



# Honeman Close, Huntingwood, NSW

Goodman Property Services (Aust) Pty Ltd (SSD 79500208)

## Remedial Action Plan

68310 | 165,577 (Rev 1)

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**We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.**

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G  
Artist: Patrick Caruso, Eastern Arrernte

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## Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CLM Act	Contaminated Land Management Act 1997
COPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DLWC	NSW Department of Land and Water Conservation
DP	Deposited Plan
DSI	Detailed Site Investigation
EPA	NSW Environment Protection Authority
ESL	Ecological Screening Level
ha	Hectare
Goodman	Goodman Property Services Pty Ltd
JBS&G	JBS&G Australia Pty Ltd
LEP	Local Environmental Plan
LGA	Local Government Area
NEPC	National Environment Protection Council
OCPS	Organochlorine Pesticides
OEH	Office of Environment and Heritage
PACM	Potential Asbestos Containing Materials
PAHs	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PCB	Polychlorinated Biphenyls
POEO Act	Protection of the Environment Operations Act 1997
PSI	Preliminary Site Investigation
PFAS	Per- and Poly-fluoroalkyl Substances
PFOS	Perfluorooctanesulfonic acid
RAP	Remedial Action Plan
SAQP	Sampling Analysis and Quality Plan
SEPP	State Environmental Planning Policy
SW	Sydney Water
TEQ	Toxicity Equivalent Quotient
TRH	Total Recoverable Hydrocarbons

## Executive Summary

BS&G Australia Pty Ltd (JBS&G) was engaged by Goodman Property Services (Aust) Pty Limited (Goodman, the client) prepare a Remedial Action Plan (RAP) to support a development application for commercial development of the property located at Honeman Close, Huntingwood (the site). The site is legally identified as Lot 1 Deposited Plan (DP) 1098102 and occupies an area of approximately 21 ha. The site location and layout are shown in **Figures 1 and 2 (Attachment 2)**.

The site is currently vacant but has previously been subject to filling activities associated with an archery field and mounds, and to level the northern portion of the site. Based on design plans (**Appendix B**) it is proposed that the site will be developed for commercial/industrial use and will include two large warehouse buildings and surrounding trafficable hardstand infrastructure. It is understood that as a result of ecological constraints, a portion of the site is proposed to be retained as an 'ecological area'. For the proposed developable area and for assessing remediation requirements, JBS&G has adopted a 'commercial/industrial' land use scenario as per NEPC (2013).

This RAP has been developed to address Condition 16 of the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning and Environment for warehouse and distribution centre applications.

Review of historical site reports (**Section 4**) identified the northern portion of the site had previously been used for archery purposes, with identified imported and flytipped materials of unknown origin present at the site, and some ground disturbance works apparent associated with either construction of the archery field, construction of the adjacent M4 motorway and other minor filling works across the site. Asbestos as bonded, non-friable asbestos (ACM) and friable asbestos identified as fibrous asbestos/asbestos fines (FA/AF) contaminated fill, containing asbestos at concentrations above commercial/industrial land use criteria, and asbestos impacted fill (asbestos concentrations below commercial/industrial land use criteria) were identified in the former archery field areas in the northern portion of the site, with fill depths up to approximately 4 m below the existing ground surface.

In addition, a septic tank was also identified at the site, as well as varying degrees of anthropogenic inclusions within fill (including timber, asphalt, concrete, glass, bricks, metal, and tile) which may present an aesthetic risk to the site during future redevelopment.

As such, remediation and / or management of the identified asbestos, anthropogenic waste inclusions, and potential microbiological impacts associated with the septic tank is required.

This document presents a RAP that outlines the principles of remedial/validation works required for the identified asbestos, anthropogenic waste inclusions, and potential microbiological impacts associated with the septic tank site, that when completed, will make and demonstrate the site is suitable for the proposed land use.

Overall, and subject to the limitations advised to **Section 11**, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3<sup>rd</sup> Edition)* (EPA 2017) because they are technically feasible, environmentally justifiable, and consistent with relevant laws policies and guidelines endorsed by NSW EPA.

EPA correspondence on 13 February 2025 confirmed the proposed development does not fall under any of the Schedule 1 activities of the *Protection of the Environment Operation (POEO) Act 1997*. This RAP has been prepared with reference to relevant guidelines made or endorsed by the NSW Environment Protection Authority (EPA) inclusive of NEPC (2013) and the requirements of Chapter 4 Remediation of Land of *State and Environmental Planning Policy (Resilience and Hazards) 2021 (R & H SEPP)*.

# 1. Introduction

## 1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Goodman Property Services (Aust) Pty Limited (Goodman, the client) to prepare a Remedial Action Plan (RAP) to support a development application (DA) for commercial development of the property located at Honeman Close, Huntingwood (the site). The site is legally identified as Lot 1 Deposited Plan (DP) 1098102 and occupies an area of approximately 21 ha. The site location and layout are shown in **Figures 1** and **2**.

The site comprised a mix of cleared and vegetated land bound to the north by Honeman Close, to the east by Reservoir Road, and to the south by the M4 western motorway. Properties bordering the site to the west comprised a Transport for NSW (TfNSW) operated Crashlab facility to the north-west and a motorway service/fuel station to the south-west as associated with the M4 motorway. At the time of preparation of this RAP, the site was vacant.

JBS&G understand that Goodman is seeking to redevelop the site for commercial/industrial (warehousing) use. JBS&G conducted a Detailed Site Investigation (DSI, JBS&G 2025<sup>1</sup>) of the site to evaluate the potential for site contamination and to support the DA. The DSI identified non-friable (bonded) asbestos containing materials (ACM) and friable asbestos contamination within fill materials at the site. In addition, a septic tank was identified at the site, as well as varying degrees of anthropogenic inclusions within fill (including timber, asphalt, concrete, glass, bricks, metal, and tile) which may present an aesthetic risk to the site during future redevelopment.

The asbestos contamination, septic tank, and anthropogenic inclusions within fill observed at the site requires remediation/management to ensure the site can be made suitable for the proposed commercial/industrial redevelopment.

This RAP has been developed to address Condition 16 of the SEARs issued by the NSW Department of Planning and Environment for warehouse and distribution centre applications. This RAP has been prepared with reference to relevant guidelines made or endorsed by the NSW Environment Protection Agency (EPA) inclusive of *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as amended 2013 (NEPC 2013).

## 1.2 Objective

The objective of this RAP is to document the procedures and standards to be followed in order to remove or manage the risks posed by the identified site contamination to future commercial/industrial users of the site.

This RAP has been developed to address Condition 16 of the SEARs issued by the NSW Department of Planning and Environment for warehouse and distribution centre applications. **Table 1.1** summarises the SEARs document Item and specific requirements met by this report.

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<sup>1</sup> *Detailed Site Investigation, Honeman Close, Huntingwood, NSW*. Prepared by JBS&G Australia Pty Ltd. 24 January 2025 Rev 0 (JBS&G 2025)

**Table 1.1: Relevant Planning SEARs, Warehouses and Distribution Centres**

SEARs Item	SEARs Item Requirements and Documentation	Addressed in this Report
16. Contamination and Remediation	<p>In accordance with Chapter 4 of SEPP (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.</p> <ul style="list-style-type: none"> <li>• Preliminary Site Investigation</li> </ul> <p>If required:</p> <ul style="list-style-type: none"> <li>• Detailed Site Investigation</li> <li>• Remedial Action Plan</li> </ul> <p>Preliminary Long-term Environmental Management Plan</p>	Remedial Action Plan

### 1.3 Proposed Development

It is understood that the client proposes to develop the site for a commercial/industrial site use, including two large warehouse buildings, surrounding trafficable hardstand and associated infrastructure. It is further understood that as a result of ecological and heritage constraints, a portion of the site is proposed to be retained as an 'ecological area'.

The broader site is located to the north of the M4 Motorway, West of Reservoir Road, and South of Great Western Highway.

The site is affected by the following constraints that have all been considered as part of the masterplan and assessment reports for the site;

- State and Local Heritage classification of Honeman Close;
- Threatened Ecological Communities / Serious and Irreversible Impact (SAIL) entities;
- First and Second Order watercourse's;
- TrfNSW Crash lab design consideration for access;
- Sydney Water Potable Water Service;
- Aboriginal Heritage artefacts;
- Contamination (Compromising of Friable & Non-Friable Asbestos and Septic Tank contamination).

The proposed development layout considers the identified site constraints, and it is understood the northern and eastern site portions will be developed with the western and southern portions retained as an ecological area as set out in the conceptual master plan included in **Appendix B**. The extent of the adopted developable area is shown in relation to the site layout on **Figure 2**.

This report has been prepared to support an application seeking approval for the construction, operation, use and fit-out approval of two warehouses spanning 52,935 m<sup>2</sup> GLA and associated infrastructure and lead-in works.

Approval is sought for 24/7 operation of the proposed Warehouse and Distribution use.

The development is proposed to be constructed in one stage and will generally consist of the following scope:

- Infrastructure and Lead-in Works

- Estate wide infrastructure and preparation works including vegetation clearing, bulk earthworks and remediation, watercourse realignment, retaining walls, internal services reticulation;
- Lead in services including stormwater, sewer, potable water, electrical and communications; and
- New Left in, Left out intersection at Great Western Highway / new proposed estate road including services relocation and eventual dedication.
- Warehouse with ancillary office development:
  - Construction, operation, fit-out and use of two warehouses, totalling 52,935 m<sup>2</sup> GLA of warehouse, including ancillary office spaces, access and hardstand, guardhouses, loading bays, landscaping, car parking, electric vehicle charging, solar panels and signage;
  - Warehouse proposed height limit of 15m.
  - 24/7 operation; and
  - Warehouse and distribution use with generic racking layout.

Based on the above information, JBS&G has adopted a commercial/industrial land use scenario as per NEPC (2013) for assessing remediation requirements for the northern, developable portion of the site.

## 2. Site Condition and Surrounding Environment

### 2.1 Site Identification

The site location and layout are shown on **Figure 1** and **Figure 2**, respectively. The site details are summarised in **Table 2.1** below and described in detail within the following sections.

**Table 2.1 Summary Site Details**

<b>Development Application (DA)</b>	State Significant Development (SSD) - 79500208
<b>Lot/Deposited Plan (DP)</b>	Lot 1 DP 1098102 – to facilitate the proposed two warehouse and distribution centre buildings with ancillary offices zoned IN1 General Industrial; and Lot 16 and 19 DP 1024111, Lot 19 DP 819317 – Great Western Highway to facilitate intersection upgrade works and formal access, zoned both SP2 Classified Road and IN1 General Industrial.
<b>Address</b>	Honeman Close, Huntingwood, NSW
<b>LGA</b>	Blacktown City Council
<b>Site Zoning</b>	<b>IN1:</b> General Industrial
<b>Current Use</b>	Undeveloped/Vacant
<b>Previous Use</b>	Privately owned land, anecdotally noted to be used as an Archery Field (northern portion of site) and as a staging yard for the M4 construction (eastern most portion of the site)
<b>Proposed Use</b>	Commercial/Industrial (northern and eastern portion) and Ecological Area (western and southern portion)
<b>Site Area</b>	Approximately 209,307 m <sup>2</sup>

### 2.2 Site Description

A detailed site inspection of the external areas of the site was completed by an appropriately qualified and experienced JBS&G environmental consultant on 5 June 2024 as summarised below.

The site comprised a vacant, densely vegetated lot, accessible via Honeman Close off Reservoir Road in the east of the site. To the north, the site was bound by Honeman Close, a heritage road covered with asphalt and concrete pavements in poor condition.

Honeman Close was observed to be fenced with a lockable gate located on the southern end of the driveway restricting vehicular access. Trucks were observed to be coming in and out of Honeman Close, associated with bulk earthworks and construction activities currently being undertaken on the property immediately north of Honeman Close. Between Honeman Close and the site fence line, minor amounts of asphalt/road base materials were observed, as well as dense vegetation.

A fence was observed running between the site and Honeman Close, along the northern boundary, with another lockable gate to allow for vehicle access into the site. An overhead power line was also observed to run across the entirety of the site, from the south-east towards the northwest.

The ground surfaces within the northern portion of the site were observed to be covered in a mixture of thick grass, some open woodland/eucalypt vegetation (within the northern Areas of Ecological sensitivity, as marked on **Figure 2**), and a number of fill mounds (Mound 1, Mound 2, and the L-shaped Mound) as shown in **Figure 2**. Mound 1 was observed to be between approximately 2 to 3 m high and was covered in thick grass. North of mound 1, an existing groundwater well was also observed to be present (stickup PVC pipe).

Mound 2 was observed to be between approximately 1 and 1.5 m high at the northern and eastern portions of the mound, tapering down to the surrounding ground levels in the south. On top of mound 2, remnants of

the former archery field targets were observed. South of Mound 2, the ground surface appeared to be consistent with the surrounding natural grade, with less dense grass coverage present.

The L-Shaped mound in the central portion of the site was observed to be approximately 2 m in height above surrounding ground levels. Some fly-tipped material comprising building and demolition rubble (B&D rubble), including concrete, wood, PVC, bricks, and domestic waste was observed to the east and south of the L-Shaped mound. Additionally, a burnt-out van was observed during the inspection, located approximately 15m south of the L-Shaped mound.

All three of the above-mentioned mounds were observed to be situated to the east of a surface water tributary associated with Bungarabee Creek, as shown on **Figure 2**. The creek and associated drainage channel were observed to be covered with dense vegetation, including bullrush, cattails, and reeds. The banks of the tributary in the northern and centre portion of the site were also observed to be between approximately 1 and 2 m deep. Most areas along the creek were inaccessible due dense vegetation present along access trails and the banks of the creek. Where water was visible, water appeared to be flowing and clear, with the exception of the low-lying wetlands in the centre of the site, where water appeared to be stagnant.

The northeastern portion of the site was observed to generally be vegetated with short grass apart from scattered trees and shrubs. The areas where stockpiled material, identified as Stockpile 1 and Stockpile 2 in CH2M Hill 2015b<sup>2</sup> (refer to **Figure 3**), were covered in thick vegetation, and the stockpiles were not identifiable at the time of JBS&G inspection. An existing groundwater well was also observed to be present (stickup PVC pipe) in this area of the site.

A fence/guardrail was present along Reservoir Road at the east site boundary, with vegetation present within the site boundary behind the guard rail. Land described in **Figure 2** as Lot 1 DP1115907, understood to be owned by TfNSW, was observed to be directly adjacent to the east site boundary, with no clear fencing or delineation separating the site from the adjacent lot.

The southern portion of the site was observed to be vegetated by dry open eucalypt forest, with various degrees of vegetation density. Some portions were also observed to contain semi cleared vehicle/access trails leading to deeper parts of the forest. The trails were generally covered in thick grass, and in some areas, exposed soil.

### 2.3 Anecdotal Evidence

JBS&G note that discussion with a Sydney Water (SW, Vendor) representative during the site inspection, identified the following additional information:

- During historical investigations commissioned by SW, Bungarabee Creek and the associated tributaries that run through the site were previously dry, indicating that the creek/tributaries are ephemeral;
- The southern portion site had only recently been identified to be ecologically significant, and access limitations were not encountered during historical investigations (including CH2MHill 2015a<sup>3</sup> and 2015b). SW also suggested that a lot of the vegetation had since increased in density, such that previously cleared, vegetated access paths at the site were no longer accessible; and
- The fill mounds in the centre/northern portion of the site and surrounding areas were stated as historically having been used as an archery field.

Additionally, a suspected septic tank was also observed by client commissioned surveyors working on-site. This feature had previously been observed during historical investigations, as noted in **Section 4.2** below. The approximate location of the septic tank is shown in **Figure 2**.

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<sup>2</sup> *Detailed Site Investigation, Northern Boiler Paddock*, April 2015, CH2MHILL, ref: 654384 (CH2MHILL 2015b).

<sup>3</sup> *Combined Preliminary Site Investigation and Sampling, Analysis and Quality Plan*, Northern Boiler Paddock, April 2015 ref: 654384 (CH2MHILL 2015a).

## 2.4 Surrounding Land-use

The current land uses of adjacent properties and/or properties across adjacent roads are summarised below.

- North – The site is bound to the north by the Honeman Close Road corridor. Further north is the Great Western Highway followed by various commercial/industrial/residential properties. A single large development lot was situated on land between Honeman Close and the Great Western Highway, for which earthworks were in progress in the eastern site portion at the time of the investigation. The balance of this lot appeared to comprise a combination of vacant remnant forest and cleared grassland areas;
- South – The site is bound to the south by the M4 Motorway corridor. Further south, beyond the M4 is vacant/undeveloped land followed by the Prospect Nature Reserve and the Prospect Reservoir;
- East – The site is bound to the east by Reservoir Road, followed by various commercial/industrial warehouse properties, including truck and bus dealerships, and a logistics centre; and
- West – The site is bound to the west by the TfNSW Crashlab facility followed by various commercial/industrial warehouse properties (occupied by a logistics/transport company and Ive Group, a printing/marketing company). The property directly to the southwest of the site is occupied by the M4 motorway service station and as such includes significant inground fuel infrastructure.

Based on the review of available information, the surrounding land use was identified to be predominately used for commercial/industrial purposes, inclusive of a number of potential off-site contaminant migration sources to the west and south-west of the site.

## 2.5 Regional Environmental Setting

Review of information provided in the DSI (JBS&G 2025) has identified the site’s environmental setting as summarised in **Table 2.2**.

**Table 2.2 Summary Site Details**

Facet	Details
Topography	Review of topographic information obtained from the Spatial Information Exchange Viewer (SIX Maps) (LPI 2025 <sup>4</sup> ) regional topographic map indicated that the site has an elevation ranging from approximately 76 m Australian Height Datum (AHD) in the eastern portion of the site to approximately 58 m AHD in the northern portion of the site. Local topography was generally sloping gently towards the north and northwest. As discussed in Section 2.7, there are two surface water features, comprising tributaries of Bungarabee Creek within the site that are likely to result in localised ground surface features within relevant portions of the site.
Geology and Soil Landscape	Reference to the 1:100 000 Geological Landscape Map for Sydney (Herbert C., 1990 <sup>5</sup> ) indicated that the site is underlain by Bringelly Shale of the Wianamatta Group. Bringelly shale consists of shale, carbonaceous claystone, laminite, fine to medium-grained lithic sandstone with rare coal and tuff.  Reference to the online ESPADE tool hosted by the NSW Department of Planning, Industry and Environment (DPIE 2025 <sup>6</sup> ) indicated that the site is underlain by the Blacktown soil landscape group. The landscape is characterised by gently undulating rises on Wianamatta

<sup>4</sup> ‘Spatial Information Exchange Viewer’, NSW Land and Property Information, Accessed 13 January 2025, <https://maps.six.nsw.gov.au/> (LPI 2025);

<sup>5</sup> *Penrith 1:100 000 Geological Sheet 9030*, Herbert C., 1991, 1st edition. Geological Survey of New South Wales, Sydney. (Herbert C., 1991)

<sup>6</sup> *ESPADE*, NSW Department of Planning, Industry and Environment, <http://www.environment.nsw.gov.au/eSpade2Webapp>, accessed 13 January 2025 (DPIE 2025);

Group shales with local relief to 30 m and slopes usually >5 %. Soils are typically characterised by shallow to moderately deep (<100 cm) hard setting mottle texture contrast soils, red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines. Limitations of the Blacktown soil group include localised seasonal waterlogging, localised water erosion hazard, moderately reactive highly plastic subsoil and localised surface movement potential.

#### Hydrogeology

Registered groundwater bore information was reviewed from the Water NSW<sup>7</sup> online resource. A review of the registered bore information indicated that there were six registered groundwater bores within a 1,500 m radius of the site. Of those bores, no records with standing water levels (SWL) were available, however, the records indicated that wells GW111067, GW111068 and GW111069 had a water bearing zone from 5.5 - 7.5 m below ground surface (bgs).

Previous site geotechnical investigation activities included the installation of 3 groundwater monitoring wells at the site, the location of which were noted in the site inspection (**Section 2.1**). Standing groundwater levels at the site were reported to have been measured within these wells at between 1.7m and 4.0 m bgs during the DP (2023<sup>8</sup>) investigation.

Based upon the reported geology and hydrology in addition to the available groundwater data, it is considered that groundwater underlying the site is likely to be present in perched conditions as associated with weathered shale discontinuities, with true regional groundwater present at depth within the much deeper sandstone basement. Localised groundwater movement is expected to occur as consistent with top of rock patterns and be influenced by localised surface water drainage as associated with deeper soil profiles. As such, groundwater underlying the site is anticipated to flow toward the Bungarribee Creek riparian zone and move in a north west to northerly direction within the site, noting that there may be localised flows in proximity to the western site boundary, given this is west of the creek channel, such that both the M4 motorway service centre and the TfNSW Crashlab facility are potentially situated upgradient of these western most site portions.

#### Hydrology

Review of SIX Maps indicated that the closest waterway is the Bungarribee Creek, the upper reaches of which commence in the central portion of the site in a north westerly direction. Bungarribee Creek flows away from the site in a north to north-westerly direction, joining Eastern Creek approximately 3.5 km to the northwest of the site. It is understood from informal conversations that several surface water drainage paths enter the site from the south, draining water from the M4 motorway corridor through to the Bungarribee Creek channels. As a result of the dense vegetation, these site features were not verified during the JBS&G site inspection.

Surface water runoff is anticipated to either infiltrate shallow soils or runoff towards low lying areas of the site, including the identified surface water features, comprising wetland and drainage channels in the western portion of site. Ultimately, surface water movement is expected to occur towards the northwest, in the direction of the Bungarribee Creek channel flow moving away from the site to the north.

#### Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Map<sup>9</sup> indicated that the site is located within an area not assessed for the presence of Acid Sulfate Soils (ASS). Such areas are identified by default, as areas where land management activities are not likely to be affected by ASS materials, consistent with the source sites elevated topography and formation geological conditions. As such, no further consideration of the potential occurrence of ASS is required for this assessment as it has been identified that ground disturbance activities at the site will not

<sup>7</sup> Water NSW website accessed 13 January 2025, <https://realtimedata.waternsw.com.au/water.stm>,

<sup>8</sup> Report on Geotechnical Investigation, Presale Due Diligence, North Boiler Paddock, Honeman Close, Huntingwood, NSW, prepared for Sydney Water Corporation by Douglas Partners Pty Ltd, dated 21 November 2023 ref. 22503900.R.001.Rev0 (DP 2023)

<sup>9</sup> Acid Sulphate Soil Risk Map – Index, 1997 1:25 000 (NSW DLWC)

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result in disturbance of known or suspected ASS conditions within, or up to 500 m downgradient of the site.

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### 3. Site History Summary

A detailed discussion of historical site use activities is presented in the JBS&G (2025) site assessment report. Historical use of the site is summarised below.

- Early historical aerial photographs indicated that the site comprised a vacant, partially cleared, undeveloped rural land comprising open grass lands with areas of scattered trees. A feature consistent with a meandering creek line was apparent in the northern portion of the site. A former portion of the Great Western Road (now Honeman Close) runs adjacent to the north-eastern boundary of the site, an unpaved access track was apparent along the southwestern site boundary, whilst the property appeared to extent further to the northwest, south and south-east.
- From the 1975 aerial, the creek line had been altered due to construction works along the western site boundary associated with a new roadway, with potential filling of materials associated with the realignment of the creek. The western and eastern tributaries appeared to join at a culvert within the northern portion of the site, which was inferred to run under the Great Western Highway alignment northwest of the site.
- From the 1984 aerial, a rectangular grassed section of the site in the central north portion appeared to have been levelled. A small area of ground disturbance immediately adjacent to the northern boundary, north-west of the fill area was apparent, which whilst not clear, appeared to possibly comprise a small building and vehicle parking area.
- From the 1986 aerial a small building and associated vehicle parking area present in the northern portion of the site (adjacent to Honeman Close) appeared to have undergone modification, enlarging the formal area of development.
- From the 1991 aerial some dirt tracks/access trials were apparent in the southeast portion of the site in addition to ground disturbance indicators generally along and beyond the southern site boundary. A surface water dam also appeared to have been constructed in the eastern portion of the site, crossing into the adjoining lot, with the adjoining lot also being occupied by temporary site sheds/vehicles, possibly associated with the nearby M4 works.
- From the 2005 aerial, the building in the northern portion of the site (against Honeman Close) was no longer present, but the carpark pavement appeared to remain. A large circular feature is also apparent in the northwestern portion of the site
- Between 2009 and 2023 dirt tracks appear across the site, with periods of vegetation overgrowth between these years.

## 4. Previous Investigations

### 4.1 Combined Preliminary Site Investigation and Sampling, Analysis and Quality Plan (PSI, CH2M HILL 2015a)

CH2M Hill Australia Pty Ltd (CH) was engaged by Sydney Water (SW) to undertake a Preliminary Site Investigation (PSI) and prepare a Sampling, Analysis and Quality Plan (SAQP) for investigation of the property identified as the Northern Boiler Paddock, located at Honeman Close, Huntingwood, NSW (the site).

The scope of the investigation included: a site walkover and inspection; desktop review of historical records of land use activities and regional environmental conditions; review of historical environmental reports provided to CH by SW at the time of reporting; completion of a geophysical survey at the site; and identification of AECs and associated COPCs; and development of a SAQP to inform the soil sampling program to be undertaken as part of a future Detailed Site Investigation (DSI).

The geophysical survey was also conducted to determine areas of high and low conductivity and in turn, the inferred areas of filling and natural materials at the site.

CH also reported its scope of include a review of the following previous land contamination reports prepared for the site, which were not available to JBS&G at the time of this report. The relevant reports reviewed by CH include the following:

- *Phase 2 Contamination Assessment* – Report for Boiler Paddock Reserve, Prospect NSW, GHD, 2005 (GHD, 2005a);
- *Phase 1 Contamination Assessment* – Report for Boiler Paddock Reserve, Prospect NSW, GHD, 2005 (GHD, 2005b); and
- *Remedial Action Plan (RAP)* – Report for Boiler Paddock Reserve, Prospect NSW, GHD, 2007 (GHD, 2007).

The findings of the above-mentioned reports were briefly summarised by CH as follows:

- The Phase 1 Contamination Assessment (GHD 2005b) indicated filling had occurred at the site in 1983, 1984 and 1986 by Blacktown City Council for the construction of the archery mounds and fields and again from 2001 to 2004 by an unauthorised contractor;
- GHD (2005b) identified the presence of asbestos within six samples from four locations. CH note that asbestos analysis by GHD only comprised presence/absence analysis in soil, and as such comparison to NEPC (2013) health investigation criteria is not possible;
  - **NB:** Only sample location IDs from GHD 2005b are noted in the PSI report, with no coordinates or mapping of sample locations provided in the PSI (CH2M Hill 2015a).
- The RAP (GHD 2007) was reported to have indicated the ACM was in the form of fibre bundles and fibro sheeting (assumed to be fibrous asbestos) identified in fill materials within the south-west portion of the archery field at six test pit locations at depths of up to 2.5m bgs. CH did not note any further contamination requiring management or remediation as part of the RAP;
- The RAP nominated ‘on-site encapsulation’ as the preferred remedial methodology to address asbestos contaminated materials present in the archery field.

The findings of the desktop review and site inspection undertaken at the site as provided in the PSI (CH2M Hill 2015a) are summarised as follows:

- The Site was zoned as IN1 – General Industrial under the Western Sydney Employment Area SEPP 2009;
- Endangered ecological communities (EEC) were present across approximately 70% of the site, comprising the Cumberland Plain Woodland and River Flat Eucalypt Forest on Coastal Floodplain;

- Five items of Aboriginal heritage significance were identified at the site (during the initial site walkover and induction);
- At the time of inspection, the site was partially cleared of vegetation but appeared to have been undergoing regeneration;
- Historically, the site appeared to have remained largely vacant, although some areas of potential agriculture were noted. A portion of the site was noted to have been leased by Blacktown City Council from 1983 and used for archery purposes until at least 2005;
- CH note that fill materials were reportedly placed at the site in 1983, 1984 and 1986 for the construction of the archery mounds and fields and again from 2001 to 2004 by an unauthorised contractor, as stated in the Phase 1 Contamination Assessment (GHD 2005b);
- Several areas of disturbed vegetation were noted during review of historical aerial photographs, notably, within the archery field during the mid-1980s, and areas to the east and southern portion of the site in the early 1990s, likely associated with the construction of the M4;
- Potentially contaminating activities at the site were noted to include historical uncontrolled filling, illegal dumping of materials at the site, earthworks associated with adjacent infrastructure (i.e. the M4 construction), and agricultural land associated with potential grazing or market gardens.

On the basis of the desktop review, the site inspection, and with consideration to the geophysical survey, the SAQP provided guidance on the proposed DSI to be undertaken at the site, inclusive of advancement of intrusive soil sampling at 70 discrete sampling locations on a grid-basis across the site, as well as advancement of an additional 18 targeted soil sample locations to further characterise suspected fill materials at the site.

## 4.2 Detailed Site Investigation (DSI, CH2M HILL 2015b)

CH was engaged by SW to undertake a Detailed Site Investigation (DSI) for the property identified as the Northern Boiler Paddock, located at Honeman Close, Huntingwood, NSW (the site). The DSI was prepared for SW to facilitate divestment of the site and assess the requirements for management and/or remediation requirements for the site to be used for commercial/industrial land use, if required.

The DSI (CH2M Hill, 2015b) provides a summary of the PSI (CH2M Hill, 2015a) as well as detailing the findings of the intrusive investigation undertaken at the site, comprising of advancement of 92 sample locations via the use of either a backhoe or hand auger (depending on accessibility). Of the 92 sample locations, it was reported that 68 were advanced on a grid basis (based on the geophysical survey results from the PSI), 18 were targeted to stockpiles and suspected fill, and 6 surface soil samples were taken from across the site (as shown in **Figure 3**).

In addition to the summary of previous investigation outlined in the PSI (CH2M Hill 2015a), the DSI cites additional data from a GHD (2006<sup>10</sup>) report, noted to not be available in its entirety to CH at the time of reporting, but the data and figures of which were provided in the RAP (GHD 2007).

The DSI noted that asbestos had been detected in six samples from four locations in GHD 2005b, and two samples from two locations in GHD 2006. All of the sample locations from GHD (2005b and 2006) were reported to be within the archery field and embankment.

Fill materials at the site were identified during the DSI to approximately 1-2 m below ground surface (bgs) within the archery field, and to a maximum depth of 4m bgs along the embankment (L-shaped mound) adjacent to the archery field. Additionally, fill material was identified in three separate stockpiles identified at the site, identified as Stockpile 1, Stockpile 2, and Stockpile 3 (as shown in **Figure 3**).

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<sup>10</sup> *Additional Investigations, Further Delineation of Asbestos Impacts in Fill Material in the Archery Field*, Boiler Paddock Reserve, Prospect NSW, GHD, 2006 (GHD, 2006).

Collected samples were analysed for a range of Contaminants of Potential Concern (COPC) including heavy metals, Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, and Xylene (BTEX), Organochlorine Pesticides (OCPs), Polycyclic Aromatic Hydrocarbons (PAHs), phenols, Polychlorinated Biphenyls (PCBs), and asbestos.

JBS&G further note that asbestos quantification (requiring a 10 L volume of soil subject to field screening with all asbestos collected and a discrete soil sample analysed for trace asbestos in soil as per NEPC 2013 and WA DOH 2009<sup>11</sup>) was not undertaken, with only 500 mL samples collected for asbestos assessment.

Analytical results from all sample locations were reported to be below the laboratory Limit of Reporting (LOR) or adopted commercial/industrial land-use criteria as stated in NEPC 2013, with the exception of asbestos detected in soil at three sample locations at and surrounding the archery field and associated embankment as follows:

- NPB01\_3.0\_PACM (bonded asbestos), with a reported concentration of 0.0036% w/w asbestos, below the adopted commercial/industrial land use criteria of 0.05% w/w;
- NPB02\_1.3\_PACM (bonded asbestos), with a reported concentration of 0.0073% w/w asbestos, below the adopted commercial/industrial land use criteria of 0.05% w/w; and
- NPB06\_1.0 (assumed friable asbestos), with a reported concentration of 0.0019% w/w asbestos, above the adopted commercial/industrial land use criteria of 0.001% w/w.

JBS&G further note that the DSI reported asbestos in the form of fibre cement debris, as well as loose fibre bundles at sample location NPB06\_1.0. On this basis, materials represented by NPB06\_1.0 are considered to be impacted with friable asbestos, as defined by NEPC (2013); i.e. friable asbestos includes weathered ACM, fibres, and fines. Lab reports provided in CH2M Hill (2015b) do not provide a specific concentration for bonded or friable asbestos, but rather asbestos concentrations as a whole. As a conservative measure, JBS&G has assumed the reported concentration to be representative of friable asbestos concentration within soil, above the adopted commercial/industrial land use criteria as stated in NEPC 2013.

All reported concentrations of bonded asbestos were below the applicable Health Screening Level (HSL) for bonded ACM in soils for commercial/industrial land-use of 0.05% w/w. Asbestos concentrations reported at NPB06\_1.0 were reported above the applicable Health Screening Level (HSL) for friable asbestos and asbestos fines (FA/AF) in soils for commercial/industrial land-use of 0.001% w/w.

CH further noted that asbestos reported in the above samples was consistent with those reported by GHD 2005b and GHD 2006 (i.e. within the archery field and embankment).

In addition to the above, a “concrete pit lid” was also observed to the west of CH Stockpile 1 (refer to **Figure 3** for CH Stockpile 1 location). JBS&G note that the concrete pit lid comprises a suspected in-ground septic tank. CH did not note any odours, standing, or putrescible materials during advancement of test pit (TS17) adjacent to the septic tank. The inferred location of the septic tank is provided on **Figure 2**.

The DSI also provides a preliminary waste classification on the basis of all data presented in the RAP (GHD 2007) and data obtained by CH during the DSI, which indicates all materials at the site could be classified as either General Solid Waste (GSW), or GSW mixed with Special Waste (Asbestos), in accordance with NSW EPA 2014<sup>12</sup>.

On the basis of the above, CH concluded that the site was suitable for continued commercial/industrial land-use, subject to the implementation of an Environmental Management Plan (EMP) to further manage asbestos impacted materials across the archery field area. CH also recommended the preparation of a RAP

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<sup>11</sup> *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009. Western Australia Department of Health (DoH), (WA DOH 2009)

<sup>12</sup> *Waste Classification Guidelines – Part 1: Classifying waste*. NSW EPA 2014 (EPA 2014)

to facilitate the placement of asbestos impacted materials beneath an appropriately designed capping layer to minimise any future migration of existing asbestos impacts due to erosion or future works at the site.

### 4.3 Review of Historical Data and Site Inspection (WSP 2023<sup>13</sup>)

WSP Australia Pty Ltd (WSP) was engaged by SW in 2023 to undertake a review of the PSI (CH2M Hill 2015a) and DSI (CH2M Hill 2015b) as well as undertake a site investigation for the property identified as the Northern Boiler Paddock, located at Honeman Close, Huntingwood, NSW (the site).

The observations made by WSP during the site inspection remained generally consistent with site observations reported in the PSI and DSI (CH2M Hill 2015a and 2015b). No surficial asbestos was observed by WSP at the time of inspection. Some illegally dumped materials (comprising domestic waste) previously reported by CH2M Hill was not observed by WSP. WSP also noted illegally dumped domestic waste in two locations not previously reported by CH2M Hill.

The *Review of Historical Data and Site Inspection* report prepared by WSP concluded that the findings of the PSI and DSI (CH2M Hill) were considered to remain valid, and site conditions were largely unchanged from those reported previously.

### 4.4 Report on Geotechnical Investigation (DP 2023<sup>14</sup>)

Douglas Partners Pty Ltd (DP) was engaged by SW to undertake a geotechnical and salinity assessment as part of a presale due diligence for the property identified as the Northern Boiler Paddock, located at Honeman Close, Huntingwood, NSW (the site).

The investigation was reported to include the advancement of 22 sampling locations via the use of a track mounted excavator, and drilling of eight boreholes using a track mounted drill rig at the site. Three of the boreholes advanced were also converted to groundwater monitoring wells.

Ground conditions as encountered by DP during this investigation are summarised in **Table 4.1** below.

**Table 4.1 DP 2023 sub-surface condition summary**

Stratigraphy	Description
Topsoil	Silty clay, gravelly clay, or silty sand topsoil observed to a depth of 0.1m to 0.4 m bgs.
Fill	Silty Clay, with inclusions of brick, gravel, and plastic pipe, to a depth of between 0.2m and 2.4m bgs.
Natural Soil	Stiff to hard silty clay or sandy clay, to a depth of between 0.6m and 4.9 m bgs.
Interbedded Siltstone and Sandstone Bedrock	High to moderately weathered siltstone and slightly weathered sandstone, observed between 1.0m and 4.9 m bgs.

No groundwater was observed during borehole or test pit advancement. Groundwater levels at the site measured at the three groundwater monitoring wells were reported at between 1.7m and 4.0 m bgs.

### 4.5 Detailed Site Investigation (JBS&G 2025)

JBS&G Australia Pty Ltd (JBS&G) were engaged by Goodman to undertake a combined Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) to support the future development application for the property located at Honeman Close, Huntingwood (the site).

<sup>13</sup> Review of Historical Data and Site inspection, *Northern Boiler Paddock, Honeman Close, Huntingwood, NSW*, prepared for Sydney Water by WSP Australia Pty Ltd, dated 08 November 2023 ref. PS207339-WSP-SYD-CLM-Boiler Paddock-LTR-01 Rev C (WSP 2023)

<sup>14</sup> *Report on Geotechnical Investigation, Presale Due Diligence, North Boiler Paddock, Honeman Close, Huntingwood, NSW*, prepared for Sydney Water Corporation by Douglas Partners Pty Ltd, dated 21 November 2023 ref. 22503900. R.001.Rev0 (DP 2023)

The scope of the investigation included a desktop assessment of historical land use activities and regional environmental conditions; review of historical environmental documents made available to JBS&G (as summarised above); development of a conceptual site model (CSM) of potential contamination; documentation of a sampling analysis and quality plan (SAQP); implementation of the plan inclusive of field sampling of potentially impacted media and subsequently laboratory analysis of samples; evaluation of the resulting data against site specific health and ecological assessment criteria; and preparation of a DSI report.

Intrusive works undertaken as part of this investigation included advancement of 36 test pits via the use of a track mounted excavator, with an additional five boreholes advanced via a track mounted drill rig to enable installation of groundwater monitoring wells, that resulted in investigation from a total of 41 soil sampling locations. Additionally, groundwater was sampled from the five groundwater monitoring wells installed at the site, and a total of six surface water samples were collected from the tributaries of Bungarribee Creek present at the site.

Based on the scope of work completed, the investigation findings included:

- The site has largely remained as a vacant lot since the 1950s;
- Review of historical site use information and inspection of site conditions identified potential AECs and associated COPCs, which were associated with importation of fill materials from unknown origins, soils impacted by potential historical agricultural purposes, and potential impacts in surface water and groundwater from adjacent and upgradient commercial/industrial land-uses, including the TfNSW Crash lab (west of the site), construction staging associated with the M4 (east of site), and M4 Service Station (southwest of site);
- Fill material was encountered at depths ranging between 0.0 m bgs to 3.2 m bgs. Fill material generally comprised dark brown/grey/brown gravelly/silty/sandy clay or gravelly sand with inclusions of timber, asphalt, concrete, glass, bricks, metal, and tile.
- The relative quantity of inclusions (except for ACM) in fill are such that they are not considered to pose an unacceptable aesthetic issue for the proposed land use, presuming that the site surface across the proposed redevelopment will be finished with imported with landscaping materials including soil and grass/shrubs/trees etc, new hardstand areas and new buildings.
- Assessment of site conditions has identified the presence of an in-ground septic tank in the eastern portion of the site, requiring management/removal or confirmation the tank and associated infrastructure are no longer present at the site;
- The soil contaminant impacts identified during the investigation and review of historical investigations include:
  - Bonded, non-friable ACM at concentrations below the applicable site criteria at five sample locations (JBTP09\_0.0-1.0, JBTP25\_0.0-1.0, JBTP25\_1.0-1.8, NPB01\_3.0\_PACM, NPB02\_1.3\_PACM);
  - Bonded, non-friable ACM at concentrations above the applicable site criteria at one sample location (JBTP35\_1.0-1.5); and
  - Friable asbestos at concentrations above the applicable site criteria at one sample location (NPB06\_1.0).
- Groundwater and surface water conditions at the site are considered indicative of typical Sydney urban industrial areas, with slightly elevated concentrations of heavy metals and PFAS in groundwater present beneath the site. No significant concentrations of these contaminants were identified within site soils, indicating that on site soils are not acting as a source material for the heavy metal and PFAS impacts in groundwater/surface water;
- No soil background issues or chemical mixtures, significant aesthetic issues (outside of the identified asbestos in soils) or significant offsite migration risks were identified.

It was concluded that a RAP should be prepared, documenting the procedures and requirements for management of the identified site contamination to demonstrate the site can be made suitable for the proposed commercial/industrial land use.

#### 4.6 Inferred Extent of Soil Impacts

Soil contamination identified at the site during previous investigations (CH2M Hill 2015b and JBS&G 2025) was compared to NEPC (2013) land use criteria applicable to commercial/industrial land uses (HIL/HSL D, NEPC 2013) and the proposed development. Consideration has also been given to the more sensitive land use scenarios associated with areas of ecological significance. The site DSI (JBS&G 2025) dataset is presented in summary tables in **Appendix A**, and historical soil sampling locations are shown in **Figure 3** and **4**.

In consideration of the known data set, site soil contaminant concentration exceedances at the site under the proposed land use were constrained to bonded, non-friable ACM within soils at sample locations JBTP35\_1.0-1.5, JBTP09\_0.0-1.0, NPB01\_3.0\_PACM, JBTP25\_0.0-1.0, JBTP25\_1.0-1.8, and NTPB02\_1.3\_PACM, and asbestos fines (AF)/fibrous asbestos (FA) (friable asbestos) within soils at sample location NPB06\_1.0 (**Figure 5**). Known asbestos contamination at the site is considered to be localised, and not representative of soil/fill types or locations as a whole, given the absence of detectable concentrations of asbestos (as ACM or AF/FA) within the remaining sample locations at the site. The inferred remediation extents of known asbestos impacts are shown in **Figure 6**.

## 5. Areas of Environmental Concern and Contaminants of Potential Concern

Based on the review of the site history and of previous investigations, JBS&G’s assessment and understanding of site conditions, potential areas/aspects of environmental concern (AEC) and associated contaminants of potential concern (COPC) have been identified as summarised in **Table 5.1**.

It is noted that asbestos impacts in soil listed in **Table 5.1** includes areas where asbestos concentrations were below HSLs and localised impacts of asbestos exceeding HSLs. Although the asbestos concentrations below HSLs are suitable for commercial/industrial landuse, these soils will require management from a works, health and safety perspective and will require management during site redevelopment.

**Table 5.1 Areas of Environmental Concern and Associated Contaminants of Potential Concern**

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)	AEC Description
Asbestos as bonded ACM and FA/AF present within fill materials stockpiled at the site	Asbestos	Stockpiled fill materials within the northern portion of the site as identified at sample locations JBTP35_1.0-1.5, JBTP09_0.0-1.0, NPB01_3.0_PACM, JBTP25_0.0-1.0, JBTP25_1.0-1.8, NPB06_1.0, and NTPB02_1.3_PACM (as shown on <b>Figure 5</b> and <b>Figure 6</b> ).
Aesthetic Issues associated with fill materials	B&D rubble including timber, asphalt, concrete, glass, bricks, metal, and tile	Stockpiled fill material across the northern and central portion of the site and B&D within fill materials in the eastern portion of the site, as presented in <b>Figure 6</b> .
Biological impacts associated with septic tank	Microbiological (Salmonella, Coliforms, E.Coli)	Soils underlying and surrounding the Septic tank in the eastern portion of the site, as identified in <b>Figure 6</b> .

### 5.1 Potential for Migration from Site

The potential for migration of contaminants off-site is considered to be very low given the nature (i.e., solid contaminants in the form of asbestos), distribution and depth of identified contamination. JBS&G considers there is little potential for the aeolian transport of contamination given the limited occurrence of ACM in bonded form and minimal reported AF/FA and respirable fibres in soil samples (at depth). The management strategy developed during asbestos related works will however still need to consider potential implications of wind blown transport during ground disturbance activities.

### 5.2 Potential Exposure Pathways

Based on the contaminants of potential concern identified in soil media, i.e. bonded ACM, and AF/FA at depth in soil as discussed above, the exposure pathways for contamination at the site during and following development works will likely be limited to potential inhalation of asbestos fibres where respirable asbestos fibres may be released during disturbance and abrasion of asbestos at the ground surface or in subsurface soils where fibres may become airborne.

### 5.3 Preferential Pathways

Given the contaminant of concern, asbestos, is a solid form contaminant, the potential for migration of contaminants is considered to not be influenced by preferential pathways at the site (typically associated with areas of greater soil permeability and/or flow paths. As such, no further consideration of the occurrence of preferential pathways is required with regard to management of the identified site contamination.

It should be noted that, in the event of unexpected finds being encountered other than asbestos in soil/fill, during site remediation/construction earthworks, the potential presence of other contaminants of potential concern may require consideration of the presence of preferential pathways inclusive of areas of historical backfilling, below ground services infrastructure, overland flow/discharge pathways etc, where the potential for migration of contamination is greater than would be expected in surrounding undisturbed soil profiles.

## 6. Remediation Action Plan

### 6.1 Remediation Goals

The remediation objectives for site impacts as identified are outlined as follows:

- Removal of unacceptable risks to human health from the identified asbestos contaminated fill (and any other identified areas of concern as may be identified via Unexpected Finds assessments during works), such that the site is suitable for the propose uses;
- Removal of potential unacceptable risks to human health associated with microbiological compound impacted fill (if present);
- Removal of anthropogenic materials representing an aesthetic issue. Aesthetic issues are defined as foreign/building materials, building and demolition waste and rubble that present a potential physical hazard such as timber, asphalt, concrete, glass, bricks, metal, and tile and do not contain soil discolouration from relatively inert materials (for example, ferric metals) or residual odour (for example, natural sulfur odour) under the proposed commercial/industrial land use;
- Validate the remedial works in accordance with the relevant NSW EPA Guidelines and with reference to the adopted validation criteria; and
- Document the validation process.

Furthermore, the remedial strategy should be consistent with Ecologically Sustainable Development (ESD) principles including the onsite reuse and retention of materials where possible (i.e., waste minimisation).

### 6.2 Guidance Framework

The RAP has been prepared with consideration to the following list of NSW EPA made or approved guidelines:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Amendment No.1 2013*, National Environment Protection Council (NEPC 2013).
- *Consultants Reporting on Contaminated Land, Contaminated Land Guidelines*, NSW EPA May 2020 (EPA 2020).
- *Contaminated Sites: Guidelines for NSW Site Auditor Scheme, 3rd edition*, NSW EPA October 2017 (EPA 2017).
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination*. DEC March 2007 (DEC 2007).

In addition, consideration is also required to guidelines made or approved by the EPA under the *Protection of the Environment Operations (POEO) Act 1997* and associated regulations, including the *Waste Classification Guidelines, Part 1 - Classifying Waste* (EPA 2014).

Other guidance that should also be considered in relation to site conditions includes:

- *Work Health and Safety Regulation 2019*. NSW Government Legislation. (WHS Regulations 2017);
- *Code of Practice for How to Manage and Control Asbestos in the Workplace*, SafeWork NSW, December 2022 (SafeWork 2022a); and
- *Code of Practice: How to Remove Asbestos*, SafeWork NSW, December 2022 (SafeWork 2022b).

### 6.3 Extent of Remediation

The extent of remedial works has been determined by a review of contamination/impacts identified in the DSI (JBS&G 2025) as summarised in **Section 4**. As well as considering the areas of site contamination required to address the identified human health risks posed by the known contamination, the remedial and validation works have been further designed to ensure that the inhalation pathway, which is considered to be the primary source-receptor pathway, has been appropriately managed such that the site can be considered suitable for the proposed land use.

Concentrations of bonded ACM in soil at sample location JBTP35\_1.0-1.5 and AF/FA in soil at sample location NPB06\_1.0 exceeded human health screening levels (HSL-D) adopted for the site. The locations of these exceedances are shown in **Figure 5**. The known extent of asbestos impacted materials (i.e. asbestos present within soil irrespective of criteria) is presented in **Figure 6**. Similarly, the location of the septic tank, and the extent of materials impacted with B&D rubble which may present an aesthetic risk during future site development works is also shown on **Figure 6**.

### 6.4 Assessment of Remedial Options

The *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as amended 2013 (NEPC 2013) lists the following order of preference for soil remediation and management:

- On-site treatment of the contamination so that it is either destroyed or the associated risk is reduced to an acceptable level; and
- Off-site treatment of excavated soil so that the contamination is either destroyed or the associated risk is reduced to an acceptable level, after which the soil is returned to the site; or,

if the above are not practicable,

- Consolidation and isolation of the soil on-site by containment within a properly designed barrier; and
- Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with appropriate material;

or,

- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

Remedial options have been assessed for the proposed development as detailed in **Table 6.1** below.

**Table 6.1 Remediation Options Assessment Matrix**

Remedial Option	Applicability	Assessment
<p>1. On-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level.</p>	<p><u>Bonded ACM and AF/FA Impacted Soils</u>            There is no known technology to remove asbestos fibres from soils and they cannot feasibly be manually separated from bulk soil(s).            Asbestos present in non-friable forms may be remediated by screening to remove oversize materials and/or manually picking ACM fragments. However, this requires suitable space to spread/stockpile materials and time to process and validated the material. In addition, where friable asbestos impacts have been identified to potentially co-occur with ACM fragments, screening of impacted material increases the risk of exposure to site workers and migration of fibres within the works area.            Onsite bonded ACM impacted soils may be treated via an emu-picking method. The efficacy of this remedial method will be dependent on a range of factors including volume of ACM impacted soils, concentration of bonded ACM, co-location of bonded ACM with friable asbestos, co-location of bonded ACM with other anthropogenic inclusions, fill material type (sand, silt or clay) and moisture of the fill materials (e.g., wet, sticky clays).</p> <p><u>Microbiologically Impacted Soils</u>            Soils impacted with faecal coliforms can be readily treated on site via aeration, drying and increasing soil pH, such that concentration of contaminant is reduced to below the site adopted criteria. However, given the time, energy, and relatively small volume of material in question, this is not considered the preferred option.</p> <p><u>Aesthetic Impacts</u>            Fill materials impacted with building and demolition waste poses an aesthetic issue that cannot be retained on-site. Removal of B&amp;D rubble from fill materials is time and resource intensive but may be suitable based on the volume of impacted materials requiring treatment. This will involve the tilling of material to remove over-size that represents an aesthetics issue. The efficacy of this method will be dependent on a range of factors, include volume of impacted soils, concentration of anthropogenic inclusions, fill material type (sand, silt or clay) and moisture of the fill materials (e.g., wet, sticky clays).</p>	<p><b>This is the preferred option for any (bonded) asbestos containing soil materials requiring management/remediation at the site.</b>            On-site treatment is not a viable option for friable asbestos impacted soils.            This is the preferred option for bonded ACM impacted/contaminated soils with the efficacy depending on a range of factors. On this basis, whilst this is a potential option, this is not preferred with regard to the current site remediation requirements.</p> <p>Potential option but not the preferred option.</p> <p><b>This is the preferred option for any soil materials requiring management/remediation due to excessive anthropogenic inclusions at the site.</b></p>
<p>2. Off-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level, after which the soil is returned to the site.</p>	<p>There are no energy efficient means of destroying contaminants (including asbestos) in large volumes of soils. There are no licensed facilities in proximity of the site that could complete this form of treatment.</p>	<p>Not appropriate/suitable.</p>

<p>3. On-site in situ management of the soil by physical separation, and ongoing management.</p>	<p><u>Bonded ACM and AF/FA Impacted Soils</u>          Asbestos contamination present as ACM and/or AF/FA in soil is able to be readily managed at the site via placement of material beneath a permanent physical barrier such that there are no complete exposure pathways upon completion of the development. On this basis, the contaminated soils are suitable for retention on the site in areas where human exposures can be restricted. Containment requires long term site management and notification on title and planning certificates which can be readily implemented and managed should this be acceptable to the site owner and associated stakeholders.</p>	<p><b>This is a suitable contingency for any asbestos containing soil materials requiring management/remediation at the site.</b>          The retention of the materials will reduce the waste generation and resource requirements of the remediation of the site, as consistent with the ESD objectives. The proposed development levels allow for substantial placement of non-contaminated fill material, in addition to significant building and paved areas which will provide physical separation between site users and retained fill materials.          This option is a potential option with respect to the ESD principles as a result of the low waste volumes and energy use.          It is noted that as this option may result in the need for a Long-Term Environmental Management Plan (LTEMP) that would be noted on documents to future tenants, it may not be desirable to include containment within the proposed development footprint.</p>
	<p><u>Microbiologically Impacted Soils</u>          Containment of microbiologically impacted soils is a possible option. Given no issues relating to microbiological impacts within soils surrounding the septic tank have been identified (to date) it is assumed that the relative quantity (if any) that may be identified during remedial works is minimal. Containment requires long term site management and notification on title and planning certificates which can be readily implemented and managed should this be acceptable to the site owner and associated stakeholders.</p>	<p>Potential option, but not the preferred option</p>
	<p><u>Aesthetic Impacts</u>          Site development should not result in unacceptable aesthetic issues (i.e. excessive anthropogenic materials should not remain present within surficial materials at the site).</p>	<p>Potential option, but not the preferred option</p>
<p>4. Excavation and off-site removal of the impacted material.</p>	<p>For this option material is required to be transported to a facility lawfully able to accept the type of waste subject to payment of associated fees including government waste levies. There are facilities within the Sydney region able to accept material classified as General Solid Waste (GSW), Special (asbestos) Waste, Restricted Solid Waste (RSW) and certain types of Hazardous Waste.          In the unlikely event that material is identified to be impacted such that contaminant concentrations that exceed the thresholds for characterisation as GSW, or GSW mixed with Special waste, material may require to be treated prior to off-site disposal to a lawful facility as discussed above.          This option is suitable to manage the site human health risks, via the off-site removal of material and is a rapid and final solution, not requiring ongoing management of site conditions. However, it does not meet ESD objectives and is the most costly option.</p>	<p><b>This is a suitable option for any materials contaminated with FA/AF, microbiologically impacted materials, or materials impacted with excessive B&amp;D rubble requiring management/remediation at the site.</b>          Given the costs associated with off-site disposal and the ESD considerations, whilst this is a feasible option, it ranks less favourably than the above on-site containment option.</p>

## 6.5 Remedial Scope of Works

Should further impacted material (i.e., not previously identified in historical investigations) be identified as part of an unexpected find during data gap, remediation and/or civil construction works, the remedial options screening matrix in **Table 6.1** will be required to be reviewed. Notwithstanding, it is anticipated that any impacts will be relatively isolated and could be appropriately managed through the controlled excavation and either on-site containment and/or off-site disposal of impacted/contaminated materials.

Remedial extents as currently understood are shown on **Figure 6** and are discussed in **Section 6.3** above.

### 6.5.1 Site Establishment

All safety and environmental controls are to be implemented as the first stage of remediation works, as outlined in **Section 8**. It is anticipated that all remedial works will be undertaken concurrently with construction of the site, and will include, but not be limited to:

- Locate and isolate all required utilities in the proximity of the works;
- Assess need for traffic controls;
- Work area security fencing;
- Site signage and contact numbers; and
- Sediment fencing (attached to security fencing).

### 6.5.2 Establishment of Asbestos Works Areas

Establishment of asbestos removal works areas with temporary exclusion measures will be required. Given the size and complexity of the site, it is anticipated that remediation areas will be identified and implemented on a progressive basis across the site based on an overall program of exposure, management/remediation and clearance.

Due to the nature of the site, requirements for establishment of the asbestos works area may vary dependent upon the location of the works area. It is anticipated that the extent of the asbestos works zone will be defined by formalised hazard mesh fencing with appropriate marked signage.

Prior to asbestos removal works, an Asbestos Management Plan will be prepared by the appointed asbestos removalist or NSW Licenced Asbestos Assessor (LAA). Friable asbestos removal works is to be completed by an NSW Class A Asbestos Removalist under the supervision of a LAA. All control measures, monitoring and PPE requirements will be reviewed and endorsed by the appointed NSW LAA.

Bonded asbestos removal work is to be completed by an NSW Class A or Class B Asbestos Removalist under the supervision of a NSW Competent Person.

Independent of the fencing arrangements, the requirements for establishment of asbestos removal areas prior to asbestos removal works will be required as follows:

- The zone will be established by the contractors with sufficient room to enable machinery to work wholly within the zone. Asbestos removal caution signage will be posted at the works area extent and remain in place until a clearance is provided by the LAA;
- A decontamination area shall be established for asbestos removal areas for personnel to enter and exit the asbestos removal area;
- A similar plant/machinery decontamination area shall also be established as appropriate to enable decontamination of plant/machinery prior to exit from the works area;
- Static air monitoring shall be completed at locations surrounding all the asbestos remediation works. Air monitoring shall be conducted for the duration of each shift and shall be completed in accordance

with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC: 3003(2005)]* for the duration of asbestos removal works.

- The remediation contractor shall be responsible for undertaking a pre-start 'toolbox' talk with all personnel involved. No unauthorised/non-inducted personnel may enter any asbestos removal area.
- Prior to excavation and removal works occurring, the appointed asbestos removal contractor shall conduct a site induction and toolbox talks to make workers aware of the presence of asbestos at the site and of the required procedures to work safely with respect to the risks posed by asbestos. No unauthorised/non-inducted personnel may enter the asbestos removal area; and
- The asbestos removal contractor shall ensure that sufficient asbestos related personal protective equipment (PPE), in addition to normal site PPE requirements, is available for all personnel for the duration of the proposed asbestos remediation works including:
  - Disposable coveralls must be worn (Type 5, Category 3 or better);
  - Disposable gloves – non disposable gloves must be cleaned within the decontamination unit;
  - P2 class respirator or higher – non disposable respirators must be cleaned in the decontamination area. Respirators should be issued for personal use only and shall be kept in a clean condition; and
  - Laceless steel capped rubber soled work shoes or gumboots.
- Plant operators undertaking sub-surface intrusive works must close cabin doors and windows and set air conditioning to re circulate when operating within the asbestos work zone or alternatively, the plant must be fitted with HEPA filters to the air conditioner inlet vents to ensure a suitable air supply. Should plant operators need to leave the isolated cabin within the asbestos removal works zone, they will be required to don the PPE requirements as outlined above.

Employees must receive instruction in the correct method of using the respirator and on the importance of correct facial fit and maintenance. No person with a beard shall be allowed within the asbestos work area except using an approved positive pressure continuous airflow hood. Alcohol based antiseptic swabs should be made available for the cleaning of respirators. Any respirator defects should be reported for subsequent repair. They should be maintained in a clean and safe working condition

It is further noted that, as part of the WorkSafe NSW permitting process, additional PPE may be required. If this occurs, then the above PPE requirements will be upgraded to reflect SafeWork NSW requirements.

The decontamination procedures specified below will be followed whenever personnel, plant or equipment leave the asbestos works areas:

#### Personnel

The following steps should be taken to ensure personnel do not leave the works areas with potentially contaminated clothing:

- Wash boots with clean water;
- Remove outer gloves and store for reuse;
- Remove overalls and place in the skip for the asbestos wastes for disposal;
- Remove respirator and goggles (if used) and store clean for reuse or decontamination, as appropriate; and
- Thoroughly wash hands and face.

#### Vehicle, Plant and Equipment

All equipment, including personal protective equipment, will be washed or otherwise cleaned to ensure that contaminated soil, water or dust is removed before it leaves the asbestos works area. All plant and equipment will have their outer bodies thoroughly cleaned of soil and sediment before moving away from the asbestos works area.

### 6.5.3 Asbestos Excavation Activities

The known areas of asbestos impact are shown on **Figure 6**.

Excavation works for asbestos impacted soil may include one or more of moving the impacted material via pushing or stockpiling to one side, or alternatively, loading directly into transport vehicles fitted with suitable covers for movement to the containment cell placement location (preferred option). During these works the following procedures will apply:

- The asbestos removal contractor shall have total control of the asbestos work area for the duration of the asbestos remediation works and shall undertake all works in accordance with the requirements of their license;
- All personnel entering the asbestos remediation area shall do so through the decontamination area/unit and don the required PPE at all times when within the asbestos removal area;
- The proposed asbestos removal area shall be kept damp by water spraying at all times during disturbance to reduce the possibility of dust generation;
- Excavated asbestos impacted soils shall be loaded directly into suitable transport vehicles for immediate movement to the placement area within the works zone. Subject to vehicles not being required to leave the works zone, the vehicles will not require to be covered, however the material should be sufficiently damp so as to minimise the potential for dust generation during movement/placement.
- When excavation works approach the vertical and/or lateral extent of the known/suspected impact, the LAA will monitor the excavation work activities and provide advice on appropriate removal depths based on visual observations in conjunction with the licensed removal contractor;
- Excavation works will continue until such time as the side and base margins of the excavation are visually free of asbestos containing material;
- Following the removal of asbestos impacted materials, the post excavation surface will be required to be cleared and validated as per **Section 7**.

The final site surface within the subject site will also be required to be cleared of visible asbestos in accordance with the validation procedures in **Section 7**.

### 6.5.4 Material Tracking Requirements

The movement of all materials on the site, to the site and from the site is required to be subject to a Material Tracking Plan (MTP). The MTP shall be administered by the Remediation Consultant with the provision of all required information by the Contractor.

Material tracking shall be required for all materials that are moved / excavated from a location on the site and not wholly replaced in the same locations within 12 hours of material movement (i.e., soils excavated for test pitting / assessment do not require material tracking, however all other material will require tracking).

To this extent, all excavation and filling works as undertaken for the purposes of site remediation require the following information to be recorded by the Contractor on Material Tracking Forms (MTFs) and in an electronic Material Tracking Spreadsheet (MTS) and verified by the Remediation Consultant, with respect to material placement activities:

- Date (yyyy/mm/dd);
- Unique MTF identification (starting at 001);

- Site figure showing source (cut) and placement (fill);
- Estimated volume (cubic metres);
- Type of material;
- Source (from) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Placement (to) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Source (from) information in terms of site feature (e.g. Remedial Zone);
- Placement (to) information in terms of site feature (e.g. Remedial Zone);
- Source (from) information from off-site source site (e.g., Quarry A);
- Placement (to) information for off-site disposal (e.g., tip, EPA tracking number, docket reference);
- Reference document (where necessary, i.e., virgin excavated natural material / excavated natural material classification);
- Purpose of placement (i.e., containment, surplus to site requirements etc); and
- Comments (when required).

For material which has been removed for the purposes of environmental remediation and is proposed to be moved again subsequent to the completion / validation of environmental remediation works, MTFs for the replacement of the material shall make reference to the initial MTFs generated by the excavation of the materials for remediation. As part of the validation of the material tracking forms, mass / material balances shall be assessed at each stage where additional material tracking forms are generated for particular site material.

It is the responsibility of the Contractor to ensure the MTF(s) are completed and submitted to the Remediation Consultant at the end of each day's work. The Remediation Consultant has ownership of the MTFs on receipt of all the necessary information from the Contractor.

The Remediation Consultant is required to review the submitted MTFs and to investigate/resolve any discrepancies. Following this review, a copy of the MTFs will be forwarded to the Principal. Ideally this would occur within two days of the Remediation Consultant verifying the MTFs from the Contractor.

The MTP is considered an active process and revisions of the MTP will be undertaken to improve the MTFs and MTS to ensure comprehensive and efficient material tracking.

### **6.5.5 On-site Containment**

Any material to be managed through on-site containment will be relocated to the proposed containment excavation through the following procedure:

- Material will be placed within the containment area in a manner consistent with requirements to be confirmed by project civil/geotechnical engineers;
- Upon completion relocation of all known asbestos or potentially impacted material to the containment area, the final surface will be covered with a marker layer comprising an easily identifiable non-woven permeable polyester continuous filament or PET (such as non-woven geotextiles). The marker layer must:
  - Be easily recognisable within soils (e.g., bright orange in colour, or otherwise contrasting with the surrounding soil colour);
  - Be durable as a long term marker layer (i.e., > 150 grams per square metre);
  - Be sufficiently permeable to allow water to penetrate through; and

- Maintain integrity during remedial/civil works such as capping layer installation.
- An LAA shall inspect and document the installation of geofabric marker layers, where FA/AF is being contained, including collection of a photographic record of site conditions during/following placement of the marker layer. A competent person can inspect and record containment of bonded ACM;
- A registered surveyor will be required to survey the elevation and upper lateral extent of the containment area and provide this to Goodman and the remediation consultant;
- Subsequent to placement of the marker layer, a capping layer with a minimum thickness of 0.5 m (after compaction) of non-impacted material will be placed above the marker layer in non-paved areas. In paved areas, concrete pavement would comprise a suitable capping layer. Material selected for use as a capping layer will be required to be environmentally and geotechnically suitable engineered fill, sourced from either the broader site, or lawfully imported under existing site approvals. Following the installation of the capping layer, a final clearance inspection will be completed by an Environmental Consultant/LAA as appropriate, with details to be included in the final validation report; and
- Where the final finished levels of the capping profile are mounded and/or battered above surrounding ground level, installation of the marker layer and subsequent capping layer will be required to be achieved to the equivalent thickness on all physical extents of the capped profile, thereby providing a durable physical barrier between contained asbestos impacted material and subsequent site users/workers.
- Should materials with concentrations of any COPCs exceeding the adopted site HILs be contained on-site, a long-term environmental management plan (LTEMP) will be required and should include specific details of the installation of a marker layer as detailed in **Section 7.5**.

#### 6.5.6 Pad Pick and Removal of ACM

The following represents a methodology to be undertaken to address bonded ACM impacted materials at the site:

- Fill identified to contain bonded ACM is to be progressively excavated and stockpiled in appropriately sized batches (as determined by the contractor based on available space etc.);
- The lateral and vertical extent of the excavation and associated stockpiled soils are to be surveyed for material volume reconciliation;
- The excavations will be validated by the remediation consultant as per **Section 7**. Should validation fail, the failed base or wall of the excavation will be excavated a further 0.2 m in the direction of the failure and the validation process repeated until validation is achieved;
- The bonded ACM impacted fill is to be spread by the remedial contractor to form pad/s not more than 0.1 m thick, within the designated pad sorting area (more than one pad may be used);
- The dimensions of each pad are to be documented such that the volume of material can be verified and meet the validation sampling density required;
- ACM fragments are to be collected by raking (teeth >10 cm long and not more than 7 mm spacing) and picking of the spread material by the remedial contractor or their appointed contractor and collected ACM fragments disposed of off-site to an appropriately licensed waste facility. A minimum of two passes of picking and raking will be made with a 90° direction change between each;
  - Other methodologies may be deployed based on a cost/benefit evaluation by remedial contractor such as use of a Table Screen (or similar) due to the variable anthropogenic inclusions which may make it difficult to sort/treat manually;
- Following the initial screening process, the remedial contractor or their appointed specialist contractor shall complete a second walkover of the pads to confirm there is no visible ACM;

- Pads will be validated by JBS&G as per **Section 7**. Should validation fail the pad will be subjected to an additional rake, walk/pick by the remedial contractor or their appointed contractor and re-validated by JBS&G until such time as validation is achieved;
- At completion of validation of a prepared pad, material will be consolidated into 25 m<sup>3</sup> stockpiles and placed in a holding area and the process restarted with the placement of a new pad;
- Upon completion of all picking works, the areal footprint of all stockpiles/pads is to be validated by JBS&G as per **Section 7**. Should validation fail, the failed base of the pad/stockpile will be excavated a further 0.1 m in the direction of the failure and the validation process repeated until validation is achieved;
- Materials will be tracked from source, through required remedial activities to final placement/disposal, noting remediation works undertaken and validation outcome such that it can be demonstrated all excavated material has been appropriately remediated and validated prior to reuse;
- Where present within ACM contaminated material, anthropogenic inclusions will be separated from the pad material for direct load out to an appropriately licensed waste facility;
- The extents/volumes are to be recorded for material volume reconciliation; and
- Validation inspection will be completed by JBS&G to document that the anthropogenic materials have been successfully removed to a level which does not represent an aesthetics issue.

#### **6.5.7 Removal of Anthropogenic Materials Representing and Aesthetic Issue**

Removal of foreign materials representing aesthetic issues from the ground surface shall be undertaken as per the following protocol:

- Carefully sort, and remove foreign materials that represent an aesthetics issue ;
- Dispose foreign materials to an appropriately licensed waste facility; and
- Validation by JBS&G that foreign materials have been successfully removed to a level which does not represent and aesthetics issue.

#### **6.5.8 Decommissioning of Septic System**

Following the removal of the septic system (tank and associated piping), the balance of materials will require sampling to demonstrate there are no residual biological impacts, in accordance with the validation requirements outlined in **Table 7.3**

#### **6.5.9 Off-site Disposal**

Should any material be identified as requiring removal from the site during implementation of the RAP, this material is required to be disposed of off-site to a facility lawfully able to receive it. Materials shall be classified prior to removal from the site in accordance with NSW EPA Waste Classification Guidelines (EPA 2014) requirements, or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014* in preparation for off-site removal.

Details of completed additional assessment activities including material characterisation reports will be included in the final validation documentation to be prepared in accordance with the requirements of the RAP. Records associated with material tracking, including trucking receipts, landfill disposal records, etc will also be reviewed to ensure material removed from the site can be accounted for and has been disposed of lawfully.

#### **6.5.10 Materials Importation**

In accordance with current EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. Imported materials will only be accepted to the site if they meet the restrictions placed on these materials and meet the definition of:

- VENM as defined in the POEO Act (1997) Schedule 1;
- ENM as defined in the ENM Exemption/Order; or
- Resource recovery materials as per an EPA exemption.

All material imported onto the site are required to be accompanied by appropriate documentation that has been verified by the appointed site contamination (environmental) consultant.

Materials proposed to be imported for use under a Resource Recovery Exemption/Order will be subject to review and endorsement by the environmental consultant prior to the importation of materials to the site.

#### **6.5.11 Validation**

Validation of the remedial works will be conducted by the Environmental Consultant to demonstrate the remediation objectives have been achieved. Details of the validation program are provided in **Section 7**.

#### **6.5.12 Site Disestablishment**

On completion of the remediation works all plant/equipment and safety/environmental controls shall be removed from the site by the appointed Remediation Contractor. All equipment used during remediation works will need to be appropriately decontaminated or disposed of as waste by the Remediation Contractor, in accordance with relevant waste regulations.

### **6.6 Contingency Plan**

Given the available site history information, consideration has been given to the potential for additional small-scale issues that may arise during works (from a contamination viewpoint). Contingency plans for a range of potential identified scenarios are discussed following to ensure firstly the safety and health of people and the environment and secondly that the overall project objectives are achieved.

#### **6.6.1 Material Storage Breach**

In the event that any materials storage containment controls are breached and stockpiled materials classified as asbestos contaminated soil or otherwise have escaped (or have the potential to escape), then the management controls shall be rectified, and investigations undertaken to review the adequacy of the controls and any improvements implemented.

#### **6.6.2 Emissions Complaints**

Due to the nature of the activities and type of contaminants identified at the site, it is unlikely that there will be complaints received from members of the public relating to environmental emissions.

#### **6.6.3 Excavation Validation Failure**

In the unforeseen event that the proposed remediation works do not meet the validation criteria, or if the selected remedial strategy is unsuccessful, the following actions will be considered to ensure firstly the safety and health of people and the environment and secondly that the overall project objectives are achieved:

- Continued controlled excavation and on-site containment, off-site disposal or treatment of impacted/contaminated material until validation is achieved; and/or
- Reassessment of remedial options for excavated materials, including:
  - Alternate on-site treatment options; and/or
  - On-site containment.

In the event that excavation cannot be further completed in one or more directions as a result of access limitations, such as boundaries to the ecological communities, etc, documentation of the extent of remediation works successfully will be completed, followed subsequently by appropriate assessment and

characterisation of the nature and extent of the contaminated material remaining in the relevant area. Where potentially complete exposure pathways remain with regard to the future development scenario, further consideration will be required to implementation of appropriate long term access control measures to manage the residual risk to future site occupants/users and the potential for contaminant migration such that the RAP objectives can be met and the site made suitable for the proposed use, subject to ongoing management.

#### 6.6.4 Unexpected Finds Protocol (UFP)

It is acknowledged that previous investigations of the site have been undertaken to assess the identified contaminants of potential concern. However, ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and / or in unexpected locations during remediation. The nature of any residual hazards which may be present at the site are generally detectable through visual or olfactory means, for example:

- The presence of significant aggregates of friable asbestos materials (visible) as ACM and or AF/FA impacted material;
- Bottles / containers of chemicals (visible);
- Ash and/or slag and/or tar contaminated soils / fill materials (visible);
- Drums, waste pits, former pipework or unrecorded USTs (visible); and
- Volatile organic compound (VOC) contaminated soils (odorous) and vapours.

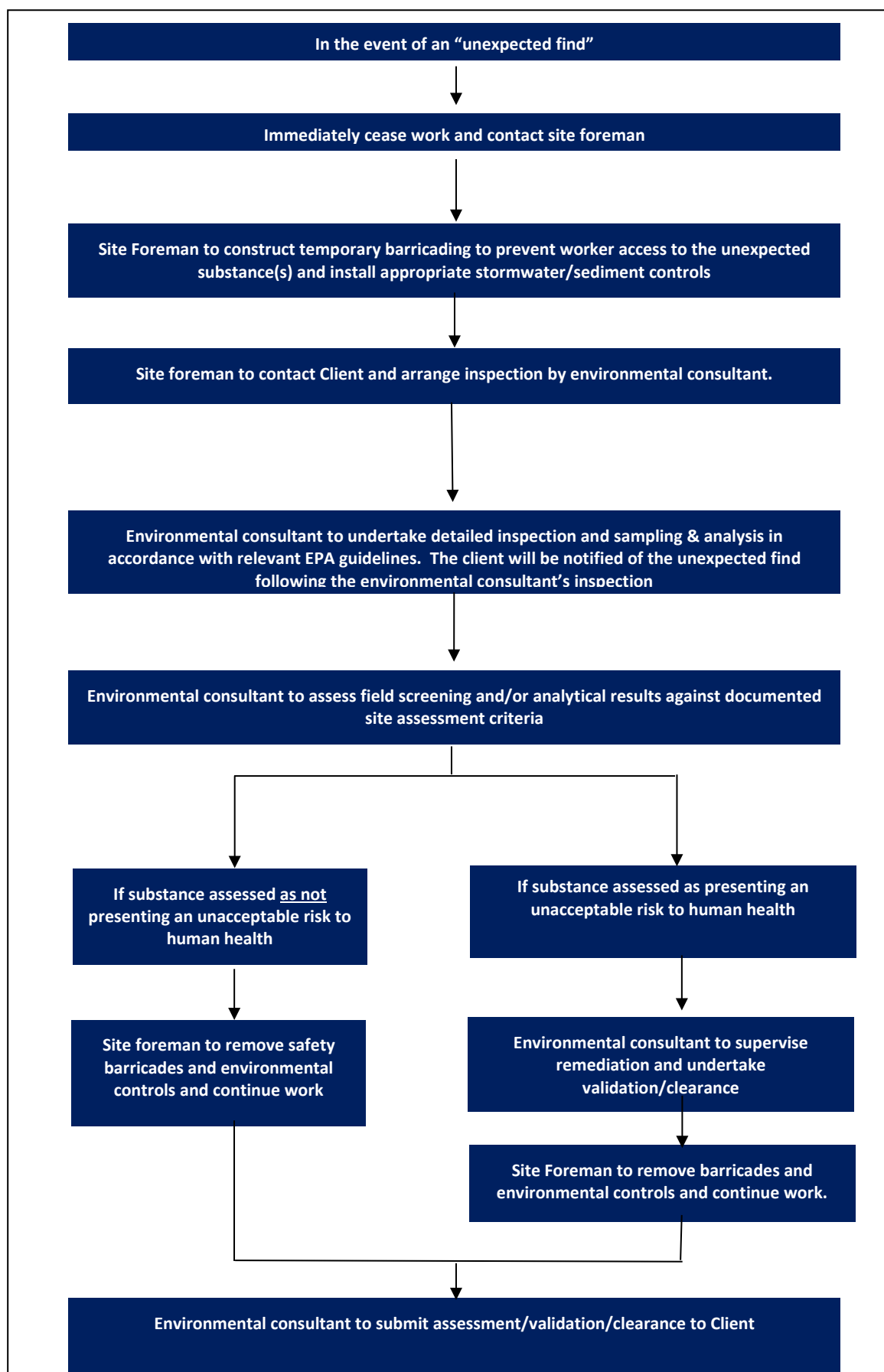
As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances be identified (or any other unexpected potentially hazardous substance), the procedure summarised in **Flowchart 6.1** is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use on-site, should be posted in the site office and referred to during the site-specific induction by the remedial / principal contractor.

The sampling strategy for each “unexpected find” shall be designed by a suitably qualified environmental consultant. The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

The sampling frequency of the identified substance/materials shall meet the minimum requirements outlined in EPA (2022) in addition to those outlined in **Section 7**.

Flowchart 6.1 - Unexpected Finds Protocol



## 7. Validation Plan

Data will be required to be collected during remediation and civil construction works to assess the effectiveness of the implemented management actions and document the final condition of the site at the completion of all works. Such information will allow conclusions to be drawn on the end suitability of the site for the proposed use. The general principles to be implemented with regard to the validation assessment are discussed in accordance NSW EPA *Guidelines for the NSW Site Auditor Scheme (3<sup>rd</sup> edition)* (NSW EPA 2017) requirements in the following sections.

It is anticipated that the validation assessment will be required to address the following broad issues:

- Collection of appropriate environmental data from excavation faces, screened material and from beneath former stockpiles and pads following the removal of asbestos;
- Collection of appropriate environmental data from excavation faces, former infrastructure footprints and backfill materials following the removal of former septic tanks, associated infrastructure and related targeted areas of concern; and
- Visual confirmation that anthropogenic materials have been removed and reduced to a level which does not represent an aesthetics issue;
- Characterisation and off-site disposal and/or beneficial use of materials excess to construction requirements, including contaminated material nominated for off-site disposal (where relevant).

### 7.1 Data Quality Objectives

Data Quality Objectives (DQOs) were established for the validation of soil impacts. NEPC (2013) describes the DQO process as a seven-step iterative planning approach which is used to determine the type, quantity, and quality of data required to inform decisions relating to the environmental condition of a site. The seven steps of the DQO process are documented in the following sections.

#### 7.1.1 State the Problem

Previous investigations as evaluated in **Section 4** have identified that management of site contamination issues is required such that at the completion of works, a final validation assessment may confirm the suitability of the site for the proposed commercial/industrial use.

As such, during remediation activities, sufficient validation of site remedial/management actions are required to demonstrate that the identified environmental impacts and associated health risks to site receptors have been adequately managed to render the site suitable for the proposed land use.

#### 7.1.2 Identify the Decision

The following decisions are required to be made during the validation works:

- Are there any unacceptable risks to future on-site receptors from any residual contamination following the implementation of the proposed remediation/civil works at the site?
- Were the impacted/surplus materials classified and disposed off-site to a facility licensed to accept the classified waste?
- Has all material imported to site to achieve development objectives been demonstrated as suitable for use?
- Have site works been completed in accordance with the RAP requirements, or where variations to the works required by the RAP have occurred, have these been appropriate to meet the objectives of the RAP, with respect to site validation?

- Is all validation data considered reliable?
- Is the site suitable for the proposed use?

During the remediation/management activities, sufficient validation of site activities is required to demonstrate that the identified environmental and health-based risks to future on-site receptors have been adequately managed to render the site suitable for the proposed land use.

### 7.1.3 Identify Inputs to the Decision

The inputs to the decisions are:

- Previous investigation results as discussed in **Section 4**;
- Previous investigation data;
- Field observations, sampling and analytical validation data during remedial works;
- Field observations, sampling and analytical data for offsite disposal of waste materials;
- Documentation of appropriate classification of imported materials;
- Assessment criteria for soil; and
- Data quality indicators as assessed by quality assurance/quality control procedures (QA/QC).

### 7.1.4 Define the Study Boundaries

The validation study boundaries are restricted to the lateral extent the subject site as shown on **Figure 2**. The vertical extent of the validation study is anticipated to be restricted to the maximum depth of excavation works and/or stockpile movement activities required to achieve site validation requirements.

Due to the nature of potential contaminants identified, temporal variables will not be assessed as part of the validation assessment activities. The temporal boundaries of investigations will be limited to the period of field validation assessment works.

### 7.1.5 Develop a Decision Rule

A summary of the decision rules to be adopted for each of the environmental issues required to be addressed are outlined in **Table 7.1** below.

**Table 7.1 Summary of Decision Rules**

Decision Required to be Made	Decision Rule
1. Are there any unacceptable risks to onsite or offsite receptors from any residual soil contamination?	<p>Soil analytical data will be compared against EPA endorsed criteria as established in the RAP.</p> <p>For the validation sample sets, statistical analysis of the data will be undertaken in accordance with relevant guidance documents, as appropriate, to facilitate the decisions. The following statistical criteria will be adopted with respect to soils:</p> <p><u>Either</u>: the reported concentrations are all below the site criteria;</p> <p><u>Or</u>: the average site concentration for each analyte must be below the adopted site criterion; no single analyte concentration exceeds 250% of the adopted site criterion; and the standard deviation of the results must be less than 50% of the site criteria.</p> <p><u>And</u>: the 95% upper confidence limit (UCL) of the average concentration for each analyte must be below the adopted site criterion.</p> <p>If the statistical criteria stated above are satisfied, the decision is <b>No</b>.</p> <p>If the statistical criteria are not satisfied, the decision is <b>Yes</b>.</p> <p>Note: it is not appropriate to apply 95% UCL to asbestos validation samples.</p>

2. Are there any aesthetic issues remaining following remediation works?	<p>If there were any remaining unacceptable aesthetic impacts including staining, odours, anthropogenic inclusions or visible ACM in the top 100 mm, the answer to the decision will be <b>Yes</b>.</p> <p>Otherwise, the answer to the decision will be <b>No</b>.</p>
3. Was excess excavated soil classified and disposed of offsite to a facility licensed to accept the classified waste?	<p>Soil analytical data will be compared against EPA Waste Classification Guidelines (2014). Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions (as detailed above). Documentation from the operation receiving the material including the dates, tonnage and classification of the accepted material will be required to facilitate the decision.</p> <p>If the statistical criteria stated above are satisfied, and if receipts are provided recording the disposal of material to an off-site licensed facility, the decision is <b>Yes</b>.</p> <p>If the material fails the criteria, and no disposal receipts are provided, the answer is <b>No</b>.</p>
4. Was imported material used as backfill suitable for the intended land use?	<p>Material required to be imported onto the site for trench backfill or road building purposes (or any other purpose) are required to be demonstrated to be Virgin Excavated Natural Material (VENM), Excavated Natural Materials (ENM) or material considered suitable for beneficial reuse in accordance with a resource recovery exemption issued by NSW EPA under clauses 51 and 51A of the Protection of the Environment Operations (Waste) Regulation 2014.</p> <p>All imported material must not be classified as containing asbestos.</p> <p><u>VENM</u></p> <p>Laboratory analysis results will be compared to published background levels (metals) and nominated laboratory LORs (for all man-made chemical constituents) for VENM. The Remediation Consultant will conduct a site inspection of all VENM source sites and approve any VENM Certificates prior to importation of material. If either the source site or supporting documentation is unsatisfactory in regard to certainty of the material comprising VENM, the Remediation Consultant will undertake additional sampling to confirm chemical characterisation of VENM material and prepare any required documentation.</p> <p><u>ENM</u></p> <p>ENM will be assessed in accordance with the “Excavated Natural Material Exemption 2014”. The Remediation Consultant will conduct a site inspection of all ENM source sites and approve any ENM material characterisations prior to importation of material. If either the source site or supporting documentation is unsatisfactory in regard to certainty of the material comprising ENM, the Remediation Consultant will undertake additional sampling to confirm chemical characterisation of ENM material and prepare any required documentation.</p> <p><u>Resource Recovery Exemptions</u></p> <p>Any materials falling under this category will be assessed in accordance with the relevant resource recovery exemption. The Remediation Consultant will undertake additional assessment and reporting if required to ensure compliance with the relevant resource recovery exemption.</p>
5. Have all remediation works been completed in accordance with the requirements of the RAP, or where variations were required, have these been appropriate to meet the RAP objectives?	<p>Were any of the answers to Question 1 to 4 Yes, the answer to the decision is <b>No</b>. Further assessment is required to establish the nature and extent of additional remediation/management as may be required.</p> <p>If the RAP requirements were addressed, and there are no outstanding issues, the answer to the decision is <b>Yes</b>.</p>
6. Is the site suitable for the proposed use?	<p>With the exception of question 6, is the answer to any of the above decisions Yes?</p> <p>If yes, have the outstanding issues appropriately addressed by further assessment/remediation/management?</p> <p>If the issues have been appropriately addressed, the answer to the decision is <b>Yes</b>.</p>

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Otherwise, the decision is **No** and the requirements for further remediation of the Site and/or implementation of additional management measures (as documented in EMP) are required to be documented such that the answer to the decision can be Yes.

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### 7.1.6 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), appropriate indicators of data quality (DQIs used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQIs for to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters). The acceptable limit on decision error is 95% compliance with DQIs.

The pre-determined DQIs established for the project are discussed below in relation to the PARCC parameters and are shown in **Table 7.2**.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD<sup>15</sup>) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; and ensuring analysing laboratories use consistent analysis techniques; and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

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$$RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

15

Where C<sub>0</sub> is the analyte concentration of the original sample  
C<sub>d</sub> is the analyte concentration of the duplicate sample

**Table 7.2 Summary of Quality Assurance / Quality Assurance Program**

Data Quality Objectives	Frequency	Data Quality Indicator
<b>Precision</b>		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD <sup>1</sup>
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD <sup>1</sup>
Laboratory Duplicates	1 / 20 samples	<50% RPD <sup>1</sup>
<b>Accuracy</b>		
Surrogate spikes	All organic samples	70-130% recovery
Laboratory control samples	1 per lab batch	70-130% recovery
Matrix spikes	1 per lab batch	70-130% recovery
<b>Representativeness</b>		
Sampling appropriate for media and analytes	All samples	- <sup>2</sup>
Samples extracted and analysed within holding times.	-	Organics (14 days), inorganics (6 months)
Laboratory Blanks	1 per lab batch	<LOR
Trip blanks	1 per lab batch	<LOR
Trip spike	1 per lab batch	70-130% recovery
Storage blank	1 per lab batch	<LOR
Rinsate sample	1 per sampling event/media	<LOR
<b>Comparability</b>		
Standard operating procedures for sample collection & handling	All Samples	All Samples
Standard analytical methods used for all analyses	All Samples	NATA accreditation
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples <sup>2</sup>
Limits of reporting appropriate and consistent	All Samples	All samples <sup>2</sup>
<b>Completeness</b>		
Sample description, monitoring and field reporting sheets and Chain of Custody (COCs) completed and appropriate	All Samples	All samples <sup>2</sup>
Appropriate documentation	All Samples	All samples <sup>2</sup>
Satisfactory frequency and result for QC samples		95% compliance
Data from critical samples is considered valid	-	Critical samples valid
<b>Sensitivity</b>		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	LOR<= site assessment criteria

<sup>1</sup> If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment was made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

<sup>2</sup> A qualitative assessment of compliance with standard procedures and appropriate sample collection methods was completed during the DQI compliance assessment.

## 7.2 Optimise the Design for Obtaining Data

The purpose of this step is to identify a resource-effective field investigation sampling design that generates data that are expected to satisfy the performance criteria, as specified in the preceding steps of the DQO Process.

For these works, after the removal of impacted fill materials, the resultant excavation walls/base/stockpile footprint will be inspected/sampled in accordance with **Table 7.3** with the results assessed against the validation criteria in **Section 7.5**.

Imported materials will also require validation to ensure their appropriateness (from a contamination perspective) for use on the site in accordance with the NEPC (2013) guidelines or relevant exemptions (such as VENM and ENM). Sample densities are outlined in **Table 7.3**. The validation criteria are discussed in **Section 7.5**.

Materials requiring offsite disposal are required to be classified in accordance with EPA (2014) Waste Classification Guidelines. Sample densities are outlined in **Table 7.3**.

**Table 7.3 Validation Analytical Schedule**

Item	Sampling Frequency			Analytes
	Excavation Base	Excavation Walls	Materials	
<b>Asbestos Impacted Materials</b>				
Excavations formed by the removal of friable Asbestos impacted soils	1 sample / 100 m <sup>2</sup> (10 m grid), minimum of 2 per base (density may be reduced for large areas)	1 sample / 10 linear metres; and 1 sample / 1 m depth	N/A	Asbestos (500 ml) for validation of friable impacted soils.
Excavations formed by the removal of bonded asbestos impacted materials.	Confirmation that the excavation walls and base are free of visible ACM impacts.			Visual Inspection required.
Stockpile footprints	1/100 m <sup>2</sup> (10 m grid) with a minimum of 2 samples	N/A	N/A	Relevant COPCs as per impacted material type
<b>Biologically Impacted Soil Remedial/Removal Activities</b>				
Septic Tank Pit Excavation	1 sample per septic tank, or a minimum of 1/25 m <sup>2</sup> where one large excavation	1 sample per wall per media, with minimum spacing of one per 5 linear metres	N/A	Total Coliforms E. Coli Salmonella
Associated Infrastructure (e.g. pipelines)	1 sample per infrastructure, 1 per 5 linear metres of pipeline	1 sample per infrastructure, 1 per 5 linear metres of pipeline	N/A	
<b>Removal of Aesthetic Issues as Building and Demolition Waste Materials</b>				

Item	Sampling Frequency			Analytes
	Excavation Base	Excavation Walls	Materials	
Aesthetic Issues	Remove materials that present an aesthetic issue; i.e. materials that pose a potential physical hazard such as timber, asphalt, concrete, glass, bricks, metal, and tile or similar, or odorous or stained soils.			Visual Inspection required to confirm absence of odours, staining or asbestos.
<b>Removal of Unexpected Finds</b>				
Excavations formed by the removal of non-asbestos related unexpected find	1 sample / 100 m <sup>2</sup> (10 m grid), minimum of 2 per base	1 sample / 10 linear metres; and 1 sample / 1 m depth	N/A	Dependant on the nature of the unexpected finds (TBC by the supervising Environmental Consultant)
<b>Miscellaneous</b>				
Waste classification of materials requiring offsite disposal	N/A	N/A	Consistent with EPA (2022) – sufficient data required to suitably characterise materials for offsite disposal.	Heavy Metals TRH/BTEX OCPs/PCBs PAHs Asbestos (500mL) (plus COPCs as appropriate to material source)
Imported Materials of VENM, if required	N/A	N/A	Minimum 3 samples per source site. Maximum of 10 samples.	<u>As a minimum:</u> Heavy metals TRH/BTEX PAHs OCPs/PCBs Asbestos (500mL)
Imported Materials of ENM, if required	N/A	N/A	As per ENM Order.	Heavy metals TPH/BTEX PAHs pH EC RTA 276 (foreign materials) Asbestos (500mL)
Quarried Imported Materials, if required	N/A	N/A	Confirmation that the material is quarried rock (VENM) prior to importation, and visual confirmation.	N/A
Recycled/Recovered Products	N/A	N/A	Minimum 3 samples per source site.	As per Resource Recovery Exemption plus Asbestos (500mL)

## 7.3 Validation Inspections and Sampling

Validation inspections and associated sampling activities as outlined in the following sections will be undertaken by an appropriately trained and experienced environmental consultant. Soil logs and sample registers will be prepared for each location showing soil description, sampling depths and sampling intervals. Photographic records will also be maintained. Aesthetic indicators of impact will be assessed for all soils consistent with the parameters identified in **Section 7.3.8** as appropriate to assist with validation assessments.

The soil sampling method shall be determined by the Remedial Consultant as consistent with the observations and appropriate to generate representative samples. The soil sampling method shall be consistent with the data quality indicators in **Section 7.3.8**.

Soil will be sampled whilst wearing disposable nitrile gloves and placed into laboratory prepared sampling containers. All samples will be labelled with a unique identifier consisting of the sample location and date and time of sampling. Samples will be placed directly into a chilled esky following collection and transported to a National Association of Testing Authorities, Australia (NATA) accredited laboratory under Chain of Custody (CoC) protocols.

The decontamination of personnel, PPE and sampling equipment (if used) will be in accordance with JBS&G's standard procedures to minimise risks to health and safety and cross contamination. Where dedicated disposable sampling equipment cannot be used, non-dedicated sampling equipment will be scrubbed and washed in Decon 90 solution and rinsed with de-ionised water. Disposable equipment will not require decontamination and reuse (i.e., nitrile gloves).

### 7.3.1 Validation of Asbestos Impacts

Asbestos impacted and contaminated soils have been identified during previous site assessment activities. Following removal or relocation of the asbestos impacted/contaminated materials, validation of the excavated areas will comprise a walkover of the removal extent on 1 x 1 m perpendicular transects to inspect the site surface for any residual fill-based soils, ACM or anthropogenic inclusions. Should ACM or fill materials be observed to remain on the ground surface – the area will require further scraping/removal works until the surface is confirmed as comprising of natural materials and free of visible ACM. The person completing the inspection will be required to be a Competent Person (bonded ACM impacts only) or LAA and will provide a clearance when the validation objectives have been met.

#### Validation and Clearance of Friable Asbestos Impacted Areas

Excavation of friable asbestos impacted soils will be undertaken within dedicated exclusion areas, following which the exclusion zone will be required to be successfully validated to demonstrate the removal of all asbestos containing materials prior to removal of the friable control conditions. Validation will comprise:

- Inspection of the exposed ground surface, excavation base and walls by a LAA. If any ACM, friable asbestos and/or building debris impacted fill material is observed at the extent of the excavation, then the excavation will be extended prior to completion of the visual validation inspection;
- Once a visual validation is successfully completed, soil samples will be collected from the footprint at the density outlined in **Table 7.3**. Samples will be collected consistent with the requirements of NEPC (2013), inclusive of 500 mL volume soil samples and analysed for asbestos in soil by a NATA accredited laboratory. The excavation will be considered validated if all samples are reported by the laboratory as free of detectable asbestos;
- If one or more validation samples identifies the presence of asbestos in soil, the excavation in the vicinity of the remaining impact will be extended a minimum of 1 m, or until visible clearance is again achieved, following which the above validation sampling procedure will be repeated until such time as the excavation can be successfully validated; and

- Following confirmation of the visual and validation sample clearance, clearance airborne asbestos fibre monitoring must be conducted upon completion of management works in areas of known friable asbestos impact, with the clearance air monitoring results to be less than 0.01 f/ml as per WHS regulatory guidance.

#### Validation and Clearance of Bonded Asbestos Impacted Areas

Following excavation works to remove the extent of bonded asbestos impact and surrounding areas within the asbestos removal works zone that may have become impacted with asbestos, validation of the successful removal of all asbestos containing material will be undertaken as follows:

- Inspection of the exposed ground surface, excavation base and walls by a Competent Person or LAA. If any ACM, or building debris impacted fill material is observed at the extent of the excavation, then the excavation will be extended prior to completion of the visual validation inspection; and
- Following confirmation of the visual clearance of the successful removal of all visible bonded ACM, the surrounding materials are considered successfully validated.

It is noted that if suspected friable impacts are observed during excavations formed for the removal of bonded ACM impacts, then the validation procedures established for friable areas above will be required to be applied.

#### **7.3.2 Validation of Stockpile Footprints**

Where stockpiles formed as a result of remediation activities have been stored on hardstand, geo-textile or plastic lining, visual validation will be used for validation of the stockpile footprint. Validation sampling would only occur when a breach of the containment method is identified.

Where impacted material has temporarily been stored on unsealed ground surfaces, the validation program for the footprint of contaminated stockpiles is:

- Inspection of the stockpile footprint by a suitably trained and experienced person. If impacted material is identified, surface soils are required to be scraped (100 mm), and the footprint re-inspected until such time as visual validation is obtained;
- Following visual validation, soil samples will be collected from the footprint on a 10 m x 10 m grid, and analysed in accordance with **Table 7.3**, based on the material type previously stockpiled; and
- If contamination is identified in a validation sample at concentrations above the site validation criteria, the soil represented by the failed validation sample will be scraped and managed (via onsite containment or offsite disposal), and the validation inspection and sampling process repeated for the failed area. Alternatively, where contamination is not identified in the samples by laboratory analysis, the footprint will be deemed to have been successfully validated.

#### **7.3.3 Validation of Removal of Aesthetic Materials**

Validation inspection is required to be undertaken to demonstrate that the anthropogenic inclusions comprising aesthetic impacts have been appropriately remediated and separated to a standard suitable for the proposed land use.

Once impacted materials are confirmed to have been removed, the material will be inspected by the Environmental Consultant to confirm visual aesthetic issues are no longer evident.

A clearance inspection shall be conducted by a suitably qualified Environmental Consultant following completion of removal of unacceptable aesthetic material, including photographic records for inclusion in the validation report.

### 7.3.4 Validation of Excavation(s)

Samples are to be collected by an appropriately trained and experienced environmental scientist / engineer using a hand trowel or directly from the bucket of mechanical excavation equipment, at the required densities to meet the project DQOs presented in **Section 7.1**.

Prior to collection of each sample, hand tools will need to be thoroughly decontaminated using phosphate free detergent and distilled water as per **Section 7.3.8**.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination will need to be noted on the field documentation.

### 7.3.5 Validation of Additional Impacted Material (If identified) Removal

The validation program for the removal of impacted materials (should they be identified as an unexpected find) will comprise the following general procedures:

- Inspection of the excavated areas by a suitably trained and experienced environmental consultant to confirm the extent of potentially impacted materials have been removed. If additional potentially impacted material is identified, further excavation will be conducted, and the affected area will be re-inspected until such time as visual and olfactory validation is obtained.
- Following visual and olfactory validation, soil (as appropriate to the nature of the impact) samples will be collected from the remediation area base and walls at a rate as nominated in **Table 7.3**;
- Excavation validation samples will be analysed at a laboratory NATA accredited for the required analyses. If the concentration of COPCs are identified in any of the excavation validation samples exceeding criteria, then the soils will be excavated 0.3 m further in the direction of failure and the validation process repeated. Alternatively, where impact exceeding criteria is not identified by the laboratory, the remedial areas will be deemed to have been successfully remediated and validated; and
- Excavated soils shall be stockpiled and the materials will be required to be classified in accordance with NSW EPA (2014) and disposed off-site to a facility legally able to accept the waste.

### 7.3.6 Validation of Soil Containment Measures

Where on-site containment of impacted material is undertaken during the remediation activities, validation of the implemented measures will be required as per the following.

#### Marker Layer

Visual inspection will be undertaken by the Remediation Consultant to verify the suitable installation of the marker layer across required areas. Photographic records and a survey prepared by a Registered Surveyor of the marker layer installation, including vertical and lateral extents will be organised by the Contractor and submitted to the Client and Remediation Consultant for inclusion in the validation report.

#### Capping Layer

Material to be used as a capping layer must be validated by the Remediation Consultant as environmentally suitable, consisting of VENM, ENM, suitable on-site materials (i.e., treated material or VENM from the site) or material considered suitable for beneficial reuse via a resource recovery exemption issued by NSW EPA. Additionally, contaminant concentrations in any capping layer material must not exceed the adopted site validation criteria for soils.

The capping layer must be placed at the thicknesses specified for each capping scenario as detailed JBS&G (2023) and JBS&G (2024b). Photographic records and a survey of the capping layer installation, which details the final thicknesses of the capping layer, including the vertical and lateral extents must be prepared for/by the Contractor and provided to the Client and Remediation Consultant for inclusion in the validation report.

#### Surveys

The Remedial Contractor must provide a survey of the marker layer and capping layer prepared by a registered surveyor that demonstrates the lateral and vertical extents each layer to a known datum. The capping layer survey must demonstrate that the minimum capping thicknesses have been achieved.

### 7.3.7 Imported Materials

Fill materials imported on site are required to be either VENM, ENM or any other suitable material. Imported materials will require validation prior to being imported to site.

Imported material source sites will be visited by the Remediation Consultant prior to confirmation of approval to import. Supporting documentation must be provided by the Contractor for imported materials to be assessed against the validation plan, relevant guidelines/exemptions and adopted site criteria.

The Remediation Consultant will collect additional samples and prepare appropriate documentation for imported materials in lieu of adequate information provided by the Contractor to ensure all material imported to site is appropriately validated prior to importation.

Validation sampling will be undertaken in accordance with the requirements of **Table 7.3**.

### 7.3.8 Soil Sampling Methodology

The soil sampling method shall be determined by the Remediation Consultant as consistent with the observations of the site sub-surface and appropriate to generate representative samples.

Samples of near surface material and stockpiled soils shall be collected by appropriately trained and experienced personnel by the use of a stainless steel hand trowel. The hand trowel will be thoroughly decontaminated using phosphate free detergent and distilled water before each sample is collected. Where deeper soil samples are required from excavation walls or floor, the material shall be retrieved using an excavator. Samples of the retrieved material shall be collected from the centre of the excavator bucket ensuring that no part of the sample has contacted the sides of the excavator bucket.

Sufficient sample material will be collected to allow both field and laboratory analyses. Additional samples will be collected from any soil horizons which exhibit staining, odours, or other physical evidence of potential contamination.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination will be noted on the field documentation. Collected soil samples will be immediately transferred to laboratory supplied sample jars which will be sealed with Teflon lined screw closures or zip-lock plastic bags as appropriate. The sample containers will be transferred to a chilled esky for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory.

### 7.3.9 Laboratory Analyses

Laboratory methods and laboratory limits of reporting (LOR) as summarised in **Table 7.4** are proposed to be adopted for analysis of soil samples collected during remediation/validation activities. All laboratories are required to be National Association of Testing Authorities (NATA) registered for the relevant analyses. Appropriate methods and LORs are required for comparison to relevant criteria.

**Table 7.4 Soil Laboratory Analysis Methods (all units in mg/kg unless stated)**

Analyte	Limit of Reporting	Laboratory Method
<b>Heavy Metals</b>		
Arsenic	4.0	ICP-AES (USEPA 200.7)
Cadmium	1.0	ICP-AES (USEPA 200.7)
Chromium (total)	1.0	ICP-AES (USEPA 200.7)
Chromium (VI)	1.0	Alkali leach colorimetric (APHA3500-Cr/USEAP3060A)

Copper	1.0	ICP-AES (USEPA 200.7)
Lead	1.0	ICP-AES (USEPA 200.7)
Nickel	1.0	ICP-AES (USEPA 200.7)
Zinc	1.0	ICP-AES (USEPA 200.7)
Mercury (inorganic)	0.05	ICP-AES (USEPA 200.7)
<b>TRH</b>		
F1 C <sub>6</sub> -C <sub>10</sub>	10	Purge Trap-GCMS (USEPA8260)
F2 >C <sub>10</sub> -C <sub>16</sub>	50	Purge Trap-GCFID (USEPA8000)
F3 >C <sub>16</sub> -C <sub>34</sub>	100	Purge Trap-GCFID (USEPA8000)
F4 >C <sub>34</sub> -C <sub>40</sub>	100	Purge Trap-GCFID (USEPA8000)
<b>BTEX</b>		
Benzene	1.0	Purge Trap-GCMS (USEPA8260)
Toluene	1.0	Purge Trap-GCMS (USEPA8260)
Ethylbenzene	1.0	Purge Trap-GCMS (USEPA8260)
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)
<b>PAH</b>		
Benzo(a)pyrene as TEQ	0.5	GCMS (USEPA8270)
Total PAHs	0.5	GCMS (USEPA8270)
<b>PCBs</b>		
PCBs (total)	0.9	GCECD (USEPA8140,8080)
<b>OCP/OPP</b>		
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)
Chlordane	0.1	GCECD (USEPA8140,8080)
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)
Heptachlor	0.1	GCECD (USEPA8140,8080)
<b>OTHER</b>		
Asbestos	500 mLsample/0.1 g/kg	PLM / Dispersion Staining as per AS4964:2004
Soil pH	0.1	5:1 leach

## 7.4 Validation Criteria

The site validation criteria are presented in **Table A** in **Appendix A** and summarised as follows:

- Health Investigation Levels (HILs) for commercial/industrial land use – NEPC 2013, HIL-D;
- Health Screening Levels (HSLs) for petroleum hydrocarbons considering potential for vapour intrusion, for commercial/industrial land use (NEPC 2013);
- HSLs for asbestos contamination in soil for commercial/industrial land use (HSL D) NEPC (2013);
- Management limits for hydrocarbons for commercial/industrial land use (NEPC 2013);
- Site specific ecological investigation levels (EILs) based on NEPC (2013) for commercial/industrial land use; and
- Ecological Screening Levels (ESLs) for TPH fractions, BTEX and benzo(a)pyrene for commercial/industrial land use (NEPC 2013) for landscape areas; and
- Grade A Microbiological Standards from EPA Use and Disposal of Biosolid Products, presented in NSW EPA (1997) Biosolids Guidelines.

EILs calculated as part of the DSI (JBS&G 2025) are presented in **Table A, Appendix A**.

For soils to be considered as meeting the adopted validation criteria (i.e., not posing an unacceptable risk), the following statistical criteria will be adopted for all suitable chemical analysis data sets:

- Either:
  - All contaminant concentrations will be less than the adopted site assessment criteria,
- Or:
  - The upper 95 % confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) is below the adopted criterion;
  - No single analyte concentration exceeded 250 % of the adopted criterion; and
  - The standard deviation of the results is less than 50 % of the criterion.

## 7.5 Reporting

### 7.5.1 Validation Report(s)

At the completion of the remedial works, a validation report will be prepared in general accordance with the *Consultants Reporting on Contaminated Land, Contaminated Land Guidelines* (EPA 2020), documenting the works as completed. The report will contain information including:

- Update relevant portions of the site description and contamination status as prepared in this RAP to the condition of the validation assessment footprint at the time of the validation assessment;
- Present all sampling field notes and laboratory data including calibration certificates for field monitoring equipment, environmental monitoring etc.;
- Undertake an assessment of QA/QC of analytical data generated by the works and identify data that is reliable for use in characterising the site;
- Sort data into data sets as required by the decision rules;
- Assess whether sufficient data has been obtained to meet required limits on decision error;
- Undertake assessment to the decision rules;
- Provide a summary of waste disposal/off-site removal activities (if any) and volumes of material removed from the site including supply of all waste disposal dockets confirming final waste disposal/landfill destination;
- Provide a summary of material imported to site for remediation (if any) including material source, type, assessment of suitability, approximate quantities, date of importation and final placement location;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of the RAP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined data quality objectives and the remediation acceptance (validation) criteria;
- Information demonstrating compliance with appropriate regulations and guidelines;
- Document any variations to the strategy undertaken during the implementation of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents;

- Other information as appropriate, including requirements (if any) for ongoing monitoring / management; and
- Provide a comment on the suitability of the site for the proposed use and requirements for any ongoing monitoring/management (where applicable).

The report will serve to document the remediation works for future reference.

### 7.5.2 Environmental Management Plan (if required)

At the conclusion of remediation/validation works, an environmental plan (LTEMP) will be required if impacted materials with concentrations of COPCs exceeding the adopted site HILs are to be managed through on-site containment. Should it be required, an LTEMP will be prepared according to the requirements outlined NSW EPA *Guidelines for the NSW Site Auditor Scheme (3<sup>rd</sup> edition)* (NSW EPA 2017) to detail the required measures to ensure the continued suitability of the containment cell underlying the site. The LTEMP shall contain the following elements (as appropriate) as based on the extent of data that will be available at the cessation and validation of remediation works:

- A statement of the objectives of the EMP – i.e., to ensure continued suitability of the site;
- Identification of residual environmental contamination issues at the site that require ongoing management/monitoring to meet the EMP objectives, including the type of contamination and location within the site (including survey plans). This should further include characterisation of the material in-situ on the site as consistent with the extent of validation data proposed to be collected;
- Mechanisms for legal enforcement and public notification;
- Documentation of environmental management measures which have been implemented to address the identified environmental issues at the site;
- Description of management controls to limit the exposure of site users to known areas of contamination to acceptable levels;
- Description of responsibilities for implementing various elements of the provisions contained in the EMP;
- Timeframes for implementing the various control/monitoring elements outlined in the EMP;
- Environmental monitoring and reporting requirements (if required) for the future management of environmental impact underlying the site including:
  - Appropriate monitoring locations and depth within and down-gradient of any residual contamination;
  - Relevant assessment criteria to be used in evaluating monitoring results;
  - Frequency of monitoring and reporting;
  - Process for reviewing monitoring data and how decisions will be made regarding the ongoing management strategy;
  - The length of time for which monitoring is expected to continue;
  - The regulatory authorities involved and the management inputs required from each;
  - The integration of environmental management and monitoring measures for groundwater;
- Health and safety requirements for particular activities;
- A program of review and audits; and
- Corrective action procedures to be implemented where LTEMP requirements are not met.

## 8. Site Management Plan

### 8.1 Overview

The controls discussed below have been developed in addition to the requirements with respect to the establishment of appropriate works zones as discussed for specific site areas in **Section 6**.

### 8.2 Hours of Operation

All remediation works shall be conducted within the following hours or those specified within the DA, anticipated to be consistent with:

- Monday to Friday: 7am to 6 pm.
- Saturdays: 8 am to 1 pm.
- Sunday and public holidays: No work permitted.

### 8.3 Erosion and Sediment Control Policy

All works shall be conducted in general accordance with Soils and Construction Managing Urban Stormwater Standards (Landcom 2004) or as updated, which outlines the general requirements for the preparation of a soil and water management plan.

### 8.4 Stockpile Management

All materials stockpiled onsite will be managed by the Contractor. Unique numbers will be provided for each stockpile, the source of the stockpile, its estimated volume, material characterisation and its location onsite will also be recorded.

The following general procedures will be implemented by the Contractor:

- No stockpiles of soil or other materials shall be placed on footpaths or road reserves unless prior Council approval has been obtained; and
- All stockpiles of soil or other materials shall be placed away from drainage lines, gutters or stormwater pits or inlets.

#### 8.4.1 Temporary Management

Any temporary stockpiles must be kept damp (not flooded) and where proposed to remain on-site for more than a day, covered by geo-fabric/plastic or sealed with a soil binding product as soon as practical. Where weather conditions are appropriate (cool/cold weather, minimal wind and/or precipitation), temporary stockpiles may be kept moist as a temporary control measure. The control measure will extend beyond the perimeter of the stockpiles and shall be secured to prevent being blown away by wind. Stockpiles must be placed in a secured, signed and excluded location onsite.

#### 8.4.2 Long Term Management

If long term stockpiles are required, they must be covered with geo-fabric or sealed with a soil binding product or sealed with hydro mulch. Large stockpiles should be bunded to prevent impacted water runoff.

Regular inspections of long term stockpiles should be undertaken to ensure the controls implemented are in good condition, no dust is being generated from the stockpile and no runoff is occurring.

When the seal is broken on long term stockpiles, such as moving, excavation or tracking over the stockpile, the interim management measures must be implemented until such a time that the long term controls can be re-implemented on the stockpile.

## 8.5 Site Access

All vehicle access to the site shall be stabilised to prevent the tracking of sediment onto the roads and footpaths. All materials must be removed from the roadway on a daily or as required basis.

## 8.6 Excavation Dewatering

No dewatering is proposed. There is a potential for minor quantities of seepage to enter the deepest excavations. This is not anticipated to affect the undertaking of the works and will be able to be managed in lieu of a requirement to dewater.

## 8.7 Noise

Remediation work shall not give rise to 'offensive noise' as defined in the Protection of the Environment Operations (POEO) Act 1997. All equipment and machinery associated with the remediation work shall be operated by the Contractor in accordance with the POEO Act (1997) and its Noise Control Regulations 2000.

Noise generated should be managed so as not to adversely impact the amenity or residents/business adjoining or nearby the site.

All machinery and equipment used on site will be in good working order and fitted with appropriate silencers when necessary.

## 8.8 Vibration

Vibration generated should be managed so as not to adversely impact the amenity or residents/ business adjoining or nearby the site.

## 8.9 Odour / Volatile Emissions Control

No odours should be detectable at the site boundary and volatile emissions of other potentially volatile substances shall be controlled. Appropriate actions will be taken by the contractor to reduce the odours, which may include odour suppressants or maintenance of equipment. Where possible, stockpiles of malodorous material shall be transferred to off-site locations as soon as possible.

Equipment and machinery will be adequately maintained to minimise exhaust emissions. No materials shall be burnt on the site.

## 8.10 Dust Control

During the remedial works, as necessary, excavation areas will be wetted down using a water spray to minimise the potential for dust to be generated by the Contractor. A wetting or bonding agent may be used to further bind the soil to minimise asbestos fibre release.

All asbestos impacted soils must be wetted (but not flooded) prior to and during excavation and movement of the soils. To control dust in significant areas of exposed asbestos contaminated fill, industrial misting fans, placed at the outer extents of remedial/excavation areas, must be utilised by the Contractor.

Dust shall also be controlled by ensuring vehicles leave via the designated (stabilised) site access and all equipment have dust suppressors fitted by the Contractor.

Where significant fugitive emissions are observed from asbestos inspection / treatment pads, or bioremediation areas, these areas shall be wetted and/or covered by the Contractor.

Meteorological conditions will be monitored by the Remediation Consultant and Contractor. Remedial work will be stopped or modified where meteorological conditions are adverse (i.e., dry conditions and strong winds towards sensitive receptors).

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse wetted haul roads. Only essential vehicles are permitted to traverse the asbestos exclusion zone.

## 8.11 Air Quality

### 8.11.1 Airborne Asbestos Fibre Monitoring

Airborne asbestos fibre monitoring will be conducted in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) *Asbestos Code of Practice and Guidance Notes*, in particular the *Guidance note for the estimation of airborne asbestos dust* [NOHSC 3002:2005]. The consultant shall undertake airborne asbestos fibres monitoring at a minimum of five static locations daily during remediation works that will disturb asbestos impacted or contaminated materials. Monitoring locations will include site perimeter locations and downwind locations. Wind Rose information available from the Bureau of Meteorology (BOM) for the nearest weather stations will be used to determine common prevailing winds in the area.

Air filters shall be analysed by a NATA accredited laboratory and results shall be required to be below 0.01 fibres/mL. All detections of fibres shall be further analysed by scanning electron microscope (SEM) to confirm if the fibres are asbestos.

If respirable asbestos fibres are confirmed and present between 0.01 and 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with the *WHS Regulations 2017*;

- Review control measures;
- Investigate the cause; and
- Implement controls to eliminate or minimise exposure and prevent further release.

If respirable asbestos fibres are confirmed and present above 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with *WHS Regulations 2017*;

- Stop removal work;
- Notify SafeWork NSW by phone, then by fax or written statement that work has ceased;
- Investigate the cause;
- Implement controls to eliminate or minimise exposure and prevent further release; and
- Do not recommence removal work until further air monitoring is conducted and fibre levels are detected below 0.01 fibres/mL.

A daily report air monitoring report will be prepared documenting the previous/same days airborne asbestos fibre air monitoring results. This report will be made available to all relevant stakeholders.

### 8.11.2 Dust Monitoring

Dust emissions shall be confined within the site boundary. The following dust control procedures may be employed to comply with this requirement:

- Erection of dust screens around the perimeter of the site;
- Securely covering all loads entering or exiting the site;
- Use of water sprays across the site to suppress dust;
- Covering of all stockpiles of contaminated soil remaining more than 24 hours (where practical); and
- Keeping excavation surfaces moist.

## 8.12 Transport of Material Offsite

In the event that materials are required to be transported off-site, all trucks will be loaded in designated areas and decontaminated (when leaving the asbestos works area) in accordance with site management procedures. The Contractor shall ensure that there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

The Contractor shall also log truck movements and approximate volume, via registration number and consignment number (where applicable), into and out of the site. Truck load details will be included as part of the Validation Report.

All appropriate road rules shall be observed, and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

All plant and vehicles will be required to obey all Austral site-specific rules when travelling within the site. In addition, all plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse designated paths.

## 8.13 Hazardous Materials

Hazardous and/or intractable wastes arising from the remediation work shall be removed and disposed of in accordance with the requirements of NSW EPA, SafeWork NSW and the relevant regulations by the Contractor.

In particular, any hazardous wastes will be transported by an NSW EPA licensed transporter.

## 8.14 Disposal of Contaminated Soil

All soils will be classified, managed and disposed in accordance with the *Waste Classification Guidelines* (EPA 2014). Documentary evidence for all soil disposal shall be kept for inclusion in the Validation Report.

Trucks will be loaded in designated areas. The Contractor shall ensure that there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

The Contractor shall also log truck movements and approximate volume, via registration number and consignment number (where applicable), into and out of the site.

All appropriate road rules shall be observed, and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse designated paths.

Integrated Waste Tracking Solutions (IWTS) is now operational within NSW and any loads of asbestos waste that trigger the values of IWTS must be tracked via the online system.

## 8.15 Site Signage and Contact Numbers

A sign/s shall be displayed adjacent to the site access point/s throughout the duration of the works with the contact details of the Contractor and project manager as provided and maintained by the Contractor.

## 8.16 Site Security

The remedial areas shall be secured against unauthorised access by means of an appropriate fence or barricade or other means by the Contractor. All persons working in asbestos remedial areas must be inducted, have undertaken required training and don appropriate PPE (refer **Section 6.5.2**). The access gates to the site will be locked at all times when remedial works are not occurring.

## 8.17 Community Consultation

Owners and/or occupants of adjacent premises and across the road from the site will be notified at least 7 days prior to the commencement of preparation for the remediation works. As a minimum, the notification shall include the details of an appropriate contact person.

## 8.18 Health and Safety Management

A Work Health & Safety Management Plan (WHSP) shall be prepared by the Contractor prior to commencement of remediation works on the site. The Plan shall contain procedures and requirements that are to be implemented as a minimum during the works.

The objectives of the WHSP are:

- Ensure all regulatory requirements for the proposed works are satisfied;
- To apply standard procedures that minimises risks resulting from the works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and
- Provision for contingencies that may arise while operations are being conducted at the site.

## 9. Regulatory Approvals / Licensing

### 9.1 Resilience and Hazards SEPP

Development consent requirements for remediation works is addressed by reference to the Resilience and Hazards SEPP and associated Planning Guidelines.

At this stage, based on the known volume of contaminated material expected to be present at the site and the proposed scope of remediation works, they are considered to be classified as 'Category 2' Remediation Works – i.e., not requiring consent. The notification requirements of SEPP R&H include notification to council 30 days before Category 2 remediation works commence. The proposed works do not constitute Category 1 works because:

- The work is not Designated Development under Schedule 3 of the EPA&A Regulation or under a planning instrument.
- The work proposed is not on land identified as critical habitat under the Threatened Species Conservation Act 1995.
- Consideration of s.5A of the EP&A Act indicates the remediation work is not likely to have a significant effect on threatened species, populations, ecological communities or their habitats.
- The work is not proposed in an area or zone to which any classifications to the following effect apply under an environmental planning instrument:
  - coastal protection;
  - conservation or heritage conservation, noting that the proposed Precinct 5 redevelopment footprint does not include disturbance to these areas identified as part of the broader site footprint;
  - habitat area, habitat protection area, habitat or wildlife corridor;
  - environmental protection, noting that the proposed Precinct 5 redevelopment footprint does not include disturbance to these areas identified as part of the broader site footprint;
  - escarpment, escarpment protection or escarpment preservation;
  - floodway;
  - littoral rainforest;
  - nature reserve;
  - scenic area or scenic protection;
  - wetland, or
  - carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Western Lands Commissioner).
- The work does not require consent under another SEPP or regional environmental plan.

It is noted that whilst the works are considered Category 2, this RAP is being prepared to support the development application and as such, the remediation works will be classed as ancillary to the development works, with approval embedded in the consent. As such, no additional notification (as per standard Category 2 requirements) is necessary.

## 9.2 Protection of the Environment Operations Act 1997

The proposed remediation/validation activities are not required to be licensed under *the Protection of the Environment Operation Act (1997)* since the works as they are currently understood do not involve:

- Treat otherwise than by incineration and store more than 30 000 cubic metres of contaminated soil originating exclusively from the site, or
- Disturb more than an aggregate area of 3 hectares of contaminated soil originating exclusively from the site.

Based on advice provided by EPA on 13 February 2025, the proposed development does not fall under any of the Schedule 1 activities of the Protection of the Environment Operation Act (POEO), and therefore does not require additional consultation.

## 9.3 Protection of The Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works on the site will not require to be licensed.

Under Clauses 76 and 79 of the POEO Regulation 2014, asbestos waste (> 100 kgs, or more than 10 m<sup>2</sup> in a single load), must be tracked using IWTS. Section 42 of the Regulation stipulates special transportation, reporting, re-use and recycling requirements relating to asbestos waste and must be complied with regardless of whether the activity is licensed.

The requirements for the transportation of asbestos waste include:

- Bonded asbestos material must be securely packaged at all times;
- Friable asbestos material must be kept in a sealed container;
- Asbestos-contaminated soils must be wetted down; and
- All asbestos waste must be transported in a covered, leak-proof vehicle.

The transporter of asbestos waste must provide the following information to the EPA prior to the transportation of asbestos waste loads:

- Source site details including address, name and contact details;
- Date of proposed transportation commencement;
- Name, address and contact details of disposal site; and
- Approximate weight of each class of asbestos in each load.

The transporter of asbestos waste must ensure the following information is given to the disposal site before or at delivery:

- Unique consignment code issued by EPA in relation to that load; and
- Any other information specified in the Asbestos and Waste Tyres Guidelines.

The requirements relating to the off-site disposal of asbestos waste are as follows:

- Asbestos waste in any form must be disposed of only at a landfill site that may lawfully receive the waste,
- When asbestos waste is delivered to a landfill site, the occupier of the landfill site must be informed by the person delivering the waste that the waste contains asbestos,
- When unloading and disposing of asbestos waste at a landfill site, the waste must be unloaded and disposed of in such a manner as to prevent the generation of dust or the stirring up of dust,

- Asbestos waste disposed of at a landfill site must be covered with virgin excavated natural material or other material as approved in the facility's environment protection licence.

Section 48 of the Regulation requires that wastes are stored in an environmentally safe manner. It also stipulates that vehicles used to transport waste must be covered when loaded.

#### 9.4 Waste Classification Guidelines (EPA 2014)

All wastes generated and proposed to be disposed offsite shall be assessed, classified and managed in accordance with this guideline. Where wastes require immobilisation prior to offsite disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of this guideline. Immobilisations are only anticipated to be required with unexpected finds that cannot be retained on site and cannot be disposed directly offsite to a licensed facility.

#### 9.5 Asbestos Removal Regulations and Codes of Practice

The remediation of fill containing asbestos will be managed in accordance with the *Work Health and Safety Act 2011* (WHS Act) and associated Work Health and Safety (WHS) Regulation (2019) including those related to Asbestos. Noting that asbestos impacts (both friable and bonded) have been identified within site soils, and works that will result in the disturbance of these soils will be required to be managed in accordance with the WHS Act, Regulations and Code of Practice How to Manage and Control Asbestos in the Workplace (SafeWork 2022a) and Code of Practice How to Safely Remove Asbestos (SafeWork 2022b).

Excavation, onsite remediation and removal/containment of asbestos impacted soils are required to be conducted by a Class A (for the Friable impacted soils) or B (for Bonded impacted soils) Asbestos Removal licensed contractor.

All airborne asbestos fibre monitoring works must be undertaken by a competent person or Licenced Asbestos Assessor, in accordance with SafeWork NSW requirements.

Before starting the affected works, licensed asbestos removal contractor shall be responsible for submitting the appropriate SafeWork NSW permit (friable and non-friable) to remove asbestos at least seven days prior to the proposed works where required.

## 10. Conclusion

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Sites Guidelines for the NSW Site Auditor Scheme* (3rd Edition) (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP and with consideration to the Limitations presented in **Section 11**, it is considered that the site can be made suitable for the intended uses and that the risks posed by the identified contamination can be managed in such a way as to be adequately protective of human health and the environment.

## 11. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties. The report has been prepared specifically for the client for the purposes of the commission, and no warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be amended in any way without prior approval by JBS&G, or reproduced other than in full including all attachments as originally provided to the client by JBS&G.

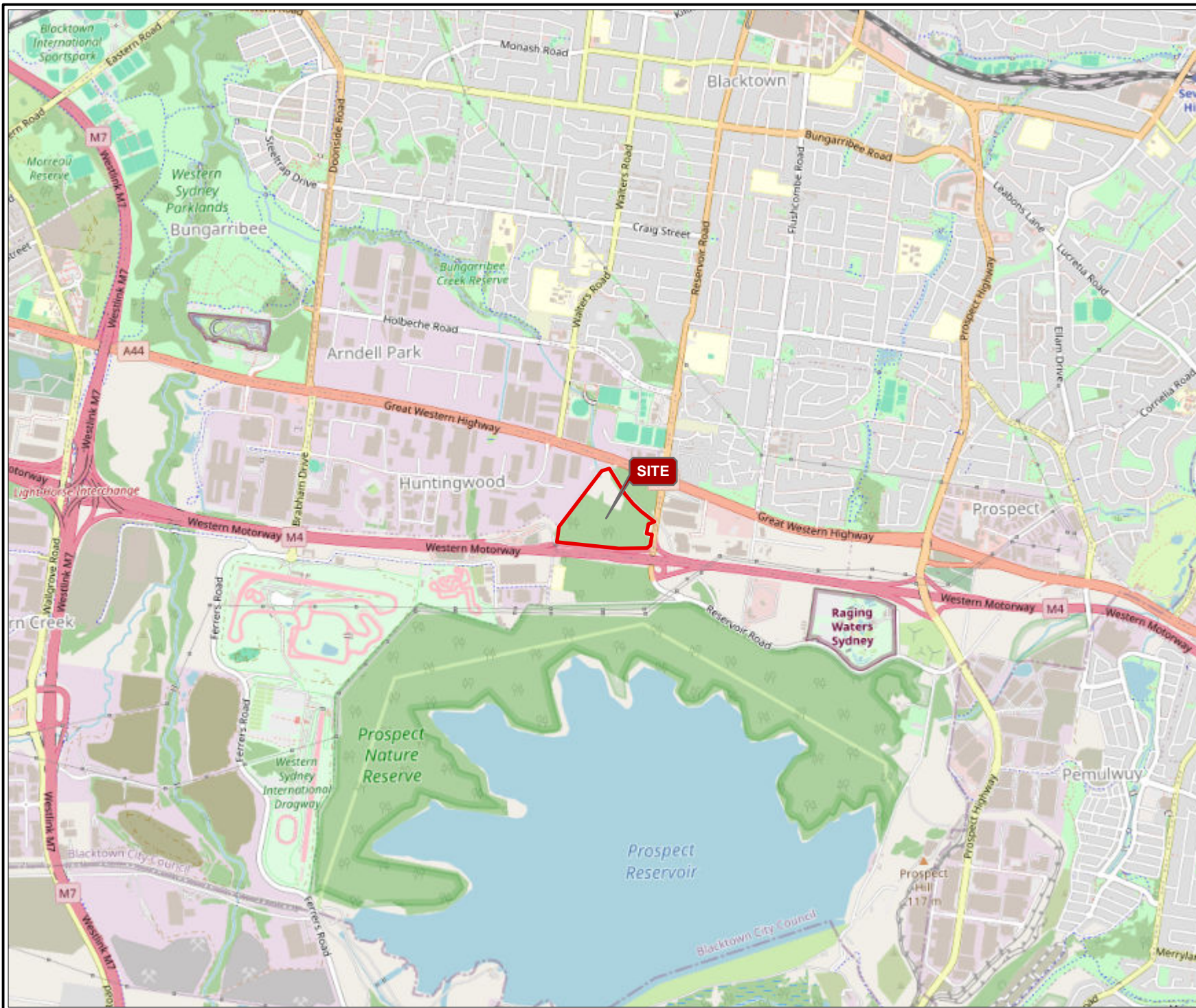
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements or agreed scope of work.


Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

## Figures



Legend  
 Approximate Site Boundary



Job No: 68310

Client: Goodman

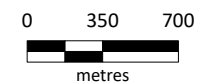
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Date 22/01/2025

Drawn By: TS

Checked By: DS

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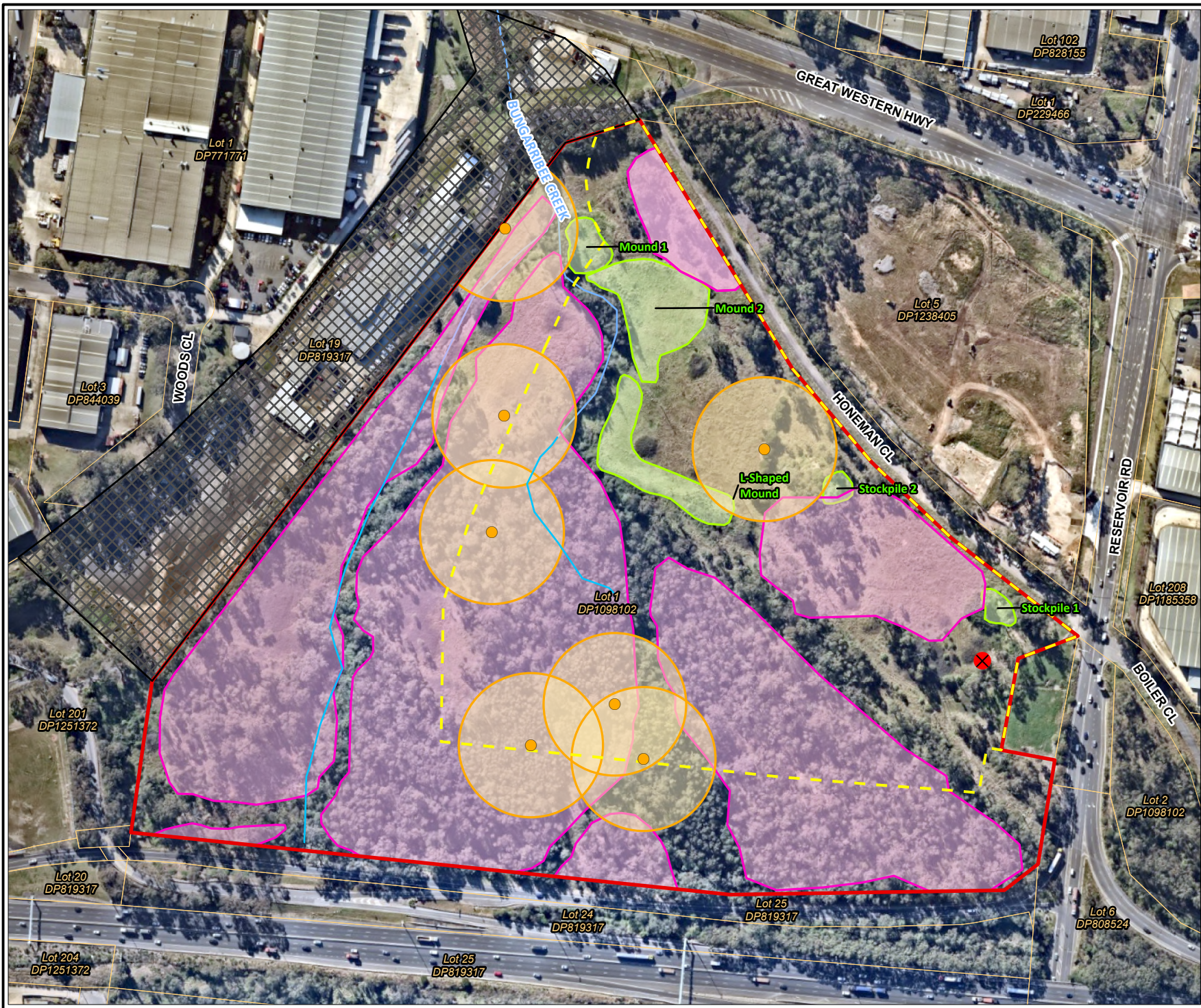


Coord. Sys. GDA2020 MGA Zone 56

**Honeman Close  
 Huntingwood, NSW**

**SITE LOCATION**

**FIGURE 1**



- Legend
- Approximate Site Boundary
  - - - Proposed Development Area Boundary
  - Transport For NSW Property
  - NSW Cadastre
  - Hydro Line
  - Approximate Creek Location
  - Approximate Mounds/Stockpile Locations
  - X Approximate Location of Septic Tank
  - 50m Buffer Zone
  - Area of Ecological Sensitivity
  - Heritage Sites



Job No: 68310	
Client: Goodman	
Version: R02 Rev A	Date 23/01/2025
Drawn By: TS	Checked By: DS
Scale 1:3,600	

Coord. Sys. GDA2020 MGA Zone 56

**Honeman Close  
Huntingwood, NSW**

**SITE LAYOUT**

**FIGURE 2**



- Legend
- ▬ Approximate Site Boundary
  - NSW Cadastre
  - Hydro Line
  - Approximate Creek Location
  - Historical Sample Locations, CH2M Hill (2015b)
  - Test Pit Locations
  - Stockpile 1
  - Stockpile 2
  - Stockpile 3
  - Embankment Extent



Job No: 68310	
Client: Goodman	
Version: R02 Rev A	Date 22/01/2025
Drawn By: TS	Checked By: DS
Scale 1:3,000	

Coord. Sys. GDA2020 MGA Zone 56

**Honeman Close  
Huntingwood, NSW**

**HISTORICAL SAMPLE LOCATIONS AND  
SITE LAYOUT**

FIGURE 3



- Legend
- Approximate Site Boundary
  - NSW Cadastre
  - Hydro Line
  - Approximate Creek Location
  - Mounds/Stockpile
  - 50m Buffer Zone
  - Area of Ecological Sensitivity
  - Heritage Sites
  - ✗ Approximate Location of Septic Tank
- Sample Locations
- + Groundwater Wells
  - + Surface Water Samples
  - Soil Test Pits



Job No: 68310	
Client: Goodman	
Version: R02 Rev A	Date 22/01/2025
Drawn By: TS	Checked By: DS
Scale 1:3,000	

Coord. Sys. GDA2020 MGA Zone 56

**Honeman Close  
Huntingwood, NSW**

**SAMPLE LOCATIONS**

**FIGURE 4**

Sample ID	Depth (m bgs)	Analyte	Concentration (%w/w)	Criteria
JBTP35	1.0-1.5	ACM in soil	0.066	NEPM 2013 Table 7 Res B Soil HSL for Asbestos in Soil

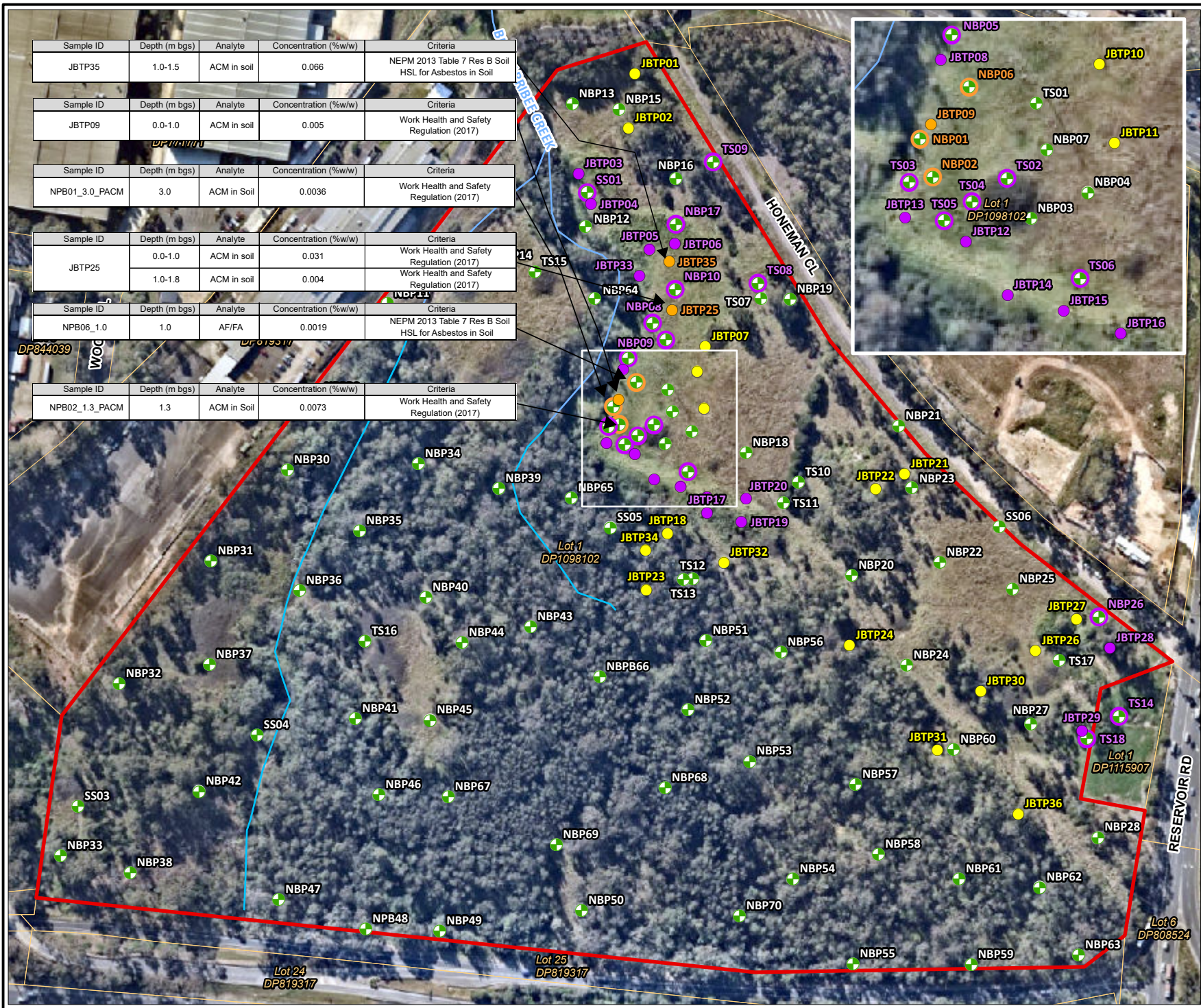
Sample ID	Depth (m bgs)	Analyte	Concentration (%w/w)	Criteria
JBTP09	0.0-1.0	ACM in soil	0.005	Work Health and Safety Regulation (2017)

Sample ID	Depth (m bgs)	Analyte	Concentration (%w/w)	Criteria
NPB01_3.0_PACM	3.0	ACM in Soil	0.0036	Work Health and Safety Regulation (2017)

Sample ID	Depth (m bgs)	Analyte	Concentration (%w/w)	Criteria
JBTP25	0.0-1.0	ACM in soil	0.031	Work Health and Safety Regulation (2017)
	1.0-1.8	ACM in soil	0.004	Work Health and Safety Regulation (2017)

Sample ID	Depth (m bgs)	Analyte	Concentration (%w/w)	Criteria
NPB06_1.0	1.0	AF/FA	0.0019	NEPM 2013 Table 7 Res B Soil HSL for Asbestos in Soil

Sample ID	Depth (m bgs)	Analyte	Concentration (%w/w)	Criteria
NPB02_1.3_PACM	1.3	ACM in Soil	0.0073	Work Health and Safety Regulation (2017)



Legend

- Approximate Site Boundary
- NSW Cadastre
- Hydro Line
- Approximate Creek Location

Historical Sample Locations CH2M Hill 2015b

- Asbestos Observed or Reported
- B&D Rubble
- Test Pit Location

Sample Locations (JBS&G 2024)

- Asbestos Observed or Reported
- B&D Rubble
- Soil Test Pits



Job No: 68310

Client: Goodman

Version: R02 Rev A	Date 22/01/2025
Drawn By: TS	Checked By: DS

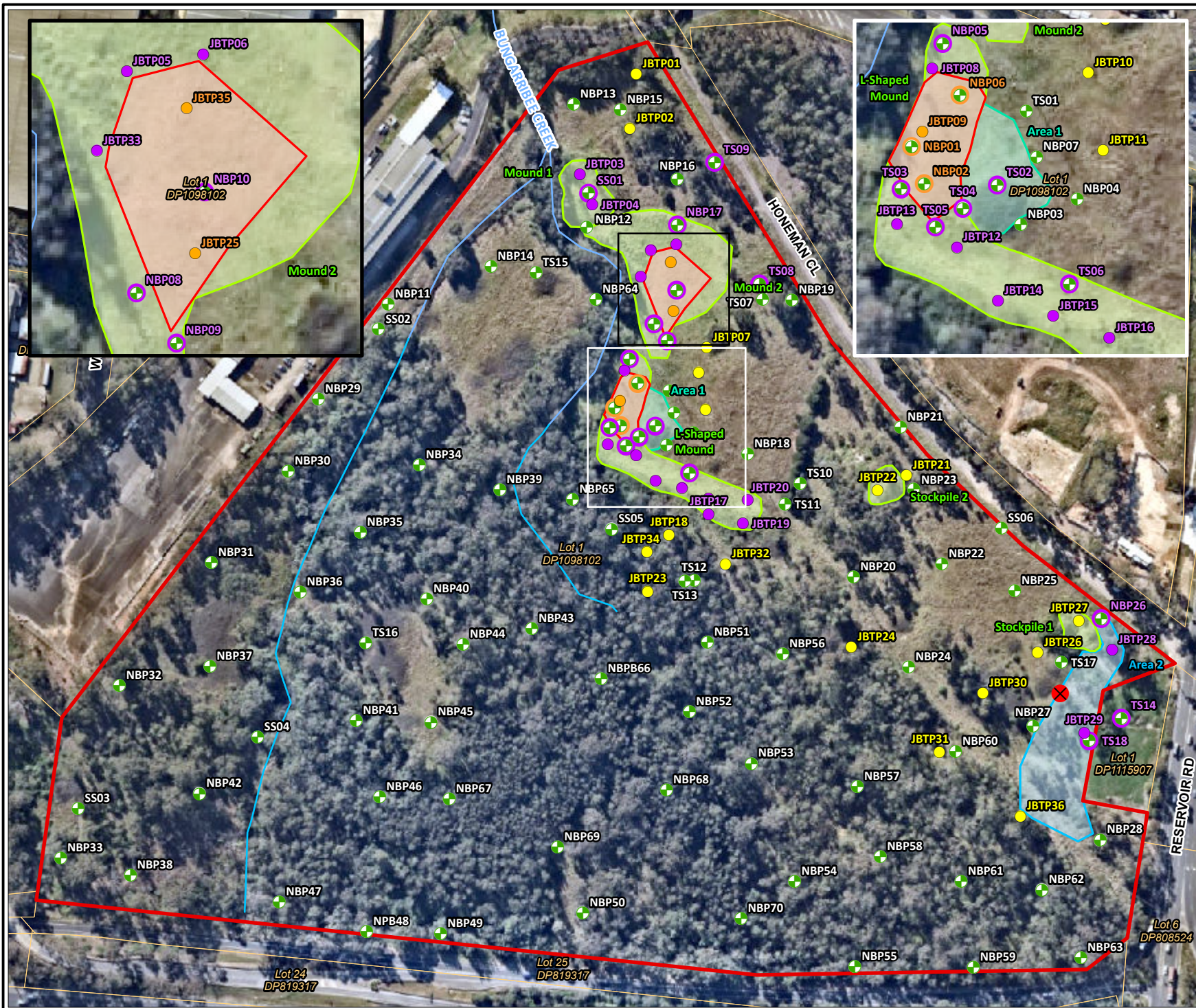
Scale 1:3,000

Coord. Sys. GDA2020 MGA Zone 56

Honeman Close  
Huntingwood, NSW

**SOIL EXCEEDANCES**

FIGURE 5



- Legend
- ▬ Approximate Site Boundary
  - ▬ NSW Cadastre
  - ▬ Hydro Line
  - ▬ Approximate Creek Location
  - ▭ Area 1 (Inferred Extent of B&D Rubble)
  - ▭ Area 2 (Inferred Extent of B&D Rubble)
  - ▭ Mound/Stockpile
  - ⊗ Known Asbestos Impact
  - ⊗ Approximate Location of Septic Tank
- Historical Sample Locations CH2M Hill 2015b
- ⊕ Asbestos Observed or Reported
  - ⊕ B&D Rubble
  - ⊕ Test Pit Location
- Sample Locations (JBS&G 2024)
- Asbestos Observed or Reported
  - B&D Rubble
  - Soil Test Pits



Job No: 68310	
Client: Goodman	
Version: R02 Rev A	Date 22/01/2025
Drawn By: TS	Checked By: DS
Scale 1:3,000	

Coord. Sys. GDA2020 MGA Zone 56

**Honeman Close  
Huntingwood, NSW**

**B&D and Asbestos Impacted Fill Extent**

FIGURE 6

File Name: 68310\_HonemanCloseHuntingwoodDAsstage\_R02RevA  
Reference: Nearmap - www.nearmap.com (Capture Date: 29/05/2024)

## Appendix A Analytical Summary Tables





TABLE A - Soil Analytical Summary Table  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood , Honeman Close

	Metals & Metalloids								TPHs (NEPC 1999)				
	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	2	0.4	1	1	1	0.1	1	1	20	20	50	50	50
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Clay	3,000	900	3,600	240,000	1,500	730	6,000	400,000					
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand													
NEPM 2013 Table 1B(1-5) Site Specific EIL - Areas of Ecological Significance	40		190	95	470		50	270					
NEPM 2013 Table 1B(1-5) Site Specific EIL - Comm/Ind	160		940	330	1,800		450	1200					
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil													
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Fine Soil													
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil													
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil													
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil													
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil													
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil													
PFAS NEMP 2020 Table 2 Health Industrial/Commercial													

Field ID	Date	Lab Report Number	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)
JBTP19_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_02	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
QAAQ20240613_02	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP21_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_03	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
QAAQ20240613_03	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_1.0-1.8	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.0-0.2	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.5-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_1.5-1.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP28_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.0-0.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.8-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_1.0-2.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_2.0-3.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_3.0-3.2	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP35_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP35_1.0-1.5	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW01_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW01_0.5-0.6	12 Jun 2024	1109075	-	-	-	-	-	-	-	<20	<20	700	<50	700	
JBMW02_0.4-0.5	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.9-1.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	<20	<20	<50	72	72	
JBMW02_1.9-2.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_4.0-4.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	
JBMW03_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	
JBMW03_3.1-3.2	12 Jun 2024	1109075	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	
JBMW03_4.2-4.3	12 Jun 2024	1109075	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	
JBMW04_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-

Number of Results	36	36	36	36	36	36	36	36	36	34	34	34	34	34
Number of Detects	34	0	36	36	36	0	36	36	0	1	2	4	5	
Minimum Concentration	<2	<0.4	5.6	11	12	<0.1	6.7	13	<20	20	<50	<50	<50	
Minimum Detect	4.9	ND	5.6	11	12	ND	6.7	13	ND	20	52	66	66	
Maximum Concentration	35	<0.4	35	46	330	<0.1	41	160	<25	<50	700	100	700	
Maximum Detect	35	ND	35	46	330	ND	41	160	ND	20	700	100	700	
Average Concentration *	9.1	0.2	16	28	45	0.05	19	59	10	11	47	33	53	
Geometric Average *	7.6	0.2	15	27	33	0.05	16	51	10	11	29	30	32	
Median Concentration *	8.05	0.2	15.5	27	29	0.05	17.5	51.5	10	10	25	25	25	
Standard Deviation *	6.5	0	5.1	8.7	55	0	10	34	0.6	3.9	116	18	117	
Geometric Standard Deviation *	1.9	1	1.4	1.4	2	1	1.8	1.8	1.1	1.3	1.8	1.5	2	
95% UCL (Student's-t) *	10.96	0.2	17.3	30.55	60.22	0.05	21.51	68.54	10.32	12.31	80.67	37.75	86.98	
% of Detects	94	0	100	100	100	0	100	100	0	3	6	12	15	
% of Non-Detects	6	100	0	0	0	100	0	0	100	97	94	88	85	







	PAH																					PAHs (Sum of total)
	PAHs (Sum of positives)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ calc (Zero)	Benzo(b)fluoranthene	Benzo(b+k)fluoranthene	Benzo(g,h)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	
	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	50	0.1	0.1	0.1	0.1	0.05	0.5	0.5	0.5	0.5	0.2	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Clay							40	40	40													4,000
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																						
NEPM 2013 Table 1B(1-5) Site Specific EIL - Areas of Ecological Significance																						
NEPM 2013 Table 1B(1-5) Site Specific EIL - Comm/Ind																			10			
NEPM 2013 Table 1B(6) ESLS for Areas of Ecological Significance, Coarse Soil							0.7															
NEPM 2013 Table 1B(6) ESLS for Areas of Ecological Significance, Fine Soil							0.7															
NEPM 2013 Table 1B(6) ESLS for Comm/Ind, Coarse Soil							1.4															
NEPM 2013 Table 1B(6) ESLS for Comm/Ind, Fine Soil							1.4															
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																						
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																						
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																						
PFAS NEMP 2020 Table 2 Health Industrial/Commercial																						

Field ID	Date	Lab Report Number	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
JBTP01_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP01_0.3-0.4	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP01_0.6-0.7	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP02_0.0-0.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP02_0.5-0.6	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP03_0.2-0.3	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP03_0.5-0.6	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP03_1.1-1.2	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP03_1.5-1.6	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP03_1.9-2.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP03_2.5-2.6	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP04_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP04_0.5-0.6	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP04_1.0-1.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP04_2.0-2.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP04_3.0-3.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC01	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA01	12 Jun 2024	354015	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
JBTP05_0.0-0.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP05_1.0-1.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP06_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP06_1.0-1.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP06_2.0-2.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP06_3.0-3.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP07_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP07_0.4-0.5	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP08_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP08_1.1-1.2	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP08_2.0-2.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP09_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP09_1.0-1.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP09_1.5-1.6	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP10_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP11_0.0-0.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP11_0.3-0.4	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP12_0.0-0.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP13_0.0-0.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP13_1.0-1.1	12 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP13_2.0-2.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_1.0-1.1	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP14_1.4-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP15_0.0-0.1	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP15_0.4-0.5	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP15_0.9-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP16_0.0-0.1	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP16_0.4-0.5	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBTP16_1.0-1.1	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC20240613_01	13 Jun 2024	1108483	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	-	&lt									



TABLE A - Soil Analytical Summary Table  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood , Honeman Close

	PAH																				PAHs (Sum of total)	
	PAHs (Sum of positives)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ calc (Zero)	Benzo(b+j)fluoranthene	Benzo(b+k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene		Pyrene
	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	50	0.1	0.1	0.1	0.1	0.05	0.5	0.5	0.5	0.5	0.2	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Clay							40	40	40													4,000
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																						
NEPM 2013 Table 1B(1-5) Site Specific EIL - Areas of Ecological Significance																						
NEPM 2013 Table 1B(1-5) Site Specific EIL - Comm/Ind																			10			
NEPM 2013 Table 1B(6) ESLS for Areas of Ecological Significance, Coarse Soil							0.7												370			
NEPM 2013 Table 1B(6) ESLS for Areas of Ecological Significance, Fine Soil							0.7															
NEPM 2013 Table 1B(6) ESLS for Comm/Ind, Coarse Soil							1.4															
NEPM 2013 Table 1B(6) ESLS for Comm/Ind, Fine Soil							1.4															
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																						
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																						
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																						
PFAS NEMP 2020 Table 2 Health Industrial/Commercial																						

Field ID	Date	Lab Report Number	PAHs (Sum of positives)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ calc (Zero)	Benzo(b+j)fluoranthene	Benzo(b+k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene
JBTP19_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_02	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAAQ20240613_02	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP21_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_03	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAAQ20240613_03	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_1.0-1.8	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.0-0.2	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.5-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_1.5-1.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP28_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.0-0.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.8-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_1.0-2.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_2.0-3.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_3.0-3.2	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP35_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP35_1.0-1.5	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW01_0.0-0.1	12 Jun 2024	1109075	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBMW01_0.5-0.6	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.4-0.5	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.9-1.0	12 Jun 2024	1109075	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBMW02_1.9-2.0	12 Jun 2024	1109075	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBMW02_4.0-4.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_0.0-0.1	12 Jun 2024	1109075	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JBMW03_3.1-3.2	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_4.2-4.3	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW04_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Number of Results	3	39	39	39	39	39	39	39	39	39	36	3	39	36	39	39	39	39	39	39	39	39	36
Number of Detects	1	0	0	0	1	1	36	36	0	0	1	1	0	2	0	2	0	1	0	0	2	1	1
Minimum Concentration	<50	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5
Minimum Detect	2,800	ND	ND	ND	0.3	0.3	1.2	0.6	ND	ND	0.5	0.2	ND	0.2	ND	0.5	ND	0.3	ND	ND	0.5	2	2
Maximum Concentration	2,800	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.6	<0.5	<0.5	0.5	<0.5	<0.5	0.6	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	2
Maximum Detect	2,800	ND	ND	ND	0.3	0.3	1.2	0.6	ND	ND	0.5	0.2	ND	0.6	ND	0.7	ND	0.3	ND	ND	0.7	2	2
Average Concentration *	950	0.23	0.23	0.23	0.24	0.24	1.1	0.57	0.25	0.25	0.23	0.24	0.25	0.25	0.23	0.26	0.23	0.24	0.23	0.23	0.23	0.26	0.3
Geometric Average *	121	0.22	0.22	0.22	0.23	0.22	1.1	0.56	0.25	0.25	0.17	0.23	0.25	0.23	0.22	0.24	0.22	0.23	0.22	0.22	0.24	0.26	0.26
Median Concentration *	25	0.25	0.25	0.25	0.25	0.25	1.2	0.6	0.25	0.25	0.1	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Standard Deviation *	1,602	0.054	0.054	0.054	0.046	0.051	0.26	0.094	0	0	0.23	0.045	0	0.073	0.054	0.095	0.054	0.046	0.054	0.054	0.095	0.29	0.29
Geometric Standard Deviation *	15	1.5	1.5	1.5	1.4	1.7	1.5	1.3	1	1	2.5	1.4	1	1.5	1.5	1.5	1.5	1.4	1.5	1.5	1.5	1.5	1.4
95% UCL (Student's-t) *	3,651	0.249	0.249	0.249	0.253	0.254	1.196	0.599	0.25	0.25	0.623	0.251	0.25	0.267	0.249	0.283	0.249	0.253	0.249	0.249	0.283	0.381	0.381
% of Detects	33	0	0	0	3	3	92	92	0	0	33	3	0	5	0	5	0	3	0	0	5	3	3
% of Non-Detects	67	100	100	100	97	97	8	8	100	100	67	97	100	95	100	95	100	97	100	100	95	97	97

















TABLE A - Soil Analytical Summary Table  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood, Honeman Close

	PFAS																		Chlorinated Benzenes	Ionic Balance			Particle Size
	N-ethyl-perfluorooctanesulfonamide acid (NEFOSAA)	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H,1H,2H,2H-perfluorooctanesulfonic acid (4:2 FTSA)	1H,1H,2H,2H-perfluorodecanesulfonic acid (6:2 FTSA)	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	Sum of PFHxS and PFOS	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of WA DWER PFAS (n=10)*	Sum of PFAS	Perfluoronanesulfonic acid ion	Hexachlorobenzene	CEC	Conductivity (1:5 aqueous extract)	pH (aqueous extract)	% Clay*	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/KG	mg/kg	mg/kg	mg/kg	MEQ/100G	US/CM	pH Units	%
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	0.0002	0.005	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0002	0.0001	0.0001	0.0005	0.0001	0.01	0.0001	0.005	0.05	0.5	10	0.1	2.5	
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Clay																		80					
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																							
NEPM 2013 Table 1B(1-5) Site Specific EIL - Areas of Ecological Significance																							
NEPM 2013 Table 1B(1-5) Site Specific EIL - Comm/Ind																							
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil																							
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Fine Soil																							
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil																							
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Fine Soil																							
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																							
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																							
NEPM 2013 Table 7 Comm/Ind D Soil HSL for Asbestos in Soil																							
PFAS NEMP 2020 Table 2 Health Industrial/Commercial						20								20									

Field ID	Date	Lab Report Number																					
JBTP19_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_02	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAAQ20240613_02	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP21_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_03	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAAQ20240613_03	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_1.0-1.8	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.0-0.2	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.5-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_1.5-1.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP28_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.0-0.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.8-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_1.0-2.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_2.0-3.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_3.0-3.2	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP35_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP35_1.0-1.5	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW01_0.0-0.1	12 Jun 2024	1109075	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	-	21	180	6.7	24
JBMW01_0.5-0.6	12 Jun 2024	1109075	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	-	-	-	-	-
JBMW02_0.4-0.5	12 Jun 2024	1109075	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	-	-	-	-	-
JBMW02_0.9-1.0	12 Jun 2024	1109075	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	-	-	-	-	-
JBMW02_1.9-2.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_4.0-4.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_0.0-0.1	12 Jun 2024	1109075	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	-	-	-	-	-
JBMW03_3.1-3.2	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_4.2-4.3	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW04_0.0-0.1	12 Jun 2024	1109075	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	-	-	-	-	-

Number of Results	18	16	18	18	18	18	18	18	18	18	18	18	18	16	18	16	18	16	18	2	2	2	2
Number of Detects	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	2	1	2	2
Minimum Concentration	<0.0002	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0002	<0.0001	<0.0001	<0.0002	<0.0002	0.0001	<0.005	0.0001	<0.01	0.0001	<0.005	<0.05	17	<10	6.7	24
Minimum Detect	ND	ND	ND	ND	ND	ND	0.0001	ND	ND	ND	ND	ND	0.0001	ND	0.0001	ND	0.0001	ND	0.0001	17	180	6.7	24
Maximum Concentration	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	<0.5	21	180	8.6	31
Maximum Detect	ND	ND	ND	ND	ND	ND	0.0001	ND	ND	ND	ND	ND	0.0001	ND	0.0001	ND	0.0001	ND	ND	21	180	8.6	31
Average Concentration *	0.0045	0.0025	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0044	0.0022	0.0022	0.0025	0.0022	0.005	0.0022	0.0025	0.12	19	92	7.6	28
Geometric Average *	0.0032	0.0025	0.0016	0.0016	0.0016	0.0016	0.0017	0.0017	0.0016	0.003	0.0017	0.0017	0.0017	0.0025	0.0017	0.005	0.013	0.0025	0.066	19	30	7.6	27
Median Concentration *	0.005	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.005	0.0025	0.0025	0.0025	0.0025	0.005	0.005	0.025	0.0025	0.0375	19	92.5	7.65	27.5
Standard Deviation *	0.0016	0	0.00079	0.00079	0.00079	0.00079	0.00078	0.00078	0.00079	0.0016	0.00078	0.00078	0.00078	0	0.00078	0	0.0081	0	0.11	2.8	124	1.3	4.9
Geometric Standard Deviation *	3.5	1	3.5	3.5	3.5	3.5	3.2	2.8	3.5	4.4	2.8	2.8	3.2	1	3.2	1	6.7	1	3	1.2	13	1.2	1.2
95% UCL (Student's-t) *	0.00511	0.0025	0.00255	0.00255	0.00255	0.00255	0.00255	0.00255	0.00255	0.00511	0.00255	0.00255	0.00255	0.0025	0.00255	0.005	0.0255	0.0025	0.161	31.63	645	13.65	49.6
% of Detects	0	0	0	0	0	0	6	0	0	0	0	0	6	0	6	0	6	0	0	100	50	100	100
% of Non-Detects	100	100	100	100	100	100	94	100	100	100	100	100	100	94	100	94	100	94	100	0	50	0	0

**Table B: Field Asbestos Quantification Results**

**Job Number: 68310**

Health Screening Level Asbestos Concentration in Soil (% w/w)	
Category	
Bonded ACM in soils	0.05
FA and AF in soils	0.001
ACM detected or observed in soil	

Sample Information			Field AQ Results				Laboratory Results		Combined Results		
Sample ID	Date	Material Type	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)*	Asbestos from ACM in soil (%w/w)	ACM (% w/w)	AF/FA (% w/w)	ACM (% w/w)	AF/FA (% w/w)
JBTP01_0.0-0.6	12/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP02_0.0-0.5	12/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP03_0.0-0.2	12/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP03_0.2-1.2	12/6/2024	FILL - Silty Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP03_1.2-1.8	12/6/2024	FILL - Silty Clay, grey/orange	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP03_1.8-2.4	12/6/2024	FILL - Gravelly Clayey Silt, brown/orange	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP03_2.4-3.2	12/6/2024	FILL - Clayey Silt, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP04_0.0-0.3	12/6/2024	FILL - Silty Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP04_0.3-1.0	12/6/2024	FILL - Silty Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP04_1.0-1.5	12/6/2024	FILL - Silty Sandy Clay, yellow/grey	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP04_1.5-2.4	12/6/2024	FILL - Clayey Silt, dark brown/grey	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP04_2.4-3.2	12/6/2024	NATURAL - Silty Clay, dark grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP05_0.0-1.0	12/6/2024	FILL - Silty Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP05_1.0-2.0	12/6/2024	FILL - Gravelly Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP05_2.0-2.5	12/6/2024	FILL - Gravelly Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP05_2.5-3.0	12/6/2024	NATURAL - Clay, red/grey	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP06_0.0-1.0	12/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP06_1.0-2.0	12/6/2024	FILL - Gravelly Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP06_2.0-2.4	12/6/2024	FILL - Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP06_2.4-3.2	12/6/2024	NATURAL - Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP07_0.0-0.5	12/6/2024	FILL - Sandy Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP08_0.0-1.0	12/6/2024	FILL - Sandy Gravelly Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP08_1.0-2.0	12/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP09_0.0-1.0	12/6/2024	FILL - Silty Gravelly Clay, grey/brown	10	16300	5	0.75	0.005	0.000	0.0000	0.005	0.0000
JBTP09_1.0-1.5	12/6/2024	FILL - Silty Gravelly Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP09_1.5-1.9	12/6/2024	FILL - Silty Gravelly Clay, dark grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP10_0.0-0.8	12/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP11_0.0-0.2	12/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP12_0.0-1.0	12/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000

**Table B: Field Asbestos Quantification Results**

**Job Number: 68310**

Health Screening Level Asbestos Concentration in Soil (% w/w)	
Category	
Bonded ACM in soils	0.05
FA and AF in soils	0.001
ACM detected or observed in soil	

Sample Information			Field AQ Results				Laboratory Results		Combined Results		
Sample ID	Date	Material Type	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)*	Asbestos from ACM in soil (%w/w)	ACM (% w/w)	AF/FA (% w/w)	ACM (% w/w)	AF/FA (% w/w)
JBTP13_0.0-1.0	12/6/2024	FILL - Silty Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP13_1.0-2.0	12/6/2024	FILL - Silty Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP14_0.0-1.0	13/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP14_1.0-1.5	13/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP15_0.0-1.0	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP16_0.0-1.0	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP16_1.0-1.8	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP17_0.0-1.0	13/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP17_1.0-2.0	13/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP18_0.0-0.1	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP19_0.0-1.0	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP19_1.0-1.5	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP20_0.0-1.0	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP20_1.0-1.5	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP21_0.0-0.2	13/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP21_0.2-0.5	13/6/2024	NATURAL - Sandy Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP22_0.0-1.0	13/6/2024	FILL - Gravelly Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP22_1.0-1.5	13/6/2024	NATURAL - Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP23_0.0-0.3	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP24_0.0-0.2	13/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP25_0.0-1.0	12/6/2024	FILL - Gravelly Silty Clay, dark brown/brown	10	16300	34	5.10	0.031	0.000	0.0000	0.031	0.0000
JBTP25_1.0-1.8	12/6/2024	FILL - Gravelly Silty Clay, dark brown/brown	10	16300	4	0.60	0.004	0.000	0.0000	0.004	0.0000
JBTP26_0.0-0.3	12/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP27_0.0-0.2	13/6/2024	FILL - Gravelly Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP27_0.2-0.5	13/6/2024	FILL - Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP27_0.5-1.5	13/6/2024	FILL - Gravelly Sandy Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP27_1.5-1.8	13/6/2024	NATURAL - Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP28_0.0-1.0	13/6/2024	FILL - Sandy Clay, tan/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP29_0.0-0.8	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP29_0.8-1.0	13/6/2024	NATURAL - Clay, red/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP30_0.0-0.3	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP31_0.0-0.3	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP31_0.3-0.5	13/6/2024	NATURAL - Silty Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP32_0.0-0.3	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP33_0.0-1.0	12/6/2024	FILL - Silty Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP33_1.0-2.0	12/6/2024	FILL - Silty Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP33_2.0-3.0	12/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP33_3.0-3.2	12/6/2024	FILL - Sandy Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP34_0.0-0.3	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP35_0.0-1.0	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000
JBTP35_1.0-1.5	13/6/2024	FILL - Sandy Clay, grey/brown	10	16300	72	10.80	0.066	0.000	0.0000	0.066	0.0000
JBTP36_0.0-0.3	13/6/2024	FILL - Silty Clay, dark brown/brown	10	16300	0	0.00	0.000	0.000	0.0000	0.000	0.0000

















TABLE C - Preliminary Waste Classification Table  
 Project Number: 68310 Project Name:  
 Honeman Close Huntingwood

	BTEXN												
	Benzene		Toluene		Ethylbenzene		Xylene (o)		Xylene (m & p)		Xylene Total		Naphthalene_1,0C
	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg
EQL	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.2	0.002	0.3	0.003	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)	10		288		600						1,000		
NSW 2014 General Solid Waste SCC1 (with leached)	18		518		1,080						1,800		
NSW 2014 General Solid Waste TCLP1 (leached)		0.5		14.4		30						50	
NSW 2014 Restricted Solid Waste CT2 (No Leaching)	40		1,152		2,400						4,000		
NSW 2014 Restricted Solid Waste SCC2 (with leached)	72		2,073		4,320						7,200		
NSW 2014 Restricted Solid Waste TCLP2 (leached)		2		57.6		120						200	

Field ID	Date	Lab Report Number	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene_1,0C
JBMW01_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-
JBMW01_0.5-0.6	12 Jun 2024	1109075	<0.1	-	<0.1	-	<0.1	-	<0.5
JBMW02_0.4-0.5	12 Jun 2024	1109075	-	-	-	-	-	-	-
JBMW02_0.9-1.0	12 Jun 2024	1109075	<0.1	-	<0.1	-	<0.1	-	<0.5
JBMW02_1.9-2.0	12 Jun 2024	1109075	-	-	-	-	-	-	-
JBMW02_4.0-4.1	12 Jun 2024	1109075	<0.1	-	<0.1	-	<0.1	-	<0.5
JBMW03_0.0-0.1	12 Jun 2024	1109075	<0.1	-	<0.1	-	<0.1	-	<0.5
JBMW03_3.1-3.2	12 Jun 2024	1109075	<0.1	-	<0.1	-	<0.1	-	<0.5
JBMW03_4.2-4.3	12 Jun 2024	1109075	<0.1	-	<0.1	-	<0.1	-	<0.5
JBMW04_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-
JBTPO1_0.0-0.1	12 Jun 2024	1108483	<0.1	-	<0.1	-	<0.1	-	<0.5
JBTPO1_0.3-0.4	12 Jun 2024	1108483	-	-	-	-	-	-	<0.5
JBTPO1_0.6-0.7	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO2_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO2_0.5-0.6	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_0.0-0.2	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_0.2-0.3	12 Jun 2024	1108483	-	-	-	-	-	-	<0.5
JBTPO3_0.2-0.6	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_0.5-0.6	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_1.1-1.2	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_1.2-1.8	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_1.5-1.6	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_1.8-2.4	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO3_1.9-2.0	12 Jun 2024	1108483	-	-	-	-	-	-	<0.5
JBTPO3_2.4-3.2	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO4_0.0-0.1	12 Jun 2024	1108483	-	-	-	-	-	-	<0.5
JBTPO4_0.0-0.3	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO4_0.3-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-
JBTPO4_0.5-0.6	12 Jun 2024	1108483	-	-	-	-	-	-	-





















TABLE C - Preliminary Waste Classification Table  
 Project Number: 68310 Project Name:  
 Honeman Close Huntingwood

	Organochlorine Pesticides																										
	4,4'-DDE	a-BHC	b-BHC	γ-BHC	δ-BHC	γ-BHC (Lindane)	Aldrin	Deltrin	Aldrin + Dieldrin	Chlordane	Chlordane (cis)	Chlordane (trans)	DDT	DDD	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Ethrin	Ethrin aldehyde	Ethrin ketone	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex	Toxaphene	
EQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NSW 2014 General Solid Waste CT1 (No Leaching)																											
NSW 2014 General Solid Waste SCC1 (with leached)																											
NSW 2014 General Solid Waste TCLP1 (leached)																											
NSW 2014 Restricted Solid Waste CT2 (No Leaching)																											
NSW 2014 Restricted Solid Waste SCC2 (with leached)																											
NSW 2014 Restricted Solid Waste TCLP2 (leached)																											

Field ID	Date	Lab Report Number	4,4'-DDE	a-BHC	b-BHC	γ-BHC	δ-BHC	γ-BHC (Lindane)	Aldrin	Deltrin	Aldrin + Dieldrin	Chlordane	Chlordane (cis)	Chlordane (trans)	DDT	DDD	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Ethrin	Ethrin aldehyde	Ethrin ketone	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex	Toxaphene	
JBMW01_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
JBMW01_0.5-0.6	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.4-0.5	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.9-1.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_1.9-2.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_4.0-4.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_3.1-3.2	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_4.2-4.3	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW04_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QCAQ20240613_03	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_0.0-0.1	13 Jun 2024	1108483	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
JBTP20_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_0.4-0.5	12 Jun 2024	1111467	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_0.4-0.5	13 Jun 2024	1108483	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
QC20240613_02	13 Jun 2024	1108483	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
QA20240613_02	13 Jun 2024	354015	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10
JBTP20_1.0-1.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP20_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP21_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAACQ20240613_02	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QAACQ20240613_03	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP21_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20240613_03	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20240613_03	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP22_1.0-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_0.0-0.1	12 Jun 2024	1108483	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5
JBTP25_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP25_1.0-1.8	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.0-0.2	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.2-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_0.5-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_1.4-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP27_1.5-1.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP28_0.0-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.0-0.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP29_0.8-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP30_0.1-0.2	13 Jun 2024	1108483	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5
JBTP31_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP31_0.3-0.4	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP32_0.1-0.2	13 Jun 2024	1108483	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5
JBTP33_0.0-1.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_1.0-1.1	12 Jun 2024	1108483	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
JBTP33_1.0-2.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_2.0-3.0	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP33_3.0-3.2	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP34_0.0-0.1	13 Jun 2024	1108483	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	<0.05	<0.05	&lt													





























TABLE C - Preliminary Waste Classification Table  
 Project Number: 68310 Project Name:  
 Honeman Close Huntingwood

	Chlorinated Benzenes	Asbestos - Eurofins														Asbestos - Envirolab							
	Hexachlorobenzene	Approximate Sample Mass	Asbestos Sample Dimensions	Mass ACM	Mass Asbestos in ACM	Asbestos from ACM in Soil	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	ACM - Comment	FA - Comment	AF - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment	Asbestos Reported Result	Asbestos FA & AF in Soil	Asbestos ID in Soil	Total Asbestos	Asbestos (ACM >7mm) Estimation	Asbestos in soil (<2mm AF/FA) (%w/w)
	mg/kg	m	Comment	m	% (w/w)	m	m	m	m	m	Comment	Comment	Comment	Comment	Comment	Comment	Comment	% (w/w)	g/kg	g/kg	% (w/w)	% (w/w)	
EQL	0.05																						
NSW 2014 General Solid Waste CT1 (No Leaching)																							
NSW 2014 General Solid Waste SCC1 (with leached)																							
NSW 2014 General Solid Waste TCLP1 (leached)																							
NSW 2014 Restricted Solid Waste CT2 (No Leaching)																							
NSW 2014 Restricted Solid Waste SCC2 (with leached)																							
NSW 2014 Restricted Solid Waste TCLP2 (leached)																							

Field ID	Date	Lab Report Number																						
JBMW01_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW01_0.5-0.6	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.4-0.5	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_0.9-1.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_1.9-2.0	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02_4.0-4.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_3.1-3.2	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW03_4.2-4.3	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW04_0.0-0.1	12 Jun 2024	1109075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP13_2.0-2.1	12 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_0.0-0.1	13 Jun 2024	1108483	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_0.0-1.0	13 Jun 2024	1108483	-	598	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP14_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_1.0-1.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP14_1.0-1.5	13 Jun 2024	1108483	-	647	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP14_1.4-1.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP15_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP15_0.0-1.0	13 Jun 2024	1108483	-	565	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP15_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP15_0.9-1.0	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP16_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP16_0.0-1.0	13 Jun 2024	1108483	-	575	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
GAAQ20240613_01	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	<0.1	<0.01	<0.001	<0.001	
GCAQ20240613_01	13 Jun 2024	1108483	-	517	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP16_0.4-0.5	12 Jun 2024	1111467	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP16_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP16_1.0-1.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20240613_01	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20240613_01	13 Jun 2024	354015-A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20240613_01	13 Jun 2024	354015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP16_1.0-1.8	13 Jun 2024	1108483	-	606	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP16_1.7-1.8	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP17_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP17_0.0-1.0	13 Jun 2024	1108483	-	554	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP17_0.4-0.5	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP17_1.0-1.1	13 Jun 2024	1108483	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP17_1.0-2.0	13 Jun 2024	1108483	-	629	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
JBTP17_1.5-1.6	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP18_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_0.0-0.1	13 Jun 2024	1108483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JBTP19_0.0-1.0	13 Jun 2024	1108483	-	690	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-
GCAQ20240613_02	13 Jun 2024	1108483	-	721	-	0.0000	0	0	0.0000	0	0.0000	0	0	1	1	1	1	1	0	-	-	-	-	-



TABLE D - Groundwater and Surface Water Analytical Results  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood

	Metals & Metalloids								TPHs (NEPC 1999)				
	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001	0.01	0.05	0.1	0.1	0.05
ADWG (2011) Health x 10 (Recreational) - Updated March-2021	0.1	0.02	0.5	20	0.1	0.01	0.2						
ANZG (2018) Freshwater 80% toxicant DGVs	0.14	0.0008	0.04	0.0025	0.0094	0.0054	0.017	0.031					
ANZG (2018) Freshwater 90% toxicant DGVs	0.042	0.0004	0.006	0.0018	0.0056	0.0019	0.013	0.015					
ANZG (2018) Freshwater 95% toxicant DGVs	0.013	0.0002	0.001	0.0014	0.0034	0.0006	0.011	0.008					
ANZG (2018) Freshwater 99% toxicant DGVs	0.0008	0.00006	0.00001	0.001	0.001	0.00006	0.008	0.0024					
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Clay													
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand													
PFAS NEMP 2020 Table 1 Health Recreational Water													
PFAS NEMP 2020 Table 5 Freshwater 95%													
PFAS NEMP 2020 Table 5 Freshwater 99%													

Field ID	Date	Lab Report Number												
Groundwater														
JBMW01	17 Jun 2024	1109064	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005	<0.02	<0.05	<0.1	<0.1
JBMW02	17 Jun 2024	1109064	0.002	<0.0002	0.005	0.001	<0.001	<0.0001	0.005	<0.005	<0.02	<0.05	<0.1	<0.1
JBMW03	17 Jun 2024	1109064	0.012	0.0003	<0.001	<0.001	<0.001	<0.0001	0.014	0.011	<0.02	<0.05	<0.1	<0.1
JBMW04	17 Jun 2024	1109064	0.005	<0.0002	<0.001	0.002	<0.001	<0.0001	0.005	<0.005	<0.02	<0.05	<0.1	<0.1
QA02_20240617	17 Jun 2024	1109064	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005	<0.02	<0.05	<0.1	<0.1
QC02_20240617	17 Jun 2024	354361	<0.001	<0.0001	<0.001	<0.001	<0.0001	0.004	0.004	<0.01	<0.05	<0.1	<0.1	<0.05
Surface Water														
SW01	17 Jun 2024	1109064	-	-	-	-	-	-	-	-	<0.02	<0.05	<0.1	<0.1
SW02	17 Jun 2024	1109064	-	-	-	-	-	-	-	-	-	-	-	-
SW03	17 Jun 2024	1109064	<0.001	<0.0002	<0.001	0.001	<0.001	<0.0001	<0.001	<0.005	-	-	-	-
SW04	17 Jun 2024	1109064	0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.004	0.011	0.02	<0.05	<0.1	<0.1
QA01_20240617	17 Jun 2024	1109064	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.003	0.010	<0.02	<0.05	<0.1	<0.1
QC01_20240617	17 Jun 2024	354361	<0.001	<0.0001	<0.001	0.001	<0.001	<0.00005	0.005	0.014	<0.01	<0.05	<0.1	<0.05
SW05	17 Jun 2024	1109064	-	-	-	-	-	-	-	-	<0.02	<0.05	<0.1	<0.1
SW06	17 Jun 2024	1109064	<0.001	<0.0002	<0.001	0.002	<0.001	<0.0001	0.001	<0.005	<0.02	<0.05	<0.1	<0.1

Statistics													
Number of Results	12	12	12	12	12	12	12	12	12	13	13	13	13
Number of Detects	4	1	1	5	0	0	9	5	1	0	0	0	0
Minimum Concentration	0.001	<0.0001	<0.001	0.001	<0.001	<0.00005	0.001	0.004	<0.01	<0.05	<0.1	<0.1	<0.05
Minimum Detect	0.001	0.0003	0.005	0.001	ND	ND	0.001	0.004	0.02	ND	ND	ND	ND
Maximum Concentration	0.012	0.0003	0.005	0.002	<0.001	<0.0001	0.014	0.014	0.02	<0.05	<0.1	<0.1	<0.1
Maximum Detect	0.012	0.0003	0.005	0.002	ND	ND	0.014	0.014	0.02	ND	ND	ND	ND
Average Concentration *	0.002	0.00011	0.00088	0.00088	0.0005	0.000046	0.0036	0.0056	0.01	0.025	0.05	0.05	0.046
Geometric Average *	0.00094	0.000098	0.00061	0.00075	0.0005	0.000045	0.0022	0.0043	0.0095	0.025	0.05	0.05	0.045
Median Concentration *	0.0005	0.0001	0.0005	0.0005	0.0005	0.00005	0.0035	0.0025	0.01	0.025	0.05	0.05	0.05
Standard Deviation *	0.0034	0.000063	0.0013	0.00057	0	0.0000097	0.0038	0.0045	0.0035	0	0	0	0.0094
Geometric Standard Deviation *	3	1.6	1.9	1.7	1	1.3	3.1	2.1	1.4	1	1	1	1.3
95% UCL (Student's-t) *	0.00377	0.00014118	0.00155	0.00117	0.0005	0.000050878	0.00558	0.00793	0.0117	0.025	0.05	0.05	0.0508
% of Detects	33	8	8	42	0	0	75	42	8	0	0	0	0
% of Non-Detects	67	92	92	58	100	100	25	58	92	100	100	100	100









TABLE D - Groundwater and Surface Water Analytical Results  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood

	PFAS																
	Perfluoropropanesulfonic acid (PFPS)	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Perfluorooctanesulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA)	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA)	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA)	1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA)	Sum of PFHxS and PFOS	Sum of enHealth PFAS (PFHxS + PFOS + PFOA) *	Sum of US EPA PFAS (PFOS + PFOA) *	Sum of WA DWER PFAS (n=10) *	Sum of PFAS	Perfluorononanesulfonic acid ion
EQL	0.001	0.0004	0.001	0.0002	0.001	0.0001	0.001	0.001	0.0004	0.0004	0.001	0.0002	0.001	0.0002	0.005	0.0002	0.001
ADWG (2011) Health x 10 (Recreational) - Updated March-2021				0.7		0.7						0.7					
ANZG (2018) Freshwater 80% toxicant DGVs																	
ANZG (2018) Freshwater 90% toxicant DGVs																	
ANZG (2018) Freshwater 95% toxicant DGVs																	
ANZG (2018) Freshwater 99% toxicant DGVs																	
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Clay																	
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand																	
PFAS NEMP 2020 Table 1 Health Recreational Water				2		2						2					
PFAS NEMP 2020 Table 5 Freshwater 95%						0.13											
PFAS NEMP 2020 Table 5 Freshwater 99%						0.00023											

Field ID	Date	Lab Report Number	Groundwater																
JBMW01	17 Jun 2024	1109064	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
JBMW02	17 Jun 2024	1109064	<0.001	0.002	0.002	0.004	<0.001	0.0044	<0.001	<0.001	<0.001	<0.001	0.0084	0.0154	0.0114	0.6844	0.6874	<0.001	
JBMW03	17 Jun 2024	1109064	<0.001	<0.001	<0.001	<0.001	<0.001	0.0007	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
JBMW04	17 Jun 2024	1109064	<0.001	0.002	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
QA02_20240617	17 Jun 2024	1109064	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
QC02_20240617	17 Jun 2024	354361	-	<0.0004	<0.001	<0.0002	<0.001	<0.0002	<0.002	<0.001	<0.0004	<0.0004	<0.002	<0.0002	-	<0.0002	-	<0.0002	
			Surface Water																
SW01	17 Jun 2024	1109064	<0.001	0.004	0.001	0.003	<0.001	0.0056	<0.001	<0.001	<0.001	<0.001	<0.001	0.0086	0.0246	0.0216	0.0616	0.0646	<0.001
SW02	17 Jun 2024	1109064	<0.001	0.002	<0.001	0.001	<0.001	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	0.0029	0.0039	0.0029	0.0129	0.0129	<0.001
SW03	17 Jun 2024	1109064	<0.001	0.002	<0.001	0.001	<0.001	0.0018	<0.001	<0.001	<0.001	<0.001	<0.001	0.0028	0.0028	0.0018	0.0108	0.0108	<0.001
SW04	17 Jun 2024	1109064	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA01_20240617	17 Jun 2024	1109064	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC01_20240617	17 Jun 2024	354361	-	0.001	<0.001	0.001	<0.001	0.0031	<0.002	<0.001	<0.0004	<0.0004	<0.002	0.0042	-	0.0046	-	0.012	-
SW05	17 Jun 2024	1109064	<0.001	0.003	<0.001	0.004	<0.001	0.0050	<0.001	<0.001	<0.001	<0.001	<0.001	0.009	0.02	0.016	0.043	0.043	<0.001
SW06	17 Jun 2024	1109064	<0.001	0.002	<0.001	0.002	<0.001	0.0027	<0.001	<0.001	<0.001	<0.001	<0.001	0.0047	0.0077	0.0057	0.0227	0.0227	<0.001

Statistics																	
Number of Results	13	15	15	15	15	15	15	15	15	15	15	15	13	15	13	15	13
Number of Detects	0	10	2	7	0	8	0	0	0	0	0	7	6	7	6	7	0
Minimum Concentration	<0.001	<0.0004	0.001	<0.0002	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0004	<0.0004	<0.001	<0.0002	<0.001	<0.0002	<0.001	<0.0002
Minimum Detect	ND	0.001	0.001	0.001	ND	0.0007	ND	ND	ND	ND	ND	ND	0.0028	0.0028	0.0018	0.0108	0.0108
Maximum Concentration	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6844	0.6874
Maximum Detect	ND	0.004	0.002	0.004	ND	0.0056	ND	ND	ND	ND	ND	ND	0.009	0.0246	0.0216	0.6844	0.6874
Average Concentration *	0.0081	0.0081	0.0072	0.0079	0.0071	0.0084	0.0072	0.0071	0.0085	0.0071	0.0072	0.0072	0.0095	0.014	0.011	0.073	0.064
Geometric Average *	0.001	0.0021	0.0011	0.0016	0.00092	0.0015	0.001	0.00092	0.0027	0.00082	0.001	0.0025	0.0039	0.0028	0.015	0.01	0.001
Median Concentration *	0.0005	0.002	0.0005	0.001	0.0005	0.0019	0.0005	0.0005	0.0025	0.0005	0.0005	0.0029	0.0039	0.0029	0.0129	0.012	0.0005
Standard Deviation *	0.019	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.018	0.017	0.19	0.17
Geometric Standard Deviation *	5.6	4.5	5	5.5	5.1	8.4	5	5.1	4.4	5.5	5	6.2	6.6	7	5.8	8	5.6
95% UCL (Student's-t) *	0.0173	0.0159	0.0151	0.0157	0.015	0.0161	0.0151	0.015	0.0162	0.015	0.0151	0.0172	0.0225	0.0189	0.164	0.143	0.0173
% of Detects	0	67	13	47	0	53	0	0	0	0	0	47	46	47	46	47	0
% of Non-Detects	100	33	87	53	100	47	100	100	100	100	100	53	54	53	54	53	100





TABLE D - Groundwater and Surface Water Analytical Results  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood

	Major Cations							Major Anions					
	Calcium	Calcium (filtered)	Potassium	Potassium (filtered)	Magnesium	Magnesium (filtered)	Sodium	Sodium (filtered)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (Bicarbonate as CaCO3)	Chloride	Sulphate
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	1	1
ADWG (2011) Health x 10 (Recreational) - Updated March-2021													5,000
ANZG (2018) Freshwater 80% toxicant DGVs													
ANZG (2018) Freshwater 90% toxicant DGVs													
ANZG (2018) Freshwater 95% toxicant DGVs													
ANZG (2018) Freshwater 99% toxicant DGVs													
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Clay													
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand													
PFAS NEMP 2020 Table 1 Health Recreational Water													
PFAS NEMP 2020 Table 5 Freshwater 95%													
PFAS NEMP 2020 Table 5 Freshwater 99%													

Field ID	Date	Lab Report Number	Calcium	Calcium (filtered)	Potassium	Potassium (filtered)	Magnesium	Magnesium (filtered)	Sodium	Sodium (filtered)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (Bicarbonate as CaCO3)	Chloride	Sulphate	
<b>Groundwater</b>																
JBMW01	17 Jun 2024	1109064	180	-	28	-	620	-	4,000	-	<20	<20	970	8,000	550	
JBMW02	17 Jun 2024	1109064	160	-	27	-	350	-	1,800	-	<20	<20	660	3,500	310	
JBMW03	17 Jun 2024	1109064	180	-	18	-	840	-	6,000	-	<20	<20	520	10,000	670	
JBMW04	17 Jun 2024	1109064	230	-	17	-	510	-	3,500	-	<20	<20	900	7,000	590	
QA02_20240617	17 Jun 2024	1109064	170	-	27	-	620	-	4,000	-	<20	<20	990	7,300	490	
QC02_20240617	17 Jun 2024	354361	-	150	-	32	-	550	-	3,600	<5	<5	1,000	6,600	530	
<b>Surface Water</b>																
SW01	17 Jun 2024	1109064	45	-	4.2	-	14	-	91	-	<20	<20	100	120	86	
SW02	17 Jun 2024	1109064	28	-	2.7	-	30	-	220	-	<20	<20	97	450	88	
SW03	17 Jun 2024	1109064	29	-	2.7	-	43	-	340	-	<20	<20	110	540	83	
SW04	17 Jun 2024	1109064	110	-	5.5	-	270	-	2,000	-	<20	<20	240	3,900	290	
QA01_20240617	17 Jun 2024	1109064	130	-	10	-	270	-	1,900	-	<20	<20	300	3,600	270	
QC01_20240617	17 Jun 2024	354361	-	87	-	4	-	240	-	1,600	<5	<5	250	3,200	290	
SW05	17 Jun 2024	1109064	34	-	3.2	-	24	-	120	-	<20	<20	100	190	71	
SW06	17 Jun 2024	1109064	73	-	2.6	-	210	-	1,500	-	<20	<20	410	2,700	350	

<b>Statistics</b>																
Number of Results	12	2	12	2	12	2	12	2	14	14	14	14	14	14	14	
Number of Detects	12	2	12	2	12	2	12	2	0	0	14	14	14	14	14	
Minimum Concentration	28	87	2.6	4	14	240	91	1,600	<5	<5	97	120	71			
Minimum Detect	28	87	2.6	4	14	240	91	1,600	ND	ND	97	120	71			
Maximum Concentration	230	150	28	32	840	550	6,000	3,600	<20	<20	1,000	10,000	670			
Maximum Detect	230	150	28	32	840	550	6,000	3,600	ND	ND	1,000	10,000	670			
Average Concentration *	114	118	12	18	317	395	2,123	2,600	8.9	8.9	475	4,079	333			
Geometric Average *	89	114	8.2	11	164	363	1,090	2,400	8.2	8.2	336	2,203	259			
Median Concentration *	120	118.5	7.75	18	270	395	1,850	2,600	10	10	355	3,550	300			
Standard Deviation *	71	45	10	20	277	219	1,894	1,414	2.7	2.7	362	3,228	206			
Geometric Standard Deviation *	2.2	1.5	2.7	4.4	4.3	1.8	4.3	1.8	1.7	1.7	2.5	4.3	2.3			
95% UCL (Student's-t) *	150.8	317.4	17.77	106.4	460.6	1,374	3,105	8,914	10.22	10.22	646	5,606	430.9			
% of Detects	100	100	100	100	100	100	100	100	0	0	100	100	100			
% of Non-Detects	0	0	0	0	0	0	0	0	100	100	0	0	0			

TABLE D - Groundwater and Surface Water Analytical Results  
 Project Number: 68310  
 Project Name: Honeman Close Huntingwood

	Ionic Balance					Inorganics Electrical Conductivity (Non Compensated)	Chlorinated Hydrocarbons Hexachlorobutadiene	Other TDS
	Alkalinity (total) as CaCO3	Electrical Conductivity (Lab)	Hardness (filtered)	Ionic Balance	pH (Lab)			
	mg/L	µS/cm	mgCaCO3/L	%	pH Units			
EQL	5	10	3		0.1	1	0.001	5
ADWG (2011) Health x 10 (Recreational) - Updated March-2021							0.007	
ANZG (2018) Freshwater 80% toxicant DGVs								
ANZG (2018) Freshwater 90% toxicant DGVs								
ANZG (2018) Freshwater 95% toxicant DGVs								
ANZG (2018) Freshwater 99% toxicant DGVs								
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Clay								
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand								
PFAS NEMP 2020 Table 1 Health Recreational Water								
PFAS NEMP 2020 Table 5 Freshwater 95%								
PFAS NEMP 2020 Table 5 Freshwater 99%								

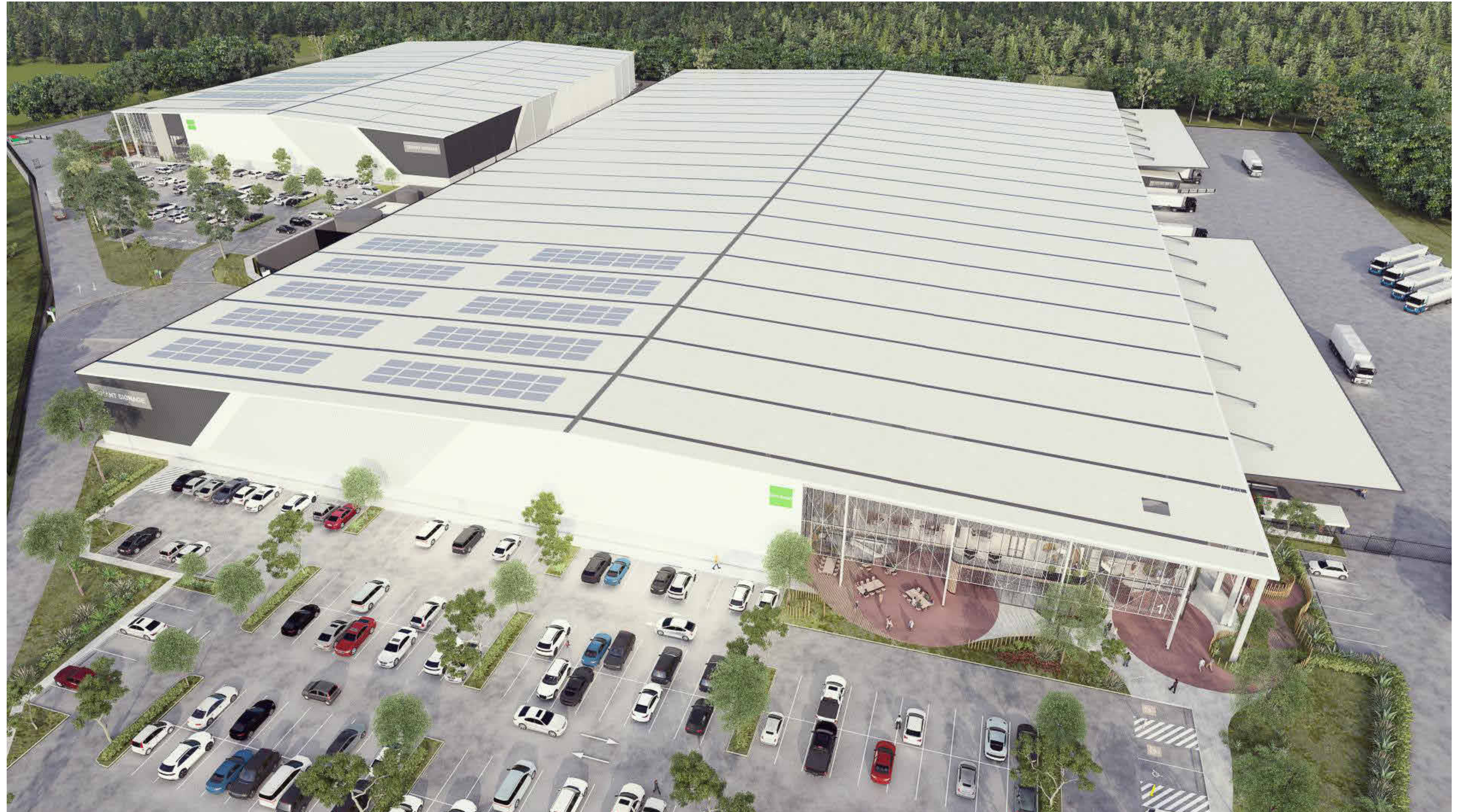
Field ID	Date	Lab Report Number								
Groundwater										
JBMW01	17 Jun 2024	1109064	970	24,000	-	-	7.0	-	-	16,000
JBMW02	17 Jun 2024	1109064	660	12,000	-	-	7.4	-	-	8,200
JBMW03	17 Jun 2024	1109064	520	30,000	-	-	7.1	-	-	17,000
JBMW04	17 Jun 2024	1109064	900	21,000	-	-	7.0	-	-	14,000
QA02_20240617	17 Jun 2024	1109064	990	23,000	-	-	7.0	-	-	14,000
QC02_20240617	17 Jun 2024	354361	1,000	-	2,700	-2.0	6.9	20,000	<0.001	14,000
Surface Water										
SW01	17 Jun 2024	1109064	100	790	-	-	7.1	-	-	520
SW02	17 Jun 2024	1109064	97	1,500	-	-	7.2	-	-	870
SW03	17 Jun 2024	1109064	110	2,300	-	-	7.1	-	-	1,400
SW04	17 Jun 2024	1109064	240	12,000	-	-	6.7	-	-	7,500
QA01_20240617	17 Jun 2024	1109064	300	12,000	-	-	6.8	-	-	7,700
QC01_20240617	17 Jun 2024	354361	250	-	1,200	-3.0	6.4	10,000	<0.001	6,900
SW05	17 Jun 2024	1109064	100	1,000	-	-	7.3	-	-	650
SW06	17 Jun 2024	1109064	410	8,400	-	-	7.5	-	-	4,400

Statistics									
Number of Results	14	12	2	2	14	2	2	2	14
Number of Detects	14	12	2	2	14	2	0	0	14
Minimum Concentration	97	790	1,200	-3	6.4	10,000	<0.001	520	
Minimum Detect	97	790	1,200	-3	6.4	10,000	ND	520	
Maximum Concentration	1,000	30,000	2,700	-2	7.5	20,000	<0.001	17,000	
Maximum Detect	1,000	30,000	2,700	-2	7.5	20,000	ND	17,000	
Average Concentration *	475	12,332	1,950	-2.5	7	15,000	0.0005	8,081	
Geometric Average *	336	6,996	1,800		7	14,142	0.0005	4,886	
Median Concentration *	355	12,000	1,950	-2.5	7.05	15,000	0.0005	7,600	
Standard Deviation *	362	10,147	1,061	0.71	0.28	7,071	0	6,024	
Geometric Standard Deviation *	2.5	3.8	1.8		1	1.6	1	3.5	
95% UCL (Student's-t) *	646	17,593	6,685	0.657	7.17	46,569	0.0005	10,933	
% of Detects	100	100	100	100	100	100	0	100	
% of Non-Detects	0	0	0	0	0	0	100	0	

## Appendix B Design Plans

## DA Drawing List

Sheet Number	SHEET NAME
DA000	COVER SHEET
DA010	ARTIST IMPRESSION PERSPECTIVES 01
DA011	ARTIST IMPRESSION PERSPECTIVES 02
DA012	SITE ANALYSIS PLAN
DA050	SITE & WAREHOUSE PLAN
DA100	OVERALL WAREHOUSE ROOF PLAN
DA200	OFFICE 1 - GROUND FLOOR PLANS
DA201	OFFICE 1 - LEVEL 1 FLOOR PLAN
DA202	OFFICE 2 FLOOR PLANS
DA203	DOCK OFFICE 1 PLAN & ELEVATIONS
DA204	DOCK OFFICE 2 PLAN & ELEVATIONS
DA205	OUTBOUND & INBOUND GATE HOUSE PLANS & ELEVATIONS
DA300	WAREHOUSE1 ELEVATIONS & SECTION
DA301	WAREHOUSE 2 ELEVATIONS & SECTION
DA302	OFFICE 1 ELEVATIONS
DA303	OFFICE 2 ELEVATIONS
DA304	SHADOW DIAGRAMS
DA400	SIGNAGE PLAN



ARTIST IMPRESSION - NORTH EAST



ARTIST IMPRESSION - WAREHOUSE 1 - NORTH WEST



ARTIST IMPRESSION - WAREHOUSE 2 - NORTH EAST



ARTIST IMPRESSION - OFFICE 1 - NORTH WEST



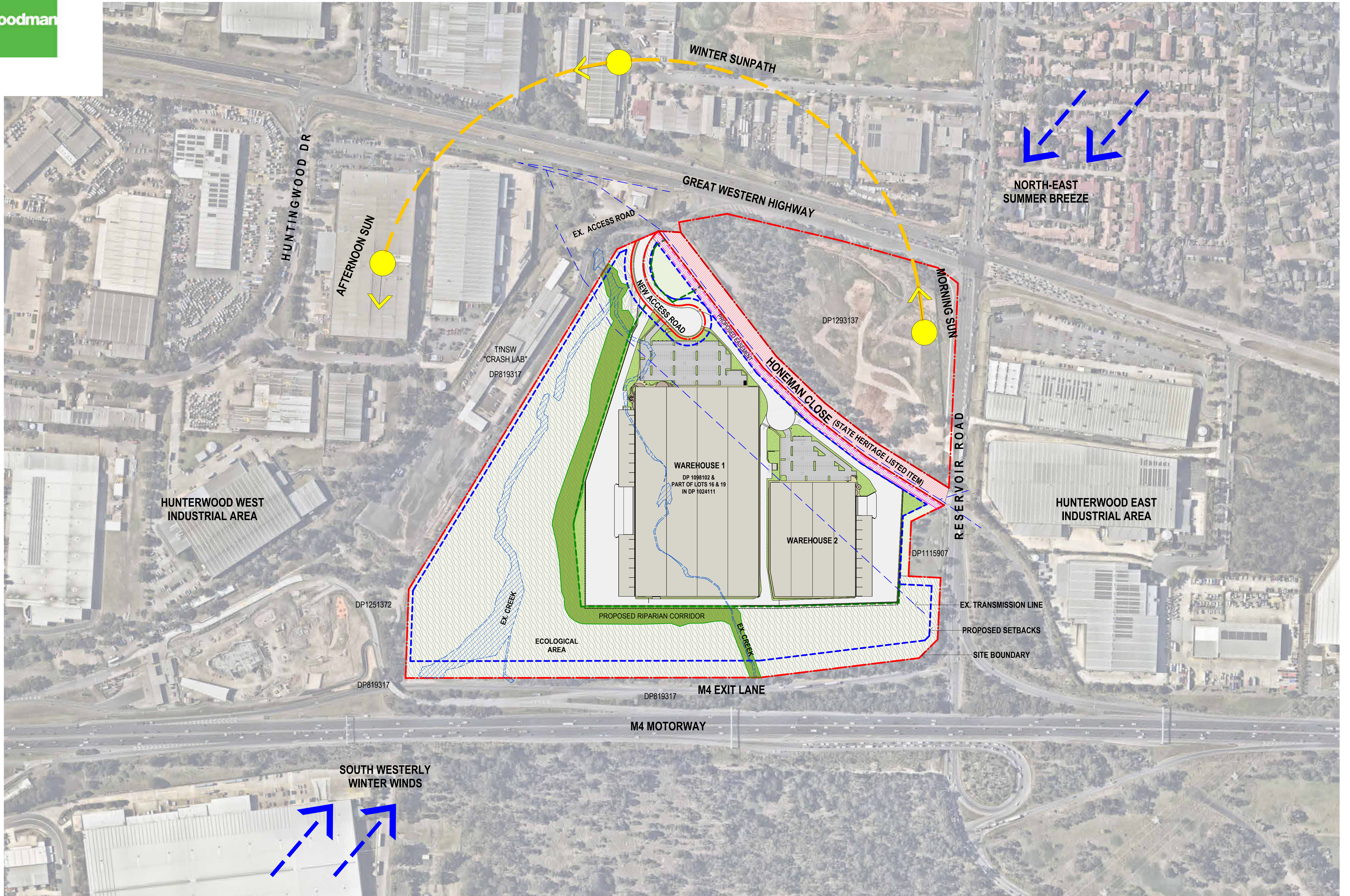
ARTIST IMPRESSION - OFFICE 2 - NORTH EAST



ARTIST IMPRESSION - OFFICE 1 - WEST



ARTIST IMPRESSION - OFFICE 1 - NORTH





**LEGEND**

- SITE BOUNDARY
- SETBACK
- EX. ELECTRICAL SERVICES
- EX. HYDRAULIC SERVICES
- BAL
- BAL RATING
- ASSET PROTECTION ZONE
- EX. SEWER LINE
- EX. HYDROLINE
- EX. TELECOM LINE
- EX. STORMWATER LINE
- PROPOSED 6M WIDE EASEMENT
- RIPIARIAN CORRIDOR
- ECOLOGICAL ZONE
- HONEMAN CLOSE & RESERVE ROAD SETBACK
- STONE LINED BATTER

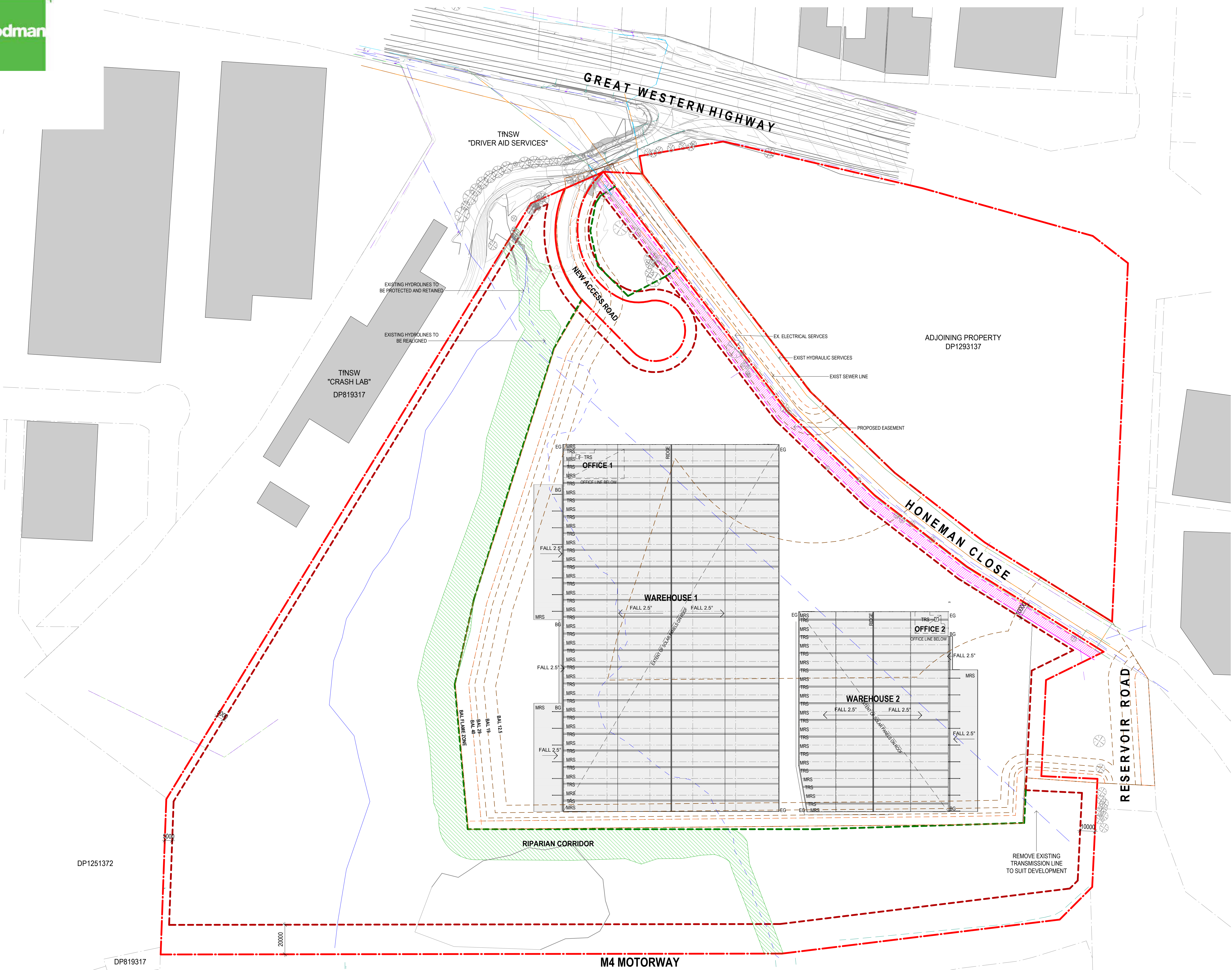
FNC-1 2400mm(H) PALISADE FENCE & GATE  
 FNC-2 2400mm(H) CHAINWIRE FENCE & GATE  
 FNC-3 1200mm(H) PALISADE FENCE

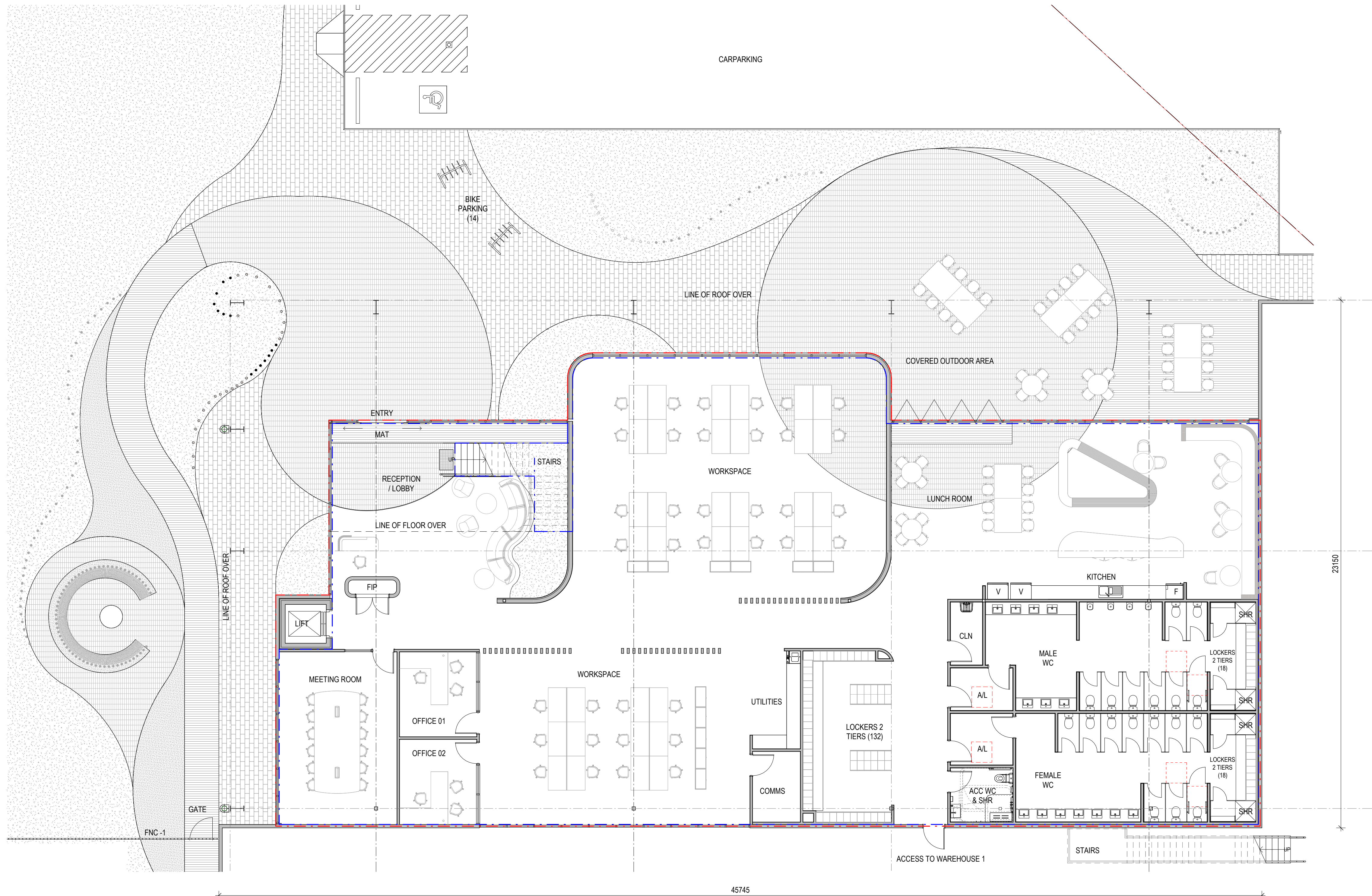
**DEVELOPMENT SCHEDULE**

<b>TOTAL SITE AREA</b>	<b>209,307 m²</b>
ECOLOGICAL AREA (INCLUSIVE OF RIPIARIAN CORRIDORS 13,980 SQM & NON-DEVELOPABLE AREA 2,416 SQM)	102,265 m²
STREET SETBACKS (HONEMAN CLOSE & RESERVOIR ROAD)	5,714 m²
NEW ESTATE ROAD	3,197 m²
<b>DEVELOPABLE AREA</b>	<b>98,131 m²</b>
WAREHOUSE 1	35,029 m²
WAREHOUSE 2	13,181 m²
<b>TOTAL WAREHOUSE GLA</b>	<b>48,210 m²</b>
OFFICE 1_GF	792 m²
OFFICE 1_L1	718 m²
OFFICE 2_GF	269 m²
OFFICE 2_L1	236 m²
GATEHOUSE INBOUND	20 m²
GATEHOUSE OUTBOUND	20 m²
DOCK OFFICE 1	100 m²
DOCK OFFICE 2	51 m²
<b>TOTAL OFFICE GLA</b>	<b>2,206 m²</b>
<b>OTHERS</b>	<b>2,520 m²</b>
<b>TOTAL BUILDING GLA</b>	<b>52,935 m²</b>
WAREHOUSE 1	30,455 m²
WAREHOUSE 2	10,726 m²
OFFICE 1_GF	759 m²
OFFICE 1_L1	679 m²
OFFICE 2_GF	244 m²
OFFICE 2_L1	210 m²
GATEHOUSE INBOUND	18 m²
GATEHOUSE OUTBOUND	16 m²
DOCK OFFICE 1	94 m²
DOCK OFFICE 2	47 m²
OTHERS (5% OF TOTAL BUILDING GLA)	2,520 m²
<b>TOTAL BUILDING GFA</b>	<b>45,766 m²</b>
<b>SITE COVERAGE</b>	<b>54%</b>
(TOTAL GLA BUILDING AREA / DEVELOPABLE AREA)	
WAREHOUSE 1 AWNINGS	3,335 m²
WAREHOUSE 2 AWNINGS	1,922 m²
<b>TOTAL AWNINGS</b>	<b>5,257 m²</b>
HARDSTAND AREA	28,228 m²
LIGHT DUTY PAVEMENT	8,812 m²
LANDSCAPE AREA (52%) (INCLUSIVE OF ECOLOGICAL AREA)	108,444 m²
<b>CARPARKING RATE</b>	
WAREHOUSE : 1 SPACE PER 200 sqm.	
OFFICE : 1 SPACE PER 40 sqm.	
<b>CARPARK DIMENSIONS:</b>	
5.5 M X 2.5 M CARPARK BAY	
6.5 M CARPARK DRIVEWAY	
PEDESTRIAN FOOTPATH ALONG NEW ACCESS ROAD = MIN. 2.5M	
WAREHOUSE 1 / OFFICE 1 CARPARK REQUIRED	218
WAREHOUSE 2 / OFFICE 2 CARPARK REQUIRED	80
WAREHOUSE 1 / OFFICE 1 CARPARK PROVIDED (INCLUSIVE OF 3 DISABLED SPACE & 10 EV CHARGING BAYS)	218
WAREHOUSE 2 / OFFICE 2 CARPARK PROVIDED (INCLUSIVE OF 2 DISABLED SPACE & 6 EV CHARGING BAYS)	118
<b>WAREHOUSE 1 BIKE PARKING</b>	<b>14</b>
<b>WAREHOUSE 2 BIKE PARKING</b>	<b>5</b>

**LEGEND**

- SITE BOUNDARY
- BUILDING SETBACK
- EX. ELECTRICAL SERVICES
- EX. HYDRAULIC SERVICES
- BAL
- BAL RATING
- ASSET PROTECTION ZONE
- EX. SEWER LINE
- EX. HYDROLINE
- EX. TELECOM LINE
- EX. STORMWATER LINE
- PROPOSED 6M WIDE EASEMENT
- RIPARIAN CORRIDOR
- MRS METAL ROOF SHEETING
- TRS TRANSLUCENT ROOF SHEETING
- BG BOX GUTTER
- EG EAVE GUTTER





1 OFFICE 1 GROUND FLOOR PLAN 1 : 100

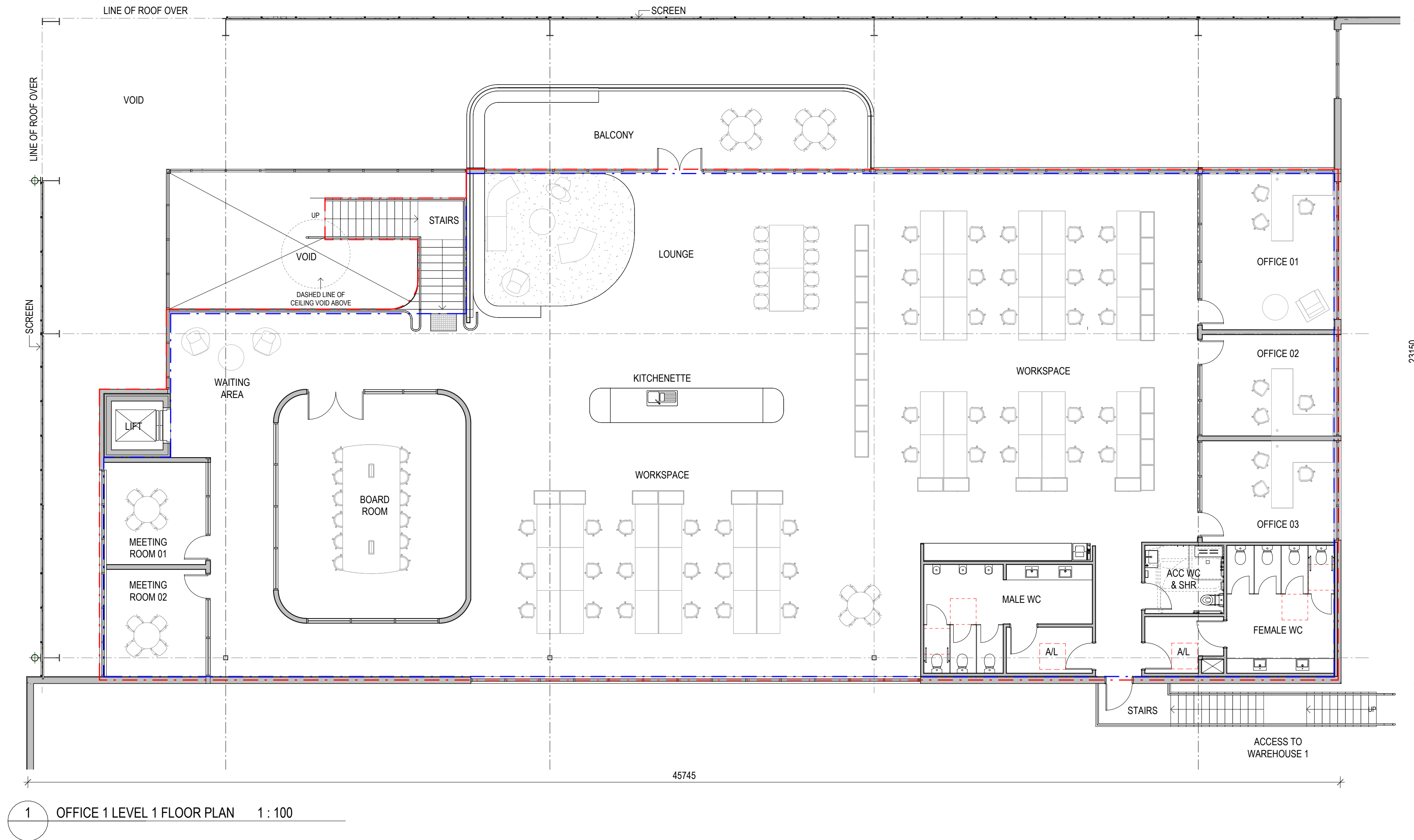
**GENERAL NOTE**  
 AMENITY PROVISIONS ARE BASED ON THE STAFF NUMBERS NOTED IN THE BCA ASSESSMENT REPORT:  
 - WAREHOUSE 1 : 292 PEOPLE  
 - OFFICE 1 : 150 PEOPLE

--- GLA AREA BOUNDARY

GLA_OFFICE 1		
NAME	NUMBER	AREA
OFFICE 1_GF		792 m <sup>2</sup>
OFFICE 1_L1		718 m <sup>2</sup>
<b>TOTAL GLA</b>		<b>1,510 m<sup>2</sup></b>

--- GFA AREA BOUNDARY

GFA_OFFICE 1		
NAME	NUMBER	AREA
OFFICE 1_GF		759 m <sup>2</sup>
OFFICE 1_L1		679 m <sup>2</sup>
<b>TOTAL GFA</b>		<b>1,438 m<sup>2</sup></b>



**GENERAL NOTE**

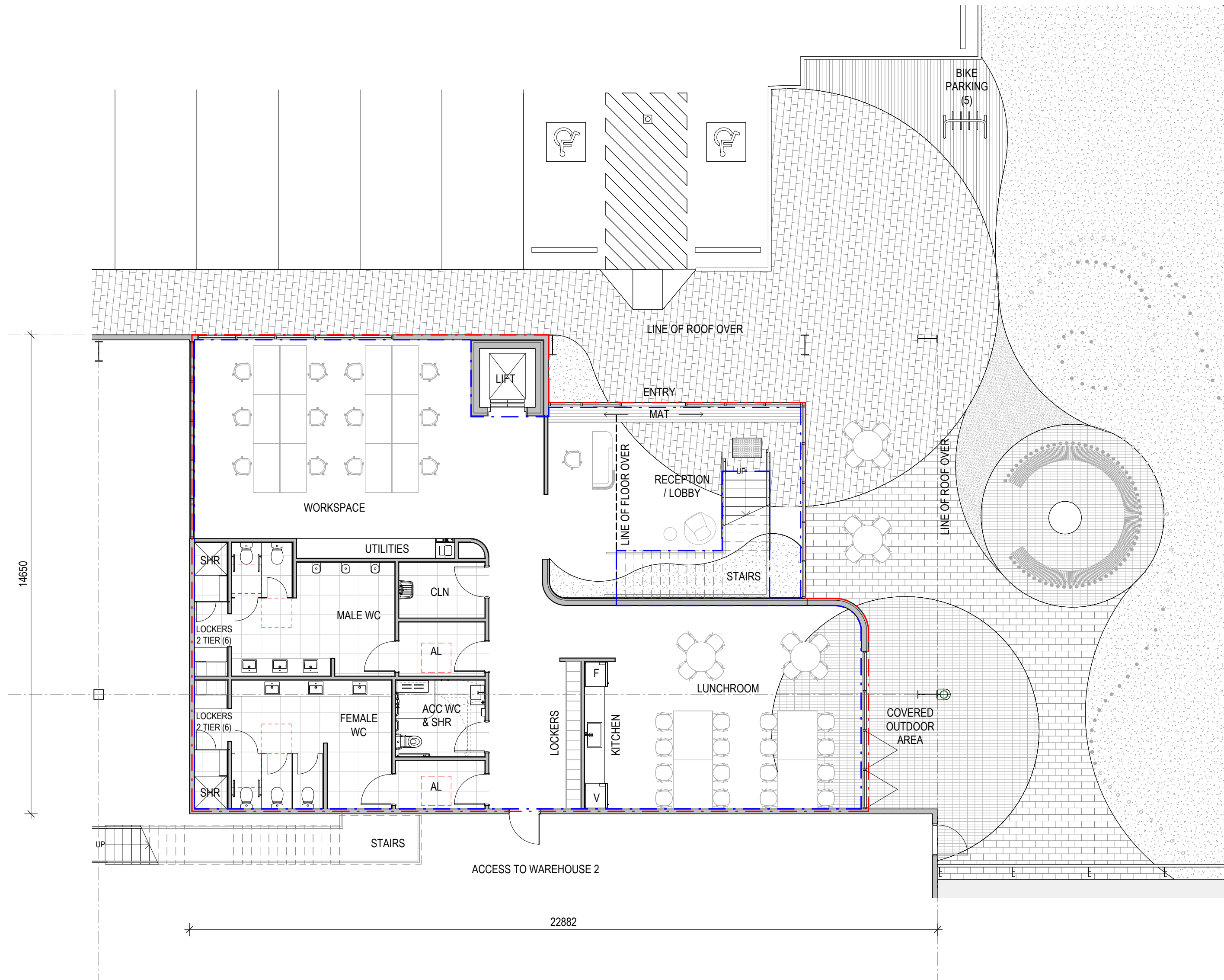
AMENITY PROVISIONS ARE BASED ON THE STAFF NUMBERS NOTED IN THE BCA ASSESSMENT REPORT:  
 - WAREHOUSE 1 : 292 PEOPLE  
 - OFFICE 1 : 150 PEOPLE

--- GLA AREA BOUNDARY

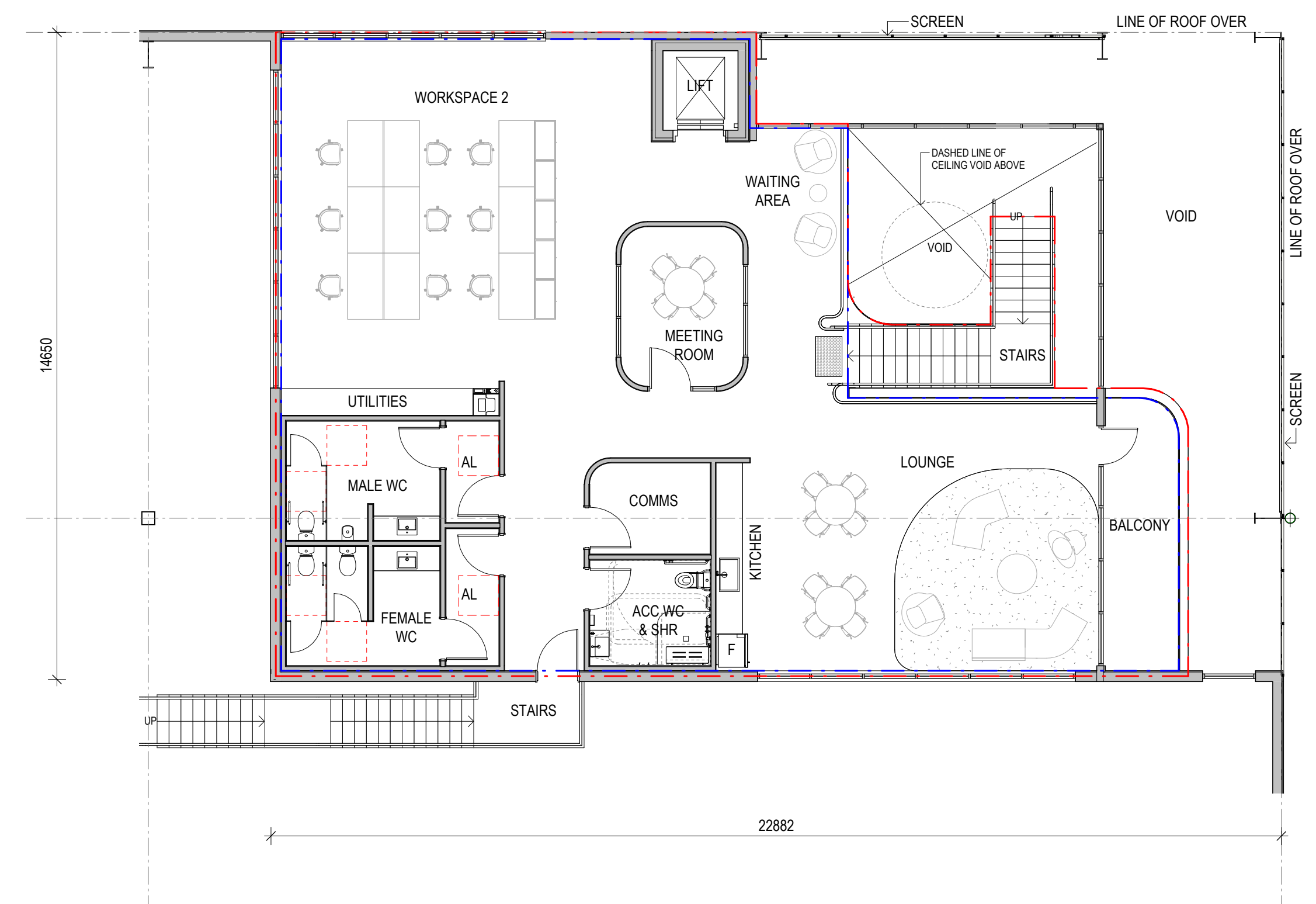
GLA_OFFICE 1		
NAME	NUMBER	AREA
OFFICE 1_GF		792 m <sup>2</sup>
OFFICE 1_L1		718 m <sup>2</sup>
<b>TOTAL GLA</b>		<b>1,510 m<sup>2</sup></b>

--- GFA AREA BOUNDARY

GFA_OFFICE 1		
NAME	NUMBER	AREA
OFFICE 1_GF		759 m <sup>2</sup>
OFFICE 1_L1		679 m <sup>2</sup>
<b>TOTAL GFA</b>		<b>1,438 m<sup>2</sup></b>



3 OFFICE 2 GROUND FLOOR PLAN 1 : 100



4 OFFICE 2 LEVEL 1 FLOOR PLAN 1 : 100

**GENERAL NOTE**

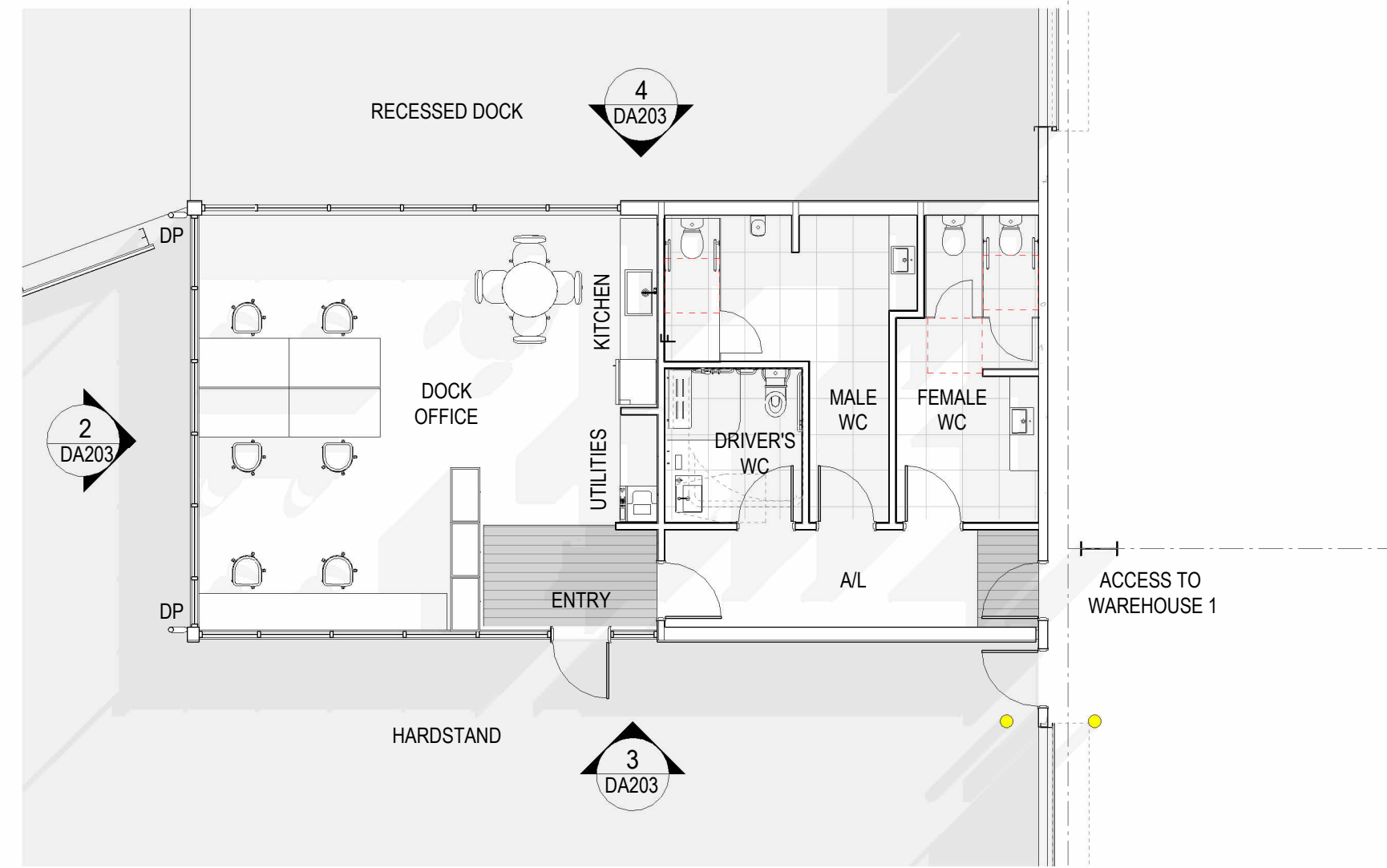
AMENITY PROVISIONS ARE BASED ON THE STAFF NUMBERS NOTED IN THE BCA ASSESSMENT REPORT:  
 - WAREHOUSE 2 : 110 PEOPLE  
 - OFFICE 2 : 50 PEOPLE

--- GLA AREA BOUNDARY

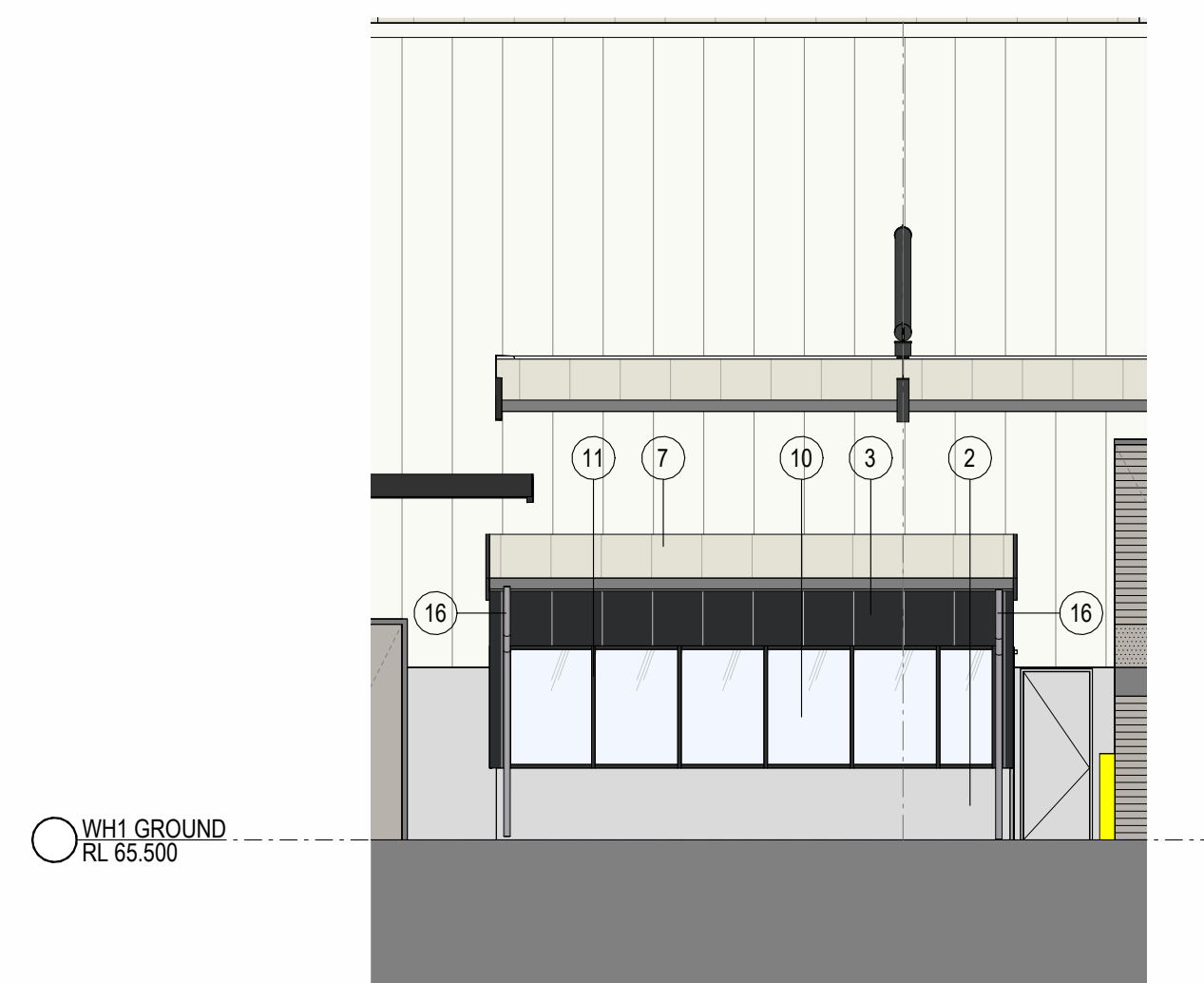
GLA OFFICE 2		
NAME	NUMBER	AREA
OFFICE 2_GF		269 m <sup>2</sup>
OFFICE 2_L1		236 m <sup>2</sup>
<b>TOTAL GLA</b>		<b>505 m<sup>2</sup></b>

--- GFA AREA BOUNDARY

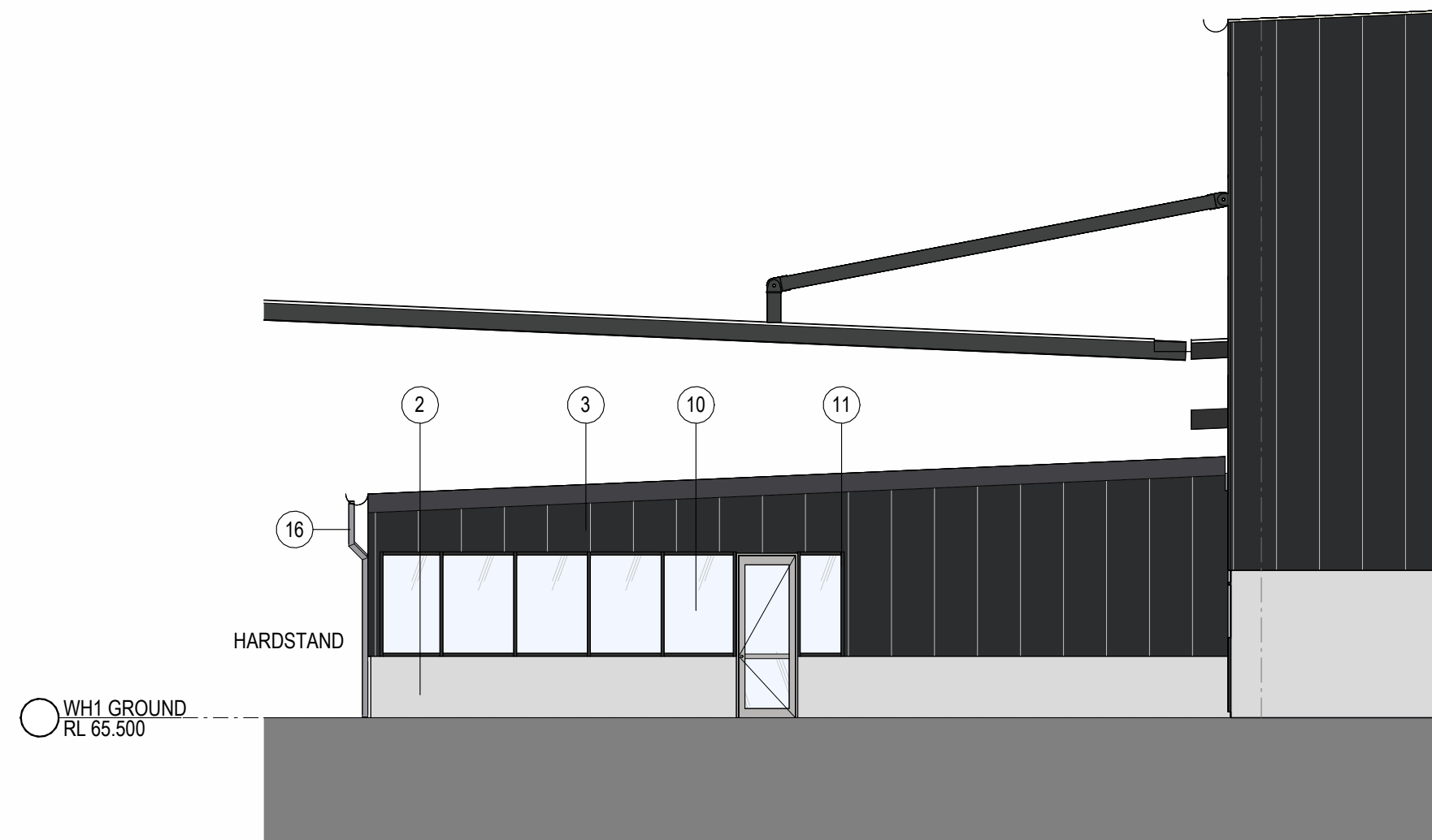
GFA OFFICE 2		
NAME	NUMBER	AREA
OFFICE 2_GF		244 m <sup>2</sup>
OFFICE 2_L1		210 m <sup>2</sup>
<b>TOTAL GFA</b>		<b>454 m<sup>2</sup></b>



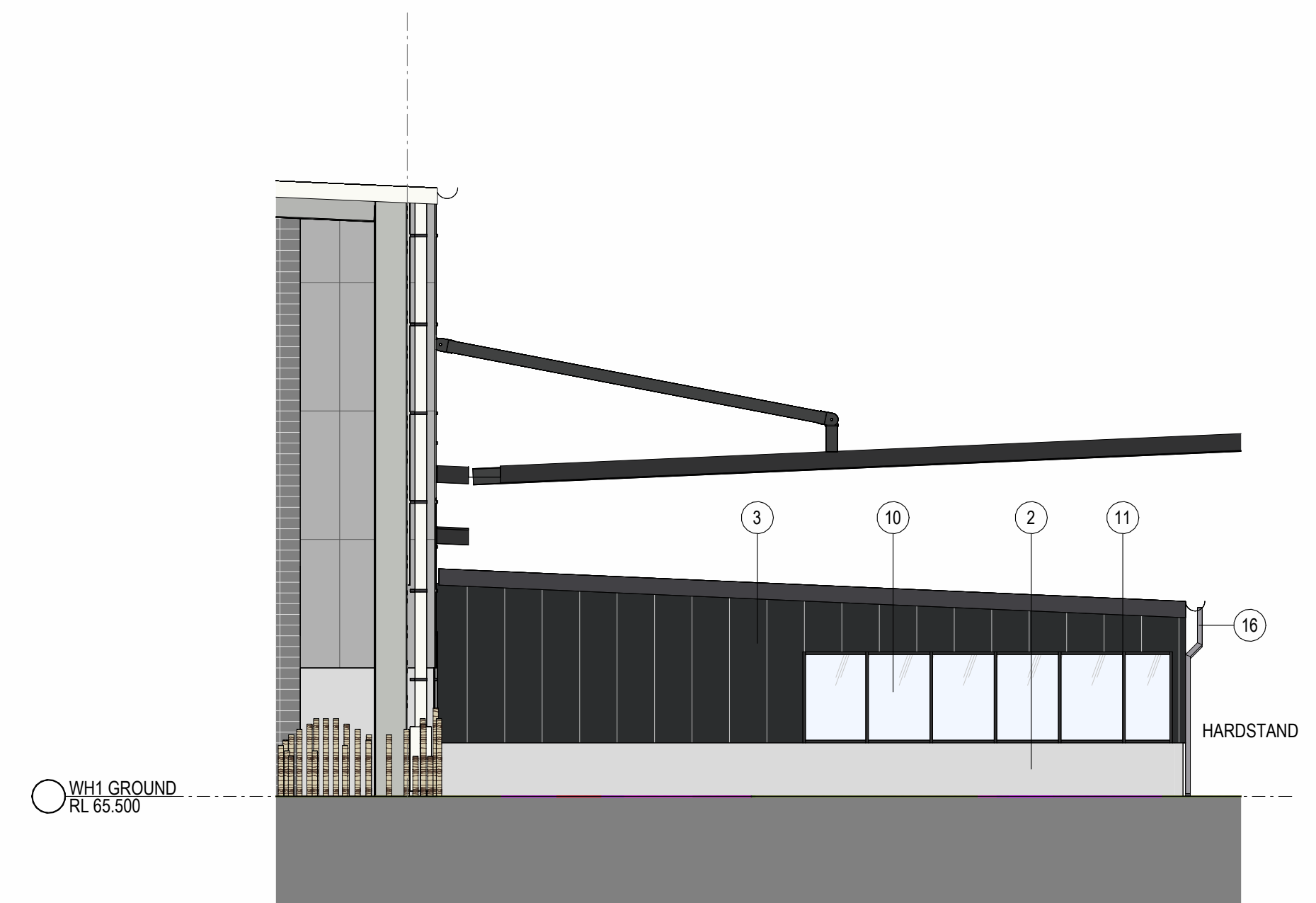
1 DOCK OFFICE 1 PLAN 1:100



2 DOCK OFFICE 1 - WEST ELEVATION 1:100



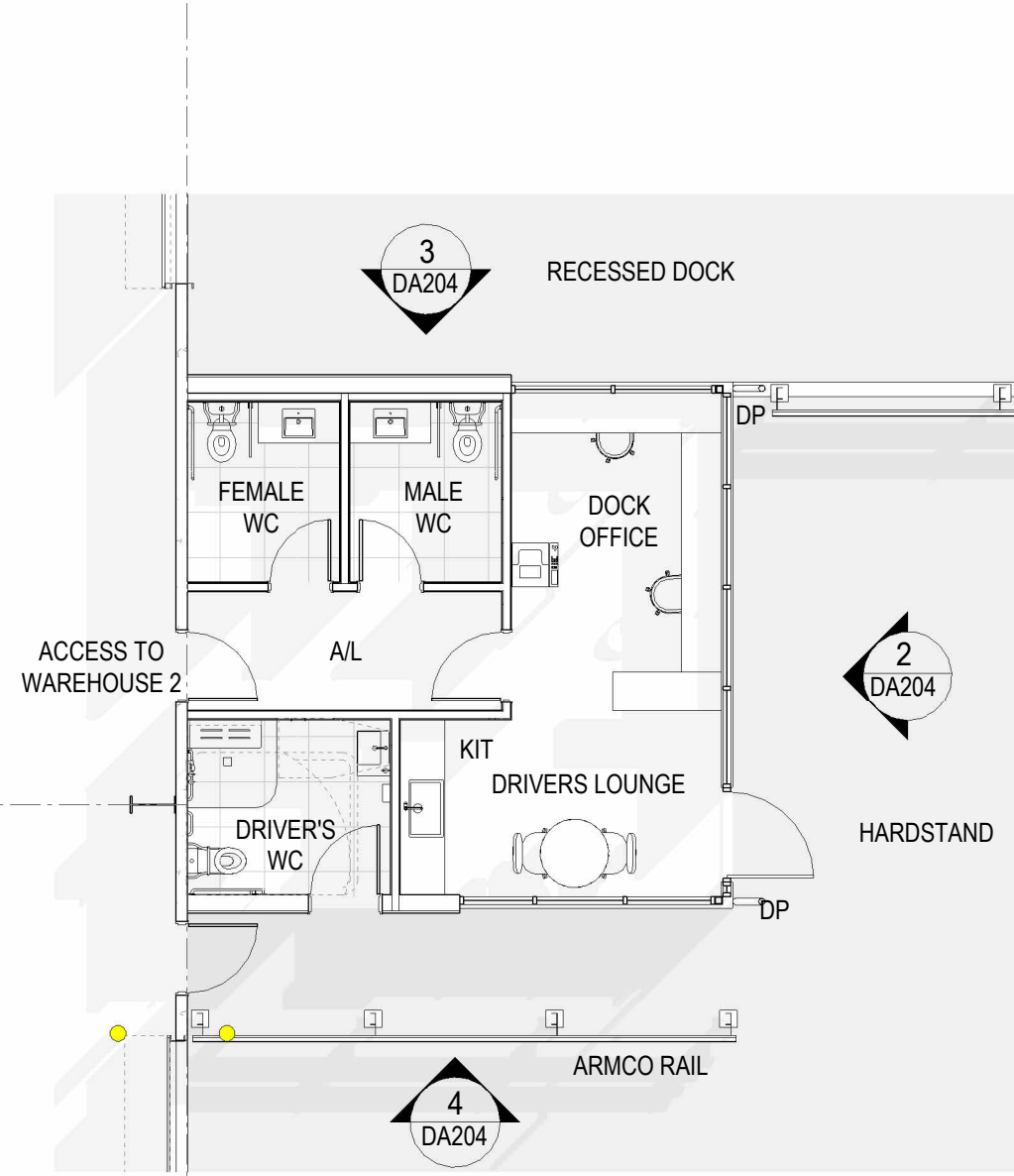
3 DOCK OFFICE 1 - SOUTH ELEVATION 1:100



4 DOCK OFFICE 1 - NORTH ELEVATION 1:100

INDICATIVE EXTERNAL FINISHES

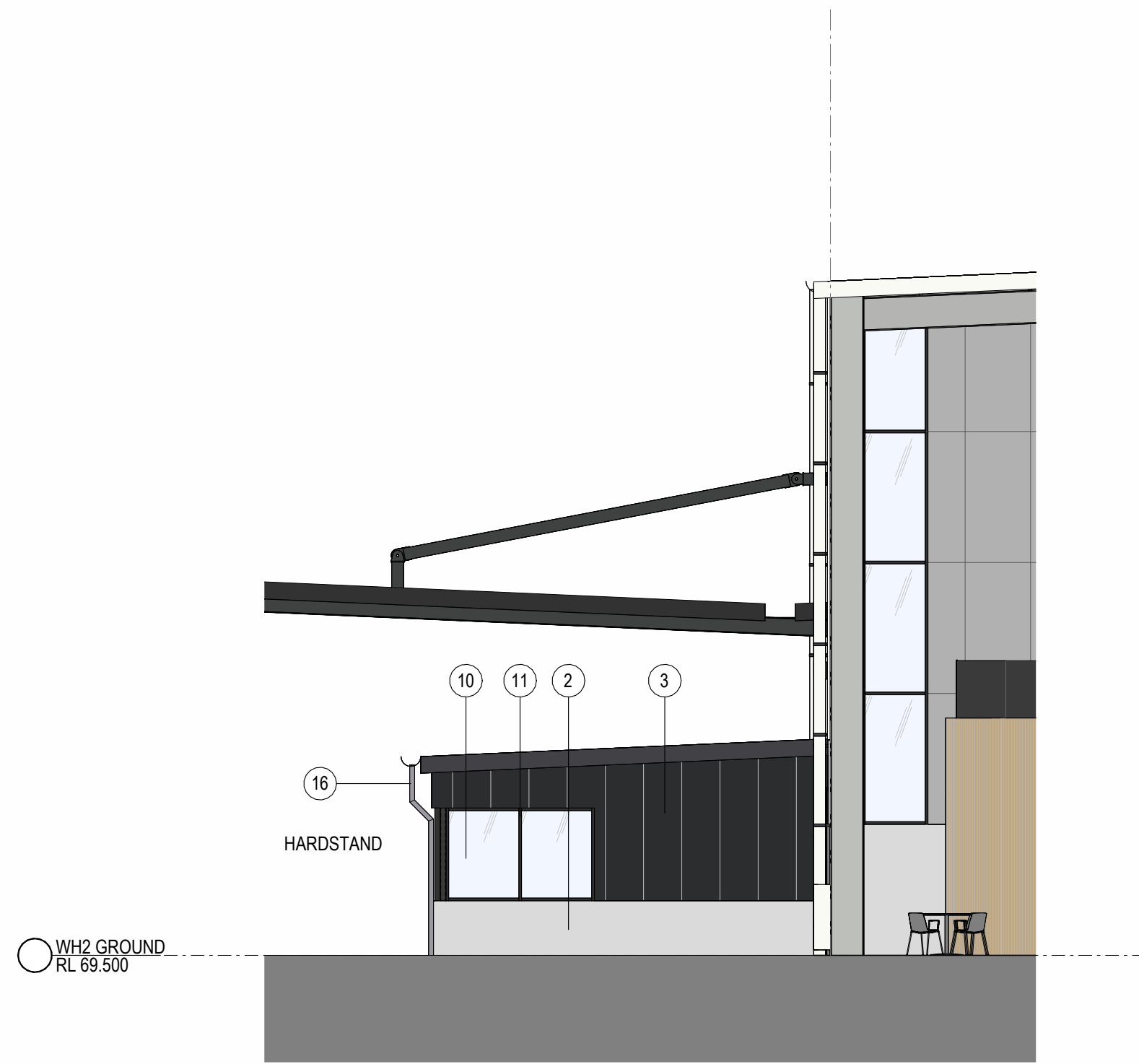
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|---|---|---|--|---|---|---|---|--|--|---|---|--|---|---|---|--|--|--|------------------------|
| 1. <b>BLOCKWORK</b><br>- EQUAL TO AUSTRAL BLOCK 'ARCHITECT'<br>- HONED - CHARCOAL' 390 X 190 X 190mm<br>- STACK BOND PATTERN<br>- COLOUR-MATCHING FLUSH MORTAR JOINTS | 2. <b>PRECAST CONCRETE PANEL</b><br>- OFF-FORM FINISH | 3. <b>PREFINISHED METAL WALL SHEET CLADDING</b><br>- COLORBOND 'MONUMENT' | 4. <b>PREFINISHED METAL WALL SHEET CLADDING</b><br>- COLORBOND 'DOVER WHITE' | 5. <b>PREFINISHED METAL WALL SHEET CLADDING</b><br>- COLORBOND 'SHALE GREY' | 6. <b>PREFINISHED CFC CLADDING</b><br>- EQUAL TO 'EQUITONE - TECTIVA - GREY'<br>1200X2400mm<br>- CONCEALED FIXING | 7. <b>METAL DECK ROOFING</b><br>- COLORBOND 'DOVER WHITE' | 8. <b>TRANSLUCENT ROOF SHEET</b><br>- OPAL COLOUR | 9. <b>TIMBER LOOK METAL CLADDING</b><br>- SCULPTFORM ALUMINIUM CLICK ON PANELS | 10. <b>GLAZING</b><br>- LIGHT GREY TINT OR SIMILAR | 11. <b>PREFINISHED ALUMINIUM WINDOW FRAME</b><br>- COLORBOND 'MONUMENT' | 12. <b>STEEL BALUSTRADE &amp; PANEL</b><br>- COLORBOND 'MONUMENT' | 13. <b>METAL ROLLER SHUTTER</b><br>- PREFINISHED IN 'SHALE GREY' | 14. <b>EXPOSED STEEL STRUCTURE &amp; STEEL AWNING</b><br>- COLORBOND 'SHALE GREY' | 15. <b>SOLID DOOR LEAF</b><br>- TO MATCH 'SHALE GREY' | 16. <b>DOWNPIPE</b><br>- COLOUR TO MATCH BACKGROUND CLADDING COLOUR | 17. <b>POWDERCOATED METAL MESH IN STEEL FRAME</b><br>- COLORBOND 'DOVER WHITE' | 18. <b>PAVER</b><br>- AUSTRAL BRICKS 230 x 76 x 5 mm<br>- ALLOW 3 COLOURS AND PATTERNS | 19. <b>TIMBER POSTS &amp; METAL OUTDOOR BENCHES IN CUSTOMISED FORM</b> | 20. <b>LOUVRE DOOR</b> |
|---|---|---|--|---|---|---|---|--|--|---|---|--|---|---|---|--|--|--|------------------------|



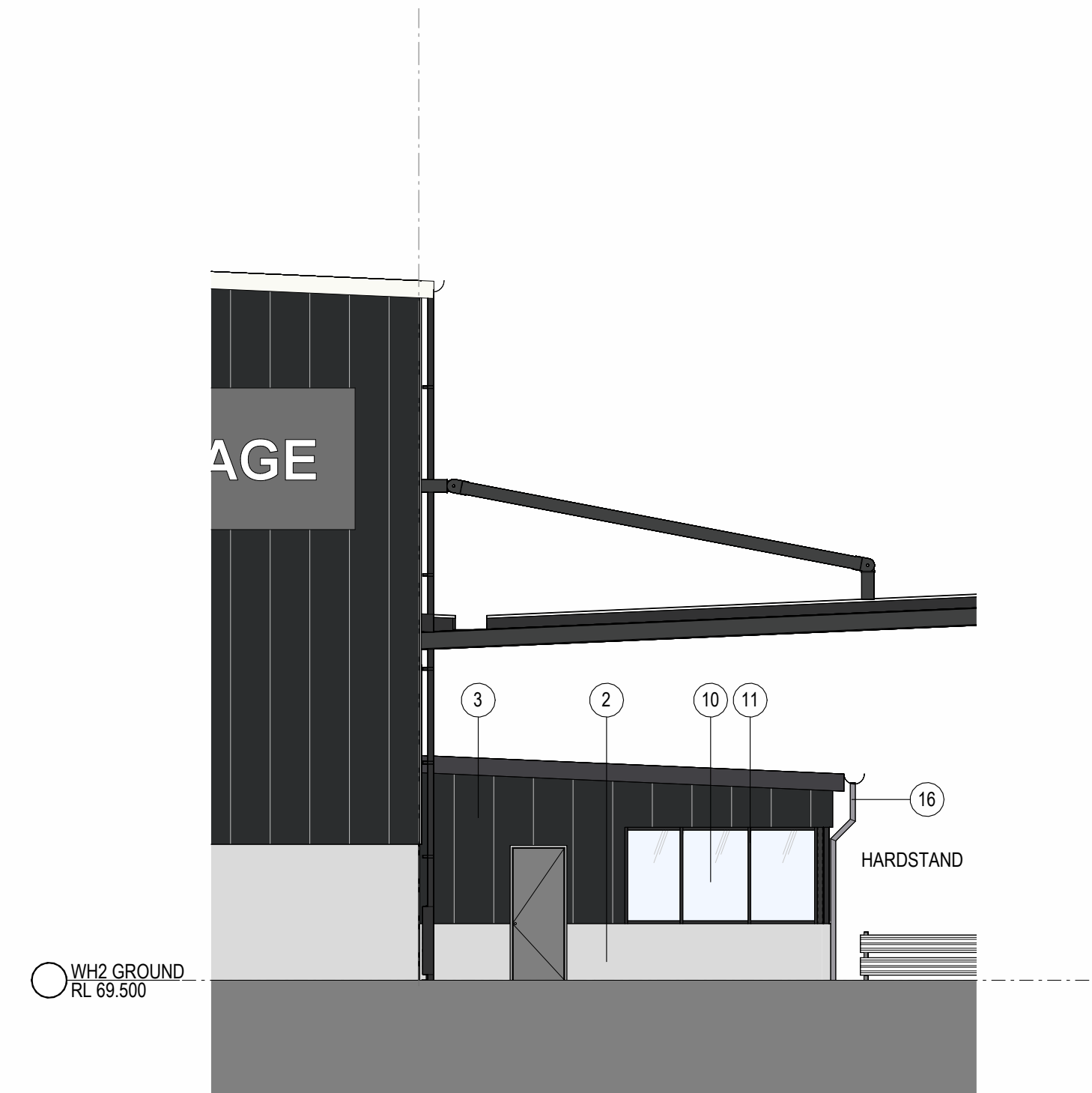
1 DOCK OFFICE 2 PLAN 1 : 100



2 DOCK OFFICE 2 - EAST ELEVATION 1 : 100



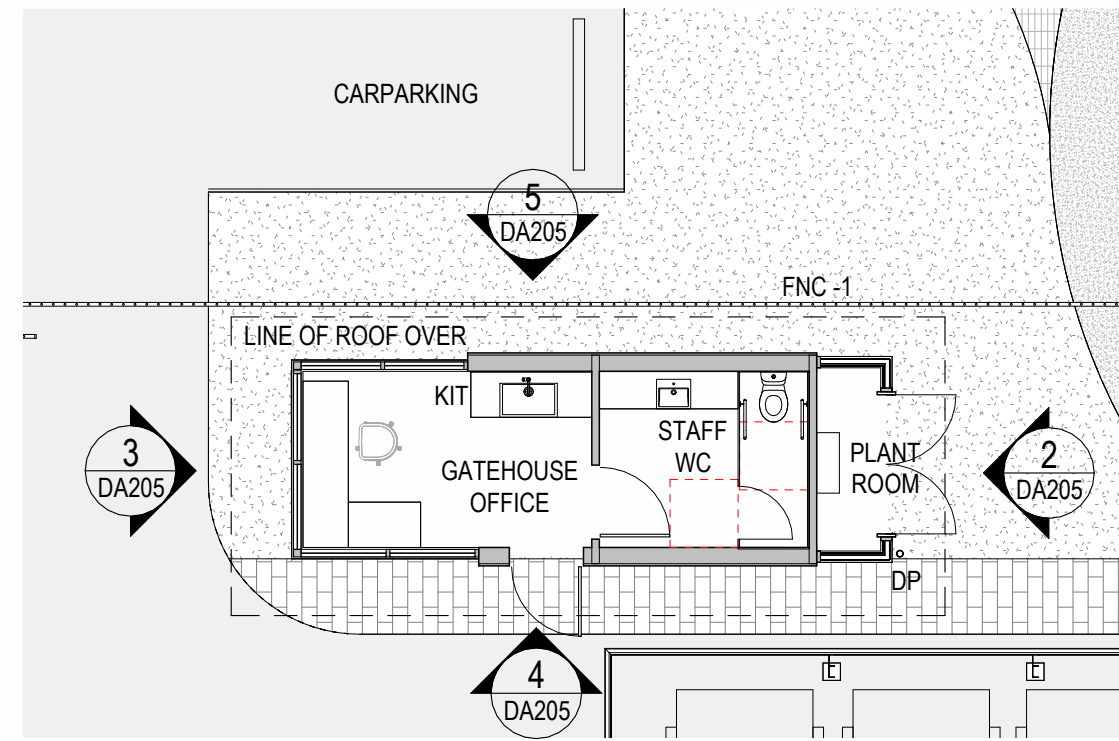
3 DOCK OFFICE 2 - NORTH ELEVATION 1 : 100



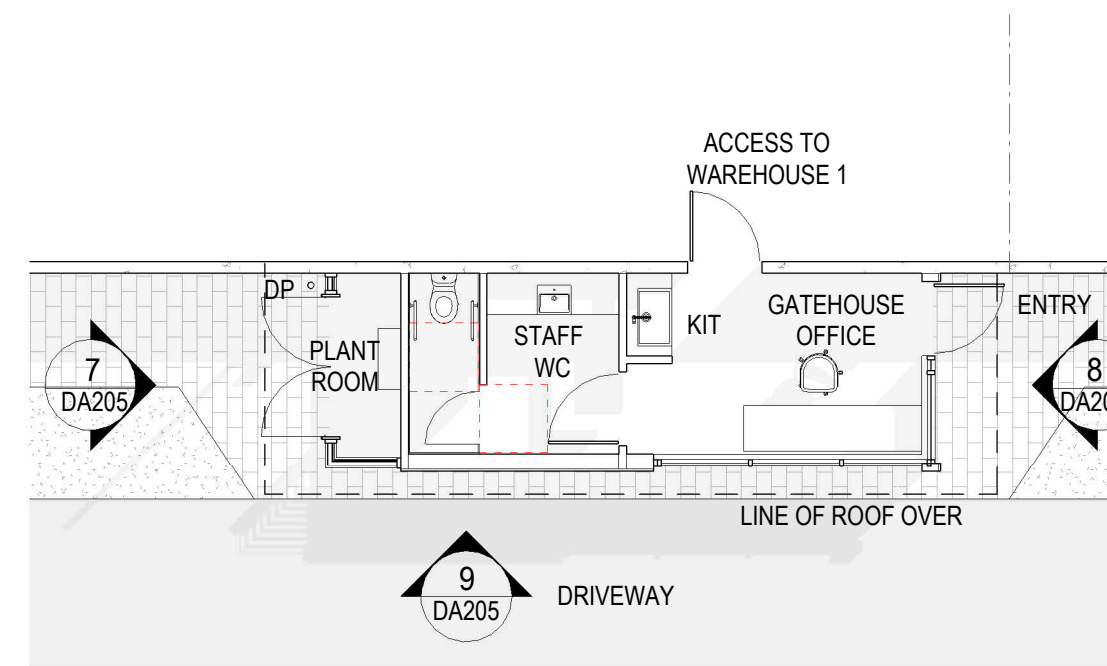
4 DOCK OFFICE 2 - SOUTH ELEVATION 1 : 100

INDICATIVE EXTERNAL FINISHES

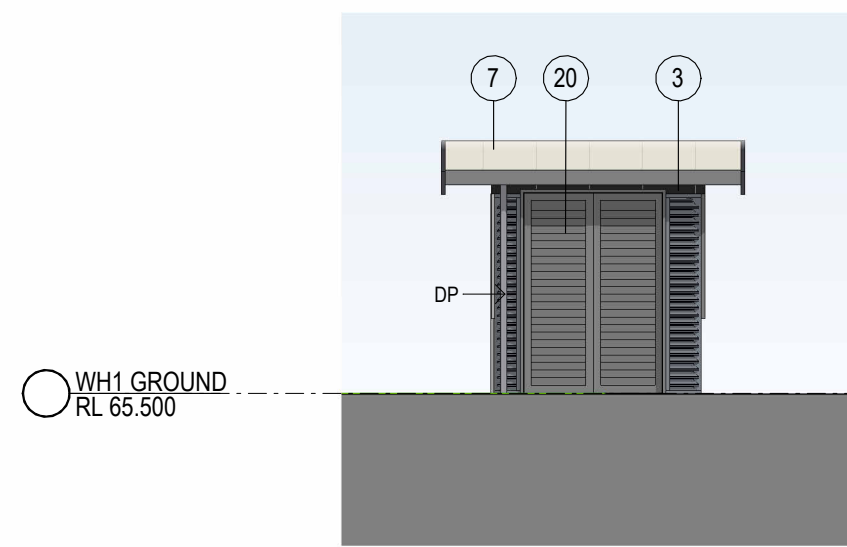
1. <b>BLOCKWORK</b> - EQUAL TO AUSTRAL BLOCK 'ARCHITEC' - HONED - CHARCOAL' 390 X 190 X 190mm - STACK BOND PATTERN - COLOUR-MATCHING FLUSH MORTAR JOINTS	2. <b>PRECAST CONCRETE PANEL</b> - OFF-FORM FINISH	3. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'MONUMENT'	4. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'DOVER WHITE'	5. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'SHALE GREY'	6. <b>PREFINISHED CFC CLADDING</b> - EQUAL TO 'EQUITONE - TECTIVA - GREY' - 1200X2400mm - CONCEALED FIXING	7. <b>METAL DECK ROOFING</b> - COLORBOND 'DOVER WHITE'	8. <b>TRANSLUCENT ROOF SHEET</b> - OPAL COLOUR	9. <b>TIMBER LOOK METAL CLADDING</b> - SCULPTFORM ALUMINIUM CLICK ON PANELS	10. <b>GLAZING</b> - LIGHT GREY TINT OR SIMILAR	11. <b>PREFINISHED ALUMINIUM WINDOW FRAME</b> - COLORBOND 'MONUMENT'	12. <b>STEEL BALUSTRADE &amp; PANEL</b> - COLORBOND 'MONUMENT'	13. <b>METAL ROLLER SHUTTER</b> - PREFINISHED IN 'SHALE GREY'	14. <b>EXPOSED STEEL STRUCTURE &amp; STEEL AWNING</b> - COLORBOND 'SHALE GREY'	15. <b>SOLID DOOR LEAF</b> - TO MATCH 'SHALE GREY'	16. <b>DOWNPIPE</b> - COLOUR TO MATCH BACKGROUND CLADDING COLOUR	17. <b>POWDERCOATED METAL MESH IN STEEL FRAME</b> - COLORBOND 'DOVER WHITE'	18. <b>PAVER</b> - AUSTRAL BRICKS 230 x 76 x 5 mm - ALLOW 3 COLOURS AND PATTERNS	19. <b>TIMBER POSTS &amp; METAL OUTDOOR BENCHES IN CUSTOMISED FORM</b>	20. <b>LOUVRE DOOR</b>
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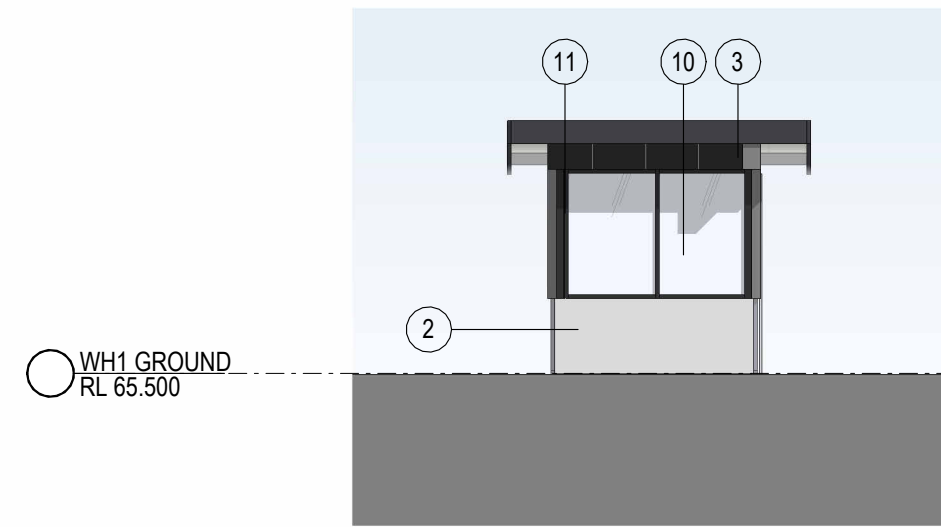
1 OUTBOUND GATE HOUSE PLAN 1 : 100



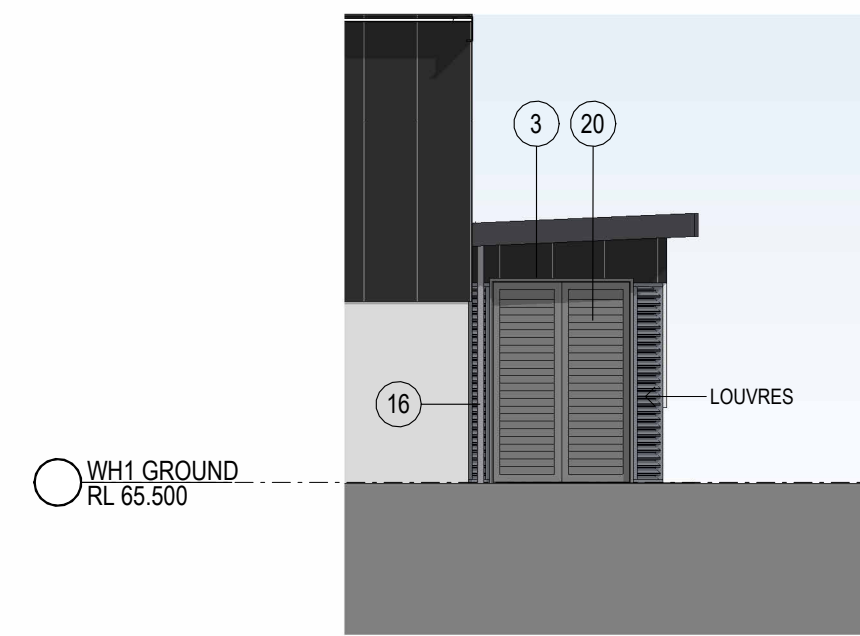
6 INBOUND GATE HOUSE PLAN 1 : 100



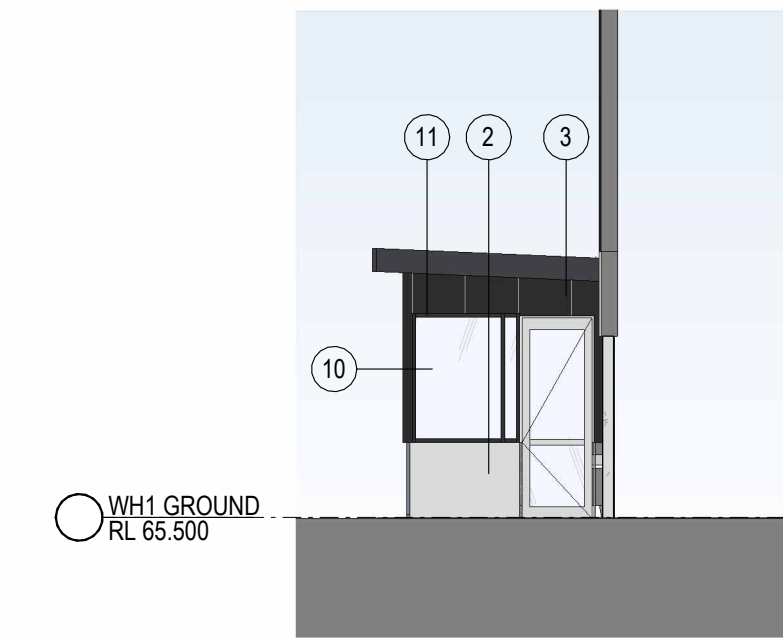
2 OUTBOUND GATE HOUSE - EAST ELEVATION 1 : 100



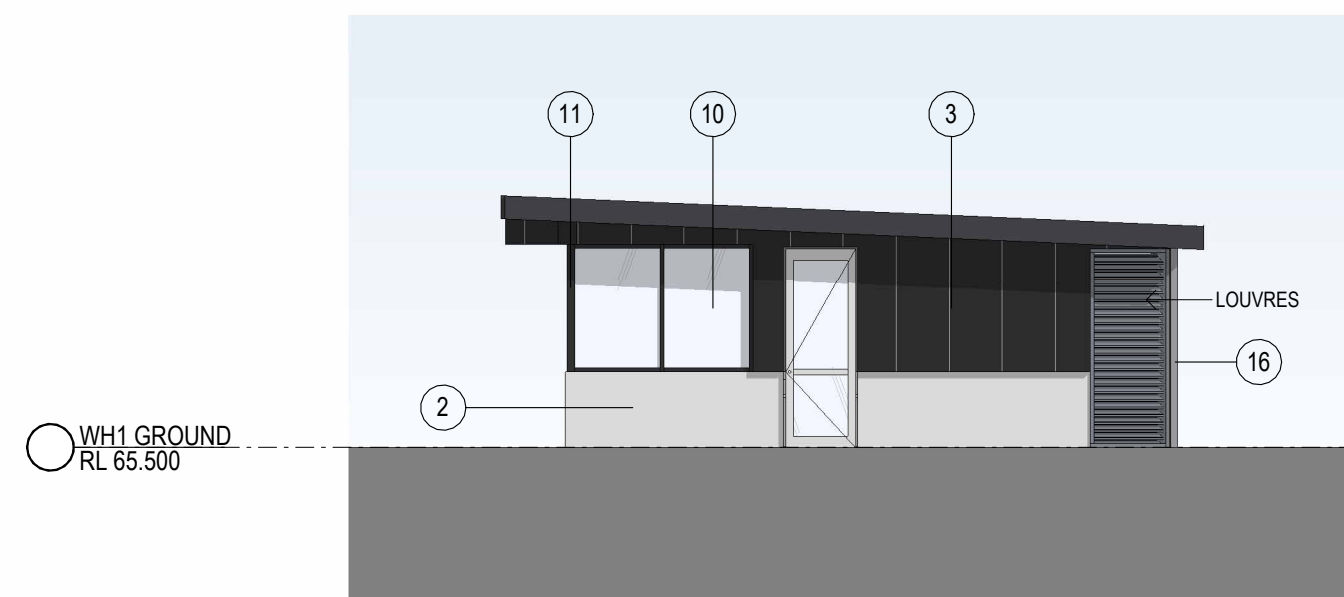
3 OUTBOUND GATE HOUSE - WEST ELEVATION 1 : 100



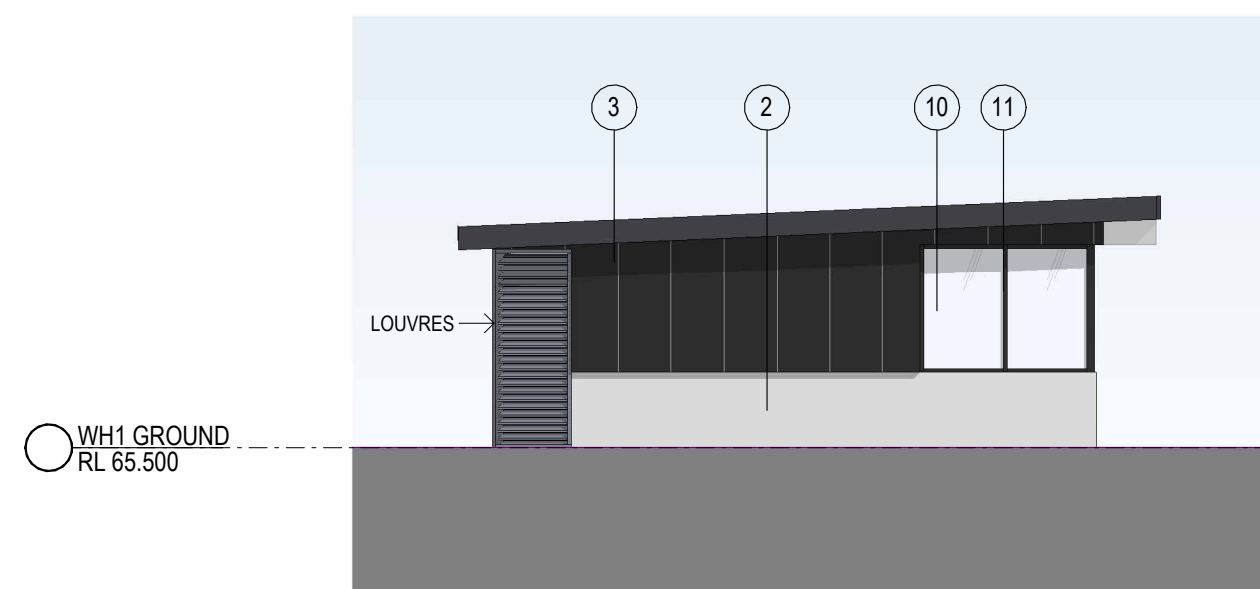
7 INBOUND GATE HOUSE - WEST ELEVATION 1 : 100



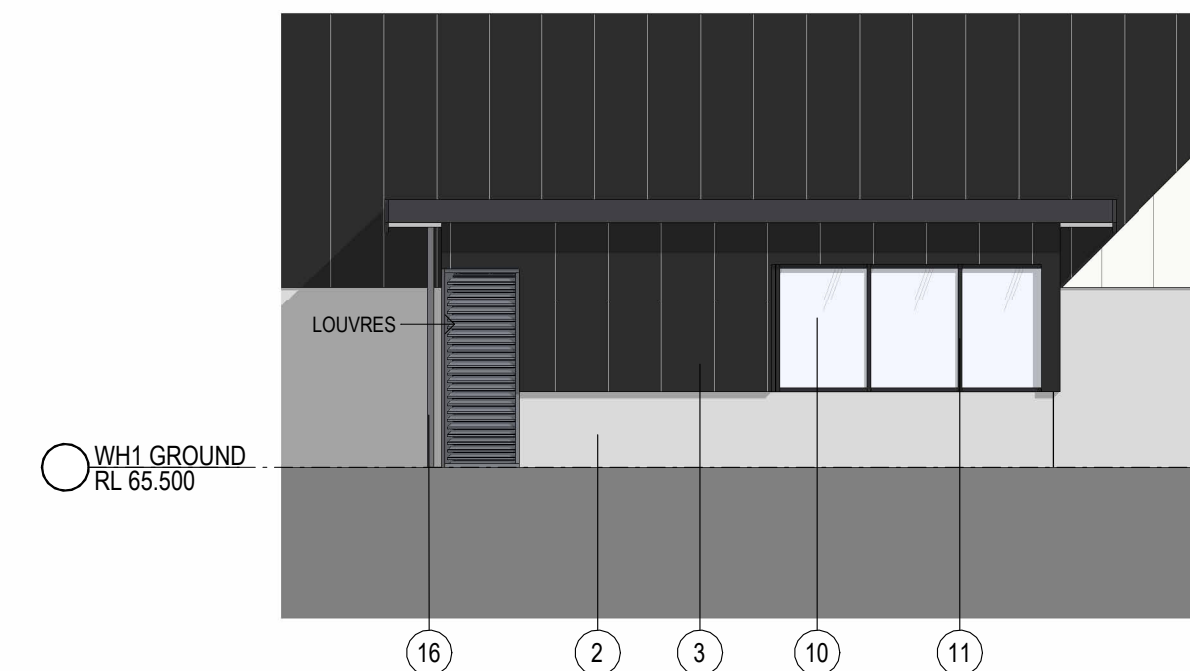
8 INBOUND GATE HOUSE - EAST ELEVATION 1 : 100



4 OUTBOUND GATE HOUSE - SOUTH ELEVATION 1 : 100



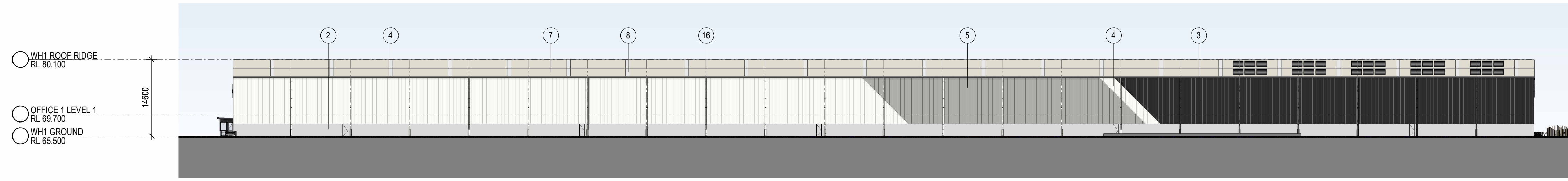
5 OUTBOUND GATE HOUSE - NORTH ELEVATION 1 : 100



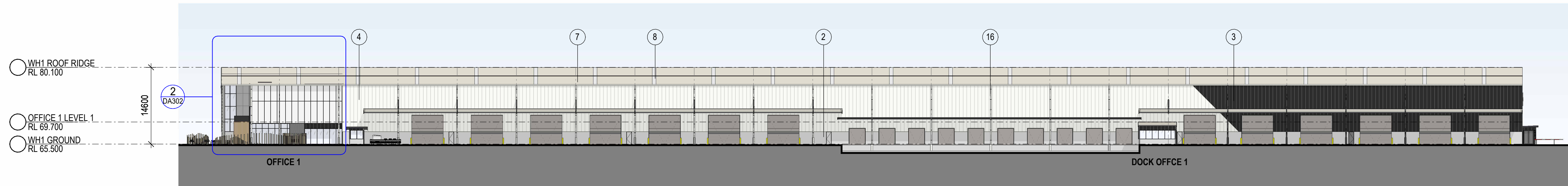
9 INBOUND GATE HOUSE - SOUTH ELEVATION 1 : 100

INDICATIVE EXTERNAL FINISHES

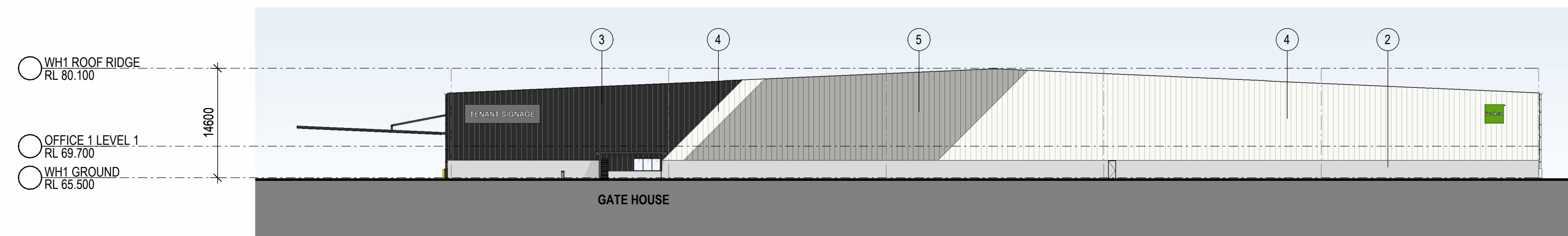
1. <b>BLOCKWORK</b> - EQUAL TO AUSTRAL BLOCK 'ARCHITEC' - HONED - CHARCOAL' 390 X 190 X 190mm - STACK BOND PATTERN - COLOUR-MATCHING FLUSH MORTAR JOINTS	2. <b>PRECAST CONCRETE PANEL</b> - OFF-FORM FINISH	3. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'MONUMENT'	4. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'DOVER WHITE'	5. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'SHALE GREY'	6. <b>PREFINISHED CFC CLADDING</b> - EQUAL TO 'EQUITONE - TECTIVA - GREY' - 1200X2400mm - CONCEALED FIXING	7. <b>METAL DECK ROOFING</b> - COLORBOND 'DOVER WHITE'	8. <b>TRANSLUCENT ROOF SHEET</b> - OPAL COLOUR	9. <b>TIMBER LOOK METAL CLADDING</b> - SCULPTFORM ALUMINIUM CLICK ON PANELS	10. <b>GLAZING</b> - LIGHT GREY TINT OR SIMILAR	11. <b>PREFINISHED ALUMINIUM WINDOW FRAME</b> - COLORBOND 'MONUMENT'	12. <b>STEEL BALUSTRADE &amp; PANEL</b> - COLORBOND 'MONUMENT'	13. <b>METAL ROLLER SHUTTER</b> - PREFINISHED IN 'SHALE GREY'	14. <b>EXPOSED STEEL STRUCTURE &amp; STEEL AWNING</b> - COLORBOND 'SHALE GREY'	15. <b>SOLID DOOR LEAF</b> - TO MATCH 'SHALE GREY'	16. <b>DOWNPIPE</b> - COLOUR TO MATCH BACKGROUND CLADDING COLOUR	17. <b>POWDERCOATED METAL MESH IN STEEL FRAME</b> - COLORBOND 'DOVER WHITE'	18. <b>PAVER</b> - AUSTRAL BRICKS 230 x 76 x 5 mm - ALLOW 3 COLOURS AND PATTERNS	19. <b>TIMBER POSTS &amp; METAL OUTDOOR BENCHES IN CUSTOMISED FORM</b>	20. <b>LOUVRE DOOR</b>
--	---	---	--	---	---	---	---	--	--	---	---	--	---	---	---	--	--	--	------------------------



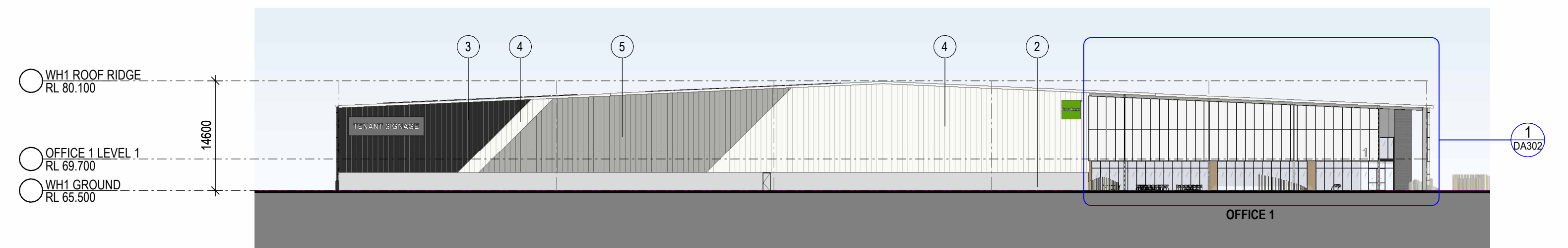
1 WAREHOUSE 1 - EAST EVELATION 1 : 500



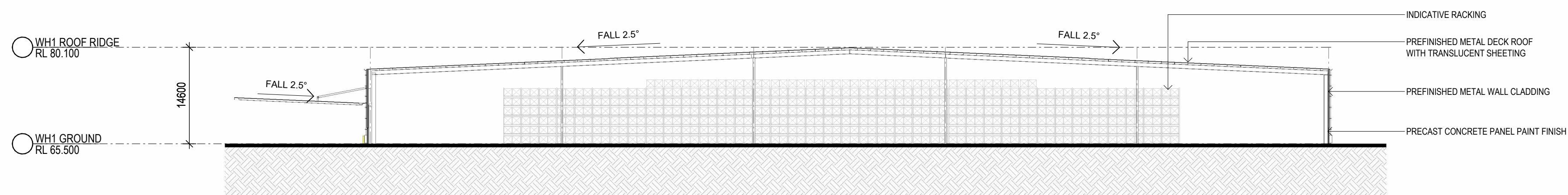
2 WAREHOUSE 1 - WEST EVELATION 1 : 500



3 WAREHOUSE 1 - SOUTH EVELATION 1 : 500



4 WAREHOUSE 1 - NORTH EVELATION 1 : 500



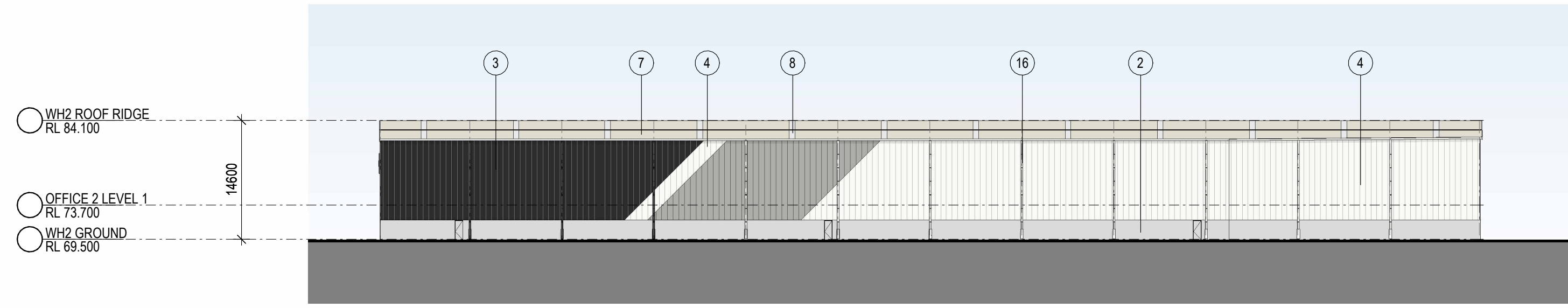
5 WAREHOUSE 1 SECTION 1 : 500

**INDICATIVE EXTERNAL FINISHES**

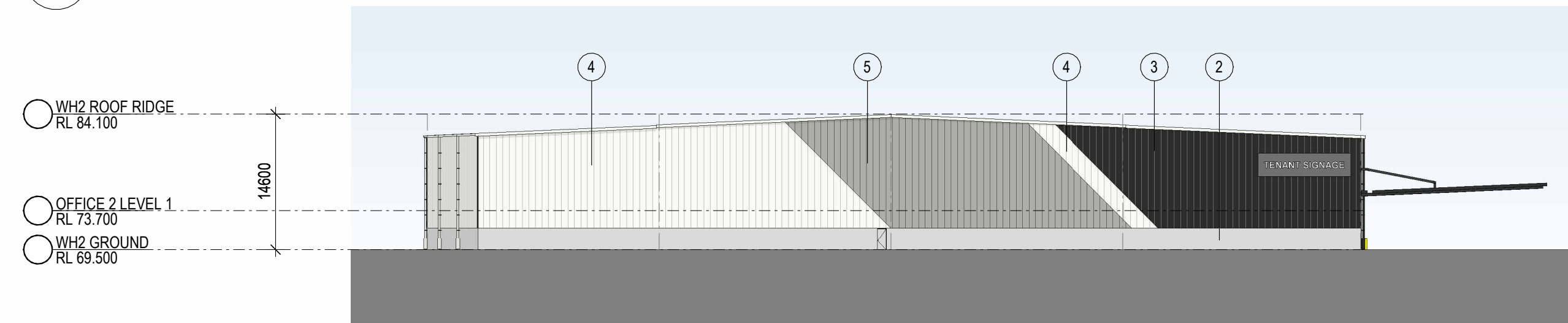
1. <b>BLOCKWORK</b> - EQUAL TO AUSTRAL BLOCK 'ARCHITEC' - HONED - CHARCOAL' 390 X 190 X 190mm - STACK BOND PATTERN - COLOUR-MATCHING FLUSH MORTAR JOINTS	2. <b>PRECAST CONCRETE PANEL</b> - OFF-FORM FINISH	3. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'MONUMENT'	4. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'DOVER WHITE'	5. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLOURBOND 'SHALE GREY'	6. <b>PREFINISHED CFC CLADDING</b> - EQUAL TO 'EQUITONE - TECTIVA - GREY' 1200X2400mm - CONCEALED FIXING	7. <b>METAL DECK ROOFING</b> - COLORBOND 'DOVER WHITE'	8. <b>TRANSLUCENT ROOF SHEET</b> - OPAL COLOUR	9. <b>TIMBER LOOK METAL CLADDING</b> - SCULPTFORM ALUMINIUM CLICK ON PANELS	10. <b>GLAZING</b> - LIGHT GREY TINT OR SIMILAR	11. <b>PREFINISHED ALUMINIUM WINDOW FRAME</b> - COLORBOND 'MONUMENT'	12. <b>STEEL BALUSTRADE &amp; PANEL</b> - COLORBOND 'MONUMENT'	13. <b>METAL ROLLER SHUTTER</b> - PREFINISHED IN 'SHALE GREY'	14. <b>EXPOSED STEEL STRUCTURE &amp; STEEL AWNING</b> - COLORBOND 'SHALE GREY'	15. <b>SOLID DOOR LEAF</b> - TO MATCH 'SHALE GREY'	16. <b>DOWNPIPE</b> - COLOUR TO MATCH BACKGROUND CLADDING COLOUR	17. <b>POWDERCOATED METAL MESH IN STEEL FRAME</b> - COLORBOND 'DOVER WHITE'	18. <b>PAVER</b> - AUSTRAL BRICKS 230 x 76 x 5 mm - ALLOW 3 COLOURS AND PATTERNS	19. <b>TIMBER POSTS &amp; METAL OUTDOOR BENCHES IN CUSTOMISED FORM</b>	20. <b>LOUVRE DOOR</b>
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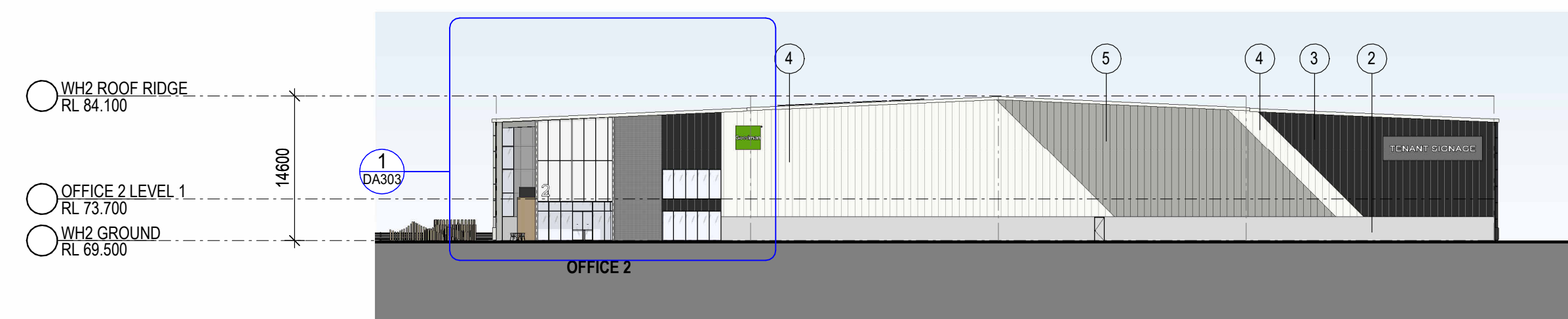
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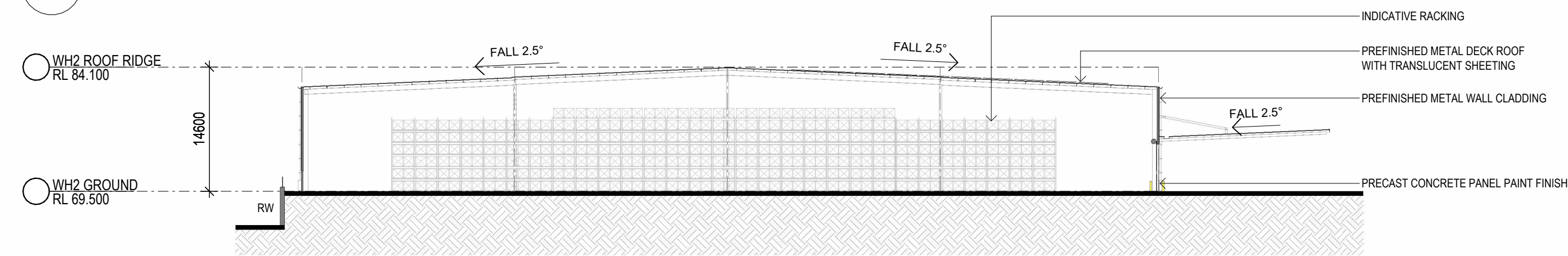
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3 WAREHOUSE 2 - SOUTH ELEVATION 1 : 500



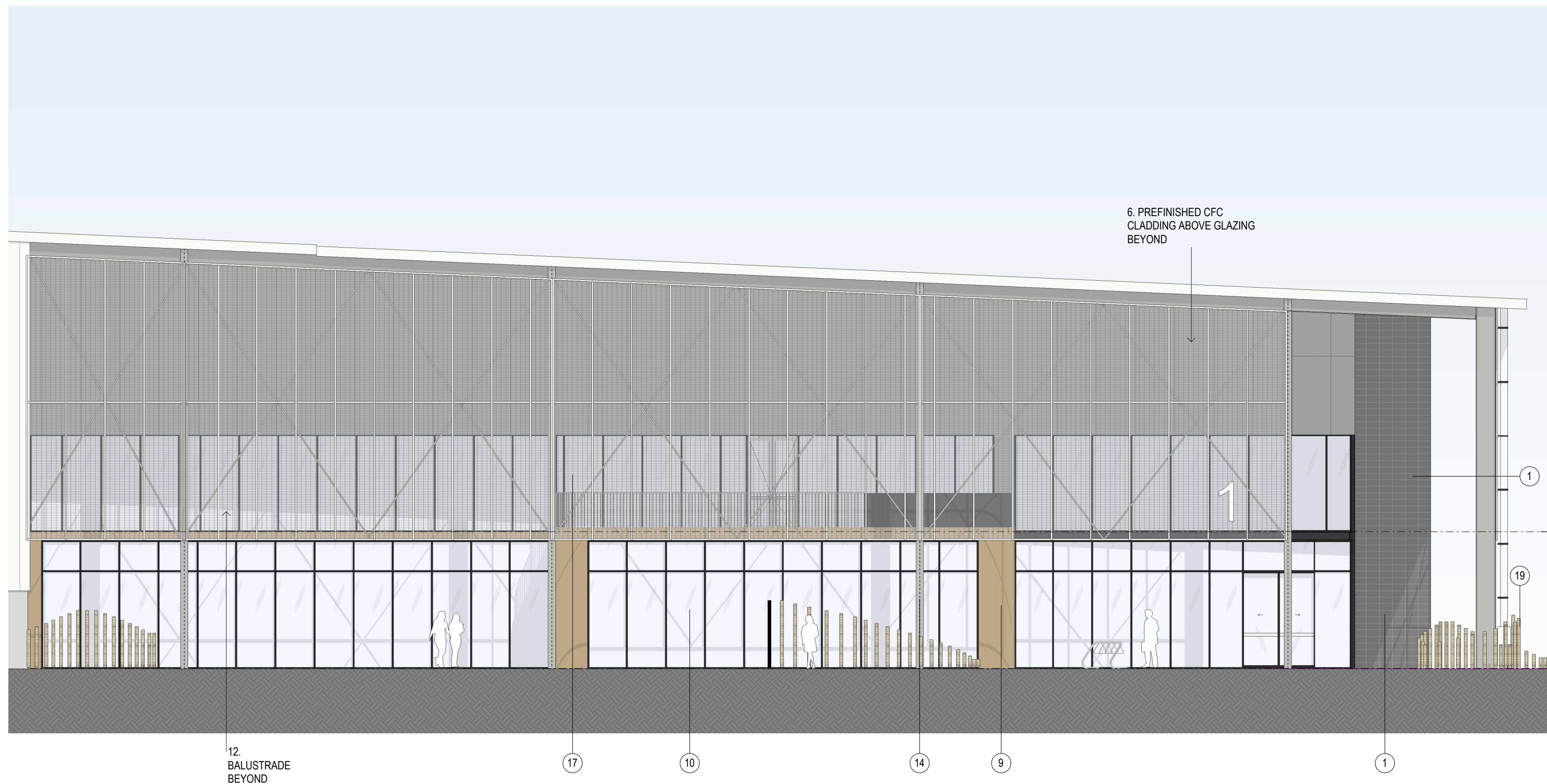
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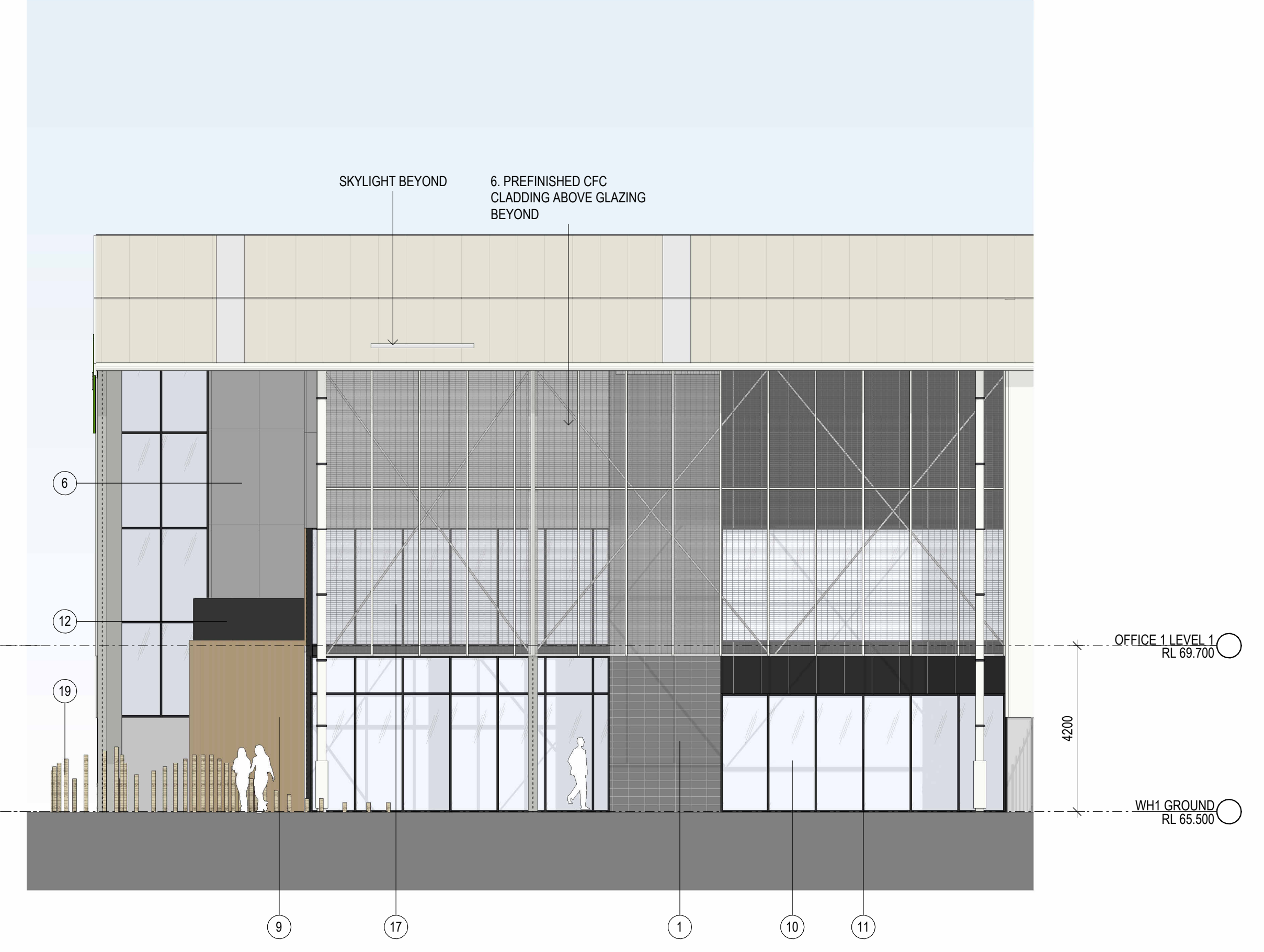
5 WAREHOUSE 2 SECTION 1 : 500

INDICATIVE EXTERNAL FINISHES

1. <b>BLOCKWORK</b> - EQUAL TO AUSTRAL BLOCK 'ARCHITECT' - HONED - CHARCOAL' 390 X 190 X 190mm - STACK BOND PATTERN - COLOUR-MATCHING FLUSH MORTAR JOINTS	2. <b>PRECAST CONCRETE PANEL</b> - OFF-FORM FINISH	3. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'MONUMENT'	4. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'DOVER WHITE'	5. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLOURBOND 'SHALE GREY'	6. <b>PREFINISHED CFC CLADDING</b> - EQUAL TO 'EQUITONE - TECTIVA - GREY' 12000X2400mm - CONCEALED FIXING	7. <b>METAL DECK ROOFING</b> - COLORBOND 'DOVER WHITE'	8. <b>TRANSLUCENT ROOF SHEET</b> - OPAL COLOUR	9. <b>TIMBER LOOK METAL CLADDING</b> - SCULPTFORM ALUMINIUM CLICK ON PANELS	10. <b>GLAZING</b> - LIGHT GREY TINT OR SIMILAR	11. <b>PREFINISHED ALUMINIUM WINDOW FRAME</b> - COLORBOND 'MONUMENT'	12. <b>STEEL BALUSTRADE &amp; PANEL</b> - COLORBOND 'MONUMENT'	13. <b>METAL ROLLER SHUTTER</b> - PREFINISHED IN 'SHALE GREY'	14. <b>EXPOSED STEEL STRUCTURE &amp; STEEL AWNING</b> - COLORBOND 'SHALE GREY'	15. <b>SOLID DOOR LEAF</b> - TO MATCH 'SHALE GREY'	16. <b>DOWNPIPE</b> - COLOUR TO MATCH BACKGROUND CLADDING COLOUR	17. <b>POWDERCOATED METAL MESH IN STEEL FRAME</b> - COLORBOND 'DOVER WHITE'	18. <b>PAVER</b> - AUSTRAL BRICKS 230 x 76 x 5 mm - ALLOW 3 COLOURS AND PATTERNS	19. <b>TIMBER POSTS &amp; METAL OUTDOOR BENCHES IN CUSTOMISED FORM</b>	20. <b>LOUVRE DOOR</b>
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1 OFFICE 1 - NORTH ELEVATION 1 : 100



2 OFFICE 1 - WEST ELEVATION 1 : 100

INDICATIVE EXTERNAL FINISHES

1. <b>BLOCKWORK</b> - EQUAL TO AUSTRAL BLOCK 'ARCHITECT' - HONED - CHARCOAL' 390 X 190 X 190mm - STACK BOND PATTERN - COLOUR-MATCHING FLUSH MORTAR JOINTS	2. <b>PRECAST CONCRETE PANEL</b> - OFF-FORM FINISH	3. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'MONUMENT'	4. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLORBOND 'DOVER WHITE'	5. <b>PREFINISHED METAL WALL SHEET CLADDING</b> - COLOURBOND 'SHALE GREY'	6. <b>PREFINISHED CFC CLADDING</b> - EQUAL TO 'EQUITONE - TECTIVA - GREY' - 12000X2400mm - CONCEALED FIXING	7. <b>METAL DECK ROOFING</b> - COLORBOND 'DOVER WHITE'	8. <b>TRANSLUCENT ROOF SHEET</b> - OPAL COLOUR	9. <b>TIMBER LOOK METAL CLADDING</b> - SCULPTFORM ALUMINIUM CLICK ON PANELS	10. <b>GLAZING</b> - LIGHT GREY TINT OR SIMILAR	11. <b>PREFINISHED ALUMINIUM WINDOW FRAME</b> - COLORBOND 'MONUMENT'	12. <b>STEEL BALUSTRADE &amp; PANEL</b> - COLORBOND 'MONUMENT'	13. <b>METAL ROLLER SHUTTER</b> - PREFINISHED IN 'SHALE GREY'	14. <b>EXPOSED STEEL STRUCTURE &amp; STEEL AWNING</b> - COLORBOND 'SHALE GREY'	15. <b>SOLID DOOR LEAF</b> - TO MATCH 'SHALE GREY'	16. <b>DOWNPIPE</b> - COLOUR TO MATCH BACKGROUND CLADDING COLOUR	17. <b>POWDERCOATED METAL MESH IN STEEL FRAME</b> - COLORBOND 'DOVER WHITE'	18. <b>PAVER</b> - AUSTRAL BRICKS 230 x 76 x 5 mm - ALLOW 3 COLOURS AND PATTERNS	19. <b>TIMBER POSTS &amp; METAL OUTDOOR BENCHES IN CUSTOMISED FORM</b>	20. <b>LOUVRE DOOR</b>
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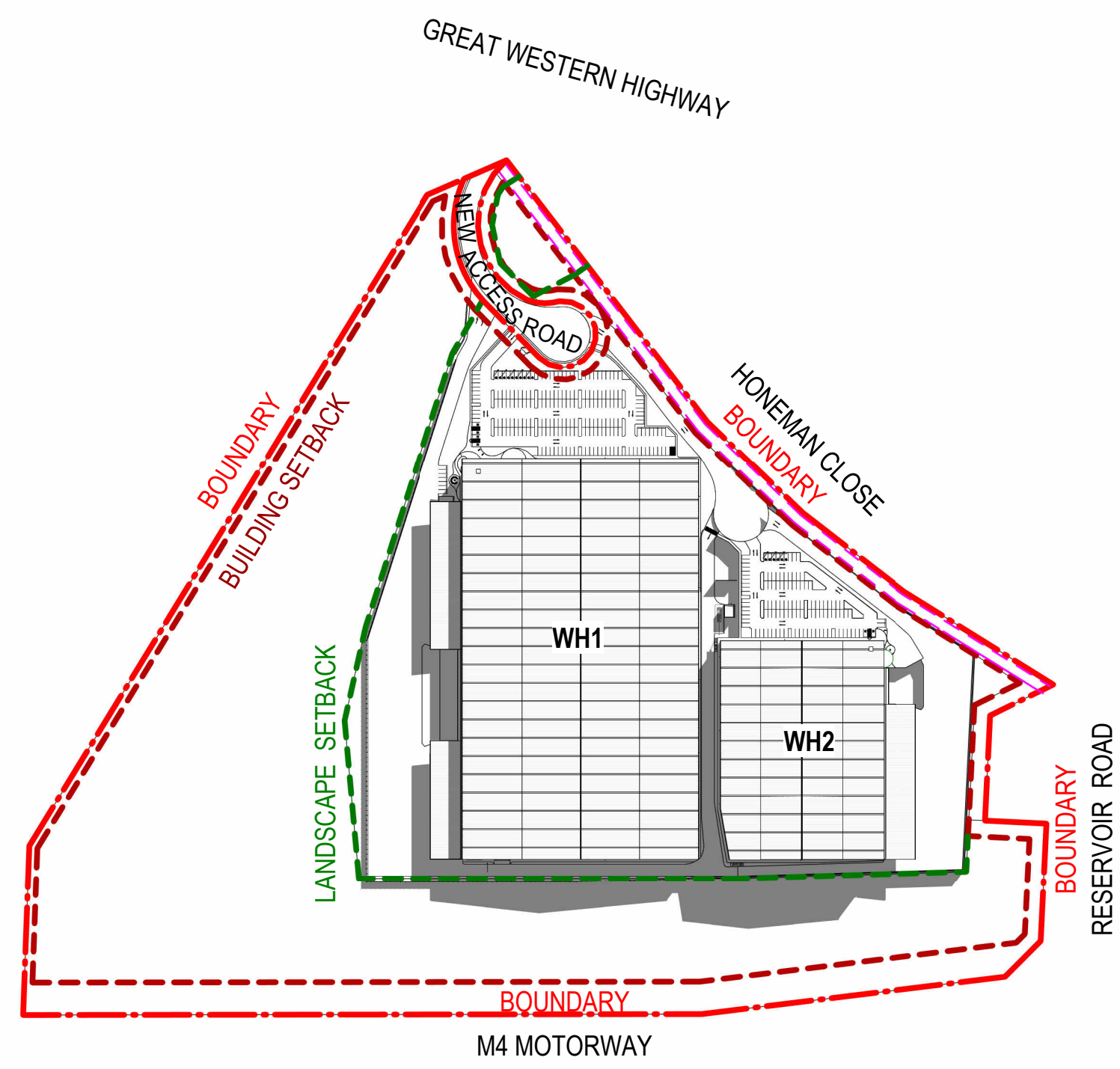
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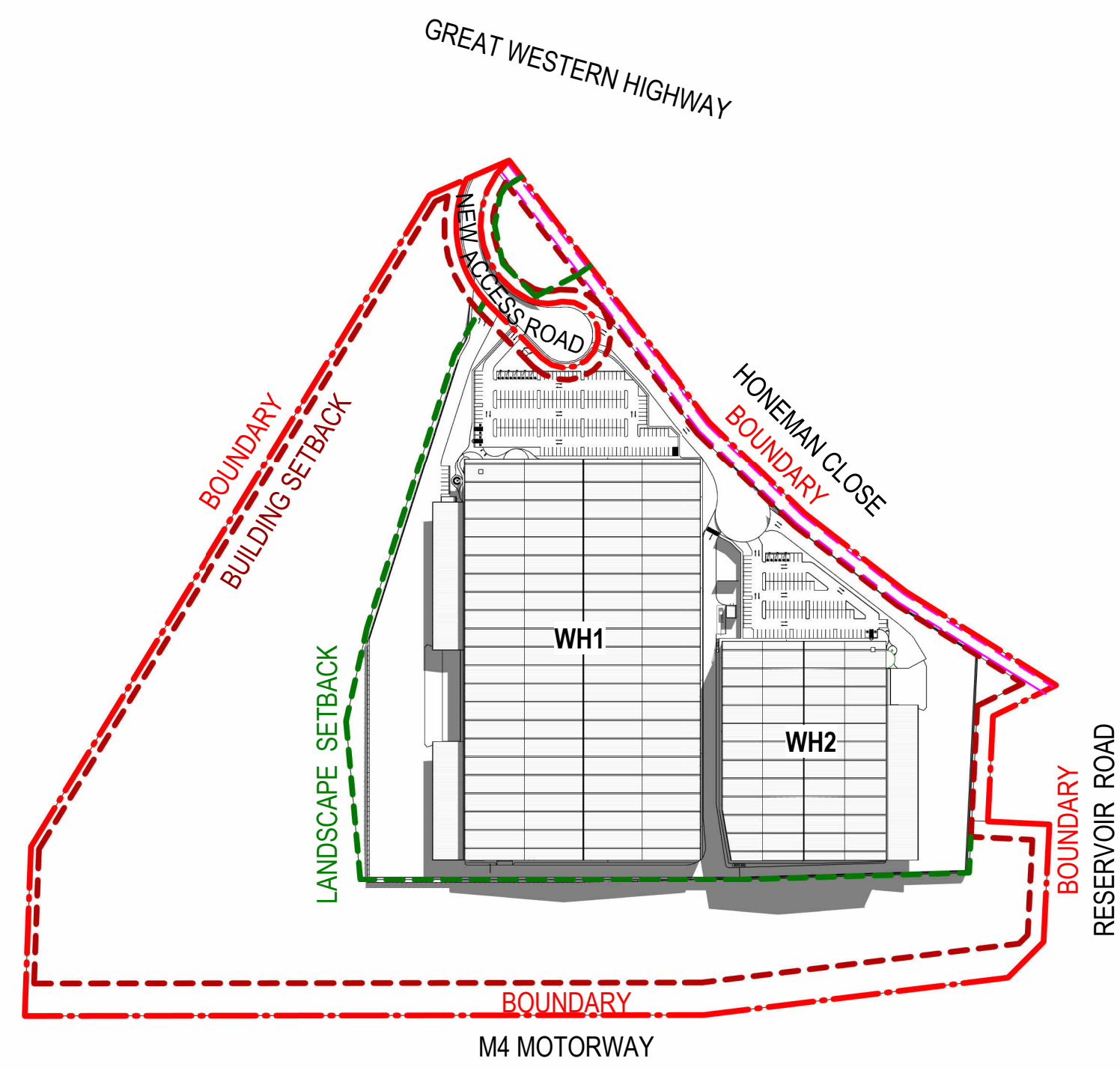
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INDICATIVE EXTERNAL FINISHES

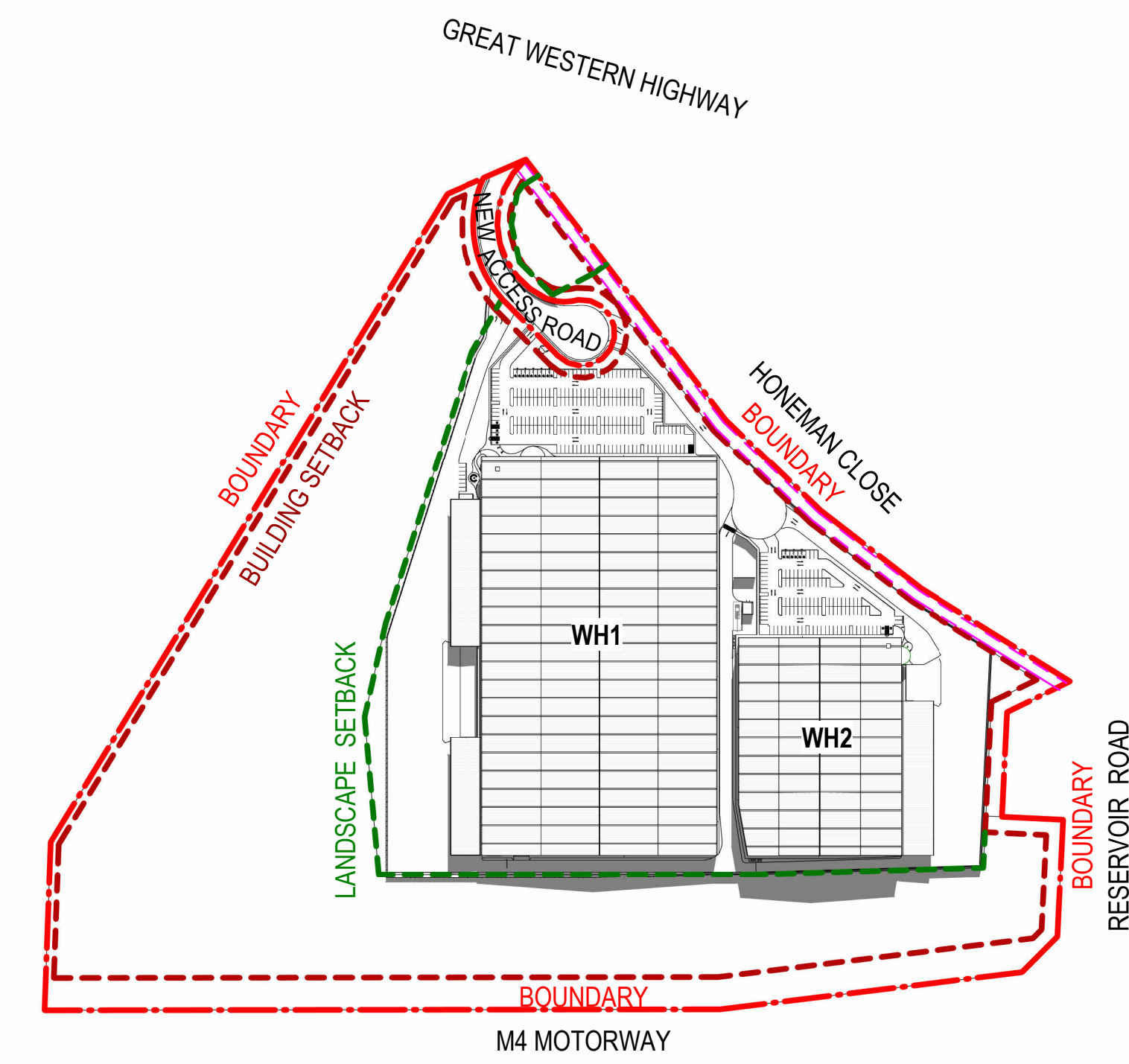
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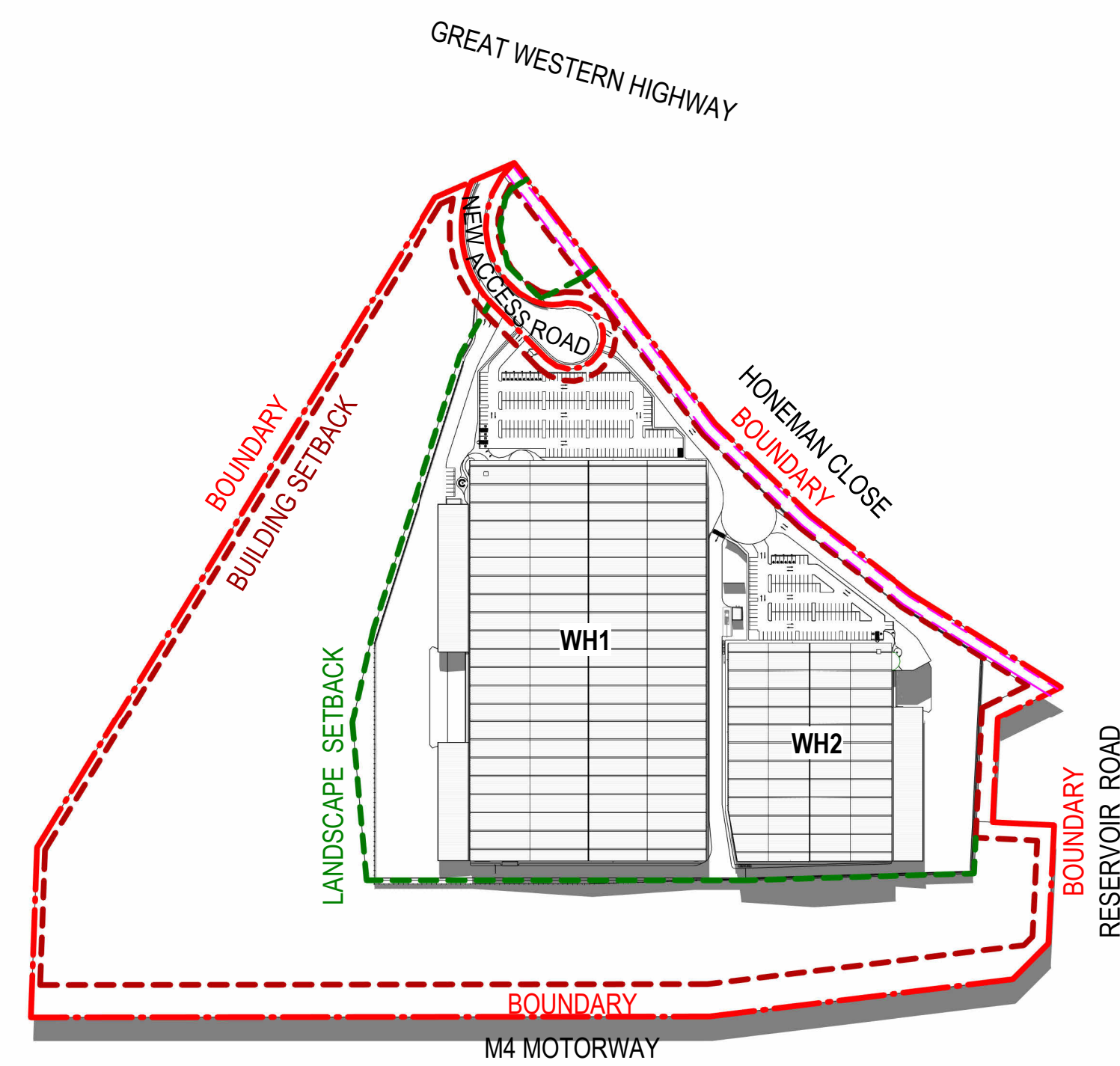
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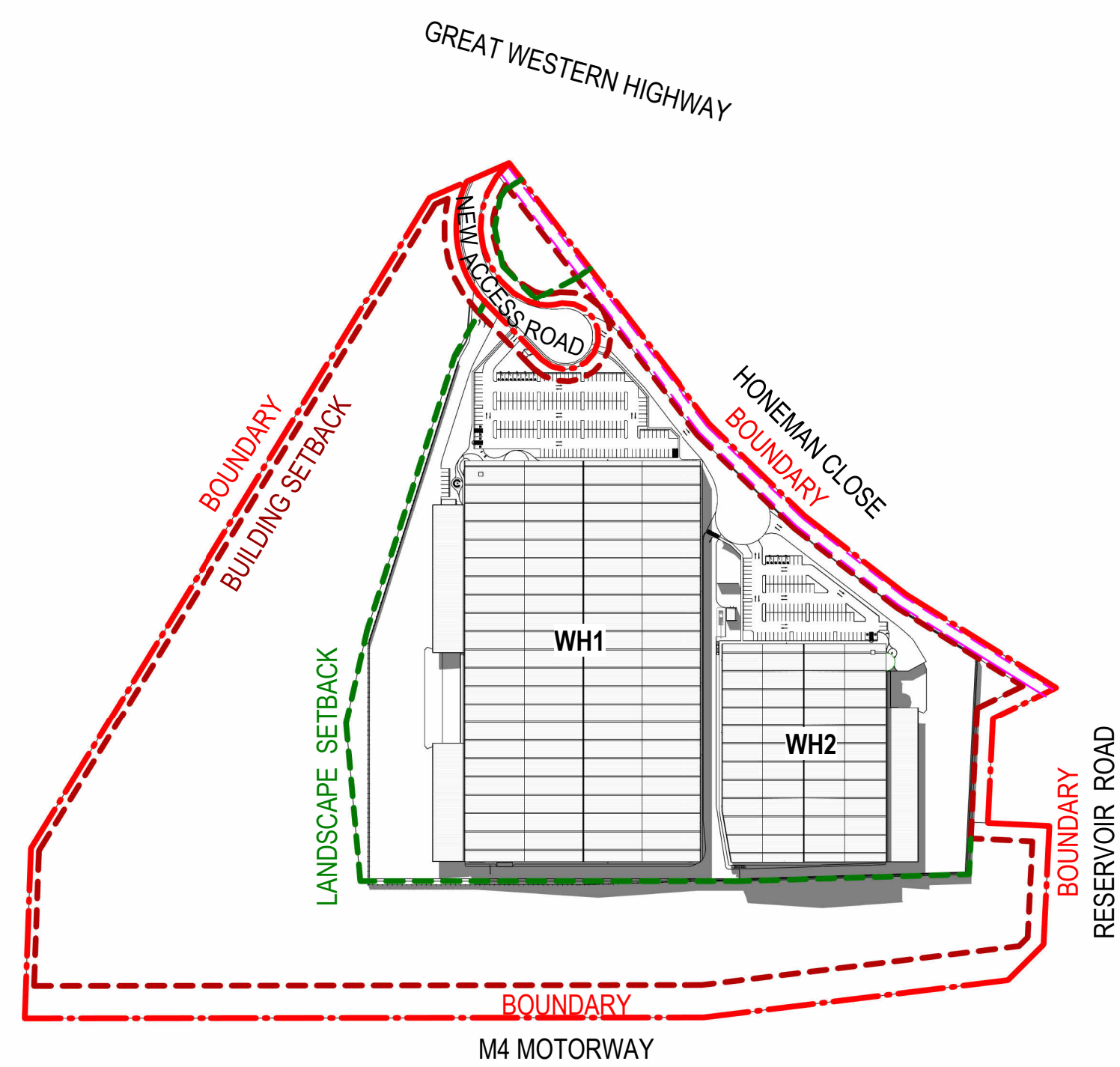
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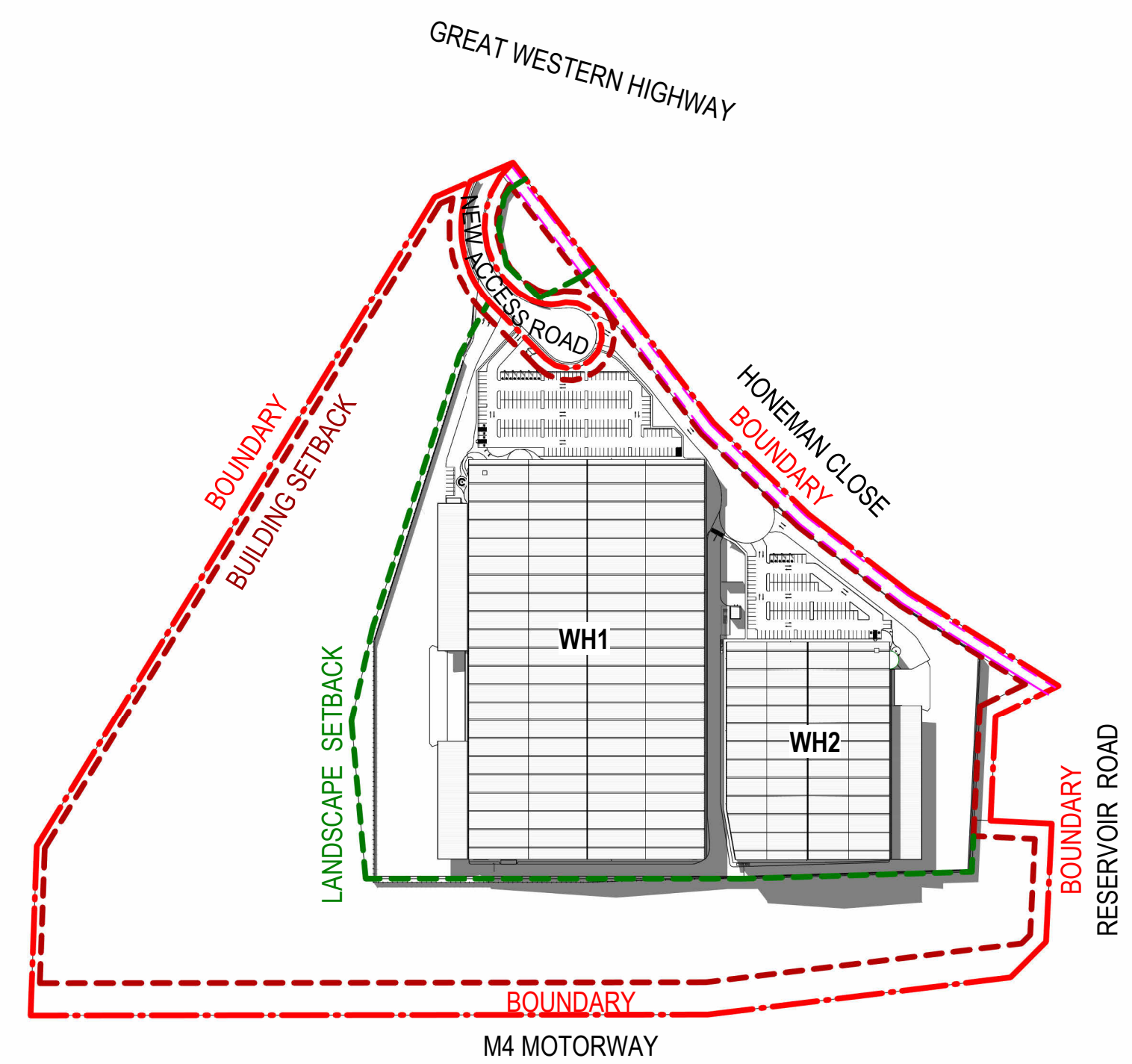
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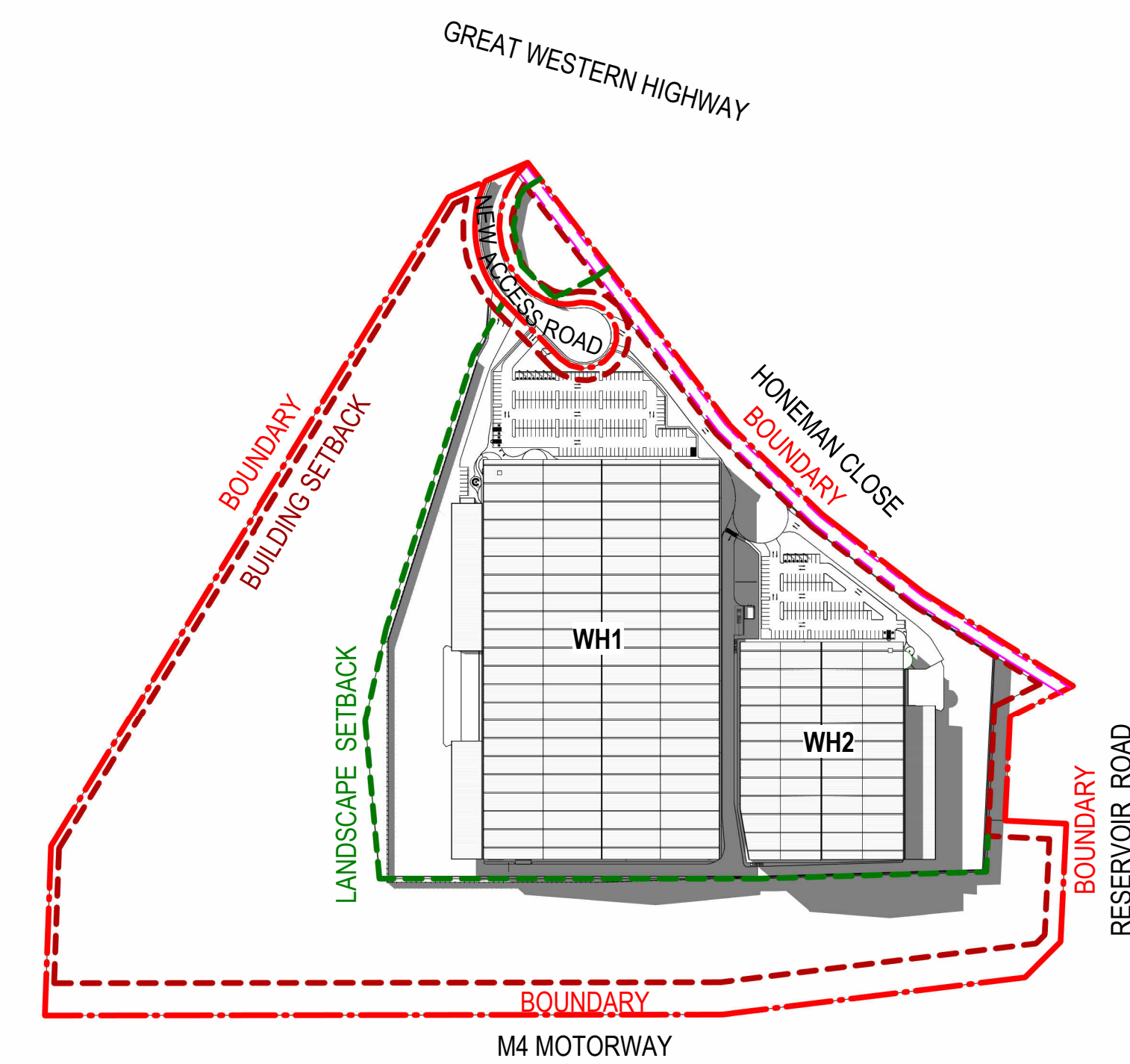
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5 WINTER SOLSTICE (21 JUNE) SHADOWS - 1PM 1 : 3500



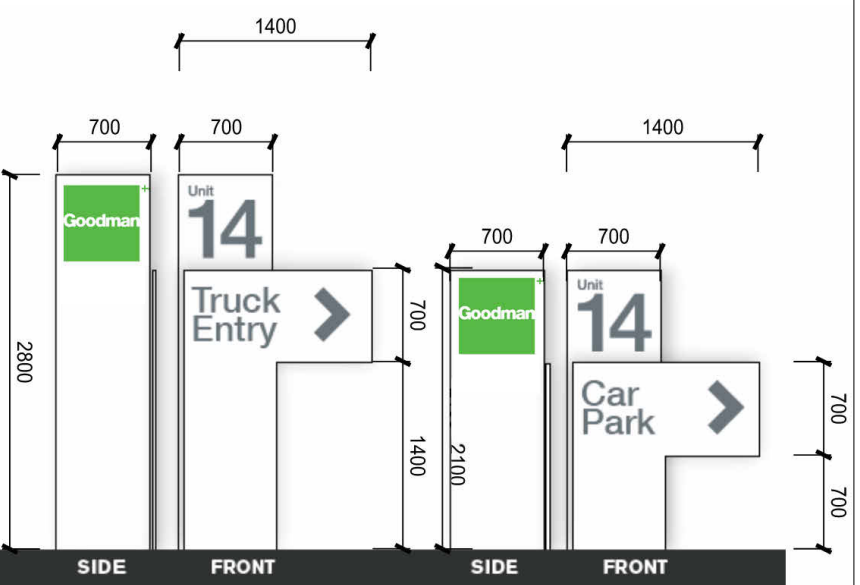
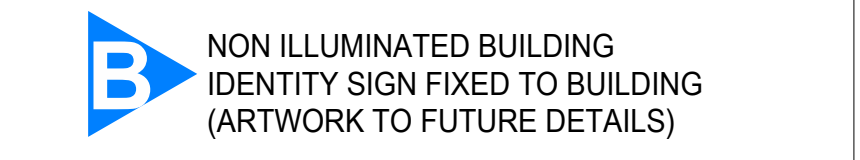
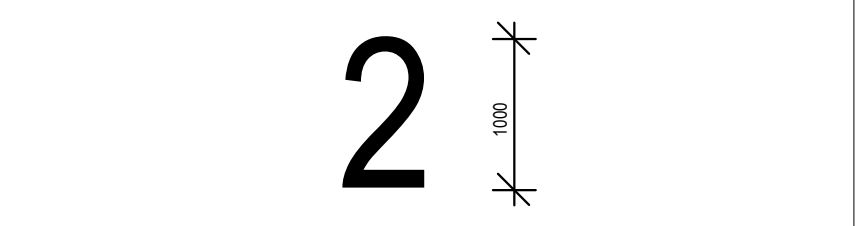
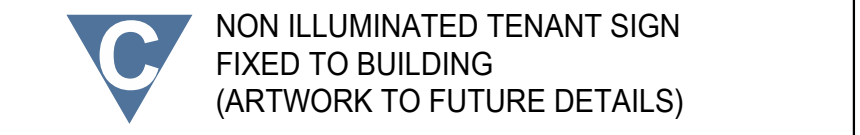
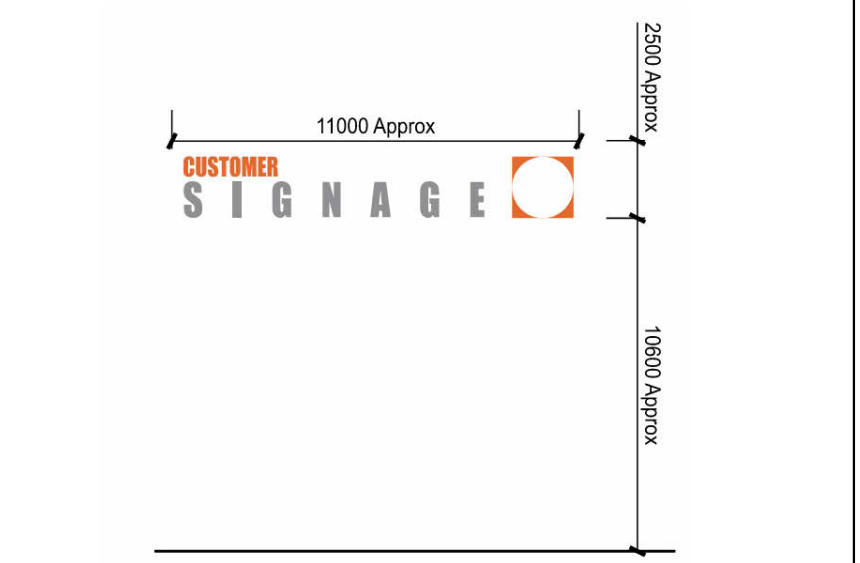
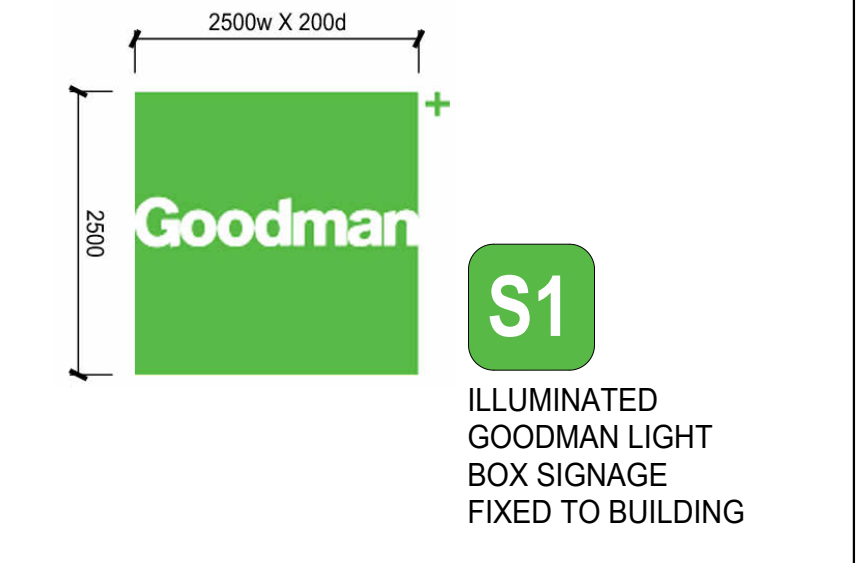
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7 WINTER SOLSTICE (21 JUNE) SHADOWS - 3PM 1 : 3500



**LEGEND**



NOTE: SIGNAGE IMAGES NOT TO SCALE

RESERVOIR ROAD

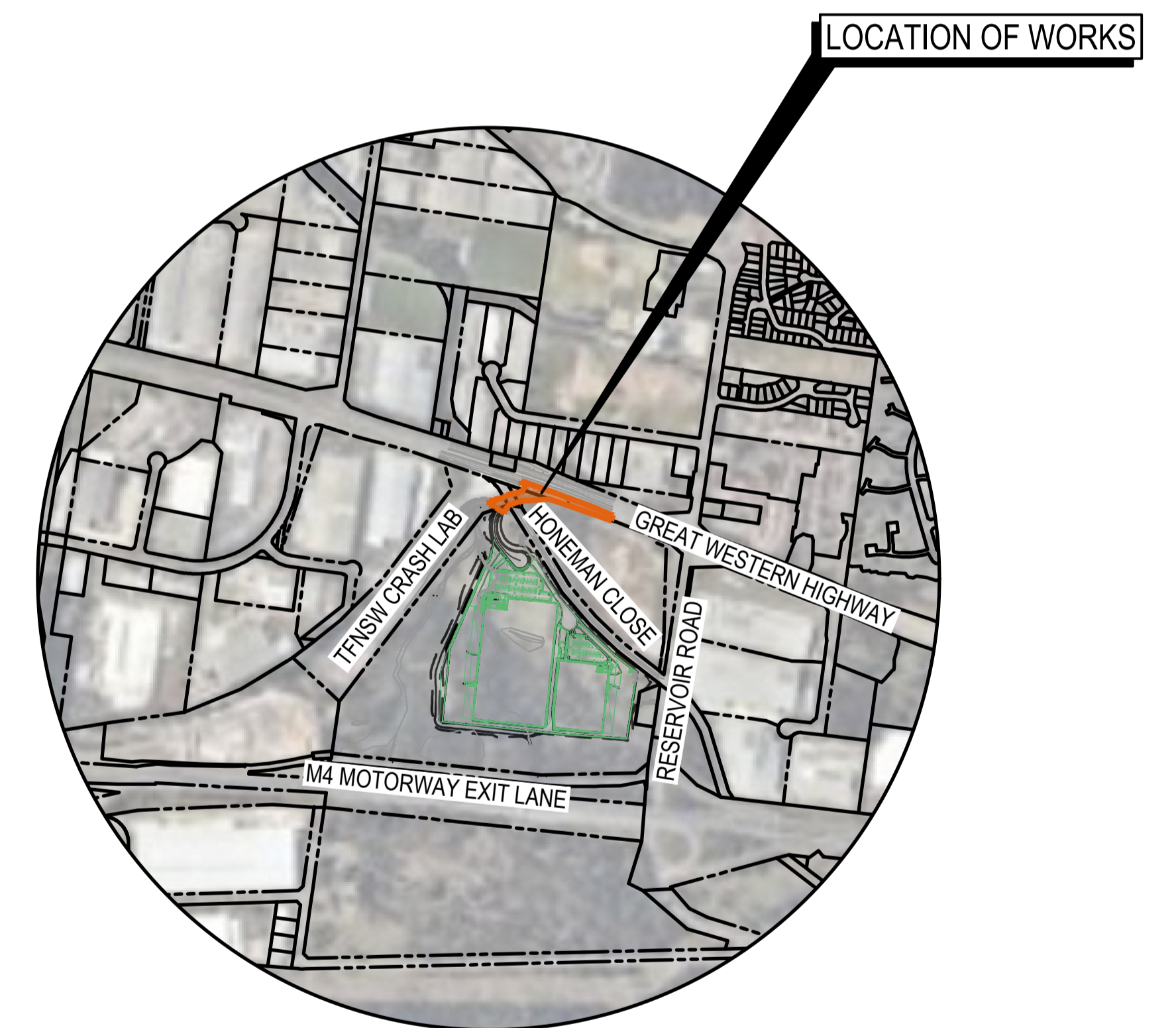
# HONEMAN CLOSE WAREHOUSE FACILITY, HUNTINGWOOD - EXTERNAL INTERSECTION

## STATE SIGNIFICANT DEVELOPMENT APPLICATION - SSD-79500208

### BLACKTOWN CITY COUNCIL

#### DRAWING SCHEDULE

DRAWING NUMBER	DESCRIPTION
GENERAL	
HON-AAP-DA-01-DRG-CI-0001	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
HON-AAP-DA-01-DRG-CI-0201	FUNCTIONAL LAYOUT PLAN
HON-AAP-DA-01-DRG-CI-0241	TYPICAL ROAD SECTION
HON-AAP-DA-01-DRG-CI-0281	ROAD LONGITUDINAL SECTION
HON-AAP-DA-01-DRG-CI-0381	TURNING PATH PLAN
HON-AAP-DA-01-DRG-CI-0501	COMBINED UTILITIES PLAN



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Issue	Description	DR	CH	VE	Date
04	ISSUE FOR DEVELOPMENT APPLICATION	JL	PC	KM	20.03.25
03	ISSUE FOR DEVELOPMENT APPLICATION	JL	KR	MK	07.03.25
02	ISSUE FOR DEVELOPMENT APPLICATION	JL	KR	MK	28.02.25
01	DRAFT - FOR CLIENT REVIEW	JL	KR	MK	14.02.25

Scales

1 : 10000

Architect

Client

Status			
FOR REVIEW NOT TO BE USED FOR CONSTRUCTION			
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Original Issue Signatures			
Drawn	J. LOPEZ	Original Size	A1
Designed	K. ROBINSON	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	.		

Project

HONEMAN CLOSE WAREHOUSE FACILITY EXTERNAL INTERSECTION

Title

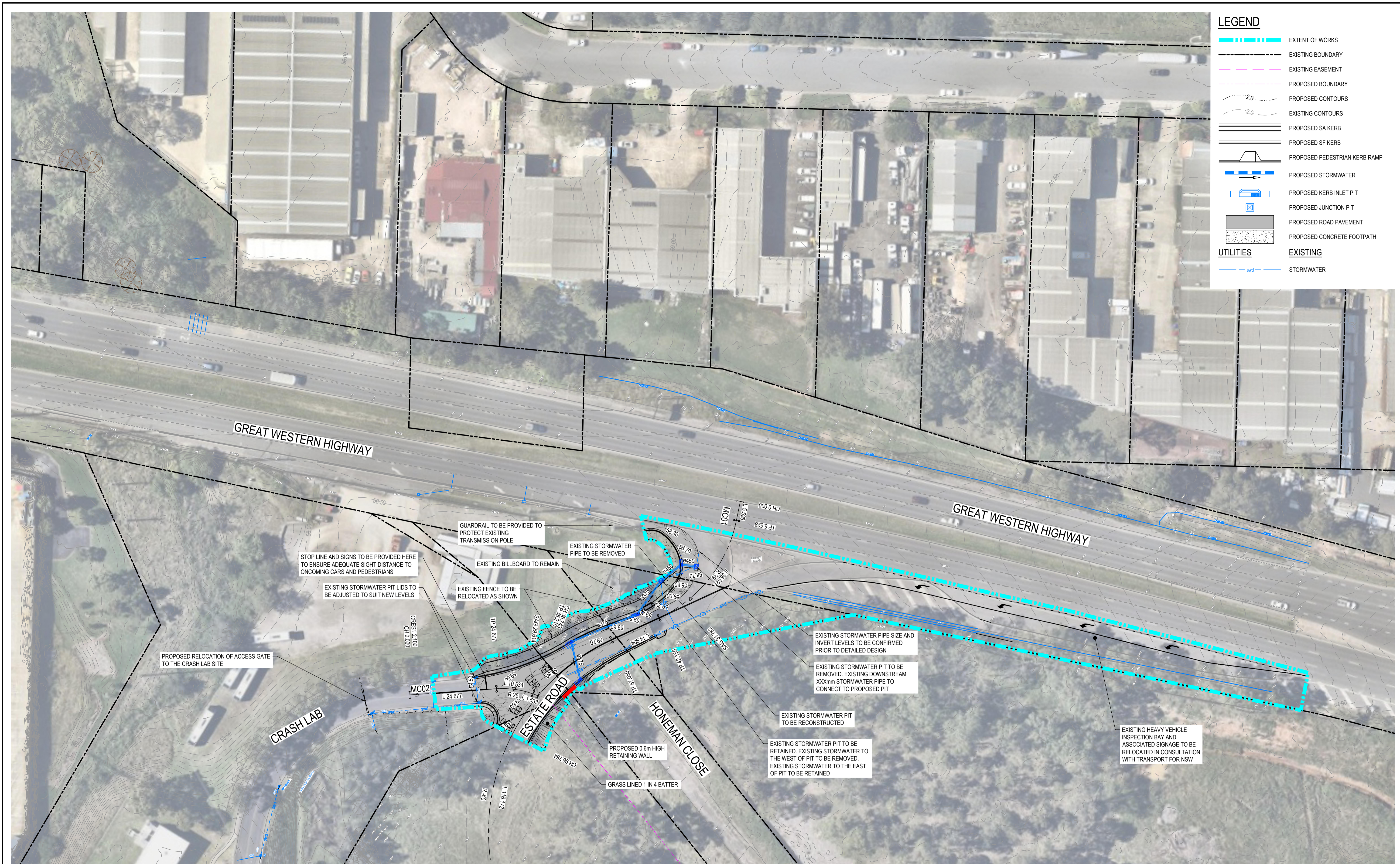
COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE

Arcadis Australia Pacific Pty Limited  
 Level 16, 580 George Street  
 SYDNEY NSW 2000  
 ABN 76 104 485 289  
 Tel No: +61 2 8907 9000  
 www.arcadis.com/au

Project Number: 30206399

Issue: 04

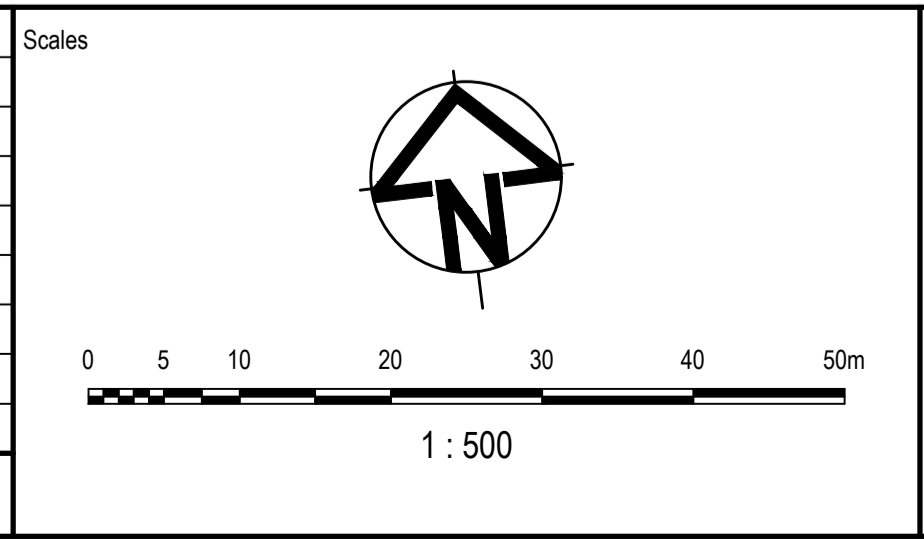
Drawing No: HON-AAP-DA-01-DRG-CI-0001



**LEGEND**

	EXTENT OF WORKS
	EXISTING BOUNDARY
	EXISTING EASEMENT
	PROPOSED BOUNDARY
	PROPOSED CONTOURS
	EXISTING CONTOURS
	PROPOSED SA KERB
	PROPOSED SF KERB
	PROPOSED PEDESTRIAN KERB RAMP
	PROPOSED STORMWATER
	PROPOSED KERB INLET PIT
	PROPOSED JUNCTION PIT
	PROPOSED ROAD PAVEMENT
	PROPOSED CONCRETE FOOTPATH
<b>UTILITIES</b>	
	EXISTING STORMWATER
	STORMWATER

Issue	Description	DR	CH	VE	Date
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01	DRAFT - FOR CLIENT REVIEW	JL	KR	MK	14.02.25



Status

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Original Issue Signatures	
Drawn	J. LOPEZ
Original Size	A1
Designed	K. ROBINSON
Height Datum	AHD
Project Manager	K. MCAREAVEY
Grid	MGA/20-56
Verified	

Project

**HONEMAN CLOSE  
WAREHOUSE FACILITY  
EXTERNAL INTERSECTION**

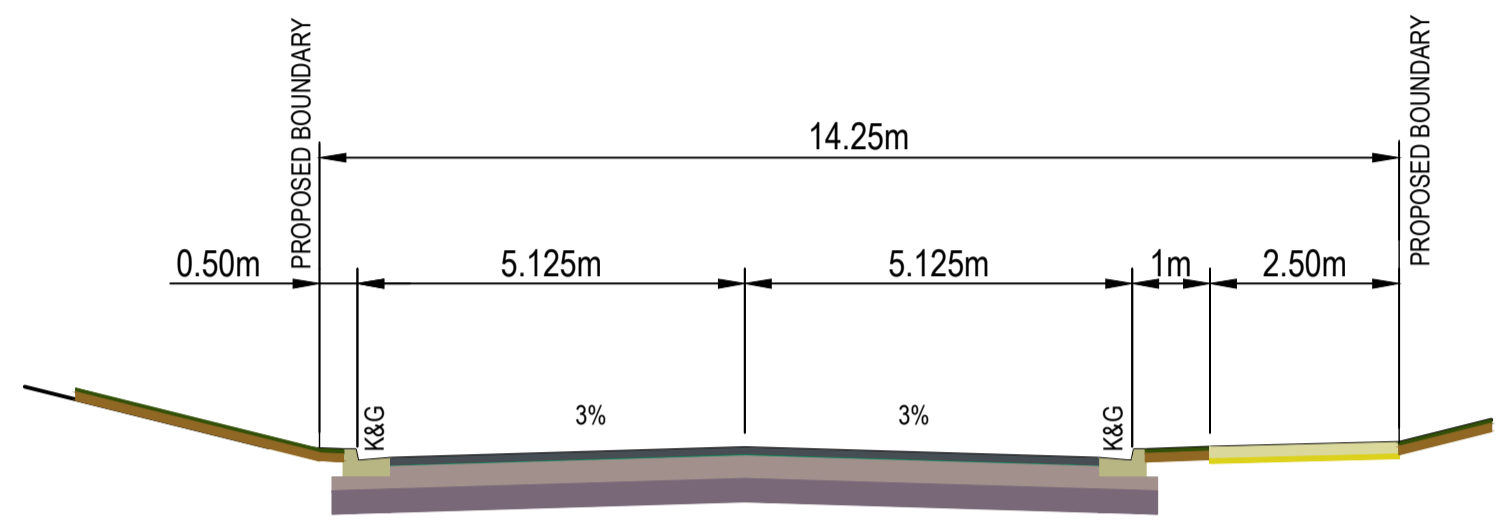
Title

**FUNCTIONAL LAYOUT  
PLAN**

Arcadis Australia Pacific Pty Limited  
Level 16, 580 George Street  
SYDNEY NSW 2000  
ABN 76 104 485 289  
Tel No: +61 2 8907 9000  
www.arcadis.com/au

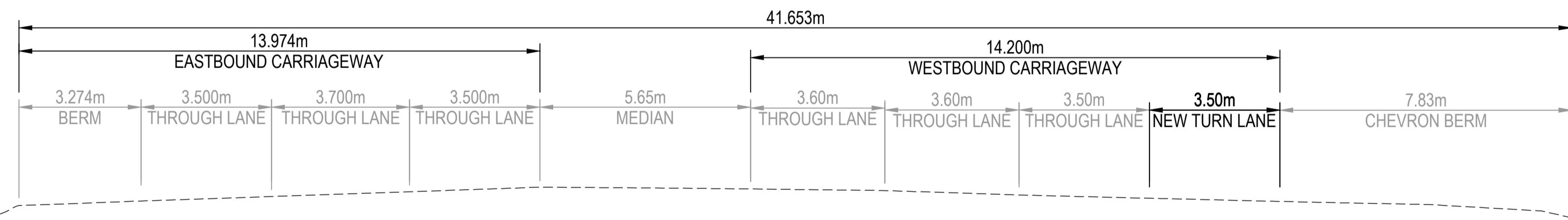
Project Number	30206399
Issue	04

Drawing No. HON-AAP-DA-01-DRG-CI-0201



TYPICAL ESTATE AND CRASH LAB ROAD

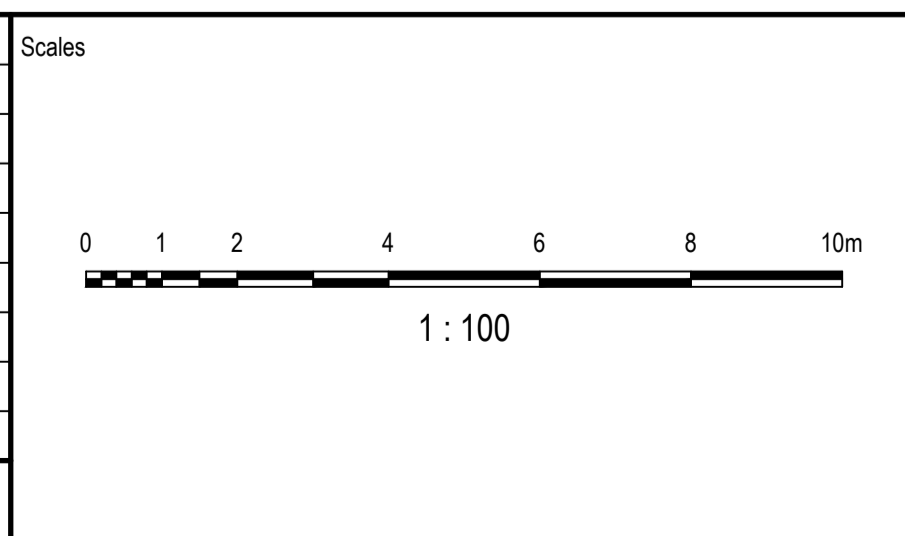
SCALE 1:100 HORI.  
1:100 VERT.



TYPICAL GREAT WESTERN HIGHWAY AT LEFT TURN INTO SITE

SCALE 1:100 HORI.  
1:100 VERT.

Issue	Description	DR	CH	VE	Date
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01	DRAFT - FOR CLIENT REVIEW	JL	KR	MK	14.02.25



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Drawn	J. LOPEZ	Original Size	A1
Designed	K. ROBINSON	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	-		

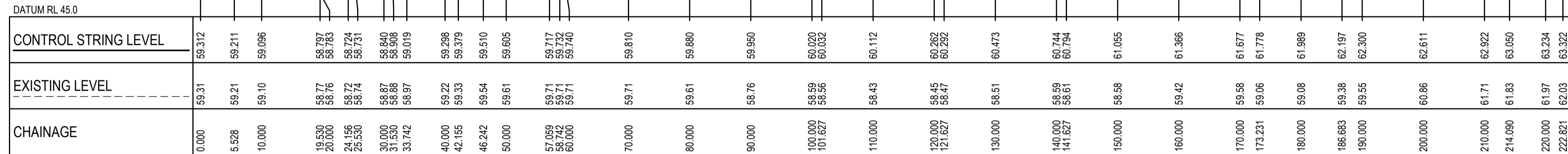
Project	
HONEMAN CLOSE WAREHOUSE FACILITY EXTERNAL INTERSECTION	
Title	
TYPICAL ROAD SECTION	

Arcadis Australia Pacific Pty Limited  
Level 16, 580 George Street  
SYDNEY NSW 2000  
ABN 76 104 485 289  
Tel No: +61 2 8907 9000  
www.arcadis.com/au

Project Number	30206399
Issue	04

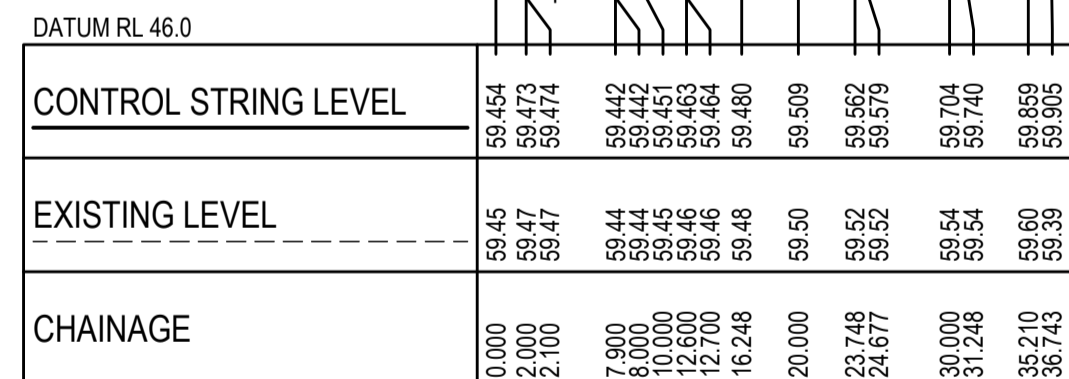
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HORIZONTAL CURVES  
VERTICAL CURVES  
GRADIENT



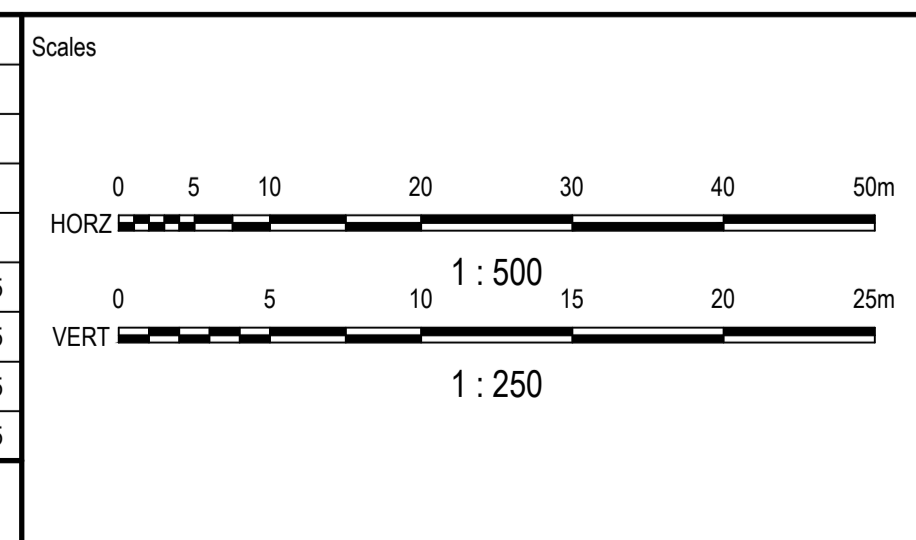
MC01 LONGITUDINAL SECTION  
SCALE 1:500 HORI.  
1:250 VERT.

HORIZONTAL CURVES  
VERTICAL CURVES  
GRADIENT



MC02 LONGITUDINAL SECTION  
SCALE 1:500 HORI.  
1:250 VERT.

Issue	Description	DR	CH	VE	Date
04	ISSUE FOR DEVELOPMENT APPLICATION	JL	PC	KM	20.03.25
03	ISSUE FOR DEVELOPMENT APPLICATION	JL	KR	MK	07.03.25
02	ISSUE FOR DEVELOPMENT APPLICATION	JL	KR	MK	28.02.25
01	DRAFT - FOR CLIENT REVIEW	JL	KR	MK	14.02.25



Status

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Drawn	J. LOPEZ	Original Size	A1
Designed	K. ROBINSON	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	.		

Project

**HONEMAN CLOSE WAREHOUSE FACILITY EXTERNAL INTERSECTION**

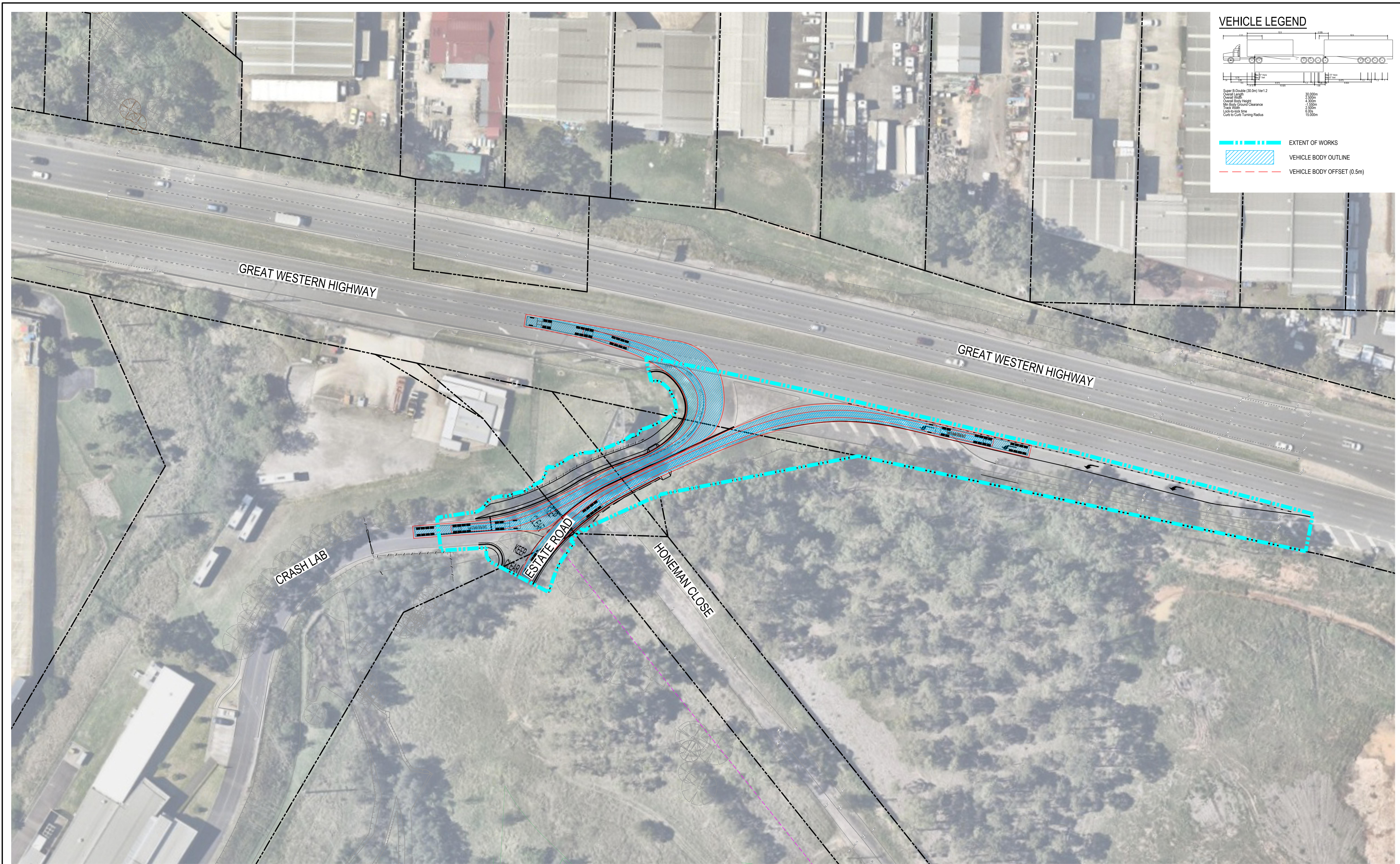
Title

**ROAD LONGITUDINAL SECTION**

Arcadis Australia Pacific Pty Limited  
Level 16, 580 George Street  
SYDNEY NSW 2000  
ABN 76 104 485 289  
Tel No: +61 2 8907 9000  
www.arcadis.com/au

Project Number	30206399
Issue	04

Drawing No: HON-AAP-DA-01-DRG-CI-0281



### VEHICLE LEGEND

Super B-Double (30.0m) Ver1.2	30,000mm
Overall Length	2,500mm
Overall Width	4,500mm
Overall Body Height	1,500mm
Min Body Ground Clearance	2,500mm
Track Width	6.0s
Lock-to-lock time	15,000m
Curb to Curb Turning Radius	

- EXTENT OF WORKS
- VEHICLE BODY OUTLINE
- VEHICLE BODY OFFSET (0.5m)

Issue	Description	DR	CH	VE	Date
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01	DRAFT - FOR CLIENT REVIEW	JL	KR	MK	14.02.25

Scales

1 : 500

Architect

Client

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Designed	K. ROBINSON	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified			

Project

HONEMAN CLOSE  
WAREHOUSE FACILITY  
EXTERNAL INTERSECTION

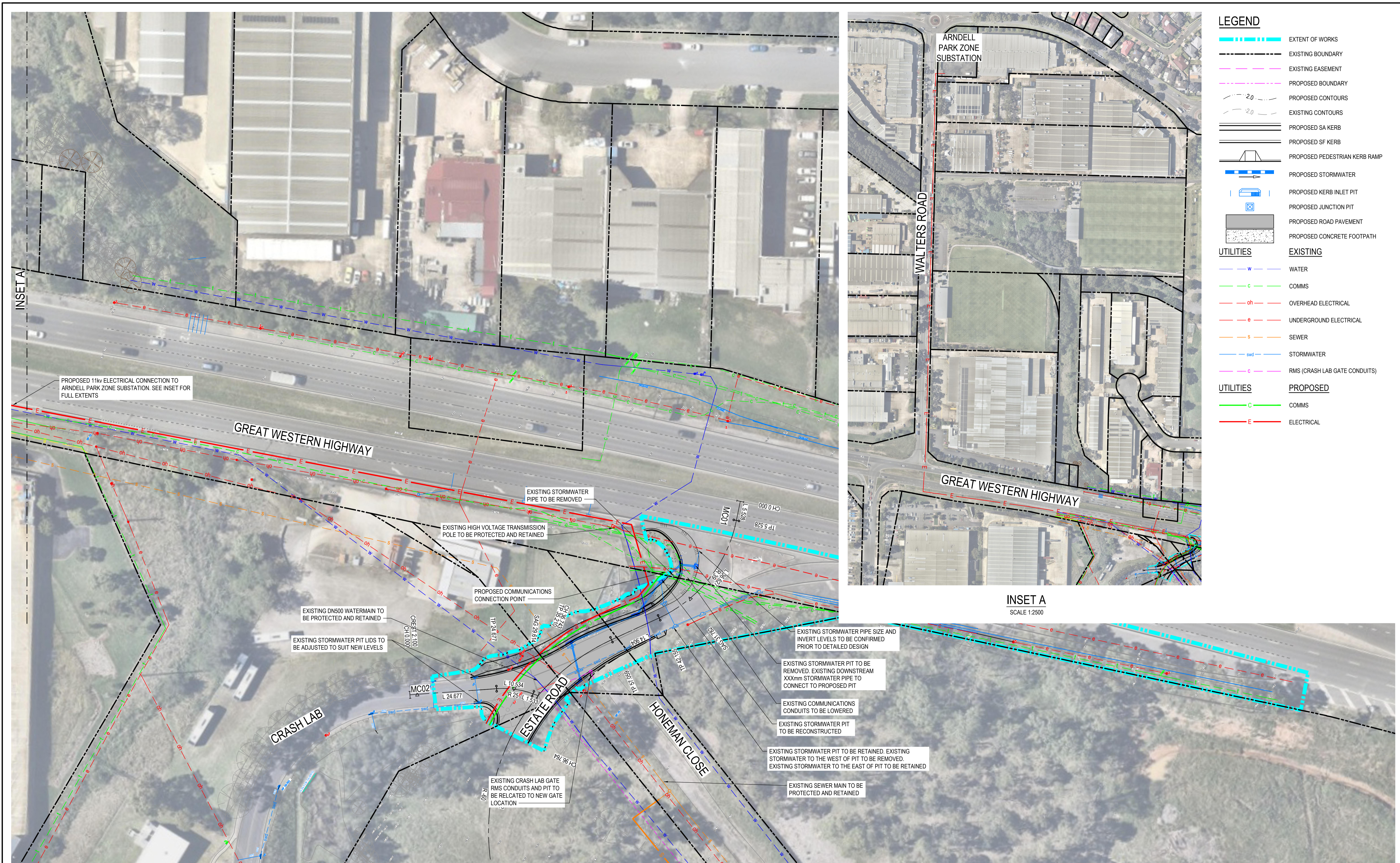
Title

TURNING PATH  
PLAN

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Level 16, 580 George Street  
SYDNEY NSW 2000  
ABN 76 104 485 289  
Tel No: +61 2 8907 9000  
www.arcadis.com/au

Project Number	30206399
Issue	04

Drawing No. HON-AAP-DA-01-DRG-CI-0381

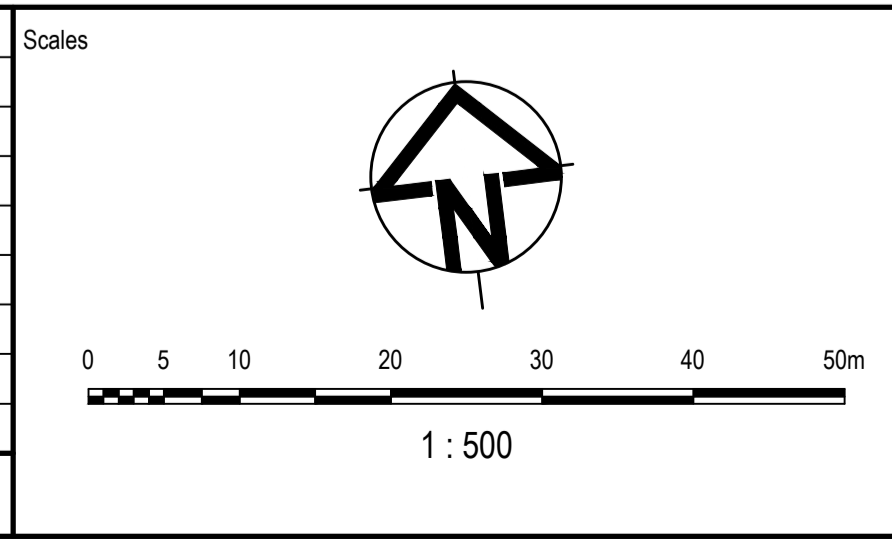


INSET A  
SCALE 1:2500

**LEGEND**

	EXTENT OF WORKS
	EXISTING BOUNDARY
	EXISTING EASEMENT
	PROPOSED BOUNDARY
	PROPOSED CONTOURS
	EXISTING CONTOURS
	PROPOSED SA KERB
	PROPOSED SF KERB
	PROPOSED PEDESTRIAN KERB RAMP
	PROPOSED STORMWATER
	PROPOSED KERB INLET PIT
	PROPOSED JUNCTION PIT
	PROPOSED ROAD PAVEMENT
	PROPOSED CONCRETE FOOTPATH
<b>UTILITIES</b>	
	<b>EXISTING</b>
	WATER
	COMMS
	OVERHEAD ELECTRICAL
	UNDERGROUND ELECTRICAL
	SEWER
	STORMWATER
	RMS (CRASH LAB GATE CONDUITS)
<b>UTILITIES</b>	
	<b>PROPOSED</b>
	COMMS
	ELECTRICAL

Issue	Description	DR	CH	VE	Date
04	ISSUE FOR DEVELOPMENT APPLICATION	JL	PC	KM	20.03.25
03	ISSUE FOR DEVELOPMENT APPLICATION	JL	KR	MK	07.03.25
02	ISSUE FOR DEVELOPMENT APPLICATION	JL	KR	MK	28.02.25
01	DRAFT - FOR CLIENT REVIEW	JL	KR	MK	14.02.25



Architect

Client

Status

**FOR REVIEW  
NOT TO BE USED FOR CONSTRUCTION**

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Original Issue Signatures	
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Designed	K. ROBINSON
Project Manager	K. MCAREAVEY
Verified	

Project

**HONEMAN CLOSE  
WAREHOUSE FACILITY  
EXTERNAL INTERSECTION**

Title

**COMBINED UTILITES  
PLAN**

Arcadis Australia Pacific Pty Limited  
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Drawing No. HON-AAP-DA-01-DRG-CI-0501

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#### 1.1.1.2 Document Status

Rev No.	Author	Reviewer	Approved for Issue		Date
		Name	Name	Signature	
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