Bayside Council
Serving Our Community

A meeting of the
City Planning & Environment Committee
will be held in the Committee Room, Botany Town Hall
Corner of Edward Street and Botany Road, Botany
on Wednesday, 10 July 2024 at 6:30 PM

UNDER SEPARATE COVER ATTACHMENTS PART ONE

7 REPORTS

Bayside Council
Serving Our Community

Bayside Local Planning Panel - Other Applications **11/06/2024**

Item No	5.1
Subject	**Planning Proposal - Le Beach Hut, Peter Depena Reserve, Dolls Point - Additional Permitted Use**
Report by	Peter Barber, Director City Futures
File	SF24/2333

Summary

A Masterplan and Feasibility Study have been undertaken by Council to investigate options for asset renewal at Le Beach Hut Restaurant and Kiosk in Peter Depena Reserve (179-183 Russell Avenue, Dolls Point). The current Le Beach Hut café and restaurant building is close to 60 years old and requires a substantial amount of work to make it compliant with current standards. It is practically at end of useful life as an asset.

Council, at its meeting on 13 May 2020 supported replacement of the current building, however, development consent for demolition and construction of a new café or restaurant cannot be granted under existing use rights, as the use is not currently permissible within the RE1 Public Recreation zone. A Planning Proposal (PP) has been prepared for a site-specific additional permitted use (APU) for a restaurant and café.

This Planning Proposal seeks to amend the *Bayside Local Environmental Plan (BLEP) 2021* as follows:

- Introduce a new Additional Permitted Use in Schedule 1 which enables a restaurant or cafe as a permissible use with development consent on the site;
- Impose a maximum gross floor area (GFA) of 825sqm on future buildings for the café / restaurant Additional Permitted Use; and
- Amend the Additional Permitted Uses Map to identify where the proposed APU applies.

The form and content of the Planning Proposal complies with Section 3.33 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Local Environmental Plan (LEP) Making Guidelines* (NSW Department of Planning, Housing and Infrastructure, August 2023).

It is recommended that the Planning Proposal proceed to Gateway determination.

Officer Recommendation

1 That the Bayside Local Planning Panel recommend to Council that pursuant to s3.34 of the *Environmental Planning and Assessment Act 1979,* the draft Planning Proposal for 179-183 Russell Avenue, Dolls Point, be supported and submitted to the Department of Planning, Housing and Infrastructure for a Gateway determination; and

2 That the Bayside Local Planning Panel recommend to Council that following receipt of a Gateway Determination, public exhibition be undertaken and, following that, a post-exhibition report be presented to Council to respond to any submissions received.

Background

The current Le Beach Hut café and restaurant building is close to 60 years old and requires a substantial amount of work to make it compliant with current standards. A Feasibility Study was undertaken to investigate the opportunities and constraints for a new building to replace the Le Beach Hut café and restaurant. The cost to bring the building up to standard is not favourable against the option of demolition and construction of a new fit for purpose building.

A concept design for the future facility was considered by Council and community consultation was undertaken in early 2021. The concept design was updated in response to the feedback received from Council, the community and internal stakeholders.

The new concept design addresses functionality and operational space, ensuring it is practical and attractive for future tenants. In addition, it provides accessible connecting paths within the park and to the newly upgraded play space.

If this draft Planning Proposal (PP) is supported through to finalisation, development consent for the new building will be sought via a Development Application (DA). To facilitate the development approval process, this draft PP has been prepared, as Schedule 1 of the Bayside Local Environment Plan (BLEP) 2021 needs to be amended to include an additional permitted use for this site to allow for the new café / restaurant.

SUBJECT SITE

The site subject of this draft PP is known as 179-183 Russell Avenue, Dolls Point and is legally described as Lot 66 to 73 in Deposited Plan 2237. The subject site is shown in **Figure 1** below, outlined in thick red.

***Figure 1**: Aerial photo of the Subject Site and adjacent land*

The subject site is located on the southern side of Russell Ave between Clareville Avenue to the west and Cook Park to the south and east. The subject site is irregular in shape with an area of approximately 6,334sqm and is generally flat. The site is located within Depena Reserve, which is classified as community land, owned by Bayside Council and adjoins Cook Park. Cook Park is a Crown Reserve under the Crown Lands Management Act 2016.

The existing development on the site includes a single storey restaurant and café with outdoor seating, perpendicular parking associated with the Park and Reserve, part of a children's playground and picnic seating shelter. The existing building has a roofed area of approximately 930sqm and a GFA of approximately 825sqm. There are also a number of significant trees surrounding the built form within the site.

There is no dedicated parking for the current use of the building and the adjoining parking spaces are for use by the general public. The site is also accessible via bus routes 303 connecting Sans Souci to Prince of Wales Hospital and 478 that connects Miranda to Rockdale through Ramsgate. Bus stops servicing both routes in either direction are located on Russell Ave to the north and west of the site. The site is also well connected with the Cook Park / Botany Foreshore walk / cycleway.

SITE CONTEXT

A mix of low and medium density residential development lie to the north and west of the site. Residential flat building development along Russell Ave and Malua Street in the immediate vicinity includes a mix of older 3 storey brick walk-up units and newer 4 to 5 storey residential flat buildings. Waradiel Creek runs along the western edge of Depena Reserve between the park and the residential development. To the northeast of the site on the eastern side of Malua Street are primarily detached dwellings as well as the locally significant heritage item Primrose House which is currently the Scots College Brighton Preparatory School.

Cook Park, which wraps around the site to the south and east, is also listed as a locally significant heritage item under Schedule 5 of the BLEP 2021. Further to the east and south-east of the site is Dolls Point Beach and Botany Bay. Within Cook Park there are public toilet facilities, public gas BBQs and various shelters and picnic areas. Georges River 16ft Sailing Club lies to the south of Cook Park (see ***Figure 2*** below) and benefits from an additional permitted use (APU) under Schedule 1 Clause 28. This APU is similar to that being proposed as part of this PP, whereby development for the purposes of a registered club or a restaurant or cafe is permitted with development consent.

***Figure 2**: Location of 55 Sanoni Avenue, Sandringham - APU under BLEP 2021 (Schedule 1 Clause 28)*

Photos of the site are provided in ***Figure 3*** below.

Figure 3*: Photos of the site and existing development surrounding the site*
(Views from the front of site, rear of site, and development opposite)

EXISTING PLANNING CONTROLS

Under BLEP 2021, the site is zoned RE1 Public Recreation (see ***Figure 4***). Permissible uses in this zone are:

> *Aquaculture; Boat launching ramps; Centre-based child care facilities; Community facilities; Emergency services facilities; Environmental facilities; Information and education facilities; Jetties; Kiosks; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Roads; Signage; Water supply systems.*

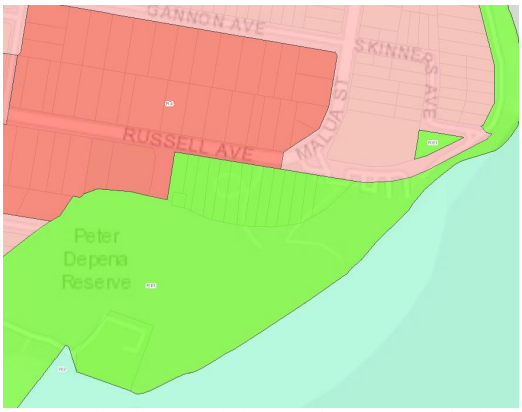


Figure 4*: Zoning Map, Bayside Local Environmental Plan 2021 (Source: NSW Planning Portal Digital EPI Viewer)*

With regards to built form controls under the BLEP 2021, the site is not identified as having a maximum Height of Building or Floor Space Ratio. The subject site is not listed as an item of environmental heritage under Schedule 5 of BLEP 2021, however, the site adjoins Cook Park to the south (I219) and is in the vicinity of Primrose House (I246) to the north, both which are listed as locally significant heritage items in Schedule 5 (see ***Figure 5*** below).

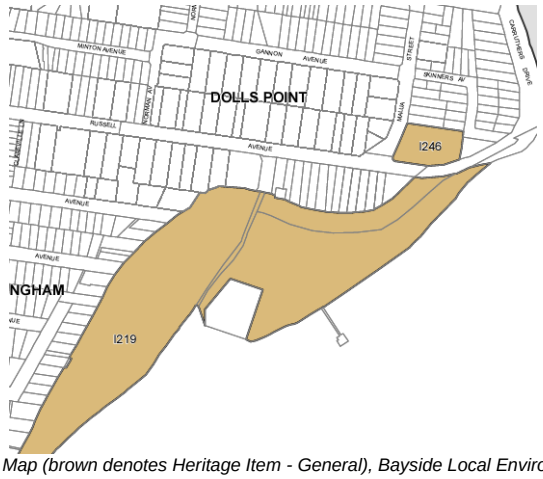


Figure 5*: Heritage Map (brown denotes Heritage Item - General), Bayside Local Environmental Plan 2021*

Environmental affectations on and around the site include Class 3 Acid Sulphate Soils (ASS), and Waradiel Creek to the west of the site is also recognised as being environmentally significant, mapped as Stream Order 1 (see ***Figure 6*** **and 7** below).

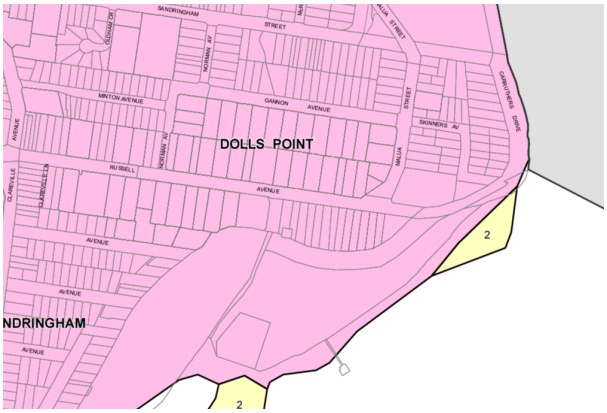


Figure 6*: Acid Sulfate Soils (ASS) Map (pink denotes ASS Class 3), Bayside Local Environmental Plan 2021*

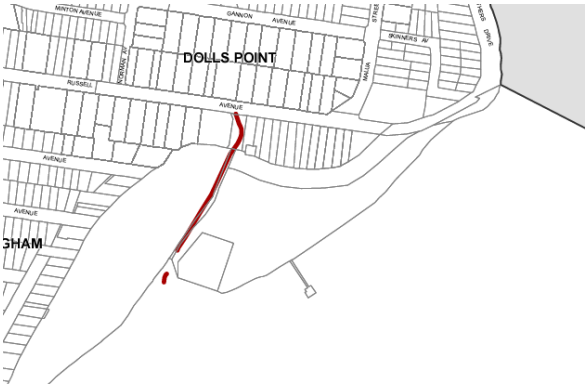


Figure 7*: Stream Order Map (red denotes Stream Order 1), Bayside Local Environmental Plan 2021*

Details of the Planning Proposal

The draft Planning Proposal (**Attachment 1**) seeks an amendment to Schedule 1 relating to Additional Permitted Uses (APUs) in the Bayside LEP 2021. The proposed amendments are shown in
Table 1 below.

Table 1: Proposed Amendments to the Bayside LEP 2021

Provisions	Change

Schedule 1 – Additional Permitted Use	• Amend Schedule 1 and Additional Permitted Uses of the BLEP 2021 to permit a Café or Restaurant on land zoned RE1 Public Recreation at 179-183 Russell Ave, Dolls Point. • Apply a maximum cap on Gross Floor Area (GFA) for the proposed additional permitted uses equal to the existing building equating to 825m^2.

The objective of the Planning Proposal (PP) is to amend the BLEP 2021 to include an 'Additional Permitted Use' within Schedule 1 of the BLEP 2021 to make restaurant and cafes a permissible use on the subject site.

The Le Beach Hut building which includes a restaurant and kiosk was approved prior to BLEP 2021, and also predates the Rockdale LEP and the 1973 Rockdale Planning Scheme Ordinance. A search of Council's records show that the building existed on the subject site prior to 1967 as alterations to the kiosk were approved (BA-1967/643) and additions to the restaurant were approved in 1972 (BA-1972/595). Consent was subsequently issued for reinstatement of the fire damaged building under BA-1989/160. Numerous subsequent applications for works have been approved since that time.

Given the cost of asset upgrades, Council plans to demolish the existing building and construct a new contemporary restaurant / café. The current restaurant / café benefits from 'existing use rights' under Division 4.11 of the Environmental Planning and Assessment Act 1979 (the Act), which will be lost if the building is completely demolished.

Under the RE1 Public Recreation zone, restaurant and cafes are a prohibited use. Accordingly, a Planning Proposal has been prepared to include restaurants and cafés as an additional permitted use on the site. This will allow rebuilding of the restaurant and café to enhance the community's use of the site.

The Planning Proposal Report (revision 1, dated 15 April 2024), prepared by *The Planning Studio* is accompanied by the technical documentation listed in **Table 2** below.

Table 2: *List of supporting documentation to the draft Planning Proposal*

Draft PP Supporting Documentation	Prepared By	Report Attachment
Appendix A – Design Report (revision B, dated 15 December 2023)	Sam Crawford Architects	Attachment 2
Appendix B – Technical Memorandum – Traffic Engineering Advice (Project No. 620.V14014.00001, dated 20 October 2023)	SLR	Attachment 3
Appendix C – Additional Commentary, Acid Sulfate Soils (ref: 5763-4-G1, dated 7 December 2022) **Geotechnical Investigation, (ref: 5763-1-G1, dated 25 November 2019)**	AssetGeoEnviro	Attachment 4 Attachment 5
Appendix D – Flood Impact Modelling Report (Reference: 230422_Flood Impact (REV B), dated 20 February 2024	Quantum Engineers	Attachment 6

Draft Planning Proposal

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (EP&A ACT)

The Department of Planning, Housing and Infrastructure (DPHI) publication *'Local Environmental Plan Making Guideline'* provides guidance and information on the process for preparing Planning Proposals. The planning proposal has been prepared in accordance with the latest version of this guide (dated August 2023).

Part 3, page 72 of The Guide clearly states that:

> *Strategic Merit means a proposal has alignment with the NSW strategic planning framework and government priority.*
>
> *The planning proposal must demonstrate how the proposed amended or principal LEP will give effect to the strategic planning framework to then ensure that the proposal has strategic merit.*
>
> *Any planning proposal that seeks to address this criteria or a government priority needs to be supported with clear and appropriate technical studies and justification.*
>
> *It is encouraged that where a planning proposal fails to adequately demonstrate strategic merit the relevant PPA is unlikely to progress the proposal, despite any site-specific merit it may have.*

Strategic Merit

SECTION 9.1 LOCAL PLANNING DIRECTIONS ISSUED BY THE MINISTER

Section 9.1(2) Local Planning Directions issued by the Minister (s.9.1 directions) set out what a Relevant Planning Authority (RPA) must do if a s.9.1 direction applies to a Planning Proposal and provides details on how inconsistencies with the terms of a direction may be justified.

How the draft Planning Proposal aligns with the applicable s.9.1 directions is provided in ***Table 3*** below:

Table 3*: Consistency with key Section 9.1 Directions (latest version issued on 10 November 2023)*

Ministerial Direction and Objective(s)	Comment	Consistency
Focus Area 3: Biodiversity and Conservation		
3.1 Heritage Conservation **Objective: To conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.**	The subject site is not identified as a heritage item or within a heritage conservation area, however, the adjoining sites Cook Park and Primrose House are identified as having local heritage significance. Given the small scale of the concept and proposed GFA cap for the additional use, any potential heritage impacts can be addressed as part of a future development application.	Yes
3.5 Public Bushland **Objectives: To protect bushland in urban areas, including**	Given the proposed location of the future building and surrounding landscape design as shown in the Design Report (**Attachment 2**), it is unlikely that the proposal will affect surrounding public bushland or existing hydrological landforms like Waradiel Creek. Should the	Yes

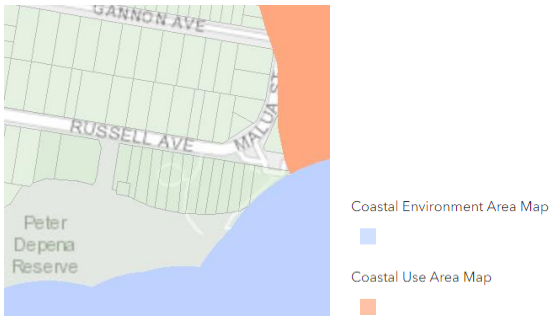
Ministerial Direction and Objective(s)	Comment	Consistency
rehabilitated areas, and ensure the ecological viability of the bushland.	PP be supported and a future Development Application be lodged, appropriate conditions can be imposed to ensure the surrounding environment is further protected.	
Focus Area 4: Resilience and Hazards		
4.1 Flooding **Objectives: To:** **(a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and** **(b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.**	The subject site is identified as being partially flood affected on Council's flood mapping:  The current restaurant / café use which this draft PP is seeking to formalise as part of an APU does not constitute any sensitive land uses and is not considered to increase the impacts of flood risk as per the Section 9.1 Directions. A Flood Impact Modelling Report (**Attachment 6**) supporting the draft PP identifies that the subject site is appropriate for a similar type and scale of development subject to further design considerations at DA stage. Council's Engineers have reviewed the Flood Report and have not raised any concern regarding consistency with this direction.	Yes
4.5 Acid Sulfate Soils **Objective: To avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.**	The site is identified as affected by Class 3 Acid Sulfate Soils and thus this draft PP is supported by an Acid Sulfate Soils commentary and Geotechnical Investigation (**Attachments 4 and 5**). The report states that there is unlikely to be any acid sulfate soils present at the subject site to a depth of 6m and no further investigation or testing is required, nor is an Acid Sulfate Soil Management Plan required for the site. As such, the proposal is considered to be consistent with this direction and current planning provisions applying to the site are considered sufficient given that the draft PP is formalising current uses and is not intending on intensifying the uses on site.	Yes

STATE ENVIRONMENTAL PLANNING POLICIES (SEPPS)

The proposal is consistent with all applicable SEPPs that are in force as the draft PP does not seek to challenge or amend the application of the SEPPs or the impact of the ongoing application of the provisions of the SEPPs on the subject site. Compliance with all SEPPs will

need to be demonstrated by any subsequent DAs for the future building, if the PP is supported. How the proposal aligns with key SEPPs is provided in ***Table 4***, below.

Table 4*: Key State Environmental Planning Policies*

State Environmental Planning Policy (SEPP)	Comment	Consistency
SEPP (Biodiversity and Conservation) 2021	The SEPP seeks to protect, manage and improve the environment in bushland, coastal zones and waterway areas. The draft PP will not be inconsistent with this SEPP as the proposal relates to formalising an existing use on site via an APU with a GFA cap. The proposal is not seeking to clear vegetation prescribed under the SEPP or impact the ongoing application of the provisions.	Yes
SEPP (Resilience and Hazards) 2021	This SEPP includes planning provisions for land use planning within the coastal zone, consistent with the Coastal Management Act 2016. This site is identified as being within the Coastal Environment and Use Area.  Compliance with Chapter 2 Division 3 and 4 relating to coastal management will need to be demonstrated with any future DA for building works, if this PP is supported.	Yes

STRATEGIC PLANNING FRAMEWORK – REGIONAL AND DISTRICT

Regional, sub-regional and district plans and strategies include outcomes and specific actions for a range of different matters including housing and employment targets, and identify regionally important natural resources, transport networks and social infrastructure.

Greater Sydney Regional Plan (GSRP) and the Eastern City District Plan (ECDP)

In March 2018, the NSW Government released the Greater Sydney Region Plan: A Metropolis of Three Cities (GSRP) a 20-year plan which outlines a three-city vision for metropolitan Sydney – the Western Parkland City, the Central River City and the Eastern Harbour City. The plan envisions for the people of Greater Sydney to live within 30 minutes of their jobs and have access to education and health facilities, services and high-quality places. The site is situated within the Eastern Harbour City to which the Eastern City District Plan (ECDP) is applicable.

The planning priorities within the ECDP are aligned to the directions of the GSRP. An assessment of the draft PP against the planning priorities of the ECDP is undertaken to demonstrate consistency with the directions of the GSRP.

A detailed analysis against the relevant priorities is provided within the PP report (**Attachment 1**) and consistency against key priorities of the ECDP relevant to the draft PP are discussed in further detail in **Table 5** below.

Table 5: *Consistency with the key relevant planning priorities within the Eastern City District Plan*

Planning Priority	Comment	Consistency
Liveability		
E3 **Providing services and social infrastructure to meet people's changing needs.**	Proposed APU for a café / restaurant on the subject is to formalise a use that is currently on the site and allow redevelopment of the café to maintain services and social infrastructure to the community and users of the public open space. An APU to allow rebuilding of a contemporary café in this location will ensure continued provision of a space within the park for community gathering and social interaction to contribute to improved community well-being.	Yes
E4 **Fostering healthy, creative, culturally rich and socially connected communities.**	An APU to allow for a new fit for purpose café and restaurant will provide a space for social gathering and connections to bring the community into the wider recreational space. A restaurant / café use complements the public open space use by serving as a focal point and bringing together users of the park and associated facilities as well as encouraging patrons of a future restaurant / café use to utilise the recreational open space.	Yes
E6 **Creating and renewing great places and local centres, and respecting the District's heritage.**	The draft PP seeks to include an APU to allow the redevelopment of the café and restaurant. The supporting Design Report by *Sam Crawford Architects* (**Attachment 2**) have shown that the concept built form aims to create a welcoming space which takes advantage of the location within the Reserve and the outlook to the beach and open space. The concept built form is designed to take cues from the surrounding environment to ensure that the building enhances connection with the wider open space. The subject site is not identified as a heritage item or is located within a heritage conservation area, however, the adjacent sites Cook Park and Primrose House are identified as having local heritage significance. The draft PP is supported by a Design Report that demonstrates that a future built form can be sensitively designed to respect the adjoining heritage items and be recessively integrated into the surrounds. Any potential heritage impacts can be addressed as part of a future DA, if the PP is supported.	Yes
Sustainability		
E16 **Protecting and enhancing scenic and cultural landscapes.**	The Cook Park Plan of Management and Masterplan referenced in the supporting Design Report (**Attachment 2**), identifies that the Reserve and surrounding areas have environmental and heritage significance and states: "*The Masterplan points to Cook Park as having significant regional and state importance, based on evidence of pre-European Aboriginal use. It recommends that any changes or development in the Park should not negatively impact on the natural environment of both land and water and provide opportunities for interpretation of the Park's natural and cultural heritage.*"	Yes

Planning Priority	Comment	Consistency
	The area proposed to be subject to the APU is well setback from the coastline of Botany Bay and the supporting concept plans show that future development is proposed to occur in the same location as the existing restaurant. Therefore, the redevelopment sought to be facilitated by this APU is unlikely to result in unacceptable impacts to the scenic and cultural landscape. The proposed GFA cap associated with the APU will limit the intensity of development and ensure that a future built form will respond appropriately to the significance of the location and maintain the extensive views currently enjoyed across the Bay.	
E17 **Increasing urban tree canopy cover and delivering Green Grid connections.**	The draft Planning Proposal will not adversely impact the opportunity to increase the urban tree canopy cover and Green Grid connections. The proposed GFA cap associated with the APU will limit the extent of future built form to what is currently existing on site and allow continued provision of high quality landscaping around the site to integrate the future built form into Depena Reserve and the wider Green Grid.	Yes
E18 **Delivering high quality open space.**	An APU to facilitate redevelopment of the café and restaurant can provide a new high quality contemporary space for users of the open space. The Design Report shows that the future built form can be sensitively designed to integrate with the scenic and heritage values of the wider open space. A café / restaurant on the site will enhance the community's enjoyment of the open space and provide a spot for refreshment and social connections.	Yes

STRATEGIC PLANNING FRAMEWORK – LOCAL

Bayside Local Strategic Planning Statement (LSPS)

Council's LSPS sets the 20-year vision for the Bayside LGA, including identifying the special character and values to be preserved and how change will be managed. The LSPS explains how Council is implementing the planning priorities and actions in the relevant district plan, in conjunction with its Community Strategic Plan. An analysis against the following relevant Planning Priorities identified in the Bayside LSPS is provided in **Table 6**, below:

Table 6: *Consistency with relevant Planning Priorities in the Bayside LSPS*

Planning Priority	Comment	Consistency
Infrastructure and Collaboration		
B2 **Align land use planning with the delivery and management of assets by Bayside Council to support our community.** **LSPS Action:** **Council will take a place-based approach to land use and asset planning to ensure growth aligns with infrastructure provision.**	The delivery of a new café at Le Beach Hut, Depena Reserve sits within City Project's Program which is aligned with Bayside's Long Term Financial Plan. The replacement of the café and restaurant has come from placed-based asset planning to ensure that a restaurant and café can continued to be provided on the site to align with the growth and renewal of open space infrastructure at Depena Reserve and Cook Park. The APU with a GFA cap to support the renewal works will not result in a loss of functional open space and will assist in delivering a contemporary building to improve the public open space.	Yes

Planning Priority	Comment	Consistency
Council will align the City Projects Program (capital works) with the Bayside Long Term Financial Plan		
Liveability		
B4 **Provide social infrastructure to meet the needs of the Bayside Community** **LSPS Action:** **Ensure social infrastructure planning is considered at the earliest stages of planning for change to ensure there is an adequate level of provision to meet the incoming population's needs and that it is part of a place-based approach.**	This draft PP has resulted from work Council has undertaken for a Masterplan for Depena Reserve and Feasibility Study to investigate the opportunities and constraints for a new building to replace the Le Beach Hut Restaurant and kiosk. The purpose of the master planning work was to identify and evaluate the project planning options for the facility with consideration of the services to be provided, future trends, demographics, existing facilities, ideal location, capital and recurrent costs and an implementation strategy. The Feasibility Study was a detailed analysis of the masterplan options which enabled Council to fully determine the outcome which provides the most cost efficient and effective delivery of its services taking into account capital and recurrent financial costs. As a result of the needs and feasibility analysis, it was resolved to rebuild the current café and restaurant with the new building to meet the changing needs of the growing Bayside community. As the current restaurant and café relies on existing use rights which would be lost if the building was demolished, this draft PP would assist in enabling this redevelopment by allowing restaurant and café uses on this site. A GFA cap to limit the intensity of future café / restaurant use to the current GFA is sought in relation to the APU. This will ensure that there will be no loss of social infrastructure and functional open space.	Yes
B5 **Foster healthy, creative, culturally rich and socially connected communities.** **LSPS Action:** **Deliver healthy, safe and inclusive places for people of all ages and abilities that support active, resilient and socially connected communities:** **a) Prioritise opportunities for people to walk, cycle and use public transport when planning for existing or future centres.** **b) Plan for local communities to access daily needs and essential services by walking and cycling to local and neighbourhood centres.**	An APU to allow for a new fit for purpose café and restaurant will provide a space for social gathering and connections to attract the community into the wider recreational space. A restaurant / café use complements the public open space use by serving as a focal point and bringing together users of the park and associated facilities as well as encouraging patrons of a future restaurant / café use to utilise the recreational open space. A café / restaurant on the subject site will serve both the local community who are within walking distance as well those who have travelled to the site via other modes of active transport or public transport. The site is serviced by bus routes 303 connecting Sans Souci to Prince of Wales Hospital and 478 that connects Miranda to Rockdale through Ramsgate with bus stops servicing both routes in either direction on Russell Ave. The site is also well connected with the Cook Park / Botany Foreshore cycleway.	Yes

Planning Priority	Comment	Consistency
B9 **Manage and enhance the distinctive character of the LGA through good quality urban design, respect for existing character and enhancements of the public realm.**	The draft PP, if supported, will enable redevelopment of an outdated building and replacement with a modern facility (subject to assessment under a development application) to improve the public realm of the park. The supporting Design Report and concept plans demonstrate that a high quality architecturally designed building can be delivered which respects the existing character and enhances the open space.	Yes
B11 **Develop clear and appropriate controls for development of heritage items, adjoining sites and within conservation areas.** **LSPS Action:** **Council will protect, celebrate, and promote Bayside's rich cultural heritage.**	The subject site is not identified as a heritage item or within a heritage conservation area, however, the adjoining sites Cook Park and Primrose House are identified as having local heritage significance. Current controls are sufficient to protect existing heritage items and this draft PP does not impact on those controls. If the PP is supported, future DAs will need to address the heritage provisions and demonstrate that it has appropriately responded to the environmental heritage context.	Yes
Sustainability		
B19 **Protect and improve the health of Bayside's waterways and biodiversity.** **LSPS Action:** **Improve public connection and access along waterway and foreshores.**	If the draft PP is supported, future development will need to demonstrate that it will protect the coast and waterway areas. Given that future development is to occur in the same location as the existing building, it is unlikely to have unacceptable impacts on surrounding waterways and biodiversity and will not interfere with public connections in and around the open space.	Yes
B20 **Increase urban tree canopy cover and enhance green grid connections.**	The draft PP will not adversely impact the opportunity to increase the urban tree canopy cover and Green Grid connections. The proposed GFA cap associated with the APU will limit the extent of future built form to what is currently existing on site and allow continued provision of high quality landscaping around the site to integrate the future built form into Depena Reserve and the wider Green Grid.	Yes
B21 **Deliver high quality open space.** **LSPS Action:** **Increase connectivity between and through open space and green grid corridors for walking and cycling.**	An APU to facilitate redevelopment of the café and restaurant can provide a new high quality contemporary space for users of the open space. The Design Report (**Attachment 2**) shows that the future built form can be sensitively designed to integrate with the scenic and heritage values of the wider open space. The Design Report and the concept design envisages a future landscape design which includes new accessible pathways connecting the building's north, east and west elevations to the carparks and playground. A café / restaurant on the site will improve connectivity within the open space and enhance the community's enjoyment of the park and provide a spot for refreshment and social connections.	Yes

Bayside Community Strategic Plan 2018-2032

An analysis against the community outcomes and associated strategies in the Bayside Community Strategic Plan 2032 is provided below in ***Table 7***.

Table 7: *Consistency with the relevant community outcomes and strategies in Bayside Community Strategic Plan 2018-2032*

Community Outcome	Strategies	Consistency / Comment
Theme One – In 2032 Bayside will be a Vibrant Place		
Bayside's places are accessible to all	Create spaces, places and interactions that are safe, accessible, and engaging Provide safe, accessible open space with a range of active and passive recreation opportunities to match Bayside's growing community. Welcome visitors and tourists to Bayside.	Yes **Comment:** The draft PP is consistent with this outcome as it seeks an APU to allow redevelopment of the existing restaurant and café with a new welcoming facility which is aligned with current and future community expectations. If supported, future development will have to achieve the latest standards to deliver a safe and accessible building.
Bayside's places are dynamic and connected	Create and maintain vibrant, visually appealing, and welcoming places with their own village atmosphere and sense of identity. Ensure public buildings are well maintained as important community hubs with the opportunity for shared and multiple use of facilities	Yes **Comment:** The concept design shows that a future building will be designed to be a visually appealing space for the community to be connected. The Design Report notes that the rectilinear concept design is also to ensure flexibility for future tenants.
Bayside's places are people focused	Activate local areas and town centres with facilities valued by the community Create and maintain vibrant, visually appealing, and welcoming places with their own village atmosphere and sense of identity. Promote innovative and well-designed local developments which incorporate open space and put people first	Yes **Comment:** An APU to allow for rebuilding of the restaurant and café will renew the facilities in Depena Reserve and activate the open space. The concept plans show that the future built form will be well designed to be visually appealing, innovative and welcoming and will integrate into, and complement the open space.
Theme Two – In 2032 Our People will be Connected in a Creative City		
The community is united and proud to live in Bayside	Engage effectively with community and provide information in a timely manner.	Yes **Comment:** Should this draft PP proceed, the proponent would be required to undertake consultation in line with the Bayside Community Participation Plan, Gateway

Community Outcome	Strategies	Consistency / Comment
		Determination and the NSW Government's *LEP Making Guidelines*.
Theme Three – In 2032 Bayside will be green, resilient, and sustainable		
Bayside's waterways and green corridors are regenerated and preserved	Enhance and extend green grid corridors Respect, manage and protect the natural environment and biodiversity	Yes **Comment:** See assessment against B19 to B21 under 'Sustainability' in the Bayside LSPS above.
Theme Four – In 2032 Bayside will be a prosperous community		
Council is financially sustainable and well governed	Manage Council assets to meet community expectations within available resources	Yes **Comment:** This draft PP has resulted from work Council has undertaken to renew the existing café and restaurant with the new building to meet the changing needs of the growing Bayside community.

Bayside Local Environmental Plan 2021 (BLEP 2021)

The proposed amendments will only seek to include an additional permitted land use on the subject site, with the rest of the BLEP 2021 continuing to apply. Whilst it is noted that any subsequent application for a restaurant or cafe would be subject to assessment under a DA, below is a preliminary consideration of the proposed amendment and relationship to relevant sections of the BLEP 2021.

An analysis of the consistency of the draft PP with the Bayside LEP 2021 is provided in ***Table 8*** below.

Table 8*: An assessment of the draft PP against the relevant provisions of Bayside LEP 2021*

Control	Objective(s)	Consistency
Zone RE1 Public Recreation	To enable land to be used for public open space or recreational purposes To provide a range of recreational settings and activities and compatible land uses To protect and enhance the natural environment for recreational purposes	Development sought to be permitted by way of the APU proposed as part of this draft PP – being a restaurant and café use – will still achieve the objectives of the RE1 Public Recreation zone. A restaurant and café is compatible with the recreational setting as it provides a point for rest and refreshment for users of the open space. The GFA cap of 825sqm proposed in connection with the APU will ensure that the bulk and scale of the new building will either be less than or equal to the GFA of the existing restaurant / café on the site to protect the provision of recreational space.
Clause 2.5 Additional permitted uses for particular land		The APU and associated GFA cap are proposed to be included in Schedule 1 of BLEP 2021 as part of this draft PP.

Control	Objective(s)	Consistency
Clause 4.3 Height of Buildings	To ensure that building height is consistent with the desired future character of an area,	There is no height of building standard applicable to the subject site and impacts associated with height of building will be subject to future development assessment should this PP be supported.
	To minimise visual impact of new development, disruption of views, loss of privacy and loss of solar access to existing development,	
	To nominate heights that will provide an appropriate transition in built form and land use intensity.	
Clause 4.4 Floor Space Ratio (FSR)	To establish standards for the maximum development density and intensity of land use,	There is no FSR standard applicable to the subject site. If supported, the GFA cap associated with the proposed APU clause will limit the intensity and bulk and scale of future development. Impacts associated with GFA will be subject to future development assessment should this PP be supported.
	To ensure buildings are compatible with the bulk and scale of the existing and desired future character of the locality,	
	To minimise adverse environmental effects on the use or enjoyment of adjoining properties and the public domain,	
	To maintain an appropriate visual relationship between new development and the existing character of areas or locations that are not undergoing or likely to undergo a substantial transformation,	
	To ensure buildings do not adversely affect the streetscape, skyline or landscape when viewed from adjoining roads and other public places such as parks and community facilities.	
Clause 5.10 Heritage Conservation	To conserve the environmental heritage of Bayside,	The subject site is not heritage listed but is located in the vicinity of two locally listed heritage items: • Cook Park at General Holmes Drive, The Grand Parade (I219) – adjoining the subject site to the south; and • Primrose House at 190 Russell Avenue (I246) – to the north east of the subject site. Future development is to occur in the same location as the existing building which is not recognised as having any significant heritage value. However, as the site is in the vicinity of existing heritage items, this provision would require future DAs to consider the impacts on surrounding heritage items. The proposal is accompanied by a Design Report (**Attachment 2**) which discusses how the design responds to the surrounding heritage character to ensure that there are no unacceptable impacts on the heritage items. Despite this, compliance with the Heritage Conservation clause will still need to be
	To conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,	
	To conserve archaeological sites,	
	To conserve Aboriginal objects and Aboriginal places of heritage significance.	

Control	Objective(s)	Consistency
		reviewed for any final design submitted as part of a DA if this PP is supported.
Clause 5.21 Flood planning	To minimise the flood risk to life and property associated with the use of land,	See discussion below under 'Site Specific Considerations and Technical Studies' in relation to flooding.
	To allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,	
	To avoid adverse or cumulative impacts on flood behaviour and the environment,	
	To enable the safe occupation and efficient evacuation of people in the event of a flood.	
Clause 6.1 Acid sulfate soils	The objective of this clause is to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage	See discussion below under 'Site Specific Considerations and Technical Studies' in relation to Acid Sulfate Soils.
Clause 6.5 Riparian land, wetlands and waterways	To protect and maintain the following— (a) water quality within waterways, (b) the stability of the beds and banks of waterways, (c) native flora and fauna and their habitats, (d) ecological processes within waterways and riparian lands, (e) scenic and cultural heritage values of waterways and riparian lands.	The subject land is in proximity to land identified as 'Stream Order 1', and accordingly this clause applies. Noting that the proposal, if supported will be rebuilt in roughly the same location, it is unlikely to result in unacceptable impacts and future DAs should be reasonably able address the objectives and requirements of this clause.

Bayside Development Control Plan 2022 (BDCP 2022)

A site-specific DCP is not considered to be required for this proposal as the controls within the Bayside DCP 2022 are sufficient to guide a merits-based assessment and drive a positive outcome on the site for any future DA, should the PP be supported.

Cook Park Plan of Management and Masterplan

The Planning Proposal for Le Beach Hut is consistent with the Cook Park Plan of Management and Masterplan, prepared by Clouston Associates for Land and Property Management Authority and (former) Rockdale City Council (Issue F, dated 03.06.10 and referred to as the 'Masterplan' elsewhere in this report). The Plan of Management authorises the current lease for the restaurant and kiosk premises at the Le Beach Hut site and outlines the details of the lease. The document also includes objectives, performance targets, means of achievement and methods of assessment for the Le Beach Hut site, which is classified as community land.

The objectives for Le Beach Hut under the Plan of Management and Masterplan are as follows:

- Ensure leased premises are for a purpose that promotes or is related to the use and enjoyment of open space for recreation and leisure.
- The leased premises do not substantially diminish public use of or access to open space.
- Ensure leased premises do not adversely affect the natural environment, any items or areas of heritage significance of the existing amenity of the area.
- Ensure leased premises do not adversely affect the visual quality of the area.

The strategic and site-specific merits of the proposal as discussed throughout this report are aligned with these objectives.

Site-Specific Considerations and Technical Studies

Traffic and Parking

The proposal is supported by a Technical Memorandum for Traffic Engineering Advice prepared by SLR. The report concludes that:

- The draft PP is consistent with the existing land uses / businesses that currently operate on the land.
- It is anticipated that the proposed new Dolls Point Café's traffic generation potential will be similar to or less than the existing uses.
- Two public car parking lots in the vicinity of the subject land generally have sufficient car parking spaces to cater for the use.

As has been discussed, a GFA cap is also proposed. This will ensure that any adverse impacts are minimised.

The concept plan indicates that the proposed scheme includes a significant reduction in GFA compared to the existing building. Consequently, it is not expected to generate parking or traffic impacts beyond the current demand. While no dedicated parking is proposed for the café/restaurant use, this aligns with the existing situation. Council's traffic engineers endorsed this approach and note that allocating parking spaces exclusively for the café/restaurant would not allow equitable access for other users of the public open space. Furthermore, they support the proposed parking provisions, considering the decreased scale of the development.

The Technical Memorandum (**Attachment 3**) recommends conducting a Traffic Impact Assessment after finalising this Planning Proposal (PP), provided it receives support. The assessment will verify the potential traffic generation and evaluate net traffic impacts on the surrounding road network. Additionally, the memorandum includes other factors, including the feasibility of designing a loading space for future use. These considerations will be further evaluated in any subsequent DA for the proposed use.

Given the above, it is considered that the proposal has adequately considered the potential traffic impacts of the proposal and that these potential impacts are acceptable.

Built Form and Heritage Impact

As discussed, the site is not heritage listed but is in the vicinity of Cook Park and Primrose House which are identified as having local heritage significance. Heritage impact and consistency with the Section 9.1 Directions regarding Heritage Conservation have been addressed as part of the Design Report by *Sam Crawford Architects* (**Attachment 2**). That report demonstrates that the APU does not preclude a design that can be sensitive and respect the surrounding heritage items.

Furthermore, to limit the impacts from building bulk and scale, the proposed GFA cap is sought to be introduced with the APU to minimise intensity of the use on the site. The Design Report has adequately considered how to integrate the concept design into the public open space to both enhance and compliment the landscape of Depena Reserve.

Any final design will be subject to assessment as part of a future DA and will need to demonstrate that it has appropriately responded to any environmental heritage and other site-specific matters.

Flooding

The site is flood affected by both 1% AEP and PMF, therefore a Flood Impact Modelling Report (Flood Report) was prepared by Quantum Engineers (**Attachment 6**). The assessment concluded that if the draft PP were to be supported to facilitate the concept design, the proposal would not materially affect local flood characteristics and:

- Proposed flood conditions are largely unchanged from the existing conditions.
- There are negligible offsite flood impacts.
- The proposal does not exacerbate the flood regime.

The Flood Report also includes recommendations to show that future built form can be designed to appropriately respond to flood risk should the draft PP be supported. The Flood Report was referred internally to Council's Engineers who did not raise any concerns in relation to flooding at this stage of the PP process.

Acid Sulfate Soils

The subject site is located on land classified as affected by Class 3 acid sulfate soils (ASS). A Geotechnical Investigation and an Additional Commentary on Acid Sulfate Soils was prepared by *AssetGeoEnviro*. The Additional Commentary letter states that the proposal is consistent with the Section 9.1 objectives and the referenced ASS Planning Guidelines. An ASS Assessment was undertaken as part of the Geotechnical Investigation which indicated that Actual Acid Sulfate Soils (AASS) and Potential Acid Sulfate Soils (PASS) was not present at the site to a depth of 6m and concluded that no further testing / investigation or ASS Management Plan was required. The documents were referred internally to Council's Environmental Scientist for comment and no concerns were raised in relation to the draft PP.

Conclusion

As detailed in the report, the proposed amendment to the *Bayside Local Environmental Plan* 2021 for the inclusion of an APU in Schedule 1 for a café or restaurant over the subject portion of the site has been prepared in accordance with Section 3.33 of the *Environmental Planning & Assessment Act 1979* and the relevant guidelines prepared by the NSW Department of Planning, Housing and Infrastructure including the *Local Environmental Plan Making Guideline,* August 2023.

The PP provides justification for the proposed amendment to BLEP 2021, and is considered to have strategic and site-specific merit. Furthermore, it does not conflict with any strategic planning objectives, plans or policies applicable to the site.

The current restaurant and café has been on the site for over 50 years and requires significant costs to bring it up to current standards, and a Feasibility Study has determined that it would be more cost effective to rebuild the asset. Unfortunately, demolition of the current building will result in a loss of existing use rights necessitating this draft PP for an APU to continue providing a restaurant / café on the site.

It is therefore recommended that the Bayside Local Planning Panel recommend to Council that pursuant to s3.34 of the *Environmental Planning and Assessment Act 1979* the draft Planning Proposal Amendment to *Bayside Local Environmental Plan 2021* for 179-183 Russell Avenue, Dolls Point (Le Beach Hut) be submitted to the Department of Planning, Housing and Infrastructure for a Gateway Determination with a request that Council is authorised as the Local Plan Making Authority.

Attachments

1 Planning Proposal Report ⇩
2 Design Report ⇩
3 Technical Memorandum – Traffic Engineering Advice ⇩
4 Additional Commentary, Acid Sulfate Soils ⇩
5 Geotechnical Investigation ⇩
6 Flood Impact Modelling Report ⇩

Planning Proposal

Bayside Local Environmental Plan 2021:

Planning Proposal to Amend

Schedule 1 of the Bayside Local Environmental Plan 2021 to enable an Additional Permitted Use (Café/Restaurant) in RE1 Public Recreation zone

15 April 2024

Planning Proposal – Planning Proposal to Amend Schedule 1 of the Bayside Local Environmental Plan 2021 to enable an Additional Permitted Use (Café/Restaurant) in RE1 Public Recreation zone

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Introduction

This Planning Proposal explains the intended effect of, and justification, for the proposed amendment to *Bayside Local Environmental Plan 2021*. It has been prepared in accordance with Section 3.33 of the *Environmental Planning and Assessment Act 1979* and *Local Environmental Plan Making Guideline (NSW Department of Planning & Environment, August 2023)*.

This Planning Proposal for 179-183 Russell Avenue, Dolls Point NSW 2219 is to amend the Bayside Local Environmental Plan 2021 (BLEP 2021) to facilitate a local renewal of the existing restaurant / cafe on the site, and redevelop it as a contemporary café/restaurant. Following the amendment of the BLEP 2021, Council will lodge a Development Application for the redevelopment of the 'Le Beach Hut'. This will include the demolition of the existing building and construction of a new restaurant, separate kiosk public toilets, and associated landscaping. This will be subject to separate processes outside of the Planning Proposal. Notwithstanding, the proposed redevelopment forms a 'proof of concept' of the potential redevelopment should the amendments to the BLEP 2021 be finalised.

The proposed changes to the planning controls are to amend Schedule 1 of the Bayside Local Environmental Plan 2021 to enable an Additional Permitted Use (Café/Restaurant) in RE1 Public Recreation zone at 179-183 Russell Avenue, Dolls Point.

Background

The existing restaurant / café has been present on site for a significant period of time, with the existing building present since the 1950s.

Council is currently planning the demolition of the existing building and the construction of a new contemporary restaurant café. The demolition of the existing building will result in the loss of the 'existing use rights' the current restaurant / café benefits from.

Currently under the existing RE1 Public Recreation Zone only the following uses are permissible:
Aquaculture; Boat launching ramps; Centre-based childcare facilities; Community facilities; Emergency services facilities; Environmental facilities; Information and education facilities; Jetties; Kiosks; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Roads; Signage; Water supply systems.
Without the inclusion of a restaurant / café to the permissible land uses, no replacement of the existing development will be possible as any future restaurant / café land use will be prohibited. Below is a summary of the current planning controls that apply to the site.

Table 1 – Overview of current planning controls

Provision	Control
Zoning	RE1 Public Recreation
Building Height	N/A
Maximum Floor Space Ratio	N/A
Minimum Lot Size	N/A
Heritage	N/A
Land Reservation Acquisition	N/A
Foreshore Building Line	N/A
Acid Sulfate Soils	Class 3

Site Description

The site is known as 179-183 Russell Avenue, Dolls Point NSW 2219 and located within Peter Depena Reserve on lots 66-73/DP 2237. The Reserve is a popular park for local families and the wider community and has a number of amenities including BBQs, public toilets and playground. The site lies within Bayside Council Local Government Area and has an approximate combined site area of approximately 6,000m2. It is bordered by Russell Avenue and Carruthers Drive to the north, Waradiel Creek to the west, and Dolls Point Beach along the southeast. The surrounding area is predominantly residential and consists of a combination of low-rise apartments (three to four storeys), and one to two storey detached residential dwellings.

The subject of the planning proposal is the redevelopment of 'Le Beach Hut', which is a single storey building constructed in the 1950s and approximately 825m^2. The building comprises of a restaurant and separate kiosk, which is owned by Bayside Council. Due to the building's ageing condition, Council proposes to demolish the existing building and construct a new restaurant, separate kiosk, public toilets, and associated landscaping.

The site can be accessed via bus routes 303 connecting Sans Souci to Prince of Wales Hospital and 478 that connects Miranda to Rockdale through Ramsgate. Bus stops servicing both routes in either direction are located on Russell Ave to the north and west of the site.

In additional to public transport, the subject site is also located on popular active transport routes along Ramsgate Beach which connects Taren Point through to the Cooks River in Marrickville and beyond.

The site is also accessible via car with an existing car park located on site.

Figure 1 – Subject Site (Bayside Council)

Figure 2 – Existing building proposed to be redeveloped by Council - Le Beach Hut (Best Restaurants)

Figure 3 – Upgraded playground in Depena Reserve (Sam Crawford Architects)

Site Context:

The Peter Depena Reserve is located adjacent to Dolls Point Beach along Elephants Eye along the entrance to Georges River. The Reserve is at the southern end of Ramsgate Beach. The broader

context of the site is predominantly residential with small scale supporting retail / café uses. To the north and west of the site along Russel Avenue are three storey residential flat buildings, with smaller detached residential dwellings in the broader catchment. A site context map is provided at **Figure 4**.

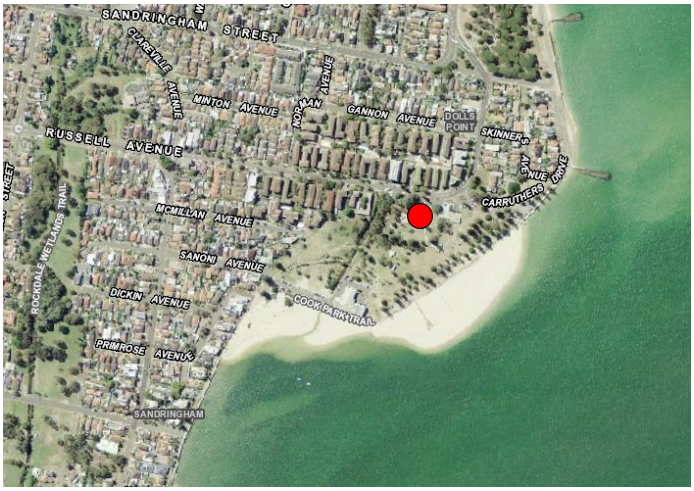


Figure 4 – Site Context (Six Maps)

Part 1 - Objectives or Intended Outcomes

Objective

To amend the BLEP 2021 to permit development for the purposes of a restaurant or cafe as an Additional Permitted Use under Schedule 1 at 179-183 Russell Ave, Dolls Point. Impose through the Additional Permitted Use schedule a maximum GFA of 825m^2 on future buildings. This will allow for the redevelopment of the 'Le Beach Hut'. Café / Restaurant uses are currently prohibited on the site, with the existing café / restaurant operating under existing use rights.

Intended Outcomes

- Allow for the replacement of the existing building with a new contemporary building which will house restaurant / café, kiosk, public toilets, and associated landscaping. The restaurant is to include full commercial kitchen, cold and dry store, bin room, and restaurant toilets.
- Future redevelopment will take advantage of the scenic views to Dolls Point Beach and the Reserve, as well as its proximity to the adjacent playground to its west.
- The future building is to be a benchmark in sustainability, be robust, and relate to the site.
- The redevelopment will enable greater activation of Depena Reserve, providing new facilities within an architecturally designed building, and enhancing the community's use of the broader reserve.
- Provide a maximum Gross Floor Area equal to the existing Le Beach Hut to ensure the proposal does not result in greater impact or unexpected outcomes beyond the existing building.

Part 2 - Explanation of Provisions

This PP has been prepared in accordance with the requirements of Section 3.33 of the *Environmental Planning and Assessment Act 1979* and addresses the guidelines set out in DPE's Local Environmental Plan Making Guidelines (August 2023).

Intended Provisions

- Amend Schedule 1 and Additional Permitted Uses Map – on the digital maps of the EPI Viewer of the BLEP 2021 to permit an Additional Permitted Use (Café/Restaurant) on land zoned RE1 zone at 179-183 Russell Ave, Dolls Point.
- Apply a maximum cap on Gross Floor Area for the proposed additional uses equal to the existing building equating 825m^2.

Part 3 – Justification

A Need for the Planning Proposal

Q1 Is the planning proposal a result of an endorsed LSPS, strategic study or report?

The specific amendment proposed by this planning proposal is not identified in any strategic study or report. However, the proposed amendment supports the delivery of the broader planning priorities of the Bayside Local Strategic Planning Statement. Key Planning Priorities are considered in Section B below. Further, the amendment will remove a site subject to 'existing use rights' and regularise an existing use of the site.

Q2 Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

A planning proposal is the only way to achieve the objectives and intended outcomes as no redevelopment of the Café / Restaurant would be possible as it is currently a prohibited use in the RE1 Public Recreation Zone. Inserting the use through Additional Permitted Uses in Schedule 1 of the BLEP2021 ensures that the use is specific to the site, and does not impact permissibility in the RE1 zone throughout the rest of the Local Government Area (LGA).

B Relationship to strategic planning framework

Q3 Will the planning proposal give effect to the objectives and actions of the applicable regional or district plan or strategy (including any exhibited draft plans or strategies)?

Below is an assessment of the planning proposal against the relevant regional, sub-regional state and district strategic policies.

Greater Sydney Region Plan: A Metropolis of Three Cities and Eastern City District Plan

The Planning Proposal is consistent with the objectives and actions of the Greater Sydney Region Plan: A Metropolis of Three Cities (GSRP) and the Eastern City District Plan (ECDP). Table 1 below provides an assessment of this ECDP. As detailed below, compliance with the ECDP demonstrates compliance with the GSRP.

Only objectives and priorities relevant to the planning proposal have been considered below.

Eastern City District Plan (March 2018)

The Planning Proposal's consistency with the priorities in the ECDP are discussed in further detail in **Table 1** below:

Table 1 –Consistency with the Eastern City District Plan

Infrastructure and Collaboration		
E1	Planning for a city supported by infrastructure	Consistency with this priority is achieved as the proposal seeks to include an additional permitted use within an existing RE1 Zoned area. This will increase the usability and function of the open space by permitting the redevelopment of the existing building, to allow a contemporary facility which is aligned with community expectations.
Liveability		

E3	Providing services and social infrastructure to meet people's changing needs	Consistency with this priority is achieved as the proposal seeks to include an additional permitted use within an existing RE1 Zoned area (and existing café use). This will increase the usability and function of the open space by permitting the redevelopment of the existing building, to allow a contemporary facility which is aligned with current and future community expectations.
E4	Fostering healthy, creative, culturally rich and socially connected communities	Consistency with this priority is achieved as the proposal seeks to include an additional permitted use within an existing RE1 Zoned area. This will increase the usability and function of the open space by permitting the redevelopment of the existing building, to allow a contemporary facility which is aligned with current and future community expectations. The new café / restaurant will create a renewed space for the community to meet and connect, supporting the creation of a resilient and socially connected community. This will be achieved through increase interaction of community members in a purpose built space. It will also foster a sense of community pride in Peter Depena Reserve through delivery of a high quality built form outcome.
E6	Creating and renewing great places and local centres, and respecting the District's heritage	Consistency with this priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which is aligned with current and future community expectations. It is noted that the subject site is not heritage listed, and that future development is to occur in the same location as the existing building which is not recognised as having any significant heritage value. In the vicinity of the site are two locally listed heritage items: • Cook Park at General Holmes Drive, The Grand Parade (I219) – immediately to the south of the subject site; and • Primrose House at 190 Russell Avenue (I246) – immediately to the north east of the subject site. Future development applications will need to demonstrate that it has appropriately responded to any environmental heritage context relevant to development assessment.
Sustainability		
E14	Protecting and improving the health and enjoyment of Sydney Harbour and the District's waterways	Future development will need to demonstrate that it has appropriately protect coast and waterway areas. It is noted that future development is to occur in the same location as the existing building and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution at the development application stage.
E15	Protecting and enhancing bushland and biodiversity	Future development will need to demonstrate that it has appropriately protect biodiversity and any existing vegetation.

		It is noted that future development is to occur in the same location as the existing building, which is disturbed land from a biodiversity perspective, and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution.
E16	Protecting and enhancing scenic and cultural landscapes	Future development will need to demonstrate that it has appropriately responded to the scenic and cultural landscapes. The subject site is not listed or identified as having scenic and/or cultural importance. It is noted that future development is to occur in the same location as the existing building and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution. The concept design is of a high quality architectural outcome and a low scale building. The Design Report, provided at Appendix 1: Architectural Design Report identifies that the reserve falls under the Cook Park Plan of Management and Masterplan. The Masterplan points to the Reserve and the surrounding areas as having environmental and heritage significance. It notes that Cook Park contains: • Ecologically significant sand dunes and dune vegetation along the foreshore north of Brighton. • Culturally significant plantings such as pines in Pine Park, Coral Trees and Norfolk Island Pines at Dolls Point and Norfolk Island Pines along The Grand Parade. • Swathes of open grassland with scattered trees providing recreation facilities and habitat for birds. • Key heritage sites and features including cannons at Brighton and Sandringham. The Masterplan identifies Cook Park as having significant regional and state importance, based on evidence of pre-European Aboriginal use. It recommends that any changes or development in the Park should not negatively impact on the natural environment of both land and water and provide opportunities for interpretation of the Park's natural and cultural heritage. The Masterplan also directly provides recommendations for both the Reserve and the existing building, Le Beach Hut. It recommends ensuring that clear access is maintained through or around leased premises, ensuring facilities provided are available for use to the public, and ensuring any renovations keep the premises at an appropriate standard with respect to scale, bulk, height and floor space. The concept design provided at Appendix 1: Architectural Design Report, details how this will be achieved. The future Master Plan is unlikely to unreasonably impact on vegetation notwithstanding the removal of some trees which can be readily replaced through

		appropriate tree planting, but future impacts will need to be considered as part of subsequent approval processes.
E17	Increasing urban tree canopy cover and delivering Green Grid connections	Future development will need to demonstrate that it has appropriately preserved (where appropriate) and increased urban tree canopy. The concept design identifies that 2 trees will need to be removed, however compensatory replacement planting can be delivered in appropriate locations throughout the reserve if required at later stages. It is noted that future development is to occur in the same location as the existing building and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution at a development application stage. The concept design is of a high-quality architectural outcome and a low scale building, and is capable of meeting this objective at development consent stage. The concept design will create opportunities for additional planting where appropriate, adding to future tree canopy targets, supporting the delivery of the Green Grid.
E18	Delivering high quality open space	The subject site forms part of the larger Depena Reserve. Notwithstanding, consistency with this priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which is aligned with current and future community expectations. Any new café / restaurant will provide facilities that enhance the surrounding open space. Through the provision of a new café / restaurant, the accessibility of the open space will be enhanced and protected, supporting the objective of this priority: *'Public open space is accessible, protected and enhanced.'*
E19	Reducing carbon emissions and managing energy, water and waste efficiently	Consistency with this priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which will inevitably be of greater efficiency than the existing older building on site.
E20	Adapting to the impacts of urban and natural hazards and climate change	The proposal will support the delivery of a new built for purpose café building capable of adapting to the impacts of urban and natural hazards and climate change.

Q4 Is the planning proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GCC, or another endorsed local strategy or strategic plan?

Bayside Local Strategic Planning Statement (LSPS)

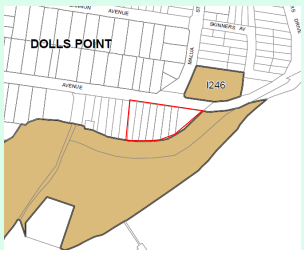
Council has adopted the Bayside LSPS in accordance with the guidance provided by the DPE. Council has aligned the Bayside LSPS Priorities to the Greater Sydney Region Plan – A Metropolis of Three Cities (GSRP), the Planning Priorities in the Eastern City District Plan as well as Councils Community Strategic Plan.

Table 2 below provides an assessment of this draft Planning Proposal against relevant sections of the Bayside LSPS:

Table 2 – Consistency with the Bayside LSPS

Planning Priority		Consistency
B1	Align land use planning and transport infrastructure planning to support the growth of Bayside	The proposal will support the delivery of a new café / restaurant in an area well serviced by transport and already visited by many members of the community who are accessing Deepena Reserve and the surrounding areas.
B2	Align land use planning with the delivery and management of assets by Bayside Council to support our community	Consistency with this planning priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which will support and enhance the ongoing use of Depena Reserve. It is not anticipated that there will be a loss of functional open space area, as the proposal seeks to support the redevelopment of the existing area of the site and will deliver improved quality assets.
B4	Provide social infrastructure to meet the needs of the Bayside Community	Consistency with this planning priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which will support and enhance the ongoing use of Depena Reserve. It is not anticipated that there will be a loss of functional open space area as the proposal seeks to support the redevelopment of the existing building. As detailed in the Design Report provided at Appendix 1, the proposed roof area of the new building is 615m^2, which is significantly less than the existing buildings roof area of approximately 930m^2 (difference of 315m^2). Demonstrating that there is no loss of valuable open space which is a key form of social infrastructure. The proposal also ensures that a new café / restaurant: • will be located in an area within walking distance of local communities given the surrounding catchment identified in the Site Context Map; • enhance the usability of the public open space through providing convenient access to food and amenities for users of the public open space; • enhances the creation of a liveable community by providing amenities and services in close proximity to the surrounding community; and • provides an opportunity to support the

Planning Priority		Consistency
		local economy through creating a built for purpose modern facility for local business and employment.
B5	Foster healthy, creative, culturally rich and socially connected communities	Consistency with this priority is achieved as the proposal seeks to include an additional permitted use within an existing RE1 Zoned area. This will increase the usability and function of the open space by permitting the redevelopment of the existing building, to allow a contemporary facility which is aligned with current and future community expectations. The new café / restaurant will create a space for the community to meet and connect, supporting the creation of a resilient and socially connected community. The proposal also ensures that a new café / restaurant will be located in an area within walking distance of local communities given the surrounding catchment identified in the Site Context Map.
B9	Manage and enhance the distinctive character of the LGA through good quality urban design, respect for existing character and enhancement of the public realm	Consistency with this priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which is aligned with current and future community expectations. Appendix 1 details a concept plan for the site which is of a high quality architectural outcome, which will serve to enhance the public realm of the park and open space. This will need to be further considered as part of any subsequent development application for the site.
B11	Develop clear and appropriate controls for development of heritage items, adjoining sites and within conservation areas	Future development applications will need to demonstrate that it has appropriately responded to any environmental heritage. It is noted that the subject site is not heritage listed, and that future development is to occur in the same location as the existing building which is not recognised as having any significant heritage value. The site is in the vicinity of two locally listed heritage items: • Cook Park at General Holmes Drive, The Grand Parade (I219) – immediately to the south of the subject site; and • Primrose House at 190 Russell Avenue (I246) – immediately to the

Planning Priority		Consistency
		north east of the subject site. Future development applications will need to demonstrate that the design of future buildings have appropriately responded to the heritage context of the subject site. These are identified in the Figure below. However, the proposal will not create any fundamental heritage impacts that would prevent the additional permitted use from being supported. 
B12	Delivering an integrated land use and a 30-minute city	The proposal will support the delivery of the 30-minute city by increasing the local amenities provided within a walking catchment and increasing the functionality of the local park.
B19	Protect and improve the health of Bayside's waterways and biodiversity	Future development will need to demonstrate that it has appropriately protect coast and waterway areas. It is noted that future development is to occur in the same location as the existing building and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution.
B20	Increase urban tree canopy cover and enhance Green Grid connections	Future development will need to demonstrate that it has appropriately preserved (where appropriate) and increased urban tree canopy. It is noted that future development is to occur in the same location as the existing building and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution. The concept design is of a high quality architectural outcome and a low scale building and is capable of satisfying this objective. The Master Plan also demonstrated that future development could deliver increased landscaping to support the Green Grid.

Planning Priority		Consistency
		It is noted that the concept scheme does identify the removal of two trees, however replacement planting to increase tree canopy cover to offset the potential loss can be achieved. This would be imposed through subsequent assessment of applications where appropriate.
B21	Deliver high quality open space	The subject site forms part of the larger Depena Reserve. Notwithstanding, consistency with this priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which is better aligned with current and future community expectations. Any new café / restaurant will provide facilities that enhance the surrounding open space.
B22	Protect and enhance scenic and cultural landscapes	Future development will need to demonstrate that it has appropriately responded to the scenic and cultural landscapes. The subject site is not listed or identified as having scenic and cultural importance. It is noted that future development is to occur in the same location as the existing building and as such, is unlikely to have unacceptable impacts, subject to detailed design resolution. The concept design is of a high quality architectural outcome and a low scale building. The Design Report, provided at Appendix 1: Architectural Design Report identifies that the reserve falls under the Cook Park Plan of Management and Masterplan. The Masterplan points to the Reserve and the surrounding areas as having environmental and heritage significance. It notes that Cook Park contains: • Ecologically significant sand dunes and dune vegetation along the foreshore north of Brighton. • Culturally significant plantings such as pines in Pine Park, Coral Trees and Norfolk Island Pines at Dolls Point and Norfolk Island Pines along The Grand Parade. • Swathes of open grassland with scattered trees providing recreation facilities and habitat for birds. • Key heritage sites and features including cannons at Brighton and Sandringham. The Masterplan identifies Cook Park as having significant regional and state importance,

Planning Priority		Consistency
		based on evidence of pre-European Aboriginal use. It recommends that any changes or development in the Park should not negatively impact on the natural environment of both land and water and provide opportunities for interpretation of the Park's natural and cultural heritage. The Masterplan also directly provides recommendations for both the Reserve and the existing building, Le Beach Hut. It recommends ensuring that clear access is maintained through or around leased premises, ensuring facilities provided are available for use to the public, and ensuring any renovations keep the premises at an appropriate standard with respect to scale, bulk, height and floor space. The concept design provided at Appendix 1: Architectural Design Report, details how this will be achieved.
B23	Reduce carbon emissions through improved management of energy, water and waste	Consistency with this priority is achieved as the proposal will permit the redevelopment of the existing building with a contemporary facility which will inevitably be of greater efficiency that the existing older building on site.
B24	Reduce community risk to urban and natural hazards and improve community's resilience to social, environmental and economic shocks and stressors	The proposal will provide the opportunity for enhancing the communities resilience by enhancing to usability and function of the open space. Environmental shocks will be considered as part of subsequent detailed design of the future building and assessed as part of any future assessment process for the site.

Bayside Community Strategic Plan 2018-2032
The Bayside Community Strategic Plan 2018-2032 sets the strategic direction for Council's Delivery Program and Operational Plans. The themes and directions outlined in the plan inform Council's activities towards achieving the identified outcomes.

The Bayside Community Strategic Plan 2018-2032 (which superseded the Rockdale City Community Strategic Plan) sets the strategic direction for Council's Delivery Program and Operational Plans. The themes and directions outlined in this plan inform Council's Delivery Program and the annual Operational Plans that describe Council's activities towards achieving those outcomes in the Delivery Program.

The Planning Proposal supports the community outcomes and strategies of the Community Strategic Plan by supporting Council to:

- 1.1.1 Create spaces, places and interactions that are safe, accessible, and engaging;

- 1.1.4 Provide safe, accessible open space with a range of active and passive recreation opportunities to match Bayside's growing community;
- 1.3.2 Create and maintain vibrant, visually appealing, and welcoming places with their own village atmosphere and sense of identity;
- 4.3.4 Manage Council assets to meet community expectations within available resources

Table 3 below identifies how the Planning Proposal is consistent with the themes:

Table 3 – Consistency with Bayside Community Strategic Plan 2018-2032 themes

Theme One – In 2032 Bayside will be a Vibrant Place	Strategies	Consistency
1.1 Bayside's places are accessible to all	1.1.1 Create spaces, places and interactions that are safe, accessible, and engaging (Deliver)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will support the accessibility of the Depena Reserve and the future building. Any future building will need to be constructed to modern standards, ensuring a accessible and well designed building is delivered.
	1.1.2 Improve availability of parking for residents (Deliver, Advocate)	
	1.1.3 Promote the provision of affordable housing for those who need it (Partner, Advocate)	
	1.1.4 Provide safe, accessible open space with a range of active and passive recreation opportunities to match Bayside's growing community (Deliver, Partner)	
	1.1.5 Welcome visitors and tourists to Bayside (Partner)	
1.2 Bayside's places are dynamic and connected	1.2.1 Create green and welcoming streetscapes (Deliver)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will enhance Depena Reserve through delivery of an architecturally designed building.
	1.2.2 Ensure public buildings are well maintained as important community hubs with the opportunity for shared and multiple use of facilities (Deliver, Advocate)	
	1.2.3 Facilitate greater connectivity through active transport (Deliver, Partner, Advocate)	
	1.2.4 Support and deliver cultural and arts facilities, programs, events, and opportunities (Deliver, Partner, Advocate)	
1.3 Bayside's places are people focussed	1.3.1 Activate local areas and town centres with facilities valued by the community (Deliver, Partner)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will enhance Depena Reserve through delivery of an architecturally designed building. This will enhance the quality and amenity of the Reserve, supporting the creation of a vibrant, visually appealing place.
	1.3.2 Create and maintain vibrant, visually appealing, and welcoming places with their own village atmosphere	

	and sense of identity (Deliver, Partner, Advocate)	The future building is expected to be architecturally designed, resulting in a high quality outcome.
	1.3.3 Promote innovative and well-designed local developments which incorporate open space and put people first (Deliver, Partner, Advocate)	
1.4 Bayside's transport system works	1.4.1 Promote adequate, accessible, reliable public transport for ease of travel to work and leisure (Advocate)	The proposal is consistent with this theme as it seeks to ensure the deliver of a fit for purpose café / restaurant building well serviced by public transport and within a high quality walking catchment.
	1.4.2 Promote Bayside as a 30-minute City where residents do not have to travel for more than 30 minutes to work (Advocate)	
	1.4.3 Support an effective and efficient local road network through investment in maintenance and reduced traffic issues in Bayside (Deliver, Partner, Advocate)	
Theme 2 – In 2032 our people will be connected in a creative City	**Strategies**	**Consistency**
2.1 Bayside celebrates and respects our diverse community	2.1.1 Reflect and celebrate cultural diversity in Bayside's activities (Deliver, Partner)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will be architecturally designed, which will support community uses of the park.
	2.1.2 Support cultural and arts events that reflect and involve community (Deliver, Partner)	
	2.1.3 Treat community members with dignity and respect (Deliver, Partner, Advocate)	
	2.1.4 Value, respect and celebrate Bayside's shared heritage and history (Deliver, Partner, Advocate)	
2.3 The community feels valued and supported	2.3.1 Engage and communicate with all community members (Deliver)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will be architecturally designed, which will support community uses of the park.
	2.3.2 Promote access to active recreation, health care and education services to support a healthy community (Deliver, Partner, Advocate)	
	2.3.3 Provide services and facilities which ensure all community members feel a sense of belonging, including children, families, young people, and seniors (Deliver, Advocate)	
	2.3.4 Value and acknowledge our pets, and	

	welcome them across Bayside (Deliver, Advocate)	
	2.3.5 Work with our partners to ensure flexible care/support arrangements for seniors, children, people with disabilities and vulnerable members of our community are available across Bayside (Partner, Advocate)	
2.4 The community is united and proud to live in Bayside	2.4.1 Develop and support community connections and networks which enhance resilience (Partner, Advocate)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will be architecturally designed, which will support community uses of the park.
	2.4.2 Develop and support emerging community leadership (Partner)	
	2.4.3 Ensure Council's decisions reflect community objectives and desires (Deliver)	
	2.4.4 Engage effectively with community and provide information in a timely manner (Deliver)	
	2.4.5 Foster a sense of community pride in and satisfaction with Bayside (Deliver, Partner, Advocate)	
	2.4.6 Support community to play their part and imagine the future together (Partner, Advocate)	
Theme 3 – In 2032 Bayside will be green, resilient, and sustainable	**Strategies**	**Consistency**
3.1 Bayside is resilient to economic, social, and environmental impacts	3.1.1 Build community capacity and resilience to prepare for, cope with, adapt to and recover from economic, social, and environmental impacts (Deliver, Partner, Advocate)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will support the broader economy by providing a place for business and employment. The future building will be designed to appropriately respond to the environmental consideration of the site.
	3.1.2 Engage with community to provide an appropriate response to threats and adverse events (Deliver, Partner)	
	3.1.3 Promote education about climate change so that the community understands the potential impacts (Deliver, Partner, Advocate)	
	3.1.4 Support and promote local climate and resilience leadership and initiatives (Partner, Advocate)	

3.3 Bayside's waterways and green corridors are regenerated and preserved	3.3.1 Capture and reuse rainwater at Council facilities where feasible (Deliver)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will enhance Depena Reserve, provide opportunities for increased tree canopy, and respond appropriately to environment and biodiversity considerations.
	3.3.2 Enhance and extend green grid corridors (Deliver, Partner, Advocate)	
	3.3.3 Increase Bayside's tree canopy (Deliver)	
	3.3.4 Involve community in the preservation of natural areas (Deliver, Partner)	
	3.3.5 Respect, manage and protect the natural environment and biodiversity (Deliver, Partner)	
Theme 4 – In 2032 Bayside will be a prosperous community	**Strategies**	**Consistency**
4.1 Bayside generates diverse local employment and business opportunities	4.1.1 Encourage and support improved employment outcomes for First Nations peoples (Deliver, Partner, Advocate)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will support the broader economy by providing a place for business and employment.
	4.1.2 Monitor socio-economic outcomes and work with partners to identify actions Council can support (Partner)	
	4.1.3 Support innovative and new and emerging businesses to locate in Bayside (Partner, Advocate)	
	4.1.4 Support local apprenticeships and cadetships, as a major employer (Deliver, Advocate)	
4.2 Bayside recognises and leverages opportunities for economic development	4.2.1 Support major employers to partner with local small business (Advocate)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will support the broader economy by providing a place for business and employment.
	4.2.2 Take advantage of Bayside's position as an international hub for transport and logistics related business (Advocate)	
	4.2.3 Preserve industrial lands and employment lands and partner with major employers to support local jobs (Deliver, Partner)	
	4.2.4 Encourage participation from creative industries and entrepreneurial businesses (Advocate)	
	4.2.5 Ensure local Plans and regulations have kept pace with the sharing economy	

	(Deliver)	
4.3 Council is financially sustainable and well governed	4.3.1 Ensure Council decision making is transparent, and data driven (Deliver)	The proposal is consistent with this theme as it seeks to allow for the delivery of a fit for purpose café / restaurant building which will support the broader economy by providing a place for business and employment.
	4.3.2 Foster a customer centric culture (Deliver)	
	4.3.3 Invest in a skilled and dynamic workforce to meet future challenges, meet accountability and compliance requirements, and deliver Council's quadruple bottom line: social, environmental, economic, and civic leadership (Deliver)	
	4.3.4 Manage Council assets to meet community expectations within available resources (Deliver)	
	4.3.5 Manage Council finances for the long-term benefit of the community and to prioritise infrastructure funding commitments (Deliver)	
	4.3.6 Plan for growth and development so the benefits of prosperity are shared (Deliver)	

Bayside Local Housing Strategy

The purpose of the Bayside Local Housing Strategy (Bayside LHS) is to set the strategic framework and vision for housing in the Bayside LGA up to 2036.

The Planning Proposal does not impact upon this draft Strategy as it does not seek to deliver or prevent the delivery of housing.

Q5 Is the planning proposal consistent with any other applicable State and regional studies or strategies?

Premier's Priorities 2015-2019

The 'Premier's Priorities' set out 12 priorities which reflect a 'whole-of-government' approach to tackling important issues for the people of NSW, from helping vulnerable children and raising the performance of school students, to improving housing affordability and building local infrastructure. The 12 priorities are:

- Creating jobs;
- Delivering infrastructure;
- Driving public sector diversity;
- Improving education results;
- Improving government services;
- Improving service levels in hospitals;
- Keeping our environment clean;

- Making housing more affordable;
- Protecting our kids;
- Reducing domestic violence reoffending;
- Reducing youth homelessness; and
- Tackling childhood obesity.

This Planning Proposal will not impact upon, and is consistent with, the Premier's Priorities.

Future Transport Strategy 2056

The Future Transport Strategy 2056 is an update of the 2012 Long Term Transport Master Plan for NSW. It is a 40-year strategy, supported by plans for regional NSW and for Greater Sydney. It outlines a vision, strategic directions and customer outcomes, with infrastructure and services plans underpinning the delivery of these directions across the state. The vision is built on the following six outcomes:

1. Customer Focused;
2. Successful Places;
3. A Strong Economy;
4. Safety and Performance;
5. Accessible Services; and
6. Sustainability.

This Planning Proposal is consistent with Future Transport Strategy 2056.

South East Sydney Transport Strategy (SESTS)

This Planning Proposal will have minimal impact on the SESTS and accordingly is consistent with this policy.

NSW State Infrastructure Strategy 2018-2038

The NSW State Infrastructure Strategy 2018-2038 (SIS) sets out the government's priorities for the next 20 years and combined with the Future Transport Strategy 2056, the Greater Sydney Region Plan and the Regional Development Framework, brings together infrastructure investment and land-use planning for our cities and regions. The SIS looks beyond the current projects and identifies policies and strategies needed to provide the infrastructure that meets the needs of a growing population and a growing economy.

The Strategy sets out six overarching strategic directions to instil best practice approaches across NSW's infrastructure sectors:

1. Continuously improve the integration of land and infrastructure planning;
2. Plan, prioritise and deliver an infrastructure program that represents the best possible investment and use of public funds;
3. Optimise the management, performance and use of the State's assets;
4. Ensure NSW's existing and future infrastructure is resilient to natural hazards and human related threats;
5. Improve state-wide connectivity and realise the benefits of technology; and
6. Drive high quality consumer-centric services and expand innovative service delivery models in infrastructure sectors.

This Planning Proposal reflects, and is consistent with, the objectives of the NSW State Infrastructure Strategy.

Q6 Is the planning proposal consistent with applicable SEPPs?

Consistency with the relevant State Environmental Planning Policies is provided in Table 4 below:

Table 3 – Consistency with Bayside Community Strategic Plan 2018-2032 themes

State Environmental Planning Policy	Comment	Consistent: Yes/ No (if No, is inconsistency adequately justified?)
SEPP (Biodiversity and Conservation) 2021	Objective of this SEPP is for the management and maintenance of existing 'prescribed vegetation' is required prior to issue of development consent. Consistent as the proposal will not seek removal of vegetation or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes
SEPP (Exempt and Complying Development Codes) 2008	Consistent as the proposal does not seek to challenge or amend the application of the exempt or complying development provisions of this SEPP on the site or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes
SEPP (Industry and Employment) 2021	Consistent as the proposal does not seek to challenge or amend the application of this SEPP and the governance of signage on the site or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes
SEPP (Planning Systems) 2021	Consistent as the proposal does not seek to challenge or amend the application of this SEPP on the site or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes
SEPP (Precincts—Eastern Harbour City) 2021	Consistent as the proposal does not seek to challenge or amend the application of this SEPP on the site or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes
SEPP (Resilience and Hazards) 2021	Consistent as the proposal does not seek to challenge or amend the application of this SEPP on the site or otherwise impact the ongoing application of the provisions of this SEPP. Compliance Division 3 of Chapter 2 to be addressed with any DA will need to be demonstrated by any subsequent applications for the future building.	Yes

State Environmental Planning Policy	Comment	Consistent: Yes/ No (if No, is inconsistency adequately justified?)
SEPP (Sustainable Buildings) 2022	Consistent as the proposal does not seek to challenge or amend the application of this SEPP on the site, considerations of sustainability or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes
SEPP (Transport and Infrastructure) 2021	Consistent as the proposal does not seek to challenge or amend the application of this SEPP on the site or otherwise impact the ongoing application of the provisions of this SEPP. Ongoing compliance will need to be demonstrated by any subsequent applications for the future building.	Yes

Q7 Is the planning proposal consistent with applicable Ministerial Directions (section 9.1 Directions) or key government priority?

Table 5 below reviews the consistency of the draft Planning Proposal with the relevant Local Planning Directions for LEPs under section 9.1 of the Environmental Planning and Assessment Act 1979.

Table 5 – Consistency with Ministerial/ Local Planning Directions

No.	Title	Draft Planning Proposal consistency with terms of direction	Consistent: Yes/ No (if No, is inconsistency adequately justified?)
Focus area 1: Planning Systems			
1.1	*Implementation of Regional Plans* The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.	This planning proposal supports the Greater Sydney Region Plan, as discussed in detail under the sections relating to Eastern City District Plan and Sydney Regional Plan	Yes
1.3	*Approval and Referral Requirements* The objective of this direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development.	This planning proposal does not include concurrence, consultation or referral provisions or identify any developments as designated development.	Yes

1.4	*Site Specific Provisions* The objective of this direction is to discourage unnecessarily restrictive site specific planning controls.	This planning proposal does not include any development standards or requirements in addition to those already contained in the principal environmental planning instrument being amended.	Yes
Focus area 3: Biodiversity and Conservation			
3.1	Conservation Zones		
3.2	*Heritage Conservation* The objective of this direction is to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.	The subject site is not identified as having any heritage significance. Sites immediately adjacent are identified as being of local significance but given the small scale of the proposal and the maximum cap of gross floor area, any such impacts can be resolved as part of future assessments for buildings on the site. Any future development will need to demonstrate that impacts on the heritage significance of adjoining land is appropriate.	Yes
3.7	*Public Bushland* The objective of this direction is to protect bushland in urban areas, including rehabilitated areas, and ensure the ecological viability of the bushland	Given the proposed location of the future building as detailed in Appendix 1, it is unlikely that the proposal will affect surrounding public bushland or existing hydrological landforms like Waradiel Creek.	Yes
Focus area 4: Resilience and Hazards			
4.1	*Flooding* The objectives of this direction are to: (a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and (b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.	The subject site is identified as being partially flood affected. The Figure below identifies the area of flood affectation.  A Flood Risk Management Report is provided at Appendix 4: Flood Risk Management Report. The Flood Risk Management Report identifies that the subject site is appropriate for a similar type and scale of development subject to further design development considerations. Critically, the additional (and existing) land use proposed is for a café / restaurant and does not constitute any sensitive land uses as identified in the	Yes

		Section 9.1 Directions.	
4.2	*Coastal Management* The objective of this direction is to protect and manage coastal areas of NSW.	The site is subject to the Georges River Estuary Coastal Zone Management Plan which is transitioning to a Coastal Management Plan under the Georges Riverkeeper group. The planning proposal does not contravene the Coastal Zone Management Plan. It seeks to formalise and existing land use which will permit the development of a contemporary restaurant / café which will be appropriately design for the site. The proposal is consistent with this direction as it does not seek to change any of the restricted maps or result in development which is of a greater intensity than what is currently on site.	Yes
4.4	*Remediation of Contaminated Land* The objective of this direction is to reduce the risk of harm to human health and the environment by ensuring that contamination and remediation are considered by planning proposal authorities.	This planning proposal is consistent as the proposal only seeks to include an additional permitted land use in Schedule 1 of the BLEP 2021 which is currently present on site. No rezoning of land is proposed, with the proposed land use similar to uses currently occurring on site.	Yes
4.5	*Acid Sulfate Soils* The objective of this direction is to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.	This planning proposal is supported by an Acid Sulfate Soils Statement provided at Appendix 3: Acid Sulfate Soils Statement. The Statement identifies that there is unlikely to be any acid sulfate soils to be present at the Site to a depth of 6m. The statement identifies that no further investigation or testing is required for Acid Sulfate Soils, and an Acid Sulfate Soil Management Plan is not required for the Site. As such, the proposal is considered to be consistent with this direction, with no need for additional planning provisions beyond that which currently apply to the site. Also the concept plans do not show intention of any excavation of groundwork that will impact ASS	Yes
Focus area 5: Transport and Infrastructure			
5.1	*Integrating Land Use and Transport* The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:	The objectives of this Direction are to improve accessibility, increase transport options, reduce travel demand and dependence on cars, support public transport, and provide for efficient movement of freight. The proposal seeks to permit additional land uses on a site in an area well serviced by non-private vehicle based modes of transport, such as active and public transport. The site can be accessed via bus routes 303 connecting Sans Souci to Prince of Wales Hospital	Yes

	(a) improving access to housing, jobs and services by walking, cycling and public transport, and (b) increasing the choice of available transport and reducing dependence on cars, and (c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and (d) supporting the efficient and viable operation of public transport services, and (e) providing for the efficient movement of freight.	and 478 that connects Miranda to Rockdale through Ramsgate. Bus stops servicing both routes in either direction are located on Russell Ave to the north and west of the site. In additional to public transport, the subject site is also located on popular active transport routes along Ramsgate Beach which connects Taren Point through to the Cooks River in Marrickville and beyond As detailed in the sections above, the proposal addresses the various requirements of the LSPS and EDCP that relate to transport infrastructure.	

C Environmental, social and economic impact

Q8 Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected because of the proposal?

There are no identified critical habitat or threatened species, populations or ecological communities, or their habitats which will be impacted by the proposal.

Q9 Are there any other likely environmental effects of the planning proposal and how are they proposed to be managed?

The proposed amendments and likely environmental effects resulting from the proposed additional permitted land use are minimal. This is because the proposed land use is currently occurring on site. Notwithstanding, critical issues not addressed elsewhere within this planning proposal are addressed below.

Traffic and Transport

The proposal is supported by a Traffic Technical Memorandum which is provided at Appendix 2: Traffic Statement. The memorandum provides a high-level review of the traffic- and parking-specific matters associated with the proposed amendments. Future development would be limited to a restaurant / café, due to the nature of the proposed amendments. The memorandum notes that future traffic generation potential will be similar to, or less than, the existing Le Beach Hut café, resulting in minimal additional impacts from traffic and transport.

It should be noted that Appendix 2 specifically identifies that:

However, it is noted that the Planning Proposal will reduce the net GFA within the subject land. A detailed traffic impact assessment (TIA) report will be prepared by SLR to accompany the DA for the proposed Dolls Point Café following the approval of this Planning Proposal. Based on the reduction in

GFA and the anticipated marginal traffic generated by the Planning Proposal, it is considered appropriate to lodge the Planning Proposal without detailed traffic analysis.

Building Bulk, Visual impact and Scale

A concept scheme has been prepared and detailed in the Design Report provided at Appendix 1: Architectural Design Report. The concept seeks to create a sensitive built form that respects the significant heritage, ecological, and environmental nature of the Reserve and its surrounds. Critically, the proposal demonstrates that future development does not detract from the scenic qualities of the park.

The redevelopment of the existing building creates opportunities to enhancing the connection between the built form and the site and deliver a new contemporary building which responds to community needs.

The form, mass and materiality of the concept scheme, are designed to ensure that the building reads as a single storey building, recessive to the Reserve. The proposed landscape design ensures that the building has high connectivity to existing pedestrian networks, and the planting scheme is reflective of the Reserve's planting palette.

The concept scheme demonstrates that any future development permitted by the proposed planning amendments would be appropriate to the site, subject to a rigorous design and assessment process which would be required under the Environmental Planning and Assessment Act 1979.

Acoustic Impact

Any future development would be subject to further detailed design development and consultation with the community. However as identified in the appended Design Report, the concept scheme consider potential acoustic impact. This has been addressed through location of outdoor plant, through incorporating an open air plant platform. The platform is located over the Bin room and recessed into the roof space to minimise the equipment's visual mass when viewed from the street, as well as the residential dwellings across from Russell avenue.

Noise impacts from patrons would be managed through setting limits for the internal open air courtyard during daytime and night time hours. This will ensure that the development does not cause adverse acoustic impacts to the Reserve and adjacent dwellings.

It should be noted that the existing use is currently operating and has received minimal complaints.

Cook Park Plan of Management and Masterplan

The Design Report, provided at Appendix 1: Architectural Design Report identifies that the reserve falls under the Cook Park Plan of Management and Masterplan. The Masterplan points to the Reserve and the surrounding areas as having environmental and heritage significance. It notes that Cook Park contains:

- Ecologically significant sand dunes and dune vegetation along the foreshore north of Brighton.
- Culturally significant plantings such as pines in Pine Park, Coral Trees and Norfolk Island Pines at Dolls Point and Norfolk Island Pines along The Grand Parade.
- Swathes of open grassland with scattered trees providing recreation facilities and habitat for birds.
- Key heritage sites and features including cannons at Brighton and Sandringham.
-

The Masterplan identifies Cook Park as having significant regional and state importance, based on evidence of pre-European Aboriginal use. It recommends that any changes or development in the Park should not negatively impact on the natural environment of both land and water and provide opportunities for interpretation of the Park's natural and cultural heritage.

The Masterplan also directly provides recommendations for both the Reserve and the existing building, Le Beach Hut. It recommends ensuring that clear access is maintained through or around leased premises, ensuring facilities provided are available for use to the public, and ensuring any renovations keep the premises at an appropriate standard with respect to scale, bulk, height and floor space.

The concept design provided at Appendix 1: Architectural Design Report, details how this will be achieved.

Q10 Has the planning proposal adequately addressed any social and economic effects?

Due to the nature of the proposed amendments, there are limited social and economic effects of the development. Any impacts of future development will need to be appropriately considered and addressed during future development applications.

The proposed amendment will allow for the replacement of an aging building with a contemporary built for purpose architecturally designed building. This will create opportunities for the activation and enhancement of the open space. It also creates economic opportunities for future businesses operating out of a purpose-built facility.

The proposal will create approximately 5 jobs during construction and between 1-3 FTE during operation depending on the size of restaurant and method of operation.

The proposal will create the opportunity for a new fit for purpose restaurant / café building in Depena Reserve. The provision of a new restaurant / café will enhance the usability and function of Depena Reserve, enhancing the ability of the Reserve to become a social connector for the broader community. Accordingly, the proposal provides significant public benefit through improving the quality and function of Depena Reserve.

D Infrastructure (Local, State and Commonwealth)

Q11 Is there adequate public infrastructure for the planning proposal?

The subject site is in an area well serviced by existing infrastructure. The proposal seeks to permit an additional land use which is already occurring on the subject site to facilitate the redevelopment of the existing building.

The proposed additional land use will provide additional services for the broader community and as such, it is considered that there are sufficient public infrastructure to support the proposed amendment. It is unlikely that the proposal would generate such significant additional demand on existing public infrastructure such as public transport as a result of the modest size of the proposed restaurant / café.

E State and Commonwealth interests

Q12 What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

Planning Proposal – Planning Proposal to Amend Schedule 1 of the Bayside Local Environmental Plan 2021 to enable an Additional Permitted Use (Café/Restaurant) in RE1 Public Recreation zone

Given the modest scale of the planning proposal and that it seeks to formalise and existing land use which has operated on the site since the 1950s, it is considered that no views of state or federal public authorities are required prior to preparing a gateway determination.

Planning Proposal – Planning Proposal to Amend Schedule 1 of the Bayside Local Environmental Plan 2021 to enable an Additional Permitted Use (Café/Restaurant) in RE1 Public Recreation zone

Part 4 – Mapping

The planning proposal will require updating of the Additional Permitted Uses Map - Sheet APU_007 as detailed in Figure 5 below with a reference made to Schedule 1 of the BLEP 2021 which will list the additional permitted use of *Restaurant / Café*.

Figure 5 – Example of mapping amendment showing Additional Permitted Use to be listed in Schedule 1 (The Planning Studio)

Part 5 - Community Consultation

Community consultation will be undertaken in accordance with the requirements of the Gateway determination.

It is proposed that, at a minimum, this will involve the notification of the public exhibition of this planning proposal on the Bayside Council website and in writing to the owners and occupiers of adjoining and nearby properties and relevant community groups.

It is expected this planning proposal will be publicly exhibited for at least 20 working days consistent with the recommendation for Standard planning proposals under Department of Planning and Environment 's Local Environmental Plan Making Guideline.

It is proposed that exhibition material be made available on the Bayside Council website.

Consultation with relevant NSW agencies and authorities and other relevant organisations will be undertaken in accordance with the Gateway determination.

Part 6 – Project Timeline

The table below provides a proposed timeframe for the project.

Table X – Approximate Project Timeline

Task	Timing
Report considered at Bayside Local Planning Panel Meeting	11 June 2024
Report considered at City Planning and Environment Committee Meeting	10 July 2024
Report considered by Bayside Council Meeting (to submit draft PP to DPE for Gateway Determination)	24 July 2024
Submit to DPE for Gateway Determination	August 2024
Gateway Determination issued by DPE	September 2024
Anticipated timeframe for completion of any further justification required by Gateway Determination	October - November 2024
Public exhibition and consultation with agencies	December - January 2024
Timeframe for consideration of submissions	January – February 2025
Bayside Council City Planning and Environment Committee Meeting (to consider submissions and recommend submitting to DPE for finalisation)	March / April 2025
Bayside Council Meeting (resolution to finalise LEP Amendments)	March / April 2025
Submission to DPE to finalise LEP Amendments	April 2025
Anticipated timeframe for finalisation of LEP Amendment	June / July 2025

Appendices

Appendix 1: Architectural Design Report

Appendix 2: Traffic Statement

Appendix 3: Acid Sulfate Soils Statement and Geotechnical Investigation

Appendix 4: Flood Risk Management Report

Design Report

for

New Restaurant and Kiosk Development and Associated Landscaping
179 Russell Avenue, Dolls Point NSW 2219

Revision	Date	Author
A	18/07/23	Sam Crawford Architects
B	15/12/23	Sam Crawford Architects

Prepared for:

Bayside Council

Prepared by:

sam crawford architects

The site that this project is located on is Kamey Country, and we acknowledge the Gadigal / Bidjigal people of the Eora Nation - the traditional owners of this land.

Part 1: The Brief

1.1 Existing Site

Peter Depena Reserve (henceforth titled the Reserve) is located within Dolls Point, a small suburb in southern Sydney. The existing site is described as Lot 67-70 on DP 2237, 179 Russell Avenue, Dolls Point NSW 2219. The suburb consists of a combination of low rise apartments (three to four storeys), and one to two storey detached residential dwellings. The Reserve is a popular park for local families and the wider community. It is bordered by Russell Avenue and Carruthers Drive to its north, Waradiel Creek to its west, and Dolls Point Beach along its south east. There are two public carparks along the north of the Reserve. The site is located on Kamey Country and is traditionally owned by the Gadigal/Bidjigal people of the Eora Nation.

1.2 Existing Building

The existing building, called Le Beach Hut, is a single storey building of approximately 825 square metres in footprint, built around the 1950s. The building comprises of a restaurant and separate kiosk. The building is owned by Bayside Council. Due to the building's aging condition, Council has decided to demolish it and build a new restaurant and kiosk building. Bayside Council has engaged Sam Crawford Architects (SCA) for the design of this new building.

1.3 Brief

The brief is for a new contemporary restaurant building, including separate kiosk, public toilets, and associated landscaping. The restaurant is to include full commercial kitchen, cold and dry store, bin room, and restaurant toilets. The building is to take advantage of the scenic views to Dolls Point Beach and the Reserve, as well as its proximity to the adjacent playground to its west. The building is to be a benchmark in sustainability, be robust, and relate to the site. As part of a separate project, Council is also undertaking upgrades to the carparks north east and north west of the building, and improving the traffic junction at the junction of Russell Avenue, Malua Street, and Carruthers Drive.

1.4 Purpose of Design Report

The existing building is currently operating under Existing Use Rights. Under the current Environmental Protection and Assessment Regulation 2021 clause 163, a new commercial premises is not permitted if it is replacing an existing commercial premise which is operating under Existing Use Rights. This Design Report supports a Planning Proposal prepared by Bayside Council to meet the objectives under clause 163, as well as the objectives set under Section 9.1 Direction: Heritage Conservation, from the NSW Minister for Planning.

Figure 1.a: Aerial map of site

Part 2: Site Analysis

2.1 Cook Park Plan of Management and Masterplan

The Reserve falls under the Cook Park Plan of Management and Masterplan (henceforth titled as the Masterplan). The Masterplan points to the Reserve and the surrounding areas as having environmental and heritage significance. It notes that Cook Park contains (refer Masterplan page 18):

- *Ecologically significant sand dunes and dune vegetation along the foreshore north of Brighton.*
- *Culturally significant plantings such as pines in Pine Park, Coral Trees and Norfolk Island Pines at Dolls Point and Norfolk Island Pines along The Grand Parade.*
- *Swathes of open grassland with scattered trees providing recreation facilities and habitat for birds.*
- *Key heritage sites and features including cannons at Brighton and Sandringham.*

The Masterplan points to Cook Park as having significant regional and state importance, based on evidence of pre-European Aboriginal use. It recommends that any changes or development in the Park should not negatively impact on the natural environment of both land and water and provide opportunities for interpretation of the Park's natural and cultural heritage.

The Masterplan also directly provides recommendations for both the Reserve and the existing building, Le Beach Hut. It recommends ensuring that clear access is maintained through or around leased premises, ensuring facilities provided are available for use to the public, and ensuring any renovations keep the premises at an appropriate standard with respect to scale, bulk, height and floor space.

2.2 Existing Structures on Site

The existing Reserve is open in nature, with mature Norfolk Island Pines (amongst other species) along the foreshore and also within the park. There are various structures within the Reserve; an amenities building built around 2018, various shade structures and picnic sheds, a newly upgraded playground, Georges River Sailing Club to the south of the Reserve, and the existing restaurant building. Scotts College (Primrose House) is located north east of Le Beach Hut.

Across from Russell Avenue, the predominant building type are three storey walk up brick residential apartments (figure 2c).

Figure 2a: Norfolk Island Pines at the Reserve

Figure 2b: Playground shade sails in the Reserve

Figure 2c: Typical residential three storey brick walk up apartment buildings north of the Reserve

Part 2: Site Analysis (continued)

2.3 Prevailing Winds

The site is primarily affected by southerly and easterly winds, coming from the water. On site discussions with the operator of Le Beach Hut revealed that due to these strong prevailing winds, outdoor seating was limited to a north facing courtyard north of the building (with plastic drop down blinds being used on its east). Views to the water and Reserve are restricted from this courtyard location.

2.4 Orientation

The existing building has a predominately north frontage, addressing Russell Avenue. The building does not have any pedestrian access points in its east, west and south elevations.

2.5 Vehicular and Pedestrian links

The primary pedestrian access to the building is from the north. There is a convoluted traffic interchange north of the building where pedestrian access intermingles with vehicular traffic. The confluence of these two elements obscures the entry to the building (figure 2f). There are existing footpaths surrounding the building in the Reserve (figure 2e) that does not connect to the building.

2.6 Existing Building

The existing building's floor level is at RL 2.320. It has various roof forms, including a small gable roof which has a ridge of RL 7.510. Projecting towards the street is a gable roof canopy which has a ridge of RL 6.120. The rest of the form is a low pitch gable with a ridge of RL 6.500 and a gutter line of approximately RL 6.000. As the land rises to its south, and combined with the low ceilings of the building, views from the restaurant to the water and Reserve are compromised and obstructed (figure 2g).

2.7 Flooding

The site is flood affected. A flood report by Council recommended the new building RL to be set at RL 3.00, approximately 700mm above the existing building floor level.

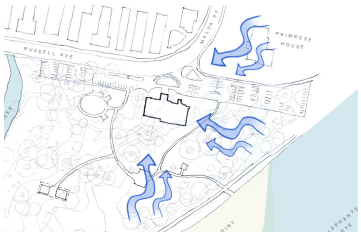


Figure 2d: Prevailing winds

Figure 2e: Existing pedestrian & vehicular networks

Figure 2f: Existing building viewed from Russell Avenue

Figure 2g: View south from inside existing building.

Part 3: Concept Design

3.1 Concept Design

Using our site analysis and Masterplan as a basis for the concept design process, SCA developed schemes to meet the functional brief of a high end restaurant and that would also respond to the heritage and environmental character of the Reserve.

Key to the resolution of the above is a floor plan that centred around a "U" shaped building, allowing for a north facing internal courtyard that is protected from the southern and eastern winds. The schemes ensured deep penetration of winter sun to the open air courtyard and internal dining spaces. Patrons in the courtyard would be able to enjoy views to the water and Reserve through the predominately glazed restaurant, maximising the connection between all parts of the building and its site. Various locations of the kitchen and amenities were tested to optimise their functional relationships within the building and their connection to the site (figure 3a). The chosen concept design that underwent further design development (figure 3b) was circular in shape, with an opening at the north facing the street.

The proposed building's north frontage is set 3m further south when compared to the existing building's north frontage. This allows for an increased buffer between Russell Avenue and the restaurant, ensuring that the building's main entry can be understood more clearly from the road. The new building is also sited to ensure that the mature fig tree, west of the existing building, would not be adversely impacted. The siting and shape of the building also ensured that unrestricted pedestrian access would be maintained around the building between the public road to the Reserve.

In considering the building form and its relationship to the site, an examination into the structure of the Norfolk Island Pines was undertaken. The Pines, identified as significant in the Masterplan from both a heritage and ecological point of view, has a consistent horizontal datum in its under canopy. The distinct conical shape of the tree's crown created "V" shaped pockets of sky (figure 3d). The development of the building form drew inspiration from the horizontal datum and the negative space created by the Norfolk Pines.

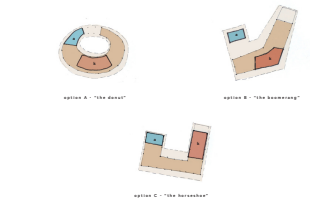


Figure 3a: Concept schemes revolving around a protected indoor courtyard

Figure 3b: Prevailing winds diagram on preferred concept

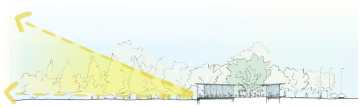


Figure 3c: Concept section of preferred concept

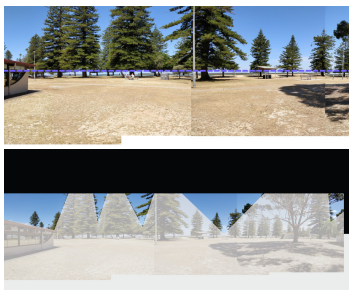


Figure 3d: Diagrams showing the horizontal datum of the Norfolk Pine under canopy, and the negative spaces of the sky its canopy creates.

Part 4: Design Development

4.1 Building Form

The three dimensional building form takes cues from the site and reflects a desire to ensure the building is subservient to the Reserve and its heritage and ecological significance. A low verandah wrap up around roof creates a horizontal datum for the building, preserving its single storey appearance and also reflecting the horizontal datum set by the Norfolk Island Pine's under canopy. A series of triangular taller pop up elements puncture the roof in the dining space, referencing the triangular negative spaces created by the Pine's iconic shape (figure 4a). The pop up roof incorporates high level windows, allowing for views to the trees and sky from the restaurant and penetration of sunlight. Internally, the pop up elements creates dynamic ceiling lines (figure 4d).

The building floor plan was changed from a circular form to a rectilinear form following from Council's feedback, to maximise flexibility for the future tenant.

The dining space is located in the eastern wing of the building, with storage, amenities, and kiosk in the western wing. The commercial kitchen occupies the southern portion of the building. A protected courtyard is located within the "U" of the building, with gates providing after hours security to the courtyard. A large covered verandah wraps around the building along the east, west and southern elevations, providing ample opportunity for outdoor seating in good weather. The verandah roof provides a 3m overhang to the dining space glazing, protecting the patrons from solar heat gain. The wrap up verandah softens the building edge, creating a gentle transition between the external walls and the Reserve.

The courtyard is kept unroofed to allow for penetration of winter sun into the space as well as the dining area. The walls of the dining space are largely glazed, with both operable and fixed double glazed windows.

4.2 Floor area

The gross floor area of the building (measured from inside face of external walls) is 300 sq.m. The roofed area of the proposed building is 615 sq.m. The existing building has a roofed area of envelope of approximately 930 sq.m.

Figure 4a: 3D perspective from north.

Figure 4b: Sections of proposed building.

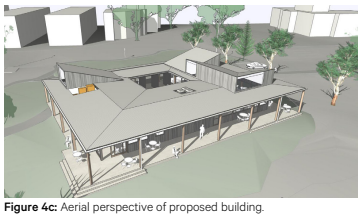


Figure 4c: Aerial perspective of proposed building.

Figure 4d: Interior of restaurant.

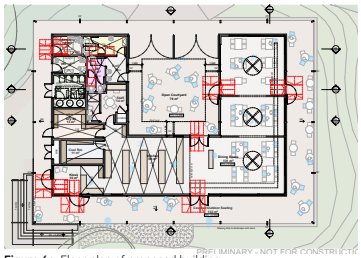


Figure 4e: Floor plan of proposed building.

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Part 4: Design Development (continued)

4.3 Height

Though the building had to be raised approximately 700mm above the floor level of the existing building to address the issue of flooding, the building form was designed to ensure it could be still understood as a single storey building.

The maximum height of the new building (the ridge of the pop up roof elements) is RL 8.935. The top of gutter of the wrap up lower vendarah is approximately 2.3m lower, at RL 6.590. Despite the new building's maximum height being approximately 1.4m higher than the existing building's maximum height, the building area is significantly smaller compared to the existing (approximately 34% reduction). Further, the pop up roof elements only occur sporadically in the development, and the consistent roof element is the lower verandah roof. Hence overall, the building visual mass of the proposed development is comparable to the existing building, if not more recessive.

4.4 Set backs

The proposed building occupies roughly the same location as the existing building, but set further back from Russell Avenue. It is set back from the west site boundary by 125m (existing west set back 117m), from the south boundary by 24m (existing south set back 21m, from the east site boundary by 22m (existing east set back 17m), and north site boundary 12m (existing north set back 9m), 22m (existing east set back 17m), and north site boundary 12m (existing north set back 9m).

4.5 Materiality

As the building is located in both a public Reserve and in a marine environment, finishes have been chosen for their durability, sustainability, ease of maintenance, and to reflect the natural setting of the Reserve. External walls are clad in a charred vertical timber cladding, creating a recessive appearance to reduce the mass of the building. Roof sheeting is in Colorbond Ultra to withstand the marine environment. A board formed concrete veneer is proposed to the lower portion of the wall and a pre-finished fibre cement product (Barestone) is proposed for the upper portion of the wall. The difference in wall cladding material creates horizontal datums that helps further break down the scale of the building. The Barestone and board formed concrete, though not natural materials, have textural qualities that reflect materials found in nature. External columns

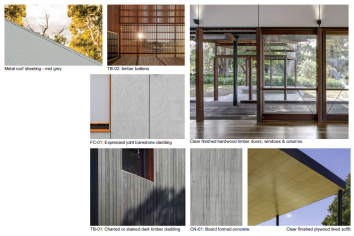

Figure 4f: Proposed external material and finishes

Figure 4g: Proposed material and finishes, viewed from inside courtyard.

are in clear finished hardwood, and the verandah soffit in marine grade plywood. External windows and door frames are clear finished recycled hardwood. Solid doors are painted solid core doors with metal frames. External wall materials and external columns will be finished in an anti-graffiti sealer.

4.6 Sustainability

Council's brief for this building was for it to be a bench mark in sustainability. The building is designed to maximise passive cooling, thermal performance, and energy efficiency through the use of the following; low carbon concrete specification, ceiling fans in the dining space, solar panels on the roof, simple construction techniques minimising use of steel, generous shading devices for all glazing, heat pump for cooling and heating, energy and water efficient fixture and fittings, and rainwater collecting and re-use.

Part 5: Landscape Design

5.1 Landscape Design

The landscape design recognises that the new development and associated landscape is a key landmark and activator for the Reserve and the surrounding neighbourhoods. The proposed landscape will be a continuation of the high quality landscape that was recently completed as part of the Reserve playground upgrade. The landscape design embodies four key principles:

Shelter and Comfort: Significant prevailing winds and windblown sand can be mitigated with strategic planting, which can contribute to spatial definition around the cafe and provide seasonal interest using native planting palettes that reflect existing planting in the Reserve.

Connection: The Reserve is a popular park with valued amenity offerings. The landscaping around the new development provides an opportunity for enhanced integration with the various amenities on site.

Resilience: Capturing, filtering and slowing on-site stormwater from the building and surrounding hardstand provides opportunities for resilient habitat creation and water sensitive urban design.

Space Making: Articulation in the landscape creates attractive and multifunctional spaces for people

5.2 Hardscape Works and Path Connections

The building is perceived in the round, hence it is important to ensure that the building can be equally accessed from existing primary pedestrian access points. Ensuring the objectives of Masterplan are met, new accessible pathways connect the building's north, east, and west elevations to the east and west carparks and to the western pedestrian path adjacent to the playground. In the eastern carpark, as part of the development, two new compliant accessible car spaces are being proposed.

To the south, to maintain the open nature of the Reserve and minimise the introduction of new impervious surfaces, a path was not proposed. The landscape design surrounding the building is also free of any physical barriers such as fencing, ensuring that pedestrian movement is not restricted around the building.

Figure 5a: Landscape design site analysis

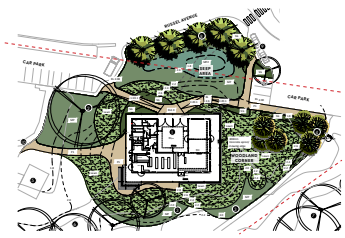

Figure 5b: Proposed landscape design

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Part 5: Landscape Design (continued)

5.3 Softscape Works

The aim of the new soft planting is to strike an appropriate balance between providing a gentle buffer between the Reserve and the new restaurant, and to ensure that the open nature of the park is maintained. A lawn batter with a gentle gradient is proposed around the perimeter of the building to meet the new building floor level. The lawn batter allows for informal seating areas for patrons to spill out from the restaurant and take in the scenic quality of the Reserve. The lawn batter is separated from the Reserve with areas of mass planting, sculpted to form shapes that are curvilinear and reflect the natural geometries of the park.

To the north, a planted area is proposed along with new trees. The trees and planting form an acoustic buffer between Russell Avenue and the restaurant, and the ground will be sculpted to form a natural drainage basin as part of the landscape design's resilience and water urban sensitive design strategy.

Selected species will reflect the Reserve's existing planting stock. A mix of low height flaxes, rushes, sedges, shrubs, grasses, and ground covers will preserve the Reserve's natural setting and ensure the development is consistent with the existing scenic quality of the Reserve.

A small grove of proposed trees, east of the building, creates a "Woodland Corner" an area for informal seating and enjoyment under a shaded canopy.

Figure 5c: Photos of adjacent landscape in the Reserve

Figure 5d: Proposed species mix of new planting

Part 6: Services

6.1 Rainwater and stormwater management

In compliance with Bayside Council's DCP, an On-site Detention system (OSD) is proposed. The OSD tank strategy ties into the development's landscape design resilience strategy. The drainage basin at the north of the project is designed to capture the overflow from the OSD tank, further slowing down the release of stormwater capture into the existing water table. All rainwater and surface run off (captured by downpipes, various pits and grates) will first be directed into the OSD tank. If the tank overflows, the overflow is directed into the drainage basin, which allows the overflow water to slowly disperse into the water table.

Further to this, and underground rainwater collection tank is proposed. The rainwater tank will re-use water for toilet flushing and irrigation.

6.2 Acoustic Measures

Consideration was made as to where to locate the outdoor units for the air conditioning system and the heat pump. To minimise the acoustic impacts to the Reserve at ground level, an open air plant platform was incorporated into the design (figure 6b). The platform is located over the Bin room and recessed into the roof space to minimise the equipment's visual mass when viewed from the street, as well as the residential dwellings across from Russell avenue.

Patron limits will be set for the internal open air courtyard (both daytime and night time hours) to ensure that the development does not cause adverse acoustic impacts to the Reserve and adjacent dwellings.

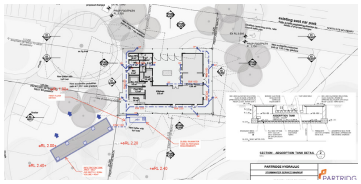

Figure 6a: Civil engineering drawing showing underground rainwater tank and OSD tank

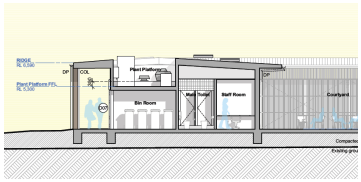

Figure 6b: Architectural section showing recessed open air plant platform at roof levelw planting

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Part 7: Conclusion

The new restaurant and kiosk, and associated landscape design, at the Peter Depena Reserve seeks to create a sensitive built form that respects the significant heritage, ecological, and environmental nature of the Reserve and its surrounds.

The building does not detract from the scenic qualities of the park, but rather, takes cues from it, enhancing the connection between the built form and the site.

The form, mass and materiality of the building and its associated landscape design, are all designed to ensure that the building reads as a single storey building, recessive to the Reserve. The proposed landscape design ensures that the building has high connectivity to existing pedestrian networks, and the planting scheme is reflective of the Reserve's planting palette.

The design complies with the objectives set out in the Masterplan as well as the Ministerial Direction 9 Heritage Conservation 3.2.

We trust that this proposal will be viewed favourably.

Technical Memorandum

SLR

To:	Benjamin Chan	**From:**	Charlie Seventekin
Company:	Sam Crawford Architects		**SLR Consulting Australia**
cc:	Hannah Alsop	**Date:**	20 October 2023
		Project No.	620.V14014.00001

RE: Dolls Point Planning Proposal
179 Russell Avenue, Dolls Point
Traffic Engineering Advice

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Sam Crawford Architects (SCA) to provide traffic engineering advice in relation to the submission of a Planning Proposal to amend the current zoning of land in Dolls Point.

The subject land is located at 179 Russell Avenue in Dolls Point, NSW 2219 and it is more formally described across 14 different lots in Deposited Plans (DPs) 733218, 733218 and 2237. Property report generated by NSW Government's Planning Portal website is provided in **Attachment A** which provides additional information on the lot that are part of the subject land.

Subject land comprises Peter Depena Reserve and Le Beach Hut Café and is zoned as RE1 – Public Recreation according to Bayside Local Environmental Plan (LEP) which was published on 27 August 2021.

It is understood that a Planning Proposal is required to enable the replacement of the existing café (Le Beach Hut) with a new café (Dolls Point Café) as the current zoning does not permit café / restaurant land use and Le Beach Hut café is operating under their existing rights. However, at the time of writing, it is not clear to SLR what new zoning is proposed.

Plans of the proposed new Dolls Point Café, prepared by SCA, is provided in **Attachment B**.

1.1 Proposed Masterplan

It is also understood that Council is seeking to enhance customer experience for the new café through creation of a new masterplan which is currently under development by Council. The proposed masterplan, although not completed, is understood to be improving the existing two public carparks that are located to the east and west of the subject land. A review of the preliminary masterplan also indicated that civil works will be undertaken to improve traffic circulation.

A preliminary plan of the proposed masterplan is included in **Attachment C**.

1.2 Assessment Scope

This technical memorandum has been prepared to undertake a high-level review of the traffic- and parking-specific matters associated with the proposed Planning Proposal. It is understood that the existing café is operating under their existing use rights, however a planning proposal is required to enable a future development application (DA) for the proposed Dolls Point Café. This technical memorandum, at a preliminary level, assesses the consistency of the proposed Planning Proposal with Council's Development Control Plan (DCP), RTA Guide to Traffic Generating Development (2002) and State Environmental Planning Policy (SEPP) Transport and Infrastructure 2021.

2.0 Existing Conditions Appraisal

2.1 Subject Land Context

The subject land is located at 179 Russell Avenue in Dolls Point and within the local government jurisdiction of Bayside Council. The land comprises an existing café and is bound by Peter Depena Reserve, Cook Park and Dolls Point Playground to the east, south and west respectively. There are several residential / commercial developments to the north.

The subject land is illustrated in **Figure 1**.

Figure 1 Subject Land in Local Context

2.2 Road Network Planning and Cumulative Traffic Impacts

In order to determine the location and nature of any other Planning Proposals or planned road upgrades in the vicinity of the subject land, SLR carried out a review of publicly available materials online. SLR's review included the following publicly available sources:

- NSW Planning Proposals Online https://www.planningportal.nsw.gov.au/ppr.
- NSW Major Projects https://www.planningportal.nsw.gov.au/major-projects.
- Bayside Council DA Tracker https://eplanning.bayside.nsw.gov.au/ePlanning/Pages/XC.Track/SearchApplication.aspx?as=n.

SLR's review indicated that there were no proposed major transport infrastructure upgrades or Planning Proposals / developments in the vicinity of the subject land.

2.3 Surrounding Road Network

Details of the key roads surrounding the subject land are shown in **Figure 1** with details provided in **Table 1**.

Table 1 Key Surrounding Roads

Road Name	Classification	Authority	Description	Posted Speed
Russell Avenue	Local	Council	Two lanes, bi-directional, undivided, parking permitted on both sides of the carriageway.	50km/h, except school zone hours (40km/h).
Malua Street			Two lanes, bi-directional, undivided, parking permitted on both sides of the carriageway.	50km/h, except school zone hours (40km/h).
Carruthers Drive			Partially trafficable. One lane, one-way, parking not permitted.	50km/h, except school zone hours (40km/h).
Skinners Avenue			Parking partially permitted. Two lanes, undivided.	Unposted (Default 50 km/h).
Gannon Avenue			Two lanes, bi-directional, undivided, parking permitted on both sides of the carriageway.	50km/h, except school zone hours (40km/h).
Norman Avenue			Two lanes, bi-directional, undivided, parking permitted on both sides of the carriageway.	50km/h.

Table 1 identifies that there are no classified roads in the vicinity of the subject land. Proposal. Based on this and the small nature of the Planning Proposal, it is anticipated that this Planning Proposal will not require Transport for New South Wales (TfNSW) concurrence. It is anticipated that Council and Department of Planning and Environment (DPE) will make the determination in relation to the rezoning of the subject land.

3.0 Planning Proposal Overview

3.1 Context

The Planning Proposal involves the demolition of all existing structures in the subject land, including an existing café, namely La Beach Hut. It is also proposed that a new café (Dolls Point Café) will be developed within the subject land following the rezoning.

Based on email correspondence between SLR, Sam Crawford Architects and Bayside Council dated 27 June 2023, it is understood that the Planning Proposal will result in a reduction in the total gross floor area (GFA) in the subject land.

The existing and proposed land uses and GFA details are also summarised in **Table 2**.

Table 2 Planning Proposal Land Use and Yield Details

Land Use	GFA (sqm)
Café (Existing: La Beach Hut)	-825
Café (Proposed: Dolls Point Café)	+300
Net Change	-525

4.0 Traffic Impact Assessment

At the time of writing, no traffic surveys have been undertaken to establish the traffic generation potential of the existing La Beach Hut café. However, it is noted that the Planning Proposal will reduce the net GFA within the subject land. A detailed traffic impact assessment (TIA) report will be prepared by SLR to accompany the DA for the proposed Dolls Point Café following the approval of this Planning Proposal.

Based on the reduction in GFA and the anticipated marginal traffic generated by the Planning Proposal, it is considered appropriate to lodge the Planning Proposal without detailed traffic analysis.

5.0 Design Considerations

At the time of writing, design details of the Planning Proposal and masterplan are not concluded, however, the current proposals have been reviewed by SLR. These are discussed below.

5.1 Servicing

The servicing strategy for the site meets the standards set out in the Bayside DCP Section 3.5.6. This includes a 6.4m loading bay which accommodates an SRV. Swept path analysis showing an SRV accessing and egressing the site in a forward gear has been undertaken and is provided at **Attachment D** for reference.

5.2 Car Parking

Through recent correspondence with Council, SLR have been advised that the Dolls Point Café development cannot rely on car parking for its sole use, as this would preclude equitable access for other users of the broader master plan public space. This proposition makes no change to the existing parking arrangements for the Le Beach Hut business, and as the future development provides a reduced GFA in comparison, future parking demands should be readily accommodated within the master planned public parking supply.

5.3 Cycle Parking

The cycle parking strategy for the site meets the standards set out in the Bayside DCP Section 3.5.4. The standards for Commercial Premises (Business Premise, Office Premise, and Retail Premise) are set out below:

- 1 bicycle space per 150sqm GFA;
- 1 bicycle space per 400sqm of GFA provided by visitors;
- 1 motorcycle space per 15 car parking spaces.

Given the above DCP Control, it is proposed to provide 6 cycle parking spaces for employees and visitors. These are shown to the west of the proposed Café on the drawings included at **Attachment B**. Motorcycle parking will be provided as part of the wider masterplan.

6.0 Recommendations

Based on the early analysis undertaken in this report, the following is recommended:

- A detailed TIA be undertaken for the Dolls Point Café following the approval of this Planning Proposal to confirm the traffic generation potential of the existing La Beach Hut café and future Dolls Point Café to identify the net traffic impacts on the surrounding road network.

- A design review be undertaken for the trafficable and car parking areas within the masterplan in the vicinity of the subject land.

7.0 Conclusions

Based on the preliminary analysis undertaken in this report, the following has been concluded:

- Subject Planning Proposal is consistent with the existing land uses/ businesses that currently operate in the subject land.
- It is anticipated that the proposed new Dolls Point Café's traffic generation potential will be similar to or less than the existing La Beach Hut café.
- It is identified that the two public car parking lots in the vicinity of the subject land generally have sufficient car parking spaces to cater for the Planning Proposal.

Regards,

SLR Consulting Australia

Hannah Alsop
Senior Project Consultant – Transport Advisory

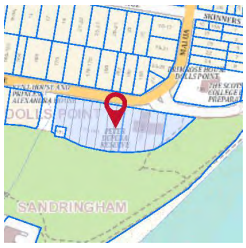
Enclosed – Attachments A to D.

Reviewed by: Brendyn Rheinberger
Review date: 20/10/2023

ATTACHMENT A – PROPERTY REPORT

Property Report

179-183 RUSSELL AVENUE DOLLS POINT 2219



Property Details

Address:	179-183 RUSSELL AVENUE DOLLS POINT 2219		
Lot/Section /Plan No:	2/-/DP733218	3/-/DP733218	66/-/DP2237
	67/-/DP2237	68/-/DP2237	69/-/DP2237
	70/-/DP2237	71/-/DP2237	72/-/DP2237
	73/-/DP2237	74/-/DP2237	75/-/DP2237
	76/-/DP2237	77/-/DP2237	
Council:	BAYSIDE COUNCIL		

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Bayside Local Environmental Plan 2021 (pub. 27-8-2021)
Land Zoning	RE1 - Public Recreation: (pub. 21-4-2023)
Height Of Building	NA
Floor Space Ratio	NA
Minimum Lot Size	NA
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA
Acid Sulfate Soils	Class 3

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

NSW GOVERNMENT

Property Report

179-183 RUSSELL AVENUE DOLLS POINT 2219

- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Excluded (pub. 21-10-2022)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Georges River Catchment (pub. 21-10-2022)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Subject Land (pub. 2-12-2021)
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application (pub. 25-6-2004)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing) 2021: Land Application (pub. 26-11-2021)
- State Environmental Planning Policy (Industry and Employment) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Planning Systems) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Primary Production) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Resilience and Hazards) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Resilience and Hazards) 2021: Land Application (pub. 23-9-2022)
- State Environmental Planning Policy (Resilience and Hazards) 2021: Subject Land (pub. 23-9-2022)
- State Environmental Planning Policy (Resources and Energy) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Transport and Infrastructure) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development: Land Application (pub. 26-7-2002)

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

Local Aboriginal Land Council	METROPOLITAN
Regional Plan Boundary	Greater Sydney

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)

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ATTACHMENT B – DEVELOPMENT PLANS

DOLLS POINT CAFE

179 RUSSELL AVENUE, DOLLS POINT, NSW

ISSUE F - OCTOBER 2023

Bayside Council
Serving Our Community

sam crawford architects

SQ1

Contents

Analysis

The cafe and associated landscape is a key landmark and activator for Doll's Point and the surrounding neighborhoods. The proposed landscape will be a continuation of the high quality landscape that was recently completed as part of the Depena Reserve playground upgrade.

Legend

- Site
- Green open space
- Bus Stop
- Bike path
- Water bodies
- Creekline
- Main roadway
- Secondary roadway

Key Principles

Shelter and Comfort

Significant prevailing winds and windblown sand can be mitigated with strategic planting which can contribute to spatial definition around the cafe and provide seasonal interest using native planting palettes approved by Bayside Council.

Connection

Depena Reserve is a popular park with valued amenity offerings. The landscaping around the Doll's Point Cafe provides an opportunity for enhanced integration with the various amenities on site.

Resilience

Capturing, filtering and slowing on-site stormwater from the building and surrounding hardstand provides opportunities for resilient habitat creation.

Space Making

Articulates the landscape to create attractive and multifunctional spaces for people

Landscape Design Statement

PROJECT OVERVIEW

Dolls Point Cafe building is perched up above its surroundings, accentuating views of the surrounding park and Botany Bay beyond. To knit the building into its immediate surroundings a sloping lawn meets the southern deck, providing an informal dining, seating area with the opportunity for locals to recline on the well-drained embankment while they enjoy a coffee or sandwich.

A ring of low-lying swales surround the building, celebrating the water's journey from the cafe roof to the bio-retention basin on the edge of the car park. The basin also collects and treats surface runoff from surrounding hardstand areas.

The Woodland corner to the east of the cafe sets-up a green edge to the car park while providing an intimate, shaded nook, with seating and space for preprogrammed play. The sense foliage along its northern and eastern edges provides shelter from the prevailing winds, while opening up to views towards the south-east.

Meandering pathways connect the cafe to a number of other facilities in the park including the newly constructed playground, alfresco dining shelters, open fields and the pedestrian track along the water's edge.

MATERIALITY & URBAN ELEMENTS

Proposed materiality for the project connects with the existing public domain palette.

Detailed design of elements such as paving, furniture, fencing and lighting will be developed further during detailed design.

VIEWS/PRIVACY

The design acknowledges the opportunity to provide communal open space that takes advantage of key views over the park and towards the bay.

AMENITY

The design incorporates a variety of amenities such as spill-out spaces for the Cafe, lawn seating berms and sheltered kickabout space.

ACCESSIBILITY

Gently graded pathways will provide accessibility for all age groups and degrees of mobility, ensuring that residents can access site amenities comfortably. Paths are rationally laid out into a clear and identifiable network, assisting orientation for visitors and access to and from building entries.

LIGHTING

Lighting will ensure adequate levels of illumination to address CPTED, and will be delivered in an artful way to express key features of the design – architectural façade elements, landscape features, and wayfinding signage.

Unobtrusive lighting will be incorporated where appropriate to enable night time recreational use.

DRAINAGE & IRRIGIATION

Consideration has been given to the incorporation of low water demand and low maintenance plant species in all areas to reduce mains consumption and fertiliser contamination of drainage water.

Permanent irrigation will be provided to all soft landscape areas.

SOIL

The planting comprises of a complementary mix of indigenous species. Soil profiles will be provided which have modest nutrient levels, particularly phosphorus. Suggested material would equal Australian Native Landscapes 'Low P' mixture.

PLANT ESTABLISHMENT & MAINTENANCE

An experienced landscape maintenance contractor will be engaged to keep all plant material in a state of health and vigour after practical completion.

Landscape Plan

Existing trees

	Existing trees to be retained no.11

New proposed trees

	Acacia implexa 45ltr no.5
	Banksia integrifolia 45ltr no.3
	Banksia marginata 45ltr no.3

Lawn (1178m²)

Lawn	*Rolled Cynodon Dactylon* (Couch Turf)

Meadow Planting Mix (680m²)

MP	*Bossiaea cinerea* 140mm@1/m² *Austrostipa stipoides* 140mm@2/m² *Patersonia occidentalis* 140mm@1/m² *Ficinia nodosa* tubestock@3/m² *Poa labillardieri* tubestock@3/m²

Meadow Planting Mix (Seep Area) (176m²)

MP2	*Lomandra longifolia* 140mm@2/m² *Lomandra multiflora* 140mm@1.5/m² *Juncus usitatus* 140mm@0.5/m²

Shrubs and Groundcovers Planting Mix (453m²)

SG	*Correa alba* 140mm@1.5/m² *Myoporum insulare* 140mm@1/m² *Olearia axillaris* 140mm@1/m² *Carpobrotus rossi 'White'* 140mm@0.5/m²

Hard Landscape

P1	Insitu Concrete Walkway Finish: Brushed 520m²
P2	Stabilized Gravel 40m²
	Lawn Edging Finish: Timber 151Lm
	Bicycle Rack Finish: Steel 3no

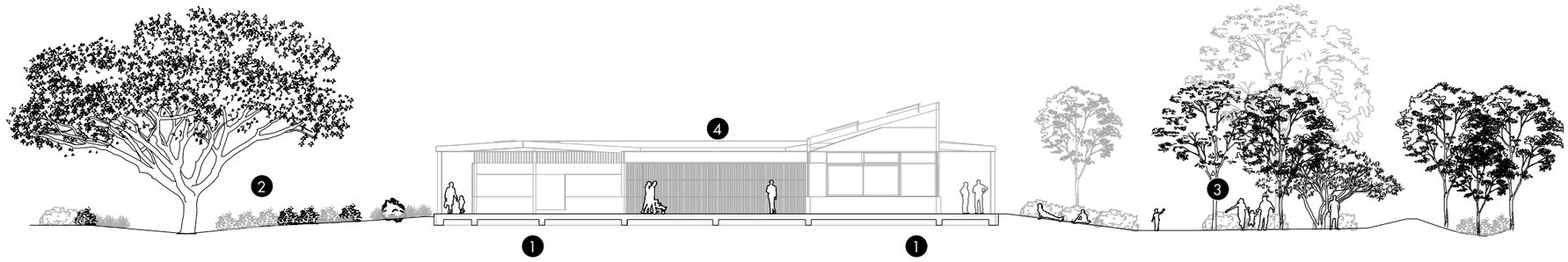
Legend

1. Dolls Point Cafe
2. Existing fig tree in Meadow planting
3. Meadow planting areas
4. Dense planted edge up to 1.2m high
5. Sheltered alfresco dining area
6. Existing trees
7. Depena Reserve open lawns
8. New trees along the bioretention pond's northern edge
9. Loading zone with stabilized gravel
10. Pathway towards playground

Landscape Sections

Legend

1. Dolls Point Cafe
2. Existing fig tree in Meadow planting
3. Woodland Corner - Dense planted edge with shaped mounds
4. Courtyard



0 5m
SCALE - 1:200 @ A3

Planting Palette

MIXES:

MEADOW PLANTING MIX
MEADOW PLANTING MIX (SEEP AREA)
SHRUBS AND GROUNDCOVERS PLANTING MIX

CATEGORIES:

GRASSES & FLAXES
Austrostipa stipoides (Coast Spear Grass)
Patersonia occidentalis (Native Iris)
Poa labillardieri (Tussock Grass)

RUSHES & SEDGES
Ficinia nodosa (Club Rush)
Lomandra longifolia (Basket Grass)
Lomandra multiflora (Mat Rush)
Juncus usitatus (Common Rush)

GROUNDCOVERS
Carpobrotus rossi 'White' (Pig face)

SMALL SHRUBS
Correa alba (White Correa)
Bossiaea cinerea (Showy bossiaea)

LARGE SHRUBS
Myoporum insulare (Common boobialla)
Olearia axillaris (Coastal Daisybush)

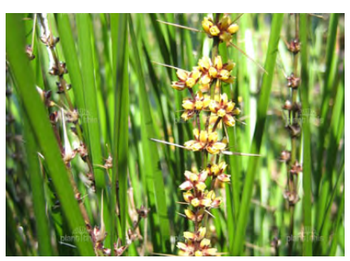
TREES
Acacia implexa (Hickory Wattle)
Banksia integrifolia (Coast Banksia)
Banksia marginata (Silver Banksia)











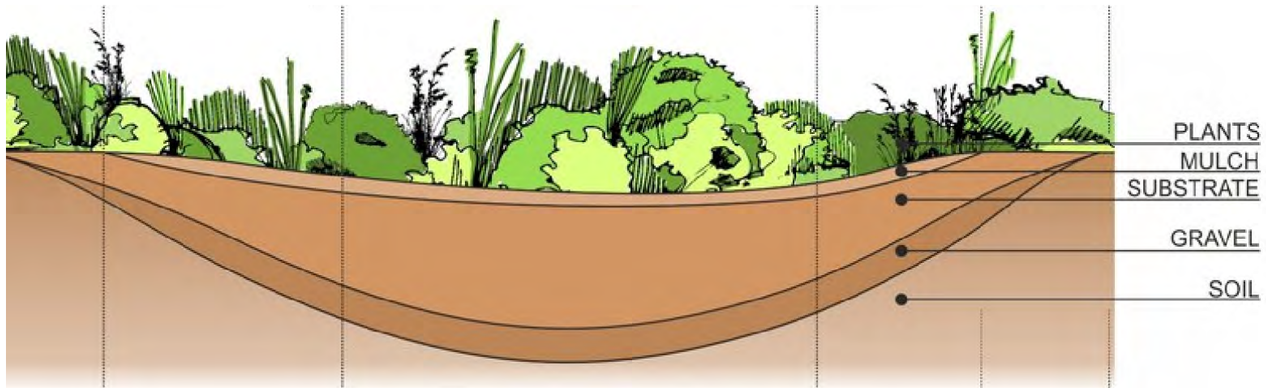
Precedent Images

Brushed Concrete Pathways

Shrub and Groundcover Planting

Meadow Planting

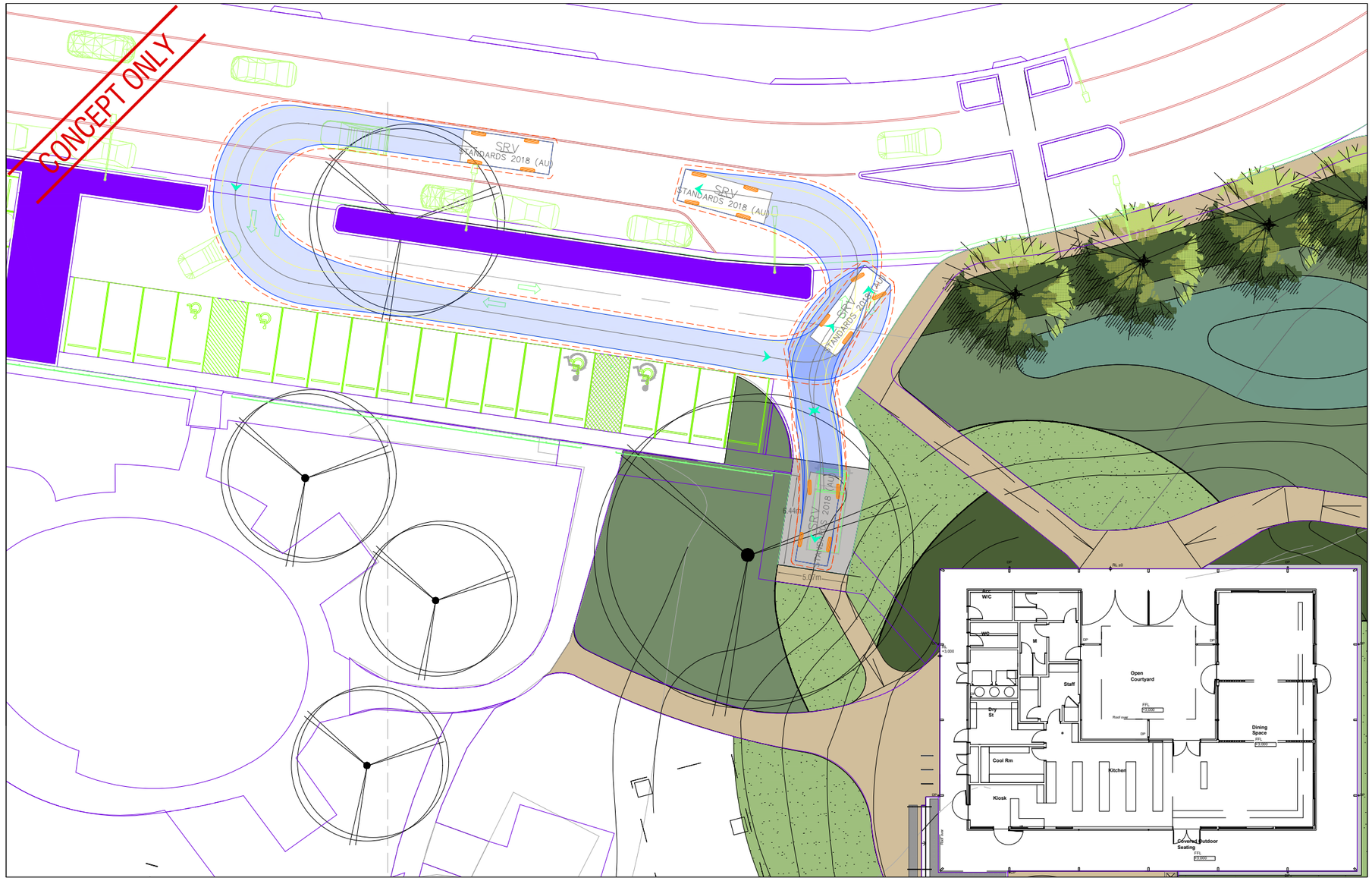
Meadow Planting (Seep Area) Section



ATTACHMENT C – PROPOSED MASTERPLAN


PARKING TOTALS - OPTION 2
TYPE
COUNT
EASTERN
ACCESSIBLE
ANGLE
MOTORCYCLE
WESTERN
ACCESSIBLE
ANGLE
Grand total: 121
1 OPTION 2 LAYOUT
SCALE 1 : 500
BAYSIDE COUNCIL
DEPENA RESERVE AND COOK PARK SANDRINGHAM - CARPARK UPGRADE
OPTION 2 LAYOUT
SCALE @ A1 1 : 500
Drg No. SK006 B
25/05/2023 B ISSUED FOR COORDINATION
09/05/2023 A ISSUED FOR COSTING
DATE NO DESCRIPTION
NORTH
SCALE BAR
SCALE 1:500 @ ORIGINAL SIZE
FOR INFORMATION

ATTACHMENT D – Swept Path Analysis

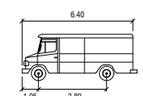


LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800

www.slrconsulting.com

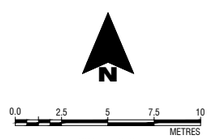
Project No:	620.000000
Date:	17/10/2023
Drawn by:	SP
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels



SRV

	meters
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.1



SCALE 1:250

Sam Crawford Architects

Dolls Point Cafe

SRV Loading Dock Movement

FIGURE SK01

LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800
www.slrconsulting.com

Project No:	620.14041.00001
Date:	17/10/2023
Drawn by:	SP
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels

6.40
1.05 3.80
SRV

	meters
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.1

N

0.0 2.5 5 7.5 10
METRES
SCALE 1:250

Sam Crawford Architects

Dolls Point Cafe

SRV Loading Dock Movement 2

FIGURE SK02

assetgeoenviro

Suite 2.06 / 56 Delhi Road
North Ryde NSW 2113
02 9878 6005
assetgeoenviro.com.au

Our ref: 5763-4-G1
7 December 2022

Bayside Council
c/– Sam Crawford Architects
Unit 4, 30 Wilson Street
Newtown NSW 2042

Attention: Benjamin Chan

Dear Benjamin,

Proposed Replacement of Commercial Building, 179 Russell Avenue, Dolls Point NSW
Additional Commentary, Acid Sulfate Soils

This letter provides additional commentary on acid sulfate soils for a proposed commercial building at 17 Russell Avenue, Dolls Point NSW (the Site). This was commissioned on 12 November 2021 by Benjamin Chan of Sam Crawford Architects on behalf of Bayside Council. The work was carried out in accordance with the email proposal by AssetGeoEnviro (Asset) dated 26 October 2021.

The letter is to address Ministerial Direction 4.5 issued under section 9.1(2) of the Environmental Planning and Assessment Act 1979, relating to Acid Sulfate Soils. This direction requires that the planning authority must include provisions to regulate works in acid sulfate soils, consistent with the Acid Sulfate Soils Model LEP in the Acid Sulfate Soils Planning Guidelines adopted by the Planning Secretary. The guidelines refer to the Acid Sulfate Soils Assessment Guidelines prepared by the Acid Sulfate Soils Management Advisory Committee (ASSMAC)[1].

Our previous Geotechnical Investigation (ref: 5763-1-G1; dated: 25 November 2019) included an Acid Sulfate Soil Assessment in accordance with ASSMAC, which involved drilling and sampling of soils to a depth of 6m, and laboratory testing for the presence of Actual Acid Sulfate Soils (AASS) and / or Potential Acid Sulfate Soils (PASS). The report indicated that AASS or PASS were not present at the Site to a depth of 6m which is below the proposed excavation depths. The report concluded that no further investigation or testing is required for Acid Sulfate Soils, and an Acid Sulfate Soil Management Plan is not required for the Site, in accordance with ASSMAC.

[1] Ahern C R, Stone, Y, and Blunden B (1998). Acid Sulfate Soils Assessment Guidelines Published by the Acid Sulfate Soil Management Advisory Committee, Wollongbar, NSW, Australia

This letter must be read in conjunction with the attached Important Information about your Geotechnical Report, and the previous Geotechnical Report.

❖❖❖

Please do not hesitate to contact the undersigned if you have any questions regarding this report or if you require further assistance.

For and on behalf of
AssetGeoEnviro

Mark Bartel
BE, MEngSc, GMQ, CPEng, RPEQ/NER(Civil), DEP/PRE (NSW)
Managing Director | Senior Principal Geotechnical Engineer

Encl: Important Information about your Geotechnical Report

Document Control

Distribution Register

Copy	Media	Recipient	Location
1	Secure PDF	Benjamin Chan	Sam Crawford Architects
2	Secure PDF	Mark Bartel	Asset Geotechnical Engineering

Document Status

Rev	Revision Details	Author	Reviewer		Approved for Issue		
			Name	Initials	Name	Initials	Date
0	Initial issue	M. Bartel			M. Bartel		7 December 2022

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ISO 9001:2015
ISO 14001:2015
ISO 45001:2018 AS/NZS 4801:2001

Important Information about your Geotechnical Report

assetgeoenviro

Scope of Services

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client and Asset Geotechnical Engineering Pty Ltd ("Asset"), for the specific site investigated. The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

The report should not be used if there have been changes to the project, without first consulting with Asset to assess if the report's recommendations are still valid. Asset does not accept responsibility for problems that occur due to project changes if they are not consulted.

Reliance on Data

Asset has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. Asset has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, Asset will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Asset.

Geotechnical Engineering

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

Limitations of Site Investigation

The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behavior with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

Therefore, the recommendations in the report can only be regarded as preliminary. Asset should be retained during the project implementation to assess if the report's recommendations are valid and whether or not changes should be considered as the project proceeds.

Subsurface Conditions are Time Dependent

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. Asset should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

Verification of Site Conditions

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that Asset be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

Reproduction of Reports

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. Asset assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Asset or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

Data Must Not Be Separated from The Report

The report as a whole presents the site assessment, and must not be copied in part or altered in any way.

Logs, figures, drawings, test results etc. included in our reports are developed by professionals based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Partial Use of Report

Where the recommendations of the report are only partially followed, there may be significant implications for the project and could lead to problems. Consult Asset if you are not intending to follow all of the report recommendations, to assess what the implications could be. Asset does not accept responsibility for problems that develop where the report recommendations have only been partially followed if they have not been consulted.

Other Limitations

Asset will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

assetgeoenviro

Bayside Council

Proposed Replacement Commercial Building
179 Russell Avenue, Dolls Point NSW

Geotechnical Investigation

Our ref: 5763-1-G1
25 November 2019

Geotechnics | Groundwater | Environmental

DOCUMENT AUTHORISATION

Proposed Replacement Commercial Building
179 Russell Avenue, Dolls Point NSW
Geotechnical Investigation

Prepared for Bayside Council

Our ref: 5763-1-G1
25 November 2019

For and on behalf of
AssetGeoEnviro

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Contents

1. INTRODUCTION

1.1 General

This report presents the results of a geotechnical investigation and preliminary acid sulfate soil assessment for the above project. The investigation was commissioned on 15 October 2019 by Yasmin McHutchison of Bayside Council. The work was carried out in accordance with the proposal by AssetGeoEnviro (Asset) dated 8 October 2019, reference 5763-P1.

Drawings supplied to us for this investigation comprised:

- Investigation location plans (provided by: Bayside Council; prepared by: Yasmin McHutchison; dated: 25 September 2019)

Based on the supplied drawings, we understand that the project involves the replacement of the existing "Le Beach Hut" café/restaurant on Depena Reserve. The replacement building is likely to be similar in scale and unlikely to have any significant below ground structure considering its closeness to Botany Bay. No scheme or detailed drawings have bene provided at this stage.

1.2 Scope of Work

The main objectives of the investigation were to assess the surface and subsurface conditions and to provide comments and recommendations relating to:

- Key geotechnical constraints to the development.
- Commentary on risk of saline soils.
- Assessment of risk of ASS from screening test results with recommendation for further testing as required.
- Excavation conditions and methodology.
- Subgrade preparation and earthworks.
- Site Classification as per AS2870 'Residential Slabs and Footings' (2011).
- Suitable foundation options and founding stratum.
- Allowable bearing pressure, end bearing and shaft adhesion for piles.
- Commentary on settlement.
- Maximum allowable permanent and temporary batter slopes.
- Groundwater conditions.

The following scope of work was carried out to achieve the project objectives:

- A review of existing regional maps and reports relevant to the site held within our files.
- Clearance of underground services at proposed test locations.
- Visual observations of surface features.
- Subsurface investigation at four locations to sample and assess the nature and consistency of subsurface soils and bedrock at accessible areas of the site.
- Acid sulfate screening tests.
- Further chemical analysis for acid sulfate soils based on the screening results.
- Engineering assessment and reporting.

This report must be read in conjunction with the attached "Important Information about your Geotechnical Report" in Appendix A. Attention is drawn to the limitations inherent in site investigations and the importance of verifying the subsurface conditions inferred herein.

2. SITE DESCRIPTION

The site is located on the southern side of Russell Avenue, Dolls Point, as shown in Figure 1. Located within Depena Reserve, it is bounded to the west by Waradiel Creek, to the south by Dolls Point Beach and to the east by Dolls Point.

Topographically, the site is located on gently sloping terrain to the north. The overall ground surface slopes in the region are about 2°.

At the time of the investigation, the site was occupied by Le Beach Hut, a single storey commercial building within Depena Reserve, part of Cooks Park. Paving comprising concrete and segmental pavers is located around the exterior of the building. There were no obvious cracks or settlement observed on the building or the external paved areas. The building and the surrounds appeared to be in moderate to good visual condition with respect to ground movement.

Vegetation comprises a thin covering of grass with Sandy topsoil present over much of the area peripheral to the building, and scattered large trees including fig, pine, and native species.

3. FIELDWORK & LABORATORY TESTING

3.1 Borehole Investigation

The fieldwork was undertaken on 1 November 2019 under the full-time supervision of a Geotechnical Engineer from Asset and included invasive investigation at four locations.

The test locations are shown in the attached Figure 2 and were set out by our Geotechnical Engineer by measurements relative to existing site features. Surface levels at the test locations were estimated by interpolation from Google Earth.

Buried metallic services and utilities within the site boundaries near the test locations were cleared by an accredited service location subcontractor and by referring to DBYD utility maps.

The invasive investigation included drilling of machine-drilled boreholes at four locations. The boreholes were auger drilled to a target depths of 6m below ground level (bgl). Standard Penetrometer Testing (SPT) was carried out within the soils at nominally 1.5m depth intervals to aid with an assessment of in-situ conditions.

Selected soil samples were retained for laboratory testing. Soils samples for Acid Sulfate Soil screening were taken at nominal 0.5m depth intervals and transported to a NATA registered laboratory under chain-of-custody protocols.

The subsurface conditions encountered were logged during drilling and testing. On completion of logging and sampling, the boreholes were backfilled with the drilling spoil.

Engineering logs are provided in Appendix B together with their explanatory notes.

3.2 Laboratory Testing

Soil and rock samples recovered during the fieldwork were delivered to a NATA registered laboratory. The following tests were carried out on selected samples:

- Potential acid sulfate soil (PASS) indicator tests (pH_f and pH_{fox}).
- Chromium Suite tests (Chromium Reducible Sulfur).

Test results are attached. Testing was carried out as described in the laboratory test results.

4. SUBSURFACE CONDITIONS

4.1 Geology

The Sydney 1:100,000 Geological Map indicates that the site is underlain by windblown sands with some silt and minor shell content.

4.2 Subsurface Conditions

A generalised geotechnical model for the site has been developed is shown in Table 1. For a detailed description of the subsurface conditions, refer the attached engineering logs and explanatory notes. For specific design input, reference should be made to the logs and/or the specific test results, in place of the following summary.

Table 1 - Generalised Site Geotechnical Model

Unit	Origin	Description	Depth to Top of Unit [1] (m)	Unit Thickness [1] (m)
1	Fill	FILL, Silty SAND, dark brown, fine grained, subrounded; trace gravel, fine grained, subangular, very loose to loose	Ground surface	0.2-0.5
2	Dune sand	SAND, pale brown/ grey / pale brown mottled dark brown/ pale brown mottled brown/ pale brown becoming grey , fine to medium grained, subrounded. Loose to dense	0.2-0.5	1.8-3.2
3	Marine sand	SAND, grey, fine to medium grained, subrounded, medium dense. SAND with shell fragments, grey, fine to medium grained, subrounded, loose to medium dense. Silty Clayey SAND with shell fragments, grey/dark grey, fine to medium grained, subrounded, medium dense Silty SAND with shell fragments, grey becoming dark grey, fine to medium grained, subrounded; trace organic material, loose to medium dense	2.2-3.4	Not proven beyond a depth of 6.0m

Notes:

1. The depths and unit thicknesses are based on the information from the test locations only and do not necessarily represent the maximum and minimum values across the site.

4.3 Groundwater

Groundwater was observed at a depth of 1.7m to 2.3m below ground level in the boreholes during auger drilling to depths of 6m bgl.

It is noted that the groundwater observation may have been made before water levels had stabilised. No long-term groundwater monitoring was carried out.

4.4 Laboratory Test Results

Results from the laboratory testing undertaken on selected soil samples are included in Appendix C summarised in Table 2 .

5. DISCUSSIONS & RECOMMENDATIONS

5.1 Acid Sulfate Soil Assessment

5.1.1 Geomorphic Criteria

ASSMAC[1] recommends the following geomorphic or site criteria be used to determine if acid sulfate soils are likely to be present:

a) Sediments of recent geological age (Holocene).
b) Soil horizons less than 5m AHD.
c) Marine or estuarine sediments and tidal lakes.
d) In coastal wetlands or back swamp areas; waterlogged or scalded areas; interdunal swales or coastal sand dunes (if deep excavation or drainage is proposed).
e) In areas where the dominant vegetation is mangroves, reeds, rushes and other swamp-tolerant or marine vegetation.
f) In areas identified in geological descriptions or in maps as bearing acid sulfide minerals, coal deposits or former marine shales/sediments.
g) Deep older estuarine sediments >10 metres below the ground surface, Holocene, or Pleistocene age (only an issue if deep drainage is proposed).

We note that criteria b) and c) are met for the subject site.

5.1.2 Soil Indicators

In accordance with ASSMAC, pH values of less than or equal to 4 indicate that actual acid sulfate soils (AASS) are present. Potential acid sulfate soils (PASS) are indicated where there is one but preferably more of the following:

- change in colour of the soil from grey tones to brown tones;
- effervescence (reaction rating of 2 or more):
  - 1 = no reaction to slight
  - 2 = moderate reaction
  - 3 = strong reaction with persistent froth
  - 4 = extreme reaction
- the release of sulfur smelling gases such as sulfur dioxide or hydrogen sulfide;
- a lowering of the soil pH by at least one unit; and
- a final pH_{fox} of < 3.5 (preferably <3)

[1] Stone, Y, Ahern CR, and Blunden B (1998). Acid Sulfate Soils Manual 1998. Acid Sulfate Soil Management Advisory Committee, Wollongbar, NSW, Australia.

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Table 2 – Laboratory Test Results: Acid Sulfate Soil

Assumed tonnes disturbed: 1000

Test location	Depth (m)	pH Screening Test Results					CRS Test Results								Action Critieria	
		Field pH (pHf)	Actual ASS?	pH fox	Drop in pH	Reaction Rating	Texture	pH-KCL	TAAs (% pyrite S)	S_{NAS} if pH-KCL <4.5 (%S)	Scr (%S)	ANC if pH-KCL >= 6.5 (%S)	Net Acidity (%S)	Net Acidity (mol H+/tonne)	Sulphur Trail S-POS (%)	Acid Trail TPA or TSA (mol/T)
BH2	0.5	8.2	No	5.1	3.1	1	C	6.5	<0.003	n/a	<0.005	n/a	0.02	10	0.03	18
BH2	1	8.5	No	4.8	3.7	1	C	6.9	<0.003	n/a	<0.005	0.02	0.02	10	0.03	18
BH2	1.5	9.4	No	7.1	2.3	3										
BH2	2	9.6	No	7.5	2.1	1										
BH2	2.5	9.7	No	7.5	2.2	1										
BH2	3	9.8	No	7.6	2.2	1	C	8.7	<0.003	n/a	<0.005	0.3	0.02	10	0.03	18
BH2	3.5	9.3	No	7	2.3	4										
BH2	4	9.3	No	7.6	1.7	1										
BH2	4.5	9.3	No	7.6	1.7	4										
BH2	5	9.3	No	7.6	1.7	1										
BH2	5.5	9.7	No	7.6	2.1	2										
BH2	6	9.5	No	7.2	2.3	1										
BH4	0.5	8.4	No	5.3	3.1	4										
BH4	1	9.6	No	7.5	2.1	1										
BH4	1.5	9.3	No	7.2	2.1	2										
BH4	2	9.8	No	7.6	2.2	2										
BH4	2.5	9.5	No	7.5	2	1										
BH4	3	9.5	No	7.6	1.9	1										
BH4	3.5	9.2	No	7.5	1.7	1										
BH4	4	9.2	No	7.4	1.8	3										
BH4	4.5	9.4	No	7.5	1.9	1										
BH4	5	9.4	No	7.2	2.2	3										
BH4	5.5	9.3	No	8	1.3	1										
BH4	6	9.3	No	7.5	1.8	1										

Samples tested in Table 2 indicated that PASS could be present, and therefore target samples were selected for further testing by Chromium Suite (Chromium Reducible Sulfur – CRS) testing.

5.1.3 Chemical Analysis

CRS test results were used to calculate "net acidity" by acid-based accounting methods as described below:

Net Acidity = Actual Acidity (as TAA) + Retained Acidity (as S_{NAS}) + Potential Acidity (as S_{CR}) – Acid Neutralising Capacity (ANC)

The test results indicated the following:

- All samples analysed returned existing acidity (TAA) below the laboratory detection limit (0.003%S).
- All samples had a pH-KCL of more than 4.5 so S_{NAS} not reported.
- All samples analysed returned an S_{CR} result below the laboratory detection limit (0.005%S).
- All samples had a pH-KCL of not greater than or equal to 6.5 so ANC not reported.
- Net Acidity (sulfur units) was below the ASSMAC Action Criteria (see Table 3, 1–1,000T disturbed, fine texture soils) of 0.03%S for all samples tested.
- Net Acidity (acidity units) was below the ASSMAC Action Criteria (see Table 3, 1–1,000T disturbed, fine texture soils) for Acid trail of 62 mol/T for all samples tested.

Table 3 – Action Criteria for Acid Sulfate Soil Management Plan

Soil Type/Texture Range	Action Criteria 1 - 1000 tonnes disturbed		Action Criteria > 1000 tonnes disturbed	
	Sulfur Trail S-POS (%)	Acid Trail TPA or TSA (mol/T)	Sulfur Trail S-POS (%)	Acid Trail TPA or TSA (mol/T)
Coarse Texture (sands to loamy sands)	0.03	18	0.03	18
Medium Texture (sandy loams to light clays)	0.06	36	0.03	18
Fine Texture (medium to heavy clays and silty clays)	0.1	62	0.03	18

5.1.4 Construction Implications / Management Strategies

The field observations and laboratory results on soil samples do not indicate the presence of PASS or AASS to a depth of 6.0m bgl. Excavation below this depth is not proposed. No further investigation or testing is required for Acid Sulfate Soils.

Based on the investigation findings, no specific ASS management is required for the proposed ground disturbances associated with the development.

5.2 Key Geotechnical Site Constraints

Based on client advice, no significant excavation is anticipated. Ground water was observed at relatively shallow depth. If excavation depth will exceed a depth of 1.7m, bulk excavation level could encounter groundwater.

Key geotechnical constraints to the development include excavation conditions, groundwater control (during construction and long-term), temporary shoring, permanent retaining, and foundation conditions. Recommendations for design and construction of the development are provided in the following sections.

5.3 Earthworks

5.3.1 Excavation

The excavation for the proposed development is anticipated to be fully within soils. Excavation within the soils would be achievable using conventional earthmoving equipment (i.e. hydraulic excavator bucket).

5.3.2 Subgrade Preparation

The following general recommendations are provided for subgrade preparation for earthworks, pavements, slab-on-ground construction, and minor structures:

- Strip any fill and topsoil. Remove unsuitable materials from the site (e.g. material containing deleterious matter). Stockpile remainder for re-use as landscaping material or remove from site.
- Excavate natural soils to design subgrade level, stockpiling for re-use as engineered fill or remove to spoil.
- Compact the upper 150mm depth to a density index (AS1289.5.6.1–1998) not less than 80%. Areas which show visible heave under compaction equipment should be over-excavated a further 0.3m and replaced with approved fill compacted to a density index not less than 80%.

Any waste soils being removed from the site must be classified in accordance with current regulatory authority requirements to enable appropriate disposal to an appropriately licensed landfill facility. Asset can provide further advice on this matter if required.

5.3.3 Filling

Where filing is required, place in horizontal layers over prepared subgrade and compact as per Table 4.

Table 4 – Compaction Specifications

Parameter	Cohesive Fill	Non Cohesive Fill
Fill layer thickness (loose measurement):		
• Within 1.5m of the rear of retaining walls	0.2m	0.2m
• Elsewhere	0.3m	0.3m
Density:		
• Beneath Pavements	≥ 95% Std	≥ 70% ID
• Beneath Structures	≥ 98% Std	≥ 80% ID
• Upper 150mm of subgrade	≥ 100% Std	≥ 80% ID
Moisture content during compaction	± 2% of optimum	Moist but not wet

Filling within 1.5m of the rear of any retaining walls should be compacted using lightweight equipment (e.g. hand-operated plate compactor or ride-on compactor not more than 3 tonnes static weight) to limit compaction-induced lateral pressures.

Any soils to be imported onto the site for back-filling and reinstatement of excavated areas should be free of contamination and deleterious material and should include appropriate validation documentation in accordance with current regulatory authority requirements which confirms its suitability for the proposed land use. Asset can provide further advice on this matter if required.

5.3.4 Batter Slopes

Recommended maximum slopes for permanent and temporary batters are presented in Table 5.

Table 5 – Recommended Maximum Dry Batter Slopes

Unit	Maximum Batter Slope (H : V)	
	Permanent	Temporary
Medium Dense Sand (or denser)	3 : 1	2 : 1

5.4 Site Classification

Where footings are founded on the underlying natural soils (Dune SAND or Marine SAND), then footings may be designed and constructed in accordance with the requirements in AS2870-2011 for a Class A site.

Footings should also be designed as per the recommendations in Section 5.5.

The classification and footing recommendations given above and in Section 5.5 are provided on the basis that the performance expectations set out in Appendix B of AS2870–2011 are acceptable and that future site maintenance is in accordance with CSIRO BTF 18, a copy of which is attached.

5.5 Footings

Suitable footings might comprise a slab on ground and pad and strip footings supporting the upper building loads. Any heavily concentrated loads could be founded on short piles (founded at nominally 2 m to 4 m below ground level) supported in friction within the medium dense sands.

Edge beams for slabs, pad footings, and friction piles may be designed for the parameters in Table 6.

Table 6 – Preliminary Foundation Design Parameters

Founding Stratum	Maximum Allowable (Serviceability) Values (kPa)			Ultimate Strength Limit State Values (kPa)			
	End Bearing	Shaft Friction – Compression #	Shaft Friction – Tension	End Bearing	Shaft Friction – Compression #	Shaft Friction – Tension*	Typical E_{field} MPa
Medium dense sand - shallow	150	– –	– –	450	– –	– –	7
Medium dense sand – piles nominal 2m to 4m bgl	500	15	10	1,500	45	30	7

Note:

* Uplift capacity of piles in tension loading should also be checked for inverted cone pull out mechanism.

clean socket of roughness category R2 or better is assumed

In accordance with AS2159-2009 "Piling–Design and Installation", for limit state design, the ultimate geotechnical pile capacity shall be multiplied by a geotechnical reduction factor (Φg). This factor is derived from an Average Risk Rating (ARR) which considers geotechnical uncertainties, redundancy of the foundation system, construction supervision, and the quantity and type of pile testing (if any). Where testing is undertaken, or more comprehensive ground investigation is carried out, it may be possible to adopt a larger

Φg value that results in a more economical pile design. Further geotechnical advice will be required in consultation with the pile designer and piling contractor, to develop an appropriate Φg value.

Settlements for pad footings on medium dense sand are anticipated to be up to about 25mm where loading does not exceed the maximum allowable values. Settlement for shallow piles designed in accordance with the above parameters is anticipated to be not more than about 10 mm. Settlement is predominantly immediate, occurring as construction proceeds.

Options for piles include:

Bored Piles. Uncased bored piles are not recommended within sand layer, due to hole collapsing once groundwater is encountered. Bored piles must be fully cased if this option is selected.

Continuous Flight Auger (CFA) Piles. CFA piles are constructed by drilling a hollow-stemmed continuous flight auger to the required founding depth. Concrete is then injected under pressure through the auger stem as the auger is extracted from the soil. The reinforcing cage is then inserted upon completion of the concreting process. Pile diameters vary from 300mm to 1200mm. Drilled spoil is produced during CFA piling, and must subsequently be removed from the site. CFA piles are considered non-displacement piles as defined in AS2159.

Steel Screw Piles. Hollow-stemmed steel piles fitted with a single or double helix at the tip are installed using specially modified hydraulic excavators. Shaft diameters typically vary from 90mm to 220mm and helix diameters vary from 350mm to 600mm. Single pile capacities range from 2 to 65 tonnes. However, given the anticipated relatively shallow founding depths, steel screw piles may be a practical and economical solution for this site.

Driven piles are not likely to be suitable as environmental factors including noise and vibration are likely to be unacceptable for the adjacent development.

An experienced Geotechnical Engineer should review footing designs to check that the recommendations of the geotechnical report have been included, and should assess footing excavations to confirm the design assumptions.

5.6 Groundwater Control

Limited groundwater observations made for this investigation are described in Section 4.3. The observations indicate that groundwater is unlikely to be a constraint to the proposed development. However, good practice should be followed to cater for potential groundwater, such as designing retaining walls with adequate subsoil drainage. Further geotechnical advice must be sought if significant groundwater is encountered during construction.

6. LIMITATIONS

In addition to the limitations inherent in site investigations (refer to the attached Information Sheets), it must be pointed out that the recommendations in this report are based on assessed subsurface conditions from limited investigations. To confirm the assessed soil and rock properties in this report, further investigation would be required such as coring and strength testing of rock and should be carried out if the scale of the development warrants, or if any of the properties are critical to the design, construction or performance of the development.

It is recommended that a qualified and experienced Geotechnical Engineer be engaged to provide further input and review during the design development; including site visits during construction to verify the site conditions and provide advice where conditions vary from those assumed in this report. Development of an appropriate inspection and testing plan should be carried out in consultation with the Geotechnical Engineer.

This report may have included geotechnical recommendations for design and construction of temporary works (e.g. temporary batter slopes or temporary shoring of excavations). Such temporary works are expected to perform adequately for a relatively short period only, which could range from a few days (for temporary batter slopes) up to six months (for temporary shoring). This period depends on a range of factors including but not limited to: site geology; groundwater conditions; weather conditions; design criteria; and level of care taken during construction. If there are factors which prevent temporary works from being completed and/or which require temporary works to function for periods longer than originally designed, further advice must be sought from the Geotechnical Engineer and Structural Engineer.

This report and details for the proposed development should be submitted to relevant regulatory authorities that have an interest in the property or are responsible for services that may be within or adjacent to the site (e.g. Sydney Water), for their review.

Asset accepts no liability where our recommendations are not followed or are only partially followed. The document "Important Information about your Geotechnical Report" in Appendix A provides additional information about the uses and limitations of this report.

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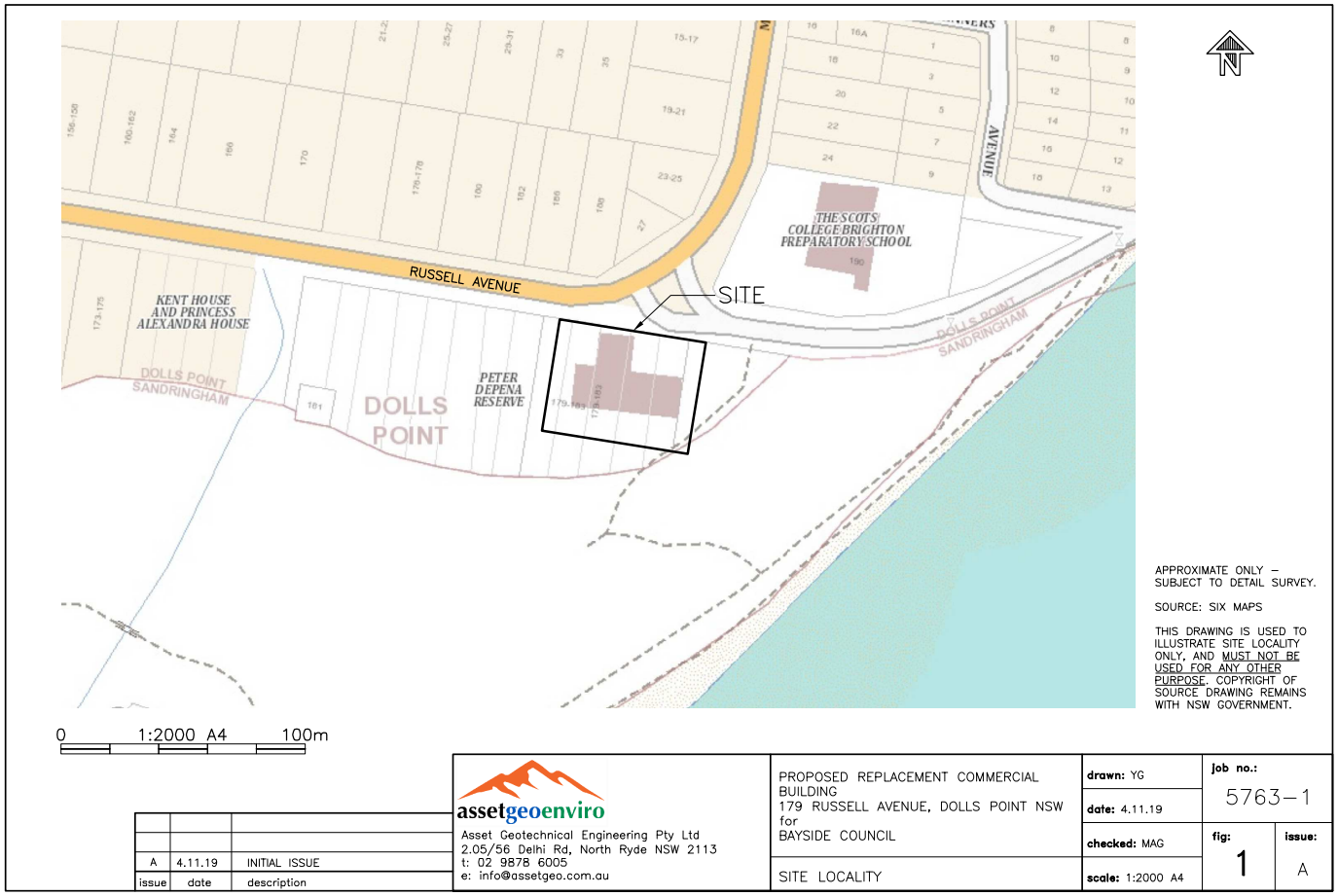
FIGURES


RUSSELL AVENUE
SITE
KENT HOUSE AND PRINCESS ALEXANDRA HOUSE
DOLLS POINT SANDRINGHAM
PETER DEPENA RESERVE
DOLLS POINT
THE SCOTS COLLEGE BRIGHTON PREPARATORY SCHOOL
AVENUE
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PROPOSED REPLACEMENT COMMERCIAL BUILDING
179 RUSSELL AVENUE, DOLLS POINT NSW
for
BAYSIDE COUNCIL
SITE LOCALITY
drawn: YG
date: 4.11.19
checked: MAG
scale: 1:2000 A4
job no.: 5763–1
fig: 1
issue: A


BH4
BH1
BH3
BH2
KEY
Borehole
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TEST LOCATIONS
drawn: YG
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fig: 2
issue: A
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APPENDIX A

Important Information about your Geotechnical Report
CSIRO BTF 18

Important Information about your Geotechnical Report

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SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client and Asset Geotechnical Engineering Pty Ltd ("Asset"), for the specific site investigated. The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

The report should not be used if there have been changes to the project, without first consulting with Asset to assess if the report's recommendations are still valid. Asset does not accept responsibility for problems that occur due to project changes if they are not consulted.

RELIANCE ON DATA

Asset has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. Asset has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, Asset will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Asset.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behavior with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

Therefore, the recommendations in the report can only be regarded as preliminary. Asset should be retained during the project implementation to assess if the report's recommendations are valid and whether or not changes should be considered as the project proceeds.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. Asset should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that Asset be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. Asset assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Asset or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

DATA MUST NOT BE SEPARATED FROM THE REPORT

The report as a whole presents the site assessment, and must not be copied in part or altered in any way.

Logs, figures, drawings, test results etc. included in our reports are developed by professionals based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

PARTIAL USE OF REPORT

Where the recommendations of the report are only partially followed, there may be significant implications for the project and could lead to problems. Consult Asset if you are not intending to follow all of the report recommendations, to assess what the implications could be. Asset does not accept responsibility for problems that develop where the report recommendations have only been partially followed if they have not been consulted.

OTHER LIMITATIONS

Asset will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

Foundation Maintenance and Footing Performance:

A Homeowner's Guide

CSIRO

BTF 18 replaces Information Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion
All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation
This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.
- In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

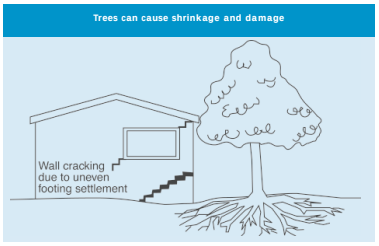
- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.



As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation cause a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem.
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

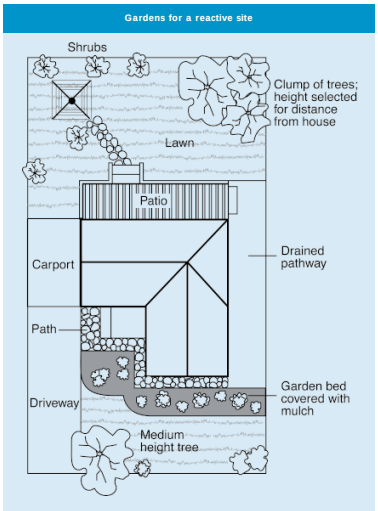
It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15–25 mm but also depend on number of cracks	4



should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation
In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden
The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees
Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs
State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation
Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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APPENDIX B

Soil & Rock Explanation Sheets
Borehole Logs

Soil and Rock Explanation Sheets (1 of 2)

assetgeoenviro

LOG ABBREVIATIONS AND NOTES

METHOD

borehole logs		excavation logs	
AS	auger screw *	NE	natural excavation
AD	auger drill *	HE	hand excavation
RR	roller / tricone	BH	backhoe bucket
W	washbore	EX	excavator bucket
CT	cable tool	DZ	dozer blade
HA	hand auger	R	ripper tooth
D	diatube		
B	blade / blank bit		
V	V-bit		
T	TC-bit		

* bit shown by suffix e.g. ADV

coring
NMLC, NQ, PQ, HQ

SUPPORT

borehole logs		*excavation logs*	
N	nil	N	nil
M	mud	S	shoring
C	casing	B	benched
NQ	NQ rods		

CORE—LIFT

⫼	casing installed
⊢	barrel withdrawn

NOTES, SAMPLES, TESTS

D	disturbed
B	bulk disturbed
U50	thin-walled sample, 50mm diameter
HP	hand penetrometer (kPa)
SV	shear vane test (kPa)
DCP	dynamic cone penetrometer (blows per 100mm penetration)
SPT	standard penetration test
N*	SPT value (blows per 300mm) * denotes sample taken
Nc	SPT with solid cone
R	refusal of DCP or SPT

USCS SYMBOLS

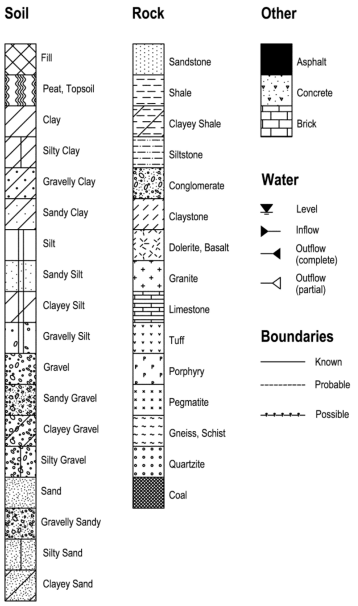
GW	Gravel and gravel-sand mixtures, little or no fines.
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures.
GC	Gravel-clay mixtures and gravel-sand-clay mixtures.
SW	Sand and gravel-sand mixtures, little or no fines.
SP	Sand and gravel sand mixtures, little or no fines.
SM	Sand-silt mixtures.
SC	Sand-clay mixtures.
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity.
CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays.
OL	Organic silts
MH	Inorganic silts
CH	Inorganic clays of high plasticity.
OH	Organic clays of medium to high plasticity, organic silt
PT	Peat, highly organic soils.

MOISTURE CONDITION

D	dry
M	moist
W	wet
Wp	plastic limit
Wl	liquid limit

CONSISTENCY		DENSITY INDEX	
VS	very soft	VL	very loose
S	soft	L	loose
F	firm	MD	medium dense
St	stiff	D	dense
VSt	very stiff	VD	very dense
H	hard		
Fb	friable		

GRAPHIC LOG



WEATHERING		STRENGTH	
XW	extremely weathered	VL	very low
HW	highly weathered	L	low
MW	moderately weathered	M	medium
SW	slightly weathered	H	high
FR	fresh	VH	very high
		EH	extremely high

RQD (%)

= $\frac{\text{sum of intact core pieces > 2 x diameter}}{\text{total length of core run drilled}} \times 100$

DEFECTS:

type		*coating*	
JT	joint	cl	clean
PT	parting	st	stained
SZ	shear zone	ve	veneer
SM	seam	co	coating

shape		*roughness*	
pl	planar	po	polished
cu	curved	sl	slickensided
un	undulating	sm	smooth
st	stepped	ro	rough
ir	irregular	vr	very rough

inclination
measured above axis and perpendicular to core

Asset Geotechnical Engineering Pty Ltd Issued September 2019

Soil and Rock Explanation Sheets (2 of 2)

assetgeoenviro

AS1726-2017

Soils and rock are described in the following terms, which are broadly in accordance with AS1726-2017.

SOIL

MOISTURE CONDITION

Term	Description
Dry	Looks and feels dry. Fine grained and cemented soils are hard, friable or powdery. Uncemented coarse grained soils run freely through hand.
Moist	Soil feels cool and darkened in colour. Fine grained soils can be moulded. Coarse soils tend to cohere.
Wet	As for moist, but with free water forming on hand.

Moisture content of cohesive soils may also be described in relation to plastic limit (W_P) or liquid limit (W_L) [>> much greater than, > greater than, < less than, << much less than].

CONSISTENCY OF FINE GRAINED SOILS

Term	Su (kPa)	Term	Su (kPa)
Very soft	< 12	Very Stiff	>100 – ≤200
Soft	>12 – ≤25	Hard	> 200
Firm	>25 – ≤50	Friable	–
Stiff	>50 – ≤100		

RELATIVE DENSITY OF COURSE GRAINED SOILS

Term	Density Index (%)	Term	Density Index (%)
Very Loose	< 15	Dense	65 – 85
Loose	15 – 35	Very Dense	>85
Medium Dense	35 – 65		

PARTICLE SIZE

Name	Subdivision	Size (mm)
Boulders		> 200
Cobbles		63 – 200
Gravel	coarse	19 – 63
	medium	6.7 – 19
	fine	2.36 – 6.7
Sand	coarse	0.6 – 2.36
	medium	0.21 – 0.6
	fine	0.075 – 0.21
Silt & Clay		< 0.075

MINOR COMPONENTS

Term	Proportion by Mass:	
	coarse grained	*fine grained*
Trace	≤ 15%	≤ 5%
With	>15% – ≤30%	>5% – ≤12%

SOIL ZONING

Layers	Continuous across exposures or sample.
Lenses	Discontinuous, lenticular shaped zones.
Pockets	Irregular shape zones of different material.

SOIL CEMENTING

Weakly	Easily broken up by hand pressure in water or air.
Moderately	Effort is required to break up by hand in water or in air.

USCS SYMBOLS

Symbol	Description
GW	Gravel and gravel-sand mixtures, little or no fines.
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels.
GM	Gravel-silt mixtures and gravel-sand-silt mixtures.
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OL	Organic silts
MH	Inorganic silts
CH	Inorganic clays of high plasticity.
OH	Organic clays of medium to high plasticity, organic silt
PT	Peat, highly organic soils.

ROCK

SEDIMENTARY ROCK TYPE DEFINITIONS

Rock Type	Definition (more than 50% of rock consists of .....)
Conglomerate	... gravel sized (>2mm) fragments.
Sandstone	... sand sized (0.06 to 2mm) grains.
Siltstone	... silt sized (<0.06mm) particles, rock is not laminated.
Claystone	... clay, rock is not laminated.
Shale	... silt or clay sized particles, rock is laminated.

LAYERING

Term	Description
Massive	No layering apparent.
Poorly Developed	Layering just visible. Little effect on properties.
Well Developed	Layering distinct. Rock breaks more easily parallel to layering.

STRUCTURE

Term	Spacing (mm)	Term	Spacing
Thinly laminated	<6	Medium bedded	200 – 600
Laminated	6 – 20	Thickly bedded	600 – 2,000
Very thinly bedded	20 – 60	Very thickly bedded	> 2,000
Thinly bedded	60 – 200		

STRENGTH (NOTE: Is50 = Point Load Strength Index)

Term	Is50 (MPa)	Term	Is50 (MPa)
Extremely Low	<0.03	High	1.0 – 3.0
Very low	0.03 – 0.1	Very High	3.0 – 10.0
Low	0.1 – 0.3	Extremely High	>10.0
Medium	0.3 – 1.0		

WEATHERING

Term	Description
Residual Soil	Material is weathered to an extent that it has soil properties. Rock structures are no longer visible, but the soil has not been significantly transported.
Extremely	Material is weathered to the extent that it has soil properties. Mass structures, material texture & fabric of original rock is still visible.
Highly	Rock strength is significantly changed by weathering; rock is discolored, usually by iron staining or bleaching. Some primary minerals have weathered to clay minerals.
Moderately	Rock strength shows little or no change of strength from fresh rock; rock may be discolored.
Slightly	Rock is partially discolored but shows little or no change of strength from fresh rock.
Fresh	Rock shows no signs of decomposition or staining.

DEFECT DESCRIPTION

Type	
Joint	A surface or crack across which the rock has little or no tensile strength. May be open or closed.
Parting	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering/bedding. May be open or closed.
Sheared Zone	Zone of rock substance with roughly parallel, near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects.
Seam	Seam with deposited soil (infill), extremely weathered insitu rock (XW), or disoriented usually angular fragments of the host rock (crushed).
Shape	
Planar	Consistent orientation.
Curved	Gradual change in orientation.
Undulating	Wavy surface.
Stepped	One or more well defined steps.
Irregular	Many sharp changes in orientation.
Roughness	
Polished	Shiny smooth surface.
Slickensided	Grooved or striated surface, usually polished.
Smooth	Smooth to touch. Few or no surface irregularities.
Rough	Many small surface irregularities (amplitude generally <1mm). Feels like fine to coarse sandpaper.
Very Rough	Many large surface irregularities, amplitude generally >1mm. Feels like very coarse sandpaper.
Coating	
Clean	No visible coating or discolouring.
Stained	No visible coating but surfaces are discolored.
Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Coating	Visible coating =1mm thick. Thicker soil material described as seam.

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Borehole Log

BH no:	**BH1**
sheet:	1 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT	N		D-BH1, ACM				SM	FILL, Silty SAND, dark brown, fine grained; trace gravel, fine grained, subrounded to subangular.	D	L		Fill
			D-BH1									PID - 0.4 ppm (base reading: 0.3 ppm)
			D-ASS	2.5	0.5							
					.5		SP	SAND, pale brown, fine to medium grained, subrounded.	D	L		Dune Sand
			D-ASS	2.0	1.0							
			SPT 4,3,4 N*=7									
			D-ASS	1.5	1.5							
					1.6		SP	SAND, pale brown mottled dark brown, fine to medium grained, subrounded.	M-W	L-MD		Dune Sand
			D-ASS	1.0	2.0							
		▼										
			D-ASS	0.5	2.5							
			SPT 5,4,5 N*=9									
			D-ASS	0.0	3.0							
					3.2		SP	SAND, grey, fine to medium grained, subrounded.	W	MD		Marine Sand
			D-ASS	-0.5	3.5							
			D-ASS	-1.0	3.9		SP	SAND with shell fragments, grey, fine to medium grained, subrounded.	W	L-MD		Marine Sand
					4.0							

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Borehole Log

BH no:	**BH1**
sheet:	2 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT			SPT 1.5,1.5,2 N*=3.5				SP	SAND with shell fragments, grey, fine to medium grained, subrounded. *(continued)*	W	L-MD		
			D-ASS	-1.5	4.5							
			D-ASS	-2.0	5.0							
			D-ASS	-2.5	5.5							
			SPT 2,3,3 N*=6									
			D-ASS	-3.0	6.0							
					6			ADT terminated at 6m, reaching target depth. Borehole No: BH1 terminated at 6m				
				-3.5	6.5							
				-4.0	7.0							
				-4.5	7.5							
				-5.0	8.0							

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Borehole Log

BH no:	**BH2**
sheet:	1 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT	N		D-BH2, ACM				SM	FILL, Silty SAND, dark brown, fine grained, subrounded; trace gravel, fine grained, subangular.	D	L		Fill
												PID - 0.3 ppm (base reading: 0.3 ppm)
				.2			SP	SAND, pale brown mottled dark brown, fine to medium grained, subrounded.	D-M	L		Dune Sand
			D-BH2, DUP1									
			D-ASS	2.5	0.5							
			D-ASS	2.0	1.0							
			SPT 3,3,4 N*=7									
			D-ASS	1.5	1.5							
			D-ASS	1.0	2.0							
		▼										
				2.3			SP	SAND, pale brown becoming grey, fine to medium grained, subrounded.	W	MD-D		Dune Sand
			D-ASS	0.5	2.5							
			SPT 5,8,9 N*=17									
			D-ASS	0.0	3.0							
			D-ASS	-0.5	3.5							
				3.4			SP	Silty Clayey SAND with shell fragments, grey/dark grey, fine to medium grained, subrounded.	W	MD		Marine Sand
				3.7			SP	SAND with shell fragments, grey, fine to medium grained, subrounded.	W	L-MD		Marine Sand
			D-ASS	-1.0	4.0							

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Borehole Log

BH no: BH2
sheet: 2 of 2
job no.: 5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT			SPT 1.5,1.5,2.5 N*=4				SP	SAND with shell fragments, grey, fine to medium grained, subrounded. *(continued)*	W	L-MD		
			D-ASS	-1.5	4.5							
			D-ASS	-2.0	5.0							
			D-ASS	-2.5	5.5							
			SPT 1.5,2.5,4 N*=6.5									
			D-ASS	-3.0	6.0							
					6			ADT terminated at 6m, reaching target depth. Borehole No: BH2 terminated at 6m				
				-3.5	6.5							
				-4.0	7.0							
				-4.5	7.5							
				-5.0	8.0							

5763-1 BH LOGS.GPJ 4/11/19

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Borehole Log

BH no:	**BH3**
sheet:	1 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT	N		D-BH3, ACM				SM	FILL, Silty SAND, dark brown, fine grained, subrounded; trace gravel, fine grained, subangular.	D	VL		Fill
												PID - 0.4 ppm (base reading: 0.3 ppm)
			D-BH3				SP	SAND, pale brown mottled dark brown, fine to medium grained, subrounded.	D	L		Dune Sand
			D-ASS	2.5	0.5							
			D-ASS	2.0	1.0		SP	SAND, pale brown, fine grained, subrounded.	D	L		Dune Sand
			SPT 3,3,4 N*=7									
			D-ASS	1.5	1.5							
							SP	SAND, pale brown becoming grey, fine to medium grained, subrounded.	M	L		Dune Sand
			D-ASS	1.0	2.0							
		▼					SP	SAND, grey, fine to medium grained, subrounded.	W	L		Dune Sand
			D-ASS	0.5	2.5							
			SPT 1,1,1 N*=2				SP	SAND with shell fragments, grey, fine to medium grained, subrounded; trace oyster shell.	W	L		Marine Sand
			D-ASS	0.0	3.0							
			D-ASS	-0.5	3.5							
							SM	Silty SAND with shell fragments, grey becoming dark grey, fine to medium grained, subrounded; trace organic material.	W	L-MD		Marine Sand
			D-ASS	-1.0	4.0							

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Borehole Log

BH no:	**BH3**
sheet:	2 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT			SPT 1,1,5,2.5 N*=4				SM	Silty SAND with shell fragments, grey becoming dark grey, fine to medium grained, subrounded; trace organic material. *(continued)*	W	L-MD		
			D-ASS	-1.5	4.5							
			D-ASS	-2.0	5.0							
			D-ASS	-2.5	5.5							
			SPT 2.5,1.5,2 N*=3.5									
			D-ASS	-3.0	6.0							
					6			ADT terminated at 6m, reaching target depth. Borehole No: BH3 terminated at 6m				
				-3.5	6.5							
				-4.0	7.0							
				-4.5	7.5							
				-5.0	8.0							

5763-1 BH LOGS.GPJ 4/11/19

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Borehole Log

BH no:	**BH4**
sheet:	1 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT	N		D-BH4, ACM				SM	FILL, Silty SAND, dark brown, fine grained, subrounded; trace gravel, fine grained, subangular.	D	VL		Fill PID - 0.4 ppm (base reading 0.3 ppm)
			D-ASS	2.5	0.5		SP	SAND, pale brown mottled brown, fine to medium grained, subrounded.	D-M	VL-L		Dune Sand
			D-BH4									
			D-ASS	2.0	1.0							
			SPT 2,3,3 N*=6		1.1		SP	SAND, pale brown becoming grey, fine to medium grained, subrounded.	M-W	L		Dune Sand
		▼	D-ASS	1.5	1.5							
			D-ASS	1.0	2.0							
					2.2		SP	SAND with shell fragments, grey, fine to medium grained, subrounded.	W	L-MD		Marine Sand
			D-ASS	0.5	2.5							
			SPT 1,1,1 N*=2									
			D-ASS	0.0	3.0							
			D-ASS	-0.5	3.5							
			D-ASS	-1.0	4.0							

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Borehole Log

BH no:	**BH4**
sheet:	2 of 2
job no.:	5763-1

client:	Bayside Council	**started:**	1.11.2019
principal:		**finished:**	1.11.2019
project:	Proposed Replacement Commercial Building	**logged:**	YG
location:	179 Russell Avenue, Dolls Point NSW	**checked:**	MAG
equipment:	GEO205	**RL surface:**	3 m approx.
diameter:	100mm **inclination:** -90° **bearing:** --- **E:** **N:**	**datum:**	AHD

drilling information | **material information**

method	support	water	notes samples, tests, etc	RL	depth metres	graphic log	USCS symbol	material description (soil type: plasticity or particle characteristics, colour, secondary and minor components.)	moisture condition	consistency/ density index	hand penetro-meter kPa 100 200 300 400	structure and additional observations
ADT			SPT 1,1,1.5,1.5 N*=3				SP	SAND with shell fragments, grey, fine to medium grained, subrounded. *(continued)*	W	L-MD		
			D-ASS	-1.5	4.5							
			D-ASS	-2.0	5.0							
			D-ASS	-2.5	5.5							
			SPT 2,2,2 N*=4									
			D-ASS	-3.0	6.0							
					6			ADT terminated at 6m, reaching target depth. Borehole No: BH4 terminated at 6m				
				-3.5	6.5							
				-4.0	7.0							
				-4.5	7.5							
				-5.0	8.0							

5763-1 BH LOGS.GPJ 4/11/19

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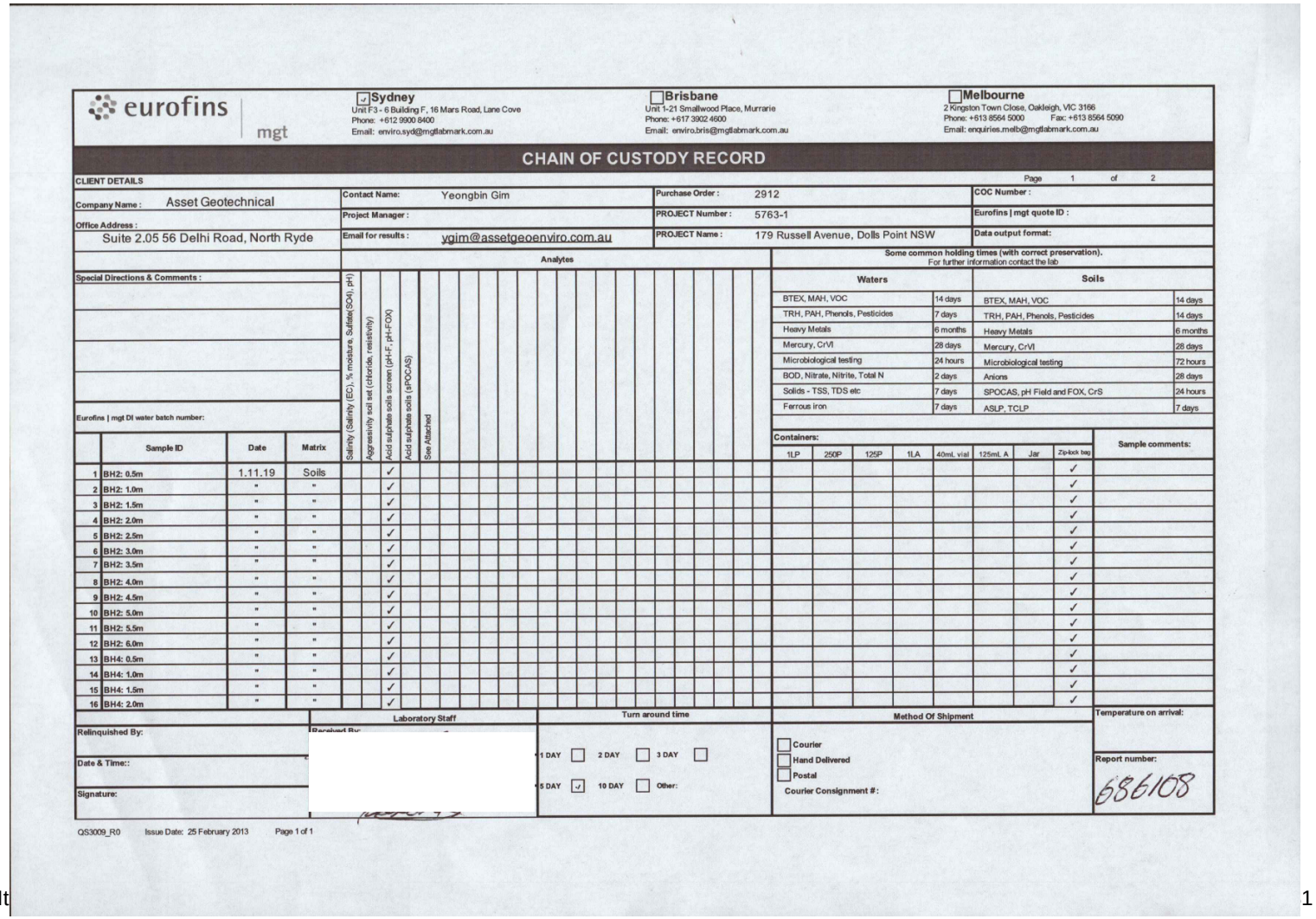
APPENDIX C

Laboratory Test Results



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CHAIN OF CUSTODY RECORD

Page 1 of 2

CLIENT DETAILS

Company Name: Asset Geotechnical
Office Address: Suite 2.05 56 Delhi Road, North Ryde
Special Directions & Comments:
Eurofins | mgt DI water batch number:

Contact Name: Yeongbin Gim
Project Manager:
Email for results: ygim@assetgeoenviro.com.au

Purchase Order: 2912
PROJECT Number: 5763-1
PROJECT Name: 179 Russell Avenue, Dolls Point NSW

COC Number:
Eurofins | mgt quote ID:
Data output format:

Analytes

	Sample ID	Date	Matrix	Salinity (Salinity (EC), % moisture, Sulfate(SO4), pH)	Aggressivity soil set (chloride, resistivity)	Acid sulphate soils screen (pH-F, pH-FOX)	Acid sulphate soils (sPOCAS)	See Attached	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Zip-lock bag	Sample comments:
1	BH2: 0.5m	1.11.19	Soils			✓										✓	
2	BH2: 1.0m	"	"			✓										✓	
3	BH2: 1.5m	"	"			✓										✓	
4	BH2: 2.0m	"	"			✓										✓	
5	BH2: 2.5m	"	"			✓										✓	
6	BH2: 3.0m	"	"			✓										✓	
7	BH2: 3.5m	"	"			✓										✓	
8	BH2: 4.0m	"	"			✓										✓	
9	BH2: 4.5m	"	"			✓										✓	
10	BH2: 5.0m	"	"			✓										✓	
11	BH2: 5.5m	"	"			✓										✓	
12	BH2: 6.0m	"	"			✓										✓	
13	BH4: 0.5m	"	"			✓										✓	
14	BH4: 1.0m	"	"			✓										✓	
15	BH4: 1.5m	"	"			✓										✓	
16	BH4: 2.0m	"	"			✓										✓	

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

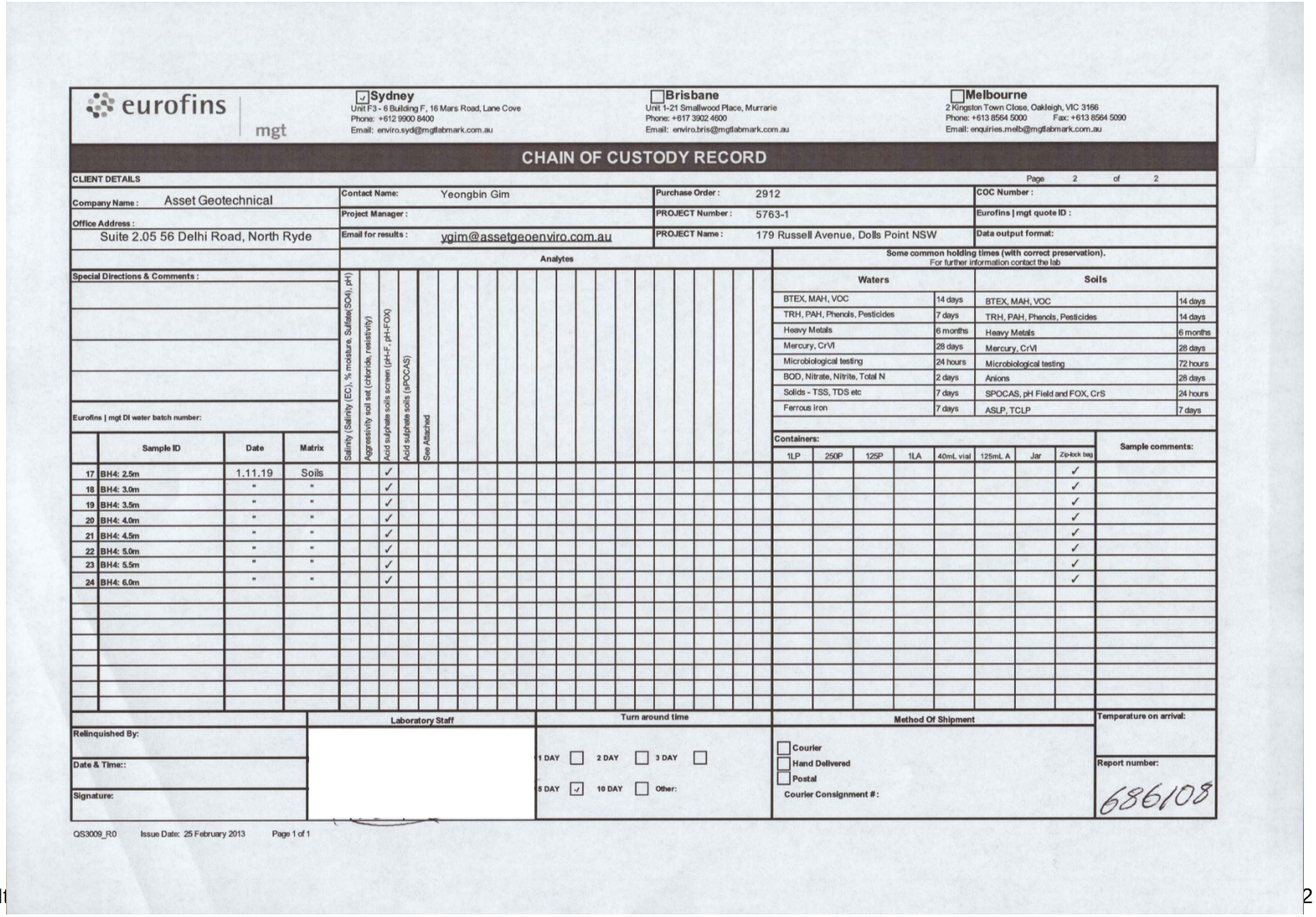
Laboratory Staff
Relinquished By:
Date & Time::
Signature:
Received By:

Turn around time
☐ 1 DAY ☐ 2 DAY ☐ 3 DAY ☐
☐ 5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment
☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment #:

Temperature on arrival:
Report number: 686108

QS3009_R0 Issue Date: 25 February 2013 Page 1 of 1



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CHAIN OF CUSTODY RECORD

Page 2 of 2

CLIENT DETAILS

Company Name: Asset Geotechnical
Office Address: Suite 2.05 56 Delhi Road, North Ryde

Contact Name: Yeongbin Gim
Project Manager:
Email for results: ygim@assetgeoenviro.com.au

Purchase Order: 2912
PROJECT Number: 5763-1
PROJECT Name: 179 Russell Avenue, Dolls Point NSW

COC Number:
Eurofins | mgt quote ID:
Data output format:

Special Directions & Comments:

Eurofins | mgt DI water batch number:

Analytes: Salinity (Salinity (EC), % moisture, Sulfate(SOA), pH); Aggressivity soil set (chloride, resistivity); Acid sulphate soils screen (pH-F, pH-FOX); Acid sulphate soils (SPOCAS); See Attached

	Sample ID	Date	Matrix	Salinity (Salinity (EC), % moisture, Sulfate(SOA), pH)	Aggressivity soil set (chloride, resistivity)	Acid sulphate soils screen (pH-F, pH-FOX)	Acid sulphate soils (SPOCAS)	See Attached	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Zip-lock bag	Sample comments:
17	BH4: 2.5m	1.11.19	Soils			✓										✓	
18	BH4: 3.0m	"	"			✓										✓	
19	BH4: 3.5m	"	"			✓										✓	
20	BH4: 4.0m	"	"			✓										✓	
21	BH4: 4.5m	"	"			✓										✓	
22	BH4: 5.0m	"	"			✓										✓	
23	BH4: 5.5m	"	"			✓										✓	
24	BH4: 6.0m	"	"			✓										✓	

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

Relinquished By:
Date & Time::
Signature:

Laboratory Staff

Turn around time: 1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment: ☐ Courier ☐ Hand Delivered ☐ Postal
Courier Consignment #:

Temperature on arrival:

Report number: 686108

QS3009_R0 Issue Date: 25 February 2013 Page 1 of 1

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Certificate of Analysis

Asset Geotechnical Engineering Pty Ltd
Suite 2.05 / 56 Delhi Road
North Ryde
NSW 2113

Attention: **Yeongbin Gim**

Report **686108-S**
Project name 179 RUSSELL AVENUE DOLLS POINT NSW
Project ID 5763-1
Received Date Nov 04, 2019

Client Sample ID			**BH2:0.5M**	**BH2:1.0M**	**BH2:1.5M**	**BH2:2.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-No03878**	**S19-No03879**	**S19-No03880**	**S19-No03881**
Date Sampled			**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.2	8.5	9.4	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.1	4.8	7.1	7.5
Reaction Ratings*[S05]		comment	1.0	1.0	3.0	1.0

Client Sample ID			**BH2:2.5M**	**BH2:3.0M**	**BH2:3.5M**	**BH2:4.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-No03882**	**S19-No03883**	**S19-No03884**	**S19-No03885**
Date Sampled			**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.7	9.8	9.3	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.5	7.6	7.0	7.6
Reaction Ratings*[S05]		comment	1.0	1.0	4.0	1.0

Client Sample ID			**BH2:4.5M**	**BH2:5.0M**	**BH2:5.5M**	**BH2:6.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-No03886**	**S19-No03887**	**S19-No03888**	**S19-No03889**
Date Sampled			**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.3	9.7	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.6	7.6	7.6	7.2
Reaction Ratings*[S05]		comment	4.0	1.0	2.0	1.0

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Client Sample ID			BH4:0.5M	BH4:1.0M	BH4:1.5M	BH4:2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-No03890	S19-No03891	S19-No03892	S19-No03893
Date Sampled			Nov 01, 2019	Nov 01, 2019	Nov 01, 2019	Nov 01, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.4	9.6	9.3	9.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.3	7.5	7.2	7.6
Reaction Ratings*[S05]		comment	4.0	1.0	2.0	2.0

Client Sample ID			BH4:2.5M	BH4:3.0M	BH4:3.5M	BH4:4.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-No03894	S19-No03895	S19-No03896	S19-No03897
Date Sampled			Nov 01, 2019	Nov 01, 2019	Nov 01, 2019	Nov 01, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.5	9.2	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.5	7.6	7.5	7.4
Reaction Ratings*[S05]		comment	1.0	1.0	1.0	3.0

Client Sample ID			BH4:4.5M	BH4:5.0M	BH4:5.5M	BH4:6.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-No03898	S19-No03899	S19-No03900	S19-No03901
Date Sampled			Nov 01, 2019	Nov 01, 2019	Nov 01, 2019	Nov 01, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.4	9.4	9.3	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.5	7.2	8.0	7.5
Reaction Ratings*[S05]		comment	1.0	3.0	1.0	1.0

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Brisbane	Nov 06, 2019	7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

Perth
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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Asset Geotechnical Engineering Pty Ltd	**Order No.:**	2912	**Received:**	Nov 4, 2019 9:19 AM
Address:	Suite 2.05 / 56 Delhi Road North Ryde NSW 2113	**Report #:**	686108	**Due:**	Nov 11, 2019
		Phone:	02 9878 6005	**Priority:**	5 Day
		Fax:		**Contact Name:**	Yeongbin Gim
Project Name:	179 RUSSELL AVENUE DOLLS POINT NSW				
Project ID:	5763-1				

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH2:0.5M	Nov 01, 2019		Soil	S19-No03878		X
2	BH2:1.0M	Nov 01, 2019		Soil	S19-No03879		X
3	BH2:1.5M	Nov 01, 2019		Soil	S19-No03880		X
4	BH2:2.0M	Nov 01, 2019		Soil	S19-No03881		X
5	BH2:2.5M	Nov 01, 2019		Soil	S19-No03882		X
6	BH2:3.0M	Nov 01, 2019		Soil	S19-No03883		X
7	BH2:3.5M	Nov 01, 2019		Soil	S19-No03884		X
8	BH2:4.0M	Nov 01, 2019		Soil	S19-No03885		X
9	BH2:4.5M	Nov 01, 2019		Soil	S19-No03886		X

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Project Name:	179 RUSSELL AVENUE DOLLS POINT NSW				
Project ID:	5763-1				

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
10	BH2:5.0M	Nov 01, 2019		Soil	S19-No03887		X
11	BH2:5.5M	Nov 01, 2019		Soil	S19-No03888		X
12	BH2:6.0M	Nov 01, 2019		Soil	S19-No03889		X
13	BH4:0.5M	Nov 01, 2019		Soil	S19-No03890		X
14	BH4:1.0M	Nov 01, 2019		Soil	S19-No03891		X
15	BH4:1.5M	Nov 01, 2019		Soil	S19-No03892		X
16	BH4:2.0M	Nov 01, 2019		Soil	S19-No03893		X
17	BH4:2.5M	Nov 01, 2019		Soil	S19-No03894		X
18	BH4:3.0M	Nov 01, 2019		Soil	S19-No03895		X
19	BH4:3.5M	Nov 01, 2019		Soil	S19-No03896		X
20	BH4:4.0M	Nov 01, 2019		Soil	S19-No03897		X
21	BH4:4.5M	Nov 01, 2019		Soil	S19-No03898		X

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Company Name: Asset Geotechnical Engineering Pty Ltd
Address: Suite 2.05 / 56 Delhi Road
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NSW 2113

Project Name: 179 RUSSELL AVENUE DOLLS POINT NSW
Project ID: 5763-1

Order No.: 2912
Report #: 686108
Phone: 02 9878 6005
Fax:

Received: Nov 4, 2019 9:19 AM
Due: Nov 11, 2019
Priority: 5 Day
Contact Name: Yeongbin Gim

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
22	BH4:5.0M	Nov 01, 2019		Soil	S19-No03899		X
23	BH4:5.5M	Nov 01, 2019		Soil	S19-No03900		X
24	BH4:6.0M	Nov 01, 2019		Soil	S19-No03901		X
25	BH1:0.5M	Nov 01, 2019		Soil	S19-No03955	X	
26	BH1:1.0M	Nov 01, 2019		Soil	S19-No03956	X	
27	BH1:1.5M	Nov 01, 2019		Soil	S19-No03957	X	
28	BH1:2.0M	Nov 01, 2019		Soil	S19-No03958	X	
29	BH1:2.5M	Nov 01, 2019		Soil	S19-No03959	X	
30	BH1:3.0M	Nov 01, 2019		Soil	S19-No03960	X	
31	BH1:3.5M	Nov 01, 2019		Soil	S19-No03961	X	
32	BH1:4.0M	Nov 01, 2019		Soil	S19-No03962	X	
33	BH1:4.5M	Nov 01, 2019		Soil	S19-No03963	X	

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Project ID:	5763-1				

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
34	BH1:5.0M	Nov 01, 2019		Soil	S19-No03964	X	
35	BH1:5.5M	Nov 01, 2019		Soil	S19-No03965	X	
36	BH1:6.0M	Nov 01, 2019		Soil	S19-No03966	X	
37	BH3:0.5M	Nov 01, 2019		Soil	S19-No03967	X	
38	BH3:1.0M	Nov 01, 2019		Soil	S19-No03968	X	
39	BH3:1.5M	Nov 01, 2019		Soil	S19-No03969	X	
40	BH3:2.0M	Nov 01, 2019		Soil	S19-No03970	X	
41	BH3:2.5M	Nov 01, 2019		Soil	S19-No03971	X	
42	BH3:3.0M	Nov 01, 2019		Soil	S19-No03972	X	
43	BH3:3.5M	Nov 01, 2019		Soil	S19-No03973	X	
44	BH3:4.0M	Nov 01, 2019		Soil	S19-No03974	X	
45	BH3:4.5M	Nov 01, 2019		Soil	S19-No03975	X	

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Project Name:	179 RUSSELL AVENUE DOLLS POINT NSW				
Project ID:	5763-1				

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
46	BH3:5.0M	Nov 01, 2019		Soil	S19-No03976	X	
47	BH3:5.5M	Nov 01, 2019		Soil	S19-No03977	X	
48	BH3:6.0M	Nov 01, 2019		Soil	S19-No03978	X	
Test Counts						24	24

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S19-No03878	CP	pH Units	8.2	8.1	pass	30%	Pass	
Reaction Ratings*	S19-No03878	CP	comment	1.0	1.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S19-No03888	CP	pH Units	9.7	9.6	pass	30%	Pass	
Reaction Ratings*	S19-No03888	CP	comment	2.0	2.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S19-No03890	CP	pH Units	8.4	8.6	pass	30%	Pass	
Reaction Ratings*	S19-No03890	CP	comment	4.0	4.0	pass	30%	Pass	

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Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S06	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Asim Khan	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)

Glenn Jackson
General Manager

End of Report - No Report additions may previously issued report

- Indicates Not Requested
* Indicates NATA accreditation does not cover the performance of this service
Measurement uncertainty of test data is available on request or please click here.

#AU03_EnviroSampleBris

From: Asim Khan
Sent: Tuesday, 12 November 2019 2:45 PM
To: #AU03_EnviroSampleBris
Subject: 5 DAY TAT ADDITIONAL ANALYSIS FW: 5763-1: request for CRS testing
Attachments: 5763-1 Eurofins Test Request crs.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: REBATCH WAITING

Additional analysis please on standard TAT.

Please let me know once logged.

Thanks,

Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | Environment Testing

From: Woochul Yang
Sent: Tuesday, 12 November 2019 3:36 PM
To: Asim Khan
Subject: 5763-1: request for CRS testing

EXTERNAL EMAIL*

Hi Asim,

Could you please arrange 3 CRS tests as per COC?
Please issue PO# seperately. Po# for CRS tests is included on COC.

Thank you.

Best regards,

Woochul Yang
Project Geotechnical Engineer

1

eurofins | mgt

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Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
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2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS — Page 1 of 2

Company Name: Asset Geotechnical	Contact Name: Yeongbin Gim	Purchase Order:	screening: 2912, CRS: 2949	COC Number:	
	Project Manager:	PROJECT Number:	5763-1	Eurofins | mgt quote ID:	
Office Address: Suite 2.05 56 Delhi Road, North Ryde	Email for results: labresults@assetgeoenviro.com.au	PROJECT Name:	179 Russell Avenue, Dolls Point NSW	Data output format:	

Special Directions & Comments:

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

Analytes / Containers

	Sample ID	Date	Matrix	Salinity (Salinity (EC), % moisture, Sulfate(SO4), pH)	Aggressivity soil set (chloride, resistivity)	Acid sulphate soils screen (pH-F, pH-FOX)	Acid sulphate soils (sPOCAS)	See Attached	Chromium Reducible Surphur (CRS)	Zip-lock bag	Sample comments
1	BH2: 0.5m	1.11.19	Soils			✓			✓	✓	requested on 12/11/19
2	BH2: 1.0m	"	"			✓			✓	✓	requested on 12/11/19
3	BH2: 1.5m	"	"			✓				✓	
4	BH2: 2.0m	"	"			✓				✓	
5	BH2: 2.5m	"	"			✓				✓	
6	BH2: 3.0m	"	"			✓				✓	
7	BH2: 3.5m	"	"			✓				✓	
8	BH2: 4.0m	"	"			✓				✓	
9	BH2: 4.5m	"	"			✓				✓	
10	BH2: 5.0m	"	"			✓				✓	
11	BH2: 5.5m	"	"			✓				✓	
12	BH2: 6.0m	"	"			✓				✓	
13	BH4: 0.5m	"	"			✓			✓	✓	requested on 12/11/19
14	BH4: 1.0m	"	"			✓				✓	
15	BH4: 1.5m	"	"			✓				✓	
16	BH4: 2.0m	"	"			✓				✓	

Containers: 1LP, 250P, 125P, 1LA, 40mL vial, 125mL A, Jar, Zip-lock bag

Laboratory Staff

Relinquished By:	Received By:
Date & Time::	Date & Time:
Signature:	Signature:

Turn around time: 1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment: ☐ Courier ☐ Hand Delivered ☐ Postal
Courier Consignment #:

Temperature on arrival:

Report number: 687623

QS3009_R0 Issue Date: 25 February 2013 Page 1 of 1

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Certificate of Analysis

Asset Geotechnical Engineering Pty Ltd
Suite 2.05 / 56 Delhi Road
North Ryde
NSW 2113

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Yeongbin Gim**

Report **687623-S**
Project name 179 RUSSELL AVENUE DOLLS POINT NSW
Project ID 5763-1
Received Date Nov 12, 2019

Client Sample ID			**BH2:0.5M**	**BH2:1.0M**	**BH4:0.5M**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B19-No16293**	**B19-No16294**	**B19-No16295**
Date Sampled			**Nov 01, 2019**	**Nov 01, 2019**	**Nov 01, 2019**
Test/Reference	LOR	Unit			
Chromium Suite					
pH-KCL	0.1	pH Units	6.5	6.9	8.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	< 0.003	< 0.003
Chromium Reducible Sulfur[S04]	0.005	% S	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	< 3	< 3
Sulfur - KCl Extractable	0.02	% S	n/a	n/a	n/a
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	0.07	0.95
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	14	190
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	n/a	0.02	0.30
ANC Fineness Factor		factor	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	< 1	< 1
Extraneous Material					
<2mm Fraction	0.005	g	75	85	59
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1
% Moisture	1	%	1.9	3.3	9.7

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Nov 12, 2019	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Nov 12, 2019	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Nov 12, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Asset Geotechnical Engineering Pty Ltd	**Order No.:**	2949
Address:	Suite 2.05 / 56 Delhi Road North Ryde NSW 2113	**Report #:**	687623
		Phone:	02 9878 6005
		Fax:	
Project Name:	179 RUSSELL AVENUE DOLLS POINT NSW		
Project ID:	5763-1		

Received:	Nov 12, 2019 2:45 PM	
Due:	Nov 19, 2019	
Priority:	5 Day	
Contact Name:	Yeongbin Gim	

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH2:0.5M	Nov 01, 2019		Soil	B19-No16293	X	X
2	BH2:1.0M	Nov 01, 2019		Soil	B19-No16294	X	X
3	BH4:0.5M	Nov 01, 2019		Soil	B19-No16295	X	X
Test Counts						3	3

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Chromium Suite									
Chromium Reducible Sulfur			%	94			70-130	Pass	
Acid Neutralising Capacity (ANCbt)			%	104			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
pH-KCL	S19-No10770	NCP	pH Units	8.8	8.8	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S19-No10770	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S19-No10770	NCP	% pyrite S	< 0.003	< 0.003	<1	30%	Pass	
Chromium Reducible Sulfur	S19-No10770	NCP	% S	0.38	0.39	4.0	30%	Pass	
Chromium Reducible Sulfur -acidity units	S19-No10770	NCP	mol H+/t	230	240	4.0	30%	Pass	
Sulfur - KCl Extractable	S19-No10770	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S19-No10770	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S19-No10770	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S19-No10770	NCP	% S	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity (ANCbt)	S19-No10770	NCP	% CaCO3	0.54	0.55	1.0	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	S19-No10770	NCP	% S	0.17	0.18	1.0	30%	Pass	
ANC Fineness Factor	S19-No10770	NCP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	S19-No10770	NCP	% S	0.26	0.27	5.0	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	S19-No10770	NCP	mol H+/t	160	170	5.0	30%	Pass	
CRS Suite - Liming Rate	S19-No10770	NCP	kg CaCO3/t	12	13	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B19-No15017	NCP	%	18	17	7.0	30%	Pass	


assetgeoenviro

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Our Reference: 230422_Flood Impact (REV B)

No.179 RUSSELL AVENUE, DOLLS POINT 'DOLLS POINT CAFÉ'

FLOOD IMPACT MODELLING REPORT

Prepared by: ***Daniel Cheng*** *BE (Civil)*
Checked by: ***Robert Eltobbagi*** *BE(Civil) MIE Aust CPEng NER (1052208) RPEQ (25464)*
Dated: ***20th February 2024***

Contents

EXECUTIVE SUMMARY

This Report analyses the Local Overland Flooding for the subject site at No.179-183 Russell Avenue, Dolls Point ('Dolls Point Café') for the existing condition and the Planning Proposal.

The Planning Proposal for 179-183 Russell Avenue, Dolls Point NSW 2219 seeks to include additional permitted land use of 'Restaurant/Café.

Following the amendment of the Bayside Local Environmental Plan 2021 (BLEP 2021), Council will lodge a Development Application for the redevelopment of the 'Le Beach Hut'. This will include the demolition of the existing building and construction of a new restaurant, separate kiosk public toilets, and associated landscaping. This will be subject to separate processes outside of the Planning Proposal.

Notwithstanding, the proposed redevelopment forms a 'proof of concept' of the potential redevelopment should the amendments to the BLEP 2021 be adopted.

In summary, our assessment report concluded:

1. ***Proposed flood conditions relative to the Planning Proposal are largely unchanged from the existing conditions;***
2. ***Planning Proposal does not materially affect local flood characteristics;***
3. ***Planning Proposal & respective conceptual design has negligible offsite flood impacts;***
4. ***Planning Proposal & respective conceptual design does not exacerbate the flood regime;***
5. ***Comprehensive Assessment of Councils 'Flood Controls', indicates the Planning Proposal complies with Council requirements;***
6. ***Low Flood Hazard Category over existing/proposed building area identified during 1% AEP.***

1 INTRODUCTION

1.1 Background

Quantum Engineers was engaged by to produce analysis of the existing flood behaviours of Local Overland Flooding for the subject site at No.179-183 Russell Avenue, Dolls Point.

A 'flood impact' and 'risk assessment' of the Planning Proposal for the renewal development from an existing café/restaurant to contemporary restaurant.

The Conceptual Proposed Site Plan for the proposed development is presented in ***Figure 1.1*** below.

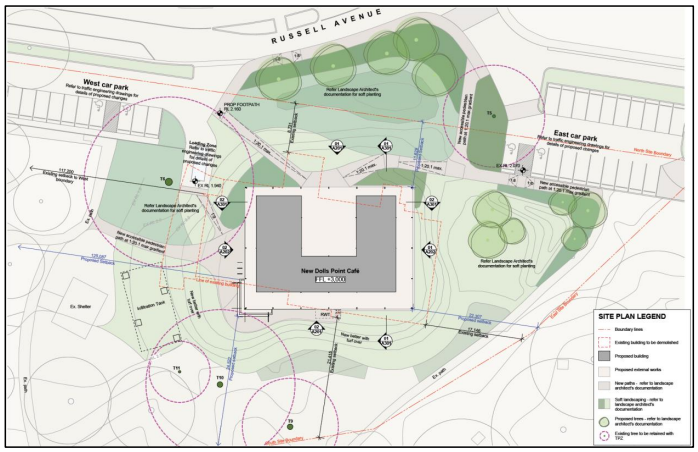


Figure 1.1: Proposed Site Plan

The Overland Flow Study incorporates the following:

- *Addressing the flood planning controls from local Council and design considerations in accordance with NSW Flood Risk Management Manual;*
- *An assessment of the overland flood from local upstream catchment affecting the subject site;*
- *Modelling of overland flow behaviours comparing pre & post flood impact from the development.*

1.2 Project Context

Per Bayside Council's DCP requirements, flood modelling is to be undertaken. TUFLOW model of council's current 'Sans Souci Flood Study Review' Report was received by Quantum Engineers on 13th November 2023 & the analysis was based on the received TUFLOW model data.

The purpose of this Overland Flow Study is to provide a detailed modelling assessment of the potential Local Overland Flooding and to determine the flood impact (if any) on the subject site. Furthermore, assessment has been undertaken of the potential impact (if any) on the surrounding properties based on the pre to post development scenario conditions.

In summary, the objectives are as follows:

- ***Replicate 2-D computer model (TUFLOW) based on Bayside Councils 'Sans Souci' Flood Study Review and the received TUFLOW model that is currently used to predict the magnitude and extent of future flood events;***
- ***Modify received TUFLOW model for any site-specific variations to provide accurate results;***
- ***Amend the model to include the proposed development footprint and investigate if the proposed development affects the flood characteristics;***
- ***Propose mitigation measures to eliminate any impacts (if required & necessary); and***
- ***Address the requirements of Bayside Council's DCP***

1.3 FIRA Requirements

The following Authority requirements have been addressed:

- **Bayside Council DCP:**
  Part 3.10 – Flood Prone Land
  Part 9.5 – Flood Prone Land Requirements

- **Environmental Planning and Assessment Act 1979 Section 9.1(2)** – *Local Planning Direction Focus Area 4.1 Flooding*

- **NSW Government Flood Risk Management Manual (2023)**

2 BACKGROUND

2.1 Study Area

The site is affected by overland flooding from the local upstream catchment. The runoff from the localised upstream catchment traverse's overland through the low-lying areas of the catchment towards Waradiel Creek via multiple residential properties & road reserves.

The subject development site is within proximity to the catchment 'gully' and is deemed to be categorised 'flood fringe' during the 1% AEP flood event based on the 'Flood Information' provided by Bayside Council.

The applicable upstream catchment is predominantly residential area of approximately 7.35Ha and is characterised by gentle slope of less than 1% fall.

Refer to ***Appendix A1 - Figure A.1.1*** for the ***Upstream Catchment Plan***

2.2 Know Flood Behaviour

Based on the flood study conducted by Cardno (2015), the 10th March 1975 historical storm event has been used to calibrate the Tuflow model.

Based on the historical event:

> *'a number of residential areas are affected by flooding associated with Waradiel Creek including properties between Park Road and Chuter Avenue in all events greater than 20% AEP and properties between Alfred Street and The Grand Parade with up to 1.0m expected in a 1% AEP event. Areas of high provisional hazard are generally confined to the open channel itself or a number of trapped low points.'* (Cardno 2015).

2.3 Emergency Management

Bayside Council provides 'online interactive mapping' which indicates the subject site is within flood planning area. As such, the State Emergency Service (SES) which provides flood emergency information for preparation, evacuation and recovery processes, is applicable as outlined in the below website:

https://www.ses.nsw.gov.au/flood-resources/during-a-flood/be-aware/

https://www.ses.nsw.gov.au/flood-resources/during-a-flood/prepare-your-home-and-business/

3 AVAILABLE INFORMATION

3.1 Rainfall Data

The design rainfall intensity-frequency-duration (IFD) data for the catchment site were obtained from the 'ARR Data Hub' as part of the received TUFLOW model.

A summary of the design rainfall depth adopted in this study is provided in ***Table 3.1*** below.

IFD

-33.995S 151.145E

DURATION	63.2%	50%	20%	10%	5%	2%	1%	AEP
5 mins	97.4	125.	160.	180.	206.	240.	266.	
6 mins	91.2	117.	150.	168.	193.	225.	250.	
10 mins	74.7	96.1	124.	140.	161.	188.	209.	
20 mins	54.7	70.8	92.5	105.	122.	144.	160.	
30 mins	44.5	57.8	76.1	86.9	101.	120.	134.	
1 hour	30.1	39.2	52.0	59.6	69.5	82.7	92.7	
2 hours	19.6	25.5	33.8	38.7	45.1	53.6	60.1	
3 hours	15.1	19.6	25.9	29.6	34.4	40.8	45.7	
6 hours	9.63	12.5	16.3	18.5	21.4	25.3	28.2	
12 hours	6.18	7.98	10.3	11.7	13.5	15.9	17.7	
24 hours	4.01	5.18	6.70	7.58	8.75	10.3	11.4	
48 hours	2.56	3.31	4.29	4.86	5.62	6.62	7.37	
72 hours	1.90	2.46	3.19	3.61	4.17	4.90	5.46	mm/hr

Table 3.1: IFD Design Rainfall Depth

The following data was also utilised as part of the Sans Souci TUFLOW model package and was adopted in this assessment:

- LiDAR topographical survey data;
- GIS data including cadastre; and
- Aerial photography.

4. FLOOD RELATED REQUIREMENTS

4.1 The Bayside Council DCP

The Controls for the development in flood liable land are detailed in **Bayside Councils DCP** under **Part 3 Section 10 'Flood Prone Land' & Part 9 Section 5 'Flood Prone Land Requirements'.**

4.1.1 Council Objective of 'controls' (Part 3 Section 10.5):

i. *To ensure that flood risk is considered as early as possible in the planning and development process and is based on the best available flood information.*
ii. *To establish guidelines for the use and development of flood prone land that are consistent with the NSW Flood Policy and the FDM.*
iii. *To minimise the risk to human life and damage to property by controlling development on flood prone land, taking into account projected changes as a result of climate change.*
iv. *To ensure that all land uses and essential services are appropriately sited and designed in recognition of potential floods.*
v. *To provide detailed controls for the assessment of applications lodged in accordance with the Environmental Planning and Assessment Act 1979 on flood-prone lands.*
vi. *To ensure that the development or use of floodplains does not adversely impact flood behaviour which creates a detrimental increase in flood affectation on other properties or developments.*
vii. *To ensure that the development incorporates measures to minimise the risk of life and ensure the safe occupation and efficient evacuation of people in the flood event.*
viii. *To apply a merit-based approach to development decisions that consider flood risk, social, economic and ecological considerations.*
ix. *To control development and other activity within all the stormwater catchments within the LGA having regard to the characteristics and level of information available for each of the catchments, in particular the FRMS and FRMP.*

4.1.2 Council Objective and Performance Criteria (Part 3 Section 10.8)

Development Aspect	Objective	Performance Criteria
Floor Levels	• To minimise the damage to properties from flooding. • To minimise risk to life from the inundation of properties. • To minimise the economic cost to the community resulting from flooding.	• Proposed building must be free from flooding up to and including the flood planning level (FPL) requirement. • Proposed building should not increase the likelihood of flooding on other developments, properties or infrastructure.
Car parking	• To minimise risk to life from the inundation of the basement and other car parking areas. • To minimise the damage to motor vehicles from flooding. • To ensure that vehicles do not become moving debris during floods.	• The proposed garage or car park should not increase the risk of vehicle damage by flooding. • The proposed garage or car park should not increase the likelihood of flooding on other developments, properties or infrastructure. • The proposed garage or car park must meet the Flood Planning Level Requirements. • Open car parking - The minimum surface level of open space car

		parking subject to flooding should be designed giving regard to vehicle stability in terms of depths and velocity during flooding.
Building components and method	• To minimise the damage to building and structures during a flood event.	• Buildings are to be designed and constructed to a standard that is compatible with the flood risk and will not result in significant structural or material damage during or after a flood event.
Fencing	• To ensure that fencing does not result in any significant obstruction to the free flow of floodwaters. • To ensure that fencing will remain safe during floods and not become moving debris.	• Fencing is to be designed and constructed in such a manner that it will not modify the flow of floodwaters and cause damage to surrounding properties.
Evacuation	• To ensure that there is no increase in risk to life to people in a flood event.	• To ensure that there is a plan in place for people to follow during a flood event that will not increase the risk to life of people on site or result in an increased reliance on the SES or emergency services personnel.
Earthworks and building on flood prone land	• To ensure that the natural function of floodplains and overland flow paths to convey and store floodwater is not compromised.	• Any earthworks or development proposal must be supported by a flood impact assessment report (refer to Sub-section 9.5.4) from a qualified civil engineer.
Storage of hazardous substances	• To prevent the potential spread of pollution from hazardous substances.	• The storage of products which, may be hazardous or pollute floodwaters, must be placed above the 1% AEP flood level plus 0.5m freeboard or placed within an area protected by bunds or levels such that no floodwaters can enter the bunded area.

4.1.3 Flood Planning Prescriptive Controls (Part 3 Section 10.13):

Per Bayside Development Control Plan 2022 Section 9.5.1 – Land Use Categories, the subject site is to be categorized as Commercial or Industrial:

Commercial or Industrial
Abattoir, Amusement centre and Amusement park; Boat building and repair facilities; Bulky goods sales room or showroom; Business premises; Community Facility Depots; Freight transport facilities; Entertainment facilities; Heavy industry storage establishments; Heliports; Heighway service centre; Hotel; Industries; Industrial retail Outlet; Industrial training facility; Junk yard; Medical Centre; Mortuaries; Motel; Motor showroom; Passenger transport facilities; Place of public worship; Plant hire; Recreation facility (indoor, major or outdoor); Registered club; **Restaurant;** Restricted premises; Roadside stall; Rural industry; Sawmill; Service station; Sex services premises Shop; Storage premises; Transport Depot; Truck depots; Vehicle body repair station; Veterinary hospital; Warehouse or Distribution centre; Waste or resource management facility

Based on the produced Flood Hazard Mapping for 1% AEP event, the site is considered as **Low Flood Hazard (Hazard Category H1 & H2).**

As such, the following prescriptive 'controls' for the Planning Proposal have been adopted:

Planning Consideration	**Land Use Category (Development Type)**					
	Critical & Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Recreation and non urban	Concessional Development
A. Floor level	A2, A3	G3	A1, A3	A1, A3	A4	A5
B. Building Components	B2, B3, B4		B1, B3, B4	B1, B3, B4	B1, B3, B4	B1, B3, B4
C. Structural Soundness	C2		C1	C1	C1	C1
D. Flood Effects	D1		D1	D1	D1	D1
E. Car Parking & Driveway Access	E1, E2, E4		E1, E2, E3	E1, E2, E3	E1, E2, E3	E1, E2, E3
F. Evacuation	F2		F1	F1	F1	F1
G. Management and Design	G2, G4, G5		G2, G4, G5	G2, G4, G5	G2, G4, G5	G2, G4, G5

Planning Consideration	**Criteria**	
Floor Level	A1	Habitable floor levels to be no lower than the 1% AEP flood level plus 0.5m freeboard
	A3	Non-habitable floor levels to be no lower than 1% AEP flood level
Building components	B1	All structures to have flood compatible building materials (Schedules – Chapter 9.5.3) below the 1% AEPflood level plus 0.5m freeboard. Any part of the building that is erected at or below the 1% AEP flood level +0.5m freeboard shall be constructed of flood compatible material.
	B3	Flow-through open form fencing (louvres or pool fencing) is required for all new fencing and all new gatesup to the 1% AEP flood level to allow floodwaters to flow through.
	B4	All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed and/or located above the 1% AEP flood level plus 0.5m freeboard. All existing electrical equipment and power points located below the 1% AEP flood level plus 0.5m freeboardwithin the subject structure must have residual current devices installed that turn off all electricity supply tothe property when floodwaters are detected.
Structural soundness	C1	All new development must be designed and constructed to ensure structural integrity up to the 1% AEP flood level plus 0.5m freeboard, taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. Structural certification shall be provided confirming the above. Where shelter-in-place refuge is required, the structural integrity for the refuge is to be up to the PMF level.Structural certification shall be provided confirming the above

Flood Effects	D1	The development must not result in increased flooding elsewhere in the floodplain. A flood assessment report (refer to Schedules – Chapter 9.5.4) shall be provided to demonstrate that the development: • does not divert floodwaters to the detriment of elsewhere on the floodplain. • does not increase flood level or velocity elsewhere on the floodplain. • does not result in a detrimental loss of flood storage. • reduces the existing flood hazard, where possible. A flood impact assessment for a site is not required where the flood storage and floodway capacity are retained. For example, a building can be elevated to retain the existing floodway and flood storage to permit the free flow of water under the building.
Car Parking & Driveway Access	E1	The minimum finished floor level of open car parking spaces or carports shall be at or above natural ground level. A flow-through roller door (or horizontal louvers) is permitted for a carport structure. Carports must be of open design, with at least 2 sides completely open such that flow is not obstructed up to the 1% AEP flood level. Otherwise, it will be considered to be enclosed. Open car parking areas shall not be located within a floodway.
	E2	For above ground level garages, the minimum surface level shall be no lower than the 1% AEP flood level
	E3	Basement garages/storage/car parking, low-level driveways must be physically protected from inundation by floods equal to or greater than the 1% AEP flood level plus 0.5m freeboard. The crest of the driveway shall be located within the property boundary. All access, ventilation, driveway crests and any other potential water entry points to any enclosed car parking shall be above the 1% AEP flood level plus 0.5m freeboard level. Council will not accept any options that rely on the electrical, mechanical or manual exclusion of the floodwaters from entering the enclosed carpark for new development. Flood barriers may be accepted for an existing development to improve flood protection.
Evacuation	F1	Reliable access for pedestrians or vehicles is required from the building, commencing at the minimum level equal to the lowest habitable floor level to an area of refuge above the PMF level, or minimum of 20% of the gross floor area of the dwelling to be above the PMF level.
Management and Design	G2	Storage of materials that may cause pollution or are potentially hazardous during any flood is not permitted below the 1% AEP plus 0.5m freeboard
	G4	Where a building is elevated to retain the existing floodway, overland flow path and flood storage, the undercroft area is to remain open to permit the free flow of water under the building. A positive covenant isrequired.
	G5	Pools located within the 1% AEP flood extent are to be in-ground, with coping flush with natural ground level. Where it is not possible to have pool coping flush with natural ground level, it must be demonstrated that the development will result in no net loss of flood storage and no impact on flood conveyance on orfrom the site.All electrical equipment associated with the pool (including pool pumps) is to be waterproofed and/orlocated at or above the 1% AEP plus 0.5m freeboard level. All chemicals associated with the pool are to be stored at or above the 1% AEP plus 0.5m freeboard level.

Table 4.1.3: Low Hazard Planning Considerations (DCP - Table 11)

4.1.4 Flood Assessment Reporting (Part 9 Section 5.4):

Per Bayside Development Control Plan 2022 Section 9.5.4 requirements, where a new development (*building or earthworks*) may impact on the flood behaviour (*e.g. filling within the flood affected area or obstruction to the overland flow path*), flood impacts for the existing and proposed development is to be conducted to validate the flood depth afflux is within 10mm for the 1% AEP and within 50mm for the PMF event.

TUFLOW model received from Bayside Council was modified and calibrated to conduct the impact assessment based on the potential building layout if the planning proposal is to be approved.

Based on the TUFLOW modelling results illustrated in Appendix A2 Figures A2.2.4 & A2.2.13, it is demonstrated that the flood impact is within Council's allowed depth increase.

4.2 Environmental Planning and Assessment Act 1979 Section 9.1(2)

4.2.1 Direction 4.1

The following items are as set by Direction 4.1 which is assessed against the Planning Proposal:

(1) A planning proposal must include provisions that give effect to and are consistent with:
- (a) the NSW Flood Prone Land Policy,
- (b) the principles of the Floodplain Development Manual 2005,
- (c) the Considering flooding in land use planning guideline 2021, and
- (d) any adopted flood study and/or floodplain risk management plan prepared in accordance with the principles of the Floodplain Development Manual 2005 and adopted by the relevant council.
  - ✓ ***Planning Proposal is consistent with the abovementioned guidelines & policies & the latest Flood Risk Management Manual 2023 which replaces the Floodplain Development Manual 2005.***

(2) A planning proposal must not rezone land within the flood planning area from Recreation, Rural, Special Purpose or Conservation Zones to a Residential, Employment, Mixed Use, W4 Working Waterfront or Special Purpose Zones.
  - ✓ ***No rezoning of land is proposed for this Planning Proposal.***

(3) A planning proposal must not contain provisions that apply to the flood planning area which:
- *(a)* permit development in floodway areas, ***development is not within floodway areas***
- (b) permit development that will result in significant flood impacts to other properties, ***based on TUFLOW modelling, the impact is within allowance of council requirements and the general acceptance of flood impact of most authorities in NSW***
- (c) permit development for the purposes of residential accommodation in high hazard areas, ***subject site within Low Hazard area and no residential accommodation proposed.***
- (d) permit a significant increase in the development and/or dwelling density of that land, ***redevelopment of café/restaurant proposed only, no increase in dwelling density***
- (e) permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate, ***no such development proposed***
- (f) permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams, drainage canals, levees, still require development consent, ***no such development proposed***

(g) are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities, or ***redevelopment will provide additional refugee area during extreme flood event which is an improvement to current flood emergency management***

(h) permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event. ***No hazardous storage establishment is proposed***

(4) For the purposes of preparing a planning proposal, the flood planning area must be consistent with the principles of the Floodplain Development Manual 2005 or as otherwise determined by a Floodplain Risk Management Study or Plan adopted by the relevant council.

- ✓ ***Planning Proposal is generally in accordance with Flood Risk Management Manual 2023 which replaces the Floodplain Development Manual 2005. Furthermore the Management guidelines & flood extent & results is consistent with the adopted Bayside Council's Sans Souci Flood Study Review by Cardno (2015)***

5. PRE-DEVELOPED MODELLING AND ANALYSIS

5.1 Existing Flood Modelling

5.1.1 Hydrology

A hydrologic model combines rainfall information with local catchment characteristics to estimate a runoff hydrograph. For this study, 'TUFLOW' model was used for the local catchment using direct rainfall model to convert rainfall hyetograph to runoff hydrographs.

5.1.2 Catchment Definition

The catchment was defined based on topographic feature (*using the DEM data supplied by Bayside Council*) and anticipated overland flow paths.

The following 'critical' estimated design rainfall was applied to the hydrological model to predict design upstream catchment runoff hydrograph based on the received TUFLOW model from Bayside Council.

- *1% AEP (100YR ARI) design rainfalls - 60min duration storm event - temporal pattern 8*
- *PMF design rainfalls - 60min duration storm event - temporal pattern 8*
- *1% AEP (100YR ARI) design rainfalls + 0.9m sea level rise - 60min duration storm event - temporal pattern 8*

5.1.3 Hydraulic

5.1.3.1 Definition

A hydraulic model converts runoff (*traditionally from a hydrological model*) to water levels and velocities throughout the major drainage/creek systems in the study area (*known as the model 'domain', which includes the definition of both terrain and roughness*).

The model simulates the hydraulic behaviour of the water within the study area as potential overland flow paths, which develop when the capacity of the channels is exceeded. The model is established in

conjunction with boundary conditions, which include upstream runoff hydrographs generated by 'TUFLOW' model and appropriate downstream boundary including the initial foreshore sea level.

A 2D fully dynamic hydraulic model was established for the study area. TUFLOW, a dynamic hydraulic modelling system developed by BMT, was utilised for the purposes of this modelling study. TUFLOW is used world-wide and has been shown to provide reliable, robust simulation of flood behaviour in urban and rural areas through a vast number of applications.

5.1.3.2 Model Topographic Surface

The DEM data included in the model was received from package received from Bayside Council as part of the TUFLOW Model.

5.1.3.3 2D Model Set-up

TUFLOW hydraulic modelling was carried out to determine the flood behaviour within the catchment area. Grid spacing of **2.0m x 2.0m** was adopted for the whole model and deemed satisfactory to define the flood extent through the developed areas in the vicinity of the subject property.

5.1.3.4 Model 2D Roughness

Material ID	Land Use	Manning's Roughness Coefficient (n)
1	Sea	0.012
2	Road	0.020
3	Open Space	0.030
4	Bush	0.050
5	Residential	0.100
6	Building	0.100
7	Creel	0.045
8	Road Median Strip	0.035
9	Paved Surface	0.020
10	Georges River Foreshore	0.018

Table 5.1.3.4: Manning's Roughness Coefficient

5.1.3.5 Building Blockage & Drainage Network Blockages

Building 'Structure' Blockages

To replicate The Bayside Council's existing flood model, the building blockage from the received Council's TUFLOW model was adopted with minor site-specific modification to best match the detailed survey information and the proposed development layout.

- Upstream buildings have been modelled as 'increased Mannings value' adopted per modelling by The Bayside TUFLOW model.

- Existing café structure within subject site have been modified and modelled as 'Removed from Grid' per methodology consistent with recommendations from *Australian Rainfall and Runoff Revision Project 15: Two-dimensional simulations in urban areas – Representation of buildings in 2D numerical flood models.* The building footprint is based on the survey and satellite imagery.

Drainage Network Blockages

The pits, pipes and drainage channel data are adopted from received TUFLOW Model from Bayside Council without any modifications.

Pit blockage factor of 50% is considered per the received TUFLOW Model.

5.1.3.6 Upstream & Downstream Boundary Condition

The rainfall hyetograph from BOM was applied the entire upstream catchment to simulate the runoff behaviour over the larger catchment that subject property is with-in.

A fixed tailwater level for Botany Bay is set based on interpolation by Cardno per the 'Sans Souci Flood Study Review' & 1D to 2D linking node was adopted as the downstream boundary condition in this study.

5.2 Existing Flood Impacts

5.2.1 Pre-Development Design Flood Modelling Discussions

The pre-development model was first replicated to verify the model was correct, then the modification to pre-development model was implemented including revising the building blockage for site specific results, a comparison between the revised pre-development Flood Models with the modification as illustrated below.

The flood depth levels for 1% AEP were not impacted as the café building footprint is outside of the 1% AEP Flood extent.

The pre-Development flood depth, flood velocity, V x D hazard and ARR 2019 Hazard generated by the TUFLOW model are presented in Appendix A 'Figures A.2.2, A.2.5, A.2.7, A.2.9, A.2.11, A.2.14, A.2.16, A.2.18, A.2.20, A.2.23, A.2.25, A.2.27'.

Figure 5.2.1: Received 'Council's' Building Blockage – Increased Manning (n = 0.10)
(Building indicated in yellow)

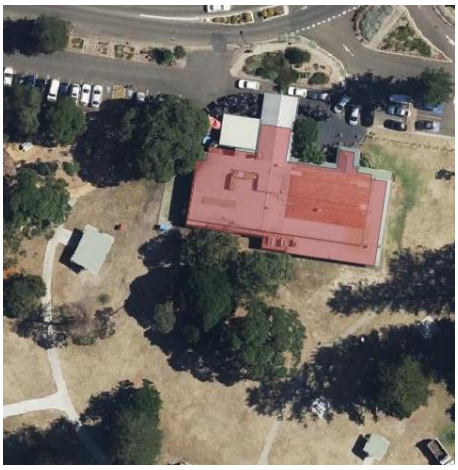


Figure 5.2.2: Adjusted 'model' Building Blockage – Removed from Grid
(Building indicated in pink)

6. POST-DEVELOPED MODELLING AND ANALYSIS

6.1 Proposed Development Flood Modelling & Assessment

6.1.1 Design Flood Modelling Results

'2D TUFLOW' hydraulic models were undertaken for the 1% AEP (100YR ARI) design flood event, PMF design flood event and 0.9 metre sea level rise design flood event. The peak water level, depth, and velocity for each 2.0m x 2.0m grid cell in the study area were determined.

The flood depth, flood velocity, V x D hazard and ARR 2019 Hazard generated by the TUFLOW model are presented in ***Appendix A 'Figures A.2.2 – A.2.28'***.

Flood depth cut off is set at 100mm.

6.2 Flood Impacts of Proposed Development

6.2.1 Flood Planning Level (Proposed Café)

According to Bayside Council's DCP, the floor levels for the habitable floor area of Commercial/Industrial Development MUST be set no lower than 1%AEP + 500mm freeboard to ensure protection from impeding flood waters.

However, for evacuation purposes, the proposed café is also to be used for 'on-site evacuation purposes', as such, the minimum Habitable floor level must be set at no lower than PMF Flood Level.

As the existing café is to be demolished, it is considered reasonable to accept that based on Councils 'Flood Planning Controls', all habitable floor levels of the proposed Dolls Point Café should be considered for freeboard requirements and to comply with Flood Control Requirements.

In summary, our TUFLOW modelling results can be tabled as follows for the **proposed 'Dolls Point Café'**:

- **Min Habitable Floor Level (*Dolls Point Café*)** - **FFL 2.80mAHD**
  - **must be set at no lower than PMF level**

Locations	Freeboard Requirements (mm)	Post Development 1% AEP Flood Level (m AHD)	Post Development PMF Flood Level (m AHD)	Flood Planning Level (m AHD)	Adopted Habitable Floor Level (m AHD)
Habitable Floor Level *(Proposed Dolls Point Café)*	**Must be no lower than PMF Level or 1% AEP + 500mm**	**RL2.25**	**RL2.80**	**RL 2.80**	**FFL 3.00**

Table 6.2 – Minimum Finished Floor Level: 'Proposed Alterations & Additions'

6.2.2 Climate Change Impact

Due to the close proximity of site to the coast, the Sea Level Rise is to be considered, projected sea level rise of 0.9m by 2100 is modelled for both pre & post development scenario.

As such, the increased sea level in consideration of Climate Change will be approx. RL2.50mAHD based on the TUFLOW model. The proposed finished floor level of FFL3.00m AHD achieves 500mm freeboard with respect to the raised sea level.

Therefore, the proposed habitable floor level is deemed satisfactory in regards to 'climate change impact'.

6.2.3 Hazard Assessment

Safety of people & residences in floods is of major concern. As such, an assessment of the ARR 2019 flood hazard (Velocity & Depth product at 0.1 m^2/s interval) is presented in ***Appendix A - Figure A.7 & A.8, A.16 & A.17, A.25 & A.26.***

Based on the ARR 2019 Flood Hazard Classification ***Figure 9.4.1***, General Flood Hazard Vulnerability Curves ***(Refer to Appendix A - Figure A.9 & A.10, A.18 & A.19, A.27 & A.28)*** is generated for both the pre-development and post development scenarios to investigate any relevant flood hazard.

It is noted the flood hazard categorisation in the pre-development the flood extent and post-development scenarios are largely unchanged.
There are local impacts from the proposed landscape works including filling & battering of land near the proposed new café area and the construction of new bioretention basin to the north of the café.

6.2.3.1 1% AEP Event

As result of compact fill and battering of the land to elevate the café floor level to meet freeboard requirements, the raised ground in close proximity of the proposed café remained unimpacted for both pre and post development scenario. There was some localised ponding of less than 150mm and hazard category H1 observed to the south of proposed café in post development scenario which can be considered negligible.

The proposed bioretention basin during 1% AEP Storm Event resulted in increased Hazard category from H1 to H2, however the area is in landscaped/pond area and is designed as non-trafficable for public pedestrians. As such the impact is deemed acceptable

6.2.3.2 PMF Event & 1% AEP + 0.9m Sea Rise Event

As result of compact fill and battering of the land to elevate the café floor level to meet freeboard requirements, the raised ground in close proximity of the proposed café is now above the flood level in the post-development scenario. Furthermore, the H3 hazard category region(s) to the east of café is reduced and small region is now converted to H2 hazard category as flood depth reduced due to filling of land.

The proposed bioretention basin during post-development event resulted in larger H3 category region compared to pre-development, as discussed above for the proposed land use of the region, the impact is deemed acceptable.

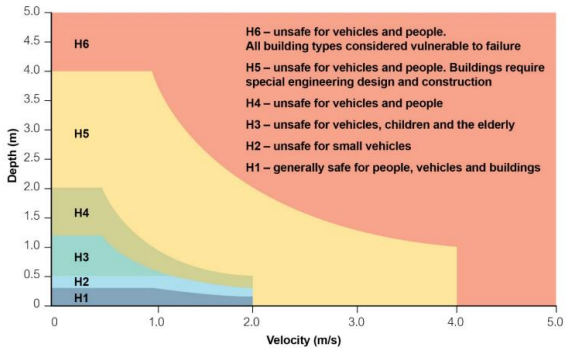


Figure 6.2.3 – General Flood Hazard Vulnerability Curves
(Figure 6 of AIDR 2017b)

6.2.4 Flood Affection

The 2D 'TUFLOW' flood modelling results undertaken for this Overland Flow Study indicate that the Proposed Development will not increase flood depth upstream nor downstream of the subject development in excess to the guidelines outlined in council's requirement during the 1% AEP, PMF and the 0.9m sea level rise scenario flood event. Furthermore, there is generally no exacerbation of the flood regime.

The Flood Impact Map (*refer to Appendix A Figure A.10*) demonstrates that there is no cumulative impact in the vicinity of the subject site with the maximum differential change in flood depth is less 10mm for the 1% AEP and 1% AEP + 0.9m sea rise. Furthermore, the cumulative impact is less than 50mm within subject lot boundaries for the PMF event.

The main overland flow traversed through Waradiel Creek which is approximately 150m away. Considering the gentle catchment sloped terrain and the distance the development is from the main flowpath, the proposed filling in the vicinity of the proposed café does not exacerbate the overall flood regime as demonstrated by the flood model results.

As such the proposed café and associated earthworks/landscape works is deemed acceptable.

7. KEY RISKS TO BE MANAGED

7.1 Flood Evacuation Strategy

To minimise risk to personal safety of occupants, evacuation strategies shall be prepared and implemented in order to mitigate the flood water impacts due to the land use nature of the proposed development.

This section of the report identifies and discusses the strategies applicable to the subject site in accordance with ***The Bayside Councils DCP*** and ***Local Floodplain Risk Management Plan***.

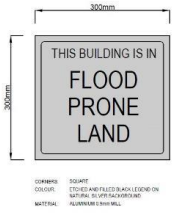
In reference to our Flood Modelling Results for the subject site (***Refer to Appendix A***), the PMF (Probable Maximum Flood) extent encompasses all frontages of the Proposed Dolls Point Café of No.179 Russell Street.

In the event of the PMF flood event, all frontages of the site will be cut off by the flood water. In this instance, offsite evacuation will no longer be practical. As such, **Shelter-In-Place strategy shall be implemented.**

The highest flood level during the PMF flood event within the subject site is RL2.80m AHD per Council Flood Advise Letter. The Proposed Ground Floor level at FFL 3.00mAHD is above the PMF flood level. Therefore, the Ground floor of proposed café will provide safe refuge area provided the building is constructed of flood compatible material for up to PMF Flood Level.

7.2 Signage

Personnel occupying and visiting the subject site shall be made aware of the 'flood prone' nature of this site, as well as the emergency evacuation routes during the 1% AEP event. As such, signages must be displayed at noticeable location. Signage(s) shown (as indicated below) shall be displayed and made visible to all personnel entering the building.



'FLOOD PRONE LAND' SIGNAGE
NTS

7.3 Procedure In Case Of Flooding

1. During floods, many local and major streets/ roads will be cut off by floodwaters that may make the escape by vehicle extremely difficult. Travelling through floodwaters on foot or in a vehicle can be very dangerous as obstructions can be hidden under the floodwaters, or you could be swept away, even if in a car, or the water may be polluted. **Council recommends staying within the building as much as practical as this is the safest option.**

If you urgently need to leave the building, do so early in the flood event & before the flood level reaches the top kerb at frontage of site.

2. Develop your own flood plan and be prepared if flooding should occur while the kids are coming home from school, or when you are returning from work. Make arrangements with neighbours or family members to look after children if there are no adults at home.

3. As flood levels appear to approach the ground floor level of the property:

a) Move important documents, personal effects, precious photographs and vital medical supplies to a safe and easily accessible place with your emergency flood kit.
b) Gather medicines, special requirements for babies or the elderly, mobile phones, first aid kit, special papers, battery operated torch and radio, fresh water, canned food and opener, waterproof clothing and small valuables into a backpack or bag in one location.
c) Locate your pets and gather any special requirements for them.
d) Put on strong shoes, raise any items within the property that may be damaged by water to as high a level as possible, with electrical items on top. Turn off any large electrical items at the power point that cannot be raised.

Note: Suitable storage areas may be on top of desks/tables/bench tops.

4. In the rare event that flood waters appear that they may enter the property:

a) Switch off electricity at switchboard.
b) Turn off gas at the meter.
c) Turn off water at the meter.
d) Block toilet bowls with a strong plastic bag filled with earth or sand.
e) Cover drains in showers, baths, laundries etc with a plastic bag filled with earth/ sand.

5. In the event that flood waters have risen up to the building, do not evacuate the building at this time unless instructed to do so by the SES or the Police. Floodwaters are much deeper, run much faster and are more dangerous outside.

6. Continue to monitor Bureau of Meteorology forecasts and warnings, listen to **ABC 702 radio**.

7. In the case of a medical or life threatening emergency, **PHONE 000** as normal, but explain about the flooding.

8. A laminated copy of this flood plan should be permanently attached to noticeboards and to the inside of the electrical meter box.

9. This flood management plan should be reviewed every 5 years, particularly with the potential sea level rise due to the greenhouse effect.

Important Phone Numbers	
State Emergency Service:	Emergency Phone - 132 500
Police, Fire, Ambulance:	Emergency Phone - 000
Bureau of Meteorology (Website):	http://www.bom.gov.au/weather
Land, Weather & Flood Warnings:	Phone - 1300 659 218

7.4 If You Need to Evacuate

- Pack warm clothing, essential medications, valuables, personal papers, mobile phones, photos and mementos in waterproof bags to be taken with your emergency kit
- Decide on how to look after your pets if you cannot take them with you
- Raise furniture, clothing and valuables on tables and shelf top spaces
- Empty freezers and refrigerators, leaving doors open
- Turn off power, water and gas
- Whether you leave or stay, put sandbags in the toilet bowl and over all laundry/bathroom drain holes to prevent sewage back-flow
- Lock your home and proceed to Russell Avenue.
- Don't drive in water of unknown depth and current
- Remember that walking through floodwaters is very dangerous.

7.5 After the Flood

- Stay tuned to ABC 702 on a battery powered radio for official advice and warnings
- Don't return home until authorities have said it is safe to do so
- Don't allow children to play in or near flood waters
- Avoid entering flood waters, it is dangerous. If you must, wear solid shoes and check depth and current with a stick
- Stay away from drains, culverts and water over knee-deep
- Don't turn on your gas and electricity until it has been checked by a professional/licensed repairer
- Avoid using gas or electrical appliances which have been in flood water until checked for safety
- Don't eat food that has been in flood waters
- Boil tap water until supplies have been declared safe
- Watch for trapped animals
- Beware of fallen power lines
- Take lots of photos for all damage for insurance purposes
- Notify family and friends of your whereabouts

8. CONCLUSIONS AND RECOMMENDATIONS

The Flood Planning Level for the PMF Flood Level applies to Proposed Dolls Point Café and was determined to be **MIN FFL2.80mAHD.** The 'Flood Planning Level' is to be no lower than PMF level to provide satisfactory 'shelter in place' evacuation.

The site has been classified as within **'Low' Hydraulic Hazard Category during 1% AEP**.

The **off-site flood impact to the neighbouring properties is negligible (*less than 10mm*)** as indicated in **Flood Impact Mapping** (***Appendix A Figure A.4, A.13 & A.22***). Hence, it is within Council's allowable impact and is deemed acceptable.

We note the following **Summary & Risk Assessment** measures which have been proposed and must be implemented to mitigate any potential flood risk(s):

- ***Proposed Habitable Floor Area for Dolls Point Café to be constructed at MINIMUM FFL2.80mAHD (PMF Level);***
- ***Adopted Habitable Floor Level FFL3.00mAHD;***
- ***Any proposed structures independent of the Proposed Dolls Point Café structure and located below the 1% AEP flood level + 500mm freeboard, must be of flood compatible building components;***
- ***All structural components of Proposed Dolls Point Café up to PMF Flood Level (RL2.80m AHD) are to be constructed with flood-compatible materials and should withstand the forces of floodwater debris, wave action, buoyancy and immersion for a prolonged duration;***
- ***All proposed structures/foundation earthworks of the proposed building structure to be designed and certified by structural engineer/geotechnical engineer to withstand the force of floodwater, debris and buoyancy up to and including RL2.80m AHD;***
- ***'Flood Warning Sign' to be installed in an appropriate location to inform customers/occupants of the danger of imminent flooding;***
- ***All goods and materials that may cause pollution or are potentially hazardous must be stored above the Flood Planning Level of RL2.75m AHD (1%AEP + 500mm freeboard);***
- ***All new electrical equipment and wirings are to be above Flood Planning Level of RL2.75m AHD or waterproofed;***

As stated above, there is no direct impact nor exacerbation of the catchment flood characteristics during the 1% AEP (100YR ARI) and the PMF storm event.

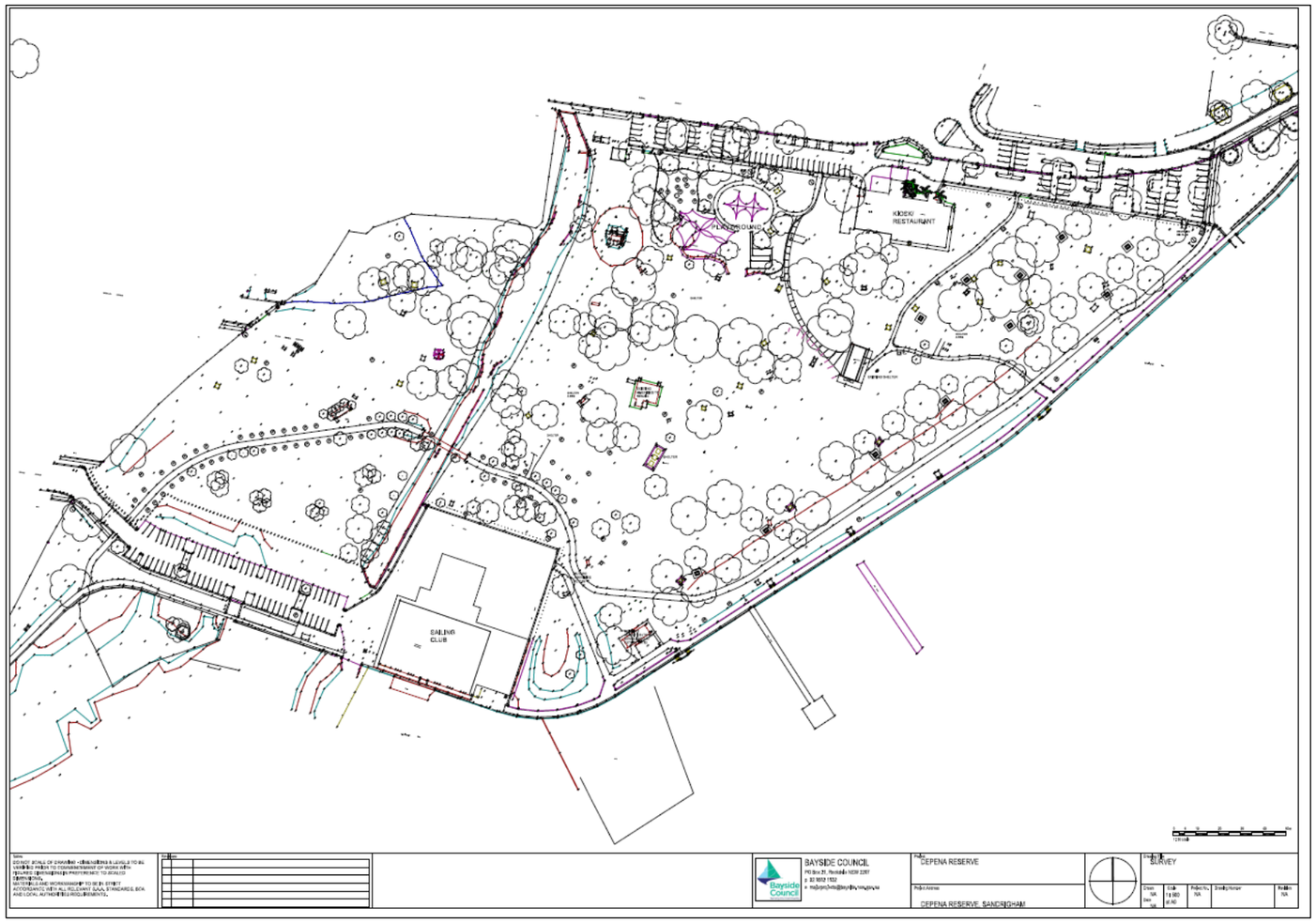
9. REFERENCES

The following documents have been referred in this Overland Flow Study:

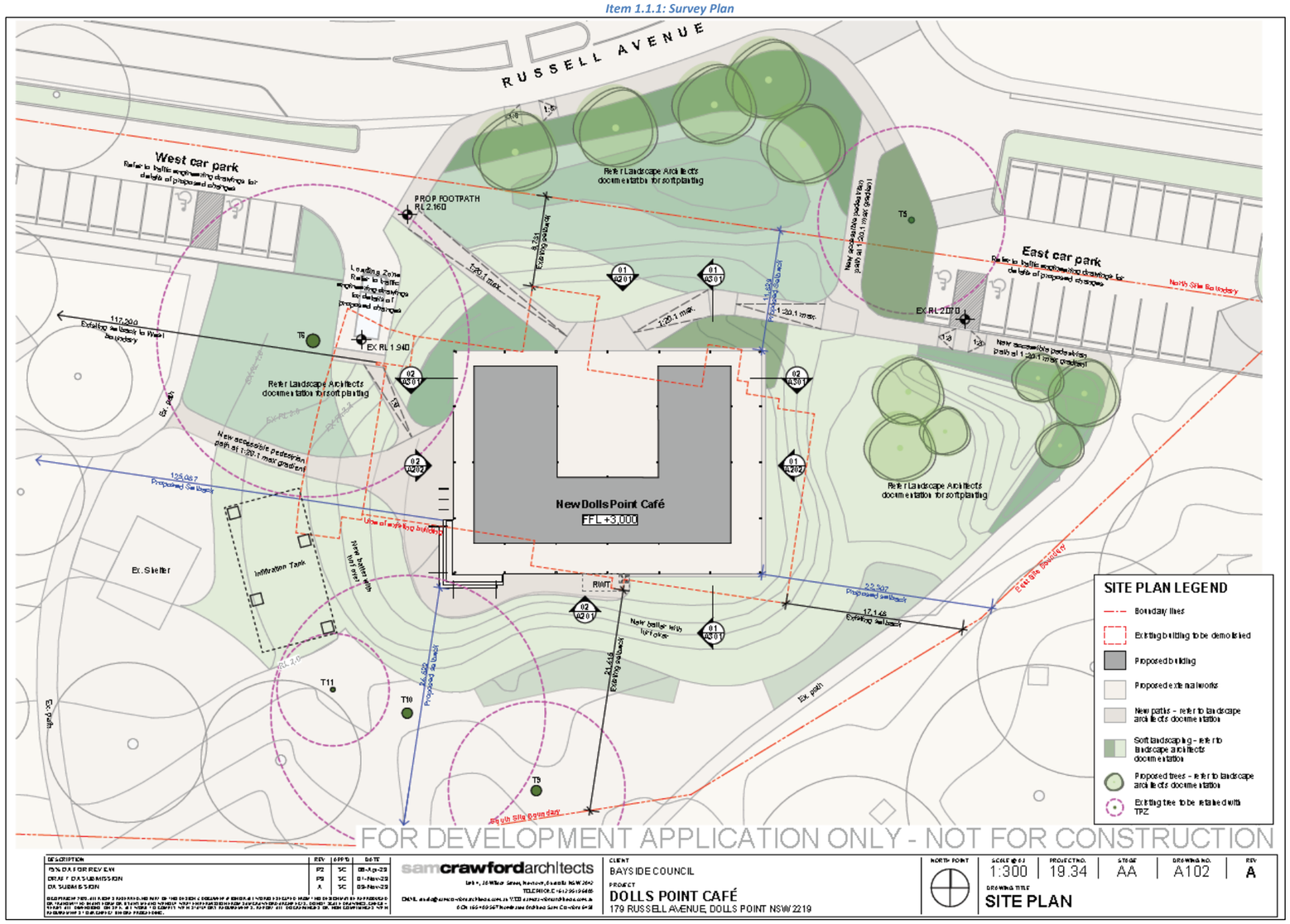
1. *Site Survey Plan provided by 'Bayside Council'*
2. *Architectural Plans prepared by 'Sam Crawford Architects'*
3. *NSW Government Flood Risk Management Manual (2023)*
4. *The Bayside Council DCP 2022 – Part 3, Section 10 & Part 9 Section 5*
5. *Flood Information Plan provided Bayside Council dated 25th November 2019*
6. *Australian Rainfall and Runoff (AR&R 1987/1998)*
7. *'Sans Souci' TUFLOW Flood Model provided by 'Bayside Council'*

APPENDICES

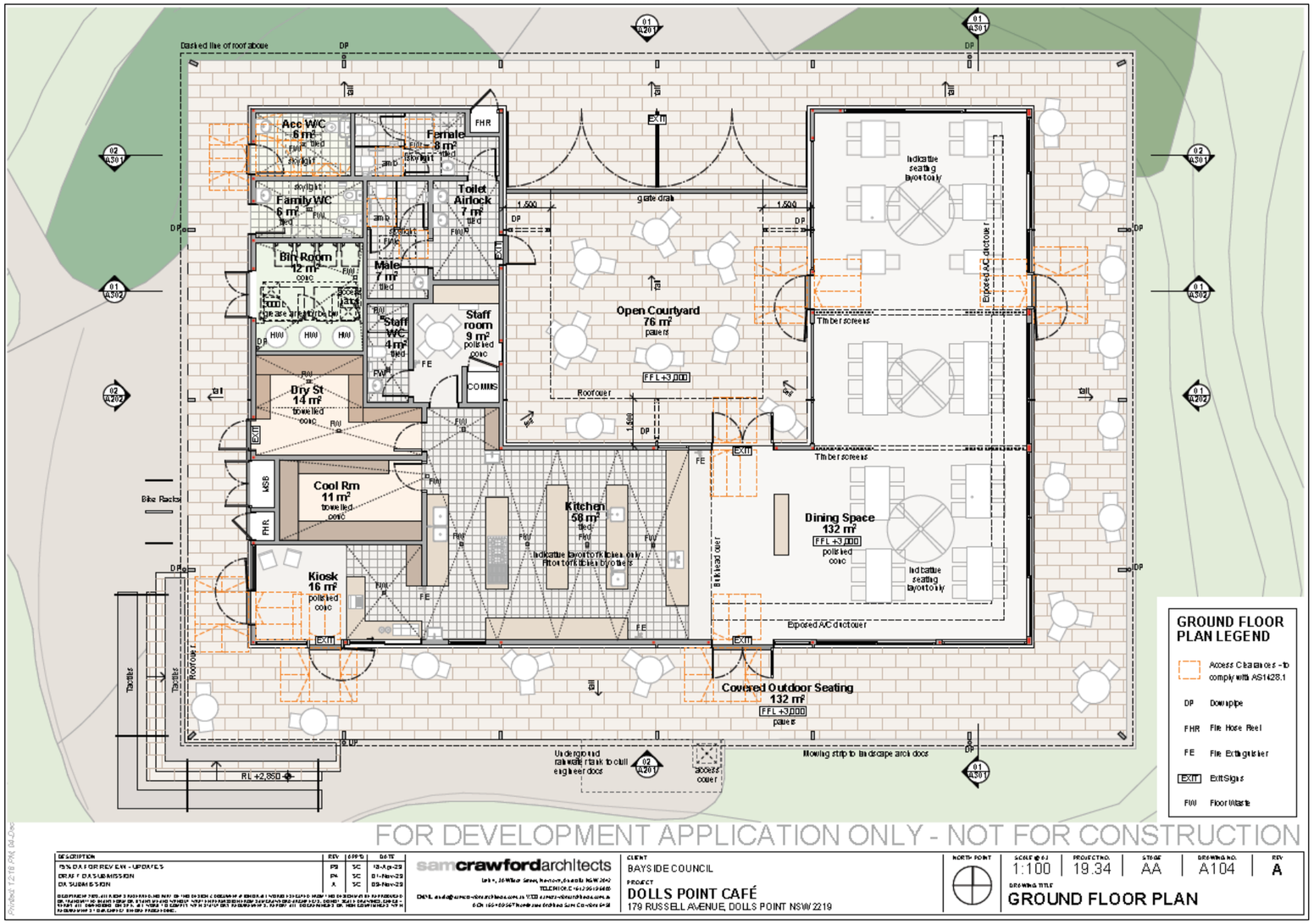
APPENDIX A1



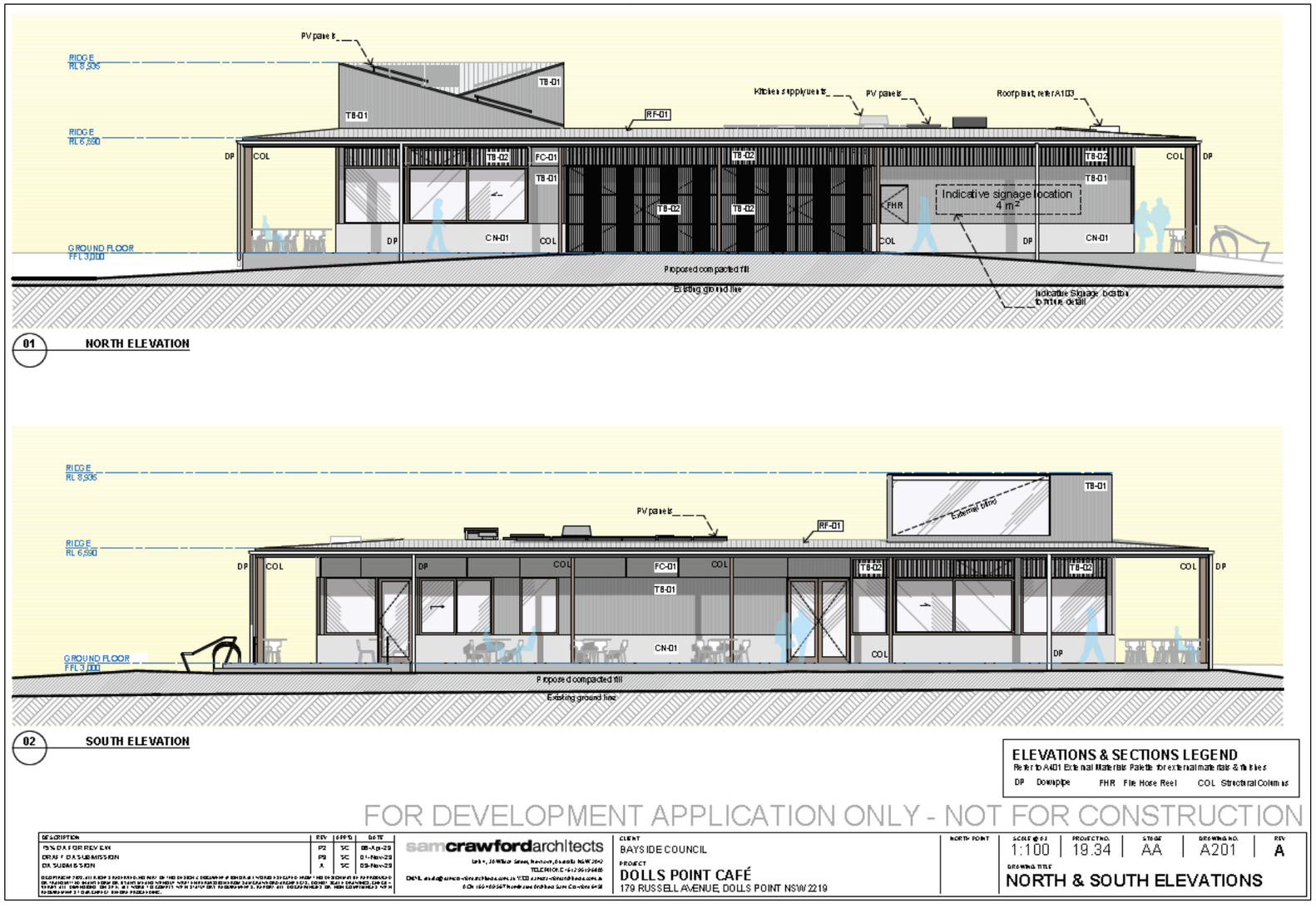
Item 1.1.1: Survey Plan



Item 1.1.2: Site Plan

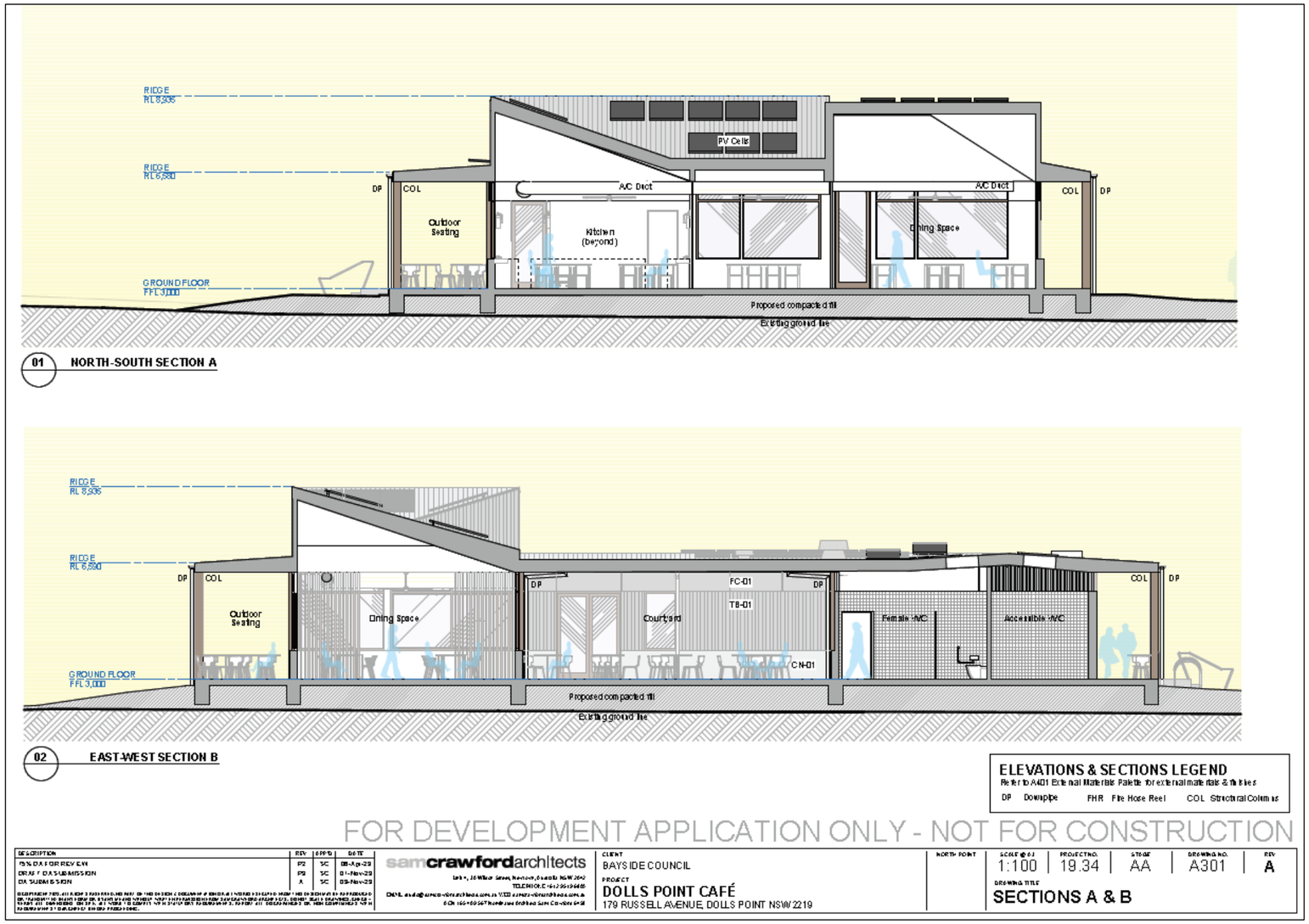


Item 1.1.3: Proposed Ground Floor Plan

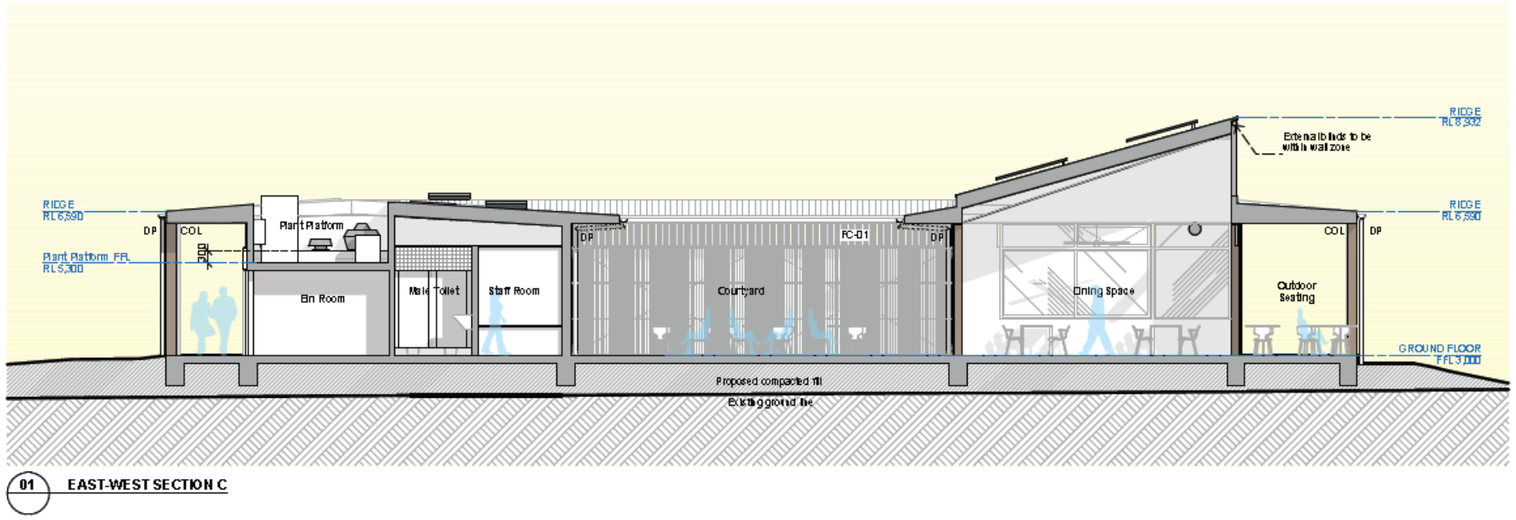


Item 1.1.4: Elevation Sections

Item 1.1.5: Elevation Section



Item 1.1.6: Elevation Section



01 EAST-WEST SECTION C

ELEVATIONS & SECTIONS LEGEND
Refer to A401 External Material Palette for external material & finishes
DP Downpipe FHR Fire Hose Reel COL Structural Columns

DESCRIPTION	REV	APP'D	DATE
75% DA FOR REVIEW	P1	SC	08-Apr-23
DRAFT DA SUBMISSION	P2	SC	01-Nov-23
DA SUBMISSION	A	SC	03-Nov-23

samcrawfordarchitects
Unit 1, 30 Wilson Street, Newtown, Australia NSW 2042
TELEPHONE +61 2 9519 6466
EMAIL studio@samcrawfordarchitects.com.au WEB samcrawfordarchitects.com.au
ACN 165 469 567 Nominated Architect Sam Crawford 6458

CLIENT: BAYSIDE COUNCIL
PROJECT: DOLLS POINT CAFÉ
179 RUSSELL AVENUE, DOLLS POINT NSW 2219

NORTH POINT

SCALE @ A1	PROJECT NO.	STAGE	DRAWING NO.	REV.
1:100	19.34	AA	A302	A

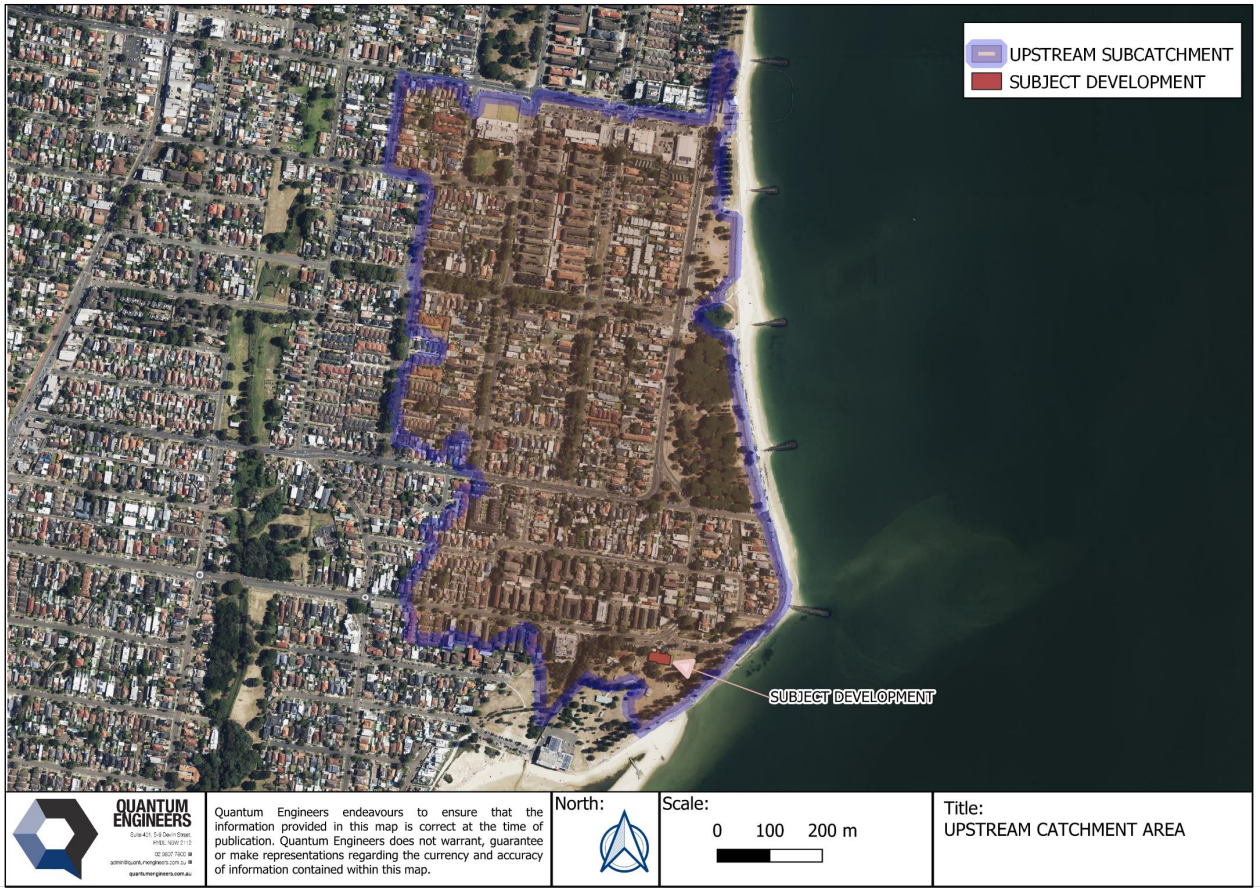
DRAWING TITLE: SECTION C

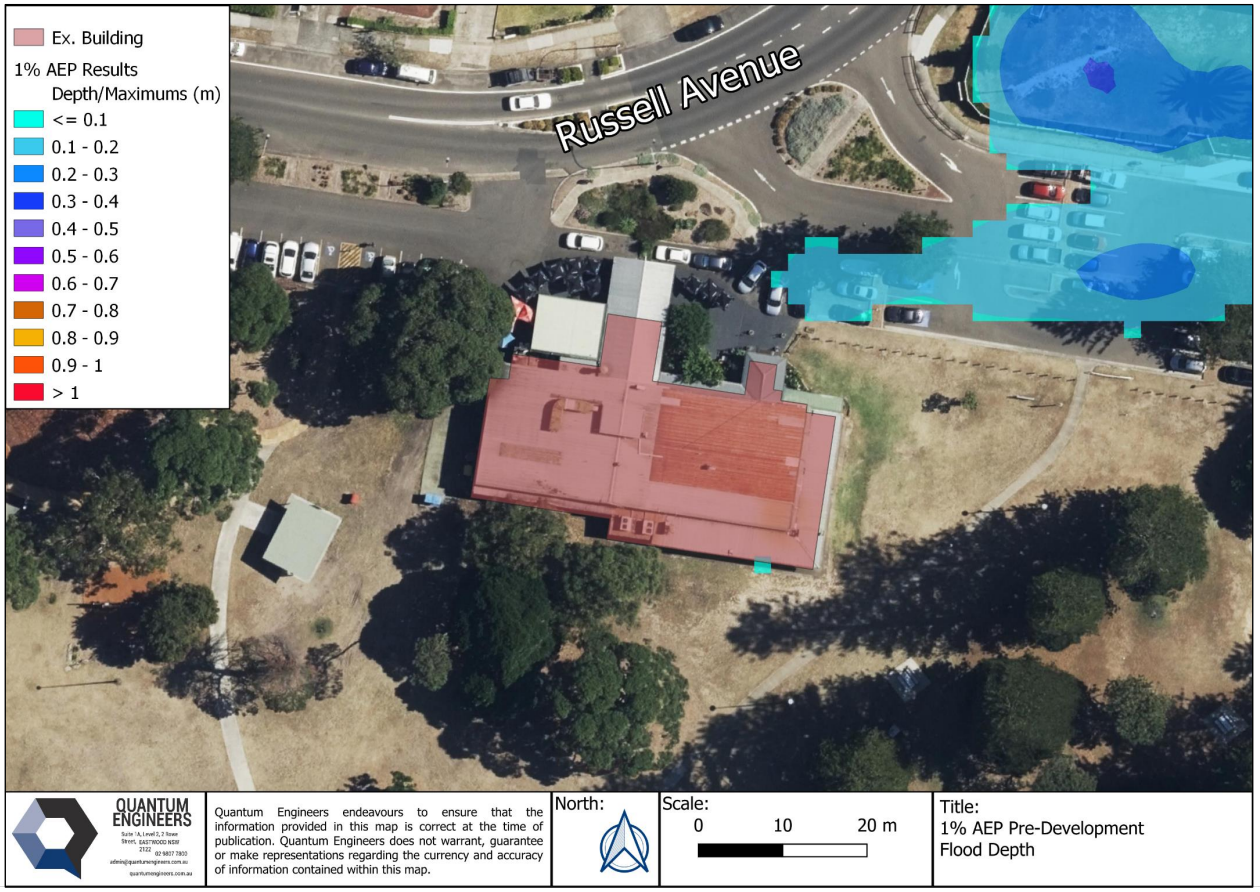
Item 1.1.7: Elevation Section

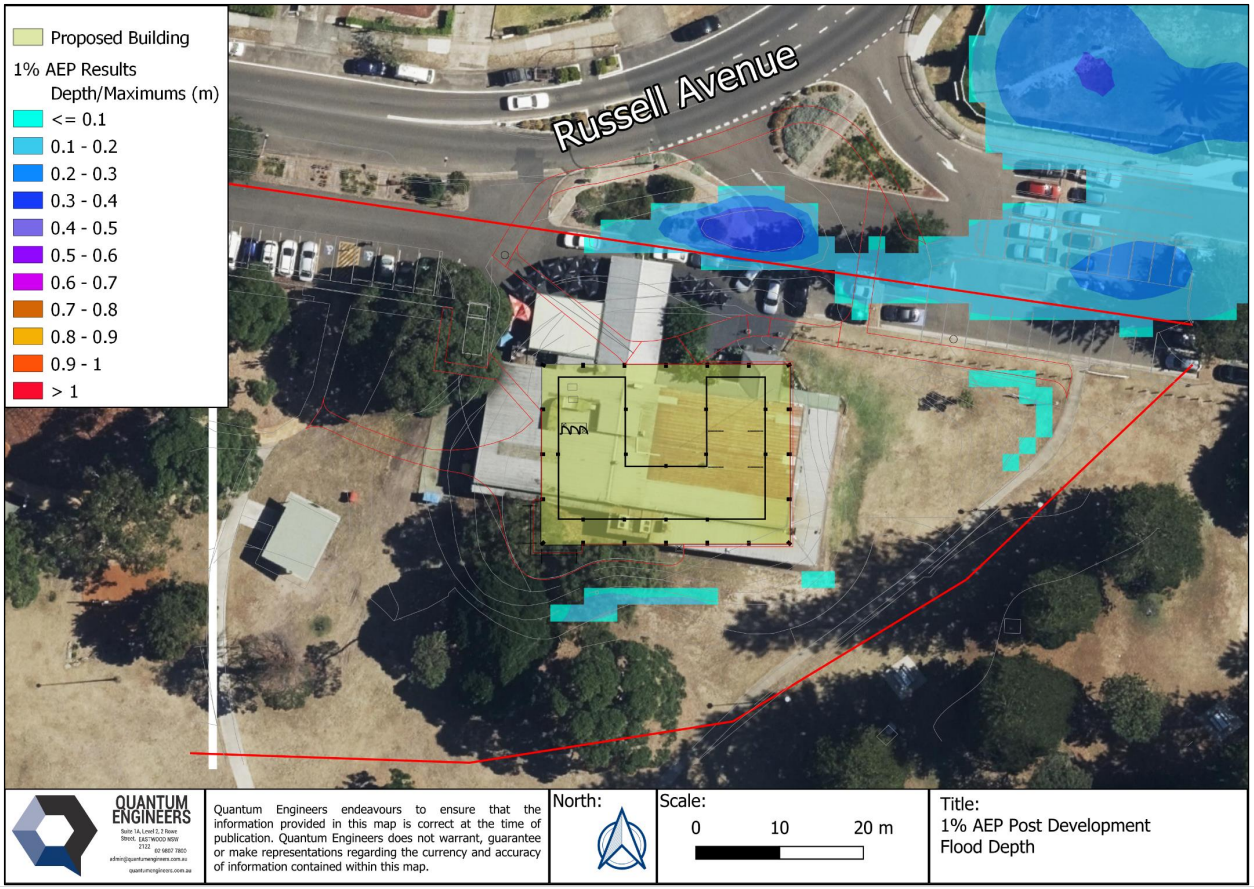
APPENDIX A2

TUFLOW Flood Modelling Flood Result Mapping for Pre & Post Development
(Prepared by Quantum Engineers)

Flood Mapping


UPSTREAM SUBCATCHMENT
SUBJECT DEVELOPMENT
SUBJECT DEVELOPMENT
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0 100 200 m
Title:
UPSTREAM CATCHMENT AREA


Ex. Building
1% AEP Results
Depth/Maximums (m)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
> 1
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
1% AEP Pre-Development
Flood Depth


Proposed Building
1% AEP Results
Depth/Maximums (m)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
> 1
Russell Avenue
QUANTUM ENGINEERS
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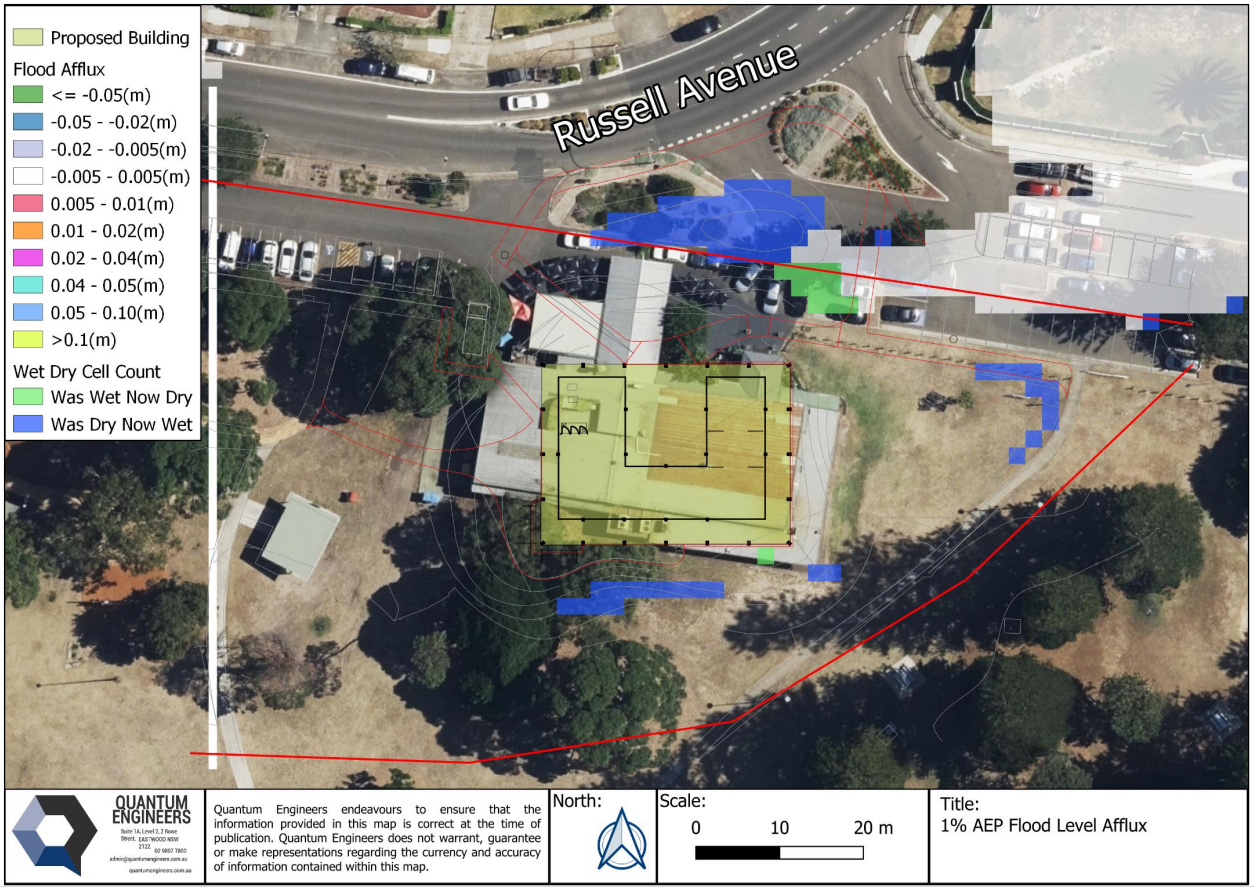
North:
Scale:
0
10
20 m
Title:
1% AEP Post Development
Flood Depth


Proposed Building
Flood Afflux
<= -0.05(m)
-0.05 - -0.02(m)
-0.02 - -0.005(m)
-0.005 - 0.005(m)
0.005 - 0.01(m)
0.01 - 0.02(m)
0.02 - 0.04(m)
0.04 - 0.05(m)
0.05 - 0.10(m)
>0.1(m)
Wet Dry Cell Count
Was Wet Now Dry
Was Dry Now Wet
Russell Avenue
QUANTUM ENGINEERS
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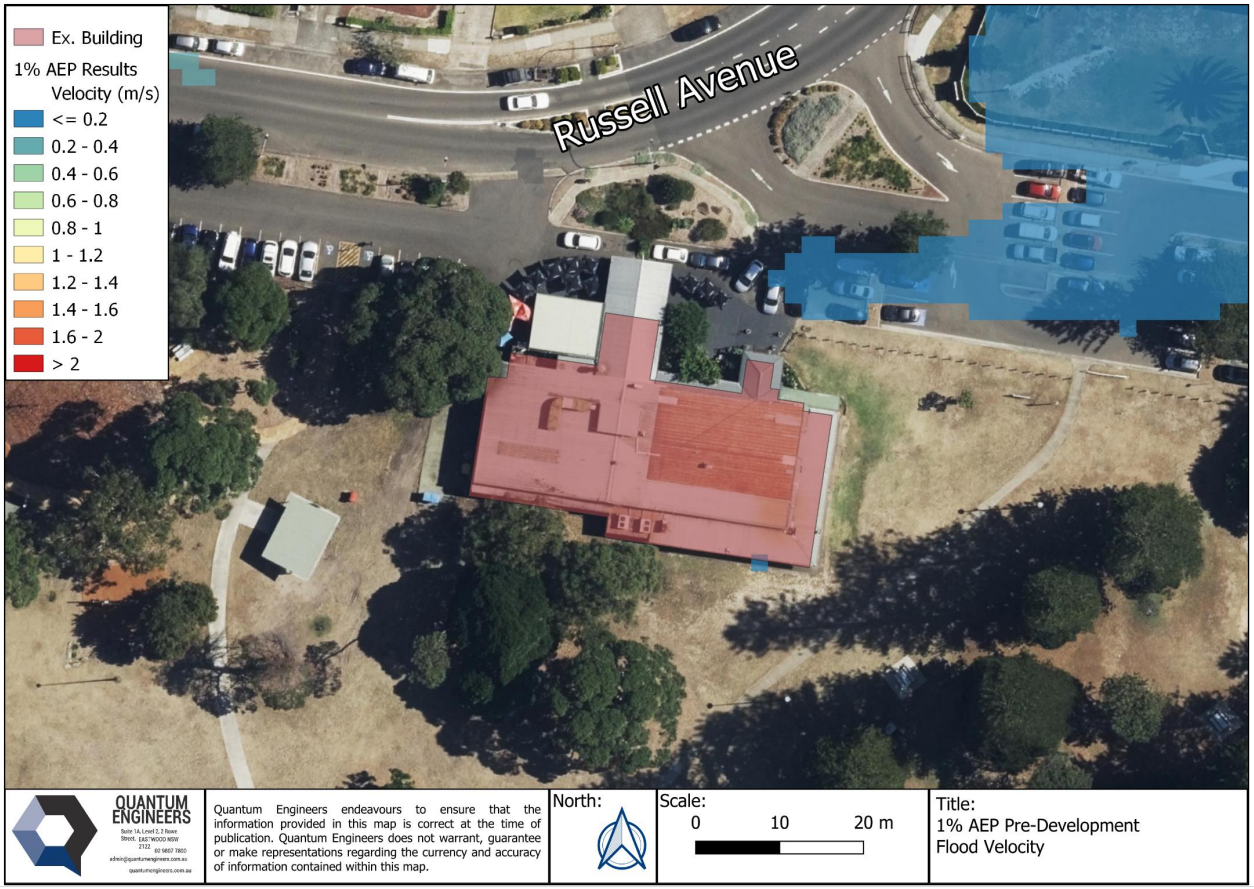
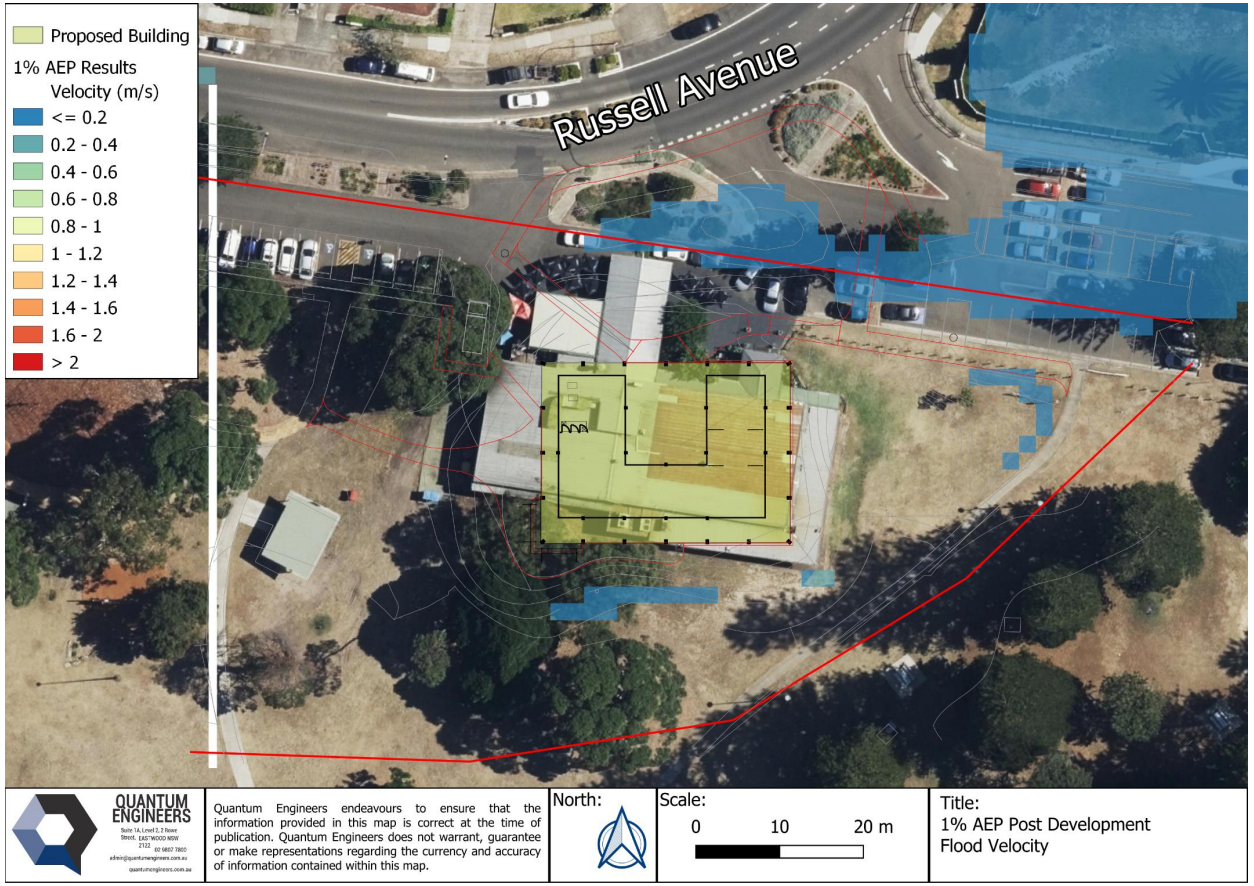
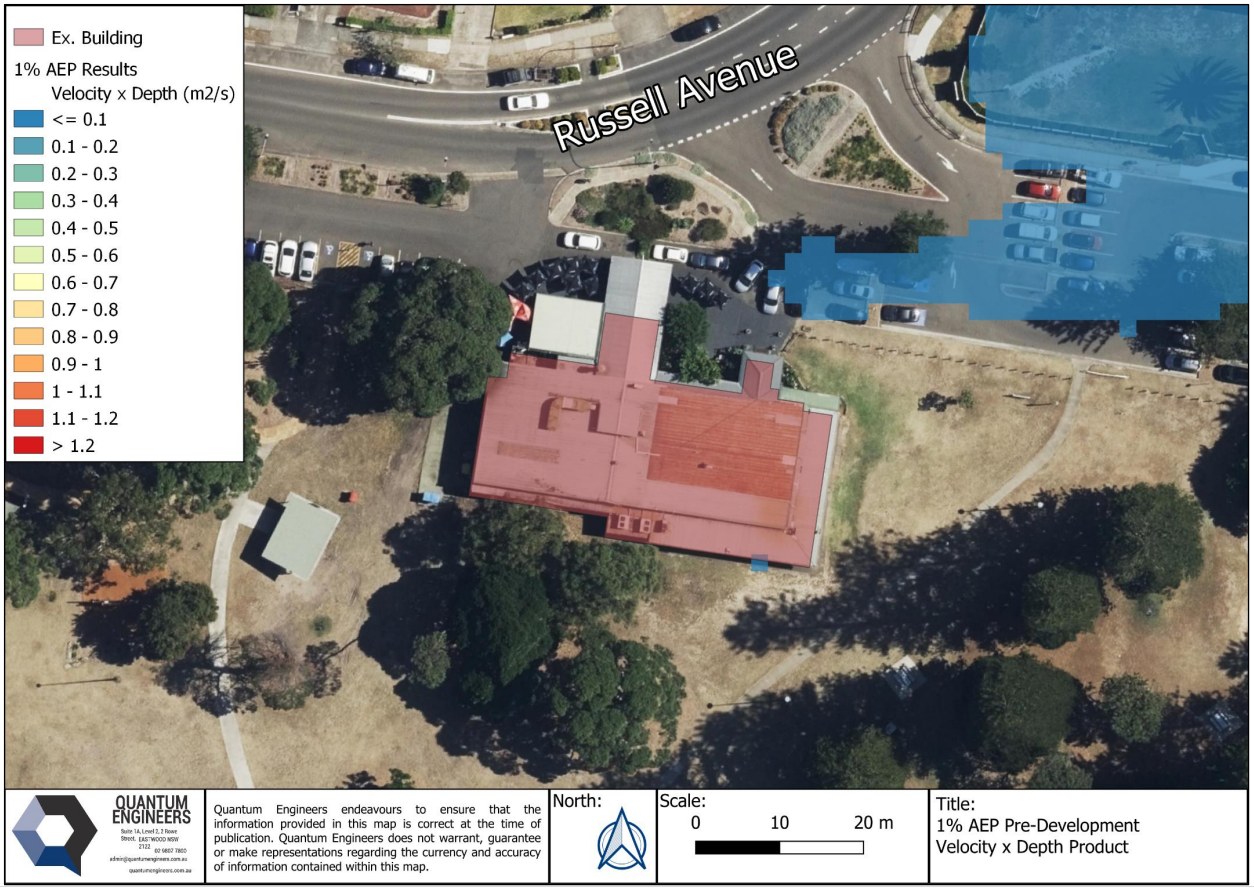
North:
Scale:
0
10
20 m
Title:
1% AEP Flood Level Afflux


Ex. Building
1% AEP Results
Velocity (m/s)
<= 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
0.8 - 1
1 - 1.2
1.2 - 1.4
1.4 - 1.6
1.6 - 2
> 2
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
1% AEP Pre-Development
Flood Velocity


Proposed Building
1% AEP Results
Velocity (m/s)
<= 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
0.8 - 1
1 - 1.2
1.2 - 1.4
1.4 - 1.6
1.6 - 2
> 2
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
1% AEP Post Development
Flood Velocity


Ex. Building
1% AEP Results
Velocity x Depth (m2/s)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1 - 1.1
1.1 - 1.2
> 1.2
Russell Avenue
QUANTUM ENGINEERS
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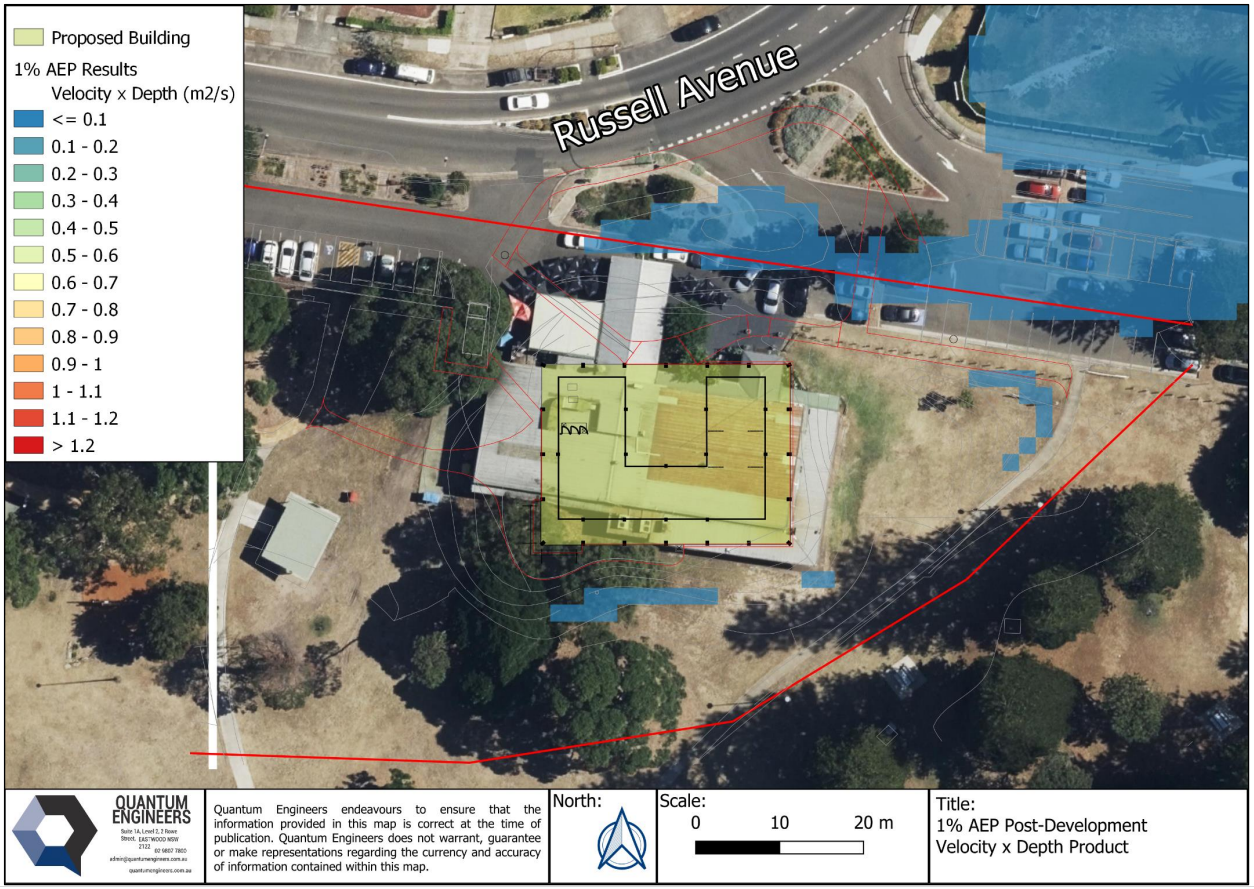
North:
Scale:
0
10
20 m
Title:
1% AEP Pre-Development
Velocity x Depth Product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1% AEP Results
Velocity x Depth (m2/s)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1 - 1.1
1.1 - 1.2
> 1.2
Russell Avenue
QUANTUM ENGINEERS
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North:
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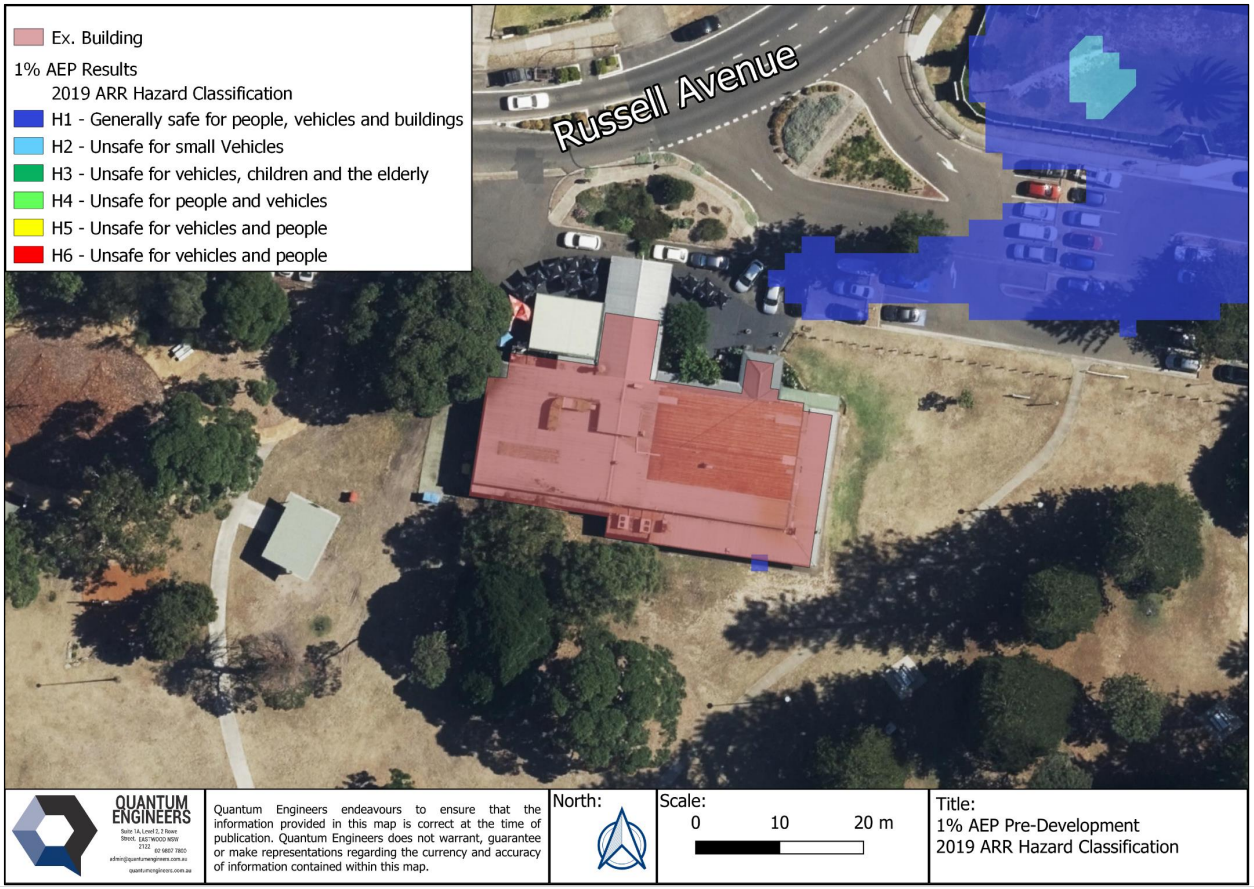
0
10
20 m
Title:
1% AEP Post-Development
Velocity x Depth Product


Ex. Building
1% AEP Results
2019 ARR Hazard Classification
H1 - Generally safe for people, vehicles and buildings
H2 - Unsafe for small Vehicles
H3 - Unsafe for vehicles, children and the elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for vehicles and people
H6 - Unsafe for vehicles and people
Russell Avenue
QUANTUM ENGINEERS
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North:
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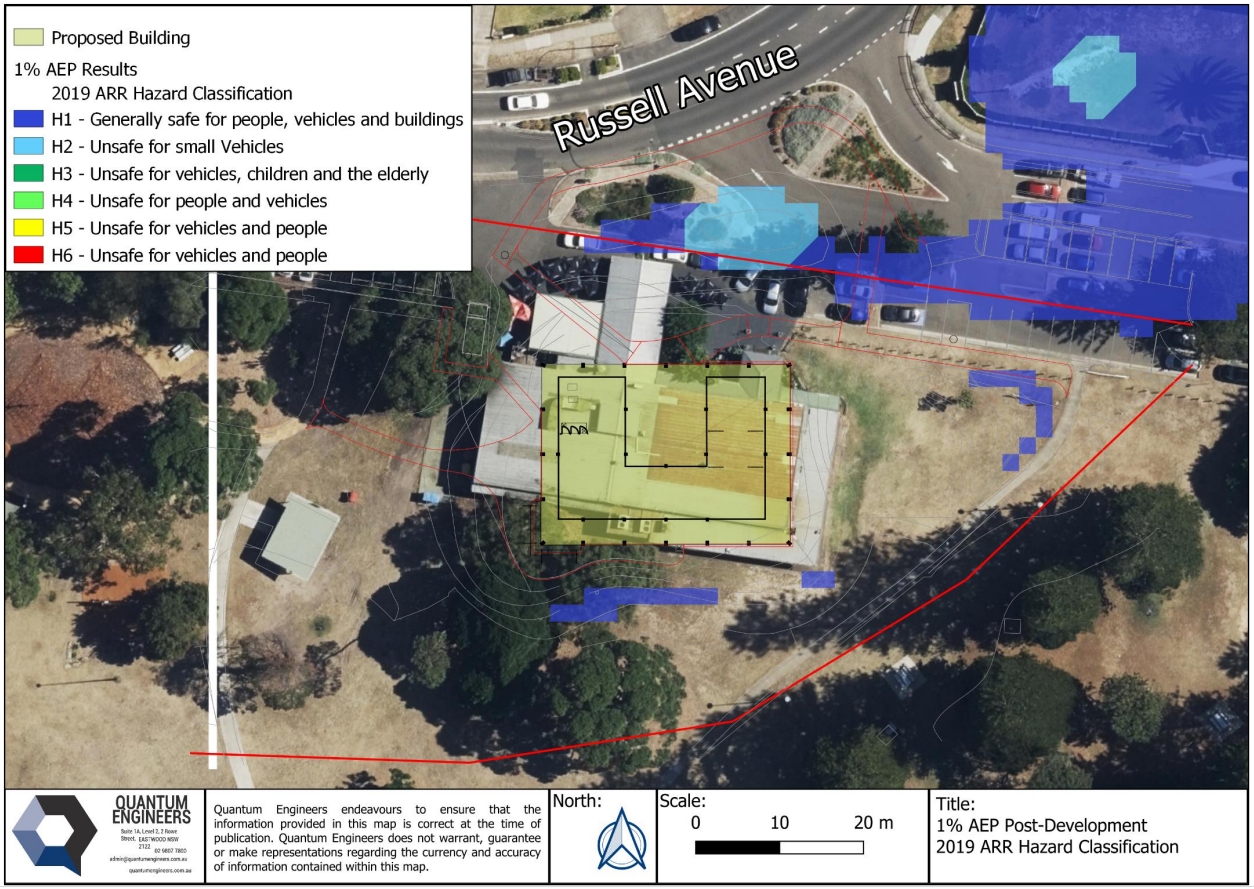
0
10
20 m
Title:
1% AEP Pre-Development
2019 ARR Hazard Classification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1% AEP Results
2019 ARR Hazard Classification
H1 - Generally safe for people, vehicles and buildings
H2 - Unsafe for small Vehicles
H3 - Unsafe for vehicles, children and the elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for vehicles and people
H6 - Unsafe for vehicles and people
Russell Avenue
QUANTUM ENGINEERS
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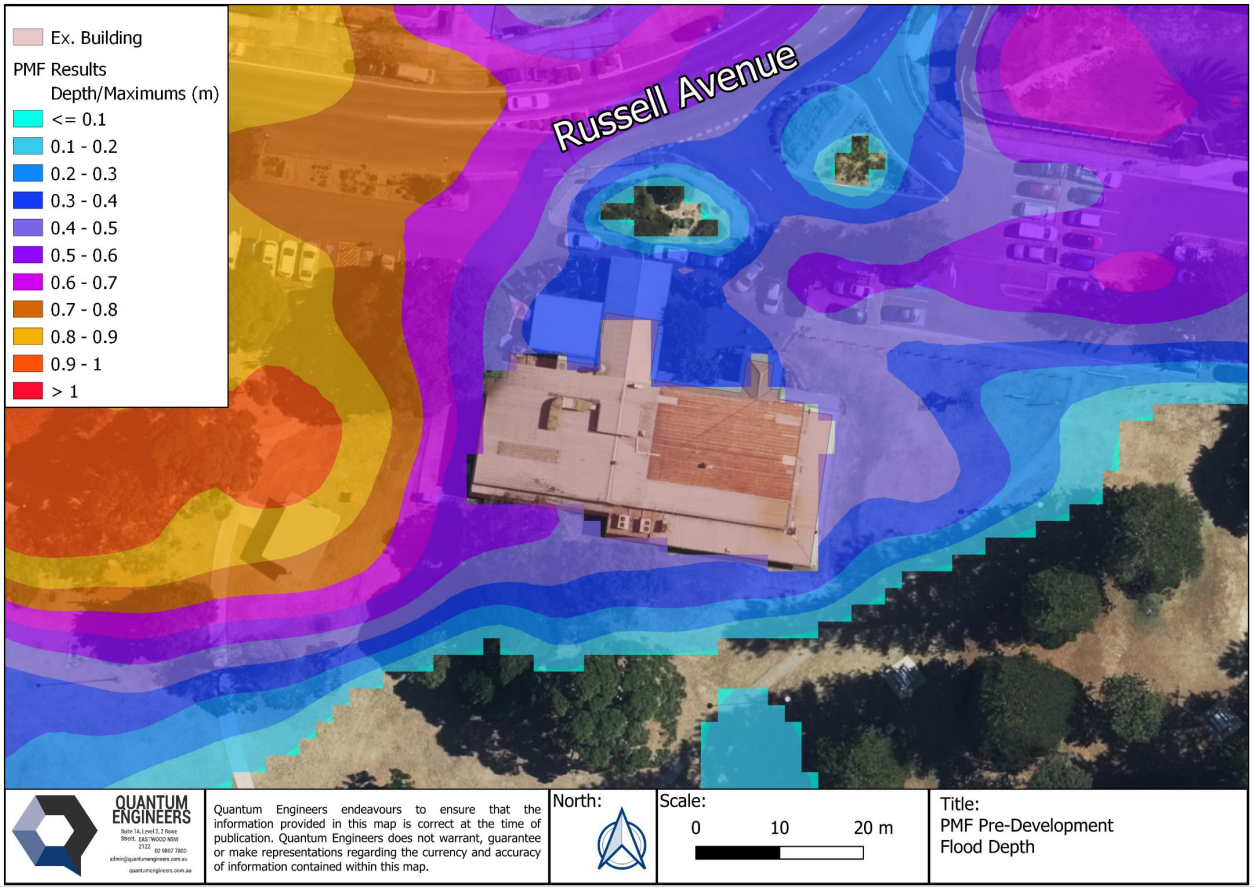
North:
Scale:
0
10
20 m
Title:
1% AEP Post-Development
2019 ARR Hazard Classification


Ex. Building
PMF Results
Depth/Maximums (m)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
> 1
Russell Avenue
QUANTUM ENGINEERS
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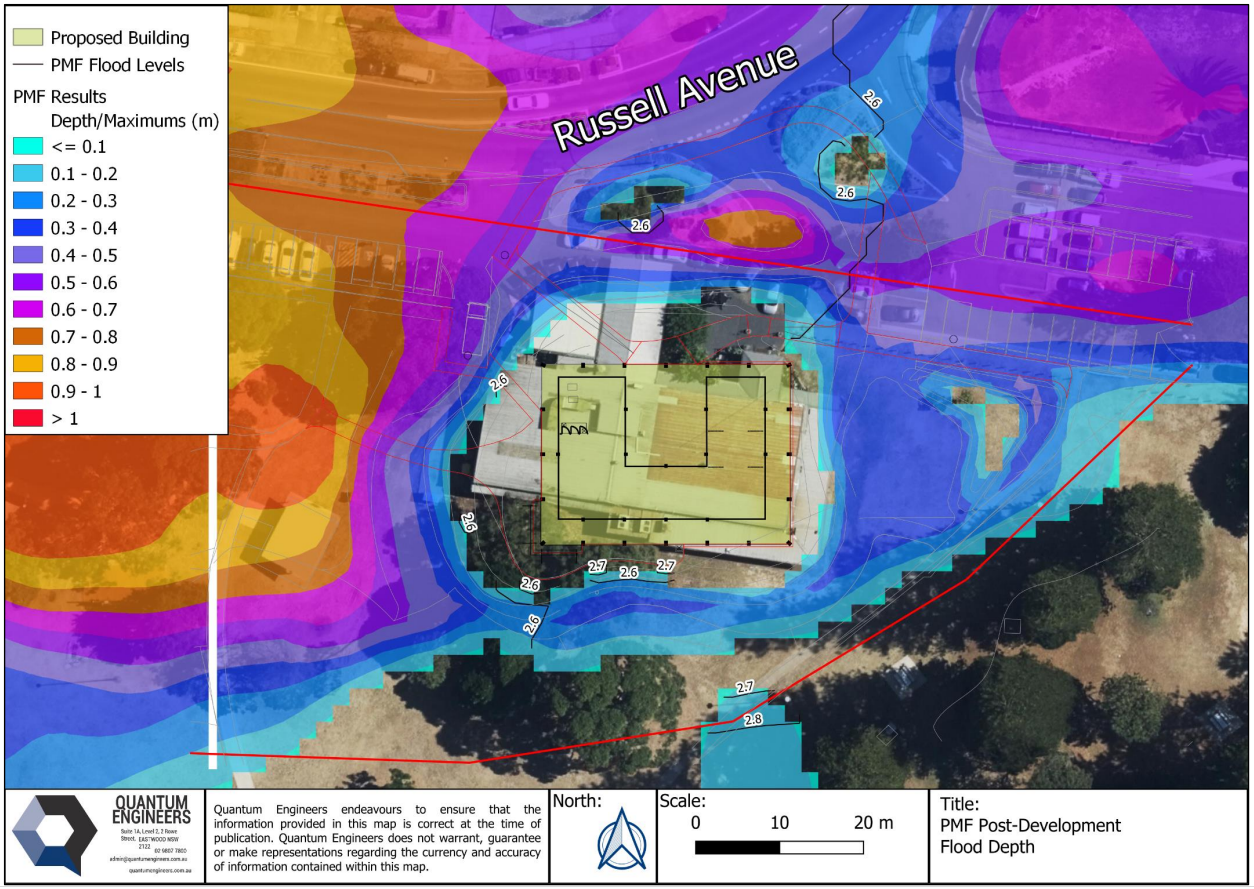
North:
Scale:
0
10
20 m
Title:
PMF Pre-Development
Flood Depth


Proposed Building
PMF Flood Levels
PMF Results
Depth/Maximums (m)
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0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
> 1
Russell Avenue
2.6
2.7
2.8
QUANTUM ENGINEERS
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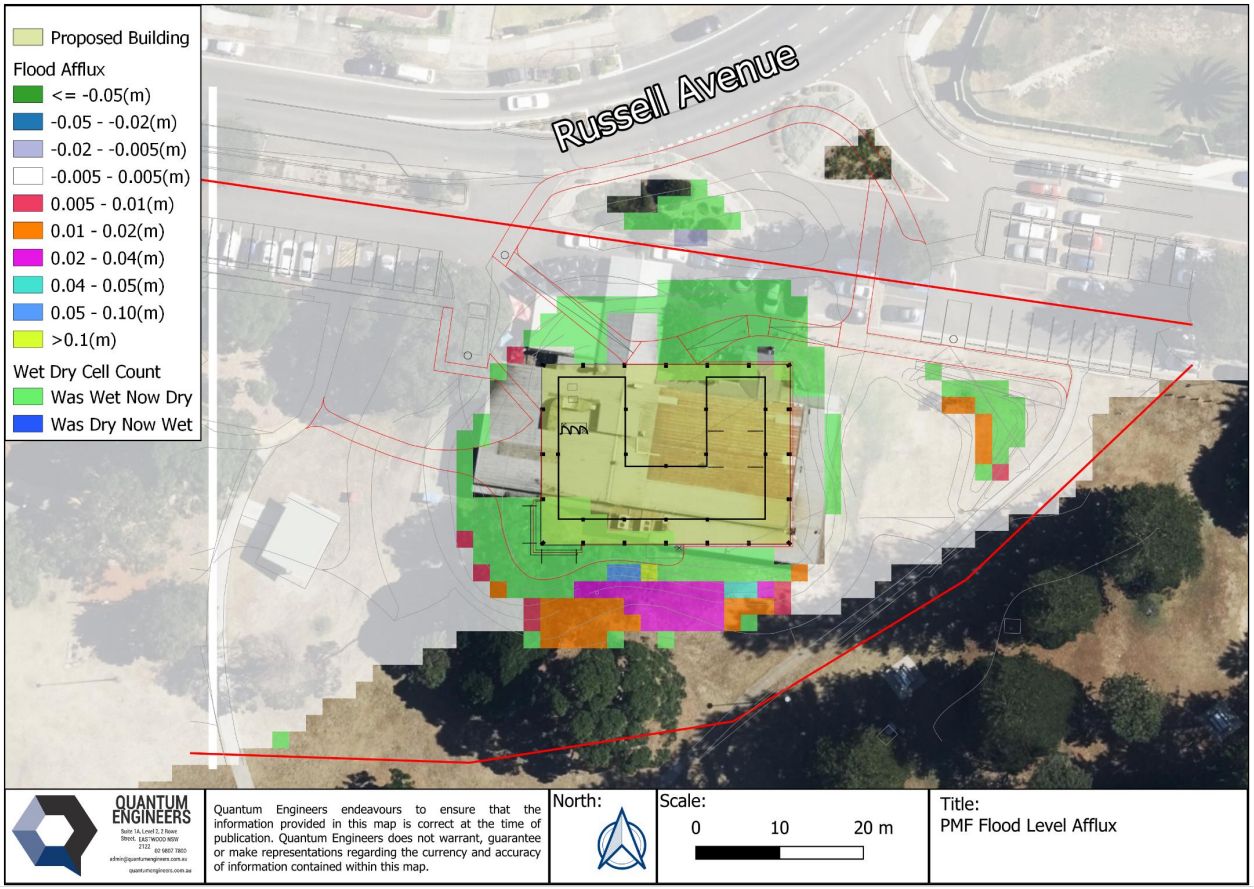
10
20 m
Title:
PMF Post-Development
Flood Depth


Proposed Building
Flood Afflux
<= -0.05(m)
-0.05 - -0.02(m)
-0.02 - -0.005(m)
-0.005 - 0.005(m)
0.005 - 0.01(m)
0.01 - 0.02(m)
0.02 - 0.04(m)
0.04 - 0.05(m)
0.05 - 0.10(m)
>0.1(m)
Wet Dry Cell Count
Was Wet Now Dry
Was Dry Now Wet
Russell Avenue
QUANTUM ENGINEERS
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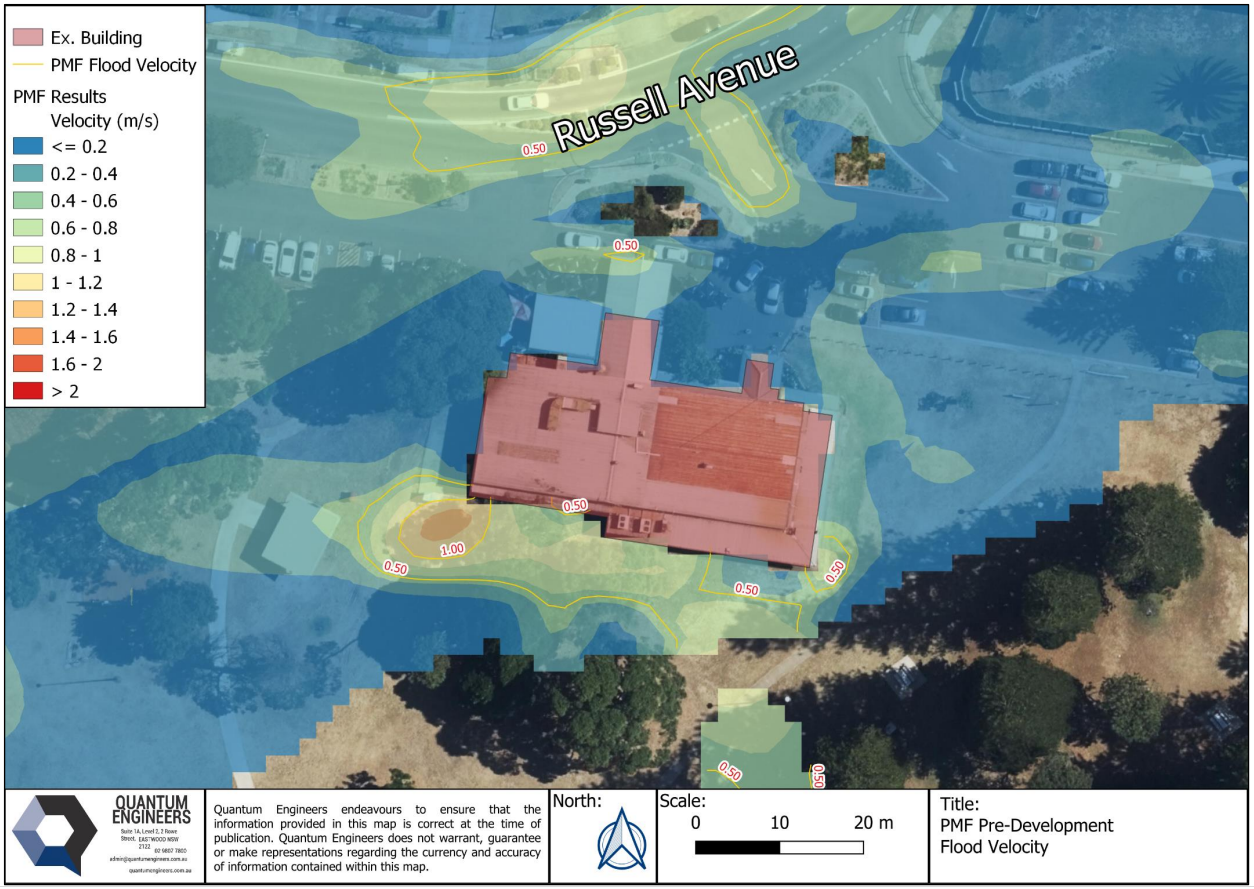
North:
Scale:
0
10
20 m
Title:
PMF Flood Level Afflux


Ex. Building
PMF Flood Velocity
PMF Results
Velocity (m/s)
<= 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
0.8 - 1
1 - 1.2
1.2 - 1.4
1.4 - 1.6
1.6 - 2
> 2
Russell Avenue
0.50
1.00
QUANTUM ENGINEERS
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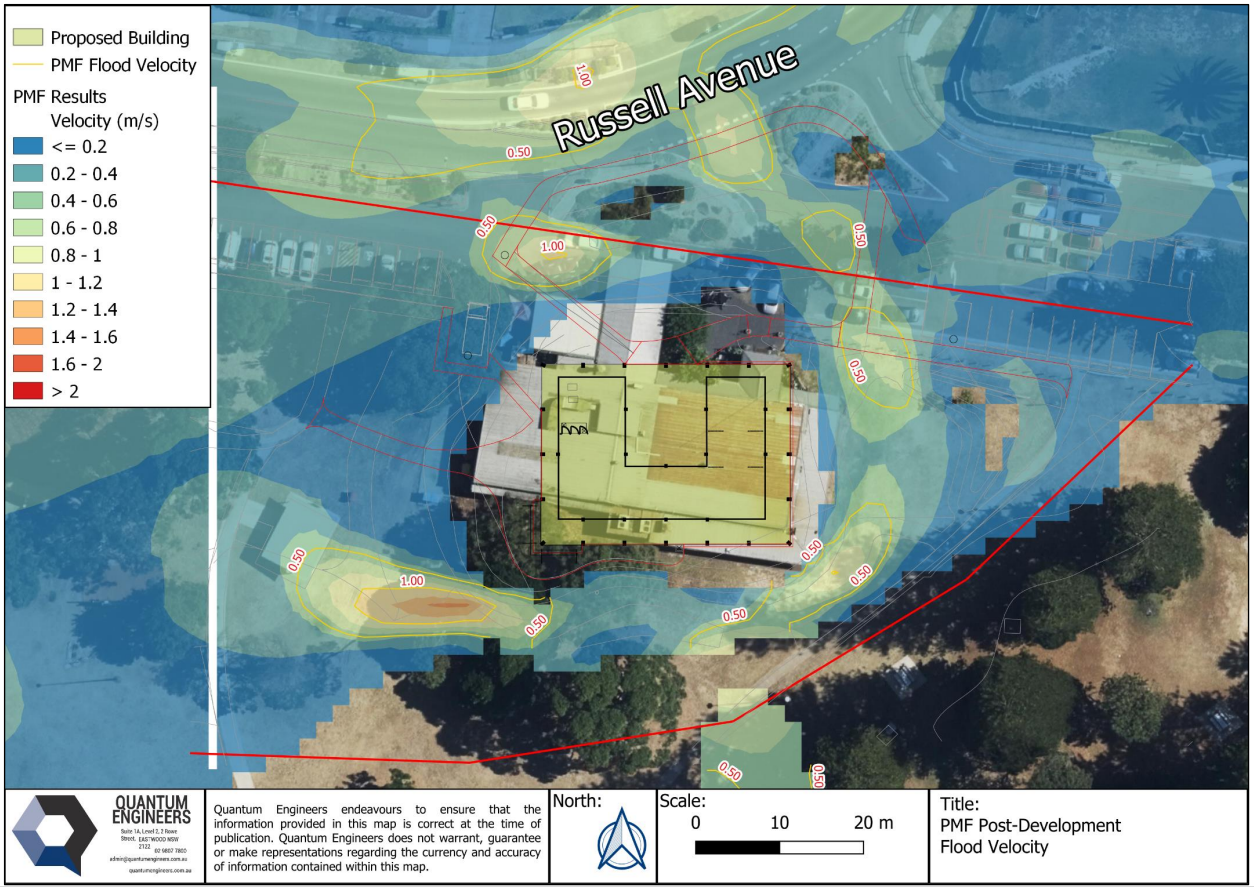
North:
Scale:
0
10
20 m
Title:
PMF Pre-Development
Flood Velocity


Proposed Building
PMF Flood Velocity
PMF Results
Velocity (m/s)
<= 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
0.8 - 1
1 - 1.2
1.2 - 1.4
1.4 - 1.6
1.6 - 2
> 2
Russell Avenue
0.50
1.00
QUANTUM ENGINEERS
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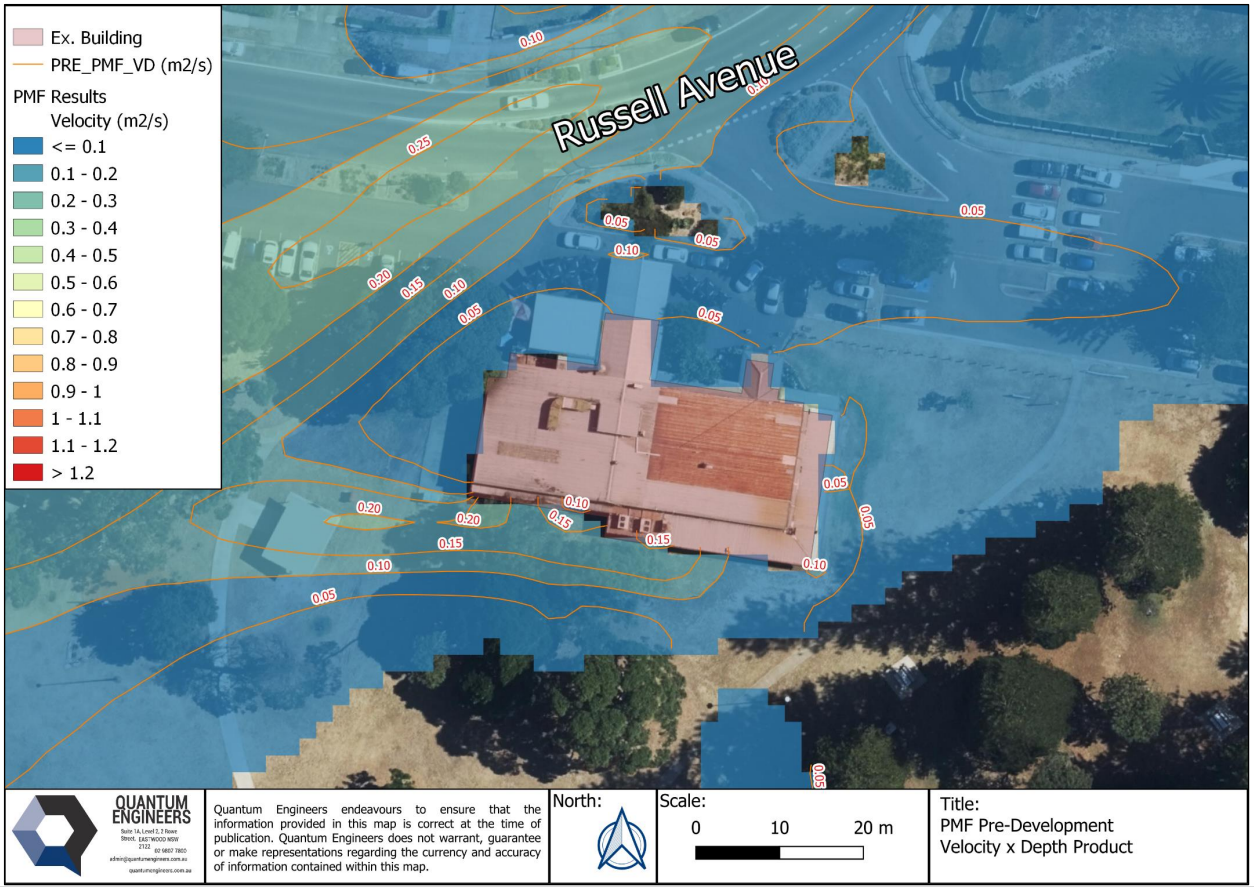
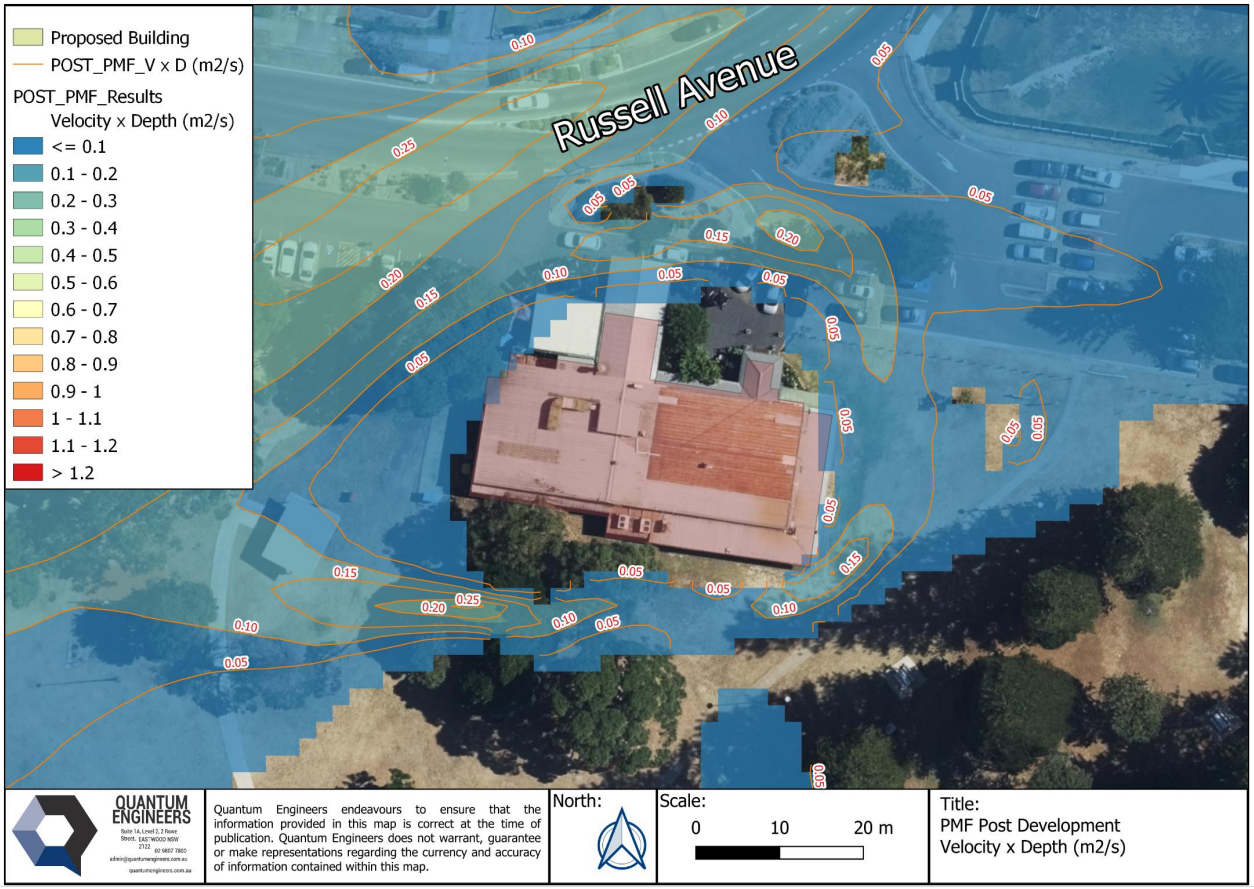
North:
Scale:
0
10
20 m
Title:
PMF Post-Development
Flood Velocity


Ex. Building
PRE_PMF_VD (m2/s)
PMF Results
Velocity (m2/s)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1 - 1.1
1.1 - 1.2
> 1.2
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
PMF Pre-Development
Velocity x Depth Product


Proposed Building
POST_PMF_V x D (m2/s)
POST_PMF_Results
Velocity x Depth (m2/s)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1 - 1.1
1.1 - 1.2
> 1.2
Russell Avenue
QUANTUM ENGINEERS
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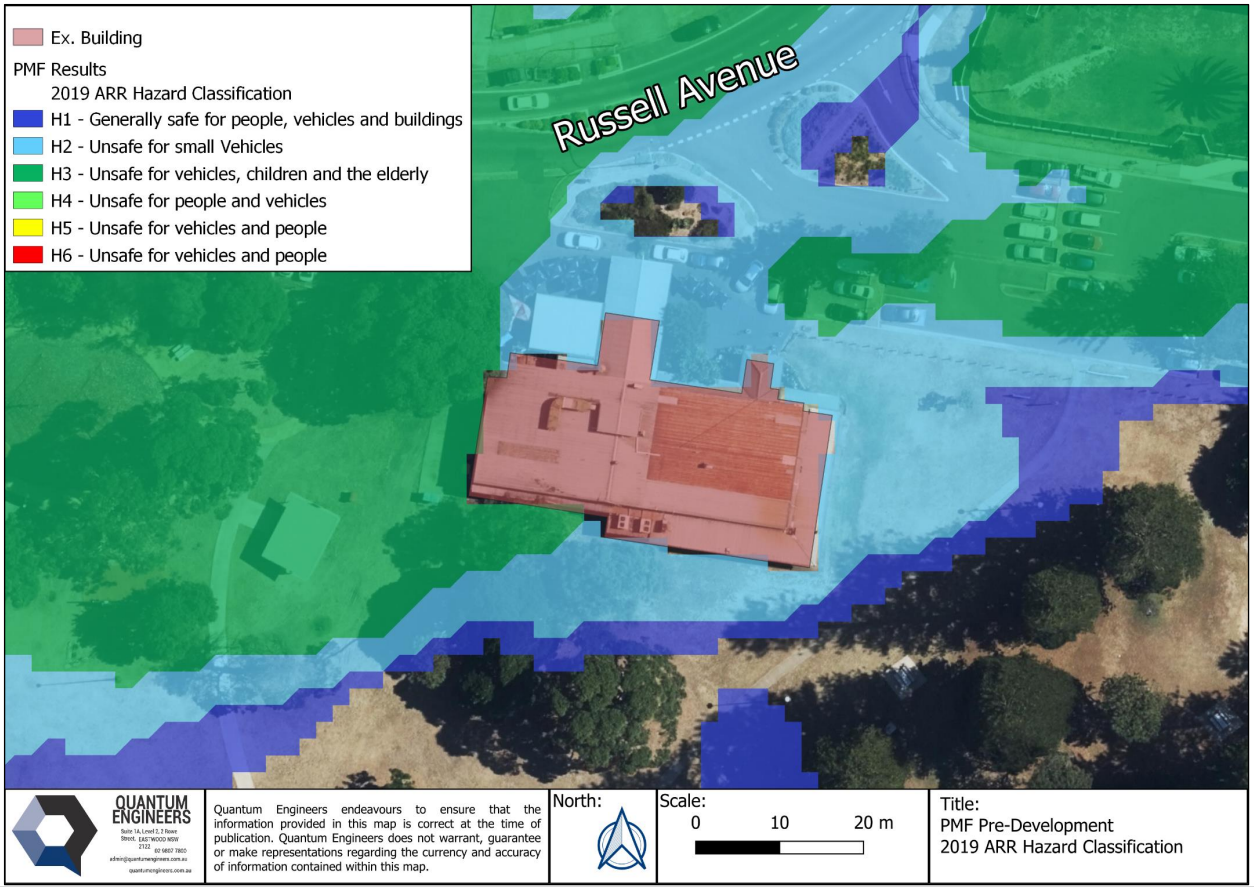
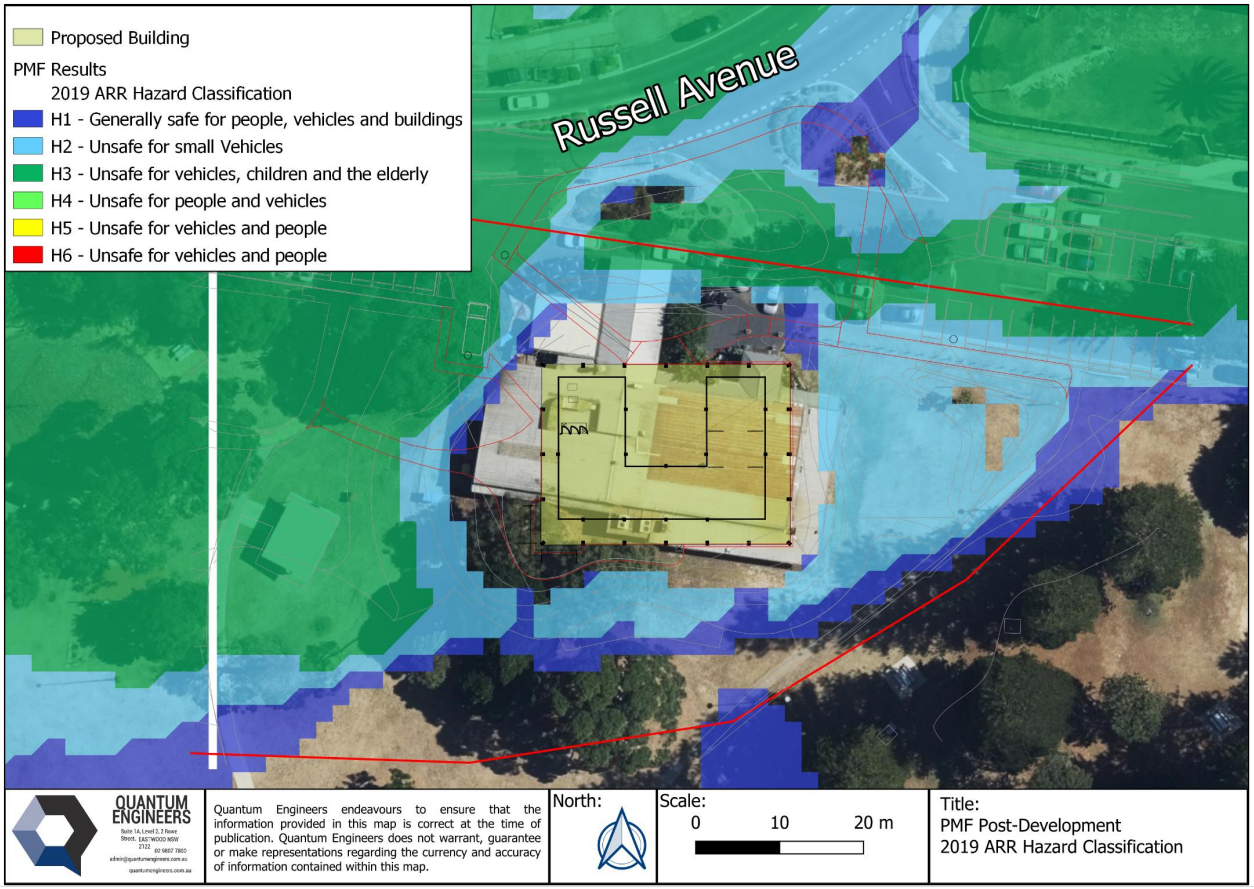
North:
Scale:
0
10
20 m
Title:
PMF Post Development
Velocity x Depth (m2/s)


Ex. Building
PMF Results
2019 ARR Hazard Classification
H1 - Generally safe for people, vehicles and buildings
H2 - Unsafe for small Vehicles
H3 - Unsafe for vehicles, children and the elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for vehicles and people
H6 - Unsafe for vehicles and people
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
PMF Pre-Development
2019 ARR Hazard Classification


Proposed Building
PMF Results
2019 ARR Hazard Classification
H1 - Generally safe for people, vehicles and buildings
H2 - Unsafe for small Vehicles
H3 - Unsafe for vehicles, children and the elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for vehicles and people
H6 - Unsafe for vehicles and people
Russell Avenue
QUANTUM ENGINEERS
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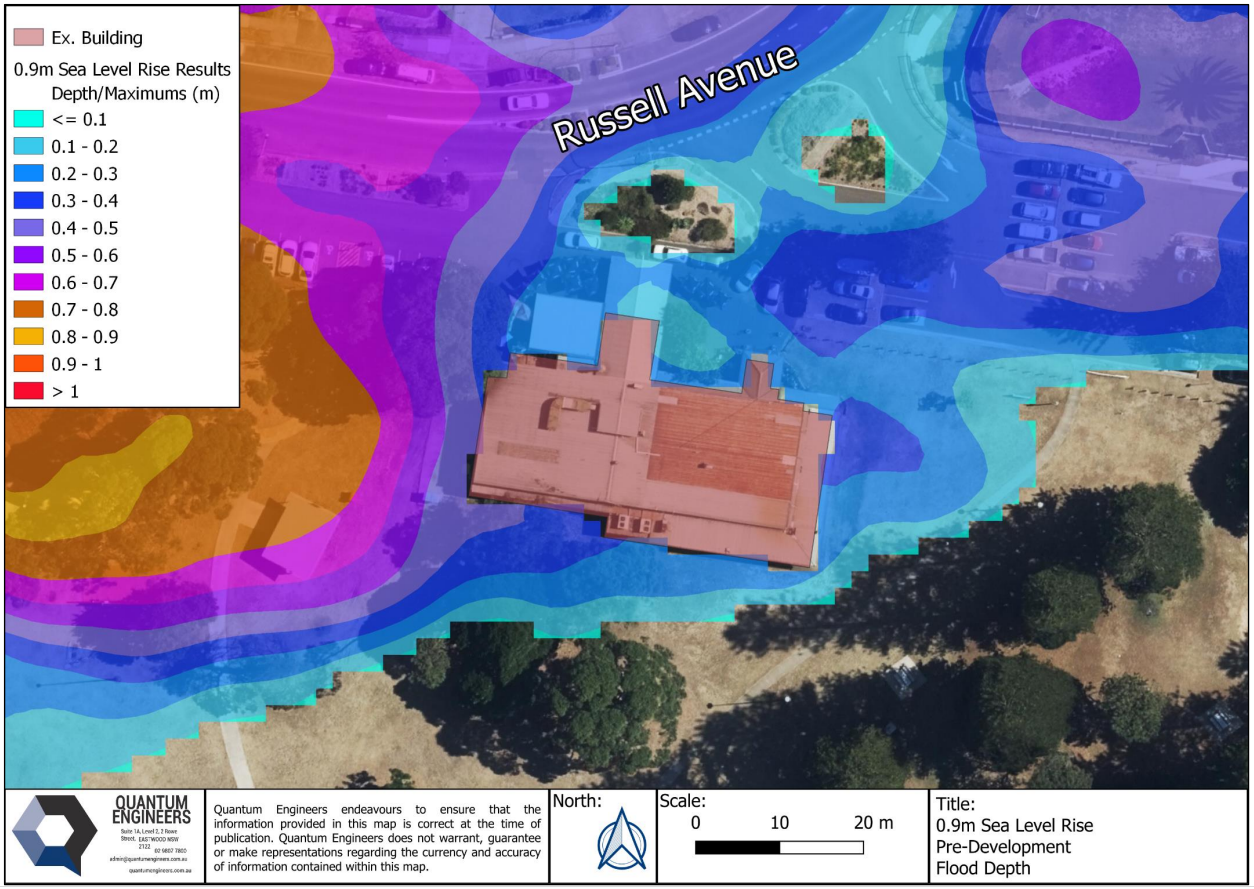
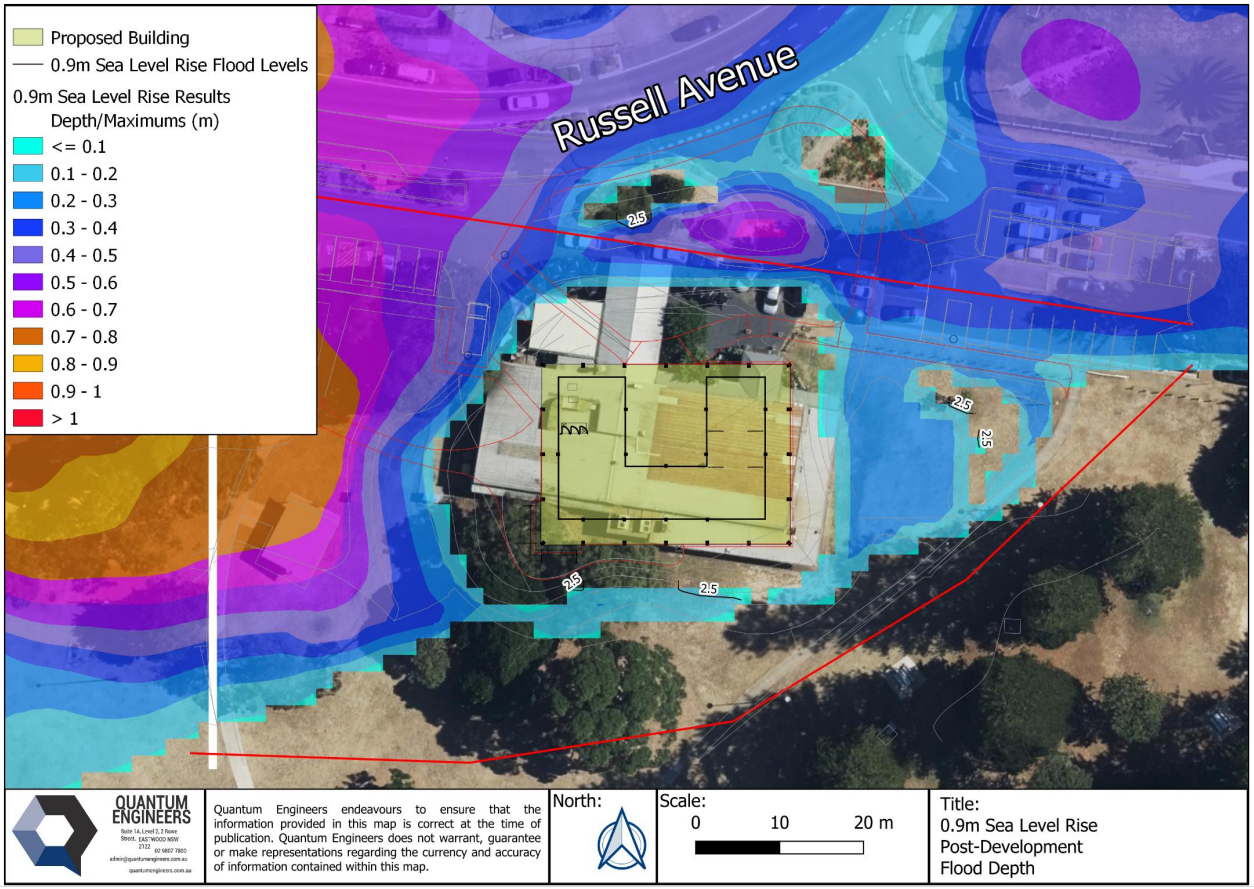
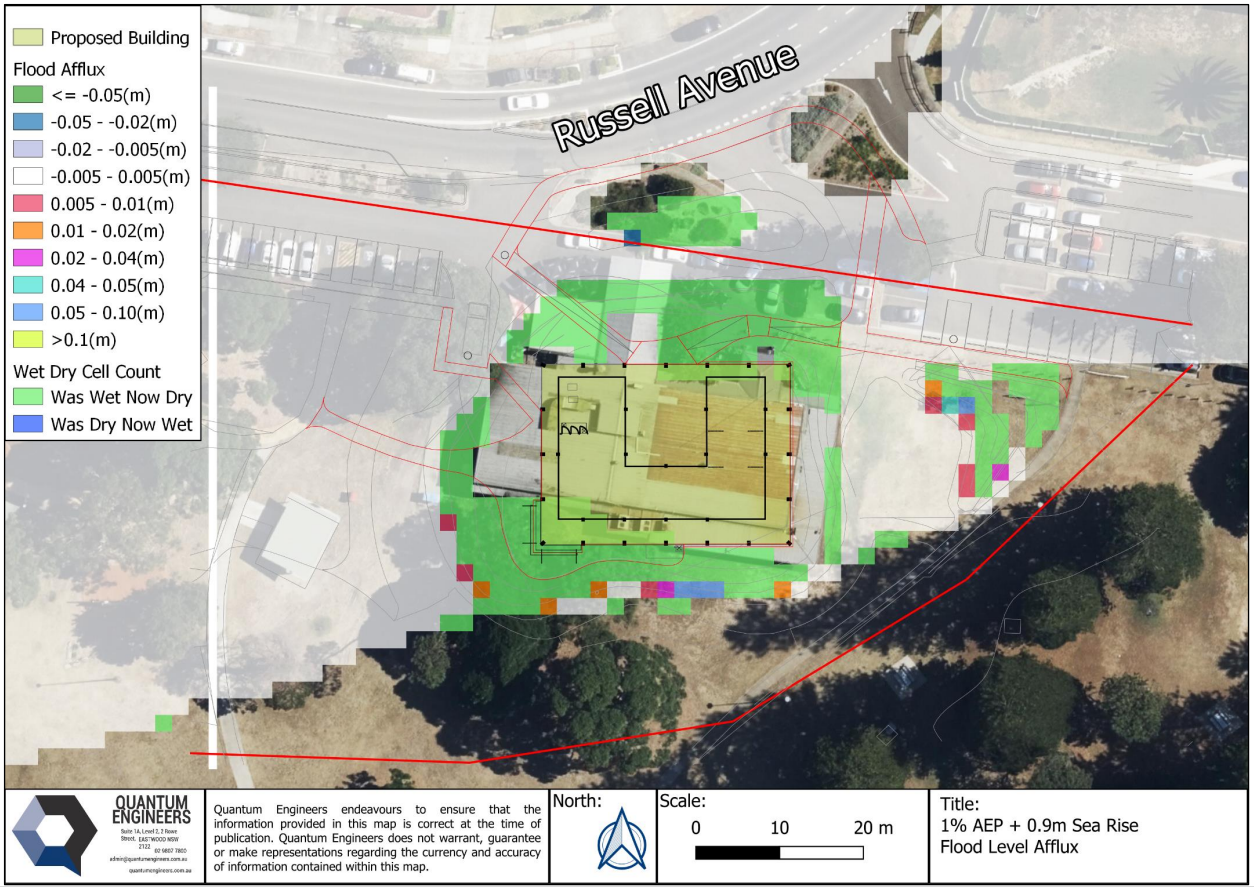
North:
Scale:
0
10
20 m
Title:
PMF Post-Development
2019 ARR Hazard Classification


Ex. Building
0.9m Sea Level Rise Results
Depth/Maximums (m)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
> 1
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Pre-Development
Flood Depth


Proposed Building
0.9m Sea Level Rise Flood Levels
0.9m Sea Level Rise Results
Depth/Maximums (m)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
> 1
Russell Avenue
2.5
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Post-Development
Flood Depth


Proposed Building
Flood Afflux
<= -0.05(m)
-0.05 - -0.02(m)
-0.02 - -0.005(m)
-0.005 - 0.005(m)
0.005 - 0.01(m)
0.01 - 0.02(m)
0.02 - 0.04(m)
0.04 - 0.05(m)
0.05 - 0.10(m)
>0.1(m)
Wet Dry Cell Count
Was Wet Now Dry
Was Dry Now Wet
Russell Avenue
QUANTUM ENGINEERS
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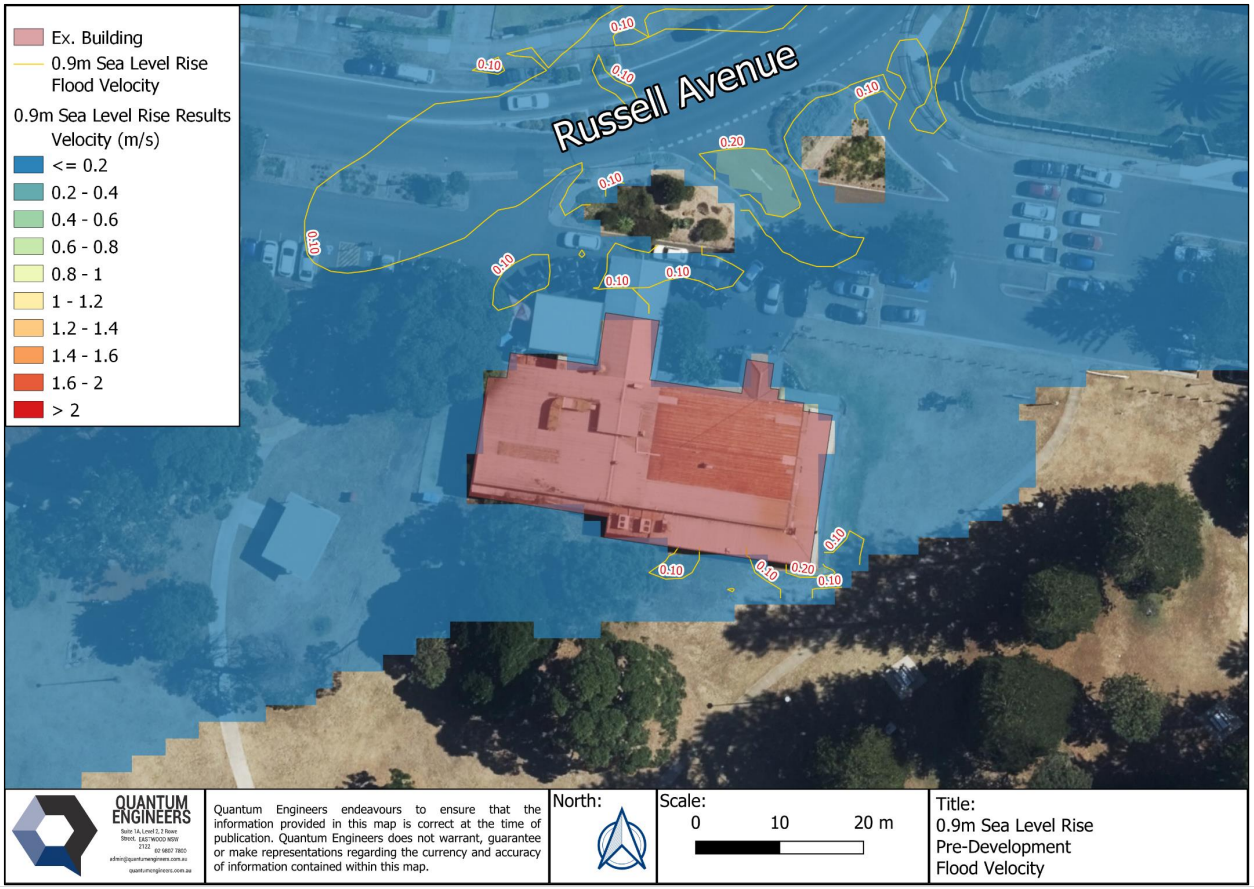
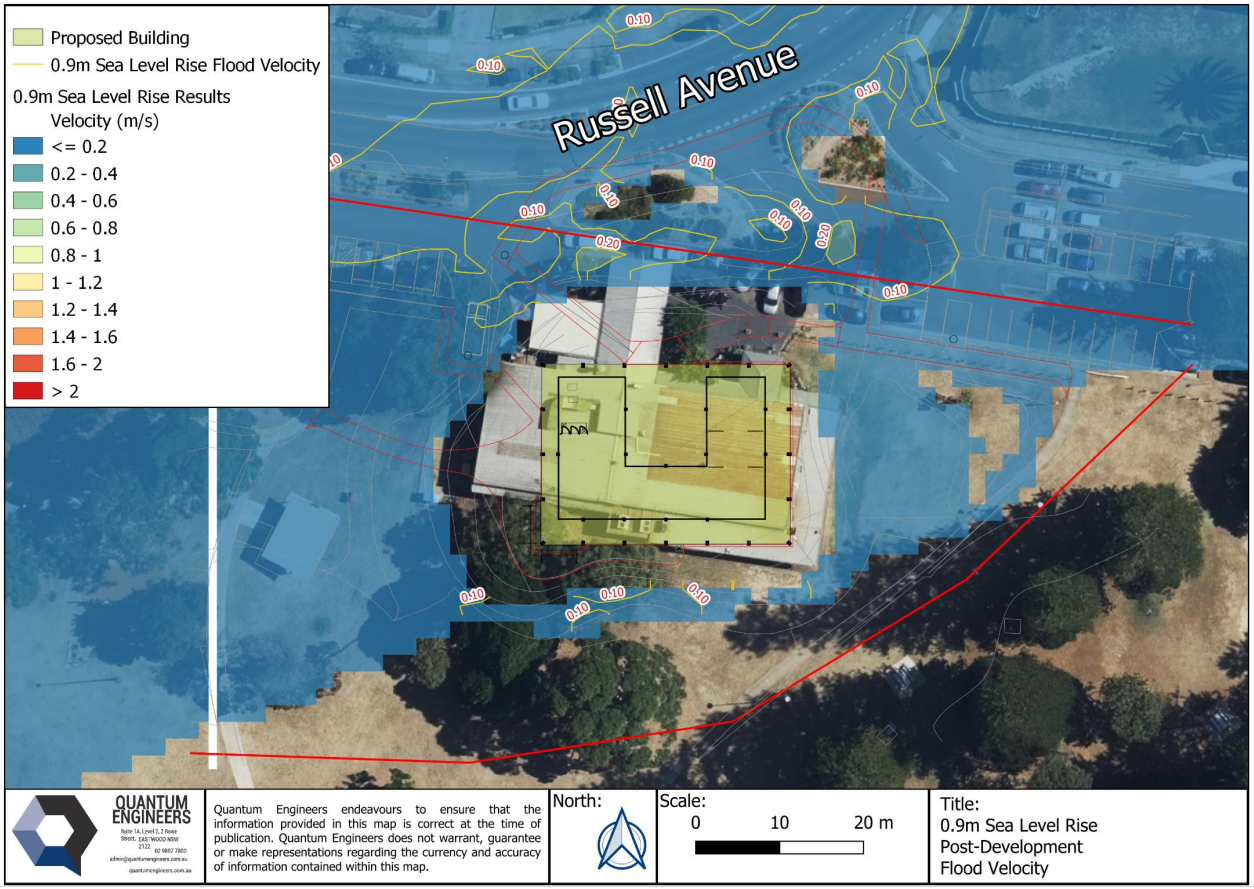
North:
Scale:
0
10
20 m
Title:
1% AEP + 0.9m Sea Rise
Flood Level Afflux


Ex. Building
0.9m Sea Level Rise Flood Velocity
0.9m Sea Level Rise Results Velocity (m/s)
<= 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
0.8 - 1
1 - 1.2
1.2 - 1.4
1.4 - 1.6
1.6 - 2
> 2
Russell Avenue
0.10
0.20
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Pre-Development
Flood Velocity


Proposed Building
0.9m Sea Level Rise Flood Velocity
0.9m Sea Level Rise Results
Velocity (m/s)
<= 0.2
0.2 - 0.4
0.4 - 0.6
0.6 - 0.8
0.8 - 1
1 - 1.2
1.2 - 1.4
1.4 - 1.6
1.6 - 2
> 2
Russell Avenue
0.10
0.20
QUANTUM ENGINEERS
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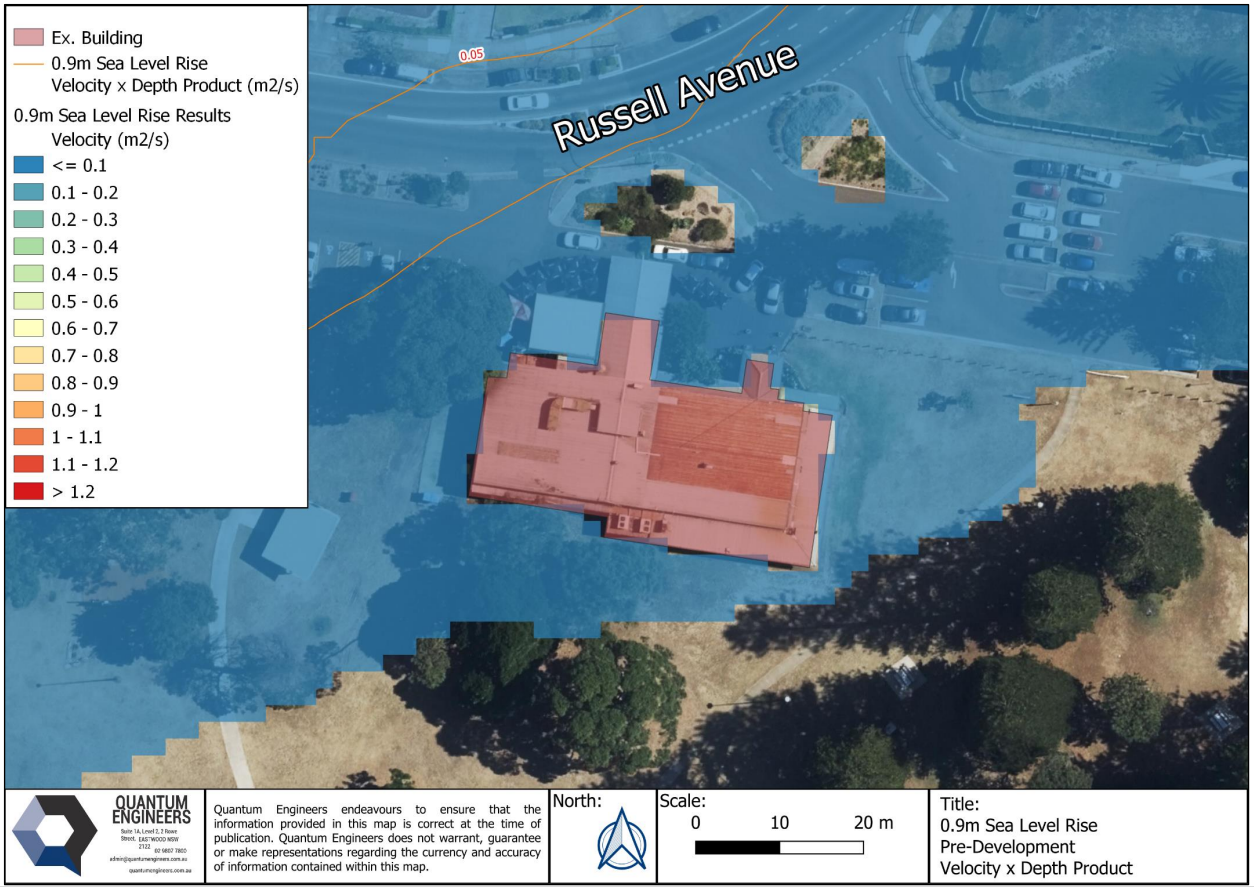
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Post-Development
Flood Velocity


Ex. Building
0.9m Sea Level Rise
Velocity x Depth Product (m2/s)
0.9m Sea Level Rise Results
Velocity (m2/s)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1 - 1.1
1.1 - 1.2
> 1.2
0.05
Russell Avenue
QUANTUM ENGINEERS
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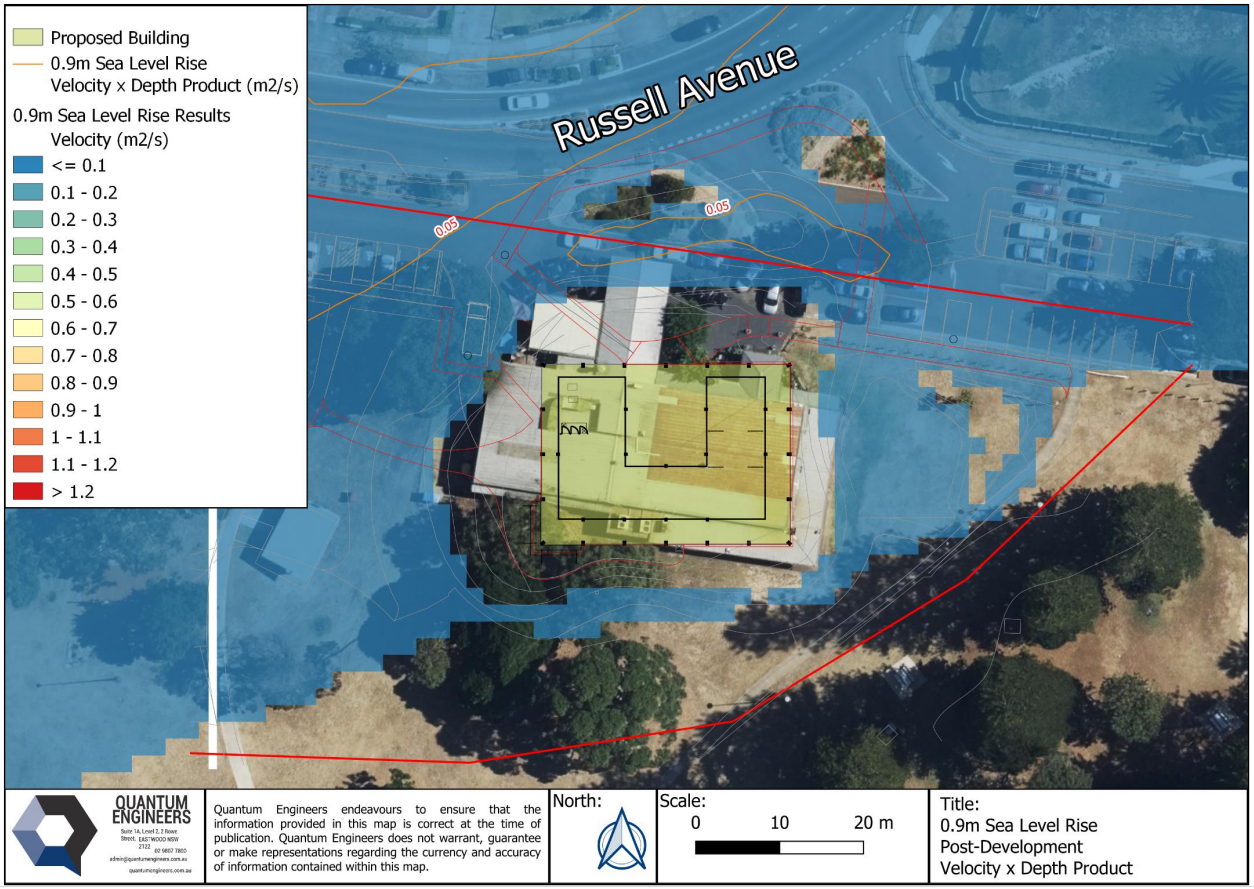
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Pre-Development
Velocity x Depth Product


Proposed Building
0.9m Sea Level Rise
Velocity x Depth Product (m2/s)
0.9m Sea Level Rise Results
Velocity (m2/s)
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1 - 1.1
1.1 - 1.2
> 1.2
Russell Avenue
0.05
0.05
QUANTUM ENGINEERS
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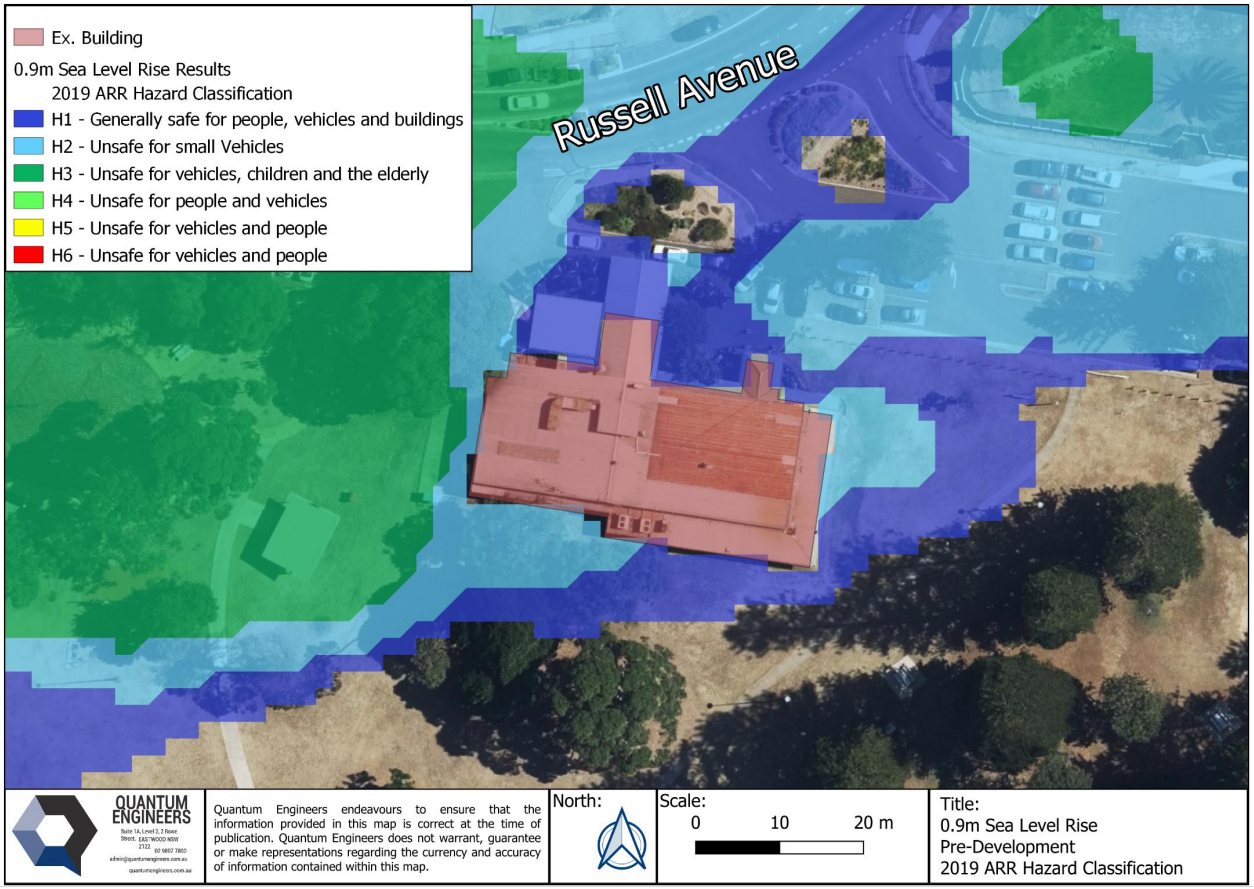
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Post-Development
Velocity x Depth Product


Ex. Building
0.9m Sea Level Rise Results
2019 ARR Hazard Classification
H1 - Generally safe for people, vehicles and buildings
H2 - Unsafe for small Vehicles
H3 - Unsafe for vehicles, children and the elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for vehicles and people
H6 - Unsafe for vehicles and people
Russell Avenue
QUANTUM ENGINEERS
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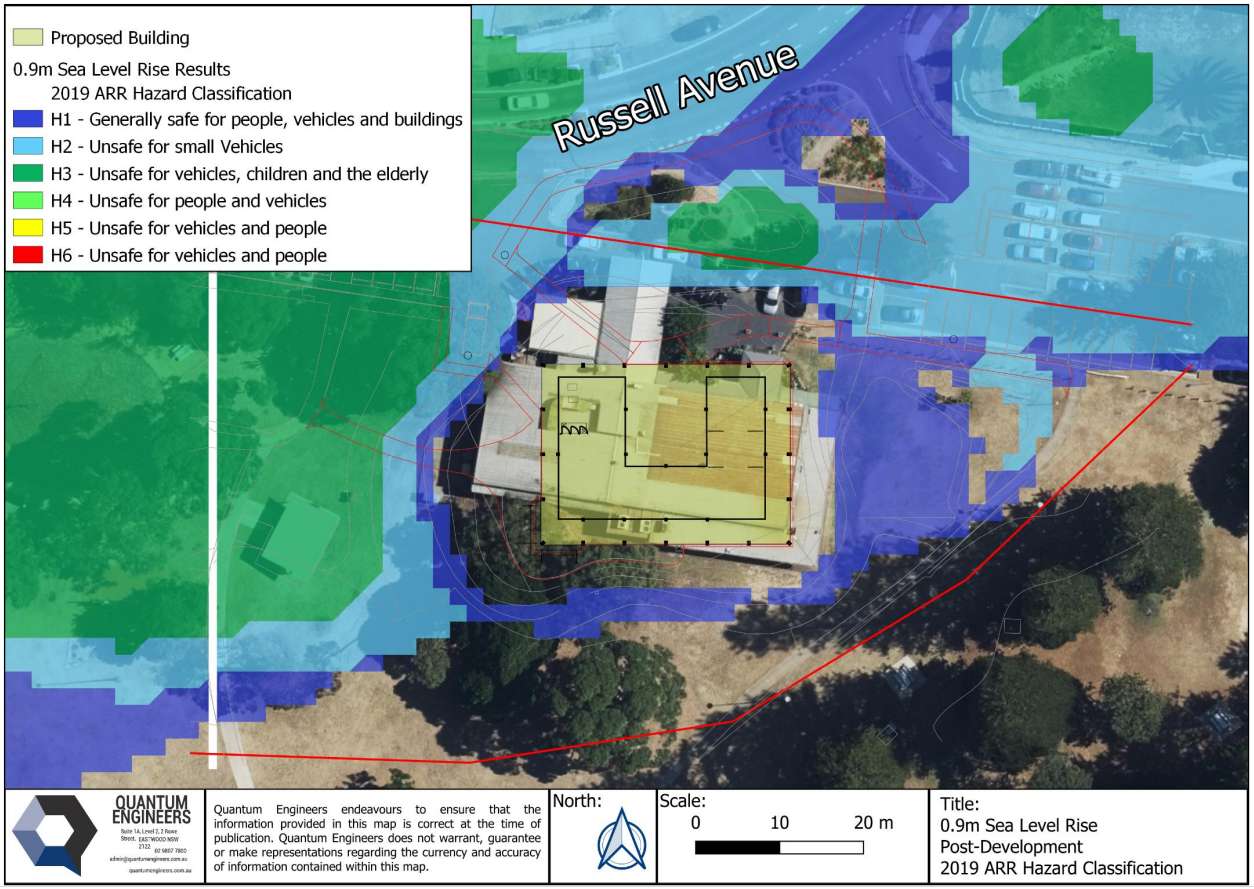
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Pre-Development
2019 ARR Hazard Classification


Proposed Building
0.9m Sea Level Rise Results
2019 ARR Hazard Classification
H1 - Generally safe for people, vehicles and buildings
H2 - Unsafe for small Vehicles
H3 - Unsafe for vehicles, children and the elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for vehicles and people
H6 - Unsafe for vehicles and people
Russell Avenue
QUANTUM ENGINEERS
Quantum Engineers endeavours to ensure that the information provided in this map is correct at the time of publication. Quantum Engineers does not warrant, guarantee or make representations regarding the currency and accuracy of information contained within this map.
North:
Scale:
0
10
20 m
Title:
0.9m Sea Level Rise
Post-Development
2019 ARR Hazard Classification

APPENDIX A3

Data Collected or Input Data Used

APPENDIX B

25 November 2019

Our Ref: F18/562
Contact: Pulak Saha

Yasmin McHutchison
Major Projects – Building Project Officer
14 Rye Avenue, Bexley NSW

Dear Sir/Madam,

Re: Flood Advice Letter for 179 Russell Ave, Dolls Point (PT 67 DP 2237)

When lodging a Development Application you must enclose a copy of this letter.

FLOOD NOTATION	Council has notated this property as being affected by the 1% Annual Exceedance Probability (AEP) flood. The 1% AEP flood means there is a 1% (i.e. a 1 in 100) chance of a flood of this height, or higher occurring in any one year.
FLOOD STUDY	The Council Flood Study applicable to the property is: • Bayside Catchments Flood Tagging, WMAwater 2019 (Draft) • Sans Souci (2D) Flood Study Review (2015), Cardno • Sans Souci Drainage Catchments Floodplain Risk Management Study, (2005) Cardno (then Cardno Willing)
FLOOD LEVELS	**1% AEP Flood Level:** 2.25m AHD **Probable Maximum Flood (PMF) Level:** 2.80m AHD
FLOOD RISK EXPOSURE	The Flood Risk Exposure of the site has been assessed as **Overland Flooding: Flood Fringe: Hazard: H1**
FLOOD COMMENTARY	• 1% AEP Flood level including sea level rise of 0.9m (year 2100) is 2.60m AHD. • Refer to figure 1 for flood extent map. • An example of the flood management plan included at the end of this letter. Additional information may be required for larger/complex developments. • No accurate information is recorded regarding the impact of tsunamis in the Bayside Local Government area.

HAZARD CATEGORY DETAILS	H1 - Generally safe for vehicles, people and buildings.
FLOOD PLANNING LEVEL (FPL)	The Flood Planning Level (FPL) is a height used to set floor levels for property development in flood prone areas. It is generally defined as the 1% AEP flood level plus an appropriate freeboard. For the design of a new development on this land the minimum habitable floor level is: 2.75m AHD The minimum level, for storage shed floor, patio, deck, carport and/or garage floor is: 2.25m AHD Basements and below ground garages are to be physically protected to the minimum habitable floor level. All electrical connections, air conditioning units and external power points are to be set above the minimum habitable floor level. As noted these floor levels are minimums, floor levels higher than these are allowable subject to normal planning rules. In order to relate these levels to your property you will need to obtain a survey to determine the ground level to AHD at the site.
FLOW THROUGH FENCING	Flow through open form fencing (louvres or pool fencing) is required for all new fencing and all new gates up to the 1% AEP Flood level to allow flood water flow through.
FLOOD RELATED DEVELOPMENT CONTROLS	The following additional flood related development controls apply: 1. Any portion of the building or structure lower than the applicable flood planning level (FPL) shall be built from flood compatible materials to be specified by a Structural Engineer. 2. All services associated with the development shall be flood proofed to the applicable FPL. 3. A Flood Management Plan is required to be lodged with the DA which will detail whether evacuation procedures are required and if so how they will be initiated, warning signs and preservation of flood awareness as owners and/or occupants change through time. An example is attached.

Councils Flood Information Plan – Dated 25th November 2019

APPENDIX C

Councils Flood Compatible Materials

9.5.3 Flood Compatible Materials & Building Components

Building Component	Flood Compatible Material
Flooring and Sub-floor Structure	A. concrete slab-on-ground monolith construction B. suspension reinforced concrete slab.
Wall Structure	A. solid brickwork, blockwork, reinforced, concrete or mass concrete
Roofing Structure (for Situations Where the Relevant Flood Level is Above the Ceiling)	A. reinforced concrete construction B. galvanised metal construction
Doors	A. solid panel with waterproof adhesives B. flush door with marine ply filled with closed cell foam C. painted metal construction D. aluminium or galvanised steel frame
Wall and Ceiling Linings	A. fibro-cement board B. brick, face or glazed C. clay tile glazed in waterproof mortar D. concrete E. concrete block F. steel with waterproof applications G. stone, natural solid or veneer, waterproof grout H. glass blocks I. glass J. plastic sheeting or wall with waterproof adhesive
Insulation Windows	A. foam (closed cell types) B. aluminium frame with stainless steel rollers or similar corrosion and water-resistant material.
Nails, Bolts, Hinges and Fittings	A. brass, nylon or stainless steel B. removable pin hinges C. hot dipped galvanised steel wire, nails or similar.

1.3.2 Glossary

Annual Exceedance Probability (AEP)
The chance of a flood of a given or a larger size occurring in any one year, usually expressed as a percentage.

Australian Height Datum (AHD)
A common national surface level datum approximately corresponding to mean sea level.

Catchment
The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.

Flood
Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse.

Flood Planning Levels (FPLs)
Are the combinations of flood levels and freeboards selected for floodplain risk management purposes.

Freeboard
Is a factor of safety typically used in relation to the setting of floor levels.

Habitable Room
In industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to damage in the event of a flood.

Probable Maximum Flood
PMF is the largest flood that could conceivably occur at a location, usually estimated from probable maximum precipitation.