



CIVIL

Flooding Assessment

for

45 Honeysuckle Drive, Newcastle

for **Bloc Constructions (NSW) Pty Ltd**

20 June 2019

Bloc Constructions (NSW) Pty Ltd
Bianca Hummel
Unit 9, Ground Floor
18 National Circuit
Barton ACT 2600

Dear Bianca,

Re: 45 Honeysuckle Drive, Newcastle

Northrop Consulting Engineers have been engaged to undertake a flooding assessment at the aforementioned address to satisfy Clause 9 of the Secretary's Environmental Assessment Requirements (SEARs) for SSD 9827. This correspondence outlines the requirements of the clauses, the assessment methodology, a description of the existing site and development proposal, and responses to the clause.

The SEARs for SSD 9827 requires;

The EIS is to include an assessment of any potential flood risk on site in accordance with any relevant provisions of the NSW Floodplain Development Manual (2005), the Honeysuckle Redevelopment Area Flood Study 2018 and the Newcastle Floodplain Risk Study 2012 including an:

- Assessment of existing flood behaviour and impact of sea level rise, climate change, and ecosystem migration
- Assessment of potential flood impacts on the proposed development and measures to mitigate any potential flooding
- Assessment of potential impacts of the proposed development on flood behaviour at the site and impacts on adjacent land, and measures to mitigate any potential flooding
- Emergency management measures and evacuation
- Consistency with any floodplain risk management plans
- Compatibility with the flood hazard of the land
- Assessment of whether the proposal will significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses
- Detailed consideration of the proposed drainage associated with the proposal, including stormwater and drainage infrastructure

		Date
Prepared by	GW	20/06/2019
Checked by	CP	20/06/2019
Admin	HB	20/06/2019

In order to address this clause, a review of the guideline documents, flood studies affecting the development, and the site-specific Flood Information Certificate was undertaken. Guideline documents reviewed include:

- The NSW Floodplain Development Manual (2005)
- Newcastle City-wide Floodplain Risk Management Study and Plan (2012)
- Newcastle DCP 2012 Section 4.01 Flood Management
- Waterfront and Cottage Creek Flood Management Plan (1999)
- Honeysuckle Redevelopment Area Flood Study (2018)
- Flood Information Certificate FL2019/00060

Existing Site

The site is located within the Cottage Creek catchment, which drains to the Throsby Basin in Newcastle Harbour. The site currently forms part of 50 Honeysuckle Drive, Lot 40, DP 1251908, but is intended to be subdivided to create a separate lot being 45 Honeysuckle Drive. The site boundaries are shown in the architectural plan enclosed.

The site is located on the north-western side of the intersection of Honeysuckle Drive and Steel Street, Newcastle and generally falls to the north, towards the Foreshore Promenade. The site is elevated in comparison to the adjacent roadway, with the existing site levels varying between 2.1m and 2.6m AHD.

The existing site covers approximately 0.56Ha and is used primarily as a carpark, including an existing commercial office building. The site is bordered by a residential development to the east, Cottage Creek channel to the west, Throsby Basin to the north and Honeysuckle Drive to the south. The proposed lot includes a 20m wide public domain area on the eastern boundary that links Honeysuckle Drive to the Newcastle Harbour promenade.

A review of the City of Newcastle stormwater plans indicates two 450mm diameter stormwater lines running north to south through the western and eastern part of the site. A detailed survey provided by ADW Johnson, however, shows a 450mm diameter stormwater line crossing the western end of the site, and a 900mm stormwater line crossing the eastern edge of the site. It is understood that the 450mm diameter stormwater pipe will be relocated clear of the development, but that the existing 900mm diameter stormwater pipe is clear of the development and is to remain. Extracts from the City of Newcastle and ADW Johnson plans are shown as attachments to this correspondence.

As noted in the Waterfront and Cottage Creek Flood Management Plan, the Steel Street Floodway sits adjacent the eastern boundary within the proposed public domain pedestrian link. Additionally, the Cottage Creek Floodway sits adjacent the western boundary.

Proposed Development

The proposed development consists primarily of two basement carparks (FFL -0.6m and -3.3m typical), a mixed-use ground floor level covering the majority of the site (FFL 2.9m typical), two seven-storey residential buildings on the eastern side and one eight-level residential building on the western side. The development includes one new vehicular access point to Honeysuckle Drive. In addition, pedestrian linkage paths are proposed from Honeysuckle Drive through to the waterfront promenade. The ground floor and basement architectural drawings are included as an attachment to this correspondence.

Existing Flood Behaviour and Impact of Climate Change

Existing flood behaviour has been obtained from Flood Information Certificate No. FL2019/00060 provided by City of Newcastle, a copy of which is enclosed. The subject site is affected by ocean and local catchment flooding.

Local catchment flooding is critical in terms of water level with a maximum level of 2.50m AHD in the 1% AEP (Annual Exceedance Probability) event and 3.40m AHD in the PMF (Probable Maximum Flood). Flood waters for local catchment flooding are expected to rise quickly to the peak, relative to ocean flooding.

Ocean flooding will also impact the site with a level of 2.30m AHD for the 1% AEP event and 3.40m AHD for the PMF event. Flood waters for the ocean flooding are expected to rise slowly relative to the local catchment flooding and enter the site from the north west.

A sea level rise of 90cm has been incorporated into the above estimate of ocean flooding and as such it is assumed that this information adequately estimates the impact due to climate change.

Life hazards describe the danger that flood waters might pose to the lives of persons affected by flooding. The Flood Information Certificate indicates that the Highest Life Hazard Category for the overall site is L4 for local catchment flooding. An L4 hazard classification is commensurate with flash flooding and requires evacuation to a suitable flood free refuge within the proposed development site. This is discussed further in the section below.

For ocean flooding, the Highest Life Hazard Category is L1. An L1 hazard classification is commensurate with slow rising flood waters and requires evacuation to flood free land outside of the entire flood.

The overall site of Lot 40 DP 1251908 has various flood classifications, however, as discussed with Alistair Peddy from City of Newcastle, the most critical classification for the subject area within the development footprint is flood fringe. Flood fringe areas are described in The City of Newcastle DCP as *"the remaining areas of floodplain not included in flood storage areas and floodways. Flood fringe areas can usually be developed without reference to how that development will affect the flood behaviour either upstream or downstream."*

Proposed Impact of the Development on Flooding and the Environment

The proposed building footprint will inhibit flood water in the 1% AEP ocean flooding event from entering the development site. In PMF events, however, flood water will be able to enter the development site at localised locations, most notably the pedestrian linkage paths and shared vehicle access points.

The proposed building footprint has been accounted for in the Honeysuckle Redevelopment Area Flood Study (2018), which has been endorsed by Council to support development in the Honeysuckle area. As shown in the Flood Information Certificate and Figure D-9 of the Honeysuckle Redevelopment Area Flood Study (2018), the most critical flood classification for the subject area is floodway, being the Steel Street Floodway. The proposed development is to remain outside of the Steel Street Floodway, and therefore, the most critical flood classification within the development footprint is flood fringe. City of Newcastle DCP describes flood fringe area as the remaining areas of floodplain not included in flood storage areas and floodways. Flood fringe areas can usually be developed without reference to how the development will affect the flood behaviour either upstream or downstream. As such it is expected that the development will have no significant adverse impact on the flood behaviour both onsite and on the adjacent properties.

The Waterfront and Cottage Creek Flood Management Plan (1999) depicts a floodway directly to the west of the proposed development site, referred to as Cottage Creek Floodway, and another directly to the east of the site, referred to as Steel Street Floodway. The proposed development footprint does not impede on either of these floodways, as shown in the attached architectural plans. The proposed pedestrian link at the Steel Street Floodway is to adopt the surface levels noted in the Honeysuckle Redevelopment Area Flood Study (2018), shown in Section 6.6 of the report as 2.3m AHD. The development is therefore considered to be consistent with the flood management plan.

Given the highly-modified nature of the waterfront land, it is not expected ecosystem migration will occur in the vicinity of the proposed development. Furthermore, it is expected that this development will not cause avoidable stream erosion, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses given its location close to the outlet of the catchment and due to the fact that flow from the site will be conveyed by formal drainage infrastructure, being below ground pipes and through road carriageway for overland flow.

Compatibility with Floodplain Risk Management Plans and Flood Hazard for the Site

The proposed development is generally compatible with the Newcastle DCP 2012 and Newcastle City-wide Floodplain Risk Management Study and Plan with respect to habitable floor levels, vehicular access and on-site refuge.

All ground floor levels are situated at or above the 1% AEP of 2.50m AHD. All habitable floor levels are set at the Flood Planning level, being 2.90m AHD, which equates to the 1% AEP plus 400mm freeboard. Non-habitable floor levels, including the bin storage area and substation are situated at 2.50m AHD which corresponds to the 1% AEP. The lowest basement parking level is proposed to be at -3.3m AHD which we acknowledge is below the flood planning level, however the proposed crest level is set at the Flood Planning Level of 2.90m AHD, which is in line with Newcastle DCP 2012 Section 4.01 Flood Management.

The L4 hazard category requires on-site refuge above the PMF (3.40m AHD). Refuge may be sought in all levels above the ground floor in line with Newcastle DCP 2012 Section 4.01 Flood Management. Further details will be provided in the Flood Emergency Management Plan prepared for the site.

A summary of flooding characteristics is shown below in Table 1:

Table 1 - Summary of flooding characteristics and proposed development

1% AEP Ocean Flooding	2.30m AHD
1% AEP Local Catchment Flooding	2.50m AHD
PMF Ocean Flooding	3.40m AHD
PMF Local Catchment Flooding	3.40m AHD
Existing site surface levels	
North east	2.19m AHD
South east	2.17m AHD
South west	2.13m AHD
North west	2.25m AHD
Proposed Basement 1 Parking Level	-0.60m AHD
Proposed Basement 2 Parking Level	-3.30m AHD
Proposed Ground Floor Level (Habitable)	2.90m AHD
Proposed Ground Floor Level (Non-Habitable)	2.50m AHD

Emergency Management and Evacuation

The emergency response will depend on the type of flooding experienced at the site. For ocean dominated flooding, sufficient warning should be available to evacuate the building to higher ground. Conversely, for extreme local catchment flooding, refuge should be sought onsite. Notwithstanding this, any evacuation or refuge should be self-directed and not reliant on emergency services or SES.

Regardless of the type or magnitude of flooding, no evacuation should be attempted through flood waters by foot or vehicle. It is expected that prior to occupation, emergency response for a range of scenarios will be developed and displayed at prominent locations around the building in the form of a Flood Emergency Management Plan.

Detailed Consideration of the Proposed Drainage

Please refer to the Stormwater Management Report prepared by the Civil Engineer for details of the proposed drainage infrastructure. An indicative strategy is depicted in the attached stormwater design prepared by GG&E.

Conclusions

From the flooding assessment undertaken, it has been concluded that the proposed development:

- Is compatible with the flood hazard onsite and floodplain risk management plans that apply to the site
- Is not likely to cause significant adverse impacts on flood behaviour on adjacent properties
- Incorporates design features to minimise risk to property and life from flooding
- Will have a Flood Emergency Management Plan prepared and implemented prior to occupation of the building
- Is not expected to cause migration of the ecosystem in the vicinity of the development
- Is not expected to cause avoidable stream erosion, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses

We trust this meets your requirements, however should you require anything further, please do not hesitate to contact the undersigned on (02) 4943 1777.

Yours sincerely,



Chris Piper
Senior Civil Engineer
BEng (Civil) MIEAus CPEng NER

Attachments

Architectural Ground Floor Plan

Architectural Basement Level 01 Plan

Architectural Basement Level 02 Plan

Stormwater Design prepared by BG&E

City of Newcastle – Stormwater Infrastructure Extract

ADW Johnson – Stormwater Infrastructure

City of Newcastle – Flood Information Certificate FL2019/00060



Ground Floor Plan
SCALE 1:200 @ A1

Schematic Design

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B		ISSUED FOR CLIENT REVIEW	1/03/2019	
C		ISSUED FOR COORDINATION	4/04/2019	
D		ISSUED FOR COORDINATION	15/04/2019	
E-WIP		ISSUED FOR COORDINATION	Work in Progress	

key plan



consultants	
Civil/Structural Engineers	Electrical Engineer
Mechanical Engineer	Hydraulic Engineer

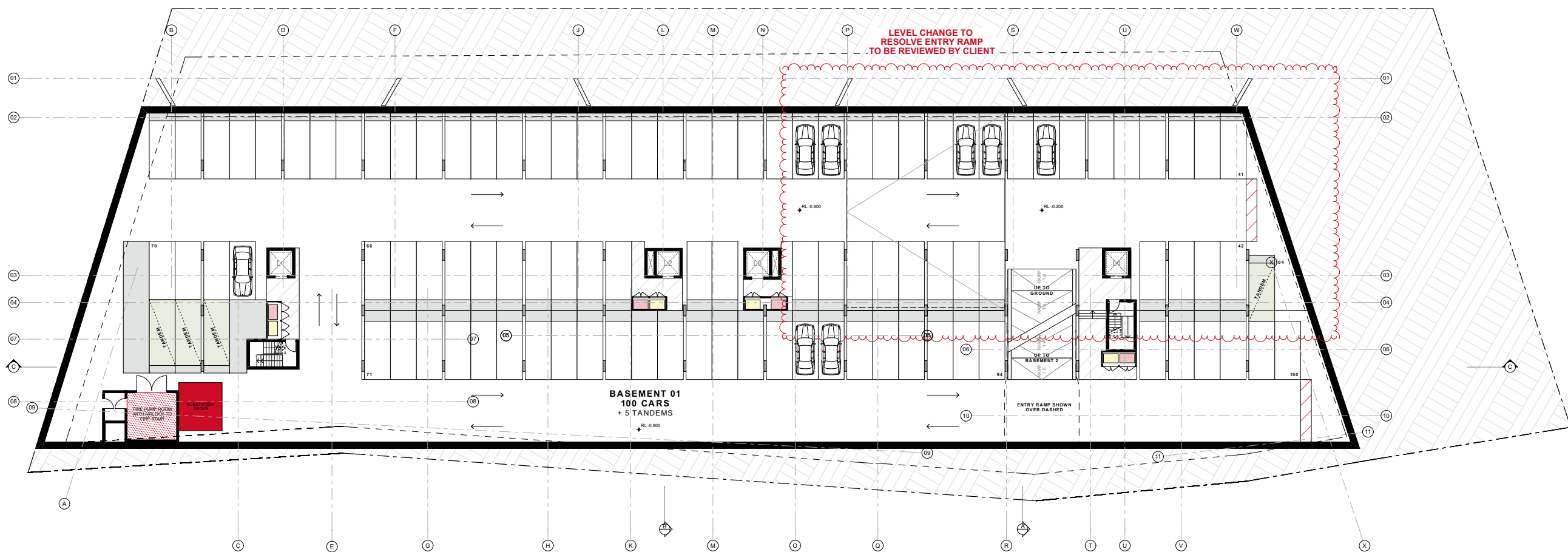
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project
Horizon Lee 5
Lee 5 Honeysuckle
Newcastle, NSW
Australia

drawing title
Plans
Ground Floor

drawing scale	drawn	verified	date
Refer to Drawing	JB	SC	xx.xx.17
project #	drawing #	issue	
18122	DA-103	E - WIP	
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A		ISSUED FOR CLIENT REVIEW	18/02/2019	
B		ISSUED FOR CLIENT REVIEW	1/03/2019	
C		ISSUED FOR COORDINATION	25/03/2019	
D		ISSUED FOR COORDINATION	4/04/2019	
E		ISSUED FOR COORDINATION	15/04/2019	
F		ISSUED FOR COORDINATION	3/05/2019	
G		ISSUED FOR COORDINATION	3/05/2019	



consultants <u>Civil/Structural Engineers</u>	<u>Electrical Engineer</u>
<u>Mechanical Engineer</u>	<u>Hydraulic Engineer</u>

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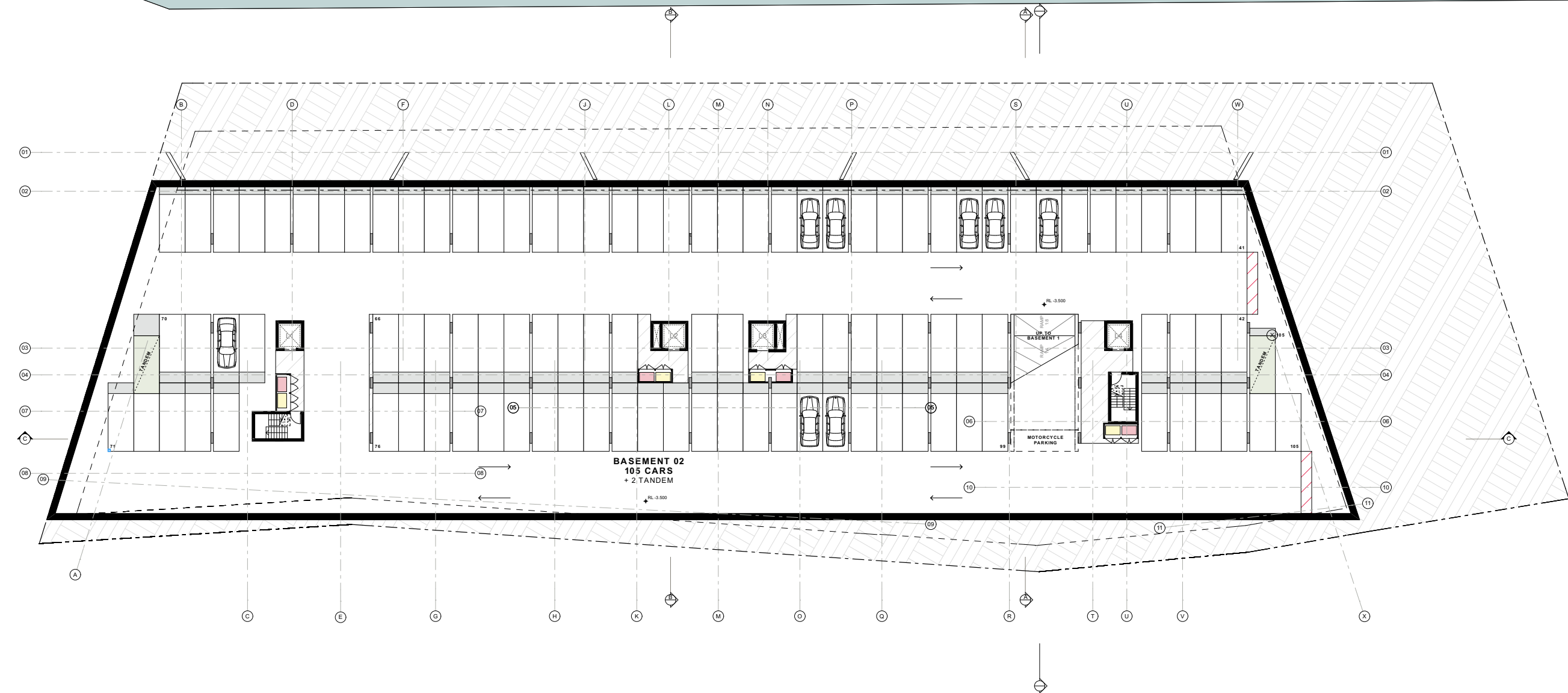
drawing title

Plans

Basement Level 01

drawing scale	drawn	verified	date
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18122	DA-102	G	

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Basement 02
SCALE 1:200 @ A1

Development Application

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E		ISSUED FOR COORDINATION	3/05/2019	
F		ISSUED FOR COORDINATION	3/05/2019	

key plan



north point

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Civil/Structural Engineers

Electrical Engineer

Mechanical Engineer

Hydraulic Engineer

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project

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drawing title

Plans
Basement Level 02

drawing scale drawn verified date

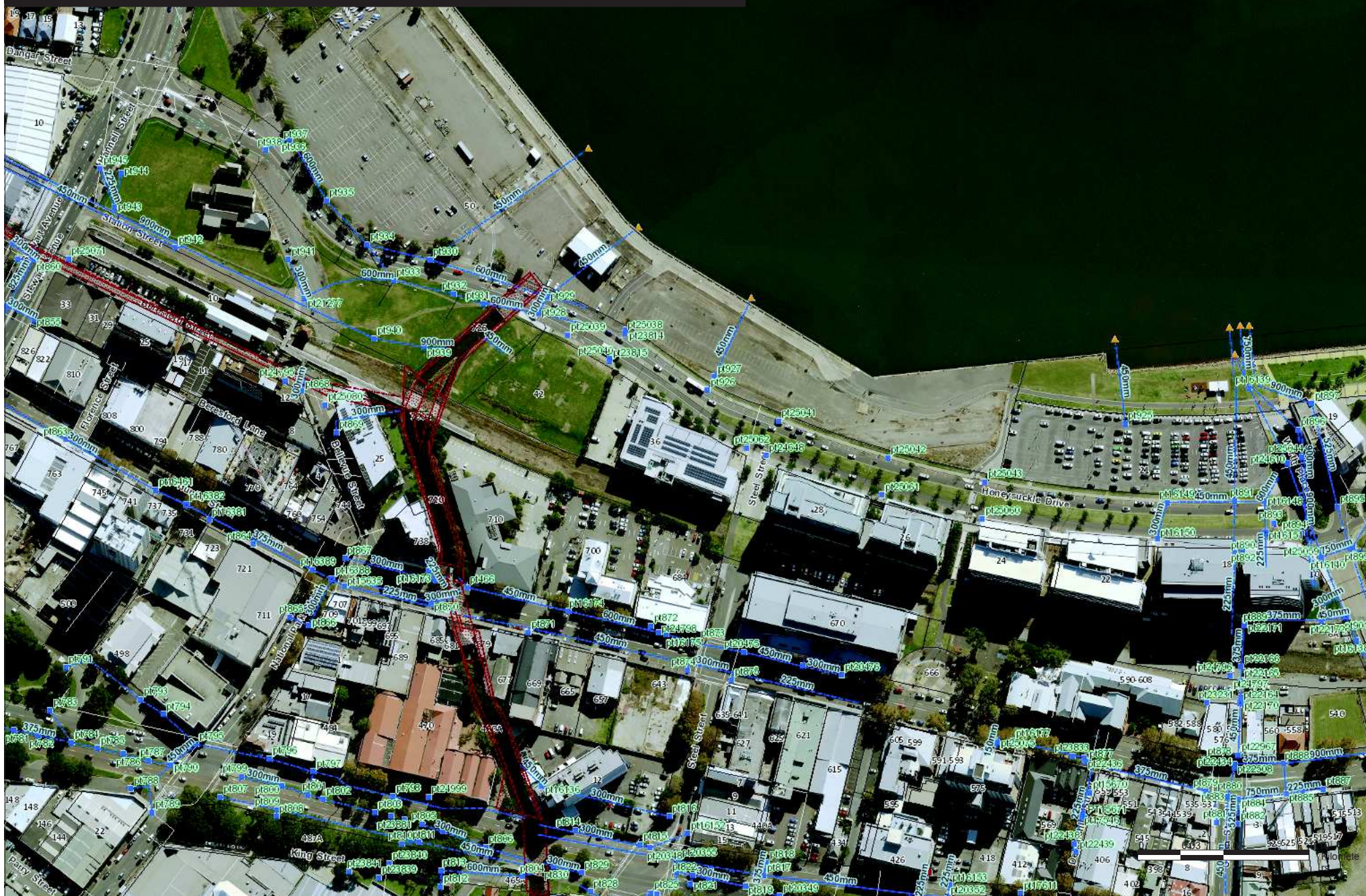
Refer to Drawing JB SC 18.02.19

project # drawing # issue

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Scale: 1: 2,000.00

at A3



02 April 2019

Northrop Consulting Engineers
C/- Bloc Constructions (NSW) Pty Ltd
24/1 Honeysuckle Drive
Newcastle NSW 2300

Flood Information Certificate No:	FL2019/00060
Land:	Lot 1 DP 1236735
Property Address:	Part of 50 Honeysuckle Drive Newcastle NSW 2300 (Lee 5 Site)

Thank you for your recent enquiry regarding flood behaviour at the above property. This letter confirms the property is located in a flood prone area.

The pertinent features of the flood behaviour are estimated as follows:

Ocean Flooding

Is any part of the site affected by a floodway?	No
Is any part of the site affected by a flood storage area?	No
Estimated 1% Annual Exceedance Probability event level: (equivalent to the " <i>Defined Flood Level</i> " in the Building Code of Australia)	2.3m AHD
Estimated Maximum Flow Velocity of floodwaters (in the " <i>Defined Flood Event</i> " as per the Building Code of Australia)	0.1m/s
Highest Property Hazard Category	P2
Estimated Probable Maximum Flood Level	3.4m AHD
Highest Life Hazard Category	L1

Hunter River Flooding

Is any part of the site affected by a floodway?	No
Is any part of the site affected by a flood storage area?	No
Estimated 1% Annual Exceedance Probability event level: (equivalent to the “ <i>Defined Flood Level</i> ” in the Building Code of Australia)	1.4m AHD
Estimated Maximum Flow Velocity of floodwaters (in the “ <i>Defined Flood Event</i> ” as per the Building Code of Australia)	0.5m/s
Highest Property Hazard Category	P1
Estimated Probable Maximum Flood Level	2.1m AHD
Highest Life Hazard Category	L1

Local Catchment Flooding

The local catchment flood information is taken from the *Honeysuckle Redevelopment Area Flood Study* (BMT, March 2018). A copy of this study is available on Council’s website (http://www.newcastle.nsw.gov.au/Newcastle/media/Documents/environment/Flooding/Honeysuckle-Redevelopment-Area-Flood-Study_March-2018.pdf).

Is any part of the site affected by a floodway?	Yes ¹
Is any part of the site affected by a flood storage area?	Yes ¹
Estimated 1% Annual Exceedance Probability event level: (equivalent to the “ <i>Defined Flood Level</i> ” in the Building Code of Australia)	2.5m AHD
Estimated Maximum Flow Velocity of floodwaters (in the “ <i>Defined Flood Event</i> ” as per the Building Code of Australia)	0.7m/s
Highest Property Hazard Category	P2
Estimated Probable Maximum Flood Level	3.4m AHD (velocity 3.3m/s)
Highest Life Hazard Category	L4

¹ Refer to Figure D-9 of the *Honeysuckle Flood Study* for location of Cottage Creek and Steel Street floodways.

The above advice may change in the future, however the advice is based on the best information held by Council at the time of issue of this certificate.

The above ocean flood level estimates include a sea level rise relative to 1990 mean sea levels of 90cm by 2100, as used in the Newcastle City-wide Floodplain Risk Management Study and Plan (June 2012).

The Newcastle Development Control Plan 2012 addresses the issues of flood management for new development. You can view the development control plan at www.newcastle.nsw.gov.au. In summary, the following requirements apply for all future development applications on the site.

Development in a floodway is not generally allowable due to likely redistribution of flood water.	Applicable
Filling of a flood storage area by more than 20% is not generally allowable due to redistribution of flood water.	Applicable
Minimum floor level for occupiable rooms in a new development on this site is: (equivalent to the " <i>Flood Hazard Level</i> " in the Building Code of Australia)	2.9m AHD
Is onsite flood refuge required?	Yes

Should you require any further clarification please contact Alastair Peddie on (02)4974 2700.

Yours faithfully

Alastair Peddie
SENIOR DEVELOPMENT OFFICER (Engineering)