Crows Nest OSD- Site B

Integrated Water Management Plan

Prepared for: Third.i Crows Nest Residential Developments Pty Ltd

Date: 20th September 2024

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Ref: 301351270

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Stantec

Revision

Site Address:	477-495 Pacific Highway, Crows Nest, NSW, 2065
Real Property Description:	Lot A/ DP442804 Lot 101/ DP747672 Lot 100/ DP747672
Proposed Development:	Mixed use development – 14 storey tower above the Crows Nest Metro Station
Client:	Third.i Crows Nest Residential Developments Pty Ltd
Local Authority	North Sydney Council
Authority Reference #:	N/A
Stantec Reference:	301351270-IWMP_005

Revision	Date	Comment	Prepared By	Approved By
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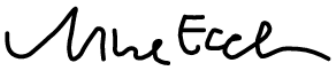
004	15.08.24	SSDA Submission	PD	VE
005	20.09.24	SSDA Submission	NO	VE

Stantec hereby declares the following:

Stantec understands that, to the best of our knowledge, this report contains all available information relevant to the assessment of the proposed development. Stantec has taken every effort to confirm that the information contained in this report is neither false nor misleading.



Vivie Eccles – CPEng, NER, MIEAust

Civil Project Technical Lead, Team Lead

For and on behalf of: Stantec Australia Pty Ltd

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1. Executive Summary

This Integrated Water Management Plan (IWMP) has been prepared by Stantec Australia Pty Ltd for Third.i Crows Nest Residential Developments Pty Ltd, to support the SSDA for the Crows Nest Metro Station Over Station Development (OSD) - Site B, located at 477-495 Pacific Highway, Crows Nest, NSW. The IWMP outlines the conceptual stormwater design for the proposed mixed-use development, ensuring compliance with the relevant requirements set forth by North Sydney Council, Australian Rainfall and Runoff (ARR) 2019, Australian Standards, and best engineering practices. The purpose of this report is to:

- To evaluate the quantity and quality of stormwater associated with the proposed development.
- To establish a robust stormwater management strategy for both the construction and operational phases.
- To ensure compliance with North Sydney Council's requirements and relevant Australian standards.

This IWMP evaluates the quantity and quality of stormwater associated with the proposed development, establishing a robust stormwater management strategy for both the construction and operational phases. The design adheres to North Sydney Council's requirements for stormwater conveyance, ensuring minor flows are managed through piped drainage and major flows via controlled overland flow. An on-site detention tank has been proposed to restrict stormwater discharge rates to permissible levels for all design storm events, up to and including the 1% Annual Exceedance Probability (AEP) event. Additionally, the development incorporates various Stormwater Quality Improvement Devices (SQIDs), such as Ocean Protect Cartridge Filters and a 15kL rainwater tank, to meet pollutant reduction targets. The pollutant reduction model generated using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software confirms that the required reductions for phosphorus, nitrogen, total suspended solids, and gross pollutants have been achieved.

The plan complies with all relevant policies and guidelines, including the North Sydney Council Development Control Plan (DCP) 2013, Australian Rainfall & Runoff 2016, and AS3500 parts 0-5: 2021-Plumbing and Drainage. A detailed flood impact assessment ensures that the proposed development will not adversely affect flooding behaviour upstream or downstream of the site. Furthermore, erosion and sedimentation control measures are in place to prevent pollution and degradation of downstream watercourses during and after construction, in accordance with Landcom’s guidelines. The IWMP also includes a comprehensive maintenance schedule for the stormwater network components to ensure ongoing effective operation.

This IWMP also includes the Utility Services Infrastructure Assessment by NDY to provide a desktop assessment of the capacity estimates and required supply for potable water and sewer. As part of the Crows Nest Metro Station construction, local infrastructure is undergoing upgrade works to cater for the proposed development. Based on calculated water and sewer demands, the existing infrastructure and proposed upgrade works will be sufficient to cater for the proposed new development.

In summary, the proposed development successfully meets all outlined requirements, including stormwater conveyance, on-site detention, water quality treatment, and flood impact mitigation. The strategies and measures detailed in this IWMP confirm that the development adheres all relevant authorities, ensuring the project's compliance and environmental sustainability.

2. Introduction

Stantec have been commissioned by Third.i Crows Nest Residential Developments Pty Ltd to prepare this Integrated Water Management Plan (IWMP) in support of the State Significant Development Application (SSDA) for the proposed Crows Nest Metro Station OSD (Over Station Development)- Site B development at 477-495 Pacific Highway, Crows Nest, NSW 2065.

This IWMP outlines the conceptual DA level stormwater design for the proposed development.

This IWMP illustrates that the proposed development complies with the conditions set out by North Sydney Council, Australian Rainfall and Runoff (ARR) 2019, Australian Standards and best engineering practices.

The purpose of this IWMP is to evaluate the quantity and quality of stormwater associated with the proposed development plan so as to demonstrate to Council that an appropriate stormwater management strategy has been adopted.

The DA seeks consent for:

- Connection to existing services as required.

This IWMP specifically addresses the following items for both the construction and operational phases of the development:

- Stormwater runoff volumes;
- Stormwater quality treatment measures;
- Water Sensitive Urban Design (WSUD) measures
- Erosion Sedimentation Control
- Stormwater Network Maintenance during Operation
- Potable Water
- Wastewater

The following will be achieved with the correct application of this IWMP report:

- Appropriate standards to be maintained on all aspects of stormwater within the site,
- Pollution control to be maintained,
- Establishment of a unified, clear, and concise stormwater management strategy.

3. Abbreviations Definitions

- **AEP** Annual Exceedance Probability
- **AHD** Australian Height Datum
- **ARI** Average Recurrence Interval
- **ARR** Australian Rainfall and Runoff
- **CNDC** Crows Nest Design Consortium
- **DA** Development Application
- **DCP** Development Control Plan
- **DN** Diameter Nominal (mm)
- **EY** Exceedances per Year
- **GPT** Gross Pollutant Trap
- **IFD** Intensity-Frequency-Duration
- **IL** Invert Level
- **L/s** Litres per second
- **m/s** Metres per second
- **MUSIC** Model for Urban Stormwater Improvement Conceptualisation
- **NSC** North Sydney Council
- **OSD** Over Station Development
- **PSD** Permissible Site Discharge
- **RCP** Reinforced Concrete Pipe
- **RL** Relative Level
- **SID** Safety In Design
- **SQID's** Stormwater Quality Improvement Devices
- **SSR** Site Storage Requirement
- **WQO's** Water Quality Objectives
- **WSC** Water Services Coordinator
- **WSUD** Water Sensitive Urban Design

4. Relevant Policies, Standards and Guidelines

The following listed policies, standards and guidelines were referred to in the preparation of this report:

- North Sydney Council Development Control Plan (DCP) 2013
- North Sydney Council Infrastructure Specification for Roadworks, Drainage and Miscellaneous Works (2022)
- North Sydney LGS- Wide Floodplain Risk Management Study and Plan (2022)
- Australian Rainfall & Runoff 2016;
- AS3500 parts 0-5: 2021-Plumbing and Drainage
- Landcom Managing Urban Stormwater: Soils and Construction Volume 1 2004
- NSW Floodplain Development Manual 2005

5. Existing Site Characteristics

5.1 Property Detail

The proposed development forms part of the site with the following property details:

Site Address:	477-495 Pacific Highway, Crows Nest, NSW 2065.
Real Property Description:	Lot A/ DP442804 Lot 101/ DP747672 Lot 100/ DP747672
Development Area:	1,872m² (0.1872Ha)

The proposed development consists of a single building with fourteen (14) storeys above the Crows Nest Metro Station. The site area is 1872 square metres. The concept approval includes a maximum height to the top of the service zone of RL 158m and includes a maximum residential FSR of 13,000 m^2.

The Metro Station is comprised of 3 levels:

- Ground Level - Hume Street includes the OSD tower lobby, retail, and back of house spaces
- Level 01 includes a retail mezzanine, back of house, and a loading dock which is used for OSD garbage collection and is a future easement for rail authority access
- Level 02 contains plant rooms for the metro station.

The OSD car parking levels are located on level 5 and 6. These are naturally ventilated with 27 car spaces on level 5 and 28 car spaces on level 6. There is a total of 55 spaces. Apartments are located from level 7 to 18. Level 19 and 20 contain penthouses. A roof terrace on level 21 includes communal gardens and pools, as well as private penthouse terraces. The proposed development can be seen on the Civil Design Documentation shown in Appendix A of this report.

The overall site is bounded by:

- Pacific Highway to the South West
- Industrial Neighbouring Properties and Clarke Street to the North East
- Industrial Neighbouring Properties to the North, South, and East
- Hume St to the North West

Refer to locality plan in Figure 1 on the following page for further clarification.

Figure 1: Site Location Plan (Source: Nearmaps 2023)

5.2 Topography

The local topography around the site shows that the site primarily falls South to North west. The high point of the site is located along the Southern boundary at a level of approximately RL 96 m AHD and the low point located along the north western boundary at a level of approximately RL 92 m AHD this is an average slope of approximately 5%.

Figure 2: Site Topography (Mecone Mosaic 2023)

5.3 Stormwater Catchments

The surrounding area has been investigated to determine the likely impact of existing external stormwater catchments on the proposed site.

The site is currently surrounded by developments and roadway, so it is believed that no external catchments impact the development site. These neighbouring properties are fully developed and hence, it is assumed they have fully functioning stormwater infrastructure which will capture and convey stormwater to the council system.

The stormwater catchments for the proposed site includes runoff within the Site B property boundary, and assumes the area is 100% impervious. The catchments include the station-roof and the footpath area within the boundary.

5.4 Existing Stormwater Infrastructure and Discharge

Through review of Sydney Metro's Drainage Design documentation, it has been determined that the site contains pit and pipe infrastructure within the street kerbs along Pacific Highway, Hume Street and Clarke Lane (A01-1, A01-3, A01-4, A01-5, A01-6, A02-1, A02-2, A02-3, A02-4, A02-5, A02-6, A03-1, A04-5A, A04-5). It appears that all roof catchments are conveyed through formalised gutter and downpipe systems and discharged into the listed lot inground drainage infrastructure before discharging from the site into council's drainage system.

As shown in Figure 3, there are two (2) downpipes (DPB1, DPB2) connecting from the stormwater main up to level 02. Each downpipe location has two (2) downpipes, with one being an overflow provision. One downpipe in each set is fitted with a 150mm diameter orifice plate to drain the level 02 catchment area. The CNDC station downpipes are sized to take unattenuated flows from vertical face catchments, for example from balcony drains and awnings.

For the Civil stormwater proposal, downpipe DPB1 will act as a discharge point for the proposed OSD into the existing drainage system. Downpipe DPB2 will be capped and shall not be used for stormwater discharge.

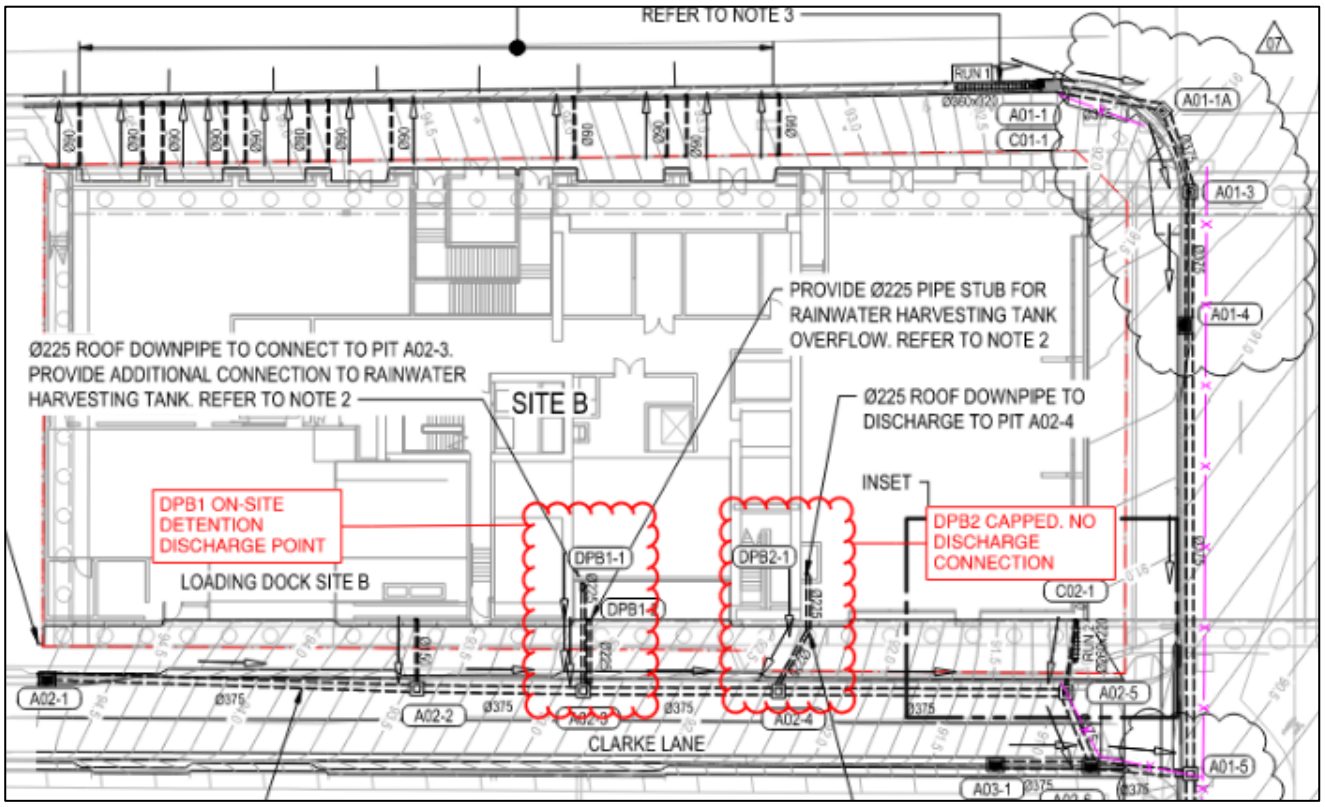

Figure 3: Existing Stormwater Infrastructure (Source: Sydney Metro Proposed Drainage plan Drawing SMCSWSCN-SMC-SCN-DD-DWG-207011 Rev 7, by CNDC, last revised 17 May 2023)

6. Local Authority Requirements

Design requirements for stormwater management on the site have been set out in North Sydney Council DCP 2013 and Sydney Metro Stage 3 Design Report SMCSWSCN-SMC-SCN-CE-REP-000001 by CNDC. These requirements are summarised in the sections below.

6.1 Stormwater Conveyance Requirements

The North Sydney Council DCP 2013 – Section 2.6.7 Stormwater Management, clearly states that the following design storm Annual Exceedance Probability (AEP) should be allowed for when designing the Stormwater runoff conveyance systems for the development. The site has been considered as Residential Medium Density.

Table 1: Stormwater Drainage Serviceability

Design Parameter	Annual Exceedance Probability (AEP)	Conveyance Method
Minor Drainage System	20%	In Ground
Major Drainage System	1%	Overland

6.2 On Site Detention Requirements

The North Sydney DCP 2013, Section 2.6.7 Stormwater Management, states that *post-development stormwater discharge rates should be less than pre-development stormwater discharge rates* for the relevant storm events. This condition must be met for storm events including the low recurrence interval (20% AEP), medium recurrence interval (10% or 5% or 2% AEP), and the upper value, which is the 1% AEP storm.

Based on Sydney Metro Stage 3 Design Report SMCSWSCN-SMC-SCN-CE-REP-000001 by CNDC, North Sydney Council requires permissible site discharge (PSD) from the development site, for all storm events up to and including the 1% AEP storm event, not to exceed that which would occur during the 20% AEP storm event during the existing pre-developed conditions.

Table 2: Permissible Site Discharge (Source: Sydney Metro Stage 3 Design Report by CNDC)

Location	Lot Area (m2)	Impervious (%)	Time of Concentration (mins)	Existing 20% AEP Flow / Permissible Site Discharge (L/s)
Site B	1872.4	100	5	73

An on-site detention tank restricting the rate of stormwater discharge to the permissible rate of discharge for the site, for all design storm events up to and including the 1% AEP event has been proposed.

CNDC has completed preliminary design assumptions and tank sizing for Site B. Stantec, as the OSD Developer, has undertaken hydraulic modelling to determine the required detention tank sizing to ensure compliance with North Sydney Council's requirements. Refer to Section 8 for further information.

6.3 Stormwater Quality

The North Sydney Council DCP 2013 states that *residential developments with a gross floor area greater than 2000m² must also submit a Water Sensitive Urban Design report from a suitably qualified consultant demonstrating that WSUD has been incorporated to the maximum extent practicable and that stormwater discharge will be reduced to the maximum extent practicable*.

The DCP also states that recycling of stormwater is encouraged to minimise runoff and improve quality. Rainwater tanks are required for re-use systems as a solution to minimise post development stormwater drainage discharge. A rainwater tank has been proposed and reservoir will be plumbed to appropriate end uses (toilet flushing, laundry, water features, car

washing or garden irrigation) to ensure sufficient use of tank water so that capacity exists to accommodate rainwater from storm events, as requested by council. Please refer to the Hydraulic consultant documentation for further information.

Based on Sydney Metro Stage 3 Design Report SMCSWSCN-SMC-SCN-CE-REP-000001 by CNDC, the recommended post-development pollutant load standards are indicated below:

- Litter and vegetation larger than 5mm: 85% reduction on the Baseline Annual Pollutant Load;
- Total Suspended Solids: 80% reduction on the Baseline Annual Pollutant Load;
- Total Phosphorus: 45% reduction on the Baseline Annual Pollutant Load;
- Total Nitrogen: 45% reduction on the Baseline Annual Pollutant Load.

7. Flood Impact Assessment

When considering a new development, it is important to assess the impact of existing flooding on the proposed development and also the impact of the proposed development on existing or potential flooding both upstream and downstream of the development.

7.1 Existing Flooding

7.1.1 Regional Flooding

The site has been identified in the SMEC Flood Maps from Enabling Report G02 Appendix J (2020) and appears to be surrounded by flooding in the 1% AEP and PMF flood events. Flooding typically appears to be contained within the road network. Refer to the figures below, for the 1% AEP and PMF flood extents in the existing and design scenario.

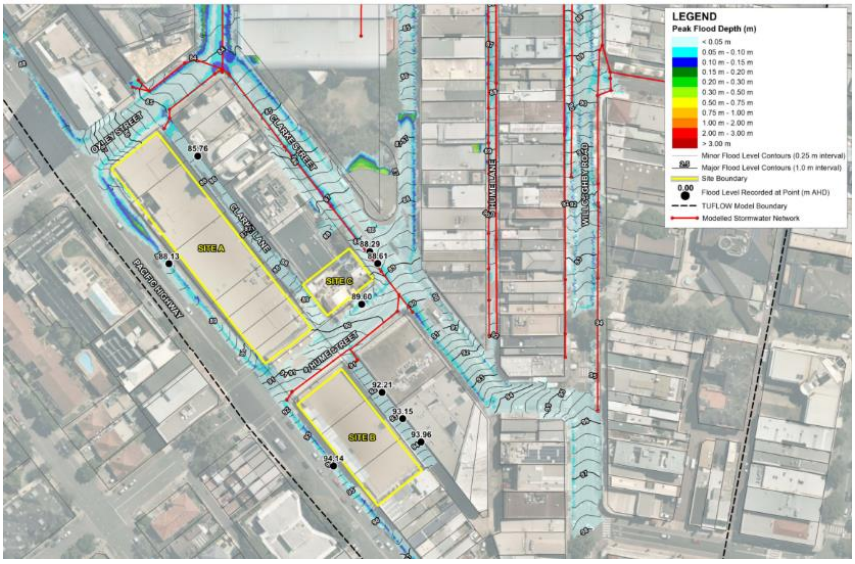

Figure 4: 1% AEP Flood Depth Existing Scenario

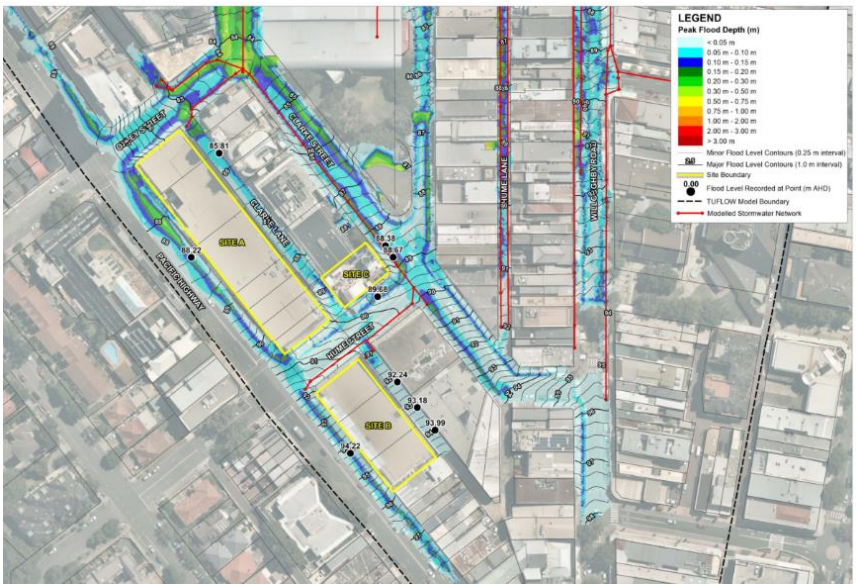

Figure 5: PMF Flood Depth Existing Scenario

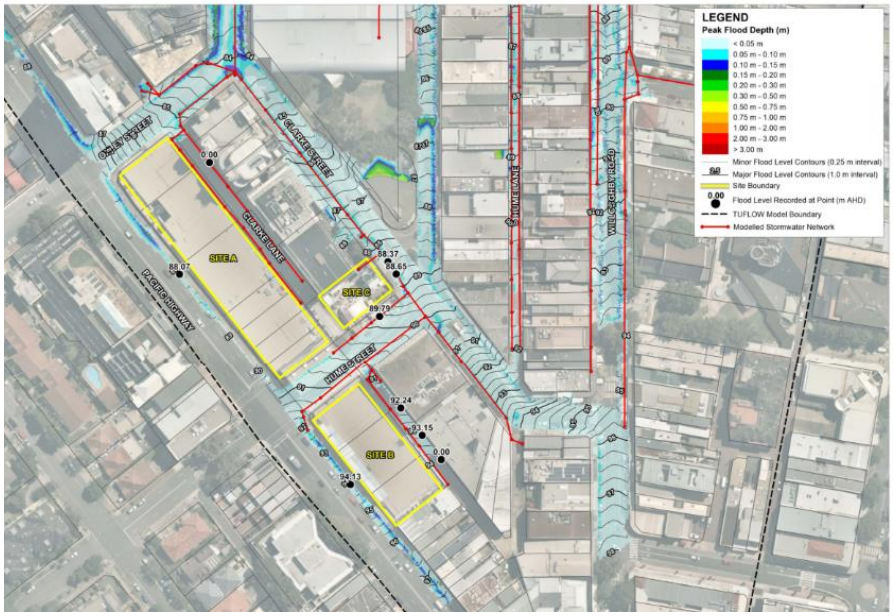

Figure 6: 1% AEP Flood Depth Design Scenario

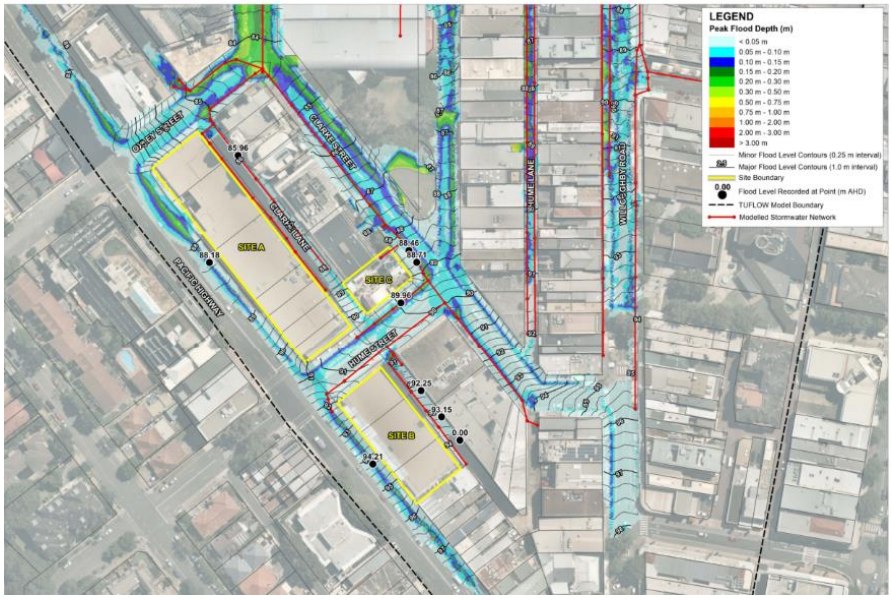

Figure 7: PMF Flood Depth Design Scenario

As the site is within a flood-affected area, a flood impact assessment has been prepared for the site. North Sydney Council have provided the North Sydney TUFLOW model, undertaken by GRC Hydro in 2022, to confirm the existing flood conditions across the site and determine impacts, if any, to existing flooding behaviour as a result of the development. Refer to the Crows Nest Over Station Development Flood Impact Assessment, prepared by Stantec, for further details of the flood impact assessment.

7.1.2 Local Flooding

Local or Nuisance flooding describes flooding occurring due to site specific constraints. Local flooding is often caused by local topographical constraints and stormwater drainage system capacity restrictions. The site appears to have no upstream catchments that will cause flooding on the site.

8. Stormwater Conveyance

This section of the report discusses the systems proposed to allow for stormwater to be conveyed across the site to the legal point of discharge.

As discussed in Section 5.1 of this report council have set serviceability requirements for the stormwater conveyance network such that minor flows are conveyed through piped drainage, and major flows are discharged via controlled overland flow.

8.1 Roof Drainage

The drainage system will be designed in accordance with AS3500.3-2021 to convey the design storm runoff from the roof to the in-ground drainage system by the Hydraulics consultant.

8.2 Surface Drainage

The surface areas will be drained through a variety of methods, discussed below, in accordance with AS3500.3-2021 and Council's stormwater drainage guidelines.

8.2.1 In Ground Drainage

The in-ground drainage has been designed by CNDC to meet the following criteria:

- The minor (piped) drainage system must be designed to convey stormwater runoff for storm events up to, and including, the 20% Annual Exceedance Probability (AEP) storm event, and;
- The major (overland) drainage system must be designed to convey stormwater runoff for storm events up to, and including, the 1% AEP storm event.

8.3 Legal Point of Discharge

As discussed in Section 4.4, the roof catchment will connect and discharge into downpipe DPB1 and connect into the kerb inlet pit A02-3 that will be installed along Clarke Lane.

9. Stormwater Attenuation

As discussed in section 5.2 the attenuation of stormwater discharge from the site will be provided in accordance North Sydney Council's requirements for permissible site discharge.

An on-site detention tank restricts the rate of stormwater discharge to the permissible rate of discharge for the site, for all design storm events up to and including the 1% AEP event has been proposed. Refer to Table 3.

Table 3: On-Site Detention Tank Details

	Tank Volume (cu.m)	Orifice Size (mm)
On-Site Detention Tank	60.44	125

Table 4: On-Site Detention Tank Results

AEP Storm Event	Pre-Development Discharge (cu.m/s)	OSD Post-Development Discharge (cu.m/s)	Bypass Post-Development Discharge (cu.m/s)	Total Post-Development Discharge (cu.m/s)	Permissible Site Discharge (cu.m/s)
20%	0.090	0.023	0.022	0.045	0.073
10%	0.106	0.026	0.026	0.052	
5%	0.122	0.028	0.030	0.058	
2%	0.142	0.031	0.035	0.066	
1%	0.158	0.033	0.040	0.073	

One (1) On-Site Detention tank has been proposed for the site. The total roof catchment area reticulating to the On-Site Detention tank is 0.1383Ha. There is a total of 0.0489Ha ground area bypassing the OSD system.

As per Sydney Metro Stage 3 Design Report SMCSWSCN-SMC-SCN-CE-REP-000001 by CNDC, it should be noted that a 19.7% climate change factor has been applied in line with AR&R 2019 recommendations to post-development discharge calculations.

10. Water Quality Treatment

As discussed in section 5.3 of this report North Sydney Council DCP (2013) require stormwater quality treatment on new developments to reduce the pollutant loading of stormwater discharged into the council drainage system.

This section of the report describes the proposed Stormwater Quality Improvement Devices (SQID's) and the effectiveness of the treatment system in achieving the reduction targets set by council for the proposed development.

10.1 Potential Pollutants

There are a wide range of potential stormwater pollutant sources which occur from urbanised catchments, many which can be managed through appropriate stormwater quality treatment. Typical urban pollutants may include:

- Atmospheric deposition
- Erosion (including that from subdivision and building activities)
- Litter and debris
- Traffic emissions and vehicle wear
- Animal droppings
- Pesticides and fertilisers
- Application, storage and wash-off of car oil, detergents and other household and commercial solvents and chemicals
- Solid's accumulation and growth in stormwater systems
- Weathering of buildings

The following specific pollutants in urban stormwater assessed through water quality modelling and management include:

- Suspended Solids
- Litter
- Nutrients such as Nitrogen and Phosphorous
- Biological oxygen demand (BOD) and chemical oxygen demand (COD) materials
- Micro-organisms
- Toxic organics
- Trace metals
- Oils and surfactants

While only the key pollutants underlined above will be examined within the modelling, the Stormwater Quality Improvement Devices implemented are expected to assist in reducing a wide range of pollutants. For example, heavy metals are commonly associated with, and bound to fine sediments. This reduces the discharge of fine sediment during the construction and operational phases will also reduce the discharge of heavy metals to existing stormwater systems.

10.2 Pollutant Reduction System

In order to achieve the pollutant reduction targets specified in section 5.3 of this report, a series of treatment devices are proposed within the stormwater network which form a treatment train.

10.2.1 Water Treatment Modelling

In order to demonstrate that the proposed treatment train meets the required reduction targets, a pollutant reduction model has been generated using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Software program Version 6.3 by eWater CRC. Pollutant export rates are currently only available for Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Gross Pollutants (GP). Therefore, only quantitative modelling for TSS, TN, TP & GN has been undertaken using MUSIC.

Modelling has only been undertaken on the post-development proposal with SQID's installed so as to demonstrate the percentage reduction for each pollutant type.

The total development area is 0.1872Ha. Approximately 0.1383Ha of roof catchment area is collected by the one (1) proposed on-site detention tank and treated by the proposed Ocean Protect Cartridge Filters and a 15kL rainwater tank. Approximately 0.0489Ha ground area bypasses the OSD system, however, based off Stage 3 Design Report- DP08 Civil Crows Nest Station Design & Technical Services Sydney Metro, due to the site usage and configuration, there is limited opportunity to use elements such as rain gardens and swales in the narrow footpath area within the property boundary. Footpath runoff into tree pits will perform some treatment function.

The treatment train proposed for the portion of stormwater discharging to the OSD tanks includes the following:

- 3x Ocean Protect Cartridge Filters proposed within the On-Site Detention Tank
- 15kL Rainwater re-use tank

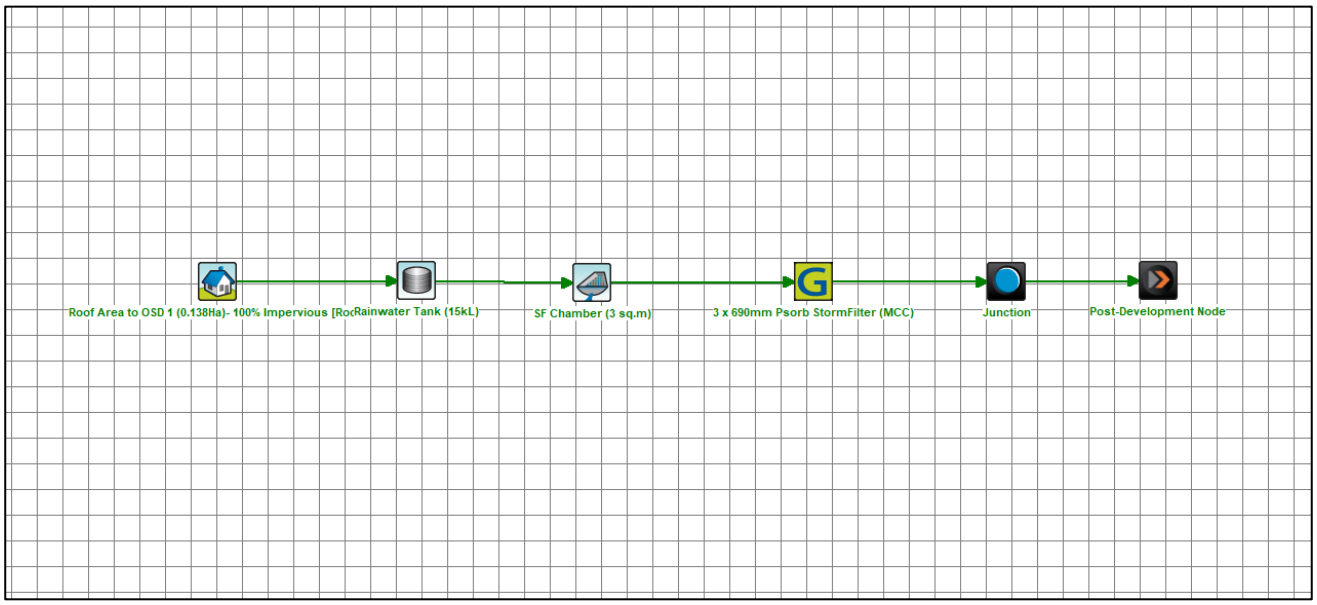

Figure 8: MUSIC Model Treatment Train

	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.44	1.44	0
Total Suspended Solids (kg/yr)	37.7	6.81	81.9
Total Phosphorus (kg/yr)	0.219	0.0582	73.4
Total Nitrogen (kg/yr)	3.16	1.57	50.4
Gross Pollutants (kg/yr)	36.3	0	100

Figure 9: MUSIC Modelling Results

Pollutant/Issue	Target	Reduction	Target Achieved
Phosphorus	45%	50.4%	YES
Nitrogen	45%	73.4%	YES
Total Suspended Solids	80%	81.9%	YES
Gross Pollutants	85%	100%	YES

Table 5: MUSIC Results vs. Site Targets

10.2.2 Ocean Protect Cartridge Filters

The Ocean Protect Cartridge Filters clean stormwater through a patented passive filtration system, effectively removing pollutants to meet regulatory requirements. This treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals and other common pollutants.

- On-Site Detention Tank will consist of 3 x 690Psorb StormFilter cartridges.

10.3 Rainwater Tank

A Rainwater Tank is a water storage system designed to be installed on an industrial/ business development to catch rainfall on roof surfaces. These tanks can provide water for non-potable uses such as, toilet flushing, hot water, laundry washing, vehicle washing, irrigation, and industrial wash down.

The proposed Rainwater tank shall be incorporated into the stormwater drainage system and will collect run-off from 0.138Ha of non-trafficable roof area in the development. The proposed rainwater tank will be 15kL, the outlet/ downpipe DPB1 from the OSD, will discharge into the rainwater harvesting tank housed within the building.

11. Water Sensitive Urban Design Strategy

WSUD Background Information

Design guidelines for Water Sensitive Urban Design (WSUD) on the site have been set out in the North Sydney Council DCP (2013). WSUD integrates land use and water management in the aim of minimising impacts of urban development on the natural water cycle. The WSUD design strategy for the proposed development is as follows. No previous WSUD studies have been done for this site.

Site Context

Full site context has been provided in Section 4 above.

Proposed Development

The proposed development has been outlined in Section 7-9 above, as well as in Appendix A with the Civil Design Documentation.

WSUD Objectives and Targets

The DCP that all development applications for sites of 2,500m^2, or more in area must be supported by a Water Sensitive Urban Design Strategy, prepared by a qualified civil engineer with suitable experience, development for the subdivision of sites of 2,500m^2 or more in area must achieve the stormwater flow targets in the Water Sensitive Urban Design Strategy, unless public water quality and flow structures downstream of the site allow these targets to be met. Details of compliance must be included in the Water Sensitive Urban Design Strategy supporting the development application.

As discussed in Section 9 above, the site will implement one (1) stormwater detention basin, stormfilters and a RWT in order minimise the development impact on the natural water cycle.

Constraints and Opportunities

There are always opportunities to adopt a range of WSUD measures for any development. There were no major constraints within or neighbouring the site such as flood plains, watercourses or sensitive environments that are required to be preserved or remediated as part of the proposed works.

Water Conservation

The proposed development will include rainwater storage. This will provide 15kL of water storage which will be reused in systems such as toilet flushing, laundry, garden watering and external cleaning, car washing.

Stormwater Management

The proposed stormwater system has been designed as per North Sydney Council Development Control Plan (DCP) 2013.

Water Table Management

It is not expected that the proposed development will have any impact on the existing water table. No impervious areas of the site will discharge to the ground and hence no groundwater quality measures are required to ensure WSUD requirements are met.

12. Stormwater Network Maintenance Schedule

In order to ensure the ongoing effective operation of the stormwater network and water quality treatment devices, the devices must be maintained in accordance with manufacturer recommendations/requirements and general best practice. It is noted that all pits are to be inspected in a safe manner that assesses localised risk and in accordance with maintenance contractor safe work method statements (SWMS).

The below summaries the various stormwater network components that will need to be maintained, whilst Schedule 1 below details required maintenance of specific items within the network requiring maintenance.

12.1 Pit and Pipe Network

A general inspection of the stormwater pit network is to be undertaken every six (6) months and after major storm events. The general inspection involves visual inspection inside pits, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable).

12.2 On-Site Detention Tanks

A general inspection of the On-Site Detention tank is to be undertaken at a minimum every six (6) months and after major storm events. The general inspection involves visual inspection inside the tank, condition of components such as orifice plates and valves, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable). It is expected that the tanks are hosed out and cleaned on an annual basis to ensure required performance can be achieved.

12.3 Water Quality Treatment Devices

The filtration inserts, located within the pits, are to undergo minor service every three (3) months and after major storm events or a hazardous material spill. This involves inspection and evaluation of the filter bad and its condition, removal of captured pollutants, and the appropriate disposal of captured material in accordance with waste disposal regulations. The minor service is designed to return the ocean guard back to optimal operating performance. An inspection of the condition is to be particularly undertaken following major storm events to check for damage and higher than normal sediment accumulation. Refer to manufacturer's maintenance procedures for details of safely undertaking hand maintenance or vacuum maintenance of the ocean guards.

A major service of the ocean guards is undertaken on an as-required basis and involves the inspection of ocean guards to determine the need for filter bag replacement and support frame rectification. Replacement is based on the outcomes from the minor service whereby damage is detected. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for safely replacing components.

A general inspection of the filtration cartridges located in a Stormfilter chamber within the On-Site Detention tank, is to be undertaken every six (6) months and after major storm events or a hazardous material spill. The general inspection involves visual inspection of the Stormfilter cartridges and chamber, removal and disposal of larger gross pollutants from the device in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Cartridges are also to be checked to ensure they are all firmly connected to the connectors.

A minor service of the Stormfilters, undertaken every twelve (12) months and after major storm events or a hazardous material spill, involves the evaluation of the Stormfilter cartridges and media, removal of accumulated sediment and a wash-down of the Stormfilter chamber. Refer to Ocean Protect maintenance procedures for details of safely undertaking maintenance of the Stormfilter cartridges. During this service, the cartridge media is to be inspected and replaced if it is revealed that the cartridge media is exhausted. If this is the case, a major service is to be undertaken to replace the Stormfilter cartridge media. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for details of safely replacing the media components.

12.4 Civil Structures

A general inspection of civil structures and associate drainage across a site should be undertaken annually. The general inspection involves visual inspection, with identified defects assessed by applicable qualified engineers

12.5 Stormwater and OSD Maintenance Schedule

Maintenance Action	Frequency	Responsibility	Procedure
Pit and Pipe Network			
Blockages of inlet and outlet pipes within pits	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within pits.
Condition of inlet grates	Six Monthly	Maintenance Contractor	Clear vegetation and any debris from the pit grate and repair as required.
Condition of pit structures and section of pipes at inlets/ outlets.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required. Notify structural engineer if detrimental features observed.
Overland flow paths and drainage swales	Six Monthly	Maintenance Contractor	Walk along the flow path and swale. Check batters and condition of path extent. Remove any debris/litter/sludge.
Survey pipe condition with CCTV's and repair defects as necessary	Five Years	Maintenance Contractor	Remove grate. Clear blockages for camera access. Operate camera in accordance with manufacturer specifications and operator standard procedures.
On-Site Detention and Discharge Control			
Blockage of orifice plate	Six Monthly	Maintenance Contractor	Remove grate and screen to inspect orifice. See attached Site Stormwater plan for location of Discharge Control Pit.
Orifice structure size and connection to wall	Five Years	Maintenance Contractor	Compare orifice diameter to approved design (see Works as Executed Drawing) and ensure edge of orifice is not pitted or damaged.
Trash rack blockage	Six Monthly	Maintenance Contractor	Remove grate and screen if required to clean it.
Trash rack condition and connection to wall.	Annually	Maintenance Contractor	Remove grate and rack screen. Check corrosion in particular corners. Check screen fixings to wall for stability and corrosion. Repair as required.
Condition and performance of flap valves	Annually	Maintenance Contractor	Remove grate. Test valve hinge by moving flap to full extent and allowing it to drop back into normal position. Flap should freely swing at hinge.

Blockage of overflow weirs	Six Monthly	Maintenance Contractor	Remove grate and open cover to ventilate underground storage if present. Ensure weir clear of blockages.
Tank and pit wall defects and structural adequacy.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Tank slab build-up of sediment and sludge.	Six Monthly	Maintenance Contractor	Remove grate and screen. Remove sediment/ sludge build up, check orifice and flap valves are clear.
Condition and fixing of step irons	Two Years	Maintenance Contractor	Remove grate to inspect step irons and connection into wall. Repair as required. Notify structural engineer if detrimental features observed.
OSD warning signage	Two Years	Maintenance Contractor	Remove grate to inspect signage and connections. Check for fading in sign and any vegetation growth over or near sign impacting visibility. Repair as required.
Water Quality Devices			
Blockages and debris within stormwater pit filtration inserts/ storm sacks	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within inserts.
Blockages and debris within filtration tanks and devices	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside tank.
Blockages and debris within filtration cartridges inside storage tanks.	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside tank.
Blockages and water conveyance within filtration stormwater lines	Annual	Maintenance Contractor	Remove grate. Flow water through filtration stormwater line from inspection openings to remove blockages.
Condition of stormwater pit filtration inserts/ storm sacks	Annual	Manufacturer's Contractor	Remove inserts from pit to inspect. Repair as required.
Condition and performance of treatment tank components	Annual	Manufacturer's Contractor	Remove grate and follow SWMS procedures to enter into the tank. View and repair damaged components.
Condition and performance of filtration cartridges	Annual	Manufacturer's Contractor	Remove cartridges from pit to inspect. Repair as required.
Civil Structures			
Check subsoil behind retaining walls drainage capacity via hose flushing	Annual	Maintenance Contractor	Blast with hose, water into inspection openings and pits to ensure conveyance through lines. Review outlets to ensure flow through line.

Condition of retaining walls and other structures, including cracking and stability	Annual	Maintenance Contractor	Walk along and inspect all visible faces of wall structure. Observe for cracking, crack width, any lean in on wall and moisture within structure. Notify structural engineer if detrimental features observed.
Check batters for signs of scour and erosion	Annual	Maintenance Contractor	Walk along bottom of embankments where possible. Check batter stability and vegetation. Notify civil engineer if detrimental features observed.

13. Erosion & Sedimentation Control

Landcom have published a design guide entitled “Managing Urban Stormwater - Soils and Construction” which is regarded as the standard to which erosion and sedimentation control should be designed to within NSW.

The control of erosion and sedimentation describes the measures incorporated during and following construction of a new development to prevent the pollution and degradation of the downstream watercourse.

An Erosion and Sediment Control Plan has been prepared as part of the development application documentation and is included in Appendix A of this report.

13.1 Stormwater Drainage Infrastructure Inlets

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will then be conveyed into the downstream waterbody by stormwater runoff, contaminating the waterbody.
- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- Sediment traps protection will be installed surrounding all existing stormwater drainage infrastructure inlets to prevent sediment entering the system.
- Temporary Stormwater Systems are to be installed where required to capture all site runoff within the zone of excavation. Runoff will be allowed to settle out suspended particles and debris, and an acceptable water of 50mg per litre of Non Filterable Residues (NFR) is required to be achieved prior to discharge.
- Installation of a fence around the perimeter of the basin is required as well as a rip rap to allow for bobcat access for periodic removal of sediment. Also, a perforated riser outlet pipe needs to be placed for the connection and discharge to an existing pit.

Maintenance:

- Frequent inspection of the sandbags to ensure they are arranged in a manner that prevents sediment from accessing the drainage system. If sediment is building up on the sandbags they should be cleared of sediment and re-established.
- All soil erosion and sediment control structures including temporary sediment basins and sediment traps shall be inspected following each storm event and any necessary maintenance work shall be undertaken to ensure their continued proper operation.

13.2 Construction Exit Protection

Risk:

- Spoil such as soil being conveyed from the site on the wheels of vehicles.

Consequence:

- Spoil being tracked onto the public road corridors where it is then washed into the existing stormwater drainage infrastructure and is then washed downstream polluting the downstream waterbody.
- Spoil being tracked onto the public road creating dangerous driving conditions for other road users.

Mitigation:

- A shaker grid and wash down facility will be installed at all exits from the construction site. All vehicles leaving the site will have their wheels washed down and pass over the shaker grid to remove any spoil collected on their wheels and retaining the spoil on site.

Maintenance:

- Frequent inspection of the shaker grid to ensure it is clean and still functioning.

13.3 Downstream Site Boundaries

Risk:

- Rainfall runoff falling on the site collecting sediment from the construction site and conveying it overland onto downstream properties and waterbodies.

Consequence:

- Sediment discharge polluting downstream properties and waterbodies.

Mitigation:

- Installation of sediment fences on all downstream boundaries of the site to collect sediment and prevent it discharging onto downstream properties or waterbodies.

Maintenance:

- Regular inspection of the sediment fences to ensure they are functioning correctly and are intact.
- If sediment build up is present it should be removed to ensure correct functionality of the fences.

14. Potable Water

Refer to Appendix B Section 3 for capacity estimates and required potable water supply.

15. Wastewater

Refer to Appendix B Section 4 for capacity estimates and required wastewater supply.

Appendix A Civil Design Documentation

Stantec

NSW GOVERNMENT | sydney METRO

DRAWING LIST	
NO.	DRAWING NAME
CI-000-001	COVER SHEET, DRAWING REGISTRY AND LOCALITY PLAN
CI-007-001	GENERAL NOTES SHEET 1 OF 2
CI-007-002	GENERAL NOTES SHEET 2 OF 2
CI-060-001	GENERAL ARRANGEMENT PLAN
CI-066-001	SITEWORKS DETAILS
CI-070-001	EROSION AND SEDIMENT CONTROL PLAN
CI-076-001	EROSION AND SEDIMENT CONTROL DETAILS
CI-440-001	PAVEMENT PLAN
CI-500-001	STORMWATER CATCHMENT PLAN
CI-520-001	STORMWATER DRAINAGE PLAN
CI-526-001	STORMWATER DRAINAGE DETAILS

CROWS NEST OSD
SITE B

495 PACIFIC HIGHWAY
CROWS NEST
NSW 2065 AUSTRALIA

ISSUED FOR SSDA
2024.06.28

Stantec Project Number: 301351270

GENERAL

1. DESIGN HEREIN HAS BEEN PREPARED BY STANTEC AUSTRALIA PTY LTD LEVEL 9, THE FORUM, 203 PACIFIC HIGHWAY, ST LEONARDS NSW 2065
2. CONTRACTOR TO CHECK WITH ENGINEER IF THESE NOTES ARE TO SUPPLEMENT A CIVIL SPECIFICATION.
3. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
4. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH 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.
5. ALL DIMENSIONS ARE IN MILLIMETRES (mm) & ALL LEVELS ARE IN METRES (m), UNO (UNLESS NOTED OTHERWISE).
6. NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.
7. ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
6. EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.

ELECTRONIC FILES

1. IF APPLICABLE AND UPON REQUEST, ELECTRONIC FILES CAN BE SUPPLIED IN AUTOCAD FORMAT FOR INFORMATION PURPOSES ONLY. THESE FILES ARE NOT INTENDED FOR SETOUT AND ARE NOT TO BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE FILES MAY FORM JUST PART OF OUR DESIGN PACKAGE / PROCESS AND, AS SUCH, THEIR ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED.
2. THE FILES ARE CONSIDERED TO BE "UNCONTROLLED" AND, AS STANTEC ARE UNABLE TO CONTROL THE ACCURACY OF THESE EDITABLE FILES, ALL RESPONSIBILITY FOR SUCH ACCURACY AND THE SUITABILITY OF THESE FILES RESTS WITH THE RECIPIENT.
3. REFER TO THE LATEST HARD COPY ENGINEERING DRAWINGS FOR ALL CURRENT INFORMATION. IN THE EVENT OF ANY DISCREPANCY BETWEEN PAPER AND ELECTRONIC VERSIONS, THE PAPER VERSION IS TO TAKE PRECEDENCE.
4. THE ELECTRONIC FILES SHALL BE USED SOLELY BY THE INTENDED RECIPIENT AND SHALL NOT BE DISTRIBUTED TO OTHERS WITHOUT THE EXPRESS CONSENT OF STANTEC. STANTEC ACCEPTS NO LIABILITY FOR USE OF THE INFORMATION BY ANY THIRD PARTIES.

COUNCIL REQUIREMENTS

1. ALL WORKS TO BE CONDUCTED IN ACCORDANCE WITH THE COUNCIL REQUIREMENTS.
2. THE CONTRACTOR MUST OBTAIN AND SUBMIT TRAFFIC/PEDESTRIAN MANAGEMENT PLANS TO THE COUNCIL PRIOR TO WORKS.
3. ALL AREAS AFFECTED BY WORKS ARE TO BE MINIMIZED AT ALL TIMES AND BE MADE GOOD AT COMPLETION OF WORKS TO THE SATISFACTION OF THE SUPERINTENDENT AND THE COUNCIL.
4. 1500mm MIN FOOTPATHS ARE TO BE MAINTAINED AT ALL TIMES AND, IF WIDTH NOT AVAILABLE, PROVIDE ADVISORY SIGNS REQUESTING PEDESTRIANS TO USE OPPOSITE FOOTPATH.
5. CONTRACTOR TO MEET ALL ABUTTING PROPERTIES REASONABLE ACCESS REQUIREMENTS THAT THEY MAY HAVE.
6. THE WORKS SHALL NOT IMPACT ON THE OPERATIONS OF BUSINESSES, HOTELS, RESTAURANTS, STREET VENDORS, OFF STREET CAR PARKS ETC. ALL PARKING AND NO STOPPING RESTRICTIONS SHALL BE OBSERVED.
7. THE WORKS/INSTALLATION SHALL NOT INTERFERE WITH COUNCILS AND PRIVATE DRAINAGE INFRASTRUCTURE INCLUDING SURFACE DRAINS.
8. THE CONTRACTOR SHALL AGREE TO A DEFECTS LIABILITY PERIOD FOR THE BACKFILLING OF ONE (1) YEAR COMMENCING FROM THE DATE OF WORK. ANY DEFECTS FOUND BY COUNCIL WITHIN THE ONE YEAR PERIOD SHALL BE RECTIFIED BY THE APPLICANT/CONTRACTOR TO COUNCILS SATISFACTION WITHIN TWO WEEKS OF NOTIFICATION IN WRITING.
9. IF COUNCIL'S INFRASTRUCTURE SUCH AS PARKING SIGNS, ROAD OR LINE MARKINGS, PARKING METERS TICKET MACHINES OR SUPPORTING CABLES/CONDUITS, IRRIGATION PIPES OR STREET FURNITURE ARE REMOVED OR DAMAGED AS A RESULT OF THE WORKS THE CONTRACTOR SHALL, AT COMPLETION OR WORKS, ARRANGE AND PAY FOR THEIR REINSTATEMENT.
10. ALL DRAWINGS TO BE READ IN CONJUCTION WITH LATEST COUNCIL STANDARD DRAWINGS. ANY DESCREPANCY TO BE RAISED WITH STANTEC.

ALTERNATIVE PRODUCTS

1. ALTERNATIVE PRODUCTS SUCH AS ALTERNATIVE STORMWATER PIPE MATERIALS OR WATER QUALITY TREATMENT DEVICES MAY ONLY BE USED WITH WRITTEN APPROVAL OF STANTEC. ALL TESTING AND MATERIAL DATA SPECIFICATIONS TO BE SUPPLIED TO STANTEC FOR REVIEW.

EXISTING SERVICES

1. EXISTING SERVICES, WHERE SHOWN, HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.
2. EXISTING SERVICES SHOWN ON THE PLANS ARE LOCATED APPROXIMATELY BASED ON INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES AND/OR SURVEY RECEIVED. STANTEC DOES NOT TAKE RESPONSIBILITY FOR THE SUITABILITY OR LOCATION/DEPTH OF THE EXISTING SERVICES.
3. STANTEC DOES NOT TAKE RESPONSIBILITY FOR ANY POSSIBLE DESIGN ADJUSTMENT OF ANY ADDITIONAL EXISTING SERVICES OR THE ASSOCIATED AUTHORITY NEGOTIATIONS AS A RESULT OF THE PROPOSED WORKS.
4. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. STANTEC DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
5. EXISTING BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE FEATURES EXISTING PRIOR TO ANY DEMOLITION WORKS.
6. THE CONTRACTOR SHALL UNDERTAKE POTHOLING AND/OR INVESTIGATION WORKS TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCING WORKS. THIS INCLUDES CONFIRMING THE LOCATION AND DETAILS OF THE EXISTING SITE STORMWATER DISCHARGE.
7. ALL AREAS WITHIN THE EXTENT OF WORKS TO BE SCANNED FOR EXISTING UTILITY SERVICES AND LOCATIONS PRIOR TO CONSTRUCTION.
8. WHIST REASONABLE EFFORT HAS BEEN MADE TO AVOID CLASHES WITH EXISTING SERVICES, EXTENT AND QUALITY OF SUPPLIED DATA IS INSUFFICIENT FOR COMPLETE CLASH DETECTION ACCURACY. CONTRACTOR TO TAKE CARE WORKING AROUND EXISTING UTILITIES AND REPORT ANY POSSIBLE CLASHES BACK TO THE ENGINEER.
9. THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION, REMOVAL AND DISPOSAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA, AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
10. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
11. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SERVICE AUTHORITY. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE RELEVANT SERVICE AUTHORITY.
12. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN WRITTEN APPROVAL OF THEIR PROGRAMME FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
13. CLEARANCE AND COVER REQUIREMENTS SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY BEFORE COMMENCEMENT OF WORKS AND SHALL BE ADHERED TO AT ALL TIMES.

PROPOSED SERVICES

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH RELEVANT SERVICE AUTHORITY DOCUMENTATION AND CURRENT NSW STREETS OPENING CONFERENCE GUIDE TO CODES AND PRACTICES FOR STREETS OPENING LITERATURE.
2. THE CONTRACTOR SHALL ATTEND, MANAGE & SUPERVISE THE PROVISION OF PUBLIC UTILITY SERVICES TO THE WORKS GENERALLY AS INDICATED ON THE SERVICES PLANS, NOTING THAT PRIOR & DURING CONSTRUCTION THE PUBLIC UTILTITY AUTHORITIES WILL FINALISE THEIR DOCUMENTATION TO CONSTRUCTION ISSUE STANDARD.
3. THE CIVIL CONTRACTOR (TRENCH PROVIDER) IS TO ARRANGE ON SITE MEETING WITH ALL SERVICE AUTHORITIES PRIOR TO THE INSTALLATION OF CONDUITS.
4. THE CIVIL CONTRACTOR TO CO-ORDINATE INSTALLATION OF ELECTRICITY, GAS,TELECOMMUNICATION, WATER AND SEWER SERVICES.
5. IT IS EXPECTED THAT ELECTRICITY, GAS AND TELECOMMUNICATION SERVICES ARE TO BE LAID FOLLOWING THE INSTALLATION OF STORMWATER, SEWER AND WATER SERVICES AND KERB AND GUTTER.
6. ALL UTILITY AUTHORITY REPRESENTATIVES TO INSPECT ROAD CROSSINGS PRIOR TO SEALING.
7. ALL ELECTRICAL ROAD CROSSINGS TO BE CLASS 6 (ORANGE) uPVC CONDUITS.
8. ALL GAS ROAD CROSSINGS TO BE uPVC GREY SEWER GRADE CONDUITS.
9. FOR ALL STREET POLES, REFER TO THE ELECTRICAL ENGINEER'S DOCUMENTATION. STREET POLES TO BE POSITIONED THE APPROPRIATE DISTANCE FROM FACE OF KERB TO FACE OF POLE ACCORDING TO THE CURRENT NSW STREETS OPENING CONFERENCE GUIDE TO CODES AND PRACTICES FOR STREETS OPENING LITERATURE. CONTRACTOR TO ALLOW TO EXCAVATE AND BACKFILL TRENCH GENERALLY IN ACCORDANCE WITH NOTE 2.
10. ALL SERVICE PIT COVERS AND MARKERS ARE TO BE LAID WHOLLY WITHIN THE CONCRETE FOOTPATH. CONTACT SUPERINTENDANT SHOULD DIFFICULTIES ARISE.
11. TELSTRA'S PLANS SHOW ONLY THE PRESENCE OF CABLES AND PLANT. THEY ONLY SHOW THEIR POSITION RELATIVE TO ROAD BOUNDARIES, PROPERTY FENCES ETC. AT THE TIME OF INSTALLATION AND TELSTRA DOES NOT WARRANT OR HOLD OUT THAT SUCH PLANS ARE ACCURATE THEREAFTER DUE TO CHANGES THAT MAY OCCUR OVER TIME. DO NOT ASSUME DEPTH OR ALIGNMENT OF CABLES OR PLANT AS THESE VARY SIGNIFICANTLY.
12. THE CONTRACTOR HAS A DUTY OF CARE WHEN EXCAVATING NEAR TELSTRA CABLES AND PLANT. BEFORE USING MACHINE EXCAVATORS TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG POTHOLING TO IDENTIFY IT'S LOCATION TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO IT'S PROPERTY AND LOSSES CAUSED TO TELSTRA AND IT'S CUSTOMERS.

EROSION AND SEDIMENT CONTROL

GENERAL INSTRUCTIONS

1. THIS SPECIFICATION IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, AND ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED AND RELATING TO DEVELOPMENT AT THE SUBJECT SITE.
2. THE CONTRACTOR WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION AND CONSTRUCTED FOLLOWING THE GUIDELINES OF "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", DEPT OF HOUSING, 2004 (BLUE BOOK).
3. REQUIRED SITE SPECIFIC ADDITIONS/CHANGES TO THE SOIL AND WATER MANAGEMENT WORKS ARE TO BE MADE AS NECESSARY BY THE SUPERINTENDENT.
4. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH
   - 4.1. LOCAL AUTHORITY REQUIREMENTS
   - 4.2. EPA REQUIREMENTS
   - 4.3. NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
5. MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
6. WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
7. CONTRACTOR IS TO ENSURE ALL EROSION & SEDIMENT CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFECTIVELY. REPAIRS AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.
8. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED PRIOR TO ANY GROUND DISTURBANCE.

LAND DISTURBANCE

1. DISTURBANCE TO BE NO FURTHER THAN 5 (PREFERABLY 2) METRES FROM THE EDGE OF ANY ESSENTIAL ENGINEERING ACTIVITY AS SHOWN ON THE APPROVED PLANS. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE ZONES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
2. ACCESS AREAS ARE TO BE LIMITED TO A MAXIMUM WIDTH OF 10 METRES. THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON-SITE. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE BOUNDARIES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
3. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE WILL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   - 3.1. INSTALL A BARRIER AND SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
   - 3.2. CLEAR SITE AND STRIP AND STOCKPILE TOPSOIL IN LOCATIONS AS AGREED WITH THE CONTRACTOR.
   - 3.3. CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
   - 3.4. CONSTRUCT DIVERSION DRAINS AS REQUIRED.
   - 3.5. INSTALL MESH AND GRAVEL INLETS FOR ANY ADJACENT KERB INLETS. REFER DETAIL.
   - 3.6. INSTALL GEOTEXTILE INLET FILTERS AROUND ANY ON-SITE DROP INLET PITS. REFER DETAIL.
   - 3.6. INSTALL SEDIMENT BASIN AS SHOWN ON PLAN (IF REQUIRED).
   - 3.7. UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS ENSURING THAT ROOF AND/OR PAVED AREA STORMWATER SYSTEMS ARE CONNECTED TO PERMANENT DRAINAGE AS SOON AS PRACTICABLE.
   - 3.8. GRADE AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 20 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
   - 3.9. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.
4. ENSURE THAT SLOPE LENGTHS DO NOT EXCEED 80 METRES WHERE PRACTICABLE. SLOPE LENGTHS ARE DETERMINED BY SILTATION FENCING AND CATCH DRAIN SPACING.
5. ON COMPLETION OF MAJOR WORKS, LEAVE DISTURBED LANDS WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING TOPSOIL LATER.

SEDIMENT CONTROL

1. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN ON THE PLAN AND ELSEWHERE AT THE DISCRETION OF THE SITE SUPERINTENDENT TO CONTAIN SOIL AS NEAR AS POSSIBLE TO THEIR SOURCE.
2. SEDIMENT FENCES WILL NOT HAVE CATCHMENT AREAS EXCEEDING 900 SQUARE METRES AND HAVE A STORAGE DEPTH OF AT LEAST 0.6 METRES.
3. SEDIMENT REMOVED FROM ANY TRAPPING DEVICES WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS CANNOT OCCUR.
4. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS AND DRIVEWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
5. WHERE AREA PERMITS, STOCKPILES SHALL BE A MAXIMUM OF 2 METRES IN HEIGHT AND WITH SIDE SLOPES OF 1(VER) TO 2(HOR). ADVICE SHOULD BE SOUGHT FROM THE CONTRACTOR FOR TEMPORARY STOCKPILES HIGHER THAN 2 METRES OR WITH SIDE SLOPES STEEPER THAN 1(VER) TO 2 (HOR).
6. TEMPORARY STOCKPILES STORED FOR LESS THAN 20 DAYS WILL BE ESTABLISHED WITH THE FOLLOWING CONTROLS:
   - 6.1. SEDIMENT FENCE ON DOWNSTREAM SIDE OF STOCKPILE
   - 6.2. DUST SUPPRESSION MEASURES TO BE PROVIDED SUCH AS COVERING STOCKPILE WITH GEOFABRIC AND/OR REGULAR WATERING
7. TEMPORARY STOCKPILES STORED FOR MORE THAN 20 DAYS WILL BE ESTABLISHED WITH THE FOLLOWING CONTROLS:
   - 7.1. SEDIMENT FENCE ON DOWNSTREAM SIDE OF STOCKPILE
   - 7.2. DUST SUPPRESSION MEASURES TO BE PROVIDED SUCH AS COVERING STOCKPILE WITH GEOFABRIC AND/OR REGULAR WATERING
   - 7.3. STABILISATION OF STOCKPILE SURFACE WITH HYDROMULCH / GEOTEXTILE BLANKET / SOIL GLUE / ROCK MULCH OR OTHER APPROVED EQUIVALENT
   - 7.4. PROVIDE DIVERSION BANK ON UPSTREAM SIDE TO PROTECT STOCKPILE FROM STORMWATER OVERLAND FLOW
8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
9. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE AND MEETS THE RELEVANT AUTHORITY REQUIREMENTS PRIOR TO LEAVING THE SITE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
10. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.
11. ACCESS TO SITES SHOULD BE STABILISED TO REDUCE THE LIKELIHOOD OF VEHICLES TRACKING SOIL MATERIALS ONTO PUBLIC ROADS AND ENSURE ALL-WEATHER ENTRY/EXIT.

EROSION CONTROL

1. DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
2. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.
3. EARTH BATTERS WILL BE CONSTRUCTED WITH AS LOW A GRADIENT AS PRACTICABLE BUT NO STEPPER, UNLESS NOTED OTHERWISE, THAN:
   - 3.1. 2(H):1(V) WHERE SLOPE LENGTH IS LESS THAN 12 METRES
   - 3.2. 2.5(H):1(V) WHERE SLOPE LENGTH IS BETWEEN 12 AND 16 METRES
   - 3.3. 3(H):1(V) WHERE SLOPE LENGTH IS BETWEEN 16 AND 20 METRES
   - 3.4. 4(H):1(V) WHERE SLOPE LENGTH IS GREATER THAN 20 METRES
4. ALL WATERWAYS, DRAINS, SPILLWAYS AND THEIR OUTLETS WILL BE CONSTRUCTED TO BE STABLE IN AT LEAST THE 5% AEP TIME OF CONCENTRATION STORM EVENT.
5. WATERWAYS AND OTHER AREAS SUBJECT TO CONCENTRATED FLOWS AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND COVER C-FACTOR OF 0.05 (70% GROUND COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION. FLOW VELOCITIES ARE TO BE LIMITED TO THOSE SHOWN IN TABLE 5-1 OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", DEPT OF HOUSING 2004 (BLUE BOOK). FOOT AND VEHICULAR TRAFFIC WILL BE PROHIBITED IN THESE AREAS.
6. STOCKPILES, AFTER CONSTRUCTION, ARE TO HAVE A MAXIMUM GROUND COVER C-FACTOR OF 0.1 (60% GROUND COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION.
7. ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND COVER C-FACTOR OF 0.15 (50% GROUND COVER) WITHIN 20 WORKING DAYS FROM INACTIVITY EVEN THOUGH WORKS MAY CONTINUE LATER.
8. FOR AREAS OF SHEET FLOW, USE THE FOLLOWING GROUND COVER PLANT SPECIES FOR TEMPORARY COVER: JAPANESE MILLET 20KG/HA AND OATS 20KG/HA.
9. PERMANENT REHABILITATION OF LANDS AFTER CONSTRUCTION WILL ACHIEVE A GROUND COVER C-FACTOR OF LESS THAN 0.1 AND LESS THAN 0.05 WITHIN 60 DAYS. NEWLY PLANTED LANDS WILL BE WATERED REGULARLY UNTIL AN EFFECTIVE COVER IS ESTABLISHED AND PLANTS ARE GROWING VIGOROUSLY. FOLLOW-UP SEED AND FERTILISER WILL BE APPLIED AS NECESSARY.
10. RE-VEGETATION SHOULD BE AIMED AT RE-ESTABLISHING NATURAL SPECIES. NATURAL SURFACE SOILS SHOULD BE REPLACED AND NON-PERSISTANT ANNUAL COVER CROPS SHOULD BE USED.

SITE INSPECTION AND MAINTENANCE

1. THE SITE PRINCIPAL CONTRACTOR WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:
   - 1.1. ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT ANY NECESSARY REPAIRS
   - 1.2. REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS AND PAVED AREAS
   - 1.3. REMOVE TRAPPED SEDIMENT WHENEVER THE DESIGN CAPACITY OF THAT STRUCTURE HAS BEEN EXCEEDED
   - 1.4. ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS NECESSARY
   - 1.5. CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS. MAKE ONGOING CHANGES TO THE PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECTED TO CHANGES IN CONDITIONS ON THE WORK-SITE OR ELSEWHERE IN THE CATCHMENT
   - 1.6. MAINTAIN EROSION AND SEDIMENT CONTROL STRUCTURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED
2. THE SITE PRINCIPAL CONTRACTOR SHALL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:
   - 2.1. THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS
   - 2.2. THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS
   - 2.3. THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE
   - 2.4. THE NEED FOR DUST PREVENTION STRATEGIES
   - 2.5. ANY REMEDIAL WORKS TO BE UNDERTAKEN. THE LOGBOOK WILL BE KEPT ON-SITE AND MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF THE WORKS

WASTE CONTROL MEASURES

1. ACCEPTABLE BINS WILL BE PROVIDED FOR ANY CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHING, LIGHTWEIGHT WASTE MATERIALS AND LITTER. CLEARANCE SERVICES WILL BE PROVIDED AT LEAST WEEKLY. DISPOSAL OF WASTE WILL BE IN A MANNER APPROVED BT THE SITE SUPERINTENDENT.
2. ALL POSSIBLE POLLUTANT MATERIALS ARE TO BE STORED WELL CLEAR OF ANY POORLY DRAINED AREAS, FLOOD PRONE AREAS, STREAMBANKS, CHANNELS AND STORMWATER DRAINAGE AREAS. STORE SUCH MATERIALS IN A DESIGNATED AREA UNDER COVER WHERE POSSIBLE AND WITHIN CONTAINMENT BUNDS.
3. ALL PERSONNEL ARE TO BE INFORMED OF THEIR OBLIGATION TO USE WASTE CONTROL FACILITIES PROVIDED.
4. ANY DE-WATERING ACTIVITIES ARE TO BE CLOSELY MONITORED TO ENSURE THAT WATER IS NOT POLLUTED BY SEDIMENT, TOXIC MATERIALS OR PETROLEUM PRODUCTS.
5. PROVIDE DESIGNATED VEHICULAR WASHDOWN AND MAINTENANCE AREAS WHICH ARE TO HAVE CONTAINMENT BUNDS.
6. ALL WASHDOWN AND MAINTENANCE AREAS ARE TO BE IMPERVIOUS PAVEMENTS TO RETAIN WATER ON THE SURFACE. NO RUNOFF FROM WASHDOWN AND MAINTENANCE AREAS ARE TO BE INFILTRATED.

OTHER MATTERS

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIR AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED.
2. ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:
   - 2.1. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE
   - 2.2. ENSURING THAT NOTHING IS NAILED TO THEM
   - 2.3. PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS.
   - 2.4. ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5 METRES OR HALF THE DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND THE TRUNK, WHICH EVER IS THE GREATER
   - 2.5. A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE (E.G. A GRAVEL BED) IS PLACED UNDER ALL FILL LAYERS OF MORE THAN 300 MILLIMETRES DEPTH
   - 2.6. CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.
3. WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE REMEDIAL ACTION PLAN, IF APPLICABLE. ANY FINDS ARE TO BE BROUGHT TO THE SITE SUPERINTENDENT'S ATTENTION WITHIN 24 HOURS.
4. ANY RECOMMENDATIONS IN THE ARBORISTS REPORT ARE TO BE FOLLOWED AND INCORPORATED INTO THE EROSION AND SEDIMENT CONTROL WORKS.

STORMWATER DRAINAGE

1. ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.
2. THE CONTRACTOR IS TO EXERCISE DUE CARE AND ATTENTIION DURING PIPE INSTALLATION ENSURING PIPES ARE NOT DAMAGES DURING CONSTRUCTION AND CONSTRUCTION TRAFFIC DOES NOT EXCEED THE LOAD SPECIFIED FOR THE PIPE PROPOSED. IF THE PROPOSED PIPE CLASS WILL NOT WITHSTAND THE CONSTRUCTION LOAD, THE CONTRACTOR IS TO UPGRADE PIPE CLASSES TO SUIT AT NO COST TO THE PRINCIPAL.
3. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS '3' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
4. PIPES LESS THAN OR EQUAL TO 225 DIA. SHALL BE uPVC DWV GRADE CLASS SN8 IN ACCORDANCE WITH AS/NZS 1260:2009-PVC-U PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATION WITH SOLVENT WELDED JOINTS.
5. EQUIVALENT STRENGTH REINFORCED CONCRETE OR FIBROUS REINFORCED CONCRETE PIPES MAY BE USED SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
6. CONTRACTOR IS TO ENSURE THAT ALL DRAINAGE STRUCTURES ARE ADEQUATELY REINFORCED AND SHALL PROVIDE DESIGN CERTIFICATION FOR ALL REINFORCED CONCRETE LIDS.
7. ALL STORMWATER DRAINAGE LINES UNDER PROPOSED BUILDING SLABS TO BE uPVC PRESSURE PIPE GRADE 6. ENSURE ALL VERTICALS AND DOWNPIPES ARE uPVC PRESSURE PIPE, GRADE 6 FOR A MIN OF 3.0m IN HEIGHT.
8. PIPES TO BE INSTALLED TO TYPE H2 (NOT UNDER ROADWAYS) OR TYPE HS2 (UNDER ROADWAYS) SUPPORT IN ACCORDANCE WITH AS 3725 (2007). IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)
9. PIT COVER LEVELS TO MATCH SURROUNDING FINISHED LEVELS. DESIGN FINISHED SURFACE LEVELS OF STRUCTURES ARE FOR THE CONTRACTORS GUIDANCE ONLY. ACTUAL FINISHED LEVELS SHALL BE SET OUT AS DIRECTED ON SITE IN KEEPING WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL AUTHORITY AND ACTUAL FINISHED GROUND LEVELS.
10. STORMWATER PIT COVERS FOR JUNCTION AND GRATED PITS TO COMPLY WITH AS 3996 FOR:

LOAD CLASS	TYPICAL USE
CLASS A	INTERNAL PEDESTRIAN PRECINCTS ONLY. NO VEHICULAR TRAFFIC
CLASS B	EXTERNAL AREAS INCLUDING FOOTPATHS, FOOTWAYS AND LIGHT VEHICULAR TRAFFIC ONLY
CLASS D	CARS, TRUCKS (HIGHWAY TRAFFIC) AND COMMERCIAL VEHICULAR TRAFFIC
CLASS E	HEAVY DUTY FORKLIFTS AND EARTHMOVING EQUIPMENT

11. REFER TO TABLE BELOW FOR MINIMUM PIT DIMENSIONS (AS 3500.3 TABLE 7.5.2.1):

DEPTH TO INVERT	WIDTH	LENGTH
LESS THAN 600mm	450mm	450mm
FROM 600mm TO 900mm	600mm	600mm
FROM 900mm TO 1200mm	600mm	900mm
MORE THAN 1200mm	900mm	900mm

12. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500 3.1 (2006) AND AS/NZS 3500 3.2 (2010).
13. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY STANTEC AUSTRALIA.
14. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
15. PIPES FOR SUBSOIL DRAINS SHALL BE SLOTTED 100mm DIA. CLASS 1000 WRAPPED IN GEOFABRIC, UNO, COMPLYING WITH THE REQUIREMENTS OF AS2439. ALL SUBSOIL PIPES SHALL BE FACTORY SLOTTED HDPE, MIN. 100mm DIA. CLASS SN8, SIMILAR OR EQUAL TO VINIDEX DRAINCOIL, CERTIFIED uPVC, IN ACCORDANCE WITH AS1260, AS2032 (PIPE) & AS3789 (JOINTING) INSTALLED ON GEOTEXTILE FABRIC WITH 150mm SURROUND OF 25mm BLUE METAL AGGREGATE, UNO. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND PAVEMENTS, UNSLOTTED uPVC DWV GRADE CLASS SN8 SEWER GRADE PIPE IS TO BE USED.
16. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
17. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
18. ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS. CCTV SHALL BE UNDERTAKEN OF EXISTING PIPES WHERE NECESSARY TO CONFIRM THEIR ADEQUACY PRIOR TO AND FOLLOWING CONSTRUCTION.
19. THE CONTRACTOR IS TO ORGANISE AND STAGE CONSTRUCTION WORK AND UNDERTAKE ANY DIVERSION WORKS TO ENSURE THE EXISTING DRAINAGE IS ABLE TO CONVEY ALL STORMWATER FLOWS THAT MAY OCCUR DURING THE PERIOD OF THE CONSTRUCTION WORKS.
20. ANY DAMAGE TO THE WORKS DUE TO STORMWATER FLOWS OR FLOODING DURING THE CONSTRUCTION PERIOD IS AT THE CONTRACTOR'S RISK.
21. SETOUT POINTS FOR STORMWATER STRUCTURES ARE AS INDICATED IN THE DRAWINGS UNLESS OTHERWISE NOTED.
22. ALL PAVED SURFACE LEVELS AND GRADES TO BE COORDINATED WITH GULLY PIT LEVELS TO ENSURE NO UNDRAINED AREAS OCCUR.
23. THE SIDES OF ALL PIPE TRENCH EXCAVATIONS DEEPER THAN 1.0m SHALL BE FULLY SUPPORTED AT ALL TIMES AND HAVE APPROPRIATE EDGE PROTECTION.
24. ALL NEW PIPES TO BE LAID IN AN UPSTREAM DIRECTION. THE LINE, LEVEL AND LOCATION OF EXISTING SERVICES CROSSING THE LINE OF THE PROPOSED STORMWATER PIPE SHALL BE DETERMINED BY EXCAVATION PRIOR TO THE LAYING OF THE PIPE. IF CONFLICT IS APPARENT, THE ENGINEER SHALL BE NOTIFIED AND INSTRUCTIONS AS TO WHETHER THE EXISTING SERVICE IS TO BE ADJUSTED OR THE PROPOSED PIPE INVERT ALTERED WILL BE ISSUED.
25. PIPE BEDDING, HAUNCH AND BACKFILL TO BE AS SHOWN ON THE CIVIL DETAILS DRAWINGS AND THE CIVIL SPECIFICATION. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50mm CONCRETE BED OR 75mm THICK BED OF 12mm BLUE METAL UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK.
26. SUBSOIL DRAINAGE PIPES TO BE SLOTTED PIPE AND FILTER SOCK CLASS 1000 TO AS2439 PART 1 LAID AT PREFERABLE MINIMUM GRADE 1 IN 100 OR ABSOLUTE MINIMUM 1 IN 200 WHERE LIMITED BY OUTFALL LEVELS.
27. 100mm DIA. SUBSOIL DRAINAGE SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS AND CONNECTED TO THE SITE STORMWATER DRAINAGE SYSTEM, UNO.:-
   - 27.1. UNDER KERBS AND ADJACENT TO ALL PAVEMENTS (UNLESS IT COINCIDES WITH A STORMWATER PIPE)
   - 27.2. AT THE BASE OF THE HIGH SIDE OF ALL RETAINING WALLS
   - 27.3. AROUND THE BUILDING SLAB FOOTPRINT
   - 27.4. AROUND ALL STORMWATER PITS

Notes

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Notes

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File Name: CI-007-001.DWG	HAL	HAL	RPW	#
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Title
GENERAL NOTES
SHEET 1 OF 2

Project No. 301351270
Scale AS SHOWN
Revision B
Drawing No. **CI-007-001**

Plotted: 28/06/2024 5:40:23 PM By: OAKLEY, NATHAN
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STORMWATER DRAINAGE

28. STORMWATER STRUCTURES ARE TO BE CONSTRUCTED PERPENDICULAR TO THE INCOMING PIPEWORK UNLESS OTHERWISE NOTED.
29. PRECAST COMPONENTS SHALL BE CONNECTED BY MEANS OF EPOXY OR CHEMICAL GROUTED BARS OF THE SAME DIAMETER AND SPACING AS THE SMALLER BARS IN THE RESPECTIVE COMPONENTS.
25. PRE-CAST PITS MUST HAVE LIFTING ANCHORS.
26. WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLES AS PER AS3725. CONSTRUCTION LOADS HAVE NOT BEEN ALLOWED FOR.
27. ALL EXPOSED EDGES ON STORMWATER PITS TO BE ROUNDED TO 5mm RAD. UNO.
28. ALL MILD STEEL FIXTURES INCLUDING GRATES, FRAMES, STEP IRONS, LADDERS, ETC., SHALL BE HOT DIP GALVANISED. GALVANISING SHALL COMPLY WITH THE REQUIREMENTS OF AS1214 OR AS1650, AS APPROPRIATE.
29. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
30. PITS DEEPER THAN 1200mm SHALL HAVE ACCESS LADDERS OR STEP IRONS INSTALLED AND SHALL BE IN ACCORDANCE WITH AS1657 AND HTHE LOCAL OR STATUTORY REQUIREMENTS.
31. WHERE A PIT IS IDENTIFIED AS A CONFINED SPACE, PIT COVERS SHALL BE PROVIDED WITH STANDARD CONFINED SPACE SIGNAGE.
32. CAPPED FLUSHING POINTS MUST BE PROVIDED FOR ALL SUBSOIL AND SEEPAGE DRAINAGE SYSTEMS AT THE END OF EACH PIPE, AT MAX. 30m SPACING AND AT CHANGES IN DIRECTION.
33. THE CONTRACTOR SHALL OBTAIN A ROAD OPENING PERMIT FOR ANY WORKS WITHIN THE PUBLIC ROAD RESERVE AND COMPLY WITH ALL AUTHORITY REQUIREMENTS.
34. PIPES SHALL BE TRUE TO GRADES SHOWN AND ALIGNED SO THAT THE CENTRES OF THE INLET PIPES INTERSECT WITH THE CENTRE OF THE OUTLET PIPE AT THE DOWNSTREAM FACE OF THE PIT.
35. MINIMUM GRADES FOR GRAVITY STORMWATER DRAINAGE SHALL CONFORM TO AS 3500 PART 3 AS FOLLOWS, UNO:-
    - 35.1. 1% FOR 100mm AND 150mm DIA. PIPES
    - 35.2. 0.5% FOR 225mm DIA. PIPES
    - 35.3. 0.4% FOR 300mm DIA. PIPES
    - 35.4. 0.33% FOR 375mm DIA. PIPES
36. MINIMUM DEPTH OF COVER SHALL BE AS FOLLOWS, UNO:-
    - 36.1. 300mm IN PRIVATE PROPERTY (NON-VEHICULAR TRAFFIC)
    - 36.2. 450mm IN PUBLIC AREAS
    - 36.3. 600mm IN VEHICULAR TRAFFICABLE AREAS (FOOTWAY/ROADWAYS)
37. BED ALL PIPES FIRMLY AND EVENLY ONTO IMPORTED BEDDING FILL MATERIAL.
38. LAY AND JOINT ALL PIPES IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION AND
    - AS 3725 BURIED FLEXIBLE PIPELINES
    - AS 2566 LOADS ON BURIED FLEXIBLE PIPELINES
    - AS 1597.2 PRECAST REINFORCED CONCRETE BOX CULVERTS
    - AS 3500 NATIONAL PLUMBING AND DRAINAGE CODE
    - SYDNEY WATER REQUIREMENTS (WHERE APPLICABLE)
39. ALLOW TO TEST ALL PIPES AND PITS TO MANUFACTURERS REQUIREMENTS.
40. WHERE STORMWATER DRAINAGE IS LAID IN THE VICINITY OF TREES / CANOPIES OF TREES, THE WORKS ARE TO BE COMPLETED TO THE PROJECT ARBORISTS REQUIREMENTS.

ON-SITE DETENTION (OSD) NOTES

1. THIS SPECIFICATION IS TO BE READ IN CONJUNCTION WITH THE STORMWATER DRAINAGE NOTES.
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS, EXISTING LEVELS, SERVICES AND STRUCTURES ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
3. ALL WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS AND THE SPECIFICATION.
4. ON COMPLETION OF PROPOSED WORKS, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL, GRASSED AND LANDSCAPE AREAS AND ROAD PAVEMENTS, UNO.
5. CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS, IF APPLICABLE.
6. MAKE SMOOTH TRANSITION TO EXISTING / PROPOSED SERVICES AND MAKE GOOD.
7. WHERE NEW WORKS ABUT EXISTING, THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.
8. THE BASE OF THE OSD TANK IS TO BE SCREEDED TO ACHIEVE A MINIMUM 1% GRADE, IN ACCORDANCE WITH AUTHORITY REQUIREMENTS AND THE ENGINEERING PLANS, TO PREVENT PONDING OF WATER IN THE TANK AND DIRECT ALL FLOWS TO THE OUTLET.
9. THE CONTRACTOR MUST ENSURE THE LEVELS SPECIFIED ON THE PLANS ARE ACHIEVED TO A 5mm ACCURACY.
10. FOLLOWING CONSTRUCTION, WORK-AS-EXECUTED (WAE) DRAWINGS ARE TO BE PROVIDED TO STANTEC CONFIRMING THE FOLLOWING:
    - 10.1. TANK REDUCED LEVELS (RL)
    - 10.2. SOFFIT LEVEL
    - 10.3. BASE INVERT LEVELS (IL)
    - 10.4. TOTAL EFFECTIVE VOLUME
    - 10.5. INSTALLATION OF THE TRASH RACK
    - 10.6. INSTALLATION OF THE ORIFICE PLATE, IF APPLICABLE, AND DIAMETER
    - 10.7. INSTALLATION OF INTERNAL WEIR WALLS
    - 10.8. INSTALLATION OF SUMP, IF APPLICABLE
    - 10.9. INSTALLATION OF STEP IRONS, IF APPLICABLE. STEP IRONS ARE TO BE INSTALLED IN ALL TANK THAT EXCEED 1200mm DEPTH
    - 10.10. INSTALLATION OF WATER QUALITY IMPROVEMENT DEVICES, IF APPLICABLE

    WAE PLANS ARE TO BE UNDERTAKEN BY A REGISTERED SURVEYOR.
10. CONTRACTOR IS TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
11. A GENERAL INSPECTION OF THE OSD TANK IS TO BE UNDERTAKEN EVERY SIX (6) MONTHS AND AFTER MAJOR STORM EVENTS. THE GENERAL INSPECTION SHALL INVOLVE THE FOLLOWING:
    - 11.1. VISUAL INSPECTION INSIDE THE TANK
    - 11.2. CONDITION INSPECTION OF COMPONENTS SUCH AS ORIFICE PLATES AND VALVES
    - 11.3. REMOVAL AND DISPOSAL OF LARGER GROSS POLLUTANTS TO PREVENT BLOCKAGES
    - 11.4. MINOR RECTIFICATION WORKS AS REQUIRED
12. THE OSD TANK SHALL BE HOSED OUT AND CLEANED ON AN ANNUAL BASIS.

ROOF AND SUSPENDED FLOOR DRAINAGE

1. ROOF AND SURFACE DRAINAGE (WITHIN THE BUILDING FOOTPRINT, INCLUSIVE OF BALCONIES, TERRACES, PODIUMS ETC) IS TO BE DETAILED BY THE HYDRAULIC CONSULTANT.
2. THE CONTRACTOR SHALL COORDINATE THE NECESSARY INTERFACE BETWEEN THE HYDRAULIC AND CIVIL WORKS.

Notes

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CROWS NEST - SITE B

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File Name: CI-007-001.DWG	HAL	HAL	RPW	#
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Title
GENERAL NOTES
SHEET 2 OF 2

Project No.
301351270

Scale
AS SHOWN

Revision
B

Drawing No.
CI-007-002

Plotted: 28/06/2024 5:45:25 PM By: OAKLEY, NATHAN
\\AU007-FP\APD_CPS\SHARED_PROJECTS\301351270\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET.SET

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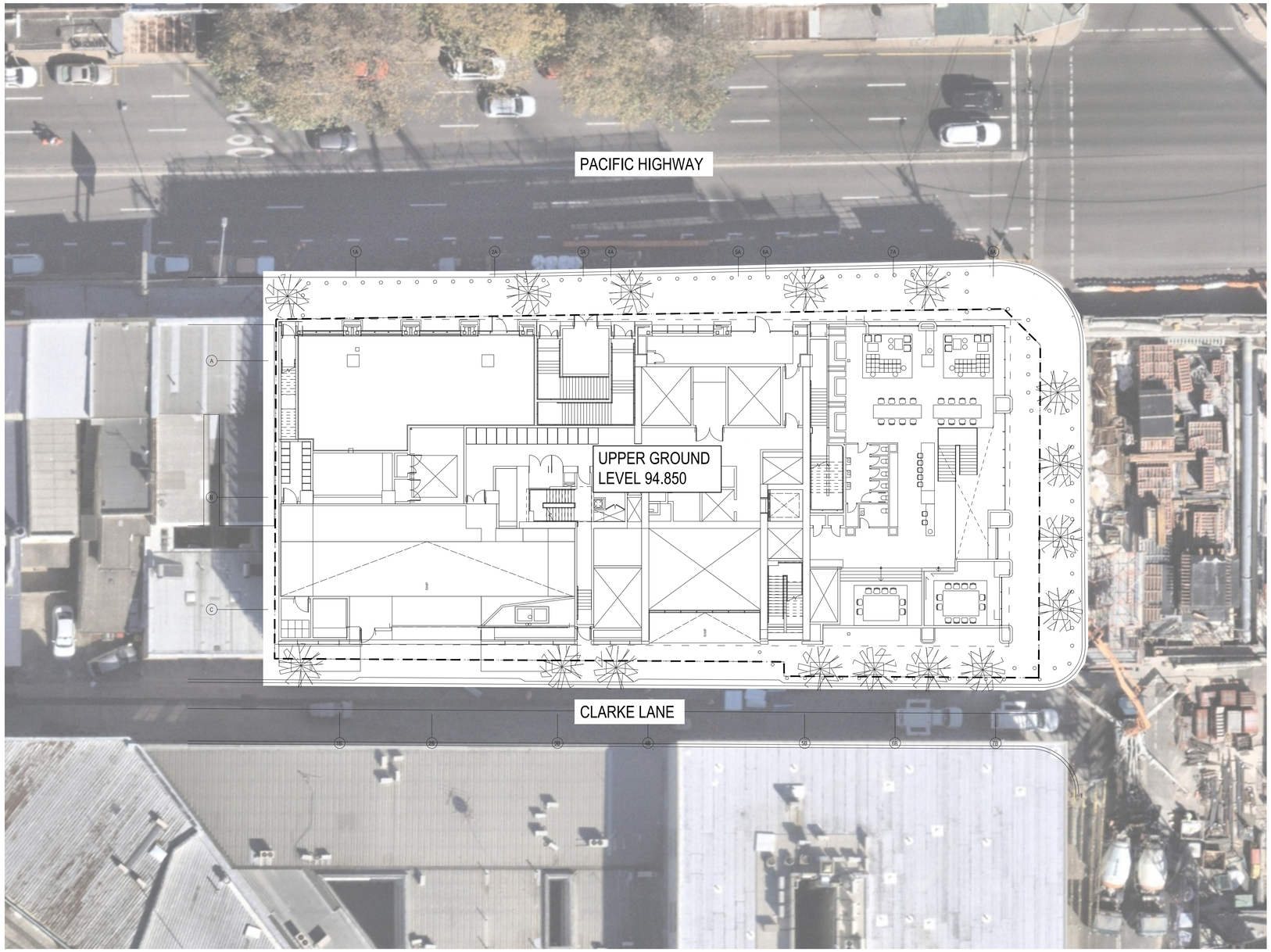

1:200 2 0 2 4 6 8 10 A1
1:400 A3

Notes

A	ISSUED FOR DA	LPT	MDR	2024.02.29
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

PRELIMINARY

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Tel: +61 8 9842 3700

Client/Project Logo

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Client/Project

CROWS NEST - SITE B

495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-050-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
EXISTING CONDITIONS PLAN

Project No.
301351270

Scale
1:200

Revision
A

Drawing No.
CI-050-001

Plotted: 28/06/2024 5:40:47 PM By: OAKLEY, NATHAN
\\AU007214FAP01_CIFS\SHARED_PROJECTS\301351270\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SET

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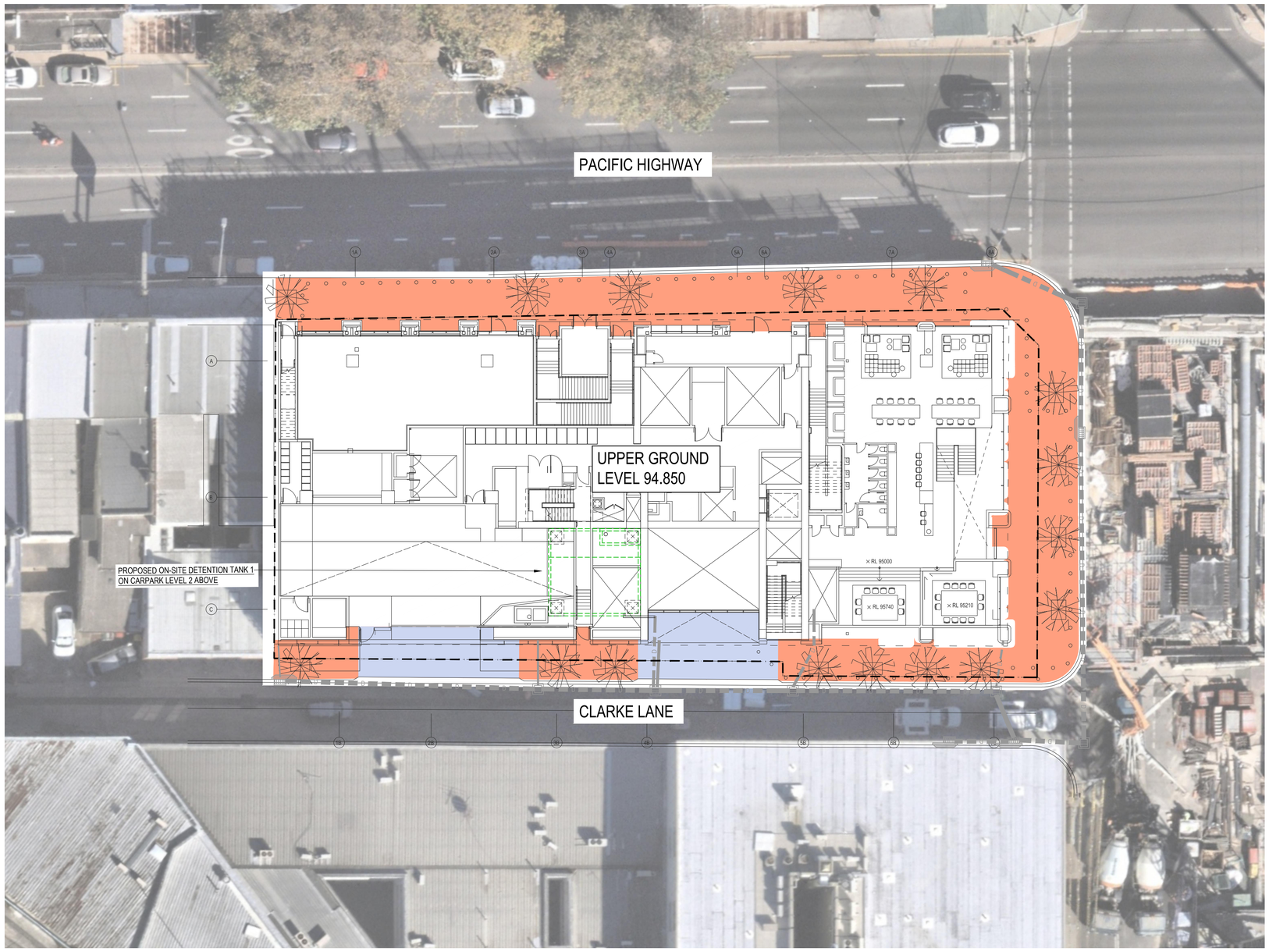

LEGEND

- SITE BOUNDARY
- ON SITE DETENTION (OSD) TANK
- EXISTING STORMWATER PIPE
- EXISTING GRATED PIT
- EXISTING KERB INLET PIT
- PROPOSED TREES
- CONCRETE FOOTPATH
- CONCRETE PAVEMENT - HEAVY DUTY

1:200 2 0 2 4 6 8 10 A1
1:400 A3

Notes

1. SURVEY WAS NOT PROVIDED FOR THE PROJECT. THE ARCHITECTURAL LAYOUT HAS BEEN MANUALLY ALIGNED TO NEARMAPS INFORMATION. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. STANTEC DOES NOT GUARANTEE THE ACCURACY DUE TO LACK OF SURVEY INFORMATION.
2. EXISTING STORMWATER INFRASTRUCTURE LAYOUT HAS BEEN TAKEN FROM CNDC 'FOR CONSTRUCTION' DOCUMENTATION REF 'SMCSWSCN-SMC-SCN-DD-DWG-207011' DATED 17.05.23
3. UPPER GROUND FLOOR PLAN SHOWN BASED ON ARCHITECTURAL DRAWING DA-2210 REV A BY WOODS BAGOT, DATED 21 JUNE 2024

B	ISSUED FOR SSDA	NO	VE	2024.06.28
A	ISSUED FOR SSDA	LPT	LS	2024.02.29
Issued/Revision		By	Appd	YYYY.MM.DD

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CROWS NEST - SITE B

495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-060-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

GENERAL ARRANGEMENT PLAN

Project No. 301351270

Scale 1:200

Revision B

Drawing No. **CI-060-001**

Plotted: 28/06/2024 5:41:18 PM By: CHALEF, NATHAN
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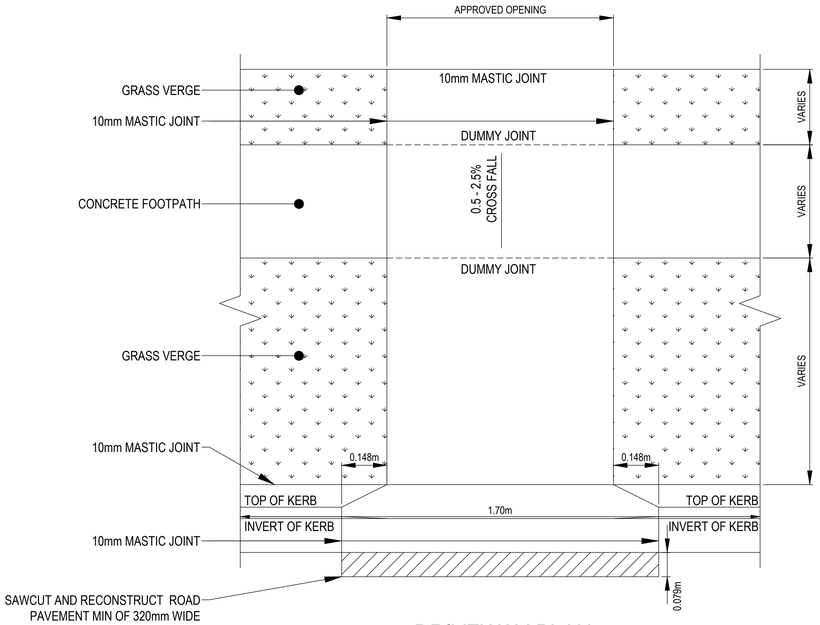
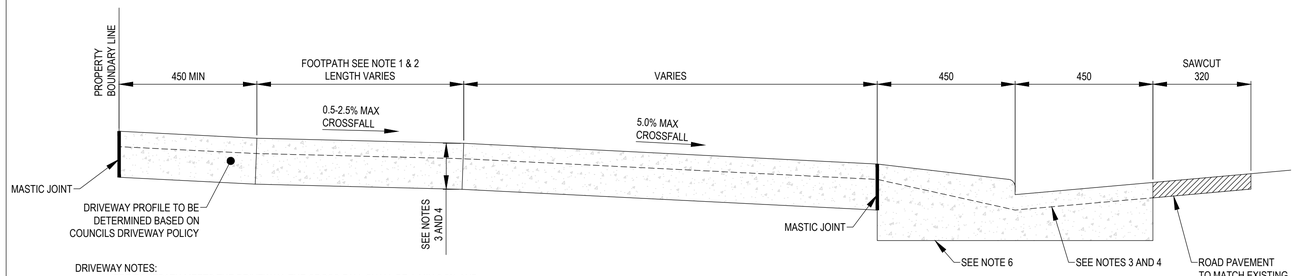


DRIVEWAY PLAN

N.T.S

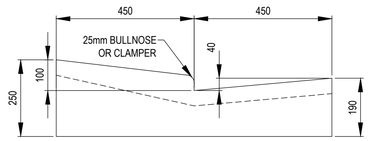


SECTION 1

SCALE 1:10

DRIVEWAY NOTES:

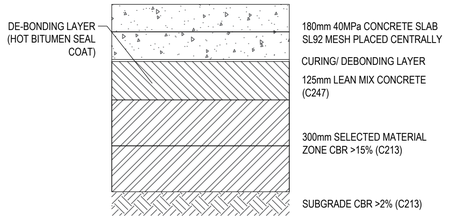
1. WHERE FOOTPATH MEETS THE DRIVEWAY, THE CROSS-FALL SHALL BE A MIN 0.5% AND MAX 2.5%, GRADED TOWARDS THE ROAD.
2. WHERE THE FOOTPATH MEETS THE DRIVEWAY, DUMMY JOINTS ARE TO BE PROVIDED. SAW CUT JOINTS WILL NOT BE ACCEPTABLE.
3. REDISDENTIAL DRIVEWAY - 110mm THICKNESS, 25MPa (MINIMUM) COMPRESSIVE STRENGTH AT 28 DAYS WITH SL62 MESH PLACED CENTRALLY AS PER SPECIFICATION.
4. INDUSTRIAL DRIVEWAY - 150mm THICKNESS, 25MPa (MINIMUM) COMPRESSIVE STRENGTH AT 28 DAYS WITH SL82 MESH PLACED CENTRALLY AS PER SPECIFICATION.
5. MATERIAL - DRIVEWAYS SHALL BE ALL CONSTRUCTED IN PLAIN CONCRETE. NO STENCILED, STAMPED, PATTERNED, COLOURED CONCRETE OR ANY OTHER TYPE OF COSMETIC FINISH IS PERMITTED.
6. EXISTING SUBBASE TO BE PROOF ROLLED WITH A SUITABLE ROLLER. AREAS WHICH SHOW VISIBLE HEAVE UNDER COMPACTION SHOULD BE OVER EXCAVATED FURTHER 300mm AND REPLACED WITH COMPACTED AND APPROVED FILL. BEDDING MATERIAL SHALL BE DGB20 (DENSELY GRADED BASE) 100mm LAYER COMPACTED TO 98%.
7. A MINIMUM 320mm WIDTH OF ASPHALT IN FRONT OF GUTTER IS TO BE REMOVED AND REPLACED WITH HOT MIX. APPLICANT CAN OBTAIN QUOTATION FROM COUNCIL.
8. ALL EXPOSED EDGES TO BE ROUNDED TO 10mm AND SURFACES BE BROOM FINISHED.
9. LAYBACK, GUTTER AND KERB SHALL BE STEEL TROWLED FINISHED.
10. IT IS THE RESPONSIBILITY OF THE OWNER TO ENGAGE THE SERVICES OF A QULAIFIED PROFESSIONAL TO DESIGN ALL DRIVEWAYS (INTERNAL AND EXTERNAL) IN ACCORDANCE WITH AS/NZS 2890.1 2004 OFF STREET CAR PARK STANDARDS.



LAYBACK DETAIL

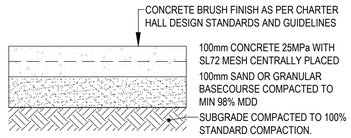
SCALE 1:10

THESE DETAILS ARE TYPICAL ONLY - COUNCIL STANDARD DRAWINGS AND NOTES ARE TO TAKE PRECEDENCE



CONCRETE PAVEMENT HEAVY DUTY

(SCALE 1:10)



ON-GRADE CONCRETE FOOTPATH DETAIL

(SCALE 1:10)

NOT FOR SUSPENDED SLABS OR STAIRS

1:20 0.2 0 0.2 0.4 0.6 0.8 1 A1
1:40 A3

Notes

B	ISSUED FOR SSDA	NO	VE	2024.06.28
A	ISSUED FOR SSDA	LPT	LS	2024.02.29
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

PRELIMINARY

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CROWS NEST - SITE B

495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-066-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

SITEWORKS DETAILS

Project No. 301351270

Scale AS SHOWN

Revision B

Drawing No. **CI-066-001**

Plotted: 28/06/2024 5:41:47 PM By: CARLET, NATHAN
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LEGEND

- SITE BOUNDARY
- PROPOSED SITE FENCE
- PROPOSED SEDIMENT FENCE
- SANDBAG PIT PROTECTION
- VEHICLE SHAKEDOWN DEVICE
- ON SITE DETENTION (OSD) TANK
- EXISTING GRATED PIT
- EXISTING KERB INLET PIT
- PROPOSED TOPSOIL STOCKPILE

NOTE:

FOR EROSION AND SEDIMENT CONTROL DETAILS REFER DRAWING CI-076-001

1:200 2 0 2 4 6 8 10 A1
1:400 A3

Notes

1. SURVEY WAS NOT PROVIDED FOR THE PROJECT. THE SEDIMENT EROSION PLAN IS BASED OFF ACCESSIBLE NEARMAPS INFORMATION.
2. EXISTING STORMWATER INFRASTRUCTURE LAYOUT HAS BEEN TAKEN FROM CNDC 'FOR CONSTRUCTION' DOCUMENTATION REF 'SMCSWSCN-SMC-SCN-DD-DWG-207011' DATED 17.05.23

B	ISSUED FOR SSDA	NO	VE	2024.06.28
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Issue Status

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495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-070-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

EROSION AND SEDIMENT CONTROL PLAN

Project No. 301351270

Scale 1:200

Revision B

Drawing No. **CI-070-001**

Plotted: 28/06/2024 5:42:12 PM By: CHARLEY, NATHAN
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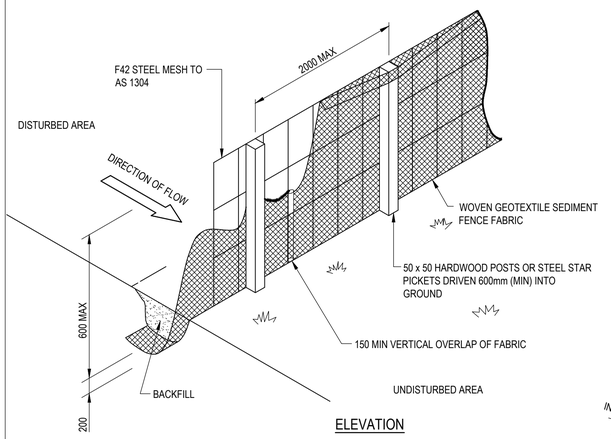
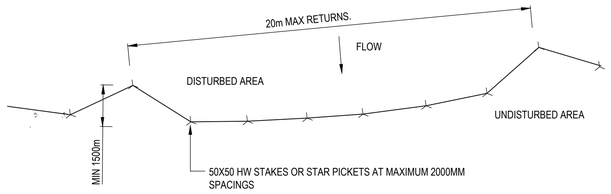
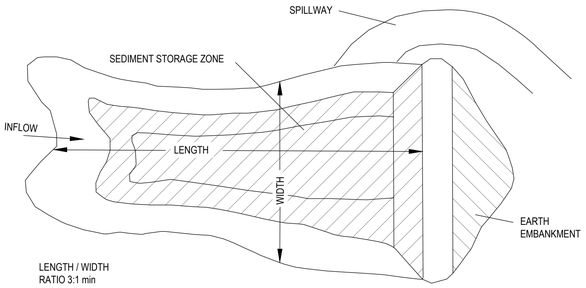


ELEVATION

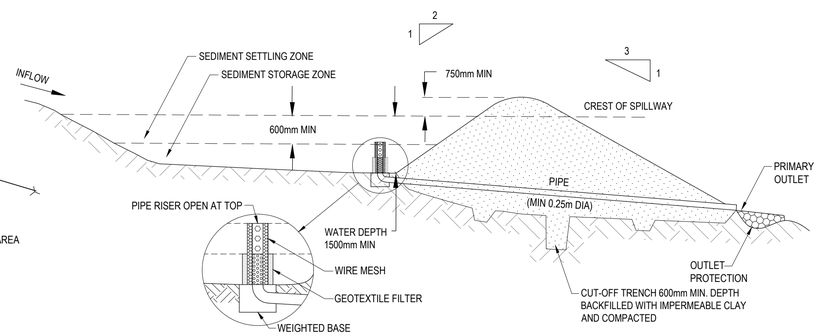


PLAN

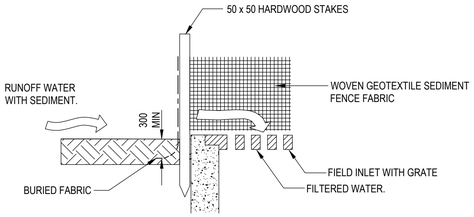


PLAN VIEW

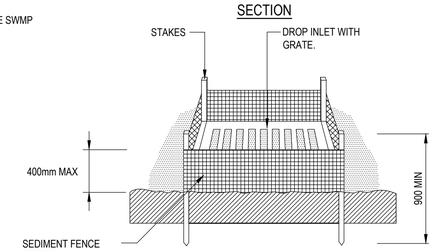
NOTES:
1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AD 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95% STANDARD PROCTOR DENSITY
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BONG COMPACTED FILL TO THE EXISTING SUBSTRATE
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP
7. CONSTRUCT THE EMERGENCY SPILLWAY
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP



CROSS-SECTION
SEDIMENT BASIN DETAIL
SCALE N.T.S



SECTION



ELEVATION

GEOTEXTILE FILTER FABRIC
DROP INLET SEDIMENT TRAP
SCALE N.T.S.

NOTES

1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS AND ANY WRITTEN INSTRUCTIONS THAT MAY BE ISSUED.
2. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DISTURBANCE OF THE RELATED CATCHMENT AREA AND TO THE STANDARD OF 'MANAGING URBAN STORMWATER, SOIL & CONSTRUCTION' & COUNCIL SPECIFICATIONS.
3. ALL SUBCONTRACTORS SHALL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWN SLOPE AREAS.
4. LAND DISTURBANCE SHALL BE LIMITED TO THAT NECESSARY FOR IMPLEMENTATION OF THE PLANS OF WORKS. BUFFER ZONES AND LAND NOT TO BE DISTURBED SHALL BE CLEARLY MARKED WITH BARRIER FENCE. 'SILT' FENCE FOR STRAW BALE SEDIMENT TRAPS SHALL BE PLACED AT REGULAR INTERVALS IMMEDIATELY DOWNSLOPE OF ALL UNPROTECTED DISTURBED LANDS.
5. THE LOCATION OF 'SILT' FENCES, BARRIER FENCES, SEDIMENT TRAPS AND OTHER DEVICES ARE INDICATIVE ONLY AND FINAL LOCATIONS ARE TO BE DECIDED ON SITE. VARIATIONS WILL BE PERMITTED TO BEST SUIT THE CIRCUMSTANCES. CONTRACTOR TO PREPARE DETAILED CONSTRUCTION SEDIMENT AND EROSION CONTROL PLAN.
6. ALL SOIL EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOLLOWING EACH STORM EVENT AND ANY NECESSARY MAINTENANCE WORK SHALL BE UNDERTAKEN TO ENSURE THEIR CONTINUED PROPER OPERATION. SEDIMENT SHALL BE REMOVED FROM THE SOIL EROSION & SEDIMENT CONTROL STRUCTURES WHEN
7. NO MORE THAN 40% CAPACITY HAS BEEN REACHED. THESE STRUCTURES SHALL CONTINUE IN PROPER OPERATION UNTIL ALL DEVELOPMENT ACTIVITIES HAS BEEN COMPLETED AND THE SITE FULLY ESTABLISHED.
8. WHERE THE AREA TO BE DISTURB CONTAINS TREES TO REMAIN, AN ARBORIST CONSULTANT SHOULD PROVIDE ADVICE ON PROCEDURES AND MEASURES TO BE PLACED.
9. TEMPORARY REHABILITATION SHALL BE UNDERTAKEN WITHIN 14 WORKING DAYS BEFORE EITHER WORKS CONTINUE OR PERMANENT REHABILITATION IS UNDERTAKEN.
10. ALL OF THE SOIL STORAGE, REVEGETATION AND SEDIMENT AND EROSION CONTROL MANAGEMENT DEVICES/MEASURES SHALL BE IMPLEMENTED TO NSW ENVIRONMENT PROTECTION AUTHORITY (EPA) AND DEPARTMENT OF LAND AND WATER REQUIREMENTS.
11. ALL SEDIMENT AND EROSION CONTROL MANAGEMENT MEASURES/DEVICES SHOWN ON THE PLANS SHALL BE IMPLEMENTED PRIOR TO CONSTRUCTION, AND MAINTAINED DURING AND AFTER.

SECTION DETAIL

SEDIMENT FENCE DETAIL
SCALE N.T.S.

SANDBAG KERB INLET SEDIMENT TRAP
SCALE N.T.S.

TEMPORARY CONSTRUCTION ENTRY/EXIT SEDIMENT TRAP
SCALE N.T.S.

SHAKER PAD
SCALE N.T.S

TYPICAL STOCKPILE CONFIGURATION
SCALE N.T.S.

NOTE:
1. LOCATE STOCKPILES AT TOP OF CATCHMENT ON FLAT GROUND AND NOT WITHIN 5m OF CONCENTRATED FLOW PATHS.

CATCH DRAIN / EARTH BANK DETAIL
SCALE N.T.S.

NOTES:
1. ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.
2. BUILD DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS RATHER THAN V SHAPED

DIVERSION CHANNEL/ BANK DETAIL
SCALE: NTS

LEVEL SPREADER (OR SILL)
SCALE N.T.S

Notes

B	ISSUED FOR SSDA	NO	VE	2024.06.28
A	ISSUED FOR SSDA	LPT	LS	2024.02.29
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

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CROWS NEST - SITE B

495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-076-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
EROSION AND SEDIMENT CONTROL DETAILS

Project No.	Scale
301351270	AS SHOWN
Revision	Drawing No.
B	CI-076-001

Plotted: 28/06/2024 5:42:24 PM By: OAKLEY, NATHAN
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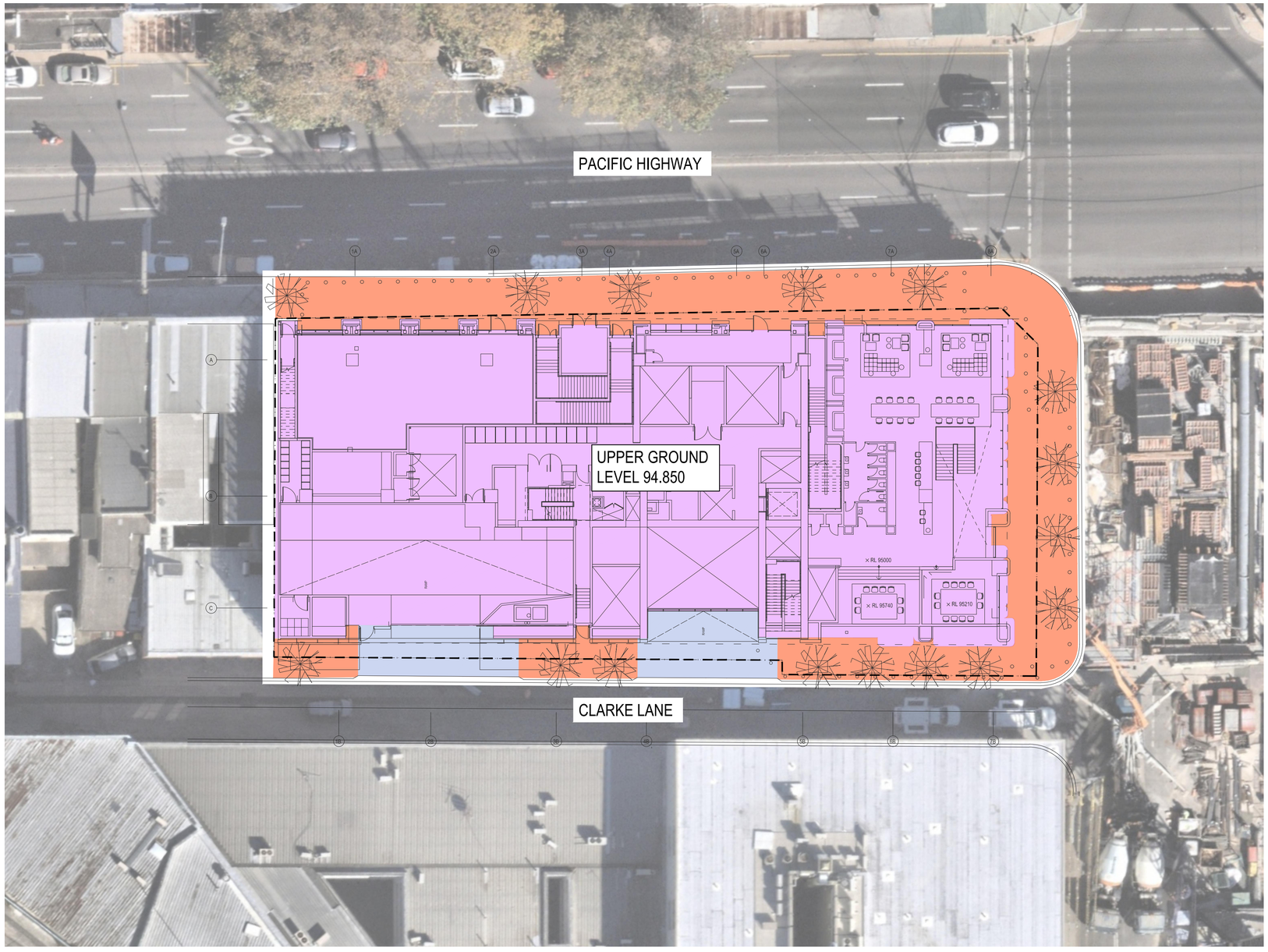

LEGEND

- SITE BOUNDARY
- PROPOSED BUILDING
- CONCRETE FOOTPATH
- CONCRETE PAVEMENT - HEAVY DUTY

1:200 2 0 2 4 6 8 10 A1
1:400 A3

Notes

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495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-440-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
PAVEMENT PLAN

Project No.
301351270

Scale
1:200

Revision
B

Drawing No.
CI-440-001

Plotted: 28/06/2024 5:42:54 PM By: DANIEL NATHAN
\\AUS01-FS1\AD_CITY\SHARED_PROJECTS\301351270\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SET

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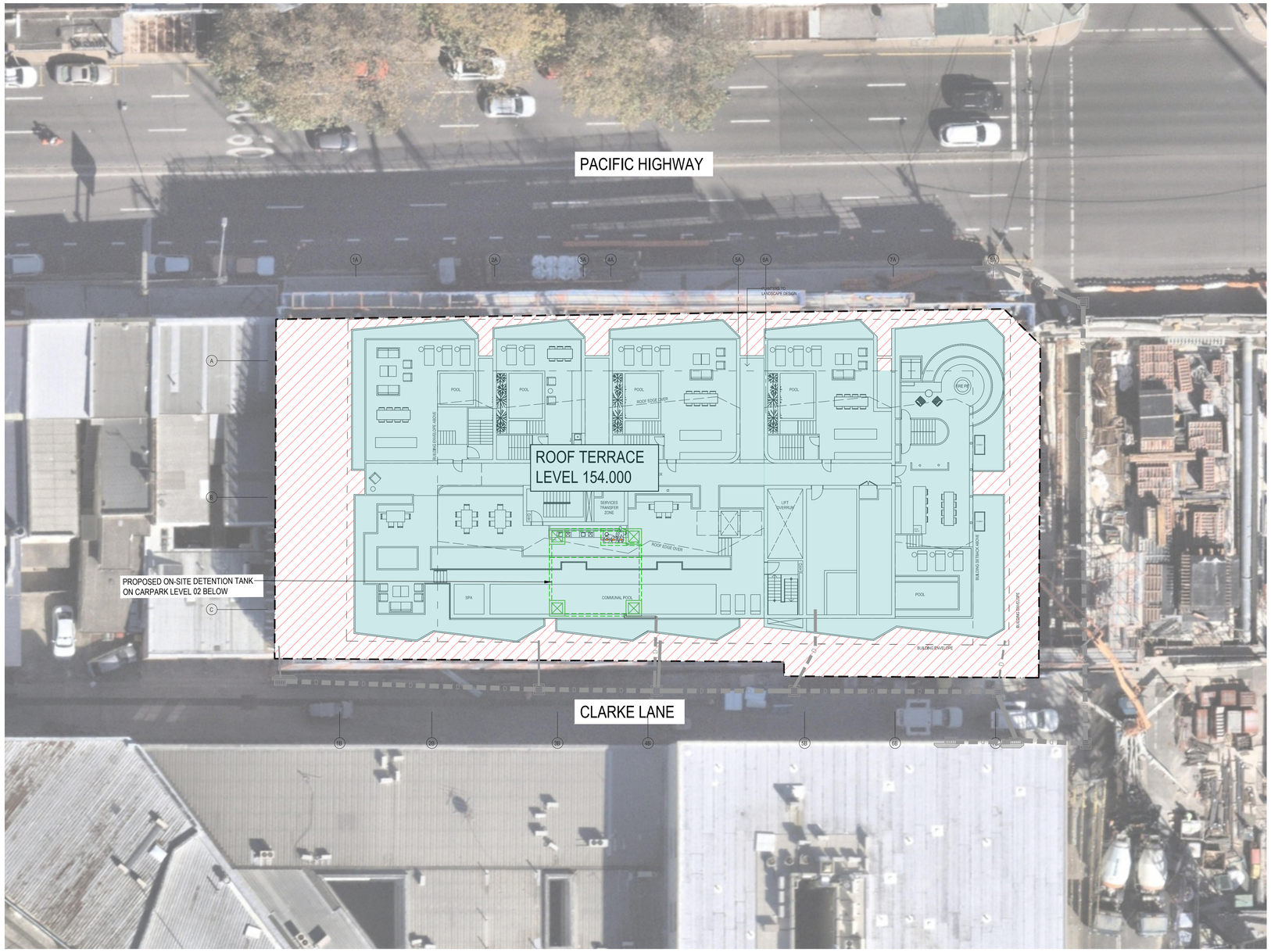

1:200 2 0 2 4 6 8 10 A1
1:400 A3

LEGEND

- SITE BOUNDARY
- ON SITE DETENTION (OSD) TANK

CATCHMENT AREAS

- ROOF CATCHMENT TO OSD 1
- BYPASS

CATCHMENT AREAS

- ROOF CATCHMENT TO OSD= 1383m^2 (100% IMPERVIOUS)
- CATCHMENT BYPASSING OSD TANKS= 489.4m^2 (100% IMPERVIOUS)

Notes

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2. EXISTING STORMWATER INFRASTRUCTURE LAYOUT HAS BEEN TAKEN FROM CNDC 'FOR CONSTRUCTION' DOCUMENTATION REF 'SMCSWSCN-SMC-SCN-DD-DWG-207011' DATED 17 MAY 2023.
3. ROOF TERRACE PLAN SHOWN BASED ON ARCHITECTURAL DRAWING SHEET DA-2227 REV A BY WOODS BAGOT, DATED 21 JUNE 2024.

B	ISSUED FOR SSDA	NO	VE	2024.06.28
A	ISSUED FOR SSDA	LPT	LS	2024.02.29
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CROWS NEST - SITE B

495 Pacific Highway Crows Nest NSW 2065 Australia

File Name: CI-500-001.DWG	HAL	HAL	RPW	2024.02.29
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

STORMWATER CATCHMENT PLAN

Project No. 301351270

Scale 1:200

Revision B

Drawing No. **CI-500-001**

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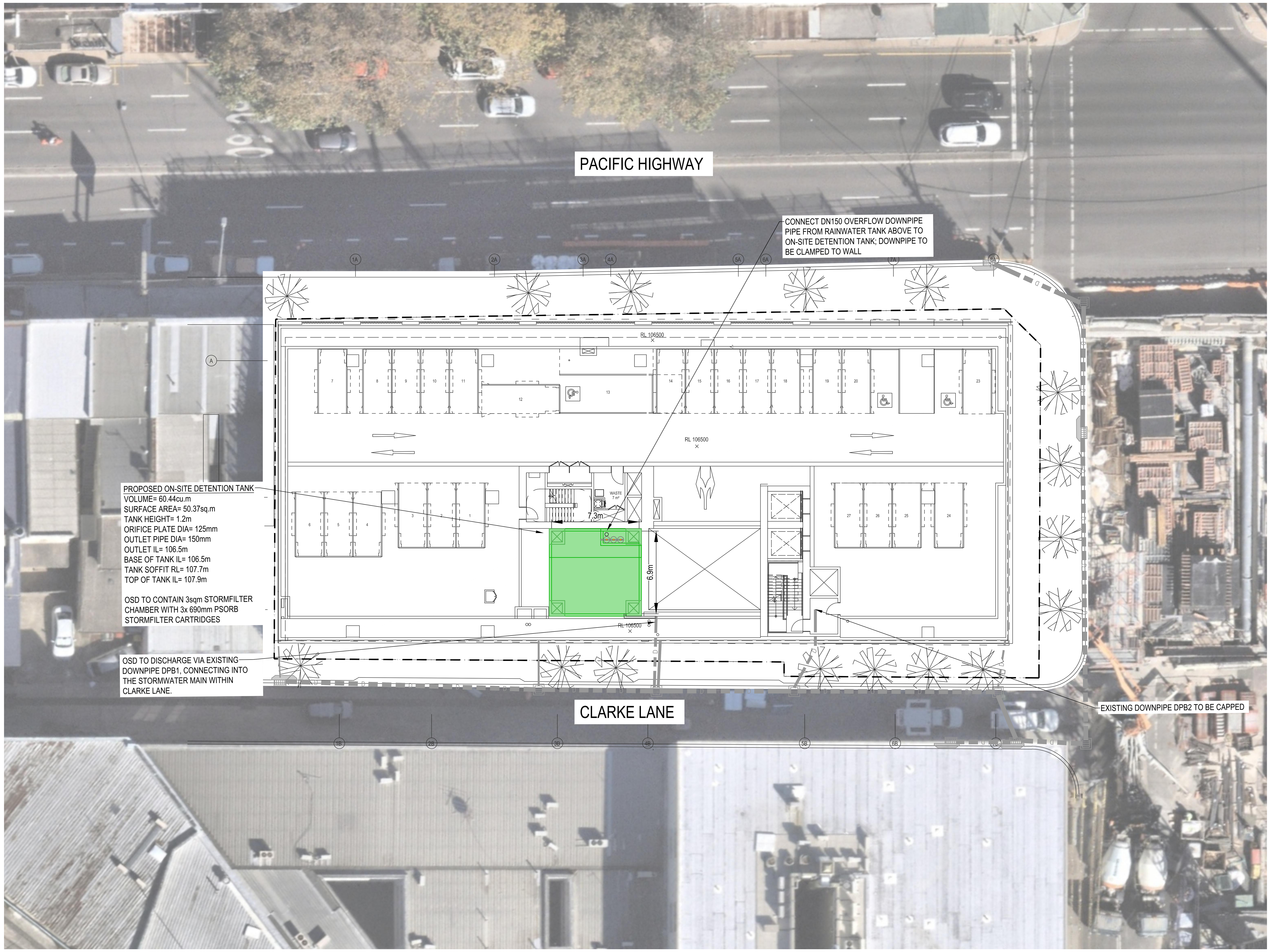

PACIFIC HIGHWAY
CONNECT DN150 OVERFLOW DOWNPIPE PIPE FROM RAINWATER TANK ABOVE TO ON-SITE DETENTION TANK; DOWNPIPE TO BE CLAMPED TO WALL
PROPOSED ON-SITE DETENTION TANK
VOLUME= 60.44cu.m
SURFACE AREA= 50.37sq.m
TANK HEIGHT= 1.2m
ORIFICE PLATE DIA= 125mm
OUTLET PIPE DIA= 150mm
OUTLET IL= 106.5m
BASE OF TANK IL= 106.5m
TANK SOFFIT RL= 107.7m
TOP OF TANK IL= 107.9m
OSD TO CONTAIN 3sqm STORMFILTER CHAMBER WITH 3x 690mm PSORB STORMFILTER CARTRIDGES
OSD TO DISCHARGE VIA EXISTING DOWNPIPE DPB1, CONNECTING INTO THE STORMWATER MAIN WITHIN CLARKE LANE.
RL 106500
7.3m
6.9m
EXISTING DOWNPIPE DPB2 TO BE CAPPED
CLARKE LANE

LEGEND

- SITE BOUNDARY
- ON SITE DETENTION (OSD) TANK
- EXISTING STORMWATER PIPE
- EXISTING GRATED PIT
- EXISTING KERB INLET PIT
- PROPOSED TREES

1:200 2 0 2 4 6 8 10 A1
1:400 A3

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Title

STORMWATER DRAINAGE PLAN

Project No. 301351270

Scale 1:200

Revision B

Drawing No. **CI-520-001**

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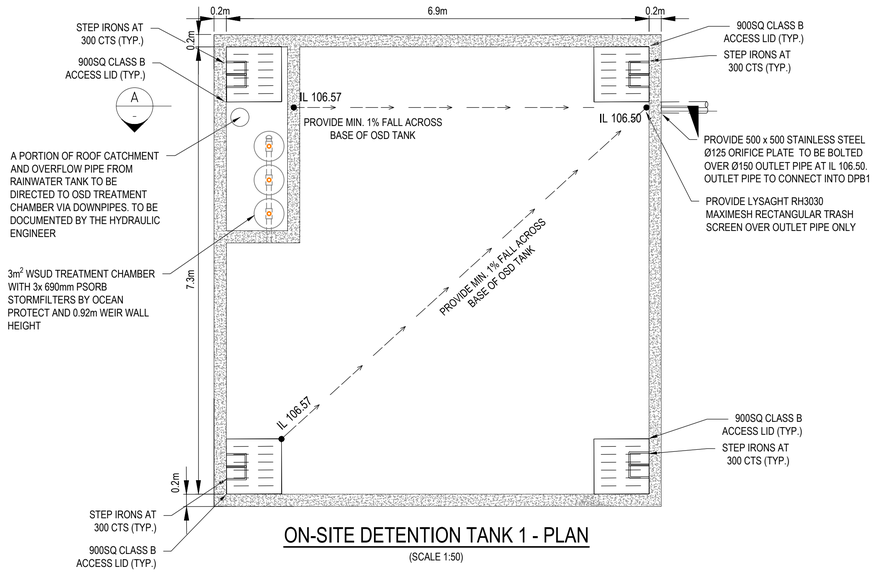
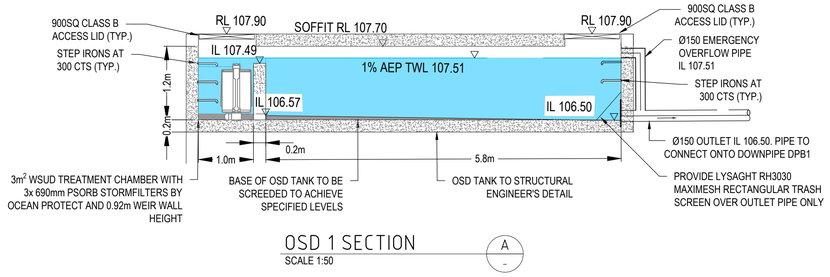


ON-SITE DETENTION TANK 1 - PLAN

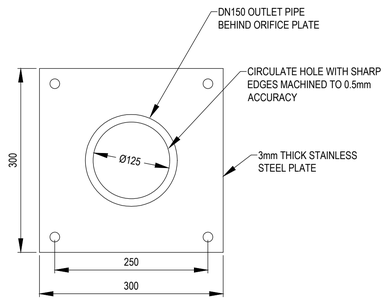
(SCALE 1:50)



OSD 1 SECTION

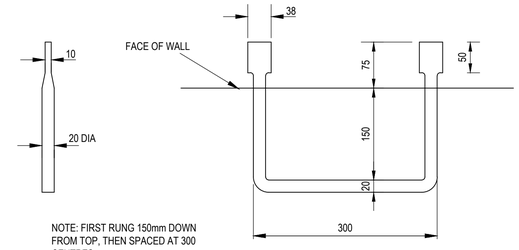
SCALE 1:50

A



OSD ORIFICE PLATE DETAIL

SCALE 1:5



NOTE: FIRST RUNG 150mm DOWN FROM TOP, THEN SPACED AT 300 CENTRES.

MATERIAL : 20mm DIA MILD STEEL HEAVY GALVANIZED

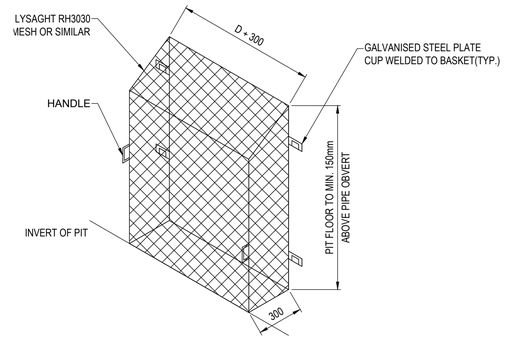
STEP IRONS DETAIL

N.T.S.

NOTES:
1. A CONFINED SPACE DANGER SIGN SHALL BE PLACED NEXT TO EACH AND EVERY ACCESS POINT SO THAT THEY ARE VISABLE TO PERSONS ENTERING ANY BELOW GROUND TANK OR PIT.
2. COLOURS:
   DANGER AND BACKGROUND = WHITE
   ELLIPTICAL AREA = RED
   RECTANGLE CONTAINING ELLIPSE = BLACK
   OTHER LETTERING AND BORDER = BLACK
3. MINIMUM DIMENSIONS OF SIGN.
   LARGE ENTRIES: 300mm x 450mm
   SMALL ENTRIES: 250mm x 180mm
4. SIGN TO BE MADE FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE.
5. SIGN FIXED USING HILTI CHEMSETS OR EPOXY.

CONFINED SPACE SIGN

SCALE N.T.S.



SCREEN MESH DETAIL

N.T.S.

Notes

1:10 0.1 0 0.1 0.2 0.3 0.4 0.5 A1
1:20 A3
1:20 0.2 0 0.2 0.4 0.6 0.8 1 A1
1:40 A3

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File Name: CI-526-001.DWG	HAL	HAL	RPW	2024.02.29
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Title

STORMWATER DRAINAGE DETAILS

Project No. 301351270

Scale AS SHOWN

Revision B

Drawing No. **CI-526-001**

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Appendix B Utility Services Infrastructure Assessment Report by NDY

UTILITY SERVICES INFRASTRUCTURE ASSESSMENT (USIA) REPORT

Crows Nest Metro – OSD Site B

Third.i

NDY
A TETRA TECH COMPANY

CONFIDENTIAL

Revision: 3.0 – PRELIMINARY | **Issued:** 17 September 2024

Document name: rp230811s0016

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1 EXECUTIVE SUMMARY

1.1 PURPOSE

This report has been produced by Norman Disney & Young and commissioned by Third.i as supporting document for Development Application.

The purpose of this report is to provide a desktop assessment of the authority services infrastructure and its general suitability for the proposed new Over Station Development (OSD) Site B associated with Crows Nest Metro station.

This report shall not be relied upon as providing any warranty or guarantee of the infrastructure, the building, its services or equipment.

1.2 AUTHORITY

Authority to undertake this report was provided by Third.i on 17th September 2024.

1.3 GFA SCHEDULE

Following gross floor areas apply to this development, based on architectural drawing set by Woods Bagot "For SSDA" Revision A dated 26 July 2024:

Crows Nest Site B
Area Schedule

W–B WOODS BAGOT

LEVEL	USE / TYPE	BUILDING HEIGHTS		FUNCTIONAL AREAS														CAR PARKING	
		RL	FL TO FL	Residential GFA	Retail GFA	Total GFA	Non-Residential GLAR	Residential NSA	Residential Balcony	Beds	Beds	Beds	Apts	Solar	Solar: Quality Natural Light Outcome	Total Solar	Cross Vent	Residential Car Spaces	Spaces Incl Storage
		m	m	m²	m²	m²	m²	m²	m²	1	2	3	No.					No.	No.
Level 21	Roof / Resi	154.00	4.000			0			389										
Level 20	Resi	150.90	3.100	896		896		872	100			3	3	2		3	3		
Level 19	Resi	147.80	3.100	938		938		919	95		1	7	8	4	4	8	8		
Level 18	Resi	144.70	3.100	918		918		895	112	4	6	1	11	7	4	11	11		
Level 17	Resi	141.60	3.100	918		918		895	112	4	6	1	11	7	4	11	11		
Level 16	Resi	138.50	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 15	Resi	135.40	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 13	Resi	132.30	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 12	Resi	129.20	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 11	Resi	126.10	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 10	Resi	123.00	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 9	Resi	119.90	3.100	1038		1038		895	102	4	6	1	11	7	4	11	11		
Level 8	Resi	116.80	3.100	875		875		800	47	4	4	2	10	6	4	10	10		
Level 7	Resi	113.70	3.100	875		875		800	47	4	4	2	10	6	4	10	10		
Level 6	Cars	109.50	4.200															28	3
Level 5	Cars	106.50	3.000															27	4
Level 2	Plant	99.79	6.715			0													
Level 1	Non-Resi	95.00	4.785	16	210	349	210												
Ground	Non-Resi & Resi	91.55	3.450	279	137	416	137												
TOTAL				12,981	347	13,451	347	11,446	1,616	44	63	23	130	81	48	130	130	55	7
										34%	48%	18%		62%	37%	100%	100%		

SITE AREA (m2)	1,872

	PROPOSED	CAP	DIFFERENCE
Total FSR	7.4	7.5	-0.1
Resi GFA	12981	13000	-19
Metro GFA	575	FIXED	
Non-Residential GFA	922	936	-14
Carparks	55	55	0

Total GFA	13,903

2 POWER

2.1 REQUIRED CAPACITY ESTIMATES

Based on maximum demand calculations conducted as part of concept design phase, the proposed new OSD Site B development required **995 kVA** power supply.

Suitable and compliant chamber provisions are to be documented in Architectural documentation for Development Application.

As part of Crows Nest Metro station construction, local infrastructure is undergoing upgrade works to cater for both developments – Metro station and OSD site B. New LV and HV conduits will be constructed, for details refer to Figure 1 below.

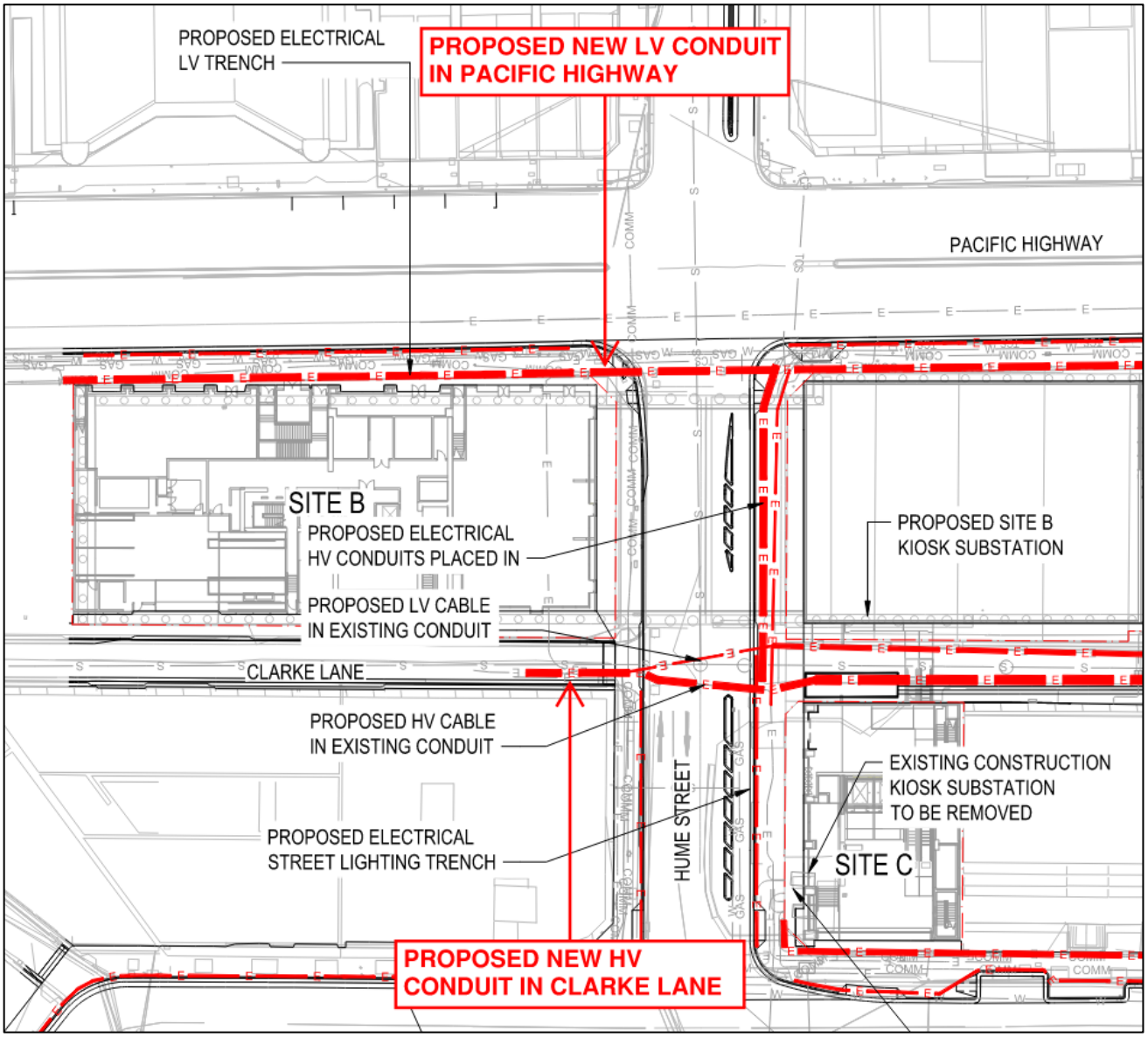

Figure 1 – Sydney Metro Crows Nest – Proposed Utilities Plan – showing proposed new LV and HV Conduits along site frontage, denote in red

3 WATER

3.1 CAPACITY ESTIMATES

Based on demand calculations conducted in accordance with AS/NZS 3500.1 and Sydney Water guidelines, following demand parameters apply to the proposed Crows Nest Metro OSD Site B development:

- Average daily demand: 42 kL/day
- Probable simultaneous flow (potable water, incl. landscape irrigation): 11.5 L/s
- Wet fire protection demand: 40 L/s.

3.2 REQUIRED SUPPLY

Based on calculated demand, it is estimated that a DN250 Sydney Water main would be sufficient to cater for the proposed new development, providing it achieves required minimum pressures for domestic and fire protection assisted operation.

As part of Crows Nest Metro station construction, local infrastructure is undergoing upgrade works to cater for both developments – Metro station and OSD site B. A new DN250 water main will be constructed with applicable connection points, for details refer to Figure 2 below.

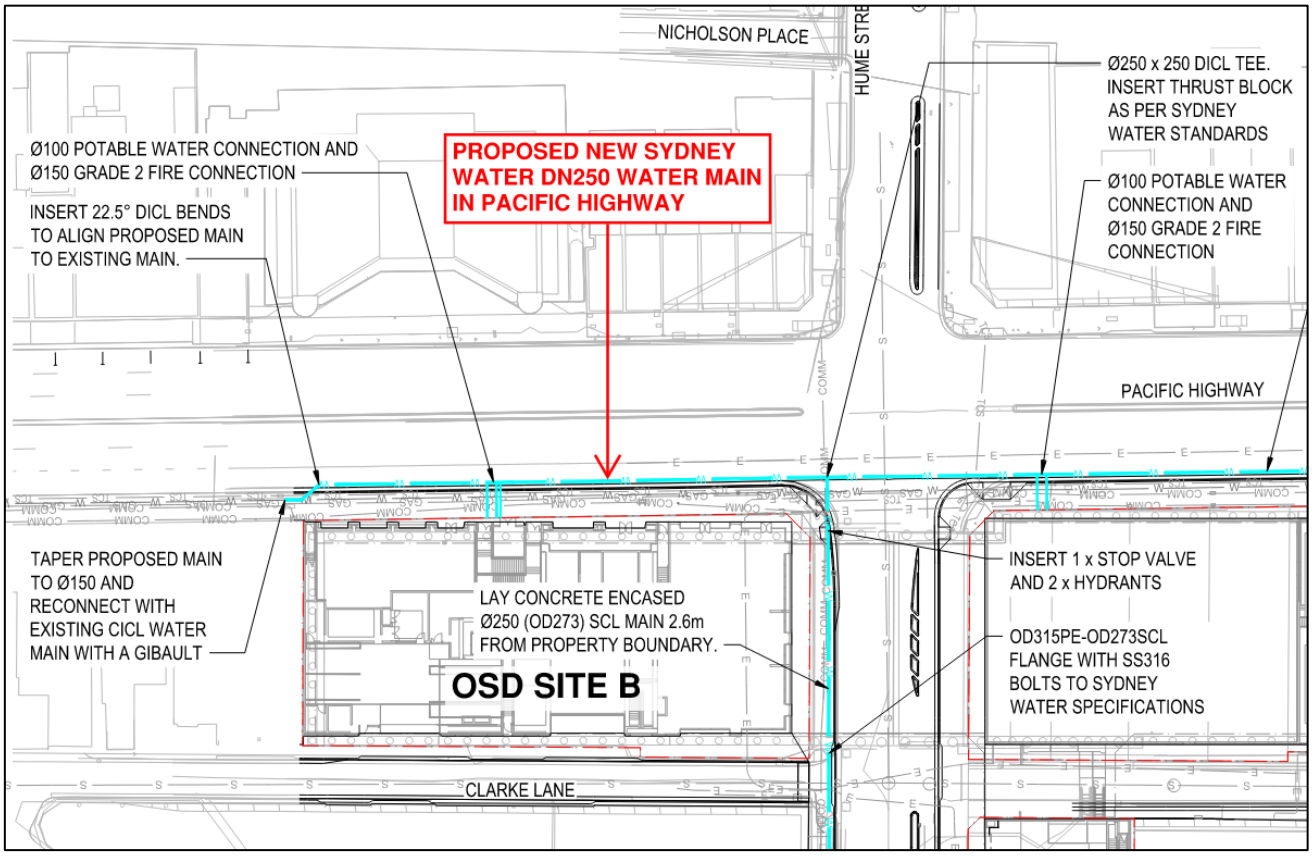

Figure 2 – Sydney Metro Crows Nest – Proposed Utilities Plan – showing proposed new DN250 Sydney Water main along OSD Site B frontage

4 SEWER

4.1 CAPACITY ESTIMATES

Based on demand calculations conducted in accordance with AS/NZS 3500.2 and Sydney Water guidelines, following demand parameters apply to the proposed Crows Nest Metro OSD Site B development:

- Average daily discharge: 39 kL/day

4.2 REQUIRED SUPPLY

Based on calculated discharge, a DN225 sewer main is sufficient to cater for the proposed new development, subject to Section 73 NOR by Sydney Water and available sewer main invert levels.

As part of Crows Nest Metro station construction, local infrastructure is undergoing upgrade works to cater for both developments – Metro station and OSD site B. Two new DN225 sewer sidelines will be constructed with connection to existing DN225 sewer main in Clarke Lane, for details refer to Figure 3 below.

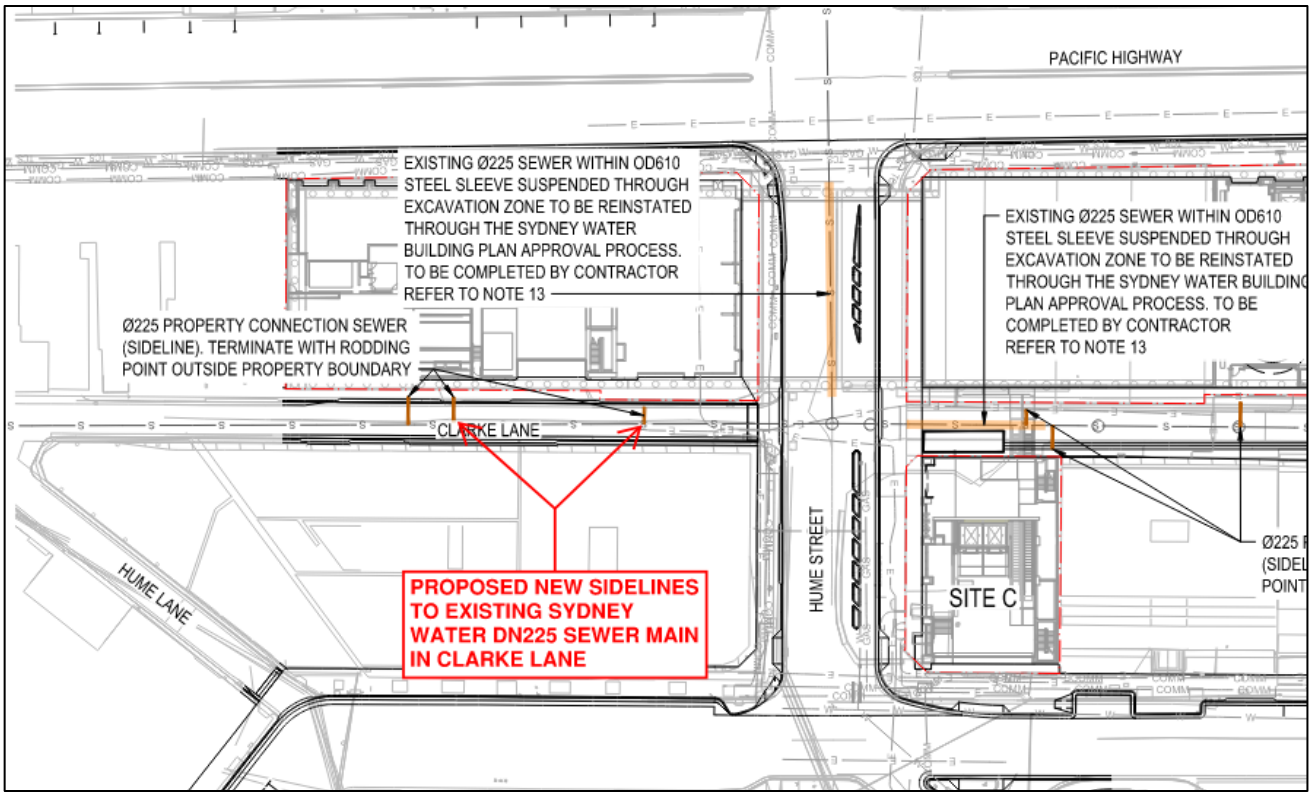

Figure 3 – Sydney Metro Crows Nest – Proposed Utilities Plan – showing proposed new DN225 Sydney Water sewer sidelines

5 NATURAL GAS

5.1 CAPACITY ESTIMATES

There is no requirement for Natural Gas supply for the proposed new Crows Nest Metro OSD Site B development. The building will be fully electrified.

5.2 REQUIRED SUPPLY

No Gas connection is required for this development.

As part of Crows Nest Metro station construction, local infrastructure is undergoing upgrade works to cater for both developments – Metro station and OSD site B. A new DN50 nylon NG main will be constructed along Hume Street and Pacific Highway, for details refer to Figure 4 below.

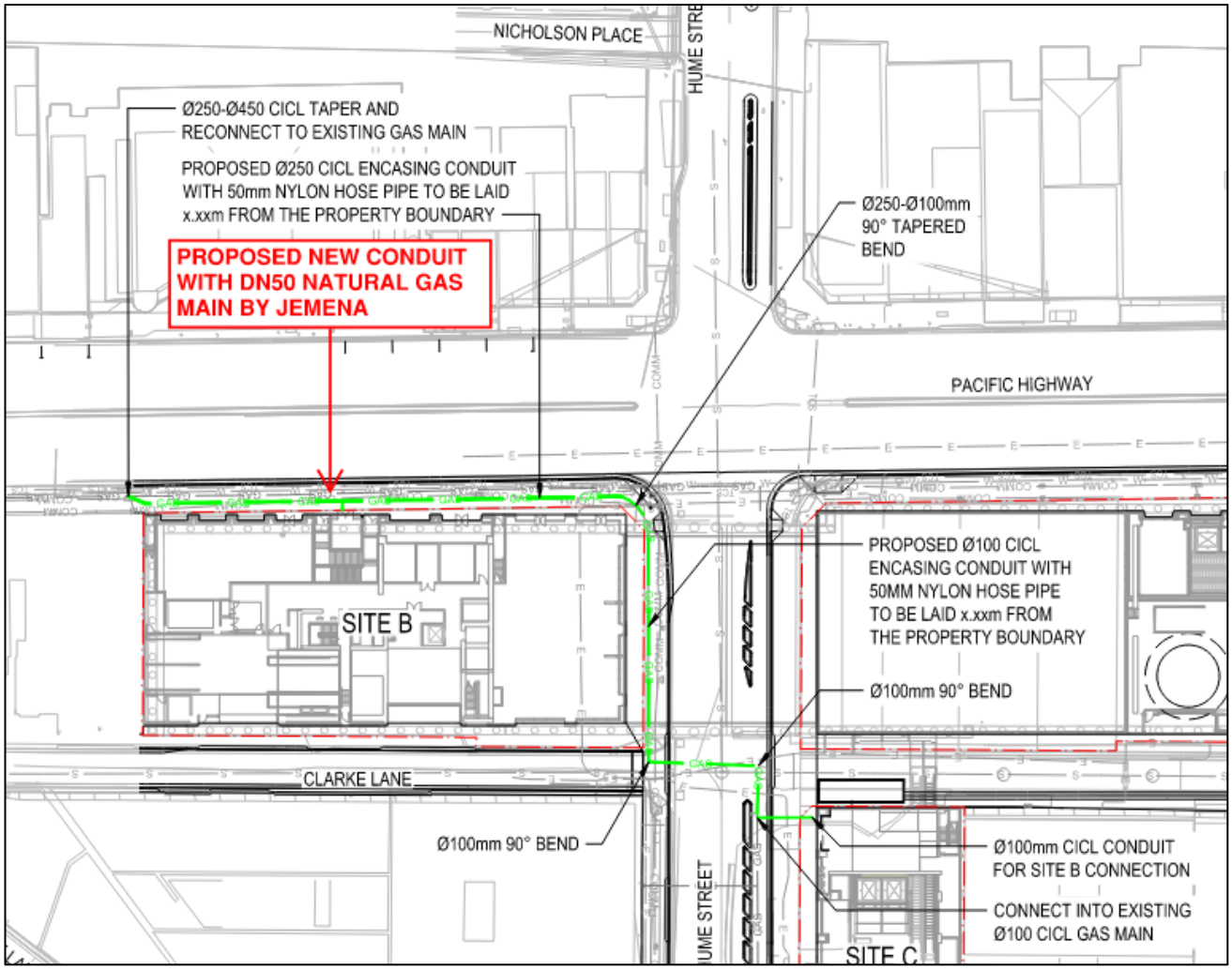

Figure 4 – Sydney Metro Crows Nest – Proposed Utilities Plan – showing proposed new DN50 Jemena gas main

6 TELECOMMUNICATIONS

6.1 EXISTING INFRASTRUCTURE

NBN is the most suitable telecommunications supplier in this area and for this particular development. Other providers, such as Telstra, Optus and TPG also have infrastructure in the vicinity of the site.

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