parts directly.

10. Default and Consequences of Default

10.1. Interest on overdue invoices shall accrue daily from the date when payment becomes due, until the date of payment, at a rate of two and a half percent (2.5%) per calendar month (and at Hercules's sole discretion such interest shall compound monthly at such a rate) after as well as before any judgment.

10.2. If the Principal owes the Contractor any money the Principal shall indemnify the Contractor from and against all costs and disbursements incurred by the Contractor in recovering the debt (including but not limited to internal administration fees, legal costs on a solicitor and own Principal basis, the Contractor's contract default fee, and bank dishonour fees).

10.3. Without prejudice to any other remedies the Contractor may have, if at any time the Principal is in breach of any obligation (including those relating to payment) under these terms and conditions the Contractor may suspend or terminate the supply of Services to the Principal. The Contractor will not be liable to the Principal for any loss or damage the Principal suffers because the Contractor has exercised its rights under this clause.

10.4. Without prejudice to the Contractor's other remedies at law the Contractor shall be entitled to cancel all or any part of any order of the Principal which remains unfulfilled and all amounts owing to the Contractor shall, whether or not due for payment, become immediately payable if:

10.4.1. any money payable to the Contractor becomes overdue, or in the Contractor's opinion the Principal will be unable to make a payment when it falls due;

10.4.2. the Principal becomes insolvent, convenes a meeting with its creditors or proposes or enters into an arrangement with creditors, or makes an assignment for the benefit of its creditors; or

10.4.3. a receiver, manager, liquidator (provisional or otherwise) or similar person is appointed in respect of the Principal or any asset of the Principal.

11. General

11.1. The failure by the Contractor to enforce any provision of these terms and conditions shall not be treated as a waiver of that provision, nor shall it affect the Contractor's right to subsequently enforce that provision. If any provision of these terms and conditions shall be invalid, void, illegal or unenforceable the validity, existence, legality and enforceability of the remaining provisions shall not be affected, prejudiced or impaired.

11.2. These terms and conditions and any contract to which they apply shall be governed by the laws of NSW in which the Contractor has its principal place of business, and are subject to the jurisdiction of the Courts in that state.

11.3. The Contractor shall be under no liability whatsoever to the Principal for any indirect and/or consequential loss and/or expense (including loss of profit) suffered by the Principal arising out of a breach by the Contractor of these terms and conditions (alternatively the Contractor's liability shall be limited to damages which under no circumstances shall exceed the Price of the Goods).

11.4. The Principal shall not be entitled to set off against, or deduct from the Price, any sums owed or claimed to be owed to the Principal by the Contractor nor to withhold payment of any invoice because part of that invoice is in dispute.

11.5. The Contractor may license or sub-contract all or any part of its rights and obligations without the Principal's consent.

11.6. The Principal agrees that the Contractor may amend these terms and conditions at any time. If the Contractor makes a change to these terms and conditions, then that change will take effect from the date on which the Contractor notifies the Principal of such change. The Principal will be taken to have accepted such changes if the Principal makes a further request for the Contractor to provide Goods to the Principal.

11.7. Neither party shall be liable for any default due to any act of God, war, terrorism, strike, lock-out, industrial action, fire, flood, storm or other event beyond the reasonable control of either party.

Annexure A – Maintenance Service Program

The following is an exhaustive list of the services the Contractor provides under the Maintenance Service Program:

1. Lubrication including top up of oil and moving parts as required.
2. Spring tensions checked and adjusted.
3. Rails cleaned and checked for secure and accurate operation.
4. Proximity sensors checked for secure and accurate operation.
5. Mechanical fasteners checked for tightness.
6. Wheels checked for freedom, wear and cracking.
7. Drive wheels checked for wear.
8. Run system and check for correct and normal operation.
9. Check operation of emergency stops and operating controls.
10. Check all safety features of equipment to ensure good working order.

Annexure B – Examples of Additional Services

The following is a non-exhaustive list of examples of Additional Services:

1. Cleaning of car park bays or similar daily domestic maintenance duties.
2. Re-fitting derailed platforms.
3. Full system change of hydraulic oil including filter.
4. Replacement of parts or components not covered by the Sale Contract Warranty.
5. Attaching to car parking equipment signage that details user requirements such as the maximum height and weight of cars that are able to use the equipment.
6. Painting line marking on the ground to provide guidance for cars to drive on to the car parking equipment.

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HERCULES
CARPARKING SYSTEMS

Hercules Carparking Systems

17 DEANE ST, BURWOOD

Residents

10/10/2017

Fully Automated Carparking System for the Hotel

The Hotel entry room located on the right can be fitted with a vehicle recognition sensor, where the hotel management/staff will enter the selected hotel client's vehicles registration into the parking system. The automated car parking system operates very similar to an automated car wash for public use. Simple instructions will be listed and all guiding sensors with heads up display will be presented to the new driver to direct them into the system. Here the system will know if the vehicle has been correctly driven into the system and that the vehicle is all the correct dimensions. These are all checked before giving the user the green light to exit their vehicle. The staff may also email, call or send a letter explaining how to park into the system, to increase ease of use on the day they arrive to the hotel.

The system guides the user into the entry room using sensor and displays directions on a heads up display visible to the driver. Once the driver in in the correct position indicated by the system the user leaves their vehicle and enters the lobby. Here the user will be presented either with a ticket or the touch screen will then ask them if they will like to park their vehicle. Which then the system will proceed to park their vehicle.

To retrieve their vehicle the user will enter the lobby and either present their ticket to the system or the system will ask for personal information such as room number, name, address etc. This way if they lose their ticket they can still retrieve their vehicle without managements help and ensures authorised use only. The system automatically returns their vehicle and rotates it 180 degrees, so the user doesn't have to reverse.

sensor dynamics

PARKING MANAGEMENT SYSTEM

PARKING RE-IMAGINED

What's different about these solutions?

- Purpose built from the ground up rather than a modification to older technology
- More accurate because of sophisticated matching algorithms
- Future proofed to take advantage of new technologies as soon as they arrive
- Highly modular and scalable
- Simple connectivity providing unlimited 3rd party integrations to ensure 'best of breed'

Choose a solution that's right for you

PAY BY PHONE

Pay by phone payment (Prepay) solution with LPR monitoring and cloud based reporting and alerting

- Optional Pay by Phone providers
- Full reporting
- Constant monitoring
- Remote enforcement
- Low cost of implementation

PAY ON SITE

Most streamlined post-pay car parking management system

- Full reporting
- Constant monitoring
- Remote enforcement
- No on-site cash handling

PRE-BOOK PLUS

Streamlining of entry process supported by multiple identifiers on pre-booking system, augmenting existing ticketed Car Park Management System

- Minimal additional hardware
- Unlimited ID options
- Future proof
- Promotes online pre-payments
- Integrates with major online booking systems

PREMIUM

Full Car Park Management System including cash/coin & parking validation

- Full reporting
- No Tickets
- Lower maintenance costs
- Cash payment option
- On-site hosting option
- 3rd Party integrations
- Parking validations
- Online accounts

03 8727 6000 sales@sensordynamics.com.au www.multiscan.com.au

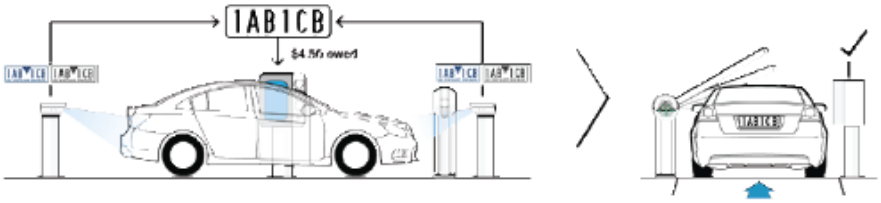
PREMIUM PARKING MANAGEMENT SYSTEM

HOW DOES IT WORK?

The mix of technologies deployed in the system can be tailored to the unique needs of your business and your car park operation. Deep levels of integration can be achieved with your retail, security, building management and other business systems to fully integrate your PPMS with your total business operation and revenue model. Based on highly accurate Automatic Number Plate Recognition (ANPR) cameras and multi-identifier customer kiosks customers and their vehicles are guided in the most efficient, pleasant and profitable path through your business. Faster, more secure and more efficient revenue generation.

ENTRY

EXIT



KEY FEATURES AND BENEFITS:

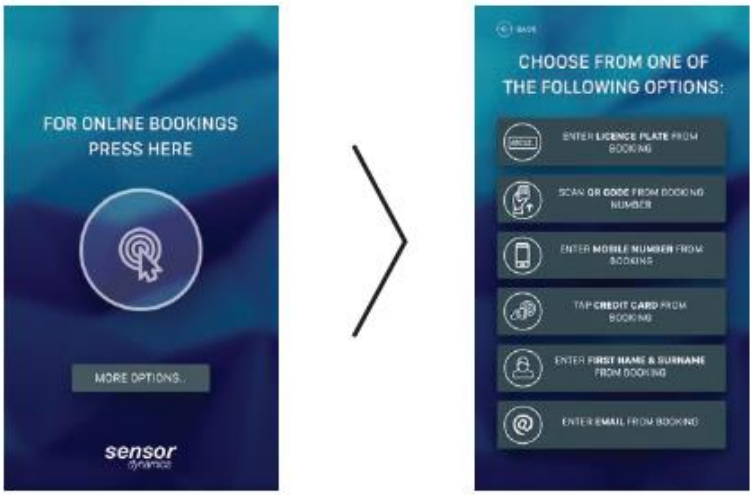
- No Tickets or consumables
- Low Maintenance
- Full Reporting
- Free Flow capable
- Cash or Card payment options
- On-site or Cloud Hosting
- Solid Vandal Proof Construction
- High Resolution Touchscreens
- Clean Modern User Interface
- Customisable and Replaceable Decals
- Parking Validation
- 3rd Party Integrations
- Optional customer specified colour schemes
- Optional customer branding, advertising and loyalty programs.

PARKING MANAGEMENT SYSTEM

PRE-BOOK PLUS

HOW DOES IT WORK?

Customer parking is pre-booked for a set date and time. Upon arrival at the car park the system automatically identifies the customer's car using Automatic Number Plate Recognition (ANPR) technology or if the parker has not pre-registered a Registration Plate another form of identification can be used to validate the car park booking. Once the customer has been identified the licence plate of the vehicle they are in becomes associated with the transaction.



KEY FEATURES AND BENEFITS:

- Integrates seamlessly with your existing equipment
- Customized web portal or form to add to your organizations website.
- Smartphone App
- Multi-Identifier
- Online capabilities
- Future-Proof
- Optimizes car park utilization levels.
- Improves customer service experience
- Reduces operational overheads
- Increases revenue
- Unlimited ID options
- Custom branding
- Expandable to full Premium CPMS

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Email: info@hercules.com.au
Website: www.hercules.com.au

HERCULES
CARPARKING SYSTEMS

Hercules Carparking Systems

17 DEANE ST, BURWOOD

Child Care

10/10/2017

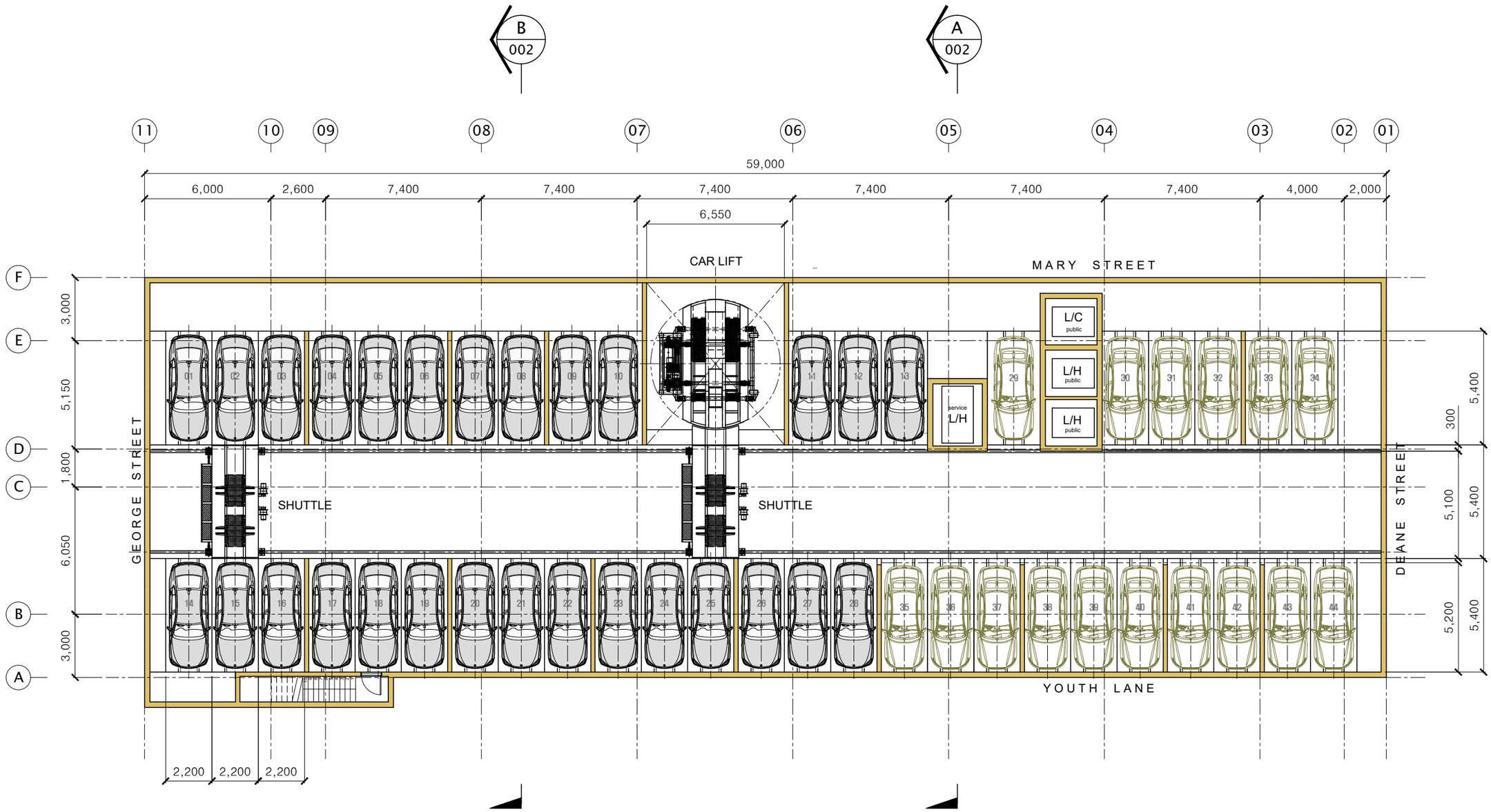
Fully Automated Carparking System for the Child Care

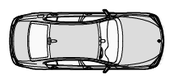
The Hotel entry room located on the right can be fitted with a vehicle recognition sensor, where the Childcare's management and staff selected vehicle registrations will be entered into the parking system.

The system guides the user into the entry room using sensor and displays directions on a heads up display visible to the driver. Once the driver in in the correct position indicated by the system the user leaves their vehicle and enters the lobby. Here the user will be presented either with a ticket or the touch screen will then ask them if they will like to park their vehicle. Which then the system will proceed to park their vehicle.

To retrieve their vehicle the user will enter the lobby and either present their ticket to the system or the system will ask for personal information such as, name, address etc. This way if they lose their ticket they can still retrieve their vehicle without managements help and ensures authorised use only. The system automatically returns their vehicle and rotates it 180 degrees, so the user doesn't have to reverse.

Otherwise the Child car management/staff will have Hercules smart parking cards, where they swipe their card to operate the system, simular to how the residents use the system.





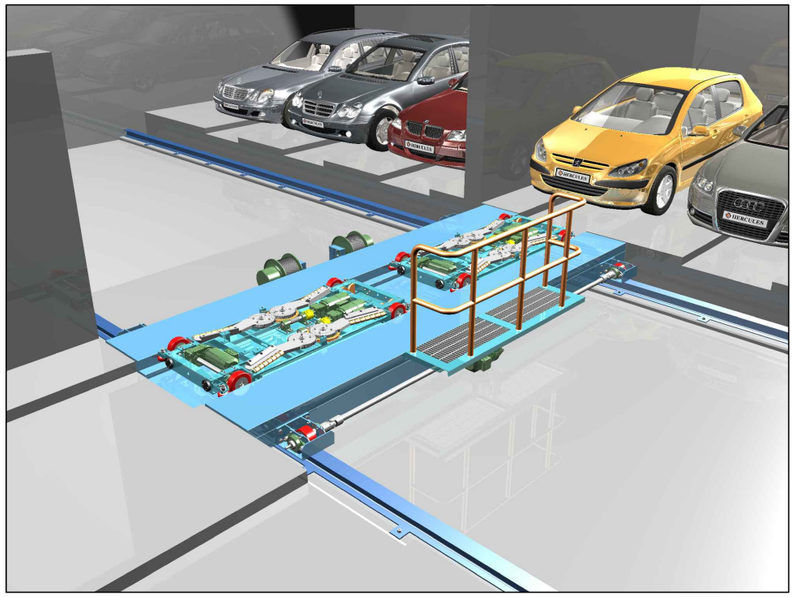
5,200L 28 CARS

5,000L 16 CARS

NO.	DATE	REVISIONS & DESCRIPTION	ENGINEER	APPROVED

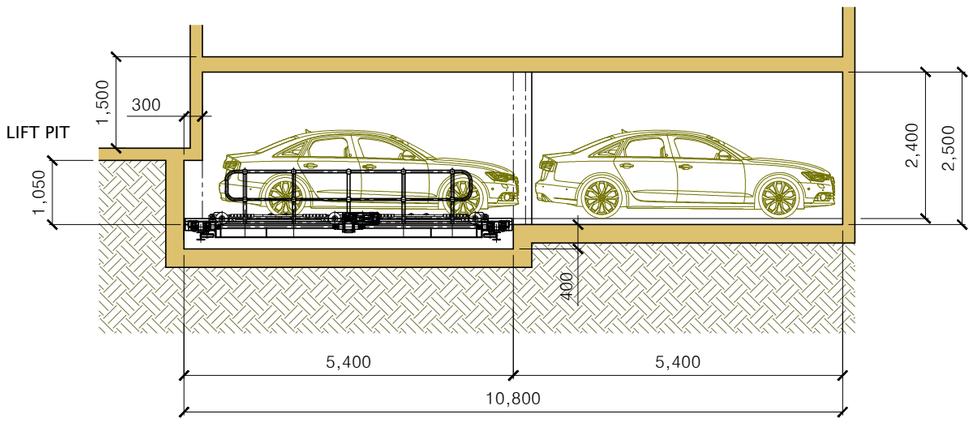
HERCULES CARPARKING SYSTEMS

MODEL NAME	H C P – S H 1 – 4 4					
SITE	17 Deane street Burwood NSW				TITLE	SHUTTLE CAR STACKER SYSTEM
DATE	5th September 2017		SCALE	1 / 200	SUBJECT	PLAN VIEW
DRAWN	DESIGNED	CHECKED	REVIEWED	APPROVED	FILE NAME	REVISION
	James Han				DWG NO.	H C P – S H 1 – L 0 1

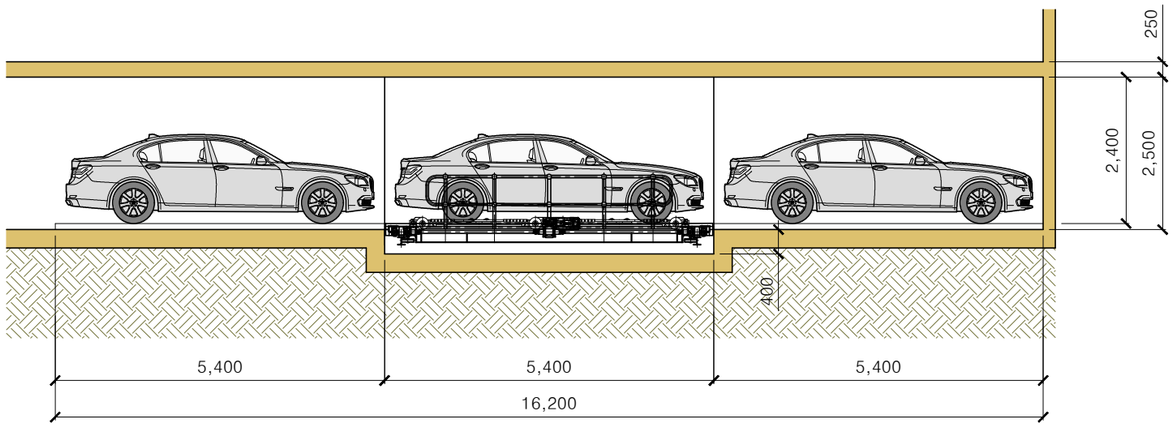


SHUTTLE AND CAR PICKER

SPECIFICATIONS				
MODEL	H C P – S H 1 – 0 4 4		SAFETY DEVICE	OVER RUN LIMITS SWITCH
TYPE	SHUTTLE TYPE CAR STACKER SYSTEM			PHOTO BEAM SENSOR
LIFTING	MOTOR	22 kW × 4P × 1SET		EMERGENCY STOP SWITCH
	SPEED	45 m/min		SIGNAL LAMP
	BRAKE	DC BRAKE	PARKING GUIDE	PARKING GUIDE MIRROR
SHUTTLE RUNNING	MOTOR	1.5 kW × 4P × 2SET		OPERATION SIGNAL LAMP
	SPEED	50 m/min	OPERATION TYPE (OPTION)	1. TOUCH SCREEN
	BRAKE	DC BRAKE		2. SWIPE CARD SYSTEM
CAR PICKER RUNNING	MOTOR	0.75 kW × 4P × 4SET	ELECTRIC SOURCE	AC 3PH × 415V × 50Hz × 160A
	SPEED	40 m/min	MAXIMUM VEHICLE SIZE	
	BRAKE	DC BRAKE	LENGTH	5,200 / 5,000 mm
CAR PICKER PICKING	MOTOR	0.75 kW × 4P × 4SET	WIDTH	2,200 mm
	SPEED	5 Sec	HEIGHT	2,300 mm
	BRAKE	DC BRAKE	WEIGHT	2,200 kg
TURN TABLE	MOTOR	5.7 kW × 4P × 1SET		
	SPEED	22 m/min		
	BRAKE	DC BRAKE		



SECTION "A-A"



SECTION "B-B"

NO.	DATE	REVISIONS & DESCRIPTION	ENGINEER	APPROVED

MODEL NAME	H C P – S H 1 – 4 4				
SITE	17 Deane street Burwood NSW			TITLE	SHUTTLE CAR STACKER SYSTEM
DATE	5th September 2017	SCALE	1 / 100	SUBJECT	SECTION VIEW
DRAWN	DESIGNED	CHECKED	REVIEWED	APPROVED	FILE NAME
	James Han				DWG NO. H C P – S H 1 – L 0 2

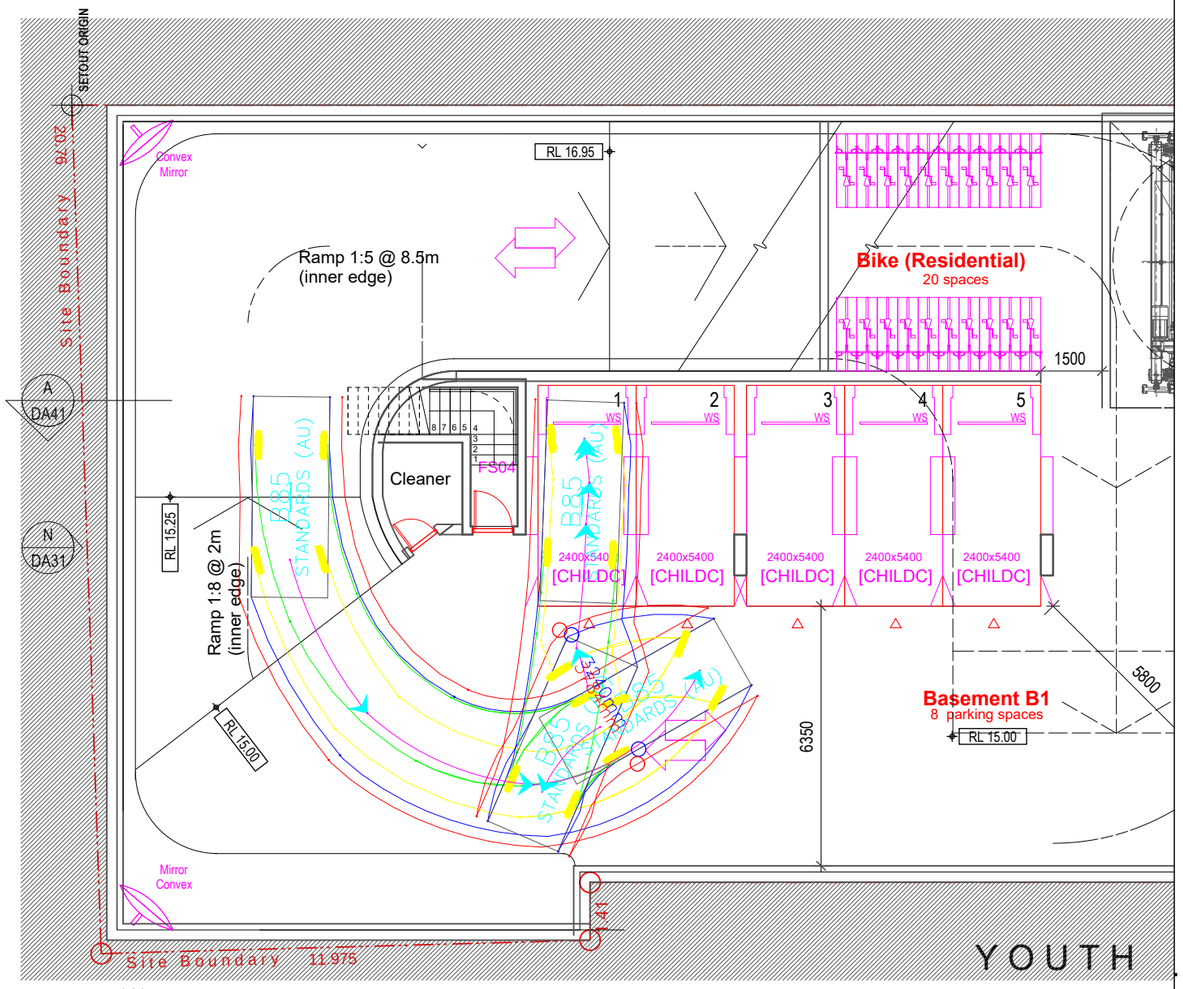
HERCULES CARPARKING SYSTEMS

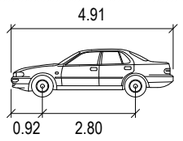
REVISION

ATTACHMENT C

BASEMENT CAR PARK SWEPT PATHS

Ground floor
slab over



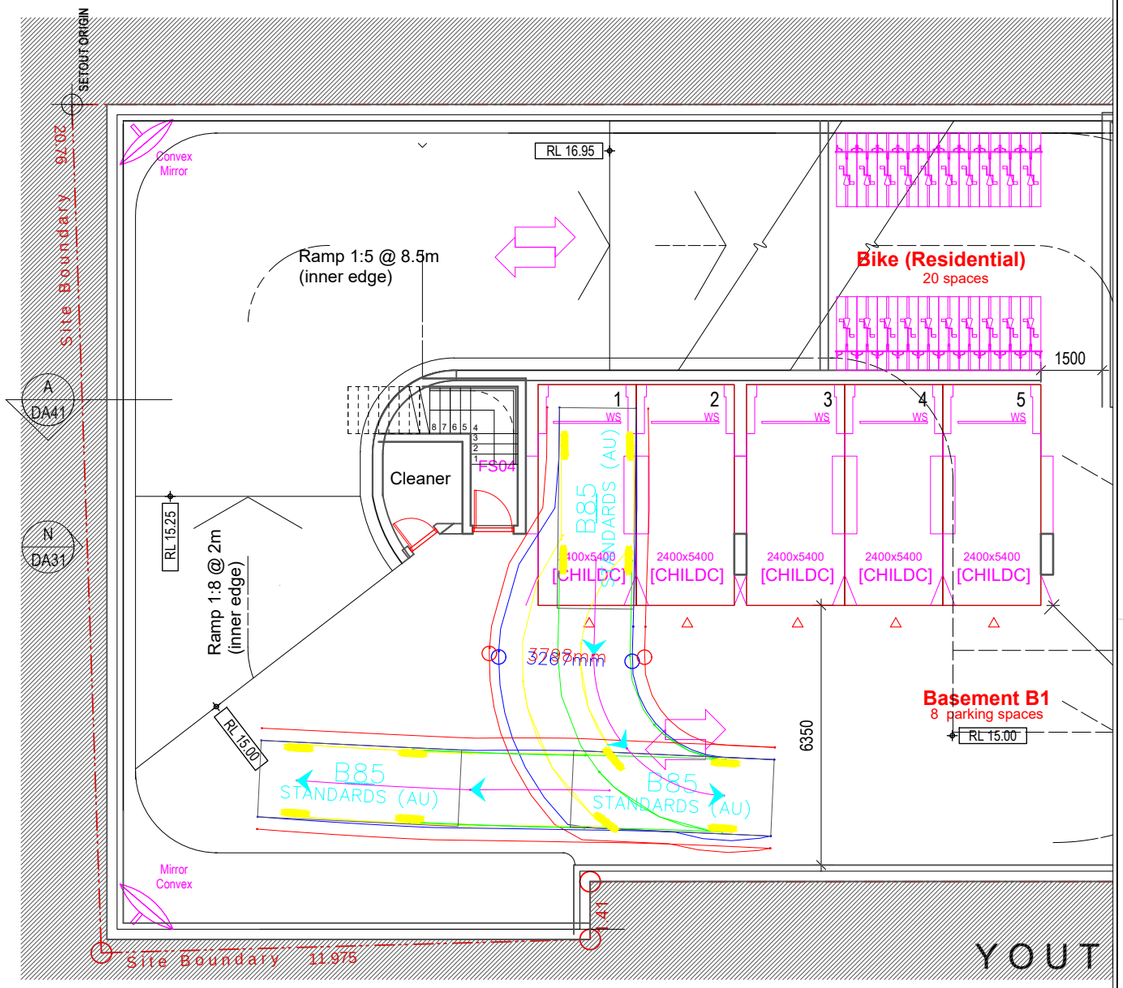


B85 meters

Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	38.5

ENTER

Ground floor
slab over



EXIT

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD
TIA

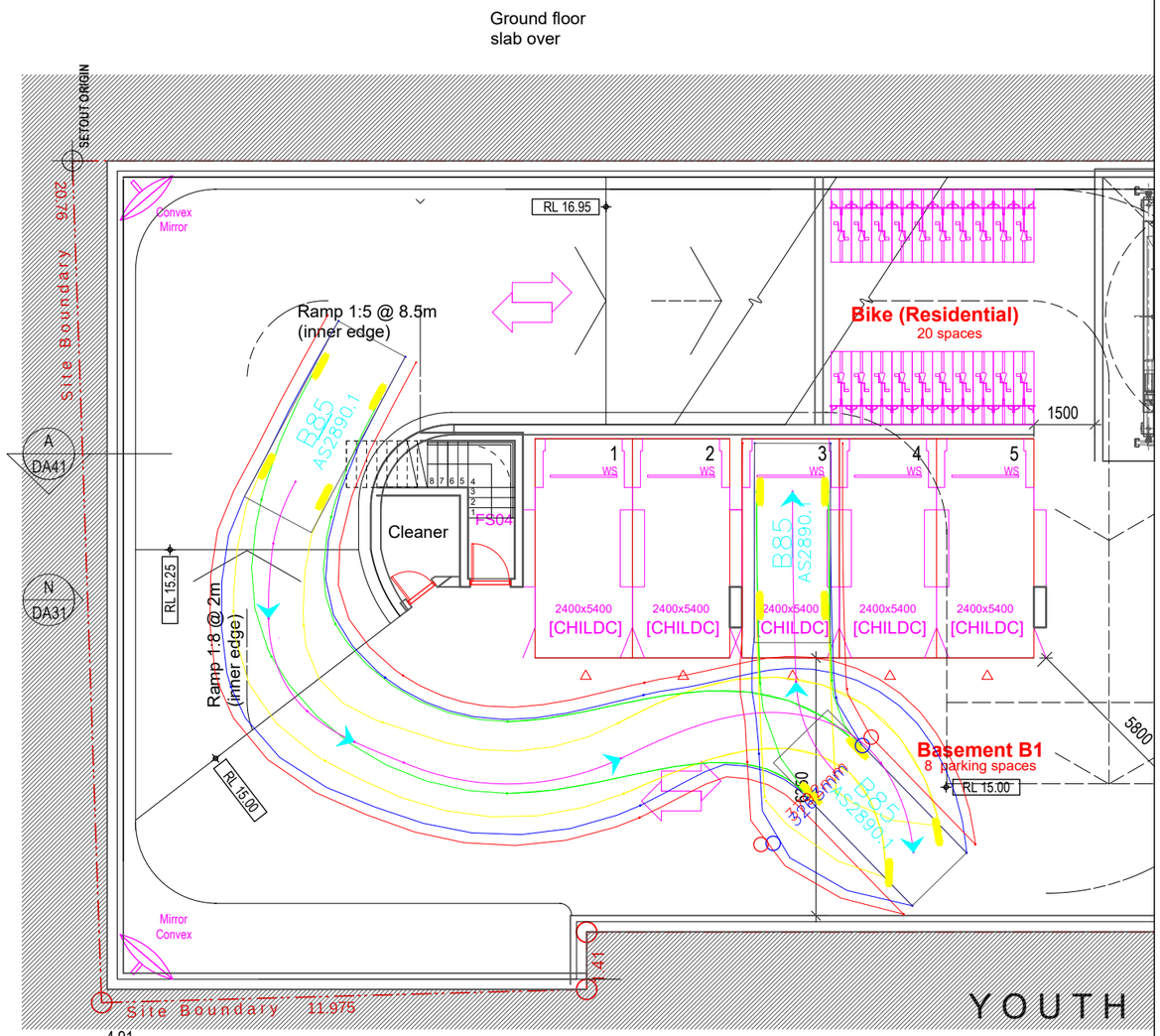
Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM PARKING SPACE 1

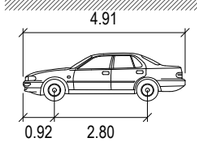
Design	Drawn	Checked
S.D	A.C	A.G

CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	1	001





B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 38.5

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD
TIA

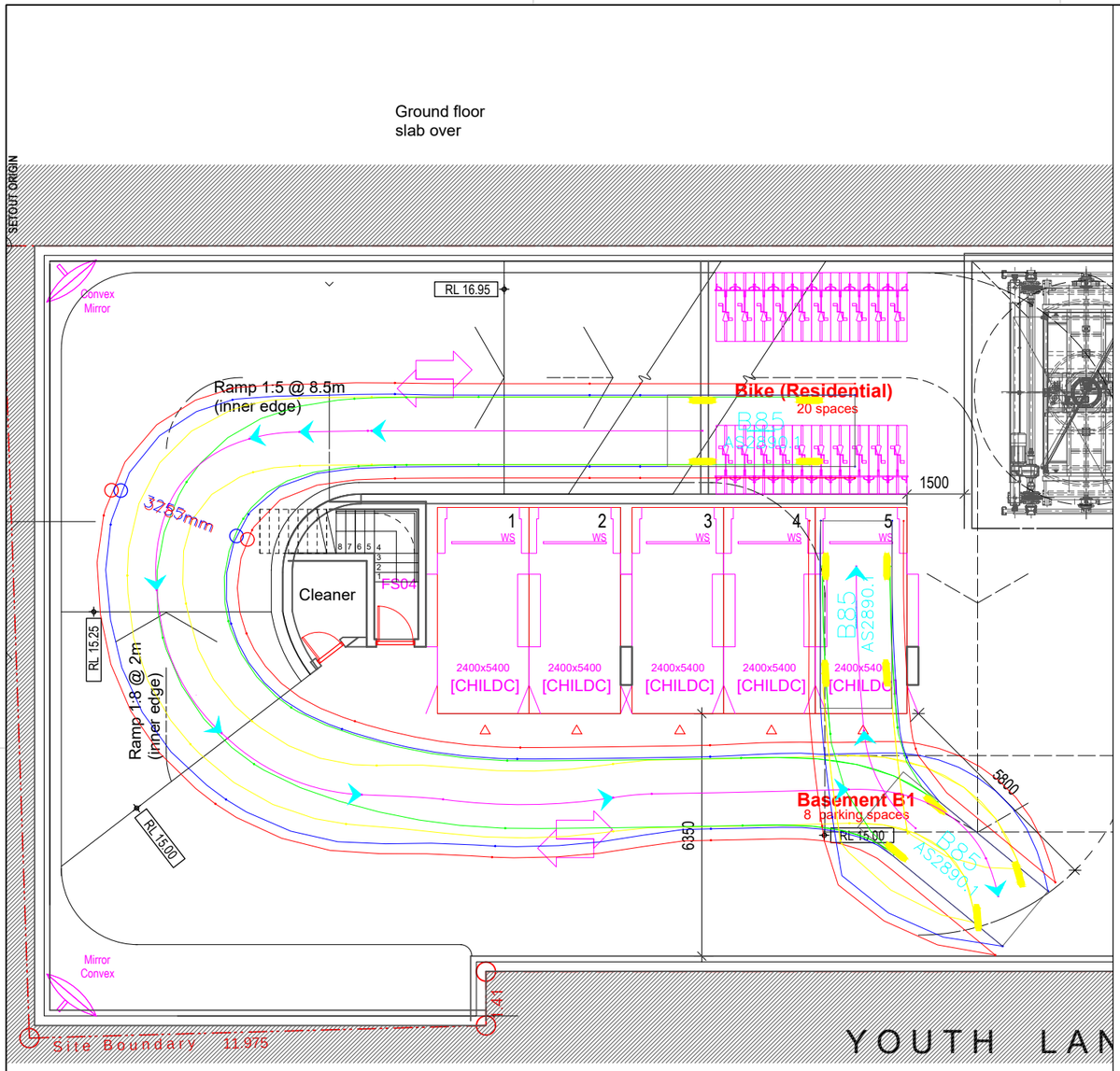
Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM PARKING SPACE 3

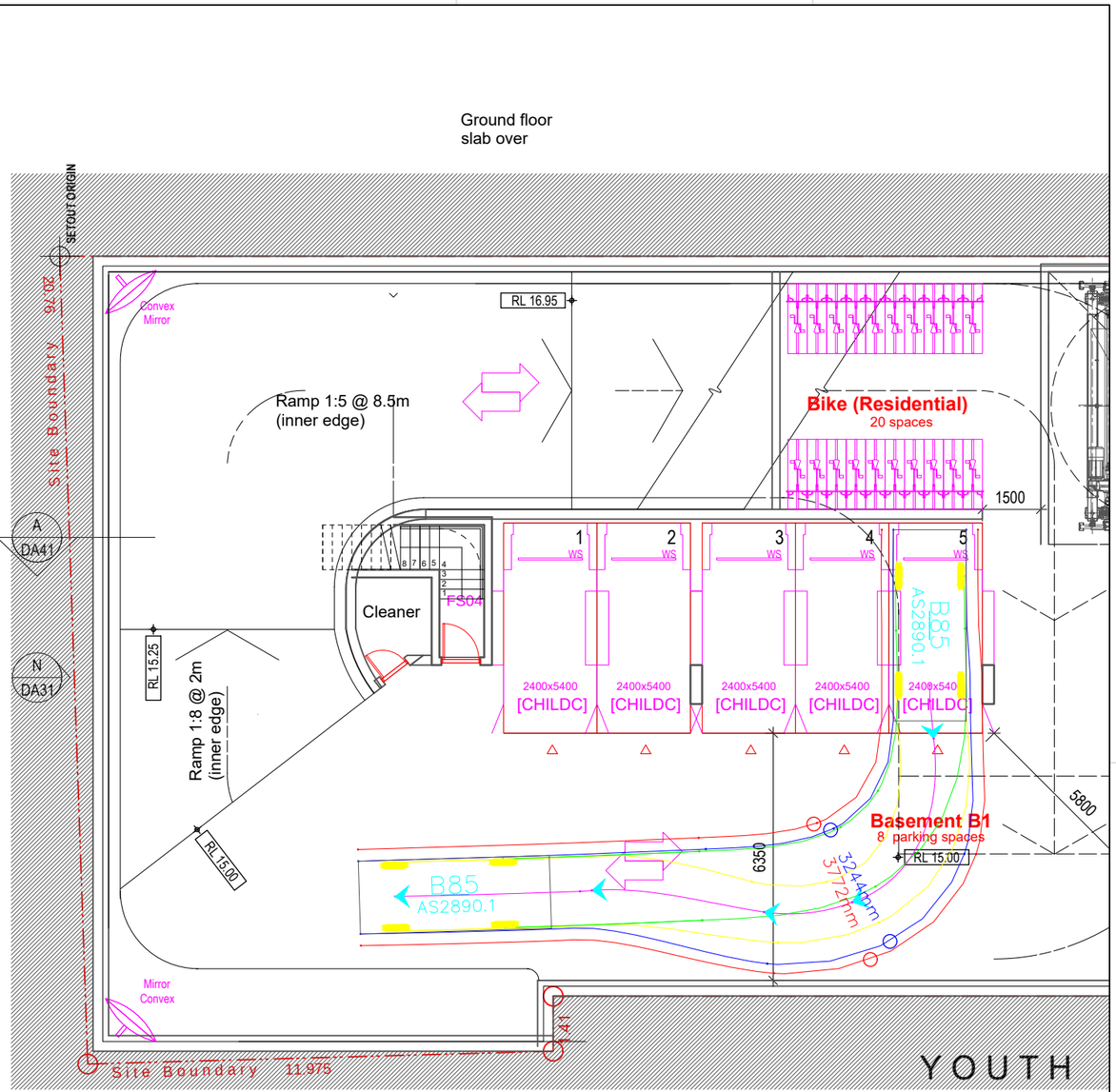
Design	Drawn	Checked
S.D	A.C	A.G

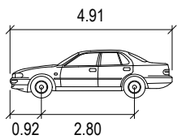
CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	2	001







B85 meters

Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	38.5

ENTER

EXIT

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD
TIA

Title: SWEPT PATH: B85 VEHICLE
ACCESS TO AND EGRESS
FROM PARKING SPACE 5

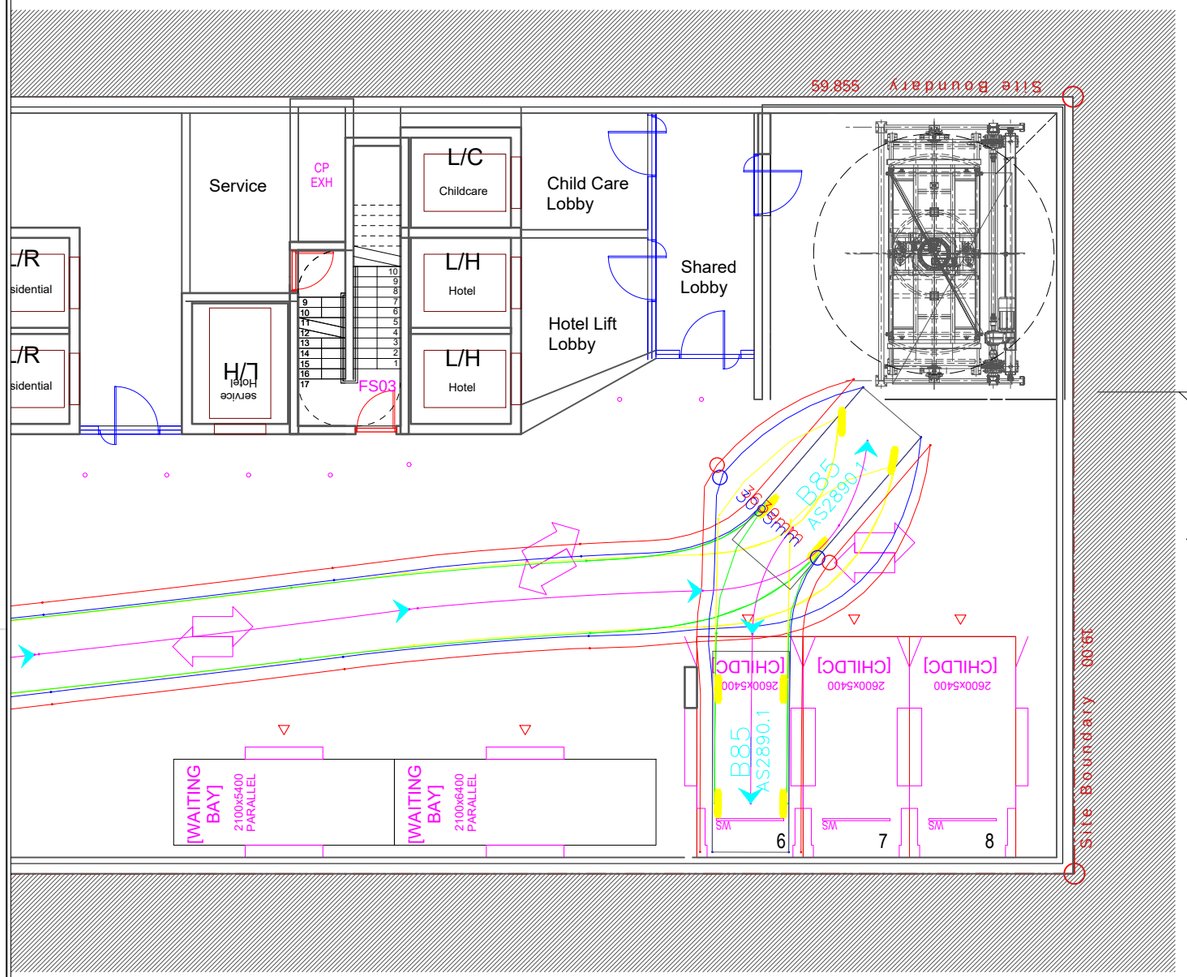
Design	Drawn	Checked
S.D	A.C	A.G

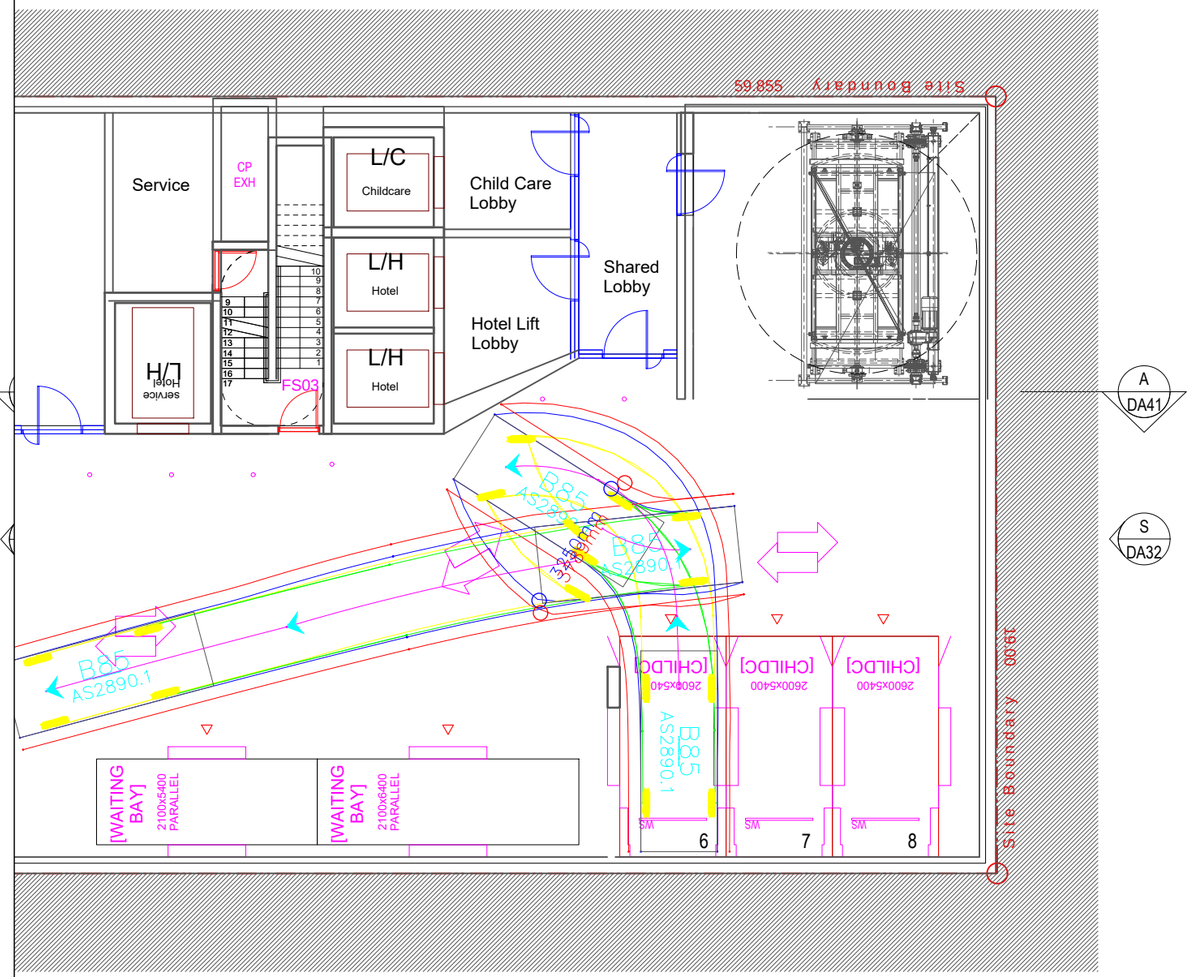
CONCEPT ONLY

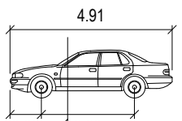
Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	3	001

MARY STREET







B85

Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	38.5

meters

W DA39 · B DA42 · A DA41 · S DA32 · B DA42

ENTER

EXIT

STREET

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD
TIA

Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM PARKING SPACE 6

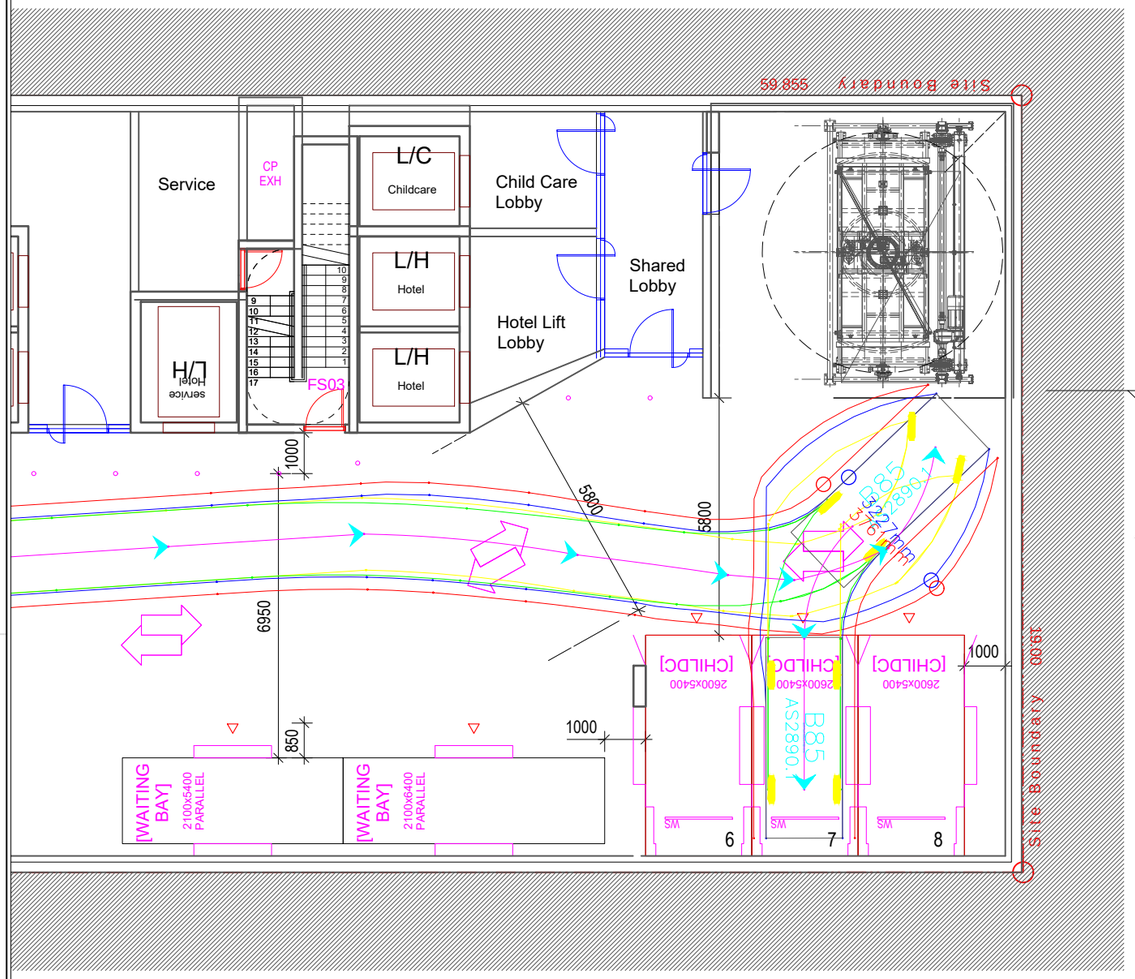
Design	Drawn	Checked
S.D	A.C	A.G

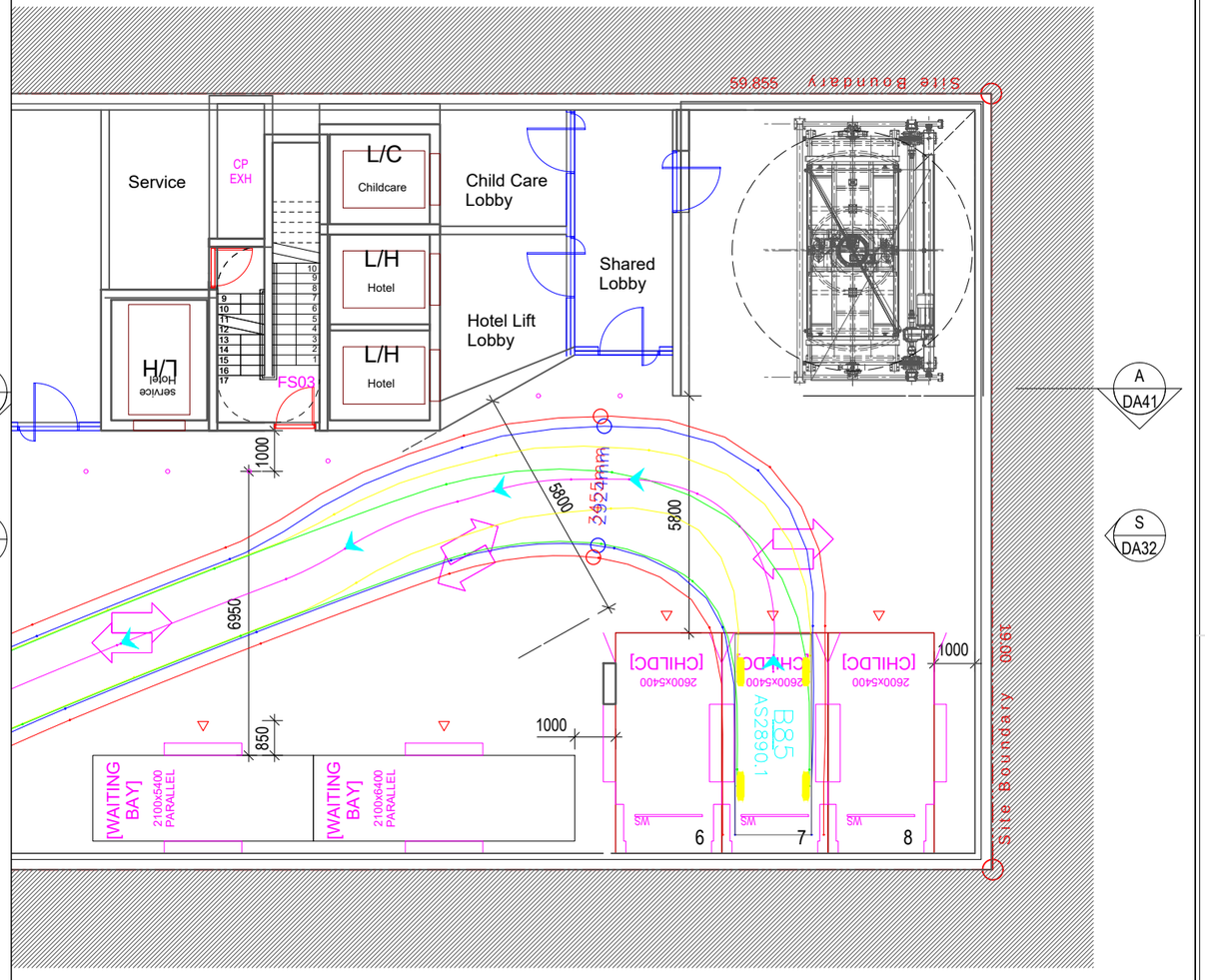
CONCEPT ONLY

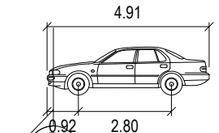
Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	4	001

MARY STREET







B85 meters

Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	38.5

STREET

ENTER

STREET

EXIT

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD TIA

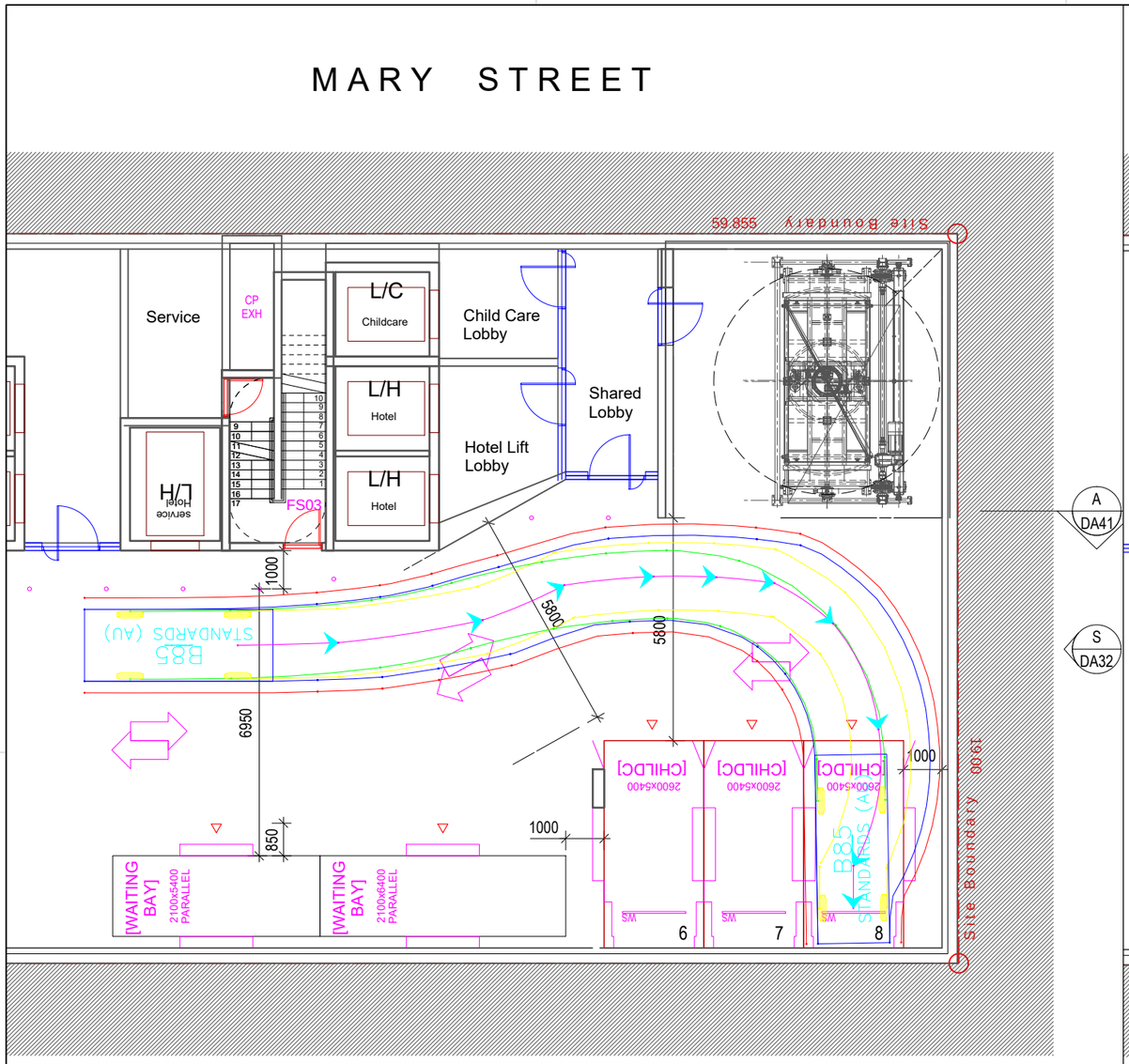
Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM PARKING SPACE 7

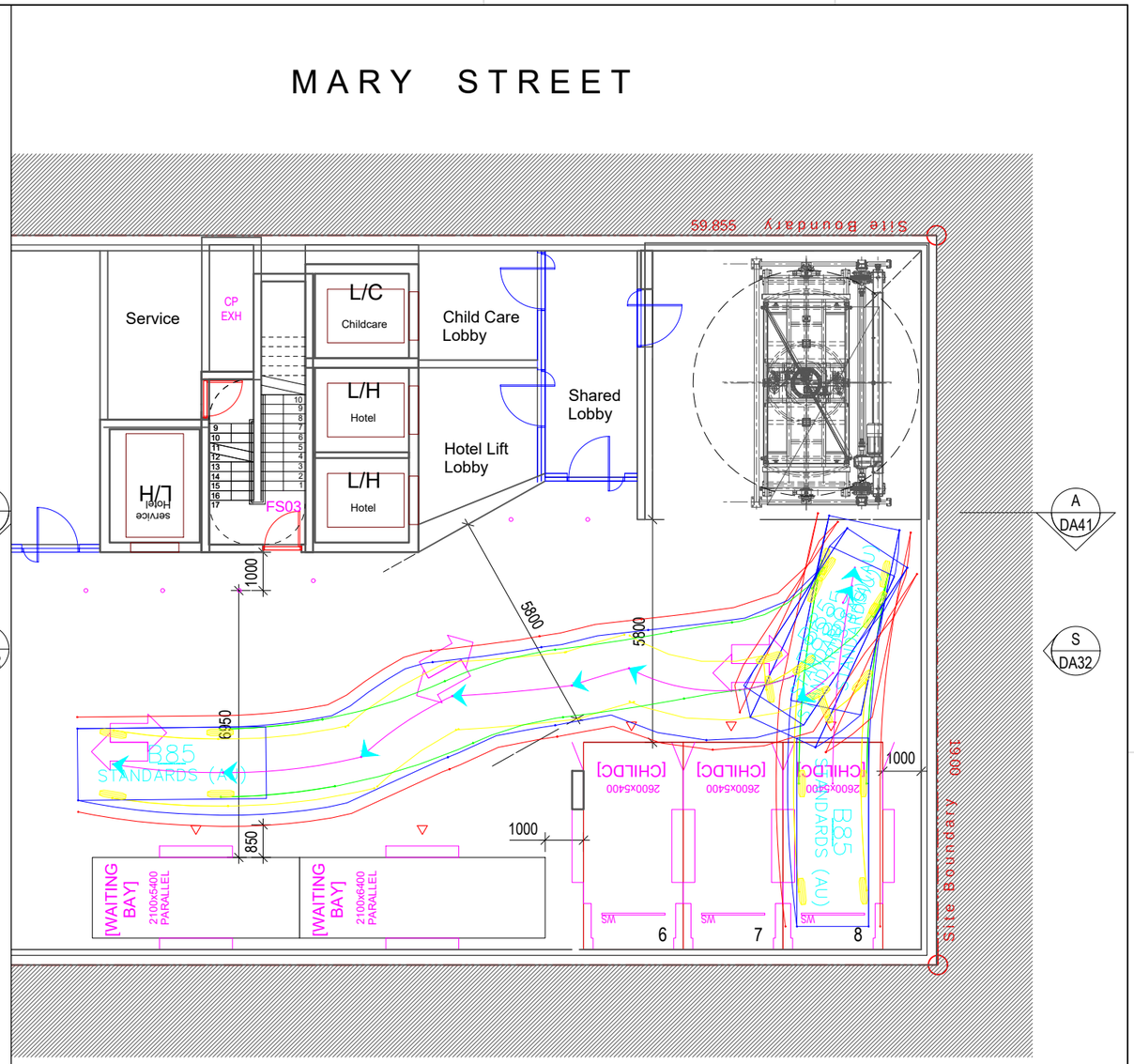
Design	Drawn	Checked
S.D	A.C	A.G

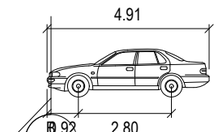
CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	5	001







B85

		meters
Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	38.5

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD TIA

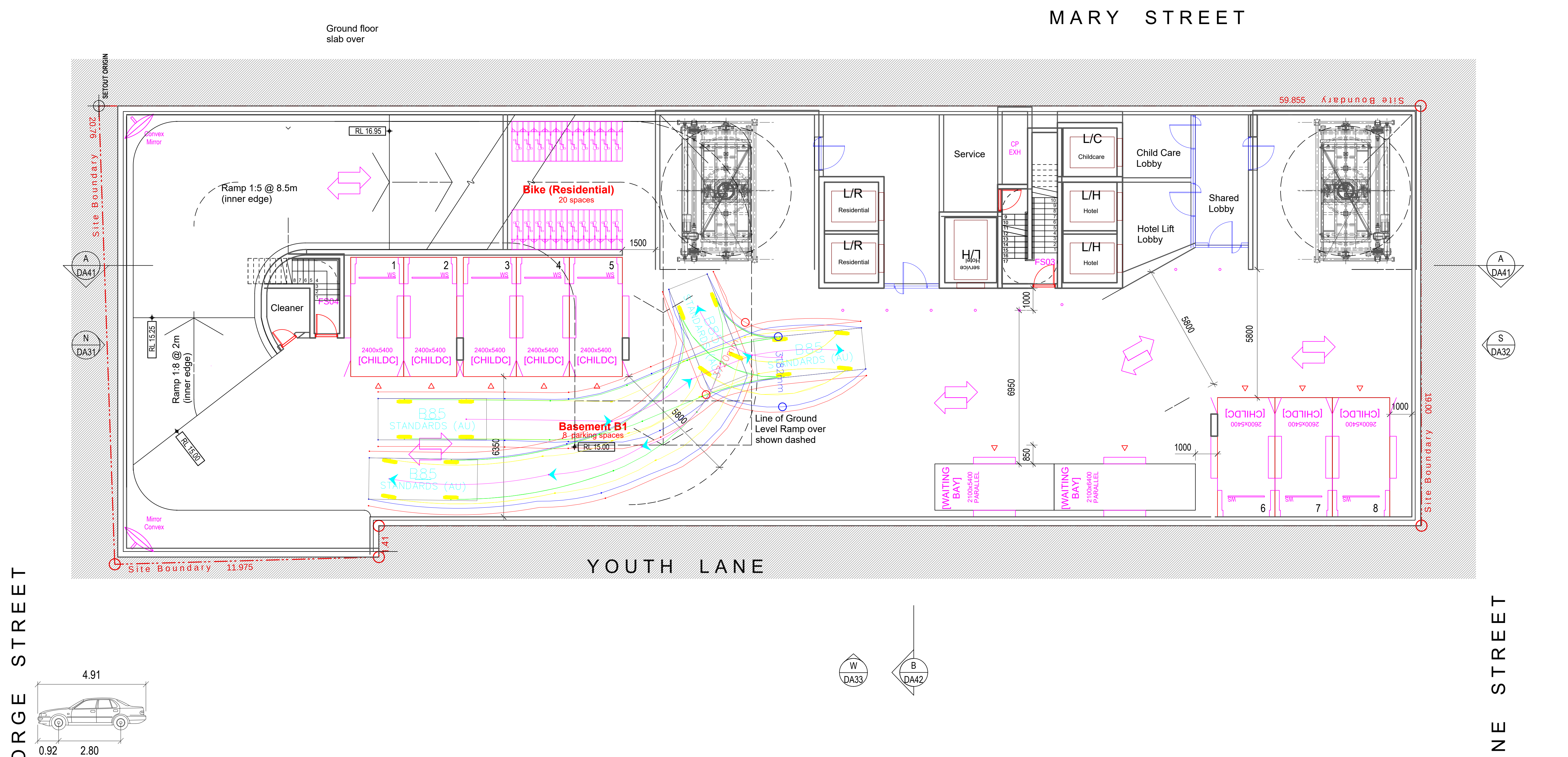
Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM PARKING SPACE 8

Design	Drawn	Checked
S.D	A.C	A.G

CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	6	001



MARY STREET
YOUTH LANE
GEORGE STREET
DEANE STREET
Ground floor slab over
Ramp 1:5 @ 8.5m (inner edge)
Ramp 1:8 @ 2m (inner edge)
Bike (Residential)
20 spaces
Cleaner
Service
L/R Residential
L/C Childcare
L/H Hotel
Child Care Lobby
Shared Lobby
Hotel Lift Lobby
Basement B1
8 parking spaces
Line of Ground Level Ramp over shown dashed
B85 STANDARDS (AU)
[CHILDC]
2400x5400
[WAITING BAY]
2100x5400 PARALLEL
Site Boundary
Mirror Convex
RL 16.95
RL 15.25
RL 15.00
1500
5800
6950
6350
1000
850

4.91

0.92 2.80

B85 meters
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 38.5

BITZIOS consulting

REVISIONS			
Issue	Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD TIA

Title: SWEPT PATH: B85 VEHICLE U-TURN

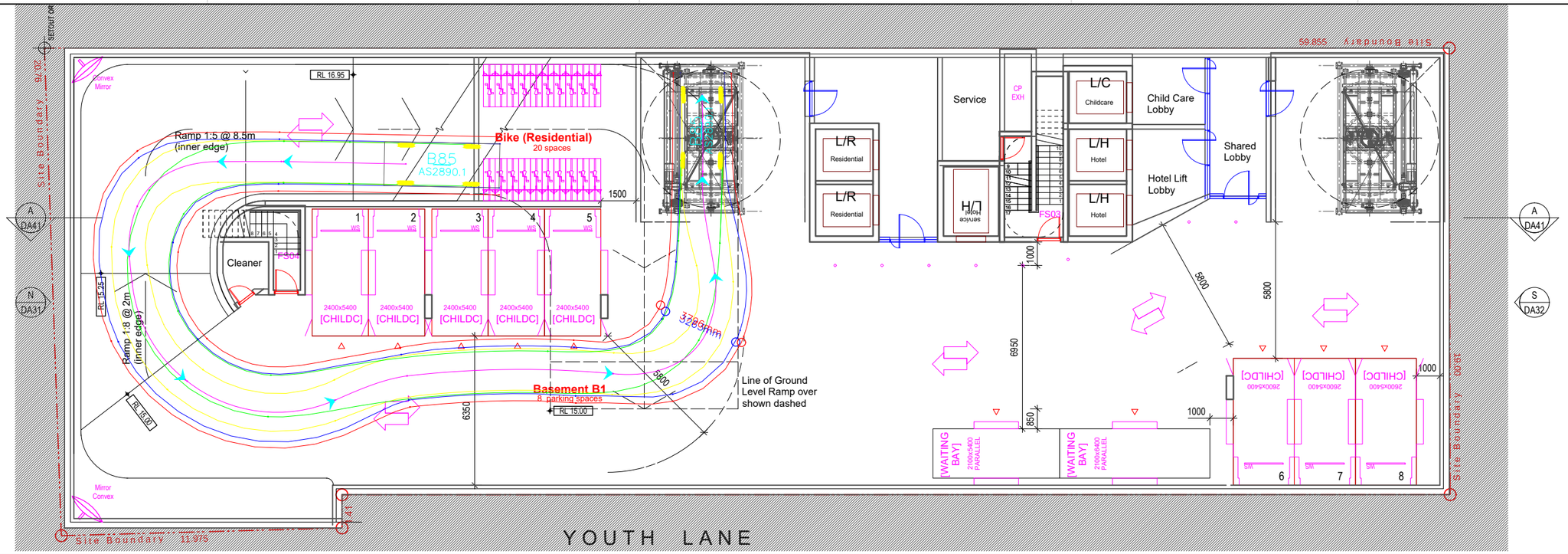
Design	Drawn	Checked
S.D	A.C	A.G

CONCEPT ONLY

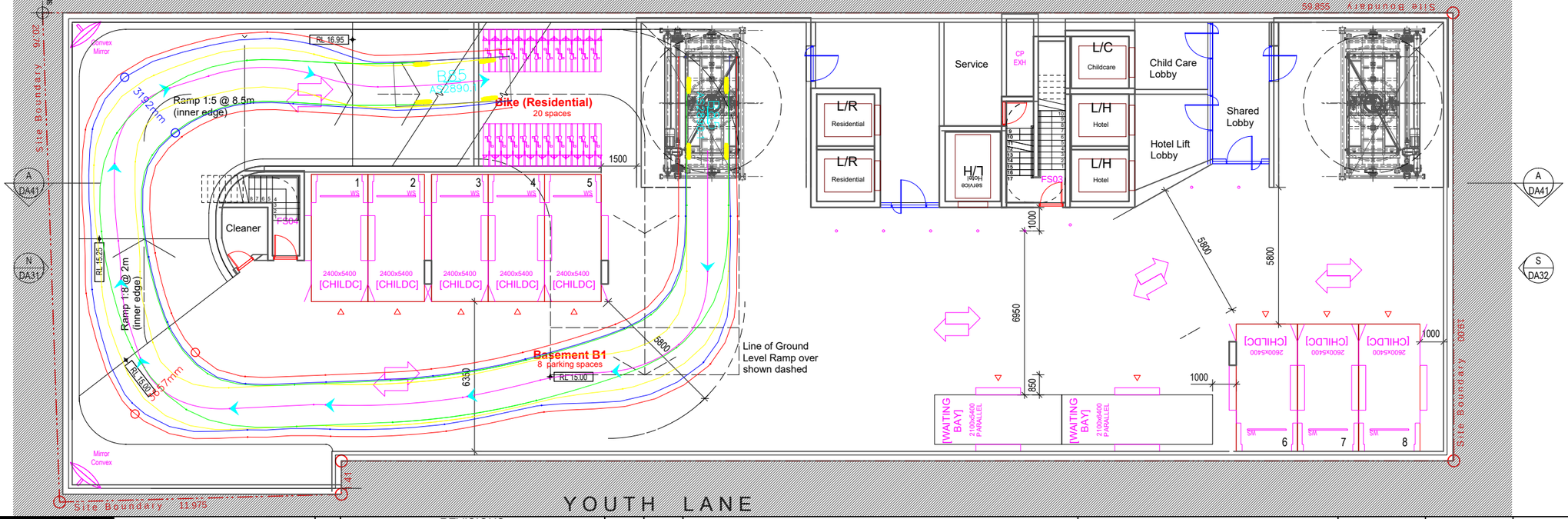
Date: 12.10.2017

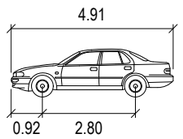
Project Number	Sheet Number	Issue
P3337	7	001

ENTER



EXIT





B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 38.5

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 2 4 6 8 10 1:200

Project: 17 DEANE STREET, BURWOOD TIA

Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM RESIDENTIAL LIFT

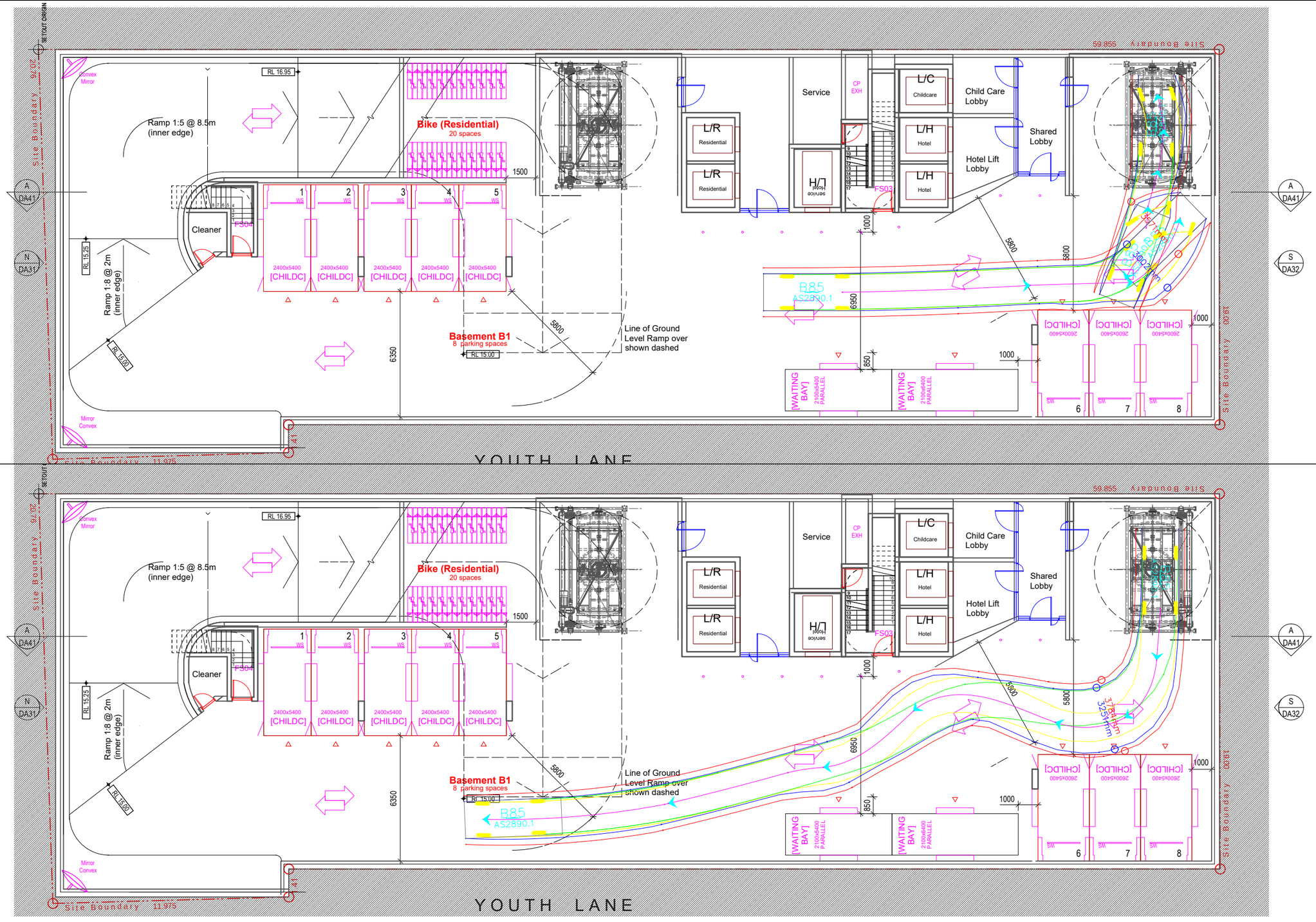
Design	Drawn	Checked
S.D	A.C	A.G

CONCEPT ONLY

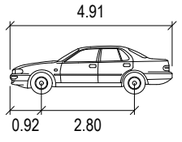
Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	8	001

ENTER



EXIT



B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 38.5

BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 2 4 6 8 10 1:200

Project: 17 DEANE STREET, BURWOOD TIA

Title: SWEPT PATH: B85 VEHICLE ACCESS TO AND EGRESS FROM COMMERCIAL LIFT

Design	Drawn	Checked
S.D	A.C	A.G

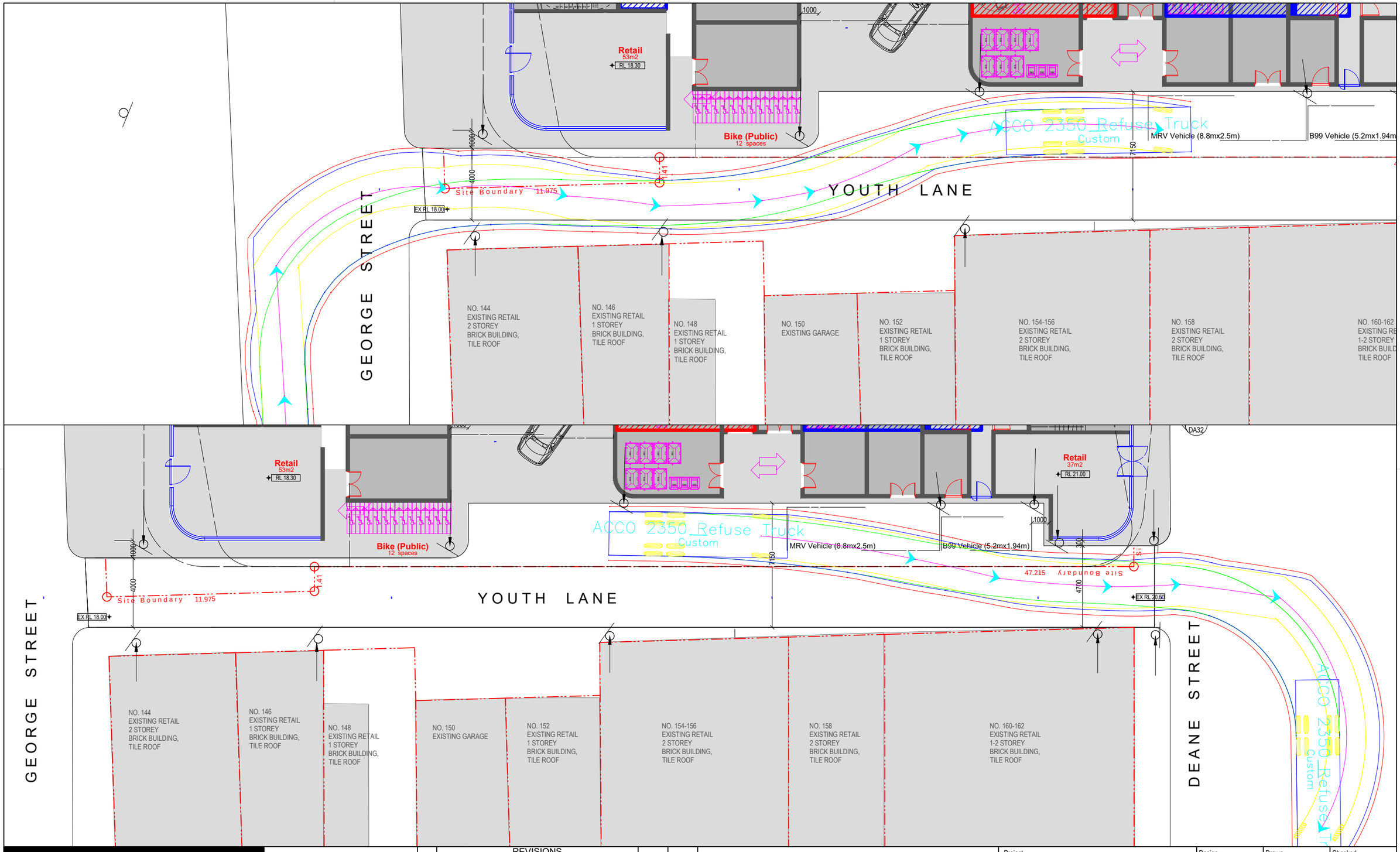
CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	9	001

ATTACHMENT D

YOUTH LANE HEAVY VEHICLE SWEPT PATHS



BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 1 2 3 4 5 6 7 1:150

Project: 17 DEANE STREET, BURWOOD TIA

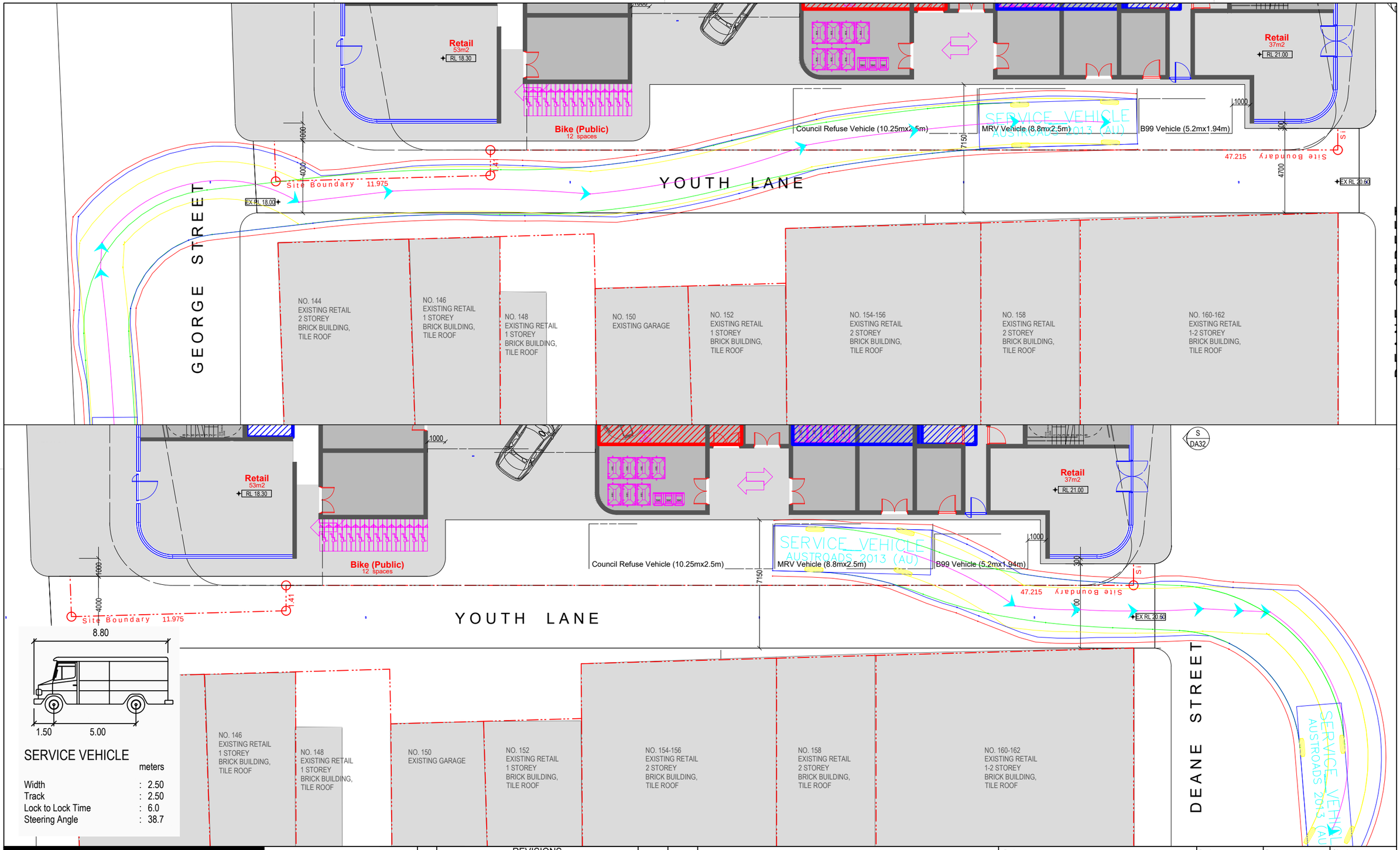
Title: SWEPT PATH: REFUSE TRUCK THROUGH YOUTH LANE

Design	Drawn	Checked
S.D	A.C	A.G

CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	1	001



BITZIOS consulting

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH	A.C	12.10.2017

Scale @ A3 0 2 4 6 8 10 1:200

Project: 17 DEANE STREET, BURWOOD TIA

Title: SWEPT PATH: 8.8M SERVICE THROUGH YOUTH LANE

Design	Drawn	Checked
S.D	A.C	A.G

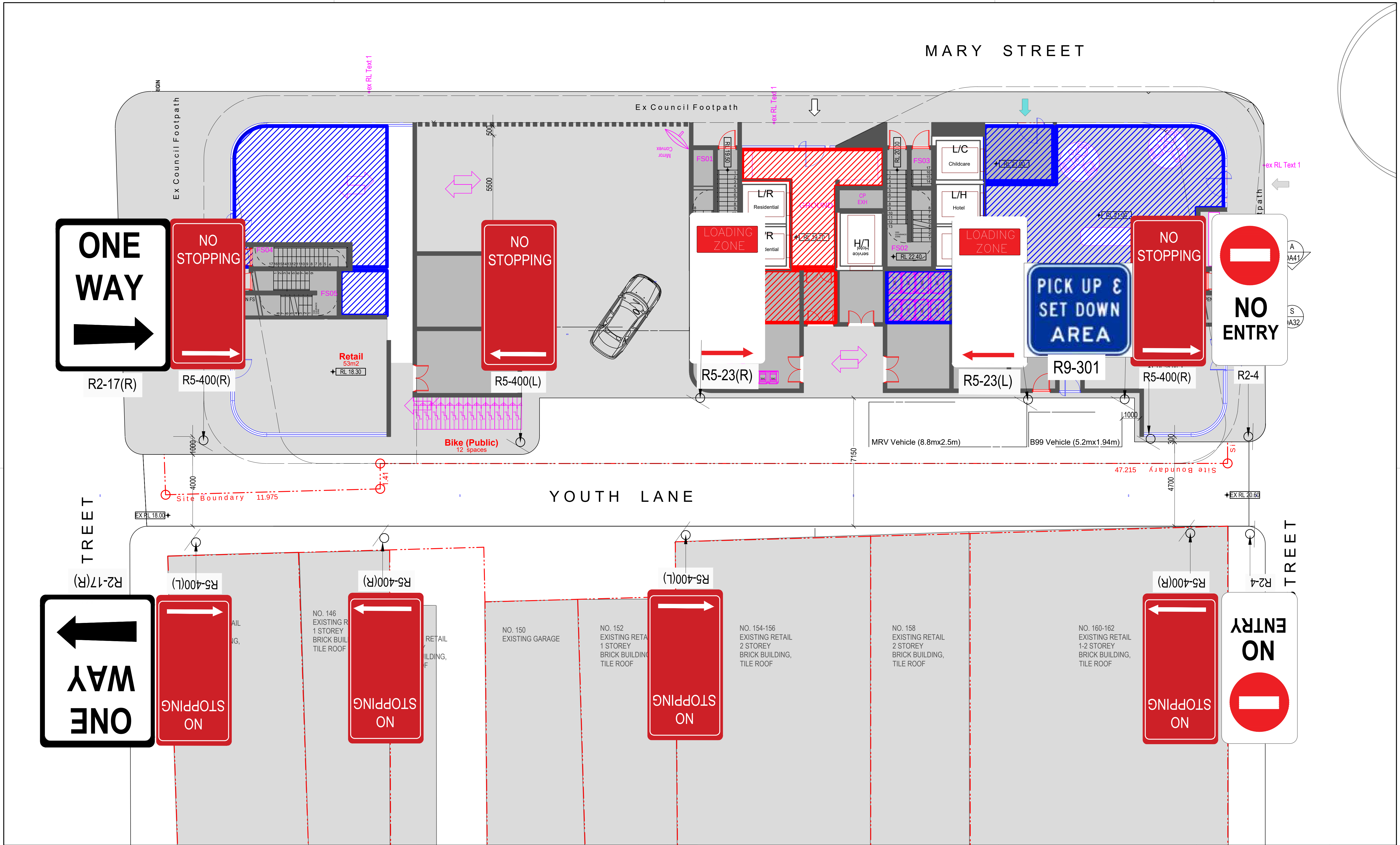
CONCEPT ONLY

Date: 12.10.2017

Project Number	Sheet Number	Issue
P3337	2	001

ATTACHMENT E

YOUTH LANE SIGNAGE PLAN



MARY STREET
Ex Council Footpath
YOUTH LANE
ONE WAY
R2-17(R)
NO STOPPING
R5-400(R)
R5-400(L)
LOADING ZONE
R5-23(R)
R5-23(L)
PICK UP & SET DOWN AREA
R9-301
NO ENTRY
R2-4
Retail
Bike (Public)
MRV Vehicle (8.8mx2.5m)
B99 Vehicle (5.2mx1.94m)
Site Boundary
NO. 146 EXISTING RETAIL 1 STOREY BRICK BUILDING, TILE ROOF
NO. 150 EXISTING GARAGE
NO. 152 EXISTING RETAIL 1 STOREY BRICK BUILDING, TILE ROOF
NO. 154-156 EXISTING RETAIL 2 STOREY BRICK BUILDING, TILE ROOF
NO. 158 EXISTING RETAIL 2 STOREY BRICK BUILDING, TILE ROOF
NO. 160-162 EXISTING RETAIL 1-2 STOREY BRICK BUILDING, TILE ROOF

BITZIOS -consulting

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	CONCEPT DESIGN	A.C	13.10.2017

Scale @ A3 1:200

Project: 17 DEANE STREET, BURWOOD TIA

Title: PROPOSED SIGNAGE ON YOUTH LANE

Design	Drawn	Checked
A.C	A.C	A.G

CONCEPT ONLY

Date: 13.10.2017

Project Number	Sheet Number	Issue
P3337	1	001