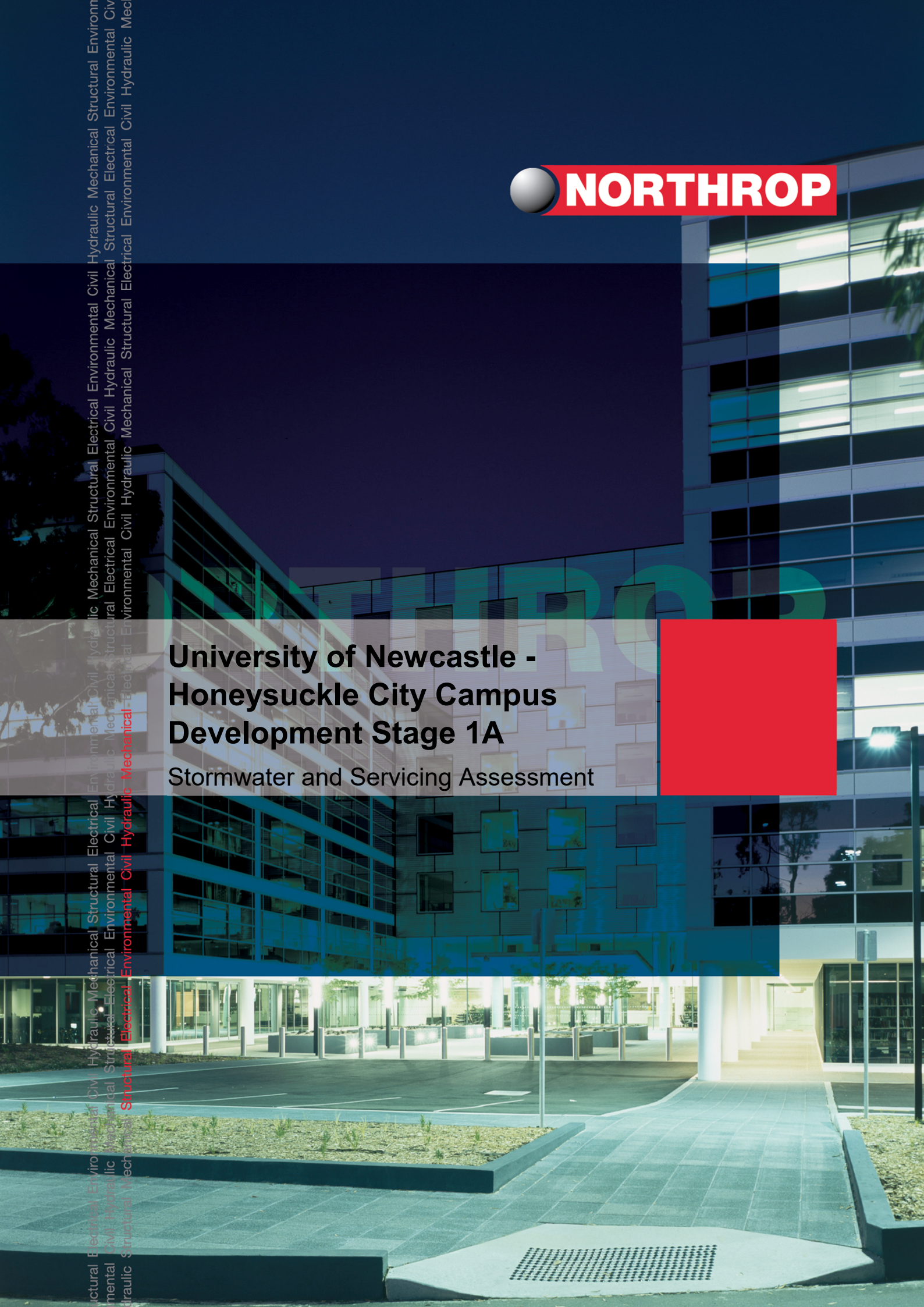

NORTHROP

University of Newcastle - Honeysuckle City Campus Development Stage 1A

Stormwater and Servicing Assessment

Structural Electrical Environmental Civil Hydraulic Mechanical

REPORT DOCUMENT CONTROL

Project: University of Newcastle – Honeysuckle City Campus Development

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Client: University of Newcastle

Title: Stormwater and Servicing Assessment

Revision History:

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A	Draft Issue	16/10/18	S. Noble	C. Piper	B. McLaren
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1 BACKGROUND

1.1 The Development

The University of Newcastle (the University) is seeking to expand its presence in the CBD of Newcastle and has acquired three parcels of land within the Honeysuckle Precinct. The three sites are proposed to house the Honeysuckle City Campus Development (HCCD), intended to be a large scale academic precinct. The proposed development will encompass the following existing lots:

- Lot 1, 2 and 3 DP 1163346 – known hereafter as Site 1;
- Lot 2 and 3 DP 1247375 – known hereafter as Sites 2 and 3.
- Lot 5 and 6 DP 1247375 – known hereafter as Wright Lane.

The extent of the proposed development footprint is illustrated in Figure 1-1.

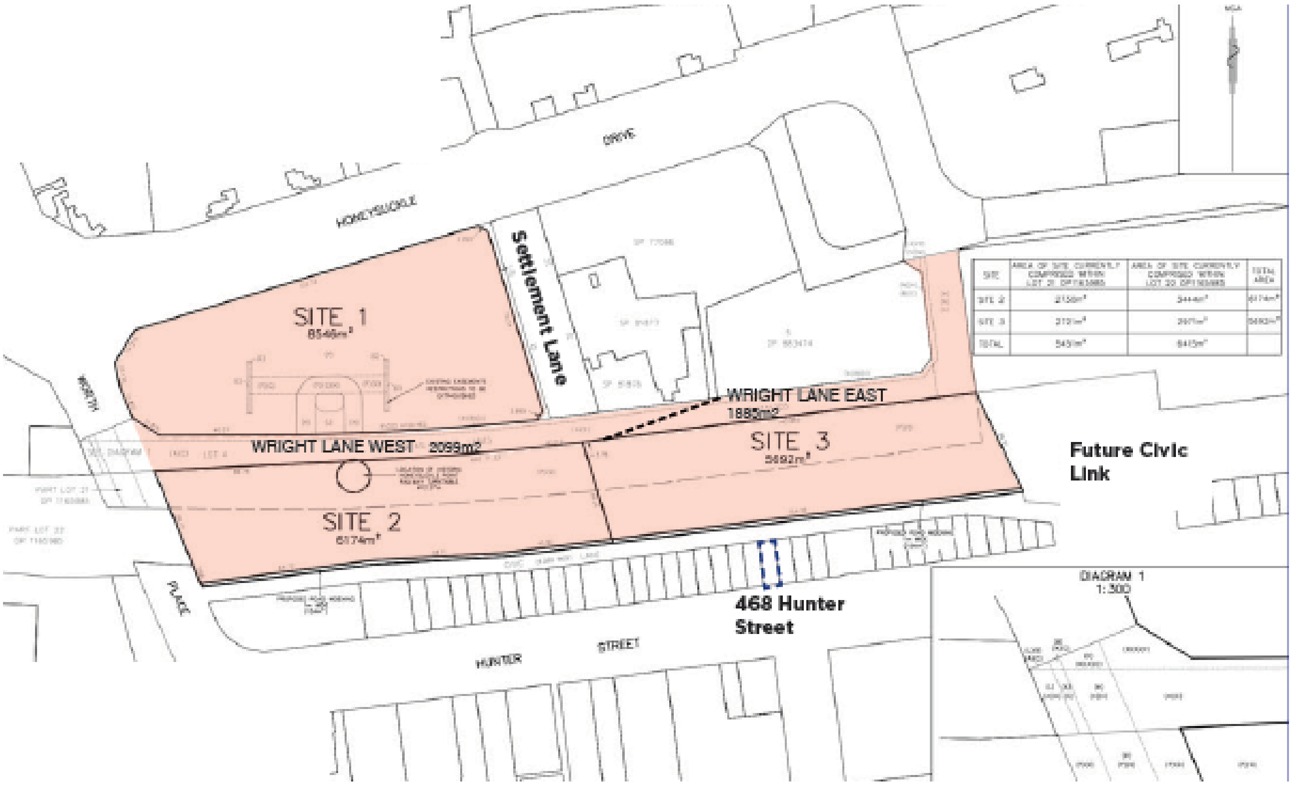


Figure 1-1: Proposed Development Footprint (Cox Architecture, 2019)

At present, the HCCD development is to be completed over multiple stages, over a number of years, as shown in Figure 1-2;

- Stage 1A – Construction of Building A1 (Site 1);
- Stage 1B – Construction of Building B (Site 2);
- Stage 2 – Construction of Building A2 (Site 1);
- Stage 3 – Construction of Building C (Site 1)

- Stage 4 – Construction of Buildings D, E & F (Site 2 & 3)

The following report pertains to Stage 1A.

Figure 1-2: Proposed Building Footprints (Cox Architecture, 2019)

Stage 1A, being the construction of building A1, will provide approximately 3,000m^2 of academic space. Building A1 is expected to house the School of Creative Industries and an Innovation Hub.

1.2 Existing Site

Stage 1A is situated within Site 1 (Figure 1-1) and is bounded by Honeysuckle Drive to the north, Wright Lane to the south, future Building A2 to the east and Worth Place to the west. It is understood that Wright Lane, which separates Sites 1 and 2, will be retained as a public access way.

Site 1 was previously used as a construction compound for the Newcastle light rail project. It is understood that on completion of the work, the site is to be left in good order, including turfing or seeding of disturbed areas. The site is generally flat, with grades of approximately 2%.

Existing stormwater drainage networks are located along Honeysuckle Drive, Worth Place and Wright Lane. These stormwater networks all discharge to a trunk drainage culvert which drains to Newcastle Harbour.

2 FLOODING ASSESSMENT

Northrop Consulting Engineers have been engaged to undertake a flooding assessment at the proposed HCCD Stage 1A project site to satisfy Clause 11 of the Secretary's Environmental Assessment Requirements (SEARs) for SSD 9510. This section outlines the requirements of the clauses, the assessment methodology, a description of the existing site and development proposal, and responses to the clauses.

Clause 11 for SSD 9510 requires;

The Environment Impact Statement (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), Waterfront and Cottage Creek Flood Management Plan 1999, Newcastle City-wide Floodplain Risk Management Study and Plan 2012, and the Honeysuckle Redevelopment Area Flood Study 2018, including:

- *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;*
- *Emergency Management measures and evacuation procedures;*
- *Consistency with any floodplain risk management plans;*
- *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 these requirements, 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);
- Waterfront and Cottage Creek Flood Management Plan 1999;
- Newcastle City-wide Floodplain Risk Management Study and Plan (2012);
- Newcastle City Council DCP 2012 Section 4.01 Flood Management;
- Honeysuckle Redevelopment Area Flood Study (2018);
- Flood Information Certificate FL2018/00123.

2.1 Existing Flood Behaviour and Impact of Climate Change

Existing flood behaviour has been obtained from Flood Information Certificate No. FL2018/00123, included in Appendix A. The subject site is affected by ocean and local catchment flooding.

As noted in the certificate, a peak water level of 2.43m AHD is expected at the site during the 1% Annual Exceedance Probability (AEP) event, as a result of local catchment flooding. A peak water level of 3.40m AHD is expected in the Probable Maximum Flood (PMF) as a result of ocean flooding. Flood waters for the ocean flooding are expected to rise slowly relative to the local catchment flood 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 L5 for local catchment flooding, however this is applicable to the nearby floodway, and not to the development area. This was confirmed with Council, and the correspondence is included in Appendix B. The highest Hydraulic Behaviour Threshold for the development area is H3, which is equivalent to a Life Hazard Category of L4. An L4 hazard classification is commensurate with flash flooding, and requires evacuation to a suitable flood free refuge within the enclosed flood waters. 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 proposed site of the HCCD Stage 1A project has various flood classifications; however 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*".

Given the highly-modified nature of the waterfront land, it is not expected ecosystem migration will occur in the vicinity of the proposed development.

2.2 Potential Flood Impact on the Proposed Development

The HCCD site forms part of the Honeysuckle Redevelopment area, and as such, has been included in the Honeysuckle Redevelopment Area Flood Study 2018. As shown in Figure 2-1.

Figure 2-1: Proposed Development Area for the Honeysuckle Redevelopment Area Flood Study (BMT, 2018)

As mentioned above, the most critical flood classification for the subject area within the development footprint is flood fringe.

The Waterfront and Cottage Creek Flood Management Plan (1999) depicts a floodway directly to the west of the proposed site, referred to as Worth Place Floodway. The Honeysuckle Redevelopment Area Flood Study (2018), which supersedes the earlier plan, retains the 20m Worth Place floodway, and also includes a 10m wide floodway between Site 2 Buildings B and D to allow an overland flow path to be maintained between Civic Lane and Wright Lane. Future design consideration will need to be given to this floodway to ensure water can flow through freely, thereby preventing localise increase in flood levels and minimising the potential for flood impact on the proposed development.

In order to adequately prevent flooding of the building in accordance with The Honeysuckle Redevelopment Area Flood Study (2018), all habitable floor levels are set at the Flood Planning Level. The Flood Planning Level in this area is the 1% AEP flood level plus 370mm freeboard which equates 2.80m AHD.

2.3 Emergency Management and Evacuation

The emergency response will depend on the type of flooding experienced at the site. For ocean dominated flooding, where the flood level rises slowly, sufficient warning should be available, and therefore the recommended response is evacuation of the building to higher ground. Conversely, for extreme local catchment flooding, where levels rise quickly, the recommended response is to shelter in place and seek refuge 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.

2.4 Consistency with Floodplain Risk Management Plans and Flood Hazard

The proposed development is generally compatible with the 2012 NCC DCP and Newcastle City-wide Floodplain Risk Management Study and Plan (2012) with respect to habitable floor levels and on-site refuge. The Flood Planning Level was obtained from NCC in Flood Certificate FL2018/00123 and is derived from The Honeysuckle Redevelopment Area Flood Study (2018). The new study allows for a single habitable floor level across the site, rather than the varying levels required under the previous plan.

All habitable floor levels are set at the Flood Planning Level, being 2.80m AHD, which equates to the 1% AEP plus 370mm freeboard.

The L4 hazard category, which is applicable to the site, requires on-site refuge above the PMF. Refuge may be sought in all levels above the ground floor for each building, in line with the Newcastle DCP 2012 Section 4.01 Flood Management. Further details will be provided in a Flood Emergency Management Plan to be prepared in the detailed design phase.

A summary of flooding characteristics is shown below in Table 2-1, noting that the flooding data shown is the maximum for the overall site.

Table 2-1: Summary of flooding characteristics and proposed development

1% AEP Ocean Flooding	2.30m AHD
1% AEP Local Catchment Flooding	2.43m AHD
PMF Ocean Flooding	3.40m AHD
PMF Local Catchment Flooding	3.31m AHD
Proposed Habitable Floor Level	2.80m AHD

2.5 Assessment of Impact on Environment

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.

The Stream Erosion Index (SEI) has not been quantified for this development due to the close proximity to the harbour. As the proposed system will connect to in-ground stormwater infrastructure which drains directly to the harbour, the SEI calculation has been deemed irrelevant in this application.

2.6 Proposed Drainage and Stormwater Infrastructure

As discussed in Section 2.2, all overland drainage paths and floodways depicted in The Waterfront and Cottage Creek Flood Management Plan (1999) and The Honeysuckle Redevelopment Area Flood Study (2018), are proposed to be maintained, allowing overland flows to drain freely from the site. Further details about the proposed stormwater and drainage infrastructure are in Section 3 below.

3 WATER, DRAINAGE AND STORMWATER

Clause 10 of SSD requires:

The EIS shall include:

- *A stormwater, groundwater and drainage assessment including modelling, contour maps and methodologies, to assess the impact of the development on surface and ground water hydrology and quality;*
- *Detail erosion, sediment and stormwater management controls during construction management and mitigation measures for the prevention of potential water quality impacts during construction;*
- *Detail surface and ground water monitoring activities and methodologies; and*
- *Identify any water licensing requirements or other approvals required under the Water Act 1912 or Water Management Act 200.*

It is noted that impact to groundwater and water licencing are to be undertaken by other consultants and do not form part of Northrop's assessment.

3.1 Impact on Surface Water Hydrology and Quality

Northrop Consulting Engineers have prepared a stormwater management strategy for Stage 1A of the proposed HCCD project to satisfy Clause 10. The existing site area for Stage 1A is approximately 1,900m^2. The proposed development covers approximately 1,400m^2 with the remaining lot area to be developed in the future as part of the overall master plan. The proposed treatment has been designed to accommodate

This stormwater management strategy has been developed in accordance with the NCC Development Control Plan (DCP) 2012 and the NCC Stormwater and Water Efficiency for Development Technical Manual (2017). This report intends to discuss stormwater issues relating to the site at a level appropriate for a Development Application submission and should be read in conjunction with drawing DA.02-C02.0 Rev (1), included in Appendix C.

The proposed stormwater management strategy for the development site can be summarised as follows:

- The roof area of the building will be captured via charged or gravity downpipes and directed to the proposed storage tank. The stored volume will be reused internally for toilet and urinal flushing. The overflow from the tank will be conveyed to a retention tank with sand filter.
- Runoff from paved areas and footpaths will be collected by pits fitted with proprietary filter baskets (Enviropod Series 200 or approved equivalent) and conveyed to the abovementioned retention tank.
- The outlet from the retention storage tank will be directed to an existing stormwater pit on Worth Place.
- The existing Wright Lane corridor is the primary overland flow path through the site. Wright Lane is proposed to become a pedestrian street/plaza, and any modification to site levels will be carefully considered to ensure overland flow is maintained.

3.1.1 Existing Stormwater Infrastructure and Proposed Connection Point

Existing stormwater drainage networks are located along Honeysuckle Drive, Worth Place and Wright Lane. These stormwater networks all discharge to a trunk drainage culvert which drains to Newcastle Harbour.

NCC requires the provision of onsite stormwater detention as a condition of the development approval. As a result, the existing stormwater network will not require upgrading as a direct result of the development, as the discharge from the post developed site will be controlled. Similarly, consultation has been undertaken with NCC to confirm that the existing stormwater infrastructure on Honeysuckle Drive will not require repair or upgrade.

The proposed connection point to the existing network for HCCD Stage 1A of the development is the kerb inlet pit (KIP) on Worth Place. This is the lowest pit adjacent the site for HCCD Stage 1A. Survey has identified that the outlet pipe from this pit is a 1050mm diameter reinforced concrete pipe.

The proposed discharge location is shown below in Figure 3-1 below.

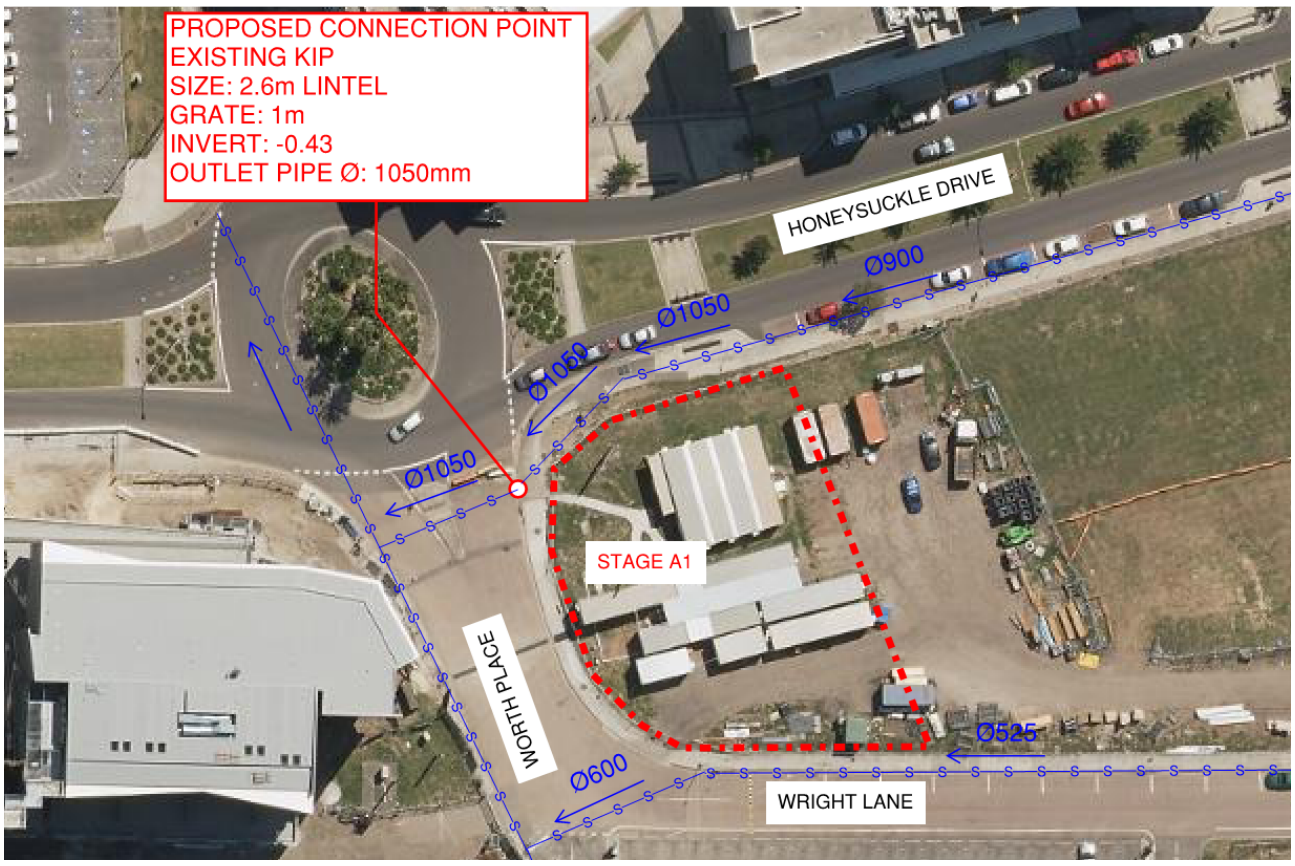


Figure 3-1: Proposed connection point to Council's existing network.

3.1.2 Stormwater Quantity Assessment

NCC's DCP 2012 requires the provision of site storage controls to limit peak runoff from the development. The objectives of these measures are to reduce the impact of the development on downstream stormwater infrastructure and receiving waters. To satisfy these requirements, stormwater storage is to be provided for the proposed building. A preliminary storage volume has been estimated in accordance with Council's storage depth calculation method, as detailed in DCP Section 7.06 (Stormwater). The volume requirement was interpolated between 20 and 25mm for

94% imperviousness of the site. The estimated site storage requirements are provided in Table 3-1 below.

Table 3-1: Site Storage Requirements for Stage 1A

Total Site Area	1,900m^2
Estimated Impervious Area (Roof + 90% of Surrounds)	1,779m^2
Impervious Fraction	94%
Interpolated Volume Requirement	23.4mm
Storage Requirement	41.6m^3

This storage is to be provided using a 21.6kL retention tank and a 20kL re-use tank. The retention tank outlet will be designed to ensure the development results in no increase in stormwater outflows to the external stormwater network. As the storage will be below the flood level, a backflow prevention device will be provided at the outlet of each storage device.

Captured rainwater is to be reticulated internally to meet the toilet and urinal flushing demand of ground floor toilets. The tank and re-use have been modelled in MUSIC as part of the stormwater quality analysis (refer Section 3.1.3 below).

Full stormwater modelling of the proposed detention system will be undertaken at the detailed design phase.

3.1.3 Stormwater Quality Assessment

Stormwater quality on-site is proposed to be managed through a treatment train approach to minimise any adverse impacts on the ecology of downstream watercourses and to meet the pollutant removal efficiency targets outlined in Council's DCP 7.06 (2012). These targets are reproduced in Table 3-2.

The performance of the proposed stormwater management strategy was assessed against these targets using the conceptual software MUSIC (Version 6.3.0). The MUSIC model was developed in accordance with the "NSW MUSIC Modelling Guidelines" (BMT WBM, 2015) and the NCC Technical Manual (2017), using the NCC MUSIC-link. The NCC MUSIC-link was used to set up all default source node data, rainfall data and evapotranspiration data.

The site was modelled in MUSIC using two catchments: One for the building roof, and one for the building surrounds. The building surrounds was assumed to be 90% impervious, allowing for an assumed small amount of landscaping. The source nodes adopted to for these two catchments were the Urban Roof node and the Urban Mixed node.

A schematic of the MUSIC model can be seen below in Figure 3-2.

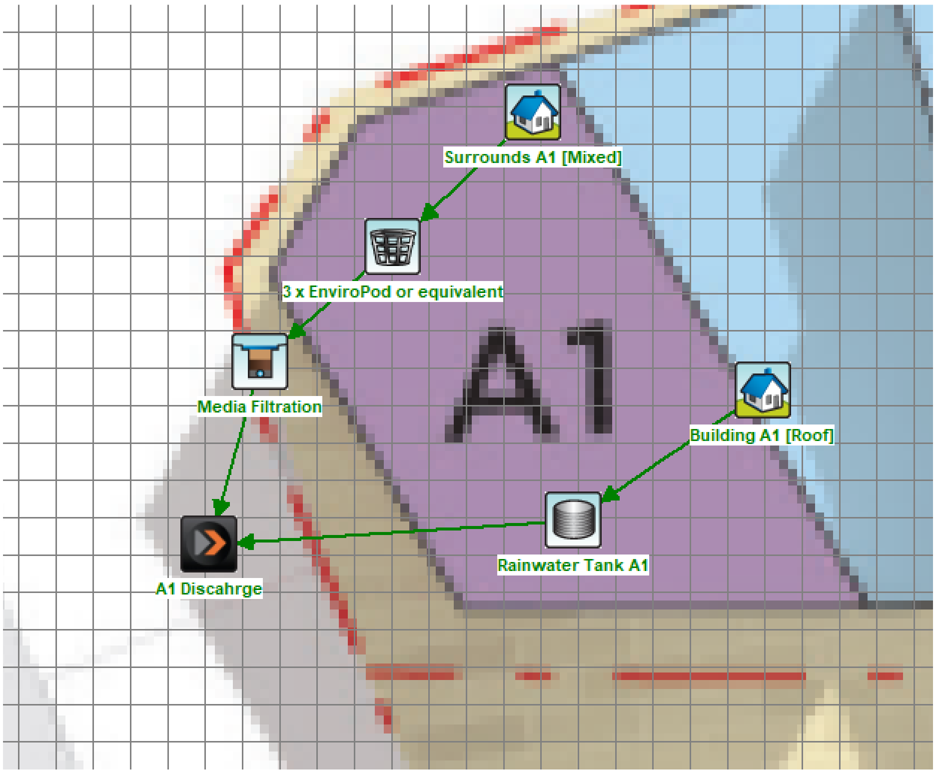


Figure 3-2: MUSIC Model Layout Schematic

It has been assumed that there is no bypass from this portion of the development.

The treatment train incorporates the following:

- Primary treatment of the roof area via a rainwater tank and primary treatment of surface runoff via filter basket pit inserts (Enviropod 200 or approved equivalent); and
- Secondary treatment via a sand filter in the retention tank.

A description of the non-proprietary measures is detailed below.

Rainwater Tank

It is proposed to connect the building to a 20kL below ground rainwater tank. It has been assumed within the MUSIC model that 100% of the roof areas will be connected to the tank, excluding terrace and podium levels.

The internal re-use demand was assumed to be for toilet and urinal flushing of the ground floor toilets. It was assumed that there would be a total of 8 toilets on the ground floor. The re-use demand adopted was 125L/toilet/day. This is based on Table 4.1 in NCC's 'Stormwater and Water Efficiency for Development Technical Manual' which has a re-use rate of 0.125kL/day/dwelling for the toilet usage of a 1-2 bedroom urban dwelling.

No external re-use was modelled from the tank as it is anticipated there will be very limited landscaping around the building. This can be amended during detailed design if significant landscaping is proposed and will only serve to better the water quality results. Thus the daily re-use in the MUSIC tank node was set to 1.0kL/day.

The proposed system satisfies approximately 86% of re-use demand which exceeds Council's minimum requirement of 70%, and is deemed a best practice outcome.

Retention Tank with Sand Filter

A sand filter is proposed to polish runoff from the paved surface areas of the site. The system has been sized in accordance with Section 4.3 of Council's Technical Manual, as shown in Table 3-2 below.

Table 3-2: Sand Filter Surface

Impervious Area (Roof + 90% of Surrounds)	1,779m^2
Sand Filter Surface Area	(1779/100) x 0.8m^2 = 14.5m^2

The sand filter was modelled in MUSIC as a Media Filtration node, with the parameters in accordance with the "NSW MUSIC Modelling Guidelines".

The results from the MUSIC modelling are presented in Table 3-3 below.

Table 3-3: MUSIC Model Result Summary (outlet node)

	Source Load (kg/yr)	Residual Loads (kg/yr)	Percentage Reduction	Target Objectives
Total Suspended Solids (TSS)	249	16.4	93.4%	85 %
Total Phosphorous (TP)	0.59	0.188	68.1%	65 %
Total Nitrogen (TN)	4.94	2.67	46%	45 %
Gross Pollutants	51.9	0	100%	90 %

Table 3-3 shows that the proposed stormwater management strategy is predicted to achieve the load reduction targets set out in the DCP, as estimated by MUSIC.

The MUSIC-Link report has been included in Appendix D. The MUSIC Model file can be provided upon request.

3.2 Erosion and Sediment control

Northrop Consulting Engineers have prepared a concept erosion and sediment control plan in accordance with the guidelines set out in Landcom's 'Managing Urban Stormwater: Soils and Construction' ("The Blue Book"). The plan, DA-02-CO1.0, is included in Appendix C, and is intended to provide sufficient information for the purposes of approval at the concept stage.

The Contractor shall be responsible for adequately managing site stormwater runoff with the aim of preventing erosion and deposition, specifically within water ways or stormwater drains. The general principles for management are to eliminate, isolate, minimise or control erosion, and therefore the potential for sediment deposition to have an effect on downstream environments.

All work is to be carried out in accordance with relevant ordinances and regulations; note in particular the requirements of the 'Blue Book'. The Contractor shall be responsible for adequately implementing the measures in these documents.

3.2.1 Dust Management

To ensure that dust generation is eliminated or reduced where possible and practical, all site operations shall be undertaken with consideration given to their potential to produce dust. A management strategy of *avoid* > *minimise* > *control* shall be implemented.

The Contractor shall instigate measures to minimise and control generation of dust from the site. These measures shall include, but not be limited to:

- Program works around periods of significant and adverse meteorological conditions.
- Install wind fences around stockpiles with significant amounts of fine particulates.
- Maintain vegetation across the site where possible, otherwise establish vegetation or seal disturbed site areas as soon as practical.
- Provide water trucks or sprinkling devices during construction as required to suppress dust, specifically for site vehicular traffic or dumping and filling operations.

4 UTILITIES

Clause 21 for SSD 9510 requires:

In consultation with relevant agencies, ascertain existing capacity and licensing requirements for ongoing water supply and any additional electricity works and or boosted water supply (including need for hydraulic plans) are adequately addressed for the provision of utilities including staging of infrastructure.

It is noted that investigation in relation to electricity or boosted water supply is to be undertaken by other consultants and do not form part of Northrop's assessment.

4.1 Water Reticulation

The Notice of Requirements has been received from Hunter Water specifying required upgrade works and a nominal connection point for Stage 1A and 1B of the development. Buildings over eight stories are required to be served by a minimum 250mm water main.

Hunter Water Corporation (HWC) have therefore requested that a DN250 water main be extended to connect the DN200 UPVC-HD20 water main along Honeysuckle Drive to the DN150 CICL-S along Worth Street. The DN100 UPVC-HD20 along Worth Place will also require upsizing to DN250. Correspondence with Hunter Water, including Figure 1 detailing the required upgrades and extensions, has been included with this report in Appendix E.

4.2 Sewer

The development is located in close proximity to the Newcastle 12 Wastewater Pump Station and is proposed to be connected to an existing 300mm gravity main on Worth Place. In the Notice of Requirements from Hunter Water, they confirmed there is sufficient capacity within both the pump station and the gravity main to service the proposed development, and that the development can connect to MH G7081 located along Worth Place. Refer to Figure 2 in the correspondence from Hunter Water included in Appendix E.

An internal gravity sewer main will be constructed along Wright Lane, which will connect into an existing maintenance hole on Worth Place.

The development must comply with Hunter Water's Building Over Sewer Assets Policy as it may impact the DN150 UPVC-SN8, DN150 Concrete, and DN300 UPVC-SN8 sewer mains located adjacent to the development lots. Refer to the correspondence in Appendix E for the Built-Over-Sewer Policy requirements.

4.3 Gas

Jemena have advised that there is sufficient capacity within the existing 30kPa network off Honeysuckle Drive to service building A1, based on an initial assessment that the load requirement for the building is around 1,500mj/hr.

Gas is therefore expected to be supplied to Building A1 by connecting to this existing 30kPa network main on the northern side of Honeysuckle Drive, then distributed through the buildings via internal pipework. Jemena have advised they will facilitate the connection to Buildings A1.

5 INFRASTRUCTURE (LIGHT RAIL)

Clause 20 for SSD 9510 requires;

The EIS shall clarify the extent of any excavation and/or ground penetration and identify any potential impacts on the adjoining light rail infrastructure, including any mitigation measures.

The development is located more than 50m from the light rail network. It is therefore not expected that the proposed building itself will have any direct impact on the adjoining light rail infrastructure. Construction of lead-in services will be required in Worth Place, including sewer, water, electrical and communication infrastructure. Construction of sewer infrastructure will be limited to within close proximity of the site and is not expected to require any works in close vicinity of the light rail.

As described in Section 4.1 of this report, construction of water infrastructure for the development will be required between Hunter Street and Honeysuckle Drive within Worth Place. The as-constructed survey provided for the light rail works has identified that a 250mm diameter water service connection from Hunter Street exists beneath the extent of the light rail, extending to the northern side of the tracks, and is expected to allow connection without impacting the light rail infrastructure.

Similarly, it is understood that surplus electrical and communication infrastructure exists beneath the light rail to allow supply of electrical and communication from Hunter Street to the site without impact on the light rail infrastructure.

6 CONCLUSION

A summary of findings of this report are as follows:

6.1 Flooding Assessment

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.
- 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; and,
- Is not expected to cause avoidable stream erosion, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

6.2 Stormwater Management

Given the results of the above investigations, it is reasoned that the stormwater management strategy meets NCC's requirements:

- Onsite detention is proposed to reduce post-developed peak discharge to below the pre-developed peaks. The combined storage volume of the retention chamber (21.6kL) and the reuse tank (20kL) adequately satisfies the total site storage requirements for the site (41.6kL);
- The treatment of stormwater runoff for waterborne pollutants is achieved through the proposed treatment train. This includes a 20kL rainwater tanks, proprietary filter basket pit inserts and a retention tank with a sand filter surface area of 14.5m^2;
- The stream erosion index for the site was not quantified due to the site discharging to an existing stormwater network which connects directly to the harbour.

6.3 Utilities

- Existing water infrastructure is available at the site and Hunter Water have advised upgrades and extensions to the existing reticulation system such that there is a minimum of 250mm water main servicing the building, due to the height exceeding 8 stories.
- Hunter water have advised that there is sufficient capacity within the nearby Newcastle 12 Wastewater Pump Station and 300mm gravity main running along Worth Place to service the whole development. They have advised a suitable take-off point in Worth Place.
- Jemena have advised that there is sufficient capacity within the existing 30kPa distribution mains along the northern side of Honeysuckle Drive to service the Building A1.

6.4 Infrastructure (Light Rail)

- The development is considered to be far enough from the light rail infrastructure to have any direct impact;
- Construction of sewer lead-in works are not expected to impact the light rail infrastructure;
- Survey has identified an existing water connection point on the northern side of the light rail which is expected to allow connection of water services, in accordance with Hunter Water Corporations Notice of Requirements, without impact on the light rail infrastructure.
- Surplus electrical and communication infrastructure beneath the light rail is expected to allow supply of electrical and communication services to the site without impact on the light rail infrastructure.

APPENDIX A –
FLOOD CERTIFICATE

REQUEST FOR INFORMATION REGARDING COMPLYING DEVELOPMENT CRITERIA

09 May 2018

The City of Newcastle

PO Box 489, Newcastle
NSW 2300 Australia
Phone: 4974 2000
Fax: 4974 2222
Email: mail@ncc.nsw.gov.au
www.newcastle.nsw.gov.au

Northrop Consulting Engineers
Suite 4, Level 1, 2115 Pacific Highway
CHARLESTOWN NSW 2290

Dear Sir/Madam

Flood Information Certificate No:	FL2018/00123
Land:	Lot 4 DP 1111305, Lot 1 DP 1163346 Lot 2 DP 1163346, Lot 3 DP 1163346 Lot 21 DP 1165985, Lot 2 DP 1226145
Property Address:	16B Honeysuckle Drive Newcastle NSW 2300 16A Honeysuckle Drive Newcastle NSW 2300 16 Honeysuckle Drive Newcastle NSW 2300 20B Wright Lane Newcastle NSW 2300 20A Wright Lane 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 flood information comes from the Honeysuckle Redevelopment Area Flood Study prepared by BMT (Revision 8 dated 8/03/18). A copy of this flood study is available on Council's website. The flood information provided is generally for the proposed sites noted as Sites 11-15 on Figure 6-6 of the report (Honeysuckle Central & Sites 1 - 4) and based on the Context Plan submitted with your application

http://www.newcastle.nsw.gov.au/Newcastle/media/Documents/environment/Flooding/Honeysuckle-Redevelopment-Area-Flood-Study_March-2018.pdf

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)	2.3m 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

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).

Local Catchment Flooding

Is any part of the site affected by a floodway?	Yes (See Figure D-9) - Wright Lane is A Floodway
Is any part of the site affected by a flood storage area?	Yes (See Figure D-9)
Estimated 1% Annual Exceedance Probability event level: (equivalent to the "*Defined Flood Level*" in the Building Code of Australia)	2.43m AHD (Site 2)
Estimated Maximum Flow Velocity of floodwaters (in the "*Defined Flood Event*" as per the Building Code of Australia)	0.3m/s
Highest Property Hazard Category	P2
Estimated Probable Maximum Flood Level	3.31m AHD (Site 1)
Highest Life Hazard Category	L5 (at Honeysuckle Central)

Note: Flood data taken from Table 6-7 in the BMT *Honeysuckle Redevelopment Area Flood Study (Rev. 8 dated 8/03/18.) Indicated Local Catchment Flooding Data is for the maximum for the overall site. For Individual sites, See Table 6-7.*

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[1]
Filling of a flood storage area by more than 20% is not generally allowable due to redistribution of flood water.	Applicable[1]
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)	2.8m AHD
Is onsite flood refuge required?	Yes

[1] Note: Wright Lane is floodway and part storage - See Figure D-9.

Council holds no information concerning floor levels of existing structures on the site. Site levels and floor levels should be verified by survey based on the Australian Height Datum.

Complying Development Criteria

1.	Is the land identified as a Flood Control Lot?	Yes
2.	Is any part of the land identified as being:	
	a) a flood storage area, or	Yes
	b) a floodway area, or	Yes
	c) a flow path, or	Yes
	d) a high hazard area, or	Yes
	e) a high risk area	Yes

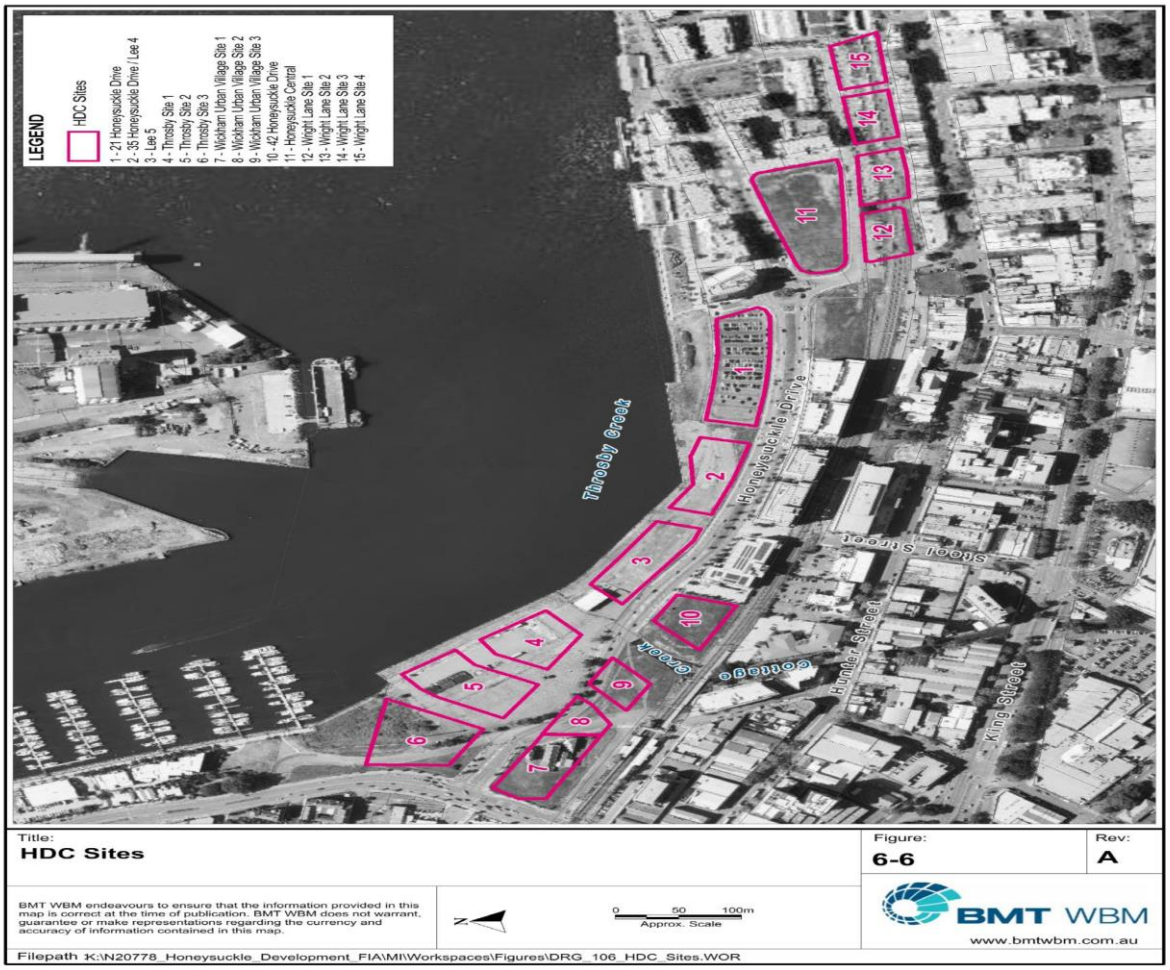
Based on the information contained within the above table the lot does not meet the "*development standards for flood control lots*", as specified within *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

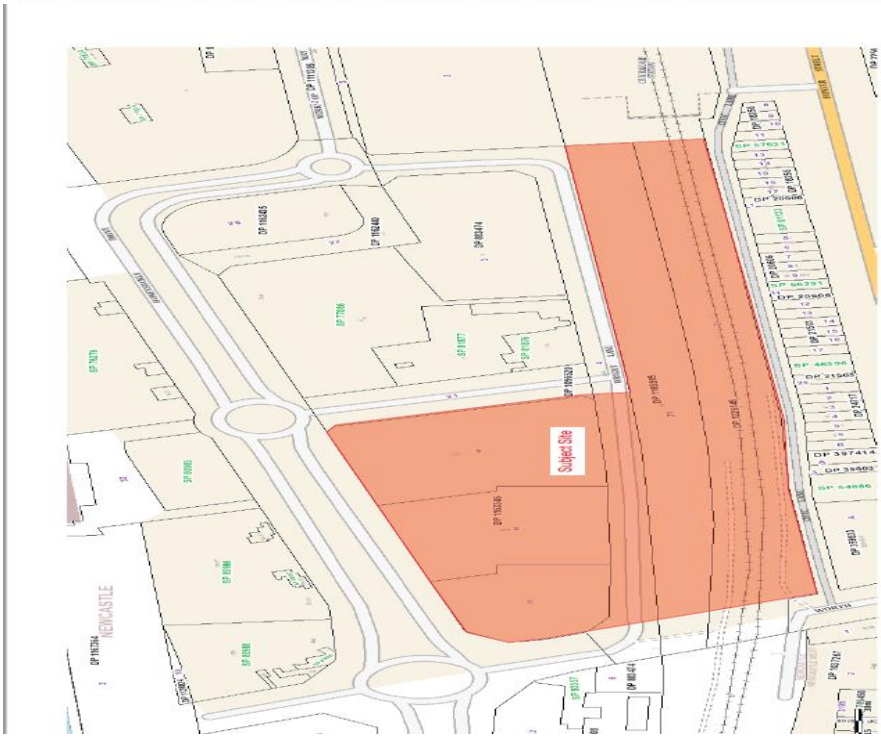
Please note that the information contained in this certificate may alter in the future. The applicant should at all times ensure the currency of this information.

Should you require any further clarification please contact Rajnesh Prakash on 4974 2137.

Yours faithfully

Rajnesh Prakash
SENIOR DEVELOPMENT OFFICER





Site Context Plan

APPENDIX B –
COUNCIL CORRESPONDENCE

Chris Piper

From: Rajnesh Prakash <rprakash@ncc.nsw.gov.au>
Sent: Thursday, 10 May 2018 9:55 AM
To: Sophie Croft
Cc: Chris Piper
Subject: RE: Enquiry regarding Flood Certificate FL2018-00123

Hi Sophie

Honeysuckle Central is not a floodway (No clarification has been provided in the BMT report on where the L5 risk point is taken), however the interpretation of Figure D-9 indicates that Wright Lane is a floodway. The risk to life at Wright Lane is very likely to have L5 risk to life due to Velocity Depth criteria.

Honeysuckle Central is noted to be developable land in the BMT report and I have the same opinion that the Risk to Life for Honeysuckle Central is L4.

I hope this information assists.

Many Thanks

Raj

Rajnesh Prakash | Senior Development Officer (Engineering)
Development and Building Services | Planning and Regulatory
Newcastle City Council
Phone: +61 2 4974 2137 **| Fax:** +61 2 4974 2701 **| Mobile:** 0478 486 327
Email: rprakash@ncc.nsw.gov.au
Web: www.newcastle.nsw.gov.au
Our Corporate Values: Cooperation | Respect | Excellence | Wellbeing

---

From: Sophie Croft [mailto:SCroft@northrop.com.au]
Sent: Thursday, 10 May 2018 8:19 AM
To: Rajnesh Prakash
Cc: Chris Piper
Subject: Enquiry regarding Flood Certificate FL2018-00123

Good morning Raj,

Thank you for sending through the attached Flood Certificate yesterday.

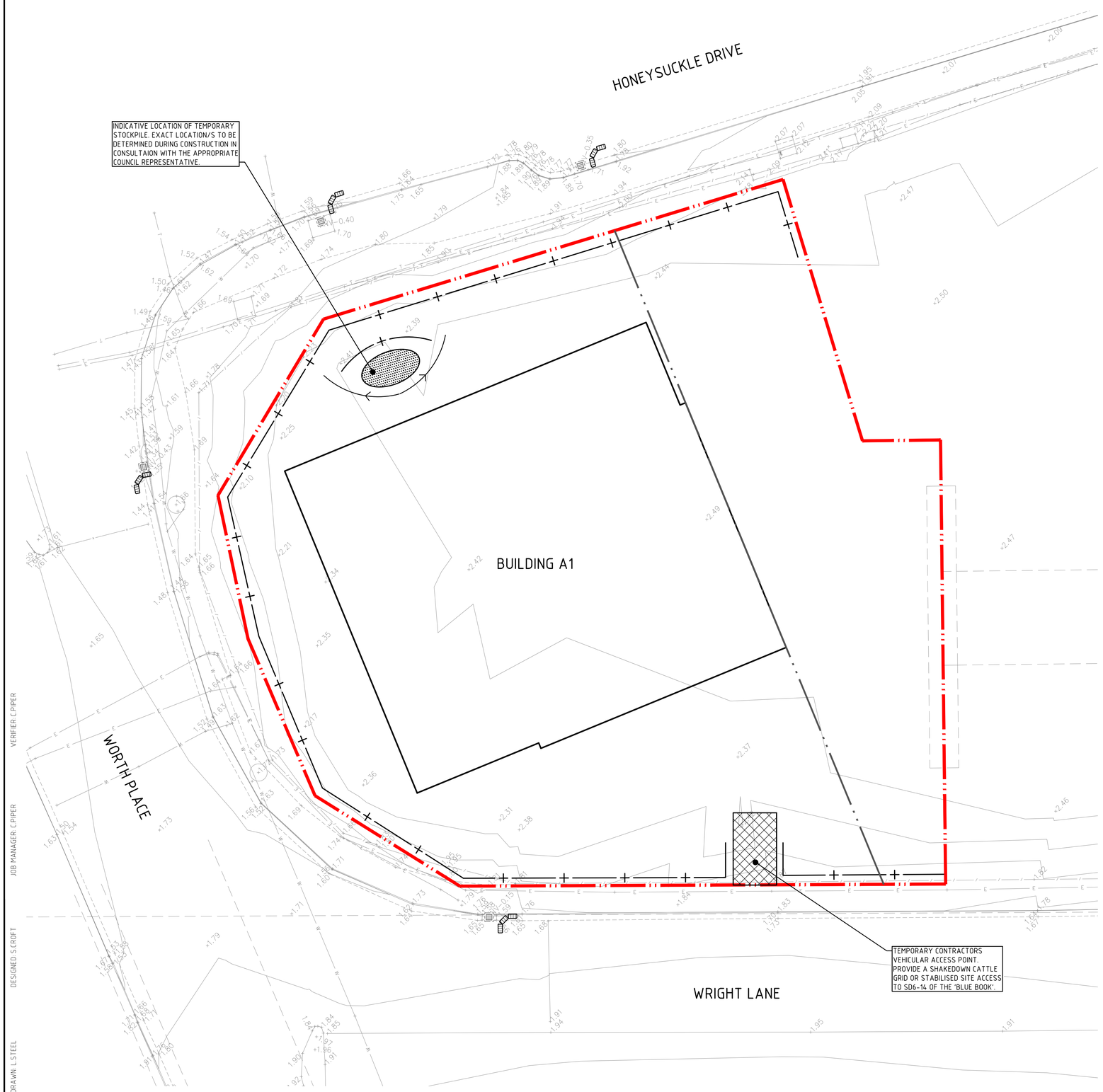
We have noticed that the Honeysuckle Central site has an L5 Life Hazard Category, based on Table 6-7 of the Honeysuckle Redevelopment Area Flood Study. Our understanding of Figure D-9 is that the L5 rating relates to the adjacent Wright Lane, and not the Honeysuckle Central site. We are not proposing to alter the Wright Lane floodway as part of the development.

Could you please confirm that the L5 does not apply to the Honeysuckle Central Site (16, 16A & 16B Honeysuckle Drive)? At this stage it reads as though no development can occur on this site, even though the flood study appears to have specifically included the site for development.

Kind regards,

Sophie Croft
Graduate Civil Engineer
Northrop Consulting Engineers Pty Ltd
T: 02 4943 1777
F: 02 4943 1577
M: 0421 064 130
Level 1, 215 Pacific
Highway Charlestown NSW 2290
PO Box 180 Charlestown NSW 2290
www.northrop.com.au

APPENDIX C –
CONCEPT DESIGN DRAWINGS



EROSION AND SEDIMENTATION CONTROL NOTES

1. ALL EROSION AND SEDIMENTATION CONTROL MEASURES MUST BE APPROPRIATE FOR THE SEDIMENT TYPE(S) OF THE SOILS ON-SITE, IN ACCORDANCE WITH THE 'BLUE BOOK' (MANAGING URBAN STORMWATER – SOILS AND CONSTRUCTION. LANDCOM, 2004), OR OTHER CURRENT RECOGNISED INDUSTRY STANDARDS FOR EROSION AND SEDIMENT CONTROL FOR AUSTRALIAN CONDITIONS. THIS INCLUDES SEDIMENT TRAPS AND LINING OF CHANNELS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION AND SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS AND SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ALL MAINTENANCE, CLEANING AND BREACHES. THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.
3. INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK'.
4. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE 'BLUE BOOK'.
5. INSTALL SEDIMENT FENCING, OR OTHER SEDIMENT CONTROL DEVICES, AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT OR APPROPRIATE COUNCIL OFFICER.
6. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK.
7. THE CONTRACTOR SHALL ENSURE THAT ALL VEGETATION (TREE, SHRUB & GROUND COVER) WHICH IS TO BE RETAINED SHALL BE PROTECTED DURING THE DURATION OF CONSTRUCTION.
8. ALL VEGETATION TO BE REMOVED SHALL BE MULCHED ON-SITE AND SPREAD/STOCKPILED AS DIRECTED BY THE SUPERINTENDENT.
9. STRIP TOPSOIL IN AREAS DESIGNATED FOR STRIPPING AND STOCKPILE FOR RE-USE AS REQUIRED. ANY SURPLUS MATERIAL SHALL BE SPREAD ON-SITE AS DIRECTED BY THE SUPERINTENDENT OR REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.
10. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE).
11. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
12. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED TO SUPPRESS DUST.
13. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALIZED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.

SEDIMENT BASIN SIZING CALCULATION

THE SITE IS LOCATED WITHIN THE HAMILTON SOIL LANDSCAPE AND PRIMARILY CONSISTS OF COARSE NON COHESIVE SOILS, WHICH HAS THE FOLLOWING PROPERTIES (IN ACCORDANCE WITH TABLE C17 OF THE "BLUE BOOK"):

SITE PARAMETERS	
CONSTRAINT	VALUE
SEDIMENT TYPE	F (DISPERSIBLE SOILS)
SOIL HYDROLOGY GROUP	D
K = SOIL ERODIBILITY (K-FACTOR)	0.015
R = RAINFALL EROSIVITY (R-FACTOR)	2583
S = 2 YEAR, 6 HOUR STORM INTENSITY	10.9 mm/hr (HONEYSUCKLE)
LS = SLOPE LENGTH/GRADIENT	0.24 (20m SLOPE @ 2% GRADE)
P = EROSION CONTROL PRACTICE (P-FACTOR)	1.3 (TYPICAL)
C = GROUND COVER (C-FACTOR)	1.0 (TYPICAL FOR STRIPPED SITE)
SOIL LOSS (RUSLE METHOD) (tonnes/ha/yr)	12.08
EROSION HAZARD (TABLE 4.2 BLUE BOOK)	VERY LOW
DISTURBANCE AREA (ha)	0.2
SOIL LOSS PER YEAR (m^3/yr)	2
SEDIMENT BASIN REQUIRED?	NO, AS <150m^3/YR

LEGEND

- PROPOSED LOT BOUNDARY LINE
- PROPOSED SITE BOUNDARY LINE
- EXISTING CONTOURS
- SEDIMENT FENCE
- SANDBAG SEDIMENT FILTER
- DRAINAGE SWALE
- STABILISED SITE ACCESS
- PROPOSED STOCKPILE LOCATION.
- EXISTING GRATED INLET PIT.

VERIFIER C.PIPER
JOB MANAGER C.PIPER
DESIGNED S.CROFT
DRAWN L.STEEL

FOR APPROVAL

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR APPROVAL	LS	CP	SC	11.02.19

CLIENT: THE UNIVERSITY OF NEWCASTLE AUSTRALIA

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT

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PLANS 1:150 0 1.5 3 4.5 6.0 7.5m

NORTHROP
Newcastle
Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
P.O. Box 180, Charlestown NSW 2290
Ph (02) 4943 1777 Fax (02) 4943 1577
Email newcastle@northrop.com.au ABN 81 094 433 100

PROJECT: HONEYSUCKLE CITY CAMPUS DEVELOPMENT HONEYSUCKLE DRIVE, NEWCASTLE, N.S.W, 2300

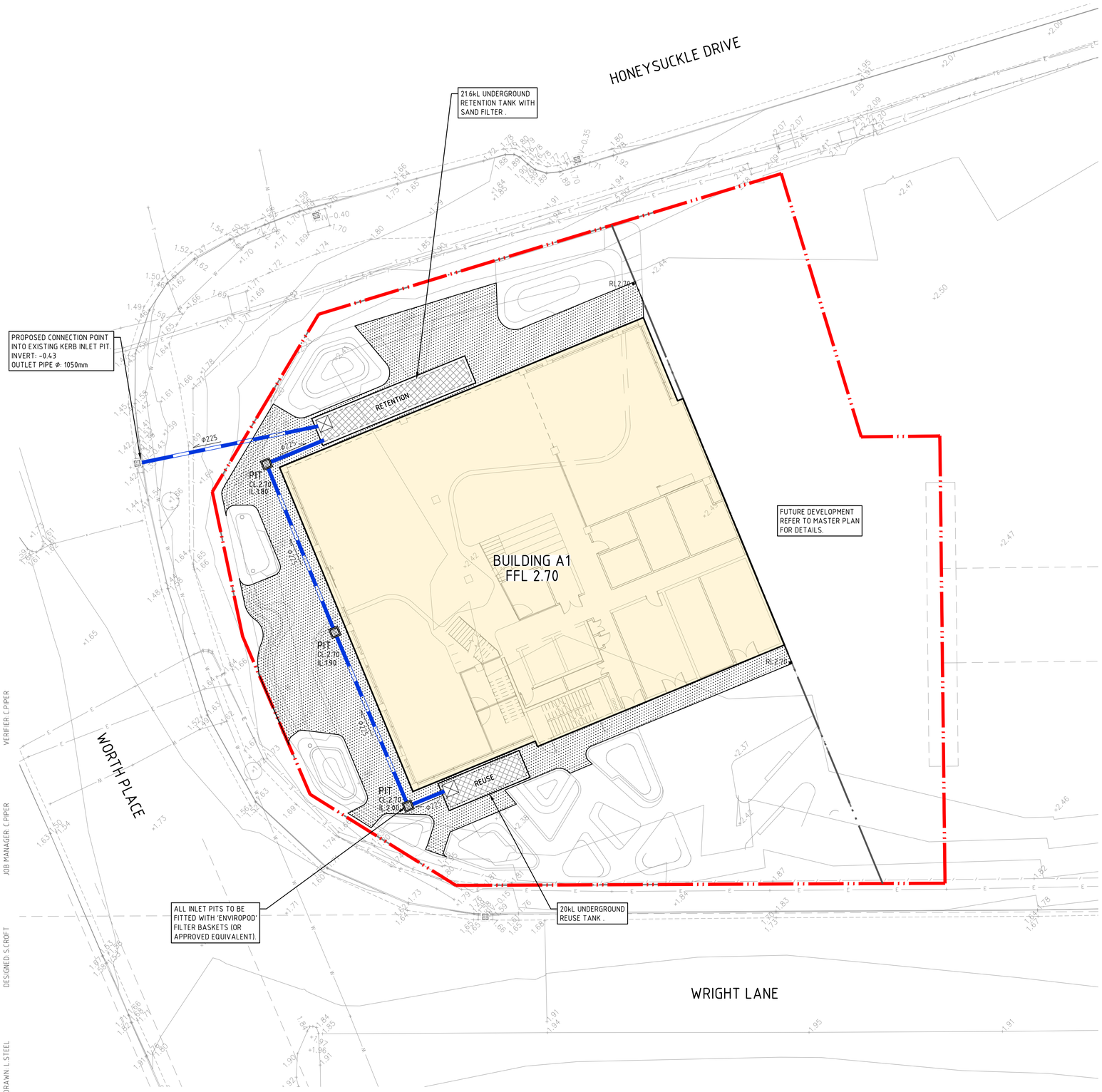
DRAWING TITLE: CONCEPT EROSION AND SEDIMENT CONTROL PLAN - STAGE 1A

JOB NUMBER: NL172766

DRAWING NUMBER: DA-02-CO1.0

REVISION: 1

DRAWING SHEET SIZE = A1



LEGEND

- PROPOSED LOT BOUNDARY LINE
- PROPOSED SITE BOUNDARY LINE
- DENOTES APPROXIMATE EXTENT OF PROPOSED BUILDING. REFER TO ARCHITECT'S DRAWINGS FOR EXACT LOCATION AND DETAILS.
- DENOTES EXTENT OF PROPOSED PEDESTRIAN PAVEMENT. DETAIL TO BE PROVIDED AT CC STAGE.
- REUSE — DENOTES EXTENT OF PROPOSED REUSE TANK. DETAILS TO BE PROVIDED AT CC STAGE.
- RETENTION — DENOTES EXTENT OF PROPOSED RETENTION TANK. DETAILS TO BE PROVIDED AT CC STAGE.
- FFL 3.00 — DENOTES PROPOSED FINISHED FLOOR LEVEL.
- ø150 — DENOTES PROPOSED ø150 uPVC STORMWATER DRAINAGE PIPE U.N.O. AND FLOW DIRECTION. DETAIL TO BE PROVIDED AT CC STAGE.
- FALL — DENOTES DIRECTION OF FALL IN PROPOSED FINISHED SURFACE LEVEL.
- PIT CL.3.00 — DENOTES STORMWATER GRATED INLET PIT AND COVER LEVEL. DETAIL TO BE PROVIDED AT CC STAGE.
- • RL2.70 — DENOTES PROPOSED FINISHED SURFACE LEVEL.

VERIFIER C.PIPER
JOB MANAGER C.PIPER
DESIGNED S.CROFT
DRAWN L.STEEL

FOR APPROVAL

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR APPROVAL	LS	CP	SC	11.02.19

CLIENT
THE UNIVERSITY OF NEWCASTLE AUSTRALIA
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT

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NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.

PLANS 1:150 0 1.5 3 4.5 6.0 7.5m

NORTHROP
Newcastle
Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
P.O. Box 180, Charlestown NSW 2290
Ph (02) 4943 1777 Fax (02) 4943 1577
Email newcastle@northrop.com.au ABN 81 094 433 100

PROJECT
HONEYSUCKLE CITY CAMPUS DEVELOPMENT HONEYSUCKLE DRIVE, NEWCASTLE, N.S.W, 2300

DRAWING TITLE
CONCEPT STORMWATER MANAGEMENT PLAN - STAGE 1A

JOB NUMBER **NL172766**
DRAWING NUMBER **DA-02-CO2.0**
REVISION **1**
DRAWING SHEET SIZE = A1

NORTHROP

APPENDIX D –
MUSIC-LINK REPORT

THE CITY OF NEWCASTLE

MUSIC-*link* Report

Project Details		Company Details	
Project:	NL172766 HCCD Stage 1A	**Company:**	Northrop
Report Export Date:	11/02/2019	**Contact:**	Chris Piper
Catchment Name:	NL172766_Concept_Stage1A_V2_SC	**Address:**	215 Pacific Highway Charlestown 2290
Catchment Area:	0.19ha	**Phone:**	4943 1777
Impervious Area*:	93.83%	**Email:**	cpiper@northrop.com.au
Rainfall Station:	61078 WILLIAMTOWN		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1995 - 31/12/2008 11:54:00 PM		
Mean Annual Rainfall:	1125mm		
Evapotranspiration:	1735mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.31		
Study Area:	Newcastle		
Scenario:	Newcastle		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness

Node: A1 Discahrge	Reduction
Flow	16.8%
TSS	93.4%
TP	68.1%
TN	46%
GP	100%

Treatment Nodes

Node Type	Number
Rain Water Tank Node	1
Media Filtration Node	1
GPT Node	1

Source Nodes

Node Type	Number
Urban Source Node	2

Comments

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	3 x EnviroPod or equivalent	Hi-flow bypass rate (cum/sec)	None	None	0.06
Post	A1 Discahrge	% Load Reduction	None	None	16.8
Post	A1 Discahrge	GP % Load Reduction	90	None	100
Post	A1 Discahrge	TN % Load Reduction	45	None	46
Post	A1 Discahrge	TP % Load Reduction	65	None	68.1
Post	A1 Discahrge	TSS % Load Reduction	85	None	93.4
Rain	Rainwater Tank A1	% Reuse Demand Met	70	None	86.3656
Urban	Building A1 (690m2)	Area Impervious (ha)	None	None	0.069
Urban	Building A1 (690m2)	Area Pervious (ha)	None	None	0
Urban	Building A1 (690m2)	Total Area (ha)	None	None	0.069
Urban	Surrounds A1 (1210m2)	Area Impervious (ha)	None	None	0.109
Urban	Surrounds A1 (1210m2)	Area Pervious (ha)	None	None	0.011
Urban	Surrounds A1 (1210m2)	Total Area (ha)	None	None	0.121

Only certain parameters are reported when they pass validation

APPENDIX E –
HUNTER WATER CORRESPONDENCE

Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
(02) 4979 9625 (F)
hunterwater.com.au

24 May 2018

Ref: 2017-760

Hunter Development Corporation
C/- Northrop Consulting Engineers
P O Box 180
Charlestown NSW 2290

Attention: Andrew Killen

Dear Andrew

AMENDED NOTICE OF FORMAL REQUIREMENTS FOR PROPOSED DEVELOPMENT

Hunter Water implemented a new asset creation process for developer works on 1 July 2017. All developer works from the implementation date are required to be delivered in accordance with the new process. Details are available on Hunter Water's website: www.hunterwater.com.au (Building and Development/New Model for Developer Works)

The Developer is required to download the relevant version of the Developer Works Deed (the Deed), noted below, by visiting Hunter Water's website. Ensure that you have a full appreciation of the content of the Deed and obligations of all parties. The Developer will need to sign and return the Deed to developer.deed@hunterwater.com.au .

The Developer is able to engage Accredited Suppliers only after Hunter Water has returned the signed Deed.

Hunter Water's amended requirements for the provision of water and sewerage facilities to the Stage 1A and 1B development of a multi-staged University Campus at Lot 1, 2, 3 DP 1163346, Lot 4 DP 1111305, Lot 2 DP 1226145 & Lot 21 DP 1165985, Newcastle are below. The amendments are based on WSAA Code requirements for buildings over eight stories to be served by a minimum 250mm water main.

Please note that the following requirements are specific to the Stage 1A and 1B developments and do not necessaily correspond to your proposed servicing arrangements. Should you wish to explore a servicing strategy for the overall development, Hunter Water would be happy to facilitate a meeting to discuss this matter further. Please note that subsequent stages of this development will require separate application to Hunter Water.

Network Infrastructure and Delivery

1 Design and construct developer works under a **Routine Major Works** Deed with Hunter Water to connect each of the lots to the existing water and sewer system(s).

The works must be designed and certified by an Accredited Design Consultant in accordance with the new asset creation process for Developer Works and the **Specific Connection Details** below.

The Deed Number for these works will be **2017-760/5.**

Please note the nominal water and sewer connection points listed in this Notice Letter. Please contact Hunter Water if the proposed connection points are unable to be utilised.

The works design must be compliant with Hunter Water's Deed, Technical Specifications and Standard Drawings.

If the works involve a system shutdown or impact on existing customers you will be required to submit a request to Shutdownrequests@hunterwater.com.au prior to submitting the final design.

It is the responsibility of the Accredited Design Consultant to lodge the finished design Documentation and Design Compliance Certificate to Hunter Water at design.submission@hunterwater.com.au prior to construction starting.

All suppliers engaged by the developer must have insurances in place in accordance with the Deed.

If necessary, you will be required to pay $622 compensation for each maintenance structure constructed on a third party property.

Specific Connection Details

2 Water Supply

The developer must extend a DN250 water main to connect the DN200 UPVC-HD20 water main along Honeysuckle Drive to the DN150 CICL-S along Worth Street (refer to **Figure 1**). The DN100 UPVC-HD20 along Worth Place will also require upsizing to DN250.

For subsequent stages of the University Precinct, the developer will need to extend a water main to provide a frontage to each building within the Precinct. Should any building be greater than 8 stories, the water main should be a minimum 250mm diameter main.

3 Wastewater Transportation

The development can connect to MH G7081 located along Worth Place (refer to **Figure 2**).

Asset Protection

4 Build-Over-Sewer Policy

The development must comply with Hunter Water's Building Over Sewer Assets Policy as it may impact the DN150 UPVC-SN8, DN150 Concrete, and DN300 UPVC-SN8 sewer mains located adjacent to the development lot(s). As such:

a All buildings, structures, landscaping and improvements to the land which are located over or adjacent to the sewer main must not impose any loading on the sewer main nor interfere with or obstruct the sewer in conveying flows.

b Compliance with Hunter Water's Act with respect to the design and construction of all building, structures, landscaping and improvements is required (refer to the Building Over Sewer Assets Policy attached to this Notice of Requirements).

c Hunter Water's minimum cover requirements are to be maintained.

d A minimum clearance of 1.5 m is to be maintained off the Dead End along Wright Lane.

5 Watermain Along Footpath

Ensure that all due care is taken by all contractors in the course of construction activities including construction of the driveway and accessing the construction site as there is a watermain located in the footpath along Worth Place adjacent to the Western boundary of the proposed development site.

The developer should confirm the depth of the watermain by site survey prior to construction to ensure Hunter Water's minimum cover requirements will be complied with in relation to the driveway. If this minimum cover requirement cannot be met, please contact Hunter Water to discuss options for protection of the watermain. An option may be lowering the watermain under a Major Works contract with Hunter Water.

Please note that it is Hunter Water's practice to seek the full costs of repairs should any damage occur to Hunter Water assets.

Other Connection Requirements

6 Environmental Assessment

You will be required to submit a Review of Environmental Factors (REF) (refer Appendix HW 1 of Water Supply Code of Australia – Hunter Water Edition) to Hunter Water for the construction and operation of the proposed works. The REF will need to be approved by Hunter Water prior to the design process being finalised.

An REF considers the likely impacts a development may have on the environment. At all times, methods for preventing or reducing adverse environmental impacts should be considered and where appropriate, incorporated into the project design.

Hunter Water will make a determination in accordance with Environmental Planning and Assessment Act 1979. An environmental report assessment fee should be pain when the REF is submitted.

In addition, please refer to the Hunter Water Review of Environmental Factors Guidance Notes, located in the Building & Development section of the Hunter Water website. The Guidance Notes provide the minimum requirements and an example template for the preparation of a REF.

Please note that a Controlled Activity Approval will be required from the NSW Office of Water for any excavation within 40 metres of a water body or should groundwater be present.

7 Third Party Entry

The proposed works will require entry to another property. You will need to arrange for entry and have evidence of consent by way of a signed Entry Permit with the affected landowner. The Permit is to be submitted with the Design submission.

8 Development Consent

Submit the Development Consent Conditions determined by Council or the Complying Development Certificate for this specific development. Hunter Water will confirm that the final development description is consistent with the details supplied by you for this application. If there are any subsequent amendments to this development consent, Hunter Water will require you to submit a revision application.

9 Trade Waste

Your proposed development has been identified as having the potential to discharge trade waste into Hunter Water's sewerage system. You are required to contact Hunter Water's Technical Services Team on (02) 4979 9712 or via email plumbing@hunterwater.com.au in order to confirm if an application for a Trade Wastewater Agreement is required or if an existing agreement will need to be amended. The discharge of trade waste to the sewer will not be permitted without a valid agreement authorising that discharge. (Refer to the Trade Wastewater factsheet on Hunter Water's website for more information).

10 Hydraulic Assessment

You will be required to submit an application for a hydraulic design assessment of internal water and sewerage services for this development, including rainwater tanks and any alternative water supply systems. Please contact Hunter Water's Technical Services Team on (02) 4979 9712 or via email plumbing@hunterwater.com.au to confirm the specific requirements. (Refer to the Hydraulic Plan Assessment factsheet on Hunter Water's website for more information).

Please note, the information shown on the plan provided with this letter may not be up to date and Hunter Water accepts no responsibility for its accuracy. Any contractor(s) or consultant(s) engaged by the developer should confirm all levels by field survey.

These requirements are valid for 12 months from the date of this letter and are specific to this development. All fees and charges are subject to adjustment using the Consumer Price Index (CPI) adjustment on 1 July each year.

Please refer to the attached Supplementary Information and Guidance which details the conditions under which water and sewer facilities are available to new customers. Hunter Water reserves its right to amend the requirements set out above prior to issuing a Section 50 Compliance Certificate.

Yours faithfully

MALCOLM WITHERS
Account Manager Major Development

Enquiries: Malcolm Withers
Tel: 02 4979 9545
Email: malcolm.withers@hunterwater.com.au

Figure 1 – Water Supply Connection Point

Figure 2 – Sewer Connection Point

BUILDING OVER SEWER ASSETS STANDARD

PURPOSE

Hunter Water maintains a network of sewer mains within its area of operation. Under its Operating Licence Hunter Water is required to meet specified levels of performance with respect to the operation of this sewerage system. The sewerage network requires regular maintenance to ensure its continued operation. Access to underground pipelines is a key factor in providing prompt and cost effective maintenance. The presence of a building or structure over a sewer main restricts or may preclude Hunter Water from accessing the asset for repairs.

SCOPE

This policy applies to all developments proposing to build over or adjacent to Hunter Water's sewer network assets.

POLICY STATEMENT

The policy of Hunter Water is to ensure compliance with the legislation (Hunter Water Act, 1991, as amended) and requires all sewer network assets to be diverted clear of proposed buildings, structures, landscaping and improvements so as to ensure ongoing access to operate and maintain the asset.

Where Hunter Water agrees that there may be a suitably low residual risk, Hunter Water may require that the asset be replaced in-situ with flexible and more durable plastic pipe prior to building works commencing. This work is at the landowner's expense and can usually be carried out by an accredited contractor. Where existing sewer mains are located on the development lot, the landowner is required to undertake work so that the sewer mains comply with the latest Hunter Water Edition, WSAA Design Manual guidelines.

APPLICATION OF POLICY

This policy applies to any development, subdivision, building (residential, commercial or industrial), or any structure proposed to be placed over or adjacent to a sewer asset of Hunter Water.

Where subdivision is proposed and the future building alignments are not known, Hunter Water requires the existing sewer mains to be relocated adjacent to boundaries in accordance with the latest Hunter Water Edition WSAA Design Manual

All footings crossing or adjacent to a sewer main should be strengthened or underpinned to prevent loading upon the sewer and to protect the stability of the structure in the event of subsidence of the

sewer trench, collapse of the sewer, or excavation by Hunter Water to repair or maintain the sewer. In this regard, it may be necessary to consult a competent designer or structural engineer.

Special consideration to footing design should extend to land within the Zone of Influence. This is a nominal strip of land (usually about twice as wide as the sewer is deep) within which the sewer main is centrally located. Ground conditions are an important consideration in determining the likely zone of influence and it may be necessary for you to engage a qualified Geotechnical Engineer to determine the appropriate design parameters influencing the structural performance of proposed foundations, footings or piers. Hunter Water requires a minimum working clearance of 1.5 metres from the centre of any access chamber to a building wall.

The location of the sewer main can be determined from the plan attached to the Section 50 Notice of Requirements. A surveyor or building contractor engaged by the developer will confirm this location. Hunter Water Corporation will not accept responsibility for future maintenance on the shaft and/or branch contained in or under the structure. Conversion of the structure to a habitable area, with or without plumbing fixtures, is not compliant with Plumbing Code of Australia and Australian/New Zealand Standard 3500 (AS/NZS 3500:1).

Enquiries on Hunter Water Corporation's Building Over Sewer Assets Policy should be directed to Hunter Water's 1300 657 657 number.

POLICY ADMINISTRATION

Effective from	29 August 2014
Approved by	Chief Customer Service Officer
Policy Owner	Manager Developer Services
Policy Administrator	Manager Developer Services
Application	All Policies and Schedules of Hunter Water Corporation
Last review date	29 August 2014
Next review date	29 August 2017
Version	2.0
File reference	HW2007-2963/1.003
Published externally	Yes

Approval Signature	Managing Director / Company Secretary

RELATED DOCUMENTS

Building Over Easement or Property

ASSOCIATED REGULATIONS AND STANDARDS

The Hunter Water Corporation Act (1991) requires that no building or structure is to impose any loading on a sewer nor interfere with or obstruct the sewer in conveying flows. Hunter Water's powers allow it to take legal action where there is a breach or threatened breach of the requirements and to recover associated costs from the landowner. Hunter Water may in any case where there is a threatened breach of these conditions; obtain an injunction to prevent any damage to, or interference with, its sewerage system or other works.

ENTRY PERMIT

File Number: 2017-760

……....being the Owner/s of the Land described in Schedule A, grants permission to:

……(the Developer), described in Schedule B, to enter upon the Land and carry out the Work described in Schedule C.

The Owner acknowledges that the Developer will execute the Deed with the Hunter Water Corporation for delivery of the Work described in Schedule C.

The Owner acknowledges that upon completion of the Works the infrastructure will be handed over to Hunter Water for ownership and operation under the Hunter Water Act 1991.

Dated at ..... (*Place*) this .....day of.....2017

…….....(Signature/s of Owner/s)

…….....(Signature of Witness)

……..... (Name of Witness)

SCHEDULE A (Land)

LOT: …….. DP: ……SUBURB: ……

SCHEDULE B (Developer)

Company: ……ABN: …….

Contact:……..Position:……..……Phone:……

…….....(Signature)

SCHEDULE C (Work)

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