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Goodman

# Stormwater Management and Infrastructure Report

## M7 Business Hub
## 9 Roussell Road, Eastern Creek
## Development Application




July 2022 | Prepared for Goodman | Revision C

# Commercial in Confidence



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# Executive Summary

Orion Consulting has been engaged by Goodman Ltd. to prepare Civil Engineering Plans and an accompanying Stormwater Management Report to support the Development Application for the development of an industrial warehouse located at 9 Roussell Road, Eastern Creek, NSW.

This report outlines the site-specific strategy for managing the stormwater quantity and quality to achieve the requirements and targets set out in the Blacktown City Council Development Control Plan. This report is to be read in conjunction with the complementary Civil Engineering Design Plans, Set No. 00, as prepared by Orion Consulting for the proposed development.

This report demonstrates that the proposed development meets and is consistent with the stormwater management requirements as identified by the Blacktown City Council WSUD Developer Handbook and the associated approved documents prepared to support the development application.

# Glossary of Terms

As compiled from the NSW Government Floodplain Development Manual 2005 unless otherwise noted.

| | |
|---|---|
| *Annual Exceedance Probability (AEP)* | The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m3/s has an AEP of 5%, it means that there is a 5% chance (that is one-in-20 chance) of a 500 m3/s or larger event occurring in any one year (see ARI). |
| *Australian Height Datum (AHD)* | A common national surface level datum approximately corresponding to mean sea level. |
| *Average Annual Damage (AAD)* | Depending on its size (or severity), each flood will cause a different amount of flood damage to a flood prone area. AAD is the average damage per year that would occur in a nominated development situation from flooding over a very long period of time. |
| *Average Recurrence Interval (ARI)* | The long term average number of years between the occurrence of a flood as big as, or larger than, the selected event. For example, floods with a discharge as great as, or greater than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.<br><br>**A note on terminology:**<br>The following conversion table as extracted from Australian Rainfall and Runoff 2019, book1, chapter 2 section 2.5.5 below provides a guide to convert ARI to AEP. ARI terminology is noted as being generally the accepted terminology under Australian Rainfall and Runoff 1987 guidelines whiles AEP terminology is noted as being the accepted terminology under Australian Rainfall and Runoff 2016 - 2019 guidelines and onwards. |

| Frequency Descriptor | EY | AEP (%) | AEP (1 in x) | ARI |
|---|---|---|---|---|
| Very Frequent | 12 | | | |
| | 6 | 99.75 | 1.002 | 0.17 |
| | 4 | 98.17 | 1.02 | 0.25 |
| | 3 | 95.02 | 1.05 | 0.33 |
| | 2 | 86.47 | 1.16 | 0.5 |
| | 1 | 63.21 | 1.58 | 1 |
| Frequent | 0.69 | 50 | 2 | 1.44 |
| | 0.5 | 39.35 | 2.54 | 2 |
| | 0.22 | 20 | 5 | 4.48 |
| | 0.2 | 18.13 | 5.52 | 5 |
| | 0.11 | 10 | 10 | 9.49 |
| Rare | 0.05 | 5 | 20 | 19.5 |
| | 0.02 | 2 | 50 | 49.5 |
| | 0.01 | 1 | 100 | 99.5 |
| Very Rare | 0.005 | 0.5 | 200 | 199.5 |
| | 0.002 | 0.2 | 500 | 499.5 |
| | 0.001 | 0.1 | 1000 | 999.5 |
| | 0.0005 | 0.05 | 2000 | 1999.5 |
| Extreme | 0.0002 | 0.02 | 5000 | 4999.5 |
| | | | ↓ | |
| | | | PMP/ PMP Flood | |

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| *Bio-retention System* | A well-vegetated, retention cell or pond designed to enhance water filtration through a specially prepared sub-surface sand filter. Bio-retention cells may be incorporated into grass or vegetated swales or may be a stand-alone treatment system. The system incorporates vegetation with medium-term stormwater retention and sub-surface filtration/infiltration. Also known as bio-filtration systems or biofilters. (QDUM 2013) |
| *Bypass Flow* | That portion of the flow on a road or in a channel which is not collected by a gully inlet or field inlet, and which is redirected out of the system or to another inlet in the system. (QDUM 2013) |
| *Catchment* | The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location. |
| *Consent Authority* | The Council, Government agency or person having the function to determine a development application for land use under the EP&A Act. The consent authority is most often the Council, however legislation or an EPI may specify a Minister or public authority (other than a Council), or the Director General of DIPNR, as having the function to determine an application. |
| *Detention Basin* | A large, open, free draining basin that temporarily detains collected stormwater runoff. These basins are normally maintained in a dry condition between storm events. (QDUM 2013) |
| *Development* | Is defined in Part 4 of the Environmental Planning and Assessment Act (EP&A Act).<br>infill development: refers to the development of vacant blocks of land that are generally surrounded by developed properties and is permissible under the current zoning of the land. Conditions such as minimum floor levels may be imposed on infill development.<br>new development: refers to development of a completely different nature to that associated with the former land use. For example, the urban subdivision of an area previously used for rural purposes. New developments involve rezoning and typically require major extensions of existing urban services, such as roads, water supply, sewerage and electric power.<br>redevelopment: refers to rebuilding in an area. For example, as urban areas age, it may become necessary to demolish and reconstruct buildings on a relatively large scale. Redevelopment generally does not require either rezoning or major extensions to urban services. |
| *Disaster Plan (DISPLAN)* | A step by step sequence of previously agreed roles, responsibilities, functions, actions and management arrangements for the conduct of a single or series of connected emergency operations, with the object of ensuring the coordinated response by all agencies having responsibilities and functions in emergencies. |
| *Discharge* | The rate of flow of water measured in terms of volume per unit time, for example, cubic metres per second (m3/s). Discharge is different from the speed or velocity of flow, which is a measure of how fast the water is moving for example, metres per second (m/s). |
| *Effective Warning Time* | The time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions. |
| *Emergency Management* | A range of measures to manage risks to communities and the environment. In the flood context it may include measures to prevent, prepare for, respond to and recover from flooding. |
| *Extended Detention* | A stormwater detention basin or tank designed to drain over a period of days rather than hours to enhance its pollution retention and solar treatment while minimising the adverse effects of coincident flooding downstream of the basin. (QDUM 2013) |
| *Flash Flooding* | Flooding which is sudden and unexpected. It is often caused by sudden local or nearby heavy rainfall. Often defined as flooding which peaks within six hours of the causative rain. |

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| *Flood* | Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami. |
| *Flood Awareness* | Flood awareness is an appreciation of the likely effects of flooding and a knowledge of the relevant flood warning, response and evacuation procedures. |
| *Flood Education* | Flood education seeks to provide information to raise awareness of the flood problem so as to enable individuals to understand how to manage themselves and their property in response to flood warnings and in a flood event. It invokes a state of flood readiness. |
| *Flood Fringe Areas* | The remaining area of flood prone land after floodway and flood storage areas have been defined. |
| *Flood Liable Land* | Is synonymous with flood prone land (i.e. land susceptible to flooding by the probable maximum flood (PMF) event). Note that the term flood liable land covers the whole of the floodplain, not just that part below the flood planning level (see flood planning area). |
| *Flood Mitigation Standard* | The average recurrence interval of the flood, selected as part of the floodplain risk management process that forms the basis for physical works to modify the impacts of flooding. |
| *Flood Plan (local)* | A sub-plan of a disaster plan that deals specifically with flooding. They can exist at State, Division and local levels. Local flood plans are prepared under the leadership of the State Emergency Service. flood planning area The area of land below the flood planning level and thus subject to flood related development controls. The concept of flood planning area generally supersedes the “flood liable land” concept in the 1986 Manual. |
| *Flood Planning Levels (FPLs)* | FPL’s are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. FPLs supersede the “standard flood event” in the 1986 manual. |
| *Flood Prone Land* | Is land susceptible to flooding by the Probable Maximum Flood (PMF) event. Flood prone land is synonymous with flood liable land. |
| *Flood Proofing* | A combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding, to reduce or eliminate flood damages. |
| *Flood Readiness* | Flood readiness is an ability to react within the effective warning time. |
| *Flood Risk* | Potential danger to personal safety and potential damage to property resulting from flooding. The degree of risk varies with circumstances across the full range of floods. Flood risk in this manual is divided into 3 types, existing, future and continuing risks. They are described below.<br>existing flood risk: the risk a community is exposed to as a result of its location on the floodplain.<br>future flood risk: the risk a community may be exposed to as a result of new development on the floodplain.<br>continuing flood risk: the risk a community is exposed to after floodplain risk management measures have been implemented. For a town protected by levees, the continuing flood risk is the consequences of the levees being overtopped. For an area without any floodplain risk management measures, the continuing flood risk is simply the existence of its flood exposure. |
| *Flood Storage Areas* | Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. Hence, it is necessary to investigate a range of flood sizes before defining flood storage areas. |
| *Floodplain* | Area of land which is subject to inundation by floods up to and including the probable maximum flood event, that is, flood prone land. |

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| *Floodplain Risk Management Options* | The measures that might be feasible for the management of a particular area of the floodplain. Preparation of a floodplain risk management plan requires a detailed evaluation of floodplain risk management options. |
| *Floodplain Risk Management Plan* | A management plan developed in accordance with the principles and guidelines in this manual. Usually includes both written and diagrammatic information describing how particular areas of flood prone land are to be used and managed to achieve defined objectives. |
| *Floodway Areas* | Those areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flows, or a significant increase in flood levels. |
| *Freeboard* | Freeboard provides reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the FPL is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. Freeboard is included in the flood planning level. |
| *GPTs* | Trash rack and/or sediment collection sump usually located at or near the end of a stormwater pipe. (QDUM 2013 in part) |
| *Grass Swale* | Shallow, low-gradient, grass-lined overland flow path used primarily for stormwater treatment. (QDUM 2013) |
| *Habitable Room* | in a residential situation: a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom.<br>in an industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood. |
| *Hazard* | A source of potential harm or a situation with a potential to cause loss. In relation to this manual the hazard is flooding which has the potential to cause damage to the community. Definitions of high and low hazard categories are provided in the Manual. |
| *Hydraulics* | Term given to the study of water flow in waterways; in particular, the evaluation of flow parameters such as water level and velocity. |
| *Hydrograph* | A graph which shows how the discharge or stage/flood level at any particular location varies with time during a flood. |
| *Hydrology* | Term given to the study of the rainfall and runoff process; in particular, the evaluation of peak flows, flow volumes and the derivation of hydrographs for a range of floods. |
| *Intensity-Frequency-Duration Data (IFD)* | Basic rainfall data used in the calculation of rainfall runoff rates. (QDUM 2013) |
| *Local Overland Flooding* | Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam. local drainage Are smaller scale problems in urban areas. They are outside the definition of major drainage in this glossary. |
| *Mainstream Flooding* | Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. |
| *Major Design Storm* | The rainfall event for the AEP chosen for the design of the Major Drainage System. (QDUM 2013) |
| *Major Drainage System* | That part of the overall drainage system which conveys flows greater than those conveyed by the Minor Drainage System and up to and including flows from the Major Design Storm. (QDUM 2013) |
| *Major Overland Flow Path* | An overland flow path that drains water from more than one property, has no suitable flow bypass, and has a water depth in excess of 75mm during the major design storms; or is an overland flow path recognised as significant by the local government. (QDUM 2013) |
| *Manning's Roughness Coefficient* | A measure of the surface roughness of a conduit or channel to be applied in the Manning's equation. (QDUM 2013) |

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|---|---|
| *Mathematical/Computer Models (TUFLOW, WBNM)* | The mathematical representation of the physical processes involved in runoff generation and stream flow. These models are often run on computers due to the complexity of the mathematical relationships between runoff, stream flow and the distribution of flows across the floodplain. |
| *Minor Design Storm* | The rainfall event for the AEP chosen for the design of the Minor Drainage System. (QDUM 2013) |
| *Minor Drainage System* | That part of the overall drainage system which controls flows from the Minor Design Storm e.g. kerbs and channels, inlets, underground drainage etc. for the purpose of providing pedestrian safety and convenience, and vehicle access. (QDUM 2013) |
| *Minor, Moderate and Major Flooding* | Both the State Emergency Service and the Bureau of Meteorology use the following definitions in flood warnings to give a general indication of the types of problems expected with a flood:<br>minor flooding: causes inconvenience such as closing of minor roads and the submergence of low level bridges. The lower limit of this class of flooding on the reference gauge is the initial flood level at which landholders and townspeople begin to be flooded.<br>moderate flooding: low-lying areas are inundated requiring removal of stock and/or evacuation of some houses. Main traffic routes may be covered.<br>major flooding: appreciable urban areas are flooded and/or extensive rural areas are flooded. Properties, villages and towns can be isolated. |
| *Modification Measures* | Measures that modify either the flood, the property or the response to flooding. Examples are indicated in Table 2.1 with further discussion in the Manual. |
| *Peak Discharge* | The maximum discharge occurring during a flood event. |
| *Probability* | A statistical measure of the expected chance of flooding (see AEP). |
| *Probable Maximum Flood (PMF)* | The PMF is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation, and where applicable, snow melt, coupled with the worst flood producing catchment conditions. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain. The extent, nature and potential consequences of flooding associated with a range of events rarer than the flood used for designing mitigation works and controlling development, up to and including the PMF event should be addressed in a floodplain risk management study. |
| *Probable Maximum Precipitation (PMP)* | The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to PMF estimation. |
| *Risk* | Chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. In the context of the manual it is the likelihood of consequences arising from the interaction of floods, communities and the environment. |
| *Runoff* | The amount of rainfall which actually ends up as streamflow, also known as rainfall excess. |
| *State Environmental Planning Policies (SEPP)* | State planning legislation and policies that set rules that control what development can occur on your land |
| *Stage* | Equivalent to “water level”. Both are measured with reference to a specified datum. |
| *Stage Hydrograph* | A graph that shows how the water level at a particular location changes with time during a flood. It must be referenced to a particular datum. |
| *Survey Plan* | A plan prepared by a registered surveyor. |

| | |
|---|---|
| *Water Sensitive Urban Design (WSUD)* | A set of design elements and on-ground solutions that aim to minimise impacts on the water cycle from the built urban environment. It offers a simplified and integrated approach to land and water planning by dealing with the urban water cycle in a decentralised manner consistent with natural hydrological and ecological processes. (QDUM 2013) |
| *Water Surface Profile* | A graph showing the flood stage at any given location along a watercourse at a particular time. |

# 1 Introduction

## 1.1 Site Description

The subject site is located within the Blacktown City Council (BCC) LGA, approximately 320m west of Wallgrove Road, Eastern Creek. The proposed development by Goodman comprises of approximately 5.68 hectares in area with site extents shown in the figure below.


Figure 1 – 9 Roussell Road, Eastern Creek, NSW 2766 (Imagery courtesy of Nearmap©)

Registered as part of Lot 251 DP1082988, the site is bordered by an existing industrial warehouse on Lot 251 to the east, Lot 368 DP1094500 to the North which serves as the location of a Bio-Retention Basin servicing Lot 251, Reedy Creek to the West, and Lot 3 DP229769 which is currently used as a maintenance access way to WaterNSW Supply Pipeline Easement.

The subject site is zoned IN1 (General Industrial) and is primarily lightly vegetated vacant land.

## 1.2 Objectives

The purpose of this stormwater management report is to outline and address any potential stormwater impacts from the proposed development submission in accordance with Blacktown City Council's WSUD Developer Handbook.

The key stormwater management objectives for the development include the following:

- To direct stormwater runoff to Council's drainage system without adversely impacting on adjoining downstream properties
- To ensure the efficient and effective planning, management and maintenance of Council's existing and future stormwater systems and reduce environmental and property damage.
- To ensure that through the use of existing Bio-Retention Basin No. 2 (Henry & Hymas, Ref: 03320-C02-07), stormwater discharge is controlled to match pre-development flows from the site, thereby ensuring the development does not increase the risk of downstream flooding, erosion of unstable waterways or a reduction of the capacity of Council's drainage network.
- Reduce the water demand utilising rainwater harvesting by enabling the use of non-potable water for toilet flushing, irrigation, and other non-potable uses.
- Mitigate the impacts of development on stormwater quality by utilising Bio-Retention Basin No. 2 (Henry & Hymas, Ref: 03320-C02-07) to meet minimum target reduction rates for total suspended solids, and total phosphorous, and provide an on-lot GPT to capture gross pollutants.
- Minimise the potential impacts of development and other associated activities on the aesthetic, recreational and ecological values of our local creeks.

The purpose of this report is to demonstrate compliance of the design with the performance requirements set by the Handbook on these elements.

# 2 Adopted Information

## 2.1 M7 Business Hub – Wallgrove Road & Old Wallgrove Road, Eastern Creek by Henry & Hymas (Ref: 03320-C02-07)

The Bio-Retention Basin No. 2 Detail Plan (03320-C02-07) was prepared by Henry & Hymas for Macquarie Goodman, dated 28th February 2006 to service the entirety of Lot 251. This plan (including drawings 03320-C02-05, -08, and -09) details structural elements of the basin including pits, pipes, weirs, and outlet details. As this basin has been previously approved and constructed, it has been adopted in its existing state to satisfy council's requirements for water quantity and quality.

## 2.2 Survey Data

Survey data utilised was prepared by LTS Lockley for use within the part of Lot 251 subject to this approval, Ref: 51018 003DT, Dated: 29/08/2020.

### 2.2.1 Aerial Imagery

Historical and recent aerial imagery of the site was obtained through NearMaps for documentation purposes.

### 2.2.2 Deposited Plan

Plan of Easement Affecting Lot 251 in DP1082988 was prepared by Matthew William Cleary, Ref: DP1246693 P, Dated 08/05/2012.

# 3 Water Quality Design

As part of Henry & Hymas previously approved design for Bio-Retention Basin No. 2, the basin was designed to manage the quality of water for a catchment area of 15.84ha, encompassing the entire catchment of Lot 251 (Figure 2). As such, no water quality treatment basins are required for the subject site.

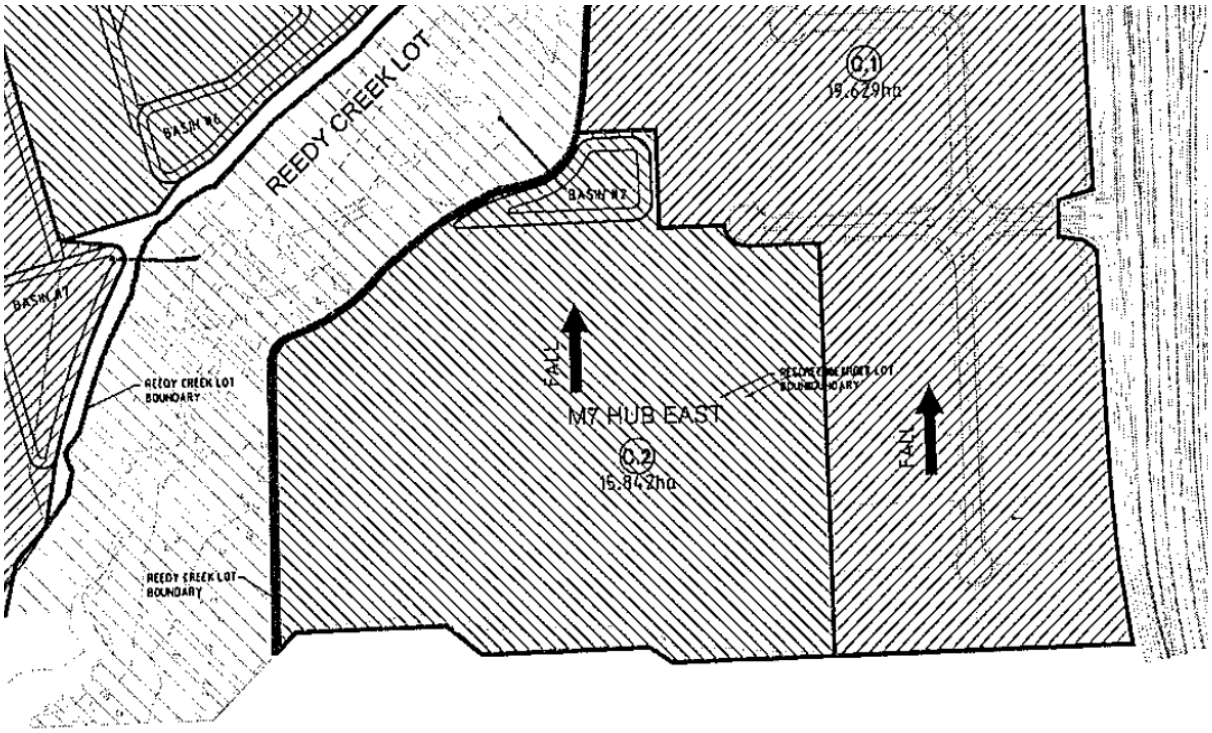


Figure 2 Excerpt from Henry & Hymas Drawing M7 CDA.03 - M7 Business Hub, Wallgrove Road - SEPP 34 Estate Masterplan

Maintaining consistency with the neighbouring development, it is proposed that a GPT will be provided for the site, with performance targets set to remove 90% of gross pollutants. Model and size of the GPT is to be confirmed at detailed design.

Rainwater tanks shall also be provided to meet 80% of non-potable demand in accordance with Blacktown City Council WSUD Developer Handbook.

### 3.1.1 Catchment Areas Summary

The table below summarise the primary sub-catchment area:

Table 1 - MUSIC Sub-Catchment Summary

| | Catchment (ha) |
|---|---|
| Roof to Rainwater Tank 1 (100% Imp) | 1.246 |
| Roof to Rainwater Tank 2 (100% Imp) | 1.560 |

### 3.1.2 Model Layout

The figure below shows the MUSIC model layout and breakdown and can be reviewed in full in the provided modelling file (.sqz).

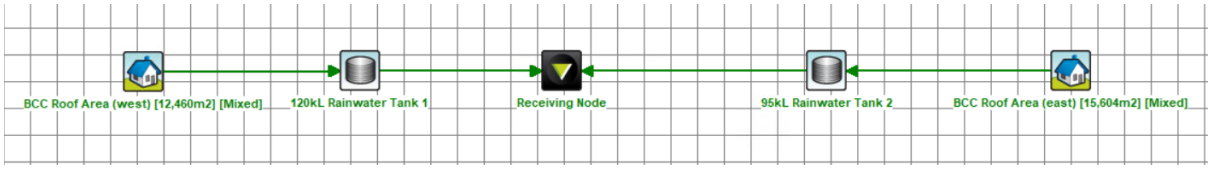


Figure 3 MUSIC Model Layout

## 3.2 MUSIC Modelling Results

Modelling results demonstrate that a 120kL rainwater tank underneath the western carpark and a 95kL rainwater tank underneath the eastern hardstand satisfy requirements for both toilet flushing and irrigation of the landscaped areas within the site.

# 4 Stream Erosion Index (SEI)

The Blacktown City Council WSUD Handbook requires the management of the volume and duration of stormwater flows entering local waterways to protect the geomorphic values of those waterways. As a result, the post-development duration of stream forming flows shall be no greater than 3.5 times the pre-developed duration of stream forming flows. As the site has been accounted for within the design of Bio-Retention Basin No. 2, it has been assumed that the Stream Erosion Index has been satisfied for the entirety of Basin No. 2 catchment.

# 5 On-Site Detention

As part of Henry & Hymas previously approved design for Bio-Retention Basin No. 2, the basin was designed to manage post-development flows for a catchment area of 15.84ha encompassing the entire catchment of Lot 251 (Figure 2). As such, no on-site detention is required for the subject site.

In order to ensure the existing tailwater levels within Basin No. 2 has no adverse effects on the proposed drainage system of the development, a HGL analysis has been conducted using 12D modelling software. A HGL level of 55.22 was adopted for the minor storm event at the connection point into the basin, reflecting the TWL of the basin documented in the Henry & Hymas design (03320-C02-08). A HGL level of 55.30 was adopted for the major storm event at the connection point, reflecting the surface level of the basin overflow weir.

# 6 SEARs Requirements

Included within the development application supporting documentation, are responses to the Planning Secretary's Environmental Assessment Requirements (SEARs). The subject site application number is SSD-41807966.

Please refer to Orion's responses below:

Item 13 -

| | |
|---|---|
| **13. Stormwater and Wastewater**<br>• Provide an Integrated Water Management Plan for the development that:<br>  ○ is prepared in consultation with the local council and any other relevant drainage or water authority.<br>  ○ details the proposed drainage design for the site including any on-site detention facilities, water quality management measures and the nominated discharge points, on-site sewage management, and measures to treat, reuse or dispose of water.<br>  ○ demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.<br>• Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority. | • Integrated Water Management Plan |

Orion Response:
Orion has attempted to contact Blacktown City Council on two (2) accounts to confirm the proposed stormwater strategy for the site and to seek their consultation and acceptance of the proposed strategy. Emails were sent to Tony Merrilees (dated 02/06/2022) and Laith Almoil (dated 02/06/2022) with no response.

Item 21 –

| | |
|---|---|
| **21. Infrastructure Requirements and Utilities**<br>• In consultation with relevant service providers:<br>  ○ assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.<br>  ○ identify any infrastructure upgrades required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained.<br>  ○ provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development. | • Infrastructure Delivery, Management and Staging Plan |

Orion Response:
Orion has engaged an accredited Water Services Coordinator (WSC) and has been advised that both sewer and water critical infrastructure are available for connection for the proposed development (refer to Appendix A).
The existing water connection point for the site (tee and valve connection) is located within the cul-de-sac verge of Roussell Road, due south of the proposed driveway entrance location. The capacity of the water connection is subject to confirmation by Sydney Water.
The existing sewer connection point to which the proposed development may connect to is located due south of the existing Coca Cola Warehouse. The connection has been documented as being capped for the future with

existing size and invert levels unknown. It is recommended that a Hydraulic Engineer confirm the existing capped sewer is suitable for connection by the proposed development. Refer to Section 7 below for discussion of remaining services.

# 7 Utilities

## 7.1 Introduction

Existing services have been identified by Dial Before You Dig and surveying. This information had been presented in the civil plan set on drawings 004-005. All known utilities have been drawn on typical sections and long sections. Where existing utility information was provided in 2D only, standard covers were assumed. All existing utilities are to be located prior to construction.

## 7.2 Water

A Ø150 uPVC watermain is located within the existing cul-de-sac verge of Roussell Road with a potable water stop valve approximately 2.2m south of the proposed driveway. An accredited WSC has advised this watermain is available for connection for the proposed development. Running along the existing verge, this main must be considered in the construction of the proposed driveway layback, with care to be taken to not damage the existing utility.

## 7.3 Sewer

An existing sewer is located south of the existing Coca Cola Warehouse and has been advised by the WSC as a potential connection point for the proposed development. Capped for future connection, the existing sewer line requires invert levels and pipe sizing to be confirmed by a qualified Hydraulic Engineer to confirm suitability for connection.

## 7.4 Communications

There is an existing telecommunication main that also runs within the existing cul-de-sac verge of Roussell Road. It is envisaged that the connection point for the proposed development will be made within the layback of the access driveway. The existing main must be considered in the construction of the proposed driveway layback, with care to be taken to not damage the existing utility.

## 7.5 Gas

There are currently no gas mains within the existing cul-de-sac verge and no gas will be provided for the development.

## 7.6 Electrical

The site currently has 4 x 11kV feeders supplied from Eastern Creek Zone Substation which cross the northern boundary of the site. Supply is to come from one of these four feeders to supply an on-lot substation for the supply of low voltage to the development.

# 8 Summary

The report demonstrates that the proposed stormwater management strategy has been accounted for within the approved Bio-Retention Basin No. 2 design by Henry & Hymas to satisfy water quality and quantity requirements.

It is our position that this integrated water cycle management strategy is suitable to support the development proposal.

A summary of key findings are provided below:

i. The modelling and site assessments provided confirm no adverse stormwater impacts to the proposed development.

ii. The water quantity strategy adopts the existing Bio-Retention Basin No. 2 to reduce post development flows for site catchments as previously designed by Henry & Hymas.

iii. The proposed water quality treatment train comprising of two rainwater tanks meets the post-development percentage reduction target for toilet re-use and irrigation as outlined by Blacktown City Council for the development.

We note that the modelling and reporting of this strategy is concept in nature for the purpose of development application and is subject to further review and refinement at detailed design / construction certificate stage.

# 9 References

Australian Rainfall and Runoff: A Guide to Flood Estimation, Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), Commonwealth of Australia (Geoscience Australia) 2019

WSUD Developer Handbook: MUSIC modelling and design guide 2020

Blacktown City Council: "Engineering Guide for Development" 2005

Queensland Urban Drainage Design Manual, Third Edition, Queensland Government Department of Energy and Water Supply 2013

Using MUSIC in Sydney Drinking Water Catchment, WaterNSW 2019

Henry & Hymas: General Arrangement Plan (03320-C02-05), October 2005

Henry & Hymas: Bio-Retention Basin No. 2 Detail Plan (03320-C02-07), February 2006

Henry & Hymas: Bio-Retention Basin Details (03320-C02-08), February 2006

Henry & Hymas: General Details (03320-C02-09), February 2006

# Appendix A – Sewer & Water Concept Servicing Arrangement

A1

# CONCEPT PLAN

EXISTING WATER CONNECTION POINT FOR THE SITE (TEE & VALVE CONNECTION)
*CAPACITY SUBJECT TO SYDNEY WATER CONFIRMATION*

CN72070 2006

DN300 R.P.

DN200 uPVC

DN150 uPVC

ROUSSELL ROAD

DN250 uPVC

DN150 uPVC

INVERT LEVEL 49.55

EXISTING SEWER CONNECTION POINT FOR THE SITE (CUSTOMER INLET IN MANHOLE)
*CAPACITY SUBJECT TO SYDNEY WATER CONFIRMATION*

150 PVC

100 PVC

100 PVC

100 PVC

50mm RM

EXISTING BUILDING

POTENTIAL PRIVATE SEWER CONNECTION FOR NEW BUILDING HYDRAULIC ENGINEER TO CONFIRM

PROPOSED BUILDING

100 PVC

CAPPED FOR FUTURE (IL UNKNOWN)

SEWER RM (SIZE UNKNOWN)

SEWER PUMP WELL

100 PVC

EXISTING BUILDING

P.F.S.L. 57.58

SHALE PLACE

DN150 uPVC

PLAN DRAWN DATE: 19/5/2022 VERSION: 1 SHEET 1 OF 1 SHEETS

PLAN TO BE READ IN CONJUNCTION WITH CURRENT SYDNEY WATER STANDARDS
SYDNEY WATER CORPORATION

PRIOR TO COMMENCEMENT OF EXCAVATION FOR PROPOSED AND EXISTING SERVICES CONTACT :-

DIAL BEFORE YOU DIG ..... Ph. 1100
ELECTRICITY ..... Ph.
GAS ..... Ph.
TELECOMMUNICATIONS ..... Ph.
..... Ph.

GIVING AT LEAST 48 HOURS NOTICE.

UTILITIES

| TYPE | DATE | REF. | TYPE | DATE | REF. |
|---|---|---|---|---|---|
| | | | | | |

WORK AS CONSTRUCTED CERTIFICATION

DEVELOPER .....
WATER SERVICE CO-ORDINATOR .....
CONSTRUCTOR .....
COMPLETED ..... W.A.C. PREPARED .....

DESIGNER .....

I CERTIFY THAT THE WORKS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE WORK AS CONSTRUCTED DRAWINGS.

PIPE SCHEDULE

| SIZE DN | TYPE | CLASS | LENGTH | PIPE JOINING METHOD / NOTES |
|---|---|---|---|---|
| | | | | |

DESIGN HEAD ..... m

NO BOUNDARY TRAPS REQUIRED.

AUSTRALIAN HEIGHT DATUM

SCALES

PLAN 1:1000 SECTION { HOR. 1:1000 / VERT. - }

CROSS SECTIONS ..... NATURAL

LENGTHS, DEPTHS & LEVELS ARE IN METRES.

NO AMENDMENTS ARE TO BE MADE TO THIS PLAN WITHOUT REFERENCE TO SYDNEY WATER. THIS PLAN IS NOT NECESSARILY UP TO DATE OR CORRECT AND SYDNEY WATER ACCEPTS NO RESPONSIBILITY.

U.B. DIRECTORY ..... 207 - E6 (17th Edition) .....

SHEET 1 OF 1 File No. EN303660

Sydney WATER

SYDNEY WATER CORPORATION

Case No. 199480

SEWER & WATER
CONCEPT SERVICING ARRANGEMENT
M7 BUSINESS HUB