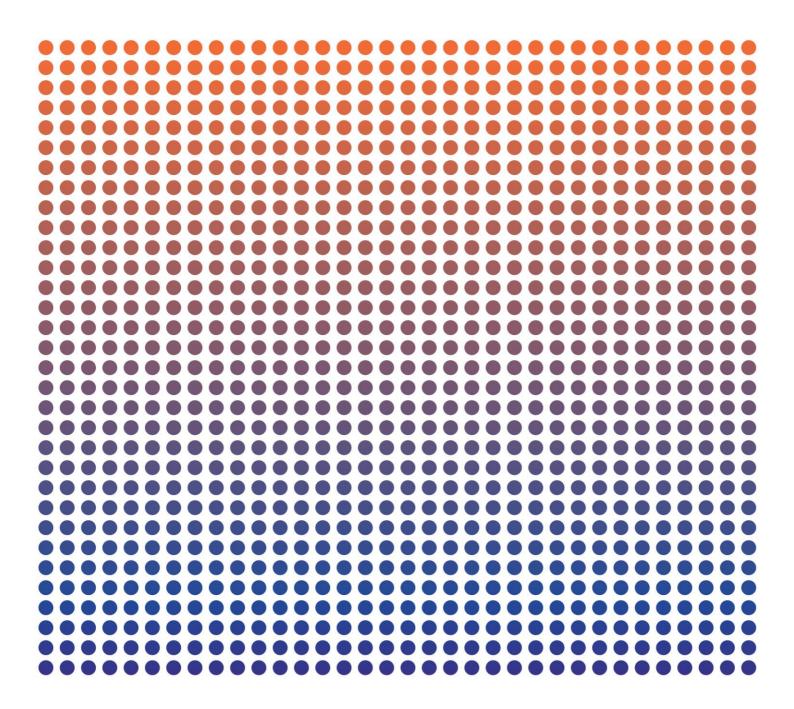


Planning Proposal

Proposed Expansion of Museum of Applied Arts and Sciences - Museum Discovery Centre, 2 Green Road, Castle Hill (Lot 102 DP 1130271)

October 2019





Prepared by Milestone (AUST) Pty Limited

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 Appendix C: Traffic Impact Assessment Report prepared by Northrop dated September 2019

1 INTRODUCTION

1.1 Introduction

This Planning Proposal has been prepared in accordance with Section 3.33 of the Environmental Planning and Assessment Act 1979 (the Act), the NSW Department of Planning and Environment guidelines and the key planning considerations discussed at the Pre-Planning Proposal Meeting held on 19 February 2019 with The Hills Shire Council Strategic and Statutory Planning Officers (Council). It relates to a proposed development comprising the expansion of the Museums Discovery Centre (MDC) at 172 Showground Road, Castle Hill (Lot 1 DP 1066281) by way of a new permanent building on the adjoining site directly to the east on the TAFE site located at 2 Green Road, Castle Hill (Lot 102 DP 1130271). The subject land is currently vacant and does not contain any buildings.

The site is zoned R2 Low Density Residential and this Planning Proposal is for an amendment to The Hills Shire Local Environmental Plan 2012 (LEP 2012) to change the zoning of the site from R2 Low Density Residential Zone to SP2 Infrastructure Zone (Information and Education Facilities) consistent with the zoning of the current MDC site.

This report details the objectives of the Planning Proposal, explains the proposed LEP 2012 amendment and provides the background to and justification for the proposal. This Planning Proposal includes an analysis of the subject site and proposal, in context of State and local planning policy and instruments and other relevant Gateway matters.

1.2 The Museum Discovery Centre

1.2.1 Overview

The MDC is owned and operated by the Museum of Applied Arts and Sciences (MAAS) and is a collaboration between MAAS, Australian Museum and Sydney Living Museums involving shared collection storage, public events and exhibition space. The MDC is located at 172 Showground Road, Castle Hill. There are six buildings primarily providing collection storage as well as some floor area use for various temporary and permanent exhibitions accessible to visitors (Building E). During 2017-2018 a total of 17,481 persons visited the MDC site.

Create Infrastructure at Create NSW is currently managing the design, development and construction of a new purpose built facility for collection storage and operations, with Lahznimmo Architects. The location of the proposed new MDC building (to be known as "Building J") is located on the western end of the existing TAFE site, near the eastern boundary of the MDC site. The primary objective of the Planning Proposal and subsequent Development Application (DA) it is to provide sufficient storage, production and operational facilities to accommodate the MAAS collections storage, workshops, offices, conservation and treatment facilities from the Ultimo Powerhouse Museum site, in a way that integrates with the existing MDC site and its operations on a permanent basis.

It is imperative that the proposed MDC expansion is operational prior to the development of the Powerhouse Museum at Parramatta in 2023 to ensure a seamless and uninterrupted transfer of the MAAS collection from the current Ultimo site whilst providing an essential permanent upgrade in facility capacity in terms of floor area and staff. The successful delivery of this project supports a priority cultural infrastructure project and is a NSW Government election commitment (Powerhouse Precinct at Parramatta).

It is intended that the existing MDC site and TAFE will remain operational during the construction of the proposed new building.

1.2.2 Government Cultural Policy Context

The proposed expansion of the MDC is an important component of the development of the Powerhouse Museum at Parramatta and redevelopment of the Powerhouse site at Ultimo, and has been developed to align with NSW Government strategic priorities specifically relating to the Government's cultural infrastructure strategy. Prior to the commencement of the proposal, a review undertaken by MAAS identified the need for the MDC expansion and the project's consistency with NSW Government policies and strategies.

An Extended Final Business Case (EFBC) was prepared following the review and supported by the NSW Government.

NSW Government Cultural Strategic Priorities

The key policies and strategies considered in the development of the EFBC are:

- Premier's Priorities
- Create in NSW: The NSW Arts & Cultural Policy Framework
- NSW 2021: A Plan to make NSW Number One
- State Infrastructure Strategy 2012 2032
- State Infrastructure Strategy Update 2014
- A Plan for Growing Sydney

The expansion of the MDC aims to deliver the following outcomes in alignment with NSW Government policy:

- Increase access and participation (target 15%) in the arts to support personal and collective wellbeing as well as flow-on economic benefits.
- Create career development opportunities.
- Facilitate the development of a Parramatta Cultural Precinct.
- Increase strategic investment in Western Sydney.
- Support partnerships with education, training, government organisations and the private sector in Western Sydney.
- Provide arts and culture infrastructure to support visitor growth, increased public interaction with creative industries and economic growth in NSW including regional areas.
- Strengthen Sydney's regional and global profile as a creative centre.
- Deliver high quality facilities that grow the arts and cultural opportunities in Western Sydney.

Cultural Infrastructure Strategic Priorities

In accordance with the Create NSW Business Plan 2018-19 objectives, a key purpose of Create Infrastructure is to deliver "fit-for-purpose" cultural infrastructure, including the delivery of the MDC Expansion Project.

The Cultural Infrastructure Plan 2025+ sets out the NSW Government's strategic priorities and associated goals for the planning and delivery of cultural infrastructure across NSW. The completion of the MDC Expansion Project is essential to the successful delivery of the Parramatta Cultural Precinct Project, which has been identified as a major project Government commitment under the Cultural Infrastructure Plan 2025+. There is a strong alignment between the MDC Expansion Project and the Cultural Infrastructure Plan 2025+ priorities and goals as noted in **Table 1**.

Table 1: Project Alignment with Cultural Infrastructure Plan 2025+ Goal and Objectives

Goal	Objective	Project Alignment - Response
2. Improve cultural infrastructure and precinct design to create better cultural spaces.	2.3 Consider and include impacts on the public domain in all planning for cultural infrastructure and clusters.	The key objective of the MDC Expansion Project is to enhance and improve upon the existing facilities whilst also delivering a high quality design with positive public domain outcomes.
8. Invest in new, fit-for-purpose infrastructure for the cultural sector.		The expansion of MDC will ensure a fit-for-purpose collections facility for MAAS.
15. Reinforce the benefits of our cultural institutions.	15.2 Maintain and renew our State Cultural Institutions.	The Project will result in the delivery of new cultural infrastructure for NSW and will support the continued successful operation of MAAS.

Cultural Infrastructure Plan 2025+

The Cultural Infrastructure Plan 2025+ defines cultural infrastructure as follows:

"Cultural infrastructure includes buildings and spaces that accommodate or support culture. It also includes the digital and technological infrastructure that enables online access to collections and performances, widening engagement, participation and appreciation for all audiences. Cultural infrastructure also includes outdoor amphitheatres and public

More than just traditional museums, galleries and theatres, cultural infrastructure includes the places where the cultural sector and broader community come together to create, share, learn and store products or experiences."

The proposal will support the attainment of the relevant Strategic Priorities and applicable Goals of the Cultural Infrastructure Plan 2025+ as detailed in Table 2 below.

"Strategic Priority 1: cultural infrastructure supports strong	Infrastructure Plan 2025+ Strategic Priorities and Associated Goals Goal 1: integrate cultural infrastructure planning with land-use and precinct planning • work with local councils to ensure that the importance of culture as a driver for creating vibrant places is reinforced through updated local planning instruments and strategic development		
communities and economies in New South Wales.			
	embed cultural infrastructure planning and delivery within cross- government land-use planning		
	Goal 2 : improve cultural infrastructure and precinct design to create better cultural spaces		
	develop a set of good design principles and criteria for NSW cultural infrastructure and promote their use within local councils, including: environmental sustainability, accessibility, resilience, using culture as an anchor for urban renewal and activation		
	Goal 3 : understand and maximise social and economic benefits of cultural infrastructure		
Strategic Priority 2 : access to space for community participation in culture	Goal 4: increase access to cultural infrastructure for all people of New South Wales		
Strategic Priority 3 : cultural infrastructure for a collaborative and thriving cultural sector	Goal 8: invest in new, fit-for-purpose infrastructure for the cultural sector Goal 9: support and invest in sustainable cultural infrastructure		
Strategic Priority 4 : creating impact through partnerships and capacity building	Goal 10: embed cultural infrastructure within other policy portfolios."		

2 THE SITE AND SITE CONTEXT

2.1 Site Description

The proposed Building J site is located within the property known as 2 Green Road, Castle Hill which comprises a single lot legally described as Lot 102 DP1130271. The site is generally square in shape with a splay corner to the intersection of Green Road and Showground Road and a total area of approximately 3.8ha. The site has a primary frontage of approximately 183m to Green Road and a secondary frontage of approximately 186m to Showground Road. Refer to **Figure 1**. The location of the proposed new MDC building (to be known as "Building J") is located on the western end of the site and is marked on **Figure 1** in a dashed yellow line (referred as the Building J Site). The overall site contains large institutional buildings set within a landscaped setting featuring a high tree canopy.

The overall site is a TAFE campus that caters for approximately 400 enrolled students, and provides courses on business and financial services, hospitality, general education, community services, health, nursing, carpentry, building and retail. Existing on site are TAFE buildings, car parking and vegetated open space areas. A dam is situated in the north eastern side of the site. The main public vehicle access to the MDC site is via Windsor Road. There are also vehicle access points to the MDC on Showground Road and Green Road. The MDC and TAFE have a longstanding arrangement, established by a good working and neighbour relationship, that permits vehicle access to the MDC site from Green Road and allowing vehicles to traverse across the TAFE site to access the MDC site.



Figure 1: Subject Site Map Source: SIX Maps 2019

The location of the proposed development (Building J) includes a plantation of densely planted trees, refer to **Photos 1 and 2**, as well as internal driveway and car parking on the southern end (refer to **Photos 3 and 4**). The Building J site has a total proposed site area of 6,990m², measures approximately 160m in length, 49.5m wide in the "middle section" and 76m wide at the southern end. The Building J site has a boundary to the MDC site to the west and a southern boundary to the road widening reserve to Showground Road. The Building J site is generally level.



Photo 1: View south east looking at the proposed site (Building J location), from Building F on the MDC site



Photo 2: View north east looking at the site, from Building F on the MDC site



Photo 3: View north along eastern edge of the site, showing interface with existing TAFE building

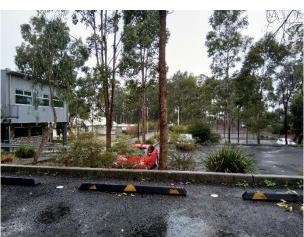


Photo 4: View east towards Green Road of existing TAFE car parking, taken from southern end of the site



Photo 5: View west towards proposed location of new Building J, from TAFE internal driveway



Photo 6: View east looking at the site (trees in background), Building F in the foreground

2.2 Site Context

Abutting the site to the south west is the existing MAAS MDC site located at 172 Showground Road, Castle Hill. Development surrounding the site to the east, and north consists of established residential neighbourhoods generally comprising two storey detached dwellings. Opposite the site to the south east and

south west are a mix of warehouses, industrial units, and large format bulky goods retail premises. Views into the TAFE and MDC site from the surrounding roads is obscured by the dense existing trees and vegetation along the perimeter of the sites.

An unnamed public park and children's playground abuts the rear boundary of the overall site and is bound by Sunderland Avenue to the east and Castlegate Place to the west. The dwellings along Sunderland Avenue and the southern side of Pentonville Parade are the nearest residential properties to the proposed Building J site. The nearest dwelling at 10 Sunderland Avenue is located approximately 50m from the northern edge of the Building J site.

The TAFE site is Zoned R2 Low Density Residential in LEP 2012 as shown in **Figure 2** with exception of a 15m-30m wide strip of land along the Showground Road boundary of the site zoned SP2 (Classified Road) which is designated for future road widening by the RMS.

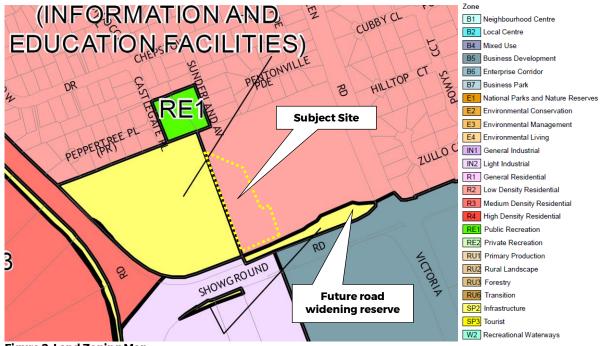


Figure 2: Land Zoning Map Source: LEP 2012

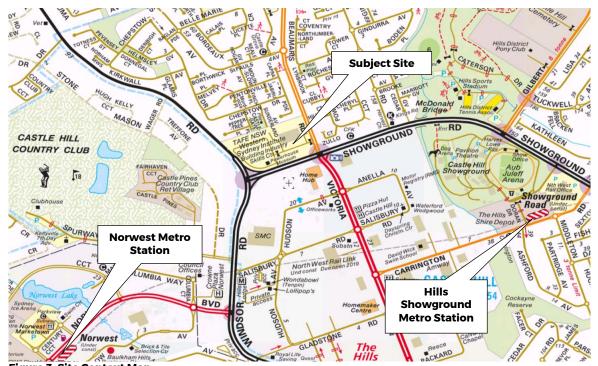


Figure 3: Site Context Map Source: Sydway Street Directory Online, 2019

The site is located 1.1km north west of the Hills Showground Metro Station and 1.45km to the north east of the Norwest Metro Station (refer to **Figure 3**). The site is accessible by bus, the nearest bus stop is located on the Showground Road frontage of the site which provides bus routes to the Hills Showground Metro Station (12 minute approx. bus ride) and nearby Castle Hill centre.

The site is within 20 minutes walking distance of the Hills Showground Metro Station. The site sits at the junction of Showground Road, Windsor Road and Victoria Road which provide connectivity to the Sydney arterial and motorway road network. The Westlink M7 Motorway is located approximately 4km to the south of the site, accessed via Windsor Road. The site is located approximately 11km and 27km north west from the Parramatta and Sydney CBDs and 8km to the north east of Blacktown (refer to **Figure 4**).

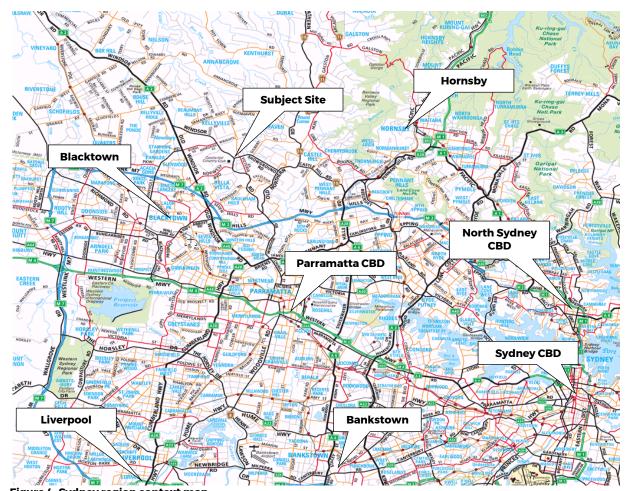


Figure 4: Sydney region context map Source: Sydway Street Directory, 2019



Photo 6: Existing Very Large Object (VLO) public display, MAAS MDC



Photo 7: Existing clean room in the MDC facility



Photo 8: Public reserve located at the rear of the TAFE site, looking at the site from Castlegate Place



Photo 9: Existing dwellings located at the north of the TAFE site, along Sunderland Avenue



Photo 10: Large format retail premises opposite the site to the south, view south from Showground Road and Green Road intersection

2.3 History of the Museum Discovery Centre Site at Castle Hill

2.3.1 Site History

In the 1940s, the Museum of Applied Arts and Sciences (the Museum) sought to acquire land in NSW to establish an experimental plantation for researching essential oils. A number of options were explored before the final decision was made to acquire property at Castle Hill, a site which encompasses what is now the Museums Discovery Centre (MDC) and TAFE sites.

Based on research undertaken by the Museum in 1990, it is understood that under the Public Works Act 1912, the State Government acquired the land, comprising the current day TAFE and MDC sites, 'for a public school' in 1947.

The Museum began research into the use of essential oils at the Castle Hill property in 1948 by planting a range of trees and shrubs. Buildings on the property included:

- A still-house containing five stills for the distillation of oil from the plantation leaves and a laboratory
- A residence for the on-site manager
- A range of sheds and a glasshouse.

Research into essential oils continued until 1979 when a report issued by the NSW Science and Technological Council recommended that the research undertaken by the Museum be transferred to the Department of Agriculture, as part of a wider rationalisation of all research being undertaken by NSW Government departments.

The Land Title to the entirety of the property (incorporating what is now the MDC and TAFE sites) was initially held by the NSW Department of Education. The Land Title for a portion of the site (on which the MDC now sits) was transferred to the Museum on 27 April 1994, and the remainder of the site was retained by the Department of Education.

2.3.2 Development of Collection Storage Facilities

From the late 1970s, a number of large buildings were constructed on the property to provide custom storage facilities for the Museum's increasing and diverse Collection.

Building A was the first storage building constructed on the site in 1978. Designed to house some of the larger objects within the Museum's Collection, Building A included two length of rail line for the storage of several trams. The open space within the store provided storage for the Museum's growing collection of planes, steam traction engines and motor vehicles.

When work began in the early 1980s on the conversion of the Ultimo power station to create the new Powerhouse Museum in Ultimo, a 'demountable' laboratory was erected for use by the Museum's Conservation team. Once the conservation facilities were completed at Ultimo, the laboratory was used for a variety of purposes including as a conservation laboratory for the Museums Association of Australia. The demountable remained on the MDC site until it was removed in 2015 to make way for the construction of the I Store Building.

Building B was constructed in the early 1980s to store medium to large objects, followed by Buildings C and G in the mid-1980s. Building C was designed specifically for the restoration of the Boulton and Watt steam engine before its installation at the Powerhouse Museum at Ultimo in 1988. Buildings B and C were demolished in 2015 to make way for the new I Store Building.

Building F was completed in 2001 and this was the first purpose built storage building that the Museum had full input into the design and construction. Prior to this, building design and construction had been managed by the NSW Department of Public Works. Building F was the first multi-level store allowing the Museum to maximise the land use for the site while providing optimal storage conditions for the Collection. This was achieved through the building having a large thermal mass allowing the plant to run with optimal efficiency while maintaining consistent temperature and humidity. Other features include interlocked roller doors on the loading dock to prevent loss of climate when the doors are opened, dedicated isolation rooms to temporarily store objects while inspection for pests and HEPA filtered air conditioning to minimise dust within the collection areas. When Building F was completed, a stores consolidation and rationalisation project began that allowed the Museum to begin storing objects by collection area, making it easier to access for both internal purposes but also for visitors and researchers.

Building H was completed in 2005 to coincide with the end of a lease on rented premises at Jones Street, Ultimo. Building H was a double floor store of a similar design to Building F with small changes to accommodate other parts of the collections. The ground floor is for large free-standing objects, many of which need to be moved by a mobile crane. The upper level is used for the storage of objects stored on pallets. This allowed the Museum to store some of the smaller items from its Collection here too, in addition to the medium-large items.

Building E was also completed in 2005 and from 2007 provided public access to the site for the first time. It provided a 'behind the scenes' experience and insight into how the Museum stored and cared for the Collection. Specialised guided tours through the other buildings were also offered to individuals and groups.

Building I was completed in 2017, to further develop storage for smaller objects from the Collection and to provide collection growth for the following 10 years. Building I was designed as a shared facility with the Australian Museum (AM) and Sydney Living Museums (SLM).

Completion of this building coincided with a refurbishment of Building A to include new shared Conservation cleanrooms and workshop, and a refurbishment of Building E designed to improve the visitor experience and incorporate objects from both the Australian Museum and SLM. The Museum occupies approximately $15,000m^2$ of collection storage space on the site with a further $3,000m^2$ in the public-facing display store (Building E).

The existing buildings on the MDC site are large warehouse style structures that have maximum building heights ranging from 7.5m (RL 121.7) on the western end of the site (Building A) to 11.6m, 13m, 14.5m and 17m above ground level for Buildings E, I and G (RLs 128.5, 126.1, 129.74 and 126) (refer to **Figure 5**).

The existing MDC site does not have any Floor Space Ratio or Building Height Controls under LEP 2012.

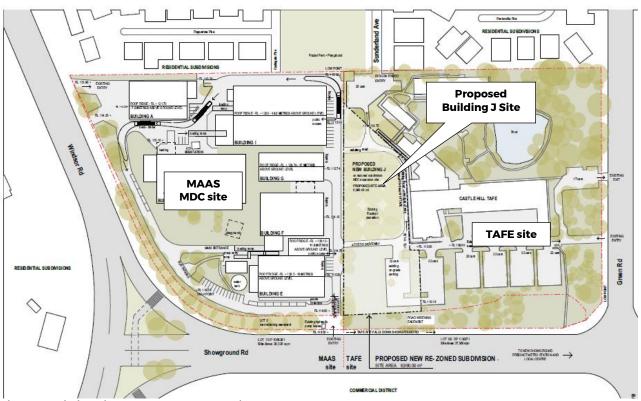


Figure 5: Existing Site Plan, TAFE and MDC Sites Source: Lahznimmo Architects, 2019

3 THE OBJECTIVES OR INTENDED OUTCOMES OF THE PLANNING PROPOSAL

This Planning Proposal has the following objectives:

- To enable the development of an expanded MDC facility (approx. 9,800m² GFA) to provide permanent additional storage, production and operational facilities suitable to the needs and specifications of MAAS that is similar in both scale and operation to existing facilities on the MDC site.
- The new facilities are to accommodate the collection storage (in particular for Very Large Objects e.g. trains, plains etc), workshops, offices, conservation and treatment facilities relocated from the existing MAAS Ultimo Site that is fully integrated with the MDC site and its operational requirements.
- Ensure the specialist facilities are delivered to a world-class standard and to protect valuable State heritage and cultural assets/collections in a secure, controlled and environmentally sustainable location.
- Enhance the role of the MDC site as an integral part of the MAAS network of sites and provide storage for all of the MAAS collection objects, which are not otherwise being displayed in Museum exhibitions or on loan to other institutions.
- Support the growth and development of the arts and cultural employment and skills sector in Western Sydney.
- Maintain the existing TAFE site functions and continue to work collaboratively with TAFE with respect to education opportunities associated with the proposal once operational.

These objectives will be achieved by amending LEP 2012 with revised zoning, development standards and associated LEP maps as follows to facilitate construction of Building J:

- Amend the zone from R2 Low Density Residential Zone to SP2 Infrastructure (Information and Education Facilities) over part of the TAFE site.
- Amend the building height from 10m to 15m over part of the TAFE site.

The existing zoning of the site is R2 Low Density Residential pursuant to LEP 2012 as shown in **Figure 2**. The existing use of the site is Castle Hill TAFE which is prohibited in the R2 Low Density Residential Zone in LEP 2012 but benefits from existing use rights on the site. Notwithstanding, it is noted that the use of the site as a TAFE facility is permissible pursuant to the provisions of the State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017.

In order to deliver a new MDC building that will cater for the objectives and proposed uses noted above, the rezoning of part of the TAFE site to SP2 Infrastructure with the specific use noted the amended zoning map as "Information and Education Facilities" is required. "Information and education facility" is defined in LEP 2012 as follows:

"information and education facility means a building or place used for providing information or education to visitors, and the exhibition or display of items, and includes an art gallery, museum, library, visitor information centre and the like."

The intended outcome of this Planning Proposal is to allow the construction of a new permanent building for use by the MDC required as a result of the development of the Powerhouse Museum at Parramatta by 2023, and to provide permanent additional collection, conservation and research facilities for the MDC on the site in a modern, purpose built building.

4 THE PROPOSAL AND EXPLANATION OF PROVISIONS

4.1 Proposed Development

An amendment to LEP 2012 is sought because the proposed development is prohibited in the R2 Low Density Residential Zone and the current 10m maximum building height that applies to the site is insufficient to accommodate the scale of development required.

The objective of the Planning Proposal is to facilitate the expansion of the existing MDC operations by constructing a new permanent building on the western end of the TAFE site. It is proposed to do this by amending the zoning to SP2 Infrastructure (Information and Education Facilities), increasing the maximum building height from 10m to 15m and lodging a DA with Council for the construction and use of the building.

There are no Floor Space Ratio or Maximum Building Height development standards that currently apply to the MDC site under LEP 2012.

Refer to Table 3 and Figures 6 - 9.

Table 3: Proposed amendments to LEP 2012

Development standard proposed to be amended	Existing LEP 2012 provision	Proposed amended LEP 2012 provision
Zoning	R2 Low Density Residential Zone	SP2 (Information and Education Facilities)
Building height	10m	15m

The main elements of the proposal are as follows:

Site Area: 6,990m² Gross Floor Area (approx..): 9,800m²

Maximum building height: 14.35m (RL 125.1 AHD)

Car parking: Existing 54 car parking spaces on the MDC site will be utilised by the

proposal. No additional on-site car parking is proposed. 24 car parking spaces within the footprint of the proposal will be relocated to the eastern

end of TAFE site near Green Road.

Loading Docks: Two

Delivery Hours: 8am to 5pm, Monday to Sundays Staff: 50 additional staff for Building J

The proposal will require the removal of 337 trees from the TAFE site to accommodate the proposed Building J. Of the total trees proposed to be removed, 330 are plantation trees that were planted on the site in the 1940s for researching essential oils (refer to Section 2.3.1). There is no remnant Cumberland Plain woodland vegetation on the proposed Building J development site. New landscaping including a mix of ground covers, shrubs and trees is proposed around the periphery of the proposed Building J and will be subject to a detailed Landscape Plan to be submitted with the DA.

It is proposed that the new building (to be known as Building J) will primarily be used for the following activities.

- Storage for the current collection and archives (both collected archives and institutional archives).
- Primary collection, conservation and care laboratories and workshop.
- Photography, digitisation and collection documentation facilities.
- Office space for staff, including staff amenities, meeting and storage rooms, collection research and study areas as well as other ancillary facilities.
- Storage for VLOs which are not on display at the new Powerhouse Museum in Parramatta or within any cultural presence at Ultimo.
- Components of the image and research library.
- Object and exhibition preparation, packing, quarantine and holding areas.
- Metal, wood and paint workshops for exhibition fabrication and construction.
- Investigation of visible collection storage and visible back of house areas.

Public access to the proposed Building J will be restricted to a pre-arranged booking basis for access to the collection for research purposes and small group visits. The existing publically accessible areas on the MDC site will not be altered by the proposal.

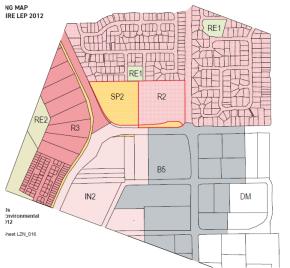


Figure 6: Existing LEP 2012 zoning map (R2 Low Density Residential Zone)

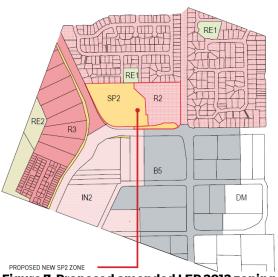


Figure 7: Proposed amended LEP 2012 zoning map (SP2 Infrastructure - Information & Education Facilities)



Figure 8: Existing LEP 2012 height of building map ("K" = 10m maximum building height)

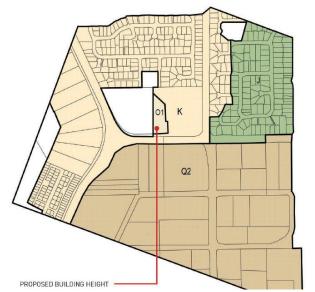


Figure 9: Proposed amended LEP 2012 height of building map ("O1" = 15m maximum building height)

5 JUSTIFICATION OF THE PROPOSAL

5.1 Need for the Planning Proposal

5.1.1 Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?

The Planning Proposal is not the result of an endorsed local strategic planning statement, strategic study or report, however it is consistent with the applicable strategic planning policies detailed in this report and is a critical component of the NSW Government's plan to relocate the Powerhouse Museum from Ultimo to Parramatta. The Final Business Case Summary for "Powerhouse Museum in Western Sydney" provides the following matters of relevance:

"The Greater Sydney Region Plan Metropolis of three Cities identifies the relocated Museum as one of the key projects that will drive the transformation of Greater Parramatta. The Greater Sydney Commission's Central City District Plan states that "a new museum on the banks of Parramatta River will be the anchor for arts and culture for the District. It has potential to deliver world-class opportunities for education and research, alongside exhibition space, and space for social and digital interaction and exchange.

Also included within the Project's scope is the expansion of the current Museum's Discovery Centre at Castle Hill to provide a purpose-built facility for the care and storage of MAAS's collections. This investment will reduce the need for collection treatment and storage in Parramatta, and thereby maximise gallery and visitor space."

The proposal has been the subject of pre-application consultation with Council Officers held on 19 February 2019. The matters raised in the meeting and Council's minutes received on 11 March 2019 have been addressed in this report.

5.1.2 Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The Planning Proposal for rezoning of the site from R2 Low Density Residential to SP2 Infrastructure (Information and Education Facilities) and increasing the building height from 10m to 15m, is the preferred method to achieve the intended outcome to permit the proposed development, which to facilitate the construction of a building for use by the Museum of Applied Arts and Sciences.

The use of the site for information and education purposes (current use of the MDC site) is not permissible in the R2 zone and a Planning Proposal is required.

It is considered that the site is well suited for the proposed use and construction of a new building, to an information and education facility, and does not inhibit the future development of the TAFE site, or detract from the amenity of the surrounding adjacent residential uses.

5.2 Relationship to Strategic Planning Framework

5.2.1 Will the planning proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

A Metropolis of Three Cities - the Greater Sydney Region Plan (2018)

The Greater Sydney Commission leads metropolitan planning for the Greater Sydney region. The key strategic plans prepared by the Greater Sydney Commission are "A Metropolis of Three Cities - the Greater Sydney Region Plan" (Greater Sydney Region Plan) and five District Plans, all released in March 2018.

The Greater Sydney Region Plan is the 40-year vision underpinning each of the 20-year District Plans. The Plan envisages Sydney's economic and population growth being located in three cities within the Greater Sydney region:

- Western Parkland City;
- Central River City; and
- Eastern Harbour City.

The Plan outlines four goals for Sydney:

- "A competitive economy with world-class services and transport;
- A city of housing choice that meets our needs and lifestyles;
- A great place to live with communities that are strong, healthy and well connected; and
- A sustainable and resilient city that protects the natural environmental and has a balanced approach to the use of land and resources."

The site is located within the Central River City identified within the Greater Sydney Region Plan (refer to **Figure 10**). The Greater Sydney Region Plan outlines the vision for Sydney which includes provision for increasing productivity, urban renewal, reducing kilometres travelled per person and investment in infrastructure (such as the Sydney Metro North West Rail Link).

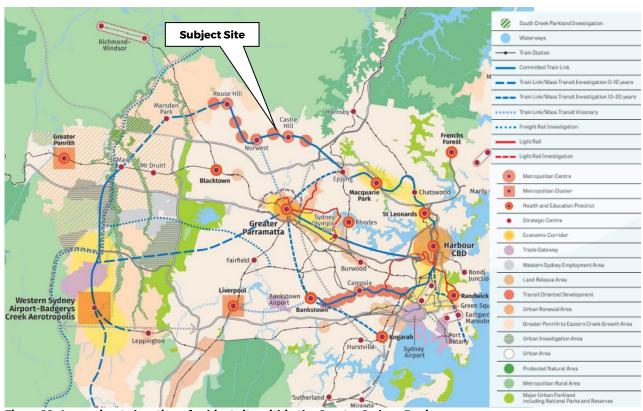


Figure 10: Approximate location of subject site within the Greater Sydney Region Source: Greater Sydney Region Plan, 2018

The Greater Sydney Region Plan notes that the Central River City is expected to increase its population from 1.3 million to 1.7 million people by 2056.

The suburb of Castle Hill is identified as a Strategic Centre. The expectations for Strategic Centres as follows:

- "High levels of private sector investment;
- Flexibility, so that the private sector can choose where and when to invest;
- Co-location of a wide mix of land uses, including residential;
- High levels of amenity and walkability and being cycle friendly; and
- Areas identified for commercial uses, and where appropriate, commercial cores."

There are no specific objectives for Castle Hill in the Greater Sydney Region Plan.

The proposal will contribute to Government investment in Castle Hill, by facilitating the expansion of the MDC via the rezoning of the subject land, which will contribute to the mix of land uses in the area, and support jobs growth during the construction and operational phases of the proposed development.

The proposed land use is compatible with the surrounding residential zoned land and will not reduce the current high levels of amenity, walkability and cycle friendly urban design which are currently enjoyed by the area. The proposal does not propose to use or rezone commercial land and will not impact on any surrounding commercial uses.

Table 4 considers the compliance of the proposal with the relevant objectives of the Greater Sydney Region Plan.

Table 4 - Compliance of the Proposal with the relevant Objectives of the Greater Sydney Region Plan

Table 4 - Compliance of the Proposal with the relevence Objective	Response
Objective 1	- Itemporine
Infrastructure supports the three cities	The proposal is for the rezoning of land and to increase the maximum building height to facilitate the provision of infrastructure, being the expansion of the MDC to allow sufficient storage, production and operational facilities to accommodate the MAAS collections, storage workshops, offices, conservation and treatment facilities from the Ultimo Powerhouse Museum as part of the development of the new Parramatta Powerhouse Museum scheduled to open in 2023. Additional custom infrastructure which integrates with the existing MDC is essential and supports the growth of arts and culture in the Central River City.
Objective 2	
Infrastructure aligns with forecast growth - growth infrastructure compact	The proposed infrastructure is located in an area of forecast growth. The Central River City is expected to experience population increase from 1.3 to 1.7 million people by 2056.
Objective 3	
Infrastructure adapts to meet future needs	The proposal is to facilitate the expansion of arts and culture infrastructure to meet the future needs of the MDC when the new Parramatta Powerhouse Museum opens in 2023. The proposal will also provide a modern, purpose built facility that will cater for current and future operational and staff requirements of the MAAS.
Objective 4	The lates of positions, and dust requirements of the mirror.
Infrastructure use is optimised	The proposed infrastructure is custom designed in close collaboration between Lahznimmo Architects, Create Infrastructure and the MAAS technical team and government representatives to meet the specific current and forecast future needs of the MDC and will be optimised as a result.
Objective 5	
Benefits of growth realised by collaboration of governments, community and business	The proposed expansion of the MDC facility will benefit the community and local business through the provision of jobs during construction and operational phases, diversification of skills employment and additional visitation leading to flow on effects to nearby businesses. The benefits of the proposal can be realised by the collaboration of Local Government to align with the goals of the State Government.
Objective 6	
Services and infrastructure meet communities' changing needs	The proposed amended maximum building height and rezoning of the site to facilitate the provision of MDC infrastructure will meet the changing needs of the community by supporting the expansion of the MDC on its current site and the relocation of the Powerhouse Museum to Parramatta.
	The proposal is an integral part of the Powerhouse Museum relocation as it will reduce the need for collection treatment and

Objective	Response	
	storage in the Parramatta site, and thereby maximise gallery and visitor space for the new Powerhouse Museum.	
Objective 7		
Communities are healthy, resilient and socially connected	The proposal will help to promote a socially connected community by providing for expansion of MDC facilities with the key purpose to support increased visitation to the new Powerhouse Museum site.	
Objective 8		
Greater Sydney's communities are culturally rich with diverse neighbourhoods	The proposal will contribute to the cultural richness of Castle Hill by allowing for the expansion of the MDC.	
Objective 9		
Greater Sydney celebrates the arts and supports creative industries and innovation	The proposed relocation of resources from the Powerhouse to the MDC directly celebrates the arts and supports creative industries and innovation in Greater Sydney.	
Objective 12		
Great places that bring people together	Castle Hill is identified as a Strategic Centre by the Greater Sydney Region Plan and the MDC site adjoins the Showground Station Precinct which is planned to accommodate an additional 2,300 jobs and 5,000 new homes by 2037. The proposal will serve an important role as a place for the local community to visit including school and community groups. The proposal will result in greater activation of the site and will contribute increased workers which in turn will support increased opportunities for social interaction in The Hills Shire LGA.	
Objective 21		
Internationally competitive health, education, research and innovation precincts	The expansion of the MDC will contribute to the enhancement of an internationally competitive education, research and innovation precinct.	
Objective 22		
Investment and business activity in centres	The government investment for the expansion of the MDC site directly contributes to economic stimulation and activity in the Castle Hill Strategic Centre.	
Objective 27		
Biodiversity is protected, urban bushland and remnant vegetation is enhanced	No remnant vegetation will be affected by the proposal. The removal of trees on the site has been assessed by a MacKay Tree Management as satisfactory. The Arborist report is held at Appendix B .	
Objective 28		
Scenic and cultural landscapes are protected	The proposed expansion of the MDC directly contributes to the protection of the cultural landscape. Some removal of vegetation is proposed, however adequate vegetation will be retained to screen the building from Showground Road to the south and Sunderland Avenue to the north. The building has been carefully designed to conform with the bulk and scale of existing buildings on the site, and will sit comfortably as an infill development of complementary scale and size for the MDC and TAFE sites.	

Central City District Plan (2018)

The Central City District Plan (2018) presents a vision for the local government areas of Blacktown, Cumberland, Parramatta and The Hills (refer to **Figure 11**). The Central City District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. In this regard, the proposal will contribute to the growth of cultural assets in an area with limited existing options.

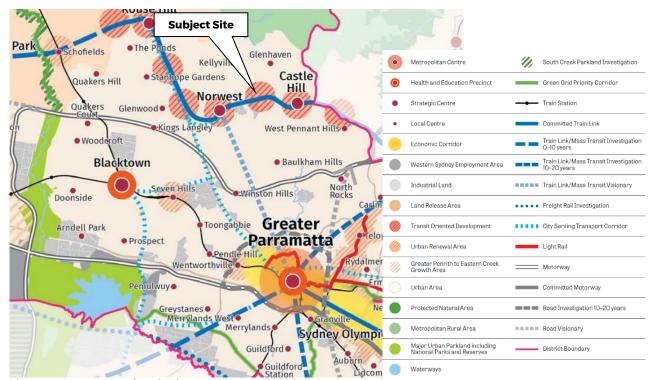


Figure 11: The Central City District Source: Central City District Plan, 2018

Table 5 considers the compliance of the proposal with the relevant Planning Priorities of the Western City District Plan 2018.

Table 5 - Compliance with the relevant Planning Priorities within the Central City District Plan 2018

Planning Priority	Response
Priority N1	
Planning for a city supported by infrastructure	The proposal is for the provision of expanded cultural infrastructure in Castle Hill, a location where there are limited existing similar facilities. The proposed infrastructure supports the cultural needs of the Central City.
	Castle Hill will be connected by the Sydney North West Metro Rail Link to Chatswood, Sydney CBD and Rouse Hill. The rail link will provide infrastructure to access the area.
Priority N2	
Working through collaboration	The proposal results in the collaboration of Local and State Government to achieve mutually beneficial targets.
Priority N3	
Providing services and social infrastructure to meet people's changing needs	The proposal will provide cultural infrastructure which contributes to social health by meeting the needs of the community for culture and the arts. The population growth expected in the Central City will create changing needs which requires a greater variety of cultural infrastructure.
Priority N4	

Planning Priority	Response	
Fostering healthy, creative, culturally rich and socially connected communities	The proposed expanded facility fosters a culturally rich community and provides opportunities for social connection within the community.	
Priority N6		
Creating and renewing great places and local centres, and respecting the District's heritage	The proposal will provide expanded services in the Castle Hill Strategic Centre which will contribute to the creation of Castle Hill as a "great place" to live, work and visit, with access to services.	
Priority N10		
Growing investment, business opportunities and jobs in strategic centres	The proposal is for significant investment in the cultural capital of the "Central City" within the Greater Sydney Region. Opportunities and jobs will be created both during construction and during future operations.	
Priority N19		
Reducing carbon emissions and managing energy, water and waste efficiently	The new building J will target a number of key initiatives that will reduce the impact of the development on the environment. These initiatives include addressing the sustainability objectives within the following documents:	
	 The Hills Shire Council DCP 2012. BCA Section J - J1 and J2. NSW Government Resource Efficiency Policy (2014) (GREP) which further mandates the development to target Australian Best Practice in Green Building design by self-assessing within the Green Star - Design and As Built V1.2 framework. 	
	The sustainability initiatives will address energy efficiency, water efficiency and waste management measures. The integration of core sustainability principles will be explored during the design development and DA submission.	

5.2.2 Q4. Will the planning proposal give effect to a council's endorsed local strategic planning statement, or another endorsed local strategy or strategic plan?

Draft "Hills Future 2036" Local Strategic Planning Statement (2019)

Section 3.9 of the Act establishes the requirement for Councils to prepare a Local Strategic Planning Statement (LSPS) and review and update the LSPS at least every 7 years. Section 3.9 of the Act stipulates that an LSPS must include or identify the following:

- "The basis for strategic planning in the area having regard to economic, social and environmental matters;
- The planning priorities consistent with any other strategic plan (Greater Sydney Region Plan and Central City District Plan) and Community Strategic Plan;
- The actions for achieving the planning priorities; and
- The basis on which Council is to monitor and report on the implementation."

The draft "Hills Future 2036 LSPS" was exhibited from 1 July to 9 August 2019 and the MDC and TAFE sites are identified as being within the "Norwest Strategic Centre" Structure Plan. The draft Hills Future 2036 LSPS does not nominate any specific aims or objectives in relation to the MDC or TAFE sites.

This Planning Proposal facilitates an extension to the existing MDC site which is an important museum facility that contributes to the cultural character of the Hills Shire LGA. The Planning Proposal will provide expanded facilities to support the ongoing operation of the MDC and the needs of the current and future Hills Shire LGA population. Further, the proposal will assist with supporting the following Planning Priorities as set out in the draft Hills Future 2036 LSPS:

- "Planning Priority 1: Plan for sufficient jobs, targeted to suit the skills of our workforce.
- Planning Priority 10: Provide services & social infrastructure to meet residents' needs.
- Planning Priority 23: Collaborate with other LGA's and Government to improve our places."

The Hills Local Strategy (2008)

The Local Strategy adopted in 2008 is Council's long-term strategy for the future of The Hills Shire community. The Local Strategy aims to "provide an overall strategic context for the planning and management of development and growth in the Shire to 2031". The objectives of the Local Strategy are:

- "To ensure that the future growth and development of the Shire reflects the vision of its community, to balance urban growth, protect the environment and build vibrant communities and a strong local economy with resilient leadership as identified in Council's 'Hills 2026 Community Strategic Plan;
- To ensure a coordinated whole of local government approach to managing our assets and achieving set targets;
- To provide guidance and a strategic context for decision making for land use and planning matters;
- To respond to State Government legislation, policy and plans;
- To inform the drafting of the Local Environmental Plan and Development Control Plan for the Shire;
- To provide key stakeholders with a clear understanding of how the Shire will grow and develop; and
- To complement and guide other programs and projects of Council regarding the planning, development and management of landuse within the Shire."

The Planning Proposal is consistent with the above objectives. The proposal will contribute to building a vibrant community by expanding an important cultural facility. The proposed amendment to the LEP 2012 zoning and building height control for the site will ensure a whole of government approach and respond to the State Government goal to develop a new Powerhouse Museum in Parramatta to open by 2023 and redevelop the existing Powerhouse Ultimo site.

Castle Hill is identified in the Local Strategy as the main centre in The Hills Shire. The proposal will strengthen this position. Council aims to provide 12,000 additional jobs in Castle Hill by 2031 and the proposal will contribute to achieving this goal.

The Local Strategy does not contain any specific reference to information and education facilities or the site.

The Hills Centres Direction (2009)

The Centres Direction adopted in 2009 provides an overall strategic context for managing the Shire's centres until 2031. The key directions and objectives are:

- "C1 Create vibrant centres that meet the needs of the community;
- C2 Make centres more attractive places to visit;
- C3 Make centres accessible to the community;
- C4 Improve the functioning and viability of existing centres; and
- C5 Plan for centres in new areas."

Castle Hill is the main centre in The Hills Shire. The expansion of the MDC will contribute to the ongoing creation of a vibrant Castle Hill centre that meets the needs of the community for access to culture, arts and sciences, it will contribute to the Castle Hill centre becoming more attractive to visit, and will improve the function and viability of the existing centre as a result of government investment and jobs growth during the construction and operational phases of the project. The objectives of the Centres Direction are achieved by the proposal.

The Centres Direction does not make any specific reference to the site or information and education facilities.

5.2.3 Is the Planning Proposal consistent with applicable State Environmental Planning Policies?

The State Environmental Planning Policies (SEPPs) that are relevant to the proposal are addressed below.

<u>State Environmental Planning Policy (State and Regional Development) 2011 (State and Regional Development SEPP)</u>

The aim of the State and Regional Development SEPP is to identify development that is state significant. Schedule 1 of the State and Regional Development SEPP specifies development that is classified as State Significant Development and includes:

"13 Cultural, recreation and tourist facilities

- (1) Development that has a capital investment value of more than \$30 million for any of the following purposes:
 - (a) film production, the television industry or digital or recorded media,
 - (b) convention centres and exhibition centres,
 - (c) entertainment facilities,
 - (d) information and education facilities, including museums and art galleries,
 - (e) recreation facilities (major),
 - (f) zoos, including animal enclosures, administration and maintenance buildings, and associated facilities."

Although the development may exceed the \$30 million Capital Investment Value threshold under Schedule 1 of the State and Regional Development SEPP to be classified as State Significant Development, it is intended that a Development Application will be lodged with Council for the future construction and operation of Building J on the basis the principal purpose of the building will not be for visitation by the public.

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

The aim of State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 (Educational SEPP) is "to facilitate the effective delivery of educational establishments and early education and care facilities across the State." The proposal is considered to be permissible development pursuant to Clause 52(4) of Educational SEPP which states that:

"52(4) A TAFE establishment (including any part of its site and any of its facilities) may be used, with development consent, for the physical, social, cultural or intellectual development or welfare of the community, whether or not it is a commercial use of the establishment."

Notwithstanding, following liaison between Create NSW and TAFE it was considered that the Educational SEPP has not been tested to the extent required to construct a new building of the scale proposed on the land where the use is not permissible, as in this instance, resulting in a large facility occupying TAFE land but not operated by TAFE. Amending the zoning of the site under LEP 2012 rather than having to rely on Clause 52(4) of the Educational SEPP was therefore considered the best planning pathway to achieve the required outcome.

State Environmental Planning Policy 55 - Remediation of Land

Clause 6 of SEPP 55 requires the planning authority to consider whether the land proposed to be rezoned is contaminated. Clause 6(1) states:

- "6 Contamination and remediation to be considered in zoning or rezoning proposal
- (1) In preparing an environmental planning instrument, a planning authority <u>is not to include in a particular zone</u> (within the meaning of the instrument) any land specified in subclause (4) if the inclusion of the land in that zone would permit a change of use of the land, unless:
 - (a) the planning authority has considered whether the land is contaminated, and
 - (b) if the land is contaminated, the planning authority is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for all the purposes for which land in the zone concerned is permitted to be used, and
 - (c) if the land requires remediation to be made suitable for any purpose for which land in that zone is permitted to be used, the planning authority is satisfied that the land will be so remediated before the land is used for that purpose.

Note. In order to satisfy itself as to paragraph (c), the planning authority may need to include certain provisions in the environmental planning instrument.

Clause 6(4) states:

- (4) The following classes of land are identified for the purposes of this clause:
 - (a) land that is within an investigation area,
 - (b) land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,

- (c) to the extent to which it is proposed to carry out development on it for residential, educational, recreational or child care purposes, or for the purposes of a hospital—land:
 - in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and
 - (ii) on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).

The use of the land for tree oil growing and research is a type of activity similar to a forest plantation and is not a type of activity that is listed in Table 1 of the *Management Land Contamination Planning Guidelines SEPP 55 - Remediation of Land* prepared by the Department of Urban Affairs and Planning dated 1998. The site is not located within an "investigation area".

A Stage 1 - Preliminary Site Investigation Report has been prepared by Alliance Geotechnical to achieve the following objectives:

- "Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted)."

The Stage 1 Report concluded that:

- "Areas of environmental concern (AEC) have been identified for the site; and
- Further assessment of the identified AEC, and subsequent management/remediation of identified unacceptable land contamination risks (if warranted), would be required to confirm land use suitability (in the context of land contamination) for the proposed redevelopment works."

Alliance Geotechnical prepared a Stage 2 - Detailed Site Investigation Report to address the conclusions in the Stage 1 Report. The Stage 2 report is submitted with this Planning Proposal and concludes:

"Ecological Screening Levels (ESLs)

The concentrations of relevant contaminants of concern detected in the soil samples analysed were less than the applicable adopted ecological screening levels (ESL) with the exception of PFOS (A PFAS compound) within soil samples P4 and P6.

Although these samples exceeded the interim indirect exposure guidelines, it is noted that soil from sampling locations where PFAS compounds were identified will be excavated as part of the basement construction thereby removing what limited risk to the limited ecological receptors surrounding the site. Furthermore, due to the nature of the construction, any soil leftover will be covered by concrete including the basement and the ground floor thus removing terrestrial ecological exposure pathways. It is thus the opinion of AC that the detected concentration of PFAS does not pose a significant risk to surrounding ecological receptors.

Based on the assessments undertaken as part of this investigation, AC has concluded that the site is deemed suitable for the proposed land use setting. AC [Alliance Geotechnical] can conclude that no further investigation should be required for this development to proceed."

Based on ground testing, analysis and conclusions within the Stage 2 -Detailed Site Investigation Report, the preparation of a Remediation Action Plan (RAP) is not deemed necessary by Alliance Geotechnical. The proposed rezoning of the site to accommodate the future Building J will be an acceptable use of the site and the Planning Proposal satisfies the provisions of Clause 6(1) of SEPP 55.

State Environmental Planning Policy 64 - Advertising Signage

The proposed MDC building will include signage, however this will be addressed at DA stage. The proposal is considered capable of complying with the requirements of SEPP 64.

5.2.4 Is the Planning Proposal consistent with applicable Ministerial Directions (s.9.1 Directions)?

The Ministerial Directions, issued on 1 July 2009, to planning authorities under section 9.1 of the Act, formerly Section 117 (as of the latest version dated 28 February 2019) that are relevant to this Planning Proposal are addressed in this section and include the following:

- 3.1 Residential Zones.
- 5.9 North West Rail Link Corridor Strategy.
- 5.10 Implementation of Regional Plans.
- 7.1 Implementation of A Plan for Growing Sydney.
- 7.4 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan.

Direction 3.1 Residential Zones

Direction 3.1 applies when a planning authority prepares a planning proposal that will affect land within an existing residential zone. The site is zoned R2 Low Density Residential and Direction 3.1 applies. When this direction applies a planning authority must:

- "(4) A planning proposal must include provisions that encourage the provision of housing that will: (a) broaden the choice of building types and locations available in the housing market, and (b) make more efficient use of existing infrastructure and services, and (c) reduce the consumption of land for housing and associated urban development on the urban fringe, and (d) be of good design.
- (5) A planning proposal must, in relation to land to which this direction applies:

 (a) contain a requirement that residential development is not permitted until land is adequately serviced (or arrangements satisfactory to the council, or other appropriate authority, have been made to service it), and (b) not contain provisions which will reduce the permissible residential density of land."

The proposal seeks to amend the R2 Low Density Residential zoning to an SP2 Infrastructure (Information and Education Facilities) zoning for the area of the site required for Building J. The site is currently occupied by TAFE buildings with no plans that it will be used for residential dwellings in the future. The removal of the R2 Zone is the most appropriate response to Direction 3.1

Direction 5.9 North West Rail Link Corridor Strategy

Direction 5.9 applies to land within the Hills Shire Council located along the North West Rail Link (known as the Sydney Metro North West). The site is located adjacent to, and not within the Showground Station Precinct nor is the site within the North West Rail Link Corridor Strategy. Direction 5.9 does not apply to the proposal.

Direction 5.10 Implementation of Regional Plans

Direction 5.10 requires all Planning Proposals to be consistent with any Regional Plan released by the Minister. The Planning Proposal is consistent with the Greater Sydney Region Plan as addressed in Section 5.2.1 of this report.

Direction 7.1 Implementation of A Plan for Growing Sydney

The objective of Direction 7.1 is to give legal effect to the planning principles; directions; and priorities for subregions, strategic centres and transport gateways contained in A Plan for Growing Sydney. Refer Section 5.2.1 for further discussion on the proposal in relation to A Plan for Growing Sydney "A Metropolis of Three Cities - the Greater Sydney Region Plan."

<u>Direction 7.4 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan</u>

Direction 7.4 applies to The Hills Shire Council with the objective of ensuring development within the North West Priority Growth Area is consistent with the North West Priority Growth Area Land Use and Infrastructure Strategy. The site is not located in the North West Priority Growth Area and Direction 7.4 does not apply.

5.3 Environmental, Social and Economic Impacts

5.3.1 Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The site has a long standing history since the 1940s as a site of scientific, research and educational uses by government. The development of the site for a TAFE campus involved the construction of buildings, car parking and associated facilities that have changed the natural features of the land. Based on the research undertaken by Create Infrastructure, and the detailed site investigation and assessment conducted by the arborist Mackay Tree Management, there is no remnant natural vegetation on the proposed Building J site.

The Planning Proposal and proposed development is not likely to result in any adverse impact on critical habitat or threatened species, populations or ecological communities, or their habitats. The proposed development will result in the loss of approximately 337 trees currently existing on the site which has been assessed the Arborist Report prepared by MacKay Tree Management (held at **Appendix B**). New landscaping will be provided along the periphery of the new building and elsewhere on the site as part of a detailed landscape plan to be submitted with the future DA.

The Arborist Report confirms that it is not necessary to carry out an assessment of significance in accordance with Part 7 of the Biodiversity Conservation Act 2016. The report concludes the following:

"The site has been aerial mapped by The Hills Shire Council as Cumberland Plain Woodland (CPW). However Council has advised that they have not tabled Stand B as CPW and although Corymbia maculata (Spotted Gum) is characteristic of CPW the subject trees are planted not remnant CPW.

The trees are planted landscape natives that will need to be removed and replaced as part of site landscaping works. A 'threatened species test of significance (former 7-part test)' in accordance with the Biodiversity Conservation Act 2016, is not required as part of this or any future DA proposal.

Replenishment plantings are unlikely to offset the percentage of lost, mature canopy, however the proposed tree removals do not exceed the threshold for removal of native vegetation under the Biodiversity Offset Scheme. It is recommended that to restore the landscape amenity of the site replacement plantings of locally indigenous trees such as Eucalyptus resinifera (Red Mahogany), Eucalyptus paniculate (Grey Ironbark) and Eucalyptus globoidea (White Stringybark) and understorey native shrubs are planted in appropriate locations."

5.3.2 Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?

Car Parking and Traffic

A Traffic Report prepared by Northrop (held at **Appendix C**) was prepared to accompany the Planning Proposal. This report outlines the car parking and traffic related impacts of the proposed development.

The analysis concludes:

"Due to the nature of the use of Building J as a storage facility, there will only be a small increase in traffic which will generate a minimal change to the performance of the surrounding key road intersections. This will also increase the parking demand for parking within the site however the MDC site has ample space to provide additional car parking opportunities.

There will be some public visits however these would have minimal traffic/car parking impact.

Additional car parking spaces will be required to be included in the existing site to accommodate the proposed development of Building J.

There is good public transport links around the area including the provision for buses and the Sydney Metro. These services link the MDC site to the Sydney network.

There is good connectivity of pedestrian and cyclist travel routes that link the MDC site with the surrounding area inclusive of the Hill Showground Station.

Overall the proposal has an acceptable minimal traffic and car parking impact and the site is well connected by bus and rail public transport options.

The Traffic Report states that the operation of Building J will generate demand for a total of 63 on-site car parking spaces, which is a shortfall of nine car parking spaces based on the existing 54 car parking spaces on the MDC site. This shortfall is deemed acceptable in this circumstance on the basis of the following factors:

- Preparation and implementation of a Green Travel Plan at DA stage to encourage use of public transport and reduce the use of on-site car parking by staff. A Green Travel Plan is not currently implemented.
- Actual car parking counts reveal a low rate of usage of car parking spaces.
- Significant improved connectivity with operation of Metro Rail Line as viable transport alternative to car travel.
- Standard timetable and On-demand buses operated by Hillsbus will provide direct transport links to the surrounding area, including to the site, for employees and visitors who live in the local Castle Hill area and surrounding suburbs as well as to and from the Hills Showground Metro Station.

In addition to the above, the site is accessible through the existing footpath network and cycleways that will facilitate walking and cycling as sustainable transport options for staff and visitors to the site.

Built Form

The proposed development has been carefully designed to provide a building envelope that will sit comfortably within the existing buildings on the MDC and TAFE sites. The proposed new building will be screened from Showground Road by existing and proposed trees and landscaping, and is set back 10m from the site northern boundary. The proposed new building will be screened by the existing trees located to the north of the Building J site and along the northern boundary of the TAFE site (refer to **Figures 13 and 14**)

The proposed new building will have a high quality architectural design that includes articulated building elevations and activation to the street and TAFE site through the provision of glazing at ground and first floor levels to the south and east elevations at the southern end of Building J. Therefore in the event the road widening along Showground Road is implemented by the RMS, and existing screening vegetation removed from the southern TAFE site boundary, the building will have a positive impact on the streetscape and the locality.

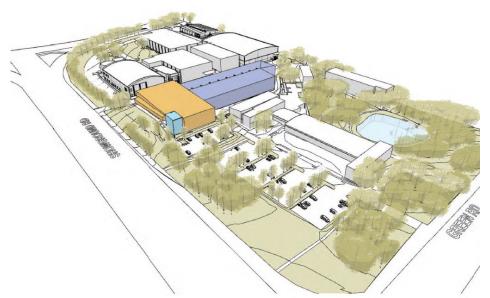


Figure 13: Elevated view of the site looking from Showground Road, showing the proposed Building J envelope in context of the existing MDC and TAFE buildings
Source: Lahznimmo Architects, 2019

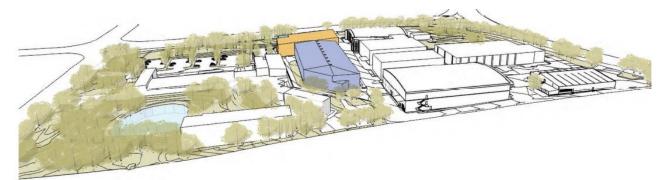


Figure 14: Elevated view of the site looking from the north showing the proposed Building J envelope in context of the existing MDC and TAFE buildings Source: Lahznimmo Architects, 2019

The view impact from the nearest residential area to the north of the site on Sunderland Avenue will be limited by virtue of the existing tree canopy screening and the comparable building envelope in relation to the existing MDC site building G and I which have building heights of 17m and 14.5m and roof ridges of RL 126 and RL 129.74, in comparison to the proposed Building J building height of 14.35m and a roof ridge of RL 125.1 (refer to **Figure 15**). The proposed siting of Building J and the bulk and scale of the proposal provides an acceptable response to the adjacent residential zone with minimal environmental impact overall.



Figure 15: Photo from Sunderland Avenue, view south looking towards the site showing the proposed building envelope (dashed lines). Note that the building will be located behind the existing tree canopies Source: Lahznimmo Architects, 2019



Figure 16: Photo from internal driveway on TAFE site, near Green Road entrance, view west looking towards the site Source: Lahznimmo Architects, 2019

The proposed building envelope will have a minimal visual impact when viewed from the eastern end of the TAFE site, near Green Road as result of the proposed building height sitting below the tree canopy and the visual screening provided by the TAFE "F Block" building adjacent to the east of the Building J site (refer to **Figures 16 and 17**).

The proposed building envelope will sit comfortably on the site as an in-fill building that will not dominate the site when viewed from the nearest residential interface to the north or from within the TAFE site from the main internal access road from Green Road.



Figure 17: View of the site from the Showground Road and Green Road intersection, looking north west towards Building J

To accommodate floor to ceiling height for the storage and display of Very Large Objects and provide sufficient floor area for curatorial, research, and associated offices within the same building, an increase to the maximum building height control of 10m to 15m is required. Based on the draft architectural concept design prepared by Lahznimmo Architects in close consultation with Create Infrastructure, MAAS technical staff and government representatives, a building height of 14.35m is required to satisfy the operational, production, storage and spatial requirements and functionality of the MDC.

The concept design prepared by Lahznimmo Architects shows a building with a sloped roof that responds to the topography of the site and an excavated lower floor level on the southern side of the site that minimises the building height at the northern end at the residential and public park interface. The proposed development will not overshadow any adjoining residential property or any public parks (refer to the shadow diagrams held at **Appendix A**).

Construction and Operational Noise

The proposed new Building J, the subject of a future DA, will have the potential to impact the nearest residential sensitive receivers to the north of the site on Sunderland Avenue during construction and operation. All likely operational noise sources from the site will be assessed and mitigation measures proposed within a Noise Impact Assessment prepared by a qualified Acoustic Consultant for the DA stage of the project. Noise from the development during operation may include noise from workshops, truck deliveries and mechanical plant. To minimise noise impacts, the workshops within Building J will be located at the southern end of the building, the furthest distance from the existing residential dwellings to the north of the site.

Construction noise will be managed in accordance with Council's standard conditions of development consent and in accordance with any mitigation measures recommended in the Noise Impact Assessment report.

5.3.3 Has the planning proposal adequately addressed any social and economic effects?

Social Effects

The MDC is an established entity which will bring a cultural benefit to the surrounding area including opportunities for new jobs for curatorial, research and related roles. In total there will be approximately 50 additional staff on the site when Building J is in operation. The proposed social outcome is a positive one for the community as a whole. Schools, universities and the community will benefit from the proposal which will enhance the ongoing role of the MDC site as a centre for preservation, maintenance and display of the MAAS collection.

<u>Heritage</u>

A search of the Office of the Environment and Heritage Aboriginal Heritage Information Management System (AHIMS) Website confirms there are no Aboriginal sites or places that are recorded or have been declared in or near the site.

The site is located approximately 115m to the north east of the nearest heritage item listed in Schedule 5 of LEP 2012, known as "Windsor Road from Baulkham Hills to Box Hill" (local heritage item No. 128). No works are proposed in proximity of the heritage item nor will the proposal impact upon views to and from the heritage item or the setting of the heritage item.

The proposal will not adversely impact upon any items or places of European or Aboriginal cultural heritage.

Economic Effects

The overall Capital Investment Value of the redevelopment of the site is estimated to be over \$30 Million. Employment will be generated both during construction and for ongoing staff when the development is in operation.

The proposed development will not have any detrimental impacts on the existing hierarchy of centres located within the Hills Shire.

5.3.4 Other Environmental Effects

Suitability of the Site

It is considered that the site is ideally suited to the proposed information and education uses given the existing information and education infrastructure and investment already on the site. The site is currently underutilised and the proposal will utilise an undeveloped part of the site without impacting upon the existing TAFE site operations and future potential TAFE facility expansion.

Given the location of the site at the intersection of three main roads (Windsor Road, Showground Road and Green Road) the site enjoys a high level of both local and regional road accessibility, and access to public transport is available within close proximity to the site.

Impact on Existing TAFE Site Operations and Future Potential TAFE Expansion

Create Infrastructure acknowledges the important education function that the TAFE serves to the community and the proposal has been developed in conjunction with input and approval of TAFE NSW as landowner and a key stakeholder. The future DA for the construction and use of the proposed Building J will be subject to the consent of TAFE as landowner.

The proposal will not hinder the ongoing operation nor will it impinge upon any future potential for expansion of the TAFE site. No FSR applies to the TAFE or MDC sites under LEP 2012. As a result of the proposed development of the new building and the TAFE site will have a total site area of approximately $30,480\text{m}^2$ of which approximately $20,200\text{m}^2$ is landscaped/open space The existing TAFE site is currently underutilised with approximately $5,300\text{m}^2$ of total Gross Floor Area for all buildings on the site, equivalent to an FSR of approximately 0.17:1. Therefore there is existing development potential to expand the TAFE to the north and north east of the site to construct new buildings and facilities.

The southern side of the TAFE site is also underutilised and could be developed with new buildings with car parking provided in basement levels or relocated elsewhere on-site. Other than the construction of Building "F Block" (approved by Council in 2007), the TAFE site has undergone limited expansion of the existing education facilities over the past 10 years and there is potential for expansion within the site which is not constrained by any FSR in LEP 2012, particularly pursuant to the provisions of Part 6 and Schedule 3 in the Educational SEPP. Opportunities for research, education, training and skills development synergies between the MDC and TAFE may be explored following the completion of Building J and further consultation between MAAS and TAFE NSW.

The proposed MDC expansion therefore does not unacceptably constrain the possible future growth of the existing TAFE facilities on the site.

5.4 State and Commonwealth Interests

5.4.1 Is there adequate public infrastructure for the Planning Proposal?

The existing public infrastructure is considered adequate for the Planning Proposal. As concluded within the submitted Traffic Impact Assessment Report held at **Appendix C**, the site has good accessibility to public transport. Bus services are provided along Windsor Road, Showground Road and Green Road. Buses provide direct connectivity with Blacktown, Castle Hill, Kellyville, Macquarie Park, North Sydney, Parramatta and Rouse Hill and Sydney CBD.

The site is located in an urban area and is already provided with adequate utility connections and sufficient public transport, roads, water, waste and recycling services infrastructure to meet the needs of the proposal.

5.4.2 What are the views of the State and Commonwealth public authorities consulted in accordance with the Cateway determination?

This section of the Planning Proposal will be completed following consultation with the State and/or Commonwealth Public Authorities identified in the Gateway determination and will detail any issues raised by public authorities and address those issues as appropriate.

The Planning Proposal assists to facilitate the achievement of the State Government goal to relocate the Powerhouse Museum to Parramatta by 2023 by providing additional space at Castle Hill for the MDC.

The future Development Application will be referred to the relevant authorities as required by the Environmental Planning and Assessment Act 1979.

6 COMMUNITY CONSULTATION

Community and public authority consultation will be undertaken in accordance with the statutory consultation provisions for rezoning and development applications.

It is anticipated that a 14 day public exhibition period will be required and outlined in the Gateway Determination. Notification will include surrounding residential properties.

7 PROJECT TIMELINE

It is imperative that the new "Building J" is completed prior to the relocation of the Powerhouse Museum to Parramatta in 2023. The target date for completion of the construction of Building J is scheduled for 2021.

Table 6 outlines the preferred project timeline.

Table 6: Project Timeline

Lodgement of Planning Proposal with Council	October 2019
Councillor Briefing (monthly):	November 2019
Local Planning Panel (monthly):	February 2020
Report to Council Meeting:	March 2020
Should Council resolve to proceed to Gateway	April 2020
Determination - Submission to Department of	
Planning, Industry and Environment:	
Issue of Gateway Determination:	May 2020
Commencement of public exhibition:	July 2020
Post-Exhibition Report to Council Meeting:	August 2020
Finalisation and Gazettal of Planning Proposal:	October 2020

8 CONCLUSION

This Planning Proposal seeks to amend the zoning of the western part of 2 Green Road, Castle Hill (Lot 102 DP 1130271) from R2 Low Density Residential to SP2 Infrastructure (Information and Education Facilities) in line with the adjoining site to the west at 172 Showground Road, Castle Hill (Lot 1 DP 1066281) as well as increase the maximum building height of the site from 10m to 15m. The zoning and building height amendments are required to accommodate the expansion of the MDC onto the site through the construction of a new permanent "Building J" which is required as part of the relocation of the Powerhouse Museum from Ultimo to Parramatta, and to cater for the existing and future growth of the MAAS collection. There are no other amendments proposed to the maps or text of LEP 2012.

This Planning Proposal has assessed the proposed development in light of the relevant State and Local planning policy and statutory requirements. The proposal provides a suitable integration with existing land uses surrounding the site to the west and east and will have minimal environmental impacts, including social and economic impacts.

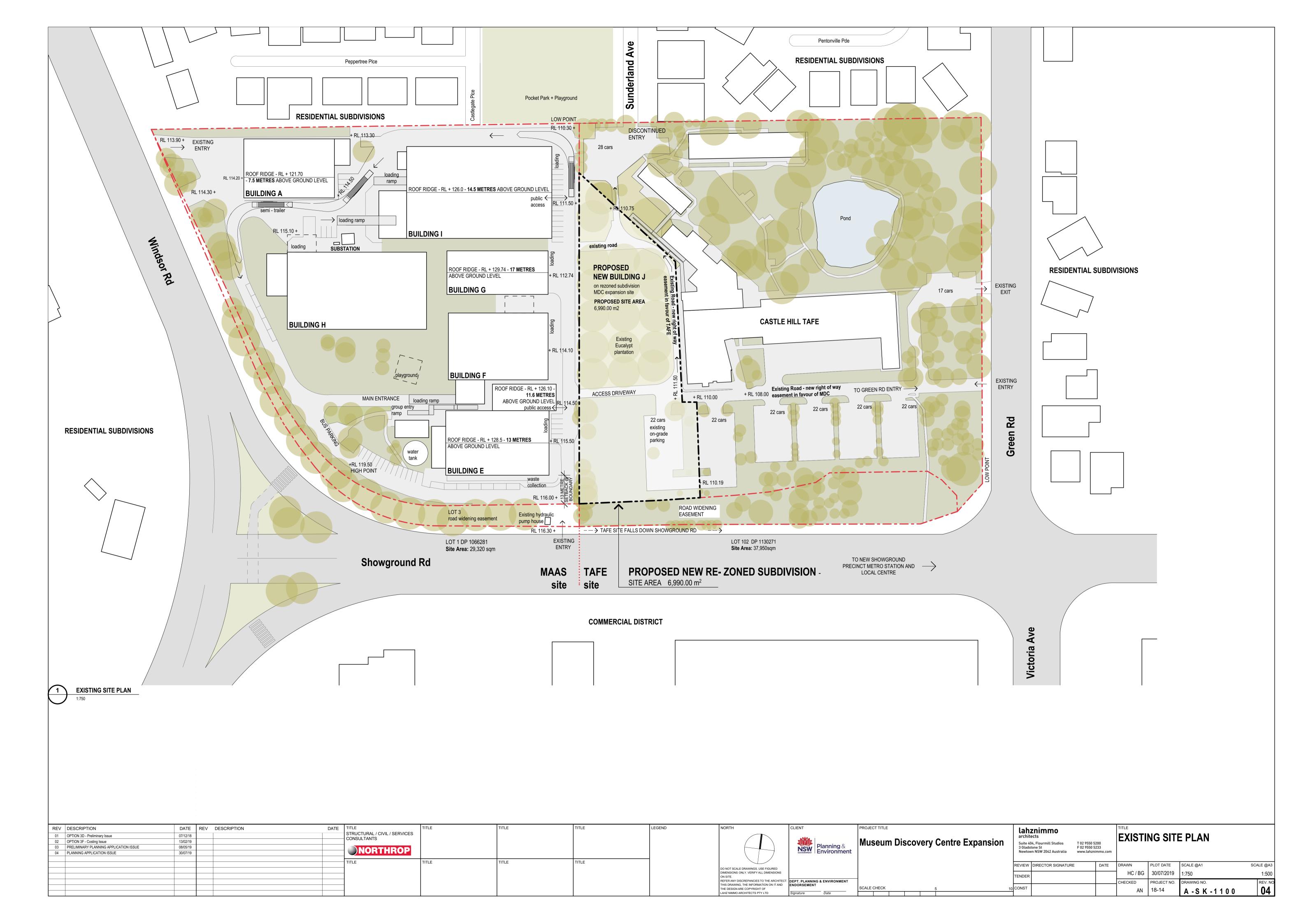
The Traffic Report submitted with this Planning Proposal concludes that the use of Building J will result in only a small increase in traffic which will generate a minimal change to the performance of the surrounding key road intersections. The operation of Building J will generate demand for up to nine additional car parking spaces on average and this shortfall is deemed acceptable in this circumstance on the basis of good public transport infrastructure and pedestrian and cycling connectivity. The Traffic Report also concludes that the preparation and implementation of a Green Travel Plan at DA stage to encourage use of public transport and reduce the use of on-site car parking by staff will further assist with addressing any car parking demands generated by the proposal.

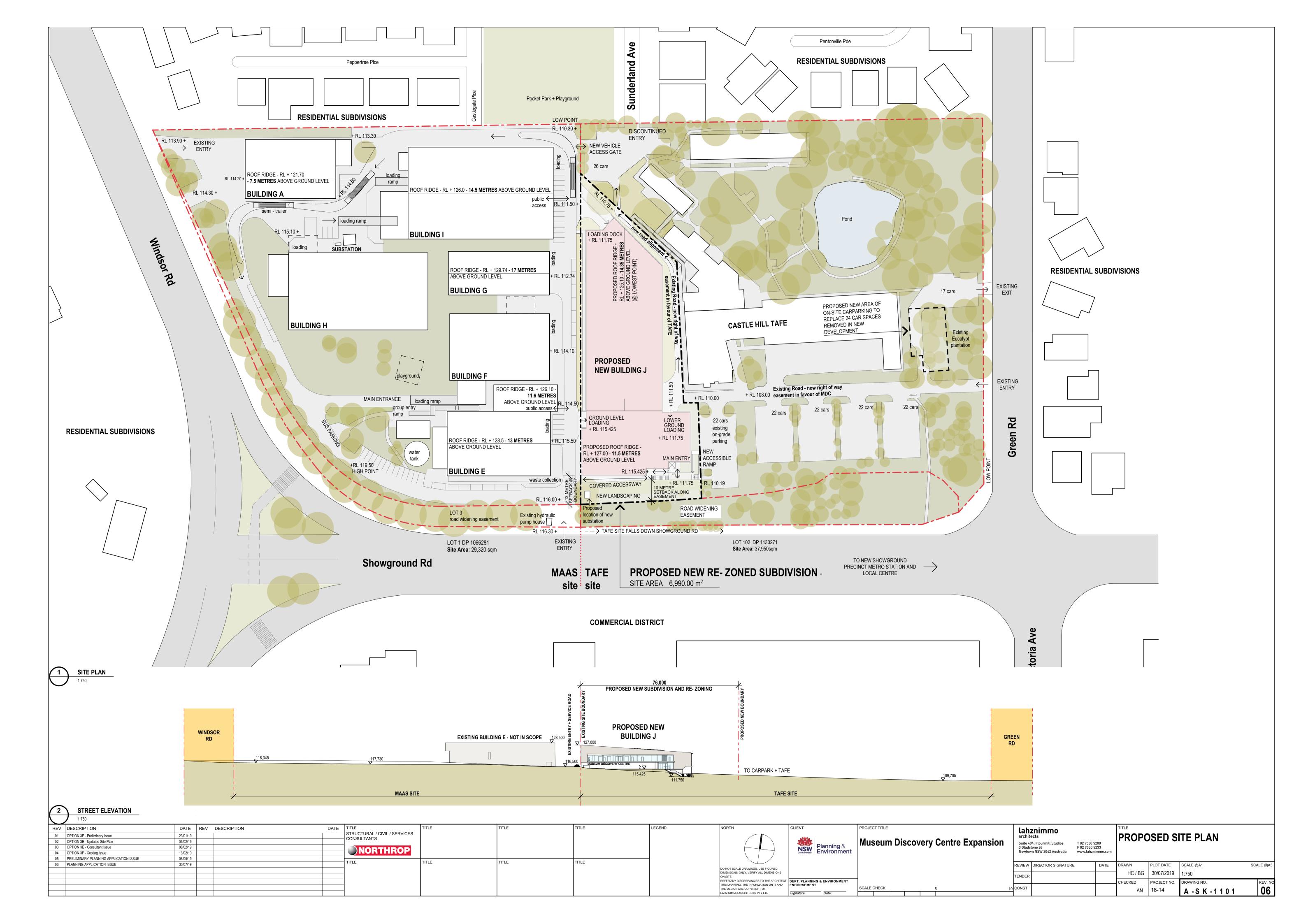
This assessment demonstrates environmental planning merits in association with the proposed development for a new MDC building (to be known as "Building J") on the existing TAFE Campus. The proposed development will result in increased utilisation of the site, support jobs growth in Western Sydney and is an essential infrastructure component in the relocation of the Powerhouse Museum from Ultimo to Parramatta and as well as providing an essential new permanent facility for the current and future MDC operations at the site.

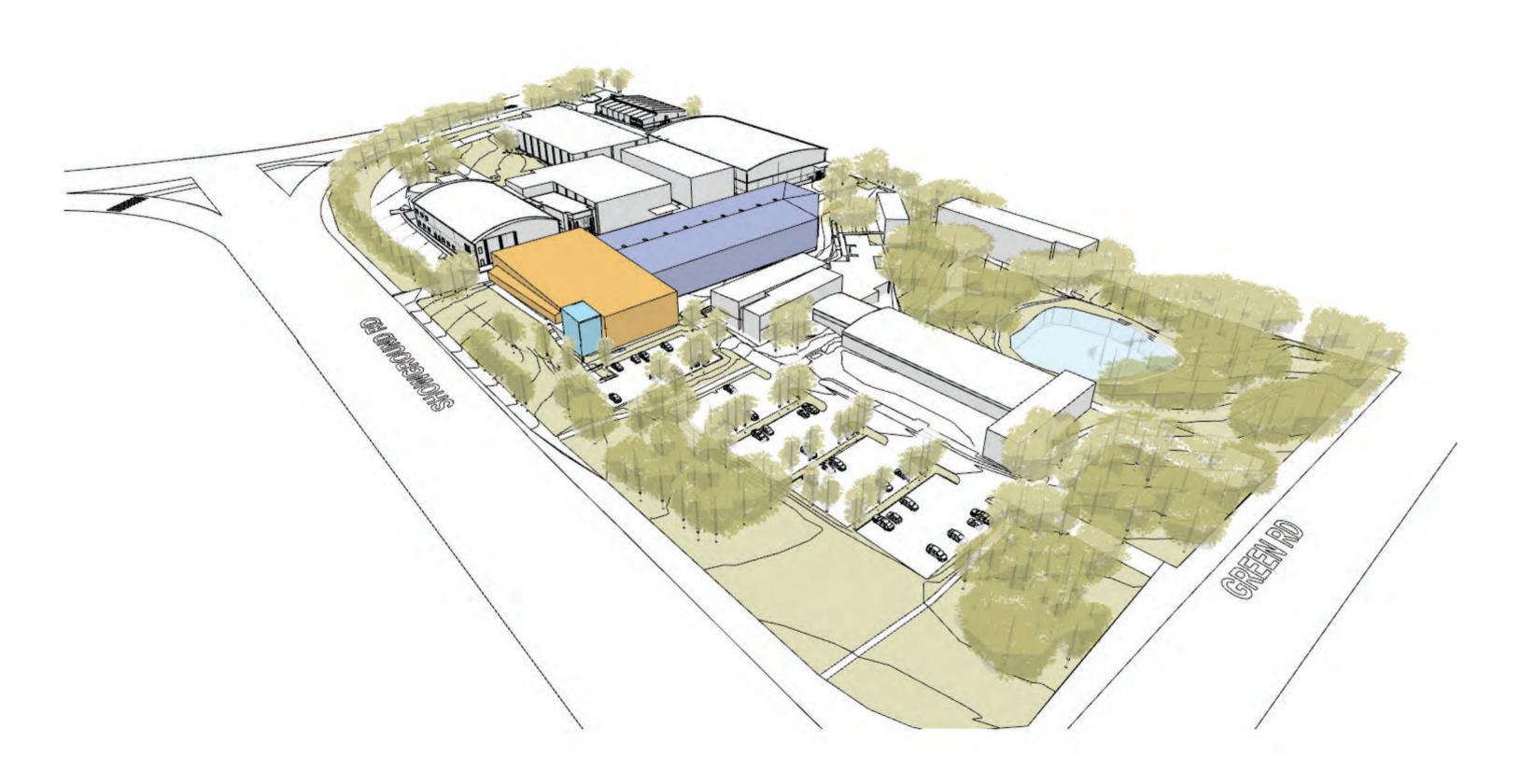
This Planning Proposal has also identified issues to be the subject of further investigations to inform the detailed design of the development in relation to noise, external building materials and finishes and proposed new landscaping including opportunities for new tree planting on the site.

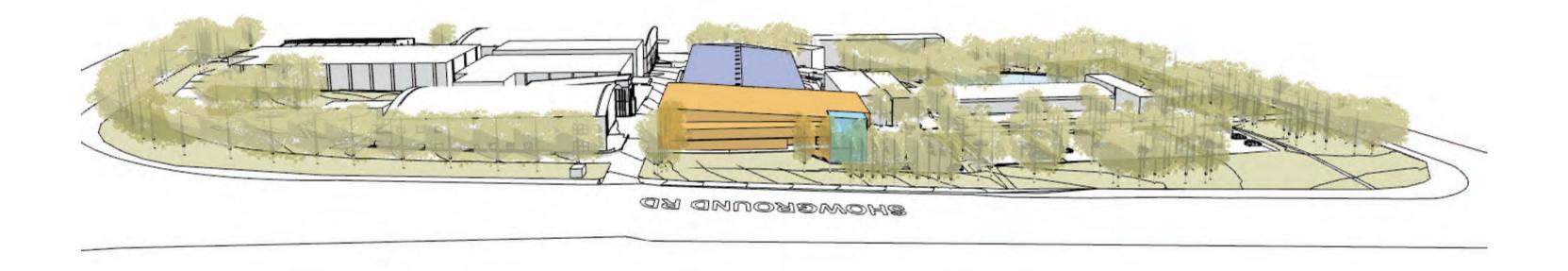
This Planning Proposal and the accompanying documents demonstrate the need for the LEP 2012 amendment and the justification for the proposed rezoning. In this regard, the implication of not proceeding is the disruption of the relocation of the Powerhouse Museum to Parramatta by 2023 as identified as a goal of the NSW State Government.

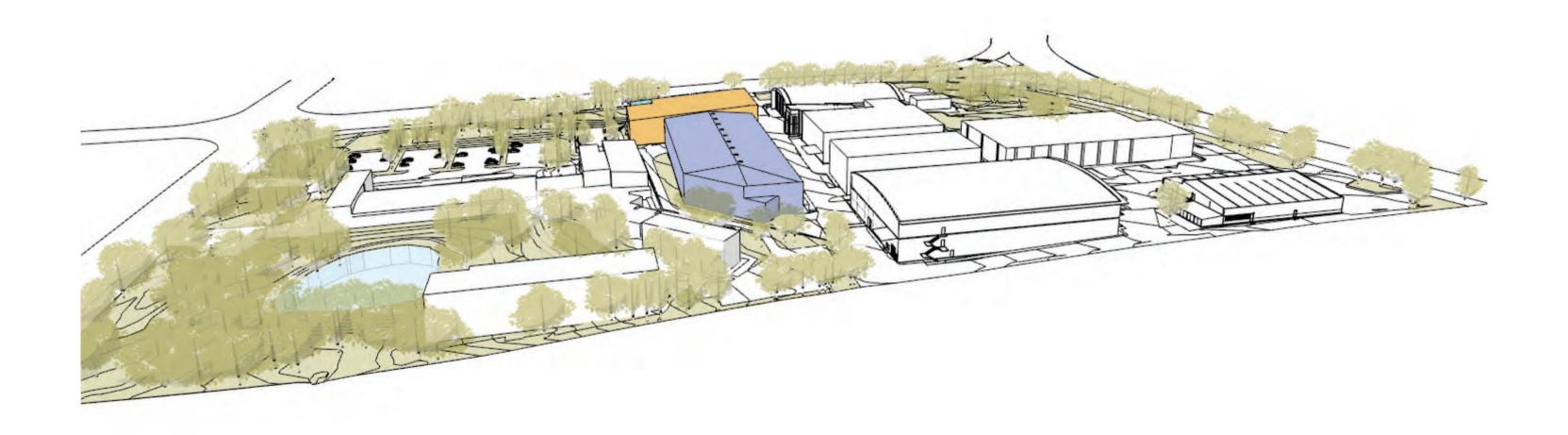
The subsequent proposed development makes good use of the existing site infrastructure including public transport. It also maintains the overall amenity of the site and the existing perception of bulk and scale by those passing the site.

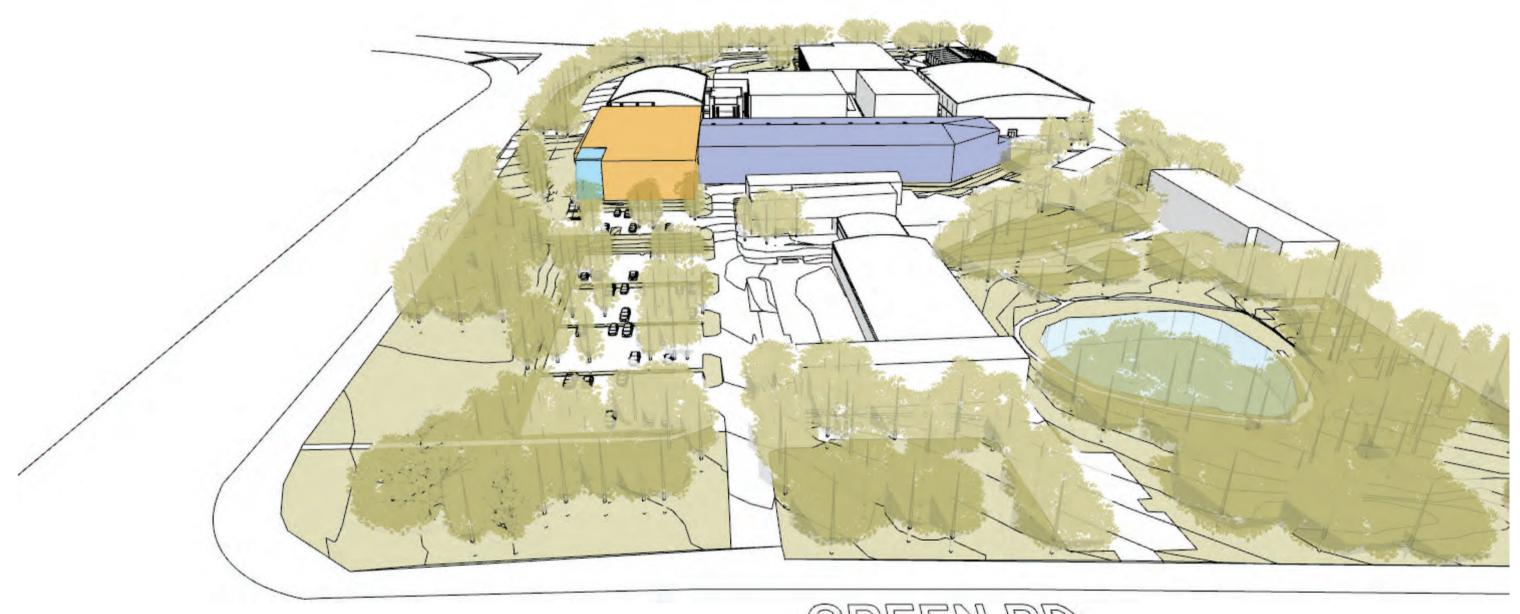




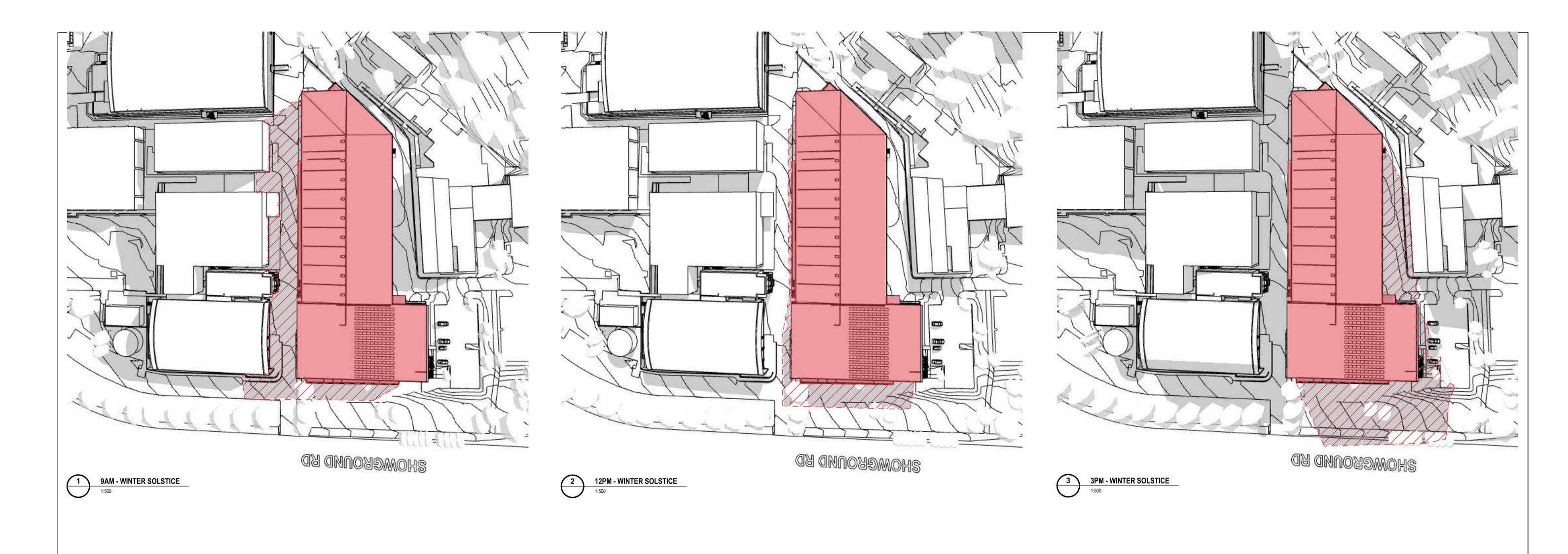








GREEN RD



01	v D.	DESCRIPTION DATE LANNING APPLICATION ISSUE 23/05/19	REV	DESCRIPTION	STRUCTURAL / CIVIL / SERVICES CONSULTANTS NORTHROP	TITLE	TITLE	TITLE	LEGEND	NORTH	CLIENT Planning & Environmen		useum Di	iscovery Centre Expansion	lahznimmo architects Suite 404, Flourmill Studios 3 Gladstone St Newtown NSW 2042 Australia	T 02 9550 5200 F 02 9550 5233 www.lahznimmo.			/ DIAGI ice 21 June		
					TITLE	TITLE	TITLE	TITLE		DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSION ON SITE. REFER ANY DISCREPANCIES TO THE ARCHTHIS DRAWING, THE INFORMATION ON IT A THE DESIGN ARE COPYRIGHT OF LAHZ NIMMO ARCHITECTS PTY LTD	ECT. DEPT. PLANNING & ENVIRONMENT ENDORSEMENT Signature Date	SCAL	E CHECK	5 	REVIEW DIRECTOR SIGNATURE TENDER 10 CONST	RE DAT	_	C / BG 23/	3/05/2019 1:5 DJECT NO. DR	ALE @A1 500 AWING NO. A - S K - 1 7 0 0	SCALE @A3 REV. NO 01

MacKay Tree Management

37 Duntroon Street Hurlstone Park NSW 2193

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19 February 2019 Updated 14 May 2019

Arboricultural Impact Assessment Tree Survey

Museum of Applied Arts and Science

Museum Discovery Centre
172 Showground Road Castle Hill NSW
Proposed New Storage facility Expansion



Above, trees bordering service driveway & western side of Museum building Below, stand of plantation trees, Castle Hill TAFE building & car park.



Prepared for; Lahznimmo Architects Suite 404 Flourmill Studios 3 Gladstone Street Newtown NSW 2042 Prepared by; Cheryl MacKay Level 5 Consulting Arboriculturist

1. Executive Summary

Lahznimmo architects are preparing a planning proposal for a new storage facilities for the Museum of Applied Arts and Sciences (MAAS), Museum Discovery Centre (MDC) in Castle Hill NSW, to be located on the adjoining Castle Hill TAFE site.

The new building (Building J) will occupy TAFE areas covered by 2 small pocket plantations of Paperbark and Spotted Gum trees, planted by MAAS approximately 50 years ago, 1 small bitumen car parking area and 1 larger concreted car park.

A new on site car parking area to replace 22 removed car spaces is proposed in another small pocket plantation area between the entry and exit driveways on Green Road.

A visual tree assessment and site inspection was carried out by a Level 5 (AQF) consulting arborist on 12 February 2019 and a survey of 312 trees was undertaken, comprising 2 stands and 55 individual trees.

Museum trees lining the northern end of the driveway, M. Melaleuca styphelioides (Prickly Leaved Paperbark), M1. Eucalyptus cinerea (Argyle Apple) and M2. Eucalyptus microcorys (Tallowwood) will be impacted by the new gate and driveway entrance and loading dock driveway. The trees are not retainable as part of the proposal.

Proposed Building J footprint will require removal of Stand A plantation trees; 27 x Melaleuca styphelioides (Prickly Leaved Paperbark), 2 x Melia azedarach (White Cedar) and 1 x Eucalyptus punctata (Grev Gum)

The stand of trees is considered to have low to medium environmental significance.

Stand B consists of 227 Corymbia maculata (Spotted Gum) also established by MAAS fifty years ago for oil production. The trees are located in the proposed Building J footprint. As the plantation does not have a shrub and near -continuous ground cover layer and the trees are planted (from stock sources unknown) they do not present as remnant tree species.

The site has been aerial mapped by The Hills Shire Council as Cumberland Plain Woodland (CPW). However Council has advised that they have not tabled Stand B as CPW and although Corymbia maculata (Spotted Gum) is characteristic of CPW the subject trees are planted not remnant CPW.

Lower car park trees 227 – 305 Eucalyptus sp. (Gum), Melaleuca styphelioides (Prickly Leaved Paperbark), Syncarpia glomulifera (Turpentine) and 308 Corymbia maculata (Spotted Gum) are impacted by the Workshop Loading Bay, building footprint and associated infrastructure works.

Museum driveway trees M3, M4, M5 and M6 Eucalyptus sideroxylon (Mugga Mugga Ironbark) are located on the south western boundary overhanging the site. They will be adversely impacted by the building (plant serving rooms) and associated infrastructure.

40 (live) Corymbia maculata (Spotted Gum) plantation trees, (Stand C) require removal to facilitate new on site car parking. This will impact on up to 40% of the stand of trees, leaving the Green Road frontage trees intact. The trees have poor to average condition, many have succumbed to termite damage and the majority show suppressed form.

All impacted trees are planted landscape natives that will be replaced with replenishment plantings as part of site wide landscaping works.

A 'threatened species test of significance (former 7-part test)' in accordance with the Biodiversity Conservation Act 2016, is not required as part of this or any future DA proposal.

Replenishment plantings are unlikely to offset the percentage of lost, mature canopy, however the proposed tree removals do not exceed the threshold for removal of native vegetation under the Biodiversity Offset Scheme.

It is recommended that to restore the landscape amenity of the site replacement plantings of locally indigenous trees such as *Eucalyptus resinifera* (Red Mahogany), *Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus globoidea* (White Stringybark) and understorey native shrubs are planted in appropriate locations.

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2. Introduction/Background

Lahznimmo architects are preparing a planning proposal for a siting option for new storage facilities for the Museum of Applied Arts and Sciences (MAAS), Museum Discovery Centre (MDC) in Castle Hill NSW.

The proposal is for new works at the existing Powerhouse Collection Store, to be located on the adjoining Castle Hill TAFE site.

The new building (Building J) will occupy TAFE areas covered by 2 small pocket plantations of Paperbark and Spotted Gum trees, planted by MAAS approximately 50 years ago, 1 small bitumen car parking area and 1 larger concreted car park.

The proposal requires removal of all plantation trees and car park trees.

A new on site car parking area to replace lost car spaces will be located in a pocket plantation area between the entry and exit driveways on Green Road.

Hugo Cottier of Lahznimmo architects has commissioned MacKay Tree Management to carry out a site survey of all trees impacted by the proposal and prepare an Arboricultural Impact Assessment on trees to be retained.

The Hills Shire Council has site vegetation mapped as Cumberland Plain Woodland vegetation, part of an Endangered Ecological Community, and consideration is given in the report to the environmental significance of the surveyed trees.

The report surveys 352 plantation trees, Groups A, B, C, 55 of which are individually assessed

This report and any works recommended herein are to form part of the Development Application to The Hills Shire Council.

3. Methodology

A visual tree assessment (VTA) 1 and site inspection was carried out from the ground by a Level 5 (AQF) consulting arborist on 12 February 2019 and 9 May 2019.

Tree height and age was estimated and Diameter at Breast Height (D.B.H.) was measured 1.4 metres (m.) above ground.

No soil/root exploration, tissue sampling or trench digging was undertaken.

Eucalyptus species were identified from bark, leaves and where possible, fruit.

A Significance of a Tree Assessment Rating System (STARS) was determined. A STARS rating establishes the contribution a tree has to the overall landscape, amenity qualities or importance due to species, size, historical/cultural planting or significance to the site.

Tree Protection Zones and Protection Methods are referenced from Standard® AS 4970 - 2009 Protection of Trees on Development Sites. ²-

In preparing this report the author is aware of and has taken into account the provisions of; The Hills Development Control Plan (DCP), 2012, Landscaping Part C Section 3 State Environment Planning Policy (SEPP), 2017, Vegetation in Non-Rural Areas Biodiversity Conservation Act (2016).

The report has relied upon the following plan/s and documents:

Architectural Drawings	Lahznimmo architects	(Siting Option 3E)	January 2019						
Survey Plan	YSCO Geomatics	98148/14A 1 – 7 sheets	December 2018						
Aerial & Vegetation Map The Hills Mapping - supp TAFE 2 Green Road - supp									
No landscape or stormwater plans were available at the time of assessment.									

4. Aims

The aims of this report are to:

Conduct a visual assessment of the subject trees and their growing environment

Consider the environmental significance of the site in regard to any remaining Cumberland Plain Woodland

Review the supplied plans to determine the impact of the construction on the retainable trees Prepare a site specific tree protection plan and if required a pruning specification to minimise adverse impacts on retainable trees.

5. Observations

5.1 The Site

The subject site is No 172 Showground Road Castle Hill, a rectangular block, running north south, east of MDC Buildings E, F, G and I, on a forested section of Castle Hill TAFE (see maps below).

The site has been aerial mapped by The Hills Shire Council as Cumberland Plain Woodland (CPW). Council's Environmental Coordinator, Mr. Mark Chidel, advises (in conversation 4/03/2019) that although mapped, the plantation has not been tabled by Council as CPW and although Corymbia maculata (Spotted Gum) is characteristic of CPW the subject trees are planted not remnant CPW.

The TAFE site was previously owned by MAAS, who established 2 small pocket tree plantations for oil harvesting, over 50 years ago. Native trees and vegetation lining Greens Road are a mixture of structurally modified woodland vegetation and planted rows of Corymbia maculata (Spotted Gum) trees.

The 3 plantation groups (A, B, C), 1 small bitumen car parking area and 1 larger concreted car park will be impacted by the new storage facility proposal.

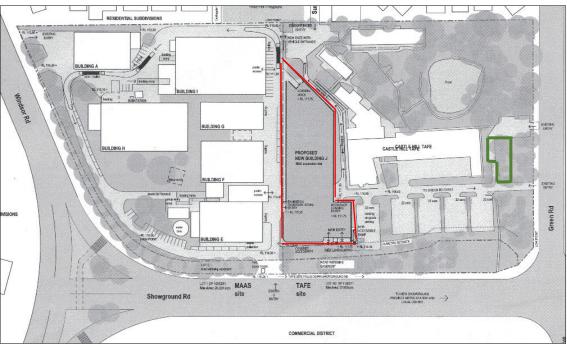


Map at left

Stand A Stand B Stand C and Carpark Trees

Below

Site Plan indicating new storage facility site and new on site car parking.



6 Arboricultural Impact Assessment

New gate with vehicle entrance

North West corner will require removal of Museum tree M Melaleuca styphelioides (Prickly Leaved Paperbark).

Loading dock driveway

May require removal of Museum trees, M1 Eucalyptus cinerea (Argyle Apple) and M2 Eucalyptus microcorys (Tallowwood).

Proposed Building J footprint

Stand A. Melaleuca styphelioides (Prickly Leaved Paperbark), 2 x Melia azedarach (White Cedar) and 1 x Eucalyptus punctata (Grey Gum) are located in the footprint.

The $27 \times Melaleuca$ trees are remnants of a MAAS plantation established 50 years ago for oil production.

The White Cedar and Grey gum are semi mature trees possibly self-seeded in the stand.

The stand of trees is considered to have low to medium environmental significance.

Stand B consists of 227 Corymbia maculata (Spotted Gum), labelled T42 – T269 also established by MAAS fifty years ago for oil production. The trees are located in the proposed Building J footprint.

The plantation grown trees have forest forms, are tall with narrow spreading crowns that are concentrated towards the top of the trees. As a group they provide site shelter and canopy cover to the area but as individuals are prone to failure because of their form and structure.

Stand B trees being a dedicated plantation do not have a shrub and near -continuous ground cover layer characteristic of CPW. The trees are planted (from stock sources unknown) not remnant tree species.

A 'threatened species test of significance (former 7-part test)' in accordance with the Biodiversity Conservation Act 2016, is not required as part of the DA proposal or any future DA proposal.

Proposed Building J footprint and associated Access Landscaping Works

Trees T270 – T311 are lower car park trees Eucalyptus sp. (Gum), Melaleuca styphelioides (Prickly Leaved Paperbark), Syncarpia glomulifera (Turpentine) and 308 Corymbia maculata (Spotted Gum). They are impacted by the Workshop Loading Bay and building footprint or have major encroachment into their TPZs. Trees T281 – T286 are retainable as part of the proposal.

Given that the location and distribution of the trees' root systems will be limited by the car park constraints any impact on their TPZs in this location is considered intolerable.

Museum driveway trees M3, M4, M5 and M6 Eucalyptus sideroxylon (Mugga Mugga Ironbark) are located on the south western boundary overhanging the site. They will be adversely impacted by the building (plant serving rooms) and associated infrastructure.

The trees are planted natives that will need to be replaced as part of site landscaping works.

Proposed New Carpark

Stand C comprises a plantation of *Corymbia maculata* (Spotted Gum), planted in a grid formation 50 years ago, for oil harvesting purposes. The stand borders an internal driveway between the entry and exit driveways on Green Road.

The trees have poor to average condition, many have succumbed to termite damage and the majority show suppressed form.

40 (live) trees require removal to facilitate new on site car parking to replace 22 removed car spaces. This will impact on up to 40% of the stand of trees, leaving the Green Road frontage trees intact.

The proposed tree removals do not exceed the threshold for removal of native vegetation under the Biodiversity Offset Scheme.

6.1 Replacement Plantings

A total of 337 trees require removal as part of the proposal. Replenishment plantings are unlikely to offset the percentage of lost mature canopy however landscape amenity can be restored with plantings of locally indigenous trees *Eucalyptus resinifera* (Red Mahogany), *Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus globoidea* (White Stringybark) and understorey native shrubs.

7.1 Trees to be Retained and Protected

The identification of trees as priorities for retention is based upon a number of factors including; species, dimensions, health, maturity and landscape significance.

The following trees are considered to have high to medium environmental and/or landscape significance and can be safely retained as part of the proposal.

Tree No	Scientific Common Name	D.B.H. mm	TPZ radius	SRZ radius	Development Impact Tree Protection Recommendations
1	Eucalyptus punctata Grey Gum	500 580	9.2 m.	3.1 m.	Trees lining bitumen car park,
2	Eucalyptus punctata Grey Gum	380	4.6 m.	2.3 m.	northern boundary. Not impacted by the proposal.
3 - 6	Melaleuca styphelioides (Prickly Leaved Paperbark)	360 av.	4.3 m. av.	2.3 m. av.	Area beneath the trees including car parking spaces to be fenced off to create a TPZ, NO GO ZONE.
7	Eucalyptus elata River Peppermint	410	4.9 m.	2.4 m.	Temporary fencing to isolate trees from works.
8 - 10	Melaleuca styphelioides (Prickly Leaved	300 av.	3.6 m. av.	4.1 m. av.	Trees lining bitumen car park, north western boundary.
	Paperbark)				Temporary fencing to isolate trees from works and vehicle movement.
11	Grevillea robusta Silky Oak	310	3.7 m.	2.2 m.	Fence off tree on edge of garden bed to protect from road widening construction works. One side of TPZ impacted only.
TI	Eucalyptus sp. Gum	380	4.6 m.	2.3 m.	Fence off TAFE tree in garden bed to protect from road widening construction works. One side of TPZ impacted only.
306, 307 310, 311 312	Corymbia maculata Spotted Gum Eucalyptus tereticornis Forest Red Gum	150 av. 310	1.8 m. av. 3.7 m.	1.7 m. av. 2.2 m.	Driveway trees. Trunk protection or fence off car park garden beds.
Part of Stand C	Corymbia maculata Spotted Gum x 40 trees	200 av.	3 m. av.	2 m. av.	Stand of native trees between entry & exit driveways on Green Road. Fence off trees to be retained, Green Rd/eastern side of stand.

7.2 Protective Fencing - Before Works Commence

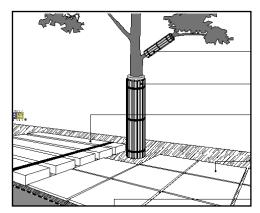
The trees' TPZs are to be fenced off to prevent any activities, storage or the disposal of materials within the fenced areas.

The fences shall be maintained intact until the completion of all demolition/building work.

A minimum 1.8m high barrier (chain wire mesh panels, plywood or wooden paling fence panels) shall be erected around the perimeters of the TPZs.

Shade cloth or similar should be attached to reduce the

transport of dust, other particulate matter and liquids into the protected area. The barrier shall be constructed so as to prevent pedestrian and vehicular entry into the protection zone.



7.3 Arborist Construction Hold Points, Inspection and Certification Retained Trees

The following pre-determined construction stages are witness points and will require the attendance of a Level 5 Arborist to document the works and certify that the inspection has taken place and that all works are completed in accordance with this Tree Protection Plan and AS 4970 - 2009 Protection of Trees on Development Sites.

W	itness Points for Site Arborist Inspection	and Certifica	tion			
Hold Point	Task	Responsibility	Certification	Inspection Timing		
1	Following Installation of Protective Fencing	Principal Contractor	Project Arborist	Prior to tree removal & site establishment		
2	Witnessing pruning of any branches or roots greater than 40 mm in diameter	Principal Contractor	Project Arborist	Prior to ground works or at time of construction.		
3	At any time fencing is required to be removed or altered	Principal Contractor	Project Arborist	At any time during construction.		
4	Final inspection and assessment of trees and final compliance certification as per Council's Notice of Determination	Principal Contractor	Project Arborist	Prior to issue of occupation certificate.		

Cheryl Makkay

Advanced Certificate of Horticulture, Diploma of Arboriculture, Certificate in Tree Surgery Founding Member I.A.C.A (M0062003), I.S.A (Member 200984) & L.G.T.R.A. Level 5 Qualified and Practicing Arborist/Horticulturist since 1995 Qualified Tree Risk Assessor (TRAQ 2016, QTRA 2018)

DISCLAIMER I have no vested interest in any forthcoming tree works or actions carried out from recommendations made in this report. The report is an independent assessment of the trees and does not reflect the opinions of the owner. The author does not receive commission to prune or remove the trees which are the subject trees of this report.

Information contained in this report covers only those trees assessed. It reflects their condition at the time of assessment. The inspection was limited to a Visual Assessment without dissection, excavation, probing or core drilling. By the nature of their size, weight and miscellaneous structure, constant exposure to the weather and the elements, susceptibility to insects, pest and decay organisms, and trees always pose an inherent degree of hazard and risk from breakage or failure. Recommendations made by MacKay Tree Management are intended to minimise, reduce or eliminate hazardous conditions associated with the trees.

There is no guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

	Appendix 1				Tree Surve	у М	useum D	iscovery C	entre Expansion
Tree No.	Genus/species Common Name	Height Spread	D.B.H. mm	Age	Crown Form Condition	Vigour	STARS Sign.	Retention Value	Observations/ Condition of Trees
1	Eucalyptus punctata Grey Gum	24 18	500 580 at 1 m.	М	Dominant Symmetrical	Normal	Med	Med	Borer damage, hollow into base of trunk, codominant limbs with compression fork at 1 m. Branch wound at 3 m. Not suitable as stand-alone tree.
2	Eucalyptus punctata Grey Gum	11 7	380	М	Intermediate Asymmetrical	Normal	Med	Low	Exposed heartwood, poor occlusion at base, trunk wound 2 sides lower trunk. Inferior to more dominant tree.
3	Melaleuca styphelioides Prickly Leaved Paperbark	10 4	220 280 at base	М	Co dominant Asymmetrical	Normal	Med	Med	
4	Melaleuca styphelioides Prickly Leaved Paperbark	10 3	220 280 at base	М	Co dominant Asymmetrical	Normal	Med	Med	Group of 4 trees lining northern TAFE boundary, end of car park and a discontinued entry.
5	Melaleuca styphelioides Prickly Leaved Paperbark	12 5	200 350 at base	М	Co dominant Asymmetrical	Normal	Med	Med	Multi trunked trees provide screening amenity. Average health and condition.
6	Melaleuca styphelioides Prickly Leaved Paperbark	10 6	350 450 at base	М	Co dominant Asymmetrical	Normal	Med	Med	
7	Eucalyptus elata River Peppermint	21 14	410	М	Dominant Symmetrical	Normal	High	High	Tree with significant size, showing good overall condition. Holding medium volume small size deadwood
М	Melaleuca styphelioides Prickly Leaved Paperbark	11 8	300 300 at 1.2 m.	М	Co dominant Symmetrical	Normal	Med	Med	Tree with average condition located end of Museum Driveway on car park Boundary.
8	Melaleuca styphelioides Prickly Leaved Paperbark	9	300	М	Co dominant Asymmetrical	Normal	Med	Med	Group of 4 trees lining western TAFE boundary, end of car park.
9	Melaleuca styphelioides Prickly Leaved Paperbark	11 7	380	М	Co dominant Asymmetrical	Normal	Med	Med	Multi trunked trees provide screening amenity. Average health and condition.
10	Melaleuca styphelioides Prickly Leaved Paperbark	10 7	Multi base	М	Co dominant Asymmetrical	Normal	Med	Med	
M1	Eucalyptus cinerea Argyle Apple	8 7	450	ОМ	Suppressed Asymmetrical	Low	Med	Low	Tree with poor form and declining vigour. Museum tree located on Museum Driveway overhanging TAFE car park.
M2	Eucalyptus microcorys Tallowwood	12 13	450	М	Dominant Symmetrical	Normal	High	High	Large tree with good condition, located on edge of Museum driveway, overhanging TAFE car park.
11	Grevillea robusta Silky Oak	12 7	310	М	Dominant Symmetrical	Normal	High	High	TAFE tree in garden bed southern end of car park. Significant tree showing good overall condition.

Tree No.	Genus/species Common Name	Height Spread	D.B.H. mm	Age	Crown Form Condition	Vigour	STARS Sign.	Retention Value	Observations/ Condition of Trees
TI	Eucalyptus sp. Gum	13 14	380	Μ	Dominant Symmetrical	Normal	High	High	Tall tree within TAFE garden bed, spreading canopy with good form and condition
Stand A 12 - 38	Melaleuca styphelioides Prickly Leaved Tea tree	5 – 8 X 4 - 7	100 - 150	М	Co dominant – Suppressed Asymmetrical	Normal	Med	Med	Group of 27 plantation trees. Average condition, shrub like form. Established as a small oil harvesting plantation by MAAS approximately 50 years ago.
Stand A 39	Melia azedarach White Cedar	6 6	175	М	Co dominant Symmetrical	Normal	Med	Med	Planted or self-sown small native tree. Good condition
Stand A 40	Melia azedarach White Cedar	5 6	180	Μ	Co dominant Symmetrical	Normal	Med	Med	Planted or self-sown small native tree. Good condition
Stand A 41	Eucalyptus punctata Grey Gum	16 9	300	М	Dominant Symmetrical	Normal	High	High	Tall tree possibly seeded from site trees. Good form and condition, near centre of Melaleuca plantation.
Stand B 42 - 26	Corymbia maculata Spotted Gum	18 - 22 X 6 - 9	150 - 350	М	Co dominant – Suppressed Asymmetrical	Normal	Med	Med - Low	Group of 227 trees, established as a small oil harvesting plantation by MAAS approximately 50 years ago. Trees have forest form canopies and average to good condition.
270	Eucalyptus elata River Peppermint	16 9	310	М	Co dominant Asymmetrical	Normal	Med	Med	Edge tree at car park entrance to Discovery Centre site. Good condition
271	Eucalyptus obliqua Messmate Stringybark	12 7	250	М	Supressed Asymmetrical	Normal	Low	Low	Suppressed, leaning tree, low retention value.
272	Corymbia maculata Spotted Gum	18 14	300	М	Co dominant Asymmetrical	Normal	Med	Med	Edge tree at car park entrance to Discovery Centre site. Good condition
273	Corymbia maculata Spotted Gum	11 7	280	М	Intermediate Asymmetrical	Normal	Med	Low	Intermediate/suppressed tree with reduced form and condition.
274	Eucalyptus obliqua Messmate Stringybark	8 8	200 280 300 from base	М	Intermediate Symmetrical	Normal	Low	Low	Small open canopies tree. Active termite nest at base. 1 of 4 leaders failed from the base, 2 nd leader damaged at base. Low retention value regardless of pest treatment.
M3 M4 M5 M6		8 – 9 X 7 - 8	300 - 350	М	Co dominant Asymmetrical	Normal	Med	Med	Trees bordering the Museum Driveway. Average health and condition. Sparse canopies, resilient species.
275	Eucalyptus resinifera Red Mahogany	12 9	250 280 at base	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, no obvious defects, Suspect previous termite nesting at base.

Tree No.	Genus/species Common Name	Height Spread	D.B.H. mm	Age	Crown Form Condition	Vigour	STARS Sign.	Retention Value	Observations/ Condition of Trees
276	Eucalyptus resinifera Red Mahogany	16 10	220 300 at base	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, no obvious defects, Suspect previous termite nesting at base.
277	Eucalyptus resinifera Red Mahogany	16 9	300	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, no obvious defects, termite nesting damage at base.
278	Eucalyptus resinifera Red Mahogany	16 9	320	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, no obvious defects, Suspect previous termite nesting at base.
279	Eucalyptus resinifera Red Mahogany	18 9	350	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, no obvious defects, Suspect previous termite nesting at base.
280	Eucalyptus resinifera Red Mahogany	18 10	300 300 from base	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, co dominant from 1.1 m.
281	Eucalyptus elata River Peppermint	15 9	350	М	Intermediate Asymmetrical	Normal	Med	Med	Tall tree, wound at base of trunk.
282	Corymbia maculata Spotted Gum	9 8	200	М	Supressed Asymmetrical	Normal	Med	Low	Poor form, suppressed canopy.
283	Corymbia maculata Spotted Gum	12 8	280	М	Supressed Asymmetrical	Normal	Med	Low	Small tree inferior to neighbours.
284	Corymbia maculata Spotted Gum	14 9	300	М	Co dominant Asymmetrical	Normal	Med	Med	Edge tree closest to street. One sided canopy.
285	Grevillea robusta Silky Oak	12 7	350	М	Dominant Symmetrical	Normal	Med	High	Tree on bank. Average condition.
286	Angophora floribunda Rough Barked Apple	14 7	380	М	Dominant Symmetrical	Normal	Med	Med	Tree on bank. Trunk cavity at 3. 5 m. suppressed, poor form for species type.
287	Melaleuca styphelioides Prickly Leaved Paperbark	6 5	multi	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
288	Eucalyptus moluccana Grey Box	10 7	200	Y	Forest Symmetrical	Normal	Med	Med	Sapling, tall narrow form.
289	Eucalyptus moluccana Grey Box	10 7	210	Y	Forest Symmetrical	Normal	Med	Med	Sapling, tall narrow form.
290	Eucalyptus moluccana Grey Box	10 8	200	Y	Forest Symmetrical	Normal	Med	Med	Sapling, tall narrow form.

Tree No.	Genus/species Common Name	Height Spread	D.B.H. mm	Age	Crown Form Condition	Vigour	STARS Sign.	Retention Value	Observations/ Condition of Trees
291	Melaleuca styphelioides Prickly Leaved Paperbark	6 7	multi	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
292	Eucalyptus moluccana Grey Box	10 8	200	Υ	Forest Symmetrical	Normal	Med	Med	Sapling, tall narrow form.
293	Eucalyptus tereticornis Forest Red Gum	16 9	340	М	Co dominant Symmetrical	Normal	Med	Med	Emergent growth, average condition. Retainable as part of a group.
294	Melaleuca styphelioides Prickly Leaved Paperbark	6 7	100 180	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
295	Melaleuca styphelioides Prickly Leaved Paperbark	6 7	multi	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
296	Melaleuca styphelioides Prickly Leaved Paperbark	6 7	150 150	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
297	Eucalyptus tereticornis Forest Red Gum	13 7	240	М	Co dominant Symmetrical	Normal	Med	Med	Emergent growth, average condition. Retainable as part of a group.
298	Eucalyptus tereticornis Forest Red Gum	17 9	380	М	Co dominant Symmetrical	Normal	Med	Med	Emergent growth, average condition. Retainable as part of a group.
299	Melaleuca styphelioides Prickly Leaved Paperbark	6 5	200	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
300	Melaleuca styphelioides Prickly Leaved Paperbark	7 7	300	М	Intermediate Asymmetrical	Normal	Low	Low	Small shrub like tree.
301	Eucalyptus moluccana Grey Box	11 9	310	М	Co dominant Symmetrical	Normal	Med	Med	Co dominant failure at 2 m. wound into trunk. Poor form and structurally compromised.
302	Corymbia maculata Spotted Gum	10 7	200	М	Co dominant Symmetrical	Normal	Med	Med	Suppressed, small size crown.
303	Eucalyptus moluccana Grey Box	8 7	200	Y	Forest Symmetrical	Normal	Med	Med	Sapling, tall narrow form.
304	Eucalyptus moluccana Grey Box	8 7	200	Y	Forest Symmetrical	Normal	Med	Med	Sapling, tall narrow form.
305	Syncarpia glomulifera Turpentine	6 5	200	М	Co dominant Symmetrical	Normal	Med	Med	Codominant leaders at 1 m. & 1.3 m. Good specimen, developing tree.

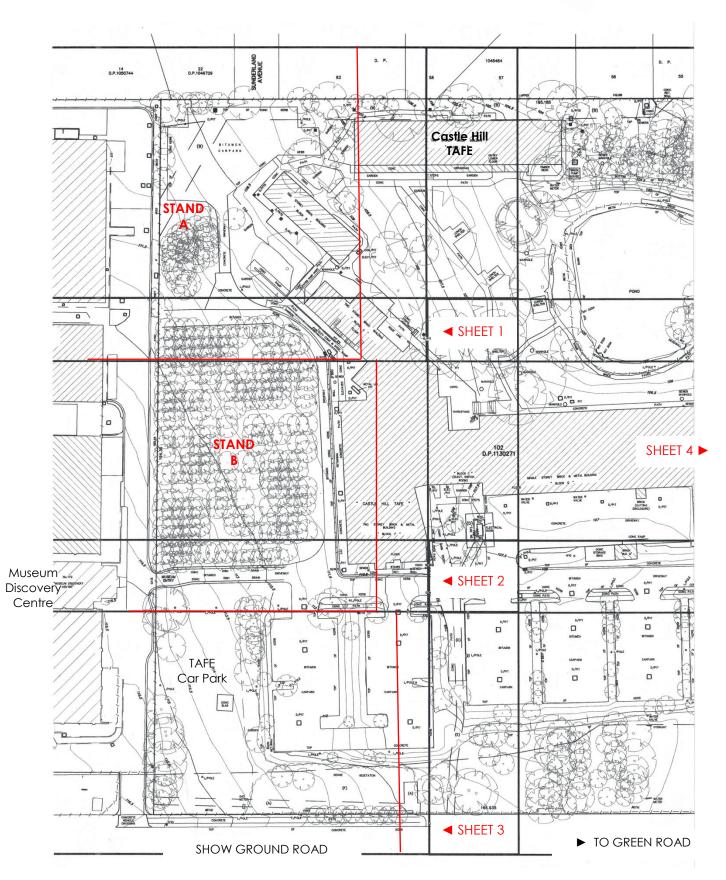
Tree No.	Genus/species Common Name	Height Spread	D.B.H. mm	Age	Crown Form Condition	Vigour	STARS Sign.	Retention Value	Observations/ Condition of Trees
306	Corymbia maculata Spotted Gum	8 5	150	М	Dominant Symmetrical	Normal	Med	Med	Tall straight, developing tree.
307	Corymbia maculata Spotted Gum	8 5	150 175	X	Dominant Symmetrical	Normal	Med	Med	Tall straight, developing tree.
308	Corymbia maculata Spotted Gum	9 5	150	М	Dominant Symmetrical	Normal	Med	Med	Tall straight, developing tree.
309	Corymbia maculata Spotted Gum	8 3	180	Μ	Dominant Symmetrical	Normal	Med	Med	Tall straight, developing tree.
310	Corymbia maculata Spotted Gum	9 3	100	М	Dominant Symmetrical	Normal	Med	Med	Tall straight, developing tree.
311	Corymbia maculata Spotted Gum	8 3	100	М	Dominant Symmetrical	Normal	Med	Med	Tall straight, developing tree.
312	Eucalyptus tereticornis Forest Red Gum	9 7	310	М	Co dominant Symmetrical	Normal	Med	Med	Damaged leader at 3 m. reduced form and structural stability.
Stand C 312 - 3	Corymbia maculata Spotted Gum	10 - 18 av. 5 - 9 av.	100 - 350 av.	M - Sen	Co dominant Suppressed Asymmetrical	Low - Normal	Med	Low - Med	Forest form trees with small, sparse canopies at top of trees, on narrow trunks. Some dead, suppressed or showing poor structure. Some trees sprouted from stumps. Edge trees showing better form and size.

References

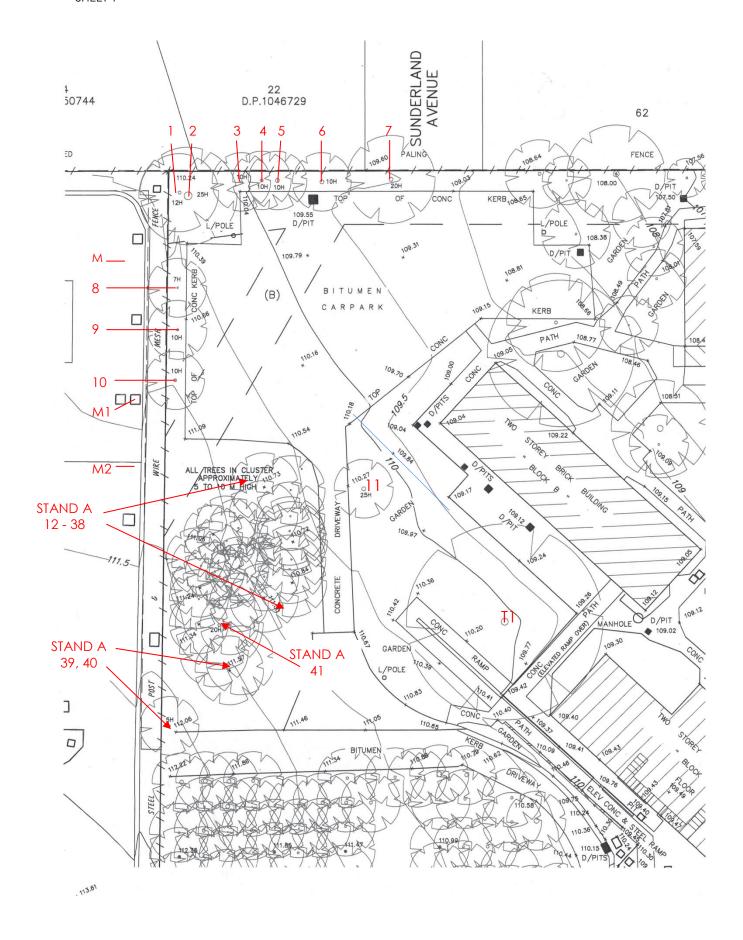
- 1. A Visual Tree Assessment (VTA) is a systematic method of identifying tree characteristics and hazard potential recognised by The International Society of Arboriculture. Journal of Arboriculture, Vol. 22, No. 6, November 1996.
- 2. Standards Australia (2009), AS 4970 Protection of trees on development sites
- 3. Standards Australia (2007), AS-4373 Pruning of Amenity Trees
- 4. Standards Australia (2018) AS-2303 Tree Stock for Landscape Use

Site Plan Indicating Tree Locations. Canopies are Indicative only. SHEET PLAN





Site Plan Indicating Tree Locations.
Canopies are Indicative only.
SHEET 1



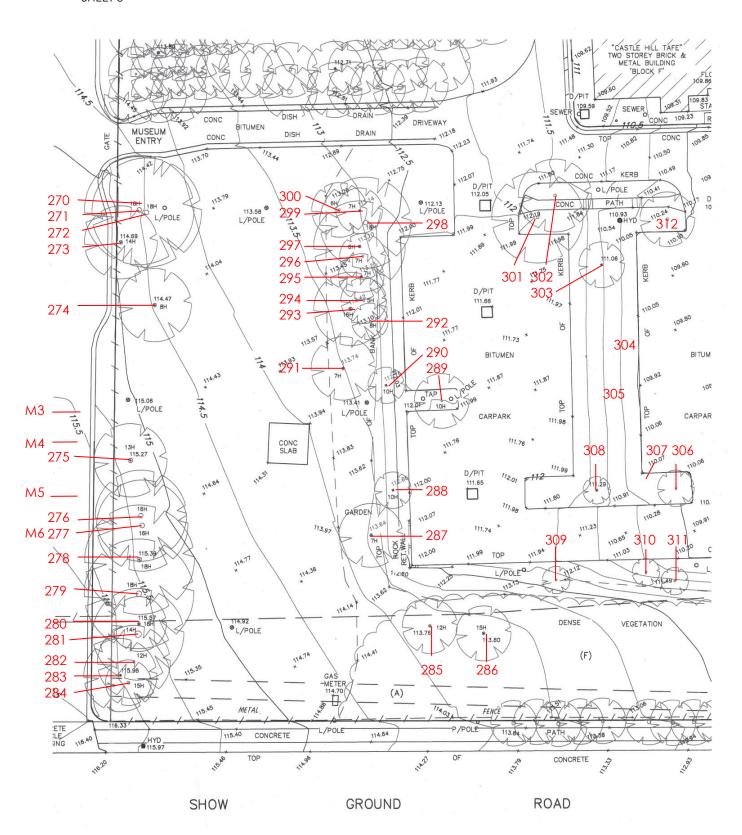
Site Plan Indicating Tree Locations.

Canopies are Indicative only

SHEET 2



Site Plan Indicating Tree Locations
Canopies are Indicative only
SHEET 3

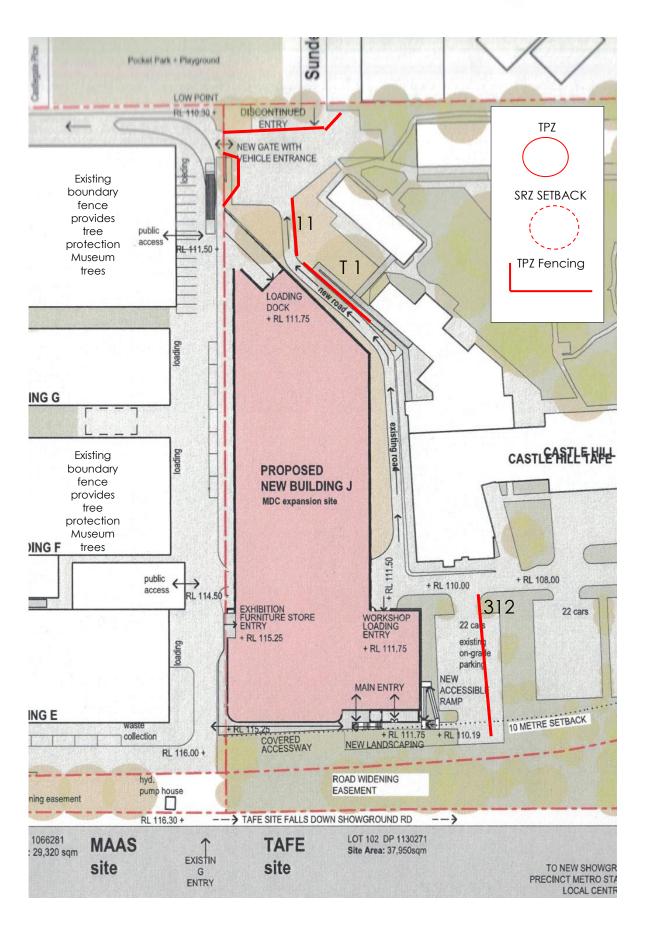


Site Plan Indicating Tree Locations Canopies are Indicative only SHEET 4

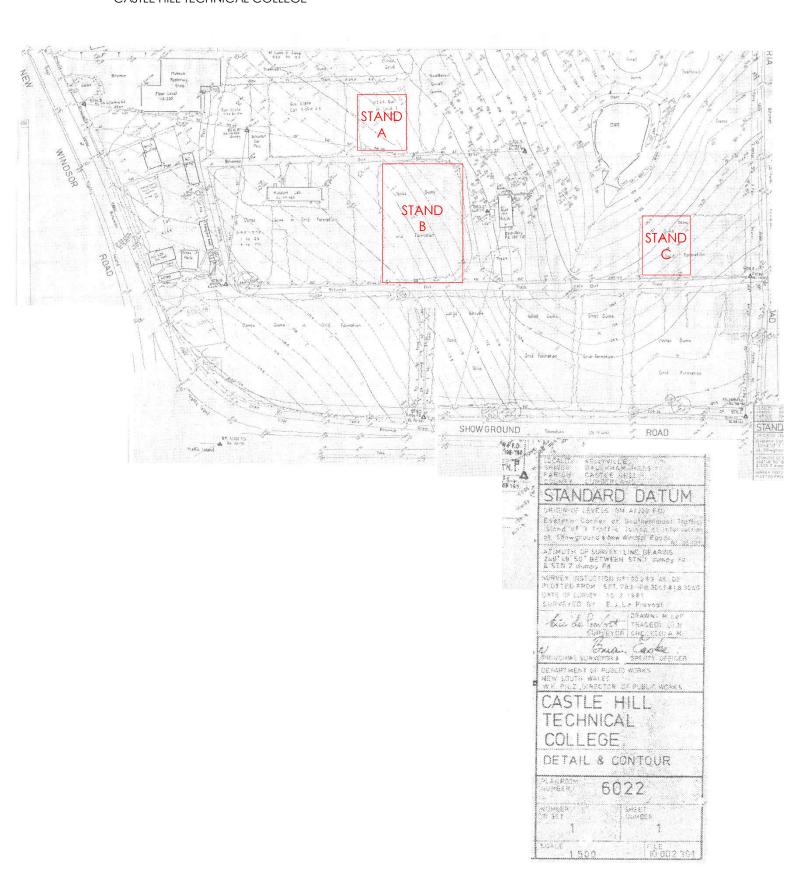


Tree Protection Plan Museum Discover Centre Expansion Indicative Tree Protection Zones





TAFE Site Plan 1981
Indicating Locations of Established Tree Plantations
CASTLE HILL TECHNICAL COLLEGE



Tree Protection Zone Calculations

Tree to Be retained

Diameter (Ø) at Breast Height (D.B.H.) was measured 1.4 metres (m.) above ground (unless indicated otherwise).

Radius is measured from the centre of the trunk at ground level.

Diameter at Root Base (DRB) is estimated at 10% greater than DBH.

TREE NO	Ø1	Ø 2	DBH (cm)	DRB (cm)	TPZ radius (m)	TPZ area (m²)	SRZ radius (m)
1	50	58	77	85	9.2	268	3.1
2	38		38	42	4.6	65	2.3
3	22	28	36	40	4.3	59	2.3
4	22	28	36	40	4.3	59	2.3
5	20	35	41	45	4.9	76	2.4
6	35	45	58	65	7.0	152	2.8
7	41		41	45	4.9	76	2.4
8	30		30	33	3.6	41	2.1
9	30		30	33	3.6	41	2.1
10	32		32	36	3.8	46	2.2
11	31		31	35	3.7	43	2.2
T1	38		38	42	4.6	65	2.3
306 307 310 311	15		15	20	1.8	10	1.7
312	31		31	35	3.7	43	2.2

Appendix 7

Tree Protection Zone (TPZ)

The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

Determining the TPZ

The radius of the TPZ is calculated for each tree by multiplying its D.B.H. x 12.

TPZ = D.B.H. x 12 where D.B.H. = trunk diameter measured at 1.4 m above ground from the centre of the trunk.

Structural Root Zone (SRZ)

The SRZ is the area required for street stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when a major encroachment into a TPZ is proposed. Root investigation may provide more information on the extent of these roots.

Determining the SRZ

SRZ radius = $(D \times 50)^{0.42} \times 0.64$ where D = trunk diameter, in metres, measured above the root buttress.

Note: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m.

20

General Tree Protection Measures

Tree Protection Fencing

The Protective fencing where required may delineate the TPZ and should be located as determined by the project or council arborist.

Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition.

Once erected, protective fencing must not be removed or altered without approval by the project or council arborist.

The TPZ must be secured to restrict access.

AS 4687 Temporary fencing and hoardings specifies applicable fencing requirements.

Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area.

Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots.

Existing perimeter fencing and other structures may be suitable as part of the protective fencing.

Chain wire mesh panels with shade cloth attached, held in place with concrete feet.

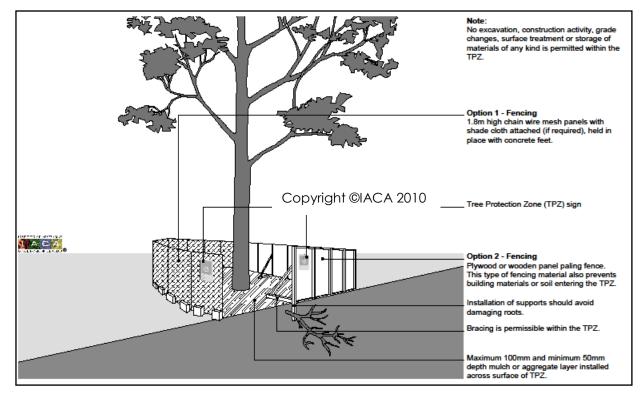
Alternative plywood or wooden paling fence panels. The fencing material also prevents building materials or soil entering the TPZ.

Mulch installation across surface of TPZ (at the discretion of the project arborist).

No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

Tree Protection Devices – as per AS4970.

Protection Fencing Section 4.3, Trunk and Branch Protection, Section 4.5.2



Significance of a Tree, Assessment Rating System (STARS) ©

From Institute of Australian Consulting Arborists 2010© from an original concept by Footprint Green Tree Significance & Retention Value Matrix, June 2001.

Tree Significance - Assessment Criteria

- 1. High Significance in landscape
- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.
 Environmental Pest / Noxious Weed Species
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation. Hazardous/Irreversible Decline
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.



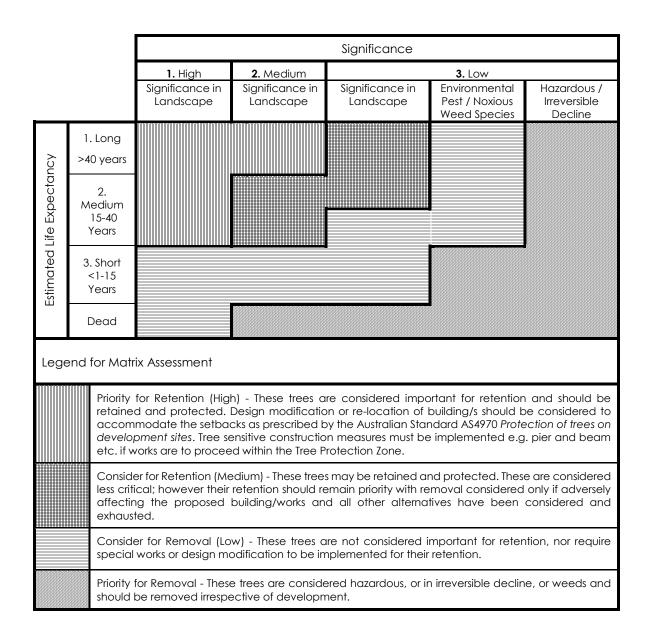
Tree Retention Value - Priority Matrix.

References

Australia ICOMOS Inc. 1999, The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, Footprint Green Tree Significance & Retention Value Matrix, Avalon, NSW Australia, www.footprintgreen.com.au



Matrix - Sustainable Retention Index Value (SRIV) ©

Institute of Australian Consulting Arboriculturists, Australia, 2010, Sustainable Retention Index Value (SRIV), Version 4.

A visual method of objectively rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria.

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition. An index value is given to each category where ten (10) is the highest value.

	Vigour Class and Condition Class ONSLITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS ®						
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)	
Age Class	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.	
Young	YGVG - 9 Index Value 9 Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	YGVF - 8 Index Value 8 Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	YGVP - 5 Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low- medium potential for future growth and adaptability. Retain, move or replace.	YLVG - 4 Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	YLVF - 3 Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low- medium potential for future growth and adaptability. Retain, move or replace.	YLVP - 1 Index Value 1 Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.	
Mature 3	MGVG - 10 Index Value 10 Retention potential - Medium - Long Term.	MGVF - 9 Index Value 9 Retention potential - Medium Term. Potential for longer with improved growing conditions.	MGVP - 6 Index Value 6 Retention potential - Short Term. Potential for longer with improved growing conditions.	MLVG - 5 Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions.	MLVF - 4 Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions.	MLVP - 2 Index Value 2 Retention potential - Likely to be removed immediately or retained for Short Term.	
Over-mature 0	OGVG - 6 Index Value 6 Retention potential - Medium - Long Term.	OGVF - 5 Index Value 5 Retention potential - Medium Term.	OGVP - 4 Index Value 4 Retention potential - Short Term.	OLVG - 3 Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions.	OLVF - 2 Index Value 2 Retention potential - Short Term.	OLVP - 0 Index Value 0 Retention potential - Likely to be removed immediately or retained for Short Term.	

Glossary of Terms

Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia

Adaptive Wood

Additional load bearing wood formed in response to mechanical stresses and gravitational force upon the vascular cambium to provide a uniform distribution of loading.

Age

Most trees have a stable biomass for the major proportion of their life.

The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as Young, Mature and Over-mature (British Standards 1991, p. 13, Harris et al., 2004, p. 262).

Young Tree aged less than <20% of life expectancy, in situ.

Mature Tree aged 20-80% of life expectancy, in situ.

Over-mature Tree aged greater than >80% of life expectancy, in situ, or senescent with or without reduced vigour, and declining gradually or rapidly but irreversibly to death.

Senescent Tree of advanced old age, or over mature leading towards death.

Condition of Trees

A tree's crown form and growth habit, as modified by its environment (aspect, suppression by other trees, soils), the stability and viability of the root plate, trunk and structural branches (first (1st) and possibly second (2nd) order branches), including structural defects such as wounds, cavities or hollows, crooked trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with vigour and it is possible for a tree to be of normal vigour but in poor condition.

Can be categorized as Good Condition, Fair Condition, Poor Condition or Dead.

Crown Form

The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment.

Crown form may be determined for tree shape and habit generally as dominant, co dominant, intermediate, emergent, forest and suppressed. It may also be categorised as good form or poor form.

Dominant

Crowns of trees generally not restricted for space and light, receiving light from above and on all sides

Codominant

Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

Emergent

Crowns of trees restricted for space on most sides receiving most light from above until the upper crown grows to protrude above the canopy in a stand or forest environment. Such trees may be crown form dominant or transitional from crown form intermediate to crown form forest asserting both apical dominance and axillary dominance once free of constraints for space and light.

Forest

Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each *inferior* and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the *lower* crown.

Suppressed

Crowns of trees generally not restricted for space but restricted for light by being overtopped by other trees and occupying an understorey position in the canopy and growing slowly.



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TRAFFIC AND CAR PARKING IMPACT STATEMENT

Proposed Expansion of Museum of Applied Arts and Sciences – Museum Discovery Centre

2 Green Road

Castle Hill

Prepared by:

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September, 2019 SY181569 – Issue 3.0



Executive Summary

Northrop Consulting Engineers has been engaged by Lahz Nimmo Architects to prepare a traffic investigation on the potential influence on surrounding roads and car parking infrastructure due to the proposed development of Building J.

Building J is predominantly a storage facility with some ancillary office space. Following an investigation of the proposed staffing levels and the purpose of the facility it was determined that there will be a small increase in traffic generated by the MDC site from the new building. This has been assessed as having minimal impact on the performance of the surrounding key road intersections.

As assessment of parking demand on the site was prepared which determined that a total of 63 spaces are needed to meet the average daily demand for the MDC site. This equates to an increase of 9 parking spaces. This additional parking will be included within the site to accommodate the proposed development of Building J.

There will be a small number of public visits. This has been assessed to have minimal traffic/car parking impact during the peak periods. With the good public transport links and footpath connectivity to the site, the ease of implementing a Green Travel Plan increases which promotes sustainable transport methods.

There are good public transport links around the area including the provision for buses and the Sydney Metro. These services link the MDC site to the Sydney transport network.

There are good connectivity of pedestrian and cyclist travel routes that link the MDC site with the surrounding area inclusive of the Hill Showground Station. There are footpaths located on both Windsor Road and Showground Road. The footpath along Showground Road provides a link to the Sydney Metro.

Overall the proposal has an acceptable minimal traffic and car parking impact and the site is well connected by bus and rail public transport options.



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Revision Schedule

Rev	Date	Description of Revision	Prepared	Reviewed	Approved
1.0	18/02/19	Issue 1.0 - Draft	Nicholas Grinter	Matthew Pike	Matthew Pike
1.1	15/05/19	Issue 1.1 - Draft	Nicholas Grinter	Matthew Pike	Matthew Pike
1.2	29/05/19	Issue 1.2 - Draft	Nicholas Grinter	Matthew Pike	Matthew Pike
2.0	14/06/19	Issue 2.0	Nicholas Grinter	Matthew Pike	Matthew Pike
2.1	14/06/19	Issue 2.1	Nicholas Grinter	Matthew Pike	Matthew Pike
3.0	04/09/19	Issue 3.0	Nicholas Grinter	Matthew Pike	Matthew Pike



1.0 Introduction

1.1 Background

Northrop Consulting Engineers (NCE) has been engaged by Lahz Nimmo Architects (LNA) to prepare a Traffic Investigation on the potential influence on surrounding roads and car parking infrastructure due to the proposed development of the Museums Discovery Centre (MDC) at Castle Hill. The works would include the rezoning of land and construction of a new building, "Building J".

The affected roads would include:

- Windsor Road:
- · Showground Road; and
- Green Road.

The car parking potentially impacted includes:

- MDC site parking;
- · Adjacent Castle Hill TAFE parking; and
- Local on-street car parking in the adjacent street.

1.2 Scope

The scope of this report is to include:

- An outline of the expected traffic generation by the proposed MDC;
- An assessment of the impact of the proposal on the nearby signalised intersections via a commentary on the quantum change for the intersections of:
 - Windsor Road/Showground Road; and
 - Victoria Road/Showground Road;
- A commentary on turning paths of service vehicles; and
- An assessment and commentary of the car parking demand from the proposed Building J.

1.3 Codes and Guidelines

The codes and guidelines referenced to for this report include:

- AS2890.1 Parking Facilities Part 1: Off-street Car Parking (2004);
- AS2890.2 Parking Facilities Part 2: Off-street Commercial Vehicle Facilities (2018);
- AS2890.3 Parking Facilities Part 3: Bicycle Parking (2015);
- AS2890.6 Parking Facilities Part 6: Off-street Car Parking for People with Disabilities (2009);
- The Hills Development Control Plan (2012);
- RTA Guide to Traffic Generating Developments (Version 2.2, October 2002);
- Guide to Traffic Generating Developments Updated Traffic Surveys (August, 2013);
- The Hills Development Control Plan (2012); and
- · Others as referenced through this report.

1.4 Limitations

This report has been written in accordance with the current standards and guidelines. Future works will need to refer to the current edition of the relevant standard or guideline.



2.0 Traffic Generation

For the purpose of this report, the proposed Building J site has been analysed for its expected traffic generation.

It is understood that the proposed Building J is primarily a storage facility for museum displays and unlike other buildings on the site, will not generate significant public traffic other than small group visits or occasional visits on a pre-booked basis by individuals.

Accordingly, Building J has been analysed for an "average weekday" where it is assumed there are MDC staff on site without an allowance for special events.

The Hills Development Control Plan (2012), RTA Guide to Traffic Generating Developments (GTGD) and self-assessment have been used as detail below.

2.1 Employee Traffic Generation for Proposed Building J

For the purpose of this investigation, Building J has been assessed as a warehouse as per the GTGD. The weekday traffic generation as per the GTGD for Building J is in Table 1. With a total GFA of 9,740m2, the total generated traffic as per the GTGD is as per Table 1.

Table 1 GTGD Traffic Generation for MDC

Weekday Rates	Sydney Average	Total Traffic Generated
AM peak ₁ (1 hour) vehicle trips	0.5	49
per 100m2 of GFA		
Daily Total	4	390

1. The AM peak (1 hour) refers to the morning hour in which most traffic either enters or exits the development. For the purpose of this study, the peak hour would most likely be 30 minutes either side of the generic start time for the site.

It is noted in the GTGD that the vehicle generation rates for warehouses vary substantially depending upon the type of goods being warehoused and the nature of the particular manufacture/retail system.

It was advised there will be up to 50 staff working at the proposed facility which is close to the number of peak hour vehicle trips as per Table 1. Noting some employees would not drive to work, this would therefore result in more vehicle trips than employees for the morning peak period. It is assumed there would be a low number of deliveries (during the peak hour) which would provide a negligible change to the peak and daily total trips.

There were more vehicle trips than employees likely to be driving to work for Building J; therefore the GTGD does not appear to be applicable for warehouses for this application, therefore a self-assessment was undertaken to provide a number of vehicle trips more suited to the unique style of storage development. This self-assessment referred to the Bureau of Statistics when developing the generation rates.

The Bureau of Statistics indicated that in 2016, approximately 66.44% of people drove a car to work (Australian Bureau of Statistics, 2071.0.55.001 – Census of Population and Housing: Commuting to Work – More Stories from the Census).

For the purpose of this traffic investigation, the conservative upper limit of 70% of employees has been assumed to drive to work. The number of employees that drive to work is shown in Equation 1.

 $50 \, Employees \times 70\% \, Employees \, Driving \, to \, Work = 35 \, Employees \, Driving \, to \, Work$

Equation 1 Number of Employees Driving to Work



The remaining 30% would use other modes of transport such as public transport, riding or walking to work.

Due to the nature of the development, it may be assumed there would be 1 vehicle trip per employee car per peak period as per by Equation 2.

35 Employees Driving to Work \div 1 Car per Employee \div 1 Car Trip Per Peak Hour = 35 Car Trips Per Peak Hour

Equation 2 Number of Peak Hour Trips

For the purpose of this study, we have assumed an average of 3 vehicle trips per employee car per day as per Equation 3. The allowance for an additional 1 car trip per employee per day recognises that some, but not all employees may need to leave the site during the day.

 $35 Car Trips Per Peak Hour \times 2 Peak Hours + 1 Car Trip Per Employee Per Day = 105 Daily Trips$

Equation 3 Number of Daily Trips

Table 2 summarises the self-assessment of the traffic generation for the MDC.

Table 2 Self-Assessment of Traffic Generation for MDC

Weekday Rates	Traffic Generated
Peak hour vehicle trips for development	35
Daily vehicle trips for development	105



3.0 Impact of the Proposed Development to Surrounding Intersections

3.1 Surrounding Road Network

For the purpose of this study, there are four main roads which provide access to the site including:

- Showground Road;
- Windsor Road;
- Green Road; and
- Victoria Avenue.

These roads as well as the site have been identified in Figure 1.



Figure 1 Site Locality

For the purpose of this traffic investigation, the following intersections have been commented on:

- Windsor Road and Showground Road; and
- Showground Road, Green Road and Victoria Avenue.

It is noted vehicles can only travel Northbound from the exit of the TAFE site onto Green Road and therefore all traffic from the TAFE car park will go to the roundabout at the intersection of Green Road and St Pauls Road. See Figure 2 for the locality plan showing Green Road and St Pauls Road.



Figure 2 Locality Plan for Green Road and St Pauls Road

Green Road is a 4 lane – 2 way median separated road.

3.2 Incoming and Outgoing Traffic Distribution

The entry to the TAFE is from Green Road approximately 50m North of Showground Road. As Green Road is separated by a median, the TAFE driveways are left in – left out only.

It is anticipated that the employees of the Building J would utilise the Green Road entry and exit location as well as the Windsor Road and Showground Road entry and exit locations. The proposed spread of vehicle trips is as per Figure 3 for incoming traffic and is as per Figure 4 for departing traffic.

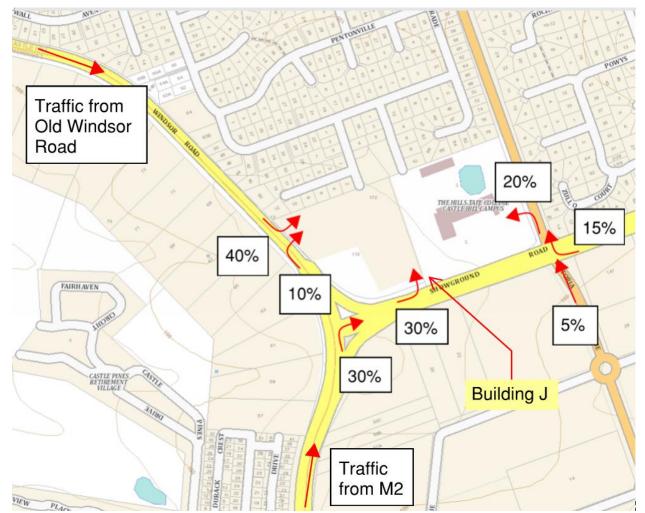


Figure 3 Incoming Employee Traffic to Site

80% of the traffic has been assigned to Windsor Road due to the connectivity with the road network. Windsor Road connects to Old Windsor Road and the M2. Southbound traffic is anticipated to enter off the entry location on Windsor Road. Most of the Northbound traffic is anticipated to enter from Showground Road with a minority entering off Windsor Road.

15% of the traffic has been assigned to Showground Road Westbound. Showground Road Westbound is a link to the surrounding suburbs.

5% of the traffic has been assigned to Victoria Road to account for drivers avoiding Windsor Road as well as capturing the surrounding suburbs.



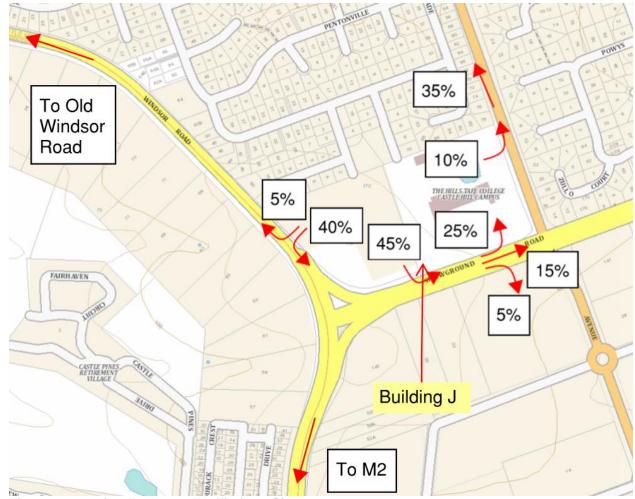


Figure 4 Outgoing Employee Traffic from Site

It is anticipated that 90% of generated traffic from the site will utilise the current MDC exit locations and 10% will use the TAFE car park exit location.

Of the 90% of generated traffic using the current MDC exits, 5% is anticipated to head Northbound from the Windsor Road exit, 40% is anticipated to head Southbound from the Windsor Road exit and 45% is anticipated to head Eastbound from the Showground Road exit. The generated traffic heading Eastbound along Showground Road is anticipated to distribute into the network as shown in Figure 4.

10% of the generated traffic using the TAFE exit is anticipated to head Northbound and distribute into the surrounding road network.

It is assumed there are more drivers utilising President Road on a proposed route to Windsor Road rather than completing a U-turn at the intersection of Green Road and St Pauls Road (i.e. leaving the roundabout from the leg to which the approach was made) as per Figure 5.

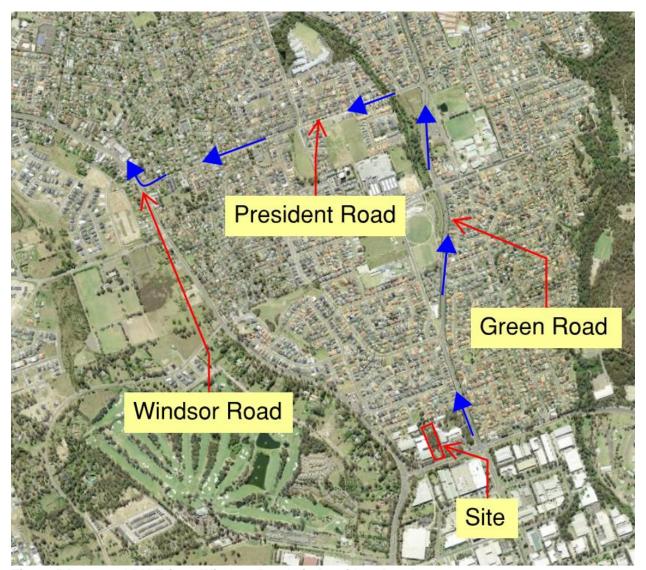


Figure 5 Proposed PM Trip to Windsor Road via President Road

This would result in the traffic movements for each intersection in the relative peak period as per Table 3 (assuming an approximate start of 8:30am and finish time of 5:00pm for the average working day). It has been assumed that visitor traffic will arrive and depart outside of the provided peak periods.

It is acknowledged drivers may also utilise Wrights Road on a proposed route to Windsor Road as per Figure 6.

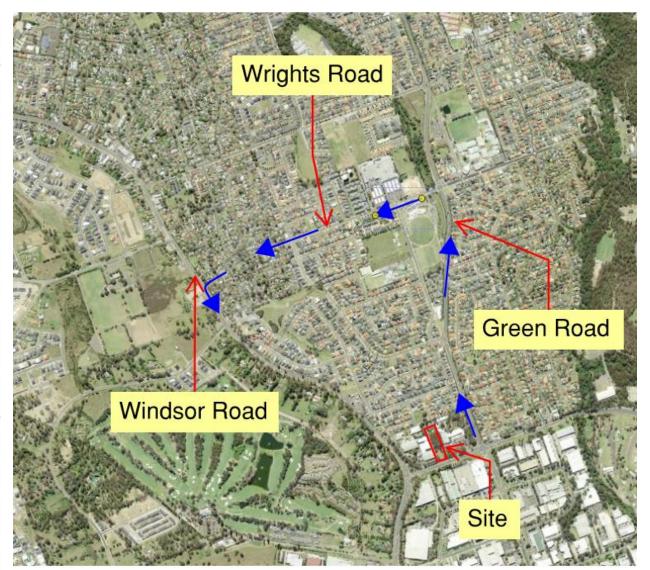


Figure 6 Proposed PM Trip to Windsor Road via Wrights Road

Table 3 Additional Traffic Movements for Each Intersection

Intersection		Peak Period	Additional No. Vehicles					
			Utilising Intersection					
Windsor Road/Showg	round Road	8:00am - 9:00am	15					
		5:00pm – 6:00pm	14					
Showground	Road/Green	8:00am - 9:00am	7					
Road/Victoria Avenue		5:00pm – 6:00pm	16					

Table 3 indicates there will be a low volume of traffic generated from Building J that will pass through the key intersections.

3.3 Impact of Additional Traffic on Surrounding Intersections

Sydney Coordinated Adaptive Traffic System (SCATS) data has been obtained from the RMS for the period from 1st April, 2019 – 8th April, 2019. The SCATS data was for the following intersections:



- TCS 1279 Windsor Road and Showground Road, Castle Hill; and
- TCS 2701 Showground Road and Victoria Avenue, Castle Hill.

Table 4 provides a summary of the SCATS data provided with the additional traffic generated from the development with the full SCATS data available in Appendix B . For the purpose of this report, the average number of weekday vehicles has been used for 1st April, 2019 – 5th April, 2019

Table 4 SCATS Summary

TCS No.	Peak Period	Approach	Movement	Existing Average No. Vehicles	Additional Vehicles	Total Average No. Vehicles
1279	8:00am –	North	Straight	1,439	Nil	1,439
	9:00am		Left Turn	777	Nil	777
		East	Left Turn	783	Nil	783
			Right Turn	485	Nil	485
		South	Straight	466	4	470
			Right Turn	471	11	482
	5:00pm –	North	Straight	597	14	611
	6:00pm		Left Turn	433	Nil	433
		East	Left Turn	373	Nil	373
			Right Turn	863	Nil	863
		South	Straight	1,355	Nil	1,355
			Right Turn	594	Nil	594
2701	8:00am – 9:00am	North	Left Turn/Straight	1,016	Nil	1,016
			Right Turn	189	Nil	189
		East	Left Turn	150	Nil	150
			Straight	972	Nil	972
			Right Turn	235	5	240
		South	Left Turn	120	Nil	120
			Straight	332	2	334
			Right Turn	130	Nil	130
		West	Left Turn	115	Nil	115
			Straight	945	Nil	945
		North	Right Turn	205	Nil	205
	5:00pm – 6:00pm		Left Turn/Straight	669	Nil	669
			Right Turn	67	Nil	67
		East	Left Turn	124	Nil	124
			Straight	879	Nil	879
			Right Turn	635	Nil	635
		South	Left Turn	308	Nil	308
			Straight	1,086	Nil	1,086
			Right Turn	240	Nil	240
		West	Left Turn	128	9	137
			Straight	884	5	889
			Right Turn	103	2	105

Most of the movements are not affected by the additional traffic from the proposed Building J. Most movements have a net increase of less than 3% during the peak periods except for the left turn from the West approach at the intersection of Showground Road and Victoria Avenue (TCS 2701). As this is a slip lane, there should be minimal disruption to the flow of traffic along Showground Road.



It is anticipated the additional traffic generated from the staff of the proposed Building J will have minimal impact to the surrounding network.

3.4 Green Travel Plan to Reduce Traffic Generation

The implementation of a Green Travel Plan would reduce the number of incoming and outgoing vehicles in relation to the proposed Building J and promote the use of sustainable transport options. The promotion of the travel plans can be through actions, promotional campaigns and incentives.

The Green Travel Plan is an initiative to encourage travel mode behaviour change. The Green Travel Plan would promote and encourage employees and visitors to use sustainable transport options such as:

- Walking;
- Cycling;
- Public Transport including buses and Sydney Metro to Hills Showground; and
- Carpooling.

A Green Travel Plan would reduce the number of vehicles on the road accessing the site; in turn reducing the number of vehicles requiring to use the surrounding intersections. Initiatives provided by the MDC such as but not limited to:

- Producing walking maps for visitors and educating employees about distances from local transport;
- Providing on site secure bicycle parking;
- Informing visitors and employees of the proposed development's proximity to public transport;
- Providing incentives for groups of people to arrive in a "shared" vehicle rather than as a single occupant of a vehicle; and
- Norwest on Demand services, operated by Hillsbus MetroConnect starting on 27 May, 2019.

The Green Travel Plan should be developed to suit the site location. Continual monitoring of the Green Travel Plan will need to be undertaken by Museum of Applied Arts and Sciences (MAAS) management as public transport schedules in the area change.

The MAAS site located at Ultimo has no provision for staff parking on site. Currently staff utilise other modes of transport to commute to the site. It is anticipated that the Castle Hill site will operate in a similar fashion.



4.0 Turning Paths

Turning templates were prepared using AutoTurn software. Turning demonstrations were prepared for a 12.5m heavy rigid vehicle (HRV) and a 19m articulated vehicle (AV). The HRV was trialled entering through Green Road and entering from and departing to Windsor Road. The AV was trialled entering from and departing to Windsor Road. A 600mm offset for the vehicles have been used as per AS2890.2.

All parking spaces were able to be retained with the vehicles manoeuvring through the site. Minor adjustments to the road width are required to retain the current parking spaces.

4.1 HRV

The HRV was able to enter from Windsor Road, manoeuvre around the site to then exit the site to Windsor Road without any conflicts when turning.

When accessing the site from the left lane on Green Road, the simulation indicated a conflict with the fence. It is noted HRV's may use the two lanes adjacent the kerb when entering a block. Additional turning space from two lanes rather than one would allow entry into the block without any conflicts.

4.2 AV

The AV requires two lanes to enter and exit the block from Windsor Road to prevent conflicts with any structures.

The AV was able to successfully manoeuvre through the site without obstructing any car parking spaces.

4.3 Recommendations

Given the HRV and AV will use two lanes to get into and out of the site, it should be timed that deliveries are scheduled out of peak traffic times.



5.0 Car Parking Demand

5.1 Replacement of Parking Spaces

Noting the proposed building is to be positioned over an existing section of the parking lot, the occupied spaces have been proposed to be moved to an alternate location on the TAFE site. The proposed location for the relocated parking spaces is identified in Figure 7. This would then result in a net change of 0 car parking spaces for the TAFE site.

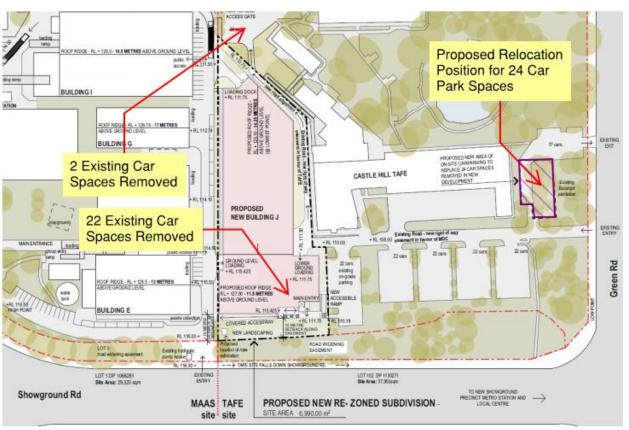


Figure 7 Proposed Location for Relocated Parking Spaces

5.2 MDC

Currently there are 54 marked car spaces on the MDC site, with the possibility of additional marked spaces to support the new proposed Building J.

The Hills Development Control Plan (DCP) 2012 Part C Section 1 Parking Table 1 outlines the required minimum car parking provision required for particular types of development. Upon review of the Industry – component uses - similar with the GTGD – there are no appropriate classes to identify the MDC site by. The closest would be warehouse which would then entail 1 space per 50m2. This would result in a number of parking spaces well above the number of staff and average number of visitors on a daily basis and therefore an independent review of the parking numbers has been undertaken.

In order to compute the approximate number of visitor spaces used at the MDC site, the total number of visitors was reviewed for 2017/2018 financial year.

The MDC daily admissions for 2017/2018 financial year welcomed 17,481 visitors. There were many reasons visitors were at the MDC including however not limited to:



- Booked group tours;
- Education tours; and
- General admission.

Excluding the free weekend, open weekend, booked group tours and education visits, there were a total of 7,767 visitors. This results in 150 visitors per week. MDC management have advised that most cars contain family groups of 3-4 passengers in each car, assuming a conservative 2-3 people in each car, there would be 50-75 cars per week which equates to 10-15 cars per day. For the purpose of this report, we have considered the conservative total of 15 cars per day arriving and departing the site under the current conditions.

Noting that there will be a small number of visitors for the proposed Building J however also taking into consideration the transport alternatives to the site as detailed in Section 6.0 and 7.0, a total of 15 cars per day for visitors have been estimated for when determining the required number of car park spaces.

As per Section 2.0 of this report, the GTGD was reviewed to determine the number of vehicular trips generated for the proposed Building J development. Due to the nature of the of the development and the GTGD requiring a GFA for the traffic generation, a traffic generation for peak periods was determined which would provide more movements to the site than proposed employees. From this, a self-assessment was conducted in line with information from the Bureau of Statistics.

It is assumed the number of peak trips generated from the development would determine the number of parking. Therefore, for Building J, 35 additional car spaces would be required for employees. Additional motorcycle and bicycle spaces should be considered for employees using alternate methods of transport. End of trip facilities should be provided as per AS2890.3. Visitor parking for the site has been accounted for in the total of visitor parking for the MDC site.

For special events occurring on weekends, it would be anticipated that the overflow parking would spill into the TAFE site, noting there would be minimal students and teachers on site at this time.

It is noted as per information from the MAAS that there is the potential for 13 staff members to be on-site at any time at this stage. For the purpose of this study, we have assumed each staff member drives their own vehicle onto the site.

A summary of the required parking per day is in Table 5.

Table 5 Summary of Parking for MDC Site

Description	Number of Car Spaces Required
MDC Visitor	15
MDC Employee	13
Proposed Building J Employee	35
Total	63

5.3 Car Park Survey

A car park survey was received from the MAAS. The survey included the MDC site. The survey was undertaken from 10th April, 2019 – 12th April, 2019.

The survey location is as per Figure 8.





Figure 8 Survey Location

The results from the car park survey at the MDC site can be found in Table 6. These results have been based off a total of 54 car parking spaces.

Table 6 Car Park Survey Results

Location	No. Car Park Spaces	Date	Time	Car Park Spaces Utilised (No.)	Car Park Spaces Utilised (%)					
MDC	54	10 th April, 2019	8:00am - 9:00am	10	19%					
			10:30am – 11:30am	34	63%					
			1:00pm – 2:00pm	29	54%					
			3:00pm – 4:00pm	9	17%					
			5:00pm - 6:00pm	3	6%					
	11 th April, 2019		8:00am - 9:00am	6	12%					
			10:30am - 11:30am	14	26%					
			1:00pm – 2:00pm	14	26%					
			3:00pm – 4:00pm	7	13%					
			5:00pm - 6:00pm	3	6%					
		12 th April, 2019	8:00am - 9:00am	6	12%					
			10:30am - 11:30am	12	23%					
			1:00pm – 2:00pm	n – 2:00pm 12						
			3:00pm - 4:00pm	9	17%					
			5:00pm – 6:00pm	4	8%					

The car park survey received from the MAAS indicates that parking onsite is underutilised and there was significant available capacity at the time of the parking counts.



5.4 Green Travel Plan to Reduce Car Parking Demand

Section 3.4 of this report outlines how a Green Travel Plan may be introduced and implemented for the proposed site.

As outlined in Section 3.4, there may be a reduction of incoming and outgoing vehicles. A reduction in vehicle movements would result in a reduction in the car parking demand.

5.5 Summary of Car Parking Demand

The car parking spaces on the TAFE site occupied by the building have been relocated to another area of the TAFE site to ensure a net zero change in car parking spaces for the TAFE.

Based upon the average number of daily visitors to the site, the MDC site requires 63 spaces inclusive of the parking requirements for Building J. Currently there are 54 spaces on site. An additional 9 spaces would meet the average daily demand for the MDC site.

The introduction of new transport services, such as the Sydney Metro as discussed in Section 6.0 of this report would see the additional 9 car parking spaces as adequate to meet the average daily parking demand for the MDC site.

The drafting and implementation of a Green Travel Plan could further reduce the number of parking spaces anticipated to be required.



6.0 Public Transport in the Area

There are many current and future public transport opportunities in the area. The following sections expand on the available modes.

6.1 City to Castle Hill Bus Route 610 and 610X

Bus routes 610 and 610X are provided by Transport NSW. The routes connect Sydney central business district (with the route starting/finishing at the Queen Victoria Building on York Street), Lane Cove Interchange, West Pennant Hills, Baulkham Hills, Castle Hill, Beaumont Hills and Rouse Hill (with the route starting/finishing at Rouse Hill Station). The route travels along Green Road adjacent to the Castle Hill TAFE. There is a bus stop located opposite the TAFE when travelling towards Rouse Hill and bus stops within walking distance from the TAFE when travelling to the city.

Bus routes 610 and 610X operate on both weekdays and weekends. Services are generally up to 30 minutes apart providing a frequent option for travel.

The latest revision of the timetable has made the service more frequent, assisting commuters travel to their destination.

See Figure 9 for the travel path of bus routes 610 and 610X.

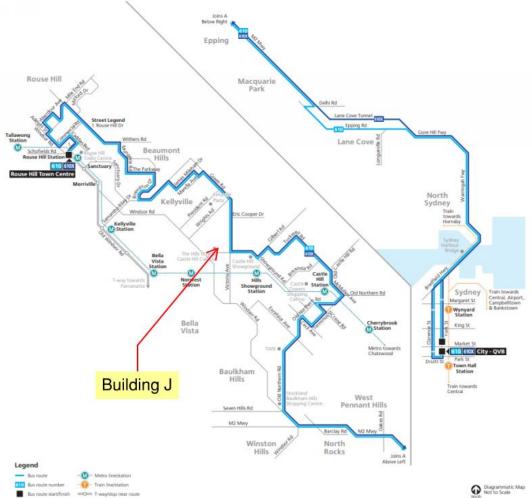


Figure 9 Route 610 and 610X (Transport NSW, May 2019)



6.2 Norwest On Demand

The Norwest On Demand service is operated by CDC Hillsbus MetroConnect.

The On Demand service picks up the person travelling from an agreed pick up point to a Norwest Station, Bella Vista Station or Hills Showground Station which makes it easier connecting with the Sydney Metro as well as travelling to the proposed Building J site.

The service is available on weekdays (inclusive of public holidays that land on a weekday). The morning service is from 6:00am – 10:00am and the afternoon service is from 4:00pm – 9:00pm making it ideal for employees of the MAAS working at the proposed Building J who live within the service pick up area.

The area for the On Demand service is shaded in blue in Figure 10.

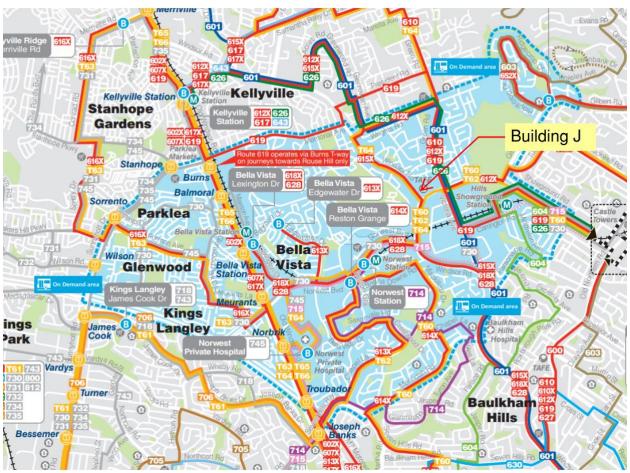


Figure 10 Area for Norwest On Demand Service (Hills District Bus Guide Effective from: Day 1 Metro [May, 2019])

6.3 Sydney Metro

The Sydney Metro is a new transport link between Bankstown and Rouse Hill which is expected to be fully operational by 2024.

The Sydney Metro commenced services between Rouse Hill and Chatswood on 26th May, 2019. It is noted that the Hills Showground Station is located at the corner of Carrington Road and Doran Drive which is approximately 1.7km from the MDC via Victoria Road or Doran Drive. The Transport NSW Trip Planner



indicates that the trip time from Tallawong Station to Hills Showground Station is 12 minutes, and from Chatswood Station to Hills Showground Station is 24 minutes.

See Figure 11 for the Sydney Metro route currently under operation including the location of the Hills Showground Station.

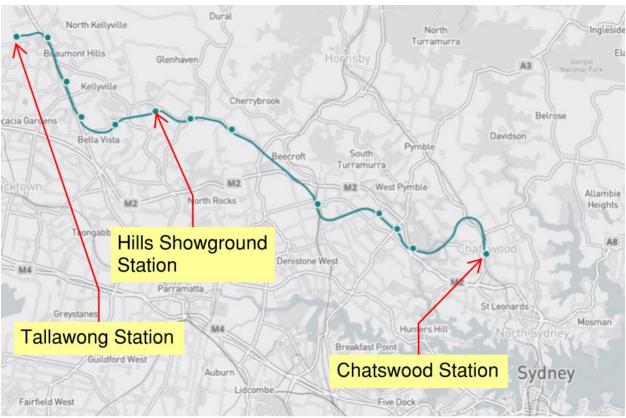


Figure 11 Sydney Metro Route (Sydney Metro [May, 2019])

See Figure 12 for the location of the Hills Showground Road Station in reference to the proposed Building J site.

Structural





Figure 12 Hills Showground Road Station Location

As per the following sections, there are current and proposed bus routes along Showground Road which provide connectivity between the Hills Showground Station and Building J.

6.4 **Local Bus Routes**

There are multiple local bus routes within the area which would assist visitors and staff travelling to and from the MDC site.

The Hills District Bus Guide (effective Day 1 Metro) illustrates there are many services which pass the MDC site. These services include:

- T64 and 615X passing the site via Windsor Road;
- T60 and T62 passing the site via Showground Road; and
- 601, 610, 612X, 619 and 626 passing the site via Green Road.

It is noted the MDC site is located within the Norwest On Demand service area and thus this will be an additional local bus service to the site.

See Figure 13 for an illustration of the bus network near the site as provided by Hills Bus. Figure 13 demonstrates there is connectivity along Showground road from the Hills Showground Station to Building J.



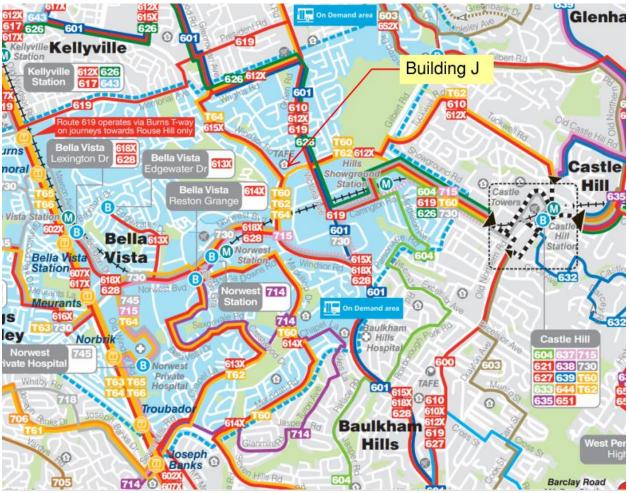


Figure 13 Extract from the Hills District Bus Guide Near Building J

Transport for NSW advised Route 619 which links Hills Showground Station to the Castle Hill Campus TAFE is a 4 minute journey on the bus with a short walk to the proposed Building J. Figure 14 illustrates the route from Hills Showground Station to the Castle Hill Campus TAFE.



Figure 14 Route 619 from Hills Showground Station to Castle Hill Campus TAFE

6.5 Other Public Transport

There are other public transport options such as alternate bus routes within close proximity to the site. These services provide connectivity to transport hubs and in turn, the Sydney Area.



7.0 Cycle and Pedestrian Path Connectivity

Northrop Consulting Engineers carried out an inspection of the area surrounding the proposed Building J site on 25th April, 2019.

General observations included:

- Wide footpaths separated by a dividing broken line;
- Pram ramps to connect the paths at road crossings;
- Footpaths are in an operational condition; and
- Connections between footpaths and bus stops.

Windsor Road has paths that link Kellyville with Castle Hill and then continue South along the road past the MDC site. The road has a wide path along the Western side to allow for efficient cycle and pedestrian travel along it. The Eastern side has a footpath however the footpath has not been upgraded to the same extents as that of the Western side. Controls have been put in place along Windsor Road such as fencing to separate the pedestrians from vehicular traffic where the path travels close to the road. An example is shown in Figure 15.



Figure 15 Fence Separating Footpath and Road

Showground Road has a pedestrian path on the Northern verge with a shared pedestrian/cycle path on the Southern Verge. Pedestrians can cross the road at the traffic signals at either Windsor Road or Green Road. There is good connectivity along Showground Road and through to the Hills Showground Station.

There is provision for on-road cycling along both sides of Green Road with a wide footpath adjacent the Western cycle lane for pedestrians as per Figure 16. At the end of the cycle lane before St Paul's Avenue, there is provision for cyclists to enter/exit the footpath network.





Figure 16 Green Road Cycle Lane

The footpath connectivity continues into St. Pauls Road into the residential area.

The intersection of Showground Road and Green Road has pedestrian crossings at all legs. There are zebra crossings at the slip lanes. See Figure 17 for an aerial image from Six Maps (May 2019) of the intersection of Showground Road and Green Road illustrating the pedestrian crossings at all legs of the intersection as well as the zebra crossings at the slip lanes.



Figure 17 Intersection of Showground Road and Green Road

The intersection of Showground Road and Windsor Road has pedestrian crossings at two of the three legs. There are zebra crossings at the slip lanes. See Figure 18 for an aerial image from Six Maps (May 2019) of the intersection of Showground Road and Green Road illustrating the pedestrian crossings at two of the three legs of the intersection as well as the zebra crossings at the slip lanes.



Figure 18 Intersection of Showground Road and Windsor Road

There is continual footpath connectivity from Hills Showground Station to the MDC site. The walking distance between the two sites is approximately 1.7km via Victoria Road – this distance increases to approximately 1.9km when the walk is via De Clambe Drive. The site inspection noted there are some changes in gradient throughout the routes.

The good connectivity and operational condition of the paths around the area provide good incentive for people to use these paths over driving to the destination as applicable and assist in the implementation of a Green Travel Plan.



8.0 Conclusion

Northrop Consulting Engineers has been engaged by Lahz Nimmo Architects to prepare a traffic investigation on the potential influence on surrounding roads and car parking infrastructure due to the proposed development of Building J.

The GTGD was reviewed for the generated traffic development. Due to the unique nature of development not fitting with the descriptions and rates in the GTGD, a self-assessment was conducted. The self-assessment identified that Building J generated 35 trips per peak period and 105 trips per day.

Building J will increase the flow of traffic by no more than 3% at the key intersections of Windsor Road and Showground Road; and Showground Road, Green Road and Victoria Avenue.

Turning paths for a Heavy Rigid Vehicle and Articulated Vehicle were trialled through the site. The Civil Engineer will need to review the turning templates during the detailed design phase of the works to ensure the internal access roads have the required width. Additional turning space from two lanes rather than one would allow entry into the block without any conflicts. Given the HRV and AV will use two lanes to get into and out of the site, it should be timed that deliveries are scheduled out of peak traffic times.

The analysis contained in this report concludes that an additional 9 spaces would meet the average daily parking demand for the MDC site. The site is within close proximity of public transport within the area inclusive of bus services and the Sydney Metro. The effect of the public transport as well as the implementation of a Green Transport Plan may see these spaces underutilised for average weekdays.

There is good connectivity of pedestrian and cyclist travel routes that link the MDC site with the surrounding area inclusive of the Hill Showground Station. There are footpaths located on both Windsor Road and Showground Road. The footpath along Showground Road provides a link to the Sydney Metro.

Overall the proposal has an acceptable minimal traffic and car parking impact and the site is well connected by bus and rail public transport options.

Do not hesitate to contact the undersigned if you have any questions related to this report.

Northrop Consulting Engineers

NICHOLAS GRINTER

Engineer

MATTHEW PIKE

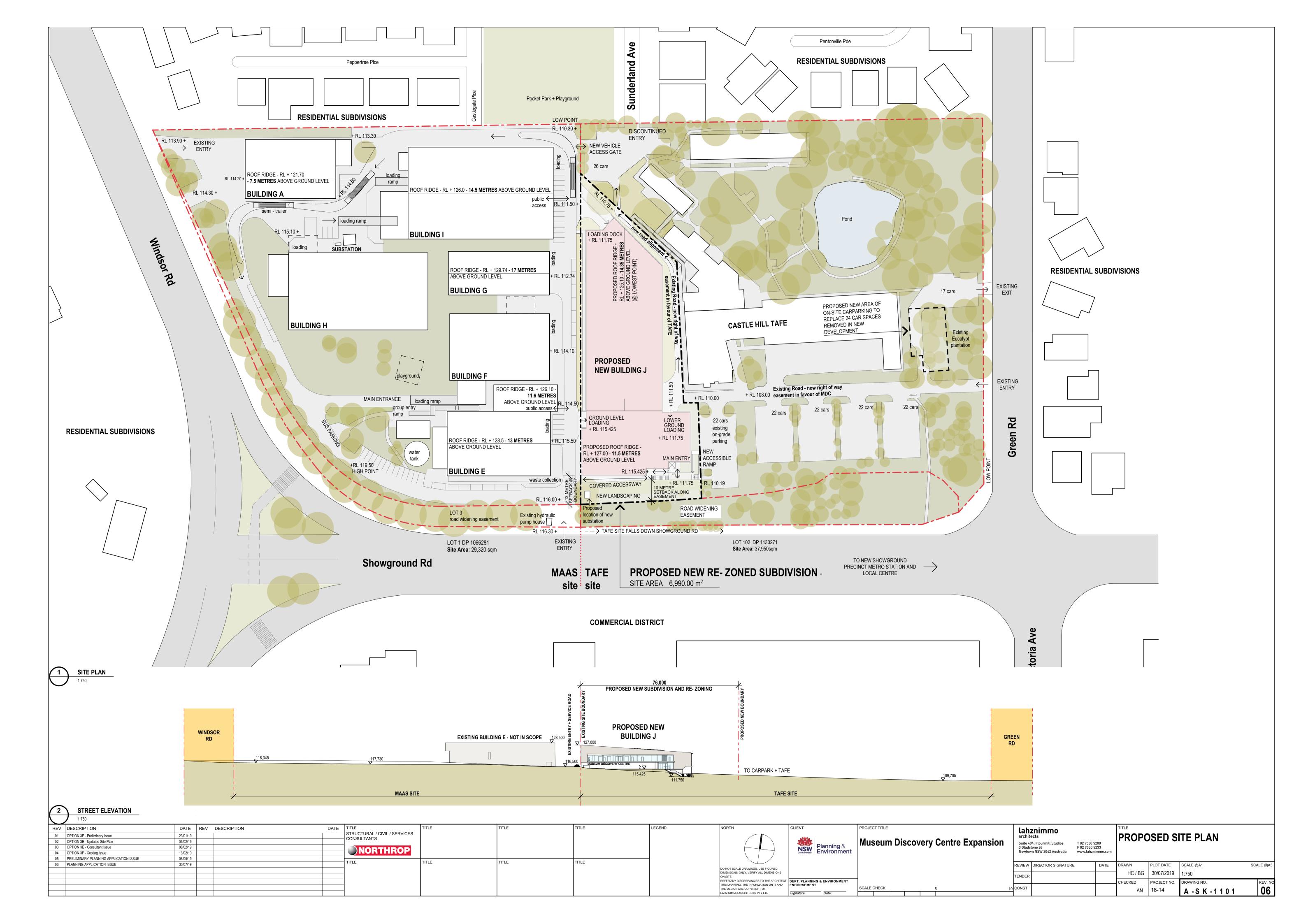
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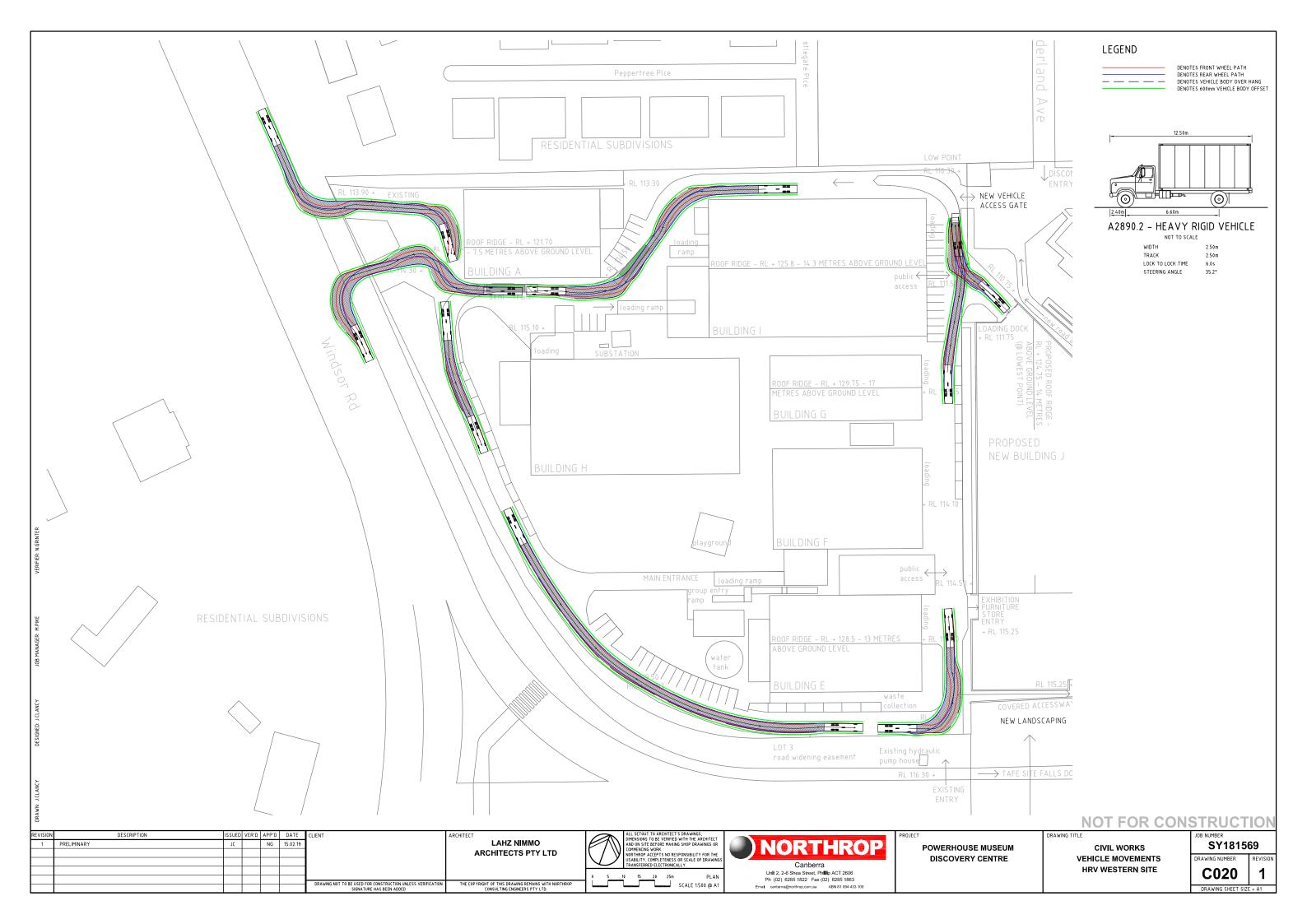
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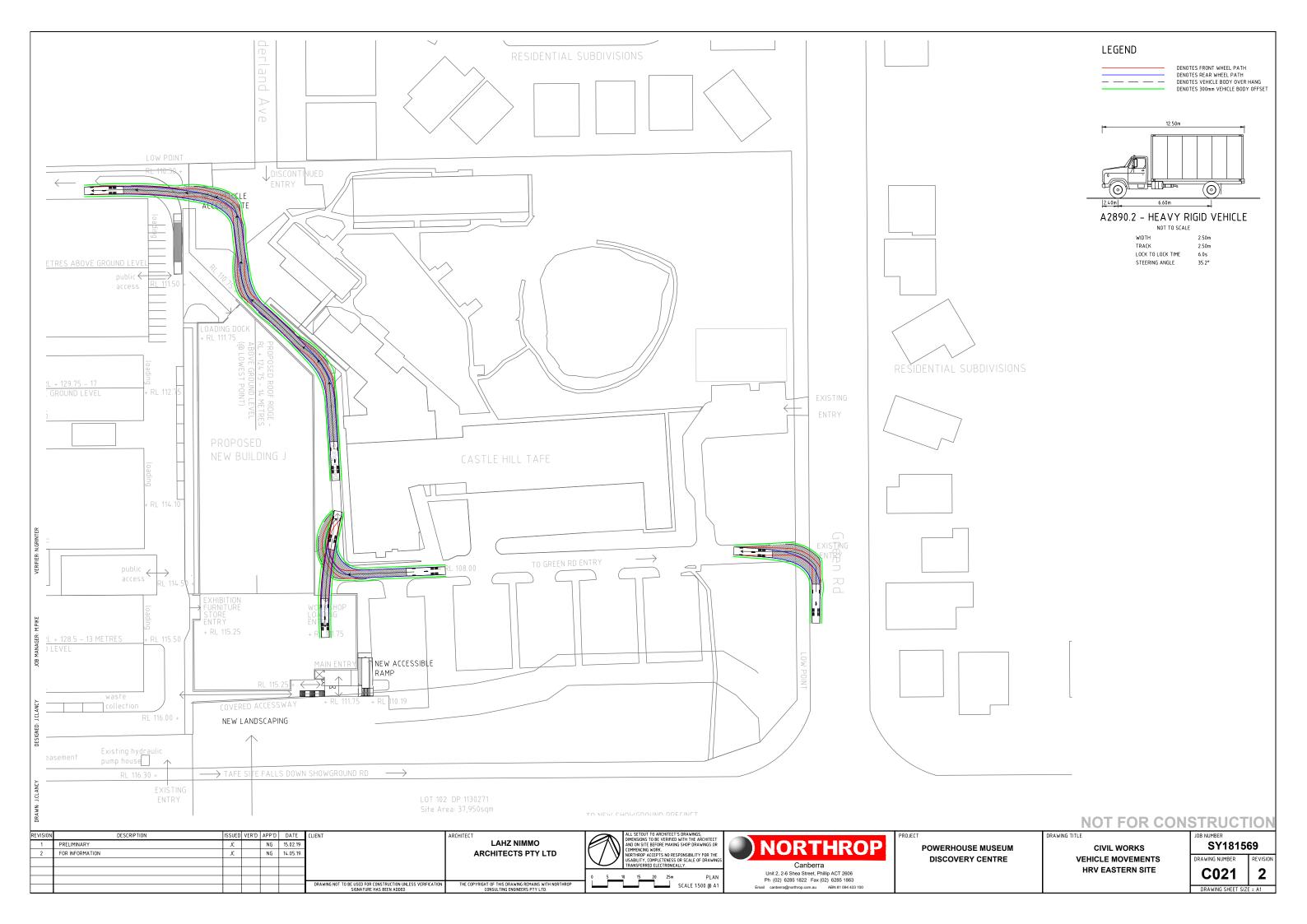


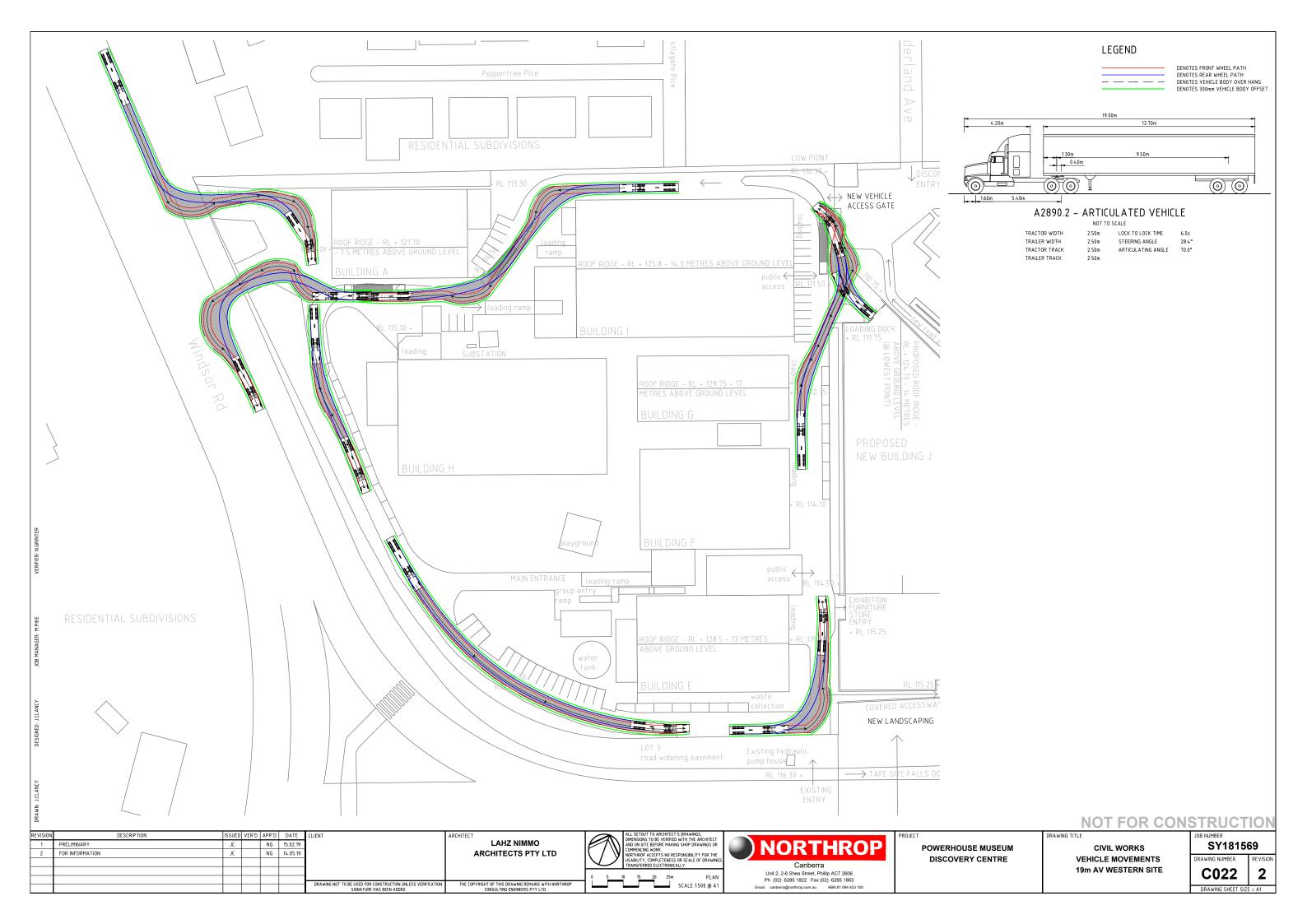
Appendix A Drawings

Structural Electrical Environmental Civil Hydraulic Mechanical Electrical







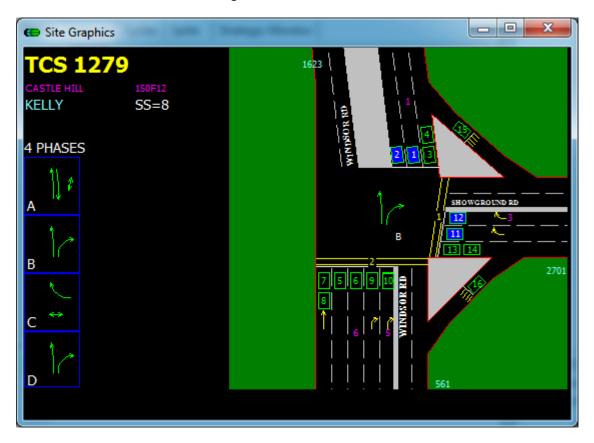




Appendix B SCATS Data

Structural Electrical Environmental Civil Hydraulic Mechanical Electrical

TCS 1279 – Windsor Road and Showground Road, Castle Hill



01-Apr 2019 Monday Approach detector(s) Approach 1 2 3 5 6 7 8 9 10 11 12 13 14 15 16 1 1:00 Approach 1 BAD BAD BAD BAD BAD BAD BAD BAD RAD BAD BAD BAD BAD BAD RAD RAD 0 2:00 Approach 1 BAD 0 3:00 Approach 1 BAD 0 BAD O 4:00 Approach 1 BAD BAD BAD BAD BAD BAD BAD 0 5:00 Approach 1 BAD 0 6:00 Approach 1 BAD 7:00 Approach 1 BAD 0 8:00 Approach 1 BAD O 9:00 Approach 1 540 821 3 11 262 172 1 1 217 272 243 261 0 1 733 788 4326 10:00 Approach 1 458 645 1 242 228 1 1 190 269 214 264 O 4 753 640 3911 11:00 Approach 208 2 1 275 339 3 1 243 0 n 171 295 230 311 0 590 471 3139 12:00 Approach 1 226 265 0 O 231 215 0 0 202 320 247 349 0 3 547 441 3046 13:00 Approach 1 230 260 1 1 299 246 0 0 178 315 267 369 0 1 537 424 3128 223 266 1 284 242 0 O 213 323 296 383 0 4 545 438 3219 14:00 Approach 1 1 337 0 2 15:00 Approach 1 240 316 349 1 1 238 335 352 445 0 576 428 3620 505 281 376 460 16:00 Approach 303 359 5 7 545 0 O 407 0 4 561 515 4328 1 17:00 Approach 1 297 342 4 4 710 690 1 1 340 364 429 446 0 3 518 395 4544 18:00 Approach 1 299 320 0 O 698 695 3 3 300 307 508 450 0 5 418 363 4369 248 287 3 596 591 3 2 256 350 385 397 n 3 505 325 3954 19:00 Approach 1 BAD BAD BAD BAD BAD BAD BAD BAD 20:00 Approach 1 BAD BAD BAD BAD BAD BAD BAD BAD O 21:00 Approach 1 BAD 0 22:00 Approach 1 BAD 0 1 BAD 0 23:00 Approach BAD BAD BAD BAD BAD BAD BAD BAD BAD O 24:00:00 Approach 1 BAD BAD BAD BAD BAD BAD BAD 7:03 0 - 0 Approach 1 AM peak 5783 8:30 PM peak 4 576 1 5:45 - 16: 45 Dail y Tot al 45207 2019 Tuesday 02-Apr 2 3 5 6 7 8 9 Approach 1 1 4 10 11 12 13 14 15 16 1:00 Approach 1 BAD 0 BAD BAD BAD BAD BAD BAD BAD 0 2:00 Approach 1 BAD O 3:00 Approach 1 BAD 4:00 Approach 1 BAD 0 5:00 Approach 1 BAD 0 BAD BAD BAD BAD BAD BAD 0 6:00 Approach 1 BAD 0 7:00 Approach 1 BAD 0 1 BAD BAD BAD RAD BAD BAD BAD RAD BAD BAD BAD RAD BAD 8:00 Approach BAD RAD RAD 9:00 Approach 1 606 894 9 239 214 3 3 198 251 241 254 0 6 786 808 4521 10:00 Approach 1 469 737 3 3 245 197 0 0 177 253 224 271 0 0 808 633 4020

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11:00 Approach

12:00 Approach

13:00 Approach

14:00 Approach

15:00 Approach

16:00 Approach

17:00 Approach

18:00 Approach

19:00 Approach

20:00 Approach

21:00 Approach

22:00 Approach

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205 2096

153 1543

23:00 Approach 24:00:00 Approach	1 1	37 17	33 22	0 0	0	114 38	108 39	0	0	38 5	83 30	119 82	124 73	0	0	110 50	87 33	853 390
Approach 1 AM	peak		4564	7:05 5 - 0		8:55	PM	peak	4 6	520 1	6:20	- 17:	20	Dail '	y Tot	al	53420	
Wednesd 03-Ap		2019	•			_	_	_	•	_	40		40	4.0		4.5	4.6	
Approach	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1:00 Approach	1	8	17	0	0	23	28	0	0	2	10	15	26	0	1	32	20	182
2:00 Approach	1	7	6	0	0	15	12		0	1	10	13	12	0	2	24	11	113
3:00 Approach	1	9	8	0	0	8	3	0	0	6	5	15	17	0	0	25	4	100
4:00 Approach	1	28	17	0	0	6	9	0	0	3	4	11	17	0	0	49	17	161
5:00 Approach	1	82	57	0	0	16	12	0	0	7	30	27	25	0	0	124	33	413
6:00 Approach	1	273	325	2	2	46	34	_	0	24	83	61	64	0	0	435		1525
7:00 Approach	1	487	790	5	5	187	132	0	0	131	182	151	163	0	0	813		3498
8:00 Approach	1	590	918	5	5	206	160	3	3	178	215	237	277	0	1	823		4380
9:00 Approach	1	602	907	4	4	243	259	1	1	212	244	224	240	0	3	807		4527
10:00 Approach	1	457	658	1	1	230	191	2	2	180	252	235	271	0	3	725	589	3797
11:00 Approach	1	267	349	0	0	261	208	0	0	180	287	255	343	0	0	620	465	3235
12:00 Approach	1	229	289	0	0	248	247	0	0	187	307	247	362	0	0	613	467	3196
13:00 Approach	1	254	307	3	1	319	245	2	2	212	315	272	371	0	4	521	483	3311
14:00 Approach	1	239	312	3	2	289	267	1	1	225	290	317	402	0	4	551	495	3398
15:00 Approach	1	225	302	0	0	418	409	1	1	256	353	356	430	0	5	611	485	3852
16:00 Approach	1	332	389	3	3	549	532	3	2	295	343	416	426	0	8	525	539	4365
17:00 Approach	1	292	361	6	6	699	684	1	1	319	333	476	447	0	6	518	420	4569
18:00 Approach	1	236	316	0	0	671	583	5	4	311	254	430	408	0	7	373	360	3958
19:00 Approach	1	251	328	2	1	619	560	1	2	284	352	421	381	0	5	505	389	4101
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22:00 Approach	1	96	104	1	1	205	184	0	0	93	183	184	200	0	0	222	177	1650
23:00 Approach	1	41	56	0	0	124	105	0	0	53	103	126	141	0	1	137	91	978
24:00:00 Approach	1	17	35	0	0	60	46	0	0	13	39	91	94	0	0	45	63	503
Approach 1 AM	peak		4563	8:00 5 - 0		9:05	PM	peak	4 6	506 1	6:10	- 17:	10	Dail	y Tot	al	60941	
Thursday 04-Ap		2019	2	2		_	_	-	0	0	40	4.4	42	4.2	4.4	4.5	16	
Approach	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
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15:00 Approach	1	261	305	1	1	413	337	0	0	300	377	398	442	0	6	581		3894
16:00 Approach	1	322	370	2	2	534	512	3	3	288	333	396	382	0	9	500	508	4164
17:00 Approach	_	316	220	•	9	ccc	CC0	1	4	295	288	451	391	0	5	497	396	4332
40.00 4	1	310	339	9	9	666	668	1	1	293	200	731	JJ 1	U	•	437	330	
18:00 Approach	1	279	353	4	4	675	671	4	4	281	279	392	332	0	5	432		4116
18:00 Approach 19:00 Approach		279 236	353 301				671 605			281 235	279 272	392 365	332 347		5 1	432 552	401 393	3941
	1	279	353	4	4	675	671	4	4	281	279	392	332	0	5	432	401 393	

	_			_					_									
21:00 Approach	1		137	2	1	282	245				233	345	365	0	0	315		2444
22:00 Approach	1	_	96	1	1	187	200			_	160	323	368	0	0	230		1953
23:00 Approach	1		57	0	0	111	91				97	140	161	0	0	125	113	967
24:00:00 Approach	1	24	25	0	0	59	44	0	0	19	42	69	70	0	0	55	48	455
Approach 1 AM	peal	<	4617	7:02 5 - 0		8:25	PM	peak	4	357 1	6:05	- 17:	5	Dail	y Tot	al	61431	
Friday 05-Ap	r	2019																
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	_		_	-	-	_		-										
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13:00 Approach	1	255	290	1	1	321	259	0	0	238	326	290	411	0	0	606		3451
14:00 Approach	1	260	304	0	0	322	299	4	4	230	319	295	407	0	2	612	545	3603
15:00 Approach	1	268	332	0	0	409	362	0	0	286	349	434	469	0	2	651		4117
16:00 Approach	1	294	366	3	3	600	533	0	0	299	291	481	395	0	6	462	447	4180
17:00 Approach	1	301	385	2	2	679	618	3	4	240	226	409	377	0	3	377	422	4048
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22:00 Approach	1	90	109	1	1	199	164	0	0	79	183	183	218	0	0	244	207	1678
23:00 Approach	1	78	93	0	0	139	132	0	0	74	147	163	188	0	1	217		1377
24:00:00 Approach	1	51	48	0	0	98	93	0	0	46	110	112	121	0	2	143	108	932
Approach 1 AM	peal	<	4459	7:01 0 - 0		8:10	PM	peak	4	322 1	6:50	- 17:	50	Dail	y Tot	al	61652	
Saturday 06-Ap	r	2019																
Approach	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
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4:00 Approach	1	_	14	0	0	11	6		0	_	12	16	29	0	0	39	11	156
5:00 Approach			BAD	BAD BAD		BAD					BAD	17	24	0	0	52		116
6:00 Approach	1		73	0	0	23	20				33	42	44	0	0	172		548
7:00 Approach	1	_	168	0	0	74	49				91	56	83	0	0	331		1185
8:00 Approach	1	_	317	0	0	143	99				132	117	149	0	0	477		1993
9:00 Approach	1		486	1	1	250	203				246	192	251	0	0	735		3347
10:00 Approach	1		506	1	1	362	274					282	315	0	1	772		3847
11:00 Approach	1		507	1	0	386	332					353	397	0	0	597		4087
12:00 Approach	1	_	560	2	2	409	345					375	376	0	1	579		4197
13:00 Approach	1		469	1	1	481	409					455	404	0	2	561		4242
14:00 Approach	1		475	2	2	458	393		1			437	528	0	0	674		4443
15:00 Approach	1		410	0	0	394	325		1			436	490	0	5	700		4101
16:00 Approach	1		353	1	1	371	333		1	_		414	501	0	2	691		3940
17:00 Approach	1		307	0	0	363	325					416	482	0	0	611		3654
18:00 Approach	1	259	335	0	0	321	280	0	0	205	288	444	502	0	0	662	446	3742

19:00 Appro	ach	1	212	284	1	1	259	263	0	0	200	259	290	349	0	2	594	315	3029
20:00 Appro	ach	1	128	179	0	0	237	197	0	0	109	204	194	228	0	1	483	290	2250
21:00 Appro	ach	1	96	110	0	0	144	135	0	0	80	248	185	220	0	0	307	194	1719
22:00 Appro	ach	1	97	111	0	0	144	120	0	0	61	143	198	226	0	1	240	248	1589
23:00 Appro	ach	1	97	124	0	0	168	194	2	1	52	119	168	202	0	1	237	158	1523
24:00:00 Appro	ach	1	73	72	0	0	131	107	0	0	44	104	123	150	0	1	184	150	1139
Approach 1 AM		peak		4197	11:00 0	- 1	2:00	PM	peak	4	540 1	2:35	- 13:	35	Dail	y Tot	al	55987	
Cundou 0	7 1 1 1 1		2010																
•	7-Apr	1	2019	2	3	4	5	6	7	8	9	10	11	12	12	1.1	15	16	
Appro	acn	1	1	2	3	4	Э	О	/	٥	9	10	11	12	13	14	15	10	
1:00 Appro	ach	1	43	65	0	0	77	74	0	0	34	68	87	108	0	0	108	73	737
2:00 Appro		1	15	39	0	0	38	35	0	0	_	43	30	53	0	0	52	41	363
2:00 Appro		1	8	14	0	0	23	20	0	0		14	22	30	0	0	28	17	179
3:00 Appro		1	2	12	0	0	23	16	0	0		13	20	30	0	0	17	15	151
4:00 Appro		1	7	9	0	0	14	5	0	0	_	4	12	11	0	0	29	8	106
5:00 Appro		1	16	15	0	0	13	12	0	0		4 17	10	18	0	1	36	15	156
• • •		1	43	37	_	_	_	363	_			25	_		_	0		38	687
6:00 Appro			_	_	0	0	18		2	2		_	27	27	0	-	98		
7:00 Appro		1	74	87	2	0	56	37	2	3		58	53	66	0	0	188	114	
8:00 Appro		1	113	146	4	4	80	63	1	1		124	77	99	0	0	274		1245
9:00 Appro		1	245	343	0	0	157	121	0	0		194	116	205	0	1	553		2451
10:00 Appro		1	357	459	2	0	285	244	0	0	_	310	193	248	0	0	843		3562
11:00 Appro		1	345	436	0	0	345	260	0	0	_	329	268	342	0	3	694		3760
12:00 Appro		1	325	410	0	0	350	293	0	0	_	353	362	463	0	3	743		4033
13:00 Appro		1	343	399	2	2	374	300	0	2		302	410	475	0	2	762		4090
14:00 Appro		1	297	330	1	1	335	307	0	0		296	359	433	0	2	682		3688
15:00 Appro		1	250	255	0	0	327	285	2	2	_	274	373	457	0	1	734		3567
16:00 Appro		1	270	306	2	0	295	272	1	1		259		BAD		BAD	BAD		1967
17:00 Appro		1	219	291	1	1	317	282	1	1		252	366	431	0	0	541		3323
18:00 Appro	ach	1	188	255	0	0	254	258	0	0	164	248	363	428	0	1	521		3140
19:00 Appro	ach	1	162	192	0	0	206	203	1	1	144	223	225	268	0	1	442	294	2362
20:00 Appro	ach	1	81	122	0	0	146	143	0	0	93	173	190	227	0	0	264	216	1655
21:00 Appro	ach	1	77	95	0	0	151	127	0	0	80	173	126	155	0	0	197	116	1297
22:00 Appro	ach	1	64	90	0	0	110	99	0	0	40	99	120	132	0	0	171	116	1041
23:00 Appro	ach	1	29	37	0	0	83	59	0	0	18	62	75	85	0	0	102	66	616
24:00:00 Appro	ach	1	13	18	0	0	41	35	0	0	10	35	55	63	0	0	40	26	336
										_									
Approach 1 AM		peak		4078	10:03 (J5-Jan	1:35	PM	peak	4	136 1	2:15	- 13:	15	Dail	y Tot	al	46612	
Monday 08	3-Apr		2019																
•			2019	2	2	4	-	c	7	0		10	11	12	12	1.1	1 5	16	
Appro	acii	1	1	2	3	4	5	6	,	8	9	10	11	12	13	14	15	16	
1:00 Appro	ach	1	8	7	0	0	18	67	0	0	4	14	14	26	0	2	27	19	206
2:00 Appro		1	5	7	0	0	5	9	0	0		5	14	15	0	0	15	11	90
3:00 Appro		1	6	4	0	0	8	4	0	0		7	5	11	0	0	17	8	71
			27	15	0		4	7		0			5	10		0	50	9	142
4:00 Appro		1				0						15			0	_			
5:00 Appro		1	73	62	0	0	18	8	0	0		23	23	16	0	0	131	36	397
6:00 Appro		1	284	374	0	0	56	27	0	0		86	71	74 172	0	0	452		1624
7:00 Appro		1	524	864	4	4	195	200	0	0		200	156	173	0	0	825		3778
8:00 Appro		1	626	993	4	4	205	164	2	2		233	236	268	0	3	830		4534
9:00 Appro		1	559	898	4	4	249	210	5	5		244	235		0	0	862		4487
10:00 Appro		1	420	601	2	2	231	199	0	0			226	278	0	5	750		3662
11:00 Appro	ach	1	269	347	1	1	247	201	1	1	170	287	221	326	0	3	603	457	3135
Approach 1 AM		peak		4658	7:01 0	- 0	8:10	PM	peak		0				Dail	y Tot	al	23650	

TCS 2701 – Showground Road and Victoria Avenue, Castle Hill



Monday	01-Apr		2019																	
,	Approach		detect	or(s)																
,	Approach	1	1	2	3	4	5	6	7	8	10	11	12	14	15	16	17	18	19	
1:00 /	Approach	1	28	14	22	25	1	0	13	13	7	8	26	6	9	21	4	4	5	206
2:00 /	Approach	1	11	9	15	16	2	0	3	4	3	3	9	2	5	7	5	3	1	98
3:00 /	Approach	1	18	3	13	14	1	0	5	3	3	5	6	3	1	1	1		2	80
4:00 /	Approach	1	31	23	8	6	4	1	4	1	1	8	15	3	1	4	5		2	121
	Approach	1	96	46	45	25	8	6	2	7	9	36	48	8	3	9	7		2	364
	Approach	1	275	188	144	100	43	22	18	9	56	173	196	20	15	18	17			1344
	Approach	1	463	463	301	256	82	29	30	39	103	384	391	38	91	97	68			2966
	Approach	1	470	484	497	518	91	51	89	95	173	501	504		127	148				4096
	Approach	1	421	533	440	576	120	71		110	170	509			145		123			4371
	Approach	1	432	476	347	433		105		105	161				138		180			3965
	Approach	1	379	421	330		101			121	101				168		207			3756
	Approach	1	380	419	293	397		111		134	77	272			182		260			3810
	Approach	1	353	393	293	390		110		157	100	239		247			271			3918
	Approach	1	379	425	336	428		106		163	71	260		225			265			3940
	Approach	1	383	469	366	466	90	77	_	177	81	250		229			288	_		4200
	Approach	1	414	514	428	525	103	84		263	144	354		218			309			4976
	Approach	1	416	520	397	465	89	59		289	79	328			518		349			5182
	Approach	1	382	474	476	465	58	28		334	63	282			594		311			5201
	Approach	1	394	491	435	407	82	34		265	74	263		190			195			4445
	Approach	1	325	337	292	256	49	38		183	62	167		145			166			3110
	Approach	1	243	209	218	190	31	23		128	36	104	183		135		142			2165
	Approach	1	163	169	226	198	16	9		107	31	57	115	74	109	109	89			1671
	Approach	1	85	85 86	114	112	5	2	59	56	10	31	60	47	49	65	39		23	866
24:00:00 /	Approach	1	5	86	80	83	2	3	20	22	8	12	26	17	17	31	13	4	11	440
Approach :	1 AM	peak		4380	8:00	5 - 0	9:05	PM	peak	5	238 1	6:10	- 17:	10	Dail	y Tot	al	65291		
Tuesday	02-Apr		2019																	
,	Approach	1	1	2	3	4	5	6	7	8	10	11	12	14	15	16	17	18	19	
1:00 /	Approach	1	2	39	20	30	7	1	9	14	2	4	26	10	8	14	4	4	8	202
	Approach	1	15	16	13	16	5	3	3	5	4	1	10	9	3	9	3	4	1	120
3:00 /	Approach	1	22	11	13	16	7	3	2	5	3	2	7	1	2	3	1	0	1	99
4:00 /	Approach	1	34	23	19	7	4	1	0	0	2	13	13	3	3	2	9	3	1	137
	Approach	1	95	52	51	25	10	4	3	3	8	39	46	10	1	7			6	376
	Approach	1	266	189	161	91	38	21	12	12	60	188	201	17	12	21	21			1366
	Approach	1	489	491		254	86	37	28	31	98	386	376	60	87	103	70			3040
	Approach	1	434	518	491		97	66	93	97	198	522		112		133				4248
	Approach	1	420	499	458		122			128	183			132			107			4411
	Approach	1	462	488	353	447		106		110		437		137			188			4158
	Approach	1	412	438	322		96	91		117	105	324		213			181			3850
	Approach	1	391	413	325	386		115		140	91				196		252			3859
13:00 /	Approach	1	345	394	327	400	81			165	88	252		249			267			3890
					275	469	105	115	157	167	97	262	272	231	205	236	269	194	110	4065
	Approach	1	379	422	375															
15:00 /	Approach	1	397	480	417	473	94	83		194	97	244			282		300			4400
15:00 / 16:00 /	Approach Approach	1 1	397 391	480 519	417 431	473 518	94 102	77	249	268	133	333	376	241	385	351	340	171	172	5057
15:00 / 16:00 / 17:00 /	Approach Approach Approach	1 1 1	397 391 404	480 519 519	417 431 442	473 518 463	94 102 88	77 48	249 260	268 285	133 102	333 354	376 373	241 249	385 519	351 495	340 328	171 164	172 145	5057 5238
15:00 / 16:00 / 17:00 / 18:00 /	Approach Approach Approach Approach	1 1 1	397 391 404 373	480 519 519 485	417 431 442 456	473 518 463 446	94 102 88 87	77 48 36	249 260 338	268 285 346	133 102 81	333 354 317	376 373 358	241 249 239	385 519 553	351 495 517	340 328 298	171 164 126	172 145 164	5057 5238 5220
15:00 / 16:00 / 17:00 / 18:00 / 19:00 /	Approach Approach Approach	1 1 1	397 391 404	480 519 519	417 431 442 456 417	473 518 463 446	94 102 88	77 48	249 260 338 245	268 285	133 102	333 354	376 373 358 320	241 249 239 199	385 519	351 495 517 406	340 328	171 164 126 113	172 145 164 147	5057 5238

) Approach	1	273	252	218	227	61	23	140		67	100	175	133	158	171		68		2486
) Approach	1	229	156	260	193	19	4		124	29	69	129	82	102	110	93	29		1791
) Approach	1	113	89	139	128	9	4	60	62	27	31	70	48	56	79	39	15	25	994
24:00:00) Approach	1	50	29	85	78	2	2	28	34	7	22	41	17	29	36	17	4	7	488
Approacl	h 1 AM	peak		4465	8:01	0 - 0	9:10	РМ	peak	5	333 1	6:30	- 17:	30	Dail	y Tot	al	67445		
Wedneso	d 03-Apr		2019																	
	Approach	1	1	2	3	4	5	6	7	8	10	11	12	14	15	16	17	18	19	
1.00) Approach	1	26	13	22	31	3	0	9	12	3	5	14	6	12	16	3	5	6	186
) Approach	1	21	11	20	14	4	0	6	5	1	3	10	4	3	6	3	1	4	116
) Approach	1	21	16	22	14	2	1	4	3	0	2	1	4	2	4	1	4	2	103
) Approach	1	39	22	22	16	3	0	0	1	4	7	20	5	1	7	5	6	1	159
) Approach	1	98	49	43	33	12	6	1	1	5	42	44	10	5	6	3	15	1	374
) Approach	1	295	184	150	85	36	19	11	12	54	179	190	17	13	16	22	50		1345
) Approach	1	477	499	359	275	84	35	34	37	94	382	376	53	83	95	59	75		3061
			484			559	100	59	_	84	_	493	469	97			87			4179
	Approach	1		512 501	490 409	524		59 88	84 108	84 117	152 203	493 540	526		147	154	125	118		4426
	Approach	1	421	501 486	343	524 461	130						466		166 140	_	_			4426
	Approach	1	447	486			106	65 10E	120		139	453	353		_		152	206		
) Approach	1	404	433	332	423	99	105		117	84	288		219	163		232	242		3852
) Approach	1	388	431	326	409	114		_	135	78	273			195		254	198		3950
) Approach	1	351	405	331	421	95	100		159	85	261		259	222		300	218		4024
) Approach	1	392	420	374	449	112	94	_	140	93	259		208	188		258	216	_	3979
) Approach	1	403	497	383	482	96	93	218		94	260		263	270		311			4487
) Approach	1	392	496	408	544	107	75		259	149	378		_	380		291			5031
) Approach	1	430	506	425	488	102	69	253		84	360		247			352	156		5223
) Approach	1	371	489	421	453	63	40		319	60	322		237			342			5159
) Approach	1	448	567	450	411	78	38		259	86	284		198			214			4761
) Approach	1	349	389	329	321	86	43		241	75	228		146	280		151	103		3666
) Approach	1	267	241	256	238	48	25		135	50	117		127	178	193	177	64		2550
) Approach	1	230	172	239	209	20	12	132	125	24	84	139	91	115	124	89	38	80	1923
) Approach	1	141	107	162	134	16	8	84	72	19	29	58	52	69	79	55	32	33	1150
24:00:00) Approach	1	54	42	125	105	5	1	47	35	7	16	24	25	16	42	17	14	6	581
Approacl	h 1 AM	peak		4457	8:01	0 - 0	9:10	РМ	peak	5	331 1	6:40	- 17:	40	Dail	y Tot	al	68359		
Thursday	/ 04-Apr		2019																	
,	Approach	1	1	2	3	4	5	6	7	8	10	11	12	14	15	16	17	18	19	
) Approach	1	27	18	33	30	2	1	11	11	4	9	14	5	9	28	3	6	4	215
) Approach	1	15	13	26	16	0	0	7	2	1	4	5	4	10	7	5	3	4	122
) Approach	1	17	17	24	17	2	0	3	4	0	2	9	3	7	5	2	1	0	113
4:00) Approach	1	38	13	11	12	2	1	3	1	4	10	12	2	4	5	5	3	0	126
) Approach	1	97	46	52	32	9	4	4	2	4	33	46	9	2	6	3	10	2	
6:00) Approach	1	278	181	158	102	42	12	10	10	42	174	185	15	17	18	18	48		1317
7:00) Approach	1	480	497	323	270	63	29	32	41	110	325	385	53	84	97	57	82	45	2973
8:00) Approach	1	480	525	473	518	87	46	86	85	156	517	500	85	147	138	85	112	89	4129
9:00) Approach	1	446	546	452	511	122	85	113	125	197	520	506	127	155	155	113	152	116	4441
10:00) Approach	1	452	534	370	521	126	110	125	125	134	437	444	180	144	162	176	212	89	4341
11.00) Approach	1	414	460	292	385	113	111	129	135	109	299	361	196	169	189	236	252	78	3928
) Approach	1	429	447	321	379	99	103	139	139	82	260	325	229	190	219	257	228	83	3929
							107	100	1.00	1 - 1	04	278	207	230	229	222	305	196	97	4059
12:00) Approach	1	375	455	338	403	107	109	102	154	81	2/0	297	233	223	232	303	130	,	7033
12:00 13:00		1 1	375 378	455 447	338 332		86	89		136	72	248		228			252	202		3911
12:00 13:00 14:00) Approach								144				285		216	262		202	91	

17:00	Approach	1	416	506	366	446	93	61	251	268	83	370	383	233	487	452	380	158	79	5032
18:00	Approach	1	378	474	420	364	63	32	311	315	76	345	394	238	581	544	281	134	90	5040
19:00	Approach	1	457	532	425	416	78	60	237	258	81	300	416	233	462	432	209	135	90	4821
20:00	Approach	1	379	432	351	374	80	61	232	252	67	222	307	185	268	282	216	139	114	3961
21:00	Approach	1	275	252	349	323	40	26	189	204	54	131	217	141	192	188	246	60	93	2980
22:00	Approach	1	205	187	397	356	18	7	211	201	21	53	134	93	129	135	138	42	73	2400
23:00	Approach	1	126	94	177	176	10	6	74	79	17	22	63	43	59	74	49	21	35	1125
24:00:00	Approach	1	56	40	94	76	4	0	40	43	9	17	40	10	38	42	10	5	18	542
Approach	1 AM	peak		4476	8:00	5 - 0	9:05	PM	peak	5	105 1	6:45	- 17:	45	Dail	y Tot	al	69327		
Friday	05-Apr		2019																	
	Approach	1	1	2	3	4	5	6	7	8	10	11	12	14	15	16	17	18	19	
1:00	Approach	1	27	18	32	39	0	1	16	19	1	8	17	8	16	27	8	4	7	248
2:00	Approach	1	12	15	17	20	2	1	5	7	2	6	13	5	4	7	7	3	2	128
3:00	Approach	1	17	8	17	16	3	0	6	7	2	5	7	1	5	7	4	2	5	112
4:00	Approach	1	36	19	17	11	1	0	4	2	6	7	15	3	6	5	2	4	2	140
5:00	Approach	1	91	43	50	26	8	6	4	1	5	34	53	7	4	9	4	9	0	354
6:00	Approach	1	262	164	140	76	42	20	8	7	40	185	195	16	14	16	13	46	9	1253
7:00	Approach	1	496	497	302	258	75	32	30	34	121	360	391	53	69	95	64	79	42	2998
8:00	Approach	1	475	509	446	510	111	63	91	82	157	527	504	100	150	147	83	104	81	4140
9:00	Approach	1	421	518	409	512	127	68	130	138	192	501	517	132	171	178	131	148	105	4398
10:00	Approach	1	464	539	368	460	124	99	108	127	140	429	449	146	141	157	184	219	71	4225
	Approach	1	416	460	307	400	102	113	127	137	86	313	377	226	179		247	239	67	3992
	Approach	1	435	522	324	448	108	99	162	160	78	316	353	265	216	232	310	234	82	4344
	Approach	1	406	465	339	448		102		180		265		253	223		282	225		4227
	Approach	1	383	467	390	475		103		215		274		259	277		282			4476
	Approach	1	455	534	439	569	108	85		226		320		264	324		352			4990
	Approach	1	378	470	416	507	99	72		288		370		245	384		310			5002
	Approach	1	327	402	399	444	80	33		334		348		230	463		310	144		4828
	Approach	1	454	539	464	430	70	39		296		276		237	507		310			4999
	Approach	1	419	512	481	459	73	34		259		287		172	395		156			4530
	Approach	1	377	403	344	324	65	29		178		171		150	207		125	80		3314
	Approach	1	314	271	278	275	38	27		144		85	_	104	121	141		57		
		1	226	193	286	244	14	11		147	38	77	149	70	100	122	62	51		1997
	Approach																-	_		
	Approach	1	200	160	229	201	22	6		109		55	117	51	83	100	36	36		1607
24:00:00	Approach	1	137	116	156	157	19	7	78	76	25	37	76	27	62	62	15	26	36	1112
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Alliance Geotechnical

Engineering | Environmental | Testing

Report Type:

Stage 1 Preliminary Site Investigation

Project Name:

Proposed Redevelopment

Project Address:

172 Showground Road, Castle Hill NSW Lot 102 in DP1130271

Client Name:

Northrop Consulting Engineers P/L

16 September 2019 Report No: 8325-ER-1-1

We give you the right information to make the right decisions

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Alliance Geotechnical

Engineering | Environmental | Testing

Report Type:

Stage 2 - Detailed Site Investigation

Project Name:

Proposed Redevelopment

Project Address:

172 Showground Road, Castle Hill NSW Lot 102 in DP1130271

Client Name:

Northrop Consulting Engineers P/L

17 September 2019 Report No: 8325-ER-1-2

We give you the right information to make the right decisions

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DOCUMENT CONTROL

Revision	Date	Author	Reviewer
Rev 0	17 September 2019	Jacob Walker	Steven Wallace

Author Signature	A	Reviewer Signature	Atten Willary
Name	Jacob Walker	Name	Steven Wallace
Title	Environmental Scientist	Title	Senior Environmental Scientist

EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by Northrop Consulting Engineers P/L, to undertake a Stage 2 Detailed Site Investigation (DSI) for 172 Showground Road, Castle Hill NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- The site is proposed for redevelopment, comprising a new storage facility for the Museum of Applied Arts and Sciences;
- A previous Stage 1 preliminary site investigation (PSI) was undertaken for the site by AG in 2019; and
- A contamination assessment consisting of a Stage 2 Detailed Site Investigation (DSI) of the site is required to assess whether the site is suitable for the proposed land use scenario.

Objectives and Scope of the Investigation

The objectives of this investigation were to:

- Assess the potential nature and extent of identified contaminants of potential concern on the site, with reference to the areas of environmental concern reported in the stage 1 PSI;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

AG undertook the following scope of works to address the project objective:

- A desktop review of relevant information relating to the site;
- A site walkover to understand current site conditions;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Conduct an intrusive site investigation to establish ground conditions and to facilitate the collection of representative soil and groundwater samples;
- Laboratory analysis to compliment the in-situ testing completed during the field investigation; and
- An assessment of the contamination status of the site and to recommend any further remedial requirements associated with the redevelopment of the site.

Results of the DSI

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

- The detected concentrations of all other identified contaminants of potential concern in the soils assessed are considered unlikely to present:
 - o an unacceptable direct contact human health exposure risk; or
 - o an unacceptable inhalation / vapour intrusion human health exposure risk;
- The detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present a petroleum hydrocarbon management limit risk;

- No asbestos was detected within the soil materials analysed; and
- The detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable ecological contamination risk.

Based on the assessments undertaken as part of this investigation, AG has concluded that the site is deemed suitable for the proposed land use setting. AG can conclude that no further investigation should be required for this development to proceed.

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FIGURES

Figure 1	Site Location
Figure 2	Site Layout
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Figure 3 Areas of Environmental Concern
Figure 4 Sampling Point Location Layout Plan

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Table LAR1 Laboratory Analytical Results – Soils

Table LAR2 Laboratory Analytical Results – Groundwater Table LAR3 Relative Percentage Difference (RPD) Analysis

APPENDICES

- A Proposed Development Plans
- B Borehole Logs
- C Calibration Certificates
- D Laboratory Documentation

LIST OF ABBREVIATIONS

A list of the common abbreviations used throughout this report is provided below:

ACM **Asbestos Containing Material** AEC Area of Environmental Concern AG Alliance Geotechnical Pty Ltd AHD Australian Height Datum

ANZECC Australian and New Zealand Environment and Conservation Council

AST Aboveground storage tank

Bgl Below ground level

BTEX Benzene, Toluene, Ethylbenzene, Xylene

Btoc Below top of casing CoC Chain of Custody CoT Certificate of Title **CSM** Conceptual Site Model

DPI-W Department of Primary Industry – Water

DSI **Detailed Site Investigation** EC **Electrical conductivity**

EIL **Ecological Investigation Level**

EPA Environment Protection Authority

GS **Geological Survey of NSW** HIL **Health Investigation Levels HSL Health Screening Levels** ΙL

Investigation Levels

LOR [Laboratory] Limit of reporting

MS Matrix spike

NATA **National Association of Testing Laboratories**

N/A Not applicable ND Not detected

NEPM National Environment Protection Measure **NSW EPA NSW Environment Protection Authority**

OCP Organochlorine Pesticide OPP Organophosphorus Pesticide PAH Polycyclic aromatic hydrocarbon

PCB Polychlorinated biphenyl

PFAS Per and polyfluoroalkyl substances

PFOA Perfluorooctanoic Acid **PFOS** Perfluorooctane Sulfonate PID Photo-ionisation detector **PSH** Phase separated hydrocarbon PSI **Preliminary Site Investigation** QA/QC Quality assurance/Quality control

RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
SVOC	Semi-volatile organic compound

TDS Total dissolved solids

TPH Total petroleum hydrocarbon

PVC Polyvinyl Chloride

UCL Upper Confidence Limit

USCS Unified Soil Classification System

UST Underground storage tank VOC Volatile organic carbon

1. INTRODUCTION

1.1. Background

Alliance Geotechnical Pty Ltd (AG) was engaged by Northrop Consulting Engineers P/L, to undertake a Stage 2 – Detailed Site Investigation (DSI) for 172 Showground Road, Castle Hill NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- The site is proposed for redevelopment, comprising a new storage facility for the Museum of Applied Arts and Sciences;
- A previous Stage 1 preliminary site investigation (PSI) was undertaken for the site by AG in 2019; and
- A contamination assessment consisting of a Stage 2 Detailed Site Investigation (DSI) of the site is required to assess whether the site is suitable for the proposed land use scenario.

1.2. Proposed Development

It is AG's understanding that it is the intention of the client to redevelop the site as a storage facility for the Museum of Applied Arts and Sciences. This is assessed as commercial/industrial land-use settings. Currently under the *State Environmental Planning Policy (SEPP) No. 55 – Remediation of Land*, a consent authority must not consent to the carrying out of any development unless it has considered whether the land is contaminated. This report has been prepared to satisfy Clause 7 (2) and (3) of SEPP No. 55 and The Hills Shire Council planning policies.

1.3. Objectives

The objectives of this project were to:

- Assess the potential nature and extent of identified contaminants of potential concern on the site, with reference to the areas of environmental concern reported in the stage 1 PSI;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

1.4. Scope of Work

AG undertook the following scope of works to address the project objective:

- A desktop review of relevant information relating to the site;
- A site walkover to understand current site conditions;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Conduct an intrusive site investigation to establish ground conditions and to facilitate the collection of representative soil and groundwater samples;
- Laboratory analysis to compliment the in-situ testing completed during the field investigation; and
- An assessment of the contamination status of the site and to recommend any further remedial requirements associated with the redevelopment of the site.

This DSI was undertaken in accordance with the NSW OEH *Guidelines for Consultants Reporting on Contaminated Sites, 2011,* NSW EPA *Sampling Design Guidelines 1995* and was also in accordance with the ASC NEPM 2013, including:

- Ecological Investigation Levels;
- Ecological Screening Levels;
- Health Investigation Levels;
- Health Screening Levels; and
- Groundwater Investigation Levels.

2. SITE IDENTIFICATION

The site is identified as Lot 102 in DP1130271.

The approximate geographic coordinates of the middle of the site, inferred from Google Earth were 33°43′29" S and 150°58′26" E.

The locality of the site is set out in **Figure 1**.

The general layout and boundary of the site is set out in Figure 2.

The site covers an area of approximately 5,000m².

A copy of a detail and level survey is presented in **Appendix A**.

3. SITE SETTING

3.1. Geology

AG (2019) indicated that the site is likely to be underlain by Middle Triassic Ashfield Shale (Rwa), comprising dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite.

3.2. Acid Sulphate Soils

AG (2019) indicated that the site lies in an area mapped as 'No Known Occurrence' with respect to acid sulfate soils. This infers that land management activities are not likely to be affected by acid sulfate soil materials.

Further assessment of acid sulfate soils in the context of this investigation is considered by AG as not warranted.

3.3. Topography

The site topography is generally flat, with a very shallow slope towards the west. AG understands that the site is located at an elevation of approximately 116m Australian Height Datum.

3.4. Hydrology and Hydrogeology

Surface water courses proximal to the site included Cattai Creek, approximately 730m to the east.

Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the east.

A review of the NSW Office of Water groundwater database (www.http://allwaterdata.water.nsw.gov.au/water) implemented on 12 September 2019 indicated there was no registered groundwater features located within a 500m radius of the site

A copy of the WaterNSW search record and associated groundwater features are presented in **Appendix B**.

3.5. Adjacent Ecological Receptors

No significant ecological receptors were identified in the vicinity of the site. Specifically, the site is situated in a commercial area with a significant portion of the surrounding area covered in either concrete hardstand or asphaltic road. Limited flora and fauna were observed in the area, generally consisting of small verges adjacent to roadways.

4. PREVIOUS CONTAMINATION ASSESSMENTS

The following reports were considered during the undertaking of this project:

 Alliance Geotechnical 2019, 'Stage 1 Preliminary Site Investigation, 172 Showground Road, Castle Hill NSW' dated 16th September 2019, ref: 8325-ER-1-1

A summary of the findings of this investigation is presented as Section

4.1. AG (2019)

The objectives of the project were to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The scope of works undertaken to address the project objectives, included:

- a desktop review;
- a site inspection; and
- data assessment and reporting.

Based on AG's assessment of the desktop review information and fieldwork data, in the context of the proposed apartment land use, AG makes the following conclusions:

- Areas of environmental concern (AEC) have been identified for the site; and
- Further assessment of the identified AEC, and subsequent management / remediation of identified unacceptable land contamination risks (if warranted), would be required to confirm land use suitability (in the context of land contamination) for the proposed redevelopment works.

Based on these conclusions, AG makes the following recommendations:

- A stage 2 detailed site investigation (DSI) should be undertaken for the identified areas of environmental concern;
- In the event that the identified areas of environmental concern are not accessible during the undertaking of the stage 2 DSI, consideration should be given to preparation of a remedial action plan (RAP), setting out what supplementary assessment works would be required; and
- Further contamination assessment works should be undertaken by a suitably experienced environmental consultant.

5. CONCEPTUAL SITE MODEL

5.1. Areas of Environmental Concern

Site history data and site walkover observations were assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be present on site. The AEC identified is presented in attached **Figure 3** and associated COPC are presented in **Table 5.2.1**

5.2. Conceptual Site Model

The above assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be (or are) present on site. The AEC identified is presented in **Table 5.2.1**.

Overall, the site setting is considered to be of low environmental sensitivity, due to the following reasons:

- The site is not within close proximity to any major watercourses;
- The site is underlain by an unconfined aquifer. The aquifer is not used as a water source in the general area; and
- The general area is zoned as B4 Mixed Use and surrounding developments are considered to be a mix of medium commercial and residential, as such the redevelopment is in-line with surrounding land-uses and thus is not a significant change from the surrounding area.

AG notes that the contaminant laydown mechanism for these areas of environmental concern is considered likely to be 'top down'.

Table. 5.2.1: AEC and CSM

ID	Potential Sources:
AEC01	Onsite sources identified:
	■ Imported fill materials.
	Offsite sources identified:
	No significant sources identified offsite.
	Potential Pathways:
	The potential contamination pathways are considered to be as follows:
	 Inhalation/ingestion of contaminants released in dust during redevelopment by Site workers;
	 Direct contact, ingestion or inhalation of soil or groundwater contaminants by future site inhabitants;

- Migration of volatile compounds into proposed buildings/basements causing toxic effects, asphyxiation or risk of explosion; and
- Permeation of hydrocarbons / organic contamination into unprotected water pipes on site.

Potential Receptors:

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Flora and Fauna;
- Future residents/end users;
- Neighbouring commercial land users; and
- Cattai Creek.

5.3. Land Use Setting

AG understands that the site is proposed for a redevelopment, new storage facility for the Museum of Applied Arts and Sciences.

5.4. Drinking Water Use

There are no groundwater bores onsite or down-gradient of the site, registered for drinking water use. It is noted that a reticulated mains potable water supply is available in the area. Therefore, further assessment of this groundwater drinking water value is considered not warranted.

5.5. Recreational Water Use

Surface water courses proximal to the site included Cattai Creek, approximately 730m to the east. Waters in this creek, particularly the downstream reaches, are considered to be highly disturbed as a result of historical commercial / industrial activity. A review of aerial photography suggests that the nearby water courses are not used recreationally. Further assessment of this value is therefore considered not warranted.

5.6. Aquatic Ecosystems

Surface water courses proximal to the site included Cattai Creek, approximately 730m to the east. This creek is considered to be a freshwater environment and consideration to freshwater guideline values is warranted.

5.8. Human Health – Direct Contact

Based on the ongoing land use scenario and guidance provided in Section 2.2 of ASC NEPM 2013, AG considers it reasonable to adopt the 'HIL B – residential with minimal opportunities for soil access' land use setting, for the purpose of assessing land contamination exposure risks.

AG notes that the proposed development includes building structures and hardstand pavement areas across most of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site. However, some open space and landscaping areas will be established on site. In these areas, it is considered that a direct contact exposure pathway may be present between potential contamination and onsite receptors.

5.9. Human Health – Inhalation / Vapour Intrusion

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) is required.

The historical evidence reviewed indicated a low potential for a primary source to be present on the site.

The same historical evidence indicated a potential land use activity to be uncontrolled filling. The excavation, transport, placement and spreading of imported (uncontrolled) fill material involves significant disturbance of soils which typically results in volatilisation of vapour producing contaminants.

A source of vapours from groundwater was not identified for the site.

The potential for vapours to be present in soils on site at concentrations which might present an unacceptable exposure risk, is considered to be likely. AG considers further assessment warranted.

5.10. Aesthetics

Section 3.6.3 of ASC NEPM 2013 advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

The historical evidence indicated potential land use activities being undertaken on the site which have the potential to result in unacceptable aesthetic impacts.

AG notes that the proposed development includes building footprints and hardstand pavement areas across most of the site, which would act as an exposure barrier between potential aesthetic impacts and onsite receptors during operation of the site. However, some open space and landscaping areas will be established on site. In these areas, it is considered that an aesthetics exposure pathway may be present between potential contamination and onsite receptors.

5.11. Ecological Health - Terrestrial Ecosystems

Section 3.4.2 of ASC NEPM 2013 provides a pragmatic risk-based approach should be taken when assessing ecological risks in residential and commercial / industrial land use settings. Section 3.4.2 also advises that when sites have large buildings and extensive areas covered with concrete, other pavement or hardstand materials, environmental values requiring consideration while in operational use may be limited.

AG (2019) reported that there was no visual evidence observed to suggest significant or widespread phytotoxic impact (in the form of dieback or plant stress) in vegetation at the site and that similar observations were made of visible vegetation on land adjacent to the site. These remarks were reaffirmed during the current investigation undertaken by AG.

Based on the field observations, guidance in ASC NEPM 2013, and the nature and extent of the proposed development concept, the need for further ecological assessment is considered not warranted.

5.12. Management Limits for Petroleum Hydrocarbon Compounds

ASC NEPM 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

ASC NEPM 2013 includes 'management limits' to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPM ASC 2013 also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

5.12. Contaminants of Potential Concern

With reference to the activities identified within Appendix A of the *State Environment Planning Policy* (SEPP) No.55 – Remediation of Land and based on information uncovered in the desktop investigation, the following items were considered potential sources of contamination:

Onsite

Uncontrolled fill:

- Heavy Metals;
- Asbestos;
- TRH;
- BTEX;
- PCBs;
- VOCs/SVOCs; and
- OCP/OPP.

No significant offsite sources were identified during the investigation undertaken by AG.

6. DATA QUALITY OBJECTIVES

Appendix B of ASC NEPM 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process.

The DQO for this project are set out in **Sections 6.1** to **6.7** of this report.

6.1. Step 1: State the problem

The first step involves summarising the contamination problem that requires new environmental data and identifying resources available to solve the problem.

The objectives of this project are to:

- Assess the potential nature and extent of identified contaminants of potential concern on the site, with reference to the areas of environmental concern reported in the stage 1 PSI;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting;
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The project is being undertaken because:

- The site is proposed for a redevelopment, comprising new storage facility for the Museum of Applied Arts and Sciences; and
- A stage 2 detailed site investigation (DSI) to address the findings of the stage 1 PSI undertaken by AG (2019) for the site.

The project team identified for this project is comprised primarily of suitably experienced environmental consultants from Alliance Geotechnical Pty Ltd.

The regulatory authorities identified for this project include NSW EPA and the local Council.

6.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this project include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do the concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Is the site suitable for the proposed land use setting, in the context of land contamination?

6.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 6.2** for this project, will include:

- Data obtained during searches of the site's history;
- The nature and extent of sampling at the site, including both density and distribution;
- Samples of relevant site media;
- The measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); and
- Assessment criteria adopted for each of the media sampled.

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, the following assessment criteria relevant to the proposed land use setting have been adopted for this project:

- Human health direct contact HILs in Table 1A (1) in ASC NEPM 2013 and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Human health inhalation/vapour intrusion HSLs in Table 1 (A) in ASC NEPM 2013
- Human health (asbestos) absence / presence for preliminary screening, and no visible ACM on surface;
- Petroleum hydrocarbon compounds (management limits) Table 1 B(7) of ASC NEPM 2013;
 and
- Aesthetics no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

6.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- The project timeframe presented in the AG proposal for this project,
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of AG field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC).

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model and the project scope, is likely to be limited to shallow soils and fill material.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this project may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

6.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

6.5.1. Rinsate Blanks

One rinsate blank will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable sampling equipment was used on that day. The rinsate blank will be analysed for at least one of the analytes the sample/s collected that day are being scheduled for analysis for (with the exception of asbestos).

6.5.2. Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH).

6.5.3. Field Duplicates and Field Triplicates

Field duplicate and field triplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates and triplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relative percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate/triplicate will be calculated.

6.5.4. Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

6.5.5. If/Then Decision Rules

AG has adopted the following 'if/then' decision rules for this project:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this project; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this project (refer **Section 6.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then AG will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this project (refer **Section 6.3**), AG will undertake an assessment of the exceedance in the context

of the project objectives to determine if additional data is required and whether management and/or remediation is required.

6.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they
 are.

AG will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern;
- Assignment of fieldwork tasks to suitably experienced AG consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced AG consulting staff and outsourcing to technical experts where required.

AG will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Completeness					
Field Considerations	Assessment Criterion	Laboratory Considerations Assessment Criterion			
Critical locations sampled	Refer Section 6.6	Critical samples analysed according to SAQP	Refer Section 6.7.7		
Critical samples collected	Refer Section 6.6	Analytes analysed according to SAQP	Refer Section 6.7.7		
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer Section 6.7.7		
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis		
		Sample extraction and holding times complied with	Refer Section 6.7.8		

Comparability					
Field Considerations	Assessment Criterion	Laboratory Considerations Assessment Criterion			
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer Section 6.7.8		
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer Section 6.7.8		
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	Same laboratory for primary sample analysis	All primary samples to Eurofins mgt		
		Same analytical measurement units	Refer Section 6.7.8		
	Represent	ativeness			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion		
Appropriate media sampled according to SAQP	Refer Section 6.4	Samples analysed according to SAQP	Refer Section 6.7.7		
Media identified in SAQP sampled	Refer Section 6.4				
	Preci	sion			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion		

Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	Laboratory duplicates	No exceedances of laboratory acceptance criteria
	No limit for analytical results <10 times LOR		
	50% for analytical results 10-20 times LOR		
	30% for analytical results >10 times LOR		
SOPs appropriate and complied with	100%		
	Accuracy	(bias)	
Field Considerations	Assessment Criterion	Laboratory Considerations	s Assessment Criterion
Rinsate blanks	Less than laboratory limit of reporting	Laboratory method blank	No exceedances of laboratory acceptance criteria
Field trip spikes	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of laboratory acceptance criteria
Field trip blanks	Analyte concentration <lor< td=""><td>Surrogate spike recovery</td><td>No exceedances of laboratory acceptance criteria</td></lor<>	Surrogate spike recovery	No exceedances of laboratory acceptance criteria

6.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

6.7.1. Sampling Point Density and Locations

Table A in NSW EPA (1995) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots by using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA (1995) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of ASC NEPM 2013 states that the number and location or sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

Table 1 in the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'* (WA DOH (2009)) indicates that where the 'likelihood of asbestos' is assessed as "possible" or "suspect", the investigation regimen should include a sampling density that is either judgemental or the same as that set out in Table A of NSW EPA (1995) for assessing asbestos.

As this project has included gathering data which provides a reasonable understanding of site history (in the context of potential areas of environmental concern on the site) and taking into consideration Table 1 in WA DOH (2009), it is considered reasonable to adopt a judgemental sampling pattern, with up to 13 sampling points.

The locations of the sampling points are set out in **Figure 4**. The location of actual sampling points will be recorded by hand on a site plan.

6.7.2. Sampling Methodology

The sampling point methodology presented in **Table 6.7.2** will be used for this project. The methodology is based on a range of factors considered relevant to this project, including:

- The identified contaminants of potential concern;
- The suspected laydown mechanisms for those contaminants of concern;
- The suspected likely depth of contamination; and
- Site specific constraints which affect the type of sampling techniques suited to the site.

Table 6.7.2 Proposed Sampling Methodology

AEC	Sampling Point ID	Method	Target Depth of Sampling Point (m bgl)
AEC01	BH01 to BH13	Handheld mechanical push tube	1.0m, practical refusal or 0.3m into natural material, whichever occurs first.

Reference will also be made to Table 5 in WA DOH (2009) for the sampling and screening of fill soils for the presence of asbestos, where practical. It is noted however, that project constraints will likely limit intrusive investigation methodologies (including the use of excavation equipment for test pitting and/or minimum 150mm diameter soil coring equipment). Subsequently, application of asbestos screening criteria published in ASC NEPM 2013 may be limited.

6.7.3. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from BH03 at a depth of 0.2m to 0.4m below ground level, would be identified as BH03/0.2-0.4.

Project samples will be stored in laboratory prepared glass jars (and zip lock bags if collected for asbestos or acid sulfate soil assessment).

Soil samples in glass jars (and acid sulfate soil samples) will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- AG project identification number
- Each sample identifier
- Date each sample was collected
- Sample type (e.g. soil or water)
- Container type/s for each sample collected
- Preservation method used for each sample (e.g. ice)
- Analytical requirements for each sample and turnaround times
- Date and time of dispatch and receipt of samples (including signatures)

6.7.4. Headspace Screening

Where the contaminants of potential concern include volatiles (e.g. TRH, BTEX), project soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on sampling point log.

6.7.5. Decontamination

In the event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

6.7.6. Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

6.7.7. Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where available);
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on site history, AG has adopted the laboratory analytical schedule (and associated upper limiting quantities) presented in **Table 6.7.7** for this project.

Table 6.7.7 Laboratory Analytical Schedule

AEC	Sampling Point ID	ткн/втех	РАН	OCP / PCB	8 Metals	Asbestos
AEC01	BH01 to BH13	13/13	13	7/7	13	13

6.7.8. Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 6.7.8**.

Table 6.7.8 Laboratory Holding Times, Analytical Methods and Limits of Reporting

Analyte	Holding Time	Analytical Method	Limit of Reporting		
		Soil			
BTEX and TRH C6-C10	14 days	USEPA 5030, 8260B and 8020	0.2-0.5 (mg/kg)		
TRH >C ₁₀ -C ₄₀	14 days	USEPA 8015B & C	20-100 (mg/kg)		
VOC	14 days	USEPA 8260	0.1-0.5 (mg/kg)		
PAH	14 days	USEPA 8270	0.1-0.5 (mg/kg)		
OCP/OPP	14 days	USEPA 8081	0.2 (mg/kg)		
PCB	28 days	USEPA 8270	0.2 (mg/kg)		
PFAS	14 days	Inhouse based on USEPA 537 V1.1	0.005 (mg/kg)		
Metals (ex. Hg & Cr ^{VI})	6 months	USEPA 8015B & C	0.05 – 2 (mg/kg)		
Hg & Cr ^{VI}	28 days	USEPA 8015B & C	0.05 – 2 (mg/kg)		
Asbestos	No limit	AS4964:2004	Absence / presence		
Asbestos	No limit	Inhouse Method	0.001% w/w		
Water					
BTEX and TRH C ₆ -C ₁₀	14 days	NEPM Schedule B3	0.02-0.1 (mg/L)		
TRH >C ₁₀ -C ₄₀	14 days	NEPM Schedule B3	0.1 (mg/L)		
VOC	714days	USEPA 8260	0.1-0.5 (mg/L)		
PAH	7 days	USEPA 8270, 8100, NEPM Schedule B3	0.001 (mg/L)		
OCP/OPP	7 days	USEPA 8141, USEPA 8081, USEPA 8270, NEPM Schedule B3	0.002-0.0005 (mg/L)		
PCB	7 days	USEPA 8082, NEPM Schedule B3	0.001-0.005 (mg/L)		
PFAS	14 days	Inhouse based on USEPA 537 V1.1	0.01-0.05 (μg/L)		
Metals (ex. Hg & Cr ^{VI})	6 months	USEPA 6010, 6020	0.05 – 2 (mg/L)		
Hg & Cr ^{VI}	28 days	USEPA 6010, 6020	0.05 – 2 (mg/L)		

7. FIELDWORK METHODOLOGY

7.1. Soil Sampling

Soil sampling was undertaken by AG on 11th September 2019. A total of thirteen (13) boreholes (BH01-BH13) were advanced across the site using a handheld mechanical push tube until reaching inferred natural materials between 0.3-0.8m bgl. Subsurface drilling was undertaken by an appropriate AG environmental scientist. Samples for analysis for potential contaminants of concern were collected from the near surface, at 0.5 m intervals within the soil profile or with change of strata, and in areas of observed contamination. Each soil sample was collected using a new clean pair of nitrile gloves and placed in the appropriate sample containers provided by the laboratory. A small subsample was transferred into a plastic bag for additional on-site PID analysis. The PID calibration certificate is provided in **Appendix C**.

The selection of samples for laboratory analyses was based upon olfactory observations and results of field screening using a photo-ionisation detector (PID) for the presence of volatile organic compounds (VOCs). The soil jars were labelled with sample identification (sample location and depth), date and name of sampler.

Upon completion of the soil boring, the holes were backfilled with the drill cuttings and sealed off with the concrete core cutting and additional concrete mix.

Soil bore logs were maintained in the field by an AG environmental scientist for all exploratory holes. Field observations such as lithology, odours, staining, depth of water etc. were noted on the logs. The logs are presented within **Appendix B**.

Each sampling point established was marked on a site plan. The locations of these sampling points are presented in **Figure 4**.

7.2. Site Geology

Observations were made of soils encountered during sampling work. These observations were recorded in borehole logs. A copy of these logs is presented in **Appendix B**.

Inferred natural material was encountered at each location.



Image 7.2.1 Example of soil profile at BH04, from surface (right) to underlain natural material (left)

7.3. Headspace Screening

Samples collected were subjected to headspace screening. A sub sample from each sampling point was placed in a zip lock bag, sealed and shaken. Each bag was then pierced with the probe tip of a calibrated photoionization detector (PID) and the screening results recorded. These results are recorded on the borehole logs presented in **Appendix B**.

The overall results of the headspace screening indicated a low potential for ionisable volatile organic compounds (VOC) to be present in the samples.

A copy of the calibration record for the PID is presented in **Appendix C**.

7.4. Odours

Olfactory evidence of odours in the soil samples collected, was not detected.

7.5. Staining

Visual evidence of staining in the soil samples collected, was not observed.

7.6. Potential Asbestos Containing Materials

No visual evidence of potential asbestos containing materials (ACM) was observed at any of the soil sampling point locations or throughout the site walkover.

8. LABORATORY ANALYSIS

The samples collected were transported to the analytical laboratory, using chain of custody (COC) protocols. A selection of these samples was scheduled for analysis, with reference to the relevant COPC identified for the AEC that the samples were collected from.

All soil and groundwater samples were forwarded to the NATA accredited laboratory for analysis of the analytes listed below. Eurofins | Mgt were used for the analysis of primary samples and SGS for the analysis of interlaboratory samples.

Table 8.1 details the analysis undertaken for soil samples and **Table 8.2** details the laboratory suite of analysis undertaken for groundwater samples.

Table 8.1 Soil Analytical Schedule

AEC	Sampling Point ID	ткн/втех	РАН	OCP / PCB	8 Metals	Asbestos
AEC01	BH01 to BH13	13/13	13	7/7	13	13
DUP1	BH01	-	-	-	1	-

A copy of the analytical laboratory certificates of analysis, is presented in **Appendix D.**

The sample analytical results were tabulated and presented in the attached **Table LAR1** and **LAR2**.

9. DATA QUALITY INDICATOR ASSESSMENT

9.1. Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 9.1**.

Table 9.1 Completeness DQI

Field Considerations	Target	Actual	Comment
Critical locations sampled	13	13	Performance against indicator considered acceptable.
Critical samples collected	13	13	Performance against indicator considered acceptable.
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.

Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	All sampling point logs, calibration logs and chain of custody forms	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Critical samples analysed according to DQO	Refer Section 6.7.7	Refer Section 6.7.7	Performance against indicator considered acceptable.
Analytes analysed according to DQO	Refer Section 6.7.7	100%	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer Section 6.7.8	100%	Performance against indicator considered acceptable.
Sample documentation complete	All sample receipt advices, all certificates of analysis	100%	Performance against indicator considered acceptable.
Sample extraction and holding times complied with	Refer Section 6.7.8	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

9.2. Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 9.2**.

Table 9.2 Comparability DQI

Field Considerations	Target	Actual	Comment
Same SOPs used on each occasion	100%	100%	Performance against indicator considered acceptable.
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	100%	Performance against indicator considered acceptable.

Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	100%	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Same analytical methods used by primary laboratory	Refer Section 6.7.8	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer Section 6.7.8	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to Eurofins mgt	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer Section 6.7.8	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable within the objectives and constraints of the project.

9.3. Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 9.3**

Table 9.3 Representativeness DQI

Field Considerations	Target	Actual	Comment
Appropriate media sampled according to DQO	Refer Section 6.7.2	100%	Performance against indicator considered acceptable.
Media identified in DQO sampled	Refer Section 6.7.2	100%	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Samples analysed according to DQO	Refer Section 6.7.7	Refer comments	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

9.4. Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 9.4**.

Table 9.4 Precision DQI

Field Considerations Target		Actual	Comment		
Field duplicate / Minimum 5% duplicates triplicate RPD and triplicates		7.7 % duplicates Nil	Parent duplicate/triplicate relationships are as follows: Soil: DUP01 = BH01-0.1-0.3		
	No limit for analytical	Nil	No RPD exceedances were observed for duplicate soil samples. Performance against indicator considered acceptable.		
	results <10 times LOR	Nil			
	50% for analytical results 10-20 times LOR				
	30% for analytical results >20 times LOR				
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.		
Laboratory Considerations	Target	Actual	Comment		
Laboratory duplicates	No exceedances of laboratory acceptance criteria	No exceedances	Performance against indicator considered acceptable.		

The data collected is considered to be adequately precise within the objectives and constraints of the project.

9.5. Accuracy

An assessment of the precision of data collected was undertaken, and the results presented in **Table 9.5**.

Table 9.5 Accuracy DQI

Field Considerations	Target	Actual	Comment		
Rinsate blanks	Less than laboratory limit of reporting	Not applicable	Performance against indicator considered acceptable.		
Field trip spikes	Recoveries between 60% and 140%	Not applicable	Performance against indicator considered acceptable.		
Field trip blanks	Analyte concentration <lor< td=""><td>Not applicable</td><td>Performance against indicator considered acceptable.</td></lor<>	Not applicable	Performance against indicator considered acceptable.		
Laboratory Considerations	Target	Actual	Comment		
Laboratory method blank	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.		
Matrix spike recovery	No exceedances of laboratory acceptance criteria	One failure due to sample matrix interference	Performance against indicator considered acceptable.		
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.		
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.		

The data collected is considered to be adequately accurate within the objectives and constraints of the project.

10. DISCUSSION

A discussion on comparison of laboratory analytical results and field observations, in the context of the assessment criteria adopted for this project, is presented below.

12.1. Human Health - Direct Contact (HIL B – residential with minimal opportunities for soil access)

TRH

The concentrations of TRH C_6 - C_{10} , $>C_{10}$ - C_{16} , $>C_{16}$ - C_{34} and $>C_{34}$ - C_{40} detected in the soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

OCP

The concentration of Organochlorine and Organophosphate Pesticides detected in soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

PAHs

The concentrations of naphthalene detected in the soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

The concentrations of benzo(a)pyrene TEQ detected in the soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

The concentration of total PAH detected in the soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

<u>PCBs</u>

The concentration of total PCBs detected in the soil samples analysed were less than the applicable adopted direct contact human health exposure criteria.

Heavy Metals

The concentrations of arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

<u>Asbestos Containing Materials</u>

No asbestos was detected within any of the soil samples analysed.

12.2. Human Health – Inhalation / Vapour Intrusion (HIL B – residential with minimal opportunities for soil access)

TRH

The concentrations of TRH C_6 - C_{10} (minus BTEX) and $>C_{10}$ - C_{16} (minus naphthalene) detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

PAHs

The concentrations of naphthalene detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

12.3. Aesthetics

There was no visual evidence of waste storage onsite. The aesthetics assessment criteria adopted for this project, indicate that no further assessment/management of these wastes would be required.

12.4. Terrestrial Ecosystems

Ecological Screening Levels (ESLs)

The concentrations of relevant contaminants of concern detected in the soil samples analysed were less than the applicable adopted ecological screening levels (ESL) with the exception of PFOS (A PFAS compound) within soil samples P4 and P6. Although these samples exceeded the interim indirect exposure guidelines, it is noted that soil from sampling locations where PFAS compounds were identified will be excavated as part of the basement construction thereby removing what limited risk to the limited ecological receptors surrounding the site. Furthermore, due to the nature of the construction, any soil leftover will be covered by concrete including the basement and the ground floor thus removing terrestrial ecological exposure pathways. It is thus the opinion of AG that the detected concentration of PFAS does not pose a significant risk to surrounding ecological receptors.

11. CONCLUSIONS AND RECOMMENDATIONS

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

- The detected concentrations of all other identified contaminants of potential concern in the soils assessed are considered unlikely to present:
 - o an unacceptable direct contact human health exposure risk; or
 - an unacceptable inhalation / vapour intrusion human health exposure risk;
- The detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present a petroleum hydrocarbon management limit risk;
- No asbestos was detected within the soil materials analysed; and
- The detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable ecological contamination risk.

Based on the assessments undertaken as part of this investigation, AG has concluded that the site is deemed suitable for the proposed land use setting. AG can conclude that no further investigation should be required for this development to proceed.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 12**.

12. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance Geotechnical Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, AG reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to AG's engagement. The report must not be used for any purpose other than the purpose specified at the time AG was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual AG consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, AG reserves the right to review and amend this report.

13. REFERENCES

AG 2019, 'Stage 1 Preliminary Site Investigation, 172 Showground Road, Castle Hill NSW', dated 16th September 2019, ref: 8325-ER-1-1

HEPA 2018, 'PFAS National Environmental management Plan'

NEPM (ASC) 2013, 'National Environmental Protection (Assessment of Site Contamination) Measures'

NSW DEC 2006, 'Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)'.

NSW EPA 1995, 'Contaminated Sites: Sampling Design Guidelines'.

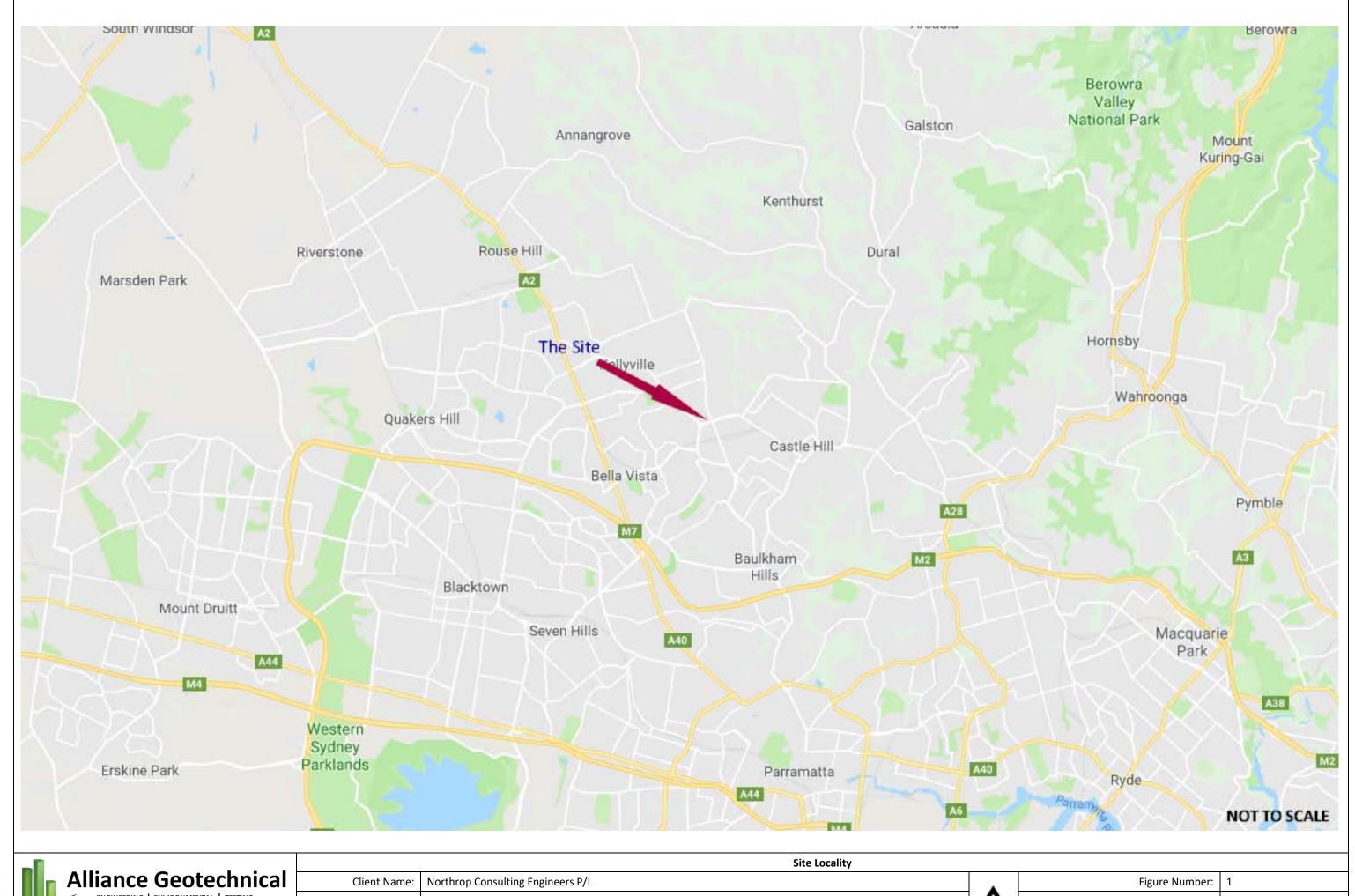
NSW EPA 1997 'Polychlorinated Biphenyl (PCB) Chemical Control Order'.

NSW EPA 2012, 'Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases'

NSW OEH 2011, 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'.

WA DOH 2009, 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia' dated May 2009.

FIGURES



1	Site Locality			
📘 Alliance Geotechnical 🛚	Client Name:	Northrop Consulting Engineers P/L	•	Figure Nun
ENGINEERING ENVIRONMENTAL TESTING	Project Name:	Stage 2 Detailed Site Investigation	\sim	Figure I
Manage the earth, eliminate the risk	Project Location:	172 Showground Road, Castle Hill NSW	14	Report Nun

Figure Number:	1
Figure Date:	17 September 2019
Report Number:	8325-ER-1-2



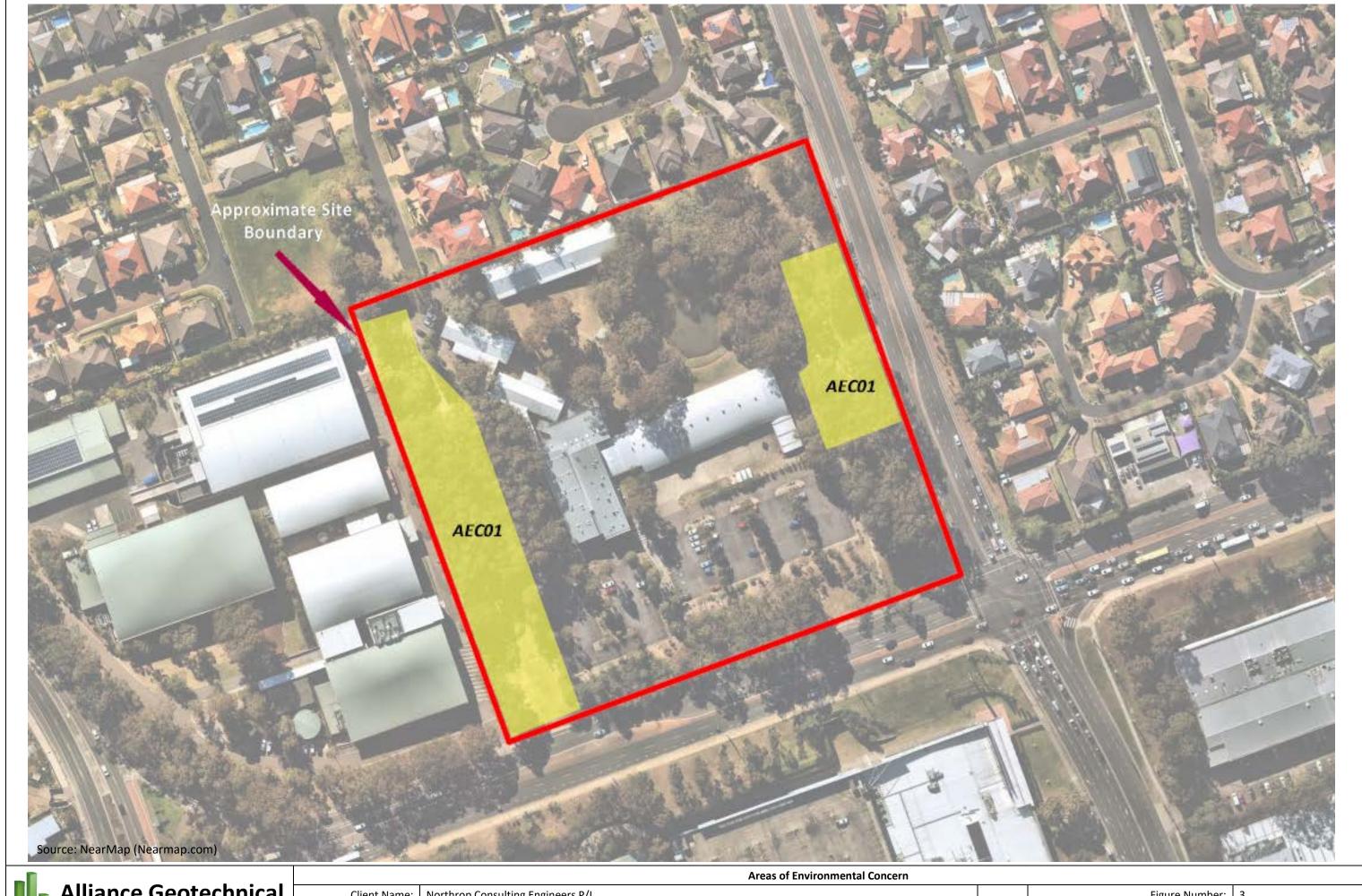
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Manage the earth, eliminate the risk

	•
Client Name:	Northrop Consulting Engineers P/L
Project Name:	Stage 2 Detailed Site Investigation
Project Location:	172 Showground Road, Castle Hill NSW

•	Figure Number:	2
N	Figure Date:	17 September 2019
14	Report Number	8325-FR-1-2



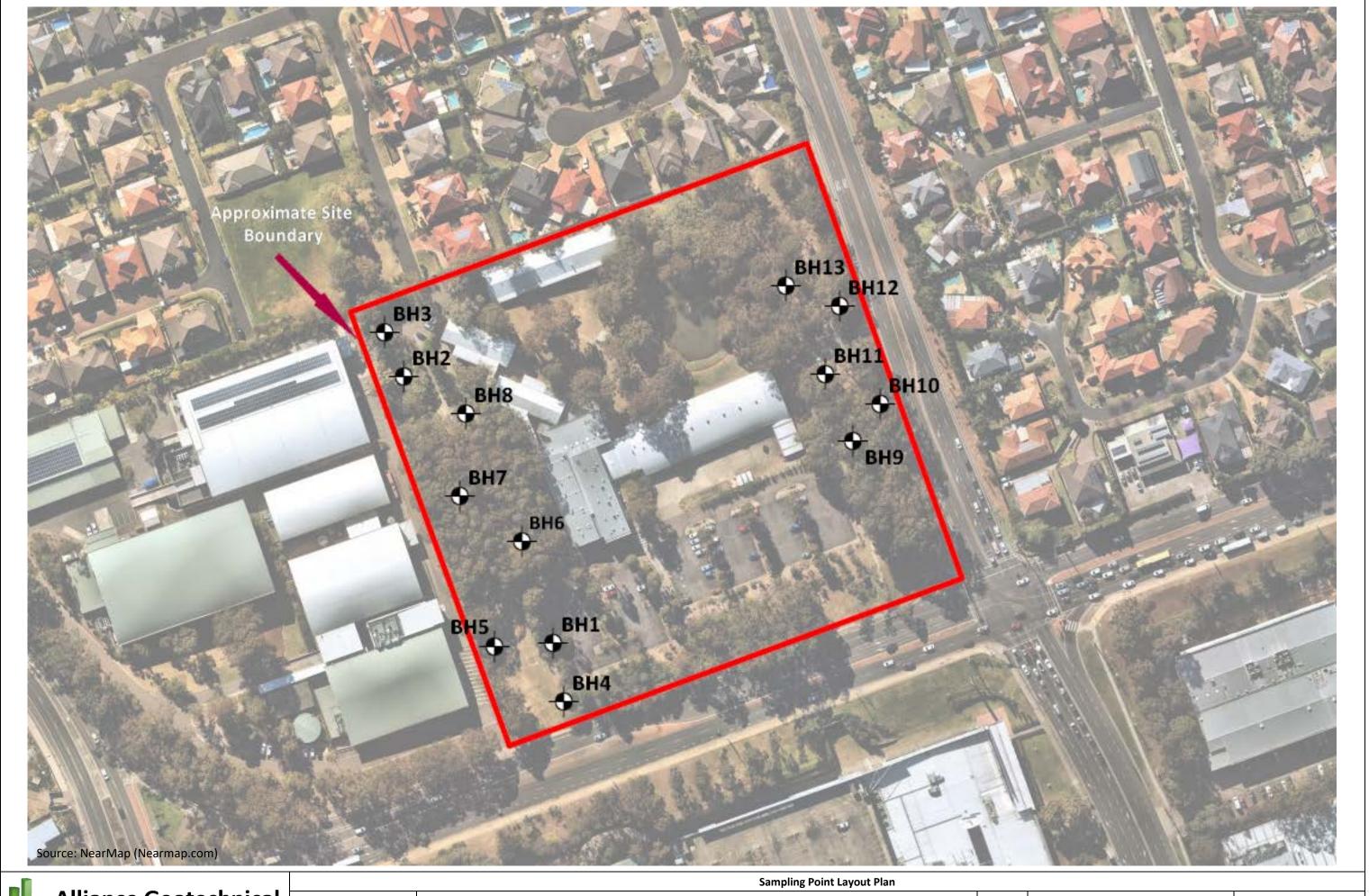
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Manage the earth, eliminate the risk

Client Name:	Northrop Consulting Engineers P/L	
Project Name:	Stage 2 Detailed Site Investigation	
Project Location:	172 Showground Road, Castle Hill NSW	

•	Figure Number:	3
\sim	Figure Date:	17 September 2019
IV	Report Number:	8325-ER-1-2





Client Name:	Northrop Consulting Engineers P/L	
Project Name:	Stage 2 Detailed Site Investigation	,
Project Location:	172 Showground Road, Castle Hill NSW	

•	Figure Number:	4
\sim	Figure Date:	17 September 2019
14	Report Number:	8325-ER-1-2

TABLES

blo 1										Sample ID	BH01-0.1-0.3	BH02-0.1-0.3	BH03-0.1-0.3	BH04-0.1-0.3	BH05-0.1-0.3	BH06-0.1-0.3	BH07-0.1-0.3	BH08-0.0-0.2	BH09-0.1-0.3	BH10-0.0-0.2	BH11-0.1-0.3	BH12-0.1-0.3	BH13-0.1-0.3
ble 1 2 Showgro	und Road, Castle Hill NSW									Reference	S19-Se20205	S19-Se20206	S19-Se20207	S19-Se20208	S19-Se20209	S19-Se20210	S19-Se20211	S19-Se20212	S19-Se20213	S19-Se20214	S19-Se20215	S19-Se20216	S19-Se20217
_	A Adopted Site Criteria									Date Sampled	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019	9/9/2019
25-ER-1-2	· ·									Sample Matrix	SOIL	SOIL	SOIL										
				Screening Levels for Direct Contact	Inhalation / Vapour Intrusion HSLs (mg/kg)	TPH Fractions F1 - F4 in		Levels for Soil															
Group	Analyte	Units	PQL	(mg/kg) - CRC Care 2011	NEPC 2013 (CLAY)	2013	2013	Contaminants - NEPC 2013															
				HSL - B Residential (High Density)	HSL A & HSL B - Low - Hig density Residential	and Public Open Space	Public Open Space	Residential B	Data Set Minimun	n Data Set Maximum													
	Arsenic, As		2		0 m to <1 m	Fine Soil Texture	Fine Soil Texture	500	6	17	8.2	17	7.2	7.1	10	11	12	8.6	8.2	9.1	6.3	0.1	9
	Cadmium, Cd	mg/kg mg/kg	0.4		-	-	-	150	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	12 < 0.4	< 0.4	< 0.4	< 0.4	6.3 < 0.4	9.1 < 0.4	< 0.4
	Chromium, Cr	mg/kg	5.0	-			-	500	21	40	24	40	26	23	22	35	33	24	30	33	21	26	23.0
	Copper, Cu	mg/kg	5.0	-	-	-	-	30,000	< 5	26	8.1	6.3	6.2	6.2	10	5.3	< 5	5.3	8.6	12	11	14	26
Metals	Lead, Pb	mg/kg	5	-		-	-	1,200	14	32	32	19	16	21	16	16	14	17	22	32	19	22	30
	Mercury (inorganic)	mg/kg	0.10	-	-		-	120	< 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
	Nickel, Ni	mg/kg	5.0	-	•	•	-	1,200	< 5	8	5.3	< 5	5.2	< 5	< 5	< 5	< 5	< 5	< 5	5.4	< 5	< 5	8.0
	Zinc, Zn Acenaphthene	mg/kg mg/kg	5.0 0.5	-	-	-	-	60,000	7 < 0.5	39 < 0.5	19 < 0.5	7.5 < 0.5	12 < 0.5	16 < 0.5	15 < 0.5	8.8 < 0.5	7.3 < 0.5	14 < 0.5	12 < 0.5	18 < 0.5	9.8 < 0.5	6.5 < 0.5	39 < 0.5
	Acenaphthylene	mg/kg	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
	Anthracene	mg/kg	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
	Benzo(a)anthracene	mg/kg	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
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	0.7	-	< 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
	Carcinogenic PAHs, BaP TEQ <lor=0< th=""><th>TEQ (mg/kg)</th><td>0.5</td><td>-</td><td></td><td>-</td><td>-</td><td></td><td>< 0.5</td><td>< 0.5</td></lor=0<>	TEQ (mg/kg)	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
	Carcinogenic PAHs, BaP TEQ <lor=lor <lor="LOR/2</th" bap="" carcinogenic="" pahs,="" teq=""><th>TEQ (mg/kg) TEQ (mg/kg)</th><td>0.5</td><td>- :</td><td></td><td>•</td><td>-</td><td>4</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td><td>0.6 1.2</td></lor=lor>	TEQ (mg/kg) TEQ (mg/kg)	0.5	- :		•	-	4	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2	0.6 1.2
	Benzo(b&j)fluoranthene	mg/kg	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
DALL	Benzo(ghi)perylene	mg/kg	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
PAH	Benzo(k)fluoranthene	mg/kg	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
	Chrysene	mg/kg	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
	Dibenzo(ah)anthracene	mg/kg	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
	Fluoranthene Fluorene	mg/kg mg/kg	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	< 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
	Indeno(1,2,3-cd)pyrene	mg/kg	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
	Naphthalene	mg/kg	0.5	2,200	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
	Phenanthrene	mg/kg	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
	Pyrene	mg/kg	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
	Total PAH (18)	mg/kg	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
	TRH C10-C36 Total TRH C10-C14	mg/kg mg/kg	50 20		-			-	< 50 < 20	422 42	< 50 < 20	< 50 < 20	< 50 < 20	280 < 20	< 50 < 20	276 < 20	422 42						
	TRH C15-C28	mg/kg	50	-			-		< 50	160	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	140	< 50	96	160
	TRH C29-C36	mg/kg	50	-	-	-	-	-	< 50	220	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	140	< 50	180	220
	TRH C6-C9	mg/kg	20	-		-	-	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	Naphthalene	mg/kg	0.5	2,200	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
TRH	TRH >C10-C16 (F2)	mg/kg	50	4,200	280	1,000	120	-	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	52
	TRH >C10-C16 (F2) - Naphthalene TRH C10-C40 Total (F bands)	mg/kg mg/kg	50 100		-		-	-	< 50 < 100	52 382	< 50 < 100	< 50 < 100	< 50 < 100	< 50 220	< 50 < 100	< 50 360	52 382						
	TRH >C16-C34 (F3)	mg/kg	100	5,800	-	3,500	1,300	-	< 100	330	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	220	< 100	240	330
	TRH >C34-C40 (F4)	mg/kg	100	8,100		10,000	5,600	-	< 100	120	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	120	< 100
	TRH C6-C10	mg/kg	20	5,600	-	800	180	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	-	-	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	Benzene Ethylbenzene	mg/kg	0.1	140 5,900	0.7 NL	•	65 125	-	< 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
	m/p-xylene	mg/kg mg/kg	0.2	-	-	-	-	-	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1 < 0.2	< 0.1 < 0.2	< 0.1 < 0.2	< 0.1	< 0.2	< 0.2	< 0.1 < 0.2	< 0.2	< 0.2	< 0.1 < 0.2	< 0.2
BTEX	o-xylene	mg/kg	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
	Toluene	mg/kg	0.1	21,000	480	-	105	-	< 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
	Total Xylenes	mg/kg	0.3	17,000	110		45	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
	4.4 - DDD 4.4 - DDE	mg/kg	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 < 0.05
	4.4 - DDT	mg/kg mg/kg	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
	a - BHC	mg/kg	0.05	-		-		-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	10	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	b - BHC Chlordanes (total)	mg/kg mg/kg	0.05	-		-		90	< 0.05 < 0.1	< 0.05 < 0.1	< 0.05 < 0.1	-	< 0.05 < 0.1										
	d - BHC	mg/kg	0.05				-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-			-	600	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Dieldrin	mg/kg	0.05	-	-		-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
ОСР	Endosulfan 2 Endosulfan sulphate	mg/kg mg/kg	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						
	Endosuitan suipnate Endrin	mg/kg mg/kg	0.05			-		20	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Endrin Aldehyde	mg/kg	0.05			-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	•	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05		< 0.05
	Heptachlor	mg/kg	0.05	-	•	-	-	10	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05
	Heptachlor epoxide Hexachlorobenzene	mg/kg mg/kg	0.05	-	•	-		- 15	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05 < 0.05	-	< 0.05 < 0.05										
	Methoxychlor	mg/kg	0.05		-	-	-	500	< 0.2	< 0.2	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2
	Toxaphene	mg/kg	1.0	-		-	-		<1	<1	<1	-	<1	-	< 1	-	< 1		< 1	-	<1		< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	< 0.2	< 0.2	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-		-		-	< 0.2	< 0.2	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-		-	-	400		-	-	-	-	-	-		-	-	-	- 10.5	-	-	- 105
	Aroclor-1016 Aroclor-1221	mg/kg mg/kg	0.1	-					< 0.5 < 0.1	< 0.5 < 0.1	-	< 0.5 < 0.1	< 0.5 < 0.1										
	Aroclor-1221 Aroclor-1232	mg/kg	0.1					-	< 0.1	< 0.5	-	< 0.5	-	< 0.1	-	< 0.5	-	< 0.1	-	< 0.1	-	< 0.1	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	< 0.5
nco		mg/kg	0.1				-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	< 0.5
РСВ	Aroclor-1248	IIIg/kg																					
РСВ	Aroclor-1254	mg/kg	0.1	-	-	-	-		< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	< 0.5
РСВ				-			:	- - 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 < 0.5 < 0.5	- - -	< 0.5 < 0.5 < 0.5	-	< 0.5 < 0.5 < 0.5	< 0.5 < 0.5 < 0.5

Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011

Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)

Highlighted concentration exceeds the adopted site criteria - Management Limits for TPH Fractions F1 - F4 in soil (mg/kg) - NEPC 2013

Highlighted concentration exceeds the adopted site criteria - ESLs for TPH Fractions F1 - F4, BTEX and Benzo(a)pyrene - NEPC 2013

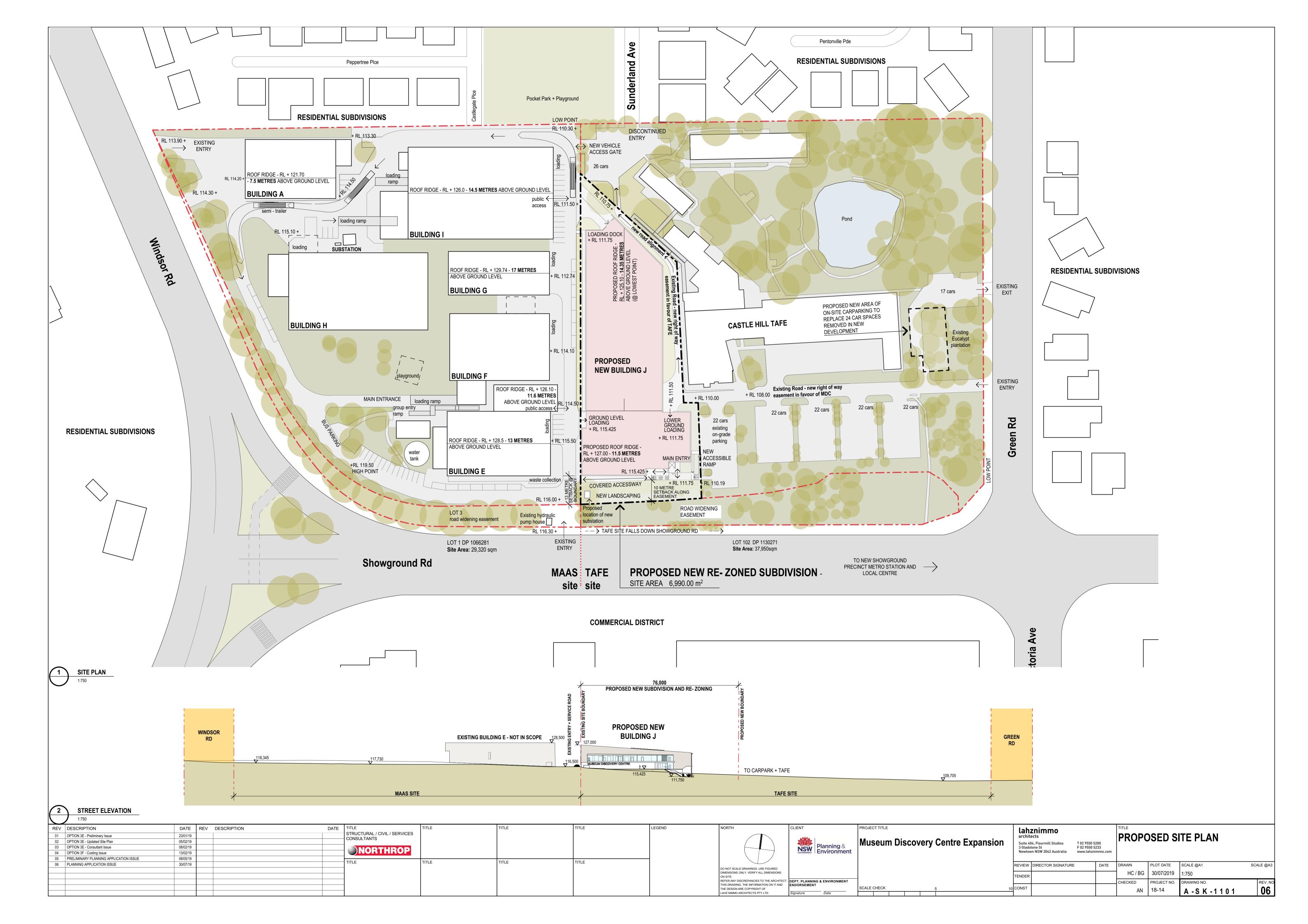
Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

No published criteria or sample not analysed

Table LAR	32	Re	ference	S19-Se20205	S19-Se20218	
172 Showg	round Road, Castle Hill NSW	Sa	mple ID	BH01-0.1-0.3	DUP01	
Soil Resul	ts & Adopted Site Criteria	Date 9	ampled	9/9/2019	9/9/2019	
8325-ER-1	1-2	Sample	Matrix	Soil	Soil	
Group	Analyte	Units	PQL			RPD (%)
	Arsenic	mg/kg	<1	8.2	7.3	12
	Cadmium	mg/kg	<0.3	< 0.4	< 0.4	N/A
	Chromium	mg/kg	<0.3	24	24	0
Metals	Copper	mg/kg	<0.5	8.1	6.6	20
ivietais	Lead	mg/kg	<1	32	21	42
	Nickel	mg/kg	<0.5	5.3	< 5	N/A
	Zinc	mg/kg	<0.5	19	5.2	114
	Mercury	mg/kg	<0.05	< 0.1	< 0.1	N/A

APPENDIX A

PROPOSED DEVELOPMENT PLANS



APPENDIX B BOREHOLE LOGS

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BH No: BH01 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Additional Observations Material Description Tests Method Remarks Depth (m) D No potential ACM, odours or staining noted. FILL: Silty CLAY, brown, soft, dry. 0.1-0.3 (PID: 0.8ppm) 0.5 No potential ACM, odours or staining noted. D CLAY w/ trace silt, pale brown/orange, stiff, dry. 0.6-0.8 (PID: 0.3ppm) 1.0 Borehole BH01 terminated at 1m

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BH No: BH02 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Material Description Tests Additional Observations Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. No potential ACM, odours or staining noted. 0.1-0.3 (PID: 0.6ppm) No potential ACM, odours or CLAY, brown/orange, stiff, moist. D staining noted. 0.<u>5</u> 0.5-0.7 (PID: 1.2ppm) 1.0 Borehole BH02 terminated at 1m

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BH No: BH03 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Material Description Tests Additional Observations Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. D No potential ACM, odours or staining noted. 0.1-0.3 (PID: 4.8ppm) No potential ACM, odours or staining noted. CLAY, orange/grey, hard/friable, dry. D 0.3-0.5 (PID: 3.2ppm) 0.5 1.0 Borehole BH03 terminated at 1m

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BH No: BH04 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Additional Observations Material Description Tests Method Remarks Depth (m) D No potential ACM, odours or staining noted. FILL: Silty CLAY, brown, soft, dry. 0.1-0.3 (PID: 0.1ppm) CLAY, brown/orange, stiff, moist. D No potential ACM, odours or staining noted. 0.5 0.4-0.6 (PID: 2.1ppm) 1.0 Borehole BH04 terminated at 1m

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BH No: BH05 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Additional Observations Material Description Tests Method Remarks Depth (m) D No potential ACM, odours or staining noted. FILL: Silty CLAY, brown, soft, dry. 0.1-0.3 (PID: 0.9ppm) CLAY, brown/orange, stiff, dry. D No potential ACM, odours or staining noted. 0.5 0.4-0.6 (PID: 0.8ppm) 1.0 Borehole BH05 terminated at 1m

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BH No: BH06 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Material Description Tests Additional Observations Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. No potential ACM, odours or 0.1-0.3 (PID: 6.7ppm) 0.5 No potential ACM, odours or staining noted. D CLAY, grey/orange, hard/friable, dry. 0.5-0.7 (PID: 1.8ppm) 1.0 Borehole BH06 terminated at 1m

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Sheet: 1 of 1

Job No: 8325

BH No: BH07

Borehole Log

Client:Northrop Consulting Engineers P/LStarted:11/9/19Project:Stage 2 DSIFinished:11/9/19Location:172 Showground RoadHole Location:Refer to figure 4Borehole Size mm

_ocation: 17	2 Showground Road	Hole Location: Refer to figure 4	Bore	Borehole Size mm						
Rig Type: Pus	sh Tube	Hole Coordinates , m	Driller: JW	Logged: JW						
RL Surface: n	n	Contractor:	Bearing:	Checked: SW						
Method (a) Nater (b) Table	(a) updec	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Moisture Additional Observation						
Push Tube M M M M M M M M M M M M M M M M M M M	0.5 CL C	LL: Silty CLAY, brown, soft, dry. LAY, grey/orange, hard/friable, dry. brehole BH07 terminated at 0.9m	0.1-0.3 (PID: 5.1ppm) 0.4-0.6 (PID: 0.9ppm)	D No potential ACM, odours staining noted. No potential ACM, odours staining noted.						

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BH No: BH08 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Material Description Tests Additional Observations Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. No potential ACM, odours or staining noted. 0.0-0.2 (PID: No potential ACM, odours or staining noted. CLAY, grey/orange, hard/friable, dry. D 0.3-0.5 (PID: 1.1ppm) 0.5 Borehole BH08 terminated at 0.7m 1.0

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BH No: BH09 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Material Description Tests Additional Observations Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. No potential ACM, odours or staining noted. 0.1-0.3 (PID: 6.1ppm) No potential ACM, odours or staining noted. CLAY, grey, hard/friable, dry. D 0.3-0.5 (PID: 3.3ppm) 0.5 1.0 Borehole BH09 terminated at 1m

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BH No: BH10 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Material Description Tests Additional Observations Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. No potential ACM, odours or staining noted. 0.0-0.2 (PID: No potential ACM, odours or staining noted. CLAY, grey/orange, hard/friable, dry. D 0.3-0.5 (PID: 0.2ppm) 0.5 1.0 Borehole BH10 terminated at 1m

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BH No: BH11 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Additional Observations Material Description Tests Method Remarks Depth (m) FILL: Silty CLAY, brown, soft, dry. No potential ACM, odours or 0.1-0.3 (PID: 4.0ppm) CLAY, grey, hard/friable, dry. D No potential ACM, odours or staining noted. 0.5 0.4-0.6 (PID: 7.1ppm) 1.0 Borehole BH11 terminated at 1m

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BH No: BH12 Sheet: 1 of 1 Job No: 8325

Borehole Log

BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19

Client: Northrop Consulting Engineers P/L Started: 11/9/19 Project: Stage 2 DSI Finished: 11/9/19 Location: 172 Showground Road Hole Location: Refer to figure 4 Borehole Size mm Hole Coordinates , m Rig Type: Push Tube Driller: JW Logged: JW RL Surface: m Contractor: Bearing: ---Checked: SW Classification Symbol Samples Graphic Log Additional Observations Material Description Tests Method Remarks Depth (m) D No potential ACM, odours or staining noted. FILL: Silty CLAY, brown, soft, dry. 0.1-0.3 (PID: 6.2ppm) 0<u>.5</u> No potential ACM, odours or staining noted. CLAY, grey, hard, dry. D 0.7-0.9 (PID: 1.0 Borehole BH12 terminated at 1m

W: www.allgeo.com.au Job No: 8325

BH No: BH13 Sheet: 1 of 1

Borehole Log

P	Client: Northrop Consulting Engineers P/L Project: Stage 2 DSI Location: 172 Showground Road Hole Location: Refer to figure 4								Started: 11/9/19 Finished: 11/9/19 Borehole Size mm						
						und Ro				ole					
			e: Po ace:	ush Tu	ıbe				er: JW						
I.	LS	ouri	ace:	m			Contractor:	bear	ng:			Checked: SW			
Method	- 1	Water	RL (m)	Depth (m)		Classification Symbol	Material Description		Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations			
BOREHOLE 8325 CASTLEHILL ENVIRO GINT LOGS.GPJ GINT STD AUSTRALIA.GDT 17/9/19 BIGH TITHS Method	- 1	Water	RL (m)	0.5		Classifica Symbol	GRASS FILL: Silty CLAY, brown, soft, dry. CLAY w/ sandstone cobbles, pale grey, hard/friable, dry. Borehole BH13 terminated at 0.8m			D D Condition	Consists Density Density	No potential ACM, odours or staining noted. No potential ACM, odours or staining noted.			
SOREHOLI															

APPENDIX C CALIBRATION CERTIFICATES

APPENDIX D LABORATORY DOCUMENTATION



Environment Testing

Alliance Geotechnical 10 Welder Road Seven Hills NSW 2147





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: Steven Wallace

Report676756-SProject nameCASTLE HILL

Project ID 8325

Received Date Sep 12, 2019

Client Sample ID			BH01-0.1-0.3	BH02-0.1-0.3	BH03-0.1-0.3	BH04-0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Se20205	S19-Se20206	S19-Se20207	S19-Se20208
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM	Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	98	100	91
Total Recoverable Hydrocarbons - 2013 NEPM	Fractions					
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)N04	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)N01	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluorantheneN07	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Report Number: 676756-S



Client Sample ID			BH01-0.1-0.3	BH02-0.1-0.3	BH03-0.1-0.3	BH04-0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Se20205	S19-Se20206	S19-Se20207	S19-Se20208
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	89	108	94	105
p-Terphenyl-d14 (surr.)	1	%	107	122	106	119
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	137	-	137	-
Tetrachloro-m-xylene (surr.)	1	%	105	-	106	-
Polychlorinated Biphenyls	ı	 				
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.) Tetrachloro-m-xylene (surr.)	1	%	-	131 112	-	139 118



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			BH01-0.1-0.3 Soil S19-Se20205 Sep 11, 2019	BH02-0.1-0.3 Soil S19-Se20206 Sep 11, 2019	BH03-0.1-0.3 Soil S19-Se20207 Sep 11, 2019	BH04-0.1-0.3 Soil S19-Se20208 Sep 11, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	8.2	17	7.2	7.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	40	26	23
Copper	5	mg/kg	8.1	6.3	6.2	6.2
Lead	5	mg/kg	32	19	16	21
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.3	< 5	5.2	< 5
Zinc	5	mg/kg	19	7.5	12	16
% Moisture	1	%	10	13	12	14

Client Sample ID			BH05-0.1-0.3	BH06-0.1-0.3	BH07-0.1-0.3	BH08-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Se20209	S19-Se20210	S19-Se20211	S19-Se20212
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM	Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	105	93	105	95
Total Recoverable Hydrocarbons - 2013 NEPM	Fractions					
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)N04	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)N01	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5



Client Sample ID			BH05-0.1-0.3	BH06-0.1-0.3	BH07-0.1-0.3	BH08-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Se20209	S19-Se20210	S19-Se20211	S19-Se20212
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons	•					
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92	106	92	110
p-Terphenyl-d14 (surr.)	1	%	101	114	109	131
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	125	-	128	-
Tetrachloro-m-xylene (surr.)	1	%	107	-	105	-
Polychlorinated Biphenyls	ı					
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	_	< 0.5	_	< 0.5



Client Sample ID			BH05-0.1-0.3	BH06-0.1-0.3	BH07-0.1-0.3	BH08-0.0-0.2 Soil	
Sample Matrix			Soil	Soil	Soil	S19-Se20212	
Eurofins Sample No.			S19-Se20209	S19-Se20210	S19-Se20211		
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	
Test/Reference	LOR	Unit					
Polychlorinated Biphenyls							
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5	
Total PCB*	0.5	mg/kg	-	< 0.5	=	< 0.5	
Dibutylchlorendate (surr.)	1	%	-	140	=	143	
Tetrachloro-m-xylene (surr.)	1	%	-	113	=	127	
Heavy Metals							
Arsenic	2	mg/kg	10	11	12	8.6	
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	
Chromium	5	mg/kg	22	35	33	24	
Copper	5	mg/kg	10	5.3	< 5	5.3	
Lead	5	mg/kg	16	16	14	17	
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	
Nickel	5	mg/kg	< 5	< 5	< 5	< 5	
Zinc	5	mg/kg	15	8.8	7.3	14	
% Moisture	1	%	9.1	7.8	8.2	8.4	

Client Sample ID			BH09-0.1-0.3	BH10-0.0-0.2	BH11-0.1-0.3	BH12-0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Se20213	S19-Se20214	S19-Se20215	S19-Se20216
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM F	ractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	140	< 50	96
TRH C29-C36	50	mg/kg	< 50	140	< 50	180
TRH C10-C36 (Total)	50	mg/kg	< 50	280	< 50	276
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	100	103	98	99
Total Recoverable Hydrocarbons - 2013 NEPM F	ractions					
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)N04	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)N01	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	220	< 100	240
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	220	< 100	360



Client Sample ID			BH09-0.1-0.3	BH10-0.0-0.2	BH11-0.1-0.3	BH12-0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Se20213	S19-Se20214	S19-Se20215	S19-Se20216
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene Dibarate handbrases	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5 < 0.5	< 0.5 < 0.5	< 0.5
Fluorene Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5 < 0.5	< 0.5	< 0.5	< 0.5 < 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	// // // // // // // // // // // // //	94	101	95	104
p-Terphenyl-d14 (surr.)	1	%	101	96	92	103
Organochlorine Pesticides		70	101		32	100
Chlordanes - Total	0.1	mg/kg	< 0.1	_	< 0.1	_
4.4'-DDD	0.05	mg/kg	< 0.05	_	< 0.05	_
4.4'-DDE	0.05	mg/kg	< 0.05	_	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	125	-	86	-
Tetrachloro-m-xylene (surr.)	1	%	106	-	99	-



Client Sample ID			BH09-0.1-0.3	BH10-0.0-0.2	BH11-0.1-0.3	BH12-0.1-0.3	
Sample Matrix			Soil	Soil	Soil	Soil	
Eurofins Sample No.			S19-Se20213	S19-Se20214	S19-Se20215	S19-Se20216	
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	
Test/Reference	LOR	Unit					
Polychlorinated Biphenyls							
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5	
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1	
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5	
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5	
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5	
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5	
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5	
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5	
Dibutylchlorendate (surr.)	1	%	-	54	-	75	
Tetrachloro-m-xylene (surr.)	1	%	-	54	-	85	
Heavy Metals		_					
Arsenic	2	mg/kg	8.2	9.1	6.3	9.1	
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	
Chromium	5	mg/kg	30	33	21	26	
Copper	5	mg/kg	8.6	12	11	14	
Lead	5	mg/kg	22	32	19	22	
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	
Nickel	5	mg/kg	< 5	5.4	< 5	< 5	
Zinc	5	mg/kg	12	18	9.8	6.5	
% Moisture	1	%	13	10	11	9.9	

Client Sample ID			BH13-0.1-0.3	DUP01	DUP01A
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-Se20217	S19-Se20218	S19-Se20219
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM	Fractions				
TRH C6-C9	20	mg/kg	< 20	-	-
TRH C10-C14	20	mg/kg	42	-	-
TRH C15-C28	50	mg/kg	160	-	-
TRH C29-C36	50	mg/kg	220	-	-
TRH C10-C36 (Total)	50	mg/kg	422	-	-
ВТЕХ					
Benzene	0.1	mg/kg	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	94	-	-
Total Recoverable Hydrocarbons - 2013 NEPM	Fractions	_			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	-	-
TRH C6-C10 less BTEX (F1)N04	20	mg/kg	< 20	-	-
TRH >C10-C16	50	mg/kg	52	-	-
TRH >C10-C16 less Naphthalene (F2)N01	50	mg/kg	52	-	-
TRH >C16-C34	100	mg/kg	330	-	-



Client Sample ID			BH13-0.1-0.3	DUP01	DUP01A
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-Se20217	S19-Se20218	S19-Se20219
•					
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM		1			
TRH >C34-C40	100	mg/kg	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	382	-	-
Polycyclic Aromatic Hydrocarbons	ı	1			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	101	-	-
p-Terphenyl-d14 (surr.)	1	%	96	-	-
Organochlorine Pesticides	1				
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-
Endosulfan II Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-
	0.05	mg/kg	< 0.05		
Endrin	0.05	mg/kg	< 0.05	-	-
Endrin aldehyde		mg/kg	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-
Heptachlor Heptachlor epovide	0.05	mg/kg	< 0.05	-	-
Heptachlor epoxide Hexachlorobenzene		mg/kg	< 0.05	-	-
Methoxychlor	0.05	mg/kg mg/kg	< 0.05 < 0.2	-	-
Toxaphene	1	mg/kg	< 0.2	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-



Client Sample ID			BH13-0.1-0.3	DUP01	DUP01A
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-Se20217	S19-Se20218	S19-Se20219
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	91	-	-
Polychlorinated Biphenyls					
Aroclor-1016	0.5	mg/kg	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	91	-	-
Heavy Metals					
Arsenic	2	mg/kg	8.9	7.3	6.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	23	24	22
Copper	5	mg/kg	26	6.6	6.2
Lead	5	mg/kg	30	21	19
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.0	< 5	< 5
Zinc	5	mg/kg	39	5.2	< 5
% Moisture	1	%	9.8	8.9	8.8



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Taatina Cita	Futurated	Haldina Time
Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 12, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 12, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 12, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Sep 12, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Sep 12, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Sep 12, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Sep 12, 2019	14 Days



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NATA # 1261 Site # 1254 & 14271 16 Mars Road NATA # 1261 Site # 18217

Sydney Unit F3, Building F Lane Cove West NSW 2066 Phone: +61 2 9900 8400

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone: +61 7 3902 4600 NATA # 1261 Site # 20794

Perth 2/91 Leach Highway Kewdale WA 6105 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736

Company Name:

Alliance Geotechnical

Address:

10 Welder Road

Seven Hills

NSW 2147

Project Name:

CASTLE HILL

Project ID: 8325 Order No.:

Report #:

676756

Phone: Fax:

1800 288 188

02 9675 1888

Received:

Sep 12, 2019 6:00 PM

Due: Sep 13, 2019 Priority: 1 Day

Contact Name: Steven Wallace

Eurofins Analytical Services Manager: Andrew Black

Molli			mple Detail	174		Asbestos - AS4964	CANCELLED	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Moisture Set	Eurofins mgt Suite B7
		ory - NATA Site		271		Х	Х	Х	Х	Х	Х	Х	X
		- NATA Site # 1				^	^	^	^	^	^	^	^
		y - NATA Site # NATA Site # 237											-
	rnal Laboratory		30										-
No	Sample ID	Sample Date	Sampling	Matrix	LAB ID								
NO	Sample ID	Sample Date	Sampling Time	IVIALITA	LABID								
1	BH01-0.1-0.3	Sep 11, 2019		Soil	S19-Se20205	Х			Х			Х	Х
2	BH02-0.1-0.3	Sep 11, 2019		Soil	S19-Se20206	Х				Х		Х	Х
3	BH03-0.1-0.3	Sep 11, 2019		Soil	S19-Se20207	Х			Х			Х	Х
4	BH04-0.1-0.3	Sep 11, 2019		Soil	S19-Se20208	Х				Х		Х	Х
5	BH05-0.1-0.3	Sep 11, 2019		Soil	S19-Se20209	Х			Х			Х	Х
6	BH06-0.1-0.3	Sep 11, 2019		Soil	S19-Se20210	Х				Х		Х	Х
7	BH07-0.1-0.3	Sep 11, 2019		Soil	S19-Se20211	Х			Х			Х	Х
8	BH08-0.0-0.2	Sep 11, 2019		Soil	S19-Se20212	Х				Х		Х	Х
9	BH09-0.1-0.3	Sep 11, 2019		Soil	S19-Se20213	Х			Х			Х	Х

Page 11 of 22



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Site # 1254 & 14271

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Phone: +61 7 3902 4600
NATA # 1261 Site # 20794

Perth 2/91 Leach Highway Kewdale WA 6105 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736

Company Name: Alliance Geotechnical

Address:

10 Welder Road

Seven Hills

NSW 2147

Project Name:

CASTLE HILL

Project ID: 8325

Order No.:

Report #:

Phone: 18 **Fax:** 02

1800 288 188 02 9675 1888

676756

Received: Sep 12, 2019 6:00 PM

Due: Sep 13, 2019

Priority: 1 Day

Contact Name: Steven Wallace

Eurofins Analytical Services Manager : Andrew Black

		Sa	mple Detail			Asbestos - AS4964	CANCELLED	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Moisture Set	Eurofins mgt Suite B7
Melk	ourne Laborate	ory - NATA Site	# 1254 & 142	271									
Syd	ney Laboratory	- NATA Site # 1	8217			Х	Х	Х	Х	Х	Х	Χ	Х
Bris	bane Laborator	y - NATA Site#	20794										
Pert	h Laboratory - N	NATA Site # 237	36										
10	BH10-0.0-0.2	Sep 11, 2019		Soil	S19-Se20214	Х				Х		Χ	Х
11	BH11-0.1-0.3	Sep 11, 2019		Soil	S19-Se20215	Х			Х			Χ	Х
12	BH12-0.1-0.3	Sep 11, 2019		Soil	S19-Se20216	Х				Х		Χ	Х
13	BH13-0.1-0.3	Sep 11, 2019		Soil	S19-Se20217	Х			Х	Х		Χ	Х
14	DUP01	Sep 11, 2019		Soil	S19-Se20218						Х	Χ	
15	DUP01A	Sep 11, 2019		Soil	S19-Se20219						Х	Χ	
16	TRIP SPIKE	Sep 11, 2019		Soil	S19-Se20220		Х						
17	TRIP BLANK	Sep 11, 2019		Soil	S19-Se20221		Х						
18	BH01-0.6-0.8	Sep 11, 2019		Soil	S19-Se20222			Х					
19	BH02-0.5-0.7	Sep 11, 2019		Soil	S19-Se20223			Х					
20	BH03-0.3-0.5	Sep 11, 2019		Soil	S19-Se20224			Х					
21	BH04-0.4-0.6	Sep 11, 2019		Soil	S19-Se20225			Х					



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Received:

Due:

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone: +61 7 3902 4600 NATA # 1261 Site # 20794 Perth 2/91 Leach Highway Kewdale WA 6105 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736

Sep 12, 2019 6:00 PM

Sep 13, 2019

Company Name:

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Alliance Geotechnical

10 Welder Road Seven Hills

NSW 2147

Project Name:

CASTLE HILL

Project ID: 8325

Order No.:

Report #:

676756

Phone: Fax: 1800 288 188 02 9675 1888

11888 Con

Priority: 1 Day
Contact Name: Steven Wallace

Eurofins Analytical Services Manager: Andrew Black

		Sa	mple Detail			Asbestos - AS4964	CANCELLED	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Moisture Set	Eurofins mgt Suite B7
Melk	ourne Laborate	ory - NATA Site	# 1254 & 142	271									
Syd	ney Laboratory	- NATA Site # 1	8217			Х	Х	Х	Х	Х	Х	Х	Х
Bris	bane Laborator	y - NATA Site #	20794										
Pert	<mark>h Laboratory - N</mark>	NATA Site # 237	736	1									
22	BH05-0.4-0.6	Sep 11, 2019		Soil	S19-Se20226			Х					
23	BH06-0.5-0.7	Sep 11, 2019		Soil	S19-Se20227			Х					
24	BH07-0.4-0.6	Sep 11, 2019		Soil	S19-Se20228			Х					
25	BH08-0.3-0.5	Sep 11, 2019		Soil	S19-Se20229			Х					
26	BH09-0.3-0.5	Sep 11, 2019		Soil	S19-Se20230			Х					
27	BH10-0.3-0.5	Sep 11, 2019		Soil	S19-Se20231			Х					
28	BH11-0.4-0.6	Sep 11, 2019		Soil	S19-Se20232			Х					
29	BH12-0.7-0.9	Sep 11, 2019		Soil	S19-Se20233			Х					
30	BH13-0.5-0.8	Sep 11, 2019		Soil	S19-Se20234			Х					
Test	Counts					13	2	13	7	7	2	15	13



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- 3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- 4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- 5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- 6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 7. Samples were analysed on an 'as received' basis.
- 8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

**NOTE: pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram ug/L: micrograms per litre ug/L: micrograms per litre

org/100mL: Organisms per 100 millilitres NTU: Nephelometric Turbidity Units MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry Where a moisture has been determined on a solid sample the result is expressed on a dry basis.

LOR Limit of Reporting

SPIKE Addition of the analyte to the sample and reported as percentage recovery.

RPD Relative Percent Difference between two Duplicate pieces of analysis.

LCS Laboratory Control Sample - reported as percent recovery.

CRM Certified Reference Material - reported as percent recovery.

Method Blank In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.

Surr - Surrogate The addition of a like compound to the analyte target and reported as percentage recovery.

Duplicate A second piece of analysis from the same sample and reported in the same units as the result to show comparison.

USEPA United States Environmental Protection Agency

APHA American Public Health Association
TCLP Toxicity Characteristic Leaching Procedure

COC Chain of Custody
SRA Sample Receipt Advice

QSM US Department of Defense Quality Systems Manual Version 5.3

CP Client Parent - QC was performed on samples pertaining to this report

NCP Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.

TEQ Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50% $\,$

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

 $WA\ DWER\ (n=10):\ PFBA,\ PFPeA,\ PFHxA,\ PFHpA,\ PFOA,\ PFBS,\ PFHxS,\ PFOS,\ 6:2\ FTSA,\ 8:2\ FTSA,\ 6:2\ FTSA$

QC Data General Comments

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxaphene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 6. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time.

 Analysis will begin as soon as possible after sample receipt.
- 7. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- 8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- 9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
- 10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.



Quality Control Results

Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
mg/kg	< 20	20	Pass	
mg/kg	< 20	20	Pass	
mg/kg	< 50	50	Pass	
mg/kg	< 50	50	Pass	
mg/kg	< 0.1	0.1	Pass	
mg/kg	< 0.1	0.1	Pass	
mg/kg	< 0.1	0.1	Pass	
mg/kg	< 0.2	0.2	Pass	
	< 0.1	0.1	Pass	
	< 0.3	0.3	Pass	
1 3 3			•	
ma/ka	< 0.5	0.5	Pass	
	1			
	1			
199	1.00			
ma/ka	< 0.5	0.5	Pass	
	1			
	1			
	1			
	1			
	1			
	1			
	1			
	1			
	1			
	1			
	t		_	
	1			
	1			
IIIg/kg	Z 0.5	0.5	Fass	
ma/ka	< 0.1	0.1	Page	
mg/kg	< 0.05	0.05	Pass	
	mg/kg	mg/kg < 20	mg/kg	mg/kg < 20 20 Pass mg/kg < 20



Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05	0.05	Pass	
Endrin	mg/kg	< 0.05	0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05	0.05	Pass	
Endrin ketone	mg/kg	< 0.05	0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05	0.05	Pass	
Heptachlor	mg/kg	< 0.05	0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05	0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05	0.05	Pass	
Methoxychlor	mg/kg	< 0.2	0.2	Pass	
Toxaphene	mg/kg	< 1	1	Pass	
Method Blank					
Polychlorinated Biphenyls					
Aroclor-1016	mg/kg	< 0.5	0.5	Pass	
Aroclor-1221	mg/kg	< 0.1	0.1	Pass	
Aroclor-1232	mg/kg	< 0.5	0.5	Pass	
Aroclor-1232 Aroclor-1242	mg/kg	< 0.5	0.5	Pass	
Aroclor-1242 Aroclor-1248	mg/kg	< 0.5	0.5	Pass	
Aroclor-1254		< 0.5	0.5	Pass	
Aroclor-1254 Aroclor-1260	mg/kg	< 0.5	0.5	Pass	
	mg/kg				
Total PCB*	mg/kg	< 0.5	0.5	Pass	
Method Blank				T	
Heavy Metals	Τ ,			<u> </u>	
Arsenic	mg/kg	< 2	2	Pass	
Cadmium	mg/kg	< 0.4	0.4	Pass	
Chromium	mg/kg	< 5	5	Pass	
Copper	mg/kg	< 5	5	Pass	
Lead	mg/kg	< 5	5	Pass	
Mercury	mg/kg	< 0.1	0.1	Pass	
Nickel	mg/kg	< 5	5	Pass	
Zinc	mg/kg	< 5	5	Pass	
LCS - % Recovery					
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	,				
TRH C6-C9	%	87	70-130	Pass	
TRH C10-C14	%	100	70-130	Pass	
LCS - % Recovery					
BTEX					
Benzene	%	95	70-130	Pass	
Toluene	%	90	70-130	Pass	
Ethylbenzene	%	89	70-130	Pass	
m&p-Xylenes	%	94	70-130	Pass	
o-Xylene	%	92	70-130	Pass	
Xylenes - Total	%	94	70-130	Pass	
LCS - % Recovery					
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene	%	93	70-130	Pass	
TRH C6-C10	%	82	70-130	Pass	
TRH >C10-C16	%	94	70-130	Pass	
LCS - % Recovery	, ,,	, , , , , , , , , , , , , , , , , , ,	1 10 100	, . 400	
Polycyclic Aromatic Hydrocarbons				I	
Acenaphthene	%	90	70-130	Pass	
Acenaphthylene	%	86	70-130	Pass	
	%	102	70-130	Pass	
Anthracene					
Benz(a)anthracene	%	96	70-130	Pass	
Benzo(a)pyrene	%	95	70-130	Pass	<u> </u>



Test			Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	80	70-130	Pass	
Benzo(g.h.i)perylene			%	103	70-130	Pass	
Benzo(k)fluoranthene			%	86	70-130	Pass	
Chrysene			%	93	70-130	Pass	
Dibenz(a.h)anthracene			%	123	70-130	Pass	
Fluoranthene			%	106	70-130	Pass	
Fluorene			%	98	70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	103	70-130	Pass	
Naphthalene			%	91	70-130	Pass	
Phenanthrene			%	92	70-130	Pass	
Pyrene			%	95	70-130	Pass	
LCS - % Recovery			70	1 00	10 100	1 400	
Organochlorine Pesticides					I		
Chlordanes - Total			%	95	70-130	Pass	
4.4'-DDD			%	75	70-130	Pass	
4.4'-DDE			%	83	70-130	Pass	
4.4'-DDT			%	89	70-130	Pass	
a-BHC			%	82	70-130	Pass	
Aldrin			%	78	70-130	Pass	
b-BHC							
			%	83	70-130	Pass	
d-BHC			%	88	70-130	Pass	
Dieldrin			%	75	70-130	Pass	
Endosulfan I			%	83	70-130	Pass	
Endosulfan II			%	94	70-130	Pass	
Endosulfan sulphate			%	73	70-130	Pass	
Endrin			%	90	70-130	Pass	
Endrin aldehyde			%	100	70-130	Pass	
Endrin ketone			%	110	70-130	Pass	
g-BHC (Lindane)			%	90	70-130	Pass	
Heptachlor			%	110	70-130	Pass	
Heptachlor epoxide			%	103	70-130	Pass	
Hexachlorobenzene			%	90	70-130	Pass	
Methoxychlor			%	124	70-130	Pass	
Toxaphene			%	87	70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260			%	72	70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic			%	107	70-130	Pass	
Cadmium			%	106	70-130	Pass	
Chromium			%	106	70-130	Pass	
Copper			%	107	70-130	Pass	
Lead			%	103	70-130	Pass	
Mercury			%	104	70-130	Pass	
Nickel			%	105	70-130	Pass	
Zinc			%	100	70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery							
Total Recoverable Hydrocarbons -	1999 NEPM Fract	ions		Result 1			
TRH C10-C14	S19-Se20131	NCP	%	107	70-130	Pass	
Spike - % Recovery							
Total Recoverable Hydrocarbons -	2013 NEPM Fract	ions		Result 1			
TRH >C10-C16	S19-Se20131	NCP	%	101	70-130	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				ļ		,		
Polycyclic Aromatic Hydrocarb	ons			Result 1				
Acenaphthene	S19-Se20110	NCP	%	86		70-130	Pass	
Acenaphthylene	S19-Se20110	NCP	%	87		70-130	Pass	
Anthracene	S19-Se20110	NCP	%	77		70-130	Pass	
Benz(a)anthracene	S19-Se20110	NCP	%	89		70-130	Pass	
Benzo(a)pyrene	S19-Se20110	NCP	%	80		70-130	Pass	
Benzo(b&j)fluoranthene	S19-Se20110	NCP	%	69		70-130	Fail	Q08
Benzo(g.h.i)perylene	S19-Se20110	NCP	%	70		70-130	Pass	
Benzo(k)fluoranthene	S19-Se20110	NCP	%	72		70-130	Pass	
Chrysene	S19-Se20110	NCP	%	90		70-130	Pass	
Dibenz(a.h)anthracene	S19-Se20110	NCP	%	79		70-130	Pass	
Fluoranthene	S19-Se20110	NCP	%	92		70-130	Pass	
Fluorene	S19-Se20110	NCP	%	83		70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Se20110	NCP	%	75		70-130	Pass	
Naphthalene	S19-Se20110	NCP	%	85		70-130	Pass	
Phenanthrene	S19-Se20110	NCP	%	75		70-130	Pass	
Pyrene	S19-Se20110	NCP	%	84		70-130	Pass	
Spike - % Recovery					T T	T		
Organochlorine Pesticides				Result 1				
Chlordanes - Total	S19-Se20110	NCP	%	98		70-130	Pass	
4.4'-DDE	S19-Se20110	NCP	%	93		70-130	Pass	
4.4'-DDT	S19-Se20110	NCP	%	106		70-130	Pass	
a-BHC	S19-Se20110	NCP	%	93		70-130	Pass	
Aldrin	S19-Se20110	NCP	%	87		70-130	Pass	
b-BHC	S19-Se20110	NCP	%	95		70-130	Pass	
d-BHC	S19-Se20110	NCP	%	95		70-130	Pass	
Dieldrin	S19-Se20110	NCP	%	84		70-130	Pass	
Endosulfan I	S19-Se20110	NCP	%	99		70-130	Pass	
Endosulfan II	S19-Se20110	NCP	%	107		70-130	Pass	
Endosulfan sulphate	S19-Se20110	NCP	%	103		70-130	Pass	
Endrin ketone	S19-Se20110	NCP	%	112		70-130	Pass	
g-BHC (Lindane)	S19-Se20110	NCP	%	91		70-130	Pass	
Heptachlor epoxide	S19-Se20110	NCP	%	129		70-130	Pass	
Hexachlorobenzene	S19-Se20110	NCP	%	95		70-130	Pass	
Spike - % Recovery				T		1		
Heavy Metals	1			Result 1				
Arsenic	S19-Se20109	NCP	%	100		70-130	Pass	
Cadmium	S19-Se20109	NCP	%	96		70-130	Pass	
Chromium	S19-Se20109	NCP	%	95		70-130	Pass	
Copper	S19-Se20109	NCP	%	89		70-130	Pass	
Lead	S19-Se16919	NCP	%	119		70-130	Pass	
Mercury	S19-Se20109	NCP	%	96		70-130	Pass	
Nickel	S19-Se20109	NCP	%	98		70-130	Pass	
Zinc	S19-Se20109	NCP	%	85		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls	040.0 400=	NGT	6.	Result 1		70.100		
Aroclor-1260	S19-Se10078	NCP	%	77		70-130	Pass	
Spike - % Recovery					T 1	1		
Organochlorine Pesticides	0.000	N-0-	2.	Result 1		70.100		
4.4'-DDD	S19-Se19139	NCP	%	78		70-130	Pass	
Endrin	S19-Se19139	NCP	%	125		70-130	Pass	
Endrin aldehyde	S19-Se19139	NCP	%	118		70-130	Pass	
Heptachlor	S19-Se19139	NCP	%	117		70-130	Pass	



		QA					Acceptance	Pass	Qualifying
Test	Lab Sample ID	Source	Units	Result 1			Limits	Limits	Code
Methoxychlor	S19-Se19139	NCP	%	116			70-130	Pass	
Toxaphene	S19-Au32511	NCP	%	113			70-130	Pass	
Spike - % Recovery		_		Ι	1				
Total Recoverable Hydrocarbons				Result 1				_	
TRH C6-C9	S19-Se20217	СР	%	83			70-130	Pass	
Spike - % Recovery				Ι	1				
BTEX	T			Result 1					
Benzene	S19-Se20217	CP	%	97			70-130	Pass	
Toluene	S19-Se20217	CP	%	90			70-130	Pass	
Ethylbenzene	S19-Se20217	CP	%	87			70-130	Pass	
m&p-Xylenes	S19-Se20217	CP	%	89			70-130	Pass	
o-Xylene	S19-Se20217	CP	%	87			70-130	Pass	
Xylenes - Total	S19-Se20217	СР	%	88			70-130	Pass	
Spike - % Recovery		_		Ι			T		
Total Recoverable Hydrocarbons				Result 1				_	
Naphthalene	S19-Se20217	CP	%	93			70-130	Pass	
TRH C6-C10	S19-Se20217	CP	%	89			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Se20108	NCP	mg/kg	5.2	6.2	17	30%	Pass	
Cadmium	S19-Se20108	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Se20108	NCP	mg/kg	8.4	9.2	10	30%	Pass	
Copper	S19-Se20108	NCP	mg/kg	29	36	19	30%	Pass	
Lead	S19-Se20108	NCP	mg/kg	82	92	11	30%	Pass	
Mercury	S19-Se20108	NCP	mg/kg	0.2	0.2	<1	30%	Pass	
Nickel	S19-Se20108	NCP	mg/kg	10	9.1	15	30%	Pass	
Zinc	S19-Se20108	NCP	mg/kg	120	140	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons	- 1999 NEPM Fract	ions		Result 1	Result 2	RPD			
TRH C6-C9	S19-Se20206	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
ВТЕХ				Result 1	Result 2	RPD			
Benzene	S19-Se20206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Se20206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Se20206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Se20206	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Se20206	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Se20206	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate				ı	1				
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
Naphthalene	S19-Se20206	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Se20206	СР	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate				T					
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD	0607		
TRH C10-C14	S19-Se20209	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Se20209	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Se20209	СР	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate Total Bassyanahla Ukudasaanhana	2042 NEDEL E			Descript	Deside	DD2			
Total Recoverable Hydrocarbons			/1	Result 1	Result 2	RPD	0001	D	
TRH >C10-C16	S19-Se20209	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Se20209	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Se20209	CP	mg/kg	< 100	< 100	<1	30%	Pass	<u> </u>



Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Se20209	СР	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5		30%	Pass	
Chrysene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Se20209	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate					, , ,,,				
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Se20209	СР	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Se20209	СР	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Se20209	СР	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Se20209	СР	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Se20209	СР	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Se20209	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Se20209	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Se20212	CP	%	8.4	8.0	4.0	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-Se16835	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-Se16835	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-Se16835	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-Se16835	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-Se16835	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-Se16835	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-Se16835	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Toxaphene	S19-Se16835	NCP	mg/kg	< 1	< 1	<1	30%	Pass	



Duplicate									
Total Recoverable Hydrod	carbons - 1999 NEPM Fract	ions		Result 1	Result 2	RPD			
TRH C6-C9	S19-Se20216	СР	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Se20216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Se20216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Se20216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Se20216	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Se20216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Se20216	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrod	carbons - 2013 NEPM Fract	ions		Result 1	Result 2	RPD			
Naphthalene	S19-Se20216	СР	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Se20216	CP	mg/kg	< 20	< 20	<1	30%	Pass	



Comments

Sample Integrity

Custody Seals Intact (if used) N/A Attempt to Chill was evident Yes Sample correctly preserved Yes Appropriate sample containers have been used Yes Sample containers for volatile analysis received with minimal headspace Yes Samples received within HoldingTime Yes Some samples have been subcontracted No

Qualifier Codes/Comments

Code Description

F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis). N01

Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.

N02

F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes. N04

Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs N07

The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference Q08

Authorised By

Andrew Black Analytical Services Manager Andrew Sullivan Senior Analyst-Organic (NSW) Gabriele Cordero Senior Analyst-Metal (NSW) Nibha Vaidva Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested
- * Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

Environment Testing

Alliance Geotechnical 10 Welder Road Seven Hills NSW 2147





NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: Steven Wallace
Report 676756-AID
Project Name CASTLE HILL

Project ID 8325

Received Date Sep 12, 2019

Date Reported Sep 13, 2019

Methodology:

Asbestos Fibre Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a subsampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestoscontaining material (ACM) The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 %" and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.



Date Reported: Sep 13, 2019

Environment Testing





Accredited for compliance with ISO/IEC 17025–Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Project Name CASTLE HILL

Project ID 8325

Date Sampled Sep 11, 2019 Report 676756-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH01-0.1-0.3	19-Se20205	Sep 11, 2019	Approximate Sample 75g Sample consisted of: Dark-brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH02-0.1-0.3	19-Se20206	Sep 11, 2019	Approximate Sample 85g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH03-0.1-0.3	19-Se20207	Sep 11, 2019	Approximate Sample 96g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH04-0.1-0.3	19-Se20208	Sep 11, 2019	Approximate Sample 133g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH05-0.1-0.3	19-Se20209	Sep 11, 2019	Approximate Sample 95g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH06-0.1-0.3	19-Se20210	Sep 11, 2019	Approximate Sample 135g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH07-0.1-0.3	19-Se20211	Sep 11, 2019	Approximate Sample 92g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH08-0.0-0.2	19-Se20212	Sep 11, 2019	Approximate Sample 68g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Eurofins Environment Testing Unit F3, Building F, 16 Mars Road, Lane Cove West, NSW, Australia, 2066

ABN: 50 005 085 521 Telephone: +61 2 9900 8400

Report Number: 676756-AID







NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Page 3 of 9

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH09-0.1-0.3	19-Se20213	Sep 11, 2019	Approximate Sample 84g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH10-0.0-0.2	19-Se20214	Sep 11, 2019	Approximate Sample 119g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH11-0.1-0.3	19-Se20215	Sep 11, 2019	Approximate Sample 125g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH12-0.1-0.3	19-Se20216	Sep 11, 2019	Approximate Sample 104g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH13-0.1-0.3	19-Se20217	Sep 11, 2019	Approximate Sample 125g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Date Reported: Sep 13, 2019



Date Reported: Sep 13, 2019

Environment Testing

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

DescriptionTesting SiteExtractedHolding TimeAsbestos - LTM-ASB-8020SydneySep 12, 2019Indefinite



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Fax:

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02 9675 1888

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Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone: +61 7 3902 4600 NATA # 1261 Site # 20794

Perth 2/91 Leach Highway Kewdale WA 6105 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736

Company Name:

Alliance Geotechnical

10 Welder Road

Seven Hills

NSW 2147

Project Name:

Address:

CASTLE HILL

Project ID:

8325

Order No.: Received: Sep 12, 2019 6:00 PM Report #: 676756

Due: Sep 13, 2019

> Priority: 1 Day

Contact Name: Steven Wallace

Eurofins Analytical Services Manager: Andrew Black

		Sa	Asbestos - AS4964	CANCELLED	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Moisture Set	Eurofins mgt Suite B7				
Melb	ourne Laborate	ory - NATA Site												
Sydi	ney Laboratory	- NATA Site # 1	8217			Х	Х	Х	Х	Х	Х	Х	Х	
Bris	bane Laborator	y - NATA Site#	20794											
Pert	h Laboratory - N	NATA Site # 237	36											
Exte	rnal Laboratory	<u> </u>		1										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	BH01-0.1-0.3	Sep 11, 2019		Soil	S19-Se20205	Х			Х			Х	Х	
2	BH02-0.1-0.3	Sep 11, 2019		Soil	S19-Se20206	Х				Х		Х	Х	
3	BH03-0.1-0.3	Sep 11, 2019		Soil	S19-Se20207	Х			Х			Х	Х	
4	BH04-0.1-0.3	Sep 11, 2019		Soil	S19-Se20208	Х				Х		Х	Х	
5	BH05-0.1-0.3	Х			Х			Х	Х					
6	BH06-0.1-0.3	Sep 11, 2019		Soil	S19-Se20210	Х				Х		Х	Х	
7	BH07-0.1-0.3	Sep 11, 2019		Soil	S19-Se20211	Х			Х			Х	Х	
8	BH08-0.0-0.2	Sep 11, 2019		Soil	S19-Se20212	Х				Х		Х	Х	
9	BH09-0.1-0.3	Sep 11, 2019		Soil	S19-Se20213	Х			Х			Х	Х	

Page 5 of 9



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Perth 2/91 Leach Highway Kewdale WA 6105 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736

Company Name:

Alliance Geotechnical

10 Welder Road Seven Hills

NSW 2147

Project Name:

Address:

CASTLE HILL

Project ID: 8325 Order No.:

Report #:

Phone: 1800 288 188

676756

Fax: 02 9675 1888 Received: Sep 12, 2019 6:00 PM Due: Sep 13, 2019

Priority: 1 Day

Contact Name: Steven Wallace

Eurofins Analytical Services Manager: Andrew Black

		Asbestos - AS4964	CANCELLED	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Moisture Set	Eurofins mgt Suite B7				
Mell	Melbourne Laboratory - NATA Site # 1254 & 14271												
Syd	ney Laboratory	- NATA Site # 1	8217			Х	Х	Х	Х	Х	Х	Χ	Х
Bris	bane Laborator	y - NATA Site #	20794										
Pert	h Laboratory - I	NATA Site # 237	36										
10	BH10-0.0-0.2	Sep 11, 2019		Soil	S19-Se20214	Х				Х		Χ	Х
11	BH11-0.1-0.3	Sep 11, 2019		Soil	S19-Se20215	Х			Х			Χ	Х
12	BH12-0.1-0.3	Sep 11, 2019		Soil	S19-Se20216	Х				Х		Χ	Х
13	BH13-0.1-0.3	Sep 11, 2019		Soil	S19-Se20217	Х			Х	Х		Χ	Х
14	DUP01	Sep 11, 2019		Soil	S19-Se20218						Х	Χ	
15	DUP01A	Sep 11, 2019		Soil	S19-Se20219						Х	Χ	
16	TRIP SPIKE	Sep 11, 2019		Soil	S19-Se20220		Х						
17	TRIP BLANK	Sep 11, 2019		Soil	S19-Se20221		Х						
18	BH01-0.6-0.8	Sep 11, 2019		Soil	S19-Se20222			Х					
19	BH02-0.5-0.7	Sep 11, 2019		Soil	S19-Se20223			Х					
20	BH03-0.3-0.5	Sep 11, 2019		Soil	S19-Se20224			Х					
21	BH04-0.4-0.6	Sep 11, 2019		Soil	S19-Se20225			Х					

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Environment Testing ABN - 50 005 085 521 ServiroSales@eurofins.com web: www.eurofins.com.au

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Company Name: Alliance Geotechnical

Address:

10 Welder Road

Seven Hills

NSW 2147

Project Name:

CASTLE HILL

Project ID: 8325

Order No.:

Report #:

676756 1800 288 188

Phone: 1800 288 188 **Fax:** 02 9675 1888

Received: Sep 12, 2019 6:00 PM

Due: Sep 13, 2019 **Priority:** 1 Day

Contact Name: Steven Wallace

Eurofins Analytical Services Manager: Andrew Black

		Asbestos - AS4964	CANCELLED	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Moisture Set	Eurofins mgt Suite B7				
Melk	ourne Laborato	ory - NATA Site	# 1254 & 142	71									
	ney Laboratory					Х	Х	Х	Х	Х	Х	Х	Х
Bris	bane Laborator	y - NATA Site #	20794										
Pert	<mark>h Laboratory - N</mark>	NATA Site # 237	36	1									
22	BH05-0.4-0.6	Sep 11, 2019		Soil	S19-Se20226			Х					
23	BH06-0.5-0.7	Sep 11, 2019		Soil	S19-Se20227			Х					
24	BH07-0.4-0.6	Sep 11, 2019		Soil	S19-Se20228			Х					
25	BH08-0.3-0.5	Sep 11, 2019		Soil	S19-Se20229			Х					
26	BH09-0.3-0.5	Sep 11, 2019		Soil	S19-Se20230			Х					
27	BH10-0.3-0.5	Sep 11, 2019		Soil	S19-Se20231			Х					
28	BH11-0.4-0.6	Sep 11, 2019		Soil	S19-Se20232			Х					
29	BH12-0.7-0.9	Sep 11, 2019		Soil	S19-Se20233			Х					
30	BH13-0.5-0.8	Sep 11, 2019		Soil	S19-Se20234			Х					
Test	Counts					13	2	13	7	7	2	15	13

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Internal Quality Control Review and Glossary

General

- 1. QC data may be available on request.
- 2. All soil results are reported on a dry basis, unless otherwise stated
- 3. Samples were analysed on an 'as received' basis.
- 4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis grams per kilogram
Filter loading: fibres/100 graticule areas

Reported Concentration: fibres/mL Flowrate: L/min

Terms

FA

Friable

Date Reported: Sep 13, 2019

Dry Sample is dried by heating prior to analysis

LOR Limit of Reporting
COC Chain of Custody
SRA Sample Receipt Advice

ISO International Standards Organisation

AS Australian Standards

WA DOH Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated

Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)

NEPM National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)

ACM Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the

NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.

Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".

Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those

materials that do not pass a 7mm x 7mm sieve.

Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.

Trace Analysis Analytical procedure used to detect the presence of respirable fibres in the matrix.

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Comments

Sample Integrity

 Custody Seals Intact (if used)
 N/A

 Attempt to Chill was evident
 Yes

 Sample correctly preserved
 Yes

 Appropriate sample containers have been used
 Yes

 Sample containers for volatile analysis received with minimal headspace
 Yes

 Samples received within HoldingTime
 Yes

 Some samples have been subcontracted
 No

Qualifier Codes/Comments

Code Description N/A Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson General Manager

Final Report - this report replaces any previously issued Report

- Indicates Not Requested

Date Reported: Sep 13, 2019

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Sydney Laboratory
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02 9900 8400 EnviroSampleNSW@eurofins.com

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2 87 9900 840

Compa	ALLIANCE GI	ALLIANCE GEOTECHNICAL		ALLIANCE GEOTECHNICAL Project № 8325						325			Project Manager		5	Samp	ier[s)	JW					
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			Surfe										Ema	ail for	Invoid	e		Er	ıviro	o@allgeo.	com.au		
Contact I	Name		Tallyces (*)	2					g				Ema	il for	Resul	ts		En	viro	o@allgeo.	com.au		
Phone	№ 04240	66612	Ses Car	ā 2					RESENC						Co	ntain	ers				und Time (TAT) Default will be 5 days = sof acc		
Special Dire	ections		Analyses	TRH / BTEX	Į.	٩.		S (8)	ICE / PR	×	9								€	Overnight (9am)*		
			etals are yo	TRH /	PAH	OCP	PCB	METALS (8)	(ABSEI	BTEX	HOLD								A Gu	□ 1 Day*	□ 2 Day*		
Purchase Quote II			Mote. When						ASBESTOS (ABSENCE / PRESENCE)				11. Plastic	250ml Plastic	125m Plastic	with Attiber old	500ml PFAS Bottle	Jar (Jass or HDPE)	4.5496	□ 3 Day*	5 Day *Surcharges app		
	Client Sample ID)	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W)	d ())					A								900		Othe Asbest	Sample Com	ments / Dangerous azard Warning		
	ВН01-0.1-0.3	11/09/19	s	×	×	X		×	×							Ī	r						
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	BH02-0.5-0.7	11/09/19	s								×					Ī	Ī						
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	BH03-0.3-0.5	11/09/19	S								×				İ	Ī							
	BH04-0.1-0.3	11/09/19	s	X	X		×	×	X							l	H						
	BH04-0.4-0.6	11/09/19	s								×				ì		П	H	Ī				
	BH05-0.1-0.3	11/09/19	s	X	X	×		×	×														
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	BH06-0.1-0.3	11/09/19	s	×	X		X	X	×						i								
	BH06-0.5-0.7	11/09/19	s								X					h		ì					
	BH07-0.1-0.3	11/09/19	s	×	×	X	ń	×	×									2					
	BH07-0.4-0.6	11/09/19	S								X			i									
	BH08-0.0-0.2	11/09/19	s	×	×		×	×	×														
	BH08-0.3-0.5	11/09/19	s								×			i	r	t							
	BH09-0.1-0.3	11/09/19	s	X	×	×		×	×														
	BH09-0.3-0.5	11/09/19	s								×												
	BH10-0.0-0.2	11/09/19	s	×	×		×	×	×														
	BH10-0.3-0.5	11/09/19	s	•							×												
		Total Counts		10	10	5	5	10	10		10												
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Company	ALLIANCE GE	OTECHNICAL	Proje	ect Nº			8	325			Project Manager	Steven Wa	llace		Sample	er(s)					JW			
Address		0 WELDER ROAD, SEVEN HILLS NSW				t Name			Cas	te Hil	II		EDD Format (ESdat, EQuIS Custom)			Hai	nded o	ver by					JW	
			UTF											Em	all for I	Invoto	e		En	ıviro	o@allgeo.	com.au		
ntact Name			r Bereid						CE)					Ema	il for F	Result	s		En	iviro	o@allgeo.d			
Phone №	042406	6612	Analyses						RESEN							Cor	itainei	S			Turnarou Requirements	and Time (TAT)		
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DOCUMENT CONTROL

Revision	Date	Author	Reviewer
Rev 0	16 September 2019	Jacob Walker	Steven Wallace

Author Signature	A	Reviewer Signature	Joen Willam
Name	Jacob Walker	Name	Steven Wallace
Title	Graduate Environmental Scientist	Title	Senior Environmental Scientist

EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by Northrop Consulting Engineers P/L, to undertake a stage 1 preliminary site investigation (PSI) for 172 Showground Road, Castle Hill NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- The site is proposed for redevelopment, comprising a new storage facility for the Museum of Applied Arts and Sciences; and
- A contamination assessment of the site is required to assess whether the site is suitable for the proposed land use scenario.

The objectives of this investigation were to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The scope of works undertaken to address the investigation objectives, included:

- A desktop review;
- A site walkover and intrusive soil sampling; and
- Data assessment and reporting.

Based on AG's assessment of the desktop review information and fieldwork data, in the context of the proposed apartment land use, AG makes the following conclusions:

- Areas of environmental concern (AEC) have been identified for the site; and
- Further assessment of the identified AEC, and subsequent management / remediation of identified unacceptable land contamination risks (if warranted), would be required to confirm land use suitability (in the context of land contamination) for the proposed redevelopment works.

Based on these conclusions, AG makes the following recommendations:

- A stage 2 detailed site investigation (DSI) should be undertaken for the identified areas of environmental concern;
- In the event that the identified areas of environmental concern are not accessible during the undertaking of the stage 2 DSI, consideration should be given to preparation of a remedial action plan (RAP), setting out what supplementary assessment works would be required; and
- Further contamination assessment works should be undertaken by a suitably experienced environmental consultant.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 10**.

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Figure 3 Areas of Environmental Concern

APPENDICES

- A Titles
- B NSW EPA
- C Planning Certificate
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1. INTRODUCTION

1.1. Background

Alliance Geotechnical Pty Ltd (AG) was engaged by Northrop Consulting Engineers P/L, to undertake a stage 1 preliminary site investigation (PSI) for 172 Showground Road, Castle Hill NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- The site is proposed for redevelopment, comprising a new storage facility for the Museum of Applied Arts and Sciences; and
- A contamination assessment of the site is required to assess whether the site is suitable for the proposed land use scenario.

1.2. Objectives

The objectives of this project were to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

1.3. Scope of Work

Alliance Geotechnical undertook the following scope of works to address the project objective:

- A desktop review;
- A site walkover and intrusive soil sampling; and
- Data assessment and reporting.

2. SITE IDENTIFICATION

The site is identified as Lot 102 in DP1130271.

The approximate geographic coordinates of the middle of the site, inferred from Google Earth were $33^{\circ}43'29''$ S and $150^{\circ}58'26''$ E.

The locality of the site is set out in Figure 1.

The general layout and boundary of the site is set out in Figure 2.

The site is located to the south of the existing grandstand, and covers an area of approximately $5,000m^2$.

3. GEOLOGY, ACID SULPHATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

3.1. Geology

A review of the Penrith 1:100,000 Geological Series Sheet 9030 (Edition 1) 1991, indicated that the site is likely to be underlain by Middle Triassic Ashfield Shale (Rwa), comprising dark-grey to black claystone- siltstone and fine sandstone-siltstone laminite.

3.2. Acid Sulphate Soils

A review of the ASRIS Acid Sulfate Soil Risk Map indicates that the site lies in an area mapped as 'No Known Occurrence' with respect to acid sulfate soils. This infers that land management activities are not likely to be affected by acid sulfate soil materials.

Further assessment of acid sulfate soils in the context of this investigation is considered by AG as not warranted.

3.3. Topography

The site topography is generally flat, with a slight north west facing slope. AG understands that the sites are located between elevations of approximately 112m to 120m Australian Height Datum.

3.4. Hydrogeology

Surface water courses proximal to the site included Cattai Creek, approximately 730m to the east.

Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the north east.

A review of the NSW Office of Water groundwater database (www.http://allwaterdata.water.nsw.gov.au/water) implemented on 12 September 2019 indicated there was no registered groundwater features located within a 500m radius of the site.

A copy of the NSW Office of Water search record is presented in **Appendix E**.

4. SITE HISTORY AND LAND USE

4.1. Land Titles

A search of historical land title ownership was undertaken. The search results indicate that registered proprietors of the site since 1870, have been private individuals and then the Minister for Education Training and Youth Affairs.

No leases were reported for the site; however, two easements were reported:

- 27.04.1994 (U 186062) Easement for Drainage; and
- 27.04.1994 (U 186062) Easement for Water Supply.

The results of the land title ownership search indicate a low potential for land contaminating activities to have been undertaken on the site. However, further assessment of potential land contaminating activities, in the context of other historical information identified during this investigation and site walkover observations, is considered warranted.

A copy of the land title search record is presented in **Appendix B**.

4.2. Aerial Imagery

A review of selected historical aerial imagery of the site was undertaken. Observations made of the imagery considered relevant to this investigation, are presented in **Table 4.2.**

Table 4.2. Aerial Imagery Observations

Image Date	Site Features	Surrounding Land Use Settings
1943	The site appears to be sparse woodland paddock.	Woodland to the north, major roads to the west and south, and paddocks beyond in all directions.
1956	The site has been cleared, and plantations now take up the majority of the site.	Some farming and orcharding activities occurring in all directions.
1965	Tree plantations cover the majority of the site, and a building has appeared in the central portion of the block.	Increase in farming and orcharding activities to the south.
1970	No significant change from previous image.	Commercial / industrial buildings have appeared to the north west.
1982	No significant change from previous image.	No significant change from previous image.
1991	A large building, and associated driveway with carpark has been erected in the centre of the site.	Further increase to commercial / industrial buildings in all directions.

Image Date	Site Features	Surrounding Land Use Settings
2004	More buildings have appeared in the north of the site, along with associated car parks, and some buildings in the south west corner have appeared.	Further increase to commercial / industrial buildings in all directions.
2019 (Nearmap)	The buildings in the south west portion of the site have disappeared.	Low density residential subdivisions to the north and east.

The aerial imagery review indicated a potential for land contaminating activities to have been undertaken, specifically uncontrolled demolition of the structures between 2004 and 2019.

Further assessment of the localised demolition activities relating to former dwellings across the site, in the context of other historical information identified during this investigation and site walkover observations, is considered warranted.

4.3. Anecdotal Information

There was no anecdotal information provided to AG as part of this project.

4.4. Incident Reports

There was no anecdotal information provided to AG as part of this project.

4.5. Complaints History

There was no complaints history provided to AG during the investigation.

4.6. Previous Contamination Assessments

There were no previous contamination assessment reports made available to AG during this investigation.

5. REGULATORY RECORDS

5.1. NSW EPA CLM Act Record of Notices

A search of the publicly available online NSW EPA CLM Act Record of Notices was completed on 12 September 2019. The results indicated that the site was not the subject of any notifications under Section 58 of the *Contaminated Land Management Act 1997*.

A copy of the CLM Act Record of Notices search record is presented in Appendix C.

5.2. NSW EPA POEO Act Register of Licences, Applications and Notices

A search of the publicly available online NSW EPA Record of Notices was completed on 12 September 2019. The results indicated that the site was not the subject of any licences, applications, notices, audits or pollution studies or reduction programs under Section 308 of the *Protection of the Environment Operations Act 1997*.

A copy of the POEO Act Register of Licences, Applications and Notices search record is presented in **Appendix C**.

5.3. NSW EPA CLM Act Register of Notified Sites

A search of the publicly available online register of sites notified to the NSW EPA under Section 60 of the *Contaminated Land Management Act 1997*, was undertaken on 12 September 2019. The results indicated that the site was not listed on the register, nor were any properties located on adjacent land.

5.4. Section 10.7 Planning Certificate

A copy of the planning certificate issued for the site under Section 10.7 of the Environmental Planning and Assessment Act was reviewed. The certificate indicated that, within the meaning of the Contaminated Land Management Act, the site was not:

- Significantly contaminated land;
- Subject to a management order;
- The subject of an approved voluntary management proposal;
- Subject to an ongoing maintenance order; or
- The subject of a site audit statement.

A copy of the planning certificate is presented in **Appendix D**.

5.5. SafeWork NSW Stored Chemical Information Database (SCID)

A search of Safe Work NSW stored chemical information database (SCID) was not undertaken for the site. A review of historical aerial imagery and historical land title ownership records for the site did not indicate a potential for licensable quantities of dangerous goods to have been historically stored on the site. AG considers that further assessment of storage of licensable quantities of dangerous goods on the site is not warranted.

6. SITE WALKOVER

A site walkover was undertaken on 4th September 2019 by a suitably experienced AG environmental consultant (Mr Jacob Walker). The purpose of the site walkover was to make observations of land use activities on the site, and on properties immediately adjacent to the site.

6.1. Current Land Use Activity

The land use setting on the site appeared to be mixed commercial land uses.

6.2. Buildings and General Infrastructure

The following buildings and infrastructure were observed on the site:

- A large multi storey commercial building, with several smaller buildings attached to the north west; and
- A commercial brick building along the northern boundary of the site.

The remainder of the site was covered with hardstand carpark or trees.



Photograph 6.2.1. Photograph of the proposed building footprint.



Photograph 6.2.2. Photograph of the proposed carpark footprint.

6.3. Boundary Fencing

The site boundary was fenced or met with neighbouring buildings.

6.4. Adjacent Land Use Activities

Observations made during the site walkover indicated the following land use activities adjacent to the site:

- North Residential
- East Residential;
- West Commercial; and
- South Commercial.

6.5. Odours and Staining

There was no olfactory evidence of odours or visual evidence of staining observed on the surface of the site, during the site walkover.

6.6. Chemical Storage

There was no visual evidence observed of significant or widespread chemical storage on the site, during the site walkover.

6.7. Underground and Aboveground Storage Tanks

There was no visual evidence to suggest the presence of underground or aboveground storage tanks on the site.

6.8. Filling Material

There was no visual evidence observed of significant or widespread filling on the site.

6.9. Wastes

There was no visual evidence observed of significant or widespread wastes being stored on the site.

6.10. Asbestos Containing Materials

There was no visual evidence observed of potential asbestos containing materials on the site.

6.11. Phytotoxicity

There was no visual evidence observed to suggest significant or widespread phytotoxic impact (in the form of dieback or plant stress) in vegetation at the site. Similar observations were made of visible vegetation on land adjacent to the site.

6.12. Site Drainage

Visual observations made in the context of site drainage during the walkover, indicated that drainage mechanisms on the site are likely to include:

- Downpipes from roofs and gutters into subsurface drainage infrastructure; and
- Infiltration into underlying soils, where soil permeability permits.

7. DATA INTEGRITY ASSESSMENT

AG has relied on the following sources of data while undertaking this investigation:

- AG field observations during the site walkover
- Local Council
- Department of Land and Water Conservations
- Department of Minerals and Energy
- Australian Soil Resource Information System
- Google Earth
- National Environment Protection Council
- Nearmap
- NSW Environment Protection Authority
- NSW Land and Property Information
- NSW Office of Water

Based on AG's experience and professional judgement, the data obtained from the sources relied upon, is considered to be adequately precise, accurate, representative, complete and comparable within the objectives of this investigation and for the purpose of drawing conclusions regarding land contamination risks at the site.

8. CONCEPTUAL SITE MODEL

8.1. Areas of Environmental Concern

The site history data collected and site walkover observations made were assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be present on site. The AEC identified are presented in attached **Figure 3** and associated COPC are presented in **Table 8.1**.

Table 8.1: AEC and COPC

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Proposed Development footprint	Uncontrolled demolition / filling	Hydrocarbons, metals, asbestos, pesticides

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during redevelopment by Site workers;
- Direct contact, ingestion or inhalation of soil by future site inhabitants;
- Migration of volatile compounds into proposed buildings/basements causing toxic effects, asphyxiation or risk of explosion;
- Migration of vapours into confined spaces within proposed on-site buildings/basements followed by inhalation by future residents; and
- Permeation of hydrocarbons / organic contamination into underground service pits on site.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Onsite flora and fauna;
- Future residents/end users; and
- Neighbouring residential land users.

8.2. Land Use Setting

AG understands that the site is proposed for redevelopment, comprising a new storage facility for the Museum of Applied Arts and Sciences.

Based on the proposed development works and guidance provided in NEPM ASC 2013, AG considers it reasonable to adopt the 'HIL D – Commercial / Industrial' land use setting for the purpose of assessing land contamination exposure risks.

8.3. Direct Contact – Human Health

AG notes that the proposed development includes building footprints and hardstand pavement areas across most of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site. However, some open space and landscaping areas will be established on site. In these areas, it is considered that a direct contact exposure pathway may be present between potential contamination and onsite receptors.

8.4. Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) must exist.

The historical evidence reviewed indicated a low likelihood for a potential primary source to be present on the site.

Potential sources of groundwater contamination in the immediate vicinity of the site were not observed. A groundwater source of vapours was therefore considered unlikely at the site.

8.5. Aesthetics – Human Health

Section 3.7 of Schedule B1 NEPM ASC advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

Due to visual observations made during site visit and the nature of the proposed development concept, AG consider further aesthetics assessment and management warranted for the site.

8.6. Ecological Health - Terrestrial Ecosystems

Section 3.4.2 of schedule B1 NEPM ASC 2013, advises a pragmatic risk-based approach should be taken when assessing ecological risks in residential and commercial / industrial land use settings.

AG notes that the proposed development includes building footprints and hardstand pavement areas across most of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site.

Due to the lack of open space areas, further ecological assessment is considered not warranted.

8.7. Management Limits for Petroleum Hydrocarbon Compounds

NEPM ASC 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

Schedule B1 of NEPM ASC 2013 includes 'management limits' to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum

depth to which the limits should apply. NEPC (2013) also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

9. CONCLUSIONS AND RECOMMENDATIONS

Based on AG's assessment of the desktop review information and fieldwork data, in the context of the proposed apartment land use, AG makes the following conclusions:

- Areas of environmental concern (AEC) have been identified for the site; and
- Further assessment of the identified AEC, and subsequent management / remediation of identified unacceptable land contamination risks (if warranted), would be required to confirm land use suitability (in the context of land contamination) for the proposed redevelopment works.

Based on these conclusions, AG makes the following recommendations:

- A stage 2 detailed site investigation (DSI) should be undertaken for the identified areas of environmental concern;
- In the event that the identified areas of environmental concern are not accessible during the undertaking of the stage 2 DSI, consideration should be given to preparation of a remedial action plan (RAP), setting out what supplementary assessment works would be required; and
- Further contamination assessment works should be undertaken by a suitably experienced environmental consultant.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 10**.

10. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance Geotechnical Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, AG reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to AG's engagement. The report must not be used for any purpose other than the purpose specified at the time AG was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual AG consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, AG reserves the right to review and amend this report.

11. REFERENCES

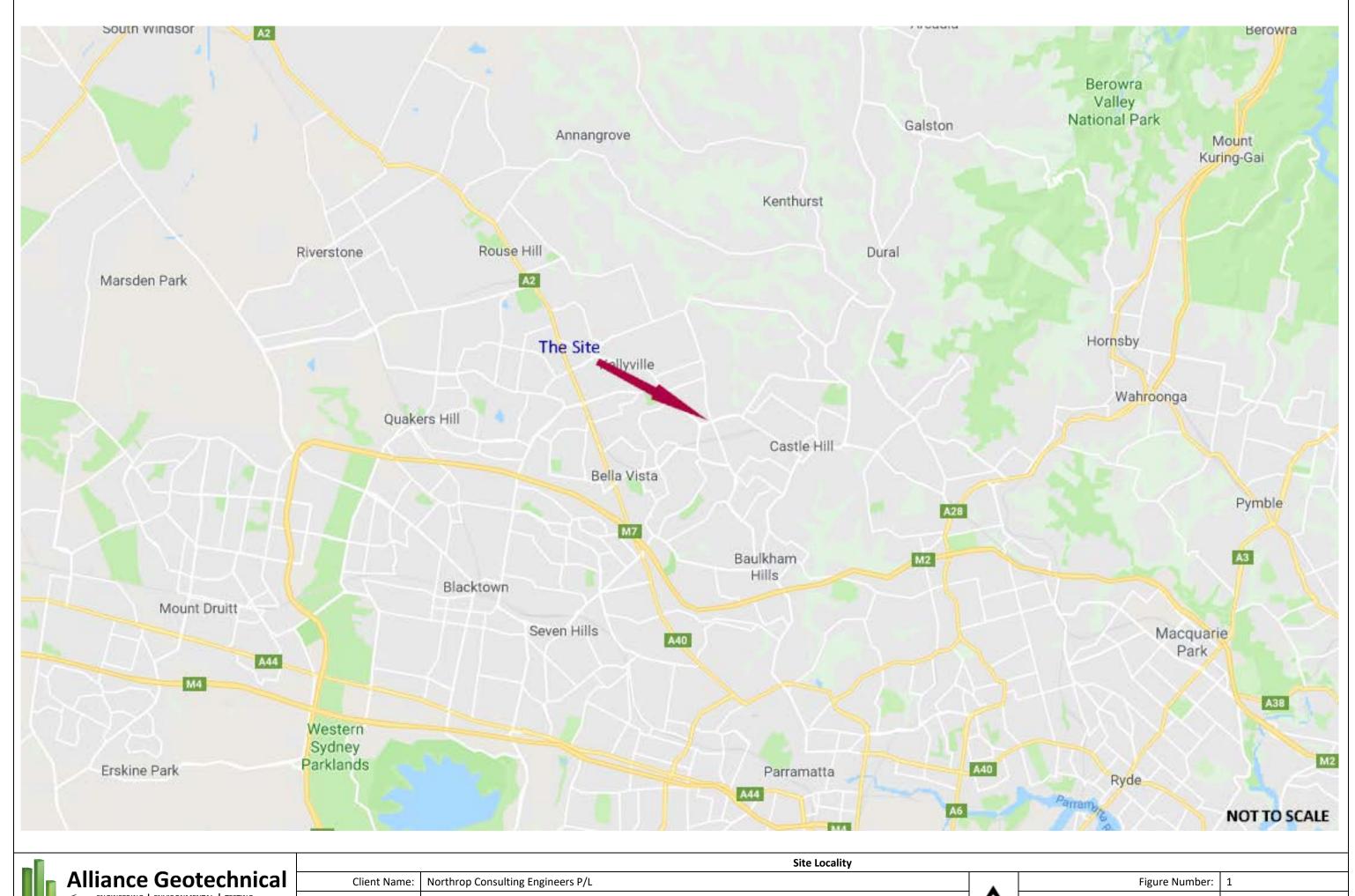
National Environment Protection Council (NEPC) 1999b, 'Schedule B(2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'.

NSW EPA (2017) Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 3rd Edition (including the Soil Investigation Levels for Urban Development Sites in NSW).

NSW OEH 2011, 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'.

NSW Office of Water Groundwater Database (www. http://allwaterdata.water.nsw.gov.au/water

FIGURES



		Site Locality		
Alliance Geotechnical	Client Name:	Northrop Consulting Engineers P/L	•	
ENGINEERING ENVIRONMENTAL TESTING Manage the earth, eliminate the risk	Project Name:	Stage 1 Preliminary Site Investigation	\triangle	
Manage the earth, eliminate the risk	Project Location:	172 Showground Road, Castle Hill NSW	10	

•	Figure Number:	1
\sim	Figure Date:	12 September 2019
14	Report Number:	8325-ER-1-1



Alliance Geotechnical

ENGINEERING | ENVIRONMENTAL | TESTING

Manage the earth, eliminate the risk

Client Name:	Northrop Consulting Engineers P/L	
Project Name:	Stage 1 Preliminary Site Investigation	
Project Location:	172 Showground Road, Castle Hill NSW	

•	Figure Number:	2
$\langle \rangle$	Figure Date:	12 September 2019
14	Report Number:	8325-ER-1-1



Alliance Geotechnical

ENGINEERING | ENVIRONMENTAL | TESTING

Manage the earth, eliminate the risk

Client Name:	Northrop Consulting Engineers P/L	
Project Name:	Stage 1 Preliminary Site Investigation	
Project Location:	172 Showground Road, Castle Hill NSW	

	Figure Number:	3
<u>^</u>	Figure Date:	12 September 2019
14	Report Number:	8325-ER-1-1

APPENDIX A

TITLES





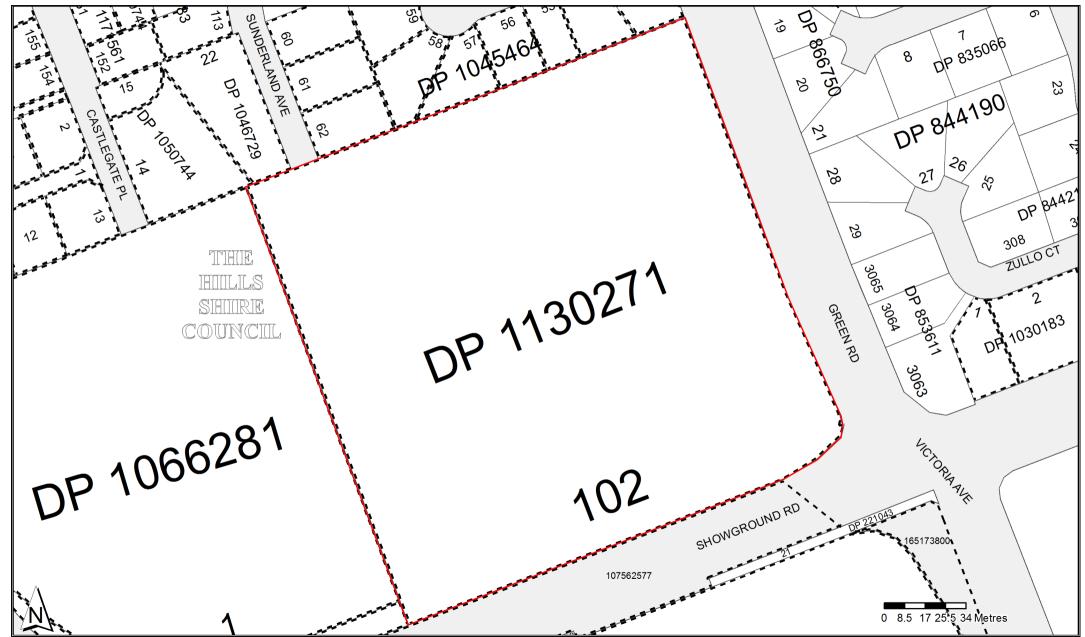
Cadastral Records Enquiry Report: Lot 102 DP 1130271

Parish: CASTLE HILL

Ref: castle hill lot 102

Page 1 of 4

Locality: CASTLE HILL **LGA**: THE HILLS SHIRE **County: CUMBERLAND**



PLANFORM 2

SIGNATURES, AND SEALS ONLY

FOR SIGNATURES AND SEALS

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that all necessary approvals in regard to the allocation of the land shown hereon, have been given. DNINADIW DAOR. Office : TABLE OF SHORT LINE PM24980 FD ESTABLISHED SHOWGROUND No BEARING DISTANCE Subdivision Certificate 347*41'25" 3.37 10*32'15" 1.48 I certify that the provisions of s.109J of the Environmental Plannin and Assessment Act 1979 have been satisfied in relation to 102 SUBDIVISION SUBDIVISION set out herein

* (insert 'subdivision' or 'new road') | SCHEDULE OF REFERENCE MARKS | RM | DESCRIPTION | BEARING | DISTANCE | REMARKS | 1 | RM | GIP | FD | 130*49*40" | 14.995 | (IP) | 10662811 | BY SURVEY | 2 | RM | GIP | 124*29" | 4.955 | PLACED | DIAGRAM N.T.S. 3 RM CONC BLK 338*27* 0.83 * Delete wichever is inapplicable. 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | Toble of mm | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 | 33 SURVEYOR'S REFERENCE: 1111 30896DP REVE 301008 - 2004MT100(460) PARTIAL SURVEY WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

-Plan Drawing only to appear in this space

DP1130271

SURVEYING REGULATION 2001 CLAUSE 32 G

NODTHING

MGA CO-ORDINATES

FASTING

ePlan

3.11.2008 Registered: C.A.: See Certificate TORRENS Title System SUBDIVISION FOR ROAD Purnose WIDENING U 9160-31#

Last Plan:

DP834952 PLAN OF SUBDIVISION OF LOT 13 IN DP834952

Lengths are in metres. Reduction Ratio 1:1250

BAULKHAM HILLS Locality: CASTLE HILL Parish: CASTLE HILL county: CUMBERLAND

This is sheet 1 of my plan in _______(Delete if inapplicable)

Surveying Regulation, 2001 JACE THOMAS PEARSON GEOMAP SERVICES PTY LTD
PI BOX 92.4 SEVEN HILLIS KEW 1736
summore represented in this plan is occurred, not been most in occurred to the summy represented in the plan is occurred, not been most in occurred to the summy represented in the plan is occurred. The been most in occurred to the plan is occurred. The plan is occurred to the plan is GEOMAP SERVICES PTY LTD

(here specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey) (Signature) SEE SIGNATURES FORM Dated: 30.05.0

Plans used in preparation of Survey/ DP38334

DP807912 DP834952 DP1045464 DP1066281

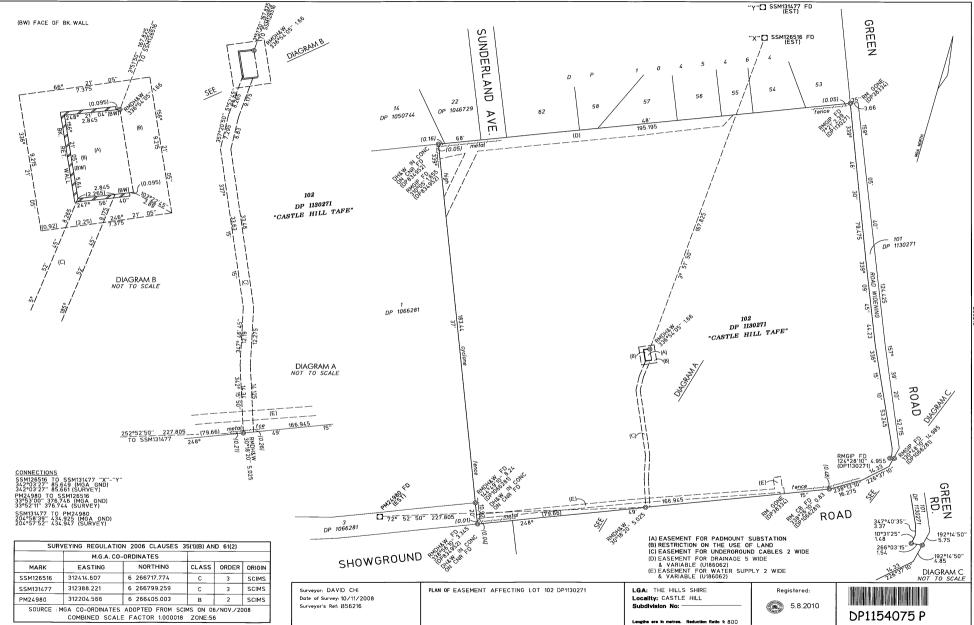
PANEL FOR USE ONLY for stotements of intention to dedicate public roads, to create public reserves drainage reserves, easements, restrictions on the use of land or positive covenants.

IT IS INTENDED TO DEDICATE LOT 101 TO THE PUBLIC AS PUBLIC ROAD.

ePlan

PL	.AN	FO	RM	6
		, ,		٠,

CERTIFICATES, SIGI	NATURES AND SEALS Sheet 1 of 1 sheet(s)
PLAN OF SUBDIVISION OF LOT 13 IN DP834952	DP1130271
	Registered: 3.11.2008 *
Surveying Regulation, 2001 JACE THOMAS PEARSON of GEOMAP SERVICES PTY LTD PO BOX 924 SEVEN HILLS NSW 1730 a surveyor registered under the Surveying Act, 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation 2001, and was completed on 10.05.04	SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads or to create public reserves and drainage reserves. IT IS INTENDED TO DEDICATE LOT 101 TO THE PUBLIC AS PUBLIC ROAD.
The survey relates toLOT.101.ONLY. (here specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey) Signature	Signed by me RA3 MASSELLA as delegate of the Minister for Education and Training purposent to Section 125 of the Education Acr 1990 and Thereby certify that I have no notices of the revocation of such delegation.
Type: Urban/Rural	
Crown Lands NSW / Western lands Office Approval I,	Signed by me AMARTHM as delegate of the Minister for Education and Training pursuant to section 27 of the Technical and Further Education Act 1990 and I hereby certify that I have no notice of the revocation of such delegation.
Subdivision Certificate I certify that the provisions of s. 109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to: the proposed SUBDIVISION set out herein (Insert "subdivision" or "new road") * Authorised Person/General Manager/Accredited Certifier. Consent Authority BAULKHAM LINES SHIRE (Outo) Date of endorsement 1	
Accreditation No: Subdivision Certificate No: 10194 File No: 2685-04	
* Delete whichever is inapplicable	Use PLANFORM 6A for additional certificates, signatures and seals.
SURVEYOR'S REFERENCE: 1111 30896DP REVD 270807	



/Prt:16-Sep-2019 12:23 :DP Regi Req:R957786 / © Office of t

20 30 40 50 Table of mm 90 100 110 120 130 140

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 1 sheet(s)

SIGNATURES, SEALS AND STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919 AS AMENDED IT IS INTENDED TO CREATE

- 1. EASEMENT FOR PADMOUNT SUBSTATION 2 EASEMENT FOR UNDERGROUND CABLES 2 WIDE
- 3. RESTRICTION ON THE USE OF LAND

Signed by Colin Isbister
Delegate of the Minister for Education
and Training under instrument of Delegation given in accordance with Sec 27 of the Technical and Further Education Commission Act 1990

Proprietor

Crown Lands NSW/Western Lands Office Approval

(Authorised Officer) in approving this plan (Authorised Officer) that all necessary approvals in regard to the allocation shown hereon have been given	•
Signature:	
File Number:	
Office:	

Subdivision Certificate

I certify that the provisions of s 109) of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to

the proposed .		sel out here
	• (insert 'subdivision' or 'new road')	

				•			
 Authorised Person/ 	Genera	l Manager	/Acc	redite	d Cerl	ifier	
Consent Authority							
Date of Endorsement							
Accreditation no :							
Subdivision Certificate no							
File no							

* Delete whichever is inapplicable



DP1154075 S

Registered:

5.8.2010

Title System TORRENS

Purpose:

EASEMENT

PLAN OF EASEMENT AFFECTING LOT 102 DP1130271

BAULKHAM-HILLS THE HILLS SHIRE LGA:

Locality: CASTLE HILL CASTLE HILL Parish: County: CUMBERLAND

L DAVID CHI of NSW DEPARTMENT OF COMMERCE a surveyor registered under the Surveying Act, 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation, 2006 and was campleted on 10/11/2008

Surveying Regulation, 2006

The survey relates to EASEMENTS (B), (C) & (D)

there specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey!

Surveyor registered under the Surveying Act, 2002

Daled 02/12/2008

Dalum Line X"-"Y" Type Urban/Rural-

Plans used in preparation of Survey/Compilation-

DP1130271 DP1066281 DP834952 DP1045464

(if insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE B56216

Req:R957900 © Office of

/Doc:CP 12358-3000 P the Registrar-General

/Rev:01-Dec-2012 /Src:INFOTRACK

/NSW LRS /Prt:16-Sep-2019 /Ref:castle hill lot 102

/Seq:1

49618.

49618

Order descrument not liable to Stamp Duty or payment of Registration or other fees.

R. J. McKAY
Crown Solicitor
per July

0 14 M S 8/1/72.

REAL PROPERTY ACT, 1900 APPLICATION UNDER SECTION 31 A (2) (a)

I, RAYMOND JAMES MCKAY, State Crown Solicitor hereby apply for the issue of a Certificate of Title in favour of THE MINISTER FOR EDUCATION for the land described in the Schedule hereto and hereby certify that:-

- (1) by Notification published in the Government Gazette No. 97 of the 22nd August, 1947 (a true copy whereof is annexed hereto) the said land was with other land resumed and vested in The Minister of Public Instruction on behalf of His Majesty the King;
- (2) the said land has not been divested from The Minister for Public Instruction (now The Minister for Education) and no estate or interest therein has been created in favour of any other person:
- (3) the said land is not under the provisions of the Real Property Act, 1900 and no sale lease or other transaction affecting it is intended to be completed prior to the issue of the Certificate of Title;
- (4) this application is correct for the purposes of the Real Property Act, 1900.

DATED at Sydney this

fi fth

day of January

1973 1972.

SCHEDULE

ALL THAT piece or parcel of land situated in the Shire of Baulkham Hills
Parish of Castle Hill, County of Cumberland, being part of Portion 55 of 500
acres granted to George Acres, and being Lot 1 in Deposited Plan. DP 559615

SIGNED by RAYMOND JAMES MCKAY
State Crown Solicitor by
JOHN WALTER HENRY who is
personally known to me:

R. J. McKAY
State Crown, Solicitor
per

The Registrar General, SYDNEY.

Cort. of T. Jorded v12080 Fol. 163

0 Felio 1952

Req:R957849 /Doc:PA 049618 PA /Rev:22-Jun-2015 /NSW LRS /Pgs:ALL /Prt:16-Sep-2019 12:28 /Seq:2 of 3 © Office of the Registrar-General /Src:INFOTRACK /Ref:castle hill lot 102

NEW SOUTH WALES GOVERNMENT GAZETTE No. 97.

19A7 [29 Ava., 13;7

NOTIFICATION OF RESUMPTION OF LAND UNDER THE PUBLIC WORKS ACT, 1912. Fd. 1952

IT is hereby notified and declared by His Excellent to Governor, acting with the advice of the Excettive Council, incomuch of the land hereunder described as in Crown land to been appropriated, and so much thereof as is private programs been resumed, under the Public Works Act, 1912, for to following putile purpose, namely, a Public School at CASTI HILL, and is vested in the Minister of Public Instruction at both of His Majesty the King for the purposes of the Public Instruction Act of 1880.

Dated the thirteenth day of August, one thousand res-hundred and forty-seven.

J. NORTHCOTT, Governor. By His Excellency's Command

R. J. HEFFRON, Minister of Public Instructive

DESCRIPTION OF LAND REFERRED TO.

Description of Land retrained to.

All that piece or parcel of land situated in the parish of Castle Hill, county of Cumberland, Shirr of Baukham has being part of partien 55 of 500 acres granted to George Acc. Commencing at the intersection of the south-western side of Show Ground rest and bounded thence on the north-cent by the south-western side of Show Ground rest and bounded thence on the north-cent by the south-western side of Victorin-road bearing 320 degrees 17 minutes 25 to 104 inches; 330 degrees 43 minutes 408 feet 14 inches; there on the north-west by that side of that road bary road; thence on the south-west by that side of that road bary 127 degrees 32 minutes 279 feet of inches; 129 degrees minutes 30 seconds 65 feet 104 inches; 135 degrees 54 minutes 50 seconds 132 feet 54 inches; 130 degrees 54 minutes 50 seconds 165 feet 4 inches; 130 degrees 15 minutes 111 feet inches to the north-western side of Show Ground road; the continuing an area of 18 acres 1 road 351 perches and 127 containing an area of 18 acres 1 road 351 perches and 127 on plan calalogued Ms. 12,363 Sy.R. in the Department of Lands.

MS 1528

This is the annexed Notification referred to in Application by the State Crown day of Solicitor dated the 1973.

January

Req:R957849 /Doc:PA 049618 PA /Rev:22-Jun-2015 /NSW LRS /Pgs:ALL /Prt:16-Sep-2019 12:28 /Seq:3 of 3

© Office of the Registrar-General /Src:INFOTRACK /Ref:castle hill lot 102

Ladged b

6-941 ha 89/73

49618

DP559615

Lodged by:

State Crown Solicitos
Goodsell Building
8-12 Chifley Square
Sydney
20355





WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE

NEW SOUTH WALES

Appln. No. 49618

THE MINISTER FOR EDUCATION.

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.



SEE AUTO FOLIO

PLAN SHOWING LOCATION OF LAND LENGTHS ARE IN METRES 38334 13 VICTORIA DIAGRAM ςť. 62 (30. 48 WIDE) SHOWGROUND Ro. \mathcal{Z} C 15188

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 559615 at Kellyville in the Shire of Baulkham Hills Parish of Castle Hill and County of Cumberland being part of Portion 55 granted to George Acres on 30-6-1823. EXCEPTING THEREOUT the minerals specified in Section 141 Public Works Act, 1912.

FIRST SCHEDULE

SECOND SCHEDULE

NIL.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED. I

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

65 RM

	* 5 ·		- Adala - Adal		FIRST	SCHEDUL	E (continu	ed)						
			DECISTEDED DOO	PRIETOR	, , , , , , , , , , , , , , , , , , , ,					INS.	TRUMENT	,	ENTERED	Signature of Registrar General
			REGISTERED PRO	PRIETUR					NATURE		NUMBER	DATE	ENTERED	Registrar General
	* .		·	A CONTRACTOR OF THE PROPERTY O										
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			SECOND SCHEDULE (continued)					
NATURE	INSTRUMENT NUMBER	DATE	PARTICULARS	ENTERED	Signature of Registrar General		ANCELLATION	
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					describers			



Historical Title



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

16/9/2019 12:25PM

FOLIO: 1/559615

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 12080 FOL 163

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
16/8/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
7/2/1991	DP807912	DEPOSITED PLAN	
18/11/1991	Z596342	RESUMPTION APPLICATION	FOLIO CANCELLED
3/2/2000	6532842	DEPARTMENTAL DEALING	

*** END OF SEARCH ***









RESUMPTION APPLICATION

SECTION 31A (3), REAL PROPERTY ACT, 1900

14	i				L
	\$	4-	7	J	

RA

DESCRIPTION
OF LAND
Note (a)
(40.40 (4)

RF 44

(See Instructions for Completion on back of form) If part only, delete Whole and give details Location Torrens Title Reference -WHOLE-1/559615 Lot 11 DP807912 PARISH: CASTLE HILL COUNTY: CUMBERLAND OFFICE USE CINLY

APPLICANT Note (b)

ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES

Note (c)

(the abovenamed Applicant) in consequence of the resumption notified in Government Gazette dated $5~\mathrm{APRIL}$, 1991, folial 656, a true copy whereof appears hereunder, hereby applies to the Registrar General (i) to make all such recordings in the Register as may be necessary to give effect to the resumption so far as it relates to the land above described and (ii) to issue a new Certificate of Title for the resumed land.

Note (d)

COPY OF GAZETTE NOTIFICATION

SEE ANNEXURE HEREWITH

Note (e)

10 APRIL, 1991 DATE

DX 19

Delivery Box Number

Passed

KF15

Extra Fee

Checked

Signed

EXECUTION Note (f)

I hereby certify this application to be correct for the purposes of the Real Property Act, 1900.

Signed in my presence by the authorised officer of the applicant

E CL LEAN

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

H. R. ROBERIS State Crown Soliciton 000

Produced by

TO BE COMPLETED BY LODGING PARTY

LODGED BY CROWN SOLICITORS OFFICE GOODSHLL BUILDING 8-12 CHIFLEY SQUARE, SYDNEY. 2000

LOCATION OF DOCUMENTS CT OTHER

C45/EDL

Herewith. In R.G.O. with

Signature of authorised officer

Notes (g) and (h)

813E

OFFICE USE ONLY

REGISTERED

-19

1 8 NOV 1991

Cert. of Title

Registrar General

Req:R957822 /Doc:DL 2596342 /Rev:28-Jun-2010 /NSW LRS /Pgs:ALL /Prt:16-Sep-2019 12:25 /Seq:2 of 3 © Office of the Registrar-General /Src:INFOTRACK /Ref:castle hill lot 102

INSTRUCTIONS FOR COMPLETION

This dealing should be lodged by hand at the Registrar General's Office.
Us 3 this form where the land resumed is under the provisions of the Real Property Act, 1900.
Typewriting and handwriting should be clear, legible and in permanent non-copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the applicant.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the applicant and the attesting witness.

The following instructions relate to the side notes on the form.

- (a) Description of land.
 - (i) TORRENS TITLE REFERENCE.—For a manual folio insert the Volume and Folio (e.g., Vol. 8514 Fol. 126). For a computer folio insert the folio identifier (e.g., 12 701924). Title references should be listed in numerical sequence.
 (ii) PART/WHOLE.—If part only of the land in the folio of the Register is the subject of the application, defece the word "Whole" and insert the lot and plan number, portion, &c
 (iii) LOCATION.—Insert the locality shown on the Certificate of Title/Crown Grant, e.g., at Chullora. If the locality is not shown, insert the Parish and County, e.g., Ph. Lismore Co. Rous
- (b) State the name of Authority in which the land is vested.
- (c) Show date and folio number of the Gazette notification.
- (d) Delete this clause if the issue of a new certificate of title is not required.
- (e) Insert a copy of the Gazette Notification. If the space provided is insufficient for this purpose, use an annexure sheet (identified as such) of the same size and quality of paper as this form.

OFFICE USE ONLY

- (f) Execution.
 - The certificate of correctness under the Real Property Act, 1900 must be signed by an authorised officer of the applicant who should execute the dealing in the presence of an adult witness to whom he she is personally 'mown.

Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900

- (g) insert the name, postal address, Document Exchange reference, telephone number and delivery box number of the lodging party.
- (h) If any document is lodged with this application, record in LOCUMENTS LODGED panel.

		FIRST SCH	EDULE DIRECTIONS						
(A) FOLIO IDENTIFIER	(B) DIRECTION (C)								
	PROP	ROADS AND WALES 2013 Buck THE M pediduc be	TRAFFIC AUTHORITY OF NEW SOUTH to past, being let "in DIRETA, 2 INISTER FOR ÉDUCATION and the eing Lot 10 in DP 807712						
		SECOND SCHEDUL	E AND OTHER DIRECTIONS						
(D) FOLIO IDENTIFIER	(E) DIRECTION (F)	OTFN (G) DEALING TYPE (G) NUMBER	(H) DETAILS						
		15 DP807912	Ment folios Lanciasana fin 1685 102 11 in DP807912						



Application

Annexure to RESUMPTION DATED 10 APRIL, 1991

by the State Crown Solicitor

2656

OFFICIAL NOTICES

5 April 1991

NOTIFICATION OF ACQUISITION OF LAND AND DECLARATION OF PUBLIC ROAD AT CASTLE HILL IN THE SHIRE OF **BAULKHAM HILLS**

IT is hereby notified and declared by His Excellency the Governor, acting with the advice of the Executive Council, that in pursuance of the State Roads Act 1986 the land described in the Schedule hereunder in respect of so much of the said land as is Crown Land is hereby appropriated and in respect of so much of the said land as is private property is hereby resumed under the Public Works Act 1912 for the purposes of the State Roads Act 1986 and that all the said land is hereby vested in the Roads and Traffic Authority of New South Wales AND further that the said land is hereby declared a public road and placed under the care, control and management of the Council of the Shire of Baulkham Hills.

DATED at Sydney this 27th day of March 1991.

P R SINCLAIR Governor

By His Excellency's Command,

WAL MURRAY Deputy Premier and Minister for Roads

SCHEDULE

ALL that piece or parcel of land situate in the Shire of Baulkham Hills, Parish of Castle Hill and County of Cumberland, being part of the land comprised within Certificate of Title Folio Identifier 1/559615 and shown as Lot 11 Deposited Plan 807912.

The land is said to be in the possession of the Minister for Education.

(RTA Papers 31.12057)

R. K. ROBERTS State Crown Soliciton

Authorised Officer

Witness T. de Len



Historical Title



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

16/9/2019 12:25PM

FOLIO: 10/807912

First Title(s): OLD SYSTEM
Prior Title(s): 1/559615

Recorded	Number	Type of Instrument	C.T. Issue
7/2/1991	DP807912	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
18/11/1991	- 2596342	RESUMPTION APPLICATION	FOLIO CREATED CT NOT ISSUED
23/12/1993	DP834952	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***



Historical Title



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

16/9/2019 12:24PM

FOLIO: 13/834952

First Title(s): OLD SYSTEM
Prior Title(s): 10/807912

Recorded	Number	Type of Ir	nstrument	C.T. Issue
24/12/1993	DP834952	DEPOSITED	PLAN	FOLIO CREATED EDITION 1
27/4/1994	U186062	TRANSFER		EDITION 2
27/11/2002	DP1045464	DEPOSITED	PLAN	
14/5/2004	DP1066281	DEPOSITED	PLAN	
3/11/2008	DP1130271	DEPOSITED	PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

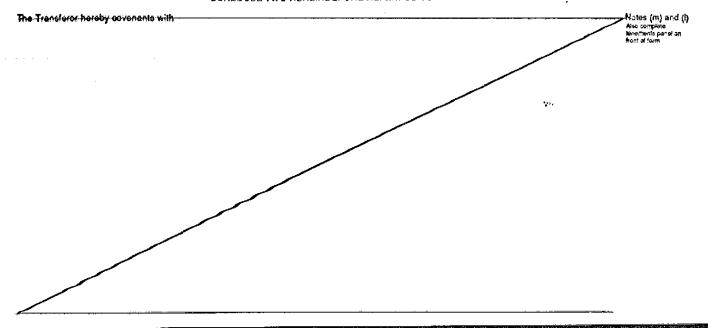
RP 13A 1986

SCHEDULE ONE HEREINBEFORE REFERRED TO

The Transferor hereby grants/reserves Easements for drainage and water supply as shown as "Proposed Easement for Erainage 5 Wide and Variable" and "Proposed Easement for Water Supply 2 Wide and Variable" in Deposited Plan 834952 and set out in the annexure hereto marked "A".

Notes (k) and (i)

SCHEDULE TWO HEREINBEFORE REFERRED TO



CU

Annexure "A"

Easement for Drainage

FULL AND FREE right for the body in whose favour this easement is created, and every person authorised by it, from time to time and at all times to drain water (whether rain, storm, spring, soakage, or seepage water) in any quantities across and through the land herein indicated as the servient tenement, TOGETHER WITH the right to use for the purposes of the easement any line of pipes already laid within the servient tenement for the purpose of draining water or any pipe or pipes in replacement or in substitution therefor and where no such line of pipes exists, to lay, place and maintain a line of pipes of sufficient internal diameter beneath or upon the surface of the servient tenement AND TOGETHER WITH the right of the body in whose favour this easement is created and every person authorised by it, with any tools, implements, or machinery, necessary for the purposes, to enter upon the servient tenement and to remain there for any reasonable time for the purpose of laying, inspecting, cleansing, repairing, maintaining, or renewing such pipeline or any part thereof AND for any of the aforesaid purposes to open the soil of the servient tenement to such extent as may be necessary PROVIDED THAT the body in whose favour this easement is created and the persons authorised by it will take all reasonable precautions to ensure as little disturbance as possible to the surface of the servient tenement and will restore that surface as nearly as practicable to its original condition.

Easement of Water Supply

FULL AND FREE right for the body in whose favour this easement is created and every person authorised by it, from time to time and at all times to pass and convey water in any quantities through the servient tenement TOGETHER WITH the right to use for the purposes of the easement any line of pipes (including works ancillary thereto) already laid within the servient tenement for the purposes of the passage and conveyance of such water or any pipe or pipes in replacement, substitution or duplication therefor and where no such line of pipes exists to lay place and maintain a line of pipes of sufficient internal diameter beneath the surface of the servient tenement and to lay place and maintain upon the surface of the servient tenement and works ancillary to the said line of pipes AND TOGETHER WITH the right of the body in whose favour this easement is created and every person authorised by it, with any tools, implements, or machinery, necessary for the purposes, to enter upon the servient tenement and to remain there for any reasonable time for the purposes of laying, inspecting, cleansing, repairing, maintaining, or renewing such pipeline or any part thereof (including works ancillary thereto) AND for any of

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le. W. E. de fan

M

Req:R957816 /Doc:DL U186062 /Rev:29-Sep-1997 /NSW LRS /Pgs:ALL /Prt:16-Sep-2019 12:25 /Seq:4 of 6 Office of the Registrar-General /Src:INFOTRACK /Ref:castle hill lot 102



the aforesaid purposes to open the soil of the servient tenement to such extent as may be necessary <u>PROVIDED THAT</u> the body in whose favour this easement is created and the persons authorised by it will take all reasonable precautions to ensure as little disturbance as possible to the surface of the servient tenement and will restore that surface as nearly as practicable to its original condition.

For	the	Transferor	- Japanes
For	the	Transferee	

NP 13A 1986	ş •		
		SCHEDULE THREE HEREINBEFORE REFERRED TO	
Notes (n) and (l)	The Transferee hereby covenants with		
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10-1280



REGISTRATION DIRECTION ANNEXURE

Use this side only for **First and Second Schedule** directions DO NOT USE BOTH SIDES OF THE FORM.

FIRST SCHEDULE DIRECTIONS

FOLIO IDENTIFIER	DIRECTION	DETAILS
12/834952	2	The Trustees of the Museum of Applied Arts and
		Sciences.
	 	
·		
	·	

SECOND SCHEDULE AND OTHER DIRECTIONS

		3500	NUD SCHEDOLE	AND OTHER DIRECTIONS
FOLIO IDENTIFIER	DIRECTION	NOIFN TYPE	DEALING NUMBER	DETAILS
13/834952	٥٨	EA		Easement for drainage affecting
				part of the land above described shown as "Proposed Easement for Drainage 5 wide & var." in
			· · · · · · · · · · · · · · · · · · ·	shown as " Proposed Easement
				for brainage swide & var. in
				bp 834 952.
13/834952	O٨	EB		Easement for Water Supply afecting part of the land above described
				part of the land above described
				shown as " Proposed Easement for
				shown as "Proposed Easement for Water Supply 2 wide & var. " in
				Dr 834952
12/834952	011	€B		to the land above described affecting
				to the land above described affecting
				part of the land chown as Proposed
				Easement for Brainage Suide & var."
				in 61834952
			·····	
12/834952	OM	€C		Easement for Water Supply apportenent to the land above described affecting
				to the land above described affecting
				part of the land shown as Proposed Easement for Water Supply Duide & var"
			******	Easement for Water Supply Dunde & var"
			···	12 DC 834952
				
12413 834952	CTS	>	813E	



Historical Title



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

16/9/2019 12:24PM

FOLIO: 102/1130271

First Title(s): OLD SYSTEM
Prior Title(s): 13/834952

Recorded	Number	Type of Instrument	C.T. Issue
3/11/2008	DP1130271	DEPOSITED PLAN	FOLIO CREATED EDITION 1
5/8/2010	DP1154075	DEPOSITED PLAN	EDITION 2
7/11/2016	AK729543	APPLICATION TO RECORD A NEW REGISTERED PROPRIETOR	EDITION 3

*** END OF SEARCH ***



NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 102/1130271

LAND

LOT 102 IN DEPOSITED PLAN 1130271
AT CASTLE HILL
LOCAL GOVERNMENT AREA THE HILLS SHIRE
PARISH OF CASTLE HILL COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1130271

FIRST SCHEDULE

MINISTER ADMINISTERING THE TECHNICAL AND FURTHER EDUCATION COMMISSION ACT 1990

(RP AK729543)

SECOND SCHEDULE (7 NOTIFICATIONS)

- 1 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912)
- 2 U186062 EASEMENT FOR DRAINAGE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 3 U186062 EASEMENT FOR WATER SUPPLY AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 4 DP1045464 EASEMENT TO DRAIN WATER 5 METRE(S) WIDE AND VARIABLE APPURTENANT TO THE LAND ABOVE DESCRIBED
- 5 DP1154075 EASEMENT FOR PADMOUNT SUBSTATION AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1154075
- 6 DP1154075 EASEMENT FOR UNDERGROUND CABLES 2 METRE(S) WIDE
 AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1154075
- 7 DP1154075 RESTRICTION(S) ON THE USE OF LAND

NOTATIONS

DP1066281 NOTE: PLAN FOR ROAD ACT, 1993

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

castle hill lot 102

PRINTED ON 16/9/2019

APPENDIX B

NSW EPA

Contaminated Land & Waste Management Facilities

172 Showground Road, Castle Hill, NSW 2154

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority © State of New South Wales through the Environment Protection Authority Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

PFAS Investigation Sites

172 Showground Road, Castle Hill, NSW 2154

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

ld	Si	Site	Address	Loc Conf	Dist	Dir
N/A	. No	lo records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority © State of New South Wales through the Environment Protection Authority

Defence PFAS Investigation & Management Program

Sites being investigated or managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation & Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

EPA Other Sites with Contamination Issues

172 Showground Road, Castle Hill, NSW 2154

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- · James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- · Pasminco Lead Abatement Strategy Area

Sites within the dataset buffer:

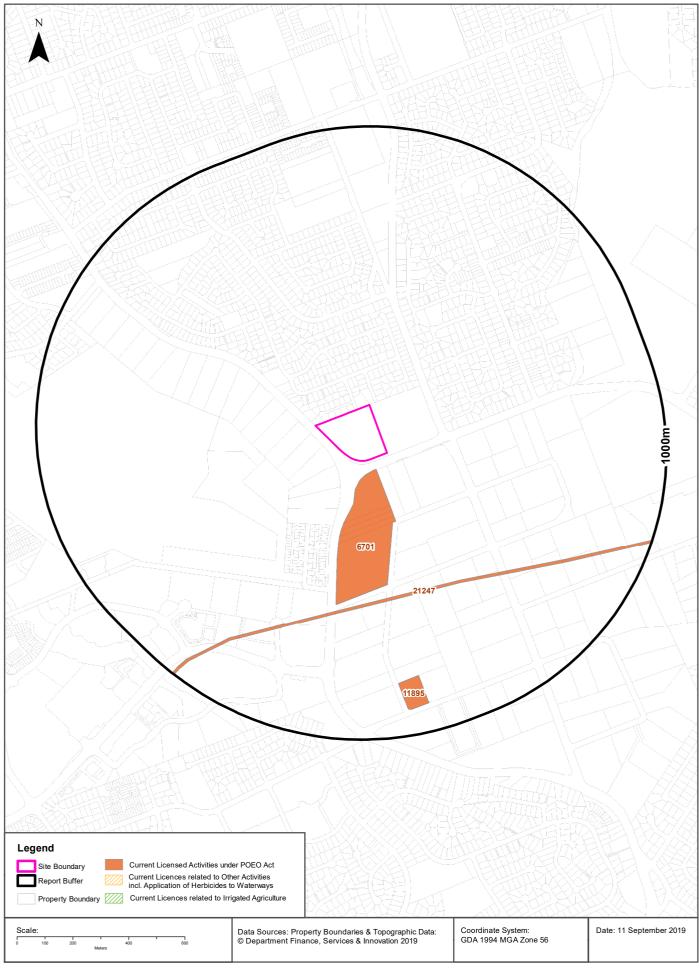
Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority © State of New South Wales through the Environment Protection Authority

Current EPA Licensed Activities

172 Showground Road, Castle Hill, NSW 2154





EPA Activities

172 Showground Road, Castle Hill, NSW 2154

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
5968	HOBSON ENGINEERING CO PTY LTD	HOBSON ENGINEERING CO PTY LTD	14 VICTORIA AVE	CASTLE HILL	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	341m	South East
11782	WALTER SCHELLANDER	BRONZING STUDIO - CHROMETECH	40/5 ANELLA AVENUE	CASTLE HILL	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	453m	East
6735	ECOLAB PTY LTD	ECOLAB PTY LTD	6 HUDSON AVENUE	CASTLE HILL	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	713m	South

Delicensed Activities Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
10553	LENDLEASE ENGINEERING PTY LIMITED	ROUSE HILL DEVELOPMENT AREA, STAGE 2, KELLYVILLE, NSW 2155	Surrendered	27/11/2000	Miscellaneous licensed discharge to waters (at any time)	General Area/ Suburb Match	0m	Onsite
2872	HOLT LLOYD AUSTRALASIA PTY LTD	15 HUDSON AVE, CASTLE HILL, NSW 2154	Surrendered	24/05/2000	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	251m	South East
20198	LENDLEASE ENGINEERING PTY LIMITED	North West Rail Link Early Works Project, Between Tallawong Road Maintenance Facility and Epping Station, EPPING	Surrendered	08/03/2013	Railway systems activities	Network of Features	486m	South
20319	THIESS PTY LTD	North West Rail Link Tunnels and Station Civil Works, Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL	Surrendered	30/09/2013	Railway systems activities	Network of Features	486m	South
12202	SIGMA-ALDRICH PTY. LIMITED	12 ANELLA AVENUE, CASTLE HILL, NSW 1765	Surrendered	23/11/2004	Hazardous, Industrial or Group A Waste Generation or Storage, Pharmaceutical and veterinary products production	Premise Match	547m	East
6080	ASPEN PHARMA PTY LTD	ASPEN PHARMA PTY LTD, 7 MAITLAND PLACE, BAULKHAM HILLS	Surrendered	23/06/2000	Pharmaceutical and veterinary products production	Premise Match	640m	South West
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	676m	-

EPA Activities

172 Showground Road, Castle Hill, NSW 2154

Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
6701	SMC CORPORATION (AUSTRALIA) PTY LTD	SMC PNEUMATICS (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	CASTLE HILL	Metal waste generation	Premise Match	41m	South
21247	Metro Trains Sydney Pty Ltd		Sydney Metro Rail Network - as defined by premise maps. , ROUSE HILL, NSW 2155		Railway systems activities	Network of Features	496m	South
11895	CRC INDUSTRIES (AUST) PTY LIMITED	CRC INDUSTRIES (AUST) PTY LIMITED	9 GLADSTONE ROAD	CASTLE HILL	Dangerous goods production	Premise Match	792m	South

POEO Licence Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	676m	-
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	676m	-
5446	SYDNEY WATER CORPORATION	BAULKHAM HILLS (including Rouse Hill Development Area) - NSW 2153	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	676m	-
2847	PARKER HANNIFIN (AUSTRALIA) PTY. LIMITED	9 CARRINGTON ROAD, CASTLE HILL, NSW 2154	Surrendered	01/05/2000	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	740m	East

Former Licensed Activities Data Source: Environment Protection Authority © State of New South Wales through the Environment Protection Authority

APPENDIX C

PLANNING CERTIFICATE



THE HILLS SHIRE COUNCIL

3 Columbia Court, Norwest NSW 2153 PO Box 7064, Norwest 2153 ABN 25 034 494 656 | DX 9966 Norwest

PLANNING CERTIFICATE UNDER SECTION 10.7 (2)

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED.

Certificate Number: 102253

Reference: 8325 TITLES:147837 Issue Date: 13 September 2019

Receipt No: 6101818 Fee Paid: \$ 53.00

ADDRESS: The Hills TAFE College - Castle Hill Campus, 2 Green Road,

CASTLE HILL NSW 2154

DESCRIPTION: Lot 102 DP 1130271

The land is zoned:

Zone R2 Low Density Residential Zone SP2 Infrastructure

The following prescribed matters apply to the land to which this certificate relates:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act, the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

(A) Local Environmental Plans

The Hills Local Environmental Plan 2012, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

State Environmental Planning Policies

SEPP No.19 - Bushland In Urban Areas

SEPP No.21 - Caravan Parks

SEPP No.33 - Hazardous And Offensive Development

SEPP No.50 - Canal Estate Development

SEPP No.55 - Remediation Of Land

SEPP No.64 - Advertising And Signage

SEPP No.65 - Design Quality Of Residential Apartment Development

SEPP No.70 - Affordable Housing (Revised Schemes)

SEPP (Building Sustainability Index: Basix) 2004

SEPP (State Significant Precincts) 2005

SEPP (Mining, Petroleum Production And Extractive Industries) 2007

SEPP (Miscellaneous Consent Provisions) 2007

SEPP (Infrastructure) 2007

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Affordable Rental Housing) 2009

SEPP (State and Regional Development) 2011

SEPP (Vegetation in Non-Rural Areas) 2017

SEPP (Educational Establishments and Child Care Facilities) 2017

SEPP (Primary Production and Rural Development) 2019

Sydney Regional Environmental Plan No. 9 Extractive Industry (No.2 - 1995)

Sydney Regional Environmental Plan No. 20 Hawkesbury – Nepean River

(No.2 - 1997)

The following SEPP's may apply to the land. Please refer to **'Land to which Policy applies'** for each individual SEPP.

SEPP (Housing For Seniors Or People With A Disability) 2004

(2) The name of each **proposed environmental planning instrument** that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

(A) Proposed Local Environmental Plans

Proposed The Hills Local Environmental Plan 2012 (Amendment No.) applies to this land.

Refer Attachment 1(2)(A)

(B) **Proposed State Environmental Planning Policies**

Draft State Environmental Planning Policy (Environment)
Draft Remediation of Land State Environmental Planning Policy
Draft State Environmental Planning Policy (Short-term Rental
Accommodation) 2019

(3) The name of each development control plan that applies to the carrying out of development on the land.

The Hills Development Control Plan 2012

Note: the land is within The Hills Development Control Plan 2012 Part D map sheet. Refer Council's website www.thehills.nsw.gov.au to view the map sheet.

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

(A) The Hills Local Environmental Plan 2012 applies to the land unless otherwise stated in this certificate and identifies the land to be:

Zone R2 Low Density Residential Zone SP2 Infrastructure

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

(F) Whether the land includes or comprises critical habitat?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

(G) Whether the land is in a conservation area (however described)?

The Hills Local Environmental Plan 2012?

NO

Any Other Planning Proposal?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

- (a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or
- (b) a Precinct Plan (within the meaning of the 2006 SEPP), or
- (c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.

(A) State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) does not apply.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) does not apply.

Note: This precinct plan applies to land within the Box Hill Precinct or Box Hill Industrial Precinct.

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development.

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

Any amendments to Proposed State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

Any amendments to Proposed State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(F) Whether the land includes or comprises critical habitat?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(G) Whether the land is in a conservation area (however described)?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

3. Complying Development

- (1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
- (2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.
- (3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Housing Code, Rural Housing Code and Greenfield Housing Code Complying development under the Housing Code, Rural Housing Code and Greenfield Housing Code may not be carried out on the land unless the development is carried out on any part of the lot that is not affected by the following specific land exemption/s:

The land is reserved for a public purpose in the environmental planning instrument. Refer to the Land Zoning Map of the applicable instrument.

Housing Alterations Code and General Development CodeComplying Development under the Housing Alterations Code and General Development Code **may be** carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code
Complying development under the Commercial and Industrial (New Buildings
and Additions) Code may not be carried out on the land unless the
development is carried out on any part of the lot that is not affected by the
following specific land exemption/s:

The land is reserved for a public purpose in the environmental planning instrument. Refer to the Land Zoning Map of the applicable instrument.

Commercial and Industrial Alterations, Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes
Complying Development under the Commercial and Industrial Alterations,
Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes may be carried out on the land.

Note: Where reference is made to an applicable map, this information can be sourced from the following websites:

The Hills Local Environmental Plan 2012 - www.thehills.nsw.gov.au State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct) or (Appendix 11 The Hills Growth Centre Precincts Plan) - http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/North-West-Priority-Growth-Area

4, 4A (Repealed)

4B. Annual charges under <u>Local Government Act 1993</u> for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the <u>Local Government Act 1993</u> for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

NO

Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the <u>Local Government Act 1993</u>.

5. Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the <u>Coal Mine Subsidence Compensation Act</u> 2017?

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under -

(A) Division 2 of Part 3 of the Roads Act 1993; or

NO

(B) any environmental planning instrument; or

YES

The Hills Local Environmental Plan 2012 identifies the land as being zoned for "Classified Road" widening.

Refer Part 2(A) of this certificate for the applicable zoning and environmental planning instrument.

- (C) any resolution of council?
 - a) The Hills Development Control Plan 2012?

NO

b) Any other resolution of council?

NO

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

- (a) adopted by council, or
- (b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding)?

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

a) By The Hills Local Environmental Plan 2012 zoning?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

b) By The Hills Local Environmental Plan 2012 local provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

c) By The Hills Development Control Plan 2012 provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

(ii) Bushfire

YES

Please note this is a statement of policy only and NOT a statement on whether or not the property is affected by bushfire. That question is answered in Section 11 of this certificate.

The NSW Rural Fire Service Guidelines entitled 'Planning for Bushfire Protection 2018'. Development subject to bushfire risk will be required to address the requirements in these guidelines and can be downloaded off the RFS web site www.rfs.nsw.gov.au

The Development Control Plan may also contain provisions for development on Bushfire Prone Land and Bushfire Hazard Management. Refer Part 1(3) of this certificate for the applicable Development Control Plan.

(iii) Tidal inundation

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by tidal inundation.

(iv) Subsidence

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by subsidence.

(v) Acid sulphate soils

NO

(vi) Land contamination

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by contamination or potential contamination.

(vii) Any other risk

NO

7A. Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

(3) Words and expressions in this clause have the same meanings as in the standard instrument set out in the <u>Standard Instrument (Local Environmental Plans) Order 2006</u>.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

State Environmental Planning Policy?

NO

Proposed State Environmental Planning Policy?

NO

9. Contributions plans

The name of each contributions plan applying to the land:

08A-08D - KELLYVILLE/ROUSE HILL THE HILLS SECTION 7.12

9A. Biodiversity certified land

Whether the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

NO

Note: Biodiversity certified land includes land certified under Part 7AA of the <u>Threatened Species Conservation Act 1995</u> that is taken to be certified under Part 8 of the <u>Biodiversity Conservation Act 2016</u>.

10. Biodiversity stewardship sites

Whether the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the <u>Biodiversity Conservation Act</u> <u>2016</u> (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage)?

NO

Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the <u>Threatened Species Conservation Act 1995</u> that are taken to be biodiversity stewardship agreements under Part 5 of the <u>Biodiversity Conservation Act 2016</u>.

10A. Native vegetation clearing set asides

Whether the land contains a set aside area under section 60ZC of the <u>Local Land Services Act 2013</u> (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section)?

NO

11. Bush fire prone land

Has the land been identified as bush fire prone land?

NO

12. Property vegetation plans

Has the council been notified that a property vegetation plan approved under Part 4 of the <u>Native Vegetation Act 2003</u> (and that continues in force) applies to this land?

NO

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the <u>Trees (Disputes Between Neighbours) Act 2006</u> to carry out work in relation to a tree on this land (but only if the council has been notified of the order)?

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under section 75P (2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing) of which council is aware, issued under <u>State Environmental Planning Policy</u> (<u>Housing for Seniors or People with a Disability</u>) <u>2004</u> in respect of proposed development on the land?

NO

(b) Whether there are any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a <u>Disability</u>) 2004 that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land?

NO

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

Whether there is a valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), of which the council is aware, in respect of proposed development on the land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 17(1) or 38(1) of <u>State Environmental Planning Policy (Affordable Rental Housing)</u> 2009 that have been imposed as a condition of consent to a development application in respect of the land?

NO

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

NO DEVELOPMENT PLAN APPLIES

(2) The date of any subdivision order that applies to the land.

NO SUBDIVISION ORDER APPLIES

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

19. Site verification certificates

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land - see Division 3 of Part 4AA of <u>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.</u>

20. Loose-fill asbestos insulation

Does the land include any residential premises (within the meaning of Division 1A of Part 8 of the <u>Home Building Act 1989</u>) that is listed on the Loose-Fill Asbestos Insulation Register that is required to be maintained under that Division?

Council has **not** been notified by NSW Fair Trading that the land includes any residential premises that are listed on the register. Refer to the NSW Fair Trading website at www.fairtrading.nsw.gov.au to confirm that the land is not listed on this register.

Note: There is potential for loose-fill asbestos insulation in residential premises that are not listed on the Register. Contact NSW Fair Trading for further information.

21. Affected building notices and building product rectification orders

(1) Whether there is any affected building notice of which the council is aware that is in force in respect of the land?

NO

(2) (a) Whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with?

NO

(b) Whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding?

NO

(3) In this clause:

affected building notice has the same meaning as in Part 4 of the *Building Products (Safety) Act 2017*.

building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

- **Note.** The following matters are prescribed by section 59 (2) of the <u>Contaminated</u> <u>Land Management Act 1997</u> as additional matters to be specified in a planning certificate:
 - (a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THE HILLS SHIRE COUNCIL

This land has frontage to a "Classified Road". Roads and Maritime Services, 27-31 Argyle St, Parramatta, is the responsible authority for classified roads and should be consulted for any road widening proposals.

MICHAEL EDGAR GENERAL MANAGER

Per: wat

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE. WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

ATTACHMENT 1(2)(A)

PLANNING PROPOSAL 1/2017/PLP - REMOVES CITY OF PARRAMATTA FROM THE HILLS SHIRE COUNCIL & CREATES LEP 2017

As a result of the State-wide Council Boundary Review process in May 2016, the Hills Shire Council area was reduced, with part of The Hills Shire becoming part of the new City of Parramatta Council Local Government Area.

This means that LEP 2012 is currently being administered by two Councils. The planning proposal seeks an administrative amendment to The Hills Local Environmental Plan 2012 to:

- 1. Create a new local environmental plan and associated maps which will be known as *The Hills Local Environmental Plan 2017* and which will apply to land within The Hills Local Government Area.
- 2. Amend *The Hills Local Environmental Plan 2012* and associated maps so that it only applies to land formerly in The Hills Local Government Area, now in the City of Parramatta. This instrument will continue to be known as *The Hills Local Environmental Plan 2012*.

The separation of LEP 2012 into two plans will allow both Councils to manage the ongoing planning framework independently. The proposal is an administrative amendment only and there is no proposal to change the planning controls that currently apply to land within The Hills Shire or the City of Parramatta.

Delegation for making of the LEP 2012 has not been issued to Council under the Gateway Determination.

For further information please contact Council's Duty Planner on 9843 0469.

The above details are in keeping with the exhibited planning proposal. Please note that changes to the planning proposal may be made post exhibition. The current status and details of the planning proposal can be viewed on Council's website www.thehills.nsw.gov.au under the 'Building & Planning' menu bar, then 'Application Tracking'.

ATTACHMENT 2(B)

Zone R2 Low Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To maintain the existing low density residential character of the area.

2 Permitted without consent

Home business; Home occupations

3 Permitted with consent

Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Dual occupancies; Dwelling houses; Group homes; Health consulting rooms; Home-based child care; Oyster aquaculture; Pond-based aquaculture; Respite day care centres; Roads; Tank-based aquaculture; Any other development not specified in item 2 and 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments: Boat building and repair facilities: Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Health services facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities: Wholesale supplies

NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2012 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

ATTACHMENT 2(B)

Zone SP2 Infrastructure

1 Objectives of zone

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

2 Permitted without consent

Roads

3 Permitted with consent

The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose

4 Prohibited

Any development not specified in item 2 or 3

NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2012 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

APPENDIX D

GROUNDWATER

9/12/2019 Real-time water data



help · contact · customise

State Overview

State Overview

Rivers and Streams

favourites · search · download sites · find a site

■ Real Time Data - Rivers And Streams

Daily River Reports

■ Daily River Reports

Dams

favourites · search · download sites · find a site

■ Real Time Data - Major Dams

Groundwater (Telemetered data)

favourites · search · download sites · find a site

■ Real Time Data - Bores

All Groundwater Site details

search · download sites · find a site

■ All Groundwater Map

- North Coast Region
- Hunter Region
- Greater Sydney Region
- **■** South Coast Region
- Northwest Region
- **■** Central West Region
- **■** Southwest Region
- **⊞** Far West Region
- **■** Great Artesian Basin
- **■** Coal Basins

Meteorology

favourites · search · download sites · find a site

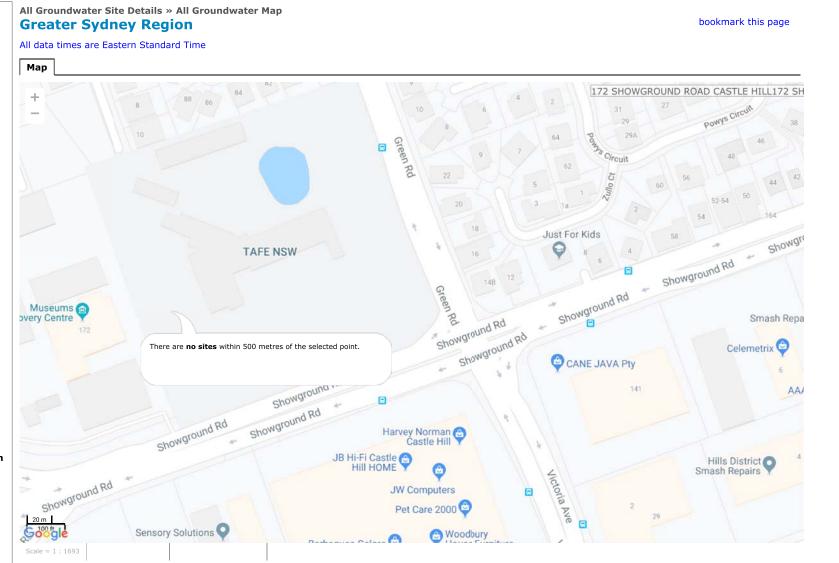
■ Real Time Data - Weather Stations

Hunter Integrated Telemetry System

Hunter Integrated Telemetry System

bandwidth
high low

glossary and metadata



contact WaterNSW

9/12/2019 Real-time water data





TOWN PLANNING

Milestone (Aust) Pty Limited ABN 29 123 048 162

Suite 9, 17 Thurlow Street, Redfern NSW 2016 PO Box 3149, Redfern NSW 2016

T 02 9518 3666

milestonemanagement.com.au

31 January 2020

Bronwyn Inglis Acting Principal Forward Planner The Hills Shire Council PO Box 7064 Norwest NSW 2153

Sent via email: binglis@thehills.nsw.gov.au

Dear Bronwyn

RE: PLANNING PROPOSAL NO. 5/2020/PLP - RESPONSE TO COUNCIL LETTER 2 GREEN ROAD, CASTLE HILL

We refer to the Planning Proposal lodged with The Hills Shire Council (Council) on 18 October 2019 for the abovementioned site and write in response to Council's letter dated 19 December 2019 requesting the submission of additional information to assist Council Officers assessment of the Planning Proposal. This letter provides a response to the matters raised in your letter to enable Council Officers to report the Planning Proposal for consideration at The Hills Local Planning Panel Meeting on 19 February 2020.

Please find enclosed with this letter the following:

- Tree Replacement Strategy prepared by ASPECT Studios dated January 2020 (Attachment A).
- Heritage Review Statement prepared by Curio Projects dated January 2020 (Attachment B).

RESPONSE TO COUNCIL LETTER

Issue (a): Proposed Tree Removal and Replanting

1. An assessment is required against the Biodiversity Conservation Act 2016 and Environment Protection Biodiversity Conservation Act 1999 (EPBC Act)

Response

The Arborist Report prepared by Mackay Tree Management assessed the potential biodiversity significance of the existing plantation on the site and concludes:

"A 'threatened species test of significance (former 7-part test)' in accordance with the Biodiversity Conservation Act 2016, is not required as part of the DA proposal or any future DA proposal. The proposed tree removals do not exceed the threshold for removal of native vegetation under the Biodiversity Offset Scheme."

On this basis, any further assessment against the EPBC Act is not required and the submission of an additional or revised arborist report is not considered necessary.

2. Clarification regarding the planning mechanism to ensure replanting occurs on the TAFE site in accordance with a future Vegetation Management Plan and/or Landscape Plan

Response

The lodgement of the Development Application with Council for the construction of Building J with associated landscaping, and inclusion of the TAFE site as part of the development subject site, will be the

planning mechanism to ensure any replanting on the TAFE site occurs in accordance with any future Landscape Plan. Land Owners consent will be obtained from TAFE and submitted with any Development Application where replanting on the TAFE site is proposed.

3. Submission of a Concept Landscape Plan

Response

A Tree Replacement Strategy prepared by ASPECT Studios is submitted with this letter (refer to **Attachment A**). The Tree Replacement Strategy confirms the commitment of the project to deliver a 2:1 ratio for tree replanting to provide a total of 674 trees on-site and off-site. The Site Plan at Appendix A of the Tree Replacement Strategy includes potential investigation areas for replacement tree planting. It is noted that the areas along the site frontage to Showground Road are generally heavily planted with mature trees and this part of the site requires close examination for replanting opportunities in addition to the other areas of the MDC and TAFE sites as part of the preparation for the future Building J Development Application.

The proposed tree replacement ratio of 2:1 exceeds the Council's minimum requirement of an equal number of replacement trees (Section 3.2 in Part C Section 3 of The Hills Development Control Plan 2012 (DCP 2012)). The proposed 2:1 replacement ratio also exceeds the NSW Government's objective of a 40% Urban Tree Canopy increase as outlined in the *Central City District Plan* (a 100% canopy cover increase is proposed). The 2:1 replanting ratio has been selected to ensure MAAS, as a State Government agency, exceeds minimum canopy cover requirements to ensure significant positive environmental outcomes.

The design development of the building and site layout of the proposed Building J is currently ongoing and subject to feedback and input from the design consultant team and MAAS which is resulting in further refinement and changes to the building footprint. Therefore it is not considered appropriate to provide a concept landscape plan at this stage.

A Landscape Plan will be submitted as part of the future Development Application for the construction of the proposed Building J and this plan will provide detailed consideration to potential planting along the northern boundary of the site to provide some additional visual screening to Sunderland Avenue and in other locations of the MAAS MDC site, where practicable, subject to landscape architect and arborist advice.

We advise that Create Infrastructure, on behalf of MAAS, has commenced discussions with Landcom, Transport for NSW (formerly Roads and Maritime Services) and the Sydney Metro Authority regarding potential suitable locations for tree replanting off-site within The Hills Local Government Area.

4. Location of Car Parking on TAFE Site

Response

Consideration of alternative car parking locations on the TAFE site will be undertaken as part of the preparation of the future Development Application with the aim to minimise the loss of any existing vegetation. Advice from the project arborist and landscape architect will be sought during consideration of any alternative locations.

TAFE does not object to the relocation of car parking within the TAFE site as outlined in the Planning Proposal. Further consultation on this matter will be undertaken with TAFE during preparation of the Development Application in conjunction with traffic consultant advice.

5. Potential Cultural or Heritage Values

Response

A Heritage Review of the plantation trees in the location of the Building J site has been undertaken by heritage consultants Curio Projects (refer to **Attachment B**). The Heritage Review includes an analysis of the history of the use of the site and concludes that based on the information available *"the eucalypt plantation has been deemed to have low significance"* from a heritage perspective for the following key reasons:

• "The plantation is not significant in their own right to meet the threshold of significance at a local or State level.

- The plantation is not so significant at a local level that it would require insitu retention.
- The plantation also has no associations with any significant personnel at either a local or State level and therefore reinforces that the plantation holds no significance beyond the site itself.
- No heritage listings for the plantations or the research conducted from them on either a local or State level."

MAAS is committed to preserve the removed trees where possible and will consider using timber from the removed trees for furniture reuse and/or interpretive displays as part of the redevelopment of the site. Additionally, MAAS is supportive of the recommendation of Curio Projects that "archival recording before the removal of the trees could be conducted to retain information about the site" as part of the future Development Application for the proposed Building J.

Issue (B): Traffic and Car Parking

6. Submission of an Amended Traffic Report

Response

The Traffic Report submitted with the Planning Proposal addresses the parking requirements of the proposed Building J for staff, volunteers and visitors. The submission of an amended report is not required in this instance.

7. Existing Parking Requirements

Response

A Traffic and Parking Report will be prepared and submitted with the Development Application for the proposed Building J which will provide an analysis of the TAFE car parking requirements and may include recommendations regarding the existing provision of car parking on the TAFE site.

The Traffic Report prepared by Traffix for the TAFE DA 1674/2007/HA included the following commentary regarding the provision of 38 "informal" car parking spaces in the south western corner of the TAFE site:

The centre has a design seating capacity for up to 160 students and it is expected that a worst-case scenario would be if 50% of this capacity was used by 'external' people and 50% for students and staff already on site. If it is assumed that 95% of these 'external' people drive, with an average car occupancy of 2.0 persons per car for these special occasions, then an increased demand for 38 spaces results. It is proposed to provide informal grassed areas to accommodate this demands and this is appropriate. It will ensure that all demands are contained within the site, while not imposing an undue burden to provide excess spaces for the normal TAFE demands, which would result in a waste of resources. Notwithstanding this, there is significant additional informal parking area within the site should this ever be required for short term peak demands.

In summary, a total of 219 formal and informal spaces combined (181 and 38 respectively) will be provided for the expanded facility.

Condition 2 of Development Consent No. 1674/2007/HA states the following:

2. Carparking

The provision and maintenance thereafter of a total of 219 spaces comprising 181 sealed parking spaces and 38 informal spaces. Should Council's Manager Development Control determine that 22 of the 38 informal spaces are required on a permanent basis, the informal spaces are required to be sealed and available for use within an agreed time after the written request of Council.

Photo 1 indicates the informal parking area located in the south western corner of the TAFE site (within the southern end of the Planning Proposal site) has not been sealed by TAFE. Based on a review of documentation provided by Council via a Government Information (Public Access) Act 2009 (GIPA) Application submitted by Milestone, Council did not require the permanent sealing of the 22 of the 38 informal spaces given the low actual demand for these parking spaces since approval of DA No. 1674/2007/HA on 26 September 2007.



Photo 1: View of informal parking area (in 2017), view looking north from Showground Road

As outlined in the Traffic Report submitted with the Planning Proposal, it is expected that a proportion of staff and visitors to Building J will travel to and from the site using public transport. It is important to note that the public transport availability in the Castle Hill area has significantly improved since the preparation of the Traffix traffic and car parking report submitted with DA No. 1674/2007/HA in 2007. At the time of the DA lodgement in 2007 the North West Metro rail line, Point-to-Point transport operators such as Uber and On Demand bus services such as *Hillsbus' MetroConnect* did not exist. On this basis, the provision of car parking specified in previous DAs for the TAFE and MDC sites would not reflect any reductions in car parking demand due to public transport infrastructure recently delivered in Castle Hill and surrounding suburbs.

TAFE did not raise any concerns with the proposed car parking relocation within the TAFE site following a review of the Planning Proposal before lodgement with Council.

8. Relocated Car Parking and Potential Impacts on Vehicle Movements on TAFE Site

Response

We confirm that the vehicle access from Green Road across the TAFE site will be maintained. Access along the eastern side of the proposed Building J will also be maintained along a revised alignment to accommodate the new proposed building. The proposal will not diminish the existing level of vehicle access and movement within the TAFE site.

The Planning Proposal was reviewed in detail by TAFE prior to granting land owners consent and lodgement with Council. No objections were raised by TAFE in regards to the relocation of car parking spaces or in regards to vehicle movements within the TAFE site. Prior to lodgement of the Development Application with Council for the proposed Building J, MAAS will consult with TAFE regarding the location for relocated car parking.

9. Confirmation from TAFE Confirming Continuation of Existing Access and Overflow Parking Arrangement

<u>Response</u>

The Planning Proposal was reviewed in detail by TAFE prior to lodgement with Council and no issue was raised in relation to the ongoing use of the TAFE site by MAAS for overflow car parking and vehicle access via Green Road.

Prior to lodgement of the Development Application with Council for the proposed Building J, MAAS will liaise with, and seek owners consent from, TAFE which will include confirmation that the existing long standing arrangement of overflow car parking and vehicle access via Green Road by MAAS will continue.

Issue (C): Visual Impact, Built Form and Amenity

10. Submission of a Visual Impact Analysis, Photomontages, Elevations and External Finishes/Materials

Response

The Planning Proposal report includes images depicting the extent of the proposed building envelope as viewed from the north of the site from Sunderland Avenue (refer to Figures 14 and 15 on Page 27). A larger version of Figure 15 is replicated below for clarity which shows the low height of the proposed 15m height envelope (shown as a dashed line).



Figure 1: Photo from Sunderland Avenue, view south looking towards the site showing the proposed building envelope (dashed lines). Note that the building will be located behind the existing tree canopies Source: Lahznimmo Architects, 2019, Figure 15 in Planning Proposal Report prepared by Milestone

Due to the ongoing design development of Building J the submission of a Visual Impact Analysis, Photomontages, Elevations and External Finishes/Materials will not be provided with the Planning Proposal as such information is likely to change and will not represent the final Development Application design submitted with Council. These documents will be provided with the Development Application for the proposed Building J. The external materials and finishes will give reference to Section 2.7 "Building Design and Materials" in Part B Section 6 of DCP 2012

As outlined in the Planning Proposal, the proposed Building J will have minimal visual impact when viewed from the residential area to the north of the site on consideration of the following key reasons:

- The proposed 15m building height control for the proposal will result in an infill building that will sit comfortably within the scale and heights of existing buildings on both the TAFE and MDC sites which range in height from 11.6m to 17m above ground level.
- The nearest residential properties to the north of Building J are located approximately 50m from the northern end of the proposed new building. The physical separation which includes an existing vegetated buffer ensures there is no visual bulk implications as a consequence of the proposal.
- The maximum height of the proposal is 15m which provides an appropriate height and scale transition to the maximum height permitted in the abutting R2 Low Density Residential Zoned area to the north of 10m
- Existing vegetation will be maintained and provide visual screening (refer to **Figure 1** above). Opportunities for additional landscaping along the northern boundary of the TAFE site will be explored during the preparation of the Development Application.

11. Hours of Operation for Proposed Building J

Response

The hours of operation for the proposed Building J will be confirmed as part of the Development Application, however, to assist with Council's assessment of the Planning Proposal we advise that the following operating hours are envisaged by MAAS:

- The Collection Areas of the building will operate from 6.30am to 6.00pm Monday to Friday with occasional "out of hours" work for special operations such as deliveries and pick-ups for international exhibitions and Very Large Objects (VLO) transportation.
- Public access (e.g. small tours, researchers) will be made available from 10.00am to 5.00pm Wednesday to Sunday only.

Please contact the undersigned if you require any clarification of this matter.

Yours sincerely

Milestone (AUST) Pty Limited

Patrick Lebon
Director

ATTACHMENT A

TREE REPLACEMENT STRATEGY PREPARED BY ASPECT STUDIOS DATED JANUARY 2020

TREE REPLACEMENT STRATEGY

Proposed Expansion of Museum Discovery Centre

January 2020

DOCUMENT CONTROL				
٧	DATE	DESCRIPTION	BY	REVIEW
1	28.01.2020	Draft 1 for review	KB	JK
2	29.01.2020	Draft 1 for review	KB	JK
3	30.01.202	FOR INFORMATION	KB	JK

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1.0 INTRODUCTION

The purpose of this document is to outline the Museum of Applied Arts & Sciences' (MAAS) approach and commitment to the replacement of any trees that would be removed, subject to the future Development Application, for the MAAS expansion at Museum Discovery Centre, 2 Green Road, Castle Hill (Lot 102 DP 1130271).

2.0 TREE REMOVAL

The proposal for Building J requires the removal of a total of 337 trees from the TAFE site. Tree removal & retention plan19107-LA-015 (appendix A) details this quantity and their location.

A detailed survey is required to determine the percentage of the site area canopy coverage that would be lost.

The Arborist Report prepared by MacKay Tree Management identifies 330 of the 337 to be removed as plantation trees (planted in the 1940s). The tight spacing of these trees and their 'forest forms'- 'tall with narrow spreading crowns that are concentrated towards the top of the trees' - means as a group they provide a mature canopy but individually are less valuable.

3.0 MITIGATION STRATEGIES

3.1 Tree Replacement

The form and structure of the existing trees mean they are not suitable for to be transplanted and therefore this document and the Arborist Report prepared by MacKay Tree Management recommend the removed trees be offset by replacement planting.

MAAS would commit to a replacement ratio of 2:1 for any trees that are removed. This ratio aims to offset the loss of mature tree canopy loss. Therefore if 337 trees are proposed for removal by a future DA application, 674 replacement trees would be planted.

3.2 Locations

Replacement planting locations will include:

 On site; wherever feasible replacement planting across the MAAS site will be proposed. A commitment is made to tree and native understorey planting to screen the relocated substation. As well as strategic planting along the frontage of Building J to ensure its facade is integrated into Showground Road and the landscape whilst also remaining highly visible for all visitors to the Museum. Additional planting along the Museum site boundary (Windsor and Showground Road) will be considered, but existing dense trees may limit opportunities and so alternatives off site will need to be considered. Tree removal & retention plan19107-LA-015 (appendix A) highlights possible investigation areas for replacement tree planting, with a future DA submission to detail all proposed on-site tree, understorey and mass planting (such as rain gardens).

 Other Locations within the LGA: Subject to further discussions with Council and other land owners, suitable locations within the LGA will be identified, these may include Open Space, Parks, Reserves and Streets. Discussion between Council and Create NSW have already commenced.

3.3 Species

The most appropriate tree species will be specified based on numerous factors such as site suitability, functional and ecological attributes, aesthetic, and suitable landscape character.

Where possible, locally indigenous tree species should be planted. Within the Hills Shire this will include species such as Eucalyptus resinifera (Red Mahogany), Eucalyptus paniculate (Grey Ironbark) and Eucalyptus globoidea (White Stringybark). Species selection will be agreed with Council once replacement locations have been confirmed.

3.4 Size & Specification

MAAS is willing to plant a range of sizes up to mature tree stock of 400L, quantities will be subject to further discussions with council.

Quality nursery stock will be specified according to latest best practice and standards. All trees supplied should conform to the National Specification System of Australia (NATSPEC) guide "Specifying Trees – a guide to assessment of tree quality".

3.5 Installation & Spacing

Standard technical specifications and installation techniques will ensure successful establishment of newly planted trees.

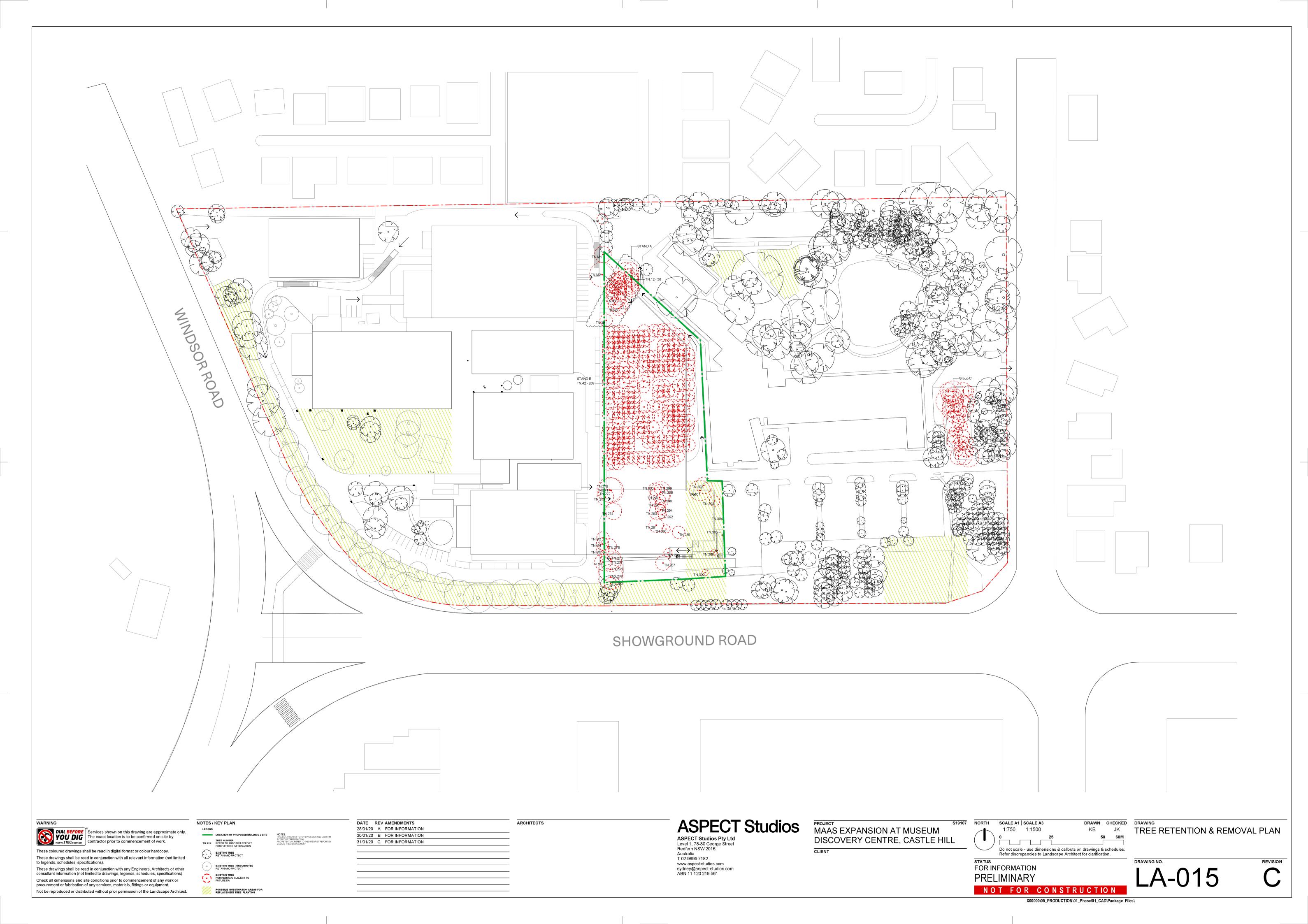
New trees plantings should be spaced at densities appropriate to the selected tree species and proposed locations. For example, 7m centers spacing would be appropriate for the species outlined in 3.3 above.

4.0 CONCLUSION

At present any trees identified for removal are subject to a future Development Application. A DA submission will include landscape plans that detail all proposed on-site planting, however this document sets out MAAS' approach and commitment to replacement tree planting. A large portion of replacement tree planting will need to occur off-site which will be subject to further discussion with Council during the DA process, working together to identify suitable sites within the LGA.

Appendix

A Tree Retension and Removal Plan



ATTACHMENT B

HERITAGE REVIEW STATEMENT PREPARED BY CURIO PROJECTS DATED JANUARY 2020



30 January 2020

Tania Alexander Create Infrastructure Level 3, 320 Pitt Street Sydney, NSW, 2000

Dear Tania,

RE: Assessment of Eucalypt Plantation for Museum Discovery Centre Expansion, Powerhouse Castle Hill

Thank you for asking Curio to provide some initial heritage advice to you on the expansion of the Powerhouse Museum Discovery Centre located at 172 Showground Road, Castle Hill.

Background

The Museum Discovery Centre (MDC) in Castle Hill (Lot 102 DP 1130271) is owned and operated by the Museum of Applied Arts and Sciences (MAAS) and is mainly used as a storage facility for museum collections from MAAS, Australian Museum and Sydney Living Museums, as well as being a public space for events and exhibitions. It consists of six buildings that are predominantly used as storage spaces for collection, as well as open public areas for guided tours of the collections and both temporary and permanent exhibitions (Building E). The site for the proposed Building J is currently owned by TAFE NSW (Figure 1).

A new building (Building J), managed and designed by Create Infrastructure at Create NSW with Lahznimmo Architects is being proposed as a new facility to accommodate both MAAS and their Ultimo Powerhouse Museum's collections, workshops, offices, production and conservation and treatment operations permanently. The proposed building will be located east of the MDC, on the western side of the existing TAFE site.²

¹ MDC Site History - MAAS

² Planning Proposal, Proposed Expansion of Museum of Applied Art and Sciences – Museum Discovery Centre, 2 Green Road, Castle Hill (Lot 102 DP 1130271), prepared by Milestone, 2019





Figure 1: TAFE site (green), MDC site (red), proposed Building J site (yellow)

(Source: SIX Maps)

Heritage Listing

When searching through the Office of Environment and Heritage Aboriginal Heritage Information Management System (AHIMS), it is revealed that there are no recorded or known locations of Aboriginal sites that are either within or around the subject area. Therefore, the proposed works at the subject site will have no significant impacts on any aboriginal heritage sites or places.

The nearest heritage item to the subject site is "Windsor Road from Baulkham Hills to Box Hill", listed in Schedule 5 of LEP 2012 (No. 128), and is located approximately 115m south-west of the MDC. Hence, due to the distance between the subject site and the closest heritage item, no proposed works in the expansion of the MDC will impact upon the visual or physical settings of the heritage item.



Historical Summary

The land on which the MDC and TAFE campus is situated on was utilised by MAAS in the 1940s, specifically to establish a variety of tree and shrub plantations for experimental research on essential oils. Thousands of seedlings, predominantly eucalyptus, were planted to determine which yielded the most oil and were therefore suitable for commercial plantations. This was a direct response to increased international competition from places like South Africa, Swaziland and Spain, that had established their own eucalyptus oil industries in the post-war period, using eucalypts grown from Australian seeds.³

During this time, the property included a still-house containing five stills for the distillation of oil from the leaves and a laboratory, a residence for the on-site manager, and a range of sheds and a glasshouse. Between 1978 and 2017, the construction of various buildings occurred as the museum's collection grew and the need to facilitate the storage of these items and spaces for both the public and exhibitions. Research into essential oils continued until 1979 when a report issued by the NSW Science and Technological Council recommended that the research was undertaken by the Museum be transferred to the Department of Agriculture, as part of a wider rationalisation of all research being undertaken by NSW Government departments.

From research undertaken by the Museum in 1990, it appears that under the Public Works Act 1912, the Government acquired the land 'for a public school' in 1947. The Land Title to the whole Castle Hill property was initially held by the NSW Department of Education. The Land Title for a portion of the site (on which the MDC now sits) was transferred to the Museum on 27 April 1994, and the remainder was retained by the Department of Education.

Assessment of Significance

The tree and shrub plantations, specifically Stands A, B and C are not heritage listed nor have they been recognised on a local or state level as having heritage significance. Much of the original plantations and other natural landscape features have already been removed with the development of the TAFE campus and MDC expansion.

An evaluation of the plantations was conducted by Mackay Tree Management, in which they used a Significance of a Tree Assessment Rating System (STARS) to determine the potential significance of the plantations and their condition. Based on the arborist report, the Stand A plantation holds a low-medium significance due to the age of the White Cedar and Grey Gum trees (semi-mature). Stand B have low significance due to the unknown source of the Spotted Gum plantation stock, as well as the weak structure of the trees due to their close proximity to

³ https://collection.maas.museum/object/373318



each other. Stand C also consists of a Spotted Gum plantation, and has low significance due to its poor condition, potentially from termite damage.⁴

Culturally, while the plantations were a response to researching which eucalyptus species yielded the most oil for commercial use, there is not a wide range of information on the results of this work.

Summary of Potential Issues Raised by Council

- Removal of trees in Stands A, B and C could impact on the landscape of the site and have environmental impacts
- The plantations and the research they were used for may have potential significance

Conclusions & Recommendations

Based on the analysis of the above information, the eucalypt plantation has been deemed to have low significance. The following summary has been prepared in response to the history and significance of the plantations in relation to the subject site to provide guidance concerning the removal of the plantations to accommodate the construction of Building J.

- Currently, there are no heritage listings for the plantations or the research conducted from them on either a local or State level.
- The plantation is not significant in its own right to meet the threshold of significance at a local or State level despite the commonality of the tree species (*Corymbia maculate*, Spotted Gum) within the local Cumberland Plain Woodland area. The physical conditions of the plantations themselves have also been deemed to have low significance overall due to their poor condition and semi-mature nature. This is in accordance with the STARS assessment criteria, where they specify the low significance for several reasons:
 - Growth is severely restricted by above or below ground influences and is unlikely to reach typical dimensions under normal circumstances
 - > The tree is in good-poor condition and good-low vigour
 - > The tree is a young specimen which may or may not have reached dimension to be protected by local tree preservation orders or similar protection mechanisms
 - > The tree has a wound or defect that has the potential to become structurally unsound
- Historically, the eucalypt plantation is interesting, however, its history could be
 interpreted throughout the redevelopment of the Building J site, as the plantation is not
 so significant at a local level that it would require insitu retention. The plantation also has
 no associations with any significant personnel at either a local or State level and
 therefore reinforces that the plantation holds no significance beyond the site itself.

⁴ Arboricultural Impact Assessment Tree Survey, Museum of Applied Arts and Science, Museum Discovery Centre, Mackay Tree Management, prepared for Lahznimmo Architects, 2019



- The plantation trees exhibit poor form and structure, and therefore will potentially cause safety and environmental issues down the track. As mentioned in the arboricultural report, the plantation does not represent the natural environment and is set in very dense grids that are unsustainable for the trees long term.
- The proposed trees to be removed do not exceed the threshold for removal of native vegetation under the Biodiversity Offset Scheme.
- Replacement plantings for the lost trees will be incorporated into the landscaping of the
 proposed construction with local indigenous eucalypt and shrub species to restore the
 landscape. By also incorporating 'representative plantings' to the landscaped areas, the
 site can hold some interpretive meaning, with the use of signage as a discussion point for
 the former history of the site. The removed trees can be used for furniture reuse and
 interpretive displays as part of the redevelopment of the site.
- The site has very little archaeological potential due to the extensive and intrusive tree root networks as a result of the dense plantation layout and already a very developed area in which the MDC is situated.
- A limited amount of information on the history of the site and the reasons for the
 research project are kept in the MAAS collections. It is suggested that further archival
 recording before the removal of the trees could be conducted to retain information
 about the site.
- There are numerous other examples of successfully established commercial eucalyptus oil plantations, such as:
 - ➤ The predominant harvest areas for all Australian eucalypt oil production are in Bendigo, Victoria (since 1890) and West Wyalong in NSW (since the early 1900s), and are distributed by a variety of companies across Australia.
 - > Australian Eucalyptus Oil Company and is located in Arnold, Victoria. Their eucalypt farm has been successful for over 120 years.
 - ➤ Western Australia established large-scale plantations for oil production and energy generation to reduce greenhouse gasses and soil salinity.
 - All listed above use Australian Blue Mallee Eucalypts (*Eucalyptus polybractea*), unlike the MDC plantation, which used Spotted Gum (*Corymbia maculate*).

Should you have any further enquiries, please do not hesitate to contact me on either email: natalie.vinton@curioprojects.com.au or tel: 0412737196.

Yours Sincerely,

Natalie Vinton

Director

Curio Projects Pty Ltd.



The Hon. Dr Geoff Lee MP

Minister for Skills and Tertiary Education Acting Minister for Sport, Multiculturalism, Seniors and Veterans

Ref: OM19/3706

Mr Michael Edgar General Manager The Hills Shire Council PO Box 7064 NORWEST NSW 2153

Michael

Dear Mr Edgar

LODGEMENT OF PLANNING PROPOSAL TO REZONE PART OF TAFE NSW CASTLE HILL SITE FROM R2 LOW DENSITY RESIDENTIAL ZONE TO SP2 INFRASTRUCTURE ZONE - 2 GREEN ROAD, CASTLE HILL

As owner of the above-mentioned property, I consent to the Planning Proposal application identified above being made to The Hills Shire Council (Council).

I hereby permit any duly authorised Council Officers to enter the site to carry out inspections in relation to the Planning Proposal application, provided that at least five business days' notice is given to TAFE NSW.

In addition, I authorise town planning consultants Milestone (AUST) Pty Limited to lodge and act as the applicant for the Planning Proposal application at this site.

In signing this letter I declare that I am aware of and acknowledge Council's Political donations and privacy policies.

Yours sincerely

The Hon. Dr Geoff Lee MP

Minister for Skills and Tertiary Education

Acting Minister for Sport, Multiculturalism, Seniors and Veterans