Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

FP3 DISTRIBUTION CENTRE
250 VICTORIA STREET
WETHERILL PARK NSW

CIVIL ENGINEERING ASSESSMENT (INCORPORATING WATER QUALITY & HYDROLOGY IMPACT ASSESSMENT)

STATE SIGNIFICANT DEVELOPMENT APPLICATION (SSD 15221509)

Prepared For:
Woolworths Group Limited
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***Rev*: B**

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Client Contact	Mr Thomas Stock, Woolworths Group

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GLOSSARY OF TERMS

Table (i) Key terms

Key terms	Definition
The Applicant	Woolworths Group Ltd
The Proposal	Construction and operation of a warehouse and distribution facility in Wetherill Park for handling chilled, frozen, and fresh products
The Proposal Site	The area occupied by Lots 1, 2, 3 and 4 DP 78975 located at 250 Victoria Street, Wetherill Park.

Table (ii) Glossary

Term	Definition
C&I	Commercial and industrial
CBD	Central Business District
CEMP	Construction Environmental Management Plan
Council	City of Fairfield Council
DA	Development Application
DP	Deposited Plan
DPIE	Department of Planning, Industry and Environment
e.g.	for example
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
ha	hectares
i.e.	that is

Term	Definition
km	kilometre
LGA	Local Government Area
m	metres
m2	square metres
NSW	New South Wales
OEH	Office of Environment and Heritage
SEARs	Secretary Environmental Assessment Requirements
SSD	State significant development
tpa	tonnes per annum

EXECUTIVE SUMMARY

Woolworths Group Ltd (Woolworths - the Applicant) are seeking to establish a state-of-the art distribution centre located at 250 Victoria Street, Wetherill Park.

The Proposal would be considered State significant development (SSD) under the requirements of the *State Environmental Planning Policy (State and Regional Development) 2011*. Accordingly, an Environmental Impact Statement (EIS) has been prepared to support the SSD Application for the Proposal. This Water and Hydrology Assessment has been prepared by Costin Roe Consulting to support the preparation of the EIS and assess the Proposal's impact on the surrounding environment in relation to stormwater and stormwater management.

Proposal overview

Consent is sought for the construction and operation of a warehouse and distribution facility. The proposed warehouse and distribution facility would comprise storage and distribution of goods. The ground floor would contain the storage of produce and general storage and Level 1 would contain the storage of chilled and frozen goods. Both levels would include hardstand for loading bays for pick up and drop off of goods via rigid vehicles. Ancillary car parking has been provided on Site to facilitate operational phase of the proposed development. Ancillary offices, support space and staff amenities are provided at both ground floor and level 1.

Purpose of this assessment

This Water and Hydrology Impact Assessment has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) as they relate to water and hydrology, including:

- Stormwater Management including stormwater quantity and quality;
- Flooding; and
- Erosion & Sediment Control.

Construction impacts

During the construction phase, a *Sediment and Erosion Control Plan* will be in place to ensure the downstream drainage system and receiving waters are protected from sediment laden runoff.

Operational impacts

During the operational phase of the development, the proposed stormwater quality treatment system incorporating the use of a treatment train of a gross pollutant trap and filtration is proposed to mitigate any increase in stormwater pollutant load generated by the development. Best management practices have been applied to the development to ensure that the quality of stormwater runoff is not detrimental to the receiving environment.

Further it has been confirmed that the development meets flood planning requirements and does not impact or encroach on existing flood affected areas (as defined in separate approval to COUNCIL and associated TUFLOW flooding assessment completed by Catchment Simulation Solutions). This shows that local post development flows from the site, in conjunction with the flood management measures to be adopted in the flooding assessment demonstrates that the site discharge will not adversely affect any land, drainage system or watercourse as a result of the development.

Conclusion

The hydrological assessment of the local site drainage confirms that recommended water quality and quantity measures will ensure that no adverse impacts result on receiving waterways as a result of the development.

The detail contained in this report provides sufficient information to show the consent authority that legal points of discharge and a suitable stormwater management strategy is available for the development and the requirements associated with the strategy. It is recommended the management strategies in this report be approved and incorporated into the future detailed design.

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1 INTRODUCTION

1.1 Introduction

Costin Roe Consulting Pty Ltd has been commissioned by Woolworths to prepare this Water and Hydrology Impact Assessment in support of a proposed State Significant Development Application (SSDA 15221509) to be lodged over the site.

Consent is sought for the construction and operation of a warehouse and distribution facility. The proposed warehouse and distribution facility would comprise storage and distribution of goods. The ground floor would contain the storage of produce and general storage and Level 1 would contain the storage of chilled and frozen goods. Both levels would include hardstand for loading bays for pick up and drop off of goods via rigid vehicles. Ancillary car parking has been provided on Site to facilitate operational phase of the proposed development. Ancillary offices, support space and staff amenities are provided at both ground floor and level 1.

The Proposal is considered a state significant development (SSD) per the *State Environmental Planning Policy (State and Regional Development) 2011* accordingly, an Environmental Impact Statement (EIS) has been prepared to support the SSD Application for the Proposal.

Revision B of this report has been produced to incorporate a revised building layout which results in improved noise reductions and reduced visual impacts on sensitive receiver locations to the south and east of the site.

from the original report. The report also included revised flooding assessments to resolve the previously reported water level changes within the trunk channel downstream of the site.

1.2 Location & Site Description

The proposed development is located in the suburb of Wetherill Park at 250-266 Victoria Street, Lots 1 to 4 of DP781975, as shown in **Figure 1.1**.

The site is roughly rectangular and has an area of approximately 8.6 Ha. The proposed development is located in the suburb of Wetherill Park on the northern side of Victoria Street, extending north to a second street frontage on Redfern Street. The site is located within an established area comprising industrial development known as the *Wetherill Park Industrial Estate* and is flanked by existing industrial development.

The existing site currently comprises several office and storage buildings. These buildings are located on the southern end of the site with access to Victoria Street. An existing container hardstand is located on the north and east of the site and storage areas are located on the west. Due to the existing site activities, the property has undergone earthworks & benching to reach its current levels.

An open concrete lined trunk drainage channel is located to the east on the property. This concrete channel conveys stormwater from the site and catchments within the Wetherill Park Industrial Estate to the north-east of the subject land. The trunk drainage line joins Prospect Creek and Council's Rosford Street Regional detention system (located in the Rosford Street reserve and playing fields).

Figure 1.1. Locality Plan (Source: Six Map Viewer 2021)

The closest residential receivers are located approximately 85 m to the south and 230 m to the east of the site.

As discussed in **Section 1.4**, the Site has approval from Fairfield City Council (Council) for earthworks and retaining wall construction per Development Approval Number 62.1/2021 (dated 23 March 2021). The SSDA assessment includes consideration of the "*Infrastructure Early Works*" engineering package (including bulk earthworks and retaining wall) which has been approved by Fairfield City Council. The earthworks approval includes cutting and filling of the site to achieve a benched site consistent with the requirements of the Proposal.

The impact assessment in this report has been completed based on condition where construction of the early works, approved by Council, has been completed, or is in the process of being completed – refer **Figure 1.3** for current assessed conditions.

1.3 Proposed Development

The Proposal would comprise the construction and operation of a warehouse and distribution centre. The proposed warehouse and distribution facility would comprise storage and distribution of goods. The ground floor would contain the storage of produce and general storage and Level 1 would contain the storage of chilled and frozen goods. Both levels would include hardstand for loading bays for pick up and drop off of goods via rigid vehicles. Ancillary car parking has been provided on site to facilitate operational phase of the proposed development. Ancillary offices, support space and staff amenities are provided at both ground floor and level 1.

The key components of the Proposal are shown in **Figures 1.2** to **1.4**.

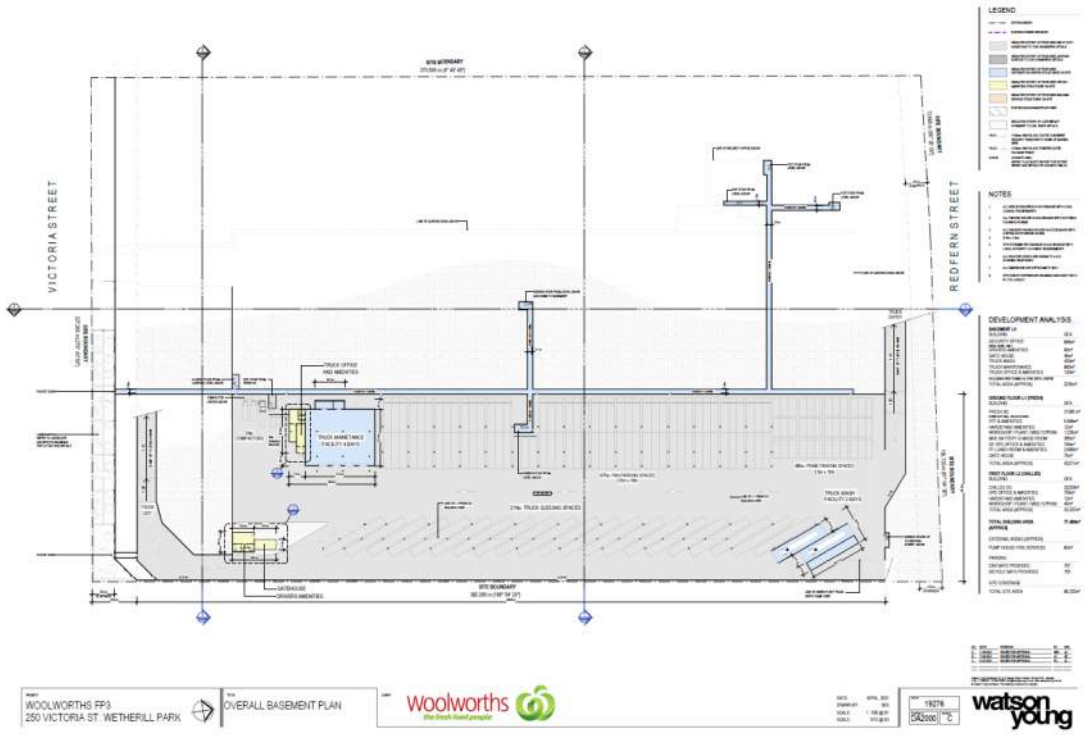


Figure 1.2. The Proposal (Basement Level)

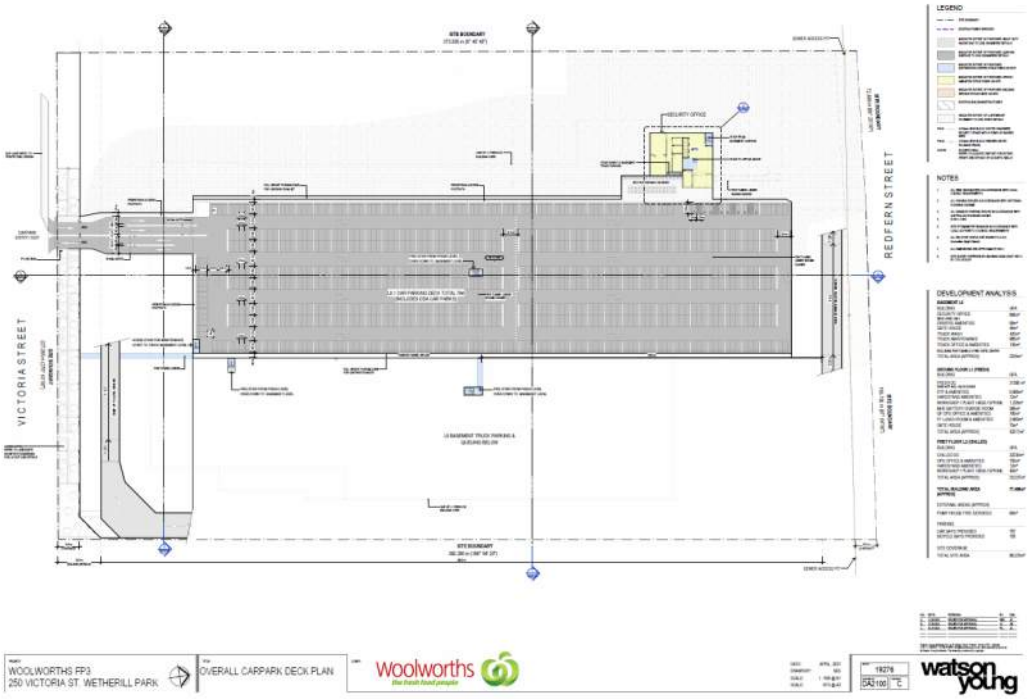


Figure 1.2. The Proposal (Carpark Level)

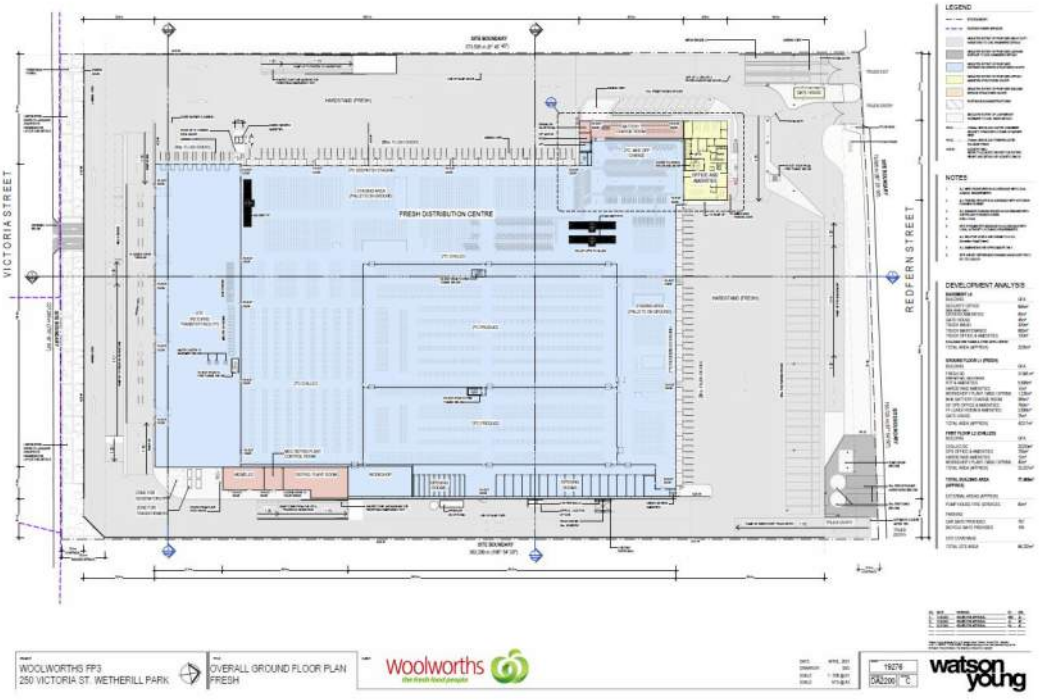


Figure 1.3. The Proposal (Ground Level)

1.4 Current Conditions and Conditions at Time of Construction of the Proposal

The site has been used for various industrial activities, most recently by Austral Masonry.

The southern portion of the site contained a single storey brick building, a two-storey rendered building, a metal awning, three demountable buildings and a large concrete panel warehouse. Surrounding the existing structures, the ground surface was predominantly covered with asphaltic concrete (AC) and concrete pavements, with isolated grass, gravel or gravelly sand covered areas. There are several garden beds located along the Victoria Street frontage and adjacent to parking area, containing scattered small to medium sized trees.

Elsewhere on the site are existing extensive hardstand and storage areas, as can be seen in **Figure 1.1**.

Located off the northern half of the western site boundary, are several neighbouring brick warehouses which either abutted, or were within about 1.5m, of the common boundary. All of these neighbouring warehouses appeared to be in good condition, based on a visual inspection from within the site. Located off the southern half of the western site boundary was an on-grade car park on an elevated fill platform. The eastern side of the fill platform. The toe of the fill batter was located just inside the neighbouring property to the west along its northern portion, and just inside the subject site along its southern portion.

On 23 March 2021, Woolworths received approval for a development application (DA) (DA62.1/2021) with Council for the development of earthworks and retaining walls (the *Infrastructure Early Works*). The DA has approval for early works and site establishment across the Proposal site to enable site clearing, implementation of earthworks and construction of perimeter retaining.

The *Infrastructure Early Works* include:

- Site clearance, including:
  - Demolition of temporary structures and general clean-up of the proposed site fill area and flood storage area;
  - Removal of tress and other vegetation;
  - Crushing of the existing concrete slab, temporary stockpiling of crushed material and reuse of it as a fill material;
- Erosion and Sediment Controls including:
  - Silt fencing;
  - Diversion drains;
  - Site stabilisation;
  - Sediment Controls including sediment basins;
- Earthworks, including:
  - Cut and fill benching works;
  - Construction of a perimeter retaining walls; and
  - Filling the area to the required level using existing crushed recycled concrete material and site won material.

The commencement of the construction of the Proposal would occur following or during the back end of the completion of the earthworks. **Figure 1.4** shows the *Infrastructure Early Works*; depicting the features of the Proposal site upon commencement of the construction of the Proposal. Reference to **Appendix D** should be made for the *Infrastructure Early Works* engineering design package approved by Council.

1.5 Differences Between the Approved DA62.1/2021 and Modified S4.55 Proposal Early Works

In addition to the approved *Infrastructure Early Works* engineering design package, a S4.55 Development Application Modification has been submitted to council for approval. **Figures 1.4** and **1.5** show the approved earthworks plans and cut to fill depths. The key differences between the approved early works development and current are as follows:

- Adjustment of overall benched pads to suit the revised anticipated future building development layout;
- Overall earthworks volumes reduced. The intention for the site to remain close to an overall cut to fill balance site with minimal export is maintained, noting some export will be anticipated as part of the earthworks completion;
- Reconfiguration of perimeter retaining walls, and overall reduction in wall height of walls on the western boundary;
- Introduction of construction of internal retaining walls;
- Introduction of some inground drainage to be incorporated into the erosion and sediment control strategy. This drainage would assist in facilitating movement of runoff from upper pads to lower pads following completion and during construction period, and prior to the future development construction. It could be anticipated that some of the drainage installed for the early works could be reused in the final building design;
- The overall erosion and sediment control measures and sediment basin design, remains consistent between the approved and modified early works proposal;
- No differences in the previously assessed flood conditions change as a result of the S4.55 modification.

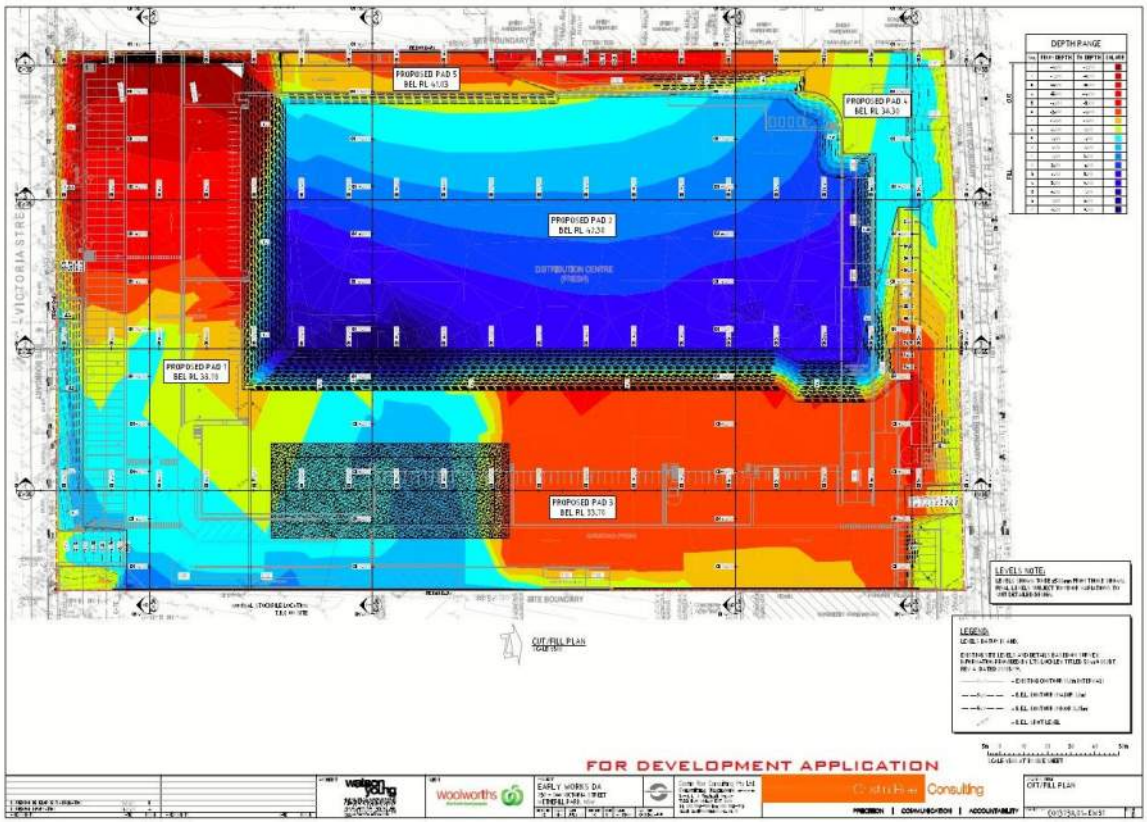


Figure 1.4. Earthworks Cut to Fill Earthworks Plan Approved Vide *DA62.1/2021*

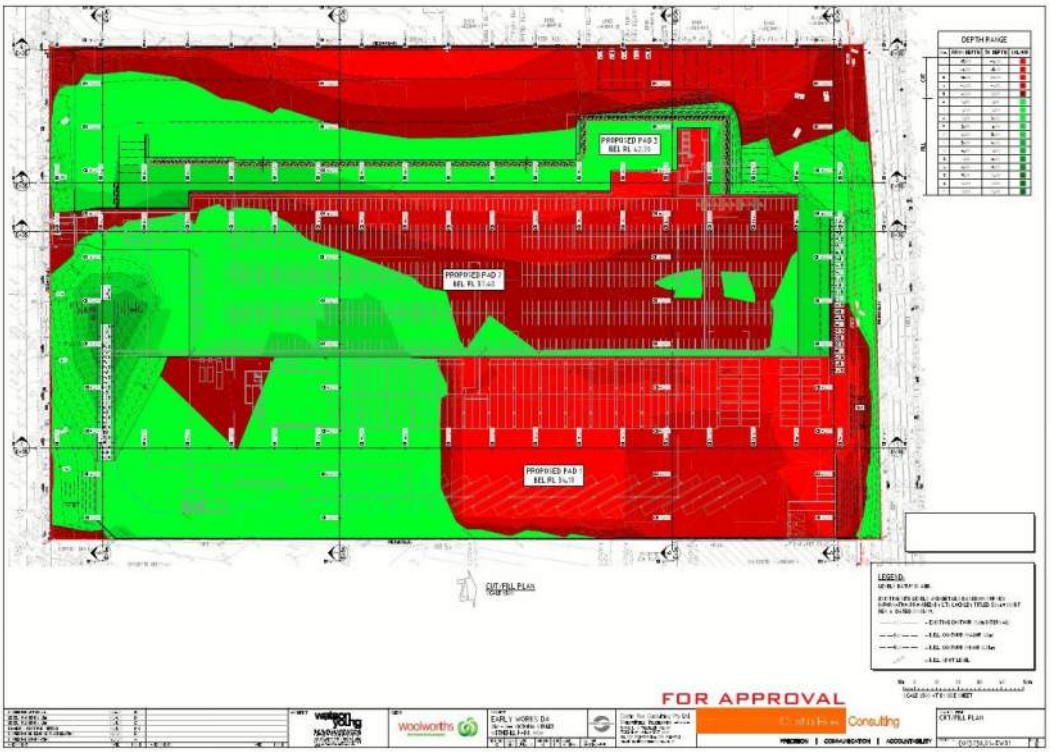


Figure 1.5. Proposed S4.55 Cut to Fill Plan

1.6 Purpose of this report

This Water and Hydrology Impact Assessment has been provided to support the EIS in relation to impacts associated with the following components of the proposal:

- Stormwater Management including stormwater quantity and quality;
- Flooding; and
- Erosion & Sediment Controls during construction.

The objectives for the assessment are to ensure that potential for detrimental impacts on the environment are mitigated through provision of development which, based on the proposed Development Layout:

- responds to the topography and site constraints, considers flooding and flood planning requirements
- provides an appropriate and economical stormwater management system which incorporates best practice in water sensitive urban design consistent with and mitigates impact to receiving waters through provision of water quality improvement measures to reduce pollutants from stormwater runoff from the development.

A set of drawings (refer **Appendix A**) have been prepared to accompany the impact assessment and show how the development and proposed civil engineering components (including site levels, stormwater drainage layout and water quantity and quality requirements) of the development can manage the potential for impact to the environment. These drawings are for development approval and impact assessment only and subject to change during detail design. Outcomes of the impact assessment would remain consistent in any future detail design process.

The consent authority is The NSW Department of Planning, Industry& Environment (DPIE) as the proposal considered a State Significant Development (SSD). However, as the subject site is located within Fairfield City local government area (LGA), the requirements of the Fairfield City Council *Stormwater Management Policy 2017* have also been considered in the setting proposed design and mitigation measures.

The DPIE has provided Secretary's Environmental Assessment Requirements (SEAR's) dated March 2021, Ref: SSD15221509. In addition to providing a general summary of civil engineering aspects of the proposal, this report addresses the Soil and Water items included in the SEAR's:

It is noted that this site has been approved for *Infrastructure Early Works* by Council for approval for earthworks and retaining wall construction. This impact assessment has been completed based on condition where the construction of the early works has been completed.

1.7 Purpose Of Report And Sears

This *Water and Hydrology Impact Assessment* supports the EIS for the Proposal and has been prepared as part of an SSD Application for which approval is sought under Part 4, Division 4.7 of the EP&A Act.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) (SSD 15221509) for the Proposal, issued by NSW Department of Planning, Industry and Environment (DPIE) during March 2021.

Table 1.1 provides a summary of the relevant SEARs which relate to water and hydrology, and where these have been addressed in this report.

Table 1.1. SEARs

SEARs	Where Addressed
8. Soil and Water	
An assessment of potential surface water impacts associated with the development, including potential impacts on watercourses	Refer **Section 1** for background conditions relating to the development site. Refer **Sections 1, 2, & 3** for assessment of stormwater management including assessments of hydrology, watercourses, and drainage lines. It is noted that no earthworks are proposed for this development (being subject to a separate approval by Fairfield Council) hence impacts on groundwater, topography and or earthworks are not considered relevant.
A detailed site water balance including a description of the water demands and breakdown of water supplies, and any water licensing requirements	Refer **Sections 5** for assessment of water balance considerations.
Details of stormwater and wastewater management systems including the capacity of onsite detention system/s, onsite sewage management and measures to treat, reuse or dispose of water	Refer **Sections 1, 2, 3 & 5** for assessment of stormwater management systems. Refer EIS relating to leachate containment and wastewater disposal systems.
Description of the measures to minimise water use.	Refer **Sections 1, 2, 3 & 5** for assessment of stormwater

SEARs	Where Addressed
	management systems including measures to minimise water use.
Description of the proposed erosion and sediment controls during construction.	Refer **Section 2.4** and **Appendix C** for proposed erosion and sediment controls during construction.

Further to the above, the SEARS Attachment 2 includes specific Government Authority Responses including Fairfield City Council, Transport for NSW (TfNSW), NSW EPA, NSW Heritage, the Water Group of DPIE, Environment, Energy and Science (EES) Group of DPIE, and Ausgrid require further details on specific requirements relating to their authority. These requirements are discussed throughout the report as indicated in **Table 1.2**.

Table 1.2 Local and State authority requirements and relevant report sections

Water and Hydrology	Where Addressed
Fairfield City Council	
Overland Flooding The site is affected by low and medium risk overland flow at the site's northern boundary with Redfern Street and Low Risk Overland flow to the site's southern boundary with Victoria Street.	Refer **Section 4** for flood and overland flow assessments.
Flood Risk Management Report Prepared by a qualified consultant, is required to demonstrate that the proposal complies with Chapter 11 of the Fairfield City Wide Development Control Plan 2013. The applicant should model the proposal using Council's established TUFLOW model. Access to Council's model is available through the 'Developer Agreement' process.	Refer **Section 4** for flood and overland flow assessments. It is confirmed that a Developers Agreement has been made with Fairfield City Council and one of their three preferred flood modellers (Catchment Simulation Solutions) who have completed the TUFLOW modelling, with interpretation of the results completed by Costin Roe Consulting.
It is encouraging to see that the proposed development will include a stormwater quality treatment train approach, to reduce pollutants leaving the site in accordance with Council's pollution reduction targets.	Water quality system consistent with Fairfield Council, Prospect Creek water quality objectives has been proposed for the development. Refer **Section 1.7**, **2.1** and **Section 2.5**.
It is also positive that rainwater harvesting will also be applied across the site incorporating reuse in irrigation and toilet flushing.	Rainwater harvesting is proposed for non-potable uses in accordance with Fairfield City Council Stormwater Drainage Policy 2017. Refer **Section 5**.
Heavy Vehicle Routes The EIS must address additional truck routes that have not been addressed in the scoping report, including:	Refer to traffic impact (TIA) assessment report by Colston Budd Rogers & Kafes Pty Ltd (CBRK) for confirmation of truck routes.

Water and Hydrology	Where Addressed
· Redfern Street between Walter Street and Hassall Street; · Redfern Street between Walter Street and Hassall Street; · Hassall Street between Redfern Street and Widemere Road; · Widemere Road between Hassall Street and Council's Boundary; · Hassall Street between Gipps Road and Widemere Road; · Walter Street between Victoria Street and Redfern Street; · Victoria Street between Cowpasture Road Elizabeth Street; · Cowpasture Road between The Horsley Drive and Victoria Street ,  *Figure 1 – potential operational and construction truck routes* Council's Assets Team require the applicant engage an experienced pavement design engineer to assess the following and provide a report in relation to the impact of the proposal on existing road pavement and existing drainage structures such as stormwater pipes, pits culverts and bridges in the surrounding road network for heavy vehicle movement during the construction phase of the project.	
Upgrading Vehicle Routes As there will be significant increase in heavy vehicle movement associated with the proposal there are likely to be impacts on	Refer to traffic impact (TIA) assessment report by Colston Budd Rogers & Kafes Pty Ltd

Water and Hydrology	Where Addressed
various road infrastructure (e.g. pavement, stormwater pipes, culverts, bridges). Consideration must be given to upgrading Redfern Street and nearby local roads to cater for a higher mass limit (HML) during construction and operation of the facility.	(CBRK) for confirmation of truck routes. It is noted that Victoria Street is an existing approved Higher Mass Limit HML road and Redfern Street is approved for General Mass Limit (GML) and Concessional Mass Limit (CML). During construction and operation, the existing road limits are proposed to be maintained. There are no proposed changes in the use of HML vehicles on roads not currently approved for HML use. Given there is no proposed change in the existing load limits for the surrounding roads, there should not be any requirement for the applicant to complete an assessment of the existing road infrastructure and/ or pavements as part of the proposal. Refer **Section 6** and **CBRK TIA**.
Pavement design Shall comply with Austroads Guidelines *"A Guide to the Structural Design of Road Pavements*" and design for other proposed infrastructures shall comply with Council's design guidelines. Construction is required to comply with Council's road works specifications. These designs will be submitted to Council for review and approval.	Pavement designs for public domain or roads are not required for the development. If required designs would be completed in accordance with the noted document. The need for approval of pavement designs for private development should not be a requirement of development, noting that detailed pavement designs would be completed by a suitably qualified civil, structural, or geotechnical engineer as part of the detail design works/ construction certificate phase of the project.

Water and Hydrology	Where Addressed
Road Works Permit In order to work on Council roads, the applicant will need to apply for a road works permit. The dilapidation survey should include information in regard to each defect on the road surface, kerb and gutter and other associated assets and is to be prepared by a suitably qualified person. This process will establish the extent of any existing damage and enable any deterioration during and after construction to be observed. Map showing below the details of pipe culvert on Redfern Street, drainage pits and pipes:  Figure 2 – Details of Pipe Culvert on Redfern Street and Drainage Pits and Pipes	Any public domain works would require the necessary design and construction authority approval. As noted above, given there are proposed changes to existing GML, CML and HML roads it is not anticipated that works in the public domain would be required. A dilapidation survey of areas local to the development can be provided prior to the construction phase of the development.
DPIE (Water) – ref: OUT21/2582	
The SEARs should include: The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.	Refer EIS and **Section 5**. Water supply will be provided by Sydney Water for the duration of the development.
A detailed and consolidated site water balance	Refer **Sections 5** for water cycle management.
Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent	Refer **Sections 2, 3 & 5** for assessment of surface stormwater management including assessments of hydrology, watercourses, and drainage lines.

Water and Hydrology	Where Addressed
ecosystems, and measures proposed to reduce and mitigate these impacts	It is noted that no earthworks are proposed for this development hence impacts on groundwater, topography and or earthworks are not considered relevant.
Proposed surface and groundwater monitoring activities and methodologies.	Surface and groundwater monitoring are not proposed or required for the proposal. Refer **Appendix B** for *DRAFT Maintenance and Monitoring* recommendations associated with the specified drainage system and water quality measures.
Consideration of relevant legislation, policies, and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans (available at https://www.industry.nsw.gov.au/water).	No water sharing activities are proposed. The site and majority of works are located adjacent to a concrete lined channel hence riparian corridors requirements are not required.
DPIE (Environment, Energy and Science)	
7. The EIS must describe background conditions for any water resource likely to be affected by the development, including: a) Existing surface and groundwater	Refer **Sections 2, 3 & 5** for assessment of surface stormwater management including assessments of hydrology, watercourses, and drainage lines. It is noted that no earthworks are proposed for this development hence impacts on groundwater, topography and or earthworks are not relevant to the SSDA impact assessments.
b) Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.	Refer **Sections 2, 3 & 5** for assessment of surface stormwater management including assessments of hydrology, watercourses, and drainage lines.

Water and Hydrology	Where Addressed
	It is noted that no water intake is proposed for the development.
c) Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.ciov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.	Refer **Section 2** for surface water quality objectives and modelling. It is noted that no earthworks are proposed for this development hence impacts on groundwater, topography and or earthworks are not relevant to the SSDA impact assessments.
d) Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.	Refer **Section 2** for water cycle management objectives including water quality and quantity criteria.
e) Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions http://www.environment.nsw.gov.au/research-andpublications/publications-search/risk-based-framework-for-considering-waterwayhealth- outcomes-in-strategic-land-use-planning	Refer **Section 2** for water cycle management objectives including water quality and quantity criteria.
8. The EIS must assess the impact of the development on hydrology, including: a) Water balance including quantity, quality and source.	Refer **Sections 5** for water cycle management and supporting assessments.
b) Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.	Refer **Section 1.7** for key water management objectives and Section **2 & 3** for supporting assessments. Discharge is noted to be to an engineered trunk drainage channel and discharge is

Water and Hydrology	Where Addressed
	consistent with discharge from the historic facility located on the site. Conveyance of stormwater from all sites within the Wetherill Park Industrial Area (including the proposal site) are all conveyed via trunk drainage infrastructure to regional detention basins upstream of Prospect Creek. As the site drains to existing engineered systems which manage stormwater quantity, there is no adverse effect on downstream rivers, wetlands, estuaries, marine waters, and floodplain areas.
c) Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.	Refer **Section 1.7** for key water management objectives and Section **2 & 3** for supporting assessments. Discharge is noted to be to an engineered trunk drainage channel and discharge is consistent with discharge from the historic facility located on the site. Conveyance of stormwater from all sites within the Wetherill Park Industrial Area (including the proposal site) are all conveyed via trunk drainage infrastructure to regional detention basins upstream of Prospect Creek. As such there is no adverse effect on downstream water-dependent fauna and flora including groundwater dependent ecosystems
d) Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect	Refer **Section 1.7** for key water management objectives and

Water and Hydrology	Where Addressed
river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches).	Section **2 & 3** for supporting assessments. Discharge is noted to be to an engineered trunk drainage channel and discharge is consistent with discharge from the historic facility located on the site. Conveyance of stormwater from all sites within the Wetherill Park Industrial Area (including the proposal site) are all conveyed via trunk drainage infrastructure to regional detention basins upstream of Prospect Creek. As such there is no adverse impacts on natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity, and access to habitat for spawning and refuge (e.g. river benches).
e) Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.	There are no changes associated with water availability as a result of the proposed development.
f) Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.	Refer **Section 1.7** for key water management objectives and Section **2 & 3** for supporting assessments. There is no change to existing flow or discharge volumes or rates, hence no impact from the Proposal.
g) Identification of proposed monitoring of hydrological attributes.	Refer **Appendix C** for DRAFT Maintenance and Monitoring requirements associated with the specified drainage system and water quality measures.

Water and Hydrology	Where Addressed
9. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including: a) Flood prone land.	Refer **Section 4** for flood and overland flow assessments.
b) Flood planning area, the area below the flood planning level	Refer **Section 4** for flood and overland flow assessments.
c) Hydraulic categorisation (floodways and flood storage areas)	Refer **Section 4** for flood and overland flow assessments.
d) Flood hazard	Refer **Section 4** for flood and overland flow assessments.
10. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1% AEP, flood levels and the probable maximum flood, or an equivalent extreme event.	Refer **Section 4** for flood and overland flow assessments. It is confirmed that a Developers Agreement has been made with Fairfield City Council and one of their three preferred flood modellers (Catchment Simulation Solutions) who have completed the TUFLOW modelling, with interpretation of the results completed by Costin Roe Consulting.
11. The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios: a) Current flood behaviour for a range of design events as identified in 14 above. This includes the 0.5% and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.	Refer **Section 4** for flood and overland flow assessments
12. Modelling in the EIS must consider and document:	

Water and Hydrology	Where Addressed
a) Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies.	Refer **Section 4** for flood and overland flow assessments. It is confirmed that a Developers Agreement has been made with Fairfield City Council and one of their three preferred flood modellers (Catchment Simulation Solutions) who have completed the TUFLOW modelling using Councils existing flood model. The result of the modelling has been interpreted by Costin Roe Consulting.
b) The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood, or an equivalent extreme flood.	Refer **Section 4** for flood and overland flow assessments.
c) Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories	Refer **Section 4** for flood and overland flow assessments.
d) Relevant provisions of the NSW Floodplain Development Manual 2005.	Refer **Section 4** for flood and overland flow assessments.
13. The EIS must assess the impacts on the proposed development on flood behaviour, including: a) Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.	Refer **Section 4** for flood and overland flow assessments. It is noted that the existing development site is free of the 1% AEP extent, being the Defined Flood Event (DFE) and applicable for impact assessment. It is confirmed there is no change in flooding conditions as a result of the development.

Water and Hydrology	Where Addressed
b) Consistency with Council floodplain risk management plans.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements.
c) Consistency with any Rural Floodplain Management Plans.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements.
d) Compatibility with the flood hazard of the land.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements.
e) Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements.
f) Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements.
g) Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements. The receiving waters are noted to be a concrete lined drainage channel hence opportunity for erosion is nil.
h) Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be	Refer **Section 4** for flood and overland flow assessments including confirmation of

Water and Hydrology	Where Addressed
discussed with the NSW SES and Council.	Councils flood planning requirements.
i) Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements. The site is noted to be above the PMF level, hence risk management measures for occupants of the site will be consistent with any local area plans, and onsite refuge is able to be made during local rainfall and flood events.
j) Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES.	Refer **Section 4** for flood and overland flow assessments including confirmation of Councils flood planning requirements. The site is noted to be above the PMF level, hence risk management measures for occupants of the site will be consistent with any local area plans, and onsite refuge is able to be made during local rainfall and flood events.
k) Any impacts the development may have on the social and economic costs to the community as consequence of flooding.	Refer **Section 4** for flood and overland flow assessments. It is noted that the existing development site is free of the 1% AEP extent, being the Defined Flood Event (DFE) and applicable for impact assessment. It is confirmed there is no change in flooding conditions, social or economic cost to community as a result of the development.

1.8 Structure of Report & Key Objectives

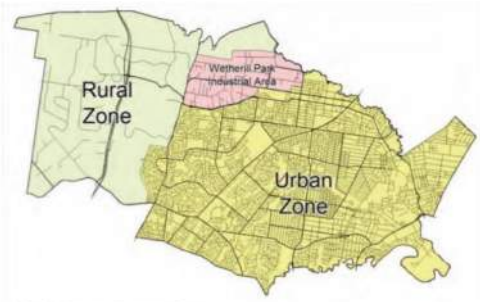
Water Cycle Management (WCM) is a holistic approach that addresses competing demands placed on a region's water resources, whilst optimising the social and economic benefits of development in addition to enhancing and protecting the environmental values of receiving waters.

Developing a WCMS at the SSDA stage of the land development process provides guidance on urban water management issues to be addressed for the estate and development as a whole. This assists urban rezoning and estate infrastructure planning for the industrial development proposed on the land.

This WCMS has been prepared to inform the DPIE and Council that the development is able to provide and integrate WCM measures into the stormwater management strategy for estate. It presents guiding principles for WCM across the precinct which includes establishing water management targets and identifying management measures required for future building developments to meet these targets.

Several WCM measures have been included in the WCMS and engineering design, which are set out in this report and the attached drawings. The key WCM elements and targets which have been adopted in the design are included in **Table 1.4** following.

Table 1.4. WCM Objectives

Element	Objectives	Reference
Surface Water & Water Quantity	<u>*Wetherill Park Industrial Area:*</u> OSD is not required within the Wetherill Park Industrial Area.  Figure 4– Stormwater Management Zones	*Section 4.2* of Fairfield City Councils *Stormwater Management Policy 2017*
Water Quality	Protection of aquatic ecosystems, visual amenity and secondary contact recreation. Load-based pollution reduction targets based on an untreated urbanised catchment: Gross Pollutants 90% Total Suspended Solids 80% Total Phosphorus 55% Total Nitrogen 40% Total Hydrocarbons 90%	*Section 6.2* of Fairfield City Councils *Stormwater Management Policy 2017*

Element	Objectives	Reference
Flooding	Buildings and habitable areas set 500mm above the 1% AEP storm event. No affectation to upstream downstream or adjoining properties as a result of development	Fairfield City Councils *Stormwater Management Policy 2017* NSW Floodplain Development Manual.
Water Supply	Reduce Demand on non-potable water uses. Provide rainwater tanks which result in an 80% reduction of rainwater for industrial and commercial properties.	*Section 5.4* of Fairfield City Councils *Stormwater Management Policy 2017*
Erosion and Sediment Control	Appropriate erosion and sedimentation control measures must be described in the environmental assessment for all stages of construction to mitigate potential impacts to receiving trunk drainage channel.	Landcom Blue Book Council DPIE

A summary of the how each of the WCM objectives will be achieved and where they are addressed in the report are described below. Reference to the relevant sections of the report should be made for further and technical details relating to the WCM measures:

- *Stormwater Quality Management (Refer **Section 2**)*

  There is a need to target pollutants that are present in stormwater runoff to minimise the adverse impact these pollutants could have on downstream receiving waters.

  The required pollutant reductions are included in **Table 1.4** of this document and MUSIC modelling has been completed to confirm the reduction objectives can be met for the development.

  A series of Stormwater quality improvement devices (SQID's) have been incorporated in the design of the proposal. The proposed management strategy will include the following measures:

  - Initial/ primary treatment via a gross pollutant trap (OceanSave GPT).
  - Tertiary treatment via proprietary filtration system (OceanProtect Jellyfish).

  Reference to **Section 6** of this document should be made for detailed Stormwater Quality modelling and measures.

  Management of stormwater measures are necessary to ensure effectiveness of the specified water quality treatment train. Refer to **Appendix C** for DRAFT Maintenance and Monitoring of water quality measures during operational period of the development.

- *Stormwater Quantity Management (Refer **Section 3**)*

  The intent of this criterion is to manage the impact of urban development on existing drainage system by limiting post-development discharge within the receiving waters to the pre-development peak, and to ensure no affectation of upstream, downstream or adjacent properties where required.

  All sites within the Wetherill Park Industrial Area drain via trunk drainage systems to Prospect Creek via one of two Councils Regional detention systems. The Proposal drains to the Rosford Street Regional detention system which is located in the Rosford Street reserve and playing fields.

  No site specific OSD or water quantity measures are required or proposed as part of the development based on the infrastructure already present within the Wetherill Park Industrial Area.

  Refer to **Section 3** of the document for further discussion on water quantity management.

- *Flood Management (refer **Section 4**)*

  The proposed development considered flooding and large rainfall events associated with the adjacent trunk drainage channel and within Redfern Street. It is noted that the site in its current conditions is sited at a minimum of 0.5m above the 1% AEP flood level and the PMF.

  The following measures have been incorporated in the design:

  - All buildings are sited 500mm above the 1% AEP design flood level of The trunk drainage channel.
  - Development is clear of the 1% AEP flood extent;
  - Requirements of Council have been met regarding works in and around flooding areas; and
  - Overland flow paths to manage runoff in large storm events have been made including achieving at least 500mm freeboard to building levels from the flow paths.

- *Water Cycle Management/ Rainwater Reuse*

  Rainwater reuse measures will be provided as part of future building development designs. For industrial and residential development, the rainwater tank size will be determined to meet the 80% non-potable reuse requirement. The reduction in demand will target non-potable uses such as toilet flushing and irrigation. Refer **Section 5**.

- *Erosion and Sediment Controls (refer **Section 2 & Appendix C**)*

  An erosion and sediment control program will be employed during construction period to ensure that sediment laden runoff is contained on site and discharge runoff meets acceptable criteria. Measures will be provided in accordance with Landcom Blue Book. A DRAFT Soil and Water Management Plan has been included for information in **Appendix C**.

1.9 Policy Framework

The below sets out the legislation and planning instruments considered in the preparation of this sub plan.

Table 1.5 lists regulatory guidelines and documents relevant to the assessment.

Table 1.5. Regulatory Documents and Guidelines

Legislation	Description	Relevance to the assessment
Environmental Planning and Assessment Act 1979	This Act establishes a system of environmental planning and assessment of development Projects for the State.	Obligations issued under Part 4 of the EP&A Act are addressed in this plan.
Protection of the Environmental Operations Act 1997	The objectives of this Act relate to the protection of the environment through pollution prevention and cleaner production, among others.	Relevant sections of the Act, including duties to report pollution incidents and disposal regulations have been incorporated into this plan and incident response procedures. A key legislative requirement applicable to construction soil and water management is Section 120 of the Protection of the Environment Operations Act 1997 which relates to pollution of waters and the need to implement all reasonable and feasible measures to minimise the risk of pollution of waters. Part 5.7 of the Act requires that a pollution incident causing or threatening material harm to the environment be notified to EPA and other relevant authorities. Material harm constitutes actual or potential harm to the health or safety of humans and/or ecosystems that is not trivial, or results in actual or potential loss or property damage of amounts in excess of $10,000 in total.
Contaminated Land Management Act 1979	The general object of this Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation under Division 2 of Part 3, and to ensure that contaminated land is managed with regard to the principles of ecologically sustainable development.	Contamination on site must be assessed and managed in accordance with this act. Division 2, Part 3, Section 11-17 of this Act details requirements for the Management of Contaminated Land.
Water Management Act 2000	The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations.	Although it is not envisaged that any construction activities would be undertaken on waterfront land, any waterfront activities that do occur would be conducted generally in accordance with

Legislation	Description	Relevance to the assessment
		the NSW Office of Water's Guidelines for Controlled Activities.
Fisheries Management Act 1994	The objectives of this Act seek to conserve fishery resources, fish stocks and key fish habitats.	This assessment has been prepared to maintain existing flow regimes surrounding the site and to contain water onsite within sediment basins until discharged with strict water quality requirements. No impacts to fisheries are envisaged as a result of Project construction.
Dangerous Goods Regulation (Road and Rail Transport) 2014	The main objects of this Regulation are to give effect to the standards, requirements and procedures of the Code so far as they apply to the transport of dangerous goods by land transport, and to promote consistency between the standards, requirements and procedures applying to the transport of dangerous goods by land transport and other modes of transport.	Provisions relating to the storage and transport of dangerous good, such as fuelling procedures and fuel storage, are to be considered in this plan.
Commonwealth Environmental Protection and Biodiversity Conservation Act 1999	The objectives of this Act seek to promote environmental protection, ecologically sustainable development, biodiversity conservation and the promotion of heritage, among others.	Requirements under EPBC Approval (No. 2011/6086) have been considered during the preparation of this CSWMP.

Additional guidelines and standards considered in relation to the management of soil and stormwater include:

- Managing Urban Stormwater – Soils and Construction Volume 1, 4th Edition (Landcom 2004);
- Managing Urban Stormwater: Soils and Construction − Installation of Services, Volume 2A (OEH 2008); and
- Australian Rainfall and Runoff – Volume 1 (2001), Engineers Australia.
- Managing Urban Stormwater: Source Control – 1998 (NSW EPA);
- Managing Urban Stormwater: Treatment Techniques – 1997 (NSW EPA);
- Managing Urban Stormwater: Soils & Construction – 2004(LANDCOM);
- Stormwater Management Policy - 2017 (Fairfield City Council);
- Water Sensitive Urban Design – "Technical Guidelines for Western Sydney" by URS Australia Pty Ltd, May 2004;
- Botany Bay & Catchment Water Quality Improvement Plan – 2011 (Sydney Catchment Management Authority)

2 SURFACE WATER QUALITY

2.1 Objectives and Performance Targets

The objectives and performance targets for the Proposal have been derived from the following key documents:

- **Prospect Creek Open Space Corridor Plan of Management** (Fairfield City Council, Holroyd City Council, NSW DIPNR 2004)
- **Botany Bay & Catchment Water Quality Improvement Plan** (Sydney Catchment Management Authority 2011)
- **Stormwater Management Policy** (Fairfield City Council 2017)

2.1.1 Objectives

There is a need to provide a design which incorporates the principles of Water Sensitive Urban Design (WSUD) and to target pollutants that are present in the stormwater so as to minimise the adverse impact these pollutants could have on receiving waters and to also meet the requirements specified by Council.

Council has nominated, in their **Stormwater Management Policy 2017**, the requirements for stormwater quality to be provided for all new developments with reference to such documents as the EPA's Manual on Managing Urban Stormwater (Treatment Techniques) and relevant Australian Standards.

The key objectives for stormwater management for the Proposal include:

- Maintain or improve existing water quality.
- To protect the aquatic environment of the downstream waterways including Prospect Creek.
- Prevent bed and bank erosion and instability of waterways.
- Provide sufficient flows to support aquatic environments and ecological processes.
- Incorporate a Water Sensitive Urban Design (WSUD) approach.

2.1.2 Performance Targets

The water quality objectives proposed to be adopted for the Proposal are based on the objectives set out in the **Stormwater Management Policy** (Fairfield City Council 2017). These are presented in terms of annual percentage pollutant reductions on a developed catchment as follows:

Gross Pollutants	90%
Total Suspended Solids	80%
Total Phosphorus	55%
Total Nitrogen	40%
Total Hydrocarbons	90%

Water quality for the catchment will require provision of a treatment train of water quality improvement devices. Proposed and constructed systems include a gross pollutant trap (GPT) to surface drainage systems and proprietary filtration systems for final water polishing. Water quality measures will need to be provided for the whole of catchment in accordance with this document.

2.2 Operational Water Quality Management Features

2.2.1 Existing

The existing site has residual drainage systems as part of previous operations. The existing system mainly comprises in-ground pipe network which convey site runoff to an existing 1200mm diameter piped culvert which conveys site runoff into Council drainage in Victoria Road and the trunk drainage channel to the south-east of the development site.

There is limited or no existing water quality treatment measures on the site.

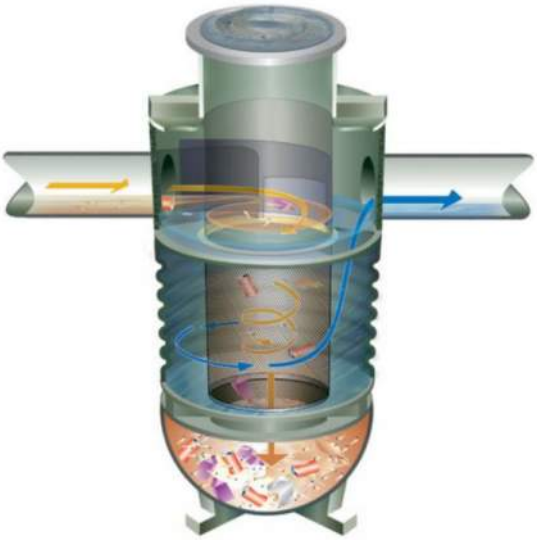
Other than the site connection drainage, these existing systems will be removed as part of the Early Works approved by Council.

2.2.2 Proposed

Roof, hardstand, car parking, roads and other extensive paved areas are required to be treated by the Stormwater Treatment Measures (STM). The STM shall be sized according to the whole catchment area of the Site. The STM's for the development are based on a treatment train approach as discussed in the NSW EPA document *Managing Urban Stormwater: Treatment Techniques* to ensure that all of the objectives above are met.

Treatment of the Proposal during operational phase is proposed to be made via a vortech style GPT (Ocean Protect OceanSave or similar) with oil baffle, in conjunction with a proprietary filtration device (Ocean Protect Jellyfish).

Reference to drawing **Co13738.01-DA40 to Co13738.01-DA42** show the location of the proposed STM with visual representation shown in **Figure 2.1** below.



Typical *GPT*

Jellyfish Filtration System

Figure 2.1. Visual Representation of Treatment Measures

In order to assist with the containment fire water runoff, provision of an automated shut off valve is proposed upstream of the discharge to Council drainage and open drainage channel. The shut off valve will comprise a keystone or knife-gate valve with an electric actuator which is triggered by the fire alarm. The sizing of storage will be completed at Construction Certificate stage to meet a minimum 90minute sprinkler discharge storage volume. It is noted that storage is proposed to be made within the drainage system, and within bunded areas of the buildings.

2.3 Existing Environment

The existing environment and receiving waters are noted to be highly urbanised. Section 2.1 of the *Botany Bay & Catchment Water Quality Improvement Plan* describes the key water quality issues associated with urbanisation which affect this waterway as follows:

- Replacement of pervious surfaces with impervious which reduces filtration of nutrients, capture of sediments
- Increased sediment loading through urban activities;
- Increased gross pollutant and litter loading through urban activities
- Infrastructure such as sewer overflow which increase nutrients, sediment and pathogens in waterways;
- Destruction of riparian corridors.

The existing receiving waters are noted to comprise in-ground pipe work and concrete lined open channel as described in **Section 1.4** of this plan. Conveyance within

ecological sensitive systems will not occur until Prospect Creek following management of quantity within the Rosford Street Regional Detention Basin, which is approximately 1200m downstream of the development site.

The existing health of the concrete lined trunk drainage is considered low, however not relevant for assessment being an engineered structure with no ecological value.

2.4 Soil and Water Management (Construction Phase)

Section 1 provides a summary of the construction works for the Proposal. While all construction activities have the potential to impact on water quality, the key activities are:

- Erosion and sediment control installation.
- Grading of existing earthworks to suit building layout, drainage layout and pavements.
- Stormwater and drainage works.
- Service installation works.
- Building construction works.

Without any mitigation measures and during typical construction activities, site runoff would be expected to convey a significant sediment load. A *Soil and Water Management Plan* (SWMP) and *Erosion and Sediment Control Plan* (ESCP), or equivalent, would be implemented for the construction of the Proposal. The SWMP and ESCPs would be developed in accordance with the principles and requirements of *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book')(Landcom, 2004)*.

In accordance with the principles included in the Blue Book, a number of controls have been incorporated into a preliminary ESCP (refer to accompanying Drawings in **Appendix A**) and draft SWMP in **Appendix C**.

The sections below outline the proposed controls for management of erosion and sedimentation during construction of the Proposal.

Sediment Basins

Sediment basins have been sized (based on 5 day 85th percentile rainfall) and located to ensure sediment concentrations in site runoff are within acceptable limits. Preliminary basin sizes have been calculated in accordance with the Blue Book and are based on 'Type F' soils. These soils are fine grained and require a relatively long residence time to allow settling.

Sediment basins for 'Type F' soils are typically wet basins which are pumped out following a rainfall event when suspended solids concentrations of less than 50 mg/L have been achieved.

Sediment Fences

Sediment fences are located around the perimeter of the site to ensure no untreated runoff leaves the site. They have also been located around the existing drainage channels to minimise sediment migration into waterways and sediment basins.

Stabilised Site Access

For the proposal, stabilised site access is proposed at one location at the entry to the works area. This will limit the risk of sediment being transported onto public roads.

Other Management Measures

Other management measures that will be employed are expected to include:

- Minimising the extent of disturbed areas across the site at any one time.
- Progressive stabilisation of disturbed areas or previously completed earthworks to suit the proposal once trimming works are complete.
- Regular monitoring and implementation of remedial works to maintain the efficiency of all controls.

It is noted that the controls included in the preliminary ESCP are expected to be reviewed and updated as the design, staging and construction methodology is further developed for the Proposal.

2.5 Stormwater Quality Modelling (Operational Phase)

2.5.1 Stormwater Quality Modelling Methodology

A MUSIC (Model for Urban Stormwater Improvement Conceptualisation) model has been utilised to model the effectiveness of the proposed water quality system. This model has been released by the Cooperative Research Centre for Catchment Hydrology (CRCCH) and is a standard industry model for this purpose. MUSIC is suitable for simulating catchment areas of up to 100 km^2 and utilises a continuous simulation approach to model water quality.

By simulating the performance of stormwater management systems, MUSIC can be used to predict if these proposed systems and changes to land use are appropriate for their catchments and are capable of meeting specified water quality objectives (CRC 2002). The water quality constituents modelled in MUSIC and of relevance to this report include Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN).

The pollutant retention criteria nominated in **Section 1.7 and 2.1.2** of this report were used as a basis for assessing the effectiveness of the selected treatment trains.

A MUSIC model "*13738.01_Rev4.sqz*" was set up to examine the effectiveness of the water quality treatment train and to predict the load-based pollution reduction requirements have been achieved for development.

The models were set up using the NSW MUSIC Modelling Guide and Fairfield City Council's Stormwater Management Policy which references Appendix O for MUSIC modelling parameters. The layout of the MUSIC model is presented in **Appendix F**.

2.5.2 Rainfall Data

Six-minute pluviographic data was sourced from the Bureau of Meteorology (BOM) as nominated below for nearby Liverpool weather station. Evapo-transpiration data for the period was sourced from the Sydney Monthly Areal PET data set supplied with the MUSIC software.

Input	**Data Used**
Rainfall Station	67035 Liverpool (Whitlam)
Rainfall Period	1 January 1967 – 31 December 1976 (10 years)
Mean Annual Rainfall (mm)	857
Evapotanspiration	Sydney Monthly Areal PET
Model Timestep	6 minutes

2.5.3 Rainfall Runoff Parameters

Parameter	**Value**
Rainfall Threshold	1.40
Soil Storage Capacity (mm)	170
Initial Storage (% capacity)	30
Field Capacity (mm)	70
Infiltration Capacity Coefficient a	210
Infiltration Capacity exponent b	4.7
Initial Depth (mm)	10
Daily Recharge Rate (%)	50
Daily Baseflow Rate (%)	4
Daily Seepage Rate (%)	0

2.5.4 Pollutant Concentrations & Source Nodes

Pollutant concentrations for source nodes are based on Sydney Catchment Authority land use parameters as per the **Table 2.1**.:

Flow Type	Surface Type	TSS (log_{10} values)		TP (log_{10} values)		TN (log_{10} values)	
		Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.
Baseflow	Roof	1.20	0.17	-0.85	0.19	0.11	0.12
	Roads	1.20	0.17	-0.85	0.19	0.11	0.12
	Landscaping	1.20	0.17	-0.85	0.19	0.11	0.12
Stormflow	Roof	1.30	0.32	-0.89	0.25	0.30	0.19
	Roads	2.43	0.32	-0.30	0.25	0.34	0.19
	Landscaping	2.15	0.32	-0.60	0.25	0.30	0.19

Table 2.1. Pollutant Concentrations

The MUSIC model has been setup with a treatment train approach based on the pollutant concentrations in **Table 2.1** above and the catchments shown in **Appendix A**.

The relevant stormwater catchment sizes are shown figuratively in **Appendix A** .

2.5.5 Treatment Nodes

Ocean Save, Jellyfish and detention basin nodes have been used in the modelling of the interim and ultimate conditions. It is noted that an existing interceptor will remain on site however is not included in the modelling, hence the model is considered conservative. Typical visual representation of the treatment measures is shown in **Figure 2.1** below.

2.5.6 Modelling Layout

The model layout is included in **Figure 2.1** below.

Figure 2.1. MUSIC Model Layout

2.5.7 Modelling Results

Table 2.3 shows the results of the MUSIC analysis for development.

The reduction rate is expressed as a percentage and compares the post-development pollutant loads without treatment versus post-development loads with treatment over the modelled catchment.

	Source	Residual Load	% Reduction	Target Met
Flow (ML/yr)	60.4	58	4	NA
Total Suspended Solids (kg/yr)	10700	1790	83.3	Y
Total Phosphorus (kg/yr)	21.2	8.95	57.8	Y
Total Nitrogen (kg/yr)	138	82.2	40.5	Y
Gross Pollutants (kg/yr)	1550	42.2	97.3	Y

Table 2.3. MUSIC analysis results

2.5.8 Modelling Discussion

MUSIC modelling has been performed to assess the effectiveness of the selected treatment trains and to ensure that the pollutant retention requirements have been met.

The model results in **Table 2.3** indicate that, through the use of the STM's in the treatment train, pollutant load reductions for Total Suspended Solids, Total Phosphorous, Total Nitrogen and Gross Pollutants will meet the target reductions for both interim and ultimate conditions.

As can be seen, the proposed treatment train achieves reductions greater than the required pollutant reduction objectives. This will ensure any variance in assumed arrangements in the final building layouts will not affect the overall outcomes of the solution, and also to ensure overall reduction values are met.

Hydrocarbon reduction values, although not modelled, will achieve 90% reduction in the interim and ultimate conditions. Further discussion on hydrocarbon removal which is not readily modelled in MUSIC is provided in **Section 2.5.9** as follows.

2.5.9 Hydrocarbon Removal

The proposed facility would be expected to produce relatively low source loadings of hydrocarbons. Potential sources of hydrocarbons would be limited to leaking engine sumps or for accidental fuel spills/leaks. The potential for hydrocarbon pollution is low and published data from the CSIRO indicates that average concentrations from Industrial sites are in the order of 10mg/L and we would expect source loading from this site to be near to or below this concentration as further discussed below.

Hydrocarbon removal cannot be readily modelled with MUSIC software however there is sufficient information on the expected source loads and treatment.

Hydrocarbon Sources

The average storm flow concentration of hydrocarbons in an industrial facility is 9.5mg/L (3 & 30mg/L 95% confidence limits) sourced from Fletcher T, Duncan H, Poelsma P & Lloyd S, 2004: *Stormwater Flow and Quality, and the Effectiveness of Non-Proprietary Stormwater Treatment Measures - A review and Gap Analysis. Cooperative Research Centre for Catchment Hydrology, Technical Report 04/8*;

Filtration Treatment

Removal of hydrocarbons within the filtration system is shown to occur due to several mechanisms.

Removal of oil, grease and hydrocarbons will take place due to entrainment to sediments.

Research by Hseih (2005) has also shown that 97% of hydrocarbons are trapped and contained in the first few centimetres of a filtration system (i.e. filter swales and bio-retention systems). These are then broken down via organic processes in a period of 2-3 days.

GPT Treatment

The vortech type GPT is reported to provide between 82-94% reduction in hydrocarbons and free oils.

The following information relating to the performance of a CDS GPT has been provided by the product manufacturers (noting similar equivalent subject to final detail design to be installed):

> *As with nutrient capture there is also a high correlation of oils and grease removal with sediment capture in CDS Units.*
>
> *UCLA have reported 50-80% of oil and grease may be attached to sediments.*
>
> *Hoffman 1982: "Our data confirm the observations of the workers in that hydrocarbons are primarily associated with particulate material (83 – 93%)".*
>
> *CRCCH 1999: "Colwill found 70% of oil and approximately 85% PAH to be associated with solids in stormwater. That study subsequently demonstrated that over a period of dry weather conditions, increasing concentrations of oil become associated with particulates with the highest oil content found in the sediment range of 200µm to 400µm.*
>
> *CSIRO 1999: In the category of "attached pollutants" CDS Units were the only GPT device to even be considered capable of capturing anything.*
>
> *CDS Units can also capture free floating oil spills. However, when most of the oil is associated with fine particulates and sediments, CDS Units remove very high levels of oils and greases due to their very high capture rate of those fine particles.*

Hydrocarbon Treatment Conclusion

Overall, when combining a treatment train of CDS (OceanSave or equivalent) and filtration systems, a reduction of greater than 90% of hydrocarbons is achieved. It is noted that the hydrocarbon removal could be achieved with the GPT alone.

Given the expected low source loadings of hydrocarbons and removal efficiencies of the treatment devices we consider that the requirements of the consent have been met for the Proposal.

2.6 Construction impact assessment

Section 2.4 discusses proposed soil and water quality measures to be provided during typical construction activities, site runoff to reduce significant sediment loads from leaving the site.

A *Soil and Water Management Plan* (SWMP) and *Erosion and Sediment Control Plan* (ESCP), or equivalent, would be implemented for the construction of the Proposal. The SWMP and ESCPs would be developed in accordance with the principles and requirements of *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book')(Landcom, 2004)*.

Based on the provision of noted measures it is concluded that potential for water quality impacts can be mitigated during construction and that any impacts would be minor.

2.7 Operational impact assessment

Section 2.2 and **2.5** discusses proposed soil and water quality measures to be provided during operational phase, and confirmation through MUSIC modelling that the proposed STM's meet recommended target pollutant reductions and water quality objectives for the Proposal

Based on the provision of noted measures it is concluded that potential for water quality impacts will be mitigated during operational phase of the Proposal.

3 SURFACE WATER QUANTITY MANAGEMENT

3.1 Water Quantity Objectives

Water quantity criteria has been based on the following key document:

- **Stormwater Management Policy 2017** *(Fairfield City Council 2017)*

The intent of the water quantity criterion is to manage the impact of urban development on existing drainage system by limiting post-development discharge within the receiving waters to the pre-development peak, and to ensure no affectation of upstream, downstream or adjacent properties where required.

As set out in **Section 1.7** of this plan and included in *Section 5.2* of Council *Stormwater Management Policy 2017*, there is no requirement for any site within the Wetherill Park Industrial Area to have on-site detention to management stormwater quantity.

3.2 Existing Environment

The existing site comprises residual drainage associated with former uses on the site. The existing site (prior to earthworks) comprises predominately pervious surfaces.

All sites within the Wetherill Park Industrial Area drain via trunk drainage systems to Prospect Creek via one of two Councils Regional detention systems.

The existing receiving waters are noted to comprise in-ground pipe work and concrete lined open channel as described in **Section 1.4** of this plan. The trunk drainage system provides conveyance of runoff from all sites in the Wetherill Park Industrial Area to Prospect Creek following management of quantity within the Rosford Street Regional Detention Basin, which is approximately 1200m downstream of the development site located in the Rosford Street reserve and playing fields.

3.3 Water Quantity Management Features

There are no water quantity measures required or proposed as part of the development based on the infrastructure already present within the Wetherill Park Industrial Area and the requirements of Fairfield City Council.

The existing discharge location is proposed to be utilised at the south-east corner of the Proposal. Refer drawings in **Appendix A** for discharge location and details.

3.4 Construction impact assessment

Section 2.4 discusses proposed mitigation measures to be provided during typical construction activities, site runoff to reduce significant sediment loads from leaving the site.

A *Soil and Water Management Plan* (SWMP) and *Erosion and Sediment Control Plan* (ESCP), or equivalent, would be implemented for the construction of the Proposal. The SWMP and ESCPs would be developed in accordance with the principles and

requirements of *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book')(Landcom, 2004)*.

The ESCP includes provision of sediment control basin which will capture and manage runoff during construction to the 85th percentile rainfall event, prior to discharge of in a controlled manner.

Based on the provision of noted mitigation measures it is concluded that potential for water quantity impacts can be mitigated during construction.

3.5 Operational impact assessment

In relation to the water runoff assessment, as discussed in **Section 3.2**, the site is considered to be predominately comprised of impermeable surfaces. Following construction of the Proposal, the extent of impermeable surface remains consistent with existing, hence the change in peak flows associated with the development is negligible.

Further, in relation to waterway stability, given there is no change in impervious surfaces or hence peak flows, impact on sensitive receiving waterway (Prospect Creek 1200m from the site and downstream of the regional detention system) is negligible and flows are further managed within the Rosford Street Regional Detention Basin system. Potential for scour of receiving waters is also confirmed as no impact given discharge to the existing concrete lined and walled trunk drainage channel.

Based on the assessment it is concluded that additional mitigation measures are not required to mitigate impact associated with water quantity during operational phase of the Proposal.

4 FLOODING

4.1 Flooding Introduction and Previous Studies

Flooding assessment for the Wetherill Park area has been completed for Council and is included in their *Wetherill Park Overland Flow Study 2015* (the council report will be referred to as the *Council Flood Study* from hereon. The *Council Flood Study* was prepared for Council by Cardno.

As part of the pre-application consultation with Fairfield City Council and SEAR's requirements, Council required modelling be undertaken using their existing model and as such has been completed by *Catchment Simulation Solutions (CSS)*. CSS are noted to be one of three Council Preferred Consultants who have access to Council's flood model and are able undertake the modelling. Council's requirements are for the interpretation of the results produced by CSS are to be completed by a different engineering consultancy experience in flooding and overland assessments, and in this regard the interpretation has been undertaken by Costin Roe Consulting and included in this report.

4.2 Existing Environment

The proposal has been identified by Council as being adjacent to medium risk flooding on Redfern Street, and low risk flooding on Victoria Street.

Figure 4.1 shows an excerpt of the 1 in 100-year ARI flood (1% AEP) extent per the FCC Study. This figure shows the site to be clear of the flood extent during the 1 in 100-year ARI event, hence works on site will not affect or impact existing flooding for councils defined flood event (the 1 in 100-year ARI event).

Some overland flow is noted to be present in Redfern Street (attributed to overland flow in the street), also in Victoria Street (overtopping of water at the culvert crossing of the open drain/ trunk drainage system described in this report).

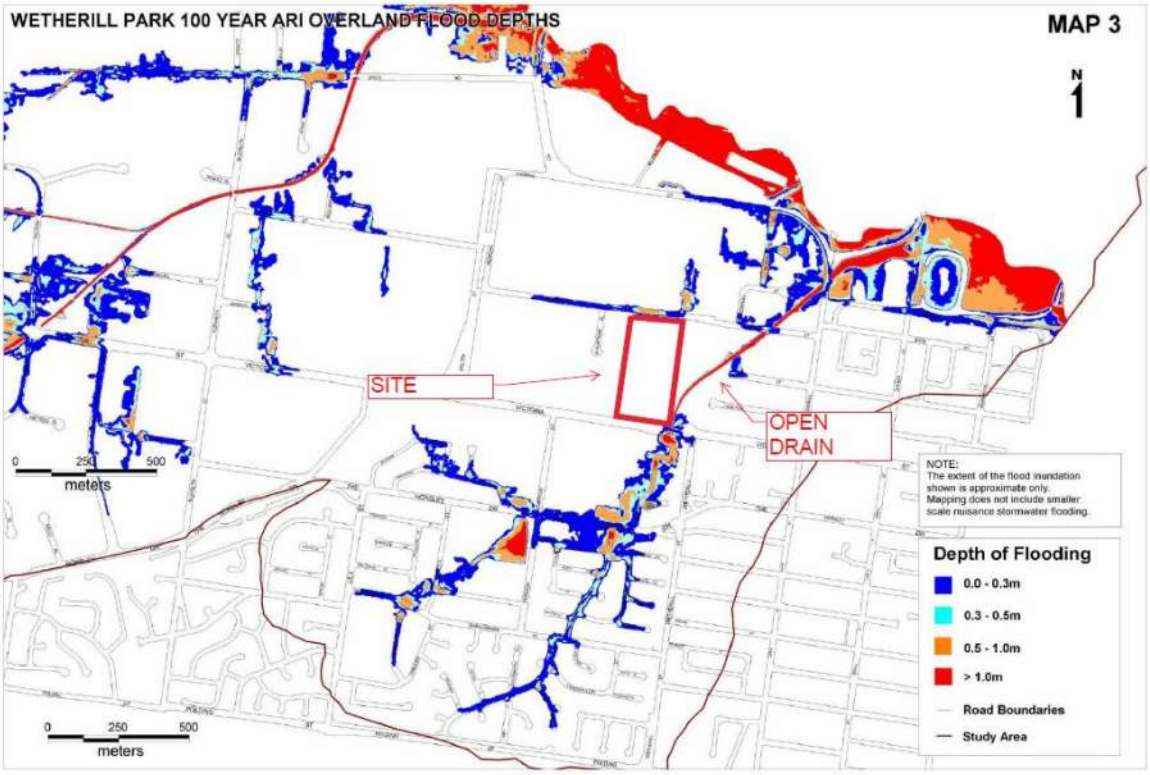


Figure 4.1. Excerpt of 1 in 100-year ARI Flood Extent

Figure 4.2 shows an excerpt of the PMF flood extent per the FCC study. This figure shows the site to be generally clear of flooding during the PMF. The overland flow shown in **Figure 4.1** in Redfern Street (attributed to overland flow in the street) is shown to encroach the northern end of the site. The extent of flooding at the low point in Victoria Street (overtopping of water at the culvert crossing of the open drain/ trunk drainage system described in Section 3 of this report) also increases however does not encroach the property.

The PMF flood is shown generally clear of the property and not expected to affect internal operations or safe egress of internal occupants of the site. Further review of flooding would be included as part of a separate future building development application in due course.

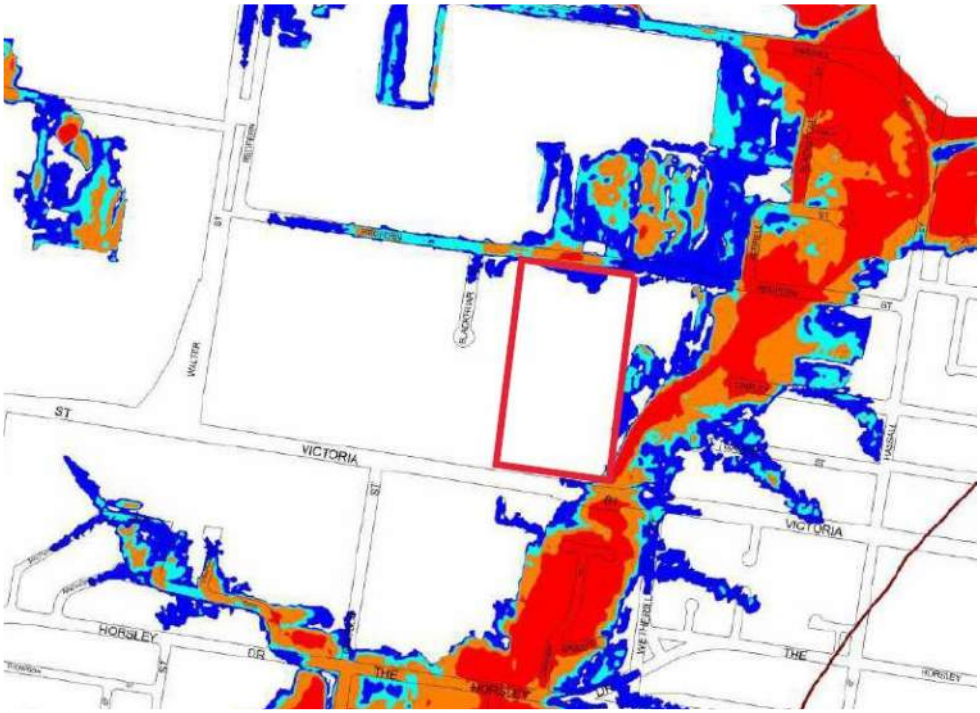


Figure 4.2 Excerpt of PMF Flood Extent

The site is generally clear of overland flow flooding as shown on the FCC Flood Extent Maps. Flooding in proximity to the development site is not expected to affect the operation of the facility or flood liability of the proposed development.

4.3 Methodology

4.3.1 Hydrological Assessment of Existing Catchment

CSS have reproduced the existing flood model locally in the area of the proposed development, construction as a pre-development condition. The flood model comprises a two-dimensional hydrodynamic flood model based on the Tuflow modelling engine. The flood model used in Fairfield City Council flood studies, as referenced above, uses rain-on-grid hydrology.

CSS has been supplied with a three-dimension digital terrain model of the proposed civil engineering design, and the proposed in-ground drainage system for use in their post developed flood assessment.

Pre and post developed flood scenarios have been compared to confirm the effect of the development on the existing conditions and to understand flood planning requirements for the precinct.

It is noted that the modelling of the pre-developed conditions has been based on limited information pertaining to the existing drainage system. The predeveloped conditions have been modelled without any existing drainage systems included (noting that existing drainage systems are however present on the site). The post development conditions, and drainage layout however are known and as such were included in the post development modelling by CSS. Some differences in timing of discharge and the point of discharge

between pre and post development conditions have been identified and discussed in further sections of the report.

4.3.2 Existing Flood Conditions

The existing flood scenario shows overland flow from four sources as described in **Section 4.2** of this report. The overland flow assessment shows the flow paths being generally clear of the development site, though located in areas adjacent to the site, with minor encroachment in extreme flood events on Redfern Street. **Figure 4.3** shows the pre-development flood levels for the 5% AEP (1 in 20 year ARI) event and **Figure 4.4** shows the flood output for the 1% AEP event.

Refer to **Appendix G, Figures G1 to G15** for flood depth, velocity and hazard categorisation for pre-development/ existing conditions.

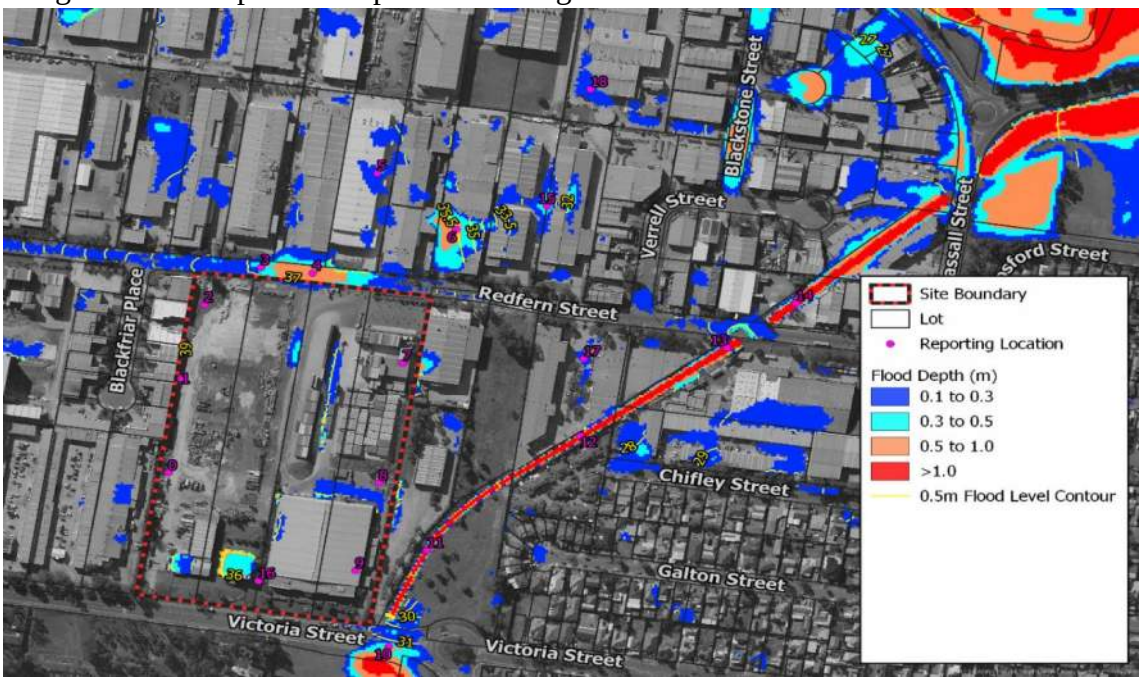


Figure 4.3 Flood Depth Output – 5% AEP (1 in 20-year ARI), Pre-Development

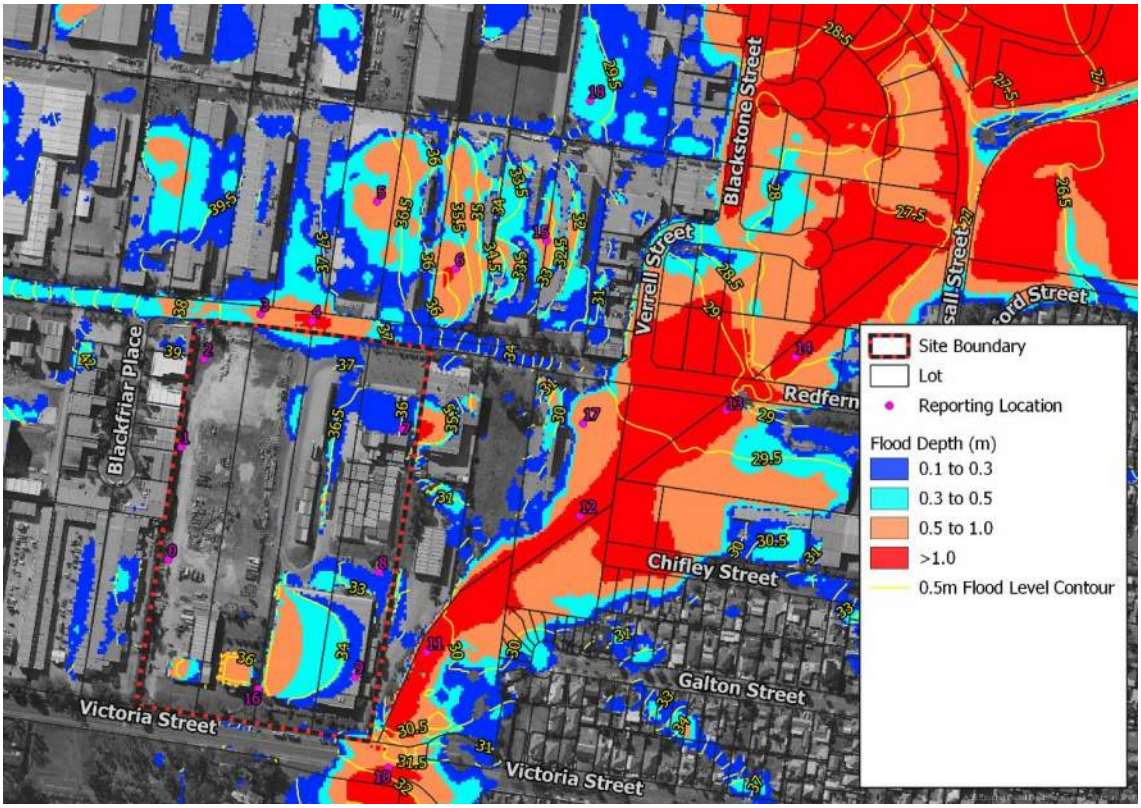


Figure 4.4 Flood Depth Output – 1% AEP (1 in 100-year ARI), Pre-Development

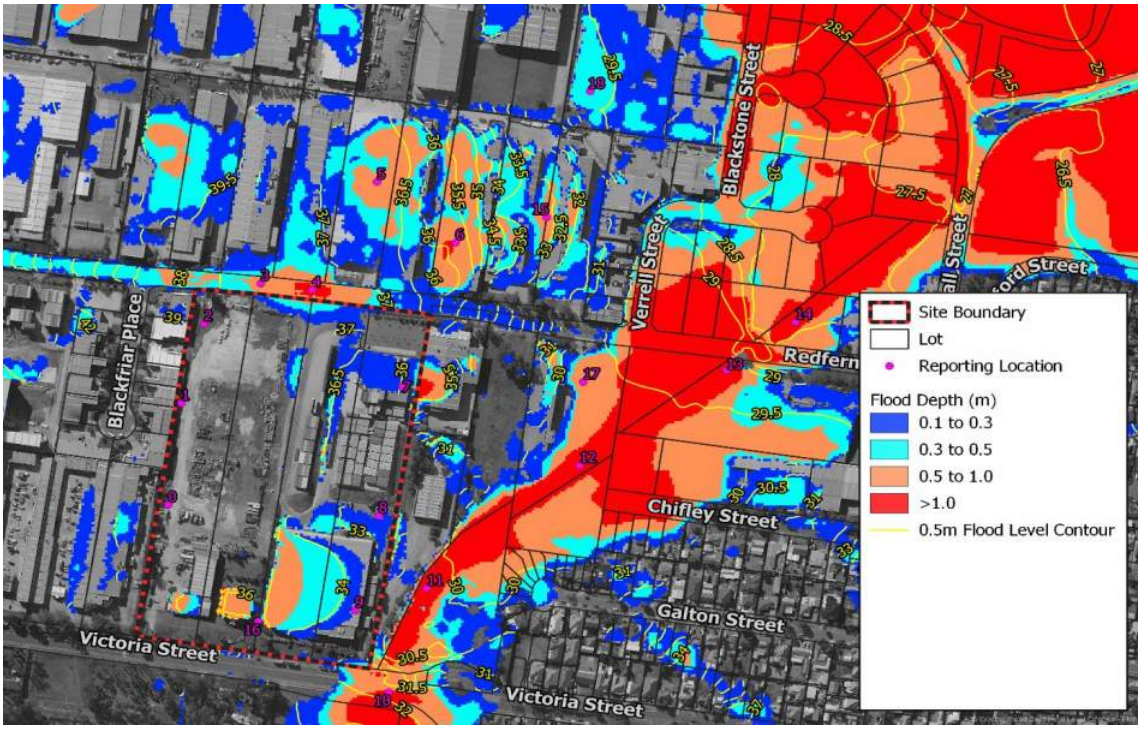


Figure 4.5 Flood Depth Output - PMF, Pre-Development

4.3.3 Developed Site Flooding

The developed flood scenario for the 5% AEP, 1% AEP events and PMF event is shown in **Figures 4.6 to 4.8**. Further details for other storms can be found in **Appendix G.**

The flood assessment shows the site is free from external flow paths in the storm events to the 0.2% AEP (1 in 500yr ARI) storm events.

The proposed internal drainage system is able to convey the required storm events to the point of discharge at the south-east corner of the development site.

Some minor areas of ponding are shown in the modelling output within the development site. These are noted to be a function of the modelling methodology, which comprises a simplified version of the proposed drainage system, in the model.

Refer to **Appendix G, Figures G16 to G30** for flood depth, velocity and hazard categorisation for post-development conditions.

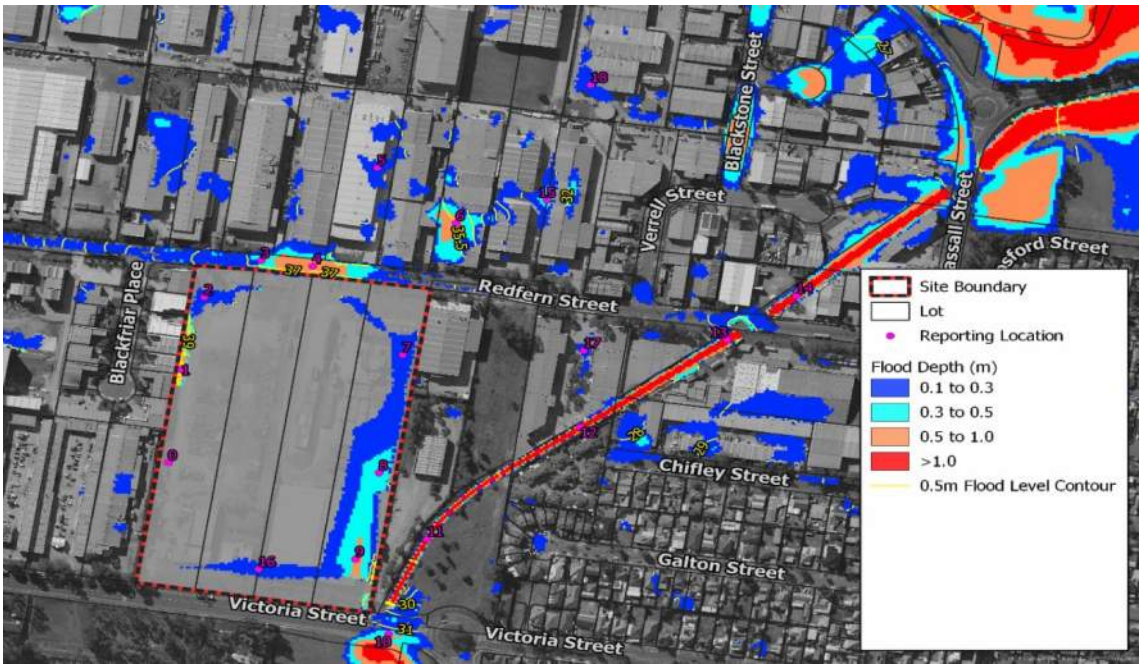


Figure 4.6 Flood Depth Output – 5% AEP, Post Developed

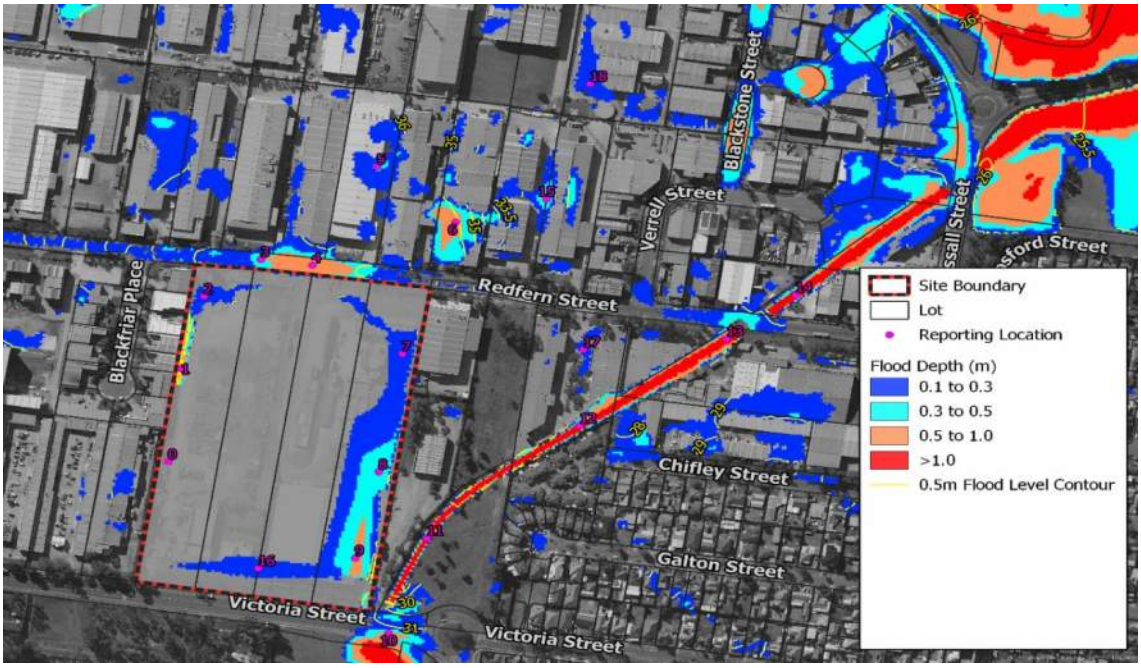


Figure 4.7 Flood Depth Output – 1% AEP, Post Developed

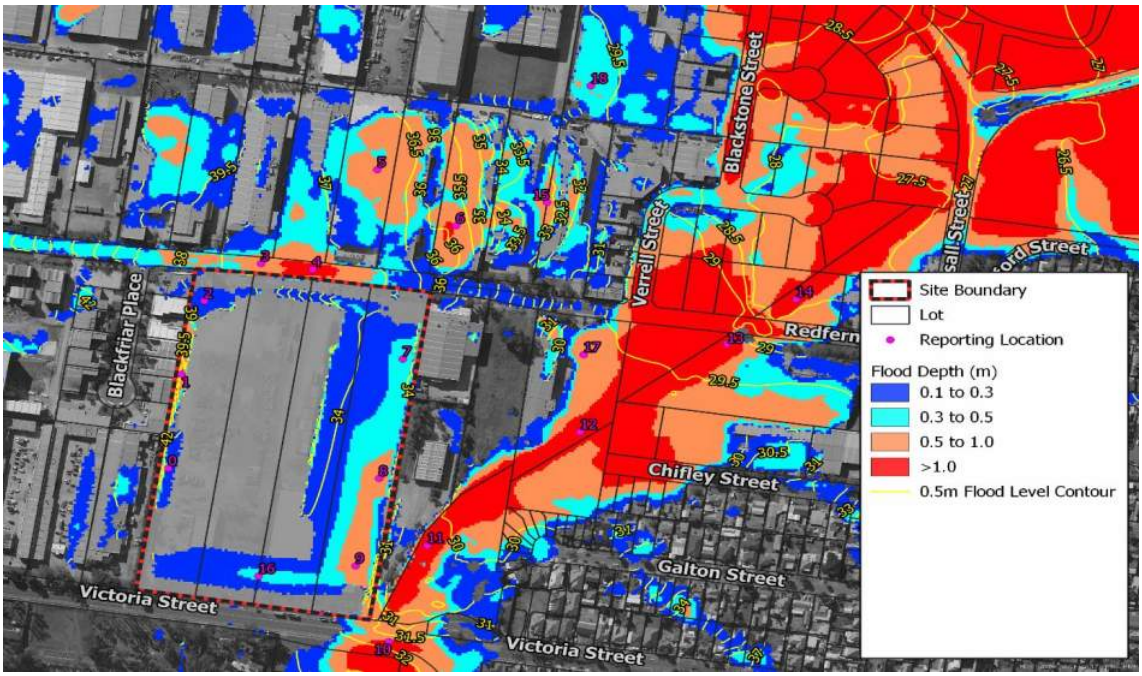


Figure 4.8 Flood Depth Output - PMF, Post Developed

4.3.4 Flood Planning Level

Redfern Street – Western Entry

The 1% AEP flood level within Redfern Street, at the upstream side of the proposed western entry point, is noted to be RL 37.9m AHD. The flood planning level for the entry on Redfern Street is RL 38.4m AHD. This level is based on 0.5m freeboard to the noted 1% AEP flood level in Redfern Street.

The proposed entry level is set at RL 38.5m, hence meets flood planning requirements.

The proposed building is noted to be RL 43.00m, hence meets requirements of flood planning and immunity.

Victoria Street

The 1% AEP flood level within Victoria Street is RL 31.3m AHD. The flood planning level for the entry on Victoria Street is RL 31.8m AHD. This level is based on 0.5m freeboard to the noted 1% AEP flood level in Victoria Street.

The development footprint is noted to be clear of flood affected areas and overland flow paths in the 1% AEP hence impact requirements are met for the development.

The proposed entry level is set at RL 37.1m, hence meets flood planning requirements.

The proposed basement level is noted to be nominal RL 33.3m, hence meets requirements of flood planning and immunity.

4.3.5 Safety and Egress

Figure 4.2, 4.5 and 4.8 shows the PMF flood extent.

The PMF extent can be seen to be generally clear of the development site. Due consideration to occupant safety will be necessary during the operation of the Proposal.

Inundation of Redfern Street and Victoria Street are shown in the pre and post developed conditions. It is noted that the inundation of surrounding roads (particularly Redfern Street) would be short duration whilst heavy rainfall is also occurring (likely less than or around 30minutes). On-site refuge would be available during periods of intense rainfall and short duration overland flow.

The proposed facility should have a specific flood management plan which sets out flood warden, evacuation zones and responsible persons. The plan of management should be completed in conjunction with relevant Council and SES sub plans as required.

The NSW SES Local Controller is responsible for monitoring the flood risk over the area and for issuing flood warnings to the community. Any person or group occupying the precinct at the time of flood danger should adhere to any warnings issued. The warning message will normally be issued via SMS (phone text) by the SES. During periods of heavy or forecast heavy rainfall it is important that one or some of the occupants of a facility should be able to receive such messages. The occupants must then immediately follow the flood evacuation plan in this report or the instructions of the SES controller in the area.

4.4 Construction Impact Assessment

All construction works are noted to be clear of the 1% AEP flood extent.

As noted in **Section 2.4**, a SWMP and ESCP will be employed during construction that will ensure runoff is contained on site in accordance with the Blue Book and minimise impact to receiving waters.

Given that works are proposed clear of 1% AEP flooding and SWMP and ESCP measures will be employed, it is concluded that impact associated with flooding during construction can be mitigated.

4.5 Operational Impact Assessment

As shown in **Sections 4.1 to 4.3** of this report, the development does not encroach on nor impact any flood affected areas. As such there will be no changes or impacts to existing flood conditions or impact as a result of the development. The assessment shows that there is no detrimental effect on surrounding properties due to flooding and the development.

Figure 4.9 shows flood difference (or afflux) for the 1 in 100-year ARI flood scenario.

Tables 4.1 to 4.5 show flood levels, flood depth, flood velocity, velocity times depth and differences for the various reporting points prepared by CSS.

The development can be seen to have no effect on surrounding roadways or adjacent properties.

Refer to **Appendix G, Figures G27 to G34,** and **Table 4.5** for flood depth difference, velocity difference between the pre and post development conditions for a range of storms which generally show either consistent pre and post development values or minor reductions offsite.

The minor increase in water levels for Reporting Points 11, 12 and 13 (of 0.03m and 0.04m) included in the original modelling and submission have now been reduced to less than 0.02m and considered to demonstrate now acceptable water level changes. The minor differences noted previously were confirmed to be modelling related, rather than an impact from development.

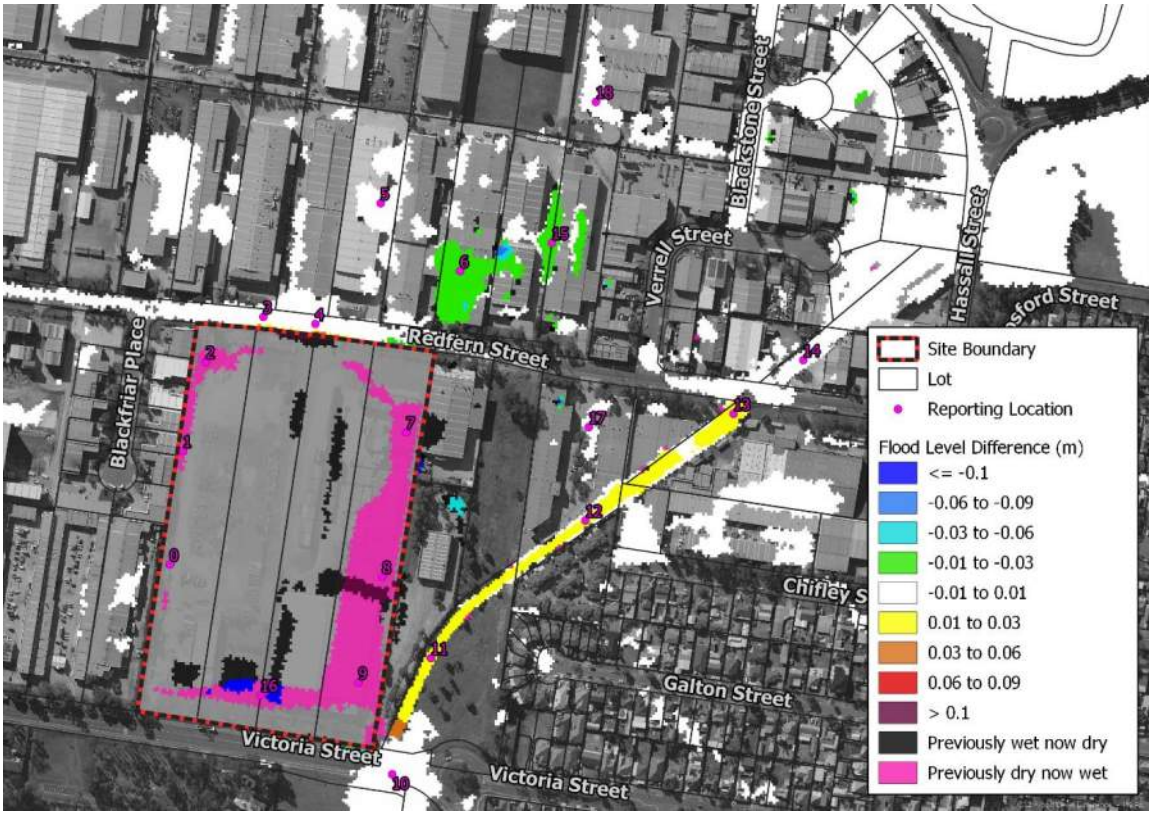


Figure 4.9 Flood Afflux – 1 in 100 year

Table 4.1 Pre and Post Development Flood Levels

Reporting Location	Existing Flood Level (mAHD)					Developed Flood Level (mAHD)				
	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF
0	-	-	-	-	-	-	-	-	-	41.6
1	-	-	-	-	-	39.4	39.4	39.5	39.5	39.8
2	-	-	-	-	-	38.6	38.6	38.6	38.6	38.7
3	37.0	37.0	37.0	37.1	37.3	37.0	37.0	37.0	37.1	37.4
4	37.0	37.0	37.0	37.1	37.3	37.0	37.0	37.1	37.1	37.4
5	36.2	36.3	36.3	36.3	36.7	36.3	36.3	36.3	36.3	36.8
6	35.5	35.6	35.6	35.7	35.9	35.6	35.6	35.6	35.6	35.9
7	-	-	-	-	36.0	33.7	33.7	33.7	33.7	33.9
8	-	-	-	-	-	33.7	33.7	33.7	33.7	33.9
9	-	-	-	-	-	33.7	33.7	33.7	33.7	33.8
10	31.2	31.3	31.3	31.4	31.9	31.3	31.3	31.3	31.4	31.9
11	27.8	28.1	28.3	28.4	30.1	28.1	28.1	28.3	28.4	30.1
12	27.3	27.7	27.9	28.1	29.7	27.7	27.7	27.9	28.1	29.7
13	27.1	27.6	27.8	28.0	29.4	27.6	27.6	27.8	28.0	29.4
14	26.6	26.8	26.8	26.9	27.9	26.8	26.8	26.8	26.9	27.9
15	32.8	32.8	32.9	32.9	33.1	32.8	32.8	32.9	32.9	33.1
16	-	-	-	-	-	33.7	33.7	33.7	33.7	33.9
17	29.1	29.1	29.1	29.1	29.7	29.1	29.1	29.1	29.1	29.7
18	29.3	29.3	29.3	29.3	29.6	29.3	29.3	29.3	29.3	29.6

Table 4.2 Pre and Post Development Flood Depth

Reporting Location	Existing Flood Depth (m)					Developed Flood Depth (m)				
	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF
0	-	-	-	-	-	-	-	-	-	0.18
1	-	-	-	-	-	0.79	0.82	0.83	0.85	1.13
2	-	-	-	-	-	0.19	0.20	0.20	0.21	0.26
3	0.36	0.40	0.41	0.44	0.65	0.35	0.40	0.42	0.44	0.76
4	0.77	0.81	0.83	0.86	1.08	0.77	0.81	0.83	0.86	1.17
5	0.25	0.33	0.36	0.39	0.73	0.24	0.33	0.36	0.39	0.83
6	0.62	0.68	0.72	0.75	0.98	0.60	0.66	0.69	0.74	0.98
7	-	-	-	-	0.11	0.14	0.16	0.17	0.18	0.34
8	-	-	-	-	-	0.38	0.41	0.43	0.44	0.60
9	-	-	-	-	-	0.52	0.55	0.56	0.58	0.72
10	0.46	0.52	0.55	0.60	1.12	0.46	0.52	0.55	0.59	1.13
11	1.36	1.63	1.82	1.97	3.63	1.38	1.65	1.83	1.98	3.63
12	1.44	1.86	2.05	2.22	3.83	1.45	1.88	2.06	2.23	3.83
13	2.54	3.03	3.24	3.43	4.85	2.55	3.04	3.24	3.44	4.85
14	2.49	2.63	2.70	2.78	3.80	2.49	2.63	2.70	2.78	3.80
15	0.44	0.48	0.49	0.52	0.75	0.43	0.47	0.48	0.50	0.76
16	-	-	-	-	-	0.14	0.16	0.17	0.18	0.32
17	0.16	0.18	0.20	0.22	0.81	0.15	0.17	0.18	0.21	0.81
18	0.12	0.14	0.15	0.17	0.45	0.12	0.14	0.15	0.17	0.49

Table 4.3 Pre and Post Development Flood Velocity

Reporting Location	Existing Flood Velocity (m/s)					Developed Flood Velocity (m/s)				
	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF
0	-	-	-	-	-	-	-	-	-	0.4
1	-	-	-	-	-	0.3	0.3	0.3	0.3	0.4
2	-	-	-	-	-	0.2	0.3	0.3	0.3	0.7
3	1.0	1.0	1.1	1.1	2.0	1.1	1.1	1.1	1.1	2.1
4	0.3	0.3	0.4	0.4	1.0	0.3	0.4	0.4	0.4	0.9
5	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
6	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
7	-	-	-	-	1.1	0.4	0.4	0.4	0.4	0.6
8	-	-	-	-	-	0.2	0.2	0.2	0.2	0.4
9	-	-	-	-	-	0.2	0.3	0.3	0.3	0.4
10	1.1	1.3	1.4	1.5	2.3	1.1	1.3	1.4	1.5	2.3
11	4.6	4.6	4.8	4.6	6.3	4.7	4.7	4.9	4.9	6.5
12	2.7	2.7	2.8	3.0	6.1	2.8	2.8	2.8	3.0	6.1
13	1.8	1.8	1.9	2.0	2.8	1.8	1.8	1.9	2.0	2.8
14	2.1	2.5	2.6	2.8	4.4	2.1	2.5	2.6	2.8	4.4
15	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
16	-	-	-	-	-	0.3	0.4	0.4	0.4	0.5
17	0.3	0.3	0.3	0.3	0.5	0.2	0.3	0.3	0.3	0.5
18	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 4.4 Pre and Post Development Flood Velocity Times Depth

Reporting Location	Existing VxD (m^2/s)					Developed VxD (m^2/s)				
	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF
0	-	-	-	-	-	-	-	-	-	0.07
1	-	-	-	-	-	0.19	0.21	0.22	0.25	0.44
2	-	-	-	-	-	0.04	0.06	0.06	0.07	0.18
3	0.29	0.34	0.38	0.44	1.13	0.29	0.36	0.40	0.46	1.14
4	0.22	0.27	0.30	0.34	1.03	0.23	0.29	0.32	0.37	1.10
5	0.04	0.04	0.04	0.05	0.12	0.03	0.04	0.05	0.05	0.16
6	0.05	0.07	0.08	0.08	0.14	0.05	0.06	0.07	0.08	0.14
7	-	-	-	-	0.12	0.05	0.06	0.06	0.07	0.16
8	-	-	-	-	-	0.03	0.04	0.05	0.06	0.20
9	-	-	-	-	-	0.05	0.05	0.06	0.06	0.11
10	0.50	0.65	0.72	0.83	2.52	0.50	0.65	0.72	0.83	2.51
11	6.27	7.56	8.79	9.04	23.01	6.45	7.79	8.96	9.66	23.51
12	4.11	5.23	5.95	6.76	23.50	4.16	5.35	5.93	6.86	23.45
13	4.52	5.52	6.15	6.75	13.62	4.55	5.58	6.19	6.80	13.58
14	5.23	6.47	7.05	7.86	16.69	5.25	6.50	7.08	7.90	16.64
15	0.07	0.07	0.08	0.08	0.14	0.06	0.07	0.07	0.08	0.15
16	-	-	-	-	-	0.05	0.06	0.06	0.07	0.14
17	0.04	0.05	0.05	0.06	0.26	0.03	0.04	0.05	0.05	0.26
18	0.01	0.01	0.01	0.02	0.05	0.01	0.01	0.01	0.02	0.06

Table 4.5 Pre and Post Development Flood Difference Summary

Reporting Location	Flood Level Difference (m)					Flood Velocity Difference (m/s)					Velocity Depth Product Difference (m^2/s)				
	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF	5%AEP	1%AEP	0.5%AEP	0.2%AEP	PMF
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	0.00	0.00	0.00	0.00	0.10	0.04	0.03	0.03	0.03	0.08	0.01	0.01	0.02	0.02	0.01
4	0.00	0.00	0.00	0.00	0.09	0.01	0.02	0.03	0.03	-0.02	0.01	0.02	0.02	0.03	0.06
5	-0.01	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.05
6	-0.03	-0.02	-0.02	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	-	-	-	-	-2.07	-	-	-	-	-0.54	-	-	-	-	0.04
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	0.00	-0.01
11	0.02	0.02	0.01	0.01	0.00	0.07	0.08	0.06	0.28	0.15	0.18	0.23	0.17	0.62	0.50
12	0.00	0.01	0.01	0.01	0.00	0.03	0.04	-0.02	0.03	-0.01	0.05	0.11	-0.02	0.10	-0.05
13	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	-0.01	0.03	0.06	0.04	0.05	-0.04
14	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	-0.01	0.02	0.04	0.03	0.04	-0.05
15	-0.01	-0.01	-0.01	-0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	0.00	-0.01	-0.01	-0.01	0.00	-0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

4.6 Climate Change

An assessment has been undertaken for the effect of climate change on the development. The assessment takes into consideration potential effect from increased rainfall intensity and sea level rise.

The effect on development has been assessed for a 10-15% increase in rainfall intensity utilising the 0.5% AEP flood event as proxies for climate change (as recommended by DPIE in the SEAR's). This increase is considered representative of potential climate change impacts for the Western Sydney area (being consistent with projected rainfall increases in accordance with the New South Wales Department of Environment and Climate Change (DECC) 'Floodplain Risk Management Guideline Practical Consideration of Climate Change' (Table 1, October 2007).

This assessment shows that the proposed stormwater drainage system and stormwater management systems would have sufficient capacity to manage the increased peak flows and water volume with minor increase in hydraulic grade line and peak water levels. We confirm the increase in rainfall intensities will achieve the required minimum 0.5m freeboard to the proposed entry locations and building levels in relation to local overland flow paths in and around the Proposal as included in the modelled flood conditions.

The site is situated well upstream from any tidally influenced receiving waters including expected potential sea level rise of 0.3m. We confirm the development will not affect or be affected by potential sea level rise due to the plan distance and height differences from any tidally influenced water bodies.

4.7 Flooding Conclusion

Flood modelling has been undertaken by Fairfield City Council preferred flood modellers, *Catchment Simulation Solutions*. The assessment utilised Councils existing flood model, to then compare the post development flood scenario and to confirm the effect of the development on flooding.

The assessment shows that the proposed design allows for the conveyance of the existing flow paths without impact from the development.

The modelling shows that the site is free from external overland flow path. Further, that buildings are able to achieve sufficient flood immunity and safety within the precinct as a result of the proposed stormwater management strategy and stormwater management measures recommended to be included in the concept.

The assessment also confirms that the development will be free of flooding from the existing flow paths allowing for a minimum freeboard to the 1% AEP flood level of 500mm.

The assessment confirms that the proposed development meets councils flooding policy and the NSW Floodplain Manual recommendations. We confirm that no upstream, downstream or adjacent properties are adversely affected as a result of the development and the CSS modelling confirms acceptable flood management has been provided for the development.

5 WATER CYCLE MANAGEMENT

5.1 Water Balance Objectives

A daily water balance analysis was undertaken to determine the feasibility of the proposed rain and stormwater harvesting scheme and in particular the effects of various storage sizes for stormwater harvesting along with changes to demand.

The water balance utilised flows generated using a simple runoff calculation using historical rainfall data, analysed for various rainfall patterns including dry, mean and wet rainfall years. The purpose for modelling dry, mean and wet years was to assess the performance of various tank sizes given the changes to rainfall patterns.

5.2 Water Use Management Features

5.2.1 Existing

Existing water use features comprise Sydney Water Mains supply.

There are no existing rainwater harvesting systems, or water extractions as the Proposal site is currently vacant.

There are no current irrigated landscaped areas

5.2.2 Proposed

Proposed management measures for water use are as follows:

- Existing Sydney Water mains supply is proposed to be maintained throughout the duration of the Proposal;
- Stormwater harvesting through rainwater reuse to reduce demand on non-potable water uses;
- Sprinkler water storage via Sydney Water mains (noting >80% of sprinkler test water to be recycled as part of the operational requirements).

A concept diagram for the proposed re-use scheme on site is shown in **Figure 5.1** below.

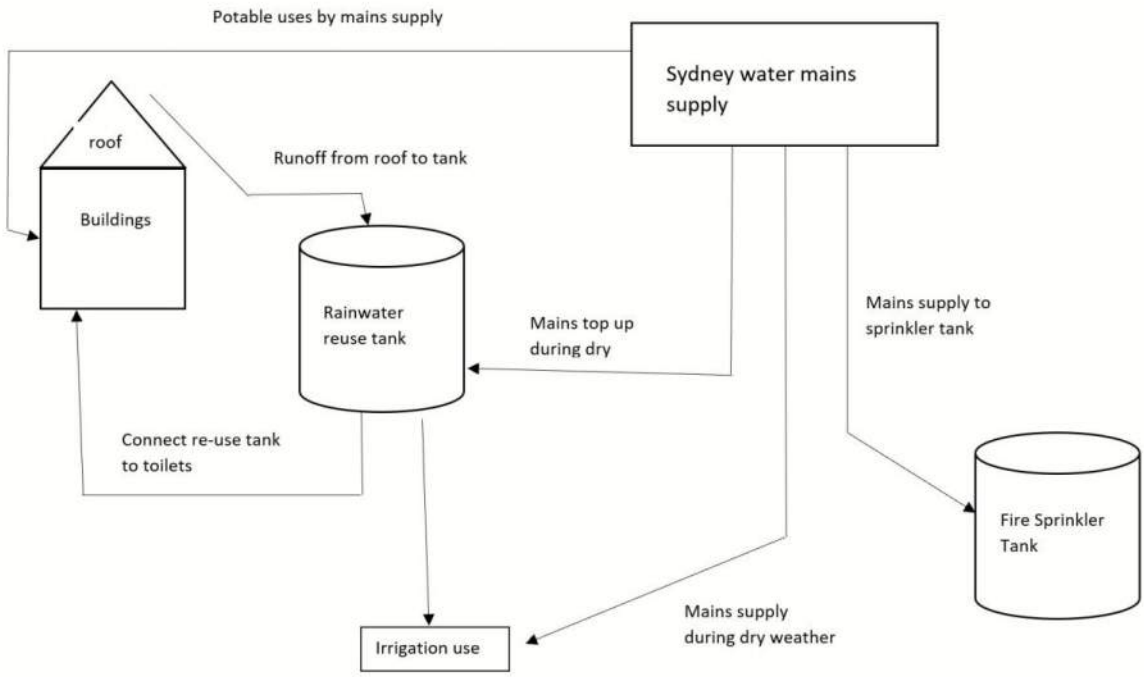


Figure 5.1. Water Cycle Management Schematic

A short description of the expected stormwater harvesting for the development is described below.

Stormwater Harvesting

Stormwater harvesting refers to the collection of stormwater from the developments internal stormwater drainage system for re-use in non-potable applications. Stormwater from the stormwater drainage system can be classified as either rainwater, where the flow is from roof areas only, or stormwater where the flow is from all areas of the development.

Rainwater harvesting is proposed for this development, and will be rainwater tank sizing will be designed during detail design stage by the hydraulic consultant via a water balance assessment. Rainwater tanks are to be sized with reference to the NSW Department of Environment and Conservation document *Managing Urban Stormwater: Harvesting and Reuse*, using a simple water balance analysis to balance the supply and demand, based on the base water demands and the requirements of Council.

The water balance assessment will be based on local rainfall data and specific utilisation rates for the facility for re-use of non-potable applications. The expected reuse applications include internal uses such as toilet flushing, and external applications including irrigation. The aim is to reduce the water demand for the development and to satisfy the requirements of Council to provide an 80% reduction in water demand.

In general terms the rainwater harvesting system will be comprised the following elements:

- In-line tank for the collection and storage of rainwater.

- Overflow to the in-ground stormwater drainage system sized to cater for the catchment being drained to the tank. This will operate at times when the rainwater storage tank is full so that rainwater can pass through the tank and continue to be discharged via gravity into the stormwater drainage system.
- Rainwater from the storage tank will be pumped for distribution throughout the development in a dedicated non-potable water reticulation system to toilets and external irrigation areas.
- Mains top up to Sydney Water system for prolonged periods of dry weather.
- First flush diverter and filters to ensure adequate quality of reuse water.
- Tank will be an underground concrete structure to minimise visual impact.

Refer drawings in **Appendix A**.

5.3 Water Balance Assessment

5.3.1 Internal Base Water Demand

Indoor water demand has been based an allowance of 0.1kL/day/ toilet or urinal. No allowance is required for disable toilets.

The above rates result in the following internal non-potable demand:

Internal Demand	32 Toilets	3.2kL/day

The final number of toilets & subsequent re-use for the development shall be confirmed during detailed design.

5.3.2 External Base Water Demand

The external base water demand has been based on an allowance of 0.4kL/year/m^2 as PET-Rain for irrigation.

The above regime for the landscaped area for the site gives the following yearly outdoor water demand:

External Demand (0.4kL/year/m^2)	4,600m^2	1,840 kL/year

5.3.3 Rainwater Tank Sizing

The use of rainwater reduces the mains water demand and the amount of stormwater runoff. By collecting the rainwater run-off from roof areas, rainwater tanks provide a valuable water source suitable for flushing toilets and landscape irrigation.

Rainwater tanks have been designed, using a simple water balance calculation to balance the supply and demand, based on the calculated base water demands and proposed roof catchment areas. Allowances in the calculation have been made for efficiency of collection, absorption/ evaporation losses.

Table 5.2. Rainwater Reuse Requirements

Tank	Roof Catchment to Rainwater Tank (m^2)	Tank Size (kL)	Tank Size in MUSIC (kL)	Predicted Non-Potable Demand Reduction (%)
FP3	17,900	200	160	80

The water balance assessment predicts 80% reduction in non-potable will be met for the development with the provision of a minimum 200 kL rainwater tank.

We note that the final configuration and sizing of the rainwater tanks is subject to detail design considerations and optimum site utilisation.

5.4 Construction Impact Assessment

Construction works will require minimal water demand to service site sheds, dust suppression and other construction related operations.

Water supply for these activities during the construction period will be made via existing Sydney Water supply.

It is considered that impact associated with water use during construction is limited and an existing supply is available through the whole of the construction works period.

5.5 Operational Impact Assessment

Rainwater harvesting is proposed to reduce demand on non-potable applications.

An existing and reliable water supply is available during operations.

Impact on environment from water use is considered to be acceptable.

6 ADDITIONAL MITIGATION MEASURES

This report describes a number of design features that will be incorporated into the Proposal to manage water quality and hydrology impacts. The features are considered suitable to suitable mitigate all construction and operation impacts related to the Proposal. Notwithstanding this, the below measure will be incorporated into the CEMP and OEMP to mitigate any residual impacts.

6.1 Construction

A Soil and Water Management Plan (SWMP) and Erosion and Sediment Control Plan (ESCP), or equivalent, will be incorporated into the CEMP for the construction of the Proposal. The SWMP and ESCPs would be developed in accordance with the principles and requirements of *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book') (Landcom, 2004)* and Volume 2 (DECC 2008) and consider the Preliminary ESCPs (**Appendix C**). The following aspects will be addressed within the SWMP and ESCPs:

- Construction traffic restricted to delineated access tracks, and maintained until construction complete
- Appropriate sediment and erosion controls to be implemented prior to soil disturbance
- Stormwater management to avoid flow over exposed soils which may result in erosion and impacts to water quality
- Location of stockpiles outside of flow paths on appropriate impermeable surfaces
- Inspection of all permanent and temporary erosion and sedimentation control works prior to and post rainfall events and prior to closure of the construction area

Construction vehicles will be required to maintain consistency with existing General Mass Limit (GML), Concessional Mass Limit (CML) and Higher Mass Limit (HML) roads and access routes.

It is noted that Victoria Street is an existing approved HML road and Redfern Street, adjacent to the site is approved for GML and CML vehicles. During construction and operation, the existing road weight limits are proposed to be maintained. There are no proposed changes in the use of HML vehicles on roads not currently approved for HML use.

If HML vehicles are required during construction, access to the site will be made from Victoria Street.

Given there is no proposed change in the existing load limits for the surrounding roads, there would no requirement for additional mitigation measures relating to construction access.

Refer to the **CBRK TIA** for further clarification on road numbers and access requirements.

6.2 Operation

An OEMP will be prepared for the Proposal to minimise water and hydrology impacts and will include the following: Emergency response and incident management protocols will cover the following types of emergency or incident:

- On-site spills or leaks
- Off-site discharges
- Flooding

In relation to vehicle access during operation, vehicles will be required to maintain consistency with existing General Mass Limit (GML), Concessional Mass Limit (CML) and Higher Mass Limit (HML) roads and access routes.

It is noted that Victoria Street is an existing approved HML road and Redfern Street, adjacent to the site is approved for GML and CML vehicles. During operation, the existing road weight limits are proposed to be maintained. There are no proposed changes in the use of HML vehicles on roads not currently approved for HML use.

Given there is no proposed change in the existing load limits for the surrounding roads, there would no requirement for additional mitigation measures relating to operational access.

Refer to the **CBRK TIA** for further clarification on road numbers and access requirements.

7 CONCLUSION

This impact assessment has been prepared to support the Proposal for the development and operation of a warehouse and distribution centre for Woolworths.

An assessment of the impacts relation to soil and water has been prepared which provides a best practice solution within the constraints of the existing landform and proposed development layout. Within this strategy a stormwater quantity and quality management strategy has been developed to reduce both peak flows and pollutant loads in stormwater leaving this site. The stormwater management for the development has been designed in accordance with *Fairfield City Council's Stormwater Management Policy 2017.*

The hydrological assessment of the local site drainage confirms that recommended water quality and quantity measures will ensure that no adverse impacts result on receiving waterways as a result of the development.

During the operational phase of the development, the proposed stormwater quality treatment system incorporating the use of a treatment train of a vortech style GPT (Ocean Protect OceanSave or similar) with oil baffle, in conjunction with a proprietary filtration device (Ocean Protect Jellyfish) is proposed to mitigate any increase in stormwater pollutant load generated by the development. Stormwater quality modelling was undertaken which demonstrated that implementation of the WSUD measures would result in improved water quality outcomes consistent with the *Fairfield City Council's Stormwater Management Policy 2017* and that stormwater runoff is not detrimental to the receiving environment.

Further it has been confirmed that the development meets flood planning requirements and does not impact or encroach on existing flood affected areas. The assessment shows that local post development flows from the site, in conjunction with the flood management measures to be adopted in the flooding assessment demonstrates that the site discharge will not adversely affect any land, drainage system or watercourse as a result of the development.

During the construction phase, a *Sediment and Erosion Control Plan* will be in place to ensure the downstream drainage system and receiving waters are protected from sediment laden runoff.

The detail contained in this report provides sufficient information to show the consent authority that legal points of discharge and a suitable stormwater management strategy is available for the development and the requirements associated with the strategy. It is recommended the management strategies in this report be approved and incorporated into the future detailed design.

8 REFERENCES

- Managing Urban Stormwater: Source Control – 1998 (NSW EPA);
- Managing Urban Stormwater: Treatment Techniques – 1997 (NSW EPA);
- Managing Urban Stormwater: Soils & Construction – 2004(LANDCOM);
- Fairfield City Council Development Control Plan.
- Stormwater Management Policy - 2017 (Fairfield City Council)
- Specification for Roadworks and Drainage associated with subdivision or other development Policy 0-60 (2011), Fairfield City Council
- Water Sensitive Urban Design – "Technical Guidelines for Western Sydney" by URS Australia Pty Ltd, May 2004; and
- Managing Urban Stormwater, Soils and Construction (1998) – The Blue Book, Landcom

Appendix A

DRAWINGS BY COSTIN ROE CONSULTING

WOOLWORTHS WAREHOUSE & DISTRIBUTION CENTRE

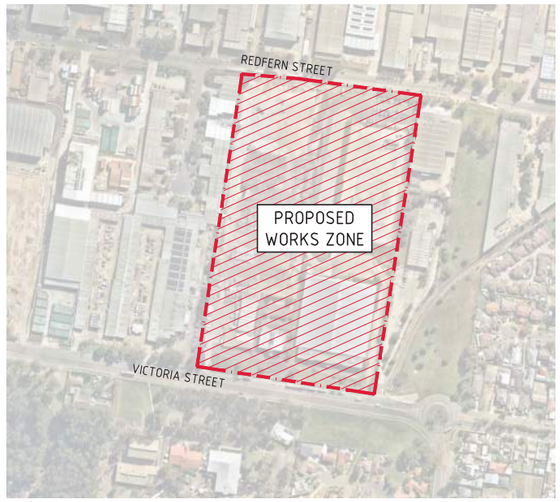
CIVIL PACKAGE - SSD15221509

250 - 266 VICTORIA STREET

WETHERILL PARK, NSW

DRAWING LIST

DRAWING NO.	DRAWING TITLE
C013738.01-DA10	DRAWING LIST & GENERAL NOTES
C013738.01-DA20	EROSION AND SEDIMENT CONTROL PLAN
C013738.01-DA25	EROSION AND SEDIMENT CONTROL DETAILS
C013738.01-DA40	STORMWATER KEY PLAN & PIT SCHEDULE
C013738.01-DA41	STORMWATER DRAINAGE PLAN - BASEMENT
C013738.01-DA42	STORMWATER DRAINAGE PLAN - GROUND FLOOR FRESH
C013738.01-DA45	STORMWATER DRAINAGE DETAILS - SHEET 1
C013738.01-DA46	STORMWATER DRAINAGE DETAILS - SHEET 2
C013738.01-DA50	FINISHED LEVELS KEY PLAN
C013738.01-DA51	FINISHED LEVELS PLAN - BASEMENT
C013738.01-DA52	FINISHED LEVELS PLAN - GROUND FLOOR FRESH



SITE LOCATION PLAN
N.T.S.

EARLY WORKS NOTE:

REFER TO DRAWINGS PREPARED BY COSTIN ROE CONSULTING AS PART OF A SEPARATE DEVELOPMENT APPLICATION FOR EARLY WORKS CONSTRUCTION. REFERENCE C013738.01-EW PACKAGE.

GENERAL NOTES:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
3. ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE.
   ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
   ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT.
   REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.
4. DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
5. UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
6. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.

SITE PREPARATION NOTES:

1. ALL EARTHWORKS SHALL BE COMPLETED GENERALLY IN ACCORDANCE WITH THE GUIDELINES SPECIFIED BY THE GEOTECHNICAL 31888AHrpt PROVIDED BY JK GEOTECHNICS DATED 18/10/18 UNDER LEVEL 1 SUPERVISION.
2. EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.
3. STRIP ANY TOP SOIL OR DELETERIOUS MATERIAL AND DISPOSE OF FROM SITE OR STORE AS DIRECTED.
4. COMPLETE CUT TO FILL EARTHWORKS TO ACHIEVE THE REQUIRED LEVELS AS INDICATED ON THE DRAWINGS WITHIN A TOLERANCE OF +0mm/-10mm THROUGH BUILDING PADS/PAVEMENTS AND +0mm/-20mm ELSEWHERE.
5. PREPARE STEEP BATTERS TO RECEIVE FILL BY CONSTRUCTING BENCHING TO FACILITATE FILL PLACEMENT AND COMPACTION.
6. AREAS TO RECEIVE FILL (THAT ARE NOT ON BENCHED BATTERS) AND AREAS IN CUT SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT HEAVING MATERIAL. SOFT MATERIAL SHALL BE BOXED OUT AND REMOVED PRIOR TO FILL PLACEMENT. PROOF ROLLING TO BE INSPECTED BY A GEOTECHNICAL ENGINEER OR THE EARTHWORKS DESIGNER.
7. SITE WON FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
8. IMPORTED FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
9. ALL ENGINEERED FILL PARTICLES SHALL BE ABLE TO BE INCORPORATED WITHIN A SINGLE LAYER. FURTHER, LESS THAN 30% OF PARTICLES SHALL BE RETAINED ON THE 37.5 MM SIEVE. ENGINEERED FILL SHALL BE ABLE TO BE TESTED IN ACCORDANCE WITH THE STANDARD COMPACTION METHOD (AS1289.5.4.1) OR HILF TEST METHOD (AS1289.5.7.1). THESE METHODS REQUIRE LESS THAN 20% RETAINED ON THE 37.5 MM SIEVE. WHERE BETWEEN 20% AND 30% OF PARTICLES ARE RETAINED ON THE 37.5 MM SIEVE THE ABOVE TEST METHODS SHALL STILL BE ADOPTED AND TEST REPORTS ANNOTATED APPROPRIATELY. THESE REQUIREMENTS SHOULD BE MET BY THE MATERIAL AFTER PLACEMENT AND COMPACTION
10. ALL THE EARTHWORKS UNDERTAKEN AND THE SUBGRADE CONDITION IN THE CUT AREAS (IN THE STATED PERIOD) ARE DOCUMENTED IN THE REPORTS AND HAVE BEEN UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION.
11. PRIOR TO ANY EARTHWORKS, EROSION CONTROL AS OUTLINED IN THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE COMPLETED.
12. EXISTING ROCK, IF ANY, SHALL BE REMOVED BY HEAVY ROCK BREAKING OR RIPPING.
13. MATCH EXISTING LEVELS AT BATTER INTERFACE.
14. CONTRACTOR TO MATCH EXISTING LEVELS AT THE INTERFACE OF EARTHWORKS AND EXISTING SURFACE AT BATTER LOCATIONS OR WHERE NO RETAINING WALLS ARE PRESENT. ANY DISCREPANCY BETWEEN DESIGN AND EXISTING LEVELS TO BE REFERRED TO THE ENGINEER FOR DIRECTION OR ADJUSTMENTS TO DESIGN LEVELS.
15. DURING EARTHWORKS THE CONTRACTOR IS TO ENSURE ALL AREAS ARE FREE DRAINING & WILL NOT RETAIN WATER DURING RAINFALL. PROVIDE TEMPORARY MEASURES AS REQUIRED TO ENSURE FREE FLOWING RUNOFF THROUGH MANAGED DRAINAGE PATHS, DIVERSION DRAINS OR OTHER SUITABLE DISPOSAL METHOD AS AGREED DURING THE WORKS. REFER ANY CONCERNS TO THE ENGINEER. REFER TO EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES.

EROSION CONTROL NOTES:

ALL CONTROL WORK INCLUDING DIVERSION BANKS AND CATCH DRAINS, V-DRAINS AND SILT FENCES SHALL BE COMPLETED DIRECTLY FOLLOWING THE COMPLETION OF THE EARTHWORKS.

1. SILT FENCES AND SILT FENCE RETURNS SHALL BE ERECTED CONVEX TO THE CONTOUR TO POND WATER.
2. HAY BALE BARRIERS AND GEOFABRIC FENCES ARE TO BE CONSTRUCTED TO TOE OF BATTER, PRIOR TO COMMENCEMENT OF EARTHWORKS, IMMEDIATELY AFTER CLEARING OF VEGETATION AND BEFORE REMOVAL OF TOP SOIL.
3. ALL TEMPORARY EARTH BERMS, DIVERSION AND SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED AND MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
4. CLEAR WATER IS TO BE DIVERTED AWAY FROM DISTURBED GROUND AND INTO THE DRAINAGE SYSTEM.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND PROVIDING ON GOING ADJUSTMENT TO EROSION CONTROL MEASURES AS REQUIRED DURING CONSTRUCTION.
6. ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING, TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE, APPROVED LOCATION.
7. ALL FINAL EROSION PREVENTION MEASURES INCLUDING THE ESTABLISHMENT OF GRASSING ARE TO BE MAINTAINED UNTIL THE END OF THE DEFECTS LIABILITY PERIOD.
8. ALL EARTHWORKS AREAS SHALL BE ROLLED ON A REGULAR BASIS TO SEAL THE EARTHWORKS.
9. ALL FILL AREAS ARE TO BE LEFT WITH A BUND AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS EARTHWORKS. THE HEIGHT OF THE BUND SHALL BE A MINIMUM OF 200mm.
10. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF FORMATION.
11. AFTER REVEGETATION OF THE SITE IS COMPLETE AND THE SITE IS STABLE IN THE OPINION OF A SUITABLY QUALIFIED PERSON ALL TEMPORARY WORK SUCH AS SILT FENCE, DIVERSION DRAINS ETC SHALL BE REMOVED.
12. ALL TOPSOIL STOCKPILES ARE TO BE SUITABLY COVERED TO THE SATISFACTION OF THE SITE MANAGER TO PREVENT WIND AND WATER EROSION.
13. ANY AREA THAT IS NOT APPROVED BY THE CONTRACT ADMINISTRATOR FOR CLEARING OR DISTURBANCE BY THE CONTRACTOR'S ACTIVITIES SHALL BE CLEARLY MARKED AND SIGN POSTED, FENCED OFF OR OTHERWISE APPROPRIATELY PROTECTED AGAINST ANY SUCH DISTURBANCE.
14. ALL STOCKPILE SITES SHALL BE SITUATED IN AREAS APPROVED FOR SUCH USE BY THE SITE MANAGER. A 6m BUFFER ZONE SHALL EXIST BETWEEN STOCKPILE SITES AND ANY STREAM OR FLOW PATH. ALL STOCKPILES SHALL BE ADEQUATELY PROTECTED FROM EROSION AND CONTAMINATION OF THE SURROUNDING AREA BY USE OF THE MEASURES APPROVED IN THE EROSION AND SEDIMENTATION CONTROL PLAN.
15. ACCESS AND EXIT AREAS SHALL INCLUDE SHAKE-DOWN OR OTHER METHODS APPROVED BY THE SITE MANAGER FOR THE REMOVAL OF SOIL MATERIALS FORM MOTOR VEHICLES.
16. THE CONTRACTOR IS TO ENSURE RUNOFF FROM ALL AREAS WHERE THE NATURAL SURFACE IS DISTURBED BY CONSTRUCTION, INCLUDING ACCESS ROADS, DEPOT AND STOCKPILE SITES, SHALL BE FREE OF POLLUTANTS BEFORE IT IS EITHER DISPERSED TO STABLE AREAS OR DIRECTED TO NATURAL WATERCOURSES.
17. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SLOPES, CROWNS AND DRAINS ON ALL EXCAVATIONS AND EMBANKMENTS TO ENSURE SATISFACTORY DRAINAGE AT ALL TIMES WATER SHALL NOT BE ALLOWED TO POND ON THE WORKS UNLESS SUCH PONDING IS PART OF AN APPROVED ESCP / SWMP.

ELECTRONIC INFORMATION NOTES:

1. THE ISSUED DRAWINGS IN HARD COPY OR PDF FORMAT TAKE PRECEDENCE OVER ANY ELECTRONICALLY ISSUED INFORMATION, LAYOUTS OR DESIGN MODELS.
2. THE CONTRACTOR'S DIRECT AMENDMENT OR MANIPULATION OF THE DATA OR INFORMATION THAT MIGHT BE CONTAINED WITHIN AN ENGINEER-SUPPLIED DIGITAL TERRAIN MODEL AND ITS SUBSEQUENT USE TO UNDERTAKE THE WORKS WILL BE SOLELY AT THE DISCRETION OF AND THE RISK OF THE CONTRACTOR.
3. THE CONTRACTOR IS REQUIRED TO HIGHLIGHT ANY DISCREPANCIES BETWEEN THE DIGITAL TERRAIN MODEL AND INFORMATION PROVIDED IN THE CONTRACT AND/OR DRAWINGS AND IS REQUIRED TO SEEK CLARIFICATION FROM THE SUPERINTENDENT.
4. THE ENGINEER WILL NOT BE LIABLE OR RESPONSIBLE FOR THE POSSIBLE ON-GOING NEED TO UPDATE THE DIGITAL TERRAIN MODEL, SHOULD THERE BE ANY AMENDMENTS OR CHANGES TO THE DRAWINGS OR CONTRACT INITIATED BY THE CONTRACTOR.

STORMWATER DRAINAGE NOTES:

1. ALL STORMWATER WORKS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3500.3:2003 PLUMBING AND DRAINAGE, PART 3: STORMWATER DRAINAGE.
2. THE MINOR (PIPED) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 20 YEAR ARI STORM EVENT AND THE MAJOR (OVERLAND) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 100 YEAR ARI STORM EVENT.
3. ALL FINISHED PAVEMENT LEVELS SHALL BE AS INDICATED ON FINISHED LEVELS PLANS DA51 & DA52
4. PIT SIZES SHALL BE AS INDICATED IN THE SCHEDULE WHILE PIPE SIZES AND DETAILS ARE PROVIDED ON PLAN.
5. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY SURVEY PRIOR TO COMMENCING WORKS ON SITE.
6. ALL STORMWATER PIPES Ø375 OR GREATER SHALL BE CLASS 2 (WITH HS2 SUPPORT) REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
7. ALL PIPES UP TO AND INCLUDING Ø300 TO BE uPVC GRADE SN8 UNO.
8. PIPE CLASS NOMINATED ARE FOR IN-SERVICE LOADING CONDITIONS ONLY. CONTRACTOR IS TO MAKE ANY NECESSARY ADJUSTMENTS REQUIRED FOR CONSTRUCTION CONDITIONS.
9. ALL CONCRETE PITS GREATER THAN 1000mm DEEP SHALL BE REINFORCED USING N12-200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE F'c=25 MPa. PRECAST PITS MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
10. IN ADDITION TO ITEM 6 ABOVE, ALL CONCRETE PITS GREATER THAN 3000mm DEEP SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 200mm.
11. PIPES SHALL BE LAID AS PER PIPE LAYING DETAILS. PARTICULAR CARE SHALL BE TAKEN TO ENSURE THAT THE PIPE IS FULLY AND EVENLY SUPPORTED. RAM AND PACK FILLING AROUND AND UNDER BACK OF PIPES AND PIPE FAUCETS, WITH NARROW EDGED RAMMERS OR OTHER SUITABLE TAMPING DETAILS.
12. CONCRETE PIPES UNDER, OR WITHIN THE ZONE OF INFLUENCE OF PAVED AREAS SHALL BE LAID USING HS2 TYPE SUPPORT, AS A MINIMUM, IN ACCORDANCE WITH AS 3725. AGGREGATE BACKFILL SHALL NOT BE USED FOR PIPE BEDDING AND OR HAUNCH/SIDE SUPPORT.
13. WHERE PIPE LINES ENTER PITS, PROVIDE 2m LENGTH OF STOCKING WRAPPED SLOTTED Ø100 uPVC TO EACH SIDE OF PIPE.
14. ALL SUBSOIL DRAINAGE LINES SHALL BE Ø100 SLOTTED uPVC WITH APPROVED FILTER WRAP LAID IN 300mm WIDE GRANULAR FILTER UNLESS NOTED OTHERWISE. LAY SUBSOIL LINES TO MATCH FALLS OF LAND AND/OR 1 IN 200 MINIMUM. PROVIDE CAPPED CLEANING EYE (RODDING POINT) AT UPSTREAM END OF LINE AND AT 30m MAX. CTS. PROVIDE SUBSOIL LINES TO ALL PAVEMENT/ LANDSCAPED INTERFACES, TO REAR OF RETAINING WALLS (AS NOMINATED BY STRUCTURAL ENGINEER) AND AS SHOWN ON PLAN.
15. ALL PIPE GRADES 1 IN 200 MINIMUM UNO.
16. PROVIDE STEP IRONS IN PITS DEEPER THAN 1000mm.
17. MIN. 600 COVER TO PIPE OBVERT BENEATH ROADS & MIN. 400 COVER BENEATH LANDSCAPED AND PEDESTRIAN AREAS.
18. PIT COVERS IN TRAFFICABLE PAVEMENT SHALL BE CLASS D 'HEAVY DUTY', THOSE LOCATED IN NON-TRAFFICABLE AREAS SHALL BE CLASS B 'MEDIUM DUTY' U.N.O.
19. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
20. DOWN PIPES (DP) TO BE AS PER HYDRAULIC ENGINEERS DETAILS WITH CONNECTOR TO MATCH DP SIZE U.N.O. ON PLAN. PROVIDE CLEANING EYE AT GROUND LEVEL.
21. PIPE LENGTHS NOMINATED ON PLAN OR LONGSECTIONS ARE MEASURED FROM CENTER OF PITS TO THE NEAREST 0.5m AND DO NOT REPRESENT ACTUAL LENGTH. THE CONTRACTOR IS TO ALLOW FOR THIS.

FINISHED LEVELS PLAN NOTES:

1. LEVELS DATUM IS A.H.D.
2. ALL CONTOUR LINES & SPOT LEVELS INDICATE FINISHED PAVEMENT LEVELS U.N.O. ON PLAN.
3. THE MAJOR CONTOUR INTERVAL IS 0.5m
4. THE MINOR CONTOUR INTERVAL IS 0.1m.
5. MINIMUM PAVEMENT GRADE IS TO BE 1:100 (1%).
6. MAXIMUM PAVEMENT GRADE IS TO BE 1:20 (5%) IN CARPARKING AREAS AND 1:25 (4%) ELSEWHERE.
7. MAXIMUM RAMP GRADES ARE TO BE 1:12 (8.3%) U.N.O. ON PLAN
8. PROVIDE MINIMUM 3.0m LONG TRANSITION WHERE CHANGES GRADE EXCEDE 1:20 (5%).
9. PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H.
10. ALL BATTER SLOPES WITH GRADES AT OR EXCEDING 1V:6H ARE TO BE TURFED IMMEDIATELY, OR APPROPRIATE EROSION CONTROL IS TO BE PROVIDED TO THE SATISFACTION OF THE ENGINEER.
11. ALL FOOTPATHS ARE TO FALL AWAY FROM THE BUILDING AT 2.5% NOMINAL GRADE.
12. ALL PAVEMENTS ARE TO BE SET AT 50mm BELOW THE FINISHED FLOOR LEVEL OF THE WAREHOUSE AND OFFICE AREAS.

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	16.07.21	B
ISSUED FOR INFORMATION	08.04.21	A

AMENDMENTS DATE ISSUE

ARCHITECT: watson young

CLIENT: Woolworths — the fresh food people

PROJECT: WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	DM	MAR' 21	XC	B1	AS SHOWN	C013738.01-DA10

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PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE: DRAWING LIST AND GENERAL NOTES

DRAWING No. C013738.01-DA10 ISSUE B

DIVERSION DRAIN TO COLLECT SEDIMENT LADEN WATER AND DIRECT TO PITS

SITE BOUNDARY

CONSTRUCTION SITE ENTRY NO.2

CONSTRUCTION SITE ENTRY NO.1

PROPOSED PAD 3
BEL RL 41.40

PROPOSED PAD 2
BEL RL 37.40

PROPOSED PAD 1
BEL RL 33.90

PROVIDE SEDIMENT BASIN

LOCALLY PROVIDE 1500x1500 SUMP AT DRAINAGE INVERT LEVEL IN SEDIMENT BASIN

ROCK LINED OVERFLOW SPILLWAY 5m WIDE 0.8m DEEP

OVERFLOW TO PROPOSED PIT

CONNECT TO EXISTING PIT

DIVERSION BUND

NOMINAL STOCKPILE LOCATION T.B.C ON SITE

SILT FENCE

BENCHMARK NAIL RL 38.44 (AHD)

BENCHMARK NAIL RL 37.52 (AHD)

BENCHMARK NAIL RL 36.48 (AHD)

VICTORIA STREET

REDFERN STREET

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/20.

- DENOTES SILT FENCE
- DENOTES DIVERSION DRAIN
- DENOTES STORMWATER TRUNK LINE
- DENOTES STORMWATER TRUNK PIT
- DENOTES OVERFLOW DIRECTION
- DENOTES KERB INLET CONTROL FILTER
- DENOTES SUBSOIL DRAIN

SEDIMENTATION BASIN NOTE:

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING C013738.01-DA25.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'. CAPACITY BASED UPON 5 DAY RAINFALL DEPTH AT 85th PERCENTILE INTENSITY (32.2mm).

APPROXIMATE AREA OF DISTURBED SITE = 8.60Ha

SEDIMENTATION BASINS TO COLLECT RUN-OFF IN RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:
1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES) SOIL TYPE ASSESSED FROM GEOTECHNICAL REPORT.

SEDIMENT BASIN:

CATCHMENT AREA	= 8.60ha
REQUIRED BASIN VOLUME	= 2077m³
BASE DIMENSION (LxB)	= 10.0m x 32.0m
TOP DIMENSION (LxB)	= 25.0m x 47.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 3.0m
PROVIDED BASIN VOLUME	= 2100m³

EROSION AND SEDIMENT CONTROL PLAN
SCALE 1:500

LEVELS NOTE:
LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO MINOR VARIATIONS TO SUIT DETAILED DESIGN.

STORMWATER TRUNK DRAINAGE NOTE:
STORMWATER TRUNK DRAINAGE TO BE INSTALLED AS PART OF THE EARLY WORKS INFRASTRUCTURE PACKAGE. DIVERSION DRAINS TO CONVEY WATER TO TRUNK DRAINAGE PITS.

NOTE:
FOR EROSION AND SEDIMENT CONTROL NOTES REFER TO DRAWING DA10

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

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ARCHITECT watsonyoung

CLIENT Woolworths — the fresh food people

PROJECT
WOOLWORTHS WAREHOUSE & DC
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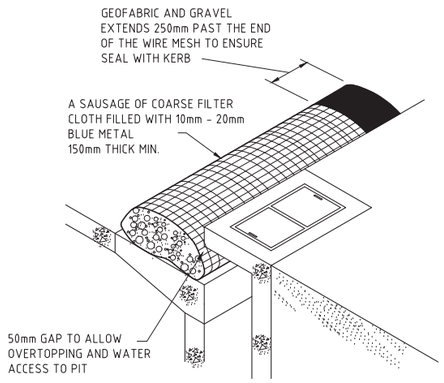
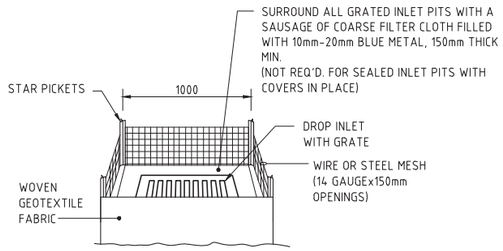
DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

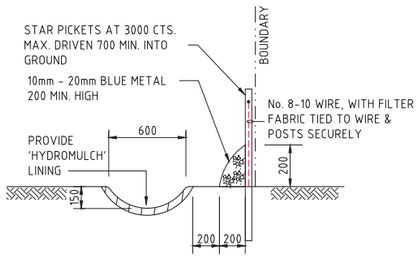
DRAWING No C013738.01-DA20 ISSUE C



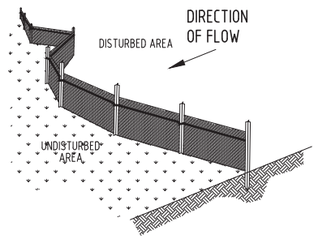
KERB INLET PIT CONTROL
N.T.S



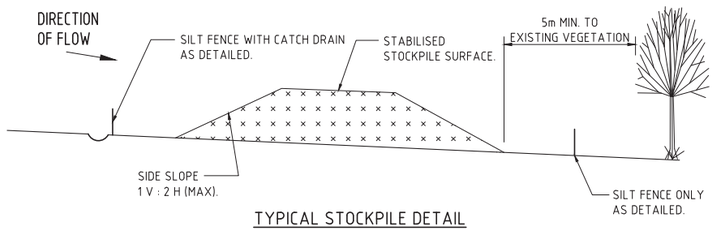
GRATED INLET PIT FILTER DETAIL
N.T.S



TYPICAL OPEN DRAIN & SILT FENCE
SCALE 1:20



TYPICAL SILT FENCE DETAIL
N.T.S.
PROVIDE 1m RETURNS AT 30m INTERVALS.
TYPICAL

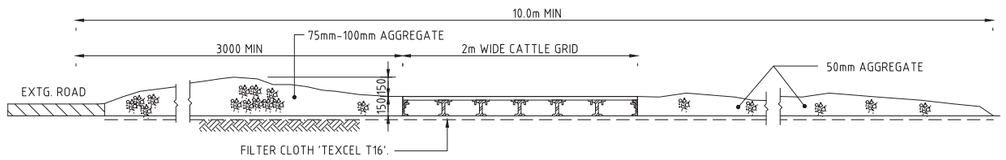


TYPICAL STOCKPILE DETAIL
N.T.S.

STOCKPILE NOTES

1. PLACE ALL STOCKPILES IN LOCATIONS MORE THAN 5m FROM EXISTING VEGETATION, ROADS & HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT ELONGATED MOUNDS. SIDE SLOPE TO BE 1 V: 2 H MAX.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE STOCKPILES ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.
5. CONSTRUCT SILT FENCE WITH CATCH DRAIN ON UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES & SILT FENCE ONLY 1 TO 2m DOWNSLOPE AS SHOWN.

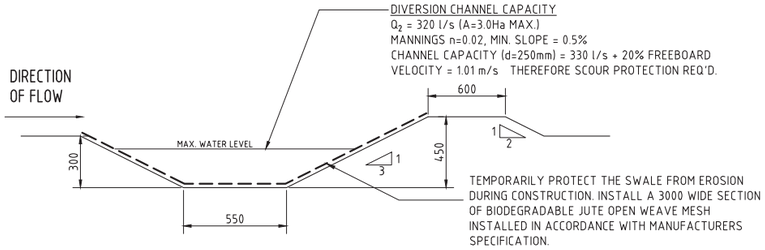
NOTE : ADOPT ABOVE DETAILS AROUND ALL PITS WITHIN AREA ENCOMPASSED BY SILT FENCE & TO PITS ON THE ROAD ADJACENT TO SITE BOUNDARY.



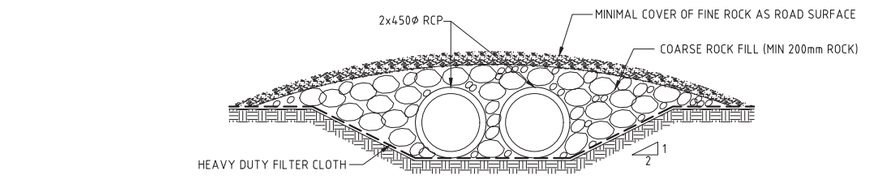
SECTION 1:20 (1 / DA20) : STABILISED CONSTRUCTION ENTRANCE 'TRUCK SHAKER'

SEDIMENT CONTROL POND NOTES:

1. VOLUME OF PONDS SHALL BE AS NOMINATED ON DRAWING DA20. NOMINAL POND LOCATIONS AND NOMINAL DIMENSIONS.
2. SEDIMENT BUILD UP TO NOT EXCEED 33% TOTAL CAPACITY OF POND.
3. WATER LEVEL TO BE MAINTAINED AT 20% CAPACITY DURING SETTLING PERIOD.
4. LENGTH TO WIDTH RATIO TO BE 3:1 MIN. TYPICAL DEPTH TO BE 1.5m.
5. PROVIDE SECURITY FENCE TO POND FOR SAFETY.
6. DEWATERING OF POND TO BE PERFORMED TO THE BOTTOM OF THE SEDIMENT SETTLING ZONE FOLLOWING ACHIEVEMENT OF WQO's. MANAGEMENT OF DOSAGE AND DISCHARGE TO BE ACHIEVED IN A TIMELY MANNER BEFORE THE NEXT RAIN EVENT AND WITHIN 5 DAYS OF THE INITIAL RAINFALL EVENT.
7. WATER TO BE DOSED WITH GYPSUM TO ACCELERATE SETTLEMENT OF SUSPENDED SOLIDS
8. GYPSUM DOSAGE RATE TO BE APPLIED AT APPROX. 32kg PER 100 CUBIC METRE OF COLLECTED RUNOFF.
9. THE USE OF ALUM AS A FLOCULANT IS NOT RECOMMENDED AND IS TO BE USED ONLY FOLLOWING CONSULTATION WITH AND ACCEPTANCE FROM PENRITH CITY COUNCIL ESC OFFICERS.
10. DISCHARGE FROM POND IS PERMISSIBLE WHEN THE WATER PH IS 6.5-8.5 AND IS CLARIFIED TO AT OR BELOW A TSS OF 50mg/L (75 NTU). CLARIFICATION WOULD GENERALLY BE ACHIEVED IN 36-72 HOURS WITH THE USE OF GYPSUM.
11. DEWATERING SHALL BE DONE IN SUCH A MANNER AS TO REMOVE THE RELATIVELY CLEAN WATER WITHOUT REMOVING OR DISTURBING THE SEDIMENT THAT HAS SETTLED. THE PUMP INTAKE PIPE IS NOT TO REST ON THE SETTLED SEDIMENT LAYER.
12. IF WATER EXCEEDS TSS OF 50mg/L (75 NTU) DURING DEWATERING, PUMPING IS TO CEASE.
13. RECORDS ARE TO BE KEPT (ON-SITE AT ALL TIMES) OF ALL MEASUREMENT PRIOR TO, DURING AND AFTER DISCHARGE. RECORDS TO BE MADE AVAILABLE TO COUNCIL OFFICERS UPON REQUEST.

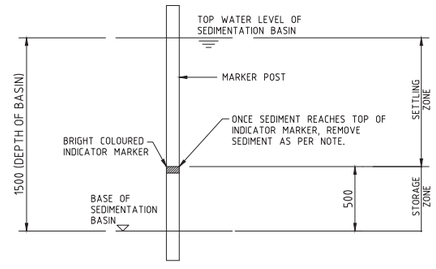


DIVERSION DRAIN SECTION
SCALE 1:20

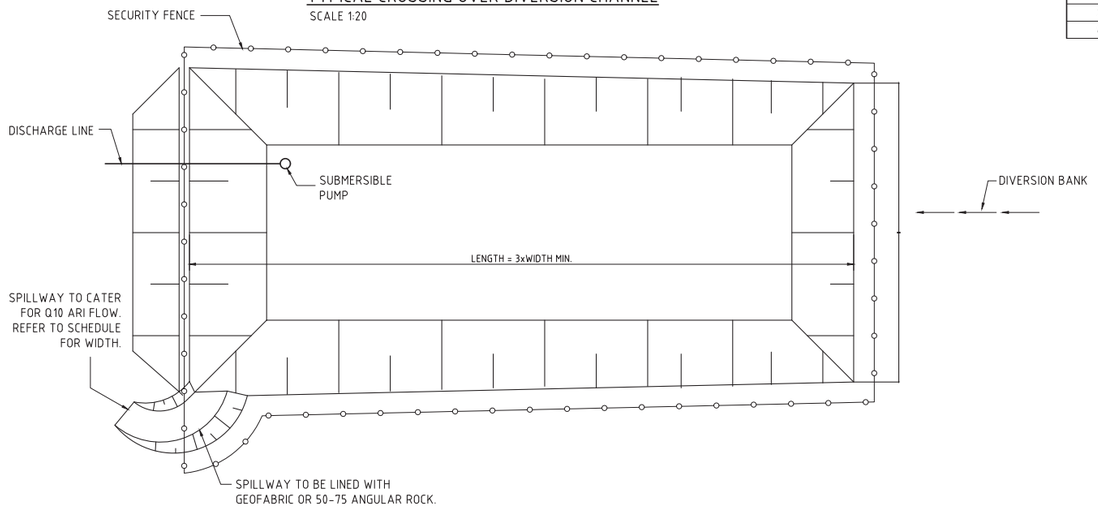


TYPICAL CROSSING OVER DIVERSION CHANNEL
SCALE 1:20

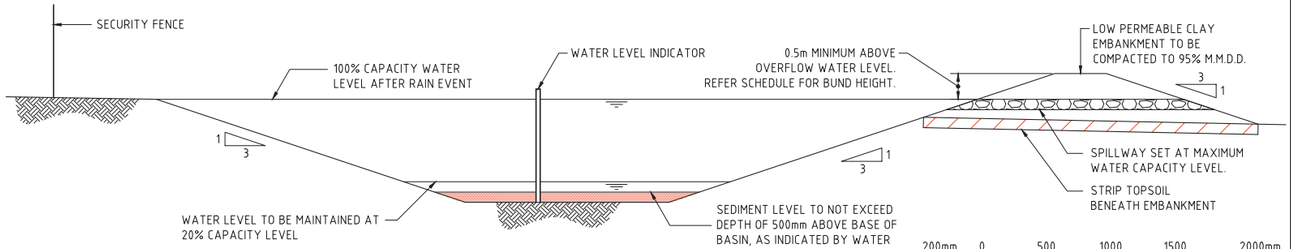
SPILLWAY SCHEDULE					
CATCHMENT (Ha)	FLOW (m^3/s)	WIDTH (m)	FLOW DEPTH (m)	ROCK SIZE (mm)	BUND HEIGHT ABOVE SPILLWAY (m)
1	0.3	2	0.20	200	0.70
2	0.6	4	0.20	200	0.70
5	1.4	5	0.30	200	0.80
10	2.8	8	0.35	200	0.85
20	5.5	14	0.40	250	0.90
40	11.0	20	0.50	250	1.00



SEDIMENT STORAGE MARKER
SCALE 1:20



TYPICAL SEDIMENT CONTROL POND PLAN
SCALE 1:250



TYPICAL SEDIMENT CONTROL BASIN SECTION
SCALE 1:50

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

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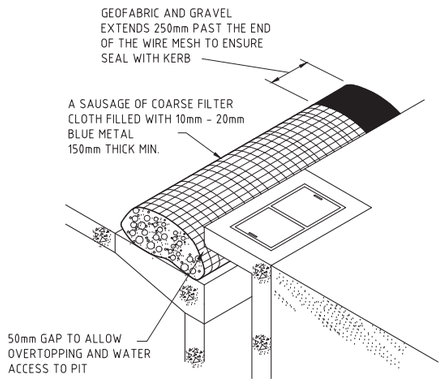
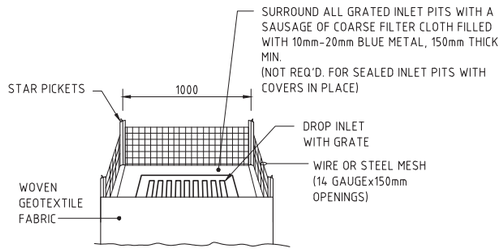
DRAWING TITLE: EROSION AND SEDIMENT CONTROL DETAILS

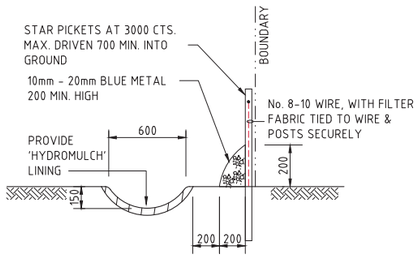
DRAWING No: C013738.01-DA25 ISSUE: C



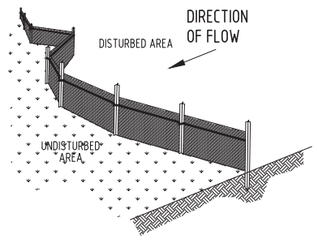
KERB INLET PIT CONTROL
N.T.S



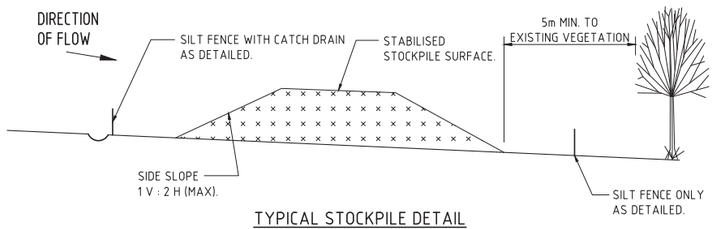
GRATED INLET PIT FILTER DETAIL
N.T.S



TYPICAL OPEN DRAIN & SILT FENCE
SCALE 1:20



TYPICAL SILT FENCE DETAIL
N.T.S.
PROVIDE 1m RETURNS AT 30m INTERVALS.
TYPICAL



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N.T.S.

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4. WHERE STOCKPILES ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.
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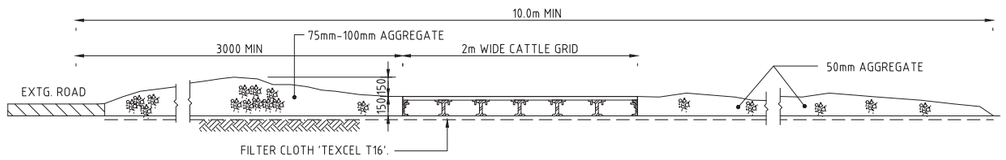

SECTION 1:20 (1 / DA20) : STABILISED CONSTRUCTION ENTRANCE 'TRUCK SHAKER'

SEDIMENT CONTROL POND NOTES:

1. VOLUME OF PONDS SHALL BE AS NOMINATED ON DRAWING DA20. NOMINAL POND LOCATIONS AND NOMINAL DIMENSIONS.
2. SEDIMENT BUILD UP TO NOT EXCEED 33% TOTAL CAPACITY OF POND.
3. WATER LEVEL TO BE MAINTAINED AT 20% CAPACITY DURING SETTLING PERIOD.
4. LENGTH TO WIDTH RATIO TO BE 3:1 MIN. TYPICAL DEPTH TO BE 1.5m.
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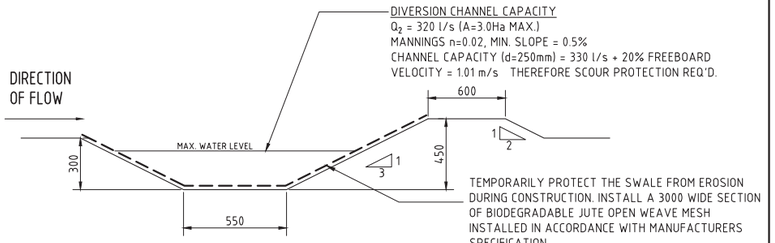
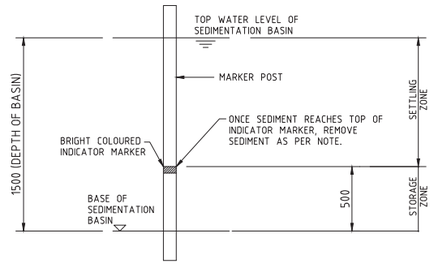
8. GYPSUM DOSAGE RATE TO BE APPLIED AT APPROX. 32kg PER 100 CUBIC METRE OF COLLECTED RUNOFF.
9. THE USE OF ALUM AS A FLOCULANT IS NOT RECOMMENDED AND IS TO BE USED ONLY FOLLOWING CONSULTATION WITH AND ACCEPTANCE FROM PENRITH CITY COUNCIL ESC OFFICERS.
10. DISCHARGE FROM POND IS PERMISSIBLE WHEN THE WATER PH IS 6.5-8.5 AND IS CLARIFIED TO AT OR BELOW A TSS OF 50mg/L (75 NTU). CLARIFICATION WOULD GENERALLY BE ACHIEVED IN 36-72 HOURS WITH THE USE OF GYPSUM.
11. DEWATERING SHALL BE DONE IN SUCH A MANNER AS TO REMOVE THE RELATIVELY CLEAN WATER WITHOUT REMOVING OR DISTURBING THE SEDIMENT THAT HAS SETTLED. THE PUMP INTAKE PIPE IS NOT TO REST ON THE SETTLED SEDIMENT LAYER.
12. IF WATER EXCEEDS TSS OF 50mg/L (75 NTU) DURING DEWATERING, PUMPING IS TO CEASE.
13. RECORDS ARE TO BE KEPT (ON-SITE AT ALL TIMES) OF ALL MEASUREMENT PRIOR TO, DURING AND AFTER DISCHARGE. RECORDS TO BE MADE AVAILABLE TO COUNCIL OFFICERS UPON REQUEST.

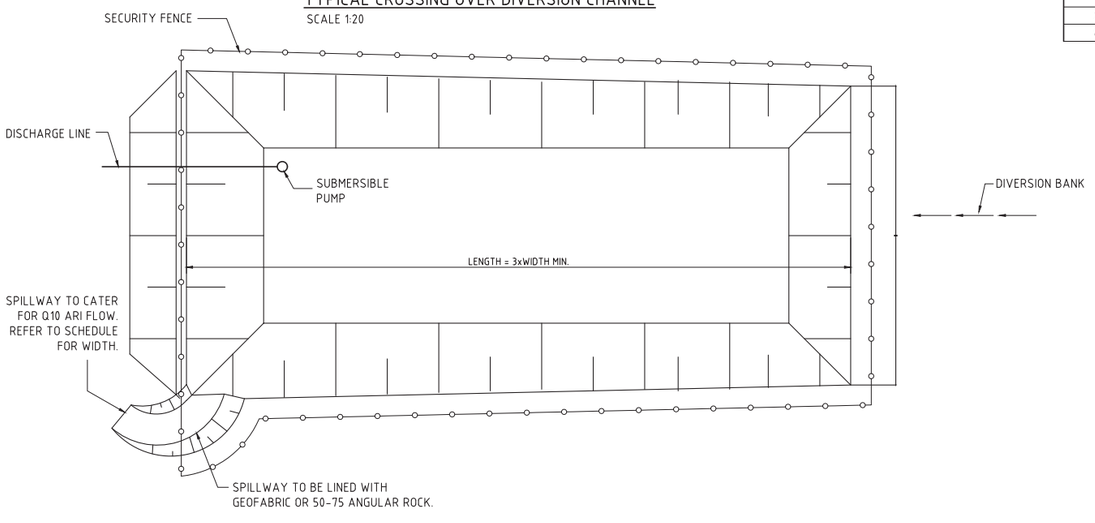


DIVERSION DRAIN SECTION
SCALE 1:20

SPILLWAY SCHEDULE					
CATCHMENT (Ha)	FLOW (m^3/s)	WIDTH (m)	FLOW DEPTH (m)	ROCK SIZE (mm)	BUND HEIGHT ABOVE SPILLWAY (m)
1	0.3	2	0.20	200	0.70
2	0.6	4	0.20	200	0.70
5	1.4	5	0.30	200	0.80
10	2.8	8	0.35	200	0.85
20	5.5	14	0.40	250	0.90
40	11.0	20	0.50	250	1.00

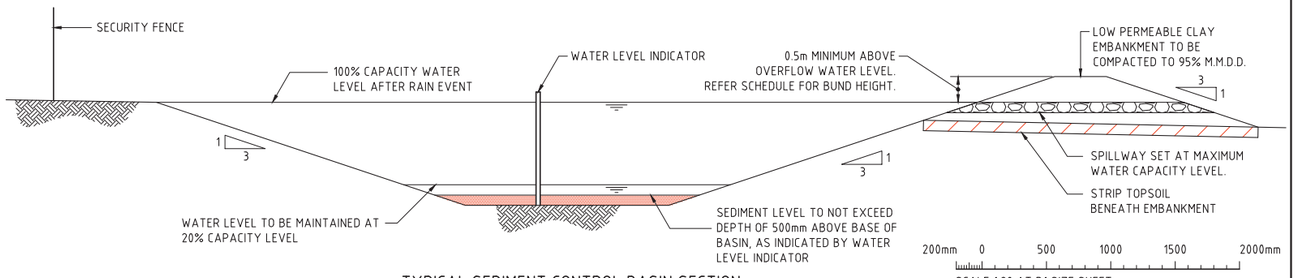


SEDIMENT STORAGE MARKER
SCALE 1:20



TYPICAL CROSSING OVER DIVERSION CHANNEL
SCALE 1:20

TYPICAL SEDIMENT CONTROL POND PLAN
SCALE 1:250



TYPICAL SEDIMENT CONTROL BASIN SECTION
SCALE 1:50

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	14.07.21	C
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ARCHITECT: watson young

CLIENT: Woolworths — the fresh food people

PROJECT: WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
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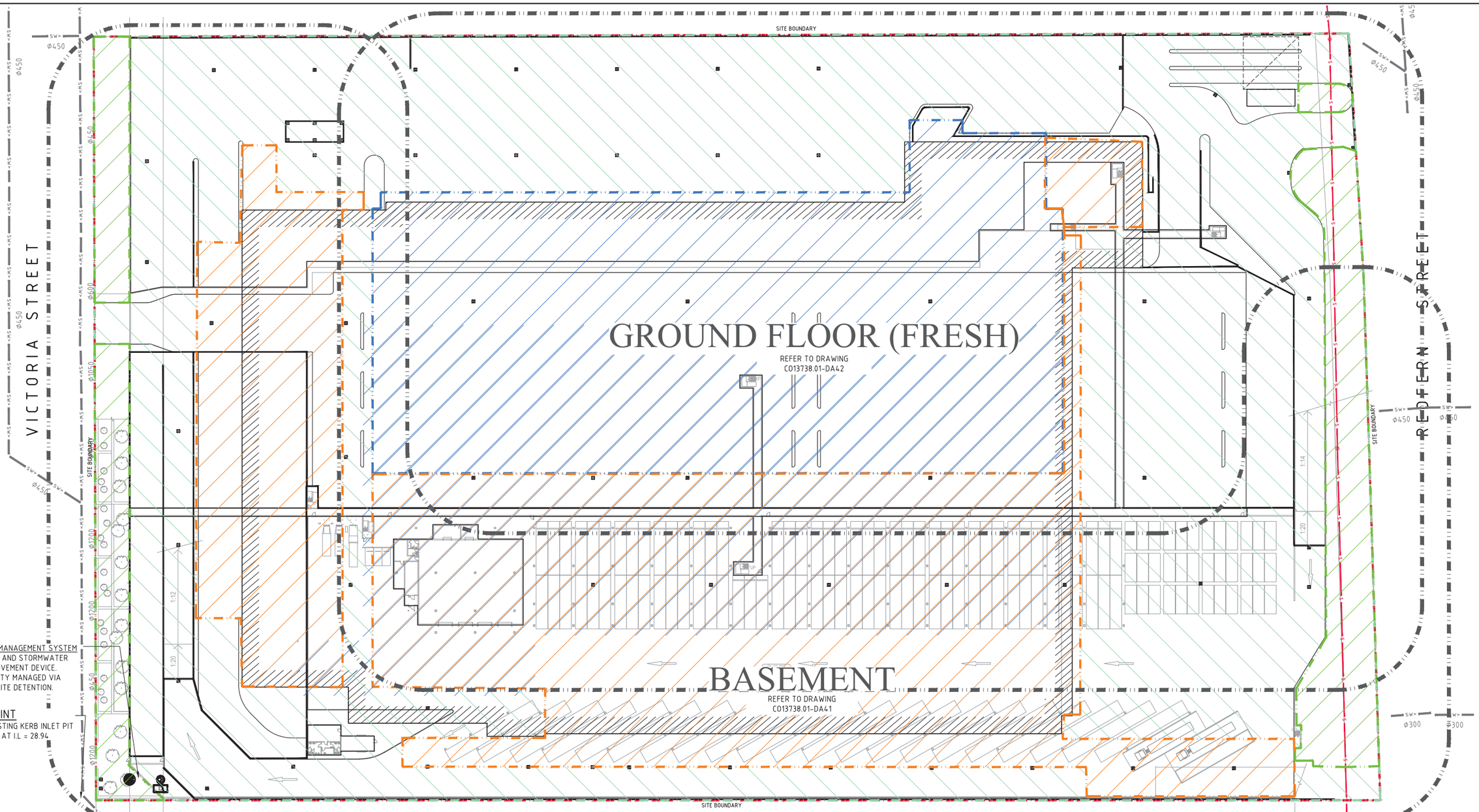
DRAWING TITLE: EROSION AND SEDIMENT CONTROL DETAILS

DRAWING No: C013738.01-DA25 ISSUE: C



PIT SCHEDULE - NETWORK 'A'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT A01	41.30	1000	SGGP	900x900	
PIT A02	41.30	1200	SGGP	900x900	
PIT A03	41.30	1400	SGGP	900x900	
PIT A04	41.30	1600	SGGP	900x900	
PIT A05	41.30	1800	SGGP	900x900	
PIT A06	41.30	2010	SGGP	900x900	
PIT A07	41.30	2210	SGGP	900x900	
PIT A08	41.70	2830	SJP	900x900	
PIT A09	41.55	5900	SGGP	900x900	
PIT A10	39.35	4010	SJP	900x900	
PIT A11	36.05	1530	SJP	900x900	
PIT A12	33.70	1480	SGGP	900x900	

PIT SCHEDULE - NETWORK 'R'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT R01	41.56	1060	SJP	900x900	
PIT R02	41.56	1260	SJP	900x900	
PIT R03	41.56	1460	SJP	900x900	
PIT R04	41.56	1660	SJP	900x900	
PIT R05	41.56	1860	SJP	900x900	
PIT R06	41.56	2060	SJP	900x900	

PIT SCHEDULE - NETWORK 'B'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT B01	36.60	1000	SGGP	900x900	
PIT B02	36.60	1370	SGGP	900x900	
PIT B03	36.60	1000	SGGP	900x900	
PIT B04	36.60	1790	SGGP	900x900	
PIT B05	36.60	1000	SGGP	900x900	
PIT B06	36.60	1370	SGGP	900x900	
PIT B07	36.60	2110	SGGP	900x900	
PIT B08	36.60	1000	SGGP	900x900	
PIT B09	36.95	4440	SGGP	900x900	

PIT SCHEDULE - NETWORK 'C'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT C01	33.55	1000	SGGP	900x900	
PIT C02	33.55	1250	SGGP	900x900	
PIT C03	33.55	1480	SGGP	900x900	
PIT C04	33.55	1710	SGGP	900x900	
PIT C05	33.55	1940	SGGP	900x900	
PIT C06	33.55	2170	SGGP	900x900	

PIT SCHEDULE - NETWORK 'D'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT D01	36.90	1000	SGGP	900x900	
PIT D02	36.90	1250	SGGP	900x900	
PIT D03	36.90	1500	SGGP	900x900	
PIT D04	33.55	650	SGGP	900x900	
PIT D05	33.45	950	SGGP	900x900	

PIT SCHEDULE - NETWORK 'E'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT E01	38.90	1000	SGGP	900x900	
PIT E02	38.60	900	SGGP	900x900	
PIT E03	37.56	1000	SGGP	900x900	
PIT E04	37.50	1090	SGGP	900x900	
PIT E05	38.60	2350	SGGP	900x900	
PIT E06	38.40	2390	SGGP	900x900	
PIT E07	33.70	1200	SGGP	900x900	
PIT E08	33.55	1160	SGGP	900x900	
PIT E09	33.30	1260	SGGP	900x900	
PIT E10	33.30	1460	SGGP	900x900	

PIT SCHEDULE - NETWORK 'E'

PIT No.	GRATE RL	DEPTH	TYPE	SIZE	COMMENT
PIT E11	33.30	1660	SGGP	900x900	
PIT E12	33.30	1860	SGGP	900x900	
PIT E13	33.30	2060	SGGP	900x900	
PIT E14	33.30	2260	SGGP	900x900	
PIT E15	33.30	2460	SGGP	900x900	
PIT E16	33.40	2680	SJP	900x900	
PIT E17	33.30	2730	SGGP	900x900	
PIT E18	33.30	2930	SGGP	900x900	
PIT E19	33.30	3180	SGGP	900x900	
PIT E20	33.30	3530	SGGP	900x900	
PIT E21	31.00	1830	SGGP	900x900	
PIT E22	31.00	1900	SGGP	900x900	
PIT E23	31.00	2060	SGGP	1500x1500	EXISTING

STORMWATER KEY PLAN

SCALE 1:500

SUB-CATCHMENT AREAS

CATCHMENT	CATCHMENT AREA (Ha)
ROOF RAINWATER TANK	1.79
ROOF	2.55
HARDSTAND/CARPARK	3.78
LANDSCAPE	0.46
TOTAL	8.6

LEVELS NOTE:

LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- SW> PROPOSED DRAINAGE LINE
- SW> EXISTING DRAINAGE LINE
- OVERLAND FLOW DIRECTION

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
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ARCHITECT watson young

CLIENT Woolworths — the fresh food people

PROJECT
WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
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DRAWING TITLE
STORMWATER KEY PLAN & PIT SCHEDULE

DRAWING No C013738.01-DA40

ISSUE C

PROPOSED DISTRIBUTION CENTRE (FRESH)
FFL 43.00 ±500mm

VICTORIA STREET

RIVERN STREET

SITE BOUNDARY

1 STOREY BRICK BUILDING

UNDERGROUND CARPARK BUILDING

PEBBLECRETE WAREHOUSE

CONCRETE CAR PARK

CONCRETE WAREHOUSE

CONCRETE SLAB

BITUMEN CAR PARK

BITUMEN DRIVEWAY

CONCRETE DRIVEWAY

CONCRETE DRAINAGE CHANNEL

EXISTING TRUNK DRAINAGE CHANNEL

SINGLE STOREY METAL CLAD BUILDINGS

BENCHMARK NAIL RL 31.52 (AHD)

BENCHMARK NAIL RL 34.18 (AHD)

JOINS TO PIT A17.
REFER TO DRAWING DA42 FOR CONTINUATION.

REFER TO DA42 FOR GROUND FLOOR ABOVE

PROPOSED OCEAN PROTECT OCEANSAVE OS-1612

PROPOSED OCEAN PROTECT JELLYFISH JF3250-25-5.

OCEAN PROTECT OCEANSAVE DIVERSION BOX

EXISTING CONCRETE OPEN TRUNK DRAINAGE CHANNEL TOP WIDTH 8.0m x BOTTOM WIDTH 3.0m x DEPTH 1.7m AT IL 26.89

DISCHARGE POINT

DISCHARGES TO EXISTING KERB INLET PIT & Ø1200 R.C.P IN VICTORIA STREET AT I.L = 28.94

STORMWATER DRAINAGE PLAN - BASEMENT

SCALE 1:500

NOTES:

REFER TO DRAWING DA10 FOR STORMWATER DRAINAGE NOTES.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED GROUND FLOOR DRAINAGE LINE
- PROPOSED BASEMENT DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- SUBSOIL LINE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

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ARCHITECT watsonyoung

CLIENT Woolworths — the fresh food people

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250 - 266 VICTORIA STREET
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DRAWING TITLE
STORMWATER DRAINAGE PLAN BASEMENT

DRAWING No. C013738.01-DA41 ISSUE C

PROPOSED UNDERGROUND 200kL RAINWATER TANK

PROPOSED DISTRIBUTION CENTRE (FRESH)
FFL 43.00 ±500mm

17,900m² ROOF DIRECTED TO RAINWATER TANK

EXISTING TRUNK DRAINAGE CHANNEL

STORMWATER DRAINAGE PLAN - GROUND FLOOR FRESH
SCALE 1:500

JOINS TO PIT A17.
REFER TO DRAWING DA41 FOR CONTINUATION.

NOTES:

REFER TO DRAWING DA10 FOR STORMWATER DRAINAGE NOTES.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED GROUND FLOOR DRAINAGE LINE
- PROPOSED BASEMENT DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- SUBSOIL LINE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR APPROVAL

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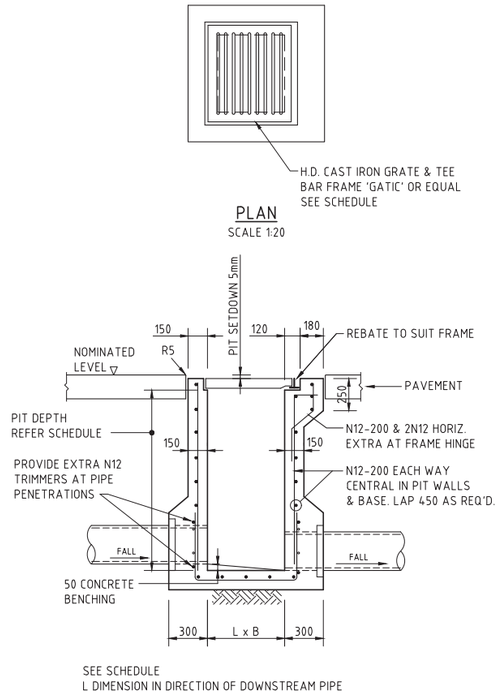
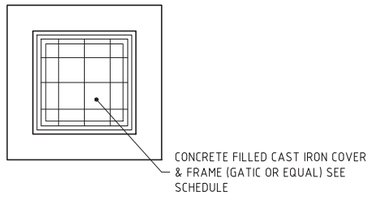
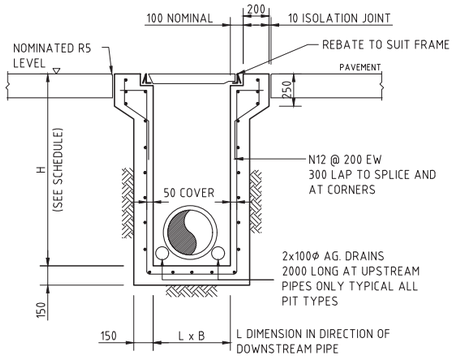
DRAWING TITLE
STORMWATER DRAINAGE PLAN
GROUND FLOOR FRESH

DRAWING No C013738.01-DA42 ISSUE C

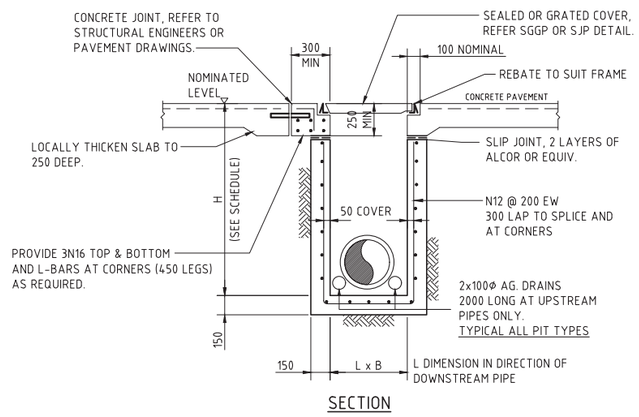


SINGLE GRATED GULLY PIT - SGGP



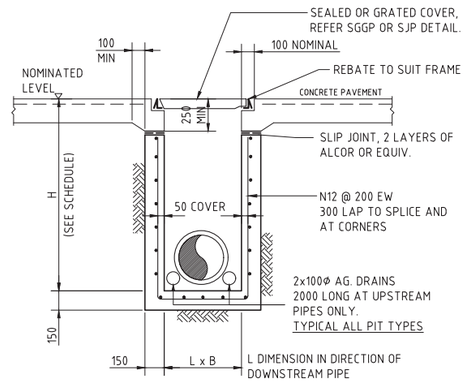


SEALED JUNCTION PIT - SJP



SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL GRATE/COVER SUPPORT CAST-INTO PAVEMENT SLAB

(ADOPT IN CONCRETE PAVEMENT FOR SGGP's & SJP's, WHERE PITS ARE LOCATED IN THE CORNER OF SLAB PANELS OR ADJACENT TO SLAB PANEL JOINTS)



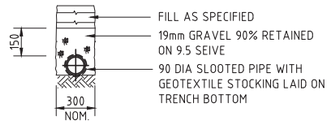
SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL GRATE/COVER SUPPORT CAST-INTO PAVEMENT SLAB

(ADOPT IN CONCRETE PAVEMENTS FOR SGGP's & SJP's, WHERE JOINTS ARE NOT LOCATED WITHIN PROXIMITY OF THE GRATE)

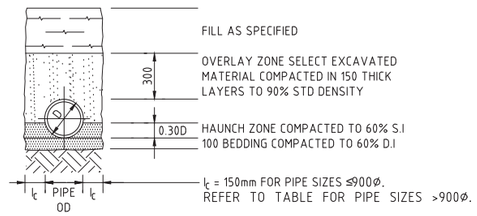
CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PIT	80	20	GP	NIL	25

NOTES:

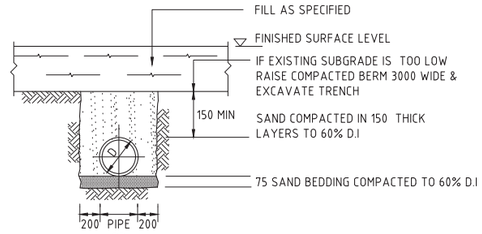
1. WHERE GULLY PIT IS LOCATED ON KERB RETURNS OR BULB OF CUL-DE-SACS PROVIDE CURVED PRECAST CONCRETE LINTELS.
2. SAG PITS SHALL HAVE LINTEL PLACED CENTRALLY ABOUT THE GRATE.
3. ALL REINFORCING TO HAVE 30 MIN. CLAER CONCRETE COVER.
4. FOR PITS DEEPER THAN 1200mm CLIMB RAILS SHALL BE PROVIDED.



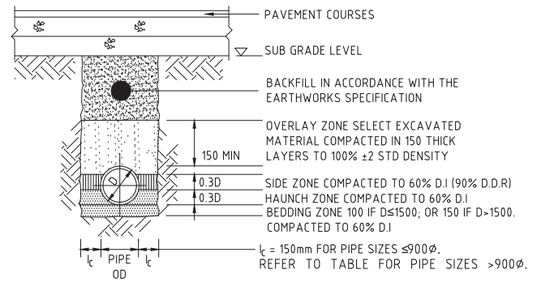
SUPPORT TO AG. DRAIN



TYPE H1 SUPPORT TO CONCRETE PIPES AT LANDSCAPED AREAS

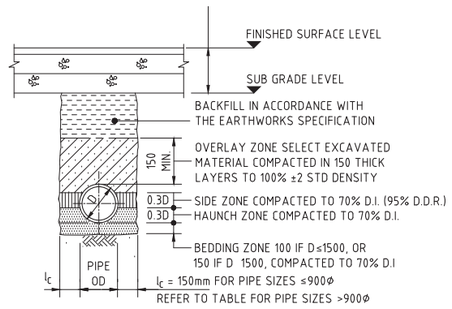


SUPPORT TO uPVC PIPES



TYPE HS2 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT

D≤ 1350, MAX FILL = 4.0m
D> 1350, MAX FILL = 3.0m



TYPE HS3 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT

SCALE 1:20
D ≤1050, MAX FILL = 6.0m
D >1050, MAX FILL = 4.8m

BEDDING & HAUNCH MATERIAL GRADING	
SIEVE SIZE	WEIGHT PASSING(%)
19	100
2.36	100 TO 50
0.60	90 TO 20
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

SIDE ZONE MATERIAL GRADING	
SIEVE SIZE	WEIGHT PASSING(%)
75	100
9.5	100 TO 50
2.36	100 TO 30
0.60	50 TO 15
0.075	25 TO 0

SELECT FILL MATERIAL IN ACCORDANCE WITH TABLE 1 AS 3725

SIDE ZONE WIDTH	
PIPE SIZE	lc (mm)
≤900Ø	150
1050Ø	175
1200Ø	200
1350Ø	225
1500Ø	250
1650Ø	275
1800Ø	300

REFER TO ENGINEER FOR TRENCH WIDTHS FOR PIPE SIZES GREATER THAN 1800Ø

PIPE LAYING DETAILS

SCALE 1:20

200mm 0 500 1000 1500 2000mm

SCALE 1:20 AT B1 SIZE SHEET

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AMENDMENTS DATE ISSUE

ARCHITECT watsonyoung

CLIENT Woolworths the fresh food people

PROJECT
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250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

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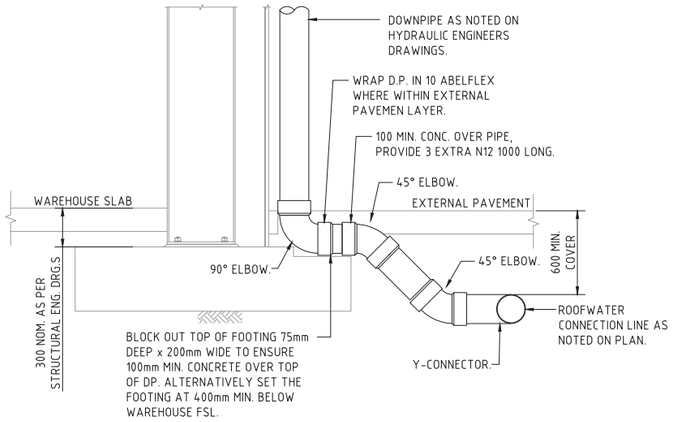
DRAWING TITLE
STORMWATER DRAINAGE DETAILS SHEET 1

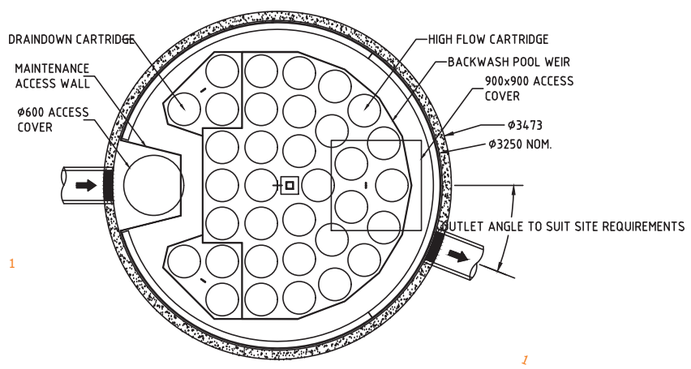
DRAWING No C013738.01-DA45 ISSUE C

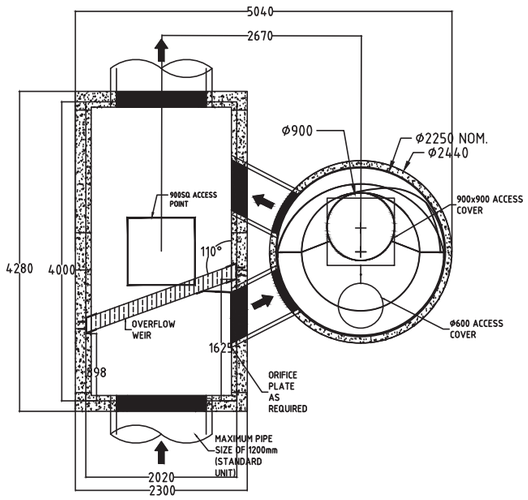


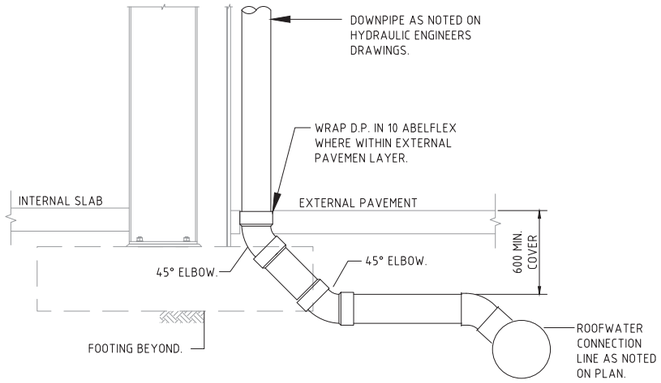
DOWNPIPE TURN-UP DETAIL A

(AT FOOTING LOCATION)

SCALE 1:20



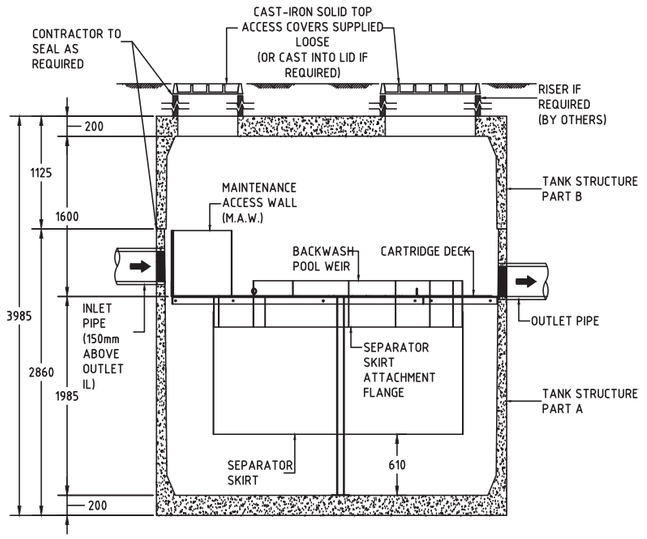




DOWNPIPE TURN-UP DETAIL

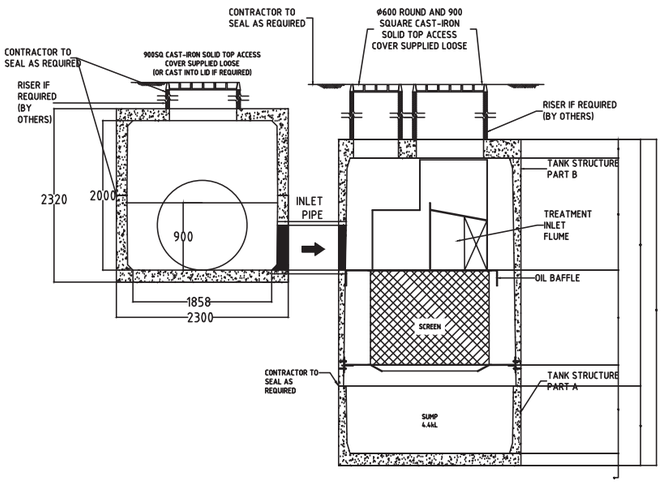
(CLEAR OF FOOTING)

SCALE 1:20



OCEAN PROTECT JELLYFISH JF3250-SD DETAIL

NOT TO SCALE



OCEAN PROTECT OCEANSAVE OS-1612 DETAIL

NOT TO SCALE

200mm 0 500 1000 1500 2000mm

SCALE 1:20 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	16.07.21	C
ISSUED FOR DEVELOPMENT APPLICATION	12.05.21	B
ISSUED FOR INFORMATION	08.04.21	A

AMENDMENTS	DATE	ISSUE

ARCHITECT watsonyoung

CLIENT Woolworths the fresh food people

PROJECT
WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	DM	MAR '21	XC	B1	AS SHOWN	C013738.01-DA46

CONSULT AUSTRALIA

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DRAWING TITLE
STORMWATER DRAINAGE DETAILS SHEET 2

DRAWING No. C013738.01-DA46

ISSUE C

SITE BOUNDARY

VICTORIA STREET

REDFERN STREET

PROPOSED DISTRIBUTION CENTRE (FRESH)
FFL 43.00 ±500mm

GROUND FLOOR (FRESH)

REFER TO DRAWING
C013738.01-DA52

SITE BOUNDARY

SITE BOUNDARY

BASEMENT

REFER TO DRAWING
C013738.01-DA51

SITE BOUNDARY

FINISHED LEVELS KEY PLAN
SCALE 1:500

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

NOTES:

REFER TO DRAWING DA10 FOR FINISHED LEVELS NOTES.

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	16.07.21	C
ISSUED FOR DEVELOPMENT APPLICATION	12.05.21	B
ISSUED FOR INFORMATION	08.04.21	A

ARCHITECT watsonyoung

CLIENT Woolworths the fresh food people

PROJECT
WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
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DRAWING TITLE
FINISHED LEVELS KEY PLAN

DRAWING No. C013738.01-DA50 ISSUE C

PROPOSED DISTRIBUTION CENTRE (FRESH)
FFL 43.00 ±500mm

REFER TO DA52 FOR GROUND FLOOR ABOVE

VICTORIA STREET

REDFERN STREET

SITE BOUNDARY

PROPOSED INTERNAL RETAINING WALL AS DETAILED ON EARLY WORKS DRAWINGS

PROPOSED RETAINING WALL IN FILL AS DETAILED ON EARLY WORKS DRAWINGS

PROPOSED RETAINING WALL IN CUT AS DETAILED ON EARLY WORKS DRAWINGS

EXISTING TRUNK DRAINAGE CHANNEL

FINISHED LEVELS PLAN - BASEMENT
SCALE 1:500

EARLY WORKS NOTE:
REFER TO DRAWINGS PREPARED BY COSTIN ROE CONSULTING AS PART OF A SEPARATE DEVELOPMENT APPLICATION FOR EARLY WORKS CONSTRUCTION. REFERENCE C013738.01-EW PACKAGE.

NOTES:
REFER TO DRAWING DA10 FOR FINISHED LEVELS NOTES.

LEGEND:
LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
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ISSUED FOR DEVELOPMENT APPLICATION	12.05.21	B
ISSUED FOR INFORMATION	08.04.21	A

ARCHITECT watsonyoung

CLIENT Woolworths — the fresh food people

PROJECT
WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
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DRAWING TITLE
FINISHED LEVELS PLAN
BASEMENT

DRAWING No C013738.01-DA51

ISSUE C

PROPOSED RETAINING WALL IN CUT AS DETAILED ON EARLY WORKS DRAWINGS

SITE BOUNDARY

PIT A07 | PIT A06 | PIT A05 | PIT A04 | PIT A03 | PIT A02 | PIT A01

PIT R06 | PIT R05 | PIT R04 | PIT R03 | PIT R02 | PIT R01

PIT A08

PIT A09

PIT E01 | PIT E02 | PIT E03 | PIT E04 | PIT E05 | PIT E06

PROPOSED DISTRIBUTION CENTRE (FRESH)
FFL 43.00 ±500mm

REFER TO DA51 FOR BASEMENT BELOW

VICTORIA STREET

REDFERN STREET

LANDSCAPED BATTER TO BE SET AT RL 38.50 TO MEET FLOOD PLANNING LEVEL

EXISTING TRUNK DRAINAGE CHANNEL

FINISHED LEVELS PLAN - GROUND FLOOR FRESH
SCALE 1:500

EARLY WORKS NOTE:
REFER TO DRAWINGS PREPARED BY COSTIN ROE CONSULTING AS PART OF A SEPARATE DEVELOPMENT APPLICATION FOR EARLY WORKS CONSTRUCTION. REFERENCE C013738.01-EW PACKAGE.

NOTES:
REFER TO DRAWING DA10 FOR FINISHED LEVELS NOTES.

LEGEND:
LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	16.07.21	C
ISSUED FOR DEVELOPMENT APPLICATION	12.05.21	B
ISSUED FOR INFORMATION	08.04.21	A

ARCHITECT: watson young

CLIENT: Woolworths — the fresh food people

PROJECT: WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
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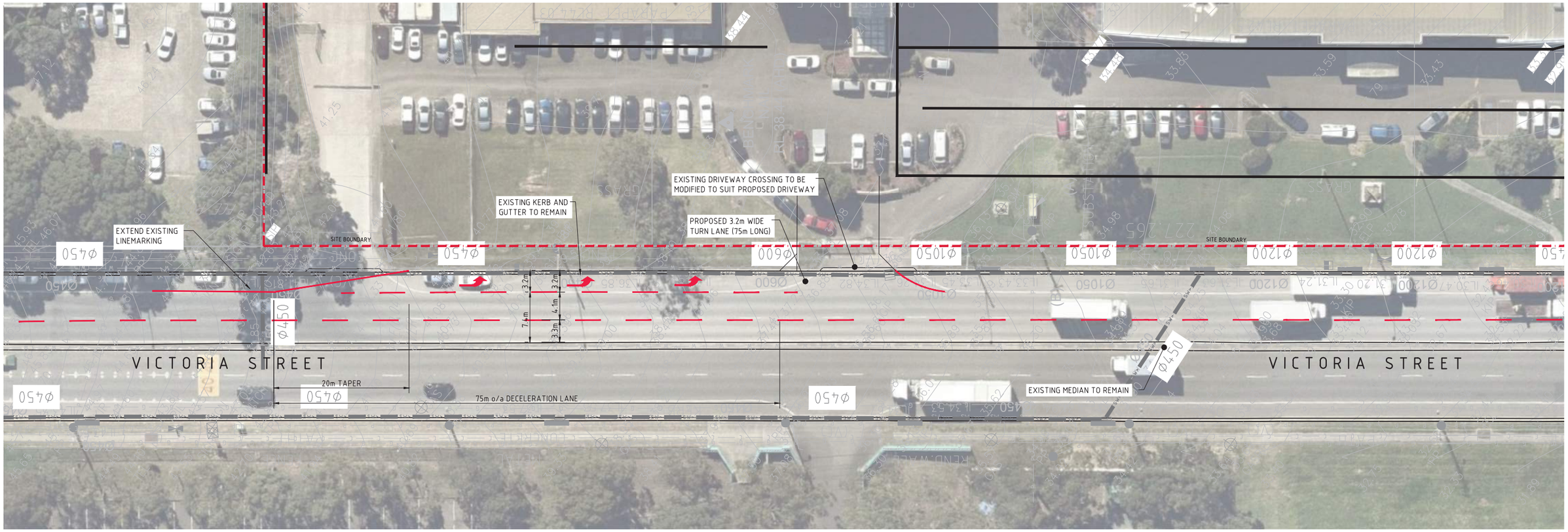
DRAWING TITLE: FINISHED LEVELS PLAN GROUND FLOOR FRESH

DRAWING No: C013738.01-DA52 ISSUE: C



FUNCTIONAL LAYOUT PLAN
SCALE 1:250

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- ROAD LINE MARKING (BROKEN)
- ROAD LINE MARKING (CONTINUOUS)
- EXISTING KERB & GUTTER

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

FOR APPROVAL

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	16.07.21	B
ISSUED FOR DEVELOPMENT APPLICATION	12.05.21	A

ARCHITECT: watson young

CLIENT: Woolworths — the fresh food people

PROJECT: WOOLWORTHS WAREHOUSE & DC
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
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Costin Roe Consulting
PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE: VICTORIA STREET FUNCTIONAL LAYOUT

DRAWING No: C013738.01-DA60 ISSUE: B

Appendix B

DRAFT

STORMWATER MAINTENANCE AND MONITORIING RECOMMENDATIONS

1 MAINTENANCE AND MONITORING

It is important that each component of the water quality treatment train is properly operated and maintained. In order to achieve the design treatment objectives, an indicative maintenance schedule has been prepared (refer to **Table B.1** below).

Note that inspection frequency may vary depending on site specific attributes and rainfall patterns in the area. In addition to the maintenance requirements below it is also recommended that inspections are made following heavy rainfall or major storm events. Event heavy rain inspections should be carried out as soon as practicable following an intense period of rainfall, (i.e. greater than 100mm over 48 hours), as measured at Prospect Dam Weather Station No. 67019.

1.1 Types of Maintenance

Water Sensitive Urban Design (WSUD) assets require both proactive and reactive maintenance to ensure long term system health and performance.

Proactive maintenance refers to regular scheduled maintenance tasks, whereas reactive maintenance is required to address unscheduled maintenance issues. If an asset is not functioning as intended, then rectification may be required to restore the asset back to its intended functionality.

The preferred and recommended approach is for proactive maintenance.

1.1.1 Proactive Maintenance

Proactive maintenance is a set of scheduled tasks to ensure that the WSUD asset is operating as designed.

Proactive maintenance involves:

- Regular inspections of the WSUD asset;
- Scheduled maintenance tasks for issues that are known to require regular attention (e.g. litter removal, weed control); and
- Responsive maintenance tasks following inspections for issues which require irregular attention (e.g. sediment removal, mulching, and scour management).

Proactive maintenance in the first two years after the establishment period (construction and planting phases) are the most intensive and important to the long-term success of the treatment asset.

Proactive maintenance is a cost-effective means of reducing the long-term costs associated with operating stormwater treatment assets.

Maintenance activities specific to each WSUD asset type are detailed in the inspection and maintenance schedules and checklists provided in the report. The frequency of scheduled maintenance depends on the asset type and the issue being managed.

As a general guide, scheduled maintenance should be completed on a three to four-month cycle. The checklists provided should be used as a minimum guide to scheduled

maintenance tasks and should be amended to suit site conditions and maintenance requirements.

Treatment assets should also be inspected at least once a year during or immediately after a significant rainfall event. This is important to confirm that the treatment system is functioning correctly under wet conditions.

A higher level of scheduled maintenance may be arranged for some treatment assets. This is often the case for treatment assets which are located in high profile locations (e.g. streetscapes and parklands), and where public amenity is considered to be a high priority. In these cases, a more frequent maintenance regime may be required to remove litter and weeds and to ensure vegetation health and cover is maintained to a high level.

1.1.2 Reactive Maintenance

Reactive maintenance is undertaken when a problem or fault is identified that is beyond the scope of proactive maintenance. Reactive maintenance may occur following a complaint about the WSUD asset (e.g. excessive odours or litter). Reactive maintenance often requires a swift response and may involve specialist equipment or skills.

1.1.3 Rectification

Rectification of a WSUD asset is undertaken when the system is not functioning as intended, and proactive and reactive maintenance activities are unable to return the asset to functional condition.

The lack of functional performance and therefore failure of a stormwater treatment asset may be related to many factors including inappropriate design, poor construction, and lack of regular maintenance or end of life cycle. In many cases, the design of assets has not included adequate consideration of the maintenance requirements, in terms of the system's ability to cope with catchment pollutant loads (i.e. sediments) and the frequency of maintenance required to maintain the system at a functional level.

Maintenance planning at the design phase is therefore crucial to both the long-term operating costs and the expected life cycle of the treatment system. In general, the expected lifecycle of a stormwater treatment asset (e.g. a bio-retention system) that has been well designed and constructed and is regularly maintained should be at least 15-20 years.

However, the lifecycle for each treatment system will be different and related to:

- whether the system has been designed, constructed and maintained according to best practice;
- catchment characteristics (influences the quality of the stormwater);
- the age and general health of the system; and
- the type of plants that have been used in the system.

Regular asset condition assessments should be undertaken to monitor the system condition and to inform where an asset is in terms of its expected lifecycle. Renewal of a system refers to replacing the main elements of the system including:

- infrastructure;
- removing deposited sediment, removing and replacing the topsoil (or filter media in the case of a bio-retention system) and profiling the topsoil level back to the design levels;
- re-planting; and
- pavement and sub-layers (in the case of permeable pavements).

A WSUD specialist may be required to assess whether a treatment system has reached the end of its life cycle and to provide advice on the renewal works.

Asset condition assessments can also identify assets that need to be rectified. The decision to continue with an increased maintenance regime or to rectify an asset, and over what timeframe, can be a difficult one to make. This is because certain maintenance items are more important to overall system function than others. For example, extended ponding on the surface of a bio-retention system or persistent scouring of a swale should be addressed more rapidly than recurrent weed problems.

1.2 Routine Inspections and Maintenance Schedule for General Stormwater System

Routine inspections are to be carried out to assess the need for maintenance and are primarily concerned with checking the functionality of the stormwater drainage facilities; items such as drains, drainage pits, box culverts, detention tanks and rainwater reuse tank systems. Maintenance of these items is vitally important for the ongoing drainage and treatment of stormwater.

Should the inspection reveal that maintenance of any item is required, this is to be reported to the building management for action.

Items that are to be subject to Routine Inspections for Maintenance may comprise, but not be limited to those listed in the table below. This table is to be read in conjunction with the Stormwater design drawings.

It is vitally important that each component of the stormwater system is properly operated and maintained. In order to achieve the modelled and design treatment outcomes, a maintenance schedule has been prepared (below) to assist in the effective operation and maintenance of the various drainage and water quality components.

Table B.1. Indicative Maintenance Schedule

MAINTENANCE ACTION	FREQUENCY RANGE	RESPONSIBILITY	PROCEDURE
SWALES/ LANDSCAPED AREAS			
Check density of vegetation and ensure minimum height of 150mm is maintained. Check for any evidence of weed infestation	Between six months and one year	Maintenance Contractor	Replant and/or fertilise, weed and water in accordance with landscape consultant specifications
Inspect swale for excessive litter and sediment build up	Between six months and one year	Maintenance Contractor	Remove sediment and litter and dispose in accordance with local authorities' requirements.
Check for any evidence of channelisation and erosion	Six monthly/ After Major Storm	Maintenance Contractor	Reinstate eroded areas so that original, designed swale profile is maintained
Weed Infestation	Three to six Monthly	Maintenance Contractor	Remove any weed infestation ensuring all root ball of weed is removed. Replace with vegetation where required.
Inspect swale surface for erosion	Between six months and one year	Maintenance Contractor	Replace topsoil in eroded area and cover and secure with biodegradable fabric. Cut hole in fabric and revegetate.
RAINWATER TANK			
Check for any clogging and blockage of the first flush device	3 Monthly/ After Major Storm	Maintenance Contractor	First flush device to be cleaned out
Check for any clogging and blockage of the tank inlet - leaf/litter screen	Between six months and one year	Maintenance Contractor	Leaves and debris to be removed from the inlet leaf/litter screen
Check the level of sediment within the tank	Every two years	Maintenance Contractor	Sediment and debris to be removed from rainwater tank floor if sediment level is greater than the maximum allowable

MAINTENANCE ACTION	FREQUENCY RANGE	RESPONSIBILITY	PROCEDURE
			depth as specified by the hydraulic consultant
INLET & JUNCTION PITS			
Inside Pit	Six Monthly	Maintenance Contractor	Remove grate and inspect internal walls and base, repair where required. Remove any collected sediment, debris, litter.
Outside of Pit	Four Monthly/ After Major Storm	Maintenance Contractor	Clean grate of collected sediment, debris, litter and vegetation.
STORMWATER SYSTEM			
General Inspection of complete stormwater drainage system	Bi-annually	Maintenance Contractor	Inspect all drainage structures noting any dilapidation in structures and carry out required repairs.
WATER QUALITY DEVICE – GPT & FILTRATION SYSTEMS			
Refer to manufacturer operation and maintenance manual.	Refer to manufacturer operation and maintenance manual.	Maintenance Contractor	Refer to manufacturer operation and maintenance manual.

Appendix C

DRAFT

SOIL AND WATER MANAGEMENT PLAN DURING CONSTRUCTION

1 EROSION & SEDIMENT CONTROLS

An erosion and sediment control plan (ESCP) is shown on drawing **Co13738.01-DA20** with details on **DA25**. These are conceptual plans only providing sufficient detail to clearly show that the works can proceed without undue pollution to receiving waters. A detailed plan will be prepared once consent is given and before works start.

1.1 General Conditions

1. The ESCP will be read in conjunction with the engineering plans, and any other plans or written instructions that may be issued in relation to development at the subject site.
2. Contractors will ensure that all soil and water management works are undertaken as instructed in this specification and constructed following the guidelines stated in Managing Urban Stormwater, Soils and Construction (1998) and Fairfield City Council specifications.
3. All subcontractors will be informed of their responsibilities in minimising the potential for soil erosion and pollution to down slope areas.

1.2 Land Disturbance

1. Where practicable, the soil erosion hazard on the site will be kept as low as possible and as recommended in **Table C.1**.

Land Use	Limitation	Comments
Construction areas	Limited to 5 (preferably 2) metres from the edge of any essential construction activity as shown on the engineering plans.	All site workers will clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope), or similar materials.
Access areas	Limited to a maximum width of 5 metres	The site manager will determine and mark the location of these zones onsite. They can vary in position so as to best conserve existing vegetation and protect downstream areas while being considerate of the needs of efficient works activities. All site workers will clearly recognise these boundaries.
Remaining lands	Entry prohibited except for essential management works	

Table C.1 Limitations to access

1.3 Erosion Control Conditions

1. Clearly visible barrier fencing shall be installed as shown on the plan and elsewhere at the discretion of the site superintendent to ensure traffic control and prohibit unnecessary site disturbance. Vehicular access to the site shall be limited to only those essential for construction work and they shall enter the site only through the stabilised access points.
2. Soil materials will be replaced in the same order they are removed from the ground. It is particularly important that all subsoils are buried, and topsoils remain on the surface at the completion of works.
3. Where practicable, schedule the construction program so that the time from starting land disturbance to stabilisation has a duration of less than six months.
4. Notwithstanding this, schedule works so that the duration from the conclusion of land shaping to completion of final stabilisation is less than 20 working days.
5. Land recently established with grass species will be watered regularly until an effective cover has properly established and plants are growing vigorously. Further application of seed might be necessary later in areas of inadequate vegetation establishment.
6. Where practical, foot and vehicular traffic will be kept away from all recently established areas
7. Earth batters during temporary works shall be constructed in accordance with the Geotechnical Engineers Report (Refer PSM Report) or as general requirement, a gradient as practical but not steeper than:
    - 2H:1V where slope length is less than 7 meters
    - 2.5H:1V where slope length is between 7 and 10 meters
    - 3H:1V where slope length is between 10 and 12 meters
    - 4H:1V where slope length is between 12 and 18 meters
    - 5H:1V where slope length is between 18 and 27 meters
    - 6H:1V where slope length is greater than 27 meters
8. All earthworks, including waterways/drains/spillways and their outlets, will be constructed to be stable in at least the design storm event.
9. During windy weather, large, unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control. In the event water is not available in sufficient quantities, soil binders and/or dust retardants will be used, or the surface will be left in a cloddy state that resists removal by wind.

1.4 Pollution Control Conditions

1. Stockpiles will not be located within 5 meters of hazard areas, including likely areas of high velocity flows such as waterways, paved areas and driveways. Silt/ sediment fences and appropriate stabilisation of stockpiles are to be provided as detailed on the drawings.

2. Sediment fences will:
   a) Be installed where shown on the drawings, and elsewhere at the discretion of the site superintendent to contain the coarser sediment fraction (including aggregated fines) as near as possible to their source.
   b) Have a catchment area not exceeding 720 square meters, a storage depth (including both settling and settled zones) of at least 0.6 meters, and internal dimensions that provide maximum surface area for settling, and
   c) Provide a return of 1 meter upslope at intervals along the fence where catchment area exceeds 720 square meters, to limit discharge reaching each section to 10 litres/second in a maximum 20 year t_c discharge.
3. Sediment removed from any trapping device will be disposed in locations where further erosion and consequent pollution to down slope lands and waterways will not occur.
4. Water will be prevented from directly entering the permanent drainage system unless it is relatively sediment free (i.e. the catchment area has been permanently landscaped and/or likely sediment has been treated in an approved device). Nevertheless, stormwater inlets will be protected.
5. Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised.

1.5 Waste Management Conditions

Acceptable bind will be provided for any concrete and mortar slurries, paints, acid washings, lightweight waste materials and litter. Clearance service will be provided at least weekly.

1.6 Site Inspection and Maintenance

1. A self-auditing program will be established based on a Check Sheet. A site inspection using the Check Sheet will be made by the site manager:
   - At least weekly.
   - Immediately before site closure.
   - Immediately following rainfall events in excess of 5mm in any 24 hour period.

The self-audit will include:

- Recording the condition of every sediment control device
- Recording maintenance requirements (if any) for each sediment control device
- Recording the volumes of sediment removed from sediment retention systems, where applicable
- Recording the site where sediment is disposed

- Forwarding a signed duplicate of the completed Check Sheet to the project manager/developer for their information

2. In addition, a suitably qualified person will be required to oversee the installation and maintenance of all soil and water management works on the site. The person shall complete a short monthly written report with records kept on site as part of the contractor Quality Assurance Documentation. The responsible person will ensure that:
   - The plan is being implemented correctly
   - Repairs are undertaken as required
   - Essential modifications are made to the plan if and when necessary

   The report shall carry a certificate that works have been carried out in accordance with the plan.
3. Waste bins will be emptied, as necessary. Disposal of waste will be in a manner approved by the Site Superintendent.
4. Proper drainage will be maintained. To this end drains (including inlet and outlet works) will be checked to ensure that they are operating as intended, especially that,
   - No low points exist that can overtop in a large storm event
   - Areas of erosion are repaired (e.g. lined with a suitable material) and/or velocity of flow is reduced appropriately through construction of small check dams of installing additional diversion upslope.
   - Blockages are cleared (these might occur because of sediment pollution, sand/soil/spoil being deposited in or too close to them, breached by vehicle wheels, etc.).
5. Sand/soil/spoil materials placed closer than 2 meters from hazard areas will be removed. Such hazard areas include and areas of high velocity water flows (e.g. waterways and gutters), paved areas and driveways.
6. Recently stabilised lands will be checked to ensure that erosion hazard has been effectively reduced. Any repairs will be initiated as appropriate.
7. Excessive vegetation growth will be controlled through mowing or slashing.
8. All sediment detention systems will be kept in good, working condition. In particular, attention will be given to:
   a) Recent works to ensure they have not resulted in diversion of sediment laden water away from them
   b) Degradable products to ensure they are replaced as required, and
   c) Sediment removal, to ensure the design capacity or less remains in the settling zone.
9. Any pollutants removed from sediment basins or litter traps will be disposed of in areas where further pollution to down slope lands and waterways should not occur.

10. Additional erosion and/or sediment control works will be constructed as necessary to ensure the desired protection is given to down slope lands and waterways, i.e. make ongoing changes to the plan where it proves inadequate in practice or is subjected to changes in conditions at the work site or elsewhere in the catchment.
11. Erosion and sediment control measures will be maintained in a functioning condition until all earthwork activities are completed and the site stabilised
12. Litter, debris and sediment will be removed from the gross pollutant traps and trash racks as required.

Appendix D

EARLY WORKS INFRASTRUCTURE DRAWINGS (DA62.1/2021) BY COSTIN ROE CONSULTING

WOOLWORTHS FACILITY

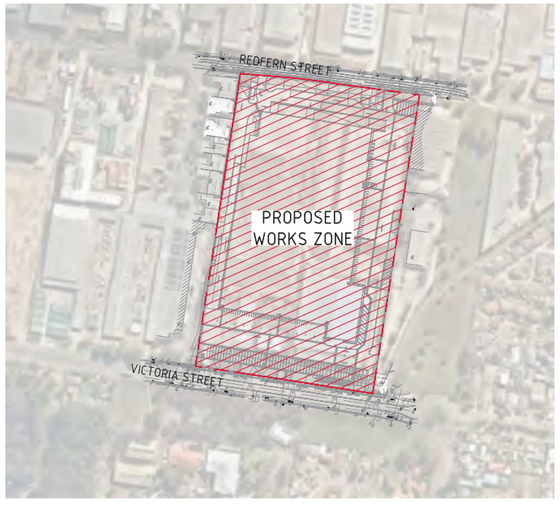
EARLY WORKS DA PACKAGE

250 - 266 VICTORIA STREET

WETHERILL PARK, NSW

DRAWING LIST

DRAWING NO.	DRAWING TITLE
C013738.01-EW10	DRAWING LIST & GENERAL NOTES
C013738.01-EW20	EROSION AND SEDIMENT CONTROL PLAN - STAGE 1
C013738.01-EW21	EROSION AND SEDIMENT CONTROL PLAN - STAGE 2
C013738.01-EW25	EROSION AND SEDIMENT CONTROL DETAILS
C013738.01-EW30	BULK EARTHWORKS PLAN
C013738.01-EW31	CUT/FILL PLAN
C013738.01-EW35	BULK EARTHWORKS PLAN SECTIONS - SHEET 1
C013738.01-EW36	BULK EARTHWORKS PLAN SECTIONS - SHEET 2
C013738.01-EW60	RETAINING WALL PLAN
C013738.01-EW61	RETAINING WALL ELEVATIONS - SHEET 1
C013738.01-EW62	RETAINING WALL ELEVATIONS - SHEET 2
C013738.01-EW65	RETAINING WALL DETAILS
C013738.01-EW68	TYPICAL SECTIONS - SHEET 1
C013738.01-EW69	TYPICAL SECTIONS - SHEET 2



SITE LOCATION PLAN
N.T.S.

GENERAL NOTES :

G1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

G2 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.

G3 ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE.
ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT.
REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.

G4 DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.

G5 UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.

G6 ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.

RETAINING WALL NOTES :

1. ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
2. MINIMUM BEARING CAPACITY OF FOUNDATION TO BE AS FOLLOWS :
   a. H MAX. 2.0m = 100 kPa
   b. H MAX. 3.5m = 150 kPa
   c. H MAX. 5.0m = 200 kPa
   BEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
3. WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMDD AND PLACED WITHIN 2% OF OMC.
4. MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O.
5. ON PLAN :
   a. LIVE LOAD = 20 kPa
   b. DEAD LOAD = 5 kPa
   c. CONSTRUCTION TRAFFIC LIVE LOAD = 10 kPa
6. MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300mm MINIMUM UNLESS NOTED OTHERWISE.
7. DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
8. TIED WALLS ARE TO BE TEMPORARILY PROPPED AT TOP UNTIL SUCH TIME THE TOP OF WALL IS TIED TO THE SLAB AND 28-DAY CONCRETE STRENGTH HAS BEEN ACHIEVED.
9. CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500KG STATIC WEIGHT IS TO BE KEPT BACK 1.5m FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 1.5m STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
10. ALL DESIGN AND CONSTRUCT WALL SYSTEM TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.

EROSION CONTROL NOTES :

ALL CONTROL WORK INCLUDING DIVERSION BANKS AND CATCH DRAINS, V-DRAINS AND SILT FENCES SHALL BE COMPLETED DIRECTLY FOLLOWING THE COMPLETION OF THE EARTHWORKS.

1. SILT FENCES AND SILT FENCE RETURNS SHALL BE ERECTED CONVEX TO THE CONTOUR TO POND WATER.
2. HAY BALE BARRIERS AND GEOFABRIC FENCES ARE TO BE CONSTRUCTED TO TOE OF BATTER, PRIOR TO COMMENCEMENT OF EARTHWORKS, IMMEDIATELY AFTER CLEARING OF VEGETATION AND BEFORE REMOVAL OF TOP SOIL.
3. ALL TEMPORARY EARTH BERMS, DIVERSION AND SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED AND MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
4. CLEAR WATER IS TO BE DIVERTED AWAY FROM DISTURBED GROUND AND INTO THE DRAINAGE SYSTEM.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND PROVIDING ON GOING ADJUSTMENT TO EROSION CONTROL MEASURES AS REQUIRED DURING CONSTRUCTION.
6. ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING, TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE, APPROVED LOCATION.
7. ALL FINAL EROSION PREVENTION MEASURES INCLUDING THE ESTABLISHMENT OF GRASSING ARE TO BE MAINTAINED UNTIL THE END OF THE DEFECTS LIABILITY PERIOD.
8. ALL EARTHWORKS AREAS SHALL BE ROLLED ON A REGULAR BASIS TO SEAL THE EARTHWORKS.
9. ALL FILL AREAS ARE TO BE LEFT WITH A BUND AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS EARTHWORKS. THE HEIGHT OF THE BUND SHALL BE A MINIMUM OF 200MM.
10. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF FORMATION.
11. AFTER REVEGETATION OF THE SITE IS COMPLETE AND THE SITE IS STABLE IN THE OPINION OF A SUITABLY QUALIFIED PERSON ALL TEMPORARY WORK SUCH AS SILT FENCE, DIVERSION DRAINS ETC SHALL BE REMOVED.
12. ALL TOPSOIL STOCKPILES ARE TO BE SUITABLY COVERED TO THE SATISFACTION OF THE SITE MANAGER TO PREVENT WIND AND WATER EROSION.
13. ANY AREA THAT IS NOT APPROVED BY THE CONTRACT ADMINISTRATOR FOR CLEARING OR DISTURBANCE BY THE CONTRACTOR'S ACTIVITIES SHALL BE CLEARLY MARKED AND SIGN POSTED, FENCED OFF OR OTHERWISE APPROPRIATELY PROTECTED AGAINST ANY SUCH DISTURBANCE.
14. ALL STOCKPILE SITES SHALL BE SITUATED IN AREAS APPROVED FOR SUCH USE BY THE SITE MANAGER. A 6m BUFFER ZONE SHALL EXIST BETWEEN STOCKPILE SITES AND ANY STREAM OR FLOW PATH. ALL STOCKPILES SHALL BE ADEQUATELY PROTECTED FROM EROSION AND CONTAMINATION OF THE SURROUNDING AREA BY USE OF THE MEASURES APPROVED IN THE EROSION AND SEDIMENTATION CONTROL PLAN.
15. ACCESS AND EXIT AREAS SHALL INCLUDE SHAKE-DOWN OR OTHER METHODS APPROVED BY THE SITE MANAGER FOR THE REMOVAL OF SOIL MATERIALS FORM MOTOR VEHICLES.
16. THE CONTRACTOR IS TO ENSURE RUNOFF FROM ALL AREAS WHERE THE NATURAL SURFACE IS DISTURBED BY CONSTRUCTION, INCLUDING ACCESS ROADS, DEPOT AND STOCKPILE SITES, SHALL BE FREE OF POLLUTANTS BEFORE IT IS EITHER DISPERSED TO STABLE AREAS OR DIRECTED TO NATURAL WATERCOURSES.
17. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SLOPES, CROWNS AND DRAINS ON ALL EXCAVATIONS AND EMBANKMENTS TO ENSURE SATISFACTORY DRAINAGE AT ALL TIMES WATER SHALL NOT BE ALLOWED TO POND ON THE WORKS UNLESS SUCH PONDING IS PART OF AN APPROVED ESCP / SWMP.

ELECTRONIC INFORMATION NOTES :

1. THE ISSUED DRAWINGS IN HARD COPY OR PDF FORMAT TAKE PRECEDENCE OVER ANY ELECTRONICALLY ISSUED INFORMATION, LAYOUTS OR DESIGN MODELS.
2. THE CONTRACTOR'S DIRECT AMENDMENT OR MANIPULATION OF THE DATA OR INFORMATION THAT MIGHT BE CONTAINED WITHIN AN ENGINEER-SUPPLIED DIGITAL TERRAIN MODEL AND ITS SUBSEQUENT USE TO UNDERTAKE THE WORKS WILL BE SOLELY AT THE DISCRETION OF AND THE RISK OF THE CONTRACTOR.
3. THE CONTRACTOR IS REQUIRED TO HIGHLIGHT ANY DISCREPANCIES BETWEEN THE DIGITAL TERRAIN MODEL AND INFORMATION PROVIDED IN THE CONTRACT AND/OR DRAWINGS AND IS REQUIRED TO SEEK CLARIFICATION FROM THE SUPERINTENDENT.
4. THE ENGINEER WILL NOT BE LIABLE OR RESPONSIBLE FOR THE POSSIBLE ON-GOING NEED TO UPDATE THE DIGITAL TERRAIN MODEL, SHOULD THERE BE ANY AMENDMENTS OR CHANGES TO THE DRAWINGS OR CONTRACT INITIATED BY THE CONTRACTOR.

SITE PREPARATION NOTES :

1. ALL EARTHWORKS SHALL BE COMPLETED GENERALLY IN ACCORDANCE WITH THE GUIDELINES SPECIFIED BY THE GEOTECHNICAL 31888AHrpt PROVIDED BY JK GEOTECHNICS DATED 18/10/18 UNDER LEVEL 1 SUPERVISION.
2. EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.
3. STRIP ANY TOP SOIL OR DELETERIOUS MATERIAL AND DISPOSE OF FROM SITE OR STORE AS DIRECTED.
4. COMPLETE CUT TO FILL EARTHWORKS TO ACHIEVE THE REQUIRED LEVELS AS INDICATED ON THE DRAWINGS WITHIN A TOLERANCE OF +0mm/-10mm THROUGH BUILDING PADS/PAVEMENTS AND +0mm/-20mm ELSEWHERE.
5. PREPARE STEEP BATTERS TO RECEIVE FILL BY CONSTRUCTING BENCHING TO FACILITATE FILL PLACEMENT AND COMPACTION.
6. AREAS TO RECEIVE FILL (THAT ARE NOT ON BENCHED BATTERS) AND AREAS IN CUT SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT HEAVING MATERIAL. SOFT MATERIAL SHALL BE BOXED OUT AND REMOVED PRIOR TO FILL PLACEMENT. PROOF ROLLING TO BE INSPECTED BY A GEOTECHNICAL ENGINEER OR THE EARTHWORKS DESIGNER.
7. SITE WON FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
8. IMPORTED FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
9. ALL ENGINEERED FILL PARTICLES SHALL BE ABLE TO BE INCORPORATED WITHIN A SINGLE LAYER. FURTHER, LESS THAN 30% OF PARTICLES SHALL BE RETAINED ON THE 37.5 MM SIEVE. ENGINEERED FILL SHALL BE ABLE TO BE TESTED IN ACCORDANCE WITH THE STANDARD COMPACTION METHOD (AS1289.5.4.1) OR HILF TEST METHOD (AS1289.5.7.1). THESE METHODS REQUIRE LESS THAN 20% RETAINED ON THE 37.5 MM SIEVE. WHERE BETWEEN 20% AND 30% OF PARTICLES ARE RETAINED ON THE 37.5 MM SIEVE THE ABOVE TEST METHODS SHALL STILL BE ADOPTED AND TEST REPORTS ANNOTATED APPROPRIATELY. THESE REQUIREMENTS SHOULD BE MET BY THE MATERIAL AFTER PLACEMENT AND COMPACTION
10. ALL THE EARTHWORKS UNDERTAKEN AND THE SUBGRADE CONDITION IN THE CUT AREAS (IN THE STATED PERIOD) ARE DOCUMENTED IN THE REPORTS AND HAVE BEEN UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION.
11. PRIOR TO ANY EARTHWORKS, EROSION CONTROL AS OUTLINED IN THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE COMPLETED.
12. EXISTING ROCK, IF ANY, SHALL BE REMOVED BY HEAVY ROCK BREAKING OR RIPPING.
13. MATCH EXISTING LEVELS AT BATTER INTERFACE.
14. CONTRACTOR TO MATCH EXISTING LEVELS AT THE INTERFACE OF EARTHWORKS AND EXISTING SURFACE AT BATTER LOCATIONS OR WHERE NO RETAINING WALLS ARE PRESENT. ANY DISCREPANCY BETWEEN DESIGN AND EXISTING LEVELS TO BE REFERRED TO THE ENGINEER FOR DIRECTION OR ADJUSTMENTS TO DESIGN LEVELS.
15. DURING EARTHWORKS THE CONTRACTOR IS TO ENSURE ALL AREAS ARE FREE DRAINING & WILL NOT RETAIN WATER DURING RAINFALL. PROVIDE TEMPORARY MEASURES AS REQUIRED TO ENSURE FREE FLOWING RUNOFF THROUGH MANAGED DRAINAGE PATHS, DIVERSION DRAINS OR OTHER SUITABLE DISPOSAL METHOD AS AGREED DURING THE WORKS. REFER ANY CONCERNS TO THE ENGINEER. REFER TO EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES.

RETAINING WALL DESIGN PARAMETERS:

RETAINING WALLS ARE DESIGNED AND ASSUMED TO HAVE THE FOLLOWING PARAMETERS AND PROPERTIES.

BACKFILL MATERIAL		
EFFECTIVE INTERNAL PEAK FRICTION ANGLE	Ø =	34°
MOIST UNIT WEIGHT	γ =	21kN/m^3
pH	pH =	4-9
EFFECTIVE COHESION	c' =	0
RETAINED MATERIAL		
EFFECTIVE INTERNAL PEAK FRICTION ANGLE	Ø =	27°
MOIST UNIT WEIGHT	γ =	18kN/m^3
EFFECTIVE COHESION	c' =	0
FOUNDATION MATERIAL		
EFFECTIVE INTERNAL PEAK FRICTION ANGLE	Ø =	30°
MOIST UNIT WEIGHT	γ =	18kN/m^3
EFFECTIVE COHESION	c' =	0

REINFORCED EARTH RETAINING WALL NOTES :

1. ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
2. MINIMUM HEIGHT (H) TO GEOGRID REINFORCEMENT LENGTH (L) TO BE 1.0.
3. MINIMUM BEARING CAPACITY OF FOUNDATION (BASED ON MINIMUM H/L RATIO OF 1.0) TO BE AS FOLLOWS:
   a. H MAX. 2M = 100 KPA
   b. H MAX. 3.5M = 150 KPA
   c. H MAX. 5M = 200 KPA
   BEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
4. WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMDD AND PLACED WITHIN 2% OF OMC.
5. MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O. ON PLAN:
   a. LIVE LOAD = 20 KPA
   b. DEAD LOAD = 5 KPA
   c. CONSTRUCTION TRAFFIC LIVE LOAD = 10 KPA
6. CONCRETE BLOCK UNITS TO ADOPT THE KEYSTONE COMPAC II BLOCK & ASSOCIATED COMPONENTS. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
7. THE GEOGRIDS SHALL BE OF THE TYPE AND INDEX STRENGTH NOMINATED ON THE DRAWINGS. THE MINIMUM GEOGRIDS SHALL BE A SINGLE LENGTH IN THE DIRECTION OF DESIGN TENSION, NOT LAPPED, MAKING PROVISION FOR CONNECTION TO THE FACING ACROSS THE WHOLE WIDTH OF THE FACING AND PROVIDING FOR THE SPECIFIED ANCHORAGE WITHIN THE DESIGNATED ANCHORAGE ZONE. GEOGRIDS SHALL COVER THE WHOLE OF THE PLAN AREA BEHIND THE WALL FOR THE SPECIFIED ANCHORAGE LENGTH AND SHALL BE LAPPED WITH ADJACENT SECTIONS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
8. MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300MM UNO.
9. DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
   d. SELECT BACKFILL MATERIAL WITHIN THE REINFORCED SOIL BLOCK SHALL BE SOUND GRANULAR MATERIAL OF NATURAL OR INDUSTRIAL ORIGIN, NON-EXPANSIVE, FREE FROM ORGANIC OR OTHER DELETERIOUS MATERIAL CONFORMING TO THE PHYSICAL, CHEMICAL AND ELECTROCHEMICAL LIMITS AS SPECIFIED AND SHALL NOT BE SUBJECT TO BREAKDOWN UNDER COMPACTION. REFER TO DESIGN PARAMETERS NOTE FOR MATERIAL SPECIFICATIONS.
11. SELECT BACKFILL IS TO BE PLACED AND COMPACTED IN LAYERS NOT MORE THAN 300MM (LOOSE). COMPACTION TO NOT LESS THAN 100% SMDD WILL BE ACHIEVED AND MATERIAL PLACED WITHIN 2% OF OMC. DENSITY TESTING SHALL BE PERFORMED IN EACH COMPACTED LIFT IN ACCORDANCE WITH AS3798.
12. PROVIDE A DRAINAGE LAYER DIRECTLY BEHIND THE FACING UNITS IN A MINIMUM 300MM WIDE 12-20MM AGGREGATE LAYER. FACING UNIT VOIDS TO BE FILLED WITH AGGREGATE. PROVIDE 100MM MINIMUM AG. DRAIN IN GEOTEXTILE SOCK AT TOE OF WALL FACING AND CONNECT TO DRAINAGE SYSTEM AT 30M MAX. SPACING.
13. THE NEED FOR A CHIMNEY DRAIN OR DRAINAGE AT THE REAR OF THE MASS SOIL BLOCK IS TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER AND DESIGNER FOLLOWING PREPARATION OF THE FOUNDATION AND PRIOR TO CONSTRUCTION OF THE MASS SOIL BLOCK.
14. CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500KG STATIC WEIGHT IS TO BE KEPT BACK 1.5 METRES FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 1.5 METRE STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
15. ALL WALL SYSTEMS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS/SUPPLIERS SPECIFICATIONS.
16. ALL DESIGN AND CONSTRUCT WALL SYSTEM TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.
17. BARRIER TO BE MIN 1.0m FROM FACE OF THE WALL OR PROVIDED WITH SEPARATE FUTURE SUPPORT STRUCTURE WHICH DOES NOT IMPACT THE PROPOSED STRAP & REINFORCED EARTH BLOCK CONSTRUCTION.

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

AMENDMENTS DATE ISSUE

ARCHITECT watson young

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW10

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Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE:
DRAWING LIST AND GENERAL NOTES

DRAWING No. C013738.01-EW10 ISSUE B

CONSTRUCTION SITE ENTRY

NOMINAL STOCKPILE LOCATION T.B.C ON SITE

SITE BOUNDARY

1 EW25

VICTORIA STREET

REDFERN STREET

1 STOREY BRICK BUILDING

2 STOREY RENDERED BUILDING

RIDGE RL18.52

BENCHMARK NAIL RL 38.44 (AHD)

BITUMEN CAR PARK

SUBSTATION

PROVIDE KERB INLET CONTROL FILTER TYPICAL

PEBBLECRETE WAREHOUSE

RIDGE RL44.84

RAMP

OVERFLOW SPILLWAY 5m WIDE

PROPOSED SEDIMENT BASIN

BENCHMARK NAIL RL 37.52 (AHD)

BENCHMARK NAIL RL 36.48 (AHD)

CONCRETE SLAB

BITUMEN DRIVEWAY

GATE

SILT FENCE

DIVERSION DRAIN

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/20.

- DENOTES SILT FENCE
- DENOTES DIVERSION DRAIN
- DENOTES OVERFLOW DIRECTION
- DENOTES KERB INLET CONTROL FILTER

STAGE 1 ESC NOTES:

APPLIES INITIAL SITE ESTABLISHMENT PHASE.

1. INSTALL CONSTRUCTION SITE ENTRY.
2. INSTALL SEDIMENT BASIN.
3. INSTALL DIVERSION DRAINS.
4. INSTALL SILT FENCES AND OTHER ESC MEASURES.
5. COMPLETE SITE STRIP & CONSTRUCTION EARTHWORKS.
6. PROGRESSIVELY ADJUST ESC MEASURES TO STAGE 2 DURING EARTHWORKS CONSTRUCTION.

SEDIMENTATION BASIN NOTE:

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING C013738.01-EW25.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'. CAPACITY BASED UPON 5 DAY RAINFALL DEPTH AT 85th PERCENTILE INTENSITY (32.2mm).

APPROXIMATE AREA OF DISTURBED SITE = 8.60Ha

SEDIMENTATION BASINS TO COLLECT RUN-OFF IN EXTREME RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:
1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)

SOIL TYPE ASSESSED FROM GEOTECHNICAL REPORT.

SEDIMENT BASIN:

CATCHMENT AREA	= 8.60ha
REQUIRED BASIN VOLUME	= 2077m³
BASE DIMENSION (LxB)	= 45.0m x 25.00m
TOP DIMENSION (LxB)	= 54.0m x 34.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 2199m³

EROSION AND SEDIMENT CONTROL PAN - STAGE 1

SCALE 1:500

LEVELS NOTE:

LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO MINOR VARIATIONS TO SUIT DETAILED DESIGN.

NOTE:

FOR EROSION AND SEDIMENT CONTROL NOTES REFER TO DRAWING EW10

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	A

AMENDMENTS	DATE	ISSUE

ARCHITECT watsonyoung

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
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DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW20

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PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN - STAGE 1

DRAWING No C013738.01-EW20

ISSUE A

PROPOSED PAD 5
BEL RL 41.03

PROPOSED PAD 3
BEL RL 38.30

PROPOSED PAD 2
BEL RL 42.30

PROPOSED PAD 1
BEL RL 33.70

PROPOSED PAD 3
BEL RL 33.70

CONSTRUCTION SITE
ENTRY NO.1

CONSTRUCTION SITE
ENTRY NO.2

PROVIDE SCOUR
PROTECTION

PROVIDE SCOUR
PROTECTION TO
DIVERSION DRAIN

PROVIDE SCOUR PROTECTION TO BATTER & DIVERSION DRAIN TO
SEDIMENT BASIN. ENSURE UPPER PAD RUNOFF IS DRAINED TO
LOWER PAD THROUGH ROCK CHUTE PER LANDCOM BLUEBOOK.

PROPOSED SEDIMENT
BASIN

ROCK LINED
OVERFLOW SPILLWAY
5m WIDE 0.8m DEEP

NOMINAL STOCKPILE LOCATION
T.B.C ON SITE

VICTORIA STREET

REDFERN STREET

SITE BOUNDARY

188°54'20"

3.0%

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/20.

- DENOTES SILT FENCE
- DENOTES DIVERSION DRAIN
- DENOTES OVERFLOW DIRECTION
- DENOTES KERB INLET CONTROL FILTER

STAGE 2 ESC NOTES:

APPLIES TO COMPLETION OF EARTHWORKS PHASE.

1. PROGRESSIVELY ADJUST ESC MEASURES BETWEEN STAGE 1 AND STAGE 2 AS PER STAGE 1 NOTE 6 AND LANDCOM BLUEBOOK.
2. ENSURE ALL CLEAN WATER DIVERTED TO STORMWATER AROUND DISTURBED AREAS.
3. ALL DIRTY WATER TO BE DIRECTED TO SEDIMENT CONTROL BASIN.
4. SEDIMENT BASIN TO BE MAINTAINED PER LANDCOM BLUEBOOK REQUIREMENTS UNTIL SITE STABILISATION HAD BEEN ACHIEVED.

SEDIMENTATION BASIN NOTE:

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING C013738.01-EW25.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'. CAPACITY BASED UPON 5 DAY RAINFALL DEPTH AT 85th PERCENTILE INTENSITY (32.2mm).

APPROXIMATE AREA OF DISTURBED SITE = 8.60Ha

SEDIMENTATION BASINS TO COLLECT RUN-OFF IN RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:
1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES) SOIL TYPE ASSESSED FROM GEOTECHNICAL REPORT.

SEDIMENT BASIN:

CATCHMENT AREA	= 8.60ha
REQUIRED BASIN VOLUME	= 2077m³
BASE DIMENSION (LxB)	= 45.0m x 25.00m
TOP DIMENSION (LxB)	= 54.0m x 34.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 2199m³

EROSION AND SEDIMENT CONTROL PAN - STAGE 2
SCALE 1:500

LEVELS NOTE:

LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO MINOR VARIATIONS TO SUIT DETAILED DESIGN.

NOTE:

FOR EROSION AND SEDIMENT CONTROL NOTES REFER TO DRAWING EW10

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

AMENDMENTS DATE ISSUE

ARCHITECT watsonyoung

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW21

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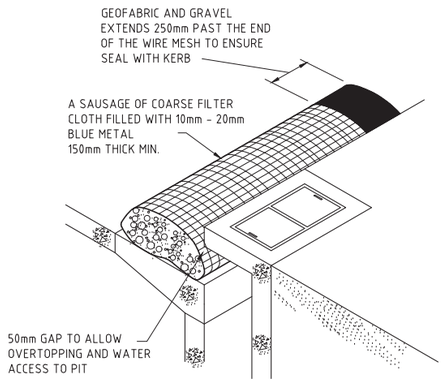
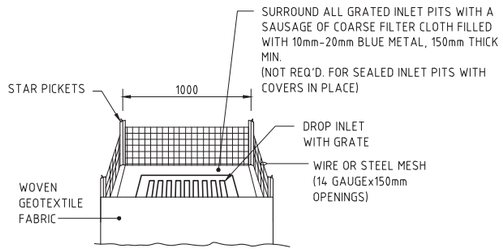
DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN - STAGE 2

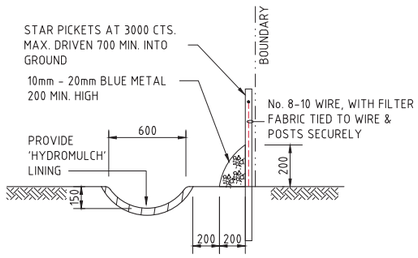
DRAWING No C013738.01-EW21 ISSUE B



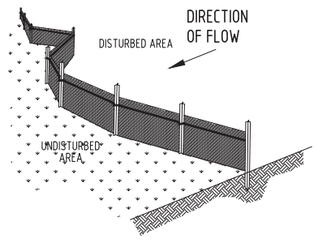
KERB INLET PIT CONTROL
N.T.S



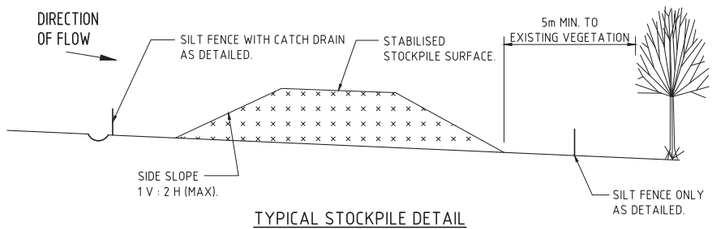
GRATED INLET PIT FILTER DETAIL
N.T.S



TYPICAL OPEN DRAIN & SILT FENCE
SCALE 1:20



TYPICAL SILT FENCE DETAIL
N.T.S.
PROVIDE 1m RETURNS AT 30m INTERVALS.
TYPICAL

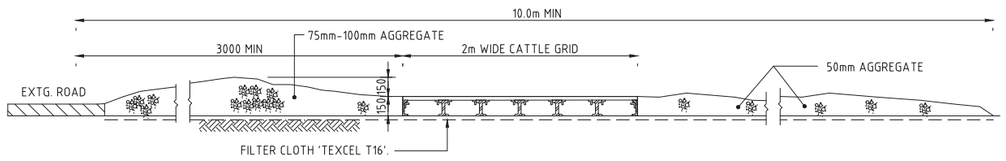


TYPICAL STOCKPILE DETAIL
N.T.S.

STOCKPILE NOTES

1. PLACE ALL STOCKPILES IN LOCATIONS MORE THAN 5m FROM EXISTING VEGETATION, ROADS & HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT ELONGATED MOUNDS. SIDE SLOPE TO BE 1 V: 2 H MAX.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE STOCKPILES ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.
5. CONSTRUCT SILT FENCE WITH CATCH DRAIN ON UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES & SILT FENCE ONLY 1 TO 2m DOWNSLOPE AS SHOWN.

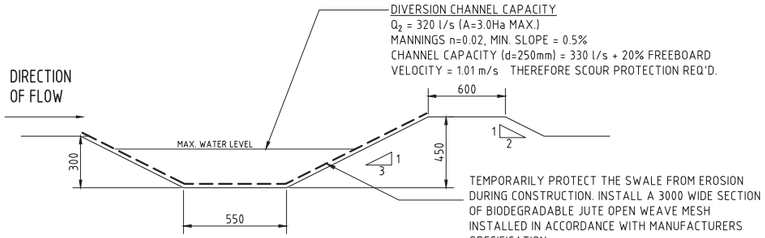
NOTE : ADOPT ABOVE DETAILS AROUND ALL PITS WITHIN AREA ENCOMPASSED BY SILT FENCE & TO PITS ON THE ROAD ADJACENT TO SITE BOUNDARY.



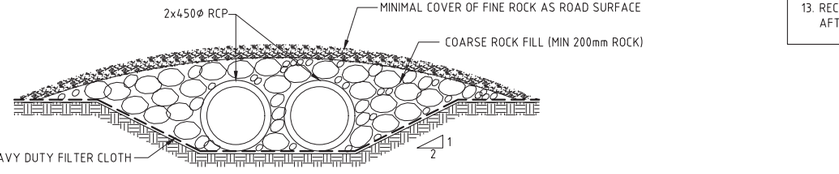
SECTION 1:20 (1 / EW20) : STABILISED CONSTRUCTION ENTRANCE 'TRUCK SHAKER'

SEDIMENT CONTROL POND NOTES:

1. VOLUME OF PONDS SHALL BE AS NOMINATED ON DRAWING EW20. NOMINAL POND LOCATIONS AND NOMINAL DIMENSIONS.
2. SEDIMENT BUILD UP TO NOT EXCEED 33% TOTAL CAPACITY OF POND.
3. WATER LEVEL TO BE MAINTAINED AT 20% CAPACITY DURING SETTLING PERIOD.
4. LENGTH TO WIDTH RATIO TO BE 3:1 MIN. TYPICAL DEPTH TO BE 1.5m.
5. PROVIDE SECURITY FENCE TO POND FOR SAFETY.
6. DEWATERING OF POND TO BE PERFORMED TO THE BOTTOM OF THE SEDIMENT SETTLING ZONE FOLLOWING ACHIEVEMENT OF WQO's. MANAGEMENT OF DOSAGE AND DISCHARGE TO BE ACHIEVED IN A TIMELY MANNER BEFORE THE NEXT RAIN EVENT AND WITHIN 5 DAYS OF THE INITIAL RAINFALL EVENT.
7. WATER TO BE DOSED WITH GYPSUM TO ACCELERATE SETTLEMENT OF SUSPENDED SOLIDS
8. GYPSUM DOSAGE RATE TO BE APPLIED AT APPROX. 32kg PER 100 CUBIC METRE OF COLLECTED RUNOFF.
9. THE USE OF ALUM AS A FLOCULANT IS NOT RECOMMENDED AND IS TO BE USED ONLY FOLLOWING CONSULTATION WITH AND ACCEPTANCE FROM PENRITH CITY COUNCIL ESC OFFICERS.
10. DISCHARGE FROM POND IS PERMISSIBLE WHEN THE WATER PH IS 6.5-8.5 AND IS CLARIFIED TO AT OR BELOW A TSS OF 50mg/L (75 NTU). CLARIFICATION WOULD GENERALLY BE ACHIEVED IN 36-72 HOURS WITH THE USE OF GYPSUM.
11. DEWATERING SHALL BE DONE IN SUCH A MANNER AS TO REMOVE THE RELATIVELY CLEAN WATER WITHOUT REMOVING OR DISTURBING THE SEDIMENT THAT HAS SETTLED. THE PUMP INTAKE PIPE IS NOT TO REST ON THE SETTLED SEDIMENT LAYER.
12. IF WATER EXCEEDS TSS OF 50mg/L (75 NTU) DURING DEWATERING, PUMPING IS TO CEASE.
13. RECORDS ARE TO BE KEPT (ON-SITE AT ALL TIMES) OF ALL MEASUREMENT PRIOR TO, DURING AND AFTER DISCHARGE. RECORDS TO BE MADE AVAILABLE TO COUNCIL OFFICERS UPON REQUEST.

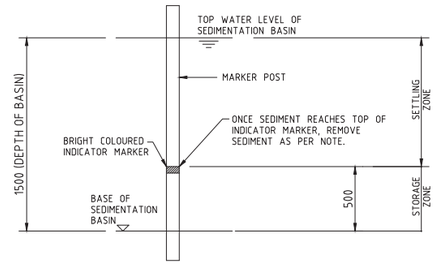


DIVERSION DRAIN SECTION
SCALE 1:20

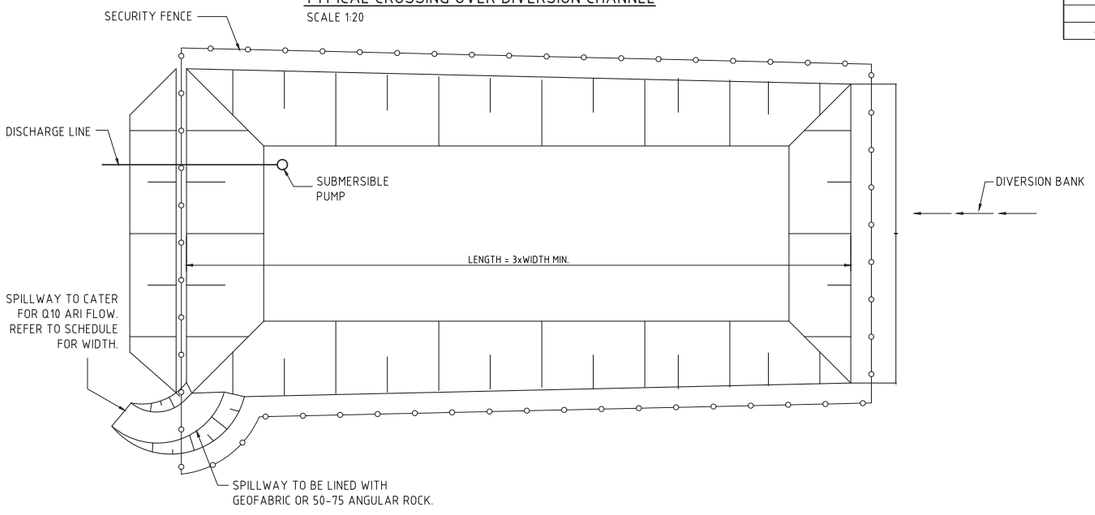


TYPICAL CROSSING OVER DIVERSION CHANNEL
SCALE 1:20

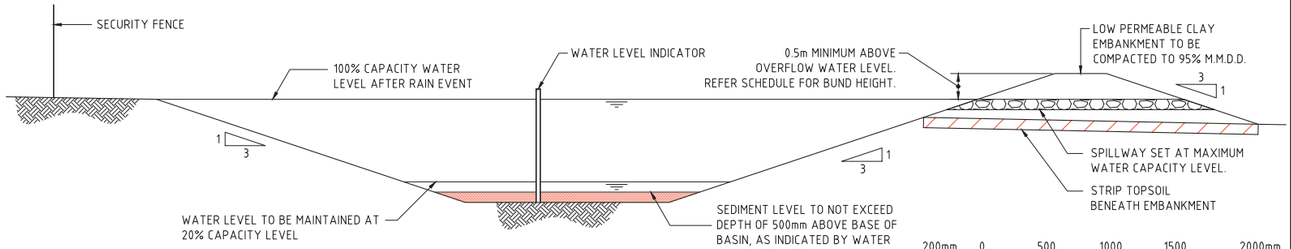
SPILLWAY SCHEDULE					
CATCHMENT (Ha)	FLOW (m^3/s)	WIDTH (m)	FLOW DEPTH (m)	ROCK SIZE (mm)	BUND HEIGHT ABOVE SPILLWAY (m)
1	0.3	2	0.20	200	0.70
2	0.6	4	0.20	200	0.70
5	1.4	5	0.30	200	0.80
10	2.8	8	0.35	200	0.85
20	5.5	14	0.40	250	0.90
40	11.0	20	0.50	250	1.00



SEDIMENT STORAGE MARKER
SCALE 1:20



TYPICAL SEDIMENT CONTROL POND PLAN
SCALE 1:250



TYPICAL SEDIMENT CONTROL BASIN SECTION
SCALE 1:50

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

ARCHITECT: watson young

CLIENT: Woolworths

PROJECT: EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW25

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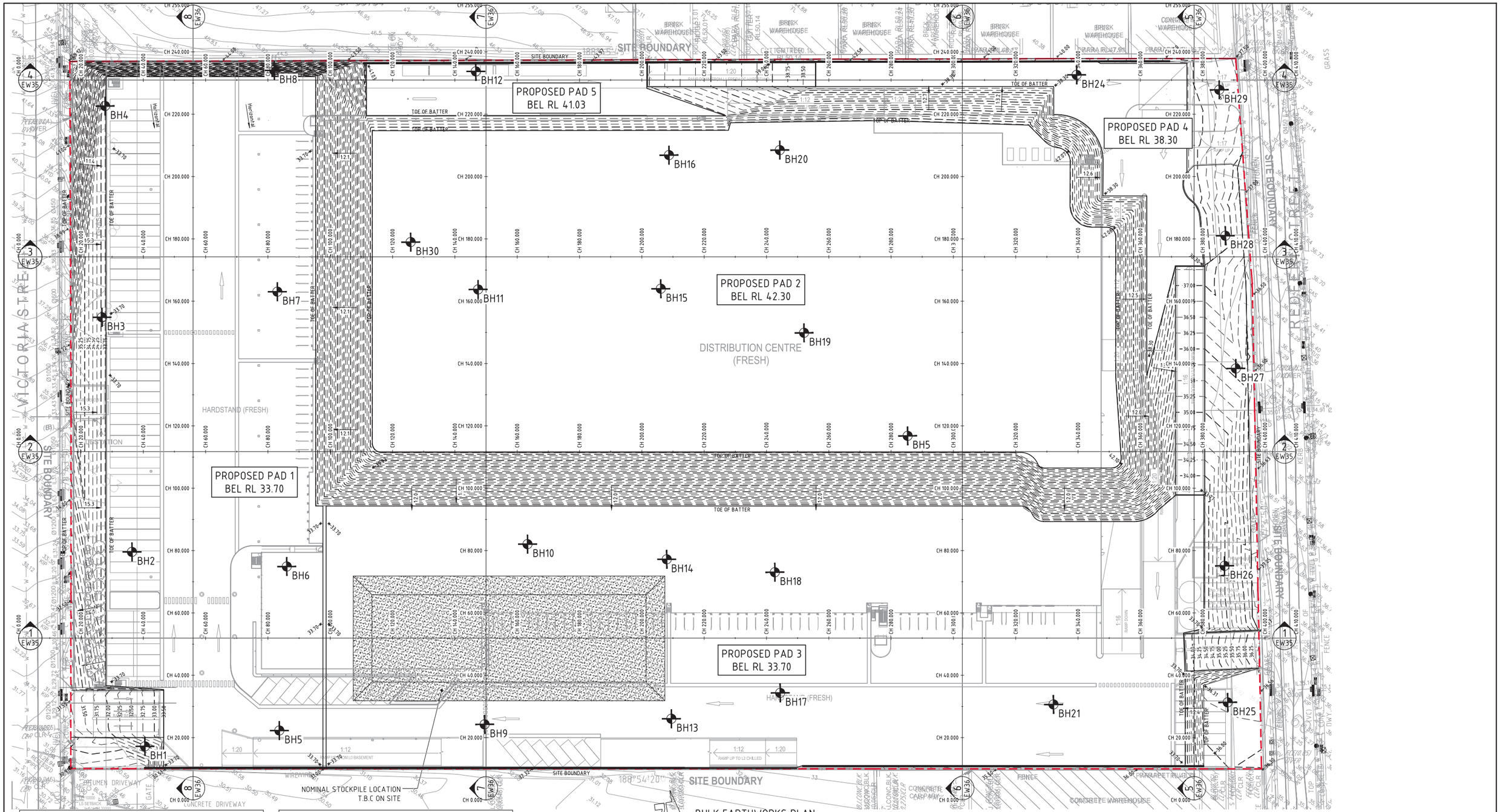
DRAWING TITLE: EROSION & SEDIMENT CONTROL DETAILS
DRAWING No: C013738.01-EW25
ISSUE: B



BULK EARTHWORKS PLAN
SCALE 1:500

SUMMARY NOTES

BULK EARTHWORKS VOLUMES:
SITE AREA = 8.6 Ha

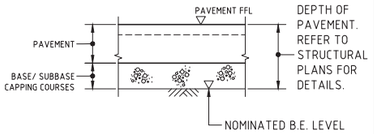
TOPSOIL STRIP (200mm OVER 8.6 Ha)	=	(-17,200m^3)
CUT MATERIAL	= -	98,200m^3
FILL MATERIAL	= +	107,500m^3
BALANCE	= +	9,300m^3 (IMPORTED)

NOTE:
EARTHWORK VOLUMES ARE APPROXIMATE ONLY.
NO ALLOWANCE HAS BEEN MADE FOR DELETERIOUS MATERIAL, EROSION AND SEDIMENT CONTROL OR BULKING OR COMPACTION OF FILLED SOILS.
CONTRACTOR TO ALLOW FOR THESE ITEMS AS REQUIRED

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/20.



NOMINATED B.E.L. DETAIL
NTS

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- 50.00 – EXISTING CONTOUR (1.0m INTERVAL)
- 50.00 – B.E.L. CONTOUR (MAJOR 1.0m)
- 50.10 – B.E.L. CONTOUR (MINOR 0.25m)
- 50.00 – B.E.L. SPOT LEVEL
- BH1 – BOREHOLE LOCATION

BOREHOLE NOTE:

REFER TO GEOTECHNICAL REPORT PROVIDED BY JK GEOTECHNICS 31888AHrpt REV 0 DATED 18/10/2018 FOR TOP OF ROCK RL.

PAVEMENT ALLOWANCE NOTE:

BULK EARTHWORKS LEVELS ARE SHOWN TO BE 300mm BELOW THE FINISHED LEVELS SURFACE.
THIS IS TO BE CONFIRMED DURING DETAILED DESIGN.

LEVELS NOTE:

LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN.
FINAL LEVELS SUBJECT TO MINOR VARIATIONS TO SUIT DETAILED DESIGN.

NOTE:

1. TOPSOIL AND EXISTING PAVEMENT MAY BE REUSED ON SITE SUBJECT TO GEOTECHNICAL ADVICE DURING DETAILED DESIGN.
2. REFER TO DRAWING EW20 & EW21 FOR ESC MEASURE THROUGHOUT WORKS.

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

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ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

ARCHITECT: watson young

CLIENT: Woolworths

PROJECT: EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW30

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DRAWING TITLE: BULK EARTHWORKS PLAN
DRAWING No: C013738.01-EW30
ISSUE: B

PROPOSED PAD 5
BEL RL 41.03

PROPOSED PAD 4
BEL RL 38.30

PROPOSED PAD 2
BEL RL 42.30

DISTRIBUTION CENTRE
(FRESH)

PROPOSED PAD 1
BEL RL 33.70

PROPOSED PAD 3
BEL RL 33.70

HARDSTAND (FRESH)

SITE BOUNDARY

VICTORIA STREET

DEPTH RANGE			
No.	FROM DEPTH	TO DEPTH	COLOUR
1	-8.000	-7.000	
2	-7.000	-6.000	
3	-6.000	-5.000	
4	-5.000	-4.000	
5	-4.000	-3.000	
6	-3.000	-2.000	
7	-2.000	-1.000	
8	-1.000	0.000	
9	0.000	1.000	
10	1.000	2.000	
11	2.000	3.000	
12	3.000	4.000	
13	4.000	5.000	
14	5.000	6.000	
15	6.000	7.000	
16	7.000	8.000	
17	8.000	9.000	

CUT

FILL

NOMINAL STOCKPILE LOCATION
T.B.C ON SITE

CUT/FILL PLAN
SCALE 1:500

LEVELS NOTE:
LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO MINOR VARIATIONS TO SUIT DETAILED DESIGN.

LEGEND:
LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS LOCKLEY TITLED 50469 002DT REV A DATED 21/05/19.

- 50.00 – EXISTING CONTOUR (1.0m INTERVAL)
- 50.00 – B.E.L. CONTOUR (MAJOR 1.0m)
- 50.10 – B.E.L. CONTOUR (MINOR 0.25m)
- 50.00 – B.E.L. SPOT LEVEL

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

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ARCHITECT watsonyoung

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW31

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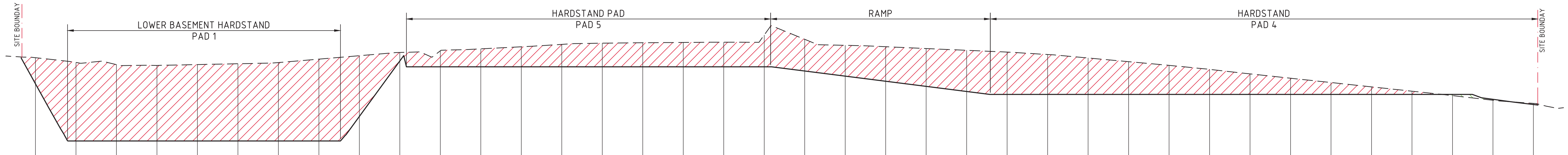
DRAWING TITLE
CUT/FILL PLAN

DRAWING No C013738.01-EW31

ISSUE B

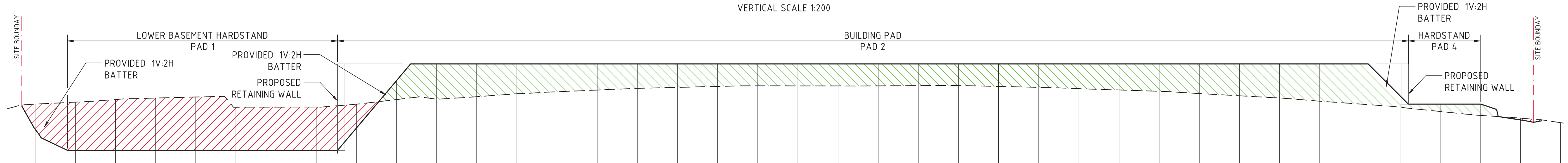


CUT/FILL DEPTH			-2.591	-7.762	-7.543	-7.467	-7.549	-7.632	-7.749	-8.088	-6.004	-0.838	-1.578	-1.774	-1.978	-2.214	-2.331	-2.373	-2.405	-2.428	-3.134
BULK EARTHWORKS LEVEL			39.341	33.700	33.700	33.700	33.700	33.700	33.700	33.700	36.124	41.605	41.030	41.030	41.030	41.030	41.030	41.030	41.030	41.030	41.030
EXISTING SURFACE LEVEL			41.932	41.462	41.243	41.167	41.249	41.332	41.449	41.788	42.128	42.443	42.608	42.804	43.008	43.244	43.361	43.403	43.435	43.458	44.164
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000

CUT/FILL DEPTH	-3.129	-3.043	-3.410	-3.738	-4.066	-4.185	-3.942	-3.599	-3.237	-2.871	-2.477	-2.030	-1.603	-1.175	-0.748	-0.321	0.118	0.093	-0.107		
BULK EARTHWORKS LEVEL	40.616	40.110	39.603	39.097	38.591	38.300	38.300	38.300	38.300	38.300	38.300	38.300	38.300	38.300	38.300	38.300	38.300	37.819	37.308		
EXISTING SURFACE LEVEL	43.745	43.153	43.013	42.835	42.656	42.485	42.242	41.899	41.537	41.171	40.777	40.330	39.903	39.475	39.048	38.621	38.182	37.727	37.415		
CHAINAGE	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	340.000	350.000	360.000	370.000	380.000	390.000	400.000	410.000

SECTION 4

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200

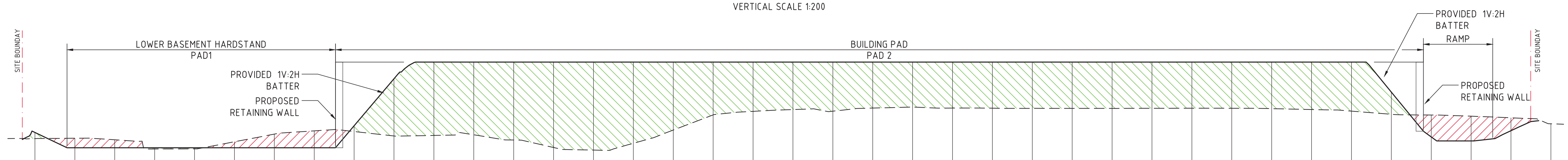


CUT/FILL DEPTH			-2.506	-4.797	-5.058	-5.203	-5.306	-4.296	-4.304	-4.307	-2.385	1.879	3.491	3.261	2.972	2.772	2.599	2.431	2.334	2.241	2.183
BULK EARTHWORKS LEVEL			35.792	33.700	33.700	33.700	33.700	33.700	33.700	33.700	35.908	40.634	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300
EXISTING SURFACE LEVEL			38.298	38.497	38.758	38.903	39.006	37.996	38.004	38.007	38.293	38.754	38.809	39.039	39.328	39.528	39.701	39.869	39.966	40.059	40.117
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000

CUT/FILL DEPTH	2.187	2.191	2.185	2.158	2.155	2.239	2.328	2.461	2.593	2.724	2.945	3.169	3.393	3.705	3.991	1.147	0.730	1.124	-0.177		
BULK EARTHWORKS LEVEL	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	39.134	38.300	38.300	36.729		
EXISTING SURFACE LEVEL	40.113	40.109	40.115	40.142	40.145	40.061	39.972	39.839	39.707	39.576	39.355	39.131	38.907	38.595	38.309	37.987	37.570	37.176	36.907	36.453	
CHAINAGE	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	340.000	350.000	360.000	370.000	380.000	390.000	400.000	410.000

SECTION 3

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200

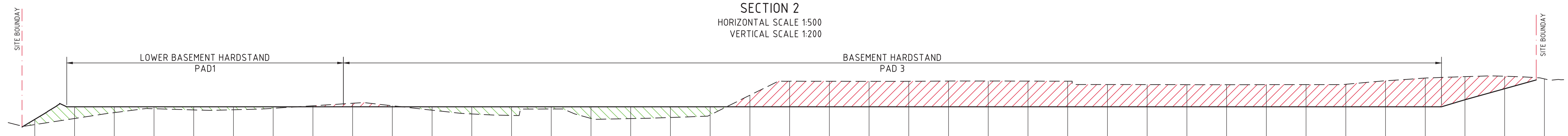


CUT/FILL DEPTH			0.612	-0.951	-0.796	0.126	0.112	-0.599	-1.367	-1.692	0.582	5.755	7.366	7.303	7.828	8.577	8.837	8.155	6.829	5.303	4.949
BULK EARTHWORKS LEVEL			35.228	33.700	33.700	33.700	33.700	33.700	33.700	33.700	35.909	40.634	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300
EXISTING SURFACE LEVEL			34.615	34.651	34.496	33.574	33.588	34.299	35.067	35.392	35.326	34.879	34.934	34.997	34.472	33.723	33.463	34.145	35.471	36.997	37.351
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000

CUT/FILL DEPTH	4.765	4.932	4.619	4.516	4.620	4.631	4.645	4.649	4.654	4.639	4.634	4.639	4.676	4.765	4.923	2.227	-2.201	-2.485	-1.294		
BULK EARTHWORKS LEVEL	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	39.286	34.784	34.381	35.411		
EXISTING SURFACE LEVEL	37.535	37.368	37.681	37.784	37.680	37.669	37.655	37.651	37.646	37.661	37.666	37.661	37.624	37.535	37.377	37.059	36.985	36.865	36.705	36.105	
CHAINAGE	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	340.000	350.000	360.000	370.000	380.000	390.000	400.000	410.000

SECTION 2

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200



CUT/FILL DEPTH			0.531	1.187	0.591	0.200	0.319	0.305	0.157	-0.099	-0.354	-0.103	0.344	0.723	0.875	0.225	1.184	1.197	1.084	0.828	-1.168
BULK EARTHWORKS LEVEL			32.428	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700
EXISTING SURFACE LEVEL			31.897	32.513	33.109	33.500	33.381	33.395	33.543	33.799	34.054	33.803	33.356	32.977	32.825	33.475	32.516	32.503	32.616	32.872	34.868
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000

CUT/FILL DEPTH	-2.585	-2.580	-2.573	-2.576	-2.601	-2.608	-2.596	-2.592	-2.248	-2.245	-2.235	-2.236	-2.238	-2.240	-2.276	-2.628	-2.903	-2.341	-1.260		
BULK EARTHWORKS LEVEL	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	34.408	35.528		
EXISTING SURFACE LEVEL	36.285	36.280	36.273	36.276	36.301	36.308	36.296	36.292	35.948	35.945	35.935	35.936	35.938	35.940	35.976	36.328	36.603	36.749	36.788	36.524	
CHAINAGE	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	340.000	350.000	360.000	370.000	380.000	390.000	400.000	410.000

SECTION 1

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200

LEGEND:

- DENOTES BULK EARTHWORKS SURFACE
- DENOTES EXISTING SURFACE LEVEL
- DENOTES AREA IN CUT
- DENOTES AREA IN FILL

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET
5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B		
ISSUED FOR INFORMATION	14.07.20	A		
AMENDMENTS	DATE	ISSUE	AMENDMENTS	DATE ISSUE

ARCHITECT: watson young

CLIENT: Woolworths

PROJECT: EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW35

Costin Roe Consulting Pty Ltd.
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Tel: (02) 9251-7699 Fax: (02) 9241-3731
email: mail@costinroe.com.au ©

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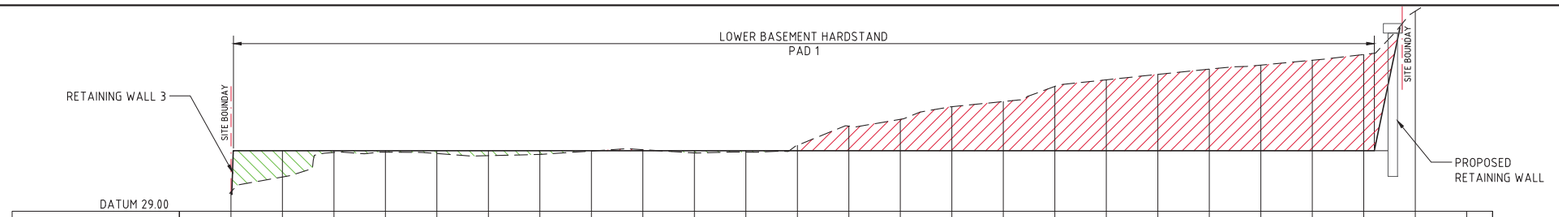
PRECISION | COMMUNICATION | ACCOUNTABILITY

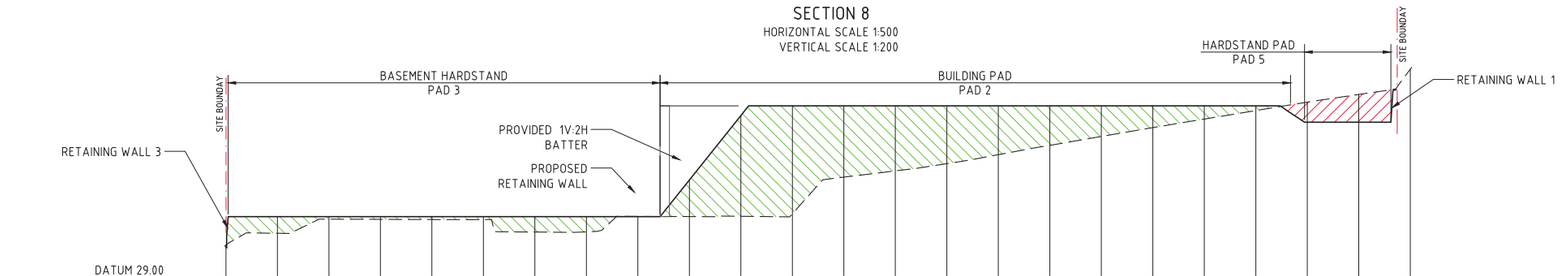
DRAWING TITLE: BULK EARTHWORKS SECTIONS SHEET 1

DRAWING No: C013738.01-EW35 ISSUE: B



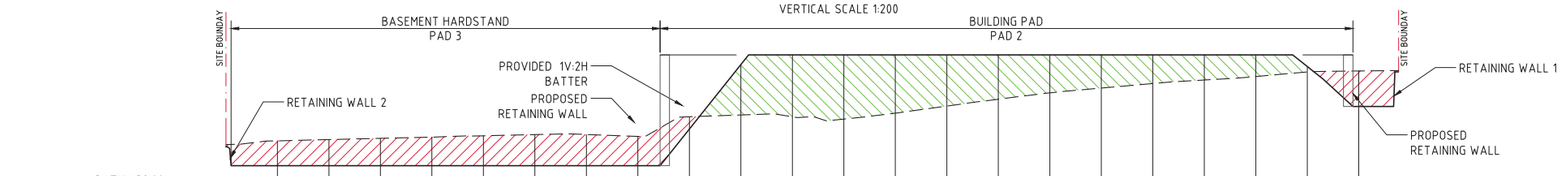
DATUM 29.00																														
CUT/FILL DEPTH			2.038	0.131	0.111	0.214	0.382	0.287	0.022	-0.083	0.174	0.109	-0.419	-1.977	-2.441	-3.419	-3.821	-4.997	-5.567	-5.928	-6.333	-6.648	-7.027	-7.472						
BULK EARTHWORKS LEVEL			33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700						
EXISTING SURFACE LEVEL		30.593	31.662	33.569	33.589	33.486	33.318	33.413	33.678	33.783	33.526	33.591	34.119	35.677	36.141	37.119	37.521	38.697	39.207	39.628	40.033	40.348	40.727	41.172	44.533					
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	255.000			

SECTION 8
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200



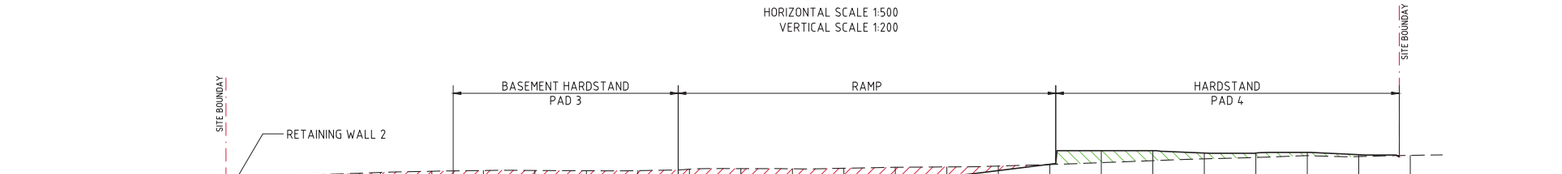
DATUM 29.00																														
CUT/FILL DEPTH			1.290	0.992	0.207	0.222	0.230	1.195	1.179	-0.021	2.840	7.815	8.378	5.531	5.045	4.485	3.786	3.065	2.370	1.687	1.021	0.363	-1.565	-2.157						
BULK EARTHWORKS LEVEL			33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	36.546	41.546	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	41.030	41.030						
EXISTING SURFACE LEVEL		31.489	32.410	33.508	33.493	33.478	33.470	32.505	32.521	33.721	33.706	33.732	33.922	36.769	37.255	37.815	38.514	39.235	39.930	40.613	41.279	41.937	42.595	43.187	45.147					
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	255.000			

SECTION 7
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200



DATUM 32.00																														
CUT/FILL DEPTH			-1.933	-2.029	-2.125	-2.219	-2.321	-2.416	-2.424	-2.273	-0.951	3.908	4.803	4.980	4.521	3.967	3.437	2.942	2.570	2.219	1.944	1.674	0.415	-2.755						
BULK EARTHWORKS LEVEL			33.700	33.700	33.700	33.700	33.700	33.700	33.700	33.700	36.547	41.547	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	42.300	41.398	38.300						
EXISTING SURFACE LEVEL		35.633	35.729	35.825	35.919	36.021	36.116	36.124	35.973	37.498	37.638	37.497	37.320	37.779	38.333	38.863	39.358	39.730	40.081	40.356	40.626	40.983	41.055							
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	255.000			

SECTION 6
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200



DATUM 32.00																														
CUT/FILL DEPTH			-1.420	-1.579	-2.020	-2.635	-3.056	-3.058	-3.040	-3.046	-3.054	-2.610	-2.105	-1.654	-1.239	-0.775	-0.352	0.024	0.934	0.777	0.450	0.339	0.250	0.143						
BULK EARTHWORKS LEVEL			34.875	34.875	34.586	34.065	33.700	33.700	33.700	33.700	33.803	34.294	34.786	35.277	35.768	36.260	36.752	37.243	38.300	38.300	38.111	38.108	38.163	37.985						
EXISTING SURFACE LEVEL		36.099	36.295	36.454	36.605	36.700	36.756	36.758	36.740	36.746	36.857	36.904	36.890	36.931	37.007	37.035	37.104	37.219	37.366	37.523	37.661	37.769	37.913	37.842	37.934					
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	255.000			

SECTION 5
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:200

LEGEND:

- DENOTES BULK EARTHWORKS SURFACE
- DENOTES EXISTING SURFACE LEVEL
- DENOTES AREA IN CUT
- DENOTES AREA IN FILL

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET
5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

AMENDMENTS	DATE	ISSUE

ARCHITECT watsonyoung

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW36

Costin Roe Consulting Pty Ltd.
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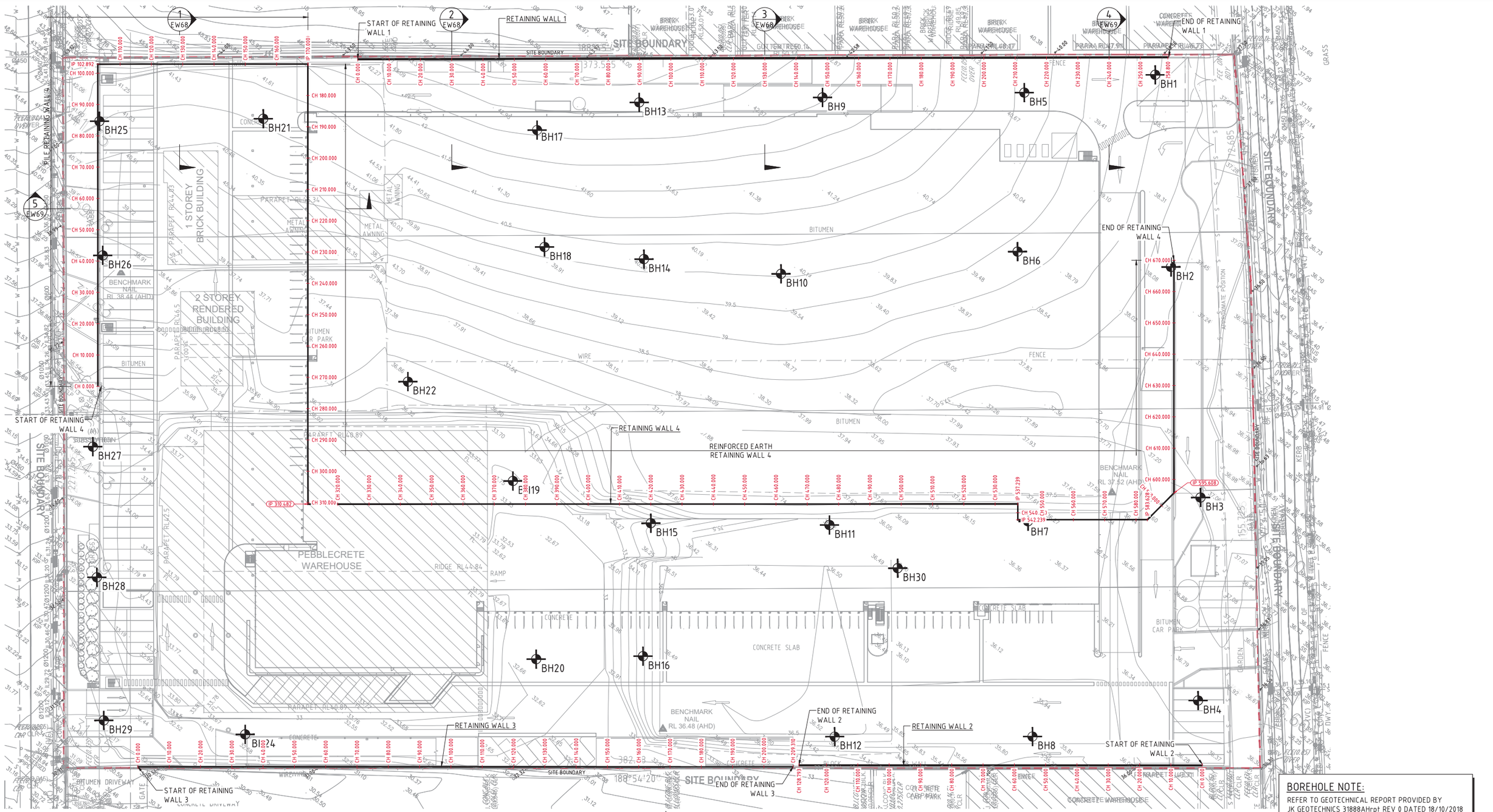
email: mail@costinroe.com.au ©

Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
BULK EARTHWORKS SECTIONS
SHEET 2

DRAWING No C013738.01-EW36 ISSUE B



RETAINING WALL PLAN
SCALE 1:500

BOREHOLE NOTE:
REFER TO GEOTECHNICAL REPORT PROVIDED BY JK GEOTECHNICS 31888AHrpt REV 0 DATED 18/10/2018 FOR TOP OF ROCK RL.

LEVELS NOTE:
LEVELS SHOWN TO BE ±500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO MINOR VARIATIONS TO SUIT DETAILED DESIGN.

NOTE:
REFER TO DRAWING C013738.01-EW10 FOR RETAINING WALL NOTES.

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

ARCHITECT watson young

CLIENT woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW60

Costin Roe Consulting Pty Ltd.
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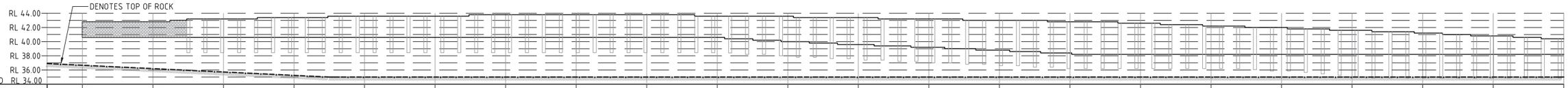
DRAWING TITLE
RETAINING WALL PLAN

DRAWING No C013738.01-EW60

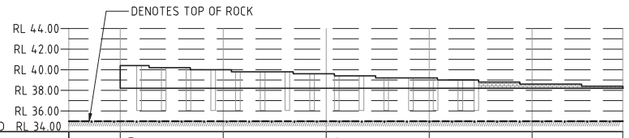
ISSUE A



HEIGHT (mm)		2200	2200	2600	2800	3000	3000	3200	3200	3200	3000	3600	3800	4000	4200	4400	4400	4000	3800	3400	3000	2600	2200		
TOP OF WALL R.L. (m)		42.80	42.80	43.20	43.40	43.60	43.60	43.80	43.80	43.80	43.60	43.60	43.40	43.20	43.00	42.80	42.60	42.20	42.00	41.60	41.20	40.80	40.40		
TOP OF FOOTING R.L. (m)		40.60	40.60	40.60	40.60	40.60	40.60	40.60	40.60	40.60	40.60	40.00	39.60	39.20	38.80	38.40	38.20	38.20	38.20	38.20	38.20	38.20	38.20		
CHAINAGE (m)		0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00	130.00	140.00	150.00	160.00	170.00	180.00	190.00	200.00	210.00		

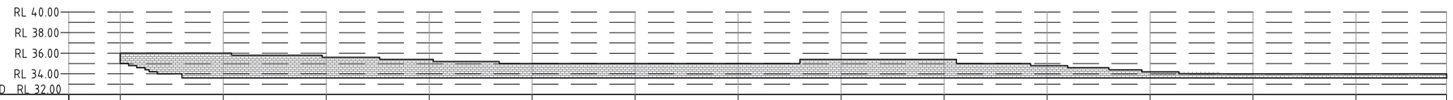
RETAINING WALL 1 ELEVATION

SCALE 1:250
WALL SURFACE AREA = 760m²
WALL TYPE: TYPE-1 CANTILEVER BLOCK & CONTIGUOUS PILE WALL
SURCHARGE: 25 kPa MIN.



HEIGHT (mm)		2200	1800	1400	1000	400	200
TOP OF WALL R.L. (m)		40.40	40.00	39.60	39.20	38.60	38.40
TOP OF FOOTING R.L. (m)		38.20	38.20	38.20	38.20	38.20	38.20
CHAINAGE (m)		210.00	220.00	230.00	240.00	250.00	258.80

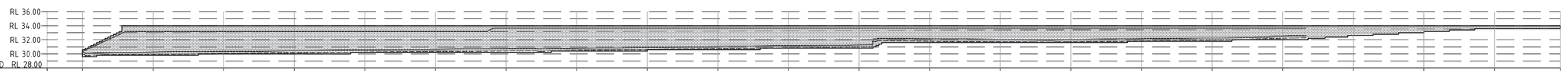
RETAINING WALL 1 ELEVATION CONTINUATION



HEIGHT (mm)		1000	2400	2000	1800	1400	1400	1400	1600	1600	1200	600	400	400	400
TOP OF WALL R.L. (m)		36.00	36.00	35.60	35.40	35.00	35.00	35.00	35.20	35.20	34.80	34.20	34.00	34.00	34.00
TOP OF FOOTING R.L. (m)		35.00	33.60	33.60	33.60	33.60	33.60	33.60	33.60	33.60	33.60	33.60	33.60	33.60	33.60
CHAINAGE (m)		0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00	128.80

RETAINING WALL 2 ELEVATION

SCALE 1:250
WALL SURFACE AREA = 270m²
WALL TYPE: TYPE-1 CANTILEVER BLOCKSURCHARGE: 25 kPa MIN.



HEIGHT (mm)		1000	5200	4000	4000	3800	3800	3800	3600	3600	3400	3200	3200	2400	2400	2400	2200	2200	2000	1400	1000	400	400		
TOP OF WALL R.L. (m)		30.60	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00		
TOP OF FOOTING R.L. (m)		29.60	28.80	30.00	30.00	30.20	30.20	30.20	30.40	30.40	30.60	30.80	30.80	31.60	31.60	31.60	31.80	31.80	32.00	32.60	33.00	33.60	33.60		
CHAINAGE (m)		0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00	130.00	140.00	150.00	160.00	170.00	180.00	170.00	170.00	179.60		

RETAINING WALL 3 ELEVATION

SCALE 1:250
WALL SURFACE AREA = 580m²
WALL TYPE: REINFORCED EARTH WALL
SURCHARGE: 25 kPa MIN.

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

ARCHITECT watsonyoung

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW61

Costin Roe Consulting Pty Ltd.
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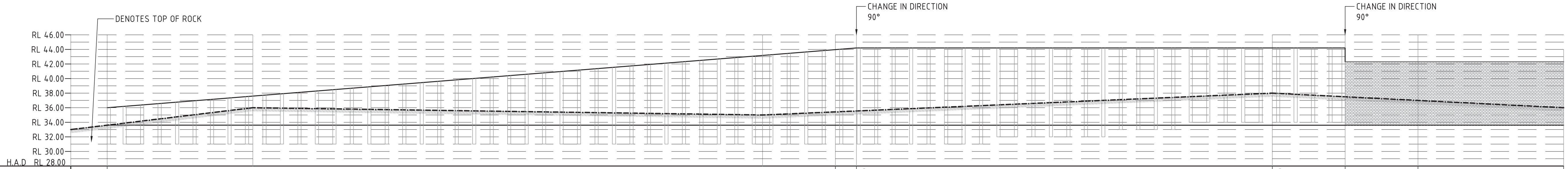
DRAWING TITLE
RETAINING WALL ELEVATIONS
SHEET 1

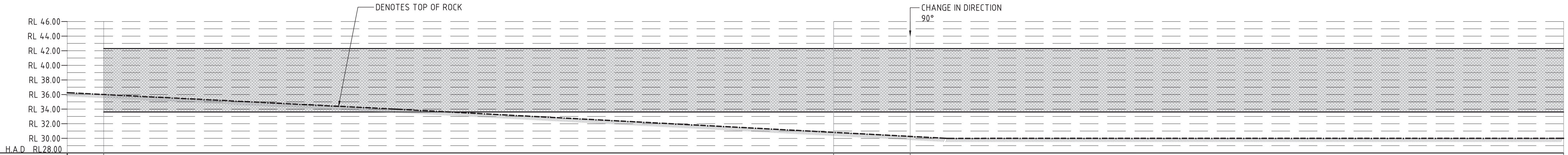
DRAWING No C013738.01-EW61 ISSUE B



HEIGHT (mm)	3000		11000	11000	8700	8700	8700
TOP OF WALL R.L. (m)	36.00		44.20	44.2	42.30	42.30	42.30
TOP OF FOOTING R.L. (m)	33.6		33.60	33.6	33.6	33.6	33.6
CHAINAGE (m)	0.00	100.00	102.89	160.00	170.00	180.00	200.00

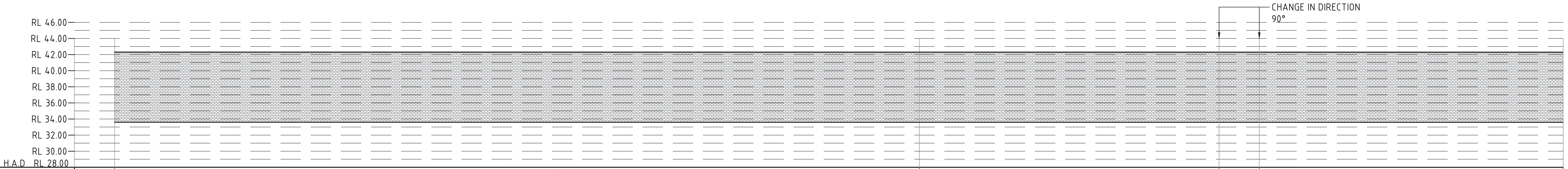
RETAINING WALL 4 ELEVATION

SCALE 1:250
WALL SURFACE AREA = 5410m²
WALL TYPE: CONTIGUOUS PILE & REINFORCED EARTH WALL
SURCHARGE: 25 kPa MIN.



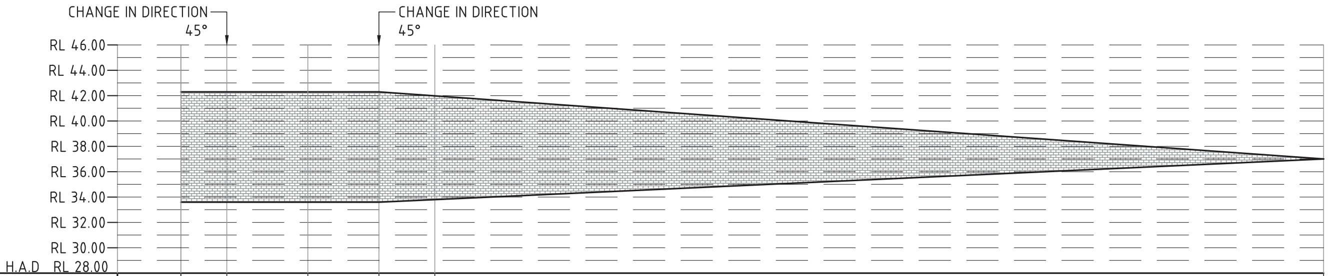
HEIGHT (mm)	8700	8700	8700	8700
TOP OF WALL R.L. (m)	42.30	42.30	42.30	42.30
TOP OF FOOTING R.L. (m)	33.6	33.6	33.6	33.60
CHAINAGE (m)	200.00	300.00	310.48	400.00

RETAINING WALL 4 ELEVATION CONTINUATION



HEIGHT (mm)	8700	8700	8700	8700	8700
TOP OF WALL R.L. (m)	42.30	42.30	42.30	42.30	42.30
TOP OF FOOTING R.L. (m)	33.6	33.60	33.60	33.60	33.60
CHAINAGE (m)	400.00	500.00	537.24	542.24	580.00

RETAINING WALL 4 ELEVATION CONTINUATION



HEIGHT (mm)	8700	8700	8700	8700		0
TOP OF WALL R.L. (m)	42.30	42.30	42.30	42.30		37.00
TOP OF FOOTING R.L. (m)	33.60	33.60	33.60	33.60		37.00
CHAINAGE (m)	580.00	583.62	590.00	595.60	600.00	670.00

RETAINING WALL 4 ELEVATION CONTINUATION

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	A

ARCHITECT watson young

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW62

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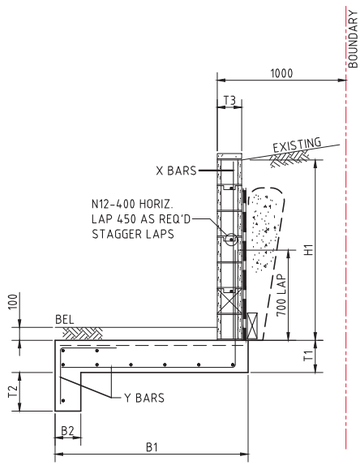
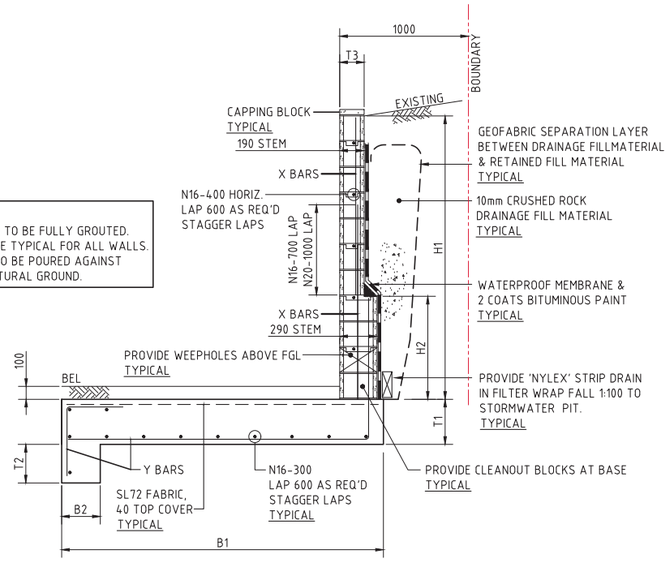
DRAWING TITLE
RETAINING WALL ELEVATIONS
SHEET 2

DRAWING No C013738.01-EW62
ISSUE A

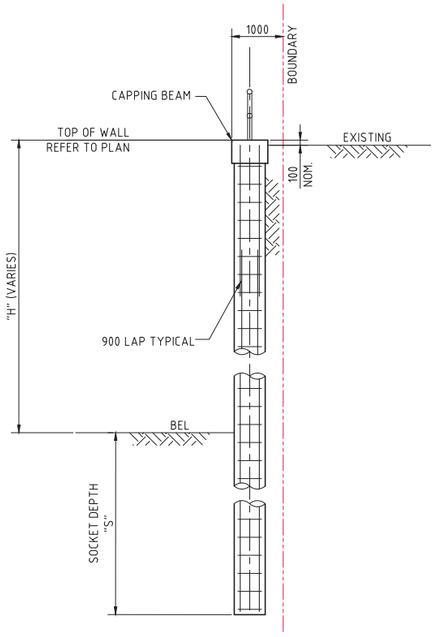


WALL WITH SINGLE STEM OF 190 BLOCK
1:20 SCALE

NOTE :
ALL BLOCK CORES TO BE FULLY GROUTED.
NOTES SHOWN ARE TYPICAL FOR ALL WALLS.
ALL BASE KEYS TO BE POURED AGAINST
UNDISTURBED NATURAL GROUND.

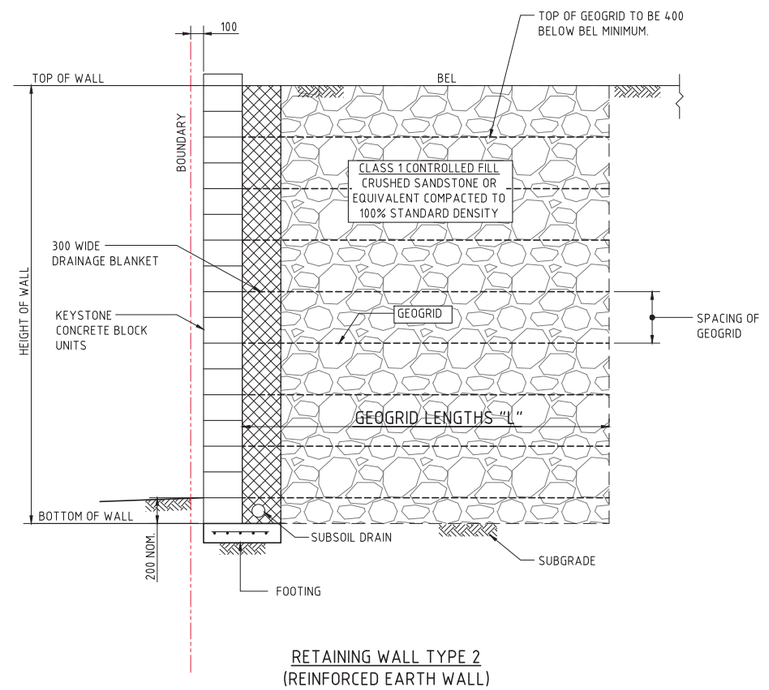


WALL WITH THIN STEM OF 190 BLOCK AND
THICK STEM OF 290 BLOCK
1:20 SCALE



CONTIGUOUS PILE WALL TYPICAL SECTION
SCALE 1:50

NOTE:
SOCKET DEPTH NOTED IS MINIMUM INTO CLASS IV ROCK OR HIGHER.
THIS IS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER DURING
INSTALLATION. IF SOFTER ROCK IS ENCOUNTERED, ENGINEER TO BE
NOTIFIED IMMEDIATELY AND WILL ADVICE OF ADJUSTED SOCKET DEPTH.



RETAINING WALL TYPE 2
(REINFORCED EARTH WALL)
SCALE 1:20

CANTILEVER BLOCK WALL - TYPE 1

RETAINING WALL 1 SPECIFICATIONS FOR 25kPa SURCHARGE					
RETAINED HEIGHT H1	290 STEM HEIGHT H2	BASE WIDTH B1	(THIN) STEM THICKNESS T1	REINF'T. X BARS	REINF'T. Y BARS
2000	800	2100	190	N16-200	N16-200
1800	800	1900	190	N16-200	N16-200
1600	N/A	1700	190	N16-200	N16-200
1400	N/A	1500	190	N16-400	N16-400
1200	N/A	1400	190	N16-400	N16-400
1000	N/A	1300	190	N16-400	N16-400
800	N/A	1100	190	N16-400	N16-400
600	N/A	900	190	N16-400	N16-400

CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
CORE FILL	230	10	GP	NIL	20
SHOT CRETE	230	10	SL	NIL	32

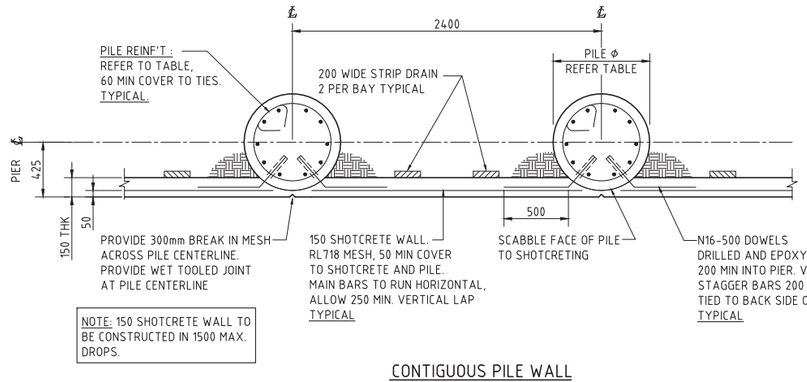
NOTE :
ALL BLOCK CORES TO BE FULLY GROUTED.
NOTES SHOWN ARE TYPICAL FOR ALL WALLS.
ALL BASE KEYS TO BE POURED AGAINST
UNDISTURBED NATURAL GROUND.

REINFORCED EARTH WALL DETAILS

WALL HEIGHT "H"	GEOGRID LENGTH "L"	GEOGRID TYPE
2300	2600	GX50/30
3300	3500	GX50/30
4300	4700	GX50/30

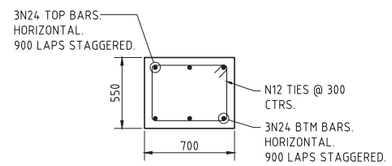
NOTE :
INDICATIVE REINFORCEMENT LENGTHS
SHOWN.

DESIGN TO BE CONFIRMED / PROVIDED
BY D+C CONTRACTOR.



NOTE: 150 SHOTCRETE WALL TO BE CONSTRUCTED IN 1500 MAX. DROPS.

CONTIGUOUS PILE WALL
SCALE 1:20



DETAIL OF 700x550 CAPPING BEAM
SCALE 1:20

CONTIGUOUS PILE WALL SCHEDULE

PILE TYPE	MAX. HEIGHT "H" (m)	PILE DIA. (mm)	PILE SPACING (mm)	SOCKET DEPTH "S" (mm)	PILE REINFORCEMENT	CLOSED TIES	CAPPING BEAM
1	4.0	600	2400	4200	8N24	R12-300	700x550

CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PILES	80	20	SL	NIL	32
SHOT CRETE	230	10	SL	NIL	32
CAPPING	80	20	GP	NIL	32

NOTE:
THE DETAILS ON THIS DRAWING ARE INDICATIVE ONLY
AND ARE SUBJECT TO DETAIL DESIGN.

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	B
ISSUED FOR INFORMATION	14.07.20	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: watson young

CLIENT: Woolworths

PROJECT: EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW65

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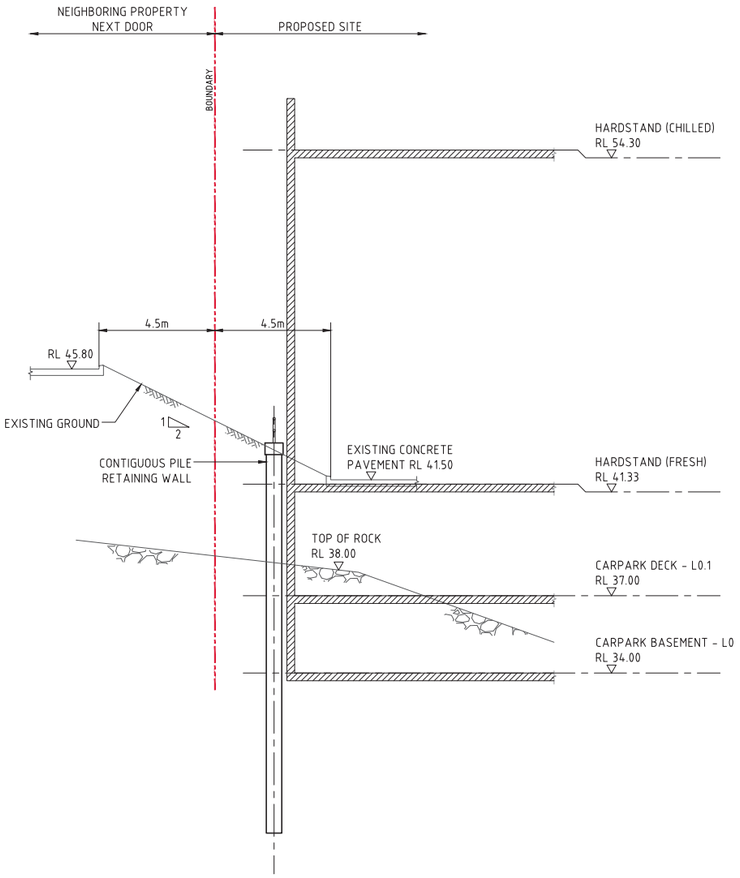
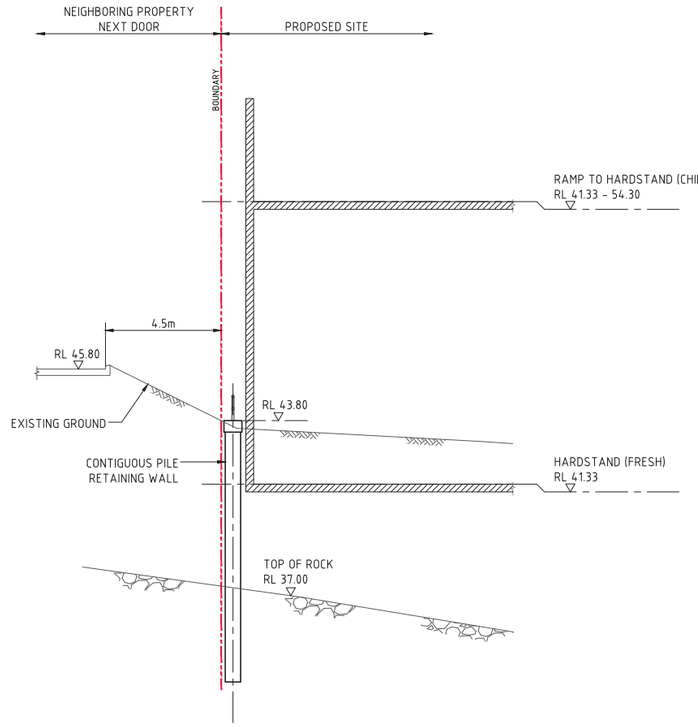
DRAWING TITLE: RETAINING WALL DETAILS

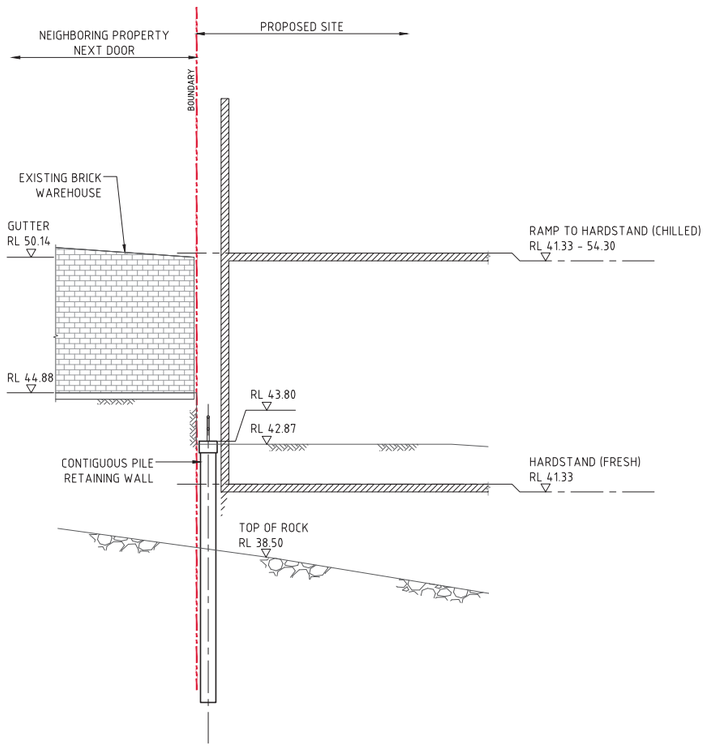
DRAWING No: C013738.01-EW65 ISSUE: B



SECTION 1:100 1 EW60



SECTION 1:100 2 EW60



SECTION 1:100 3 EW60

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	A

AMENDMENTS	DATE	ISSUE

ARCHITECT watsonyoung

CLIENT Woolworths

PROJECT
EARLY WORKS DA
250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW68

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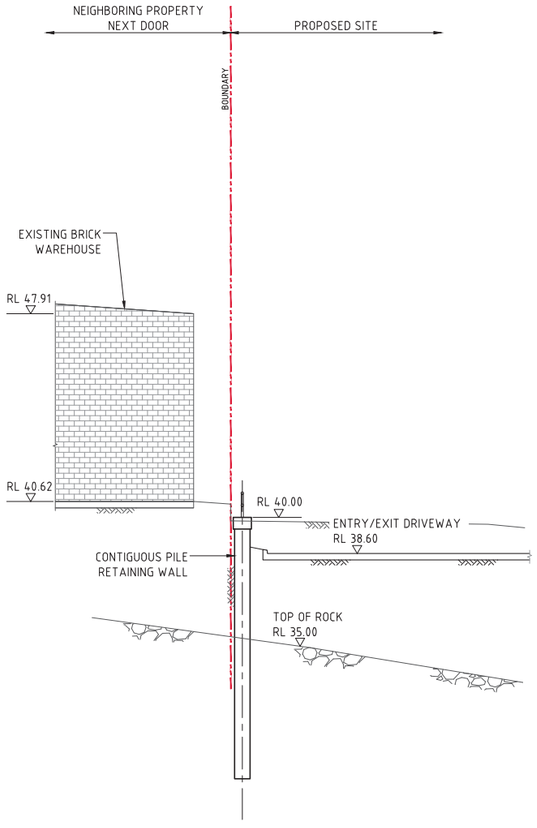
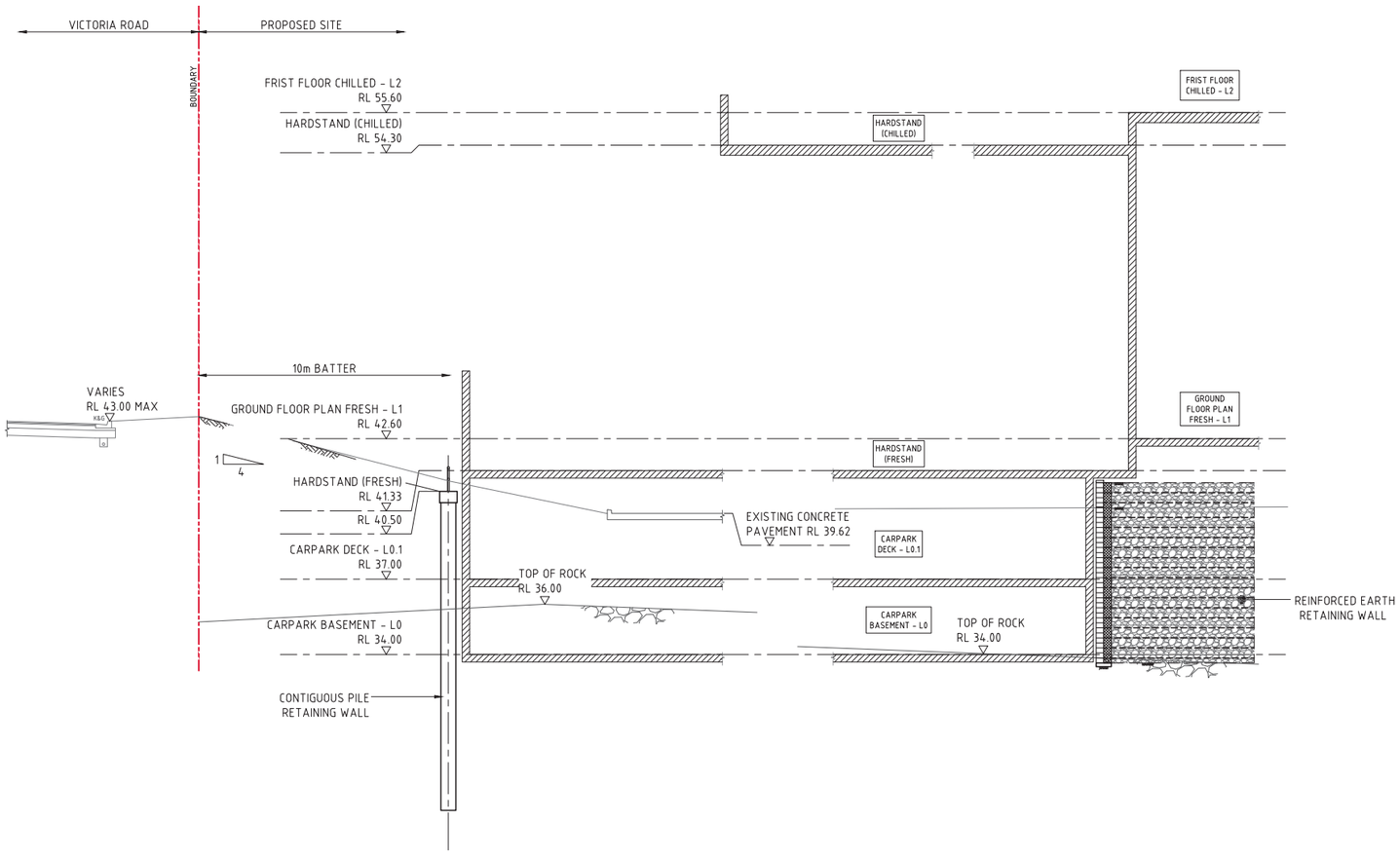
DRAWING TITLE
TYPICAL SECTIONS
SHEET 1

DRAWING No C013738.01-EW68

ISSUE A



SECTION 1:100 4 EW60



SECTION 1:100 5 EW60

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

ISSUED FOR DEVELOPMENT APPLICATION	10.02.21	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT watson young

CLIENT Woolworths

PROJECT
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250 - 266 VICTORIA STREET
WETHERILL PARK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
XC	MdW	JULY '20	XC	B1	AS SHOWN	C013738.01-EW69

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DRAWING TITLE
TYPICAL SECTIONS
SHEET 2

DRAWING No. C013738.01-EW69 ISSUE A

Appendix E

COUNCIL CORRESPONDANCE

From: Prawi Woods <prawi.woods@csse.com.au>
Sent: Wednesday, 5 May 2021 5:03 PM
To: Mark Wilson
Cc: Xavier Cure; Darcy Medway; Leonie Gray; David Tetley
Subject: [Results] 250 Victoria Street Wetherill park - Flood Modelling

Hi Mark and team,

I'm pleased to advise that we have completed the requested flood modelling for 250 Victoria Street at Wetherill park.

As you may be aware, this site is potentially at risk of overland flooding. As a result, we have run Fairfield City Council's Wetherill Park TUFLOW hydraulic model to complete the assessment. The assessment was undertaken in three stages:

1) Existing flood assessment: in order to understand the potential flood impacts associated with the proposed development it is first necessary to confirm flood behaviour for existing (i.e. pre-development) conditions. To ensure the flood model was providing a reliable description of existing flood behaviour we made some minor updates to Council's existing model. This included refining the building extents around the site to better reflect present day conditions and the impediment to flow afforded by these obstructions. We also included the survey provided by yourself to represent contemporary elevations across the site. Finally, we have also modified the hydrologic/rainfall inputs to enable simulation of the 0.5% AEP event.

2) Post-development flood assessment: The model that was used to define existing flood behaviour was then updated to include a representation of the proposed development. This included modifications to the building footprint, the inclusion of the proposed drainage network and proposed terrain. The proposed GPT and Stormwater Quality Improvement device are assumed to be by-passed in the modelled events. We understand that OSD is also proposed, but as details of the OSD are not yet available, this was not represented in the post-development model .

3) Extraction of results: Both the existing and post-development models were used to simulate flood behaviour for the 5% AEP, 1% AEP, 0.5% AEP, 0.2% AEP and PMF flood. The results from the simulations were used to prepare a range of results images for existing and post-development conditions. This includes:
    - Peak floodwater depths with flood level contours
    - Peak velocity
    - Peak velocity depth product

    We also prepared "difference mapping". This was prepared by subtracting peak "existing" flood results from peak "post-development" flood results and shows the magnitude and extent of changes in flood levels, velocity and VxD associated with the proposed development (relative to existing conditions). We have also extracted flood results at discrete locations to more specifically quantify differences (refer to the results images for the reporting locations).

    Please note that the flood model utilises a "direct rainfall" modelling approach which results in the entire model being "wet". Therefore, to distinguish between areas of negligible inundations versus more significant inundations, all areas exposed to water depths of less than 0.1m have been filtered out or "clipped" out of the results.

The results images are available using the download link below. Also included below is a link to the TUFLOW model results. However, please note that the results are quite large and you will need special software to view the results:

- TUFLOW Results Files
- Results Images

I trust this provides a suitable summary of the flood modelling work that we have completed. However, if you have any questions or require any additional information please not hesitate to contact David Tetley (CC'd) or myself.

Please note that this email is also being forwarded to Fairfield City Council so they are aware of the model updates that we have completed and the associated results.

Regards,

Prawi Woods
Water Engineer

Catchment Simulation Solutions

M 0451 791 752
P (02) 8355 5509
prawi.woods@csse.com.au
www.csse.com.au

Local Government PROCUREMENT
APPROVED CONTRACTOR

Appendix F

MUSIC MODELLING OUTPUT AND MODEL CONFIGURATION BY COSTIN ROE CONSULTING

Treatment Train Effectiveness - GP90/TSS80/TP55/TN40

	Sources	Residual Load	% Reduction
Flow (ML/yr)	60.4	58	4
Total Suspended Solids (kg/yr)	10700	1790	83.3
Total Phosphorus (kg/yr)	21.2	8.95	57.8
Total Nitrogen (kg/yr)	138	82.2	40.5
Gross Pollutants (kg/yr)	1550	42.2	97.3

Appendix G

FLOOD MODELLING OUTPUT

CATCHMENT SIMULATION SOLUTIONS

EXISTING FLOOD OUTPUT

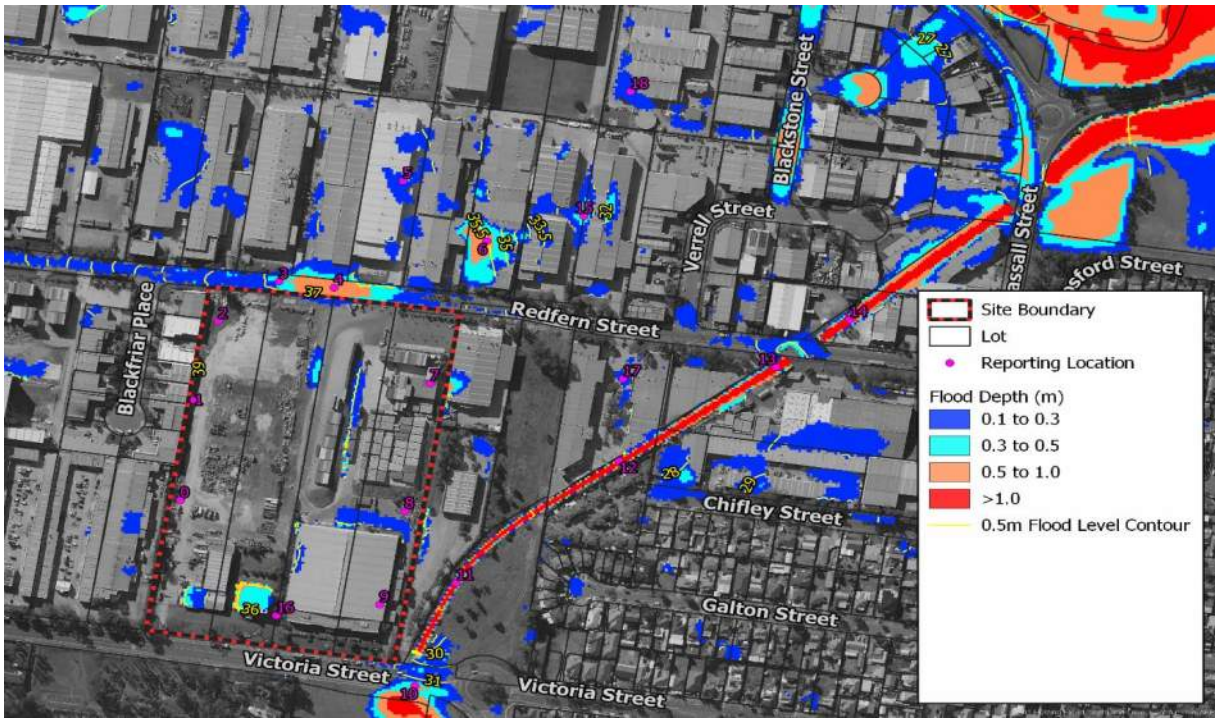

Figure G1- 5% AEP Flood Depths (Existing)

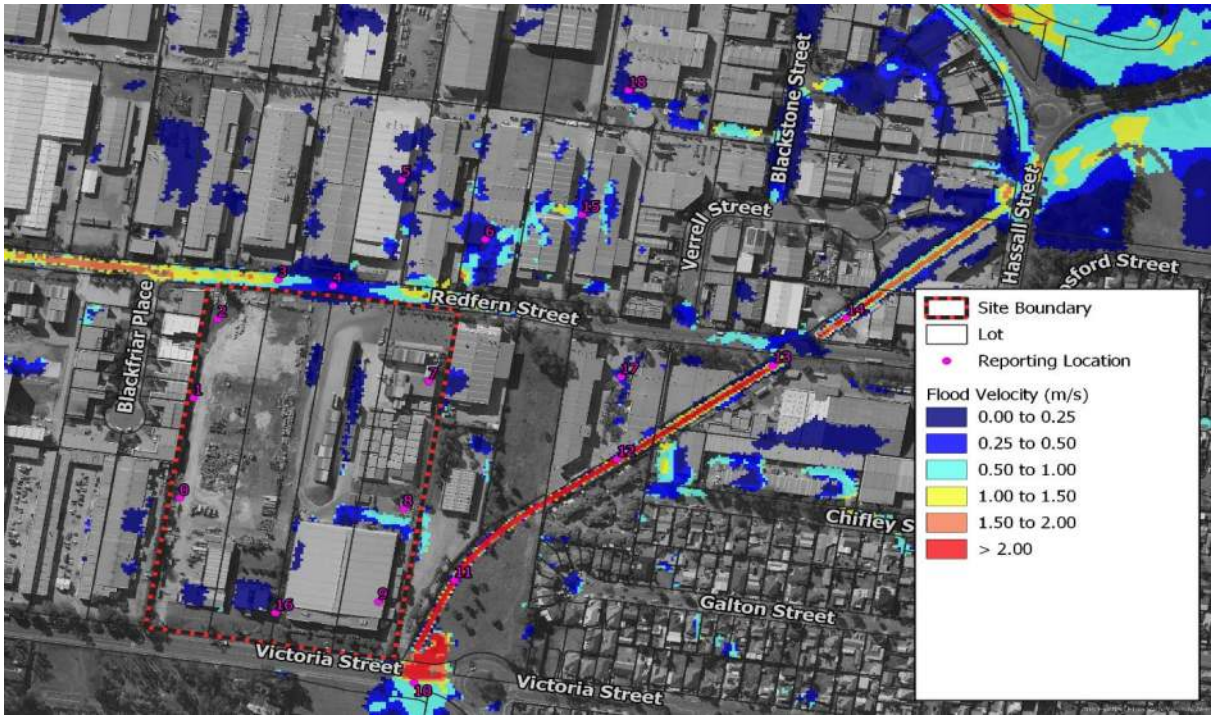

Figure G2-5% AEP Flood Velocity (Existing)

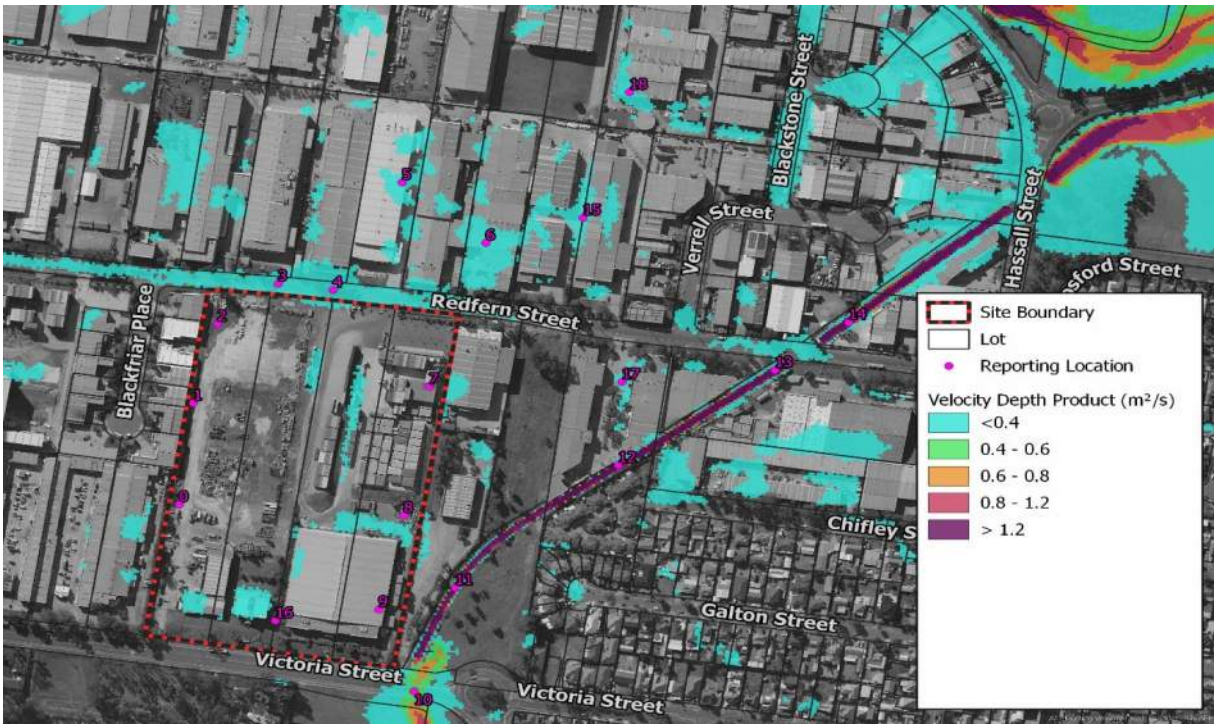

Figure G3- 5% AEP Velocity Depth (Existing)

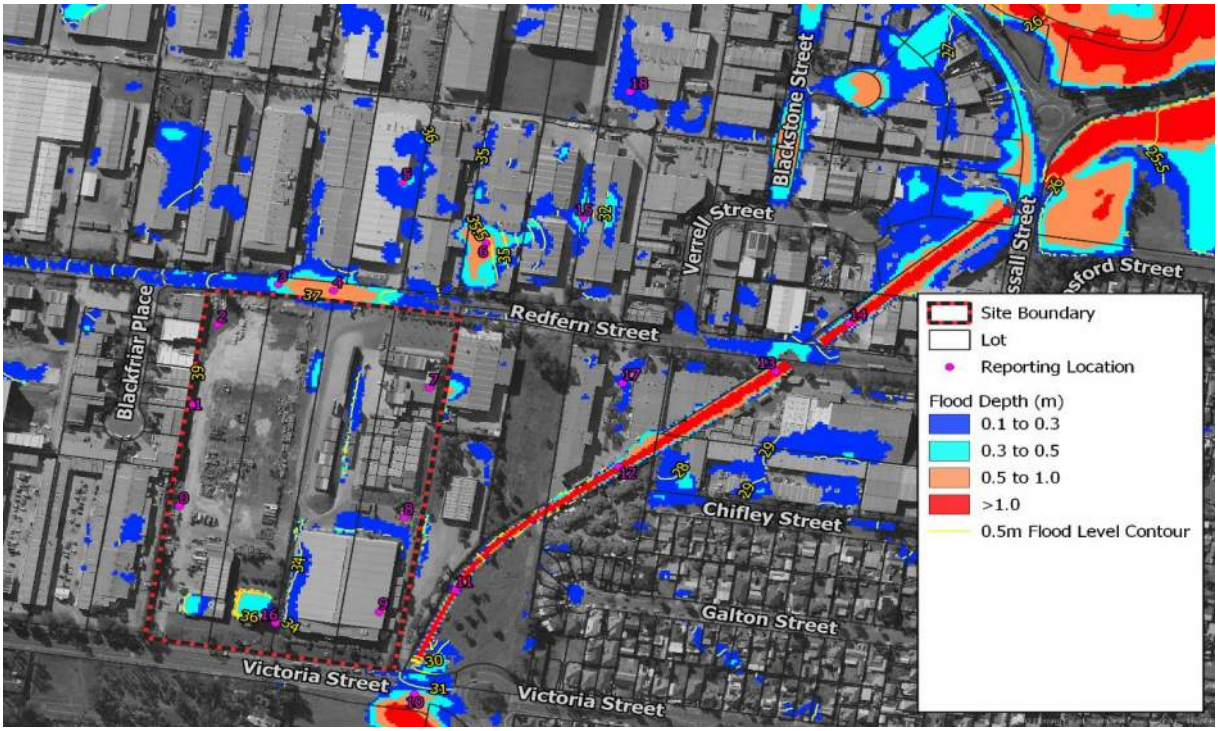

Figure G4- 1% AEP Flood Depth (Existing)

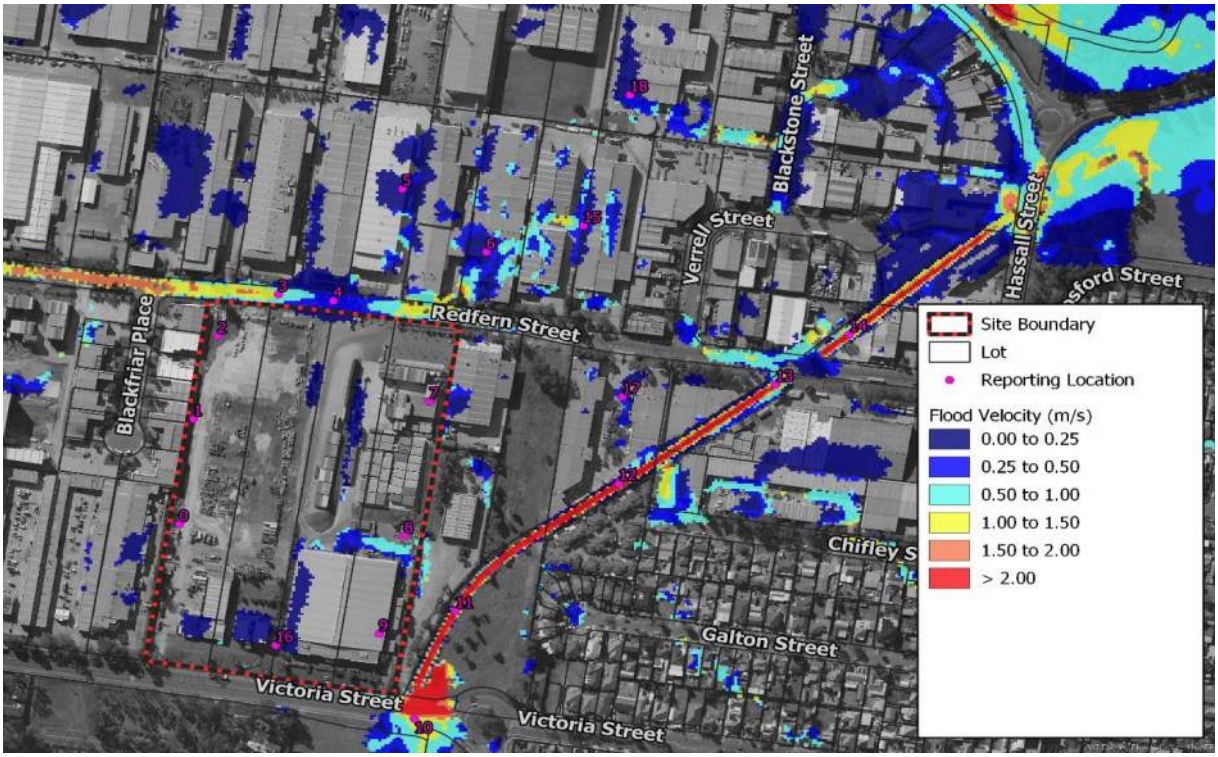

Figure G5- 1% AEP Flood Velocity (Existing)

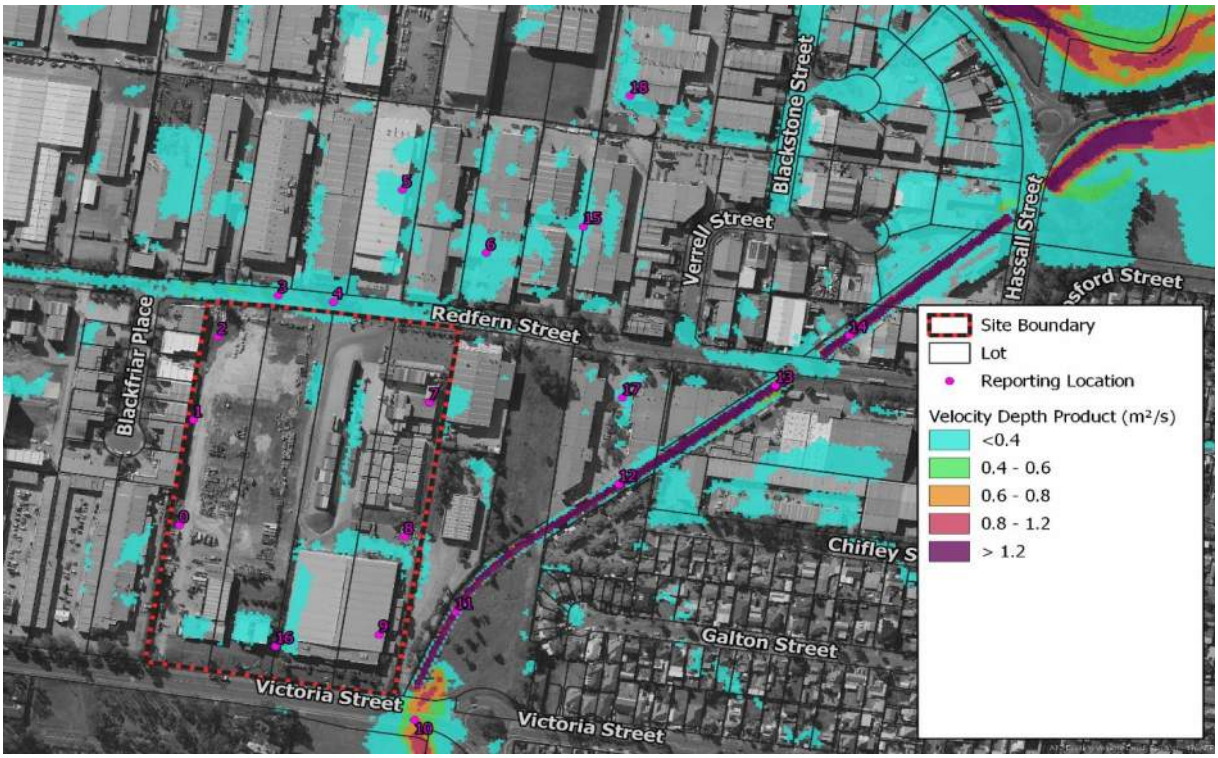

Figure G6- 1% AEP Velocity Depth (Existing)

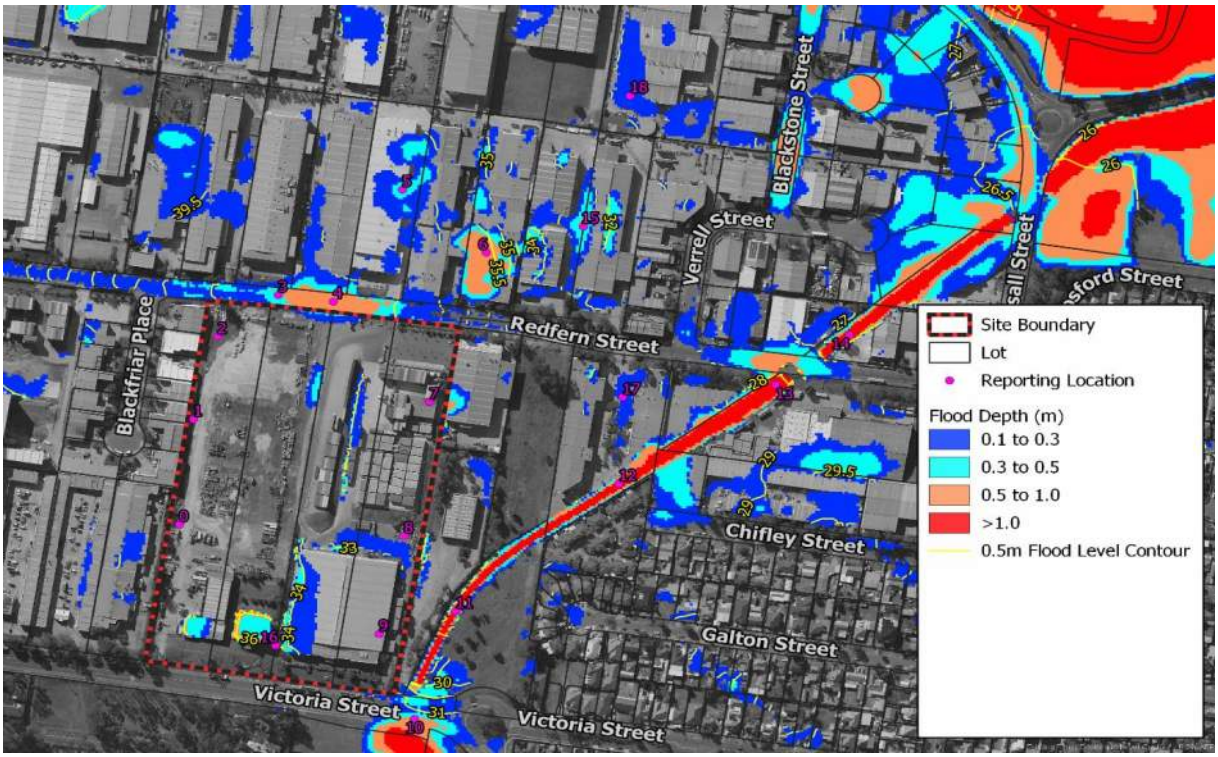

Figure G7- 0.5% AEP Flood Depth (Existing)

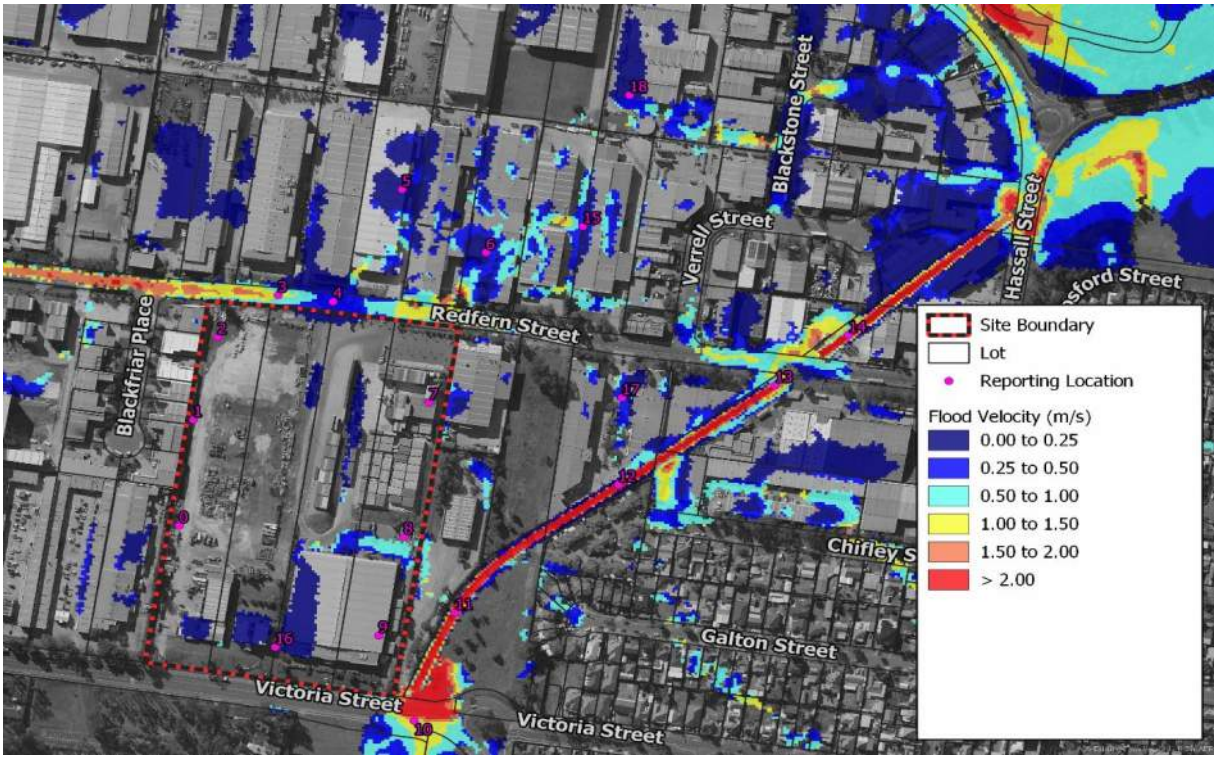

Figure G8- 0.5% AEP Flood Velocity (Existing)

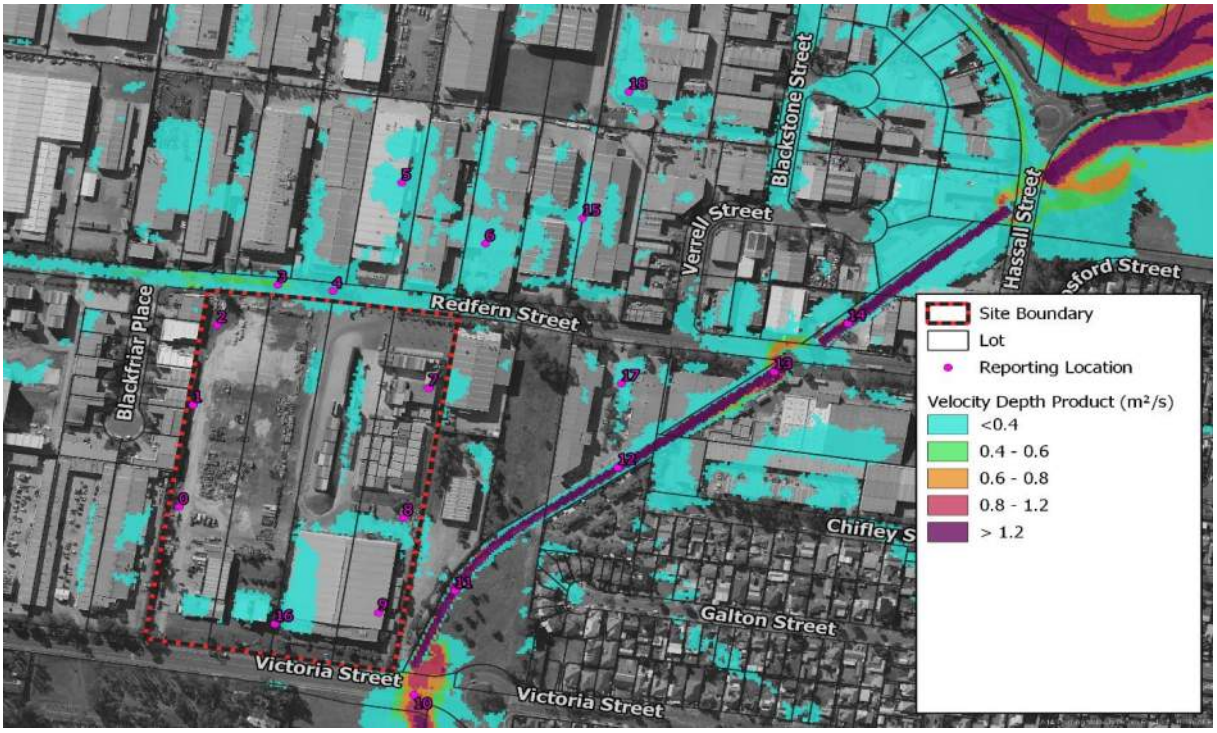

Figure G9- 0.5% AEP Velocity Depth (Existing)

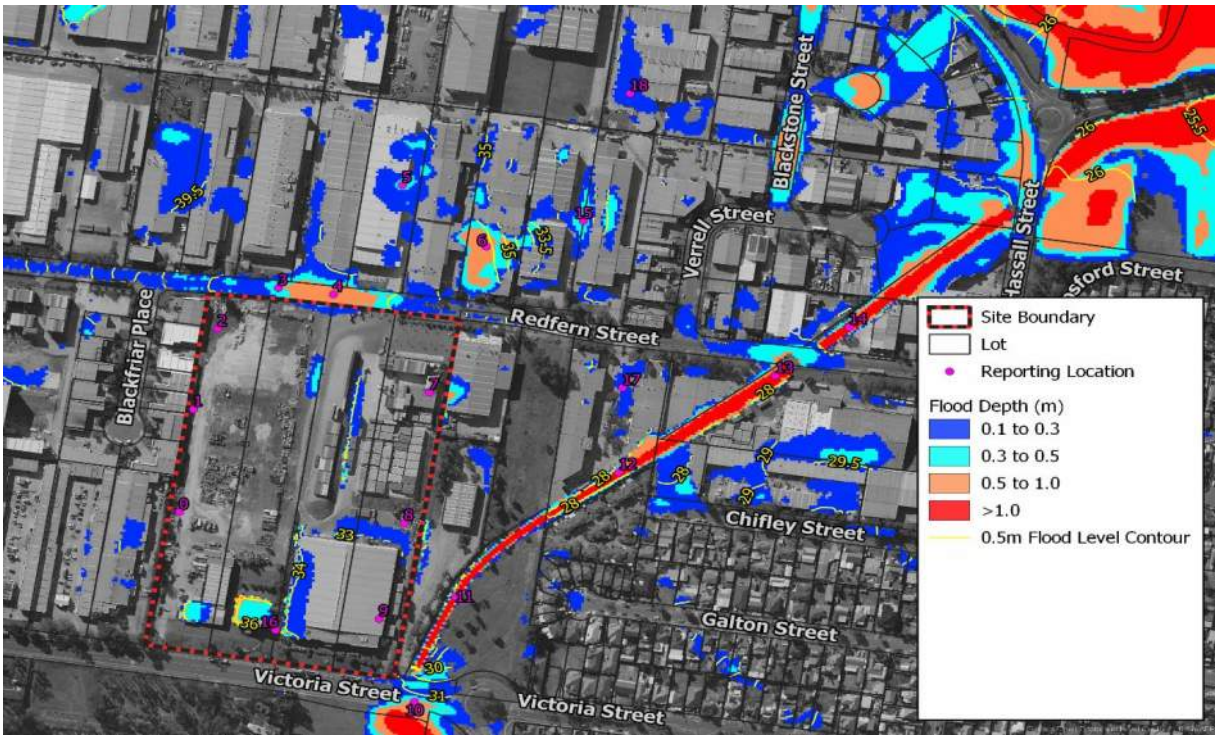

Figure G10- 0.2% AEP Flood Depth (Existing)

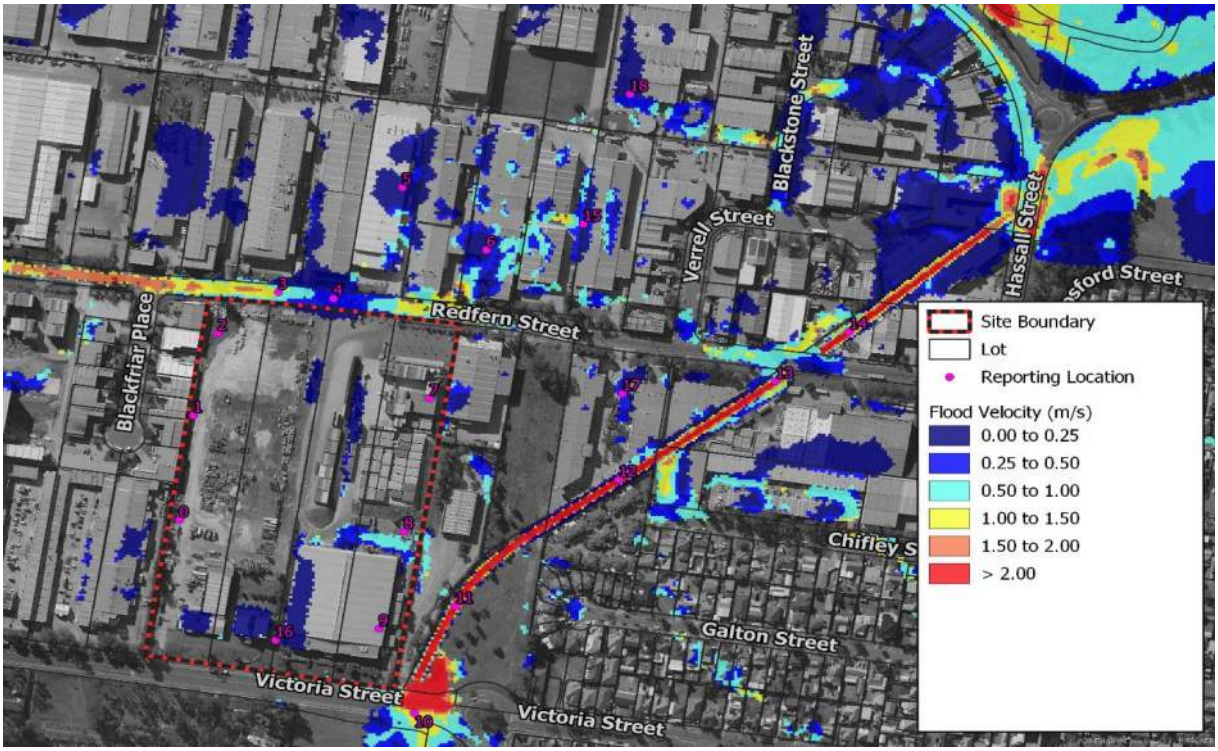

Figure G11- 0.2% AEP Flood Velocity (Existing)

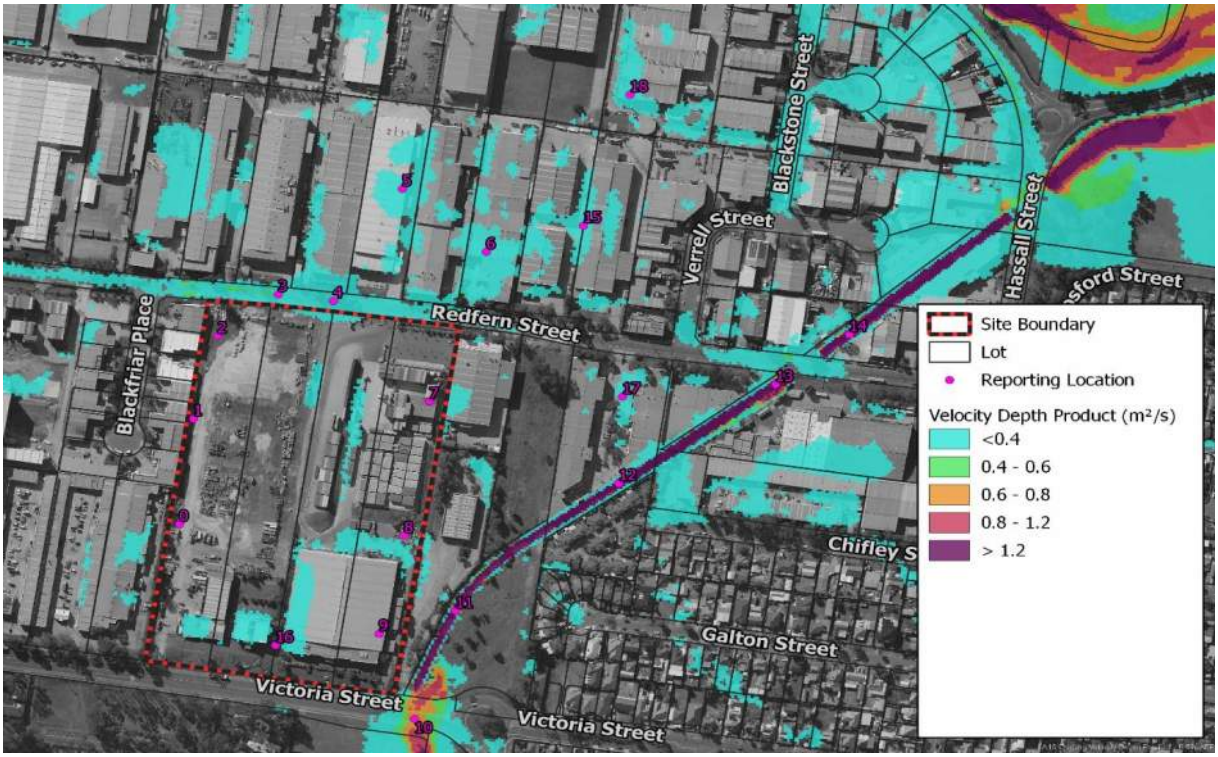

Figure G12- 0.2% AEP Velocity Depth (Existing)

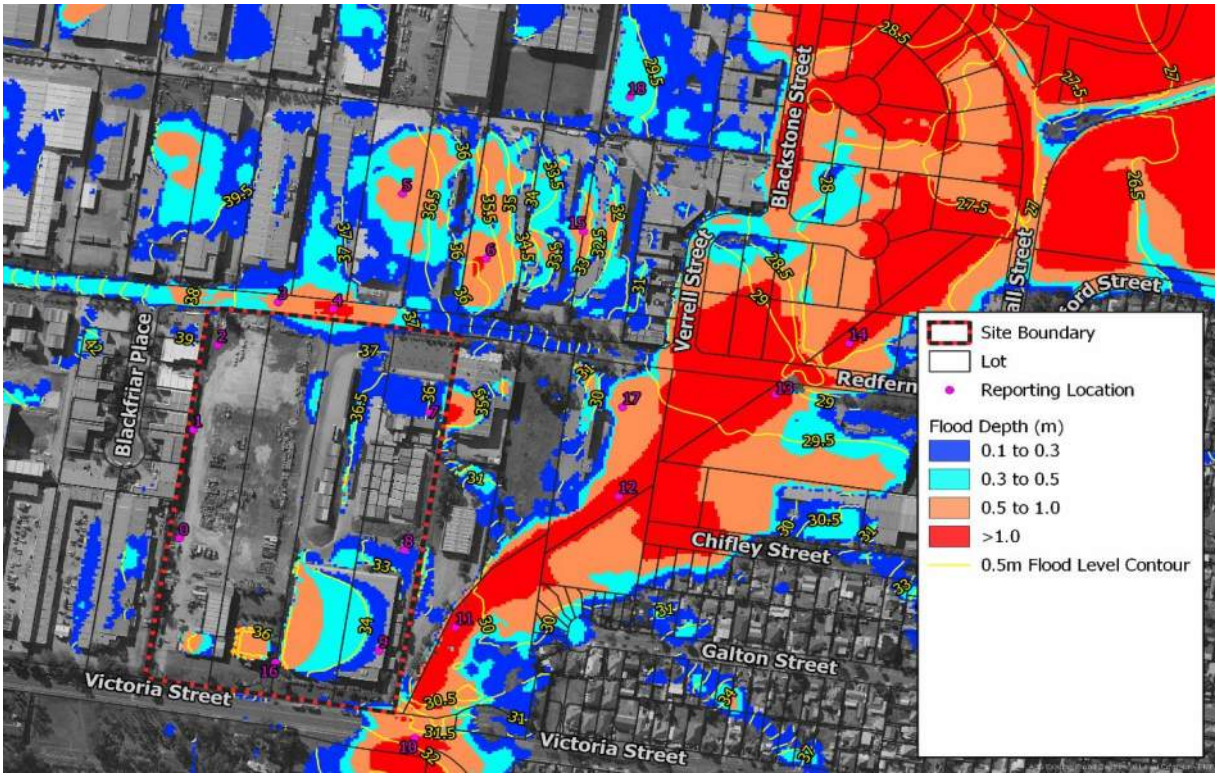

Figure G13- PMF AEP Flood Depth (Existing)

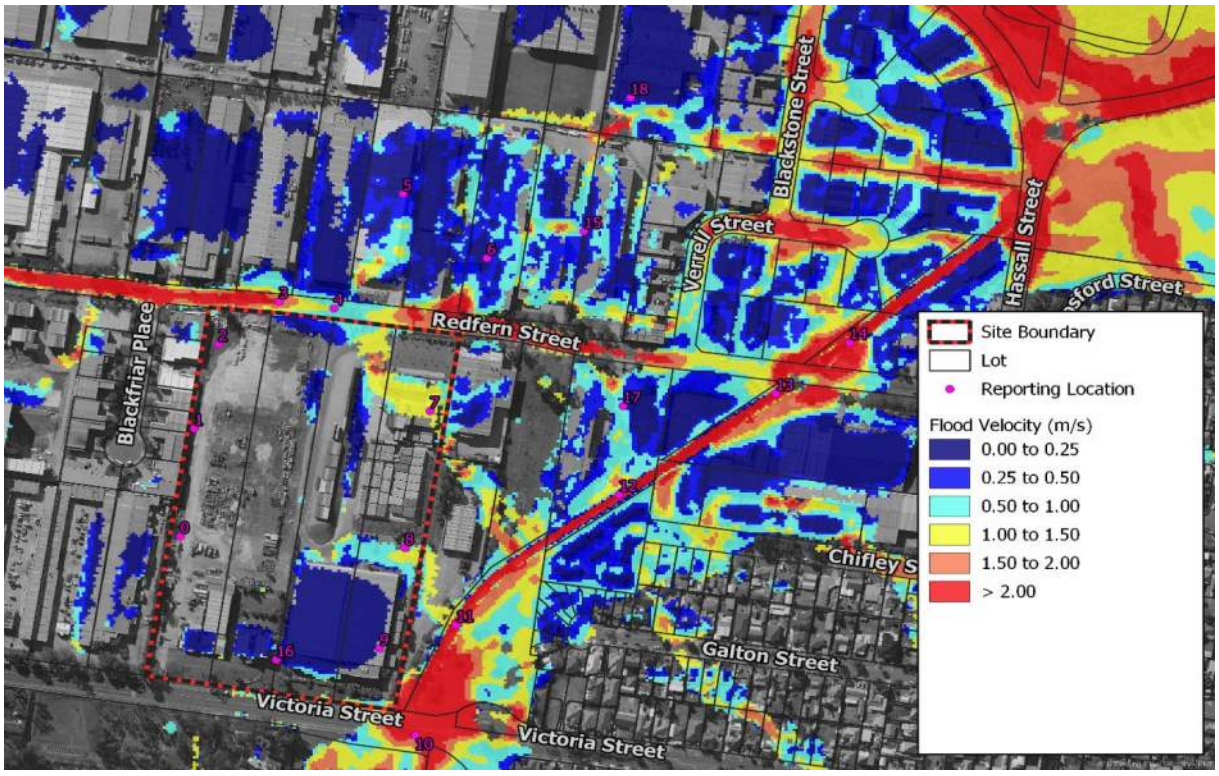

Figure G14- PMF AEP Flood Velocity (Existing)

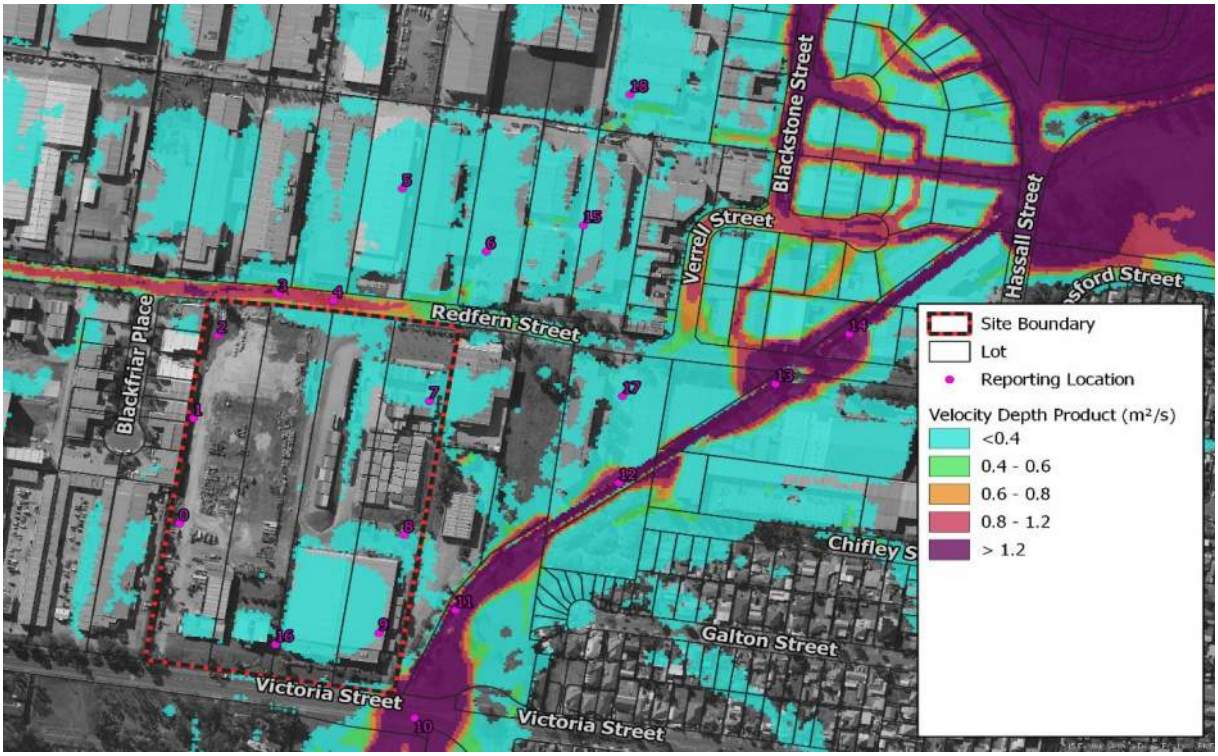

Figure G15- PMF AEP Velocity Depth (Existing)

POST DEVELOPMENT FLOOD OUTPUT

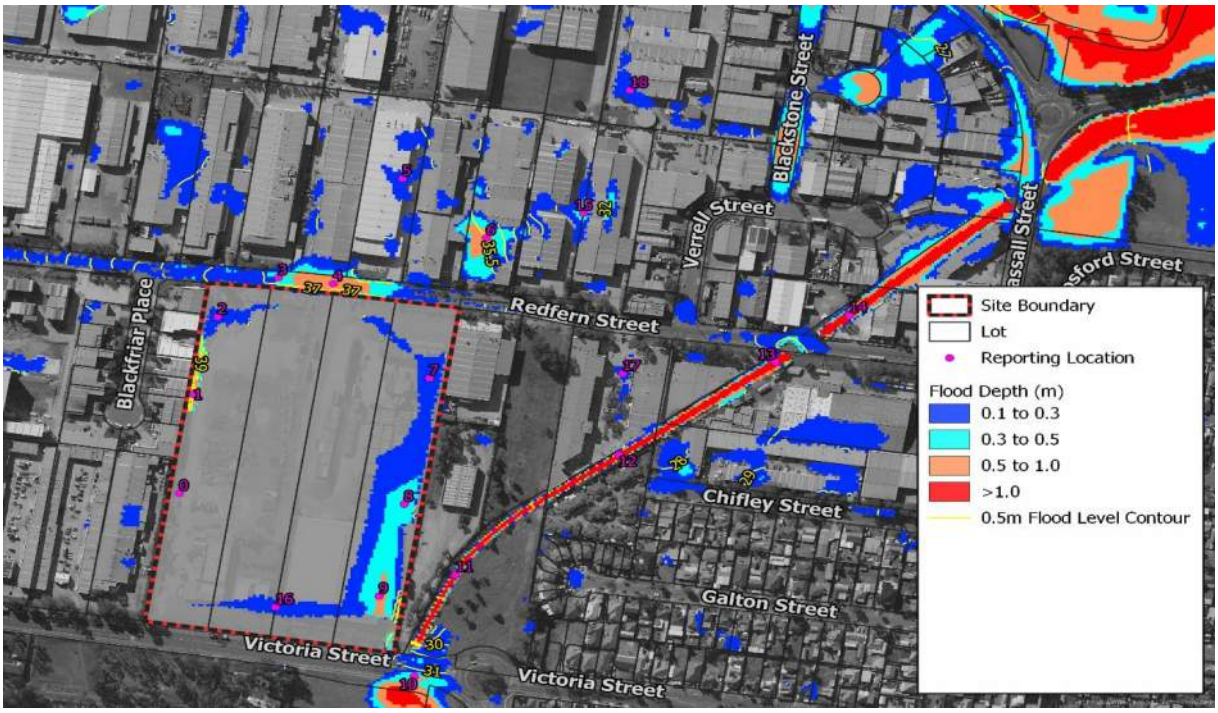

Figure G16- 5% AEP Flood Depth (Post Development)

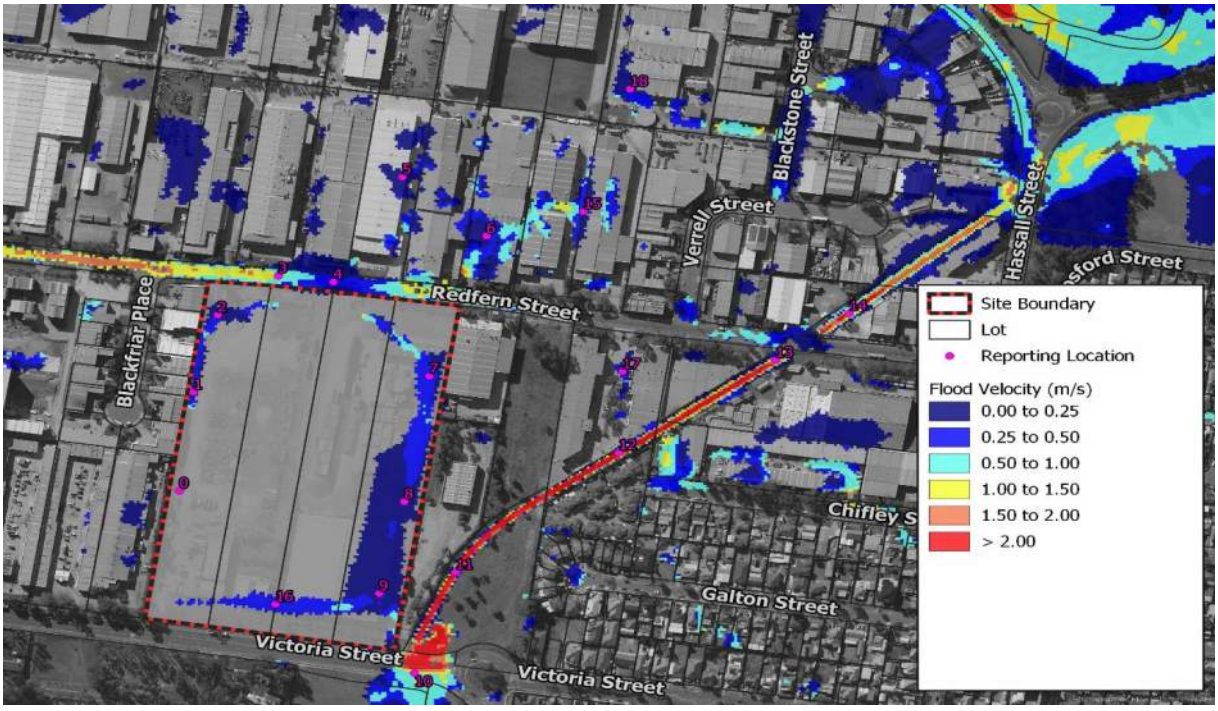

Figure G17-5% AEP Flood Velocity (Post Development)

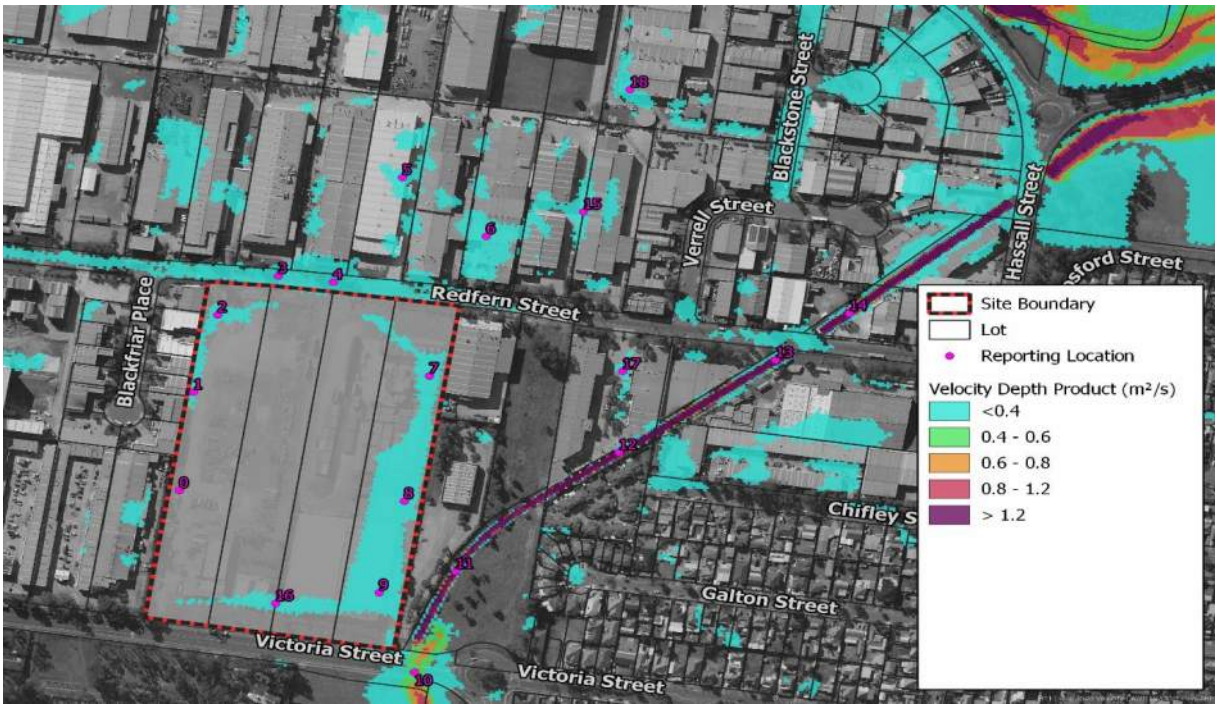

Figure G18-5% AEP Velocity Depth (Post Development)

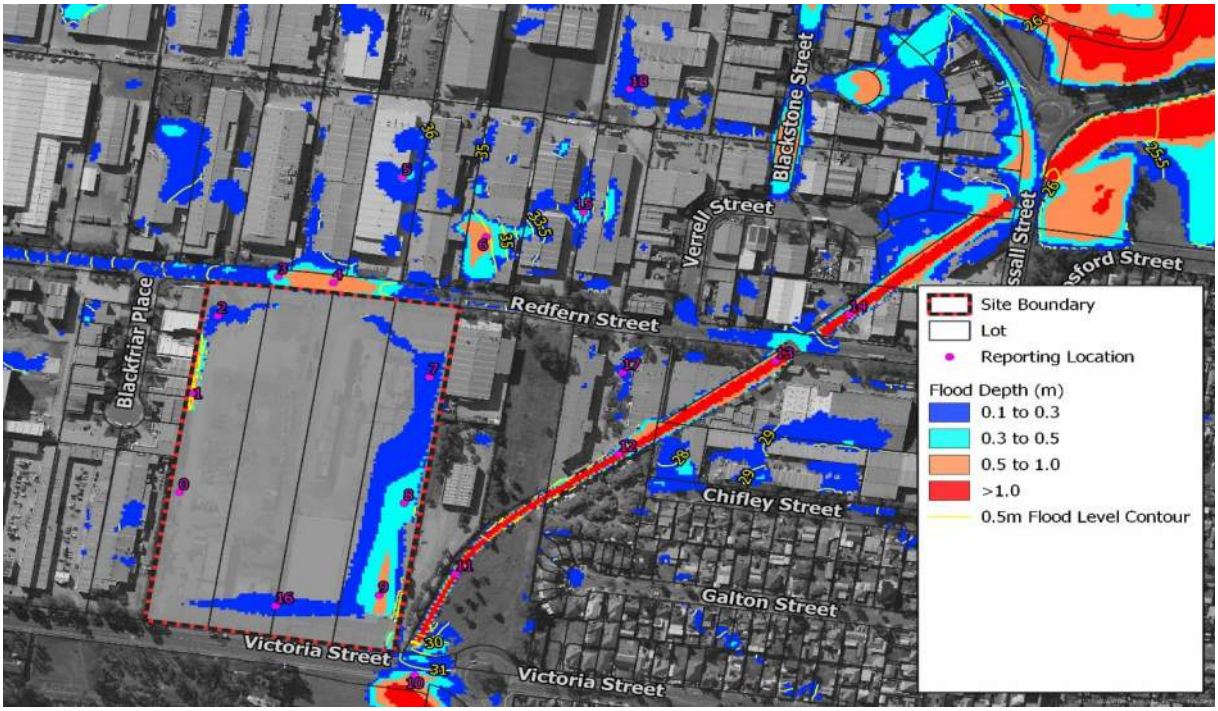

Figure G19- 1% AEP Flood Depth (Post Development)

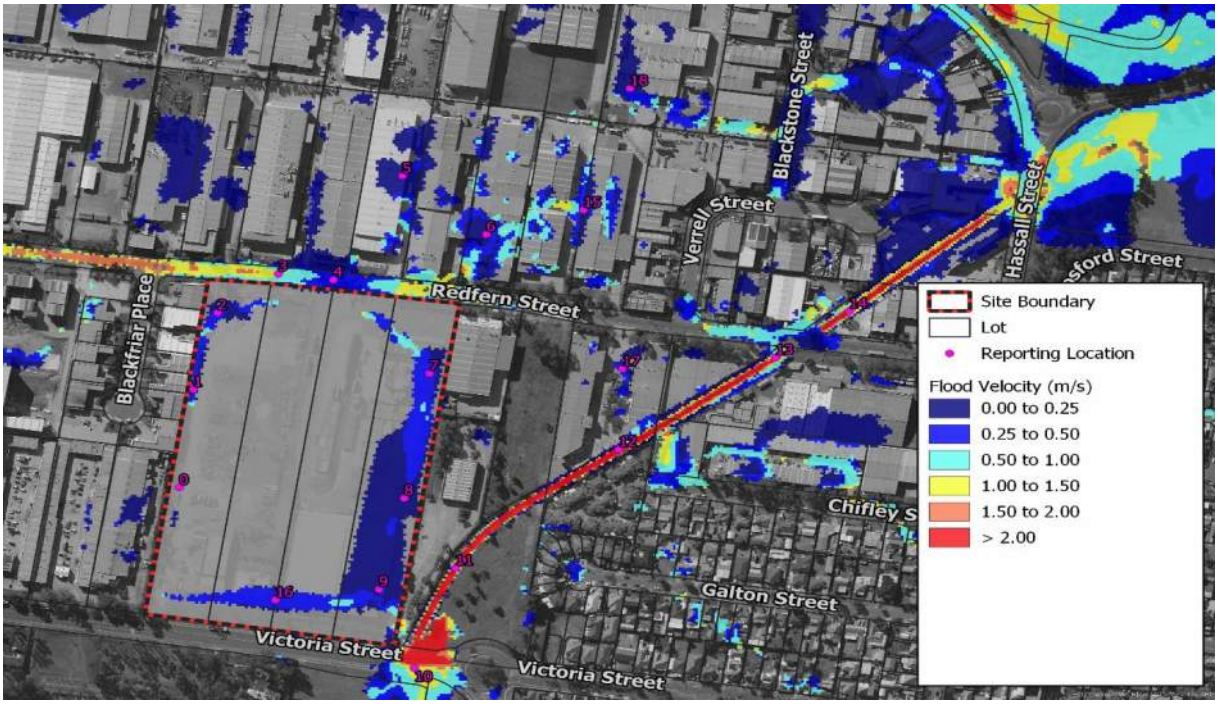

Figure G20- 1% AEP Flood Velocity (Post Development)

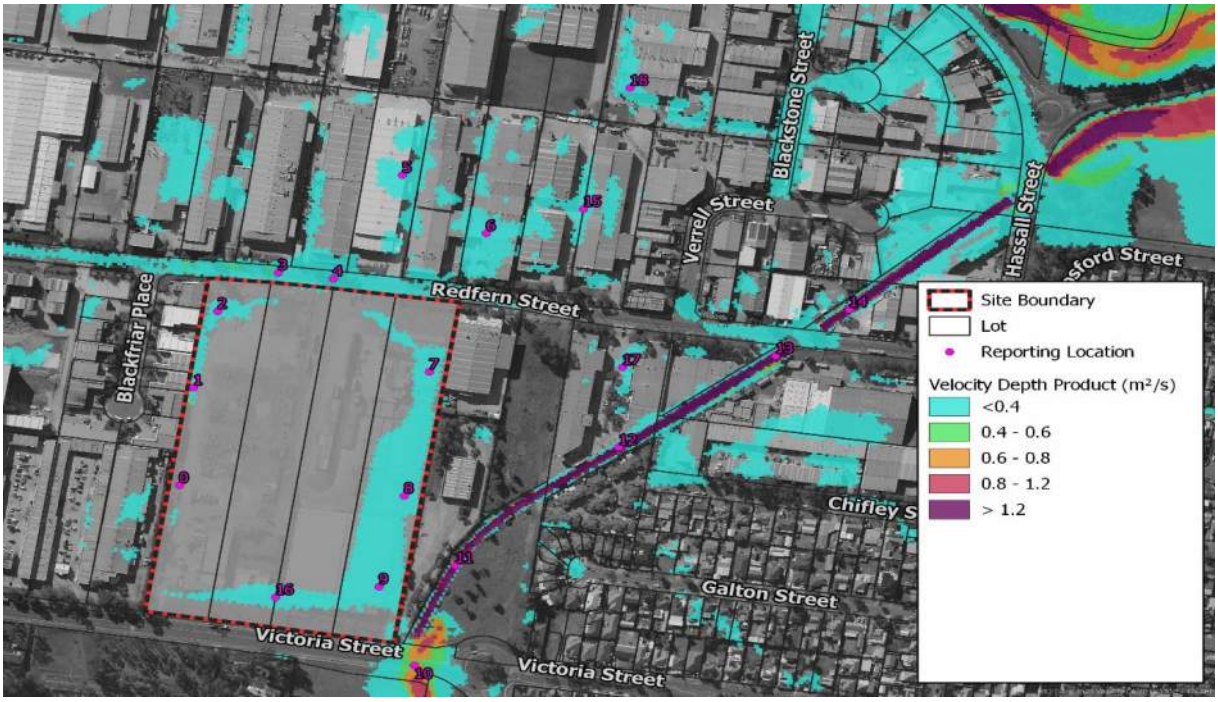

Figure G21- 1% AEP Velocity Depth (Post Development)

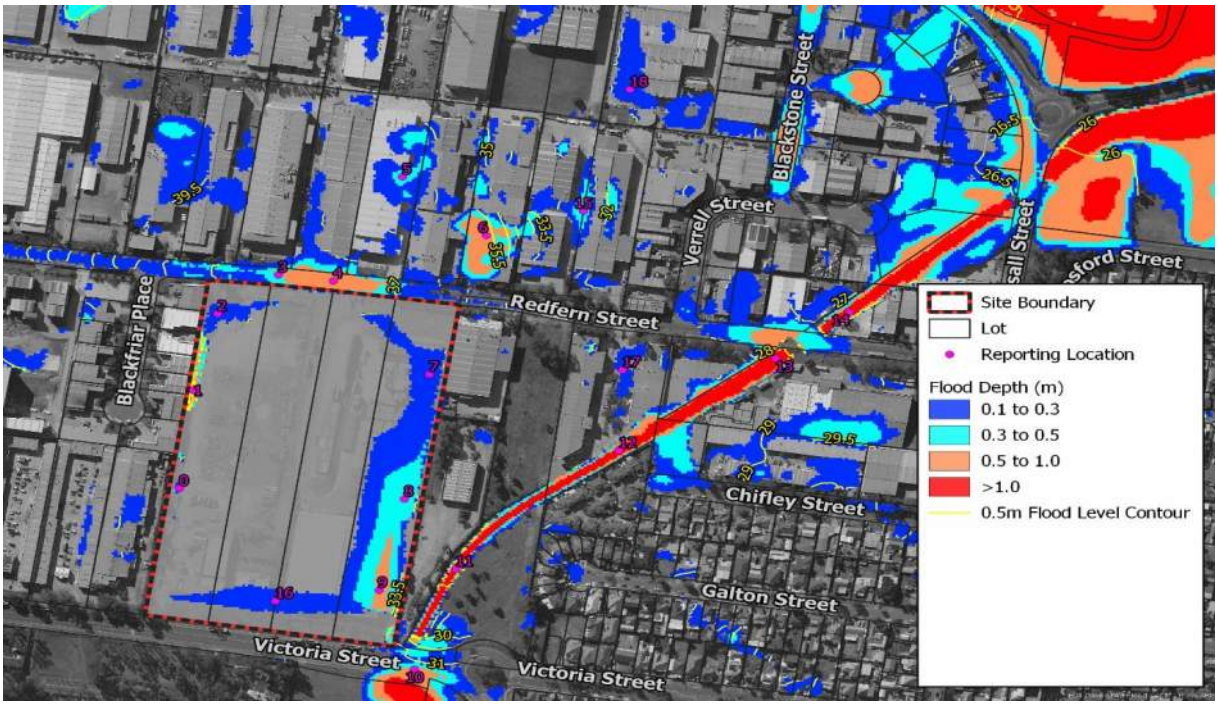

Figure G22- 0.5% AEP Flood Depth (Post Development)

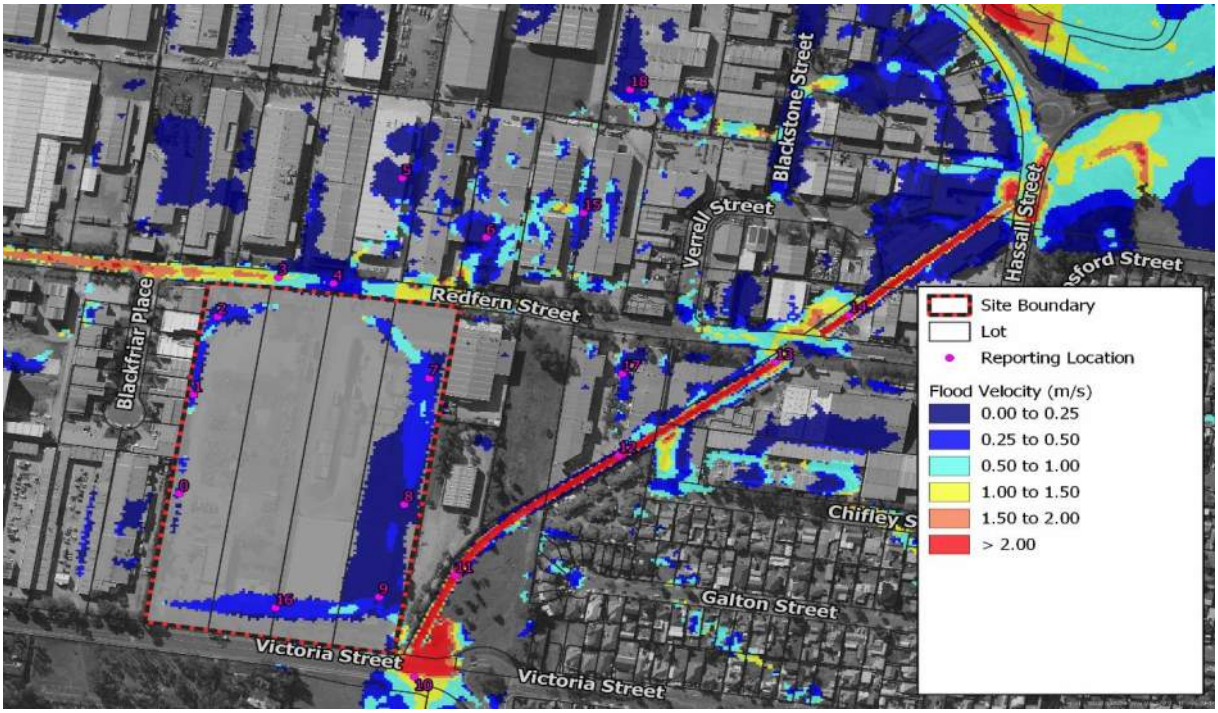

Figure G23- 0.5% AEP Flood Velocity (Post Development)

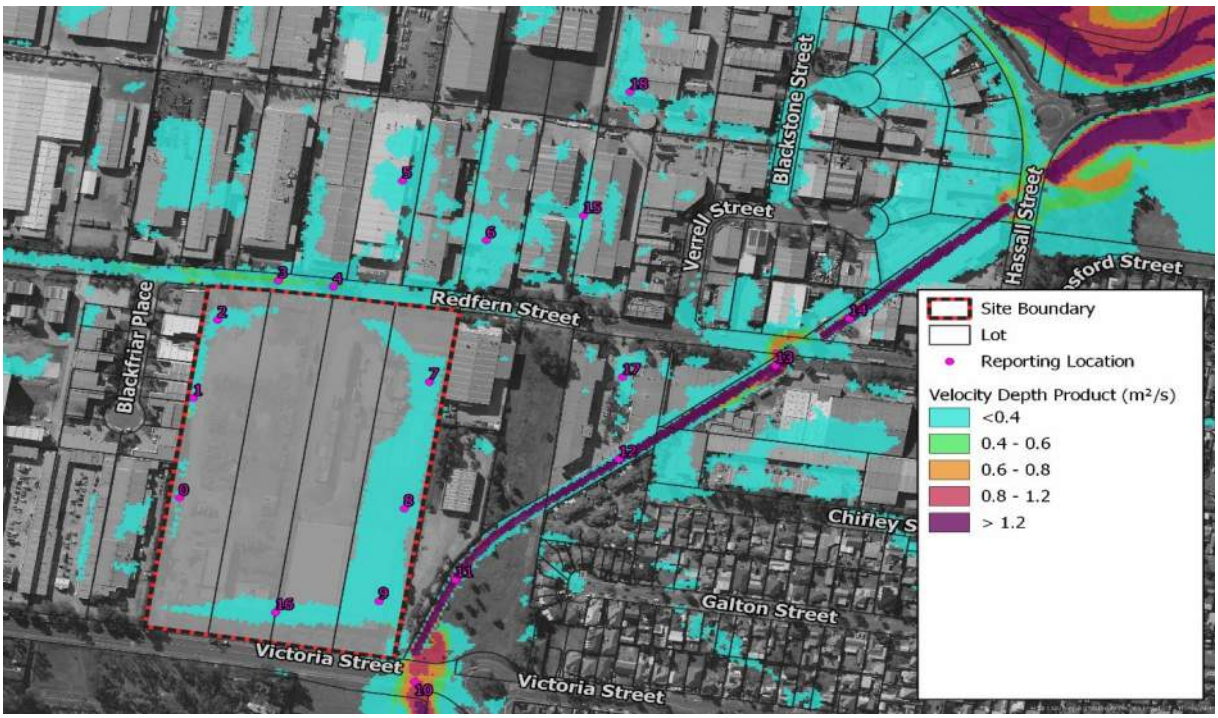

Figure G24- 0.5% AEP Velocity Depth (Post Development)

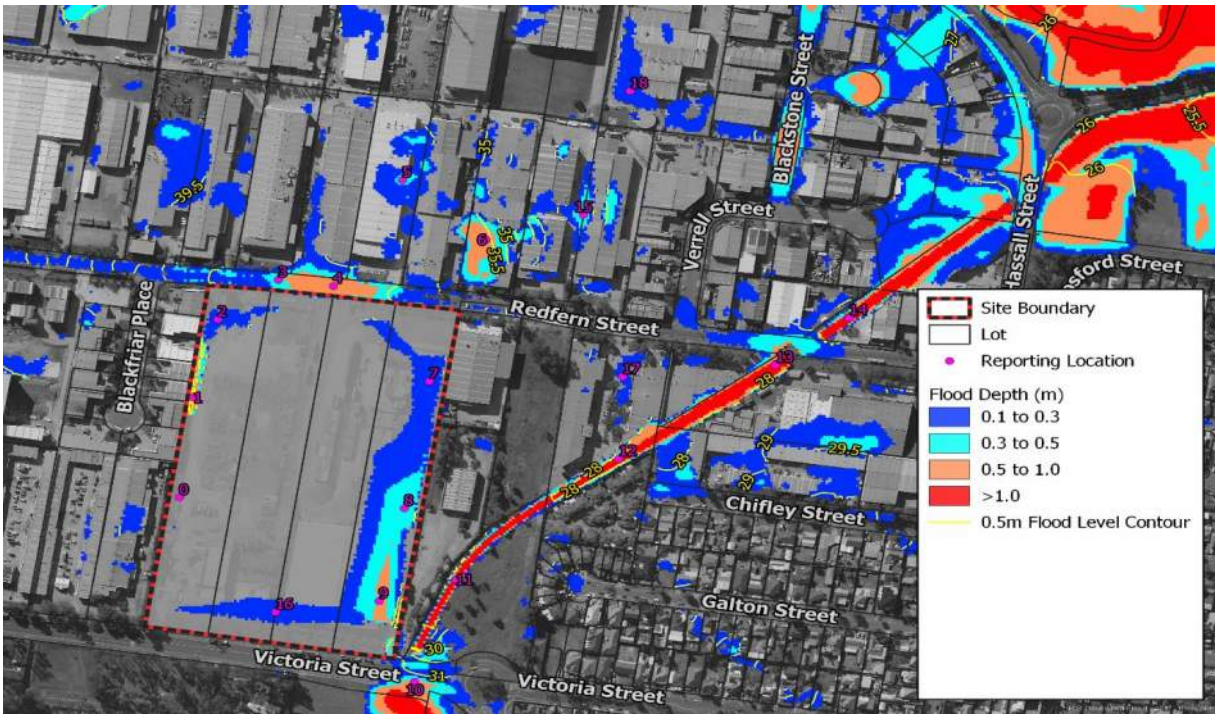

Figure G25- 0.2% AEP Flood Depth (Post Development)

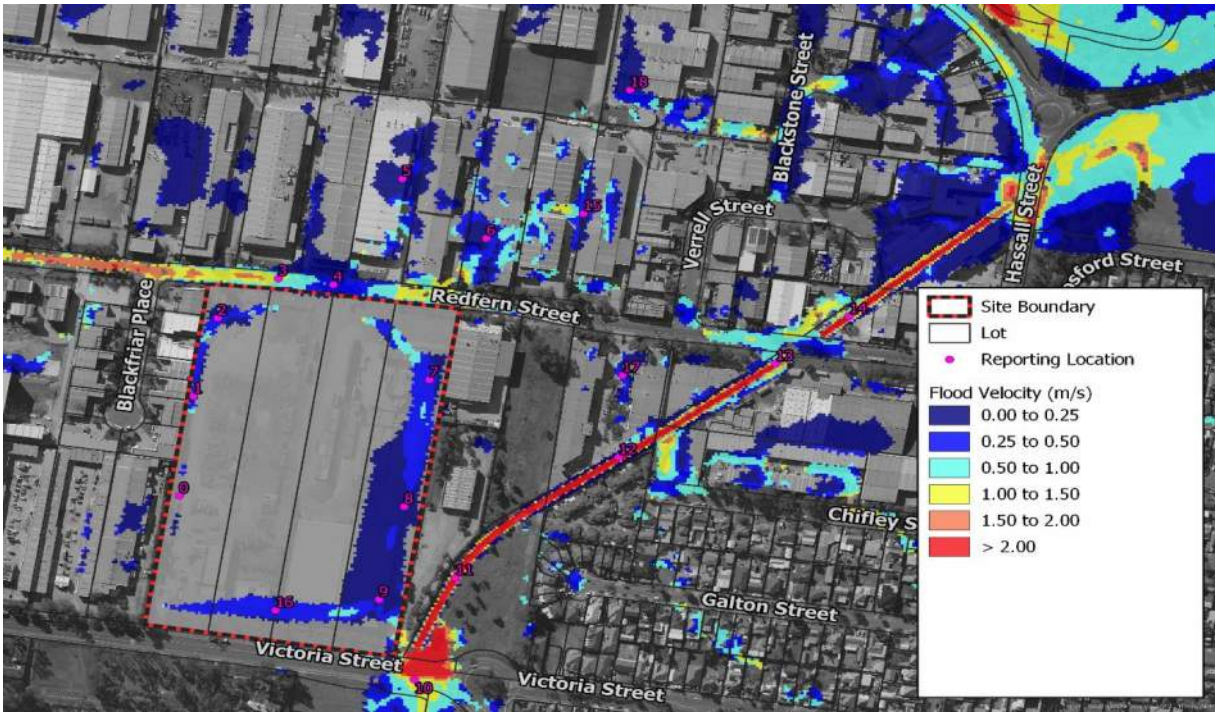

Figure G26- 0.2% AEP Flood Velocity (Post Development)

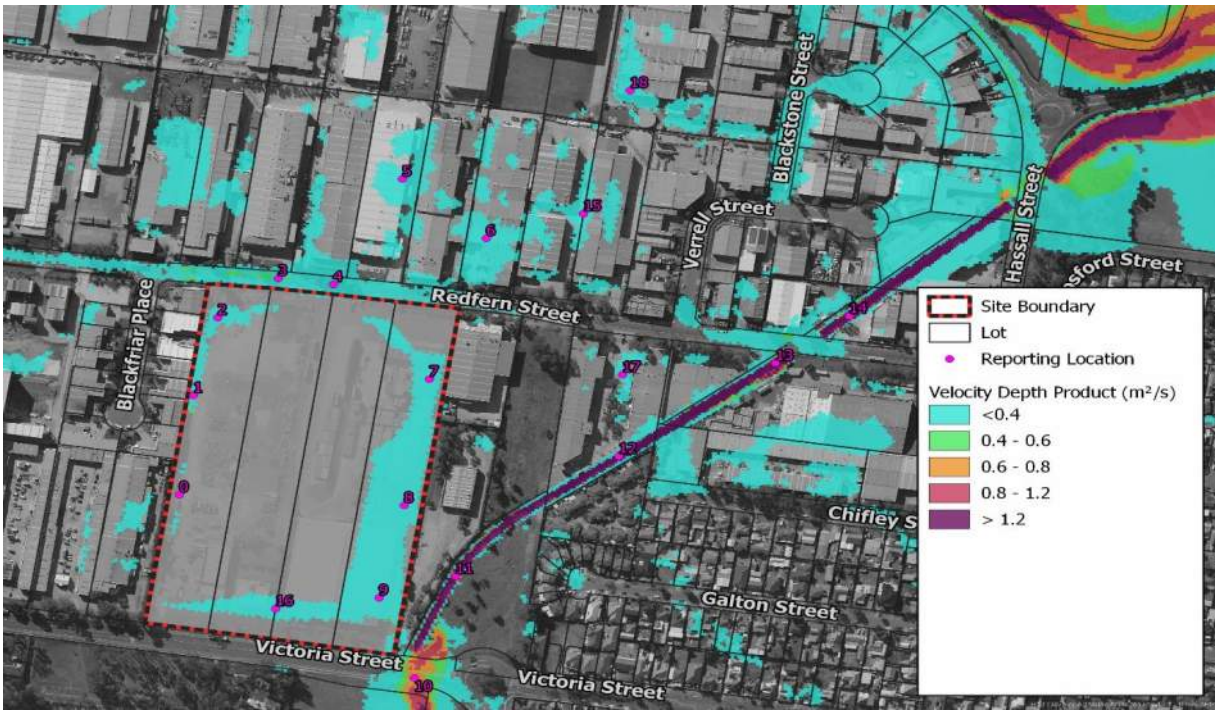

Figure G27- 0.2% AEP Velocity Depth (Post Development)

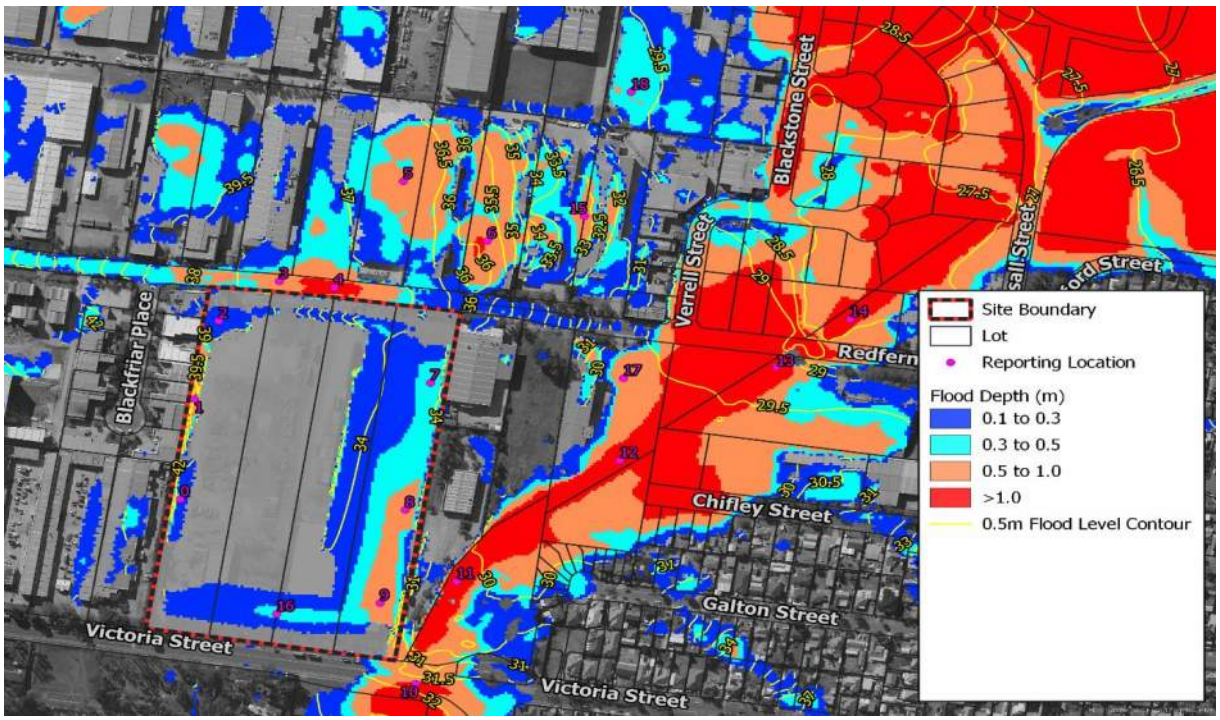

Figure G28-PMF AEP Flood Depth (Post Development)

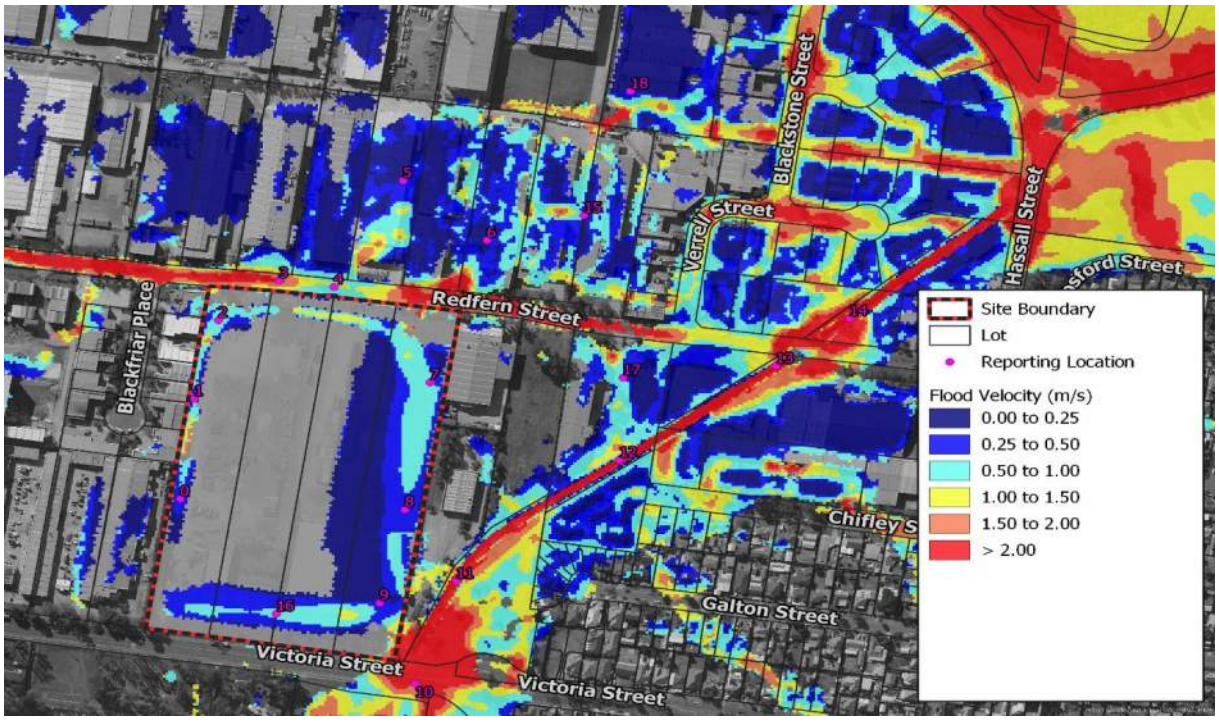

Figure G29-PMF AEP Flood Velocity (Post Development)

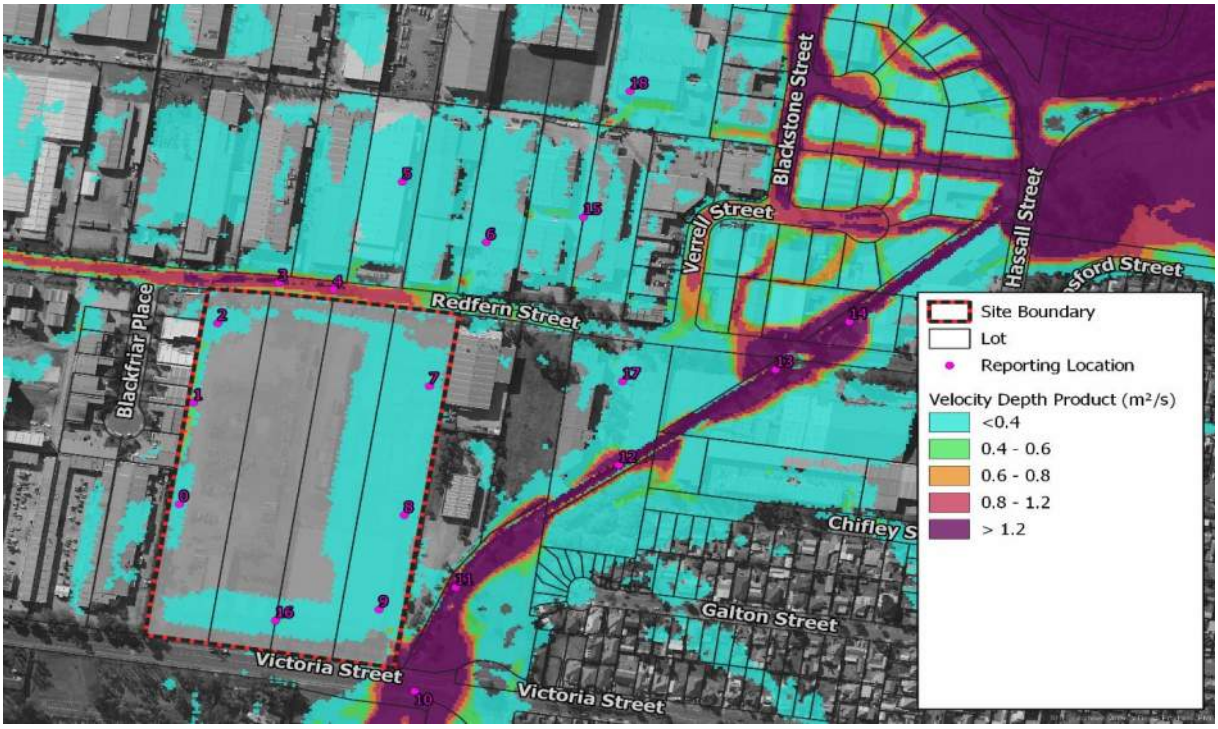

Figure G30- PMF AEP Velocity Depth (Post Development)

PRE AND POST DEVELOPMENT COMPARISONS

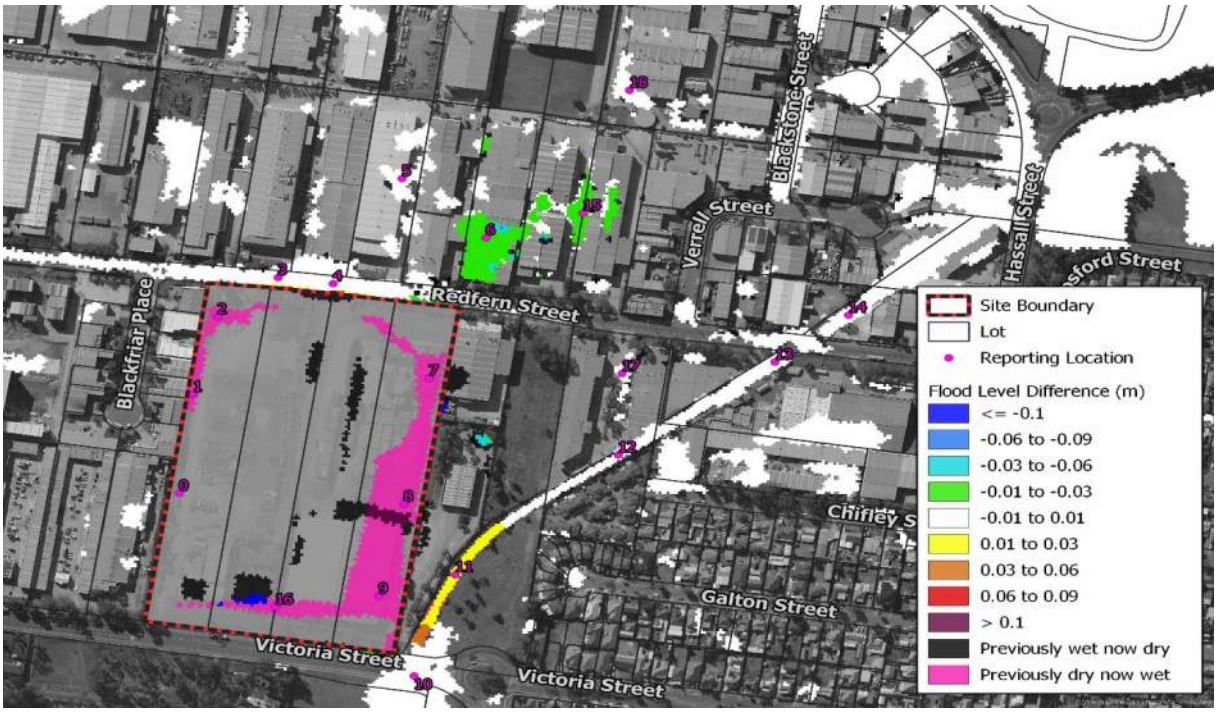

Figure G31- 5% AEP Flood Depth (Differences)

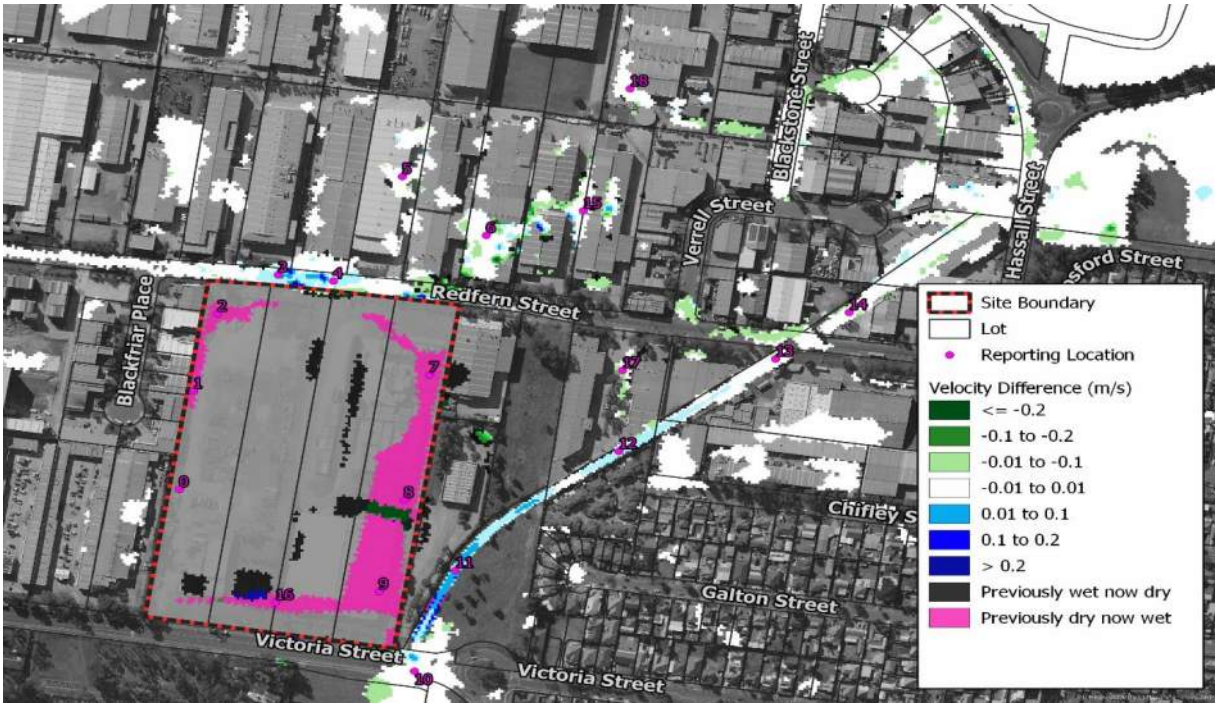

Figure G32- 5% AEP Flood Velocity (Differences)

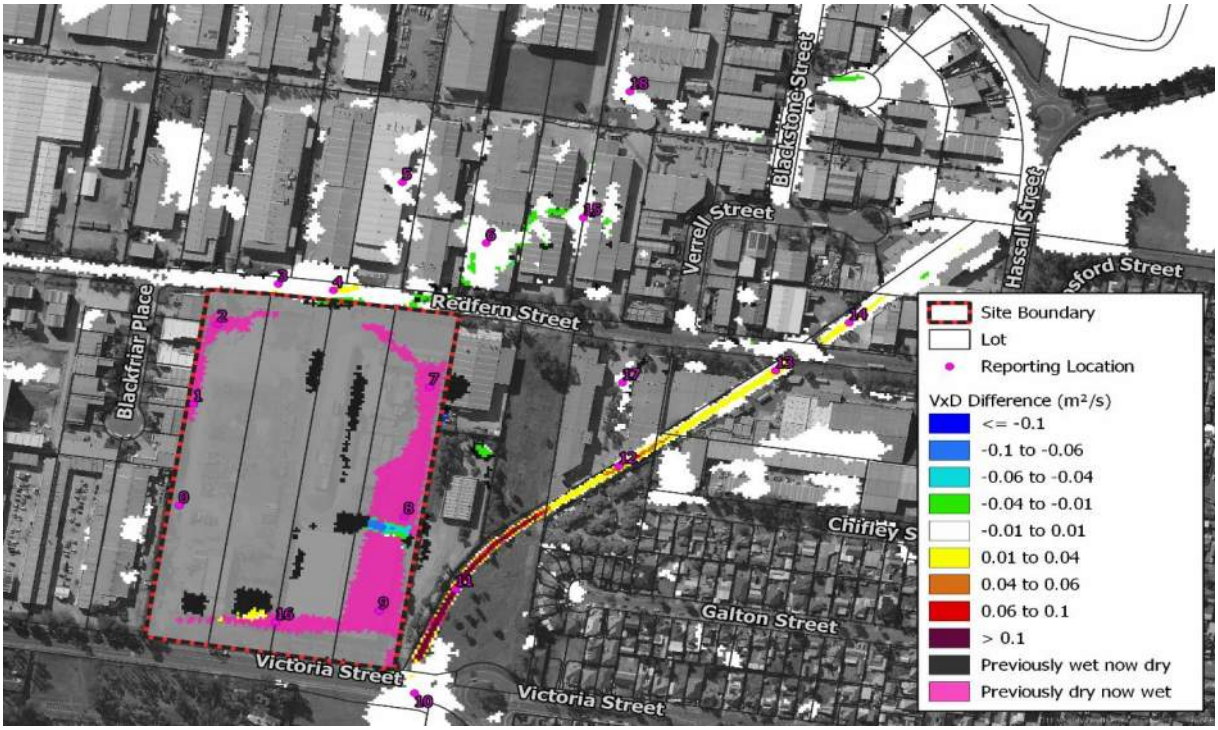

Figure G33- 5% AEP Velocity Depth (Differences)

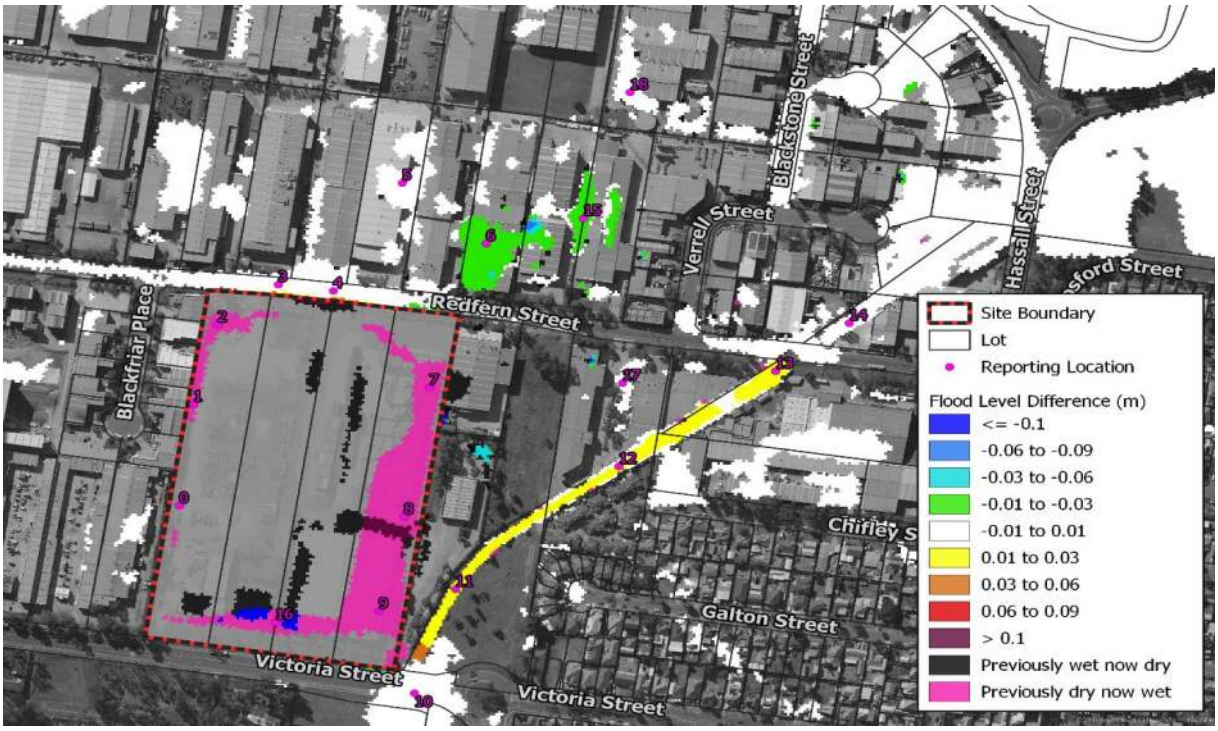

Figure G34- 1% AEP Flood Depth (Differences)

Figure G35- 1% AEP Flood Velocity (Differences)

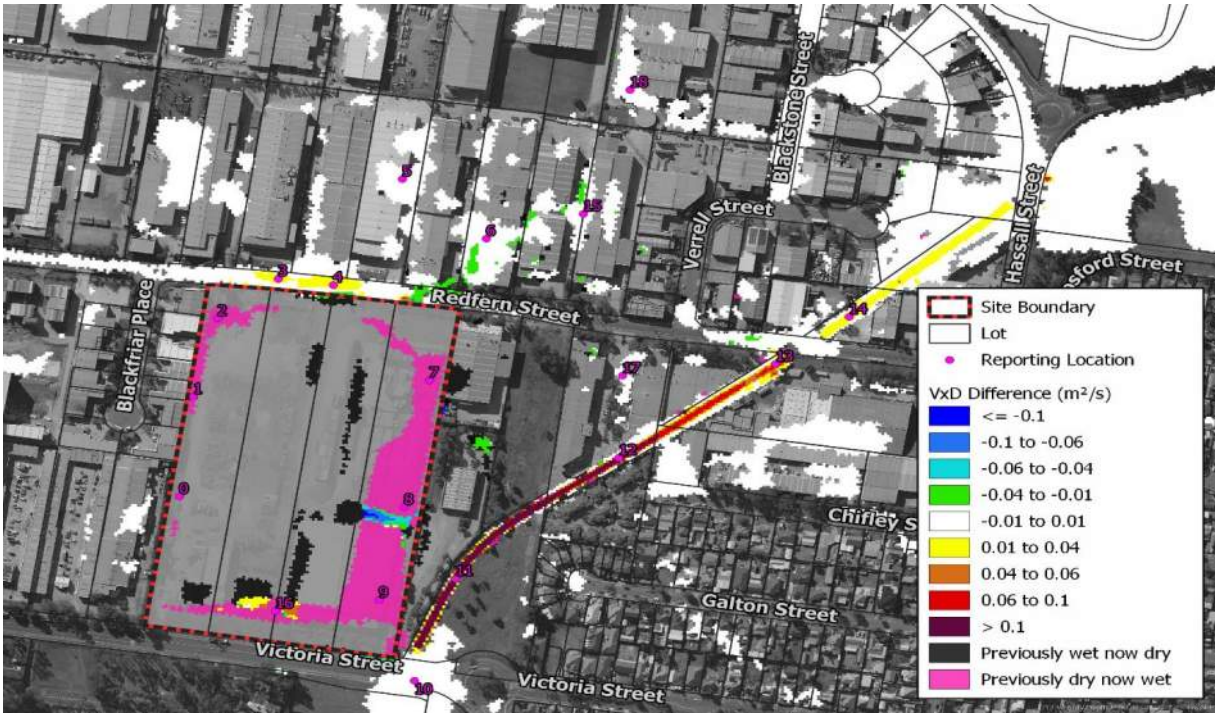

Figure G36- 1% AEP Velocity Depth (Differences)

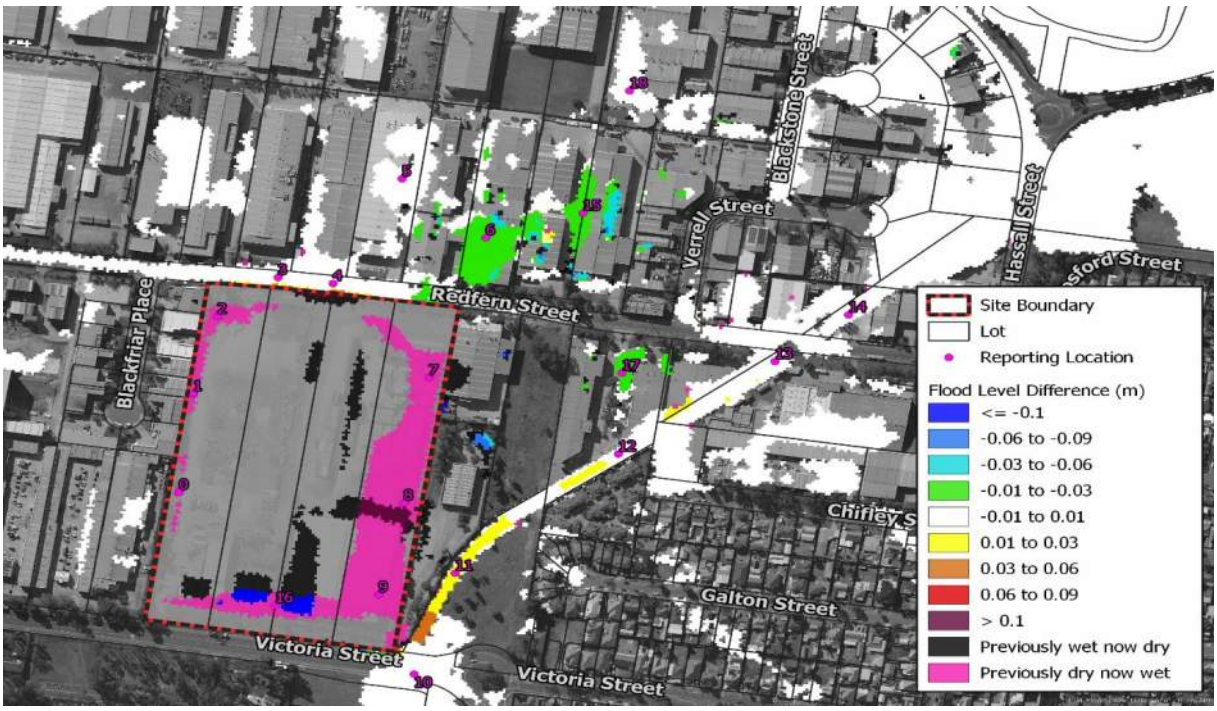

Figure G37 -0.5% AEP Flood Depth (Differences)

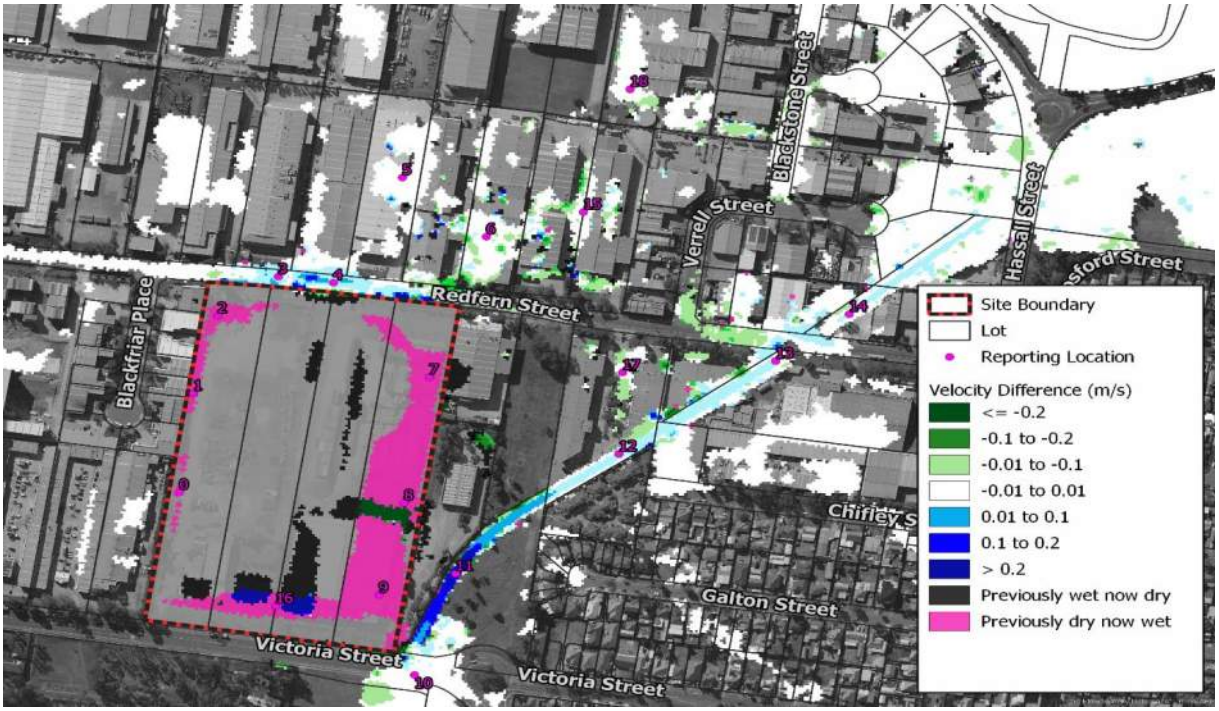

Figure G38- 0.5% AEP Flood Velocity (Differences)

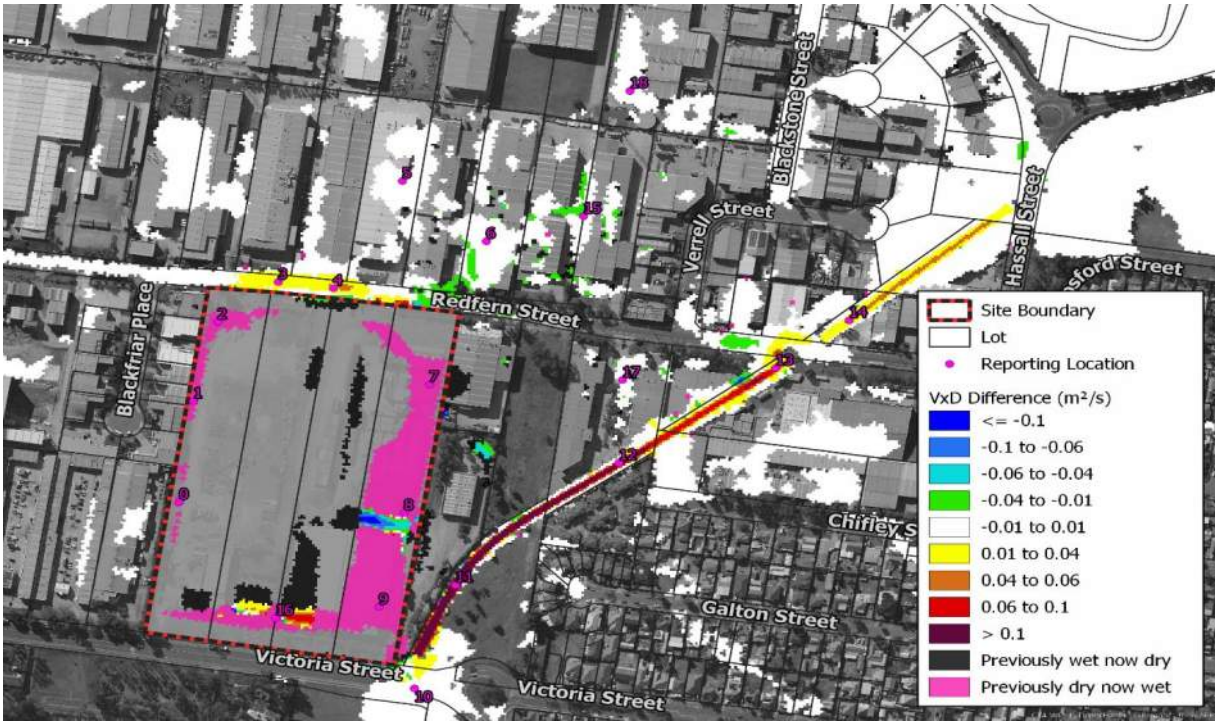

Figure G39-0.5% AEP Velocity Depth (Differences)

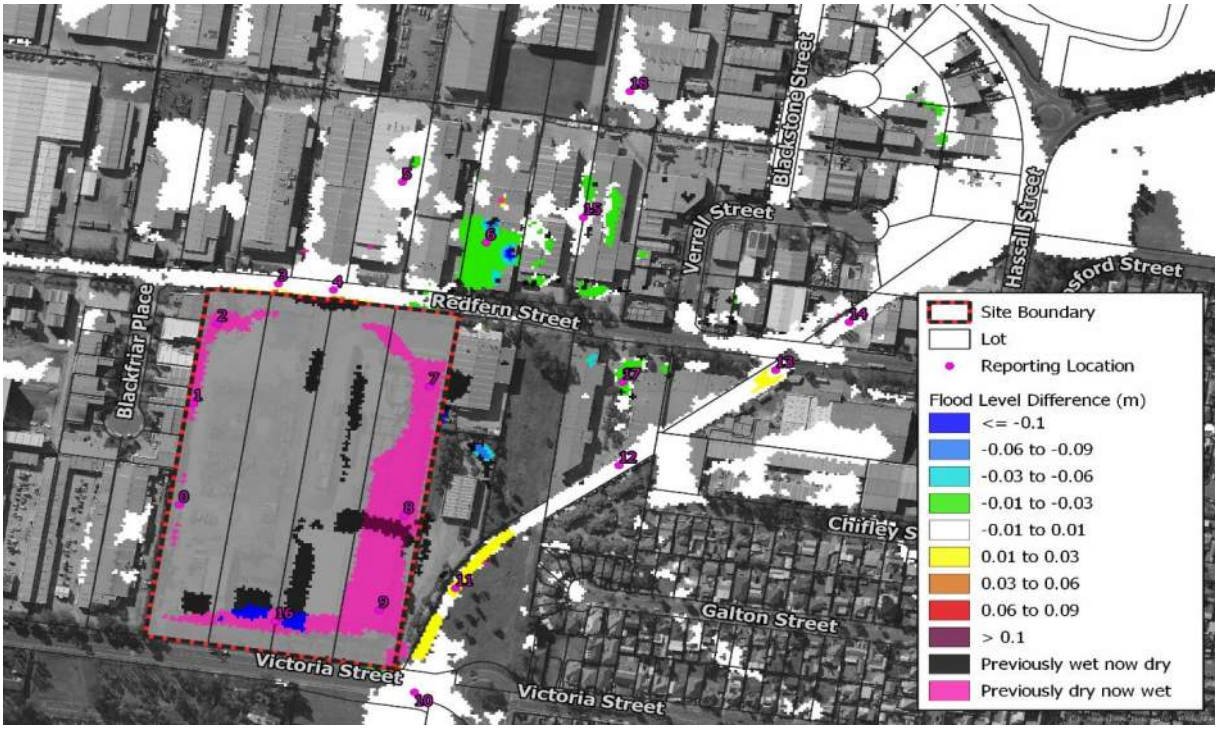

Figure G40- 0.2% AEP Flood Depth (Differences)

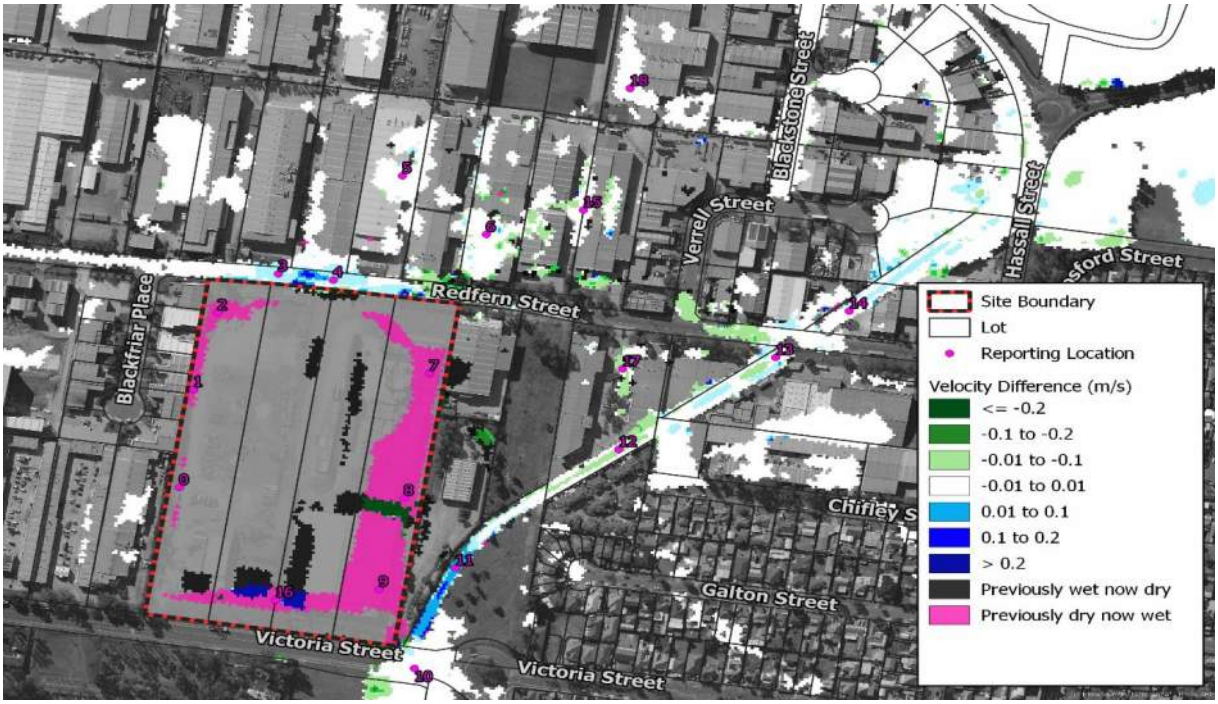

Figure G41- 0.2% AEP Flood Velocity (Differences)

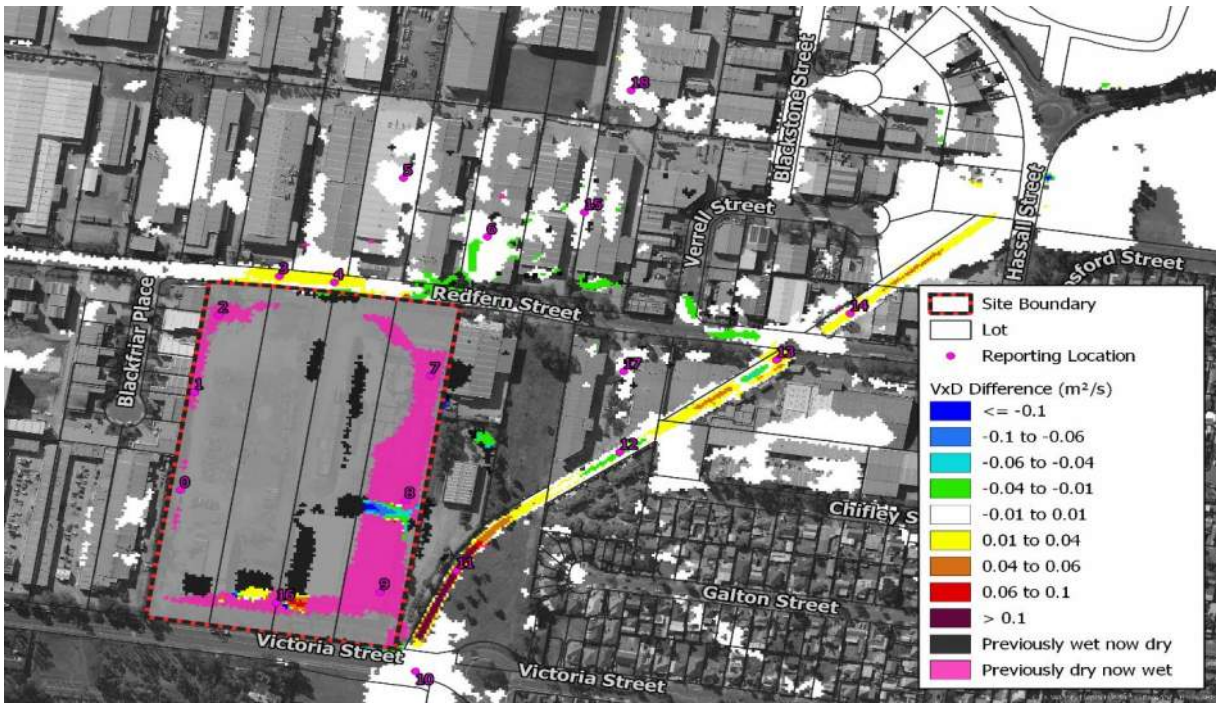

Figure G42-0.2% AEP Velocity Depth (Differences)

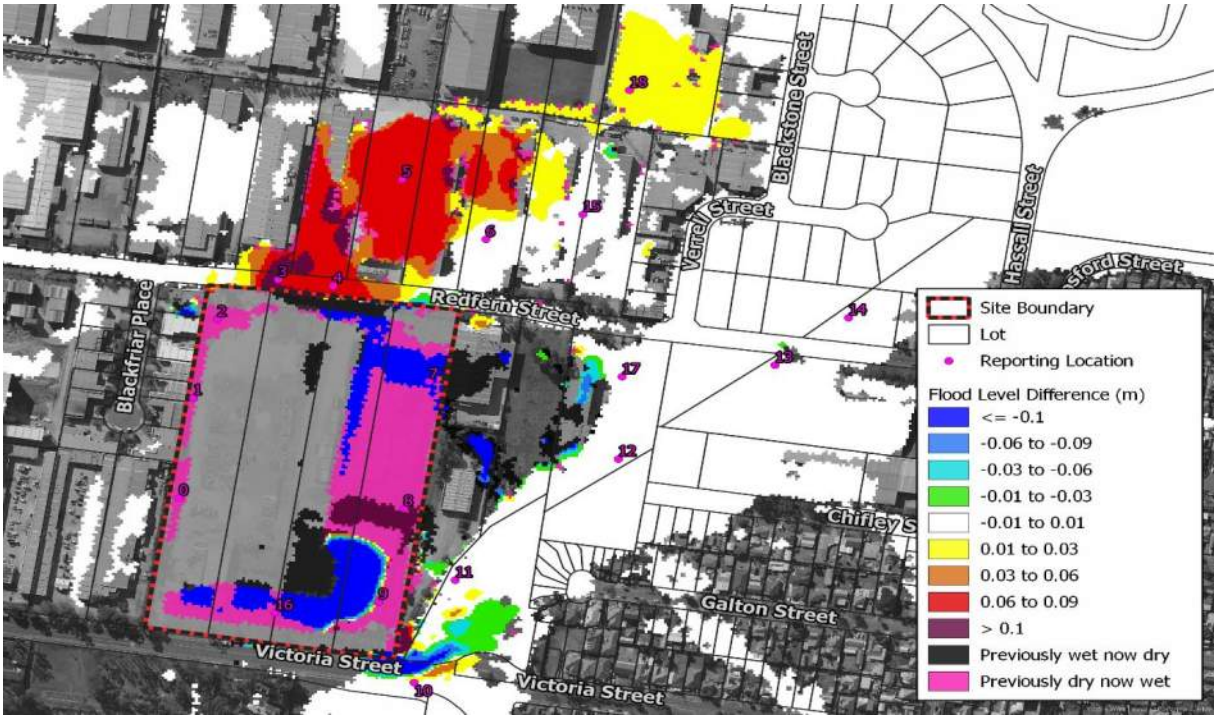

Figure G43-PMF AEP Flood Depth (Differences)

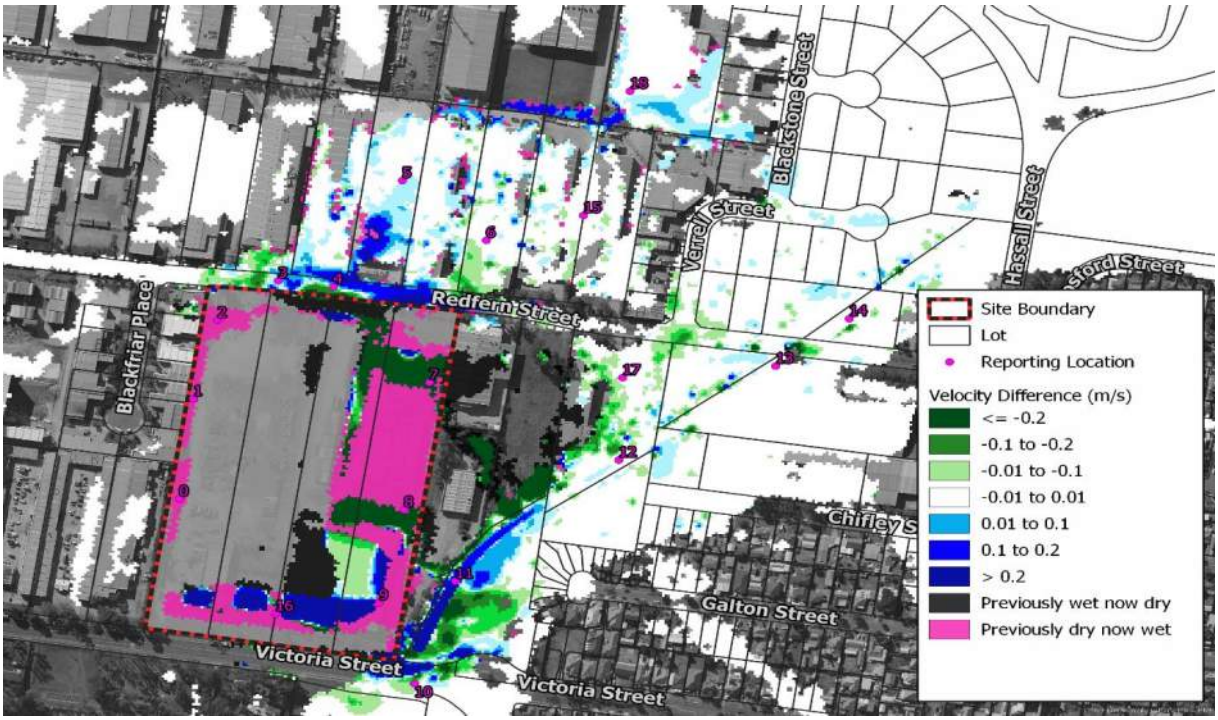

Figure G44-PMF AEP Flood Velocity (Differences)

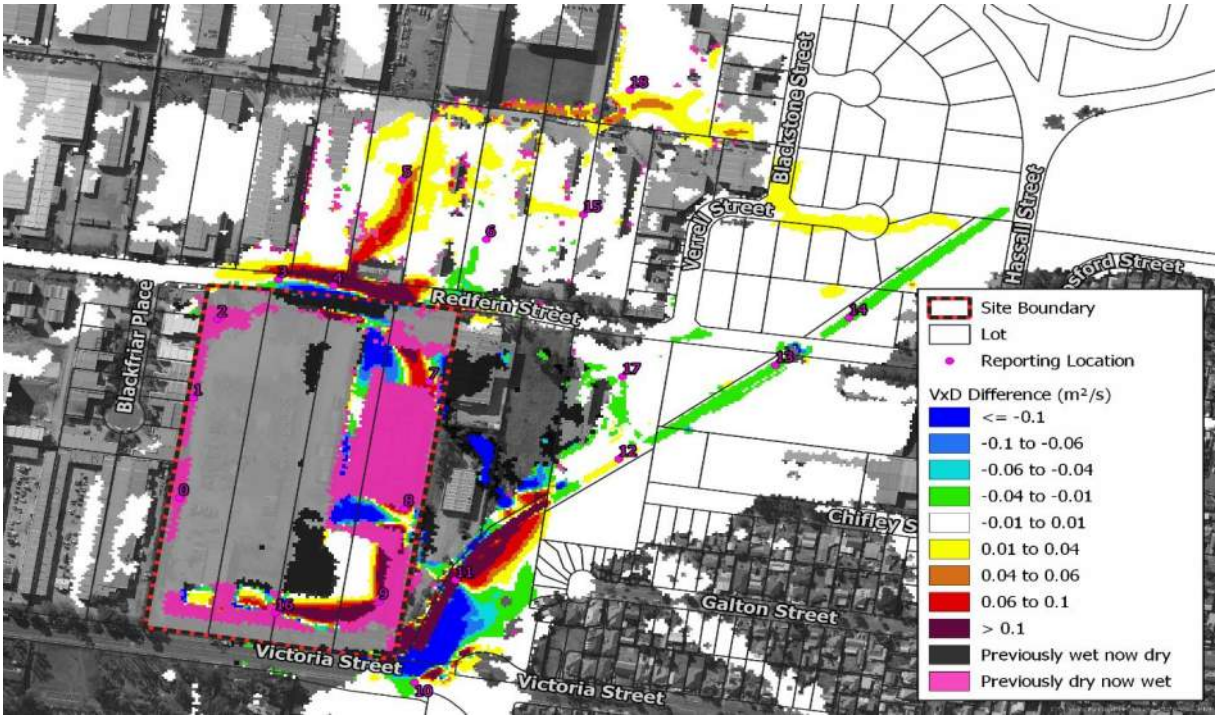

Figure G45-PMF AEP Velocity Depth (Differences)