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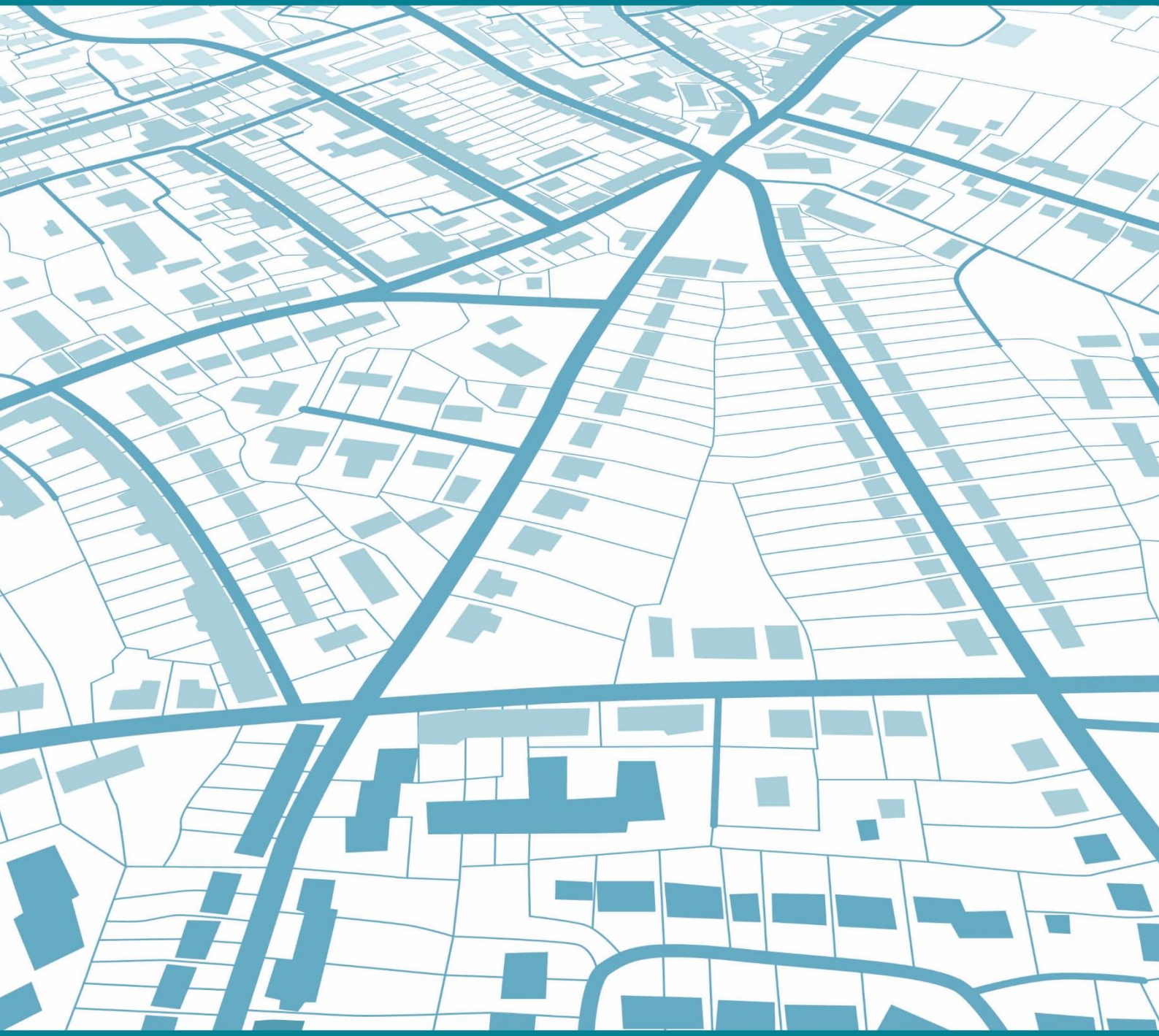

Frenchs Forest Bushland Cemetery
1 Hakea Avenue, Davidson
Proposed Additions and Alterations
Assessment of Traffic and Parking Implications

Ref: 19073
Date: April 2020
Issue: A

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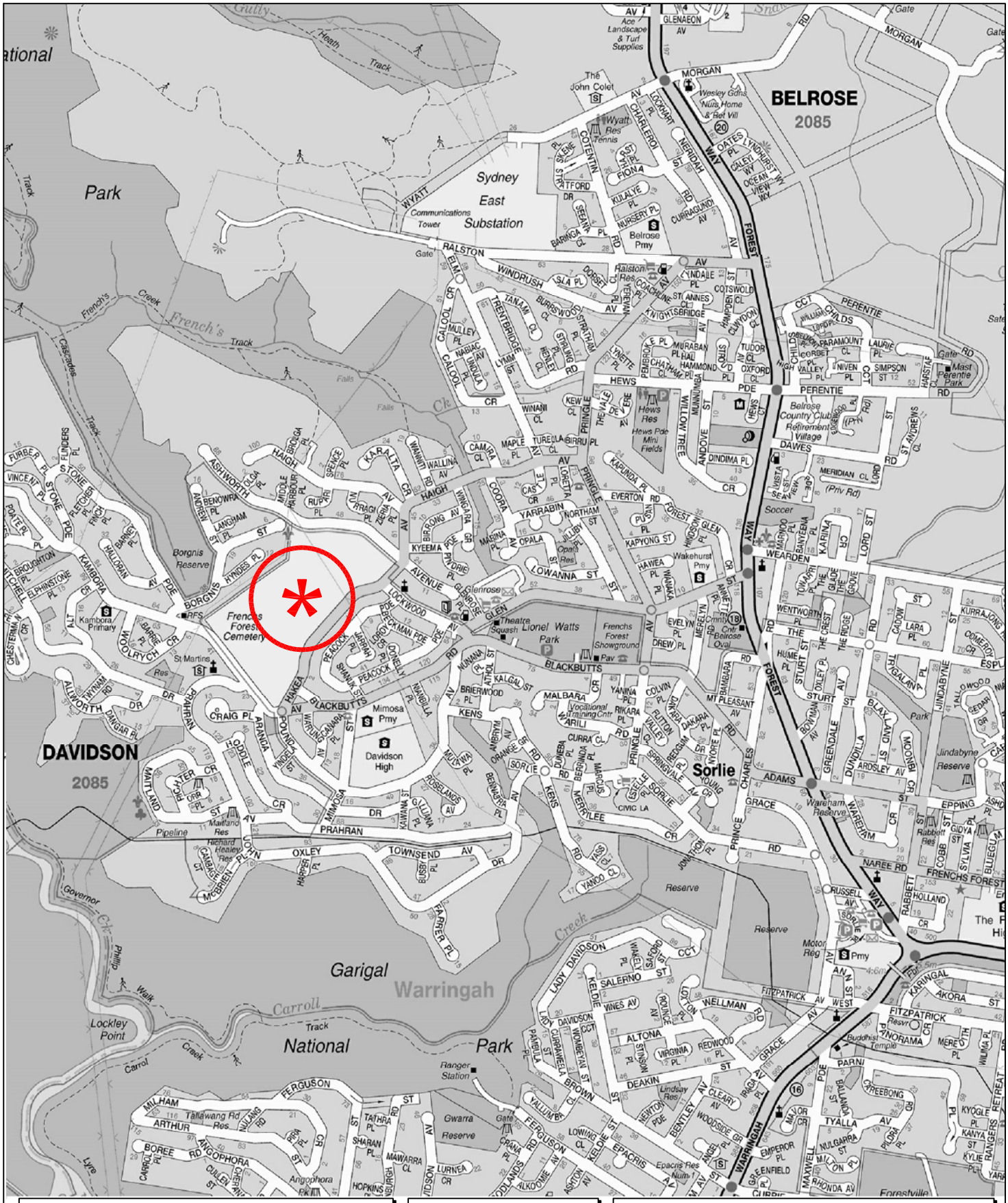
1.0 Introduction

This report has been prepared on behalf of Northern Metropolitan Cemeteries Land Manager (NMCLM) to accompany a Development Application (DA) to Northern Beaches Council for the proposed additions and alterations of the existing Frenchs Forest Bushland Cemetery (FFBC) at 1 Hakea Avenue. The existing cemetery is located on a large site in Davidson (Figure 1) and has ready access to the regular bus services.

The purpose of this report is to:

- describe the site, its context, the existing uses and the proposed
- describe the road network serving the site and the existing traffic and public transport circumstances
- assess the proposed vehicle access arrangements and the potential traffic implications
- assess the adequacy of the proposed parking provisions
- assess the suitability of the proposed internal circulation and existing servicing provisions



LOCATION

FIG 1

2.0 Proposed Development Scheme

2.1 Site, Context and Existing Circumstances

The site (Figure 2) is of Lot 7335 in DP1152473, which occupies an irregular shaped area of some 22ha. This site has extensive frontages to Kambora Avenue, Hakea Avenue and Ashworth Avenue. While the FFBC occupies a large area, it is partially covered by the typical Hawkesbury Sandstone bushland. FFBC currently has:

- burial areas for lawn burial, monumental lawn, full monumental, guardian angel mausoleum, crypts and vaults - some 18,000 burial areas
- cremation areas including ash interment and memorialization
- an administration building
- the multi-purpose function hall attached to the administration building - Lorikeet Room which is being used as a chapel or a function room and features movable seating for 100 people
- a porte-cochere to the south of the existing administration building which can accommodate up to 3 B99 cars/buggys. Vehicle accesses to/from the porte-cochere are provided via two two-way driveways on Kanooka Way (7m wide) and Darwina Drive (8m wide)
- a workshop/shed with staff room to the southeast of the administration building. Vehicle access to/from the shed is provided via a two-way 7m wide driveway on Darwina Drive
- a manager's residence with vehicle access via a two-way driveway on Hakea Avenue
- a total of 8 staff (administration and maintenance personnel)
- 16 90-degree parking spaces (including 1 disabled space) to the east and south

N

SITE

FIG 2

of the existing administration building

- an informal on-site carpark without proper line-marking to the west of the administration building which can accommodate up to 12 cars

Access to the FFBC is currently provided by 2 driveways along Hakea Avenue. The primary driveway (Kanooka Way) and secondary driveway (Casuarina Crescent) provided on the southern side of the site currently accommodate two-way and all turning movements at their intersections with Hakea Avenue. Details of the existing driveways are provided on the following figure.

The cemetery is publicly accessible every day between 6 am and 6 pm (between May and August) and 6 am and 7 pm (between September and April). The office hours run between 8 am and 4 pm.

The surrounding area comprises:

- single dwellings and Garigal National Park to the north
- single dwellings and Mimosa Public School and Children Centre as well as

Davidson High School to the south

- single dwellings and St Martin's Primary School and Catholic Church to the west
- single dwellings and Glenrose Village Shopping Centre to the east

2.2 Proposed Development

The proposed development scheme comprises:

- the expansion of the Lorikeet Room to accommodate an additional 30 people with a maximum capacity of 130 people.
- the construction of a new chapel to the southwest of the existing administration building which can accommodate up to 170 people

Vehicle access to the new chapel involves a new 5m-wide vehicle driveway on the Darwina Drive southern frontage. The access will be restricted to only hearse and service vehicles for the new chapel.

The proposal also includes 37 new/upgraded angled/parallel central car parking spaces (including 5 disabled spaces) to the west and east of the existing administration building. This includes the formalisation of the on-site parking area to the west of the administration building to include RMS standard line-marking for 14 car spaces. On-street spaces will be formalised through sign posting to allow parking for 182 cars. In summary, the proposed development will provide a total of 219 car spaces.

New toilets and 8 car parking spaces are proposed to the east of Coonangurra Circuit south of the existing electricity sub-station.

Details of the proposed development scheme are provided on the plans prepared by Hector Abrahams Architects which accompany the DA and are reproduced in part in Appendix A.

3.0 Road Network and Traffic Conditions

3.1 Road Network

The road network serving the site (Figure 3) comprises:

- *Warringah Road* – a State Road and arterial route connecting between Babbage Road, Roseville and Pittwater Road, Dee Why
- *Forest Way* – a State Road and arterial route connecting between Mona Vale Road and Warringah Road
- *Blackbutts Road, Hakea Avenue, Haigh Avenue/Pringle Avenue* – a collector road connecting between Kambora Avenue and Forest Way
- *Kambora Avenue* – a collector road connecting between Hakea Avenue and Stone Parade and Sir Thomas Mitchell Drive
- *Ashworth Avenue* – local access cul-de-sac which connects to Hakea Avenue

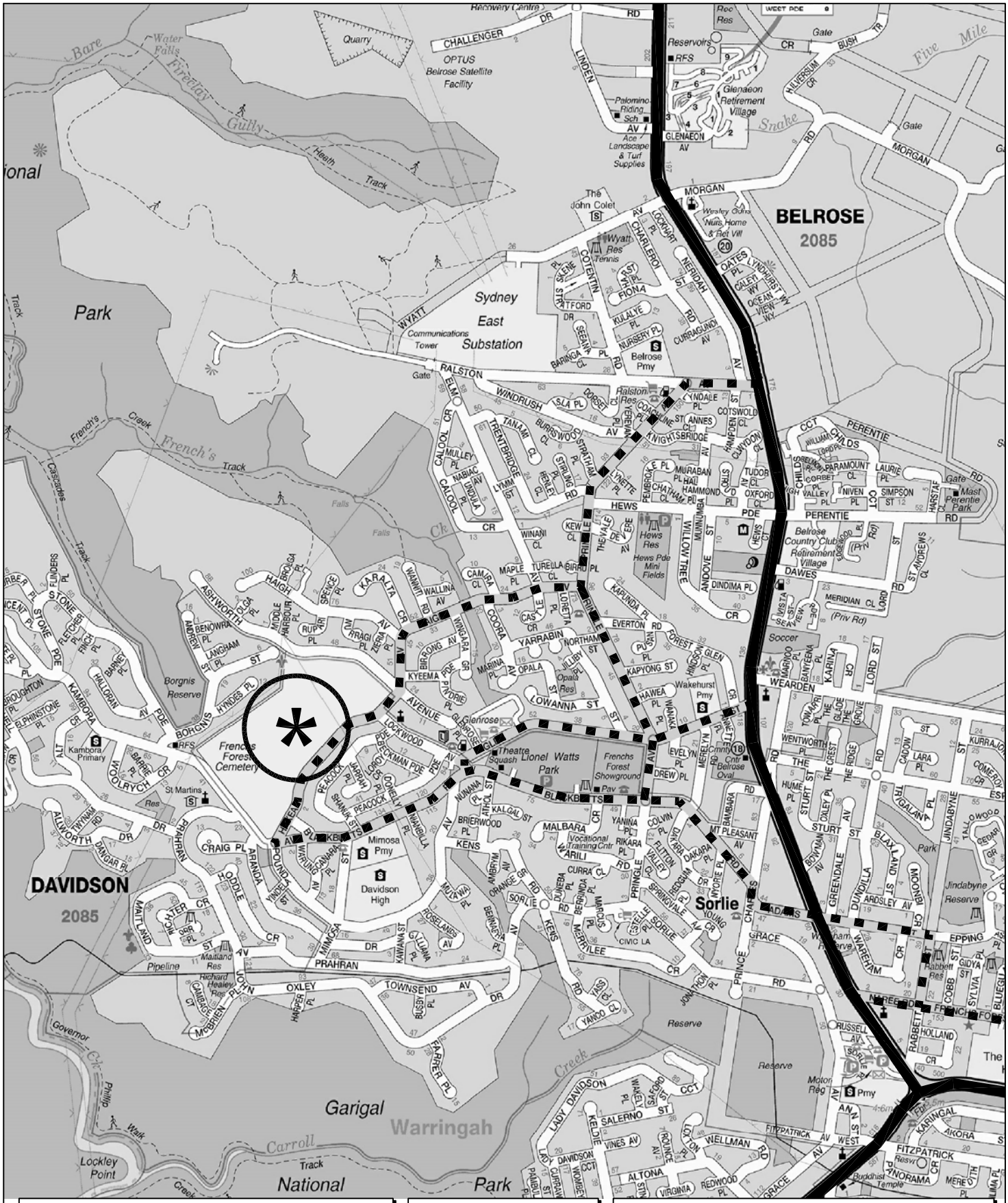
Kambora Avenue and Ashworth Avenue have slightly curvilinear alignments in the vicinity of the site frontage with one lane in each direction.

Hakea Avenue is relatively straight and level south of the driveway to/from the manager's residence. Hakea Avenue has a 9.6m-wide carriageway and an ascending grade towards the north with a 23˚ bend at the manager's residence' driveway location.

3.2 Traffic Controls

The existing traffic controls which have been applied to the roads in the vicinity of the site (Figure 4) include:

- the roundabout at the intersections of:
    - Kambora Avenue/Hakea Avenue



LEGEND

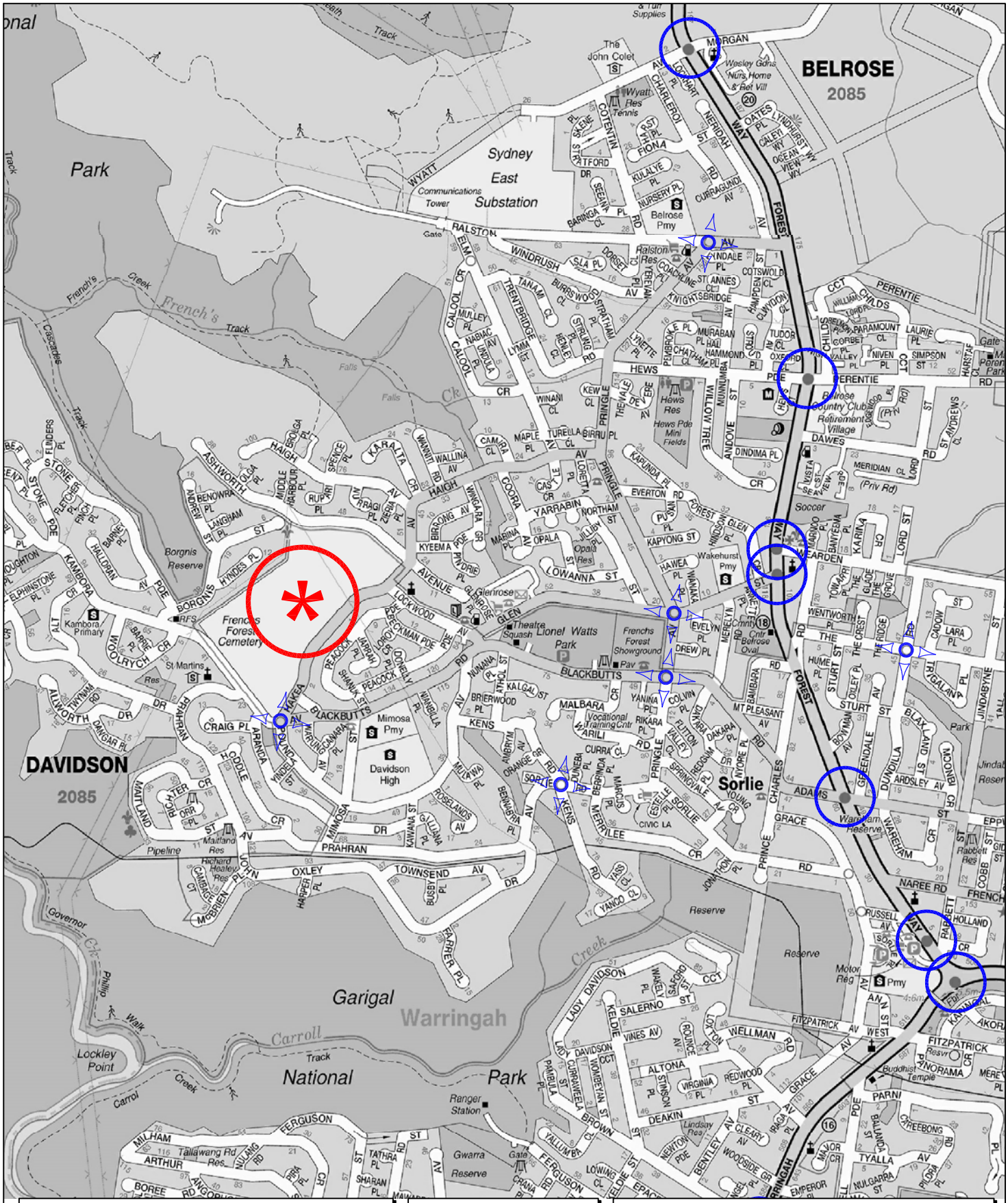
ARTERIAL

COLLECTOR

N

ROAD NETWORK

FIG 3



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT

N

TRAFFIC CONTROLS

FIG 4

- Kambora Avenue/Prahran Avenue

- the GIVE WAY control at the Kanooka Way and Breynya Street approaches at their intersections with Hakea Avenue
- the GIVE WAY control at the intersections of other local roads with Hakea Avenue
- the 50 kmph restriction on the local road system, including Hakea Avenue
- the 40 kmph School Zone near St Martin's Primary School

3.3 Traffic Conditions

An indication of the existing traffic conditions in the vicinity of the site is provided by data published by the RMS and surveys undertaken as part of this assessment. The data published by the RMS is expressed in terms of Annual Average Daily Traffic (AADT) and the most recently available data is summarised in the following:

Location	AADT
Forest Way east of Neridah Avenue	35,922

The existing traffic flows along Hakea Avenue are low during the cemetery's peak periods. There are regular lengthy gaps available in Hakea Avenue traffic flow simply because of the light volume. No undue delays were observed to occur with the ingress and egress movements to or from the site during the AM and PM as well as the cemetery's peak periods.

3.4 Transport Services

Public transport services in the area comprise the Forest Coach Line routes no. 169, 274, 281 and 282 running along Hakea Avenue on a 7 days a week basis connecting to Belrose, Davidson, Chatswood, and Terrey Hills (see details overleaf).

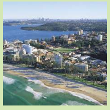
Buses around the Northern Beaches

Train | Bus | Ferry | Light Rail

City

Catch a B1 B–Line bus from Warringah Mall, Pittwater Rd, Stand B to City Wynyard.

Catch an F1 ferry from Manly Wharf to Circular Quay.



Manly

Catch a bus from Warringah Mall, Pittwater Rd, Stand A to Manly.

Palm Beach

Catch a B1 B–Line bus from Warringah Mall, Pittwater Rd, Stand C to Mona Vale.

Change at Mona Vale for connecting bus services to Palm Beach.

Chatswood

Catch a B1 B–Line bus to Neutral Bay Junction.

Change at Neutral Bay Junction for a 143, 144 or 257 bus to Chatswood.

*Images from Destination NSW

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4.0 Access and Internal Circulation

4.1 Existing Vehicle Accesses

The existing vehicle accesses will be retained:

- Kanooka Way (primary access) - 10m-wide two-way access along Hakea Avenue to/from the site. The access is located 20m from a bend along Hakea Avenue to the north. See the following figure.

- Breynya Street (secondary access) - 5m-wide two-way access along Hakea Avenue to/from the site. The access is located 30m south of the primary access. See the following figure.

- Manager's residence driveway - 3m-wide two-way access along Hakea Avenue to/from the manager's residence. The access is located at the tangent point of the bend along Hakea Avenue.

4.2 Proposed Vehicle Access Arrangement

To accommodate the increase in traffic generation by the proposed development, the following vehicle access arrangement is planned to be undertaken as part of the DA:

- Kanooka Way - converted to a 1-way ingress only (two-way for fire appliances/emergency vehicles) with a 30m No Stopping zone along the western side and a No Parking zone along the eastern side between Darwina Drive and Hakea Avenue.
- Breynya Street - converted to a 1-way egress only with a 40m No Stopping zone along the southern side and a No Parking zone along the northern/eastern side between Gunyang Grove and Hakea Avenue.
- Manager's residence driveway – upgraded to include road pavement reconstruction and improved drainage to allow access for hearses only.

The conversion of the two-way to one-way operations will increase the road capacity of Kanooka Way and Breynya Street given the fewer vehicular conflict points. The one-way movements will also result in enhanced safety through the fewer conflicting turning movements at their intersections with Hakea Avenue. In addition, kerbside parking activity can be less disruptive to the traffic flow on a one-way road, where only 1 travel lane being blocked by the parking activity while allowing passing opportunities for through traffic.

4.3 Proposed Internal Circulations

To facilitate the on-street parking and vehicle manoeuvring within the internal road network, it is proposed to provide a general one-way counter clock-wise circulation within the site along the main internal road such as Kanooka Way, Gunyang Grove, Casuarina Crescent and Breynya Street.

4.4 Proposed Parking Restrictions and Pedestrian Amenities

There is currently no sign-posting in relation to the car parking within the site. It is

proposed to provide car parking restrictions along the internal road network. Such parking restrictions provide NMCLM an effective means of controlling and regulating on-street parking within the site. The restrictions will also deter motorists from parking on critical intersections, pedestrian desire lines and verges/grassed areas which are designated for pedestrian spaces. This will help improve traffic circulation as well as improve traffic and pedestrian safety.

It is proposed that the internal roads be sign-posted at 10kph and as shared zones to facilitate pedestrian safety through low vehicle speeds. A shared zone is a road that is designed to give priority to pedestrians while significantly reducing the dominance of vehicles. The vehicles must give way to pedestrians and equally, pedestrians should not hinder vehicles. The proposed changes will provide an environment where access and safety for pedestrians are prioritised and through traffic is minimised. With drivers travelling at a maximum speed limit of 10kph, drivers will have better control of their vehicles to avoid potential conflicts with pedestrians.

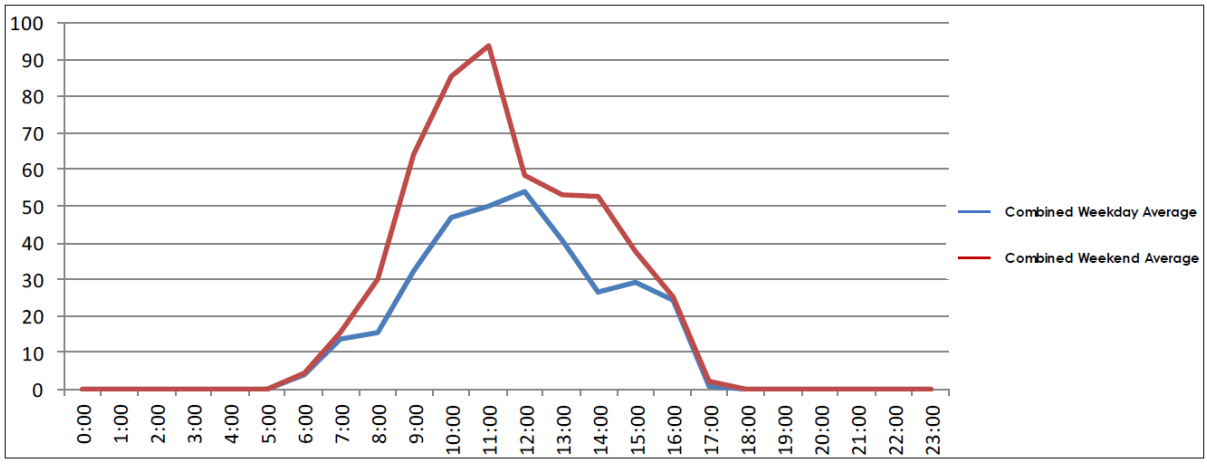
Further to the above, improvements to the existing internal road network would be required to maintain a safe environment for all users, and will include line marking, raised pedestrian crossings and speed humps.

The proposed car parking restriction plan is shown in Appendix B.

5.0 Traffic

There is currently no traffic generation guidance given within the RMS Guide to Traffic Generating Developments (2002) for cemeteries.

As such, the proposed development's traffic generation was determined based on an empirical assessment of the existing operational Liverpool Cemetery undertaken by GTA Consultants (GTA). GTA completed traffic counts at the access point of the Liverpool Cemetery, as shown in the following figure.



While the Liverpool Cemetery is approximately half the size (9.5ha) of the FFBC, it has 24,000 burial plots and consists of two chapels (with a maximum capacity of 250 people), condolence lounge, mausoleum and staff office.

Based on the similarities of the two sites, it is assumed that the proposed development and the current Liverpool Cemetery have similar traffic generation rates based on:

- the chapel/function room maximum capacity during the weekday and weekend noon peak
- the number of burial plots during the AM and PM commuter peak periods.

The traffic counts completed at Liverpool Cemetery's three access points indicate that there are between 30 and 25 trips generated in the weekday AM and PM commuter peak hours, respectively. The AM and PM commuter trip generation comprised mostly of visitors to grave sites and staff. As such, the trips equate to 1.25 and 1.05 trips for

every 1,000 burial plots in the weekday AM and PM commuter peak hours respectively. Based on 18,000 burial plots, it is likely that the proposed development would generate 23 and 19 trips in the AM and PM commuter peak hours.

It is noted that the peak for cemetery would generally occur during mid/ late morning (such as 10 am to 11 am), which is confirmed by the above figure, which shows a profile of weekday and weekend traffic volumes at Liverpool Cemetery. Based on the traffic survey, the Liverpool Cemetery generated 55 and 95 trips during the weekday and weekend noon peak hour respectively. This traffic would comprise visitors to grave sites, the two chapels, the condolence room and staff. As such, these trips represent 0.22 and 0.38 vehicle trips per person during the weekday and weekend noon peak hour respectively.

In the busiest weekday and weekend cemetery peak hours and based on the maximum capacity of 300 people of the proposed chapel and upgraded function room, the proposed development would generate up to 66 and 114 trips during the weekday and weekend noon peak hours respectively.

These are for “normal” days and obviously, for major funerals and other peak days, the movements would be somewhat greater.

However, importantly, these will arrive/depart at different times and in 2 directions (i.e., north and south) and will not occur during the on-street peak traffic periods.

The additional development traffic volumes are no more than 2 vehicle movements every minute through the adjacent key intersections during the weekday commuter peak hours as well as the cemetery’s busiest weekday and weekend peak hours.

The use of Hakea Avenue by vehicles accessing the cemetery and church uses, which abut them is entirely appropriate and consistent with their existing functional role in the road network. In summary, the additional traffic generated by the proposed development could not be expected to compromise the safety and function of the surrounding road network.

6.0 Parking and Internal Circulation

6.1 Car Parking Requirement

There are currently no parking requirements within DCP 2011 in relation to cemeteries. As such, the proposed development's car parking requirement was determined based on an empirical assessment of the existing Liverpool Cemetery.

Off-street car parking to support the expanded cemetery will include a new carpark area to the north of the new chapel and the east of the west administration building. The formalisation of the existing kerbside parking will be carried out as part of the proposed development with car parking restriction signs along Kanooka Way, Breynya Street, Darwina Drive, Casuarina Crescent, Gunyang Grove, Dianella Parade, Eucalyptus Avenue and Callistemon Way.

Considering the peak demand of traffic generated by the proposed development discussed in Section 5, parking demand of up to 114 vehicles could be generated during the busiest period.

The proposed chapel and expanded function room will be operated with the services being offset in order that the chapel/function room can be cleaned, flowers can be arranged, coffins can be offloaded from hearses (e.g., two hearses are rarely seen at the same time at a chapel). As such, the instance of patrons turning up and looking for parking while another ceremony is finishing is limited. Conservatively, it has been assumed that 50% of the patrons from the previous services were to stay back, the proposed development would require 171 spaces to accommodate the patrons for the on-going services and those from the previous services.

The proposed development will provide a total of 219 car spaces. Of these spaces, 37 central car spaces (including 5 disabled spaces and 8 staff spaces) are provided within a formal carpark near the chapel/function room.

The site provides internal roads with widths suitable to allow parking to occur alongside the road so if there was a short period when the central carpark area near the chapel/function room is full, the patrons could park adjacent to the roads. As such, the remaining 182 car parking spaces, equivalent to about 1,100m (based upon an average carpark length of 6m) of kerbside parking could be accommodated along Kanooka Way, Breynya Street, Darwina Drive, Casuarina Crescent, Gunyang Grove, Dianella Parade, Eucalyptus Avenue and Callistemon Way. Kerbside parking is also provided along the internal road network to allow patrons to park next to the grave/memorial stone as opposed to having all parking being provided in a central carpark and patrons having to walk to the grave/memorial stone.

It is proposed that the kerbside parking be staggered on either side of Dianella Parade and Callistemon Way to provide parking and passing opportunities for vehicles entering via Kanooka Way and Casuarina Crescent.

A free buggy service travelling on a loop within the site will be provided for the patrons. The service aims to encourage patrons to seek parking spaces away from the chapel/function room. This will reduce vehicle queueing along the main internal roads and intersections, thus minimizing any potential queuing at the site entry via Kanooka Way and the intersection of Darwina Drive/Kanooka Way. Buggy stops will be located every 50m along the route and run at 7-15 minute intervals during peak times so the patrons can jump on the buggy conveniently.

The proposed buggy stop is shown in Appendix C.

6.2 Accessible Parking

The accessible car parking requirements for different development types are set out in the Building Code of Australia (BCA), 2014. The relevant disabled parking requirements are 1 space per 50 parking spaces. Based on the 219 spaces, the proposal will be required to provide up to a total of 5 accessible spaces, to be compliant with the BCA. The proposed development provides 5 disabled spaces to the east of the administration building, in accordance with the BCA.

6.3 Motorcycle Parking

DCP 2011 does not provide any requirements for motorcycle parking. It is, however, recommended that dedicated motorcycle parking spaces be provided at the rate of one space per 50 car parking spaces. Based on the peak parking provision of 219 car spaces, the proposed development is recommended to provide 5 motorcycle parking spaces. Motorcycle spaces are provided to the east of the existing function centre at 2.5m long by 1.2m wide.

6.4 Minibus Parking Requirement

DCP 2011 does not require dedicated minibus parking. However, it is common for minibuses (maximum of 7m length, for a Toyota Coaster minibus or similar) to be used to transport visitors to/ from services associated with funeral activities. The use of minibuses, which typically have a capacity of approximately 20 passengers, is encouraged to reduce the overall traffic volumes generated by the proposed development, during extraordinary events.

It is proposed to provide 3 minibus parking spaces along the southeastern side of Darwina Drive.

6.5 Internal Circulation and Car Parking Layout

The design of the proposed internal circulation and car parking arrangements accords with the requirements of AS2890.1, 2, 5 and 6. The proposed parking manoeuvring arrangements will be quite satisfactory as confirmed by the turning path assessment for an 8.3m rigid truck, 6.4m SRV and hearse manoeuvres within the site which are provided in Appendix D.

6.6 Adequacy of Parking Provision

The car parking provision of 219 spaces exceeds the empirically assessed car parking demand and is considered appropriate and likely to meet the parking demand of the development of 171 spaces, with overprovision to accommodate parking overflow during special events.

7.0 Servicing

Given the nature of the proposed development, servicing requirements are generally completed by a 6.4m small rigid truck with the largest service vehicles limited for refuse collection (via an 8.3m medium rigid vehicle operated by a private waste contractor), the occasional service vehicle (e.g. maintenance/ delivery/ trade vehicles) with vans/utes and emergency vehicle (including fire appliance of 7.8m long by 2.5m wide). Garbage collection would occur within the hardstand area west of the existing maintenance sheds, consistent with the existing arrangements. The hardstand area provides sufficient manoeuvring area for the garbage truck to complete a three-point turn and leave the site in a forward direction.

It is noted that the Kanooka way access (with the on-street parking provision) provides sufficient width for the garbage truck and fire appliance to manoeuvre in and out of the site in a forward direction. The intersection of Darwina Drive/Kanooka Way can accommodate a three-point turn by the fire appliance and exit the site in a forward direction.

All service vehicles (except fire appliances) will enter the site via Kanooka Way and exit via Breynya Street. Fire appliance will enter and exit the site via Kanooka Way only.

The maintenance/ delivery/ trade vehicles which typically include vans, utes or cars, could use the car parking spaces within the proposed car parking facility.

8.0 Construction Traffic Management Plan

Construction is due to commence in late 2019 and will complete in late 2020.

8.1 Construction Process

Construction traffic access provision for the main contract works will occur via the existing primary driveway on Hakea Avenue. The works will involve:

- up to 8m bogies for the transport of construction waste materials.
- up to 8.8m medium rigid trucks, i.e., mobile concrete pump, Hymix concrete mixer during the concrete pumping phases
- up to 12.5m semi-trailers for the deliveries of construction materials

There will be on-site parking for construction workers.

8.2 Spoil Management

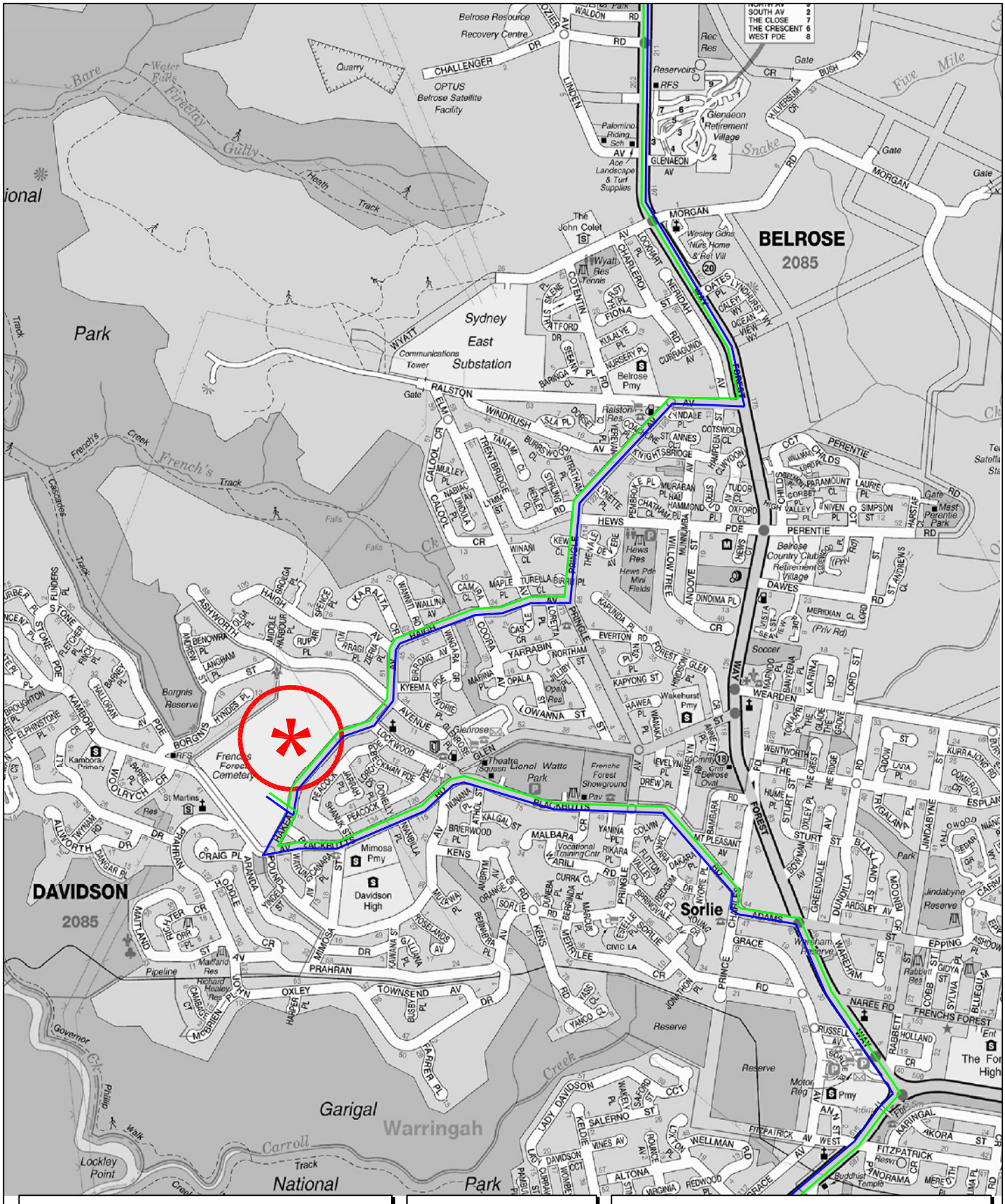
It is proposed to minimise the need for removal of spoil from the site by endeavouring to balance cut and fill to create the ground platform. Truck shaker grids and wheel wash stations shall be positioned at all entry/exit points.

8.3 Construction Vehicle Route

Truck movements associated with the proposed works will approach and depart the site via the arterial route illustrated in Figure 5. Details of the routes shall form part of the contract and distributed to all drivers.

8.4 Construction related Vehicle Movements

An average of 2 trucks per day is expected, with a maximum of 4 trucks per day during peak construction (8 movements per day). The heavy vehicle movements are likely to be spread through the day. However, in the worst-case assessment, it has been



LEGEND

ARRIVAL

DEPARTURE

TRUCK ROUTES

FIG 5

assumed that 25%, or 1 vehicle (2 two-way vehicle movements), would occur during the peak hour.

Workers typically begin and end their workday outside of network peak periods (i.e., 6.30am – 3.30pm) and as such is unlikely to adversely impact the surrounding road network.

8.5 Pedestrian Movements

Pedestrian movements will remain on the internal roads within the work areas, separated from the site through the provision of Class A hoarding/ fencing along the perimeter of the work areas. To maintain the safety of pedestrians, RMS accredited traffic controllers will be present at the site access to manage pedestrian movements when construction vehicles are entering the work areas.

8.6 Road Closure

It is not anticipated that the proposed works would require a road closure.

8.7 Cranage and Materials Handling

Mobile cranes will be used to lift materials to/from trucks standing in the site compound while all delivered materials will be stored in designated secured facilities within the bounds of the work areas.

8.8 Site Induction

All workers and visitors employed on the site by the appointed contractor (including sub-contractors) will be required to undergo a formal ‘site induction’ process and all the inductions will be performed specific to each trade according to Workcover OH&S requirements.

The induction will include details of approved access routes to and from the construction site for site staff and delivery vehicles, parking arrangements, as well as standard environmental, WHS, driver protocols and emergency procedures. The

agreed work hours must be included as part of this induction.

8.9 Traffic Guidance Schemes

Any required Traffic Guidance Schemes will be prepared by the builder's appointed Traffic Control Contractor and submitted to the NMCLM for approval.

8.10 Road Serviceability

The contractor shall be responsible for ensuring that the internal roads within the site remain in a serviceable state during construction. Under the direction of NMCLM, the contractor will make good any roadway facilities affected by the construction works, being verges and road pavement, etc. to the NMCLM's satisfaction, at no cost to NMCLM.

8.11 Cumulative Impacts

The works will only involve some 1 vehicle (2 movements) per hour and with the primary approach and departure routes being Hakea Avenue, there will not be any perceptible construction vehicle traffic impact. The contractor will also ensure where practical that construction vehicle movements occur outside of the cemetery's peak hours.

Based on the above, it is not expected the concurrently undertaken works will have any undue impact on the existing internal and local road networks.

8.12 Emergency Vehicle Access

Emergency protocols on the site would include a requirement for an accredited traffic controller to assist with emergency access, and as such, access to the by emergency vehicles will not be affected. Liaison will be maintained with the emergency services agencies throughout the construction period and a site contact will be made available for out-of-hours emergencies and access.

9.0 Conclusion

This assessment for the proposed additions and alterations of the existing FFBC at 1 Hakea Avenue in Davidson, has concluded that:

- there are no apparent traffic constraints to the development of a cemetery at this location
- the provision of the one-way ingress (via Kanooka Way) and one-way egress (via Breynya Street) on Hakea Avenue will be satisfactory with the recommendations made
- the envisaged parking provision of 219 spaces will be suitable which has considered:
    - 114 spaces for the proposed chapel and upgraded function room at maximum capacity of 300 people
    - some additional parking (57 spaces) should 50% of the patrons from the previous services staying back
    - some additional overflow parking (42 spaces) for special events

Appendix A

Architectural Plans

Appendix B

Proposed Car Parking Restriction Plan

Appendix C

Proposed Buggy Stop

Appendix D

Turning Path Assessment

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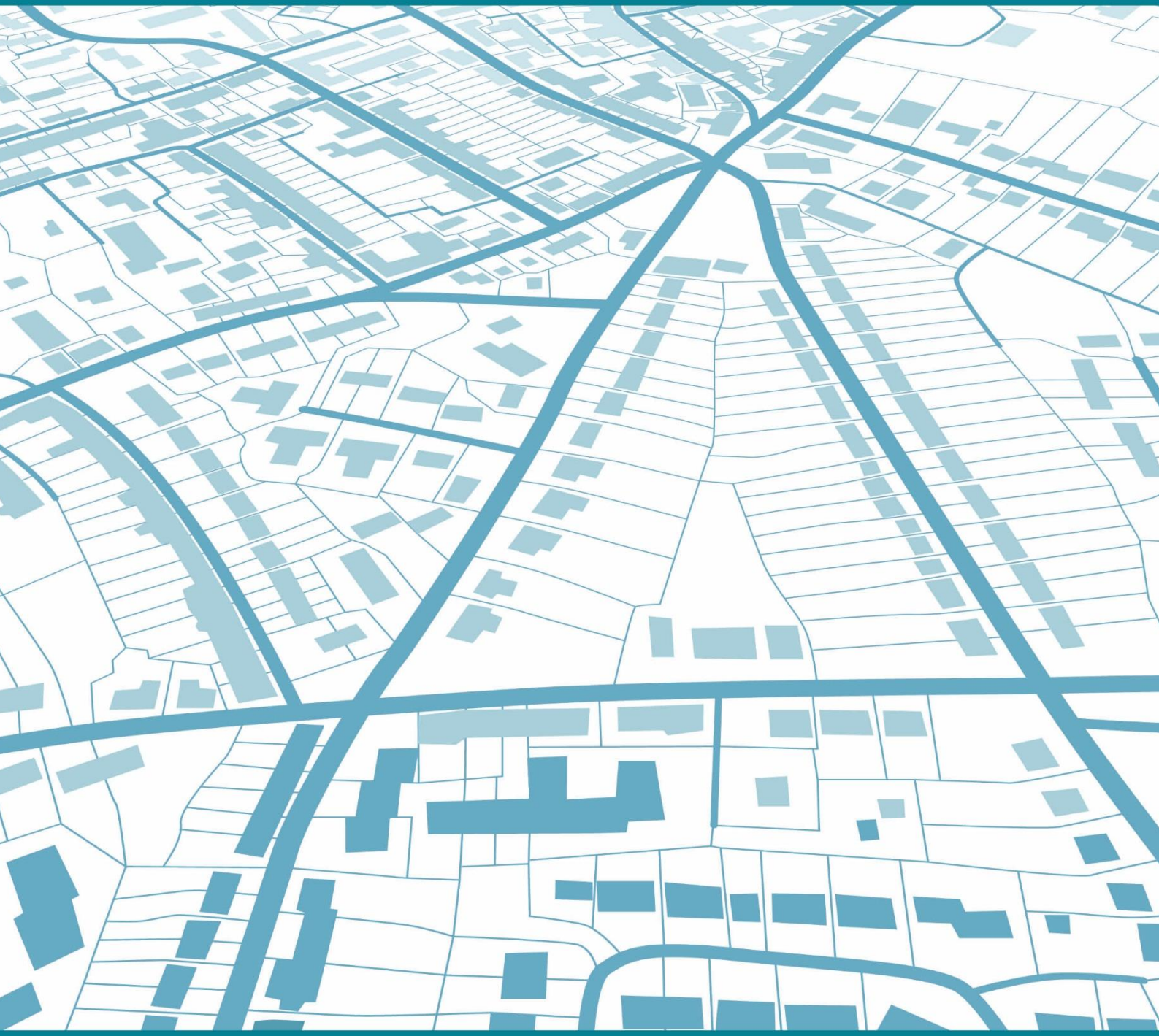

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Date: September 2019
Issue: Draft B

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1.0 Introduction

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- assess the adequacy of the proposed parking provisions
- assess the suitability of the proposed internal circulation and existing servicing provisions

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- 16 90-degree parking spaces (including 1 disabled space) to the east and south

of the existing administration building

- an informal on-site carpark without proper line-marking to the west of the administration building which can accommodate up to 12 cars

Access to the FFBC is currently provided by 2 driveways along Hakea Avenue. The primary driveway (Kanooka Way) and secondary driveway (Casuarina Crescent) provided on the southern side of the site currently accommodate two-way and all turning movements at their intersections with Hakea Avenue. Details of the existing driveways are provided on the following figure.

The cemetery is publicly accessible every day between 6 am and 6 pm (between May and August) and 6 am and 7 pm (between September and April). The office hours run between 8 am and 4 pm.

The surrounding area comprises:

- single dwellings and Garigal National Park to the north
- single dwellings and Mimosa Public School and Children Centre as well as

Davidson High School to the south

- single dwellings and St Martin's Primary School and Catholic Church to the west
- single dwellings and Glenrose Village Shopping Centre to the east

2.2 Proposed Development

The proposed development scheme comprises:

- the expansion of the Lorikeet Room to accommodate an additional 30 people with a maximum capacity of 130 people.
- the construction of a new chapel to the southwest of the existing administration building which can accommodate up to 170 people

Vehicle access to the new chapel involves a new 5m-wide vehicle driveway on the Darwina Drive southern frontage. The access will be restricted to only hearse and service vehicles for the new chapel.

The proposal also includes 37 new/upgraded angled/parallel central car parking spaces (including 5 disabled spaces) to the west and east of the existing administration building. This includes the formalisation of the on-site parking area to the west of the administration building to include RMS standard line-marking for 14 car spaces. On-street spaces will be formalised through sign posting to allow parking for 182 cars. In summary, the proposed development will provide a total of 219 car spaces.

New toilets and 8 car parking spaces are proposed to the east of Coonangurra Circuit south of the existing electricity sub-station.

Details of the proposed development scheme are provided on the plans prepared by Hector Abrahams Architects which accompany the DA and are reproduced in part in Appendix A.

3.0 Road Network and Traffic Conditions

3.1 Road Network

The road network serving the site (Figure 3) comprises:

- *Warringah Road* – a State Road and arterial route connecting between Babbage Road, Roseville and Pittwater Road, Dee Why
- *Forest Way* – a State Road and arterial route connecting between Mona Vale Road and Warringah Road
- *Blackbutts Road, Hakea Avenue, Haigh Avenue/Pringle Avenue* – a collector road connecting between Kambora Avenue and Forest Way
- *Kambora Avenue* – a collector road connecting between Hakea Avenue and Stone Parade and Sir Thomas Mitchell Drive
- *Ashworth Avenue* – local access cul-de-sac which connects to Hakea Avenue

Kambora Avenue and Ashworth Avenue have slightly curvilinear alignments in the vicinity of the site frontage with one lane in each direction.

Hakea Avenue is relatively straight and level south of the driveway to/from the manager's residence. Hakea Avenue has a 9.6m-wide carriageway and an ascending grade towards the north with a 23˚ bend at the manager's residence' driveway location.

3.2 Traffic Controls

The existing traffic controls which have been applied to the roads in the vicinity of the site (Figure 4) include:

- the roundabout at the intersections of:
    - Kambora Avenue/Hakea Avenue

- Kambora Avenue/Prahran Avenue

- the GIVE WAY control at the Kanooka Way and Breynya Street approaches at their intersections with Hakea Avenue
- the GIVE WAY control at the intersections of other local roads with Hakea Avenue
- the 50 kmph restriction on the local road system, including Hakea Avenue
- the 40 kmph School Zone near St Martin's Primary School

3.3 Traffic Conditions

An indication of the existing traffic conditions in the vicinity of the site is provided by data published by the RMS and surveys undertaken as part of this assessment. The data published by the RMS is expressed in terms of Annual Average Daily Traffic (AADT) and the most recently available data is summarised in the following:

Location	AADT
Forest Way east of Neridah Avenue	35,922

The existing traffic flows along Hakea Avenue are low during the cemetery's peak periods. There are regular lengthy gaps available in Hakea Avenue traffic flow simply because of the light volume. No undue delays were observed to occur with the ingress and egress movements to or from the site during the AM and PM as well as the cemetery's peak periods.

3.4 Transport Services

Public transport services in the area comprise the Forest Coach Line routes no. 169, 274, 281 and 282 running along Hakea Avenue on a 7 days a week basis connecting to Belrose, Davidson, Chatswood, and Terrey Hills (see details overleaf).

4.0 Access and Internal Circulation

4.1 Existing Vehicle Accesses

The existing vehicle accesses will be retained:

- Kanooka Way (primary access) - 10m-wide two-way access along Hakea Avenue to/from the site. The access is located 20m from a bend along Hakea Avenue to the north. See the following figure.

- Breynya Street (secondary access) - 5m-wide two-way access along Hakea Avenue to/from the site. The access is located 30m south of the primary access. See the following figure.

- Manager's residence driveway - 3m-wide two-way access along Hakea Avenue to/from the manager's residence. The access is located at the tangent point of the bend along Hakea Avenue.

4.2 Proposed Vehicle Access Arrangement

To accommodate the increase in traffic generation by the proposed development, the following vehicle access arrangement is planned to be undertaken as part of the DA:

- Kanooka Way - converted to a 1-way ingress only (two-way for fire appliances/emergency vehicles) with a 30m No Stopping zone along the western side and a No Parking zone along the eastern side between Darwina Drive and Hakea Avenue.
- Breynya Street - converted to a 1-way egress only with a 40m No Stopping zone along the southern side and a No Parking zone along the northern/eastern side between Gunyang Grove and Hakea Avenue.
- Manager's residence driveway – upgraded to include road pavement reconstruction and improved drainage to allow access for hearses only.

The conversion of the two-way to one-way operations will increase the road capacity of Kanooka Way and Breynya Street given the fewer vehicular conflict points. The one-way movements will also result in enhanced safety through the fewer conflicting turning movements at their intersections with Hakea Avenue. In addition, kerbside parking activity can be less disruptive to the traffic flow on a one-way road, where only 1 travel lane being blocked by the parking activity while allowing passing opportunities for through traffic.

4.3 Proposed Internal Circulations

To facilitate the on-street parking and vehicle manoeuvring within the internal road network, it is proposed to provide a general one-way counter clock-wise circulation within the site along the main internal road such as Kanooka Way, Gunyang Grove, Casuarina Crescent and Breynya Street.

4.4 Proposed Parking Restrictions and Pedestrian Amenities

There is currently no sign-posting in relation to the car parking within the site. It is

proposed to provide car parking restrictions along the internal road network. Such parking restrictions provide NMCLM an effective means of controlling and regulating on-street parking within the site. The restrictions will also deter motorists from parking on critical intersections, pedestrian desire lines and verges/grassed areas which are designated for pedestrian spaces. This will help improve traffic circulation as well as improve traffic and pedestrian safety.

It is proposed that the internal roads be sign-posted at 10kph and as shared zones to facilitate pedestrian safety through low vehicle speeds. A shared zone is a road that is designed to give priority to pedestrians while significantly reducing the dominance of vehicles. The vehicles must give way to pedestrians and equally, pedestrians should not hinder vehicles. The proposed changes will provide an environment where access and safety for pedestrians are prioritised and through traffic is minimised. With drivers travelling at a maximum speed limit of 10kph, drivers will have better control of their vehicles to avoid potential conflicts with pedestrians.

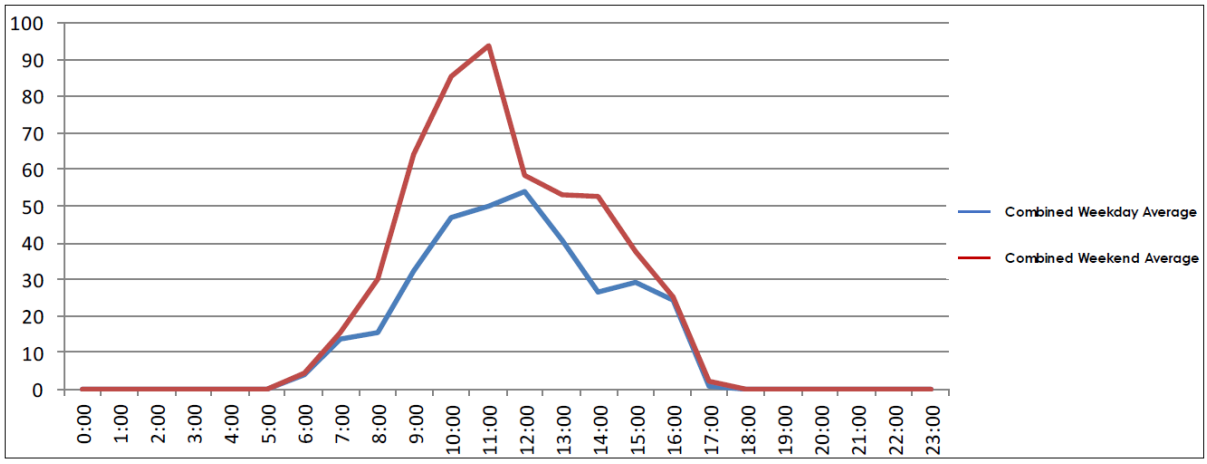
Further to the above, improvements to the existing internal road network would be required to maintain a safe environment for all users, and will include line marking, raised pedestrian crossings and speed humps.

The proposed car parking restriction plan is shown in Appendix B.

5.0 Traffic

There is currently no traffic generation guidance given within the RMS Guide to Traffic Generating Developments (2002) for cemeteries.

As such, the proposed development's traffic generation was determined based on an empirical assessment of the existing operational Liverpool Cemetery undertaken by GTA Consultants (GTA). GTA completed traffic counts at the access point of the Liverpool Cemetery, as shown in the following figure.



While the Liverpool Cemetery is approximately half the size (9.5ha) of the FFBC, it has 24,000 burial plots and consists of two chapels (with a maximum capacity of 250 people), condolence lounge, mausoleum and staff office.

Based on the similarities of the two sites, it is assumed that the proposed development and the current Liverpool Cemetery have similar traffic generation rates based on:

- the chapel/function room maximum capacity during the weekday and weekend noon peak
- the number of burial plots during the AM and PM commuter peak periods.

The traffic counts completed at Liverpool Cemetery's three access points indicate that there are between 30 and 25 trips generated in the weekday AM and PM commuter peak hours, respectively. The AM and PM commuter trip generation comprised mostly of visitors to grave sites and staff. As such, the trips equate to 1.25 and 1.05 trips for

every 1,000 burial plots in the weekday AM and PM commuter peak hours respectively. Based on 18,000 burial plots, it is likely that the proposed development would generate 23 and 19 trips in the AM and PM commuter peak hours.

It is noted that the peak for cemetery would generally occur during mid/ late morning (such as 10 am to 11 am), which is confirmed by the above figure, which shows a profile of weekday and weekend traffic volumes at Liverpool Cemetery. Based on the traffic survey, the Liverpool Cemetery generated 55 and 95 trips during the weekday and weekend noon peak hour respectively. This traffic would comprise visitors to grave sites, the two chapels, the condolence room and staff. As such, these trips represent 0.22 and 0.38 vehicle trips per person during the weekday and weekend noon peak hour respectively.

In the busiest weekday and weekend cemetery peak hours and based on the maximum capacity of 300 people of the proposed chapel and upgraded function room, the proposed development would generate up to 66 and 114 trips during the weekday and weekend noon peak hours respectively.

These are for “normal” days and obviously, for major funerals and other peak days, the movements would be somewhat greater.

However, importantly, these will arrive/depart at different times and in 2 directions (i.e., north and south) and will not occur during the on-street peak traffic periods.

The additional development traffic volumes are no more than 2 vehicle movements every minute through the adjacent key intersections during the weekday commuter peak hours as well as the cemetery’s busiest weekday and weekend peak hours.

The use of Hakea Avenue by vehicles accessing the cemetery and church uses, which abut them is entirely appropriate and consistent with their existing functional role in the road network. In summary, the additional traffic generated by the proposed development could not be expected to compromise the safety and function of the surrounding road network.

6.0 Parking and Internal Circulation

6.1 Car Parking Requirement

There are currently no parking requirements within DCP 2011 in relation to cemeteries. As such, the proposed development's car parking requirement was determined based on an empirical assessment of the existing Liverpool Cemetery.

Off-street car parking to support the expanded cemetery will include a new carpark area to the north of the new chapel and the east of the west administration building. The formalisation of the existing kerbside parking will be carried out as part of the proposed development with car parking restriction signs along Kanooka Way, Breynya Street, Darwina Drive, Casuarina Crescent, Gunyang Grove, Dianella Parade, Eucalyptus Avenue and Callistemon Way.

Considering the peak demand of traffic generated by the proposed development discussed in Section 5, parking demand of up to 114 vehicles could be generated during the busiest period.

The proposed chapel and expanded function room will be operated with the services being offset in order that the chapel/function room can be cleaned, flowers can be arranged, coffins can be offloaded from hearses (e.g., two hearses are rarely seen at the same time at a chapel). As such, the instance of patrons turning up and looking for parking while another ceremony is finishing is limited. Conservatively, it has been assumed that 50% of the patrons from the previous services were to stay back, the proposed development would require 171 spaces to accommodate the patrons for the on-going services and those from the previous services.

The proposed development will provide a total of 219 car spaces. Of these spaces, 37 central car spaces (including 5 disabled spaces and 8 staff spaces) are provided within a formal carpark near the chapel/function room.

The site provides internal roads with widths suitable to allow parking to occur alongside the road so if there was a short period when the central carpark area near the chapel/function room is full, the patrons could park adjacent to the roads. As such, the remaining 182 car parking spaces, equivalent to about 1,100m (based upon an average carpark length of 6m) of kerbside parking could be accommodated along Kanooka Way, Breynya Street, Darwina Drive, Casuarina Crescent, Gunyang Grove, Dianella Parade, Eucalyptus Avenue and Callistemon Way. Kerbside parking is also provided along the internal road network to allow patrons to park next to the grave/memorial stone as opposed to having all parking being provided in a central carpark and patrons having to walk to the grave/memorial stone.

It is proposed that the kerbside parking be staggered on either side of Dianella Parade and Callistemon Way to provide parking and passing opportunities for vehicles entering via Kanooka Way and Casuarina Crescent.

A free buggy service travelling on a loop within the site will be provided for the patrons. The service aims to encourage patrons to seek parking spaces away from the chapel/function room. This will reduce vehicle queueing along the main internal roads and intersections, thus minimizing any potential queuing at the site entry via Kanooka Way and the intersection of Darwina Drive/Kanooka Way. Buggy stops will be located every 50m along the route and run at 7-15 minute intervals during peak times so the patrons can jump on the buggy conveniently.

The proposed buggy stop is shown in Appendix C.

6.2 Accessible Parking

The accessible car parking requirements for different development types are set out in the Building Code of Australia (BCA), 2014. The relevant disabled parking requirements are 1 space per 50 parking spaces. Based on the 219 spaces, the proposal will be required to provide up to a total of 5 accessible spaces, to be compliant with the BCA. The proposed development provides 5 disabled spaces to the east of the administration building, in accordance with the BCA.

6.3 Motorcycle Parking

DCP 2011 does not provide any requirements for motorcycle parking. It is, however, recommended that dedicated motorcycle parking spaces be provided at the rate of one space per 50 car parking spaces. Based on the peak parking provision of 219 car spaces, the proposed development is recommended to provide 5 motorcycle parking spaces. Motorcycle spaces are provided to the east of the existing function centre at 2.5m long by 1.2m wide.

6.4 Minibus Parking Requirement

DCP 2011 does not require dedicated minibus parking. However, it is common for minibuses (maximum of 7m length, for a Toyota Coaster minibus or similar) to be used to transport visitors to/ from services associated with funeral activities. The use of minibuses, which typically have a capacity of approximately 20 passengers, is encouraged to reduce the overall traffic volumes generated by the proposed development, during extraordinary events.

It is proposed to provide 3 minibus parking spaces along the southeastern side of Darwina Drive.

6.5 Internal Circulation and Car Parking Layout

The design of the proposed internal circulation and car parking arrangements accords with the requirements of AS2890.1, 2, 5 and 6. The proposed parking manoeuvring arrangements will be quite satisfactory as confirmed by the turning path assessment for an 8.3m rigid truck, 6.4m SRV and hearse manoeuvres within the site which are provided in Appendix D.

6.6 Adequacy of Parking Provision

The car parking provision of 219 spaces exceeds the empirically assessed car parking demand and is considered appropriate and likely to meet the parking demand of the development of 171 spaces, with overprovision to accommodate parking overflow during special events.

7.0 Servicing

Given the nature of the proposed development, servicing requirements are generally completed by a 6.4m small rigid truck with the largest service vehicles limited for refuse collection (via an 8.3m medium rigid vehicle operated by a private waste contractor), the occasional service vehicle (e.g. maintenance/ delivery/ trade vehicles) with vans/utes and emergency vehicle (including fire appliance of 7.8m long by 2.5m wide). Garbage collection would occur within the hardstand area west of the existing maintenance sheds, consistent with the existing arrangements. The hardstand area provides sufficient manoeuvring area for the garbage truck to complete a three-point turn and leave the site in a forward direction.

It is noted that the Kanooka way access (with the on-street parking provision) provides sufficient width for the garbage truck and fire appliance to manoeuvre in and out of the site in a forward direction. The intersection of Darwina Drive/Kanooka Way can accommodate a three-point turn by the fire appliance and exit the site in a forward direction.

All service vehicles (except fire appliances) will enter the site via Kanooka Way and exit via Breynya Street. Fire appliance will enter and exit the site via Kanooka Way only.

The maintenance/ delivery/ trade vehicles which typically include vans, utes or cars, could use the car parking spaces within the proposed car parking facility.

8.0 Construction Traffic Management Plan

Construction is due to commence in late 2019 and will complete in late 2020.

8.1 Construction Process

Construction traffic access provision for the main contract works will occur via the existing primary driveway on Hakea Avenue. The works will involve:

- up to 8m bogies for the transport of construction waste materials.
- up to 8.8m medium rigid trucks, i.e., mobile concrete pump, Hymix concrete mixer during the concrete pumping phases
- up to 12.5m semi-trailers for the deliveries of construction materials

There will be on-site parking for construction workers.

8.2 Spoil Management

It is proposed to minimise the need for removal of spoil from the site by endeavouring to balance cut and fill to create the ground platform. Truck shaker grids and wheel wash stations shall be positioned at all entry/exit points.

8.3 Construction Vehicle Route

Truck movements associated with the proposed works will approach and depart the site via the arterial route illustrated in Figure 5. Details of the routes shall form part of the contract and distributed to all drivers.

8.4 Construction related Vehicle Movements

An average of 2 trucks per day is expected, with a maximum of 4 trucks per day during peak construction (8 movements per day). The heavy vehicle movements are likely to be spread through the day. However, in the worst-case assessment, it has been

assumed that 25%, or 1 vehicle (2 two-way vehicle movements), would occur during the peak hour.

Workers typically begin and end their workday outside of network peak periods (i.e., 6.30am – 3.30pm) and as such is unlikely to adversely impact the surrounding road network.

8.5 Pedestrian Movements

Pedestrian movements will remain on the internal roads within the work areas, separated from the site through the provision of Class A hoarding/ fencing along the perimeter of the work areas. To maintain the safety of pedestrians, RMS accredited traffic controllers will be present at the site access to manage pedestrian movements when construction vehicles are entering the work areas.

8.6 Road Closure

It is not anticipated that the proposed works would require a road closure.

8.7 Cranage and Materials Handling

Mobile cranes will be used to lift materials to/from trucks standing in the site compound while all delivered materials will be stored in designated secured facilities within the bounds of the work areas.

8.8 Site Induction

All workers and visitors employed on the site by the appointed contractor (including sub-contractors) will be required to undergo a formal ‘site induction’ process and all the inductions will be performed specific to each trade according to Workcover OH&S requirements.

The induction will include details of approved access routes to and from the construction site for site staff and delivery vehicles, parking arrangements, as well as standard environmental, WHS, driver protocols and emergency procedures. The

agreed work hours must be included as part of this induction.

8.9 Traffic Guidance Schemes

Any required Traffic Guidance Schemes will be prepared by the builder's appointed Traffic Control Contractor and submitted to the NMCLM for approval.

8.10 Road Serviceability

The contractor shall be responsible for ensuring that the internal roads within the site remain in a serviceable state during construction. Under the direction of NMCLM, the contractor will make good any roadway facilities affected by the construction works, being verges and road pavement, etc. to the NMCLM's satisfaction, at no cost to NMCLM.

8.11 Cumulative Impacts

The works will only involve some 1 vehicle (2 movements) per hour and with the primary approach and departure routes being Hakea Avenue, there will not be any perceptible construction vehicle traffic impact. The contractor will also ensure where practical that construction vehicle movements occur outside of the cemetery's peak hours.

Based on the above, it is not expected the concurrently undertaken works will have any undue impact on the existing internal and local road networks.

8.12 Emergency Vehicle Access

Emergency protocols on the site would include a requirement for an accredited traffic controller to assist with emergency access, and as such, access to the by emergency vehicles will not be affected. Liaison will be maintained with the emergency services agencies throughout the construction period and a site contact will be made available for out-of-hours emergencies and access.

9.0 Conclusion

This assessment for the proposed additions and alterations of the existing FFBC at 1 Hakea Avenue in Davidson, has concluded that:

- there are no apparent traffic constraints to the development of a cemetery at this location
- the provision of the one-way ingress (via Kanooka Way) and one-way egress (via Breynya Street) on Hakea Avenue will be satisfactory with the recommendations made
- the envisaged parking provision of 219 spaces will be suitable which has considered:
    - 114 spaces for the proposed chapel and upgraded function room at maximum capacity of 300 people
    - some additional parking (57 spaces) should 50% of the patrons from the previous services staying back
    - some additional overflow parking (42 spaces) for special events

Appendix A

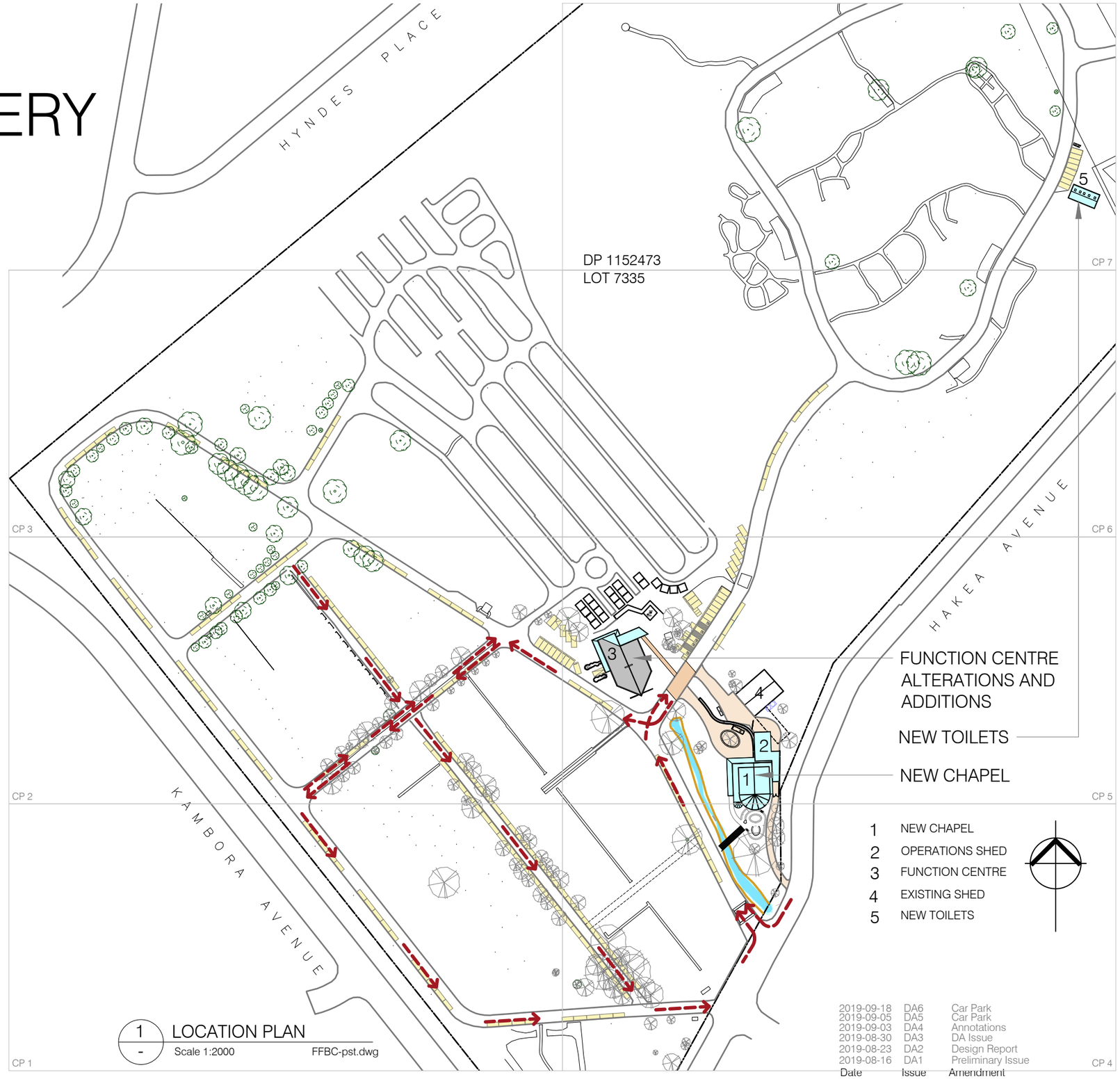
Architectural Plans

FRENCHS FOREST BUSHLAND CEMETERY

1 HAKEA AVE, FRENCHS FOREST 2086

DRAWING REGISTER - DEVELOPMENT APPLICATION

JOB	DWG. NO.	DRAWING TITLE	SCALE
FFBC	00	DRAWING REGISTER & LOCATION PLAN	1:2000
FFBC	01	SITE PLAN - EVENT AREA	1:500
FFBC	03	CHAPEL - GROUND FLOOR PLAN	1:200
FFBC	04	CHAPEL - CLERESTORY PLAN	1:200
FFBC	05	CHAPEL - ROOF PLAN	1:200
FFBC	06	CHAPEL - NORTH AND SOUTH ELEVATIONS	1:200
FFBC	08	CHAPEL - EAST AND WEST ELEVATIONS	1:200
FFBC	10	CHAPEL - SECTION A	1:100
FFBC	12	CHAPEL - SECTION C	1:100
FFBC	20	FUNCTION CENTRE - MEASURED PLANS	1:200
FFBC	21	FUNCTION CENTRE - MEASURED ELEVATIONS	1:200
FFBC	22	FUNCTION CENTRE - GROUND FLOOR PLAN / ROOF PLAN	1:200
FFBC	23	FUNCTION CENTRE - ELEVATIONS 1	1:200
FFBC	24	FUNCTION CENTRE - ELEVATIONS 2	1:200
FFBC	25	FUNCTION CENTRE - SECTIONS 1	1:200
FFBC	30	TOILET BLOCK	1:100
FFBC	31	SHADOW DIAGRAMS	NTS
FFBC	32	CAR PARK PLAN 1	1:500
FFBC	33	CAR PARK PLAN 2	1:500
FFBC	34	CAR PARK PLAN 3	1:500
FFBC	35	CAR PARK PLAN 4	1:500
FFBC	35	CAR PARK PLAN 5	1:500
FFBC	35	CAR PARK PLAN 6	1:500
FFBC	35	CAR PARK PLAN 7	1:500



Existing buildings

Proposed new works shown coloured

Proposed new roads

Proposed new carspaces

Existing Water course

Traffic flow

1 - LOCATION PLAN
Scale 1:2000 FFBC-pst.dwg

Date	Issue	Amendment
2019-09-18	DA6	Car Park
2019-09-05	DA5	Car Park
2019-09-03	DA4	Annotations
2019-08-30	DA3	DA Issue
2019-08-23	DA2	Design Report
2019-08-16	DA1	Preliminary Issue

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Project : FRENCHS FOREST BUSHLAND CEMETERY

for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : DRAWING REGISTER & LOCATION PLAN

Scale @ A3 : 1:2000	Drawn: AC AB
Issue Date : SEPT 2019	Checked: BS

Dwg. Name :	Dwg. No :	Stage:	Issue:
FFBC	00	DA	6

0 10 20 30 40 50 100mm

Proposed new carspaces

1 / - CAR PARK PLAN 1
Scale 1:500 FFBC-pst.dwg

2019-09-18 Date | DA1 Issue | DA Issue Amendment

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for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : CAR PARK 1

Scale @ A3 : 1:500		Drawn: AC AB	
Issue Date : SEPT 2019		Checked: BS	
Dwg. Name : FFBC	Dwg. No : 32	Stage: DA	Issue: 1

0 10 20 30 40 50 100mm

1 / - CAR PARK PLAN 2
Scale 1:500 FFBC-pst.dwg

2019-09-18 Date | DA1 Issue | DA Issue Amendment

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Verify all dimensions
Figured dimensions to be taken in preference to scale

Project : FRENCHS FOREST BUSHLAND CEMETERY

for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : CAR PARK 2

Scale @ A3 : 1:500		Drawn: AC AB	
Issue Date : SEPT 2019		Checked: BS	
Dwg. Name : FFBC	Dwg. No : 33	Stage: DA	Issue: 1

0 10 20 30 40 50 100mm

1 / - CAR PARK PLAN 3
Scale 1:500 FFBC-pst.dwg

2019-09-18 Date | DA1 Issue | DA Issue Amendment

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Project : FRENCHS FOREST BUSHLAND CEMETERY

for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : CAR PARK 3

Scale @ A3 :	Drawn:
1:500	AC AB
Issue Date : SEPT 2019	Checked: BS

Dwg. Name :	Dwg. No :	Stage:	Issue:
FFBC	34	DA	1

0 10 20 30 40 50 100mm

1 / - CAR PARK PLAN 4
Scale 1:500 FFBC-pst.dwg

2019-09-XX Date | DA1 Issue | DA Issue Amendment

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Project : FRENCHS FOREST BUSHLAND CEMETERY
for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : CAR PARK 4

Scale @ A3 : 1:500	Drawn: AC AB
Issue Date : SEPT 2019	Checked: BS

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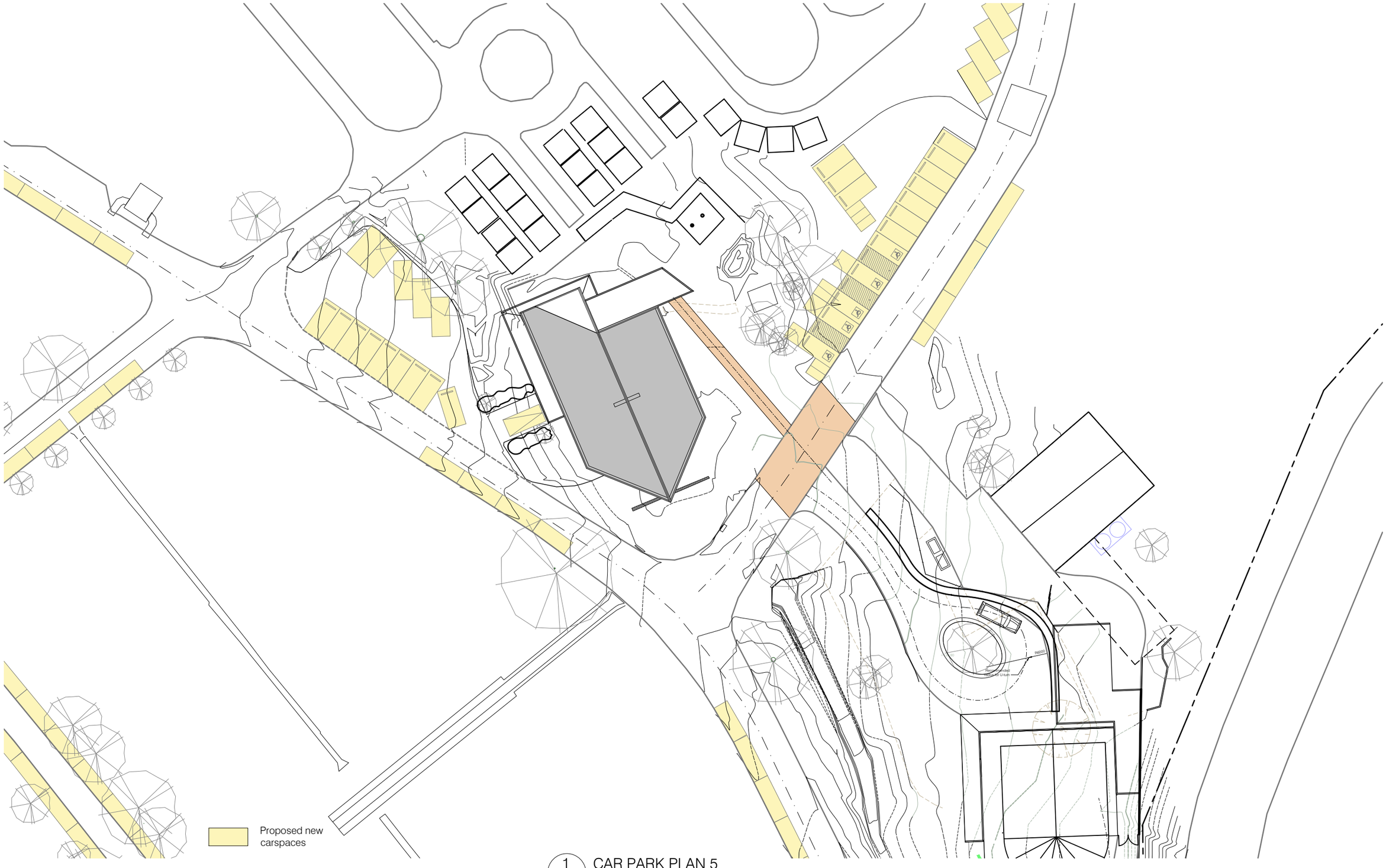

1 / - CAR PARK PLAN 5

Scale 1:500 FFBC-pst.dwg

2019-09-18 Date | DA1 Issue | DA Issue Amendment

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Project : FRENCHS FOREST BUSHLAND CEMETERY

for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : CAR PARK 5

Scale @ A3 :	Drawn:
1:500	AC AB
Issue Date :	Checked:
SEPT 2019	BS

Dwg. Name :	Dwg. No :	Stage:	Issue:
FFBC	36	DA	1

0 10 20 30 40 50 100mm

1 / - CAR PARK PLAN 6

Scale 1:500 FFBC-pst.dwg

Date	Issue	Amendment
2019-09-18	DA1	DA Issue

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Project : FRENCHS FOREST BUSHLAND CEMETERY

for : NORTHERN METROPOLITAN CEMETERIES TRUST

Dwg. Title : CAR PARK 6

Scale @ A3 : 1:500			Drawn: AC AB
Issue Date : SEPT 2019			Checked: BS
Dwg. Name : FFBC	Dwg. No : 37	Stage: DA	Issue: 1

0 10 20 30 40 50 100mm

Proposed new carspaces

1 / - CAR PARK PLAN 7
Scale 1:500 FFBC-pst.dwg

2019-09-18 Date | DA1 Issue | DA Issue Amendment

HECTOR ABRAHAMS ARCHITECTS

ABN 95 160 116 030

Nominated Architect :
Hector Abrahams
Registration No. 5245

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Verify all dimensions
Figured dimensions to be taken in preference to scale

Project : FRENCHS FOREST BUSHLAND CEMETERY

for : NORTHERN METROPOLITAN CEMETERIES TRUST

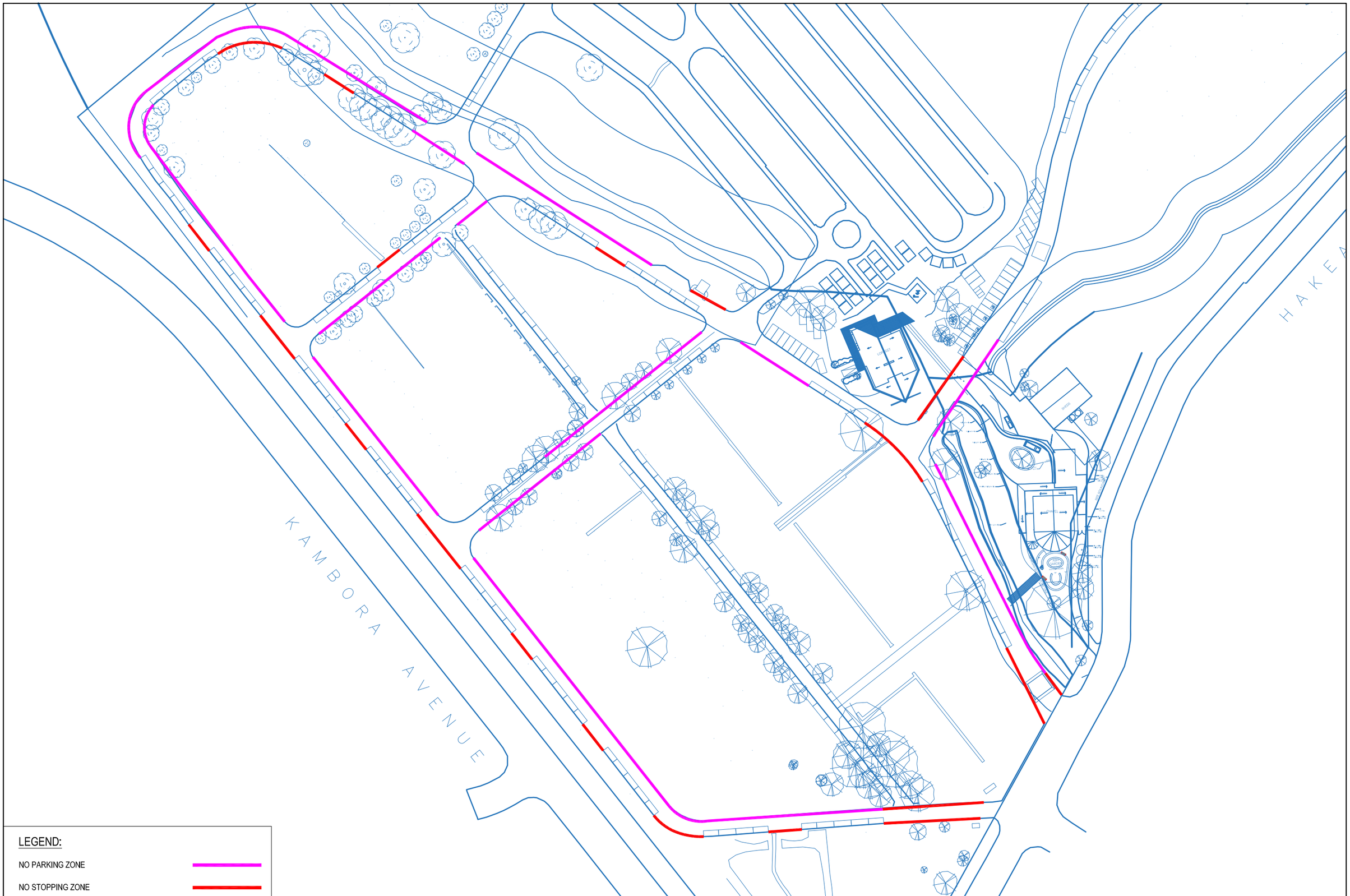
Dwg. Title : CAR PARK 7

Scale @ A3 : 1:500		Drawn: AC AB	
Issue Date : SEPT 2019		Checked: BS	
Dwg. Name : FFBC	Dwg. No : 38	Stage: DA	Issue: 1

0 10 20 30 40 50 100mm

Appendix B

Proposed Car Parking Restriction Plan



LEGEND:

NO PARKING ZONE

NO STOPPING ZONE

FRENCHS FOREST BUSHLAND CEMETERY
PROPOSED PARKING RESTRICTION

DRAWING REF NO. 19073-01-01 ISSUE A ISSUE DATE 17 SEPTEMBER 2019

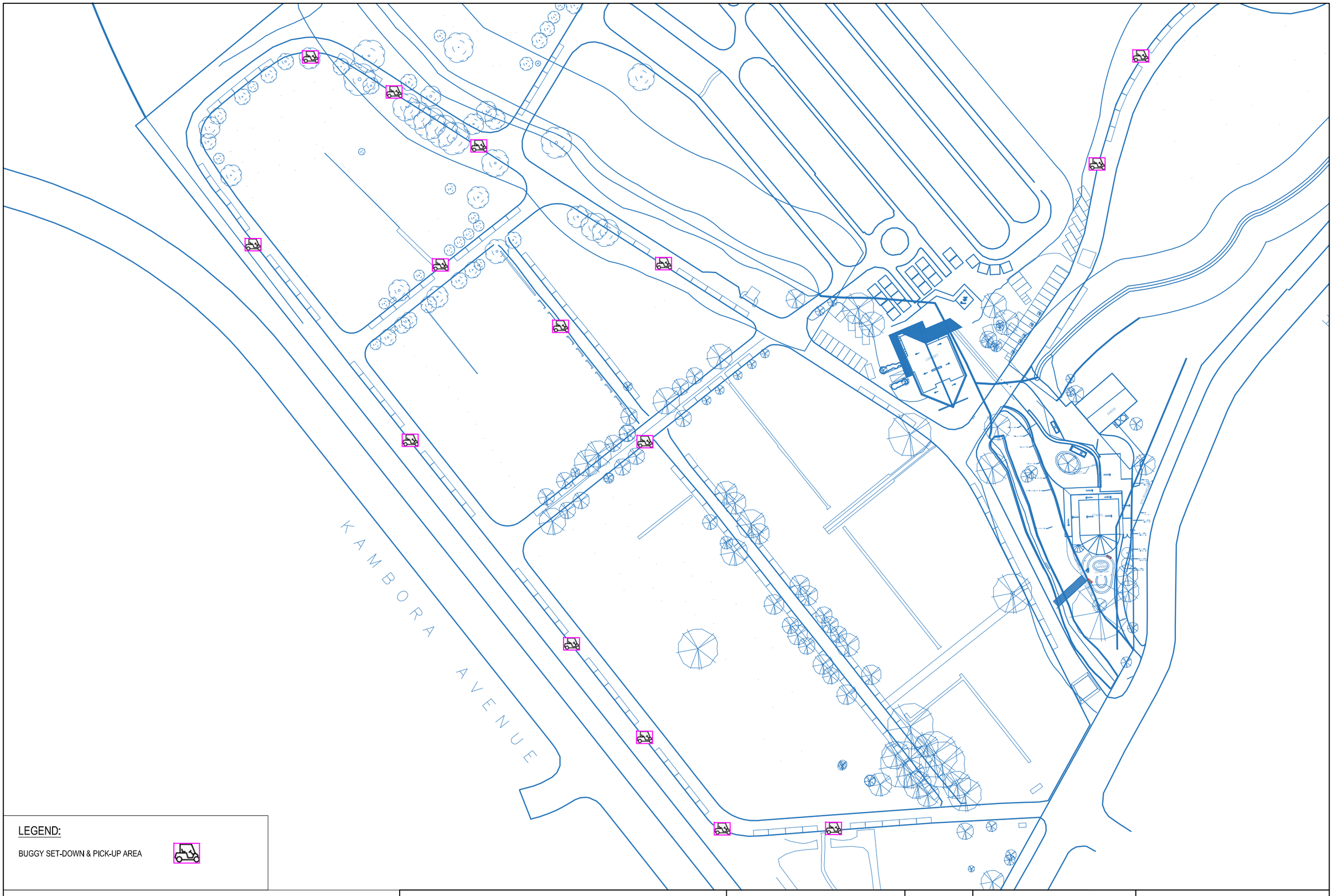
DESIGNED BY M.KONG REVIEWED BY M.KONG

SCALE A3 0 NTS NTS NOT TO SCALE

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: (02) 9411 5660 F: (02) 9904 6622 W: www.ttpa.com.au

Appendix C

Proposed Buggy Stop



LEGEND:

BUGGY SET-DOWN & PICK-UP AREA

FRENCHS FOREST BUSHLAND CEMETERY
PROPOSED BUGGY SET-DOWN/PICK-UP AREA

DRAWING REF NO. 19073-01-01 ISSUE A ISSUE DATE 17 SEPTEMBER 2019

DESIGNED BY M.KONG REVIEWED BY M.KONG

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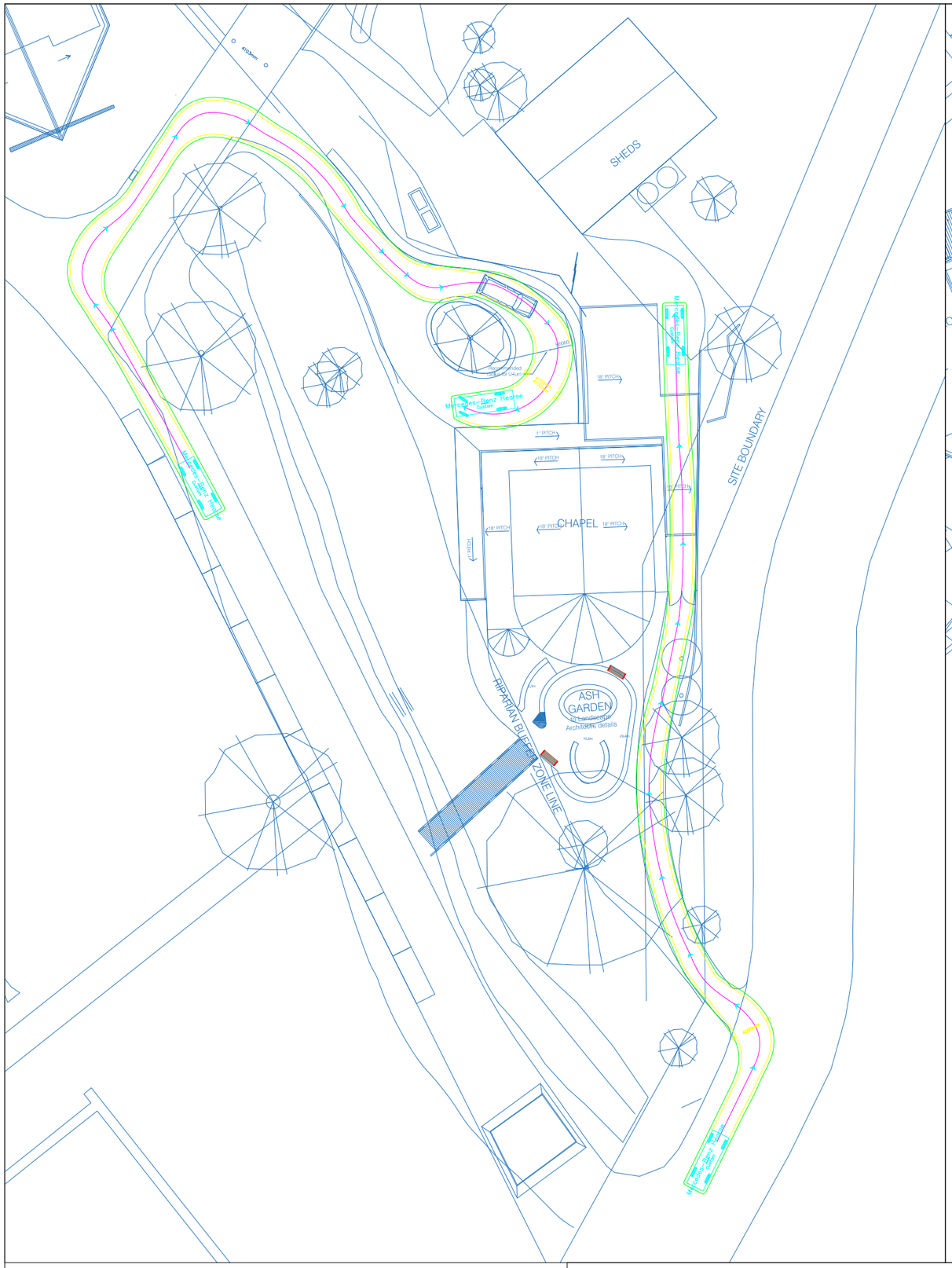
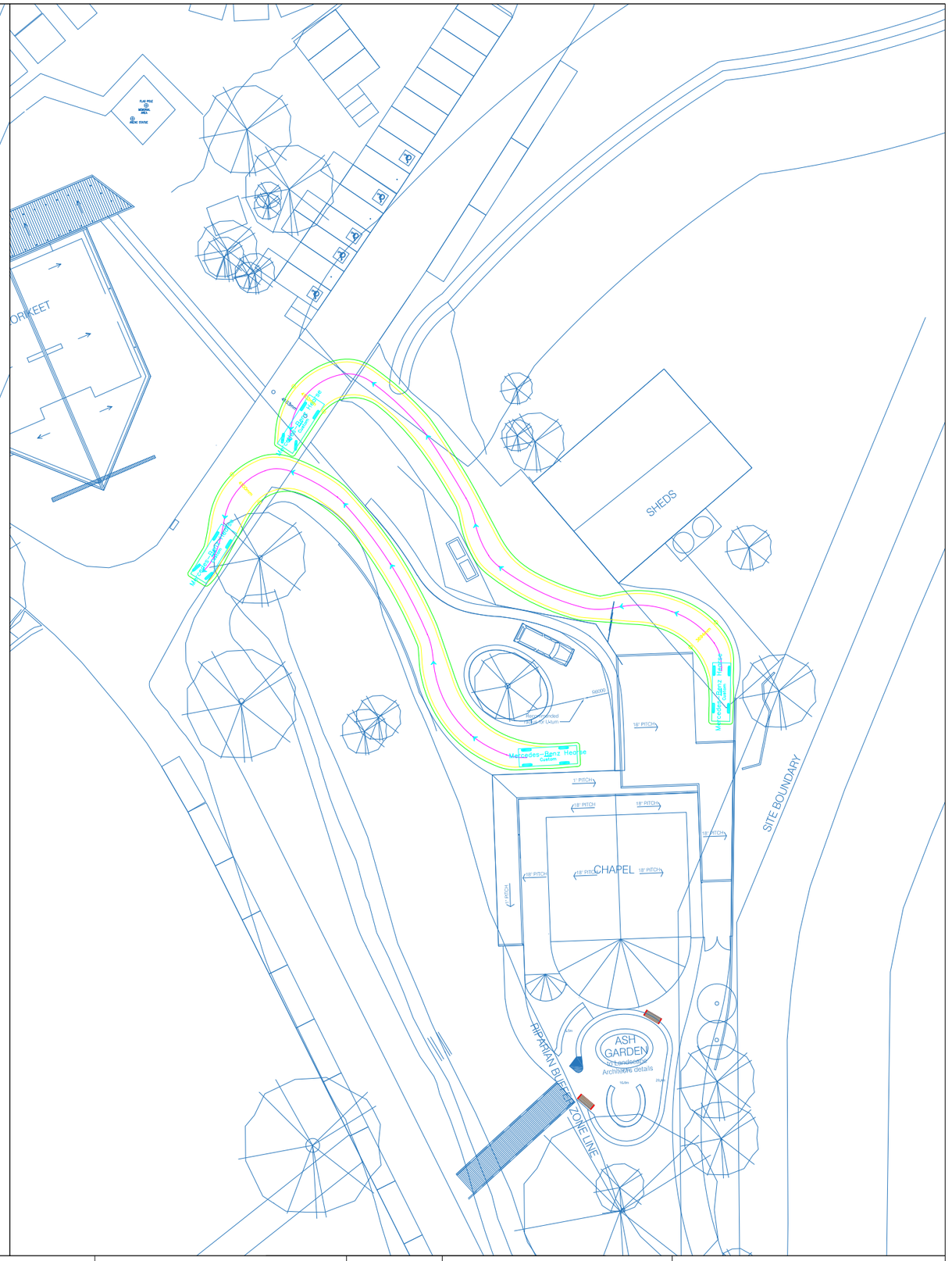
Appendix D

Turning Path Assessment





FRENCHS FOREST BUSHLAND CEMETERY
SWEPT PATH ASSESSMENT FOR 6.2M HEARSE VEHICLE

DRAWING REF NO. 19073-01-01 ISSUE A ISSUE DATE 17 SEPTEMBER 2019

DESIGNED BY M.KONG REVIEWED BY M.KONG

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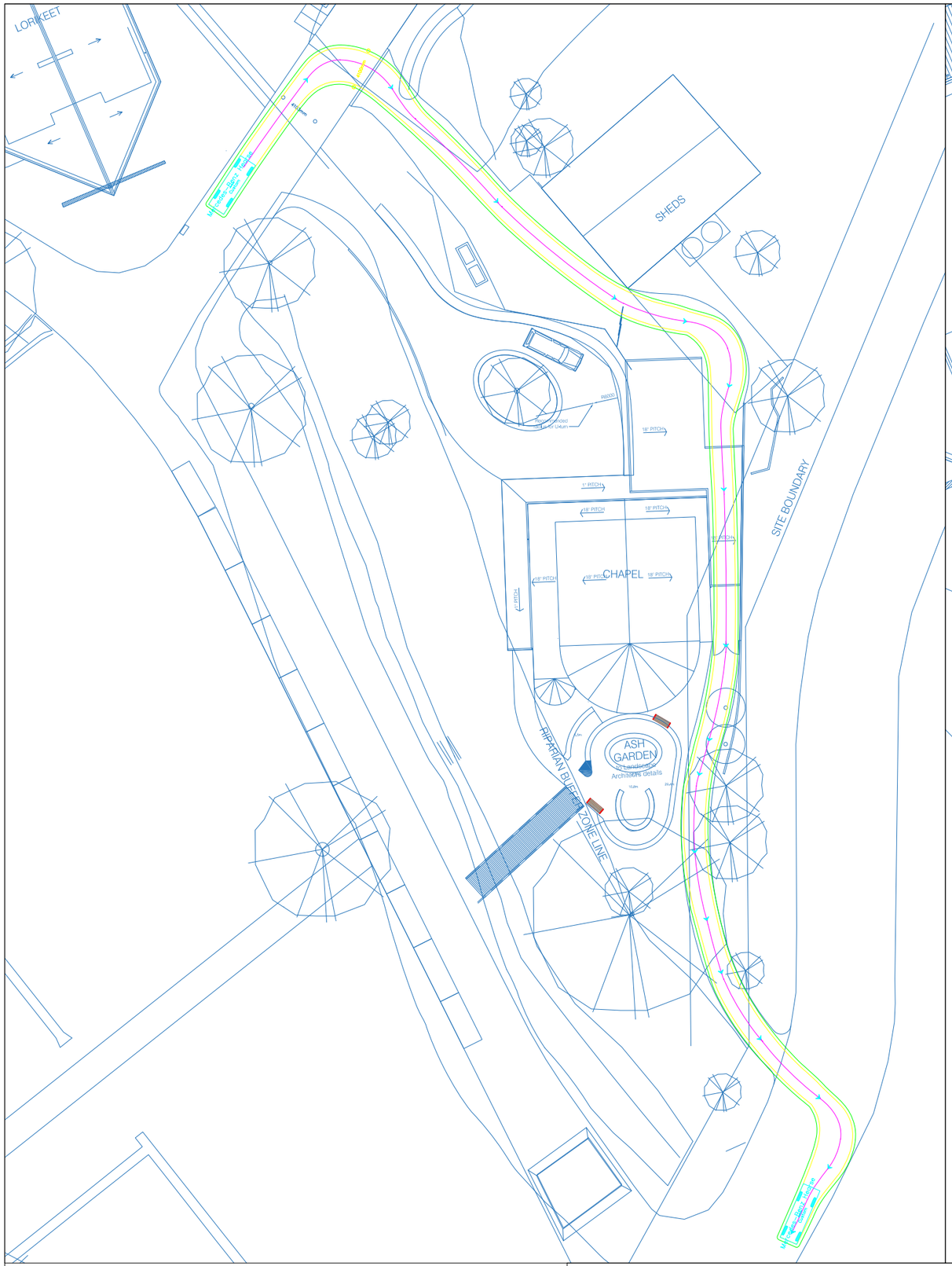

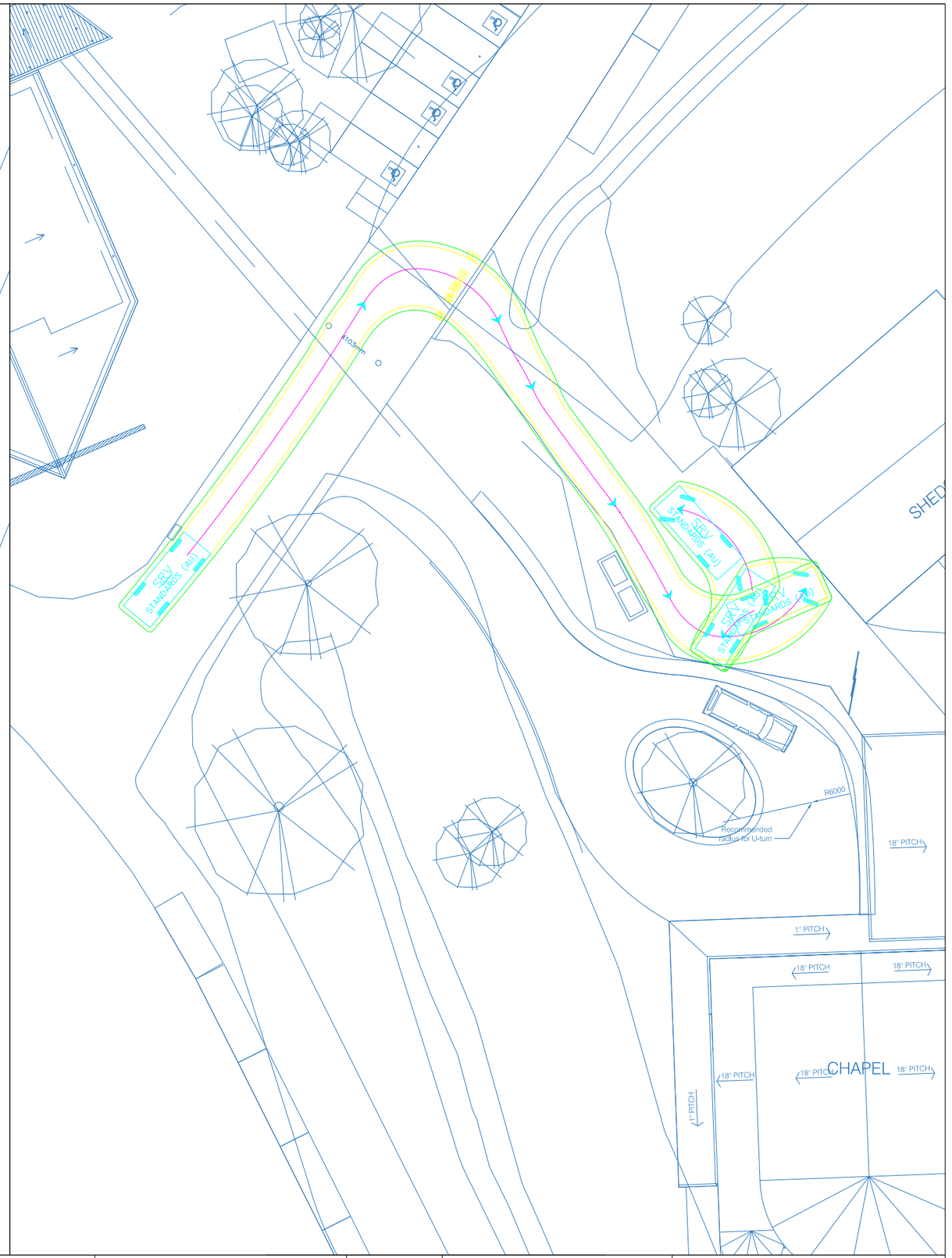

FRENCHS FOREST BUSHLAND CEMETERY
SWEPT PATH ASSESSMENT FOR 6.2M HEARSE & 6.4M SMALL RIGID VEHICLE

DRAWING REF NO. 19073-01-01 ISSUE A ISSUE DATE 17 SEPTEMBER 2019

DESIGNED BY M.KONG REVIEWED BY M.KONG

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FLAG POLE
MEMORIAL AREA
ANZAC STATUE

8.3m WASTE TRUCK GTA

4103mm

5683mm

R6000

Recommended radius for U-turn

18° PITCH

1° PITCH

FRENCHS FOREST BUSHLAND CEMETERY
SWEPT PATH ASSESSMENT FOR 8.3M WASTE VEHICLE

DRAWING REF NO. 19073-01-01 ISSUE A ISSUE DATE 17 SEPTEMBER 2019

DESIGNED BY M.KONG REVIEWED BY M.KONG

SCALE A3 0 NTS NTS NOT TO SCALE

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