Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Site Investigation

Australian Museum
1 William Street, Sydney

Prepared for
Australian Museum

Project 86582.00
October 2018

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	86582.00	Document No.	R.001
Document title	Report on Preliminary Site Investigation Australian Museum		
Site address	1 William Street, Sydney		
Report prepared for	Australian Museum		
File name	86582.00.R.001.Rev0		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Matthew Hyde	Paul Gorman	16 October 2018

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Greg Murphy, Australian Museum

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		16 October 2018
Reviewer		16 October 2018

bsi. ISO 9001 Quality Management
FS 604853

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

Table of Contents

Page

Report on Preliminary Site Investigation
Australian Museum
1 William Street, Sydney

1. Introduction

This report describes the methodology and results of a preliminary site investigation (PSI) for contamination for the site identified as 1 William Street, Sydney (Australian Museum) as shown on Drawing 1, Appendix A (the site). The work was commissioned by Mr Greg Murphy on behalf of the Australian Museum and was undertaken in general accordance with Douglas Partners Pty Ltd (DP) proposal dated 4 October 2018. This PSI is required to support a development application to Council for Phase 1 of the redevelopment and additions to the current structure.

The objectives of the PSI were to:

- Where possible, identify potential sources of contamination and determine the potential contaminants of concern;
- Where possible, identify potential human and ecological receptors; and
- Where possible, identify potentially affected soil and groundwater.

The PSI has been conducted in general accordance with the National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure* 1999 (amended 2013, NEPC 2013) and included a review of historical information, a site walkover and development of a preliminary conceptual site model (CSM).

2. Scope of Works

The scope of works comprised:

- Order and review of a Lotsearch Report including the following:
  - Historical aerial photographs;
  - Public databases held under the *Contaminated Land Management Act 1997* (CLM Act) and the *Protection of the Environment Operations Act 1997* (POEO Act);
  - Topographic maps;
  - Soils, acid sulphate soils and geological maps;
  - Department of Primary Industry groundwater bore records;
  - Historic maps (including historic UBD);
  - Historic business searches;
- Obtain and review the following:
  - Historical title deeds; and
  - Section 149(2) Planning Certificates provided by the client.

- A site walkover to observe current and recent land use and assess the potential for contaminating activities.

On the basis of the above scope, this PSI report documents the findings of the investigation. The report includes a preliminary CSM of the potential contamination sources, potential contaminant transport pathways and receptors for the proposed development, comments on the risk of contamination, and provides recommendations for further investigation (if necessary).

3. Site Description

3.1 Site Identification

The site has a street address of 1 William Street Darlinghurst and is identified by the following:

- Lot 1 in DP 1157811, and
- Lot 3 in DP 1046458, and
- Lot 11 in DP 588102.

The site covers an area of approximately 1.1 hectares and is within the Local Government Area of the City of Sydney.

The site location is shown on Drawing 1, Appendix A.

3.2 Site Description

A walkover of the site was undertaken by an environmental scientist from DP on 10 October 2018 in the presence of Greg Murphy and Glen Murray. Observations of the site and surrounding areas, in particular with respect to the potential for contamination, is summarised below with photographs provided in Appendix B.

At the time of the walkover, the majority of the site was occupied by the operational Museum and general support buildings such as archives and stores. The main Museum building is comprised of several wings built over the course of the history of the site, and comprises nine levels, namely: loading dock, basement, lower ground, lower ground mezzanine, ground floor, and Levels 1 – 4. A two storey heritage listed school (former National School) building faces onto William Street and there are two sections of asphalt hardstand allowing vehicle access to the dock and a small carpark for visitors and staff. The hardstand area was generally in good condition, with no obvious signs of cracking.

The interior of the building was accessible via College Street for public access and William Street for staff and deliveries.

Multiple ventilation and service pipes (including water, gas and electrical) were connected to the buildings and multiple air-conditioning units of variable age and condition were also present. The asphalt footpaths on William and College Streets were in good condition with minimal staining and cracking.

The undersides of floor slabs in the Lewis Wing and Still Addition were observed via access next to plant rooms. Generally the slabs were observed to be poured onto the cut sandstone, however small amounts of demolition rubble were observed in some areas as backfill.

The internal flooring was a combination of carpet, concrete, ceramic tile, wood and vinyl that were in good condition. Although access was not available to all areas of the building interiors, it is noted that majority of the buildings contained bathrooms and the food outlets had kitchen areas. It is expected that the storage of general waste, general cleaning supplies and cooking oils were indoors.

Two major plant rooms containing electrical distribution boards and air conditioning, and a single grease trap was observed via access through the loading dock (Photograph 10).

There was no observed evidence of underground storage tanks at the site (e.g. vent pipes, filler points, monitoring points). Furthermore, discussions with site staff indicate that USTs have never been located on site. The backup diesel generator has a small amount of diesel in an internal (above ground) storage tank. Refuelling is undertaken via a pumping from a truck in the loading dock. The area does not have any evidence of bunding and it is unknown whether the drainage from the loading dock goes to sewer or stormwater.

One wing of the museum, known as the Spirit House, is used for the storage of embalmed specimens. Traditionally this is achieved through the use of formaldehyde. The current method is to use ethanol. A storage and waste room is found towards the rear of the dock. The storage room is sealed and there is no egress available for spills.

In summary the site is surrounded by the following:

- North: Domain Park and St Marys Cathedral;
- East : Yurong Street with mixed low density commercial buildings and a hotel with a pub;
- South: Yurong Street with Sydney Grammar School; and
- West: College Street with Hyde Park.

3.3 Proposed Development

The proposed development includes the refurbishment and extension of portions of the museum in a number of phases. It is understood that Phase 1 of the works includes the demolition and refurbishment of a portion of the storage in the “Still Addition” and the installation of a lift and escalator with associated excavation for service pits, and an extension to the recently constructed “Crystal Hall”.

Selected architectural drawings are provided in Appendix A for reference.

4. Geology, Topography and Hydrogeology

Reference to the Sydney 1:100 000 Series Geological Sheet indicates the site is underlain by Hawkesbury Sandstone and Wianamatta group shales of Triassic age. Hawkesbury sandstone typically comprises medium to coarse grained quartz sandstone, very minor shale and laminate lenses, and Wianamatta group shales are comprised of black to dark grey shale and laminate.

The geological mapping was confirmed by DP's previous geotechnical investigation in February 2007[1], and during the site walkover on 9 October 2018, wherein the cut face of the basement level was inspected from the underside of the slab (refer Photograph 3, Appendix B).

The NSW Acid Sulphate Soil (ASS) Risk Map indicates that the site is not within an area of known ASS and hence the potential presence of ASS is considered to be low. This is consistent with the site's elevation (above 20 m AHD) and the site's geological setting (discussed above).

The site slopes down from College Street (29 m AHD) to the east towards Yurong Street (16 m AHD).

Given that the site and surrounding areas is predominately covered in hardstand (i.e. buildings, roads, etc.), surface water is predominantly intercepted by artificial drainage lines and redirected to the local stormwater network. This would continue to be the case post development of the site.

Page 117 of the Lotsearch Report (Appendix C) shows that the site sits on a porous and highly productive aquifer (source: *Hydrogeology Map of Australia: Commonwealth of Australia* Geoscience Australia). Pages 118 and 119 of the Lotsearch Report show registered groundwater bores in close proximity to the site. The nearest bores (generally 400 m to the east of the site) are noted as monitoring bores of about 30 m, with no reported standing water levels (source : NSW Department of Primary Industries - Office of Water). On this basis it is considered likely that regional groundwater is at depth beneath the site.

5. Site History

The desktop component of this investigation involved a review of historical information relating to potential contamination sources at the site. Relevant findings are provided in this section, and are based on a review of the Lotsearch Report in Appendix C, and Section 10.7 Planning Certificates included in Appendix D.

5.1 Aerial Photographs

Historical aerial photographs are provided in the Lotsearch Report, pages 90 to 99.

Historical aerial photographs from 1943, 1955, 1961, 1976, 1984, 1994, 2008 and 2016 were reviewed to gain an understanding of features on the site and immediate surrounds and hence the potential for contaminating activities to have impacted the site.

[1] Douglas Partners Pty Ltd, *'Report on Waste Classification of Filling Material Australian Museum, College Street Sydney*, project reference 44653. February 2007 (DP, 2007)

In the 1943 image the site was occupied by buildings associated with the Museum to the west, and a public school for girls to the east (as noted on the historical map, page 103 of the Lot search Report). The site was surrounded by William Street to the north, College Street to the west, Yurong Street to the east and Sydney Boys Grammar School (as noted on the historical map) to the south.

The 1955 image shows no significant change to the appearance of the site and immediate surrounds since 1943.

In the 1961 image, the north-eastern part of the museum has had buildings demolished and a new building erected, as part of the museum. The eastern portion of the site is documented as "Child Welfare Department" (as at 1956 as noted on page 102 of the Lotsearch Report). Apart from a new building in the Sydney Boys Grammar School, there are no other significant changes to the appearance of the immediate surrounds.

The remaining images from 1965 through to 2016 show on minor (or no) changes to the building layouts on the site and immediate surrounds.

5.2 Historical Title Deeds

A historic title deed search was conducted for the site by InfoTrack Pty Ltd (Appendix D) and was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site. A summary of the title deeds and possible land uses (with reference to other information presented in this report) is presented in the Tables 1 to 4 below for the three lots as shown on the cadastre map in Appendix D.

Discussions with site staff indicate that prior to the granting of a title for the museum, the site was used as a convict garden.

Table 1: Historical Titles for Lot 1 DP 1157811

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Activity
2017 – to date	Australian Museum Trust	Public Museum
(2015 – to date)	*(current lease to Ausgrid of substation premises no. 35223 shown on Folio Identifier 1/1157811)*	Public Museum
(2015 – to date)	*(current lease to Blue Asset Partner Pty Ltd, Eric Alpha Asset Corporation 1 Pty Ltd, Eric Alpha Asset Corporation 2 Pty Ltd, Eric Alpha Asset Corporation 3 Pty Ltd & Eric Asset Corporation 4 Pty Ltd shown on Folio Identifier 1/1157811)*	Public Museum
2010 – 2017	The Trustees of The Australian Museum	Public Museum

Table 2: Historical Titles for Lot 11 DP 588102

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Activity
1988 – to date	Australian Museum Trust	Public Museum
	(Lot 11 DP 588102 – CTVol 13387 Fol 62)	
1986 – 1988	Australian Museum Trust	Public Museum
1977 – 1986	Minister for Public Works	Public Museum
1977 – 1977	The Trustees of The Sydney Grammar School	School
	(Land in Parish Alexandria – Area 2 Roods 15 ¼ Perches – CTVol 6534 Fol 163)	
1975 – 1977	The Trustees of The Sydney Grammar School	School
1952 – 1975	The Commonwealth of Australia *(vide Acquisition)*	School
	(Land in DP 59572 – Area 2 Roods 13 ¼ Perches – CTVol 1212 Fol 82)	
1948 – 1952	Reginald Thomas Coulson, secretary Beaufort Burdekin, barrister at law	School
1948 – 1948	Beaufort Burdekin, barrister at law	School
(1946 – 1952)	*(lease to Society Entertainments Pty Limited shown on CTVol 1212 Fol 82)*	School
(1946 – 1946)	*(lease to Society Entertainments Pty Limited shown on CTVol 1212 Fol 82)*	School
1933 – 1948	Beaufort Burdekin, barrister at law Florence Hay	School
1932 – 1933	James Alison, gentleman Florence Hay	School
1929 – 1932	Winton Estate Proprietary Limited	School
(1911 – 1935)	*(lease to The Hyde Park Skating Rink Limited shown on CTVol 1212 Fol 82)*	School
1904 – 1929	Catherine Burdekin, widow James Alison, gentleman	School

Table 3: Historical Titles for Lot 3 DP 1046458

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Activity
1988 – to-date	Australian Museum Trust	Public Museum
	(Lot 11 DP 588102 – CTVol 13387 Fol 62)	
1986 – 1988	Australian Museum Trust	School
1977 – 1986	Minister for Public Works	School
1977 – 1977	The Trustees of The Sydney Grammar School	School
	(Land in Parish Alexandria – Area 2 Roods 15 ¼ Perches – CTVol 6534 Fol 163)	

5.3 Council Section 149 Planning Certificates

Section 149 (2) Planning certificates for the site were provided to DP by the client. These certificates were dated between 11 June and 25 October 2017 and indicated that the land is zoned Zone B8 Metropolitan Centre. There was no indication that the site is known to be contaminated or has been subject to a site audit.

Copies of the Section 149 Planning certificates are provided in Appendix D.

5.4 Regulatory Notice Search

The EPA publishes records of contaminated sites under Section 58 of the CLM Act on a public database, accessible via the internet. The notices relate to investigation and/or remediation of significant contaminated as defined under the CLM Act. More specifically the notices relate to the following:

- Actions taken by the EPA under Sections 15, 17, 19, 21, 23, 26 or 28 of the CLM Act;
- Actions taken by the EPA under Sections 35 or 36 of the Environmentally Hazardous Chemicals Act 1985; and
- Site audit statements provided to the EPA under section 52 of the CLM Act on sites subject to an in-force remediation order.

The NSW EPA also issues environmental protection licenses under Section 308 of the POEO Act. The register contains:

- Environmental protection licenses;
- Applications for new licenses and to transfer or vary or extend licenses;
- Environment protection and noise control licenses;
- Convictions and prosecutions under the POEO Act;
- The result of civil proceedings;
- License review information;
- Exemptions and provisions of the POEO Act or Regulations;
- Approvals granted under Clause 9 of the POEO (Control of Burning) Regulation; and
- Approvals granted under Clause 7a of the POEO (Clean Air) Regulation.

As noted on page 10 of the Lotsearch Report the site is not listed on the record of contaminated sites under Section 58 of the CLM Act.

As noted on pages 13 to 17 of the Lotsearch Report, the site is not listed as having a present or former licensed activity under the POEO Act.

5.5 Historical Business Activity

A review of historical business activities was undertaken by reviewing the UBDs Business to Business Directory for 1950, 1961, 1965, 1970, 1975, 1978, 1982, 1986 and 1991 (Lotsearch Report, pp. 19-89). Activities that are located up-gradient have the greatest potential to be a source of contamination which may have potentially impacted the site through migration. Noting the site's location is down gradient of a park, and its closest neighbours are a school and a church, the following comments are limited to businesses directly adjacent, yet downgradient (within 100 m, east) of the site. Further details are provided in Appendix C.

The key findings of the search are as follows:

- Onsite: Deposited plans indicate the site has operated as a museum and education facility since 1854.
- Offsite activities to the east: Motor garages, glass manufacturers, and refrigeration engineers from the 1950s, sheet metal workers and motor garages from the 1960s, rubber manufacturing, sheet metal and motor garages from the 1970s, all cross gradient or down gradient of the site.

In broad terms, business uses in the area appear to have progressively become more service and retail focused and less associated with wholesaling and manufacturing.

6. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present of in the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

6.1 Potential Contamination Sources and Contaminants of Concern

Based on the site walkover and historical information obtained, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified and summarised in Table 4 below:

Table 4: Potential Contamination Sources and Contaminants of Concern

Potential Source	Description of Potential Contaminating Activity	Contaminants of Concern
S1- Partial demolition and deterioration of site structures	Impact on soils at rear of site under concrete hardstand due to demolition and removal of sections of the buildings as part of building alterations and/or deterioration of these structures.	Asbestos, lead based paints, PCB capacitors, synthetic mineral fibres (SMF).
S2- Imported fill	Use of uncontrolled fill to level the site prior to construction of the buildings and/or concrete hardstand at centre of the site. Anticipated to be minimal given shallow depth to sandstone.	Asbestos, heavy metals, TRH, BTEX, PAH, OCP, OPP, PCB and phenols
S3- Former and existing on-site uses	Inappropriate disposal of wastes and associated leaking pipework or tanks (e.g. generated from embalming samples, grease traps associated with food preparation, and above ground petroleum storage systems). Storage and use of solvents for cleaning of premises and equipment. Application of pesticides for building management.	TRH, BTEX, PAH, VOC, VCH, heavy metals OCP, OPP, PCB and phenols.

Notes:
TRH - total petroleum hydrocarbon
BTEX - benzene, toluene, ethylbenzene, xylene
PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyls
OCP - organochlorine pesticides
OPP - organophosphorus pesticides
VOC - volatile organic compounds
VCH- volatile chlorinated hydrocarbons

The potential contamination sources on the site are therefore as follows:

S1 Partial demolition and deterioration of site structures;

S2 Imported fill;

S3 Former and existing on-site commercial/retail site uses (e.g. embalming of samples with formalin / formaldehyde and ethanol).

6.2 Potential Receptors

6.2.1 Human Health Receptors

R1 Current site users (workers, visitors);

R2 End users (workers, visitors);

R3 Construction and maintenance workers; and

R4 Adjacent site users (school / commercial).

6.2.2 Environmental Receptors

R5 Groundwater

Given that surface runoff area is collected by the local storm water network and the proposed alterations and additions will not result in any significant changes to stormwater management, stormwater is not considered as a contaminant receptor.

Similarly, the site has been built up since prior to 1943, and the proposed alterations and additions will not significantly alter the exposure to soils at the site, therefore it is considered that terrestrial ecology receptors are not relevant for this assessment.

6.2.3 Potential Pathways

Potential pathways for the identified contamination to impact on the receptors include the following:

P1 Ingestion and dermal contact;

P2 Inhalation of dust and / or vapour;

P3 Leaching of contaminants and vertical migration into groundwater; and

P4 Lateral migration of groundwater.

It is noted, however, that the regional groundwater has been assumed to exist at considerable depth beneath the site and therefore the potential for contaminants to migrate to groundwater is considered to be low.

6.3 Summary of Preliminary CSM

A ‘source – pathway – receptor’ approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on the site, via the identified exposure pathways. The possible pathways between the above sources (S1 to S3) and receptors (R1 to R5) are provided in Table 5 below.

Table 5: Summary of Potential Complete Pathways

Potential Source and Contaminants of Concern	Pathway	Receptor	Risk Management Action Recommended
S1 – Partial demolition and deterioration of site structures - Asbestos, lead based paints, PCB capacitors, SMF.	P1 – Ingestion and dermal contact	R1 - Current users R3 - Construction and maintenance workers	Assessment of the filing, primarily near surface soils, for contaminants. Removal of impacted materials of concern during bulk excavation of the site. (Moderate Risk)
	P2 – Inhalation of dust and/or vapours	R1 - Current users R2 - End users R3 - Construction and maintenance workers R4 – Adjacent site users	
S2 - Imported fill S3- Former and existing on-site commercial/retail uses) - Asbestos, TRH, BTEX, PAH, VOC, VCH, heavy metals OCP, OPP, PCB and phenols.	P1 – Ingestion and dermal contact	R3 - Construction and maintenance workers	An intrusive investigation is recommended to assess possible contamination including chemical testing of the soils in the area(s) of proposed works. Removal of impacted materials of concern during bulk excavation. (Low Risk)
	P2 – Inhalation of dust and/or vapours	R1 - Current users R2 - End users R3 - Construction and maintenance workers R4 – Adjacent site users	
	P3 – Leaching and vertical migration into groundwater P4- Lateral migration of groundwater	R5 –Groundwater	

7. Discussion

A review of site history information indicates that the site has remained essentially in the ownership of the Museum and Education since its incorporation. Prior to development, the previous use as a convict garden is considered to have low or limited potential for contamination impact. There have been some changes to the buildings on the site over the history of the Museum, with new wings constructed and old structures being demolished or refurbished.

There are signs of building demolition waste and general waste remaining on site and this suggests that asbestos (and other HBM) may to be present.

On the basis of the information presented herein, it is considered that the site has only a low to moderate risk of localised contamination associated with the partial demolition and/or deterioration of building products, the presence of imported fill, and/or past and present activities on site.

The site can be made suitable for the proposed redevelopment, subject to the following:

- Completion of a hazardous materials survey in the areas of proposed works such that all identified hazardous materials can be removed prior to general demolition and construction activities;
- Removal and disposal of the hazardous materials in the proposed works areas, followed by a clearance by a qualified occupational hygienist;
- Limited and targeted soil sampling and testing in the areas of proposed works to (a) assess the presence or otherwise of the identified COPC, and (b) to provide a preliminary waste classification to inform the off-site disposal options for surplus soils. In areas of difficult access, such sampling may need to be undertaken post-demolition;
- If required, remediation of soils with contaminants posing a risk to the identified receptors; and
- Preparation of an assessment and/or validation report upon completion of the targeted investigation and/or completion of remediation (if required) stating that the site is suitable for the proposed redevelopment.

8. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at the Australian Museum, 1 William Street Darlinghurst in accordance with DP's proposal dated 4 October 2018and acceptance received from Greg Murphy via email dated 8 October 2018. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of the Australian Museum for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the (geotechnical / environmental / groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

About This Report

Drawings

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

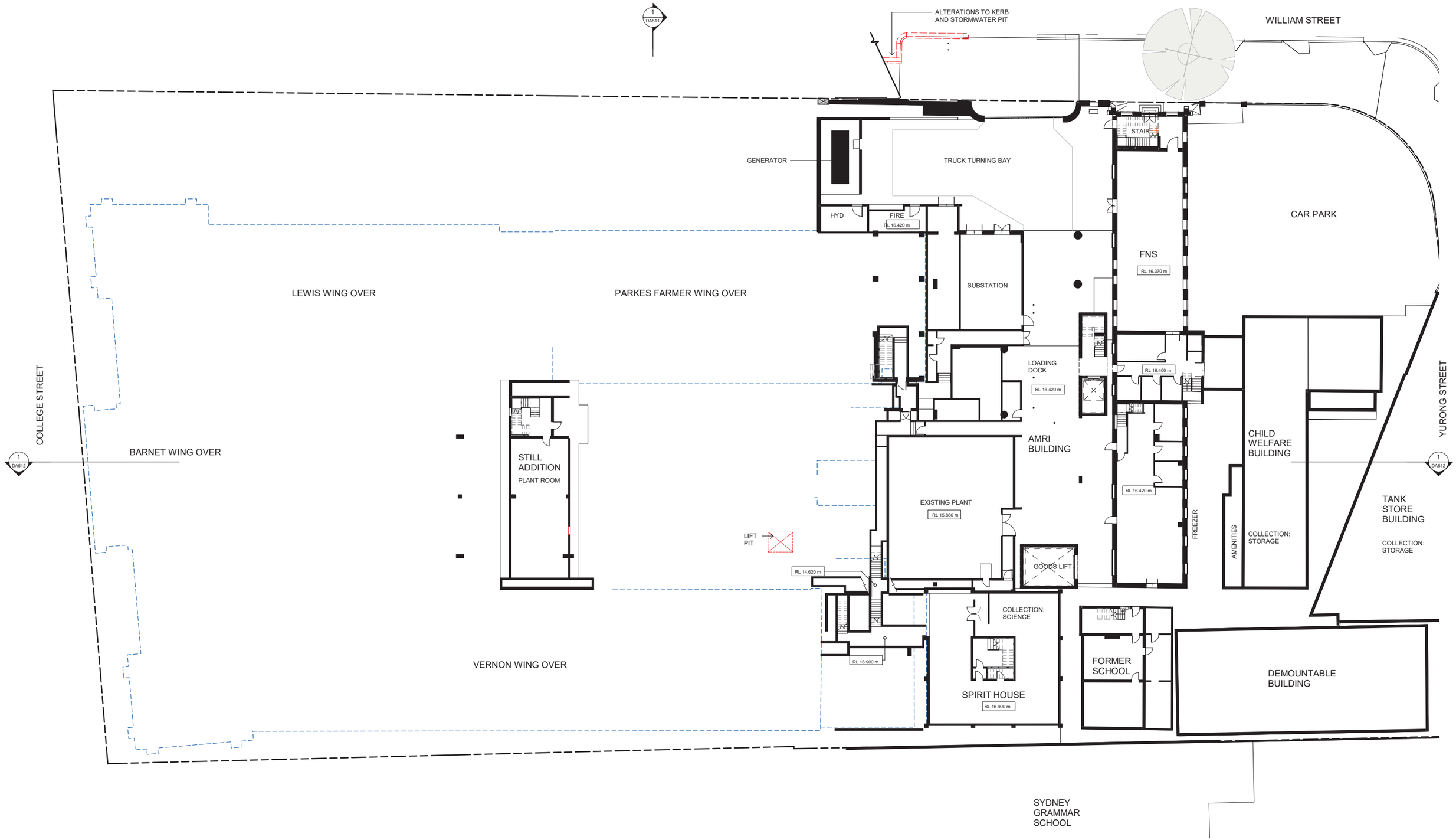
Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

N

Source: Nearmap

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: The Australian Museum		TITLE: **Preliminary Site Assessment**	PROJECT No:	86582.00
	OFFICE: Sydney	DRAWN BY: MH	**Australian Museum**	DRAWING No:	1
	SCALE: As Shown	DATE: 15/10/2018	**1 William Street Sydney**	REVISION:	A



AUSTRALIAN MUSEUM | barrabuwari muru

DEMOLITION - LOADING DOCK

AM ADDITIONS & ALTERATIONS

Status: FOR APPROVAL
Path: C:\Revit Local Files\2017\51023_Host_R2017_dchieppa.rvt
Note: INDICATIVE ONLY - SUBJECT TO SURVEY & SPECIALIST CONSULTANT DESIGN INPUT. INTERNAL WALL LININGS HAVE NOT BEEN ALLOWED FOR IN AREA CALCULATIONS

Scale: 1:200 @ A1
0 16

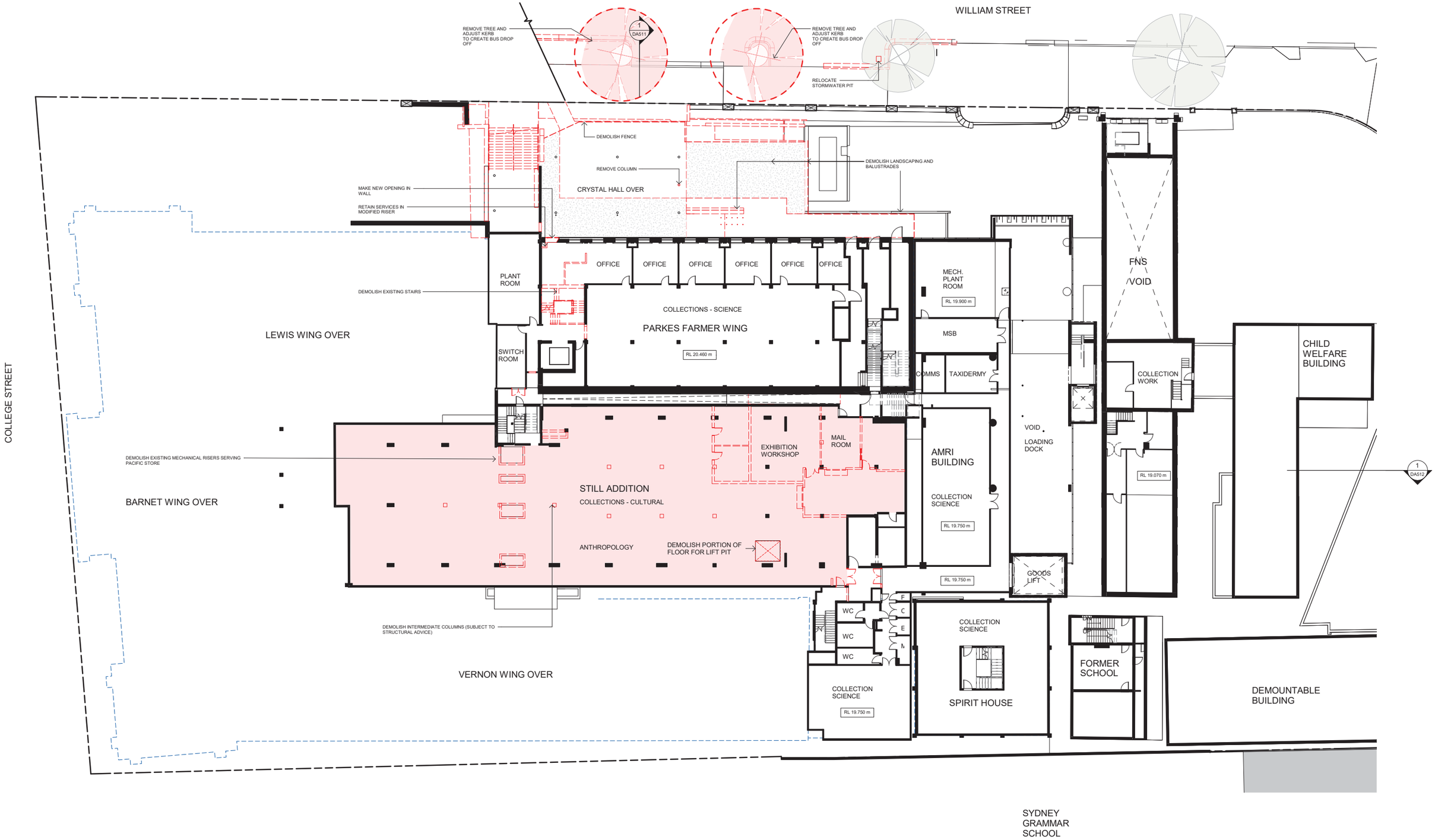
North:

Project Number: 51023
Drawing Number: DA210
Revision: B
Date: 31/08/18

FINAL DRAFT

NEESON MURCUTT ARCHITECTS PTY LTD

Hames Sharley



AUSTRALIAN MUSEUM | barrabuwari muru

DEMOLITION PLAN - BASEMENT (WILLIAM STREET)

AM ADDITIONS & ALTERATIONS

Status: FOR APPROVAL
Path: C:\Revit Local Files\2017\51023_Host_R2017_dchieppa.rvt
Note: INDICATIVE ONLY - SUBJECT TO SURVEY & SPECIALIST CONSULTANT DESIGN INPUT. INTERNAL WALL LININGS HAVE NOT BEEN ALLOWED FOR IN AREA CALCULATIONS

Scale: 1:200 @ A1
0 16

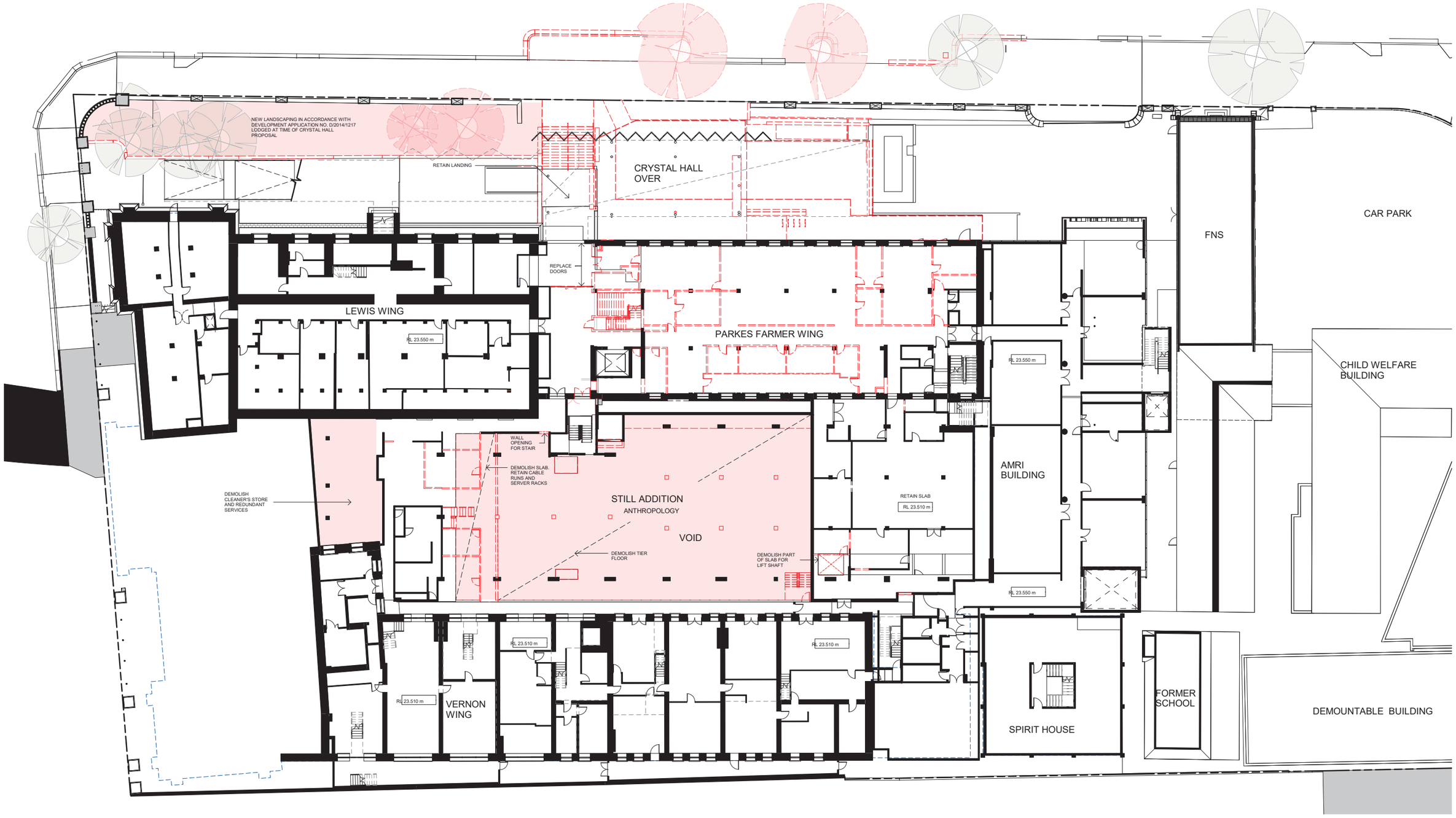
North:

Project Number: 51023
Drawing Number: DA211
Revision: G
Date: 31/08/18

FINAL DRAFT

NEESON MURCUTT ARCHITECTS PTY LTD

Hames Sharley



AUSTRALIAN MUSEUM | barrabuwari muru

DEMOLITION PLAN - LOWER GROUND

AM ADDITIONS & ALTERATIONS

Status: FOR APPROVAL
Path: C:\Revit Local Files\2017\51023_Host_R2017_dchieppa.rvt
Note: INDICATIVE ONLY - SUBJECT TO SURVEY & SPECIALIST CONSULTANT DESIGN INPUT. INTERNAL WALL LININGS HAVE NOT BEEN ALLOWED FOR IN AREA CALCULATIONS

Scale: 1:200 @ A1
0 16

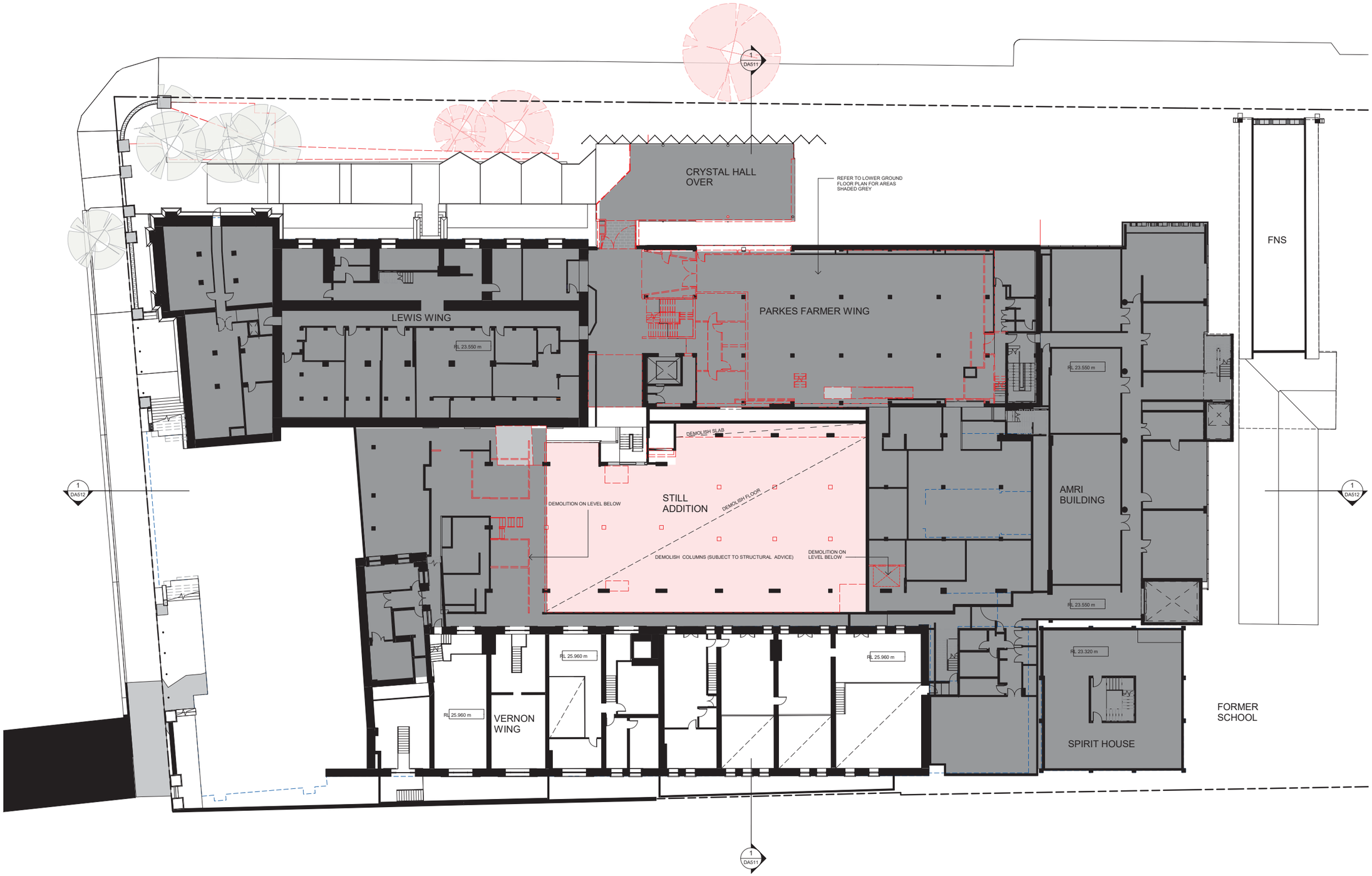
North:

Project Number: 51023
Drawing Number: DA212
Revision: G
Date: 31/08/18

FINAL DRAFT

NEESON MURCUTT ARCHITECTS PTY LTD

Hames Sharley



AUSTRALIAN MUSEUM | barrabuwari muru

DEMOLITION PLAN - LOWER GROUND MEZZANINE
AM ADDITIONS & ALTERATIONS

Status: FOR APPROVAL
Path: C:\Revit Local Files\2017\51023_Host_R2017_dchieppa.rvt
Note: INDICATIVE ONLY - SUBJECT TO SURVEY & SPECIALIST CONSULTANT DESIGN INPUT. INTERNAL WALL LININGS HAVE NOT BEEN ALLOWED FOR IN AREA CALCULATIONS

Scale: 1:200 @ A1
0 16

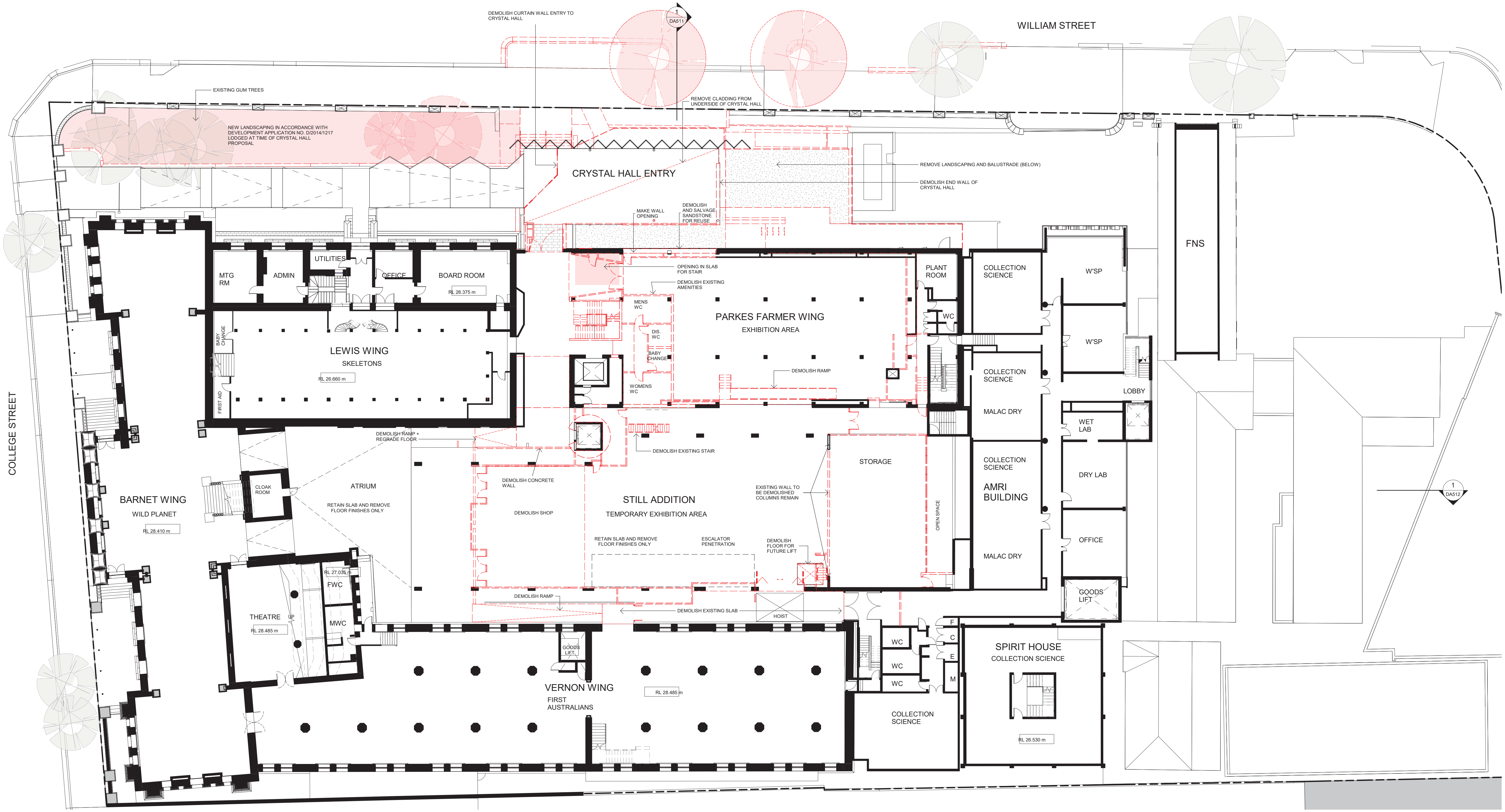
North:

Project Number: 51023
Drawing Number: DA213
Revision: F
Date: 31/08/18

FINAL DRAFT

NEESON MURCUTT
ARCHITECTS PTY LTD

Hames Sharley



FINAL DRAFT

AUSTRALIAN MUSEUM

barrabuwari muru

DEMOLITION PLAN - GROUND FLOOR

AM ADDITIONS & ALTERATIONS

Status: FOR APPROVAL
Path: C:\Revit Local Files\2017\51023_Host_R2017_dchieppa.rvt
Note: INDICATIVE ONLY - SUBJECT TO SURVEY & SPECIALIST CONSULTANT DESIGN INPUT. INTERNAL WALL LININGS HAVE NOT BEEN ALLOWED FOR IN AREA CALCULATIONS

Scale: 1:200 @ A1
0 16

North:

Project Number:	51023
Drawing Number:	DA214
Revision:	F
Date:	31/08/18

NEESON MURCUTT ARCHITECTS PTY LTD

Hames Sharley