NORTHROP

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NL171278

5th October 2017

The Doma Group
Mr Chris Farrington
PO Box 5419
KINGSTON ACT 5419

Dear Chris,

Re: Flooding Assessment – 42 Honeysuckle Drive, Newcastle

Northrop Consulting Engineers have been engaged to undertake a flooding assessment at the aforementioned address to satisfy Clause 8 of the Secretary's Environmental Assessment Requirements (SEARs) for SSD 8440. This correspondence outlines the requirements of the clauses, the assessment methodology, a description of the existing site and development proposal, and responses to the clauses.

The SEARs for SSD 8440 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 Cottage Creek Flood Management Plan 1999 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; and*
> - *Detailed consideration of the proposed drainage associated with the proposal, including stormwater and drainage infrastructure.*

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);

Prepared	KS	05/10/2017
Reviewed	CS	05/10/2017
Admin	LD	05/10/2017

- Newcastle DCP 2012 Section 4.01 Flood Management;
- Waterfront and Cottage Creek Flood Management Plan (1999); and
- Flood Information Certificate FL2017/00211.

Existing Site

The existing site, 42 Honeysuckle Drive is also known as Lot 22 DP 1072217 and is located between Honeysuckle Dr and the Great Northern Railway, to the east of the Cottage Creek Floodway (separated by Lot 2000 DP 1145678).

The existing 0.37Ha site is mostly cleared, with various below ground electrical/telecommunication services traversing the site. The site is bordered by a chain wire fence on the southern boundary, and a retaining wall on the eastern boundary (bordering the Hunter Water Corporation site).

An existing ridge is located near the centre of the site, falling away towards the north (Honeysuckle Dr), south (Great Northern Railway) and west (Cottage Creek Floodway). The site is generally elevated in comparison to the adjacent Honeysuckle Dr roadway. The existing site levels vary between approximately 4.0m AHD at the ridge point, to approximately 2.0m-2.4m AHD at the boundary.

Proposed Development

The proposed development consists primarily of a mixed-use ground floor level which covers the majority of the site, four hotel levels and four residential apartment levels above. The proposed development includes a multi-level above ground car park incorporated into the first 5 levels. In addition to this there is a communal courtyard, a pool, various lobby and storage rooms and external landscaping.

The development also includes a new vehicular access point to Honeysuckle Drive, a drop-off zone on Honeysuckle Dr and various pedestrian access points. The ground floor architectural drawing is 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. FL2017/00211, included as an attachment to this correspondence. The subject site is affected by ocean and local catchment flooding.

Ocean flooding is critical in terms of water level in the PMF (Probable Maximum Flood with a maximum level of 3.40m AHD. However in the 1% AEP (Annual Exceedance Probability) event, the maximum water level is 2.2m AHD, which is less than local catchment flooding. Flood waters for the ocean flooding are expected to rise slowly relative to the local catchment flood and enter the site from the northern, western and southern boundary.

Local catchment flooding affects the site in both the 1% AEP event and PMF event, with a maximum water level of 2.5m AHD and 3.1m AHD respectively. Flood waters for local catchment flooding are expected to rise quickly to the peak, relative to ocean flooding.

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 L3 for local catchment flooding, which is commensurate with flash flooding. For this hazard classification, evacuation is not required. 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 extent of the site which is flood prone, is classified as flood fringe in the 'Newcastle City-wide Floodplain Risk Management Study and Plan (2012)'. 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 does not cover the entirety of the subject site, therefore flood water will be able to enter the development site in some locations most notably the western and southern boundary, and localised locations along the northern boundary including the pedestrian and vehicular access points. This is similar to the behaviour in the current scenario.

As mentioned earlier, the most critical flood classification for the site is flood fringe. 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 to the west of the proposed development site (separated by Lot 2000 DP 1145678), referred to as Cottage Creek Floodway. The proposed development footprint does not impede on the floodway, as shown in the attached detailed site survey. 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 parking, and on-site refuge.

The ground floor level for all occupiable rooms is set at the *Flood Hazard Level* of 3.0m AHD. Non-occupiable ground floor rooms, and the perimeter of the ground floor carpark are set at the critical 1% AEP flood level of 2.5m AHD.

The P2 property hazard category for the site assumes a floodwater depth greater than 0.3m, commensurate with a H2 hydraulic behaviour threshold. The floodwater depth in the ground floor carpark is not anticipated to exceed 0.3m in the 1% AEP storm event, therefore is consistent with a P1 classification.

The L3 hazard category does not necessitate refuge to be sought on-site. However, if required in the PMF event, refuge may be sought on all levels above the ground floor.

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

Table 1 - Summary of flooding characteristics and proposed development

1% AEP Ocean Flooding	2.20m AHD
1% AEP Local Catchment Flooding	2.50m AHD
PMF Ocean Flooding	3.40m AHD
PMF Local Catchment Flooding	3.10m AHD
Existing site surface levels North east South east South west North west	 2.10m AHD 2.01m AHD 2.36m AHD 2.34m AHD
Proposed Ground Floor Level (Habitable) Proposed Ground Floor Level (Non-Habitable)	3.0m AHD 2.50m AHD

Emergency Management and Evacuation

On-site refuge is not necessary for local catchment flooding or ocean dominated flooding. However, if required on-site refuge may be sought on all levels above the ground floor. 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 for detail of the proposed drainage infrastructure.

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; and
- Incorporates design features to minimise risk to property and life from flooding.

Furthermore, we expect that a Flood Emergency Management Plan be prepared and implemented prior to occupation of the building.

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

Yours sincerely,

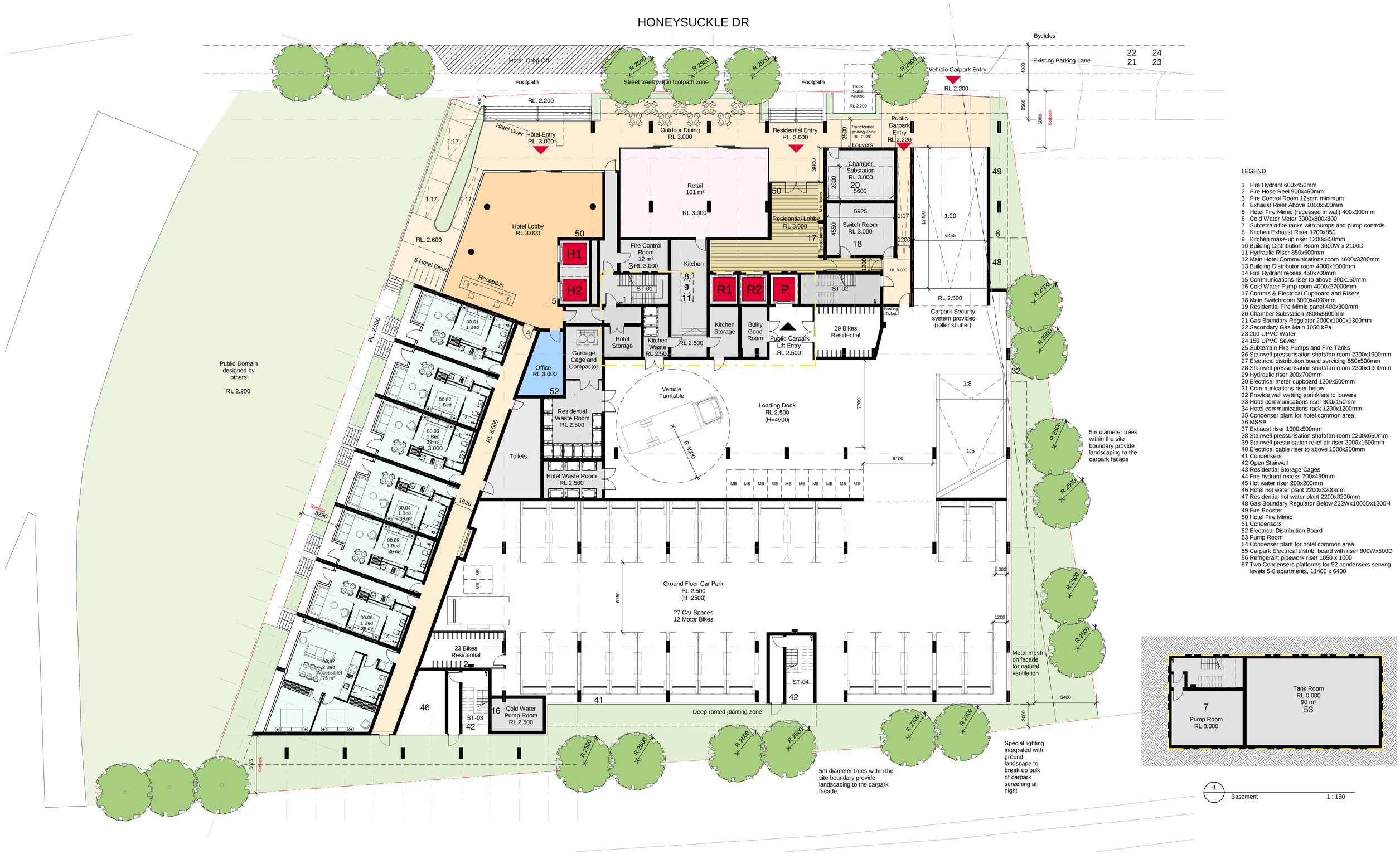
Kane Sinclair
Civil Engineer
BEng(Civil) (Hons 1) Grad IE Aust
Northrop Consulting Engineers

Attachments

Architectural Plan

Detailed Survey Plan

City of Newcastle – Flood Information Certificate FL2017/00211



LEGEND

1 Fire Hydrant 600x450mm
2 Fire Hose Reel 900x450mm
3 Fire Control Room 12sqm minimum
4 Exhaust Riser Above 1000x500mm
5 Hotel Fire Mimic (recessed in wall) 400x300mm
6 Cold Water Meter 3000x800x800
7 Subterrain fire tanks with pumps and pump controls
8 Kitchen Exhaust Riser 1200x850
9 Kitchen make-up riser 1200x850mm
10 Building Distribution Room 3600W x 2100D
11 Hydraulic Riser 850x600mm
12 Main Hotel Communications room 4600x3200mm
13 Building Distributor room 4000x1000mm
14 Fire Hydrant recess 450x700mm
15 Communications riser to above 300x150mm
16 Cold Water Pump room 4000x27000mm
17 Comms & Electrical Cupboard and Risers
18 Main Switchroom 6000x4000mm
19 Residential Fire Mimic panel 400x300mm
20 Chamber Substation 2800x5600mm
21 Gas Boundary Regulator 2000x1000x1300mm
22 Secondary Gas Main 1050 kPa
23 200 UPVC Water
24 150 UPVC Sewer
25 Subterrain Fire Pumps and Fire Tanks
26 Stairwell pressurisation shaft/fan room 2300x1900mm
27 Electrical distribution board servicing 650x500mm
28 Stairwell pressurisation shaft/fan room 2300x1900mm
29 Hydraulic riser 200x700mm
30 Electrical meter cupboard 1200x500mm
31 Communications riser below
32 Provide wall wetting sprinklers to louvers
33 Hotel communications riser 300x150mm
34 Hotel communications rack 1200x1200mm
35 Condenser plant for hotel common area
36 MSSB
37 Exhaust riser 1000x500mm
38 Stairwell pressurisation shaft/fan room 2200x650mm
39 Stairwell presurisation relief air riser 2000x1600mm
40 Electrical cable riser to above 1000x200mm
41 Condensers
42 Open Stairwell
43 Residential Storage Cages
44 Fire hydrant recess 700x450mm
45 Hot water riser 200x200mm
46 Hotel hot water plant 2200x3200mm
47 Residential hot water plant 2200x3200mm
48 Gas Boundary Regulator Below 222Wx1000Dx1300H
49 Fire Booster
50 Hotel Fire Mimic
51 Condensors
52 Electrical Distribution Board
53 Pump Room
54 Condenser plant for hotel common area
55 Carpark Electrical distrib. board with riser 800Wx500D
56 Refrigerant pipework riser 1050 x 1000
57 Two Condensers platforms for 52 condensers serving levels 5-8 apartments, 11400 x 6400

Revision	Date	Description	Initial	Checked
A	27/09/17	DA Draft	DOMA	BS

42 Honeysuckle Drive

42 Honeysuckle Drive, Newcastle

Ground Floor Plan

Scale	1 : 150 @ A1 — 1:300 @ A3
Drawn	MDJ
Checked	VG
Project no.	s12109
Status	DA
Plot Date	27/09/2017 6:06:15 PM
Plot File	\\liv-vfp-01\home$\JDM\Documents\42HONEYSUCKLEDRIVE_BS_ARCH_DA_JDM.rvt
Drawing no.	A03.101
Revision	A

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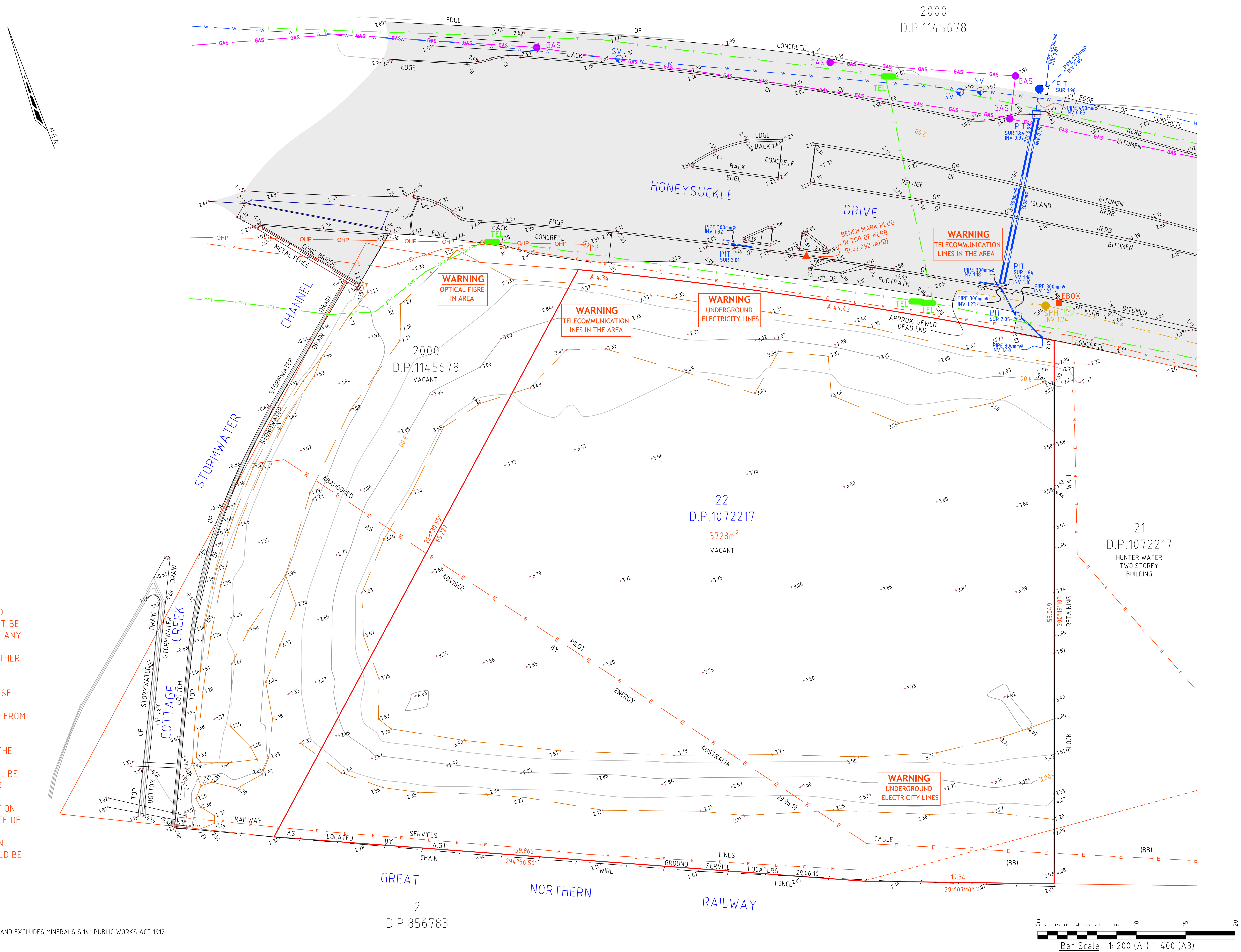
BATESSMART™

LEGEND

━━	BOUNDARY LINE
──	ADJACENT BOUNDARY
──	MINOR CONTOUR LINE
—10—	MAJOR CONTOUR LINE
– – –	EASEMENT
—/—	FENCE LINE
– – –	TOP & TOE OF BANKS
—OHP—	OVERHEAD POWER LINE
▲	BENCH MARK
PP	POWER POLE
□ PIT	DRAINAGE PIT
SV	STOP VALVE
● SMH	SEWER MAN HOLE
● GAS	NATURAL GAS MARKER
TEL	TELSTRA PIT
	DENOTES TREE
━━	STORMWATER PIPE
—W—	UNDERGROUND WATER LINE (DBYD)
—E—	UNDERGROUND ELECTRICAL LINE (DBYD)
—T—	UNDERGROUND TELSTRA LINE (DBYD)
—OPT—	UNDERGROUND OPTICAL FIBRE (DBYD)
—S—	UNDERGROUND SEWER LINE (DBYD)
—GAS—	UNDERGROUND GAS LINE (DBYD)



MGA
2000
D.P.1145678
HONEYSUCKLE
DRIVE
EDGE
OF
CONCRETE
BACK
REFUGE
ISLAND
BITUMEN
KERB
FOOTPATH
CONC. BRIDGE
METAL FENCE
CHANNEL
DRAIN
STORMWATER
COTTAGE
CREEK
TOP
BOTTOM
WARNING
OPTICAL FIBRE IN AREA
WARNING
TELECOMMUNICATION LINES IN THE AREA
WARNING
UNDERGROUND ELECTRICITY LINES
WARNING
TELECOMMUNICATION LINES IN THE AREA
WARNING
UNDERGROUND ELECTRICITY LINES
BENCH MARK PLUG IN TOP OF KERB RL=2.092 (AHD)
PIPE 450mmø INV 0.81
PIPE 275mmø INV 0.85
PIT SUR 1.96
PIPE 450mmø INV 0.83
PIT SUR 1.84 INV 0.97
300mmø
PIT SUR 1.84 INV 1.16 INV 1.16
PIPE 300mmø INV 1.18
PIPE 300mmø INV 1.21
PIPE 300mmø INV 1.23
PIT SUR 2.05
PIPE 300mmø INV 1.48
PIPE 300mmø INV 1.32
PIT SUR 2.01
SMH INV 1.74
EBOX
APPROX. SEWER DEAD END
A 4.34
A 44.43
2000
D.P.1145678
VACANT
22
D.P.1072217
3728m²
VACANT
228°30'55"
65.227
55.049
200°19'10"
RETAINING WALL
BLOCK
21
D.P.1072217
HUNTER WATER TWO STOREY BUILDING
ABANDONED AS ADVISED BY PILOT ENERGY AUSTRALIA 29.06.10
RAILWAY AS LOCATED BY SERVICES A.G.L.
CHAIN WIRE
GROUND SERVICE LINES LOCATERS 29.06.10
FENCE
CABLE
59.865
294°36'50"
19.34
291°07'10"
(BB)
(BB)
GREAT NORTHERN RAILWAY
2
D.P.856783
Bar Scale 1: 200 (A1) 1: 400 (A3)

NOTES:

1. FEATURES SHOWN TO SCALE ACCURACY.
2. THIS PLAN IS SUITABLE FOR DETAILED PLANNING AND DESIGN AT THE SCALE/S STATED. THE PLAN MAY NOT BE SUITABLE FOR ANY OTHER PURPOSE OR FOR USE AT ANY OTHER SCALE/S.
3. THE LOCATION OF ALL UNDERGROUND SERVICES WHETHER SHOWN ON THE PLAN OR NOT, SHOULD BE PRECISELY DETERMINED BEFORE ANY CONSTRUCTION WORK COMMENCES AND MEASURES TAKEN TO PROTECT THESE SERVICES FROM DAMAGE.
4. UNDERGROUND SERVICES SHOWN HAVE BEEN SCALED FROM DIAL BEFORE YOU DIG PLANS DATED 05.07.2017.
5. CONTOUR INTERVAL – 0.5m
6. THE BOUNDARIES SHOWN ARE APPROXIMATE ONLY. THE BOUNDARIES SHOWN HAVE BEEN COMPILED FROM THE RELEVANT DEPOSITED PLANS. FURTHER SURVEY WILL BE REQUIRED IF CONSTRUCTION IS TO TAKE PLACE ON OR ADJACENT TO THE BOUNDARIES.
7. DURING THE COURSE OF THIS SURVEY NO INVESTIGATION HAS BEEN UNDERTAKEN TO DETERMINE THE EXISTENCE OF ANY POSSIBLE SUBTERRANEAN ENCROACHMENTS.
8. THE SUBJECT PROPERTY IS AFFECTED BY A COVENANT. THE RELEVANT CONDITIONS OF THE COVENANT SHOULD BE CHECKED FOR COMPLIANCE PRIOR TO DESIGN & CONSTRUCTION.

(BB) LAND EXCLUDES MINERALS S.141 PUBLIC WORKS ACT 1912

de Witt Consulting
planning ■ surveying ■ project management

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TITLE

DETAIL SURVEY OF
LOT 22 D.P.1072217

Ed.	Date	Amendment
H		
G		
F		
E		
D		
C		
B		
A	27.07.17	INITIAL ISSUE

JOB ADDRESS: 42 HONEYSUCKLE DRIVE, NEWCASTLE
CLIENT: DOMA HOLDINGS
PLAN No 001
JOB REF: 7768
SCALE: A1 1:200 A3 1:400
SURVEY DATE: 18.07.17
PLAN DATE: 27.07.17
DATUM: AHD
CAD REF: 7768DETAILgp.mjo
ORIGIN OF LEVELS SSM 135836 RL 2.071
DRAWN CJ
SURVEYOR NB/GP
CHECKED WS
APPROVED WS
SHEET No 1/1
DRAWING REF: 7768-DET-27.07.17

02 August 2017

The City of Newcastle

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Northrop Consulting Engineers P/L
PO Box 180
CHARLESTOWN NSW 2290

Flood Information Certificate No:	FL2017/00211
Land:	Lot 22 DP 1072217
Property Address:	42 Honeysuckle Drive Newcastle NSW 2300

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 "*Defined Flood Level*" in the Building Code of Australia)	2.2m AHD
Estimated Maximum Flow Velocity of floodwaters (in the "*Defined Flood Event*" as per the Building Code of Australia)	0.1m/s
Highest Property Hazard Category	P1
Estimated Probable Maximum Flood Level	3.4m AHD
Highest Life Hazard Category	L1

Local Catchment 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 "*Defined Flood Level*" in the Building Code of Australia)	2.5m AHD
Estimated Maximum Flow Velocity of floodwaters (in the "*Defined Flood Event*" as per the Building Code of Australia)	0.5m/s
Highest Property Hazard Category	P2
Estimated Probable Maximum Flood Level	3.1m AHD
Highest Life Hazard Category	L3

The flood study from which the above information is derived is part of a Newcastle City Wide Floodplain Management Plan. 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.	Not Applicable
Filling of a flood storage area by more than 20% is not generally allowable due to redistribution of flood water.	Not Applicable
Minimum floor level for occupiable rooms in a new development on this site is: (equivalent to the "*Flood Hazard Level*" in the Building Code of Australia)	3.0m AHD
Is onsite flood refuge required?	Not Required

Should you require any further clarification please contact Alastair Peddie on 02 4974 2788.

Yours faithfully

Alastair Peddie
SENIOR DEVELOPMENT OFFICER (Engineering)