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Flood Assessment Report

for

10 Young Street, West Gosford

for Japrico Developments Pty Ltd

Contents

Report Details

Project: Flood Assessment Report

Mixed-Use Development at 10 Young Street, West Gosford, NSW

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		Date
Prepared by	RB	22/11/2022
Checked by	LG	22/11/2022
Admin	BBR	22/11/2022

Introduction

Northrop Consulting Engineers have prepared a Flood Assessment Report for the proposed multi-use development located at 10 Young Street, West Gosford, NSW 2250 herein referred to as “the subject site” or “the site”.

This study has been prepared to review the potential effect the proposed development has on the existing flood behaviour for the subject site and general vicinity. The Assessment has given consideration to the following documents:

- Australian Rainfall and Runoff 2019 (AR&R 2019).
- NSW Government Floodplain Development Manual (NSW Government, 2005).
- Gosford Local Environmental Plan 2014.
- Gosford Development Control Plan 2013.
- Updated Narara Creek Flood Study (Golder, 2018).
- Brisbane Water Foreshore Floodplain Risk Management Study (Cardno, 2015).
- Gosford CBD Local Overland Flow Flood Study (Cardno, 2013)

This report should be read in conjunction with the following reports and documents:

1. Flood Information Certificate for 10 Young Street, West Gosford provided by Central Coast Council and dated 28th of May 2020, included in Appendix A.
2. Pre-DA advice provided by Central Coast Council and dated the 9th of September 2019 and subsequent additional advice dated the 30th of October 2019.
3. Architectural Drawings prepared by Marchese Partners.
4. Civil Drawings prepared by Northrop Consulting Engineers.

Contained herein is a description of the subject site, a summary of the available information used to inform the development of the study, an outline of the methodology used in undertaking this assessment, and a discussion of the results.

Locality Description

Subject Site

The subject site is located at 10 Young Street, West Gosford and is contained within Lot 1 DP 1194024 and part of Lots 11 DP1201715 and Lot 201 DP 1201057 (refer to **Figure 1**).

The site has an approximate area of 0.44 hectares and is bounded by existing commercial premises on all sides. The site has frontages of approximately 24 metres to Racecourse Road to the west and 12 metres to Young Street to the north-east.

The existing site is largely made up of hardstand pavements and is currently used for the storage of vehicles by the adjacent car dealership. An existing private laneway also exists along the northern boundary which is used for access into the subject site and the adjacent property to the north.

Elevations of the site range approximately from 1.20m Australian Height Datum (AHD) to 3.50m AHD and gradually increase from the west to the east with approximate average grade of 2 percent.

The land use in the vicinity of the site includes commercial, industrial and residential land uses with large areas of open space and recreational land uses. Gosford Racecourse (west), Gosford Golf Course (north), Garnet Adcock Memorial Park (south), Carawah Reserve (south-east) and Waterview Park (north-east) are all located in close proximity to the subject site. The Central Coast Highway is also located approximately 50 metres from the southern boundary of the site.

Catchment Context

Flooding of the subject site occurs through three major catchments namely, the regional Brisbane Water and Narara Creek catchments and the local Gosford Central Business District (CBD) catchment.

Flood levels contained in the Pre-DA advice and the Flood Information Certificate provided by Council suggests flooding of the subject site is largely dominated by the Narara Creek and Gosford CBD catchments, with the Brisbane Water catchment producing lower flood levels during the 1% AEP design storm event. Flooding across the eastern portion of the site is governed by the local Gosford CBD catchment while flooding across the western portion of the site is governed by the regional Narara Creek catchment.

The Narara Creek catchment, herein referred to as the regional catchment, has an upstream area of approximately 44 square kilometres. *The Updated Narara Creek Flood Study (Golder, 2018)* suggests the site is subject to inundation from the regional catchment during events equal to and in excess of the 5% Annual Exceedance Probability (AEP) flood event.

The site is also located in the lower reaches of the Gosford CBD, herein referred to as the local catchment, and is prone to flooding during both minor and major flood events. The local catchment has relatively steep topography (approximate average slope of 7 percent) with a large percentage of impervious surfaces and therefore quick runoff response is expected (refer to **Figure 2**).

The local catchment has an area of approximately 30 hectares with elevations ranging from 0.5m AHD in the lower reaches to 91m AHD at the top of the catchment. Runoff enters the subject site both overland from Young Street, and through the below ground network. The subject site is burdened by three stormwater lines, one running from Young Street, which extends through the existing laneway located in the northern portion of the subject site and two additional stormwater lines running across the southern boundary and continuing in a northerly and westerly direction respectively.

The majority of the stormwater network in the vicinity of the subject site runs to a small open channel in 1A Racecourse Road before discharging through an existing stormwater pipe that runs in a westerly direction along the southern portion of 1A Racecourse Road before connecting into the network in Racecourse Road. Downstream of the subject site, the stormwater network in the Central Coast Highway and Racecourse Road is connected to an open channel located within Adcock Avenue which continues into Carawah Reserve before discharging towards Brisbane Water.

Proposed Development

The proposed development consists of a multi-storey mixed-use facility, including a car showroom, hotel apartments and residential units (refer to **Figure 3 as well as the Architectural drawings prepared by Marchese Partners**). A new access road is proposed along the eastern and southern boundaries, linking Young Street with Racecourse Road. The proposed land use and terrain around the building is largely hardstand with elevations ranging from 1.25m AHD to 2.60m AHD.

As part of the development, it is proposed to upgrade the stormwater drainage network in the vicinity of the site to mitigate the potential flood impact of the proposed development during minor and major flood events. The upgrade includes a diversion of the existing underground pipes extending from the south, running beneath the proposed new road before connecting into Racecourse Road. In addition, it is proposed to upgrade the existing network in 1A Racecourse Road to a new 1200mm RCP. Details of the proposed drainage upgrade are presented in the below **Figure 3**.

Legend

Subject Site

Cadastre

0 150 300 600 Meters 1:12,000

Figure 1

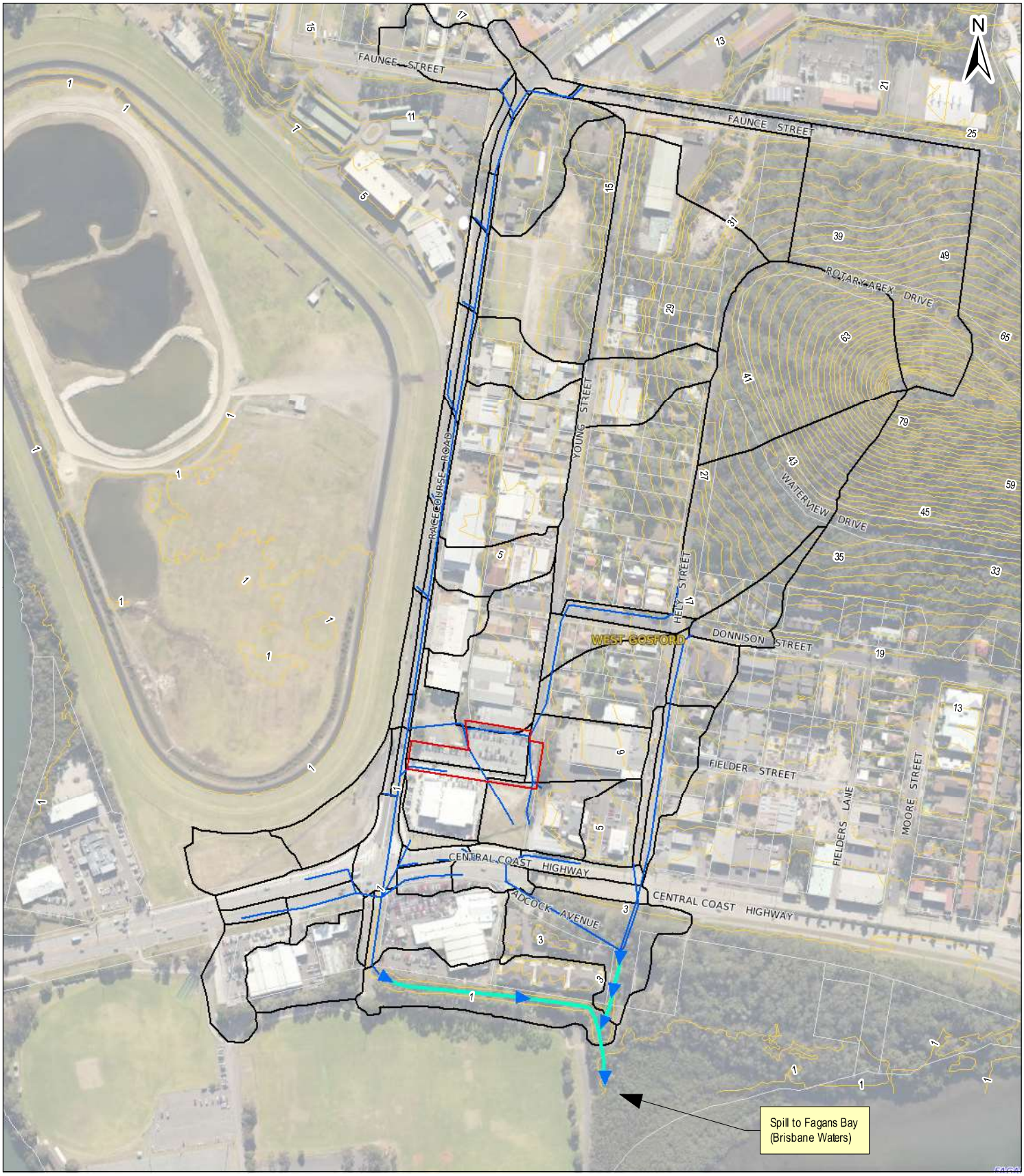
Locality

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

27/08/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_F001_Locality.mxd



Legend

- Subject Site
- Existing Pipe Network
- Open Channel
- Local SubCatchments
- Cadastre
- Ground Levels, mAHD (2 metre)

0 55 110 220 Meters 1:4,500

Figure 2

Local Catchment and Drainage

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

21/08/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_F002_Local_Catchments.mxd

Legend

- Proposed Pits
- Proposed Pipes
- Existing Pipes to be removed
- Existing Pits
- Existing Pipes
- Proposed Building
- Subject Site
- Cadastre
- Existing Contours, mAHD (0.5 metre)

Proposed Surface (mAHD)

- High : 2.60
- Low : 1.25

0 12.5 25 50 Meters 1:1,000

Figure 3

Proposed Development

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

27/08/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_F003_Proposed_Development.mxd

Methodology

This Flood Assessment Report has been prepared generally in accordance with the following procedure:

- Desktop review of previous investigations and studies including recent local and regional flood studies adopted by Central Coast Council.
- Creation of a truncated XP-RAFTS hydrological model to determine the 10% AEP, 1% AEP and PMF flows derived from the local upstream catchment.
- Setup of an "Existing Case" truncated two-dimensional TUFLOW hydraulic model using the flows derived by the XP-RAFTS model, information provided by Council, detailed survey, information obtained through the desktop review and observations made during a site investigation.
- Creation of a "Developed Case" truncated two-dimensional TUFLOW model by modifying the existing case model to include the proposed development.
- Two flooding scenarios have been considered, the local West Gosford catchment with inflows derived using XP-RAFTS and the regional Narara Creek catchment with inflows extracted from the *Updated Narara Creek Flood Study (Golder, 2018)*.

Flood data for the below studies has been provided by Central Coast Council and used under a Data Sharing Agreement (DSA) for the purposes of this study:

- Gosford CBD Local Overland Flow Flood Study (Cardno, 2013).
- Updated Narara Creek Flood Study (Golder, 2018).
- Brisbane Waters Foreshore Floodplain Risk Management Plan (Cardno, 2015).

A description of the modelling exercise undertaken, including the parameters and assumptions used in the development of this study are contained herein.

Hydrological Model

The hydrological model used in this study to determine the local catchment inflows is XP-RAFTS using Laurenson Hydrology. It is noted that flows derived by the Narara Creek catchment have been extracted from the Updated Narara Creek Flood Study (Golder, 2018).

The latest Australian Rainfall and Runoff 2019 (AR&R 2019) guidelines have been used for this study with a total of 65 sub-catchments delineated using a combination of LiDAR terrain data, cadastre and aerial imagery. The modelled sub-catchments are shown in the above **Figure 2**.

Burst Rainfall

Australian Rainfall and Runoff 2019 (AR&R 2019) provides guidance on design storm events which are defined in terms of Intensity, Frequency and Duration (IFD) and rainfall temporal patterns. AR&R 2019 recommends the use of the storm ensemble method using 10 temporal patterns for each storm duration. For this investigation, storm durations including the; 10, 15, 20, 25, 30, 45 minute and 1, 1.5, 2, 3, 4.5, 6, 12 and 24 hours were assessed in the hydrological model.

The Probable Maximum Precipitation (PMP) design storm event rainfall depths and temporal patterns were estimated using the Generalised Short-Duration Method (GSDM) for durations up to 6 hours. The durations 15, 30, 45 minutes and 1, 1.5, 2, 2.5, 3, 4, 5, 6 hours were modelled to define the PMF.

Pre-Burst Rainfall

The latest NSW Specific Transformational Pre-Burst depths have been added to the design rainfall events prior to the burst of the design storm events. As recommended by the latest AR&R 2019 guidelines, the 60min pre-burst depths have been used for storm durations that are less than 60 minutes.

Losses and Roughness

The Initial and Continuing Loss model was used for this study with the latest AR&R 2019 storm losses obtained from the AR&R Data Hub for a location over the subject site and presented in the below **Table 1**. The Initial and Continuing Loss method simulates catchment storage as an initial loss in rainfall followed by a constant rate (continuing loss).

The latest OEH guidelines recommend reducing the continuing loss values provided by the ARR Data Hub, by a factor 0.4 for un-calibrated models within NSW. Similarly, the Rural pervious initial loss provided by the ARR Data Hub has been reduced by a factor of 0.7 to represent the Urban pervious areas.

A hydrological roughness of 0.015 has been used for impervious areas which is consistent with concrete surfaces while, a roughness of 0.035 has been adopted for urban pervious areas which is consistent with grassed areas expected over urban catchments. A portion of the catchment was made up of bushland which has been modelled with a roughness of 0.080.

Table 1: Adopted Infiltration Loss Rates and Hydrological Roughness

Landuse	Initial Loss (mm/hr)	Continuous Loss (mm/hr)	Roughness (Manning's)
ARR Data Hub	58.0	3.2	N/A
Modelled Pervious Areas (Bushland)	58.0	1.28	0.08
Modelled Pervious Areas (Urban)	40.6	1.28	0.035
Modelled Impervious Areas	1.5	0.0	0.015

Hydraulic Model Setup

The hydraulic assessment was undertaken using the TUFLOW hydrodynamic modelling software. A two-dimensional TUFLOW model was developed to represent the flood behaviour in the vicinity of the subject site (refer to **Figure 4**).

The following provides a brief overview of key modelling assumptions and parameters used in the development of the two-dimensional model.

Model Extent and Topography

The model domain extends upstream of the subject site, north of Gosford Racecourse and into the downstream reaches of Narara Creek and Coorumbine Creek at the entrance to Brisbane Waters.

The digital terrain model was developed as a combination of the following datasets:

- Light Detection and Ranging (LiDAR) elevation data, 1m gridded DEM (NSW LPI dated May 2011).
- Narara Creek and Brisbane Waters bathymetric survey (dated OEH 2008).
- Topographic (existing landform) survey in the vicinity the site (dated 2015).
- Proposed development design surface created using AutoCAD Civil 3D design software.

It is noted that the existing car showroom located to the south of the subject site (1 Racecourse Road) was entered into the TUFLOW model manually based on drawings obtained from Council's DA Tracker and observations made during the site investigation.

A TUFLOW model terrain grid size of one metre was adopted for all modelled cases. This was shown to appropriately represent flows around the buildings and through overland flow paths. The latest TUFLOW GPU Solver (version 2020-01-AA) was used for the analysis.

Boundary Conditions

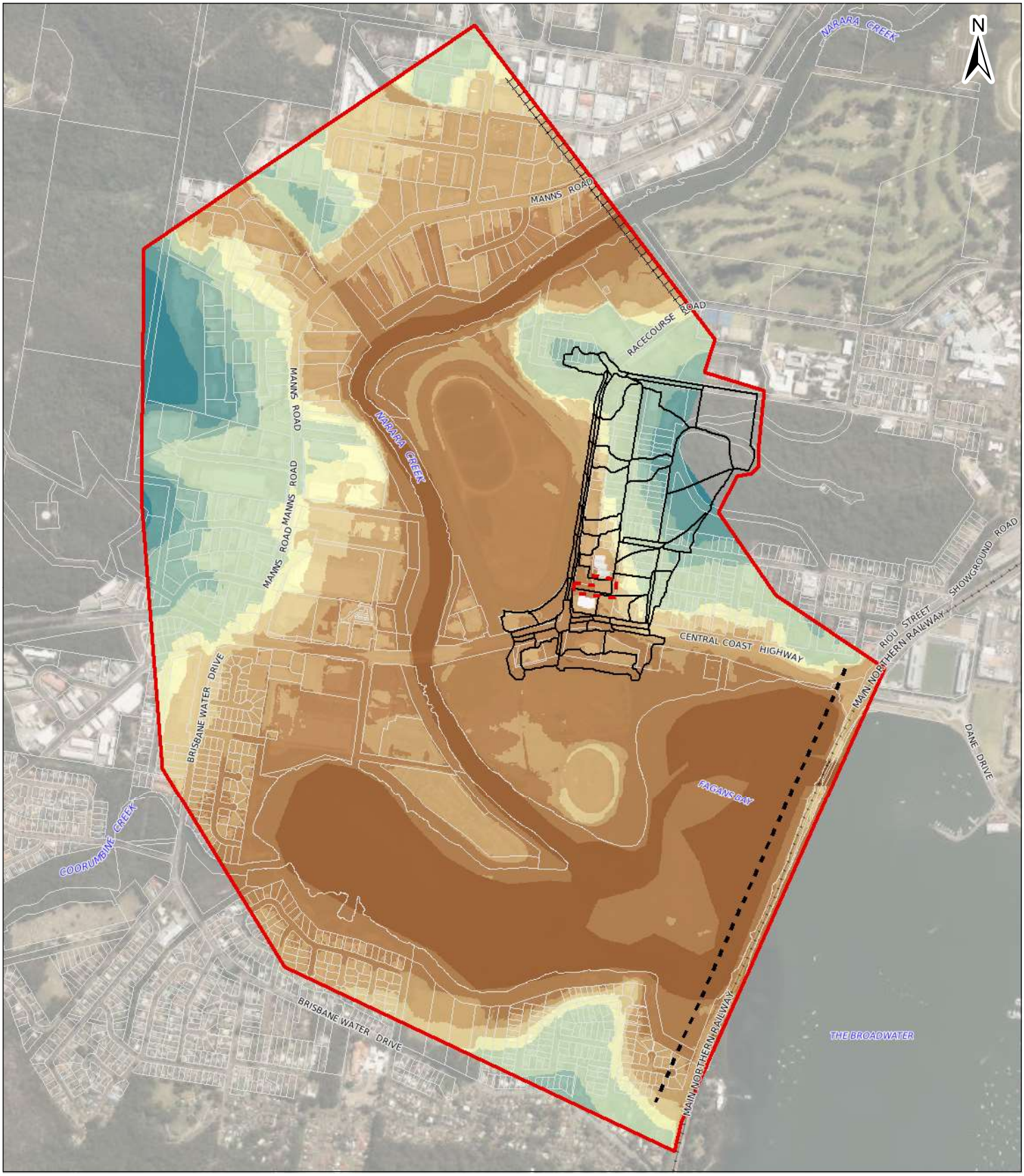
For the regional Narara Creek catchment, inflows have been extracted from the *Updated Narara Creek Flood Study (Golder, 2018)*. Flow hydrographs were obtained by enveloping the hydrographs from the one-dimensional channel flows and the two-dimensional overland flow at a location upstream of the subject site. As a result, a maximum peak flow of 428 m^3/s during the 1% AEP and 1900 m^3/s during the Probable Maximum Flood (PMF) events were extracted from the regional flood model.

Inflows for the local catchment have been produced using XP-RAFTS and applied directly to the two-dimensional grid for each sub catchment shown in the above Figure 2.

Tailwater conditions at a location downstream of Adcock Park have been entered as a static head boundary of 0.72m AHD which is consistent with the tailwater conditions used in the *Updated Narara Creek Flood Study (Golder, 2018) (refer to Table 18 of the Updated Narara Creek Flood Study (Golder, 2018)*.

Below Ground Network

The modelled pit and pipe network has been created from a combination of the data provided in the *Gosford CBD Local Overland Flow Flood Study (Cardno, 2013),* the *Updated Narara Creek Flood Study (Golder, 2018)*, geodetic surveys and observations made during a site investigation. Pipes with a size equal or greater than 375mm were incorporated into the model.



Legend

- Narara Creek Inflow
- DS Boundary Conditions
- Model Extent
- Subject Site
- Local SubCatchments
- Cadastre

Existing Landform(mAHD)

- -3.9 - 0
- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 16
- 16 - 24
- 24 - 42
- 42 - 91

0 175 350 700 Meters 1:14,000

Figure 4

TUFLOW Model Extent and Topography

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

27/08/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_F004_Model_Setup.mxd

Surface Roughness and Building Representation

Modelled Manning's surface roughness values are listed in the below **Table 2.** The adopted values are based on a review of aerial imagery and observations made on-site during a site investigation.

Table 2 - Manning's n Roughness

Land Use/Cover	Manning's n
Water Bodies	0.030
Bushland	0.080
Industrial / Residential Areas	0.100
Grass, Cultivated Land	0.045
Mangroves	0.100
Roads and Hardstand	0.020
Bay	0.040
Buildings	0.900

Buildings were incorporated into the model based on building footprints and were delineated using aerial imagery and observations made during a site investigation. Two methodologies were adopted for the model representation of buildings. A high roughness (as shown in the above Table 2) with the topography raised 300mm around the building footprint was used where flow through buildings was expected. Buildings that were expected to restrict flow through (i.e., impermeable) were "blocked out" from the model.

Modelled Scenarios

Five flood scenarios for both existing and post-development conditions have been considered as listed in the **Table 3** below. As previously mentioned, flooding of the subject site from Narara Creek during events more frequent than the 5% AEP is not expected and therefore only local catchment flooding has been considered during the 10% AEP. Flooding from both the regional and local catchments has been reviewed for both the 1% AEP and PMF design storm events.

Table 3 – Modelled Scenarios

Design Flood Event	Flooding Mechanism		
	West Gosford CBD (Local Catchment)	Narara Creek (Regional Catchment)	Tailwater Conditon*
10%	10%	-	0.72m AHD
1%	1%	-	0.72m AHD
1%	-	1%	0.72m AHD
Probable Maximum Flood (PMF)	PMF	-	0.72m AHD
PMF	-	PMF	0.72m AHD

** Tailwater Conditions Based on Table 18 of the Updated Narara Creek Flood Study (Golder 2018)*

Results

Critical Storm Duration

Local Catchment

To determine the critical storm duration for the subject site and vicinity during the local catchment event, the guidance provided in the latest AR&R 2019 guidelines was considered as summarised below:

- Classification of the median value of the ten temporal patterns for each storm duration.
- Selection of the duration that produced the maximum median value for each return interval.

All ten rainfall patterns for the 10, 15, 20, 25, 30, 45 minute and 1, 1.5, 2-hour and 3-hour durations were passed into the TUFLOW model to determine the critical storm duration for each of the 1% and 10% AEP local catchment flood events. Similarly, flow hydrographs for all events for the 15, 30, 45 minute and 1, 1.5, 2 and 3 hour durations were passed to the TUFLOW model to define the critical duration for the PMF local catchment flood event.

The two-dimensional TUFLOW modelling indicates that the 45-minute duration, temporal pattern 6 was critical for 1% while the 1-hour duration, temporal pattern 7 was critical for the 10% AEP across the subject site and general vicinity. Similarly, the 15-minute duration was determined to be critical for the PMF.

Regional Catchment

The *Updated Narara Creek Flood Study (Golder, 2018)*, in particular Figure "Appendix H – 4B", suggests the 9-hour storm duration is critical at the location of the subject site and vicinity for the 1% AEP. Similarly, Figure "Appendix H – 1B" of the *Updated Narara Creek Flood Study (Golder, 2018)* suggests the 3-hour duration is critical for the PMF at the location of the subject site and vicinity.

Existing Flood Behaviour

The existing case maximum water depth and elevation contours, flow velocity and flood hazard for the 10% AEP, 1% AEP and PMF flood events are presented in **Figures B1-B9** of Appendix B. The Local and Regional flood events presented in the above **Table 3** have been enveloped for each return interval to produce the **Figures B1-B9** presented in Appendix B

Flood hazard is based on the latest AR&R 2019 and Australian Institute of Disaster Resilience (AIDR) hazard categories presented in the **Figure 5** below.

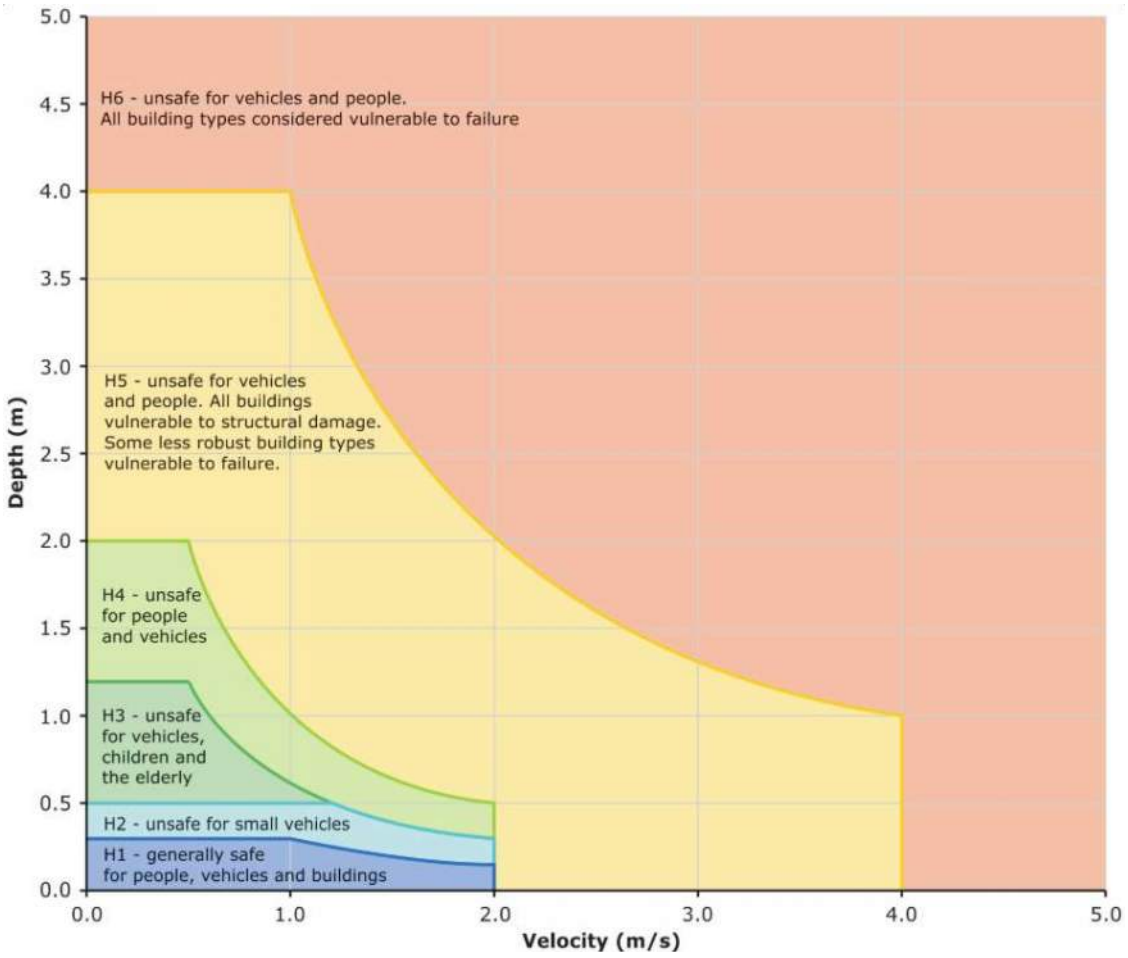


Figure 5 – Australian Rainfall and Runoff (2019) Hazard Categories

The following **Table 4** outlines the existing case maximum flood depth, velocity and hazard for the subject site during the 10% AEP, 1% AEP and PMF. Similarly, **Table 5** presents the maximum flood elevations at Racecourse Road and Young Street

Table 4 – Maximum Existing Case Flood Depth, Velocity and Hazard across the Subject Site

Flood Event	Depth (m)	Velocity (m/s)	Hazard (ARR 2019)	Flooding Mechanism
10% AEP	0.55	0.67	H2	Local Catchment
	-	-	-	Narara Creek
1% AEP	0.60	0.80	H3	Local Catchment
	1.00	0.74	H3	Narara Creek
PMF	0.76	2.19	H5	Local Catchment
	3.08	1.45	H5	Narara Creek

Table 5 – Maximum Existing Case Flood Elevations

Flood Event	Racecourse Road (SW Corner) (m AHD)	Young Street (NE Corner) (m AHD)	Flooding Mechanism
10% AEP	1.60	2.46	Local Catchment
	-	-	Narara Creek
1% AEP	1.65	2.53	Local Catchment
	2.11	-	Narara Creek
PMF	1.76	2.80	Local Catchment
	4.20	4.16	Narara Creek

Developed Flood Behaviour

The local and regional catchment developed case maximum water depth and elevation contours, flow velocity and flood hazard maps for the 10% AEP, 1% AEP and PMF flood events are presented in **Figures C1-C9** of Appendix C. Similar to the existing case, the Local and Regional flood events presented in the above Table 3 have been enveloped for each return interval to produce the Figures **C1-C9** of Appendix C.

The following **Table 6** presents the maximum developed case flood depth, velocity and hazard conditions across the subject site during the 10%, 1% AEP and PMF design storm events for both the local and regional flood events. Similarly, the below **Table 7** presents the maximum developed case flood elevations at the site interface at Racecourse Road and Young Street.

Table 6 – Maximum Developed Case Flood Depth, Velocity and Hazard across the Subject Site

Flood Event	Depth (m)	Velocity (m/s)	Hazard (ARR 2019)	Flooding Mechanism
10% AEP	0.39	0.98	H2	Local Catchment
	-	-	-	Narara Creek
1% AEP	0.52	1.20	H2	Local Catchment
	0.90	0.93	H3	Narara Creek
PMF	0.79	2.30	H5	Local Catchment
	2.86	2.13	H6	Narara Creek

Table 7 – Maximum Developed Case Flood Elevations

Flood Event	Racecourse Road (SW Corner) (m AHD)	Young Street (NE Corner) (m AHD)	Flooding Mechanism
10% AEP	1.60	2.45	Local Catchment
	-	-	Narara Creek
1% AEP	1.65	2.48	Local Catchment
	2.11	-	Narara Creek
PMF	1.76	2.67	Local Catchment
	4.09	4.16	Narara Creek

Flood Effects

Local Catchment

Figure D2 of Appendix D presents the local catchment flood effect during the 1% AEP design storm event. Generally, a decrease is observed in the properties adjacent to the northern boundary which is expected to be the result of the proposed upgrades to the existing stormwater pipe extending through number 1A Racecourse Road.

A localised increase of up to 80mm is observed adjacent to the northern boundary of the subject site which is expected to be due to a minor change in flow behaviour in the area due to the introduction of the development and the pipe upgrade in 1A Racecourse Road. This increase is localised with a comparison of Figures B5 and C5 suggesting it does not result in a significant change in the existing hazard conditions within the property. As such, this increase is not considered to result in a significant adverse impact.

An increase of up to approximately 100mm is observed in Young Street which is expected to be due to some minor regrading at the corner of the site to match to the existing levels in Young Street. The increase is contained within the road reserve and does not result in a change in hazard conditions in Young Street and is therefore not considered to create a significant adverse impact.

The property to the south of the subject site shows a decrease which is expected to be due to the regrading proposed for the new access road forcing flows into the proposed below ground stormwater network and towards Racecourse Road rather than continuing south into the adjacent lot. An increase of up to approximately 165mm is also observed along the proposed new road in the southern portion of the site. This increase is expected to be due to re-grading across the proposed access road. Flood depths of generally less than 220mm are observed in this location with Figure C5 of Appendix C demonstrating hazard conditions are limited to a maximum of H1 suggesting flows remain safe for both vehicles and pedestrians.

Figure D1 of Appendix D presents the local catchment flood effect during the 10% AEP design storm event. Similar to the 1% AEP, the 10% AEP shows a decrease in flood depth in the properties adjacent to the northern and southern boundaries of the subject site as a result of the proposed upgrade to the existing culvert extending through 1A Racecourse Road and the proposed grading for the new access road. An increase of up to 85mm is also observed in Young Street which as mentioned previously is expected to be due to some minor regarding works in the corner of the site.

Regional Catchment

Figure D3 of Appendix D presents the 1% AEP flood impact during the regional Narara Creek flood event. The results show a localised increase of up to approximately 13mm in 1A Racecourse Road to the north of the subject site. This increase is expected to be due to the proposed development blocking flows from continuing in a southerly direction and building up behind the proposed development. This increase is relatively minor in magnitude with flood depths in the area generally range from approximately 300mm to 900mm during the existing case. The 13mm increase observed in the area is equivalent to an increase of less than a 5% when compared to the existing flood depth in the area. As such, this increase is considered minor in nature and is not considered to create a significant adverse impact within this property.

Discussion

Finished Floor Levels

The proposed ground level finished floor ranges from an elevation of 2.09m AHD to 2.59m AHD. It is noted that only the showroom at 2.09m AHD is below the minimum finished floor level stated in the Flood Information Certificate provided by Council (i.e. 2.59m AHD).

As an alternative, flood barriers/gates are proposed at the ground floor level across the façade and doorway entrances. These flood gates/barriers are proposed to extend up to a minimum elevation of the 1% AEP plus a freeboard of 500mm or the Flood Planning Level, therefore providing flood protection up to the necessary level. There are numerous flood barrier/gate types currently available with Automatic (activated through electrical triggers), Passive (activated through buoyancy) and Manual (manual placement) type barriers available.

Some additional information for a passive type of gate is provided in Appendix E which demonstrates how these flood barrier systems work, how they are installed and an example of the maintenance procedures. We recommend passive barriers like these (or similar) are installed and maintained in accordance with manufacturers written instructions

The risk to life for the showroom is expected to be low with the potential for flood management measures, such as a Flood Emergency Response Plan, to be implemented to improve education, awareness and preparedness in the event of a predicted major or extreme flood event. It is recommended a Flood Emergency Response Plan be prepared for the proposed development at Construction Certificate phase.

With the introduction of flood barriers for protection, preparation of a Flood Emergency Response Plan and ample opportunity for flood refuge in the upper levels of the facility, the proposed development is considered to adequately minimise the existing flood risk across the subject site.

Building Components

The building is of robust construction and all structural components are expected to be flood compatible. Similarly, due to the type of building, it is expected flood forces, debris impact loading and buoyancy will not be limiting in the design. This will be confirmed by the structural engineers prior to construction certificate.

It is recommended the building incorporate flood compatible finishes below the 1% AEP plus 500mm to allow for easy maintenance in the event of a very rare flood.

Driveway Access

Above ground parking is proposed with the proposed driveway ramping up above the PMF level.

Safety and Evacuation

The proposed development provides plenty of refuge above the PMF level. This will facilitate vertical evacuation in the event of a very rare or extreme flood event. The building is to be designed to withstand flood forces and debris impact in the PMF to facilitate this approach. This will be confirmed by a structural engineer prior to construction certificate.

Given the nature of the development, an excellent opportunity exists to provide education of the existing flooding risks prior to a flood event occurring. Building management will also play a role in the response and control of this evacuation during flood events.

A Flood Emergency Response Plan (FERP) will formalise this process and assist in reducing the risk to life by educating building occupants on the flood risk prior to the onset of very rare to extreme rainfall, and outlining response procedures and areas of refuge. This should be provided prior to Occupation Certificate.

The regional road network is expected to be compromised in the 1% AEP event and access is unlikely during the peak of the event. It is strongly recommended access and egress to and from the facility not be attempted during a major or extreme flood event.

Conclusion

A Flood Assessment Report has been prepared for the proposed development at 10 Young Street West Gosford, NSW.

It is concluded that the proposed development will not create any significant adverse impacts to flood behaviour on the subject site and on the properties surrounding the subject site during 1% AEP flood event.

Flood gates/barriers are proposed to provide protection for the property at the ground floor level during major and extreme flood events. The preparation of a Flood Emergency Response Plan including on-site refuge and vertical evacuation is proposed to mitigate risk to life during extremely rare flood events such as the PMF.

Should you have any queries regarding this correspondence, please feel free to contact the undersigned on (02) 4943 1777.

Prepared by:

Ruslan Batirov
Flooding and Water Resources Engineer

Reviewed by:

Laurence Gitzel
Flood Engineer

Appendix A – Council Flood Information

28 May 2020

Laurence Gitzel
Northrop Engineers
Email: lgitzel@northrop.com.au

Minimum Floor Level Enquiry:
Property: Lot: 1 DP: 1194024 10 Young Street, West Gosford

Subject: Flood Information Certificate 10 Young Street, West Gosford

The above lot has been identified as being flood prone and affected by flooding from Narara Creek Flood Study Review 2012 & Brisbane Water Foreshore Flood Study. As such, flood related development conditions may be relevant for the property.

ENQUIRY DATE:	18 May 2020
5% AEP FLOOD LEVEL:	RL 1.51m AHD (from Brisbane Water Foreshore Flood Study)
1% AEP FLOOD LEVEL:	RL 2.09m AHD (from Narara Creek Flood Study)
MINIMUM FLOOR LEVEL:	RL 2.59m AHD (from Narara Creek Flood Study)

DISCLAIMERS: Council provides you with the above information as general advice only, and you should not rely upon that information when making decisions relating to the purchase or development of the above property. Council **strongly recommends** that you seek site specific flooding advice from a suitably experienced expert prior to making any decisions relating to the purchase or development of the above property. That disclaimer and recommendation is provided for the following reasons:

1. The information in the above table is based on Council's records. Those records do not include a recent flood study or a recent detailed survey of the above property. For example, a recent detailed survey would provide precise ground levels for the subject property as well as identify, with precision, the location of any watercourses, drainage structures and systems, overland flowpaths and built structures that might impact on the extent and degree to which the subject property might flood.
   Council does not have sufficient information to provide you with accurate prediction of the likelihood and extent to which the above property might flood, and so cannot provide you with accurate design levels for potential development of that property.

2. Council does not, and cannot, warrant that it will, in its capacity as a consent authority under the *Environmental Planning and Assessment Act 1979*, grant consent to a development application that seeks to erect or use dwellings or other structures on the above property that conform with the levels set out in the above information. As a consent authority, Council is required to consider the suitability of the above property for the specific development proposed as well as consider the requirements of Council's Development Control Plan 2013 – Chapter 6.7 Water Cycle Management (this is available on Council's website).

GLOSSARY OF TERMS

Term	Definition
AHD	The Australian Height Datum (AHD) is the reference level for defining reduced levels adopted by the National Mapping Council of Australia. The level of 0.0 m AHD is approximately mean sea level.
AEP	The Annual Exceedance Probability (AEP) is the chance of a flood of a given or larger size occurring in any one year. Usually expressed as a percentage. Eg a 1% AEP flood event has a 1% chance of occurring in any one year. Equally, it is likely to occur on average once every 100 years.
Minimum Floor Level	The minimum floor level (MFL) provides a freeboard to building within flood prone land. This is also referred to as the Flood Planning Level.
Freeboard	A factor of safety usually expressed as a height above the adopted Flood Level. A freeboard tends to compensate for factors such as wave action and historical and modelling uncertainties.

The information provided in this letter is provided only to you and is not intended to be provided to any third party.

Should you have any enquiries with regard to this letter, please do not hesitate to contact Anthony Favetta on 1300 463 954 during the hours of 8.30am to 5.00pm Monday to Friday.

Yours faithfully,

C Favetta

Carlo Favetta
Engineer – Development Assessment

Phone: 1300 463 954
Reference: D13979361

Planning & Assessment
Regional Assessments
Contact: Louise Starkey
Phone: (02) 4345 4410
Email: Louise.Starkey@planning.nsw.gov.au

Our Ref: GPDA001/2019

Japrico Developments Pty Ltd
c/o Ms Rachel Condon
Willowtree Planning Pty Ltd
SE4 L7, 100 Walker Street
NORTH SYDNEY NSW 2060

Email: rcondon@willowtreep.com.au

Dear Ms Condon,

Pre-Development Application Advice
10 Young Street, West Gosford (Lot 1 in DP1194024)

I refer to your pre-development application (Pre-DA) meeting held on Wednesday 18th September 2019 in relation to a 12-storey mixed use development in Gosford City Centre for the above site. I provide this written advice for your records.

This advice is based on the proposed development, as described by you, in:

- Pre-DA Advice Request Form received 23 July 2019
- Pre-DA briefing prepared by Willow Tree Planning dated and received 23 July 2019
- Architectural presentation prepared by Marchese Partners dated July 2019
- Land owners consent dated and received 26 August 2019
- NSW LRS – Title Search dated 9 August 2019 and received 26 August 2019
- S10.7 Planning Certificate dated 3 June 2019 and received 18 September 2019.

Please note that this advice is preliminary in nature and that no detailed assessment of the site or proposed development has been undertaken. Should the development or any relevant planning policy change in any way prior to the lodgement of a development application (DA) then this advice may no longer be fully accurate or complete.

In preparing this advice, the Department has consulted Central Coast Council. A copy of Council's Pre-DA advice is enclosed for your information.

Following lodgement of the DA and a detailed assessment, additional issues may arise that are not detailed in this letter and may require the proposed development to be modified or additional information provided. The determining authority may also determine that the proposed development cannot be supported on the site.

Proposed development
Your proposed development includes the following:

- construction of a 12-storey mixed use development, comprising a hotel, ground floor retail premises and residential units (as shop-top housing)
- associated onsite carparking and site works, including any site remediation (where required), site preparation, earthworks, drainage, services and landscaping.

Zoning and Permissibility
The site is zoned B6 Enterprise Corridor pursuant to State Environmental Planning Policy (Gosford City Centre) 2018 (Gosford SEPP). The objectives of the B6 zone are:

- To promote businesses along main roads and to encourage a mix of compatible uses.
- To provide a range of employment uses (including business, office, retail and light industrial uses).
- To maintain the economic strength of centres by limiting retailing activity.
- To provide for residential uses, but only as part of a mixed-use development.

The proposed development is defined as “hotel or motel accommodation”, “retail premises” and “shop-top housing”, which are permitted with consent in the B6 zone.

Any site remediation of contaminated land (if required) is permitted with consent pursuant to Clause 8 of State Environmental Planning Policy No. 55 – Remediation of Land.

Any demolition of a building or work (if required) may be carried out but only with development consent pursuant to clause 2.7 of the Gosford SEPP.

Capital Investment Value
Any DA lodged with the Department must clearly state the capital investment value (CIV) of the proposed development. According to your pre-DA documentation, the development is anticipated to have a capital investment value (CIV) of approximately $28,000,000.

Any future DA must be accompanied by a report from a qualified quantity surveyor providing a detailed calculation of the CIV of the proposal, including details of all assumptions and components from which the CIV calculation is derived. The report shall be prepared on company letterhead and indicate the applicable GST component of the CIV, an estimate of jobs that will be created during the construction and operational phases of the proposed development and certification that the information provided is accurate at the date of preparation.

Please refer to the Department of Planning, Industry and Environment's planning circular PS 10-008 which describes what items must be included and excluded when calculating the CIV for development.

Consent Authority
Based on the estimated CIV, clause 1.6 of the Gosford SEPP prescribes that the Minister for Planning is the consent authority for the development.

Statement of Environmental Effects
The Regulation requires all DAs, except for designated development, include a Statement of Environmental Effects (SEE).

A SEE must be submitted with the DA that fully describes the proposed development and includes an assessment of the potential environmental impacts associated with the development, how these impacts have been identified and how you will minimise these impacts.

The DA and SEE must be prepared in accordance with, and meet the minimum requirements of, Schedule 1 of the Regulation. The SEE must provide an assessment against all relevant environmental planning instruments, development control plans and plans applicable to the site and development. Where relevant, the SEE should also include:

- adequate baseline data
- consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed)

- measures to avoid, minimise and if necessary, offset predicted impacts, including detailed contingency plans for managing any significant risks to the environment.

Any future DA and SEE should consider and address the planning advice and key issues listed below. The SEE must also address the relevant matters for consideration in accordance with section 4.15 of the *Environmental Planning & Assessment Act 1979* (EP&A Act).

Planning Advice
The Department has provided planning advice below for your consideration, organised by key issue. Feedback on any specific request for advice is provided under the relevant key issue.

Statutory and Strategic Provisions

- Provide an assessment against relevant provisions, including (but not be limited to) those outlined in **Attachment A**.
- Demonstrate that the site is suitable for the proposed development.
- Provide details of the proposed use for each component of the development, and the relationship between the different uses within the building.
- Provide detailed particulars outlining what portion of the development each land use will occupy and the total floor area.
- Detail the nature and extent of any prohibitions that apply to the development.
- Identify compliance with the development standards applying to the site and provide a detailed justification for any non-compliances.
- Provide a clause 4.6 objection for any non-compliance with applicable development standards in the Gosford SEPP (i.e. a written application that compliance with that development standard is unreasonable or unnecessary).
- Provide suitable justification for any variation to height or floorspace development standards in accordance with clause 8.4 of Gosford SEPP.
- Address the adequacy of floor space provided for commercial purposes and provide relevant justification.

Design Excellence

- If the proposal seeks variation to the height of buildings development standard under clause 8.4(3) of the Gosford SEPP, the proposal should be reviewed by the City of Gosford Design Advisory Panel (COGDAP or the Panel) and a copy of the Panel advice must be attached to any future DA. The COGDAP Guide for Proponents and Stakeholders is provided at **Attachment B**.
- A Design Excellence Statement (DES) must be provided that demonstrates how the proposal exhibits design excellence and contributes to the natural, cultural, visual and built character values of Gosford City Centre. In considering whether the development exhibits design excellence, demonstrate compliance with Clause 8.3 of the Gosford SEPP.
- The SEE and DES must demonstrate how the Panel advice has been considered and incorporated into the proposal and address consistency with the advice.

Built Form and Urban Design

- The SEE must address the height, bulk and scale of the proposed development, including consideration of the building layout, separation, massing, setbacks and the size of the proposed floor plates.
- Demonstrate how the proposal is informed by the Gosford Urban Design Framework (GANSW, 2018) and the Gosford Development Control Plan 2018 (DPE).
- Consider the character of the area described in Chapter 3 of the Gosford DCP:

  "The enterprise corridor allows a mix of employment generating uses to complement those in the commercial core. Located to the west of Presidents Hill, built form is to remain relatively low to maintain the prominence of Presidents Hill and views to Brisbane Water."

- Three maximum building height development standards (12m, 24m and 36m) apply to the site. The proposal appears to exceed the mapped maximum height of buildings.
- Provide clear justification for the proposed height of the building and how it responds to Panel advice and key urban design principles for Gosford. Any variation to the height development standard must be accompanied by suitable justification in accordance with clause 8.4 of Gosford SEPP. Any variation to the development standards must address each part of the site. The variations will be evaluated through the design review process and merit assessment process and must not result in any unacceptable visual, solar access, amenity or traffic impacts.
- Address the design quality of the proposed development, including consideration of building articulation, street activation and interface with the public domain.
- The proposal includes a blank wall, approximately 12m wide and 17m high, fronting Racecourse Road (western elevation). The proposed blank wall with minimal articulation facing the street is not supported in its current form.
- All building facades, including those above the street wall, must be well articulated to be attractive in all view angles.
- The proposed ground floor and above ground parking fronting Racecourse Road is not supported in its current form. Additional consideration should be given to design solutions that provide improved street activation and minimise visual impacts to the street.
- Demonstrate how above-ground parking and services (including waste management, loading zones and mechanical plant) would be fully integrated into the design of the development. This includes how on-site car parking is provided wholly underground, or otherwise is not visible from, or minimises visual impacts to the street.
- The site has a limited street frontage to Racecourse Road and is physically constrained in terms of its shape, characteristics and location.
- Demonstrate how the proposal complies with clause 8.1 Minimum building street frontage in zone B6. Alternatively, demonstrate how the proposal meets the objectives of the clause and provide a written application (clause 4.6 objection) that compliance with that development standard is unreasonable or unnecessary) accompanied by suitable justification.
- Consider consulting with the owners of 1A Racecourse Road to improve the sites Racecourse Road street frontage and built form.
- Elevations are to be provided which include the adjoining properties to demonstrate how the scale of the proposed development will relate to its (current and future) surroundings.
- The proposal must demonstrate how the future development potential of adjoining properties would not be compromised by the proposal.
- Setbacks should comply with Chapter 5 of the Gosford DCP.
- Setbacks for residential and hotel uses (including front, rear and side setbacks) should be compliant with the Apartment Design Guide that accompanies SEPP 65 regarding building separation and visual privacy.
- Plant/Services located on the roof should be disguised by architectural roof features.
- Two mapped floor space ratio (FSR) development standards apply to the site (2.5:1 and 4:1). The proposed development must address both development standards for each part of the site and should not be averaged across the site.
- Based on the site characteristics, the floor space ratio (FSR) may not be varied according to clause 4.6(8) and clause 8.4(3) of the Gosford SEPP.
- Ensure the proposal has been designed following consideration of the Crime Prevention through Environmental Design (CPTED) strategies.
- The DA must provide justification as to how the proposed unit mix has been arrived at. This should be in the form of a market analysis that considers, but is not necessarily limited to, future demographics, proximity to public transport systems, etc.
- Detail the location, size and content of any proposed signage zones (if proposed) and provide an assessment of the proposed signage zones against the requirements of SEPP 64 - Advertising and Signage (where required).

Public Domain/Landscaping

- Outline the scope of public domain improvements, pedestrian linkages, street activation, and landscaping to be provided as a part of the proposal.
- Investigate options to improve the pedestrian connections to adjacent sites and streets.
- Demonstrate how the proposed through site link will provide safe and direct pedestrian and vehicular access that is designed to be attractive, inviting and accessible to site users and the general public.
- Demonstrate how the proposal would:
    - maximise permeability throughout the development and to adjoining sites
    - maximise street activation within the town centre
    - provide sufficient open space for future residents
    - provide access for people with disabilities
    - minimise potential vehicle, bicycle and pedestrian conflicts.
- Detailed landscaping plans must be submitted with the DA. The landscaping plans must include a planting schedule, planting locations, deep soil zones, pot sizes, densities and measures to protect existing trees to be retained.
- Details of any tree or vegetation removal (including justification) will be required. Should any trees be deemed to be significant, an arborist report may be required. The proposed development should maximise the retention of good quality vegetation on the site.

Visual Impacts

- Prepare a comprehensive Visual Impact Assessment and view analysis of the proposal to/from key vantage points depicting images of the proposal in the background of those views. Photomontages or perspectives should be provided showing the project.
- Demonstrate how the proposal respects and maintains key view corridors (for example to the ridgelines of Presidents Hill and Rumbulara Reserve) and street vistas.

Environmental and Residential Amenity

- Assess the environmental and residential amenity impacts associated with the proposal, including solar access, acoustic impacts, visual privacy, view loss, overshadowing, lighting impacts and wind impacts. A high level of environmental amenity must be demonstrated.
- Demonstrate how the proposal maintains solar access to surrounding development and the surrounding public domain.
- Include detailed shadow diagrams (A3) that show the expected shadows cast by the proposal at hourly intervals between 9am and 3pm (inclusive) on the 21 June (Mid-Winter Solstice) and at 9.00am, 12.00pm and 3.00pm on 21 December (Summer Solstice). The diagrams must demonstrate existing and approved built form impacts and the proposal's net contribution, and cumulative impact.
- The proposed development should achieve compliance with the minimum numerical requirements of the ADG. While the Department has not undertaken a detailed assessment of the proposal against the ADG at this preliminary stage, the proposal appears to have several non-compliances with the ADG, specifically in relation to deep soil zones and separation.
- Demonstrate that the proposed development complies with SEPP 65 and the Apartment Design Guide (ADG) and ensure the proposal achieves a high level of environmental and residential amenity. The SEE must provide a detailed compliance table that clearly sets out how SEPP 65 and the ADG (design objectives, criteria and design guidance) have been addressed. Should the DA propose any variations these must be clearly identified and justified in the ADG compliance table.
- The DA must be accompanied by a design verification statement from a registered architect as defined in SEPP 65 that addresses those matters required to be verified by SEPP 65.
- Consider architectural and ADG compliance issues identified in Central Coast Council's advice dated 9 September 2019.

Transport and Accessibility (Construction and Operation)

The SEE must be accompanied by a Traffic Report prepared in accordance with relevant guidelines. The report must:

- Assess the traffic impacts of the development on the surrounding local and classified road network using SIDRA or similar traffic model and specify any road upgrade works (local and classified) required to maintain acceptable levels of service.
- The assessment is to include traffic and parking generated by existing and approved developments, as well as that by the proposal, and consider car sharing facilities to reduce overall parking demands in the area.
- Estimate the total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips.
- Assess the adequacy of public transport, pedestrian and bicycle provisions to meet the likely future demand of the proposed development.
- Demonstrate the proposed road layout, access points, and car parking can comply with the relevant Australian Standards and Council requirements.
- Demonstrate that sufficient on-site car parking, loading/unloading, pedestrian and cycling facilities (including bicycle parking and end-of-trip facilities) would be provided for the development.
- Assess the impact of the proposal on car parking within the Gosford CBD during construction and operation of the proposed development.
- Describe the measures to be implemented to promote sustainable means of travel, including public transport use, pedestrian and bicycle linkages.
- Prepare a preliminary Construction Traffic Management Plan for the proposal and outline how construction traffic, public transport, bicycle and pedestrian impacts, and parking impacts would be appropriately managed and mitigated.
- Detail the public transport options and pedestrian links for future residents of the proposed development.
- Consider the road works, access and traffic comments in Central Coast Council's advice dated 9 September 2019.

Flooding

- The site is affected by flooding and overland stormwater flows as identified in the Brisbane Water Foreshore Flood Study (BW), Narara Creek Flood Study (NC), and Gosford CBD (GCBD).
- A flood assessment report should accompany the DA.
- Assess the potential flooding impacts associated with the development and consider the relevant provisions of the NSW Floodplain Development Manual (2005), including the potential impacts of climate change, sea level rise and increase in rainfall intensity.
- Consider the flooding comments in Central Coast Council's Pre-DA Advice dated 9 September 2019.

Bushfire

- Part of the site is mapped as bush fire prone land (Vegetation Buffer).
- The DA must be accompanied by a Bushfire Assessment Report that demonstrates compliance with the RFS publication 'Planning for Bush Fire Protection 2006' (or subsequent version).

Building sustainability and environmental performance

- Demonstrate how future buildings would meet or exceed minimum building sustainability and environmental performance standards in accordance with the Gosford SEPP and the Gosford DCP.
- Demonstrate how the proposal promotes energy efficiency.

- Demonstrate how the proposal meets the Water Sensitive Urban Design principles and incorporates Water Sensitive Urban Design practices.

Heritage

- Assess any impacts on State and local heritage items, including conservation areas, natural heritage areas, relics, gardens, landscapes, views and trees and recommend mitigation and management measures where required.
- Prepare an aboriginal archaeology report in accordance with the relevant Office of Environment and Heritage (OEH) guidelines (as required).
- Should any aboriginal heritage items be identified that will be impacted the proposed development will be classed as integrated development and require approval from the Department of Premier and Cabinet (Heritage Division), formerly known as the Office of Environment and Heritage. In this event an Aboriginal Heritage Cultural Assessment must be submitted with the DA.

Social & Economic Impacts

- The SEE must include an assessment of the social and economic impacts of the development, including consideration of any increase in demand for community infrastructure and services.

Public Benefit and Contributions

- Outline the contributions and proposed public benefits to be delivered as part of the proposal including details of any Voluntary Planning Agreement.

Noise and Vibration

- Prepare a noise and vibration assessment in accordance with the relevant EPA guidelines. This assessment must detail construction and operational noise impacts on nearby sensitive receivers and outline the proposed management and mitigation measures that would be implemented.

Contamination

- Provide details on present and previous land uses on site and adjoining land, and determine whether the present or any previous use is a potentially contaminating activity.
- Prepare a contamination assessment for the site, by a qualified environmental consultant and demonstrate that the site is suitable for the proposed development, in accordance with the requirements of SEPP 55.
- If contaminated land is found on the site a remediation action plan will be required and must be submitted with the DA.

Biodiversity and Coastal Management

- Assess any biodiversity impacts associated with the proposal.
- Address costal management issues and State Environmental Planning Policy (Coastal Management) 2018.

Soil and Water

The DA should include a:

- Geotechnical assessment
- Acid Sulfate Soils Assessment
- Groundwater Assessment.

Utilities

- Assess the capacity of existing services and utilities and identify any upgrades required to facilitate the development

- Assess the impacts of the proposal on existing utility infrastructure and service provider assets and describe how any potential impacts would be managed.
- Chapter 5 of Gosford DCP provides details for substation locations. Substations must be provided wholly within the subject site, either internal to the development or suitably located and integrated within the architectural or landscaping design.
- Substations are to be designed in accordance with Ausgrid's requirements for distribution substations which are set out in their network standards NS117 and NS141 for kiosks, and NS113 and NS114 for chambers (or as updated from time to time). Substations within the street will not be accepted.
- Consult with Ausgrid regarding the organisations preferred substation location.

Stormwater and Drainage and Water Quality

- The site is affected by several drainage easements. Demonstrate consultation with Central Coast Council regarding the easements that affect the site and identify any impacts and mitigation measures required to facilitate the development, including any upgrades or realignment.
- Any adjustments and/or connections to the drainage easements that benefit Council will require formal approval under section 68 of the *Local Government Act 1993*.
- Permission in writing from the owners of adjoining properties will be required for any works within their property to tie-ins, adjustment or connections to drainage and other infrastructure within those adjoining properties. In this regard, the Department recommends the applicant notify and consult with adjoining land owners prior to lodgement.
- Water and sewer is available to the land. A section 307 certificate is required for the development.
- Consider drainage and water and sewer comments in Central Coast Council's Pre-DA Advice dated 9 September 2019.
- Assess water quality and hydrology impacts of the development, including any downstream impacts for both surface and groundwater and any impacts on natural processes and functions.
- Prepare a Water Cycle Management Plan Strategy demonstrating how stormwater would be appropriately managed in accordance with Council's requirements.

Easements, restrictions, staging and consents

- The site is benefited and burdened by easements. Provide details of all easements, restrictions or positive covenants applying to the land.
- Provide details regarding the staging of the proposed development.
- Detail the proposal's relationship to any existing development consents (if any).
- Consult with Central Coast Local Health District to ensure Gosford Hospital's Strategic Helicopter Landing Site (and associated flight paths) are not adversely impacted by the proposal during construction or operation at any stage.

Construction and Operational Management Plans

- Prepare a preliminary Construction Management Plan for the proposed works and outline how construction impacts would be appropriately managed and mitigated.
- Demonstrate how public safety will be maintained during construction and operation, including any public safety measures that will be implemented.
- A Plan of Management is required for the hotel.

Waste Management and Services

- A demolition, construction and operational waste management plan that details how demolition, construction and operational waste will be managed must be submitted.

- Chapter 8.6 of Gosford DCP provides development controls for waste and recycling. For further information refer to Council's Waste Control Guidelines and Council's waste services comments in Central Coast Council's Pre-DA Advice dated 9 September 2019.

Air Quality & Pollution

- Assess the construction and operational air quality impacts and ensure they meet Council and/or the Environment Protection Authority requirements.
- Clearly demonstrate whether any activities associated with the proposed development would be a scheduled activity as listed in Schedule 1 of the Protection of the Environment Operations Act 1997 (the POEO Act), or other legislative requirements administered by the EPA.

Building and Fire Safety

- The proposed development must comply with the Building Code of Australia (BCA), part of the National Construction Code, and any relevant Australian Standards.
- A valid BASIX Certificate for the proposed development must be submitted with the DA.

Development Contributions

The following development contribution levies apply in Gosford City Centre:

- 2% Special Infrastructure Contribution (SIC), in accordance with Gosford City Centre SIC Ministerial Direction, Ministerial Determination and Order; and
- 1% local contribution, in accordance with Central Coast Council's 7.12 (former S94A) Contributions Plan Centre (Civic Improvement Plan 2007) for Gosford City Centre.

Pre-DA Consultation

The Department has consulted with Central Coast Council on the proposal. A copy of Council's advice dated 9 September 2019 is provided at **Attachment C** for your information.

Prior to lodging the DA, it is strongly recommended that you consult with the following bodies to ensure that their requirements are fully understood and addressed:

- Ausgrid
- Environment Protection Authority
- NSW Department of Premier and Cabinet - Heritage division (formerly known as Office of Environment and Heritage)
- NSW Department of Planning, Industry and Environment (Biodiversity and Conservation Division, Crown Land, NRAR, Office of Water)
- NSW Department of Primary Industries
- NSW Roads and Maritime Services
- NSW Rural Fire Service
- Transport for NSW
- Central Coast Local Health District
- The local NSW Police Force Area Command

The SEE should describe where the proposal has been designed or amended in response to agency or Council comments. Where amendments have not been made to address an issue, an explanation should be provided.

DA Lodgement

Any future DA should be lodged with attention to the Director - Regional Assessments and addressed to:

Level 3, 107 Mann Street, Gosford
PO Box 1148 - Gosford NSW 2250
Email: centralcoast@planning.nsw.gov.au

A copy of the 'DA form' and 'DA supplement: a guide to filling in your application' is provided at **Attachment D**. The applicant must submit at least 1x soft copy and 1x hard copy of the DA for assessment purposes. Please contact the Department at least 2 weeks prior to lodgement for confirmation of the number of additional hard copies (up to 4) required for exhibition locations.

Development Classification
A preliminary review of the site and proposed development has identified that:

- The proposal is local development, as it does not meet the requirements of regionally significant or state significant development.
- The proposal will be referred to the NSW Rural Fire Service for advice and a bushfire safety authority may be required under section 100B of the *Rural Fires Act 1997*.
- The proposal will be referred to Central Coast Council and NSW Roads and Maritime Services for advice and may require approval under section 138 of the *Roads Act 1993*.
- The proposed development may be Nominated Integrated Development under the *Water Management Act 2000.*
- The proposal may involve the remediation of contaminated land, which must be clearly identified in the development description of any DA, and may be classed as Advertised Development.

The applicant must determine whether the proposed development is also integrated development, requiring a specified permit or other types of approvals pursuant to Section 4.46 of the EP&A Act. In making this determination, the applicant should complete the integrated development questionnaire in the 'DA supplement: a guide to filling in your application' (refer **Attachment D**).

The applicant must also determine whether the proposal is also designated development, involving any development listed in Schedule 3 of the *Environmental Planning & Assessment Regulation 2000* (the Regulation), requiring the preparation of an Environmental Impact Statement (EIS).

The applicant must also identify whether any activities (or work) associated with the proposed development would be a scheduled activity (or work) as listed in Schedule 1 of the *Protection of the Environment Operations Act 1997* (the POEO Act), or any other legislative requirements administered by the Environmental Protection Authority.

The DA will be notified and/or publicly exhibited in accordance with the Gosford DCP and other legislative requirements.

Documents to be submitted with the DA
The DA and SEE must include all relevant documentation required under Schedule 1 of the Regulation and address the Planning Advice provided above. To assist the Department in assessing the impacts of your proposal, you may need to attach one or more environmental reports to your application. The DA should include any material aforementioned above, as well as documents listed in **Attachment A** and **Attachment E** and a 3D digital model of the proposal satisfying the requirements listed in **Attachment F**.

Failure to submit the above information will result in the Department rejecting the DA.

DA Fees
The DA must be accompanied by the application fees specified in the *Environmental Planning and Assessment Regulation 2000*. All DA fees must be calculated and submitted in accordance with the Department of Planning and Environment's planning circular PS 13-002. The circular requires that a cost estimate of the proposed development be submitted with the DA along with the methodology used to calculate it. A detailed cost report must be prepared by a registered quantity surveyor and submitted with the DA.

Other Information
Please note that following receipt and detailed assessment of the DA, additional issues may arise that are not detailed in this letter and may require the proposed development be modified and/or additional information provided. The determining authority may also determine that the proposed development cannot be supported. You will be advised of this as soon as possible following the lodgement of the DA.

Conclusion
It is recommended that the applicant consider the pre-DA advice provided and address the issues raised through further investigations and design refinement. If the proposal seeks variation to the height of buildings development standard under clause 8.4(3) of the Gosford SEPP, the proposal should be reviewed by the City of Gosford Design Advisory Panel prior to lodgement of any future DA.

For further enquiries, please contact Louise Starkey on (02) 4345 4410 or Louise.Starkey@planning.nsw.gov.au

Yours sincerely

Silvio Falato 30/10/2019
Team Leader
Regional Assessments

Enclosed:
Attachment A: Policies, Plans Guidelines and DA Documents
Attachment B: COGDAP Guide
Attachment C: Central Coast Council advice
Attachment D: DA form and DA supplement
Attachment E: DA Lodgement Checklist Mixed-use Buildings
Attachment F: 3D model submission requirements

ATTACHMENT A
Policies, Plans, Guidelines and DA Documents

The following guidelines may assist in the preparation of the DA and SEE. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.legislation.nsw.gov.au
http://www.shop.nsw.gov.au/index.jsp
http://www.australia.gov.au/publications
https://www.centralcoast.nsw.gov.au/council/news-and-publications/policies-and-codes

Policies, Plans and Guidelines	
Statutory policies and plans	• Environmental Planning & Assessment Act 1979 • Biodiversity Conservation Act 2016 • NSW Rural Fires Act 1979 • State Environmental Planning Policy (Gosford City Centre) 2018 • State Environmental Planning Policy (Infrastructure) 2007 • State Environmental Planning Policy (Building Sustainability Index BASIX) 2004 • State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 • State Environmental Planning Policy (Coastal Management) 2018 • State Environmental Planning Policy No.55 – Remediation of Land • State Environmental Planning Policy No 64 - Advertising and Signage • State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development & Accompanying Apartment Design Guide • Draft State Environmental Planning Policy (Environment) • Central Coast Council's 7.12 (former S94A) Contributions Plan Centre (Civic Improvement Plan 2007) for Gosford City Centre • Gosford City Centre Special Infrastructure Contribution (Ministerial Direction, Ministerial Determination and Order).
Strategic plans	• Future Transport Strategy 2056 and supporting plans • State Infrastructure Strategy 2018-2038 • Central Coast Regional Plan 2036 • NSW Government Architect's Gosford Urban Design Framework 2018 • Gosford City Centre Transport Management and Accessibility Plan
Guidelines and policies	• Gosford City Centre Development Control Plan 2018 • City of Gosford Design Advisory Panel (CoGDAP) Guide for Proponents and Stakeholders (DPE, 2018) • Gosford City Centre Streetscape Design Guidelines (Oculus for Gosford City Council, 2011) • Central Coast Council's 3D Model Submission Requirements (rev2 dated 11 September 2019) • Central Coast Council's Civil Works Specifications • Central Coast Council's Gosford City Centre Developer Services Plan (DSP) • Central Coast Council's Gosford City Centre Water Servicing Strategy (Aug 2017) • Central Coast Council's Gosford City Centre Sewer Servicing Strategy (Mar 2017) • Central Coast Council's Gosford CBD Overland Flood Study • Central Coast Council's Voluntary Planning Agreements Policy for Gosford City Centre (adopted July 2017) • Central Coast Council's Draft Greener Places Strategy • Central Coast Council's Draft Biodiversity Strategy • Central Coast Council's Gosford Bike Strategy 2014 • NSW Planning guidelines for walking and cycling (DIPNR & RTA, 2004) • Guide to Traffic Generating Developments (RMS, 2002), including Section 2 Traffic Impact Studies • Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development (Austroads, 2016)

	• Standards Australian AS2890 Parking Facilities Set • Cycling Aspects of Austroads Guides (2017) • Managing Land Contamination: Planning Guidelines - SEPP 55 Remediation of Land (DUAP) • Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) • Statement of Heritage Impact Guide (OEH) • Design in context: Guidelines for infill development in the Historic Environment (NSW Heritage Office, 2005) • Managing Urban Stormwater – Soils & Construction Volume 1 (Landcom, 2004) • NSW Aquifer Interference Policy (2012) • Guidelines for Controlled Activities on Waterfront Land (2018) • Central Coast Council's Water Cycle Management Guidelines • Central Coast Council's Waste Control Guidelines • Interim Construction Noise Guideline (DECC, 2009) • Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2005) • Better Placed: An integrated design policy for the built environment of New South Wales (GANSW, 2017) • Healthy Urban Development Checklist (NSW Health, 2009)

The following Documents are to be submitted with any DA:

DA Documents

• Completed DA form
• All of the information listed in Schedule 1, Part 1, Clause 2(5) of the Regulation.
• All relevant documents contained within the DA lodgement checklist (refer **Attachment E**) and a completed copy of the checklist.
• Architectural Plans (A3) including:
  ○ Concept landscape and public domain plans
  ○ Detailed overshadowing diagrams
  ○ Materials/colours schedule
  ○ Cross ventilation diagrams
• Storm water and drainage concept plans (A3)
• 3D digital model (refer submission requirements in **Attachment F**)
• Visual impact assessment
• Compliance tables for all relevant development standards and planning controls
• A table identifying the proposed land uses including a floor-by-floor breakdown of GFA, total GFA and site coverage
• Water cycle management plan strategy
• Contamination assessment
• Access statement
• Acoustic report
• Bushfire assessment report
• Erosion & sediment control plan
• Design excellence statement
• Flood assessment report
• Aboriginal archaeology report (if applicable)
• Flora and fauna report (if applicable)
• Arborist report (if applicable)
• Remediation action plan (if applicable)
• Salinity assessment and management plan (if applicable)
• Acid sulphate soil assessment (if applicable)

COPY

Central Coast Council

9 September 2019

Ms Louise Starkey
Senior Planning Officer, Regional Assessments
Department of Planning and Environment

Louise.Starkey@planning.nsw.gov.au

Dear Ms Starkey

Pre DA advice - Proposed Mixed Use Development comprising retail, hotel accommodation and Shop-top housing - Lot 1 DP 1194024 No. 10 Young Street, West Gosford

I refer to your email dated 9 August 2019 and provide the following comments on the proposed development.

Council identifies the following matters should be taken into consideration and addressed in the proposed development;

Planning

1. There are two different mapped height and floor space ratio (FSR) development standards on the site. The proposed development must address both development standards for each part of the site and cannot be averaged across the site.

2. A detailed site plan is required showing existing and finished surface levels, existing structures, easements and adjoining development.

3. Shadow diagrams to be provided. Shadow impact on southern side shall be 1 hourly in winter time between 9.00am and 3.00pm.

4. Car parking spaces near entry from Racecourse Road should be located so as not to cause a bank up of traffic onto Racecourse Road. May require deletion or relocation of car parking spaces.

5. A drop off/pick up area at for coaches and buses should be provided at hotel.

6. Turning bay on level 01 may not comply with AS2890. Turning movements need to be provided.

7. Blank walls on northern and western elevations are not supported.

8. Landscape Plan required with DA.

9. Visual impact/view loss assessment to be provided from street and surrounding properties.

10. Address relevant planning controls; including SEPP (Gosford City Centre) 2018, Gosford DCP 2018, SEPP65/ADG. SEPP (Coastal Management) 2018, SEPP (Infrastructure) 2007.

11. DA to be compatible for inclusion in Council's 3D model for the Gosford City Centre.

12. Plant/Services on roof need to be disguised by an architectural roof feature.

13. Acoustic report to address likely road traffic noise and noise from Gosford Racecourse / Entertainment Grounds.

14. Proposed development should address likely future development potential on adjoining lots to ensure the proposed development does not significantly reduce the development potential.

Waste Services

1. Separate Residential and Commercial waste storage areas are required to be provided to avoid conflict of use.

2. Residential waste storage requirements to be assessed at 140 litre mixed waste/120 litre recyclable waste weekly. Maximum 1100 litre bulk waste bins will be provided for residential waste.

The waste storage area is to be sized in accordance with the above requirements and located to give a path of travel for roll out of the bulk bins free of obstructions to the rear of the residential waste vehicle.

The Residential waste storage enclosure is to be located adjacent to a waste truck servicing location. A minimum of a 12.0m x 4.0m waste truck servicing area at a maximum gradient of 3% is required to be provided.

Internal waste storage enclosures are required to be well ventilated, floors graded to a sump connected to sewer. Hot and cold water tap to be provided to facilitate bin and enclosure cleaning. The tap to be protected from damage.

Plans are to indicate an interim recyclable waste storage enclosure within the garbage chute recyclables storage waste room/s for the proposed Residential units. The garbage chutes are for mixed waste only and must be suitably signposted.

Transfer of recyclable waste from the Residential floors to the ground level waste storage enclosure is to be detailed within a Waste Management Strategy to form part of the Waste Management Plan.

No access to the garbage chutes from non-residential floors permitted to ensure no conflict of use.

A bin lifter to be indicated within the residential waste storage enclosure to facilitate transfer of recyclables waste from waste rooms on residential floors into the bulk waste bins.

The Commercial waste storage enclosure to be sized consistent with the use and the projected waste servicing frequency.

Construction of the Commercial waste storage enclosure is to be consistent with the Residential waste storage enclosure.

Commercial waste to be serviced by a Private Waste Collection contractor at such times as to not conflict with scheduled residential waste collection. Commercial waste storage is required to provide for separation of mixed and recyclable waste.

Waste servicing is to be capable of being undertaken without impeding other traffic movement within the development.

The Commercial waste storage enclosure is to be sized consistent with Chapter 7.2 – Waste Management, Appendix B: Waste/Recycling Generation Rates of the former Gosford City Council DCP 2013.

3. Residential waste servicing by Council's Domestic Waste Contractor to be designed for a dual axle, rear loading HRV. A minimum 4.0m height clearance to be provided in all waste manoeuvring area/s.

Areas for forward entry/forward exit to the site must be designed for a dual rear axle HRV with a minimum radius turn of 12.5m. The rear loading waste truck must be able to enter/exit the site without crossing the centre line of the public road/s.

Plans are to be overlayed with swept truck turning paths to AS2890 to demonstrate access and servicing ability and are to be certified by the applicant's Traffic Engineer.

4. Submission of a signed and dated Waste Management Plan in accordance with Chapter 7.2 – Waste Management of Gosford DCP 2013 and Central Coast Council "Building & Development on the Central Coast for land subject to Gosford Local Environment Plan 2014 (GLEP2014) – A Guide for Applicants on Supporting Document Requirements", for all site preparation, demolition, construction, use of premises and on-going management of waste.

A Waste Management Strategy is to be included to identify responsibilities of owners/tenants/management etc to detail waste transfer, storage and servicing.

Architecture

The proposal is for the construction of a residential flat building (RFB) and hotel with above ground parking for 127 cars.

It is subject to the Gosford City Centre Development Control Plan 2018 (DCP) and the SEPP 65 Apartment Design Guide (ADG).

These are preliminary comments only. It is noted that the plans and elevations do not match and that the elevations indicate major non-compliance with setbacks required by the ADG.

Context and neighbourhood character

The site is located within the Enterprise Corridor section of the DCP. It is bounded by a car sales yard and a vacant lot to the south, a carpark to the east and industrial buildings to the north.

A hotel and residential development could be supported in principle in this location but the development has major non-compliances with the DCP and the ADG. This results in poor urban design, poor amenity for occupants and will have detrimental impacts on the development potential of adjoining sites.

It is acknowledged the site proportions and water table may create issues but these are site constraints. They are not a justification for non-compliance with controls and poor design.

Built form and scale

The DCP Chapter 3.5 includes the following:
The enterprise corridor allows a mix of employment generating uses to complement those in the commercial core. Located to the west of Presidents Hill, built form is to remain relatively low to maintain the prominence of Presidents Hill and views to Brisbane Water.

The eastern part of the building has a 3 to 4 storey (17.5%) non-compliance with the height control. No photomontages have been provided but the tower will clearly obstruct views of Presidents Hill from the important entry point of the Central Coast Highway.

The DCP Chapter 5.2.9 includes the following controls:

3. On-site parking is to be accommodated underground, or otherwise fully integrated into the design of the building as illustrated in Figures 10 and 11. Where integration is not achieved,
car-parking areas will count towards gross floor area for the purposes of calculating Floor Space Ratio.
4. Any on site above ground parking should be 'sleeved' by a minimum 8m depth activation (commercial or residential use) facing any street as illustrated in Figure 11.

The application fronts Racecourse Road with 3 levels of above ground carparking. This is not sleeved by commercial or residential use and does not create an active street front or an

integrated design and the proposed 17m high blank wall that will be clearly visible from the important junction of Racecourse Road and the Central Coast Highway.

There are similar concerns with the eastern side of the site where it is viewed from Young Street and the adjoining commercial development where the proposed carpark screening is an inadequate response that fails to activate the ground level and emphasises the bulk and scale of the building.

Landscape

Deep soil zones and landscaping should be an integral part of the design. They should complement the existing natural features, provide outlook from units, provide screening to and from adjoining developments and contribute to the buildings setting. They should not be relegated to leftover or unbuildable area.

The ADG requires 7% of the site; or 323M2 to be deep soil zone. The application proposes 63m2 deep soil or only 19% of the required minimum. This is all located in a narrow strip on the Racecourse Road frontage where it achieves none of the objectives.

The remainder of the unbuilt area is completely occupied by driveways, carparking and a substation.

Amenity

The ADG includes:

3G. Pedestrian access and entries.

Good pedestrian access delivers high quality, equitable, safe and pleasant walking environments along the street, into the development and to individual apartments. Pedestrian access and entries must be prioritised over vehicle access.

The DCP Includes:

7.2 Pedestrian Access and Mobility

Any new development must be designed to ensure that safe and equitable access is provided to all, including people with mobility problems and disabilities. This is of particular concern in Gosford where a significant percentage of the population is 55 years or older and the topography can be difficult to negotiate on foot.

The proposal does not comply with the ADG or DCP. There is no pedestrian access to the building other than via shared vehicle driveways. This does not contribute to the buildings identity or character and is a significant safety issue particularly for children and the elderly. As an absolute minimum there must be a clear, safe, pedestrian only access to the residential units and hotel from Racecourse Road.

This should preferably be well designed and landscaped to provide a residential character to the development building and not be visually dominated by the above ground carpark.

Conclusion

The proposal is contrary to the aims and objectives of the DCP and the ADG and is not supported.

It requires major redesign to comply with the DCP and ADG and to properly address the issues detailed above and to ensure all drawings are consistent.

Engineering

Road works access & traffic

- An application would require referral to Roads & Maritime Services (RMS). The site is within 90m of Central Coast Hwy which is a State road. Racecourse Road is a Regional Road.
- A development consent for a previous hotel development (DA46375/2014) on this site required:
  - The construction of a 900mm wide, central concrete median in Racecourse Road of sufficient length to physically prevent right turn movements into or out of the right of carriageway and be designed and constructed in accordance with Austroads Guide to Road Design 2009 (with Roads and Maritime supplements) and relevant Australian Standards, to the satisfaction of Council.
  - Appropriate and approved road signage regarding the no right turn requirement.
- Footway formation graded at +2% from the top of kerb to the property boundary across the full frontage of the site in Racecourse Road.
- Footpath required across full frontage of site in Racecourse Road.
- A traffic report prepared by a suitably qualified traffic engineer is to be submitted which addresses:
  - The impact of the development on the surrounding road network
  - Compliance with AS2890 in relation access, parking, etc.
  - Servicing arrangements.
- All vehicles to enter and exit the site in a forward direction.

Flooding

- The site is affected by flooding and overland stormwater flows as identified in the Brisbane Water Foreshore Flood Study (BW), Narara Creek Flood Study (NC), and Gosford CBD (GCBD). 1%AEP flood levels and flood planning levels (FPL) from these studies are:
  - BW: 1%AEP RL 1.77m AHD, FPL RL 2.47m AHD;
  - NC: 1%AEP RL 2.09m AHD, FPL RL 2.59m AHD;
  - GCBD: Racecourse Road frontage: 1%AEP RL 1.56m AHD, FPL RL 2.06m AHD
  - GCBD: NW corner (near substation): 1%AEP RL 2.13m AHD, FPL RL 2.63m AHD
  - GCBD: NE corner (ROW next to Young St): 1%AEP RL 2.56m AHD, FPL RL 3.06m AHD
  - GCBD: SE corner (ROW next to Young St): 1%AEP RL 2.53m AHD, FPL RL 3.03m AHD

  Higher of the levels from these flood studies are applicable for development on the site.
- Flood compatible materials below the FPL to be used.

Drainage

- Residential units are currently assessed at 2/3 an ET per unit. Commercial floor space is assessed at 50 ET per gross built up Hectare. Shops are assessed at 50 ET per gross built up Hectare. Restaurants are assessed at 80 ET per gross built up Hectare.
- Building Over Sewer Mains - Council sewer mains traverse the site and will need to be relocated. Any works impacting the sewer will be required to comply with Councils Building Over Adjacent to Sewer Water Mains Guidelines. Council shall require unrestricted access to all mains within the development site.
- Capacity within the water and sewerage reticulation systems was designed to accommodate load / demand from development permissible under the Gosford City Centre LEP. The current planning instrument (SEPP Gosford City Centre 2018) allows for greater development than that which the system has been designed to accommodate. The developer shall be responsible for the full cost of augmenting Councils water and sewer systems where capacity is exceeded.

Conclusion

The proposed development should be redesigned to address the above issues. This may require a reduction in the height and scale of the proposed development to better address the constraints of the site, and reduce the impact on the locality and adjoining properties.

Yours sincerely

Andrew Roach
Unit Manager
DEVELOPMENT ASSESSMENT

AP:VC/A Prendergast
IR: 27075041

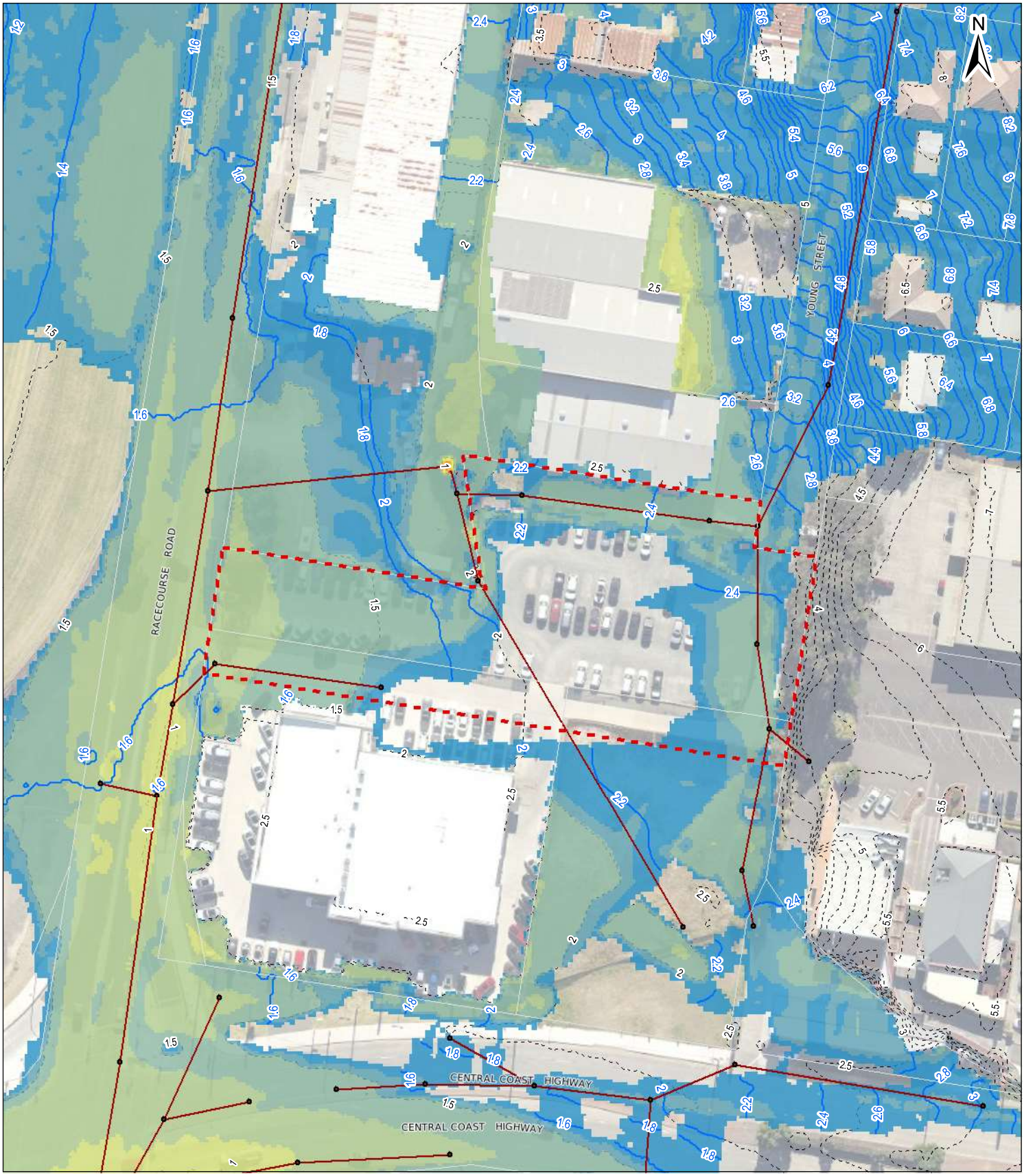
- There is a drainage easement located within the right of way on the northern side of the proposed hotel that discharges stormwater from Young Street to the drainage system within Lot 120 DP 846754 (No 1A Racecourse Road). This easement benefits Council and is piped. The development would need to be piered below the zone of influence of this easement/pipeline.
- There is a drainage easement located in the middle of the site that traverses the site in a NW to SE direction. This easement discharges stormwater flows from Lot 120DP846754 through the site to Lot 11 DP 1201715 and beyond to Central Coast Highway. This easement benefits Council and is piped. The development must not be built over this pipeline/easement. An unobstructed secondary stormwater flow path must be maintained over this drainage easement. The development would need to be piered below the zone of influence of this easement/pipeline.
- Any adjustments and/or connections to the drainage easements that benefit Council will require formal approval under s68 of the Local Government Act.
- A Water Cycle Management Plan Strategy undertaken by a suitably qualified engineer is to be prepared to address the requirements of Chapter 6.7 of Council's Gosford DCP2013 and include:
  - On-site detention to limit post development flows back to pre-development flows for all storms up to and including the 1%AEP storm event. A runoff routing method is to be used in the design/analysis. (There are existing drainage/flooding problems in Racecourse Road and Central Coast Highway downstream of the site.)
  - Nutrient/pollution controls.
  - Retention of rainwater for reuse within the development.
  - Address overland stormwater flows and flooding.
  - Piping of stormwater from the development to Council's drainage system in Racecourse Road.
  - A stormwater plan.
- Permission in writing from the owners of adjoining properties will be required for any works within their property to tie-ins, adjustment or connections to drainage and other infrastructure within those adjoining properties.

Water & Sewer

- The site is located within the Gosford City Centre Developer Water & Sewer Services Plan (DSP) Area. Water and sewer are available to the land.

- The developer shall be required to obtain a Section 307 certificate for development of the land. Water and sewer developer (S307) contributions apply. The current rate is $6917.01 per Equivalent Tenement (ET) and is subject to annual review. Water & Sewer S307 contributions are utilised to ensure suitable capacity is available within the system to accommodate development within the area.

Appendix B – Existing Case Flood Behaviour



Legend

- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Water Levels, mAHD (0.2 metre)
- Ground Levels, mAHD (0.5 metre)

Depth(m)

- 0.02 - 0.05
- 0.05 - 0.1
- 0.1 - 0.3
- 0.3 - 0.5
- 0.5 - 0.7
- 0.7 - 0.9
- 0.9 - 1.1
- 1.1 - 1.3
- 1.3 - 1.5
- 1.5 - 1.7
- 1.7 - 2

0 12.5 25 50 Meters 1:1,000

Figure B1

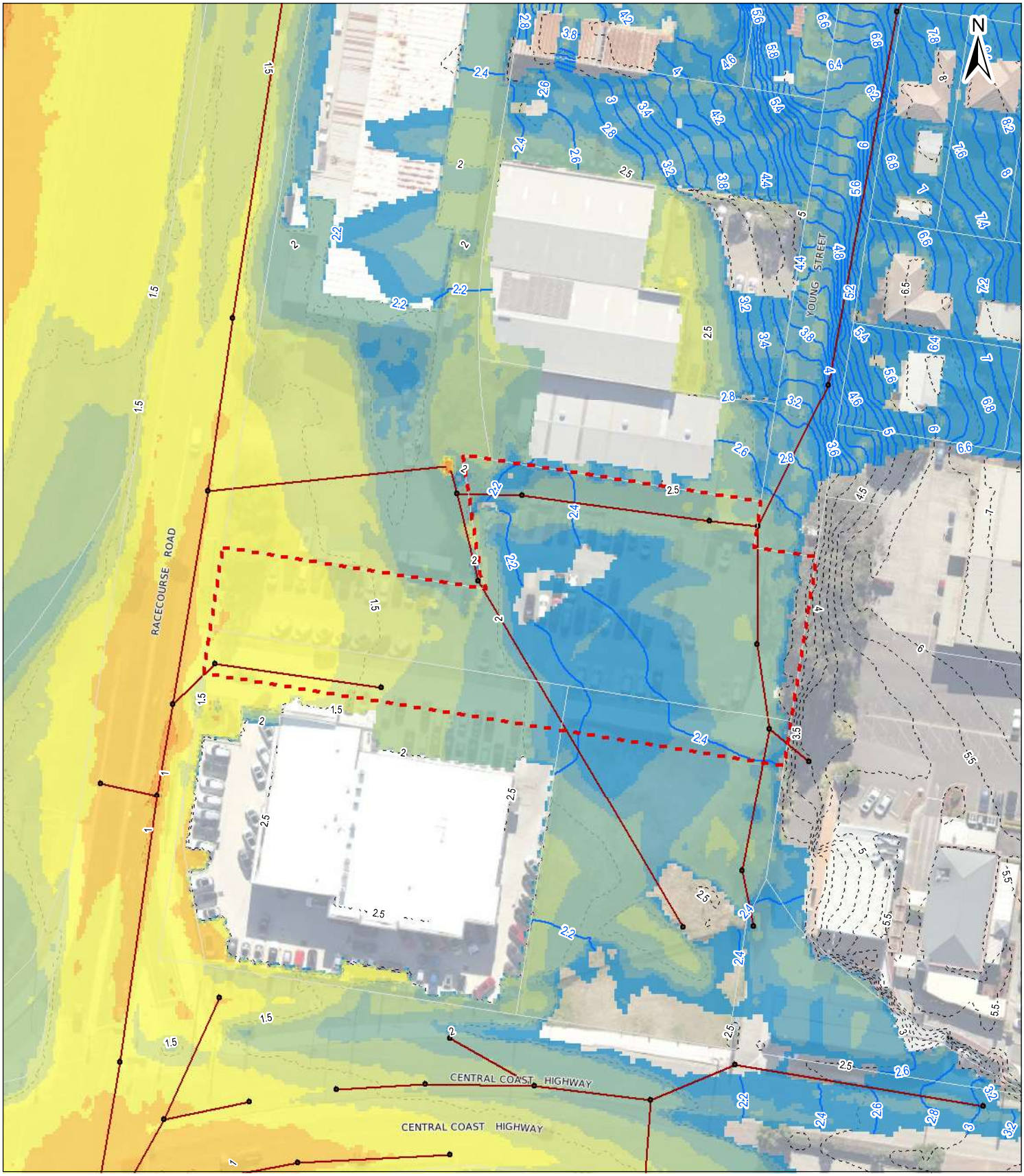
10% AEP Flood (Local Catchments)
Depth and Elevations
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FB01_10AEP_Local_Depth_Elev.mxd



Legend

- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Water Levels, mAHD (0.2 metre)
- Ground Levels, mAHD (0.5 metre)

Depth(m)

0.02 - 0.05	0.3 - 0.5	1.1 - 1.3
0.05 - 0.1	0.5 - 0.7	1.3 - 1.5
0.1 - 0.3	0.7 - 0.9	1.5 - 1.7
	0.9 - 1.1	1.7 - 2

0 12.5 25 50 Meters 1:1,000

Figure B2

1% AEP Flood Max Envelope
(Local Catchments + Narara Creek)
Depth and Elevations
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

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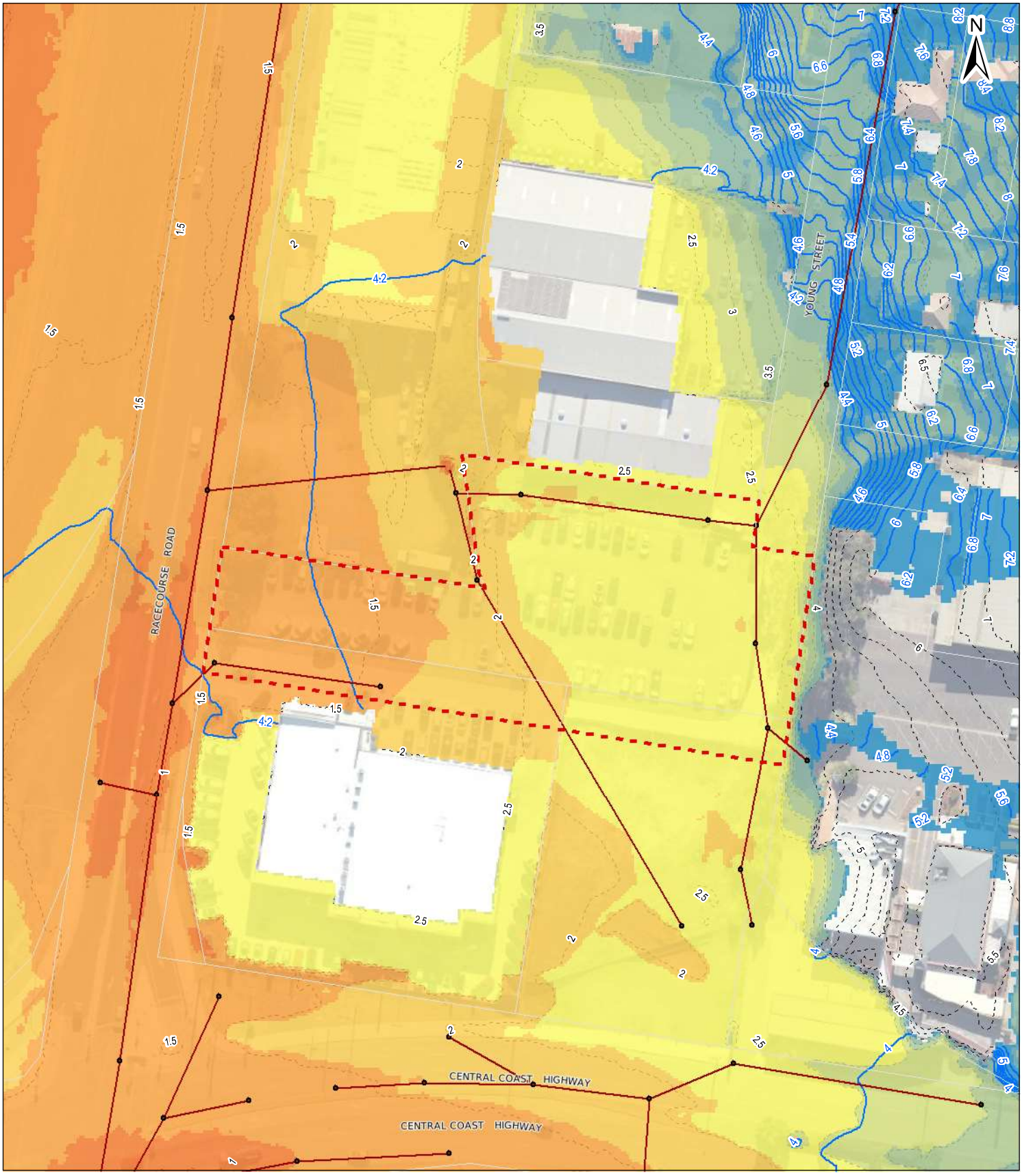

Legend

- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Water Levels, mAHD (0.2 metre)
- Ground Levels, mAHD (0.5 metre)

Depth(m)

- 0.02 - 0.05
- 0.05 - 0.1
- 0.1 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 5.0

0 12.5 25 50 Meters 1:1,000

Figure B3

PMF Flood Max Envelope
(Local Catchments + Narara Creek)
Depth and Elevations
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

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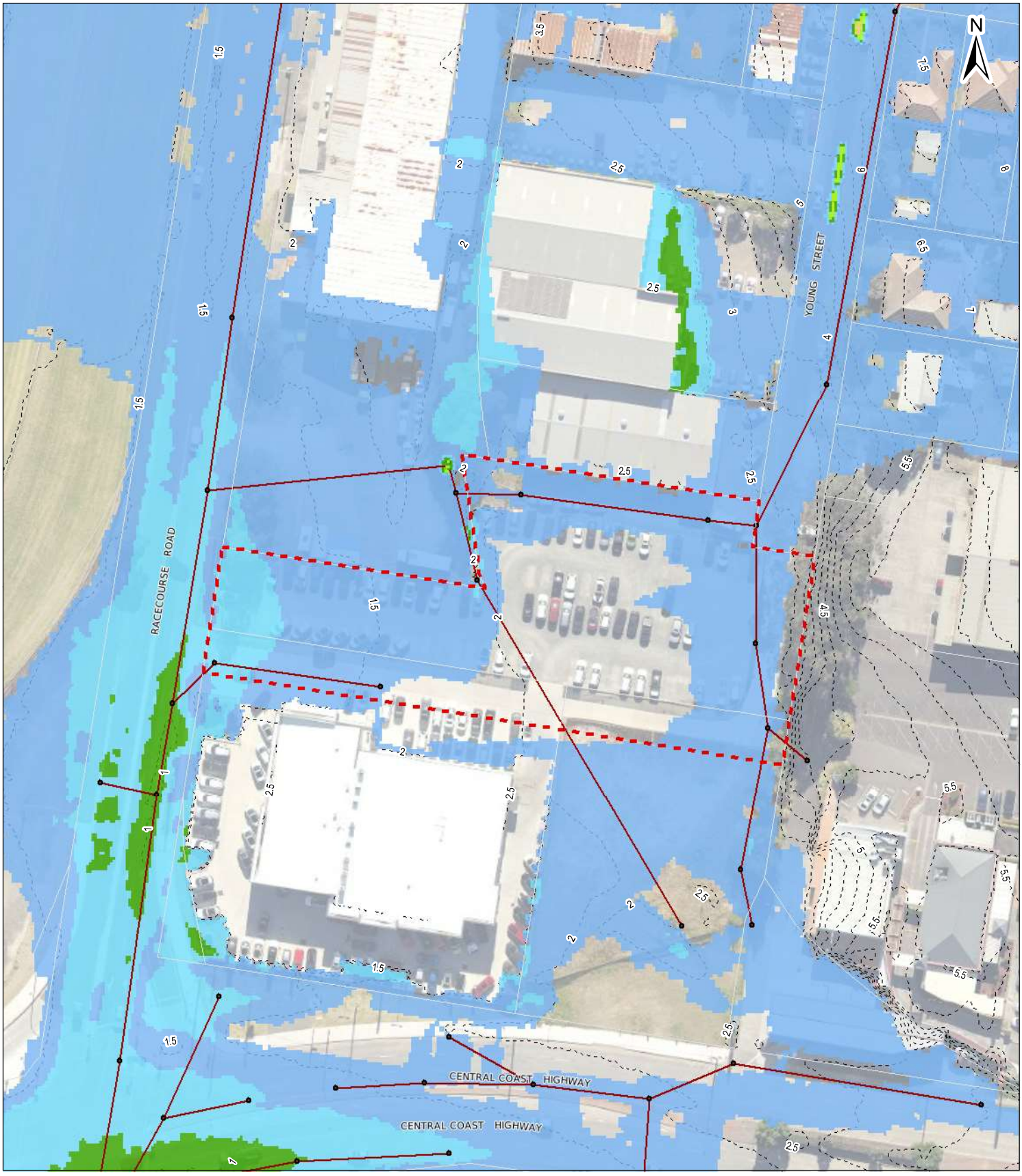

Legend

- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Ground Levels, mAHD (0.5 metre)

Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 12.5 25 50 Meters 1:1,000

Figure B4

10% AEP Flood (Local Catchments)
AIDR Flood Hazard
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

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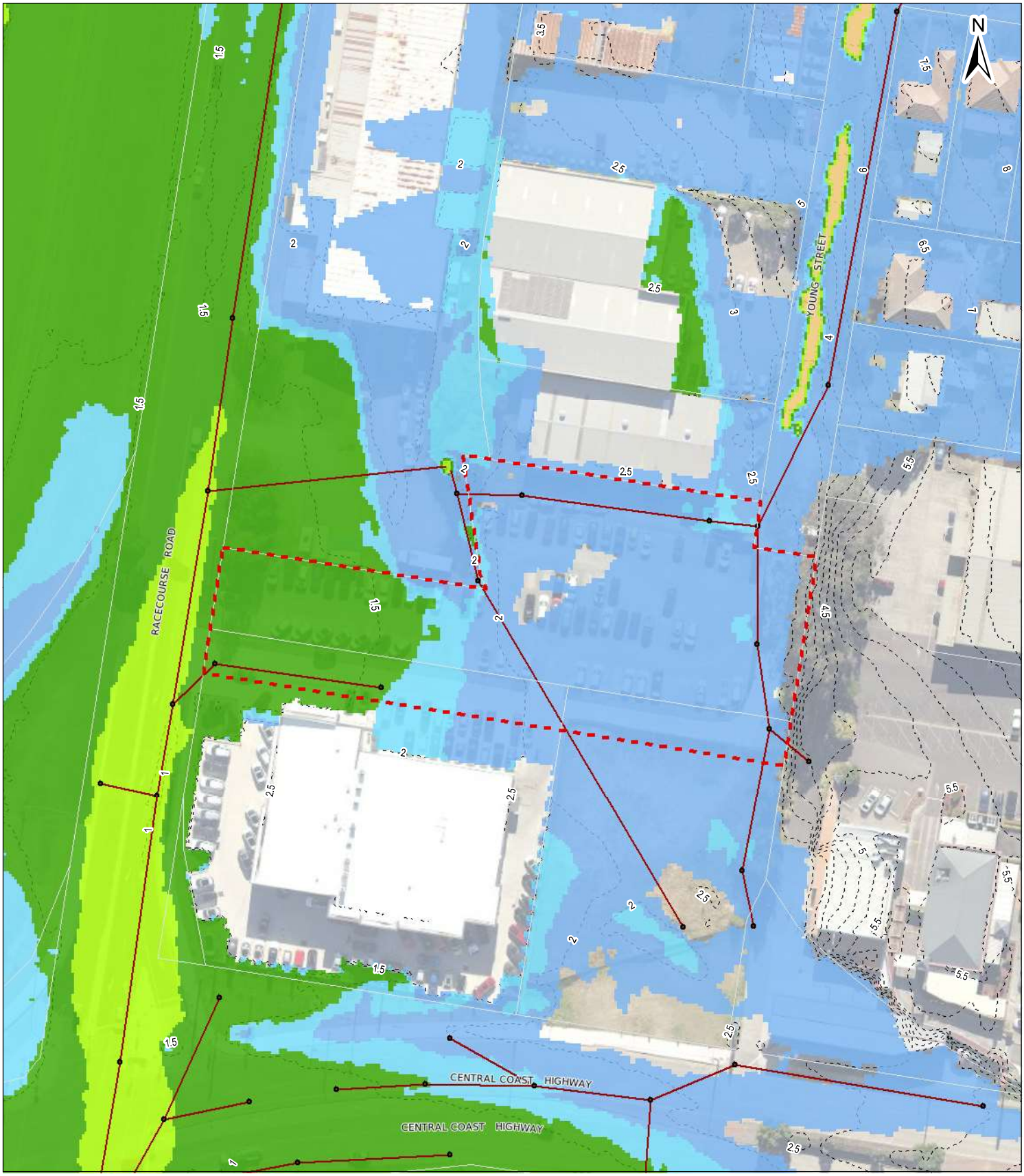

Legend

- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Ground Levels, mAHD (0.5 metre)

Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 12.5 25 50 Meters 1:1,000

Figure B5

1% AEP Flood Max Envelope
(Local Catchments + Narara Creek)
AIDR Flood Hazard
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

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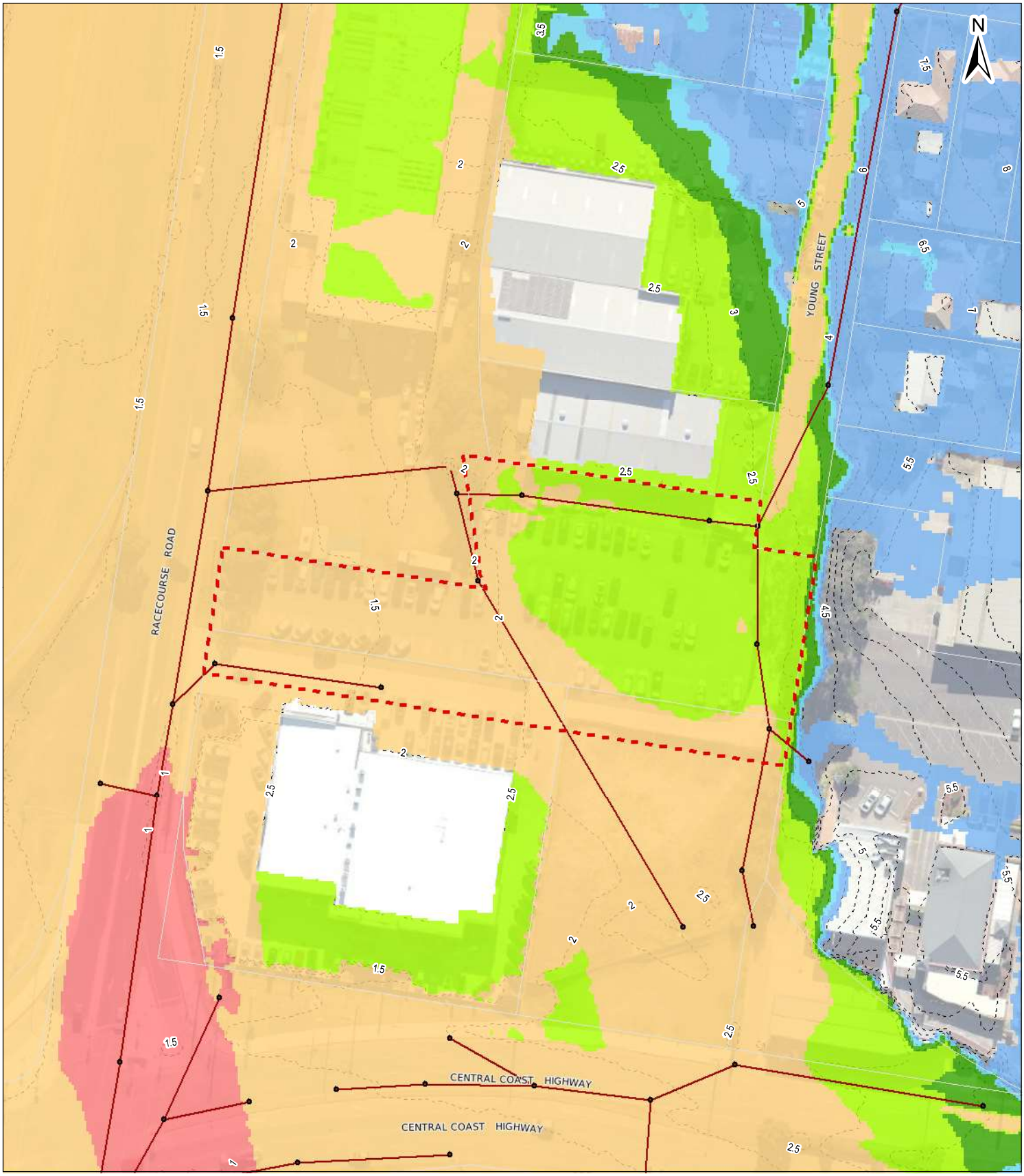

Legend

- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Ground Levels, mAHD (0.5 metre)

Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 12.5 25 50 Meters 1:1,000

Figure B6

PMF Flood Max Envelope
(Local Catchments + Narara Creek)
AIDR Flood Hazard
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

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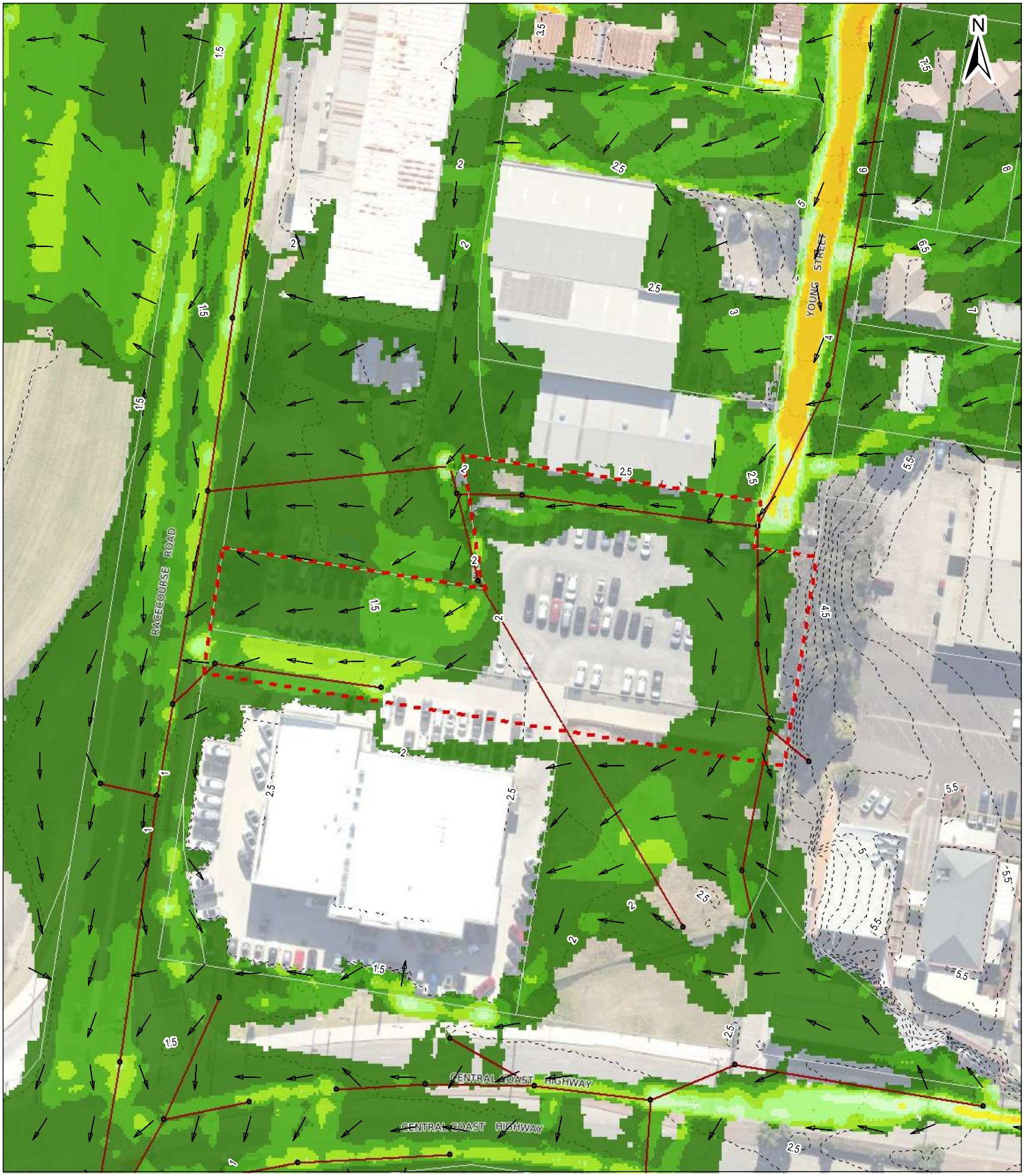

Legend

- Velocity Vector
- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Ground Levels, mAHD (0.5 metre)

0 12.5 25 50 Meters 1:1,000

Velocity(m/s)	
0.00 - 0.20	1.01 - 1.20
0.21 - 0.40	1.21 - 2.00
0.41 - 0.60	2.01 - 3.00
0.61 - 0.80	3.01 - 4.00
0.81 - 1.00	4.01 - 5.00
	5.01 - 6.00

Figure B7

10% AEP Flood (Local Catchments)
Flow Velocity
Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

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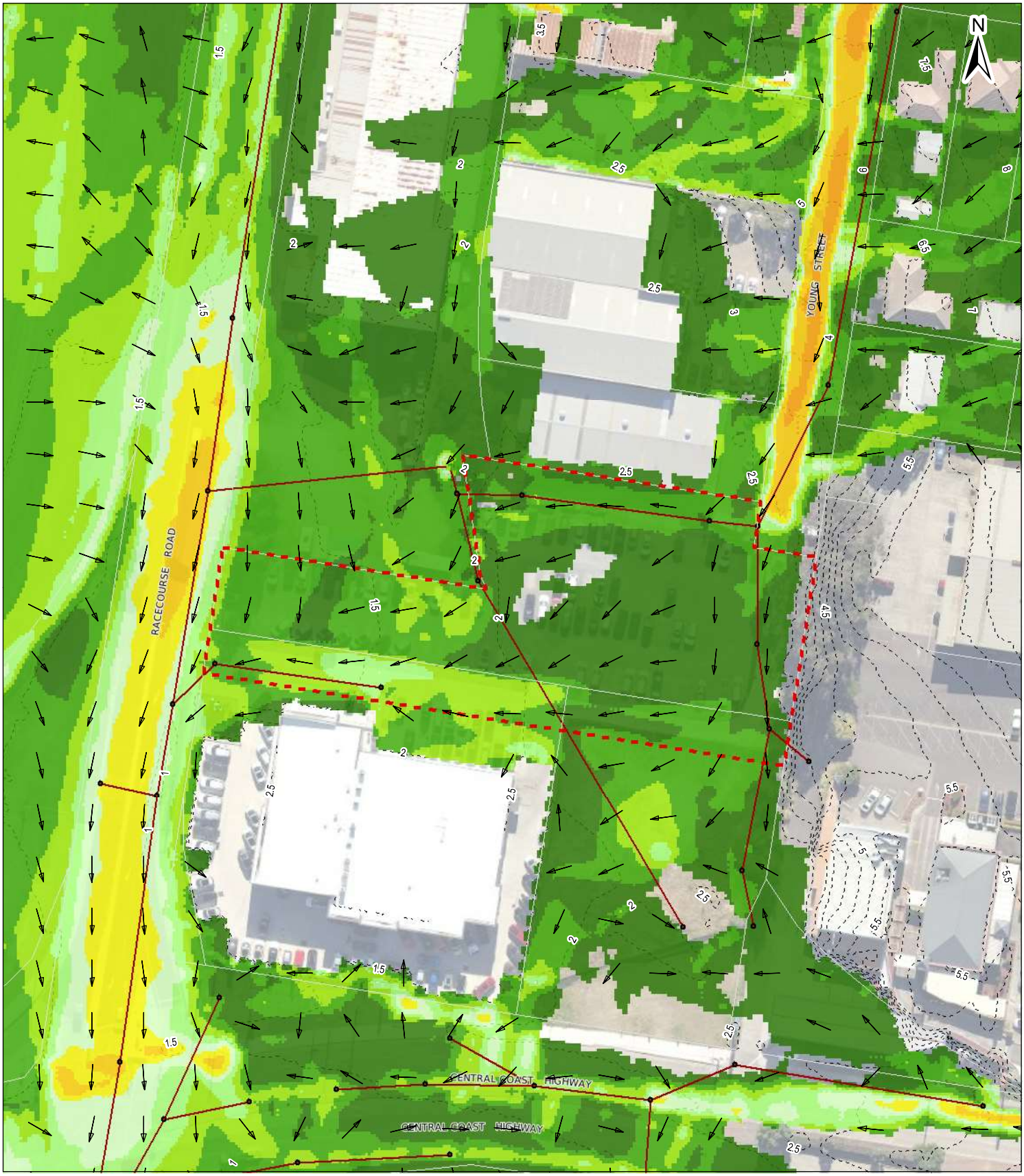


Legend

- Velocity Vector
- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Ground Levels, mAHD (0.5 metre)

Velocity(m/s)

0.00 - 0.20	1.01 - 1.20
0.21 - 0.40	1.21 - 2.00
0.41 - 0.60	2.01 - 3.00
0.61 - 0.80	3.01 - 4.00
0.81 - 1.00	4.01 - 5.00
	5.01 - 6.00

0 12.5 25 50 Meters 1:1,000

Figure B8

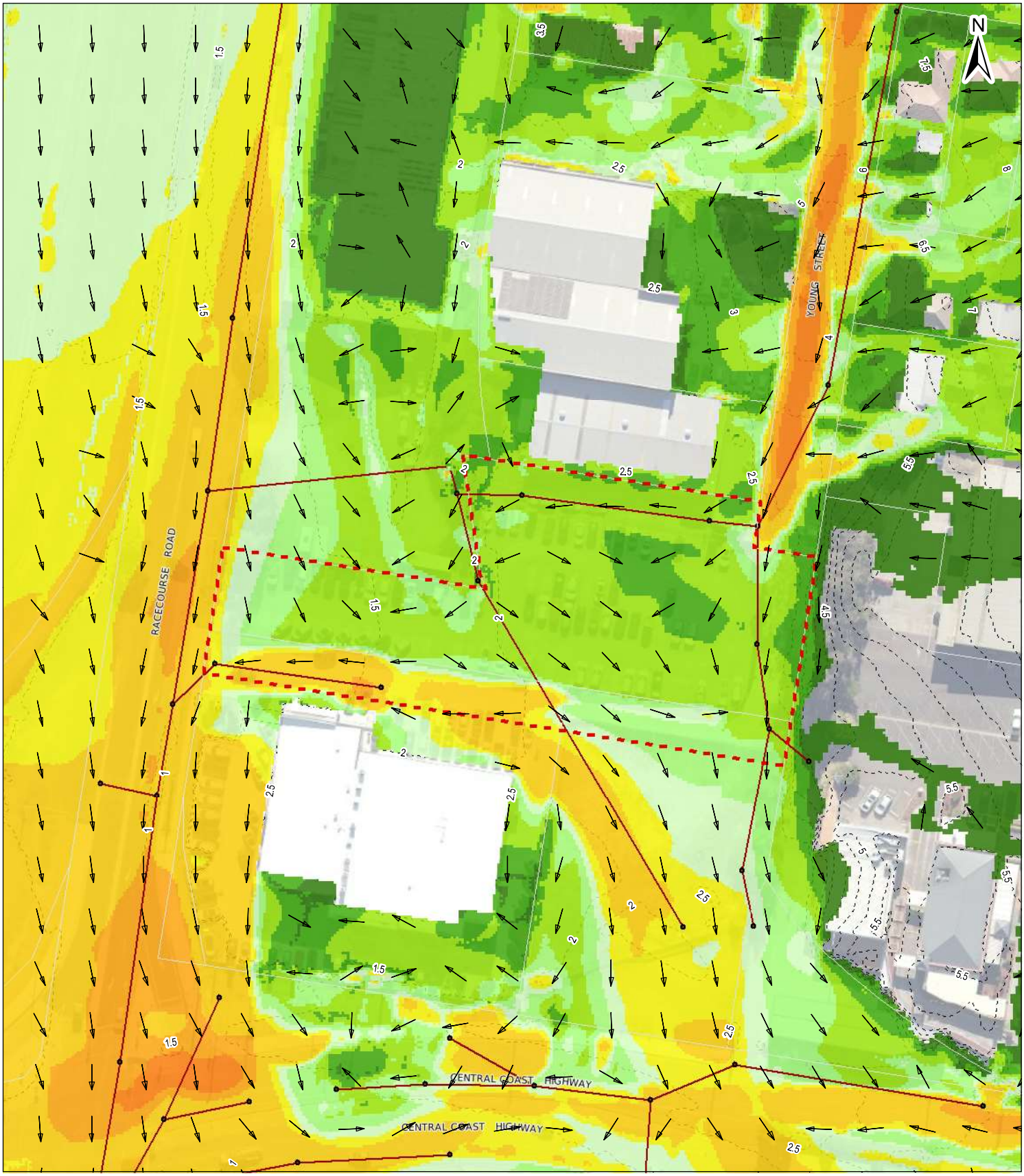
1% AEP Flood Max Envelope (Local Catchments + Narara Creek) Flow Velocity Existing Conditions

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FB08_1AEP_MaxEnvelope_Velocity.mxd



Legend

- Velocity Vector
- Subject Site
- Cadastre
- Existing Pits
- Existing Pipes
- Ground Levels, mAHD (0.5 metre)

0 12.5 25 50 Meters 1:1,000

Velocity(m/s)

0.00 - 0.20	1.01 - 1.20
0.21 - 0.40	1.21 - 2.00
0.41 - 0.60	2.01 - 3.00
0.61 - 0.80	3.01 - 4.00
0.81 - 1.00	4.01 - 5.00
	5.01 - 6.00

Figure B9

PMF Flood Max Envelope (Local Catchments + Narara Creek) Flow Velocity Existing Conditions

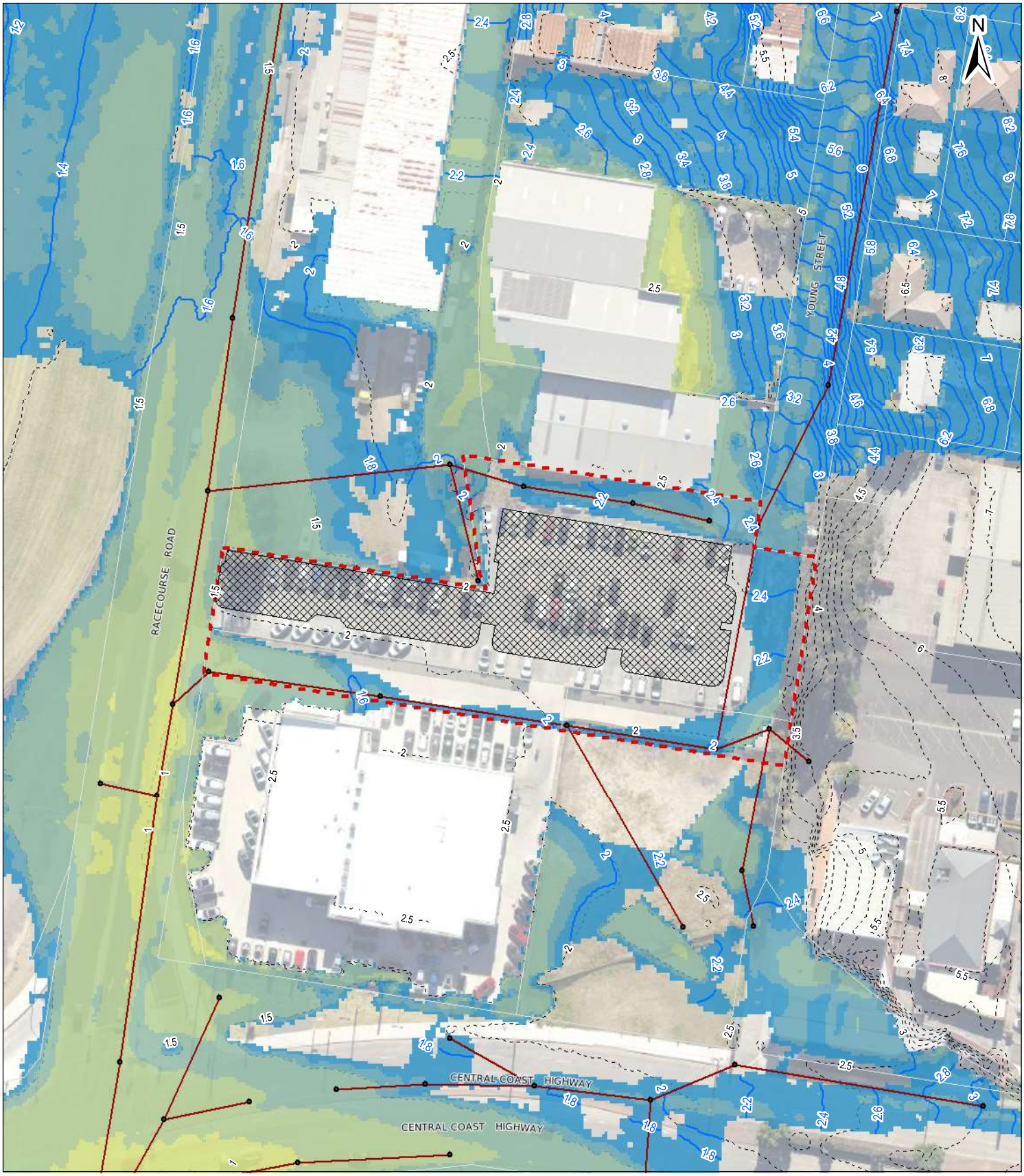
10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FB09_PMF_MaxEnvelope_Velocity.mxd

Appendix C – Developed Case Flood Behaviour



Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Water Levels, mAHD (0.2 metre)
- Ground Levels, mAHD (0.5 metre)

Depth(m)

- 0.02 - 0.05
- 0.05 - 0.1
- 0.1 - 0.3
- 0.3 - 0.5
- 0.5 - 0.7
- 0.7 - 0.9
- 0.9 - 1.1
- 1.1 - 1.3
- 1.3 - 1.5
- 1.5 - 1.7
- 1.7 - 2

0 12.5 25 50 Meters 1:1,000

Figure C1

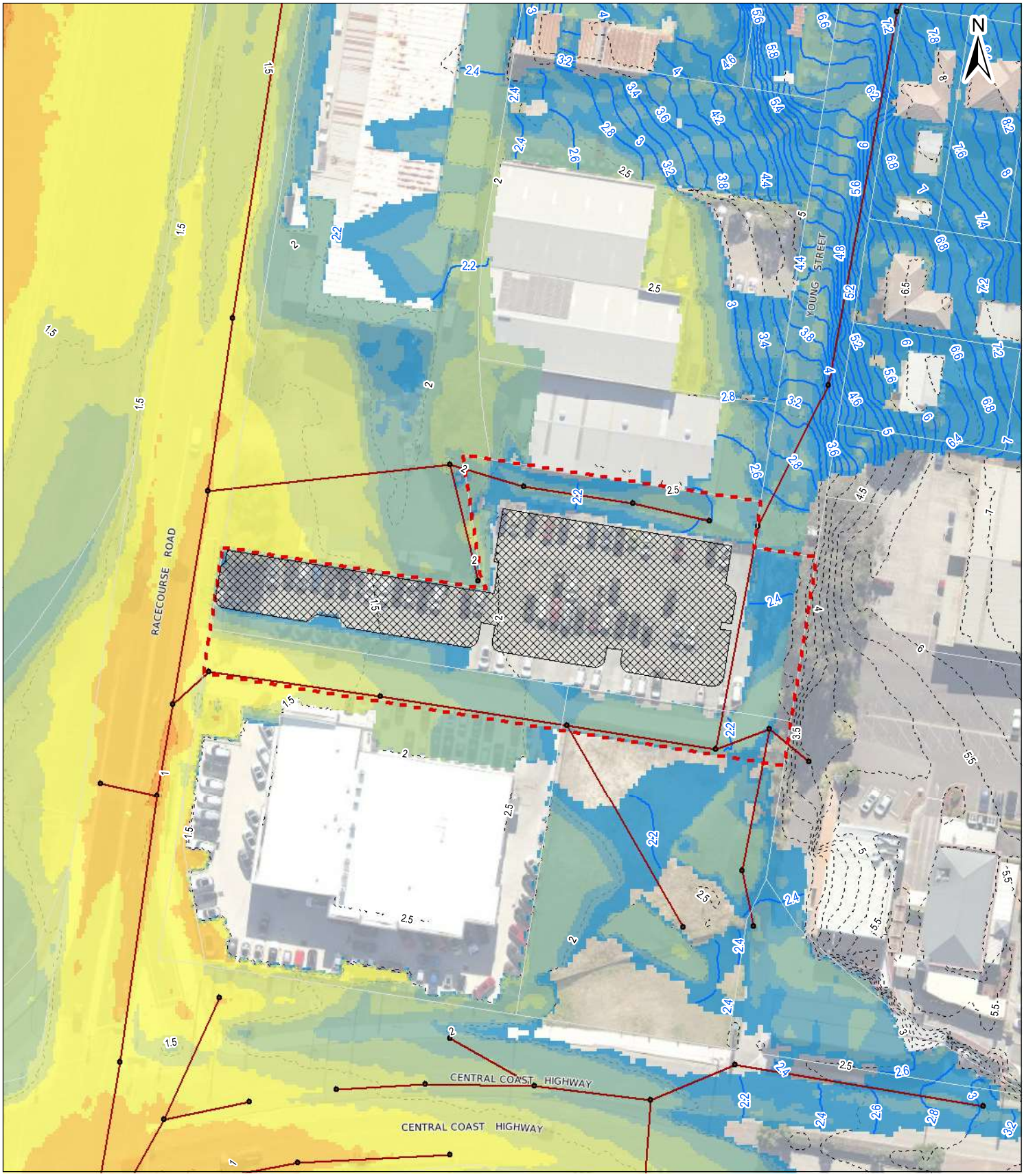
10% AEP Flood (Local Catchments)
Depth and Elevations
Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC01_10AEP_Local_Depth_Elev.mxd



Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Water Levels, mAHD (0.2 metre)
- Ground Levels, mAHD (0.5 metre)

Depth(m)

0.02 - 0.05	0.3 - 0.5	1.1 - 1.3
0.05 - 0.1	0.5 - 0.7	1.3 - 1.5
0.1 - 0.3	0.7 - 0.9	1.5 - 1.7
	0.9 - 1.1	1.7 - 2

0 12.5 25 50 Meters 1:1,000

Figure C2

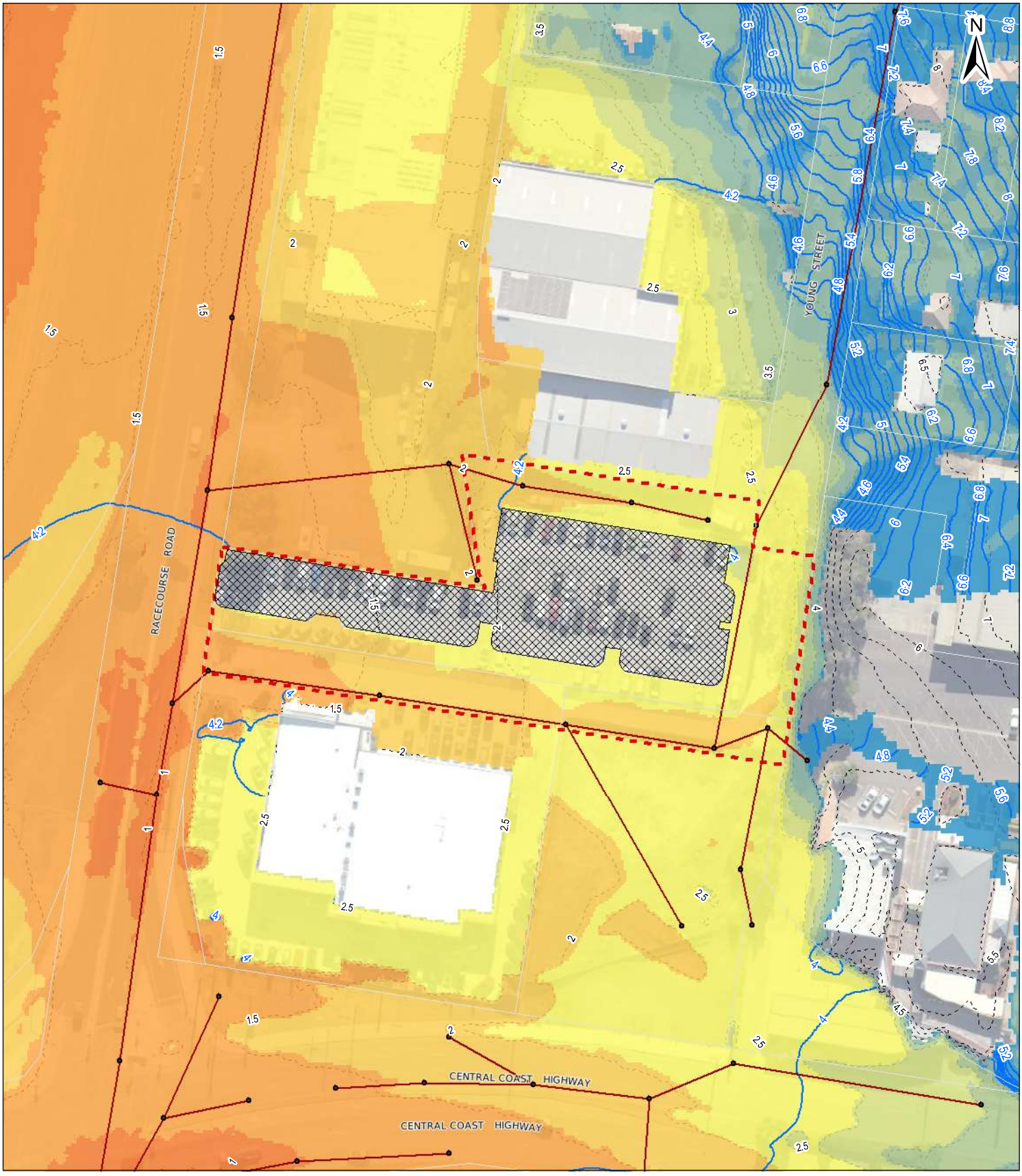
1% AEP Flood Max Envelope (Local Catchments + Narara Creek) Depth and Elevations Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC02_1AEP_MaxEnvelope_Depth_Elev.mxd



Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Water Levels, mAHD (0.2 metre)
- Ground Levels, mAHD (0.5 metre)

Depth(m)

- 0.02 - 0.05
- 0.05 - 0.1
- 0.1 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 5.0

0 12.5 25 50 Meters 1:1,000

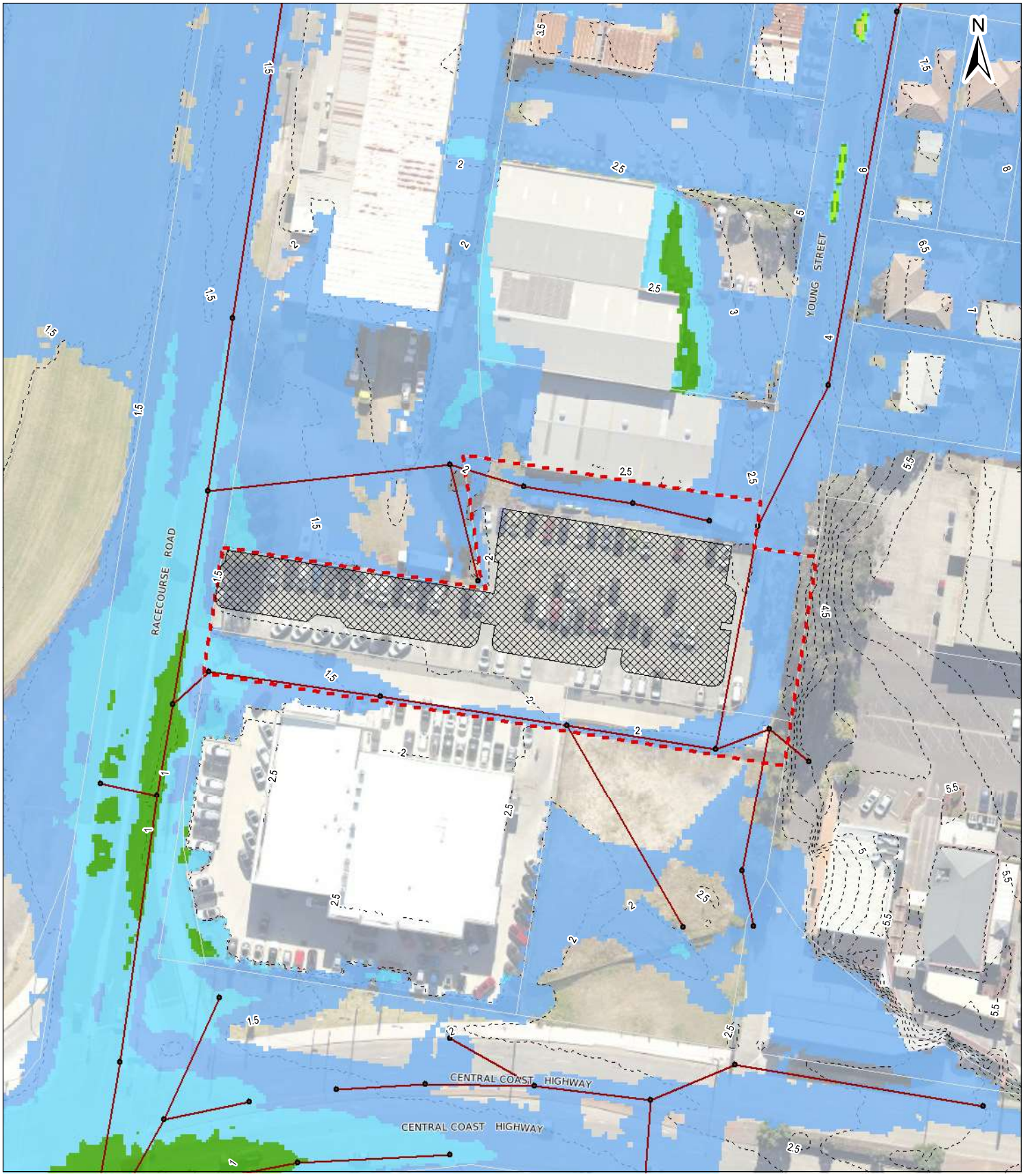
Figure C3

PMF Flood Max Envelope
(Local Catchments + Narara Creek)
Depth and Elevations
Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial



Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Ground Levels, mAHD (0.5 metre)

Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 12.5 25 50 Meters 1:1,000

Figure C4

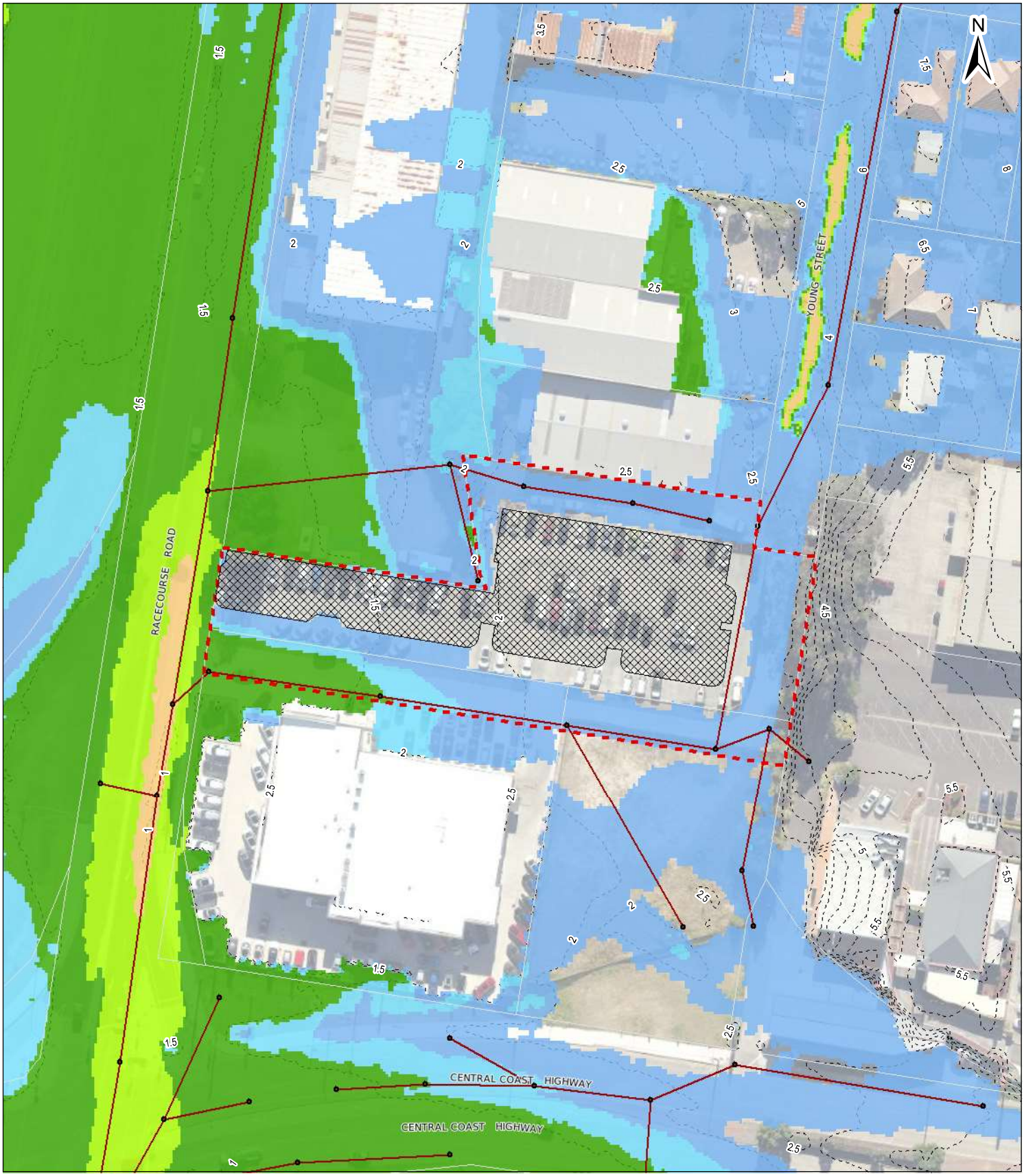
10% AEP Flood (Local Catchments)
AIDR Flood Hazard
Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC04_10AEP_Local_Hazard.mxd



Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Ground Levels, mAHD (0.5 metre)

Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 12.5 25 50 Meters 1:1,000

Figure C5

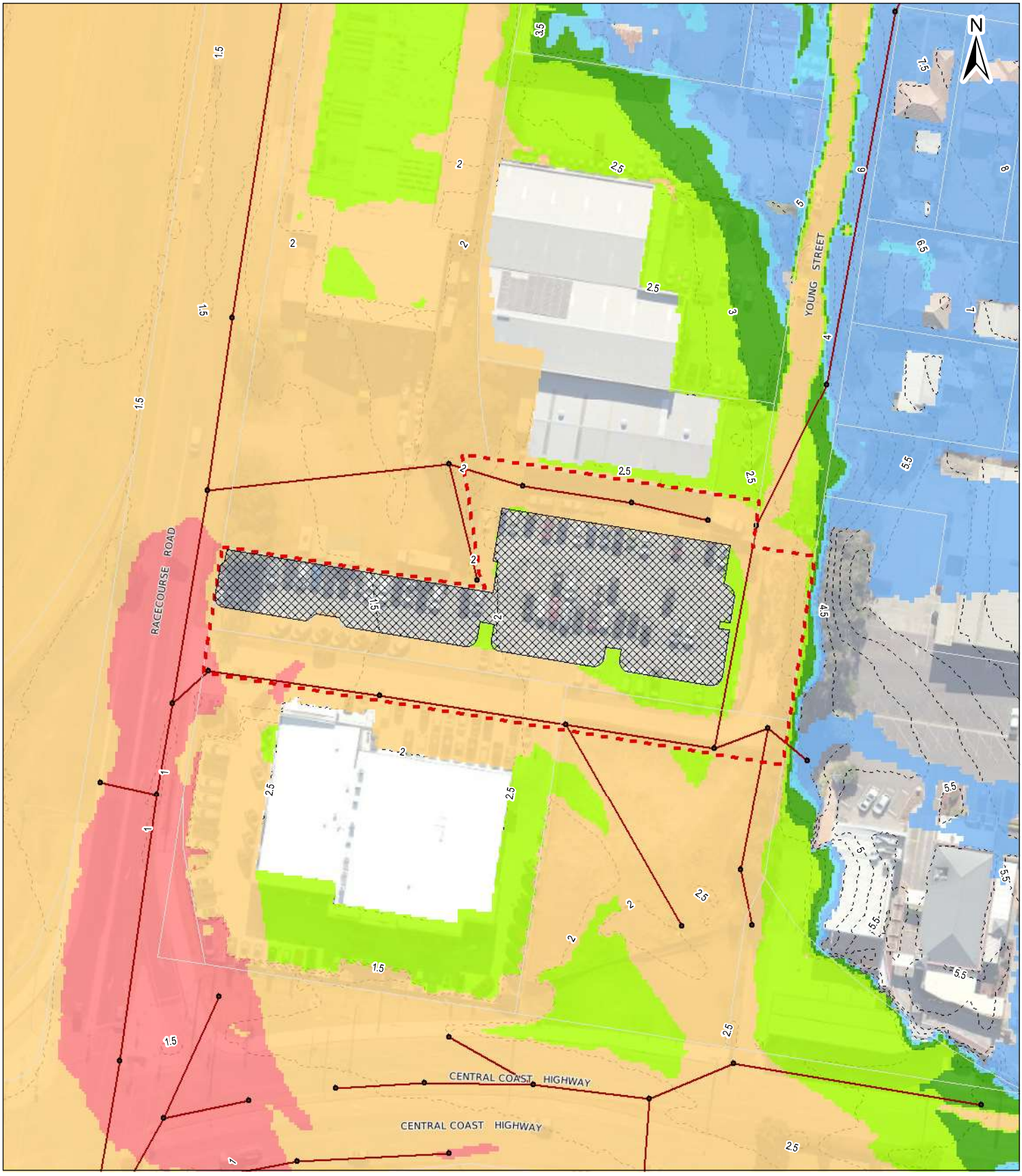
1% AEP Flood Max Envelope
(Local Catchments + Narara Creek)
AIDR Flood Hazard
Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC05_1AEP_MaxEnvelope_Hazard.mxd



Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Ground Levels, mAHD (0.5 metre)

Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 12.5 25 50 Meters 1:1,000

Figure C6

PMF Flood Max Envelope
(Local Catchments + Narara Creek)
AIDR Flood Hazard
Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC06_PMF_MaxEnvelope_Hazard.mxd

Legend

- Velocity Vector
- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Ground Levels, mAHD (0.5 metre)

0 12.5 25 50 Meters 1:1,000

Velocity(m/s)	
0.00 - 0.20	1.01 - 1.20
0.21 - 0.40	1.21 - 2.00
0.41 - 0.60	2.01 - 3.00
0.61 - 0.80	3.01 - 4.00
0.81 - 1.00	4.01 - 5.00
	5.01 - 6.00

Figure C7

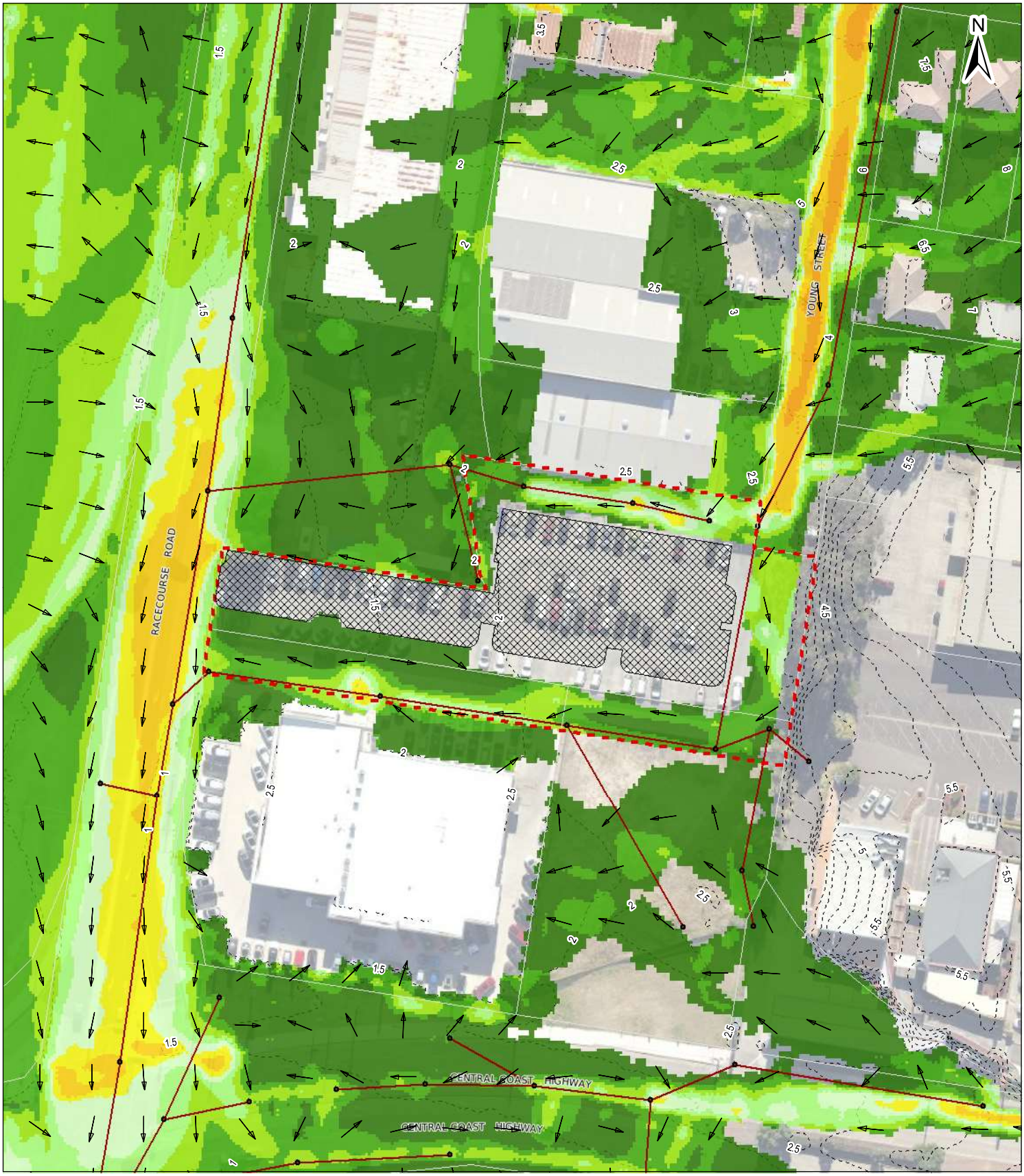
10% AEP Flood (Local Catchments)
Flow Velocity
Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC07_10AEP_Local_Velocity.mxd



Legend

- Velocity Vector
- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Ground Levels, mAHD (0.5 metre)

0 12.5 25 50 Meters 1:1,000

Velocity(m/s)

0.00 - 0.20	1.01 - 1.20
0.21 - 0.40	1.21 - 2.00
0.41 - 0.60	2.01 - 3.00
0.61 - 0.80	3.01 - 4.00
0.81 - 1.00	4.01 - 5.00
	5.01 - 6.00

Figure C8

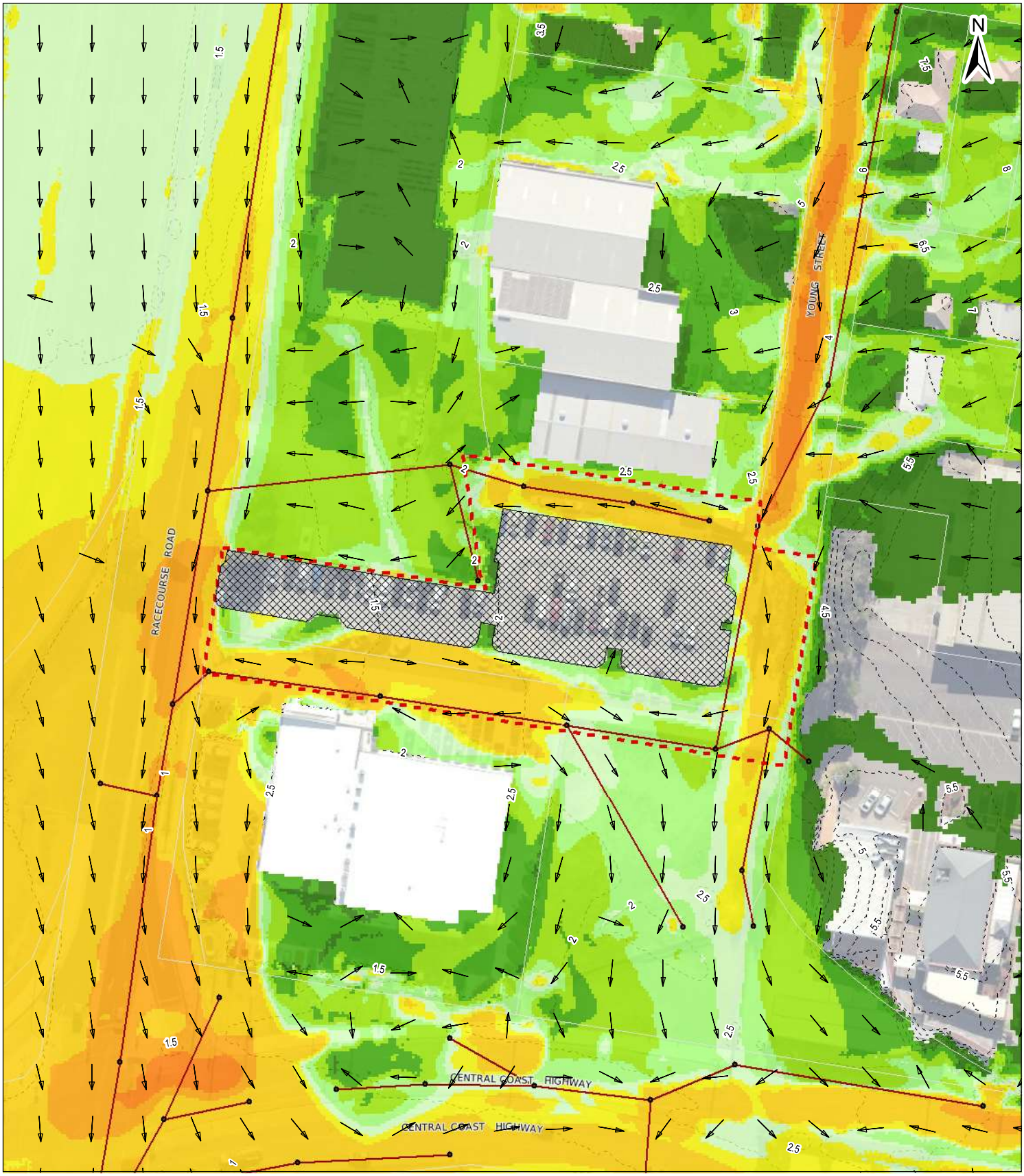
1% AEP Flood Max Envelope (Local Catchments + Narara Creek) Flow Velocity Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC08_1AEP_MaxEnvelope_Velocity.mxd



Legend

- Velocity Vector
- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes
- Ground Levels, mAHD (0.5 metre)

Velocity(m/s)

0.00 - 0.20	1.01 - 1.20
0.21 - 0.40	1.21 - 2.00
0.41 - 0.60	2.01 - 3.00
0.61 - 0.80	3.01 - 4.00
0.81 - 1.00	4.01 - 5.00
	5.01 - 6.00

0 12.5 25 50 Meters 1:1,000

Figure C9

PMF Flood Max Envelope (Local Catchments + Narara Creek) Flow Velocity Developed Scenario

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FC09_PMF_MaxEnvelope_Velocity.mxd

Appendix D – Flood Effects

Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes

Depth Difference (m)

- <-0.499
- -0.499 - -0.300
- -0.299 - -0.100
- -0.099 - -0.050
- -0.049 - -0.030
- -0.029 - -0.010
- Less than +/- 10mm
- 0.011 - 0.030
- 0.031 - 0.050
- 0.051 - 0.100
- 0.101 - 0.300
- 0.301 - 0.500
- >0.500

0 12.5 25 50 Meters 1:1,000

Figure D1

10% AEP Flood (Local Catchments)
Depth Difference
Developed minus Existing

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FD01_10AEP_Local_Diff.mxd

Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes

Depth Difference (m)

- <-0.499
- -0.499 - -0.300
- -0.299 - -0.100
- -0.099 - -0.050
- -0.049 - -0.030
- -0.029 - -0.010
- Less than +/- 10mm
- 0.011 - 0.030
- 0.031 - 0.050
- 0.051 - 0.100
- 0.101 - 0.300
- 0.301 - 0.500
- >0.500

0 12.5 25 50 Meters 1:1,000

Figure D2

1% AEP Flood (Local Catchments)
Depth Difference
Developed minus Existing

10 Young Street, West Gosford (NL200900)

NORTHROP

Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FD02_1AEP_Local_Diff.mxd

Legend

- Proposed Building
- Subject Site
- Cadastre
- Pits
- Pipes

Depth Difference (m)

- <-0.499
- -0.499 - -0.300
- -0.299 - -0.100
- -0.099 - -0.050
- -0.049 - -0.030
- -0.029 - -0.010
- Less than +/- 10mm
- 0.011 - 0.030
- 0.031 - 0.050
- 0.051 - 0.100
- 0.101 - 0.300
- 0.301 - 0.500
- >0.500

0 12.5 25 50 Meters 1:1,000

Figure D3

1%AEP Flood (Narara Creek)
Depth Difference
Developed minus Existing

10 Young Street, West Gosford (NL200900)

NORTHROP

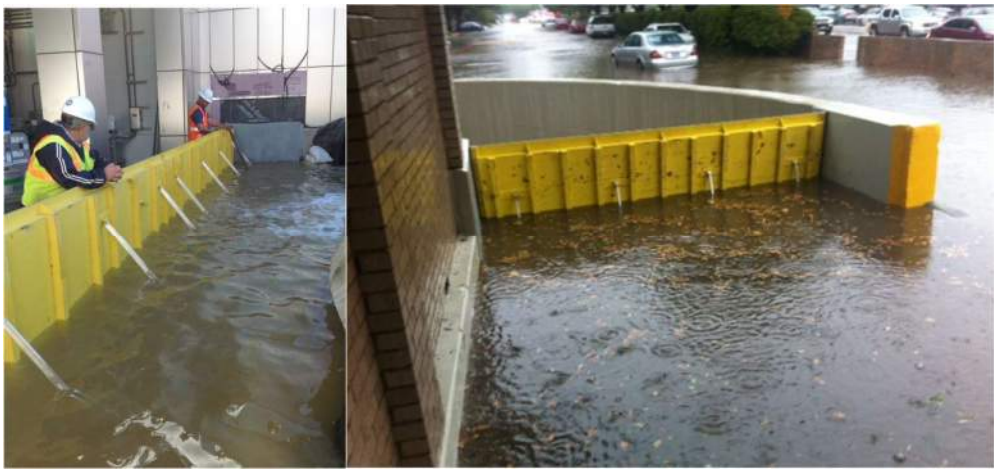
Data Source: NSW LPI - Cadastre, NSW Imagery - Aerial

7/09/2020 X:\PROJECTS\NEWCASTLE\YEAR 2020 Jobs\NL200900 - 10 Young Street\FIGURES\ArcMap\NL200900_FD03_1AEP_NararaCk_Diff.mxd

Appendix E – Flood Barriers

FloodBreak
REVOLUTIONARY FLOOD CONTROL

Introduction to FloodBreak, the passive automatic flood barrier



Passive automatic flood barriers are deployed by flood water and are not dependent on any power source, pumps or human interaction. When the floodwaters arrive the flood barrier goes up, when the flood waters recede, the flood barrier returns to its original position.

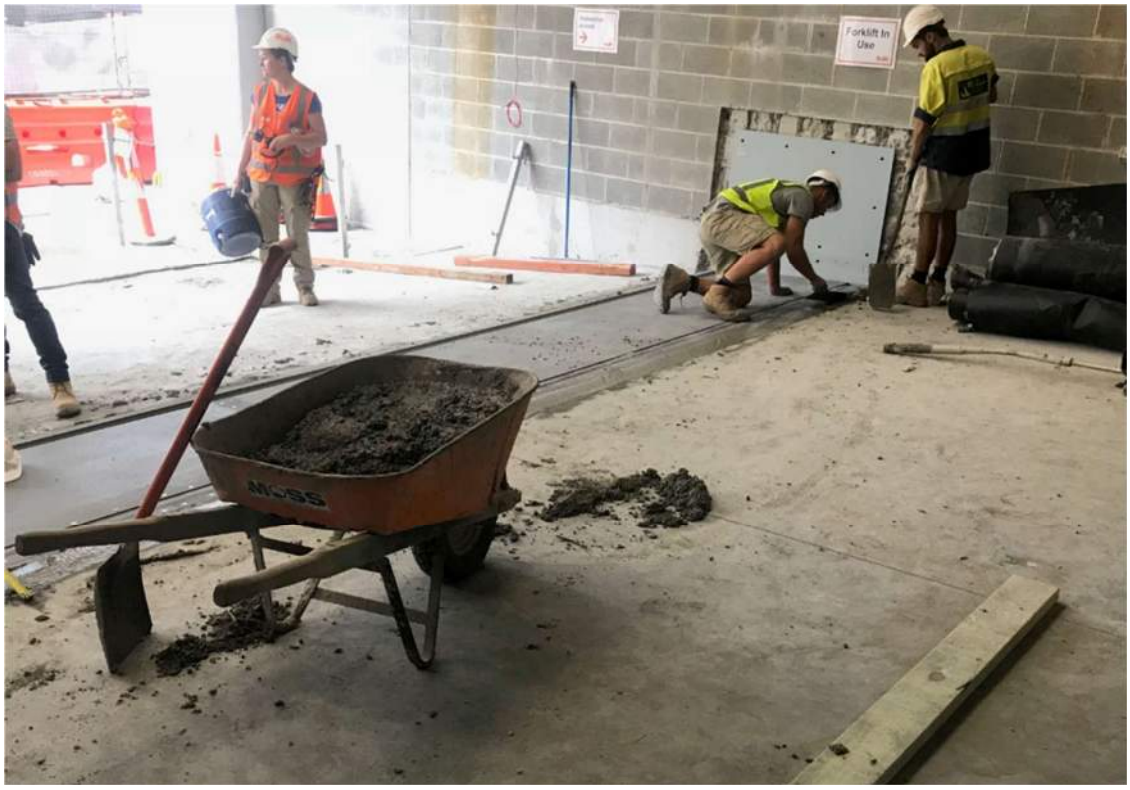
FloodBreak USA (www.floodbreak.com) is the global leader for passive automatic flood barriers which are custom made to the specifications of each client. Bluemont is the distributor for FloodBreak in Australia and New Zealand.

FloodBreak flood barrier can be made to any length and up to 7 metres high.

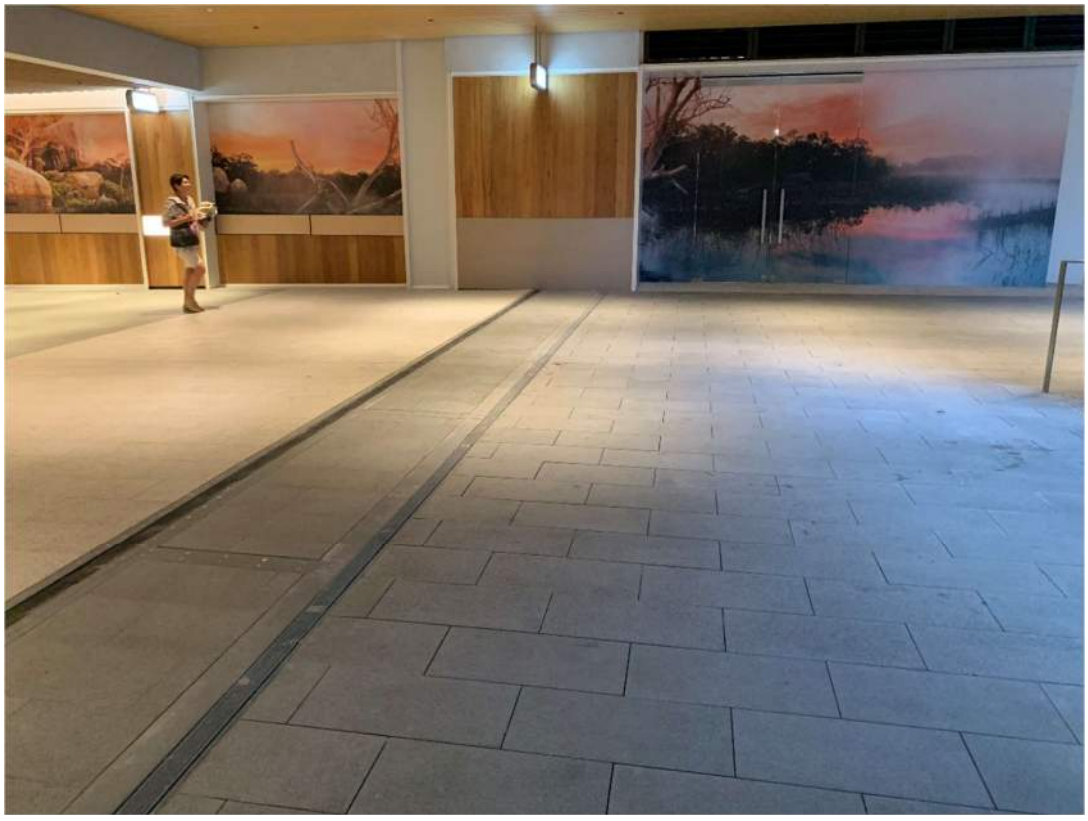
FloodBreak passive automatic flood barriers have been subjected to many floods and have never failed.

Some examples of FloodBreak installations in Sydney area:

Parramatta, 105 Phillip Street: garage entry during installation

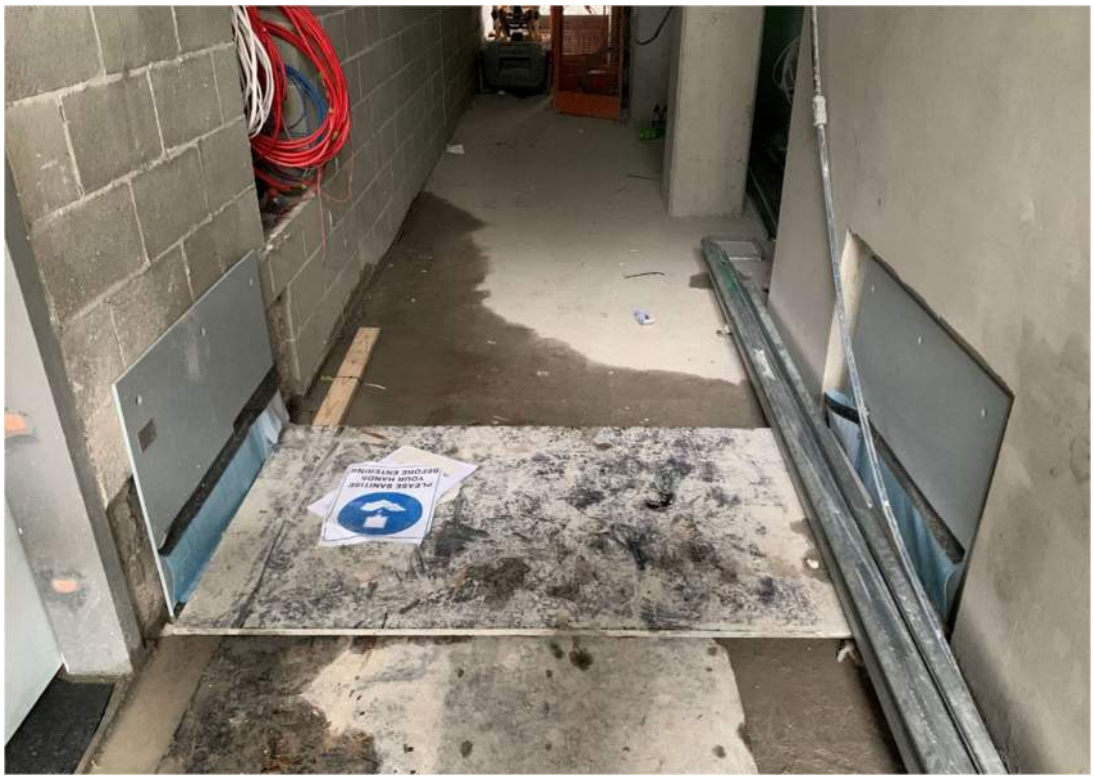


Parramatta, 4 Parramatta Square to Train Station: tiled FloodBreak:



Warriewood, Northern Beaches, Warriewood Square shopping centres: multiple pedestrian FloodBreaks including a pedestrian flood barrier with tiles:

404 Church Street, Parramatta, under construction photos of car park entry and foyer with tiled FloodBreak:



FloodBreak information

Bluemont often selects the **passive automatic FloodBreak flood barrier** for larger projects.

We believe this to be the best and most reliable solution for this location because:

- Over 2,000 FloodBreak have been installed - tried and tested
- Many deployments, no failures - no failures ever
- Works by flotation, activated by flood water - reliable
- No power/battery, No pumps, No push buttons - easy to install and maintain
- Aluminium does not corrode - long design life
- Low installation costs - no services to be connected
- Low maintenance cost - mostly self-cleaning
- Warranty 5 years - cost control

The FloodBreak works by flotation only: No Power/Batteries, No People or push buttons, No Pumps, Works 24/7.

Over 2,000 FloodBreaks have been installed globally. It is the most reliable flood barrier available. No failures.

In Australia multiple FloodBreak flood barriers have been installed in QLD, NSW and VIC.

Australian Councils / Melbourne Water have approved the use of FloodBreak flood barriers and prefer them over flood barriers which need a power/battery source to operate.

No human intervention is required.

When the flood waters arrive the FloodBreak lid floats up and when the flood waters recede the FloodBreak lid comes down without any intervention by human, sensors, power or pumps.

Videos, photos, information:

- https://www.bluemont.com.au/flood-prevention/floodbreak/
- https://www.youtube.com/watch?v=cvwDfeNYFTI&list=PLVs5k2H7Jr7aTxGw22g6her8m6bvCIiey

Why choose FloodBreak?:

Bluemont advises you to choose the most reliable option when selecting a passive automatic flood barrier and to consider existing track records for flood barrier options.

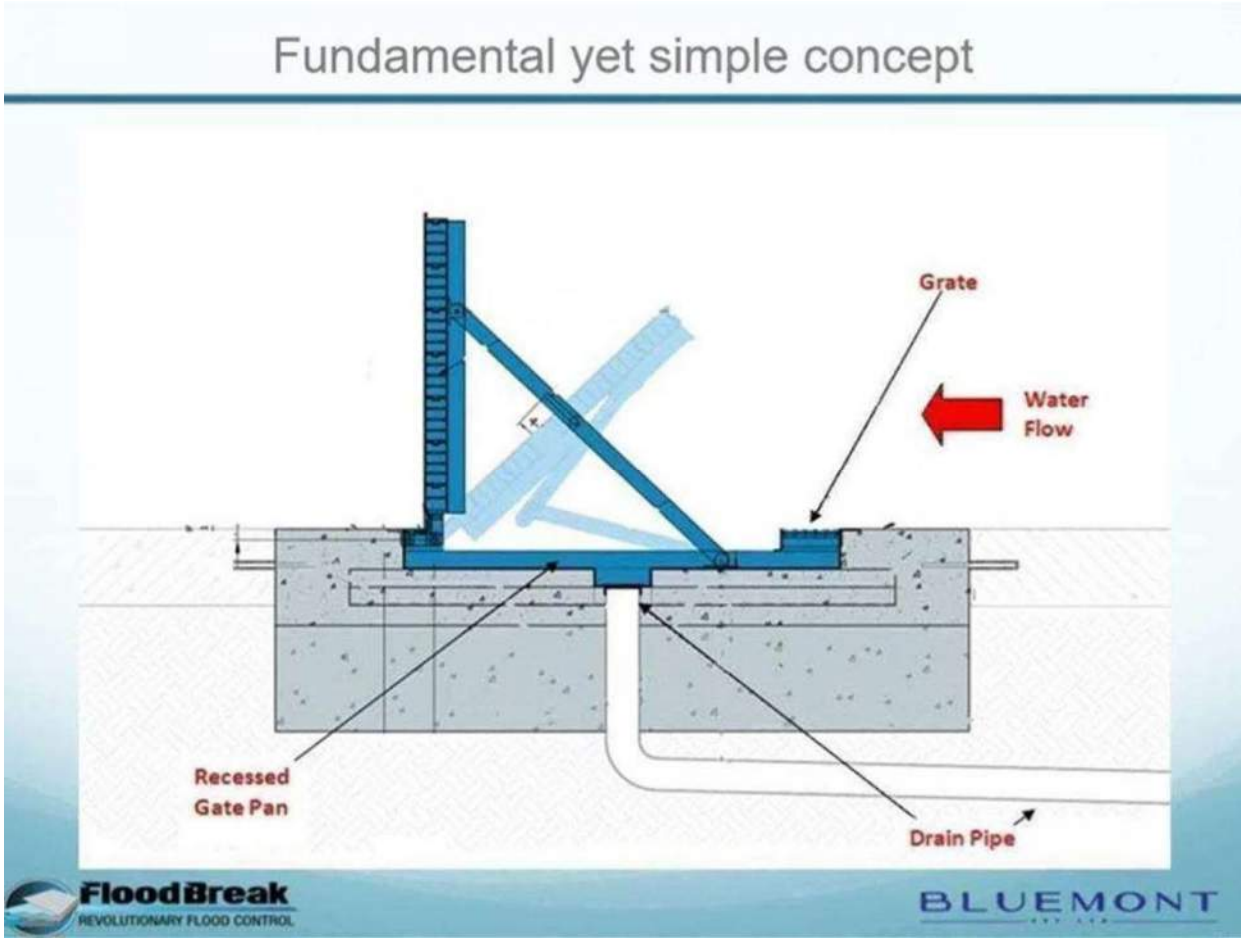
FloodBreak has unparalleled experience with passive automatic aluminium flood barriers which is their core product and 2,000 passive automatic FloodBreak flood barriers have been installed globally.

FloodBreak flood barriers protect offices, hospitals, nuclear power plants, embassies, shopping centres, warehouses, main roads and multiple other critical assets.

No FloodBreak flood barrier has failed during floods and many have been tested in real flood events.

A reliable flood barrier is a critical tool in the fight against flooding. When a flooding occurs, we need to be prepared in the best possible manner to limit the damage, both in life, dollars, inconvenience and reputation.

FloodBreak (no failures) provides you with the most reliable solution making sure that the owners and tenants are safe, the assets (including cars) are well protected, and that flood damage is minimised.



Shop drawings:

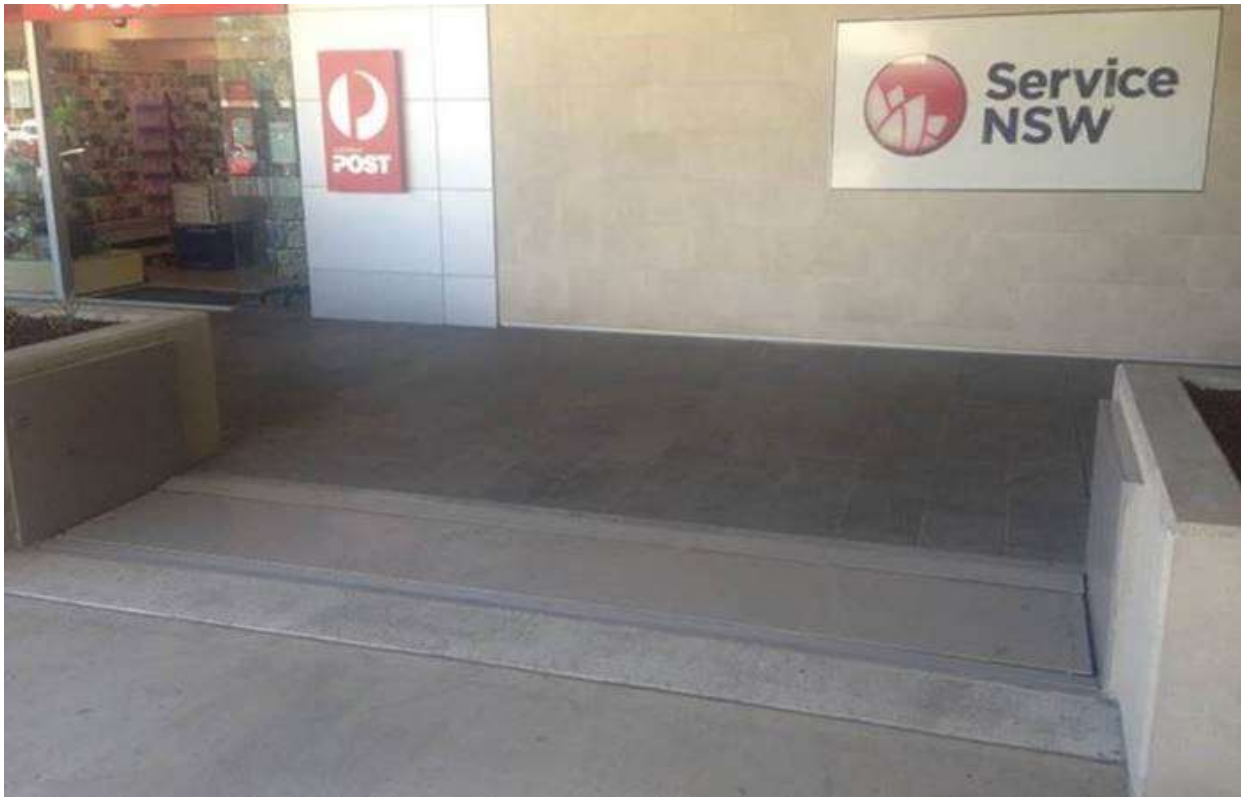
Attached is a sample shop drawings of a FloodBreak flood barrier.

Materials:

FloodBreak passive automatic flood barriers are made from different types of **aluminium**. This means they are not subject to corrosion and have a design life at least as long as the structure they protect.

The bolts which anchor the FloodBreak to the concrete foundation are stainless steel.

Every FloodBreak passive automatic flood barrier is custom made and tested in the USA.



Shopping centre in NSW installed 6 FloodBreaks

Installation:

Installation can be done by the builder, supported by our certified FloodBreak Advisor or Bluemont can install the FloodBreak.

The flood barrier is installed in four phases.

Please visit www.floodbreak.com and go to the Technical section for installation information. http://floodbreak.com/installation-guide/

1. Phase One- consists of excavation, digging or cutting the hole for the foundation (footing) (depth to be designated by job engineer).

2. Phase Two- consists of pouring the foundation (footing).

3. Phase Three- consists of placing, levelling and anchoring the system.

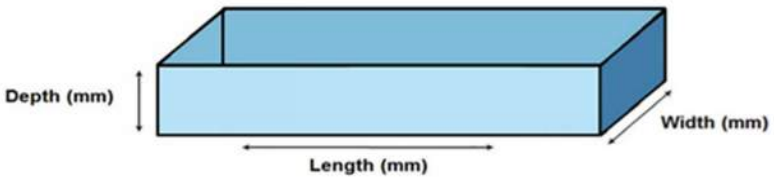
4. Phase Four- consists of the final pour to bring the area to finish grade.

Cut-out set-down dimensions:

Length/width/depth: See below under 'Dimensions and Cost'. The foundation slab to be made by others.

Drain: 100mm open drain in each cut out to the Council stormwater system, location to be discussed with Bluemont.

Services: No connections/services need to be made in the cut out set-down as FloodBreak works without power, pumps, push button**s.**



Finish:

Standard, non-skid upper surface, safety yellow underneath.

Loading:

FloodBreaks are designed to support your loading requirements:

All gates support hydrostatic pressure to the design height.

Maintenance:

FloodBreaks are mostly self-cleaning. A yearly check for debris and inspection of the rubber gasket is required.

As no electricity is involved no regular testing for certification is required.

Bluemont can do the annual maintenance at your request (option).

After 10 years the rubber gasket needs to be replaced, which is an easy operation.

Warranty:

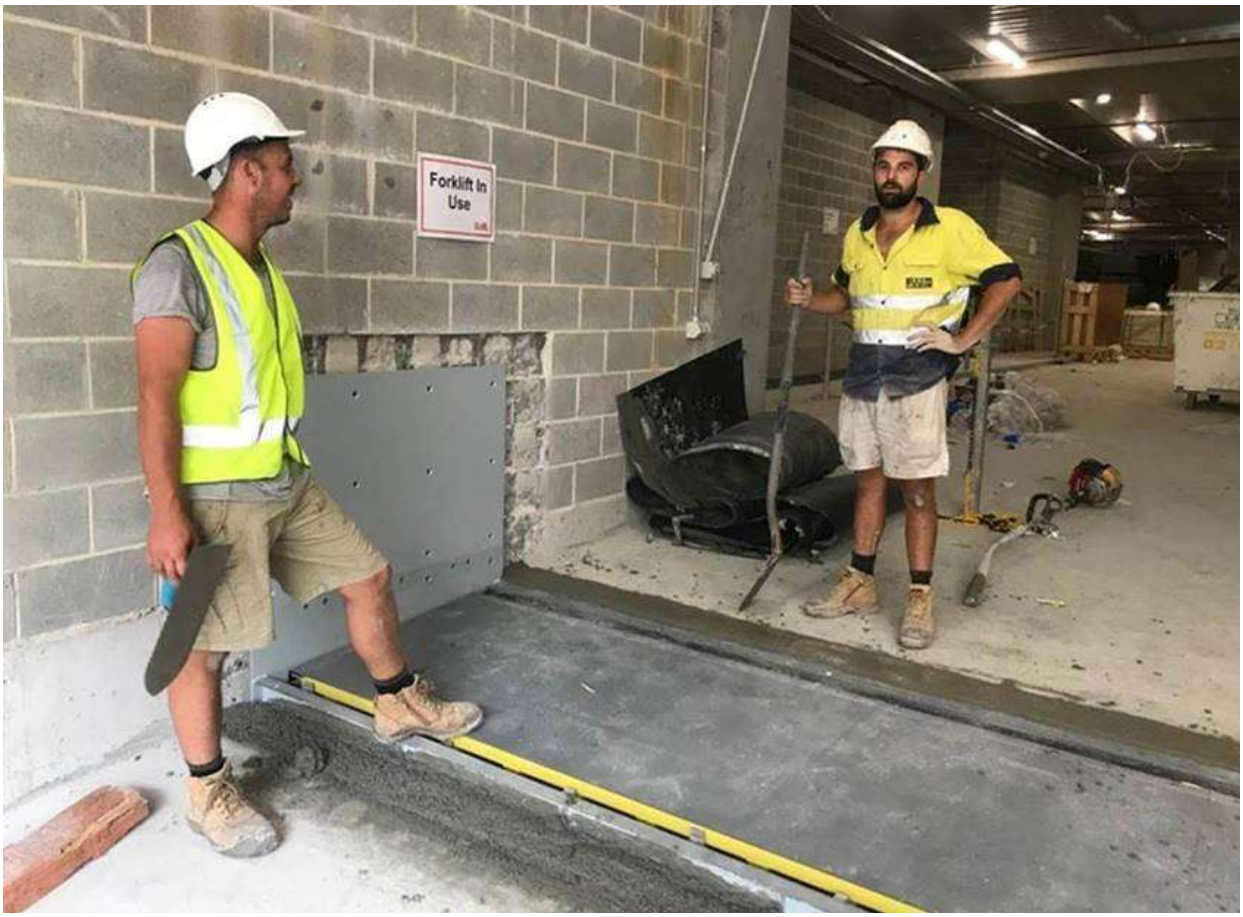
5 years. During installation, the certified FloodBreak advisor is present to document the installation for FloodBreak USA.

This report is required for the 5 year warranty activation.

Driveway private residence

Installing a FloodBreak in Monash Children's Hospital VIC

This 500mm high FloodBreak Slimline was installed in Brisbane, car park entry new high rise apartment building, downwards slope.



FloodBreak vehicle flood barrier in Parramatta during installation.

Should you require any more information re passive automatic FloodBreak flood barriers than please contact me or visit www.bluemont.com.au/flood-prevention .

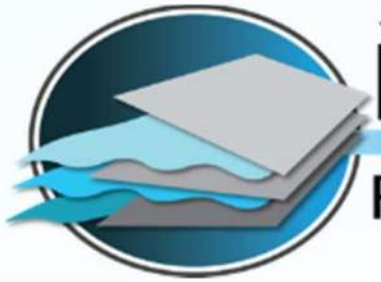
Kind regards,

Arnaud Diemont

BLUEMONT
PTY LTD

M: +61 431 870 223 | P: +61 2 9091 0360
E: arnaud.diemont@bluemont.com.au
W: bluemont.com.au | bluemont.nz

Australia, New Zealand, PNG, Pacific Islands



FloodBreak

REVOLUTIONARY FLOOD CONTROL

Passive Automatic Flood Barriers An Innovative Flood Control Solution

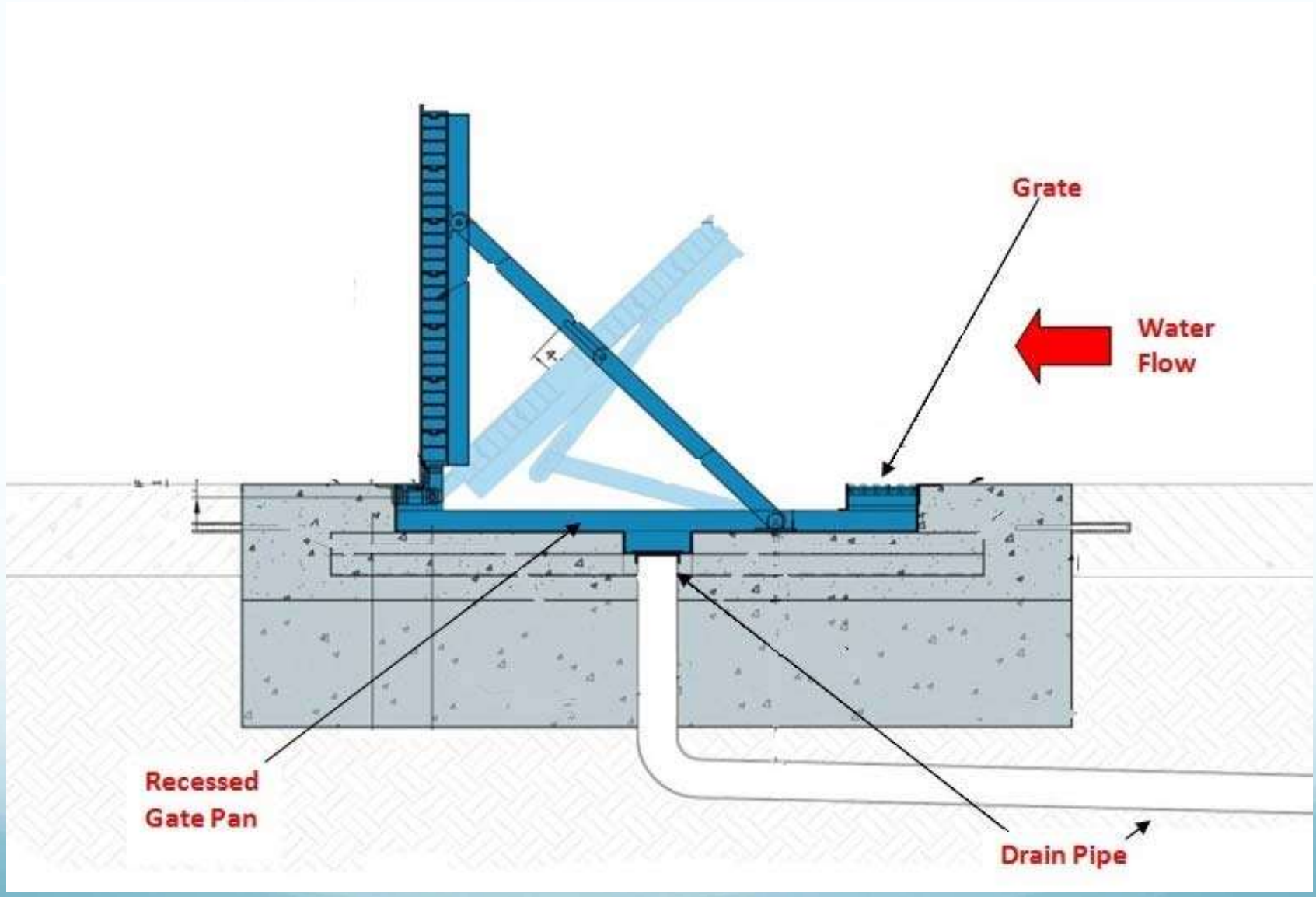
BLUEMONT

Use the power of rising water against itself

FloodBreak
REVOLUTIONARY FLOOD CONTROL

BLUEMONT PTY LTD

Fundamental yet simple concept



FloodBreak
REVOLUTIONARY FLOOD CONTROL

BLUEMONT

24/7 protection without human intervention & full access









FloodBreak
REVOLUTIONARY FLOOD CONTROL

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Highly Engineered

FloodBreak
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Rated for HS-25 loads

FloodBreak
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No practical height or length limitation

FloodBreak
REVOLUTIONARY FLOOD CONTROL

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Long Service Life with minimal maintenance

FloodBreak
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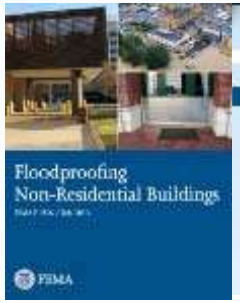
Passive flood mitigation recommended by FEMA



Terminology

Passive/active measures. Floodproofing measures are either passive or active depending on whether they require human intervention. Passive measures do not require human intervention and are recommended whenever possible. Active (or emergency) measures require human intervention and are effective only if there is enough warning time to mobilize the labor and equipment necessary to implement them and to safely evacuate.

FEMA

Advanced Mitigation Planning Allows Hospital to Stay Dry During Tropical Storm Lee

Lourdes Hospital, located in the picturesque city of Binghamton (pop. 47,376), and surrounded by rolling hills and rivers, averted major storm damage thanks to hazard mitigation and a new floodwall.

The floodwall with passive floodgates, built with hazard mitigation funds from the Federal Emergency Management Agency (FEMA) and New York State, protected this vital property from floodwaters that devastated other parts of the city during Tropical Storm Lee. City officials estimated that as many as 2,000 buildings suffered flood damage from the storm.

Broome County,
New York

Floodwall with Passive Floodgates Signals Commitment to Patients and Community

Columbus Regional Hospital, the only hospital serving Bartholomew County, Indiana, is now protected from future flooding thanks to hazard mitigation and a floodwall with passive floodgates.

The floodwall with passive floodgates, built with funds from the Federal Emergency Management Agency (FEMA) Public Assistance 406 program (for hazard mitigation) and Columbus Regional Hospital, will protect this vital hospital from catastrophic flood damage, should the area be hit with flooding as was the case in 2008.

Bartholomew County,
Indiana

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Versatility – Main Entrances

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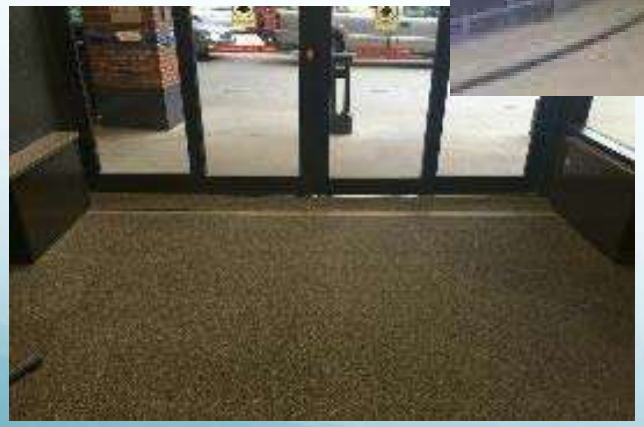
Versatility – Inside Vestibules & Walkways



FloodBreak
REVOLUTIONARY FLOOD CONTROL

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> 600 Barriers Installed
Proven Track Record
Real Flood Saves
100% Performance
No Failures

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Versatility – Walkways

FloodBreak
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Versatility – Vehicle Loading Docks & Parking

Versatility – Vehicle Loading Docks & Parking

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Versatility – Roadway, protecting highways

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FloodBreak Installations

US Embassy - London

FloodBreak
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Warriewood Square - Sydney

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Tacoma Central Waste Water Treatment Plant

FloodBreak is installed in three vehicle driveways as part of a perimeter protection system.

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Large Barriers to protect Hospital Row & Javits in NYC

- NYU Langone Medical Center - NYC
  - Energy Building: 15.3m x 3.2m
  - Science Building: 6.4m x 3.6m
  - Science Building: 9.1m x 3.6m
  - Smilow Building: 9.1m x 3.6m
- VAMC-Manhattan
  - 7.9m x 2.4m
  - 6.1m x 2.9m
  - 6.1m x 3.1m
  - 6.1m x 2.9m
  - 4.2m x 1.1m

EDF France – Nuclear Site Protection

19 Nuclear sites over 4 years

> 100 barriers

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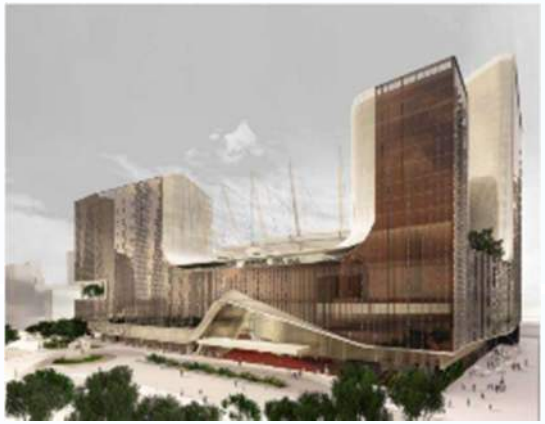
Canadian Mixed Use and Urban Development

The Jarvis – Toronto

Block 100 Vancouver



Parq Resort & Casino – Vancouver

Arris – East Village –Calgary

Anthem Memorial – Calgary

New Development – Ft. McMurray

The Concord – Calgary

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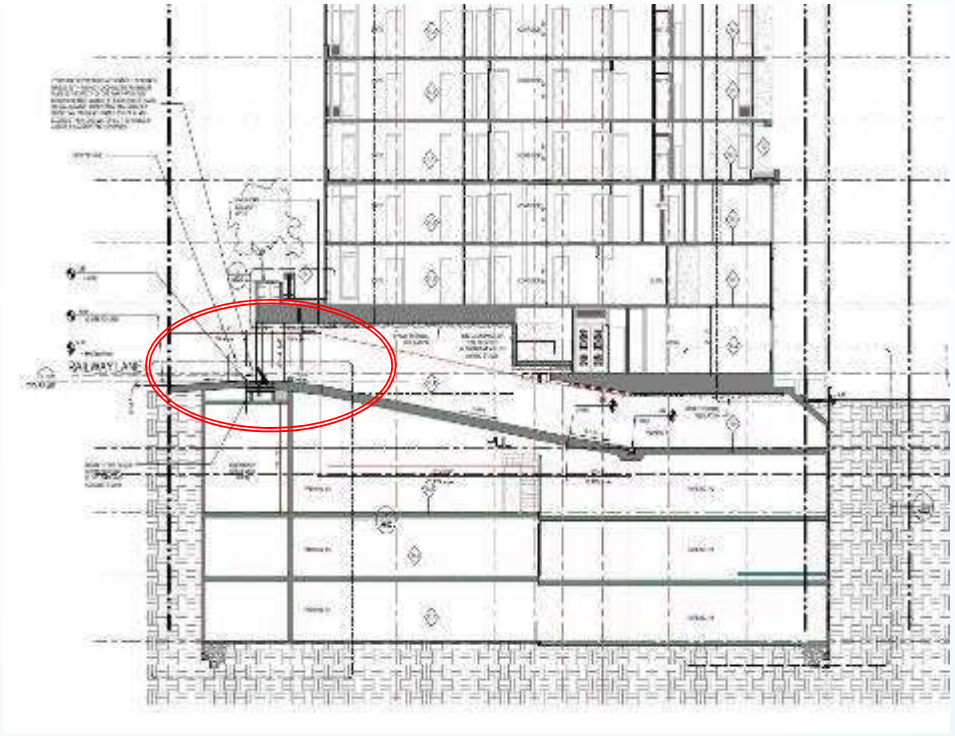
Block 100 – Vancouver, BC



Block 100 consists of three blocks: Quebec, Centre and Main. These blocks are comprised of condominiums and townhomes, indoor and outdoor amenities, rooftop decks and retail space. Block 100 incorporates modern materials to create comfortable, contemporary homes. FloodBreak will protect underground parking access.

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Proven: 500 year event

FloodBreak
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Proven: multiple flash floods

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Proven: flash floods

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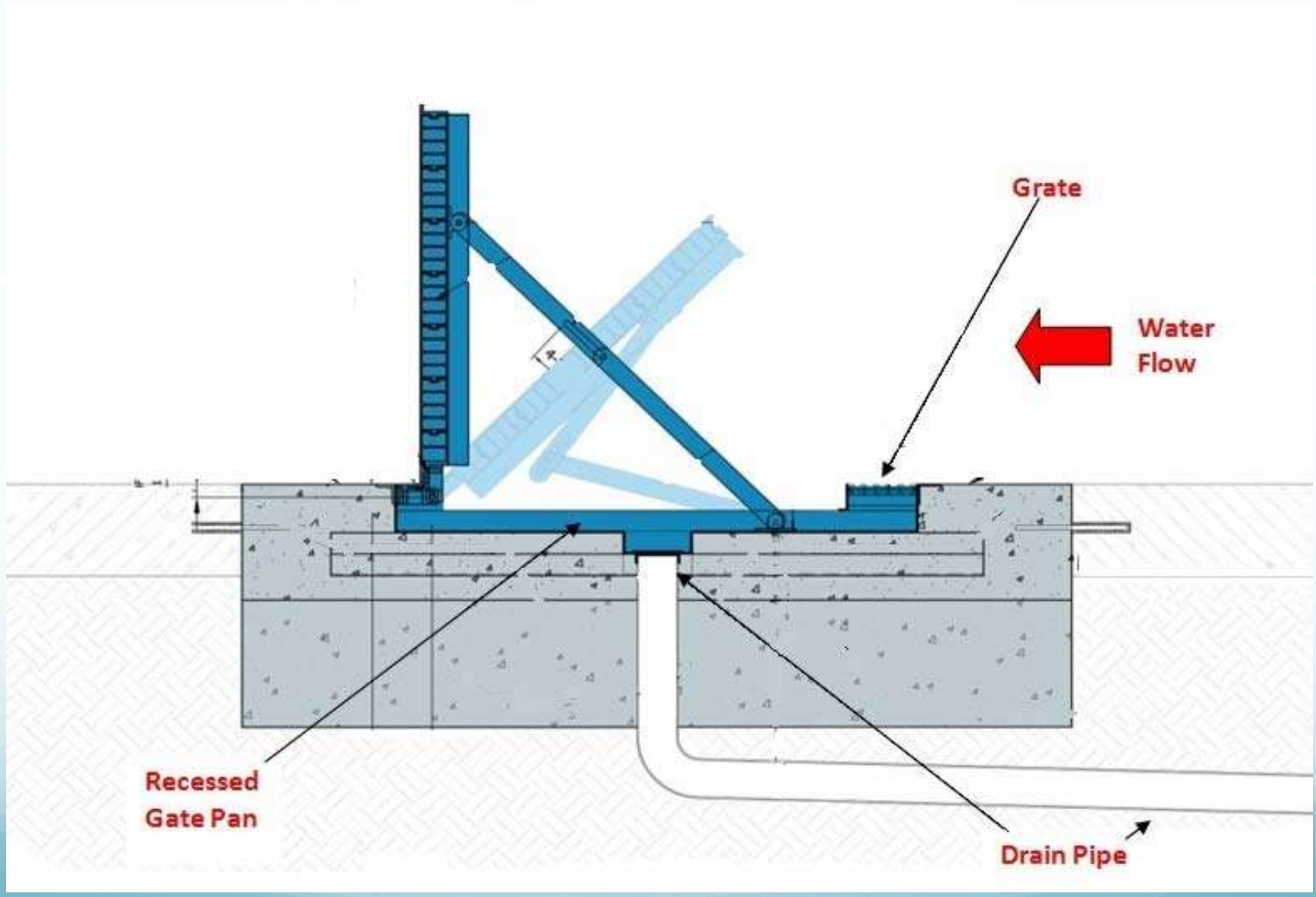
Wide range of customers

- University of Houston – TX (2003)
- MD Anderson Cancer Center – TX (2004–15)
- U.S. Federal Courthouse – IA (2006)
- Christus Hospital – TX (2006)
- Pentagon Federal CU – VA (2007)
- Bayshore Medical Center – TX (2007)
- Kensington Gate Coop– NY (2008)
- Nestle Prepared Foods – OH (2008)
- Harris County Courthouse – TX (2008)
- Route 22 Honda – NJ (2008)
- Lourdes Hospital – NY (2010)
- One Briarlake Plaza – TX (2010)
- James Madison University – VA (2010)
- BP Office Complex – TX (2010)
- MTA NYC Transit – NY (2010, 2016)
- soulbrain MI (TSC) – MI (2011)
- World Trade Center– Danang, VN (2011)
- IBWC – Hidalgo/URG Levees, TX (2010–12)
- Univ. of Colorado Boulder – CO (2012–13)
- Columbus Regional Hospital – IN (2012)
- Portland Water Treatment – TN (2012)
- Vattanac Capital, Cambodia (2012)
- Vanderbilt Eye Institute – TN (2013)
- Land Transit Authority – Singapore (2013)
- Cummins Diesel – IN (2013)
- UTMB – Galveston, TX (2013)
- Rosenberg Library – Galveston, TX (2013)
- Cyride Bus Terminal – IA (2013)
- Cheyenne Medical Center – WY (2013)
- Coney Island Commons – NY (2013)
- SUNO (Southern University) – LA (2014)
- Acqualina Resort & Spa – FL (2014)
- Royal Orleans – TX (2014)
- Elmwood Park – IL (2014)
- Chateau Beach Residences – FL (2015)
- World Financial Center – NY (2015)
- Citigroup – NJ (2015)
- NYU Langone – NY (2015)
- EDF – France (2015–2016)
- VAMC Manhattan – NY (2016)
- Warriewood –Australia (2016)
- Moen – China (2016)

Fundamental yet simple concept



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E: info@bluemont.com.au

W: bluemont.com.au