Proposed Access Road Development Frenchs Forest Bushland Cemetery – 1 Hakea Avenue, French Forest NSW 2085

Concept Stormwater Drainage Design Report

NORTHERN METROPOLITAN CEMETERIES TRUST

30 March 2020
Ref: 20190763R001A

tonkin

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Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
A	For Development Application	MZ	KL	KL	30 March 2020

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1 Introduction

Northern Metropolitan Cemeteries Trust is proposing a new access road for an existing cemetery at 1 Hakea Avenue, Frenchs Forest, New South Wales. The proposed development consists of a construction of access road, driveway, visitor parking and site landscaping.

Tonkin Consulting Pty. Ltd. (Tonkin) has been engaged to provide a preliminary design and documentation of stormwater drainage within the site to support the Development Application (DA) to Northern Beaches Council (Council).

1.1 This report

This report forms the basis for the concept stormwater drainage design. It outlines the design requirements for site drainage and discharge, details the design procedure and presents the proposed stormwater drainage plan for the management of site runoff. The report should be read in conjunction with the Stormwater Management Plan.

1.2 Design inputs

The most recent architectural plans from Spackman Mossop Michaels (L 12, L 13, L 31 and L 32 Rev D dated 28 Aug 2019) and most recent survey of the site (TSS TOTAL SURVEYING SOLUTIONS Pty. Ltd. dated 18 Mar 2020) were used to provide input into the preliminary design of the stormwater drainage system.

1.3 Relevant standards and guidelines

The preliminary stormwater drainage design has been carried out in accordance with the relevant local, state and national design guidelines and Australian Standards. These include, but are not limited to:

- Australian Rainfall and Runoff guidelines (2016)
- AS 3500.3 – Plumbing and Drainage – Stormwater Drainage
- Northern Beaches Council (Former Warringah) - Development Control Plan (2011)
- Northern Beaches Council (Former Warringah) – On-site Stormwater Detention Technical Specification
- Northern Beaches Council WSUD & MUSIC Modelling Guidelines (Revision 3: June 2016)
- WaterNSW - Using MUSIC in Sydney Drinking Water Catchment (2nd Edition: June 2019)

1.4 Council requirements

There are a number of Council requirements that guided the formulation of the preliminary stormwater drainage design. The most notable of these requirements include:

- assessment of the site to determine whether additional stormwater management measures are required to protect the development from external floodwaters in a 100 year ARI event;
- site drainage systems must be designed to the major/minor system design principles outlined in Australian Rainfall and Runoff and Council guidelines, allowing for overflows of the piped system and flows more than the capacity of the piped system to be discharged in a controlled manner;
- Water Sensitive Urban Design (WSUD) principles are to be implemented into the development through the design of stormwater drainage, on-site detention and landscaping to improve the quality of site discharge so that natural drainage systems downstream of the development are protected.

2 Site description and conditions

The existing site consists of a cemetery and its associated buildings and adjoins Hakea Avenue on its south east boundary. The existing site has an area of approximately 22.3 ha whilst the proposed development footprint is approximately 1070 m^2 with 29% impervious and 71% pervious. The general topographic fall of the site is 4.5% to the north east, with the south eastern corner being the lowest point. (RL 140.50 mAHD).

Figure 1 - Site Locality Plan

The proposed development involves constructing a new chapel and an access road from Hakea Avenue to Darwinia Drive, including manoeuvring areas and a driveway. The proposed development also involves resurfacing and adjust level of existing pavement in Darwinia Drive and adding six car spaces along Darwinia Drive.

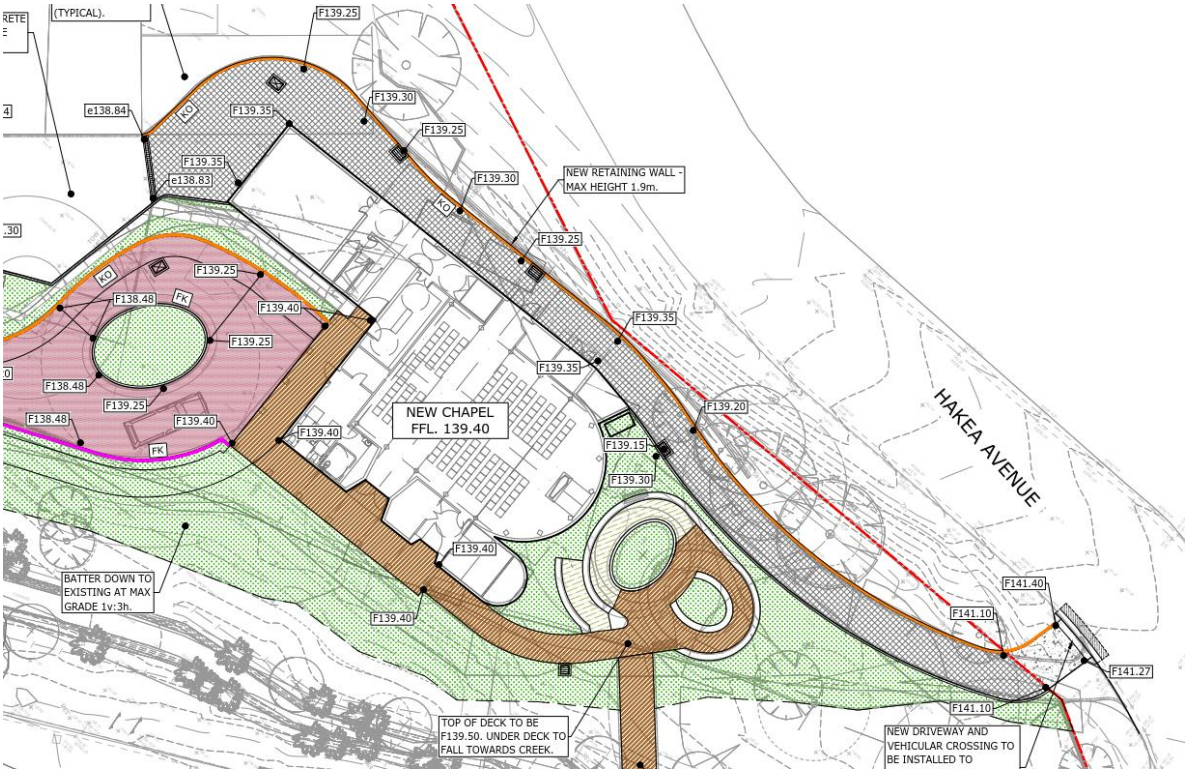


Figure 2 - Proposed Chapel & Access Road Layout

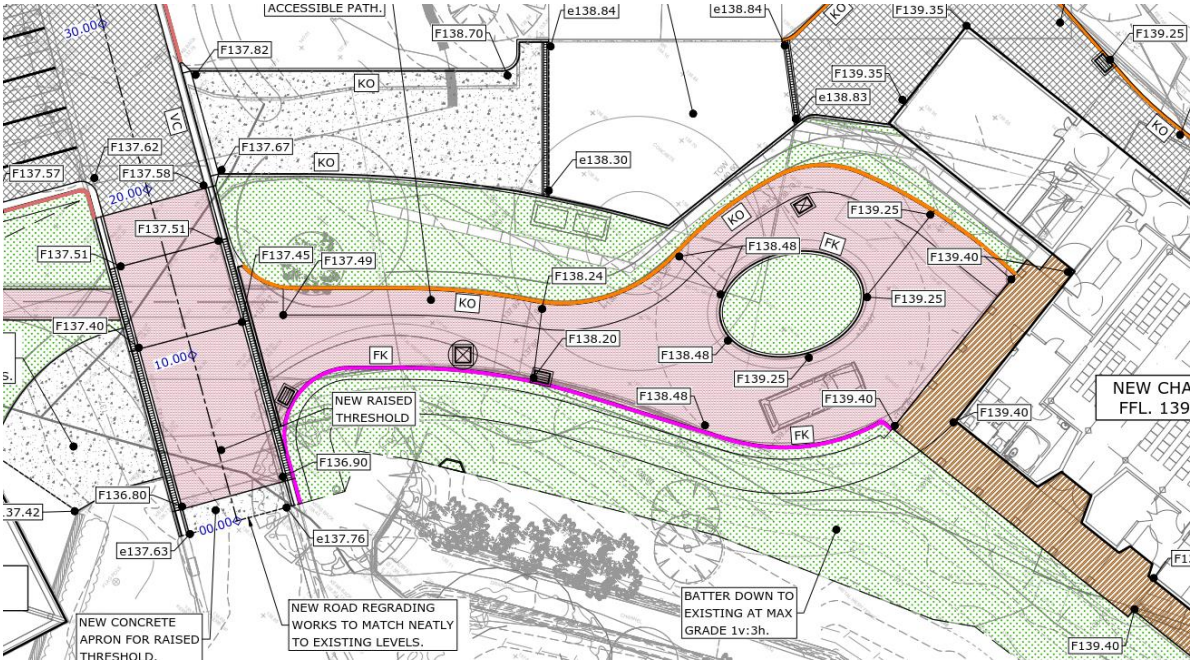


Figure 3 - Proposed Driveway and Manoeuvring Area

3 Flood and overland flow assessment

A catchment wide flood model, previously completed by GRC Hydro was utilised to provide the Flood Planning Levels for the proposed development. GRC Hydro has provided the 1% AEP Peak Flood Level and flood planning levels in flood maps. These levels have been incorporated in the design development for the external civil design and setting the building floor level.

Copies of the flood mapping have been affixed to in the appendix A.

4 On-site detention

As per correspondence with Northern Beaches Council, On-site detention is not required as the OSD will not be operationally effective due to high tailwater levels downstream. Email and correspondence have been affixed to in the appendix B. The meeting minutes of the pre-lodgement advice meeting have affixed to in the appendix C.

5 Site drainage system

The in ground stormwater drainage system within the site has been designed to provide conveyance of stormwater flows for all storms up to and including the 5 year ARI event, as detailed in Northern Beaches On-site Stormwater Detention Technical Specification.

5.1 Design criteria

In accordance with the relevant standards and guidelines, the site drainage system was designed to achieve the following:

- the inground system caters for 5 year ARI storm events;
- the above ground system caters for overland flow in events where inground infrastructure has been blocked in an emergency scenario.

5.2 Design considerations

The proposed stormwater network meeting the above-mentioned criteria consists of the following:

- Grated inlet pits and rainwater outlets (RWOs) at the ground floor for the collection of stormwater surface flows;
- Grated trench drains at lineal low points and driveway;
- Junction pits to help with the navigation of the pipe network throughout the site.
- Subsoil drainage in landscape areas to collect infiltrated flows.

6 Water Sensitive Urban Design

As per Northern Beached Council WSUD & MUSIC Modelling Guidelines, it requires that all developments implement the principles of Water Sensitive Urban Design (WSUD) in order to meet the water quality improvement targets provided in Table 6.1. Improving the quality of water leaving the site is intended to at protecting or enhance natural drainage systems downstream, including natural watercourses.

Table 6.1 Water quality improvement targets

Pollutant	Performance target reduction loads
Gross pollutants	90% reduction in the mean annual load of gross pollutants
Total suspended solids (TSS)	85% reduction in the mean annual load of TSS
Total phosphorus (TP)	65% reduction in the mean annual load of TP
Total nitrogen (TN)	45% reduction in the mean annual load of TN

6.1 Water quality modelling

The water quality of runoff from the site was modelled using the eWater Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The meteorological data, parameters for source nodes (catchments) and water quality improvement measures were selected using the NSW MUSIC modelling and Northern Beaches Council guidelines. The work of resurfacing the pavement of Darwinia Drive and proposed car spaces is excluded from the MUSIC model as these are minor development and it is unlikely to cause much impact on the water quality.

The following water quality improvement measures will be implemented in order to meet the aforementioned performance objectives:

- Gross pollutant traps (Oceanguard pits or approved equivalent);
- Rainwater storage and re-use; and
- StormFilters.

6.1.1 Gross pollutant traps

It is proposed that a total of six gross pollutant traps (GPTs) are installed on nominated grated inlet pits (GIPs). There are four GPTs within the site to capture contaminants of driveway and roof, as well as one GPT to be installed to service the ashes garden so that stormwater will be filtered before entering to StormFilter system. This will also help to prevent blockage of the piped network. Another GPT is to be installed at the downstream of the StormFilter bypass area.

It is recommended that Ocean Protect OceanGuards or an approved equivalent are used. The treatment efficiency data required for input into the MUSIC model was provided by the manufacturer.

6.1.2 Rainwater tank and re-use

A proposed 5-kL rainwater tank (RWT) is currently implemented into the stormwater drainage system for collecting and retaining runoff from the roof of the existing buildings for on-site re-use. The RWT has been modelled to irrigate the landscape areas only.

6.1.3 Filtration system

While the proposed GPTs are an effective measure for removing gross pollutants, they are not very effective at removing suspended and dissolved pollutants, including total suspended solids, phosphorus and nitrogen. It is therefore proposed that a filtration system is used to absorb and retain these pollutants.

In order to meet the water quality improvement objectives, the proposed filtration system will comprise 6x 460 PSorb StormFilters by Ocean Protect, or an approved equivalent. Water entering the StormFilters will be filtered through the system.

The treatment efficiency data and model parameters for the were provided by the manufacturer.

6.2 Modelled results

Modelling of the above water quality improvement measures has confirmed that the pollutant loads leaving the site meet the targets outlined in Table 6.1. The modelled results demonstrating the level of treatment that is provided by the proposed water quality improvement measures outlined in the above sections is shown in Table 6.2. The model setup has been affixed to this report in the Appendix D.

Table 6.2 Mean annual pollutant loads leaving the site

	Source	Residual load	Reduction
Flow (ML/yr)	2.48	2.42	2.4%
Total Suspended Solids (kg/yr)	564	51.1	90.9%
Total Phosphorus (kg/yr)	1.04	0.359	65.7%
Total Nitrogen (kg/yr)	5.93	3.14	47%
Gross Pollutants (kg/yr)	60.6	0	100%

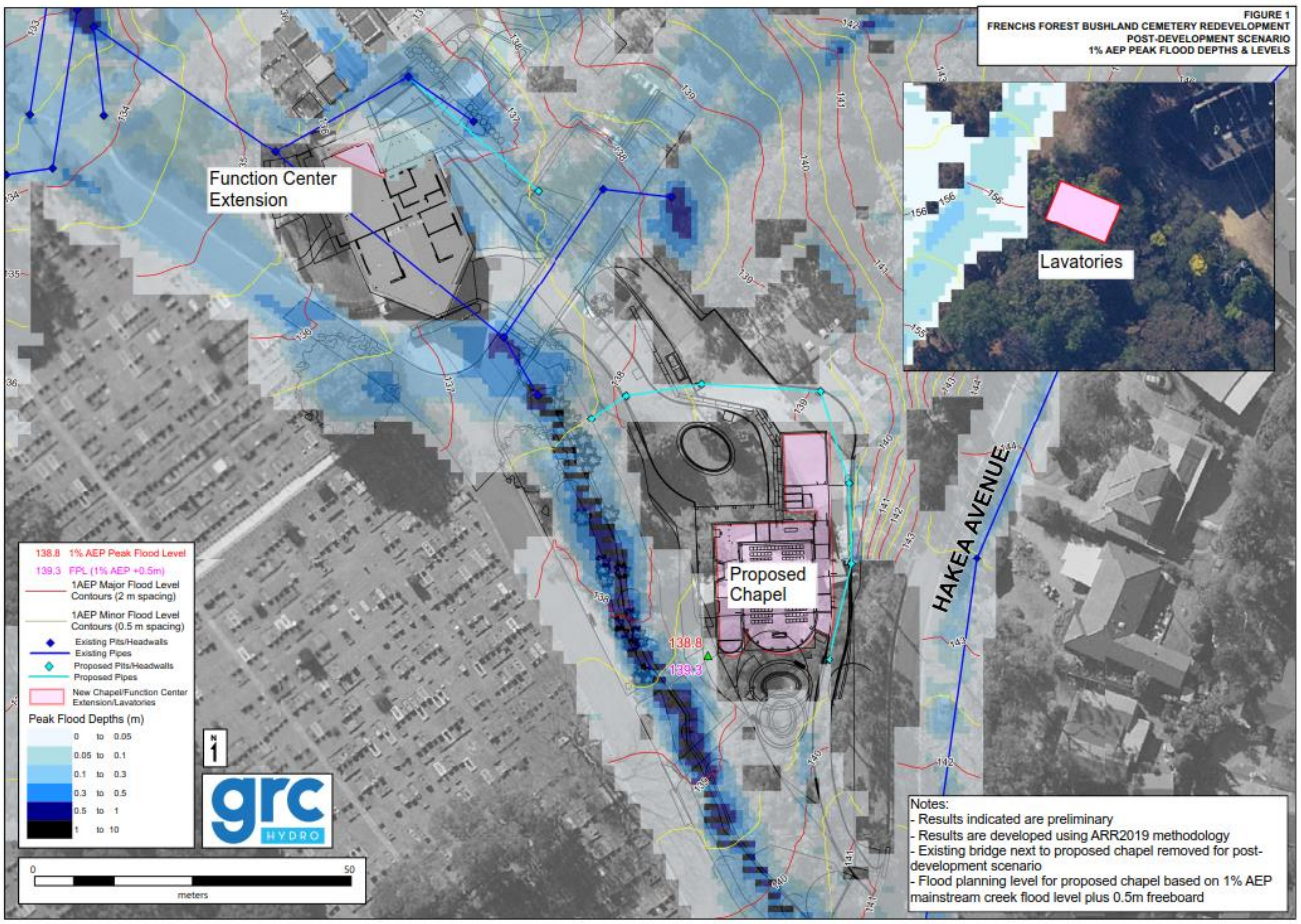
7 Conclusion

This stormwater design report has been developed to support the development application for the proposed chapel and access road for Bushland Cemetery at 1 Hakea Avenue, Frenchs Forest, New South Wales. The preliminary stormwater drainage design has been carried out in accordance with the relevant local, state and national design guidelines and Australian Standards.

The key design elements include:

- a stormwater drainage system that was designed in accordance with Australian Rainfall and Runoff guidelines, and consisting of:
  - a pit and pipe system of sufficient capacity to collect and convey runoff in 5 year ARI events.
  - overland flow paths for ensuring that in the event of overland flows that exceed the capacity of the pit and pipe system are safely conveyed towards the discharge point.
- water quality improvement measures that meet the principles of Water Sensitive Urban Design (WSUD) and provide the level of treatment. The adopted measures include:
  - gross pollutant traps;
  - rainwater storage and re-use; and
  - a filtration system.

Appendix A – Overland flow assessments



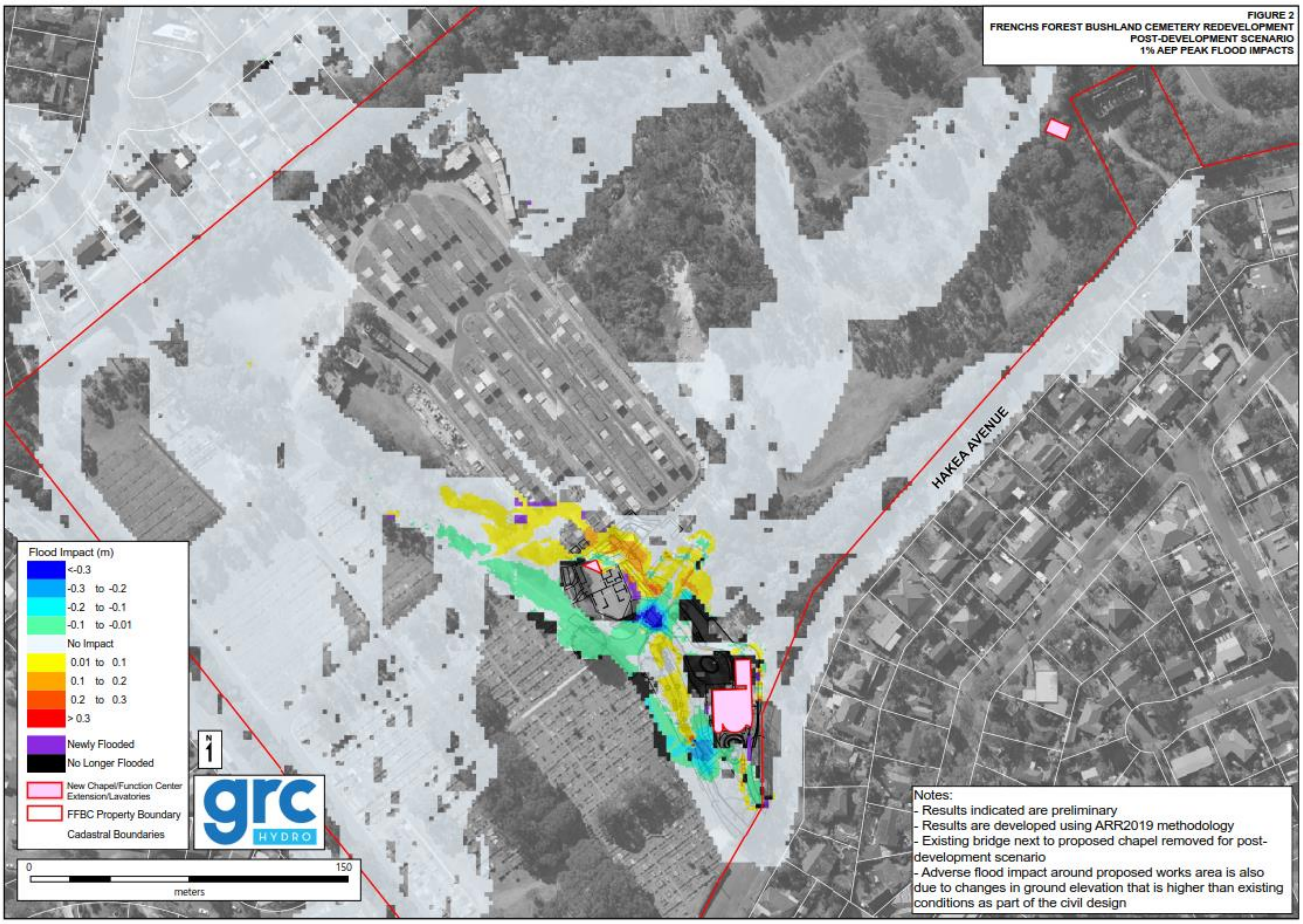


FIGURE 2
FRENCHS FOREST BUSHLAND CEMETERY REDEVELOPMENT
POST-DEVELOPMENT SCENARIO
1% AEP PEAK FLOOD IMPACTS
HAKEA AVENUE
Flood Impact (m)
<-0.3
-0.3 to -0.2
-0.2 to -0.1
-0.1 to -0.01
No Impact
0.01 to 0.1
0.1 to 0.2
0.2 to 0.3
> 0.3
Newly Flooded
No Longer Flooded
New Chapel/Function Center Extension/Lavatories
FFBC Property Boundary
Cadastral Boundaries
N
1
grc HYDRO
0
150
meters
Notes:
- Results indicated are preliminary
- Results are developed using ARR2019 methodology
- Existing bridge next to proposed chapel removed for post-development scenario
- Adverse flood impact around proposed works area is also due to changes in ground elevation that is higher than existing conditions as part of the civil design

Appendix B – Email to council

From: Chris Veleski
Sent: Friday, 20 March 2020 5:37 PM
To: Oscar Guzman
Subject: Email to Council
Attachments: Fig1_FFBC_FPL.pdf; Fig2_FFBC_Impacts.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Oscar,

With reference to the French's Forest Bushland Cemetery development, particularly the pre-DA meeting minutes provided to Tonkin we note that Council have requested an OSD be designed for the proposed development.

On page 18 of the meeting minutes, it is specifically noted that the development is required to implement OSD. On the subsequent page, it is noted that the site is subject to flooding due to overland flow whereby the building must have 500mm freeboard. An analysis of the upstream overland flow suggests that the site largely is subjected to the overland flow as it is not wholly contained within the creek. To this end, there would be very high tailwater conditions that the OSD will be subjected to in addition to the additional flows that the inground infrastructure would be subjected to. Please see attached the figures referencing the overland flow analysis highlighting the depth of flows from the catchment upstream.

In addition to the abovementioned, the OSD is required to be sized to reduce the post development flows to that of state of nature in all storm events. Whilst we understand Council's objective behind this design requirement in minimising the impact to downstream properties, the developable site currently has large amounts of impervious area, notwithstanding the site's discharge directly to the creek. As the creek converges to a piped culvert just downstream of the development, we effectively would be discharging to the creek prior to any upstream catchment flows making their way through the creek and through the piped culvert. Appreciating that the piped culvert could be undersized to convey any large storm events, the build-up of stormwater flows at the entrance to the piped culvert creating the resultant high tailwater as mentioned above.

To this end, we kindly request this part of the minutes be reviewed in conjunction with the attached figures as the implementation of the OSD will not drastically improve the downstream scenario.

We trust that this is well received. Should you have any questions, please feel free to contact Tonkin for further discussions on the best and most practical solution.

Kind Regards,
Chris

Chris Veleski
Senior Civil Engineer

tonkin
Building exceptional outcomes together

Tonkin
Level 6, 1 James Place
North Sydney NSW 2060

From: Oscar Guzman <og@lighthousepm.com.au>
Sent: Monday, 23 March 2020 4:32 PM
To: Catriona Shirley <Catriona.Shirley@northernbeaches.nsw.gov.au>
Cc: Michael Haynes <michael@bbfplanners.com.au>; Alex Bloch-Jorgensen <ABJ@lighthousepm.com.au>; Chris Veleski <Chris.Veleski@tonkin.com.au>; Andrew Sutton <Andrew.Sutton@tonkin.com.au>; Kevin Luo <Kevin.Luo@tonkin.com.au>
Subject: Pre DA Notes - Chapel and Function Centre - NMCLM
Importance: High

Hi Catriona,

Hope you are well. I'm writing to you regarding a condition that was raised in the PRE DA minutes for the Chapel and Function Centre Development at Frenchs Forest Bushland Cemetery. The condition is regarding the need to include an OSD as part of the Civil Design. I've highlighted the conditions in the document attached for your reference.

Our Project Civil Engineer (Tonkin) have reviewed this condition and is of the view that the requirement for an OSD may be excessive due to current site conditions. I've attached Tonkin's comments regarding this issue in the email above. Within that email you will also find some flood modelling to help justify Tonkin's reasoning. Could you please assist by directing this email to the relevant Engineer at Council to review and comment.

I've cc'ed Tonkin in this email for their reference. If you have any questions please feel free to contact me.

Kind Regards,
Oscar Guzman
Project Manager

LIGHTHOUSE
PROJECT GROUP

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A: PO Box 920, Milsons Point, NSW, 1565
P: 0412 723 893
W: lighthousepm.com.au

From: Catriona Shirley <Catriona.Shirley@northernbeaches.nsw.gov.au>
Sent: Tuesday, 24 March 2020 12:56 PM
To: Oscar Guzman <og@lighthousepm.com.au>
Subject: RE: Pre DA Notes - Chapel and Function Centre - NMCLM

Dear Oscar,

I have spoken to the Development Engineers who had the following comments to make:

"The justification provided by the Applicant's engineer regarding the On-site Stormwater Detention (OSD) system appears to be adequate. The Applicant should ensure that the justification, along with any supporting information, is submitted as part of the Development Application.

Please note that I have also previously spoken directly with the Applicant's engineer regarding the proposed development and OSD requirements."

I hope this answers your queries. Please don't hesitate to let me know if you have any further queries.

Kind regards,
Catriona

Catriona Shirley
Planner

Development Assessment
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northern beaches council

Appendix C – Pre-lodgement advice meeting minutes

northern beaches council

PRELODGEMENT ADVICE

Application No:	PLM2019/0280
Meeting Date:	14/01/2020 11:15:00 AM
Property Address:	Lot 7335-7336/1152473 Hakea Avenue FRENCHS FOREST
Proposal:	Development Application Prelodgement Meeting
Attendees for Council:	Catriona Shirley – Planner Lashta Hadari – Acting Development Assessment Manager Ruby Arden – Project Leader Water Management
Attendees for applicant:	Michael Haynes – Consultant Planner David Ham – Chief Operating Officer Northern Cemeteries Alex Bloch – Jorgenson – Project Manager Oscar Guzman – Project Manager Hector Abrahams – Architect Ben Slee - Architect

General Comments/Limitations of these Notes

These notes have been prepared by Council on the basis of information provided by the applicant and a consultation meeting with Council staff. Council provides this service for guidance purposes only. These notes are an account of the specific issues discussed and conclusions reached at the pre-lodgement meeting. These notes are not a complete set of planning and related comments for the proposed development. Matters discussed and comments offered by Council will in no way fetter Council's discretion as the Consent Authority. A determination can only be made following the lodgement and full assessment of the development application.

In addition to the comments made within these notes, it is a requirement of the applicant to address ALL relevant pieces of legislation including (but not limited to) any SEPP and any applicable clauses of the Warringah LEP 2011, Warringah LEP 2000 and Warringah DCP 2011 within the supporting documentation of a development application including the Statement of Environmental Effects.

You are advised to carefully review these notes. If there is an area of concern or non-compliance that cannot be supported by Council, you are strongly advised to review and reconsider the appropriateness of the design of your development for your site and the adverse impacts that may arise as a result of your development prior to the lodgement of any development application.

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Manly Office: 1 Belgrave Street Manly NSW 2095
Avalon Office: 59A Old Barrenjoey Road Avalon Beach NSW 2107

These notes address the plans and documentation presented at the pre-lodgement meeting held on 14 January 2020 to discuss a proposal for the alterations and additions to an existing Cemetery (Frenchs Forest Bushland Cemetery), located on Hakea Road, Frenchs Forest.

The proposal includes the following works:

- The expansion of the existing administration building (known as the Lorikeet Room) to provide a larger function room;
- Construction of a new Chapel;
- Vehicle access to the new chapel via a new 5m-wide vehicle driveway on the Darwina Drive southern frontage;
- Car parking provision for 213 spaces;
- New operations building for administration, staff amenities, and storage;
- New landscaping and ash garden; and
- New toilet amenities building at the north-eastern section of the site.

SPECIFIC ISSUES RAISED BY APPLICANT FOR DISCUSSION

WARRINGAH LOCAL ENVIRONMENTAL PLAN 2011 (WLEP 2011)

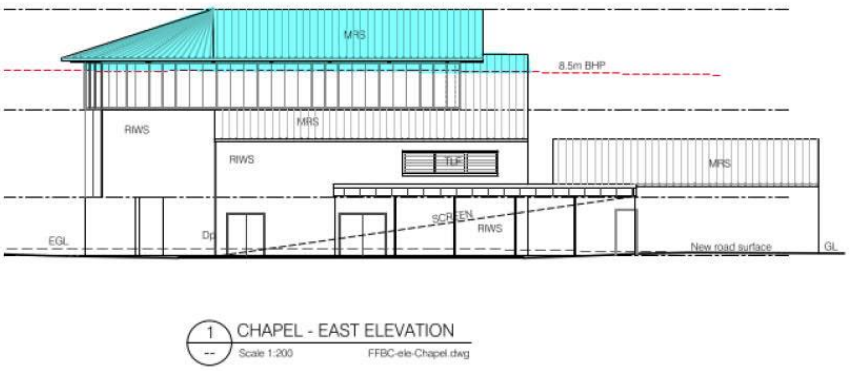
Note: WLEP 2011 can be viewed at Council's website.

Zoning and Permissibility	
Definition of proposed development: (ref. WLEP 2011 Dictionary)	The definition of the "*cemetery"* under the WLEP 2011 is: *"Cemetery means a building or place used primarily for the interment of deceased persons or pets or their ashes, whether or not it contains an associated building for conducting memorial services."* Each of the incidental and ancillary' land uses is also defined below: The Chapel would be defined under the WLEP 2011 as a "*place of public worship"* being: *"A building or place used for the purpose of religious worship by a congregation or religious group, whether or not the building or place is also used for counselling, social events, instruction or religious training".* The proposed function space is defined under the WLEP 2011 as a "*community facility" and is* defined as*:* *"A building or place:* *(a) owned or controlled by a public authority or non-profit community organisation, and* *(b) used for the physical, social, cultural or intellectual development or welfare of the community, but does not include an educational establishment, hospital, retail premises, place of public worship or residential accommodation."* Finally a mortuary is proposed to be located within the chapel building.A "mortuary" is defined under the WLEP as: *"A mortuary means premises that are used, or intended to be used, for the receiving, preparation, embalming and storage of bodies of deceased persons pending their interment or cremation".*

Zone:	SP1 Special Activities - *cemetery* pursuant to the provisions of the Warringah Local Environmental Plan 2011 (LEP).
Permitted with Consent or Prohibited:	**Permitted with consent** It is determined that the above land uses are assessed as being ancillary to the principal land use on the site (being a cemetery). These ancillary land uses would not exist in isolation of the cemetery. Therefore, the land uses serve the regular functions of the cemetery and are ancillary to the principal land use on the site.

Objectives of the Zone – SP1 Special Activities
• *To provide for special land uses that are not provided for in other zones.* • *To provide for sites with special natural characteristics that are not provided for in other zones.* • *To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land.*
The development is considered to be inconsistent with the objectives of the zone for the following reasons: • *To provide for special land uses that are not provided for in other zones.* <u>Comment:</u> The site is especially zoned for use as a cemetery and ancillary purposes such as the proposed chapel and function space. Therefore, the proposal satisfies this objective. • *To provide for sites with special natural characteristics that are not provided for in other zones.* <u>Comment:</u> The site is identified as containing riparian areas, wetland, threatened species and native vegetation. The development presented at the meeting proposes to locate the chapel adjoining the riparian buffer area. However, the proposed works are not anticipated to cause any significant detrimental environmental impacts which are considered unacceptable and contrary to the zone objectives. Therefore, the proposal satisfies this objective. • *To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land.*

Objectives of the Zone – SP1 Special Activities
Comment: The proposed works are considered ancillary to the designation of the site. However, the proposed building height of the chapel could result in visual impacts to surrounding residential dwellings. Further refinement to minimise visual impact is recommended for the proposed Chapel. Evidence that the proposed chapel will not cause unreasonable visual impact due to the building height variation is also require to ensure the chapel will not result in any significant amenity impacts on surrounding land.

Principal Development Standards:	
4.3 Height of Buildings	
Standard	**Proposed**
8.5m	11.69m (37.5%) Chapel 3.3m – Community Facilities (Function Room) 3.28m – Amenities Building (Toilet Block)
Comment CHAPPEL ***Does not comply*** There is a large portion of the chapel proposal above the 8.5m height limit. The building height exceeds the 8.5m development standard at 11.69m for the upper glazed area and roof line over the whole of the chapel.  ***Figure 1.*** *Building height variation highlighted in blue when viewed from the east (area adjoining the residential zone).*	

The proposed building height of 11.69m is a significant departure from the Building Height Standard, and may create unreasonable visual dominance to the surrounding residential area.

A review of the context and the uniqueness of the site as well as the surrounding residential area reveals that the proposal whilst inconsistent with the adjoining residential dwellings, is keeping in character of the subject site.

It is acknowledged that while the building height does not comply, the proposed design is fit for purpose in order to achieve the intended Design Statement of those in mourning and grieving.

However, the building height is inconsistent with the streetscape and the character of the adjoining residential area. The non-compliant building height does not relate to any natural constraints of the site (such as significant slope), and has the potential to give rise to unacceptable amenity and visual bulk impacts to the surrounding residential dwelling houses.

There has been no attempt to minimise the bulk and scale and further refinement could be undertaken to reduce the overall building height and balance the architectural design in sympathy with the nearby residential neighbours.

Any future application must address any building height variation and the quantum of the impact within The Statement of Environmental Effects.

It is also recommended that Photo Montages, from multiple angles be incorporated to demonstrate any visual impact of the proposed Chapel.

A comprehensive Clause 4.6 Variation to the Building Height, along with a detailed Design Statement, must also be submitted to clarify and establish how the location and high architectural merit and its intentional purpose of the building balances with the planning controls and the nearby residential area.

COMMUITY FACILITIES (FUNCTION ROOM)/ AMENTIES BUILDING (TOILET BLOCK)

Complies

There is no building height variation for the proposed administration building, or amenities block.

Note: Building heights are measured from existing ground level.

Part 5. Miscellaneous Provisions	
Provision	**Comment**
5.1. Relevant acquisition authority	Not Applicable
5.2. Classification and reclassification of public land	Not Applicable
5.3. Development near zone boundaries	Not Applicable

Part 5. Miscellaneous Provisions	
5.4. Controls relating to miscellaneous permissible uses	Not Applicable
5.5. Development within the coastal zone	Not Applicable
5.7. Development below mean high water mark	Not Applicable
5.8. Conversion of fire alarms	Not Applicable
5.9. Preservation of trees or vegetation	The application proposes the removal of a number of trees and prescribed vegetation from the site which requires development consent. See discussion under Referral Section (Landscaping and Biodiversity) later in these notes for specific advice in relation to tree removal.
5.9AA Trees of vegetation not prescribed by a development control plan	Not Applicable
5.10. Heritage conservation	Not Applicable
5.11. Bush fire hazard reduction	The subject site is identified as bushfire prone land. In this regard a Bushfire Report prepared by a suitably qualified person is to be submitted with the application and any clearing of vegetation required to provide Asset Protection Zones is to be detailed on the submitted plans.
5.12. Infrastructure development and use of existing buildings of the Crown	Complies.

Part 6. Relevant Additional Local Provisions	
Provision	**Comment**
6.1. Acid Sulfate Soils	Not Applicable
6.2. Earthworks	Any required excavation and landfill must address and satisfy all objectives of this Clause.
6.3. Flood Planning	Not Applicable
6.4. Development on Sloping Land	The subject site falls under Area A and B. A preliminary geotechnical investigation prepared by a qualified person is to be submitted in this regard.

WARRINGAH DEVELOPMENT CONTROL PLAN 2011 (WDCP 2011)

Note: The WDCP can be viewed at Council's website.

Part B: Built Form Controls	
B7. Front Boundary Setbacks	
Control/Requirement	**Proposed**
6.5m	1.9m – 3.5m Chapel

Comment

Does not comply

It is acknowledged that the siting of the proposed chapel is dictated by the constraints of the site, being the location of existing and future interments, stormwater channel, established native trees, riparian zone and the location of existing buildings.

Therefore, due to these constraints of the site, the available location of the Chapel creates a variation to the 6.5m front setbacks, being 1.9m – 3.5m, as shown below.

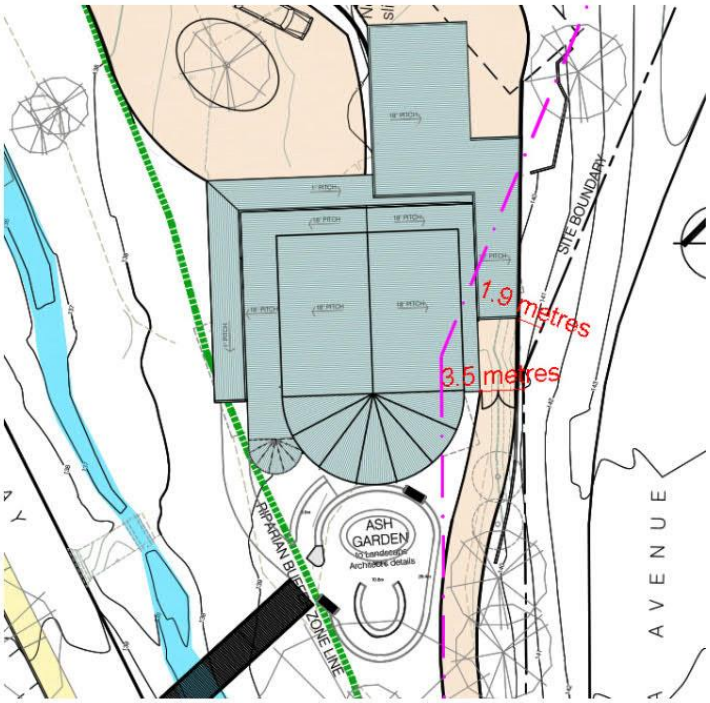


Figure 2. *Demonstration of proposed front setbacks.*

However, these setback could be supported providing demonstration that the non-compliant setbacks do not cause amenity impacts to the eastern residential dwelling neighbours, particularly the dwelling houses on Hakea Avenue that adjoin the boundary.

It is also recommended that any future proposal should include an increase in the landscaping within the curtilage of the front setback adjoin the Chapel considering the significant increase in height, bulk and scale.

Part C: Siting Factors	
Control	**Comment**
C2. Traffic, Access and Safety	As discussed at the meeting, a Traffic and Parking Assessment Report and Plan of Management is to be submitted with the application to address the impacts of the proposed development on the road network.
C3. Parking Facilities	Appendix 1 does not specify parking rates for the proposed development. As such, the proposal increase in car spaces to 213 spaces is considered satisfactory. A Traffic and Parking Assessment Report and Plan of Management for the Chapel services should support any future application.
C4. Stormwater	Please see the Councils Stormwater and Development Engineering response below.
C5. Erosion and Sedimentation	An 'Erosion and Sedimentation Plan' is to be provided with the development application.
C6. Building over or adjacent to Constructed Council Drainage Easements	Any development over Council's Drainage System, which runs through the site, is to comply with the requirements of this control, see Councils Stormwater comments below.
C7. Excavation and Landfill	The development application is to address and satisfy the objectives and requirements of this control.
C8. Demolition and Construction	A Construction Management Plan (CMP) is to be submitted with the lodgement of the development application.
C9. Waste Management	A Waste Management Plan is to be submitted with the lodgement of the development application.
Part D: Design	
Control	**Comment**

D1. Landscaped Open Space and Bushland Setting	The application will comply with the minimum requirement of 40% of the total site area to be maintained as landscaped open space. However, it is recommended that the additional planting and landscaping be incorporated in the front setback area between the road reserve and the proposed Chapel in order to screen and soften the additional built form. Additional landscaping will create greater sympathy with the built form and is more keeping in theme of a bushland setting.
D3. Noise	The proposal is required to address this control within the Statement of Environmental Effects, particularly in relation to the services being held at the proposed chapel.
D9. Building Bulk	The overall bulk and scale of the proposed administration building and amenities block is considered generally acceptable. Further refinement could be undertaken to reduce the overall building height of the Chapel to improve the perceived bulk and scale. The proposal is required to address this control within the architectural plans and the Statement of Environmental Effects.
D10. Building Colours and Materials	A detailed schedule of materials and finishes is to be submitted with the application. The schedule of colours and materials should be consistent with this control.
D18. Accessibility	The development application is to address and satisfy the objectives and requirements of this control.
Part E: The Natural Environment	
Control	**Comment**

E1. Private Property Tree Management	See Council's Environment Officer (Biodiversity) comments below.
E2. Prescribed Vegetation	
E3. Threatened species, populations, ecological communities listed under State or Commonwealth legislation, or High Conversation Habitat	
E4. Wildlife Corridors	
E5. Native Vegetation	
E6. Retaining unique environmental features	
E8. Waterways and Riparian Lands	See Council's Project Leader Water Managements comments below.
E10. Landslip Risk	The subject site falls under Area B, as such, a preliminary geotechnical report is required to be submitted with the application.

Specialist Advice	
Referral Body	**Comments**
Landscaping	***General Comment:*** • The Arborist's Report provided is indicated as a Preliminary Arborist's Report, and states that it has been prepared without the benefit of the detailed plans. As such, the report should be updated to an Arboricultural Impact Assessment (AIA) to assess impacts against the plans to be submitted for DA. • In general terms, however, it is apparent that the Landscape Plans provided indicate retention of the 4 Category A trees on the site, with retention of numerous others, which is supported (subject to the findings of the AIA).

	• The proposed Landscape treatments indicated on the Landscape Plans are also not objected to from a Landscape perspective. • The plans provided are unclear regarding the extent of impacts of the new toilet block and tree removal/retention and landscape treatments should be included in the Arborist Report and Landscape Plans provided with a DA. ***DA documentation recommended*** Arborist Report and Landscape Plans

Biodiversity	***General comments*** The proposal presented on the plans is for the construction of a Chapel and Function Centre, and associated roads, bridge and landscaping, as well as additional car parking. The biodiversity constraints including Coastal Upland Swamp EEC has been identified and mapped north of the existing shed. The plans do not show any direct impacts in this area, however indirect impacts should also be avoided, including adjacent proposed car parking. The draft Arborist Report shows 14 trees will be removed, 10 of these are prescribed and 5 are locally native species. The Landscaping shows 14 locally native canopy tree species to be planted. Any new car parking should avoid removal of high retention value prescribed trees. The proposal as presented for the PLM is generally acceptable subject to submission and consideration of the following: ***DA documentation recommended*** • An Ecological Report, which must include an Assessment of Significance "5-part test" for Coastal Upland Swamp EEC and any other, threatened entity, which may be affected by the works. A draft Watercourse Assessment report was provided for the PLM. The ecological assessment in accordance with WDCP and s 7.3 of the NSW BC Act could be included within this report as a combined ecological and watercourse assessment report for DA lodgement. • Finalised Arborist Report in accordance with Council requirements.
Stormwater	**General Comments**

	Council's records indicate that the property located at Lot 7335-7336/1152473 Hakea Avenue Frenchs Forest is burdened by numerous public drainage systems and associated infrastructure. This is shown on Council's stormwater map, which is available on the webpage. (Please follow the relevant link below and select the 'Stormwater' map from the 'No Overlay Map' drop down menu. You can then search by address and use the zoom functionality to see pipe diameters and asset id numbers. I.e. 600 mm and SPP or SPI etc.). **Council's Stormwater Planning Map:** https://services.northernbeaches.nsw.gov.au/icongis/index.html According to the plans submitted for this Pre-lodgement meeting, the Alterations and Additions proposed for the Functions Centre is located within the direct vicinity of Council's drainage system. Prior to the DA stage, the applicant would be required to accurately locate and confirm dimensions including depth, and plot to scale Council's public drainage system and associated infrastructure on the DA site plans that outline the proposal. This should be carried out by a service locating contractor and registered surveyor. All structures are to be located clear of any Council pipeline, pit, channel or easement and comply with minimum horizontal and vertical clearance requirements for Construction and Maintenance Access as outlined in Council's "Building Over or Adjacent to Constructed Council Drainage Systems and Easements Technical Specifications". To demonstrate compliance with Warringah Council's Development Control Plan 2011 and Northern Beaches Council's Water Management policy PL 850 Water (Section 6-Building Over or Adjacent to Council Drainage Systems and Easements), it is recommended that the following details are submitted with any application:

	▪ Accurately locate, confirm dimensions including depth and plot to scale Council's public drainage system and associated infrastructure on the DA site plans that outline the proposal. This should be carried out by a service locating contractor and registered surveyor. (Evidence of methodology used for locating stormwater system should be provided); ▪ If the applicant proposes to use a CCTV pipeline survey to confirm the location of the pipeline, it is recommended that the survey is carried out in accordance with Council's guideline attached; ▪ All structures are to be located clear of any Council pipeline, pit or easement and comply with minimum vertical and horizontal clearances; ▪ Footings of any structure adjacent to an easement, pipeline or channel are to be designed in accordance with the above-mentioned policy; and ▪ Structural details prepared by a suitably qualified Civil Engineer demonstrating compliance with Council's policy are to be submitted.
Development Engineering	**General Comments:** Stormwater: • Stormwater drainage for the site shall be in accordance with Council's Warringah Water Management Policy. • The proposed development will require the implementation of an On-site Stormwater Detention (OSD) system in accordance with Council's OSD Technical Specification for the new developed area. The pre-developed site discharge (PSD) is to be calculated using a fraction impervious area of 0% i.e. the "state of nature" condition for all design storms up to and including the 1 in 100 year storm event. The applicant's consultant is to use the 'Drains' hydraulic model to design the

	system and provide the calculations with the submission of a development application to Council. Tailwater conditions may need to be considered. The OSD tank is to be located in an open area that will permit 24 hour access to Council staff. • Any discharge to the creek shall be in accordance with the requirements of Council's Environment – Water Management section. Overland Flow: • The property is shown on Council's best available flood mapping as affected by overland flow flooding. Any application shall be supported by an overland flow flood report to assess the impact of the development with respect to local overland flows. The report shall be prepared by a suitably qualified engineer in accordance with Council's Warringah Water Management Policy and shall include, but not be limited to, an address of the following: o The site survey and all levels shall be provided to Australian Height Datum (AHD). o Catchment plan highlighting the full upstream catchment(s). o A detailed analysis of any flood affectation in both pre-development and post-development conditions, considering the 1% AEP storm. o Consideration is to be given to the capacity of existing Council drainage infrastructure with appropriate blockage factors. o Submission of plans clearly indicating pre-development and post-development flow path extents for the 1% AEP storm. o Any relevant supporting longitudinal and cross-sectional

	information at appropriate intervals. ○ Provision of any supporting stormwater models used in assessment, and/or relevant supporting input and output information. ○ Demonstration of compliance with flood related development controls, in particular Warringah LEP 2011 Section 6.3 and DCP 2011 Section E11. ○ Demonstration that there is no adverse impact to adjoining properties and the road reserve in relation to flood level, velocities and extents. • The 100 year ARI flood level must be established in AHD for the proposed future floor levels which shall be a minimum of 500 mm above the 100 year flood level. This is to ensure that the proposed future dwellings are protected in major storm events. <u>Carparking, Access and Manoeuvrability:</u> • The driveway crossing is to incorporate one of Council's standard driveway profiles, which is available in Council's web page. Any transitions to the driveway levels/gradients are to occur within the development site. The driveway design must be in accordance with AS2890.1 and shall ensure that proposed levels adjacent the driveway match into the existing levels. .
Riparian & Water Quality	This application will be assessed under • Warringah DCP 2011 C4 – Stormwater • Warringah DCP 2011 C5 – Erosion and Sedimentation • Warringah Council PL 850 Water Management Policy • Warringah DCP 2011 E8 Waterways and Riparian Lands

	• Warringah Council PL 740 Protection of Waterways and Riparian Land Policy **Riparian** The site has works that impact the headwaters of a tributary to Frenchs Creek. A 10 metre riparian zone applies, and initial plans provided by the applicant comply with this riparian zone requirement. The applicant intends to replace a bridge over the waterway. • As this is a small watercourse, the bridge only needs to span the watercourse with its supports outside the 'top of bank' of the creek. Top of bank is the normal high water level of the waterways and appears as a break in the slope of the bank. • The bridge must not restrict flows in the creek, or redirect them in high water in a way that causes flooding. • The footprint of the bridge and accessway must be minimised. • Stabilisation of the bank around the bridge must be considered in the design if necessary. Natural materials are preferred for stabilising works e.g. Coir logs and sandstone blocks. A variety of sizes of rock should be used to ensure the stones interlock and transition well to the banks and creek bed. • The bridge design must be certified by a qualified engineer. • Weeds in the riparian zone must be removed and the area revegetated with appropriate native species. Removing the weeds during works may expose areas of bank that require stabilisation. Identify a typical treatment approach for bank stabilisation of this type in the application. An integrated development referral is required to the Natural Resources Access Regulator.

	A waterways impact statement must be submitted with the DA (this can be an updated version of the draft Watercourse Assessment Report provided at the pre-lodgement meeting). All references to riparian vegetation work should be included in the vegetation management plan prepared for the DA. The draft report recommended that a 1.2m fence be constructed around the riparian area. This is not required, and better integration of the riparian area with the general landscaping is preferred to improve access for maintenance and passive recreation. If a mowing barrier is required to guide landscaping contractors, the use of a low barrier to define the area can be used. **Stormwater** The applicant is required to provide stormwater treatment for the site. A stormwater engineer should prepare the stormwater plan. 1. The treatment targets to use are set out in Warringah Council's Water Management Policy Section 8.1 Table 4 (GP 90%, TSS, 85%, TP 65% and TN 45%). 2. Stormwater treatment measures must be included in the Water Management Plan, with detail provided of each measure. 3. The use of a treatment train approach is recommended as it will allow the use of a number of smaller devices to achieve the targets. It is believed that there is sufficient room on site to avoid the use of proprietary (modular) devices, apart from a gross pollutant trap. An important objective for this site is to ensure rainwater infiltrates to groundwater if possible, as we

	aim to maintain baseflows via groundwater and reduce runoff at the top of catchments to prevent erosion in creeks downstream. Consider the use of bio/infiltration strips if space is limited. 4. A MUSIC model file MUST be provided with the DA to allow Council to review the model and parameters used. The application will not be assessed until the MUSIC model is provided. 5. A restriction as to user and positive covenant will be placed over the asset(s) and the applicant is required to provide an operation and maintenance plan for each asset. **Sediment** A soil and water management plan must be provided. This must address how sediment will be controlled during creek works. **Groundwater** If the applicant intends to excavate deeper than 1.5m, bores must be drilled to greater than the intended depth of the basements to monitor groundwater. The presence of groundwater should be discussed in the Geotech report and if present, measures to respond should be addressed. Policies and DCP controls relating to water management have finished pubic exhibition and a report will be submitted to Council for endorsement in March 2020. Requirements for this development will be substantially the same as above.
Traffic	**General Comments:** The proposed parking numbers are deemed to be satisfactory The internal circulation appears to be adequate (one-way)

	The applicant will need to ensure a minimum 3.2m clearance is available along all internal road ways (clearance between parked cars and kerb) to accommodate emergency vehicles. To ensure major events to not impact on the local network, a Plan of Management will be required indicating that major events will NOT occur between 7.30-9.30am and 4.00-6.00pm weekdays. The applicant will need to address pedestrian movements within the site. I.e. footpaths, shared zone, etc.

Other Relevant Environmental Planning Instruments/SEPPs/Council Policies

Integrated Development

The development is Integrated Development under Section 91 of the *Environmental Planning and Assessment Act 1979* as it is within 40m of a watercourse. The proposal will therefore be referred to the Natural Resources Access Regulator (NRAR) for concurrence.

Relevant Council Policies

You are advised of the following (but not limited to all) Council's policies available at Council's website:

- Applications for Development - Policy for the handling of unclear, non-conforming, insufficient and Amended applications: PDS-POL 140
- Stormwater drainage for low level properties PDS-POL 135
- Vehicle access to all roadside development: LAP-PL 315
- Water Management Policy PL850:
- Building Over or Adjacent to Constructed Council Drainage Systems and Easements Technical Specifications (Section 6):
- Waste PL 850

Documentation to accompany the Development Application

- Electronic copies (USB)

- Statement of Environmental Effects
- Request to vary a development standard
- Cost of works estimate/ Quote
- Site Plan
- Floor Plan
- Elevations and sections
- Survey Plan
- Site Analysis Plan
- Demolition Plan
- Excavation and fill Plan
- Waste Management Plan (Construction & Demolition)
- Certified Shadow Diagrams
- Schedule of colours and materials
- Landscape Plan and Landscape Design Statement
- Arboricultural Impact Assessment Report
- Photo Montage
- Erosion and Sediment Control Plan / Soil and Water Management Plan
- Stormwater Management Plan / Stormwater Plans and On-site Stormwater Detention (OSD) Checklist
- Geotechnical Report
- Bushfire Report
- Waterway Impact Statement
- Traffic and Parking Report
- Construction Traffic Management Plan
- Construction Methodology Plan
- Integrated Development Fees

Please refer to Development Application Checklist for further detail.

Concluding Comments

These notes are in response to a pre-lodgement meeting held on 14 January 2020 to discuss alterations and additions at Frenches Forest Bushland Cemetery. The notes reference preliminary plans prepared by Hector Abrahams Architects dated October 2019.

The main concerns are in regards to the proposed Chapels building height, the front setback, and the visual relationship between the Cemetery and the adjoining residential dwelling houses.

These elements result in a built form that is unsatisfactory for the following reasons:

- Excessive visual bulk
- Excessive height
- Potential amenity impacts for the adjoining properties

Therefore, you are advised to thoroughly review these notes and consider pursuing minor amendments to the current design.

Fundamentally, the proposal could be supported as the site can accommodate a Chapel within the existing Cemetery. However, minor redesigns and further

information on the potential amenity impacts for the neighbouring properties is required to ensure an appropriate form and scale of development is achieved.

Appendix D – MUSIC results