ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

JDH ARCHITECTS

ON

REMEDIATION ACTION PLAN

FOR

PROPOSED ALTERATIONS AND ADDITIONS

AT

LIDCOMBE PUBLIC SCHOOL, MILLS STREET, LIDCOMBE, NSW

6 SEPTEMBER 2017 **REF: E30429KPrpt-RAPrev1**

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EXECUTIVE SUMMARY

JDH Architects ('the client') commissioned Environmental Investigation Services (EIS)[1] to prepare a Remediation Action Plan (RAP) for the proposed alterations and additions at Lidcombe Public School, Mills Street, Lidcombe. For the purpose of this report, the wider school property has been referred to as 'the site'. The site location is shown on Figure 1.

The RAP applies to the proposed development area only which has been nominated by the client in consultation with other project stakeholders. The area applicable to the RAP is referred to as 'the remediation area'. The terms 'northern area'/'northern remediation area' and 'southern area'/'southern remediation area' have also been used throughout this report to differentiate between the two development/remediation areas.

EIS previously completed a Preliminary Stage1/Stage 2 Contamination Assessment and Preliminary Salinity Assessment at the site[2]. The contamination assessment should be read in conjunction with this RAP. Summary information from the contamination assessment is presented in Section 2 of this report.

The goal of the remediation is to render the site suitable and confirm the suitability of the site for the proposed primary school development. The primary aim of the remediation is to reduce the potential for exposure to the contaminants of concern so that the potential risks posed by these contaminants in the remediation area are low and acceptable. The objectives of the RAP are to:

- Provide a methodology to remediate and validate the remediation area;
- Provide a framework for staged remediation and validation of the various remediation areas;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works.

The proposed strategy for remediation includes a 'cap and contain' approach. EIS are of the opinion that the remediation area can be made suitable for the proposed development provided this RAP is implemented accordingly. A site validation report (and environmental management plan) should be prepared on completion of remediation activities and should be submitted to the consent authority.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

[1] Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

[2] EIS Report Reference E30429KPrpt, dated 13 June 2017 (referred to as the contamination assessment)

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ABBREVIATIONS

Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Contaminated Land Management	**CLM**
Conceptual Site Model	**CSM**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Environmental Protection Agency	**EPA**
Environmental Site Assessment	**ESA**
Ecological Screening Level	**ESL**
Health Investigation Level	**HIL**
Health Screening Level	**HSL**
International Organisation of Standardisation	**ISO**
Local Government Authority	**LGA**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Photo-ionisation Detector	**PID**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Total Recoverable Hydrocarbons	**TRH**
United States Environmental Protection Agency	**USEPA**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
Work Health and Safety	**WHS**

1 INTRODUCTION

JDH Architects ('the client') commissioned Environmental Investigation Services (EIS)[3] to prepare a Remediation Action Plan (RAP) for the proposed alterations and additions at Lidcombe Public School, Mills Street, Lidcombe. For the purpose of this report, the wider school property has been referred to as 'the site'. The site location is shown on Figure 1.

The RAP applies to the proposed development area only which has been nominated by the client in consultation with other project stakeholders. The area applicable to the RAP is referred to as 'the remediation area'. The terms 'northern area'/'northern remediation area' and 'southern area'/'southern remediation area' have also been used throughout this report to differentiate between the two development/remediation areas.

EIS previously completed a Preliminary Stage1/Stage 2 Contamination Assessment and Preliminary Salinity Assessment at the site[4]. The contamination assessment should be read in conjunction with this RAP. Summary information from the contamination assessment is presented in Section 2 of this report.

This report has been prepared to support the lodgement of a Development Application (DA) to Cumberland Council.

1.1 Proposed Development Details

Based on the details provided, EIS understand that the proposed additions will include separate one and two storey buildings with balconies and walkways. Associated landscaping works are also proposed. We have assumed that limited cut and fill earthworks may be required. The proposed ground floor of the southern building is at reduced level (RL) 20.5m and will require excavation up to 0.5m in depth at the western end, with the ground floor above existing grade at the eastern side.

The development is likely to proceed in two stages, most likely commencing with the northern area. Other minor works are being undertaken at the site to facilitate the proposed development, including the relocation of demountable buildings and other soft landscaping. This RAP does not apply to these works if they occur outside of the remediation area.

A selection of proposed development plans are included in the appendices.

1.2 Remediation Goal, Aims and Objectives

The goal of the remediation is to render the site suitable and confirm the suitability of the site for the proposed primary school development.

[3] Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

[4] EIS Report Reference E30429KPrpt, dated 13 June 2017 (referred to as the contamination assessment)

The primary aim of the remediation is to reduce the potential for exposure to the contaminants of concern so that the potential risks posed by these contaminants in the remediation area are low and acceptable. The objectives of the RAP are to:

- Provide a methodology to remediate and validate the remediation area;
- Provide a framework for staged remediation and validation of the various remediation areas;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works.

1.3 Scope of Work

The RAP was prepared generally in accordance with an EIS proposal (Ref: EP45149KPrev1) of 16 June 2017 and written acceptance from the client dated 7 July 2017. The scope of work included the following:

- Review of the EIS (2017) contamination assessment report;
- Review of the generic Asbestos Management Plan for NSW Government Schools (2015);
- Review of the proposed development details; and
- Preparation of a report.

The report was prepared with reference to regulations/guidelines outlined in the table below. Individual guidelines are also referenced within the text of the report.

Table 1-1: Guidelines

Guidelines/Regulations/Documents
Asbestos Management Plan for NSW Government Schools (2015)[5]
Contaminated Land Management Act (1997)[6]
State Environmental Planning Policy No.55 – Remediation of Land (1998)[7]
Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)[8]
Guidelines for Consultants Reporting on Contaminated Sites (2011)[9]
Guidelines for the NSW Site Auditor Scheme, 2nd Edition (2006)[10]

[5] NSW Department of Planning, (2015). *Asbestos management Plan for NSW Government Schools*

[6] NSW Government Legislation, (1997). *Contaminated Land Management Act 1997.* (referred to as CLM Act 1997)

[7] NSW Government, (1998). *State Environmental Planning Policy No. 55 – Remediation of Land.* (referred to as SEPP55)

[8] Department of Urban Affairs and Planning, and Environment Protection Authority, (1998). *Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land*. (SEPP55 Planning Guidelines)

[9] NSW Office of Environment and Heritage (OEH), (2011). *Guidelines for Consultants Reporting on Contaminated Sites.* (referred to as Reporting Guidelines 2011)

[10] NSW DEC, (2006). *Guidelines for the NSW Site Auditor Scheme, 2nd ed.* (referred to as Site Auditor Guidelines 2006)

Guidelines/Regulations/Documents
National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)[11]

[11] National Environment Protection Council, (2013). *National Environmental Protection (Assessment of Site Contamination) Amendment Measure 1999* (as amended 2013). (referred to as NEPM 2013)

2 SITE INFORMATION

2.1 Site Identification

Table 2-1: Site Identification

Site Address:	Lidcombe Public School, 1 Mills Street, Lidcombe, NSW
Site Owner:	Minister for Education and Training
Lot & Deposited Plan:	Lot 1 DP1095078
Current Land Use:	Primary School
Proposed Land Use:	Unchanged
Local Government Authority (LGA):	Cumberland Council (formerly Auburn City Council)
Current Zoning:	R2 – Low Density Residential and R3 – Medium Density Residential
Site Area (m^2 approx.):	24,400 (the southern remediation area is estimated to cover <2,000m^2 and the northern remediation area is estimated to cover <800m^2)
RL (AHD in m) (approx.):	19-21
Geographical Location (decimal degrees) (approx.):	Latitude: -33.860665 Longitude: 151.047412

2.2 Background

The client provided EIS with a copy of an existing, site-specific *Asbestos in Grounds, Asbestos Management Plan* (Parsons Brinkerhoff (PB), 2013)[12]. The AMP identified five "Asbestos Zones" (referred to as Area A to E inclusive as shown on Figure 3) where fibre cement fragments were reportedly identified in 2004.

The AMP refers to a separate report (dated 2004) that proposed various remediation measures for each of the asbestos zones. These broadly included removal of any fragments of suspected asbestos containing material (ACM) from the ground surface, followed by encapsulation of the potentially contaminated soil. Area D required removal of impacted soil, placement of a geofabric marker and re-instatement with clean soil.

[12] PB, (2013). *Asbestos in Grounds, Asbestos Management Plan, Lidcombe Public School, Lidcombe, NSW.* Dated March 2013 (referred to as the AMP)

The AMP did not confirm what remediation had occurred (if any) in the asbestos zones, but noted that certain asbestos clean-up/removal works were "approved" in July 2006. These included bare areas in Area A, B, C and E to be encapsulated with turf and/or mulched garden beds. A paved pathway was also to be installed in a heavily trafficked part of Area A. Area D was to be monitored until capital works had been completed.

2.3 Site Description

The site is located on the northern side of Dodson Avenue and to the south and east of Mills Street. The regional setting is generally characterised by low to medium density residential dwellings, however some commercial and light industrial land uses exist to the west of the site.

The regional topographic setting is gently undulating and the site is located towards the top of a low rising hill. The site in the vicinity of the investigation areas generally falls towards the east at slopes of 1-3°.

A walkover inspection of the site was undertaken by EIS on 20 May 2017. At the time of the inspection the site was occupied by Lidcombe Primary School and comprised various buildings, grassed, paved, astro-turf and soft fall recreational areas. Visible or olfactory indicators of contamination were not observed within the remediation area.

2.4 Summary of Geology and Hydrogeology

Regional geological maps reviewed for the contamination assessment indicated that the site is predominantly underlain by Ashfield Shale which typically consists of black to dark grey shale and laminate.

Information reviewed for the contamination assessment indicated that the subsurface conditions at the site are likely to consist of residual soils overlying relatively shallow shale bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions was considered to be low. Use of groundwater is not proposed as part of the development.

There were no registered groundwater users within 500m of the site. The nearest registered bore was located approximately 600m to the south-west of the site and was registered for monitoring purposes.

2.5 Summary of Site History

The contamination assessment included a review of historical information from various sources. The historical information indicated that the site was used for educational and residential purposes from the late 1800s to around the 1970s. The majority of the residential structures were demolished between 1970 and 1982 and it is likely that the majority of the site was utilised for educational purposes from this time.

2.6 Summary of Soil Results

Soil samples analysed for the contamination assessment identified elevated concentrations of lead, carcinogenic polycyclic aromatic hydrocarbons (PAHs) (referred to as benzo(a)Pyrene TEQ) and asbestos above the human health-based site assessment criteria (SAC). An elevated concentration of total recoverable hydrocarbons (TRHs) was also identified in soil at one location, above the ecological/environmental SAC.

The asbestos was identified in bonded ACM and in matted material. The asbestos in matted material was considered to be equivalent to friable asbestos.

TRH (F3) above the ecological/environmental SAC was identified at one location (BH3). EIS were of the opinion that the TRHs in this sample were most likely associated with the elevated PAHs, rather than a petroleum source (the analytical method for TRH analysis includes a non-specific screen for recoverable hydrocarbons and does not differentiate between PAHs and mid to long-chain petroleum hydrocarbon compounds). For a Tier 1 ecological screening, PAHs are assessed via the naphthalene and benzo(a)pyrene concentrations. The naphthalene and benzo(a)pyrene concentrations in the BH3 sample were below the respective ecological SAC, therefore EIS were of the opinion that there was no significant source of petroleum contamination or risk from TRHs at BH3.

The contaminants were considered to be associated with ash and slag in fill, and with the demolition of former residential structures containing asbestos/fibro cement and lead paint. The potential for contaminant migration to groundwater was considered to be low based on the soil type and hydrogeology. However, further consideration of the leachability of the lead impacted soil was recommended in the event that contaminated material was to be capped and retained on-site.

2.7 Summary of Recommendations

Based on the contamination assessment findings, remediation was recommended to address the potential human health risks associated with lead, PAHs and asbestos in fill. EIS also recommended that:

- Interim measures be implemented to address the risks associated with site contamination (see Section 9.3 for further details regarding the interim measures); and
- The Department of Education review the data within the contamination assessment report in order to meet their obligations under the NSW EPA Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (2015)[13].

[13] NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under the Contamination Land Management Act 1997.* (referred to as Duty to Report Contamination 2015)

3 CONCEPTUAL SITE MODEL (SITE CHARACTERISATION)

The table below includes an iteration of the conceptual site model (CSM) based on the findings of the contamination assessment. This CSM has been used to design the remediation strategy.

Table 3-1: CSM

Contaminant source(s) and contaminants of concern	The primary contamination source in the remediation area is fill. The fill is impacted with asbestos, lead and carcinogenic PAHs above the human-health SAC. TRHs have not been considered for the purpose of the RAP following the Tier 1 risk assessment.
Affected media	Soil/fill has been identified as the affected medium.
Receptor identification	Human receptors for asbestos, lead and PAH contamination include site users (teachers, support staff, maintenance staff and primary school children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent residential land users.
Exposure pathways	The exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (for lead and PAHs), and inhalation of airborne asbestos fibres.
Evaluation of data gaps	The leachability of the lead impacted fill is the primary data gap. Using a weight of evidence approach, this data gap has been adequately considered in the RAP as outlined in Section 4.

4 REMEDIATION EXTENT

4.1 Known Extent

The known extent of remediation for the purpose of the RAP includes the areas defined on Figure 5.

4.2 Unknown Extent and Data Gaps

Prior to the commencement of remediation, additional samples should be collected from the fill in the northern remediation area. The leachability of the lead should be evaluated via toxicity characteristic leaching procedure (TCLP) and Australian Standard Leaching Procedure (ASLP) analysis. The leachate results should be assessed by the validation consultant using a weight of evidence approach to evaluate whether an alternative remediation approach is required to reduce the risks associated with lead migrating to groundwater.

Based on the available data, including the lead concentrations identified during the contamination assessment, the geology and hydrogeology, potential receptors, and the fact that the proposed development will include the construction of a building over the lead impacted soil (which will reduce the transport mechanism for lead to impact the groundwater), EIS are of the opinion that the extent of remediation is unlikely to change based on the leachate analysis.

In the unexpected event that the above assessment indicates that off-site disposal of the lead impacted fill is required, an addendum RAP should be prepared to the satisfaction of the Department of Education and other relevant stakeholders.

5 REMEDIATION OPTIONS

5.1 Soil Remediation

The NSW EPA follows the Australian and New Zealand Environment and conservation Council and National Health and Medical Research Council (ANZECC/NHMRC) Guidelines for the Assessment and Management of Contaminated Sites (1992) published hierarchy for the remediation of contaminated sites. The preferred order for soil remediation and management is as follows:

1) On-site treatment of soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
2) Off-site treatment of excavated material so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;
3) Removal of contaminated material to an approved site or facility, followed where necessary by replacement with clean material; and
4) Consolidation and isolation of the soil on-site by containment within a properly designed barrier.

The Site Auditor Guidelines 2006 provide the following additional requirements to be taken into consideration:

- Remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed; and
- Where there are large quantities of soil with low levels of contamination, alternative strategies should be considered or developed.

5.2 Consideration of Remediation Options

The tables below discusses a range of remediation options:

Table 5-1: Site Specific Remediation Options

Option	Discussion	Applicability
Option 1 On-site treatment of contaminated soil	On-site treatment provides a mechanism to reuse the processed material and in some instances, to avoid the need for large scale earthworks. Some of the treatment options include bio-remediation, soil washing, air sparging and soil vapour extraction, thermal desorption and physical removal of bonded ACM fragments. Depending on the treatment option, licenses may be necessary for specific individual waste streams due to the potential for air pollution and the formation of harmful by-products during incineration processes.	Not appropriate or economically viable for the mixture of contaminants of concern identified at the site.
Option 2 Off-site treatment of contaminated soil	Contaminated soils are excavated, transported to an approved/ licensed treatment facility, treated to remove/stabilise the contaminants then returned to the subject site, transported to an alternative site or disposed to an approved landfill facility. This option provides for a relatively short program of on-site works, however there may be some delays if the material is to be returned to the site following treatment. The cost per tonne for transport to and from the site and for treatment is considered to be relatively high. The material would also have to be assessed in terms of suitability for reuse as part of the proposed development works under the waste and resource recovery regulatory framework.	Not applicable for this project.
Option 3 Removal of contaminated	Contaminated soils would be classified in accordance with NSW EPA guidelines for waste disposal, excavated and disposed of off-site to a NSW EPA licensed landfill. The material would have to meet the	This is a potential option for this project. However, this would require excavation and off-site disposal of all fill which may not be economically viable.

Option	Discussion	Applicability
material to an appropriate facility and reinstatement with clean material	requirements for landfill disposal. Landfill gate fees (which may be significant) would apply in addition to transport costs.	This option is also not considered to be sustainable in an environmental context.
Option 4 Consolidation and isolation of impacted soil by cap and containment	This would include the placement of an impermeable barrier such as concrete/pavers etc, or a warning barrier and non-contaminated soil material, over the existing ground surface to isolate the contaminated material and thereby reduce the health risk to future site users. This action may also reduce the transport of contamination via surface water movement and dust generation. The capping and/or containment must be appropriate for the specific contaminants of concern. An ongoing Environmental Management Plan (EMP) would be required and site identification documentation, possibly including the Section 149 council planning certificate, land title or other appropriate statutory documentation (in consultation with the Department of Education), would be modified to note the presence of the contamination. This may impact upon development approval conditions, place restrictions on the use of the land and limit the future potential land value.	Considered to be applicable and is the preferred option for the remediation area.

6 REMEDIATION DETAILS

Prior to commencement of any demolition, site preparation or remediation work within the remediation area, a suitably qualified contaminated land consultant[14] should be engaged as the validation consultant to validate the implementation of the RAP. The site management plan for remediation works (see Section 9) should also be reviewed and implemented by the remediation contractor.

6.1 Sequence of Remediation Works

EIS understand that the remediation is likely to be completed in two primary stages including:

1) The southern area; and
2) The northern area.

EIS are of the opinion that the sequence of the proposed development/remediation works will not have a significant impact on the outcome of the validation provided that the potential for cross-contamination is considered during all on-site activities.

6.2 Remediation Area

The preferred option for remediation is Option 4 (cap and contain). A cap and contain strategy is considered to be the most appropriate option as it reduces the potential for disturbing asbestos impacted fill, and can be relatively easily integrated into the proposed development works.

As the built development features will form an integral part of the capping strategy, EIS recommend that the client and other relevant stakeholders engage early with the consent authority to ensure the conditions of consent align with the RAP requirements (e.g. remediation under this RAP cannot be completed prior to the Construction Certificate, however the remediation and validation can be completed prior to the Occupation Certificate).

The specific remediation details for the remediation area are described in the table below:

Table 6-1: Remediation Details

Step	Procedure
1.	Site Set-Up: Reference should be made to Section 9 prior to commencement of works. EIS understand that the proposed development works will be undertaken with regards to the existing AMP, therefore the

[14] EIS recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

Step	Procedure
	existing AMP should be reviewed by the contractors. A construction-specific AMP should subsequently be prepared for the specific development and remedial activities.
2.	Personal Protective Equipment (PPE) and Work Health and Safety (WHS): Check PPE and WHS requirements prior to commencement of remediation works. The minimum PPE required for the remediation of asbestos includes the following: • Disposable coveralls rated type 5, category 3 (prEN ISO 13982–1) or equivalent. The hood must be worn; • Disposable gloves (heavy duty may be required); and • P2/P3 respirator conforming to the requirements of AS/NZS 1716:2009. Other site/project specific PPE may be required including hard hat, covered clothing, eye protection, steel toed boots and will be dependent on the requirements of the contractor.
3.	Review of Proposed Capping Design and Adjustment of Site Levels: The contractor should undertake a review of the minimum acceptable capping standards outlined in Step 5. In the event that the site levels need to be reduced in order to achieve these standards, a waste classification should be undertaken for the material to be excavated. The material should subsequently be excavated and disposed off-site under the waste classification provided.
4.	Site Preparation and Surface Clearance: Once the initial site levels are achieved and the site has been prepared to facilitate the remediation and construction activities, the ground surface should be inspected and any visible fragments of fibre cement/ACM should be picked from the surface, double bagged and disposed of to a licensed facility. A surface clearance inspection for visible asbestos materials should subsequently be undertaken by a licensed asbestos assessor or similar competent person. A clearance certificate should be provided for inclusion in the validation report.
5.	Capping Procedures: The following are considered to be the minimum acceptable capping standards for the purpose of remediation: • Existing paved areas that will remain undisturbed – no action required; • Unpaved areas including landscaped or grassed areas with shallow plantings, turf and/or rubber soft fall – visual marker layer comprising geogrid (e.g. TriAx) and geofabric[15] over the contaminated fill, overlain by a minimum of 0.5m of clean (validated) soil; • Unpaved areas including landscaped or grassed areas with tree plantings – tree plantings should be boxed out to 1m deep over a 1m by 1m area. The base and sidewalls of the tree pits should be lined with visual marker layer comprising geogrid and geofabric over the contaminated fill.

[15] Reference to 'geofabric' in the context of this RAP includes a high visibility, orange, non-woven product that is also suitable from an engineering and geotechnical point of view. A product such as Bidim A14 or similar would be acceptable to achieve its objective under this RAP.

Step	Procedure
	Areas where no trees are to be planted can include the marker layers and 0.5m of clean soil as noted above. The root ball of the tree should be approximately 0.5m above the marker layer; • New hardstand areas, including areas beneath the building slab, paved walkways and new paved ramps – visual marker layer comprising geogrid and geofabric over the contaminated fill, overlain by pavement materials; • New walkways (including raised/suspended walkways) or areas beneath raised/suspended balconies (assuming there is no crawlspace beneath the walkways/balconies) – visual marker layer comprising geogrid and geofabric over the contaminated fill. If the marker layer is not visible and does not pose an aesthetic issue, no further capping other than construction of the walkway/balcony is required. Mulch or other suitable material could otherwise be placed over the marker layer (prior to construction of the overlying walkway/balcony) to a depth of approximately 0.1m. In the event that there is an accessible crawl space or the area beneath the suspended walkway/balcony is easily accessible, a more robust cap should be constructed, similar to that required for unpaved areas; and • Underground services – all services to be placed above the marker layer. If service installation extends below the contaminated fill, the base and walls of service trenches are to be lined with a visual marker layer comprising geogrid and geofabric. Service trenches are to be backfilled with clean (validated) materials. Overlying capping requirements to meet the specification for paved or unpaved areas etc as noted above. A general capping specification plan for the above is provided in the appendices. The integration of the different capping requirements across the site and between the various areas should be appropriately considered prior to commencement. The marker layer should be rolled out with at least a 0.2m overlap. Considering the minimum acceptable capping standards, remediation of capped areas will be undertaken as follows: • The marker layer placement should be inspected by the validation consultant prior to the placement of the overlying clean capping materials/pavement. This should be documented photographically; • In any unpaved areas, a levels survey should be completed to document the ground levels at the time the visual marker layers are installed (and prior to placement of the clean capping materials); • Any tree pits and service trenches should be inspected and documented by the validation consultant; • Imported capping materials should be validated in accordance with Section 7; • Construct the capping layers to meet the requirements of the development and address the minimum acceptable capping standards; and • Following installation of the capping materials in unpaved areas, a levels survey should be completed to document the finished ground levels. This survey will be compared to the previous survey to confirm the minimum capping thickness of 0.5m is achieved in the unpaved areas.

6.3 Remediation Documentation

The construction/remediation contractor must retain all documentation associated with the remediation, including but not limited to:

- Waste/surplus soil disposal dockets;
- Imported materials information;
- Photographs of remediation works, including photographs of marker layers prior to placement of the overlying capping materials;
- Asbestos air fibre monitoring results; and
- Site surveys of any capped areas after the marker layers are installed, and again after the capping layers are constructed.

Copies of these documents must be forwarded to the validation consultant on completion of the remediation for inclusion in the final validation report.

7 VALIDATION PLAN

Validation is necessary to demonstrate that remedial measures described in this RAP have been successful and that the remediation area is suitable for the intended land use. The validation can be staged if required to permit the various areas of the site to be remediated, validated and signed off progressively.

The sampling and documentation requirements for the validation are outlined in Section 7.1. These are the minimum requirements based on conditions anticipated to exist at the site. Additional validation sampling may be required based on site observations made during remediation. Site observations will also be used as a validation tool to assess the extent of site contamination.

7.1 Validation Sampling and Documentation

The table below outlines the validation requirements for the site.

Table 7-1: Validation Requirements

Aspect	Sampling	Analysis	Observations and Documentation
Remediation Area			
Capping	Refer to imported materials validation requirements in the following sections of this table	Refer to imported materials validation requirements in the following sections of this table	Visual inspection and photo-documentation of marker layer installation. Levels surveys following placement of marker layers and following placement of capping material (unpaved areas). Documentation of capping materials and thickness of capping layers above the marker layers (new balconies/walkways). Validation of imported materials used as capping (as described later in this table). Disposal dockets to be retained for any fill requiring off-site disposal.
Imported Materials (applicable to the remediation area)			
Imported VENM backfill	Minimum of three samples per source	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH/BTEX, polycyclic aromatic	VENM documentation/ report required (should include source site history to demonstrate analytes are appropriate). Additional analysis may be required depending on site history. Material to be inspected upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation.

Aspect	Sampling	Analysis	Observations and Documentation
		hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs) and asbestos	
Imported engineering materials such as recycled aggregate, road base etc	Minimum of three samples per source/material type	Heavy metals (as above), TRHs, BTEX, PAHs, pesticides, PCBs and asbestos	Documentation required to confirm material has been classified with reference to a relevant exemption and is fit for purpose on site. Material to be inspected upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation. Dockets for imported material to be provided.
Imported engineering materials comprising only natural quarried products such as blue metal etc	At the validation consultants discretion based on supplier documentation	At the validation consultants discretion based on supplier documentation	Documentation to be provided from the supplier confirming the material is a product comprising only VENM (i.e. quarried product). Review of quarry licence. Material to be inspected upon importation to confirm it is free of anthropogenic materials, visible and olfactory indicators of contamination, and is consistent with documentation. Dockets for imported material to be provided.
Imported landscaping materials	Minimum of three samples per source/material type	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, BTEX, PAHs, pesticides, PCBs and asbestos	Documentation required to confirm material has been produced under an appropriate standard and is fit for purpose on site. Material to be inspected upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation. Dockets for imported material to be provided.

7.2 Boundary Survey of Remediation Areas

On completion of the works, a boundary survey should be undertaken for each of the proposed remediation areas. This survey will be utilised in the validation report to demonstrate the extent of the remediation and the areas being signed off by the validation consultant.

7.3 Validation Assessment Criteria and Data Assessment

The validation assessment criteria (VAC) to be adopted for the validation assessment are outlined in the table below:

Table 7-2: VAC

Validation Aspect	Criteria
Waste classification (soil disposal)	In accordance with the procedures and criteria outlined in the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014)[16].
Soil validation	Analytical soil validation does not currently form part of the proposed remediation strategy. In the event that soil validation sampling is required as the result of an unexpected find, the soil validation criteria will be the Health Investigation Level A (HIL-A) and Health Screening Level A (HSL-A) criteria based on NEPM (2013). NEPM (2013) Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) will be considered for validation samples collected in proposed landscaped areas.
Imported materials	Heavy metal concentrations to be consistent with background range, organic compounds to be less than the laboratory practical quantitation limits (PQLs) and asbestos to be absent. Imported landscaping materials are also to consider EILs and ESLs based on NEPM 2013. Aesthetics: soils to be free of staining and odours.

Data should initially be assessed as above or below the VAC. Statistical analysis may be applied if deemed appropriate by the consultant and undertaken in accordance with the NEPM (2013).

7.4 Validation Report and EMP

As part of the validation process, a site validation report will be prepared by the validation consultant. The report will outline the remediation work undertaken at the site and any deviations to the

[16] NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

remediation strategy. The report will present the results of the validation assessment and will be prepared in accordance with the Reporting Guidelines 2011.

The validation report should draw conclusions regarding the success of the remediation/validation and the suitability of the site for the proposed development (from a contamination viewpoint). Staged validation reporting may occur progressively for each area as the development proceeds.

Any areas where contaminated material is capped in-situ will require on-going management (it is anticipated that this will apply to the entire remediation area). The validation reporting will also include the preparation of a long term EMP. EIS recommend that early engagement be undertaken with the consent authority and any other relevant stakeholders so that the EMP can be publically notified and enforceable.

7.5 Data Quality

Appropriate QA/QC samples should be obtained during the validation (where applicable) and analysed for the contaminants of concern. As a minimum, QA/QC sampling should include duplicates (5% inter-laboratory and 5% intra-laboratory), trip spikes, trip blanks and rinsate samples.

Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) should be clearly outlined and assessed as part of the validation process. A framework for the DQO and DQI process is outlined below and should be reflected in the validation report.

DQOs should be established for the validation with regards to the seven-step process outlined in the Site Auditor Guidelines 2006 and with reference to USEPA documents Data Quality Objectives Processes for Hazardous Waste Site Investigations (2000) and Guidance on Systematic Planning Using the Data Quality Objectives Process (2006). The seven steps include the following:

- State the problem;
- Identify the decisions/goal of the study;
- Identify information inputs;
- Define the study boundary;
- Develop the analytical approach/decision rule;
- Specify the performance/acceptance criteria; and
- Optimise the design for obtaining the data.

DQIs are to be assessed based on field and laboratory considerations for precision, accuracy, representativeness, completeness and comparability.

7.6 Summary of Roles and Requirements

A summary of the roles and requirements of the contractor and validation consultant are provided below:

Table 7-3: Summary of Roles and Requirements

Contractor Requirements	Validation Consultant Requirements
• Engage the validation consultant • Review and implement the Site Management Plan and AMP • Prepare a construction-specific AMP (this may be outsourced) • Review minimum capping standards and arrange waste classifications (as required) for any surplus material • Arrange surveys of capped areas (as required) to demonstrate minimum capping standards are being achieved as the works progress • Implement the unexpected finds protocol • Arrange for the validation consultant to inspect the site at appropriate times in accordance with the RAP • Provide supporting documentation required for the validation as outlined in Section 6.3 • Provide supporting documentation for all imported materials • Keep a photographic record of all marker layer installation • Provide a final boundary survey of the remediation areas (see Section 7.2) • Obtain the validation assessment report and EMP from the validation consultant	• Complete the initial unexpected finds inspection and prepare a report documenting the findings • Inspect the marker layer installation as the works proceed • Keep a photographic record of all marker layer installation and the remediation works in general • Review documentation and validate imported materials • Inspect and document any unexpected finds advised by the contractor • Review documentation associated with asbestos-related controls/management, remediation and waste disposal • Prepare the site validation report and EMP

8 CONTINGENCY PLAN

A review of the proposed remediation works has indicated that the greatest risks that may affect the success of the remediation are an unexpected find or validation failure of imported materials. Contingency plans are provided below to address these risks.

8.1 Unexpected Finds

Unexpected finds would typically be able to be identified by visual or olfactory indicators and could include:

- Waste materials in fill, including building and demolition waste;
- Fibre cement fragments (e.g. ACM);
- Stained fill/soil;
- Odorous soils (e.g. hydrocarbon odours); and/or
- Ash, slag and/or coal wash.

The following unexpected finds procedure should be implemented for the remediation area:

- Following the initial site preparation works (e.g. following demolition of the buildings, pavements and scrape back of grass/vegetation etc), the northern and southern remediation areas should be inspected by the validation consultant. A letter should be prepared to document the findings of the inspection and provide further commentary on contamination and any unexpected finds;
- The following should be implemented in the event of an unexpected find:
    - All work in the immediate vicinity should cease, and the contaminated land consultant (who was engaged to complete the initial inspection should be contacted immediately to inspect and document the find;
    - Temporary barricades should be erected to isolate the area;
    - The consultant should develop and implement a strategy to assess the issue and provide guidance on the appropriate course of action; and
    - Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors. The remediation actions outlined in Section 6 could be utilised where appropriate, depending on the contamination issues identified.

8.2 Importation Failure for Imported Materials

Where material to be imported onto the site does not meet the importation acceptance criteria detailed in Section 7, the only option is to not accept the material. Alternative material must be sourced that meets the importation requirements.

9 SITE MANAGEMENT PLAN FOR REMEDIATION WORKS

The information outlined in this section of the RAP is for the remediation work only. The client should contact the local consent authority (council or certifier) for specific site management requirements for the overall development of the site.

9.1 Existing Management Plans

EIS understand that the AMP and the generic AMP for NSW Government Schools will be implemented for the proposed development works where required.

9.2 Asbestos Controls and Licensing Requirements

The following requirements should be met for the asbestos remediation works at the site:

- A Class A licensed asbestos removalist should be engaged to undertake any asbestos-related remediation works. The licenced contractor is to prepare an Asbestos Removal Control Plan for the site works;
- The contractor should review this RAP and the proposed development requirements to establish whether SafeWork NSW are to be notified;
- All personnel and contractors must be informed of site conditions, asbestos work areas and any exclusion zones;
- Air fibre monitoring should be undertaken on a daily basis during remedial works and all readings are to be below the detection limit of 0.01 fibres per millilitre; and
- The site should be managed in accordance with this plan and the general requirements of SafeWork NSW and strategies outlined in the relevant regulations, guidelines, codes and standards.

9.3 Interim Site Management

The contamination assessment report included recommendations for interim management. EIS recommended that interim remediation/management works be implemented as a matter of priority to address risks posed by contamination at the ground surface.

Potential interim measures should be discussed in consultation with the Department of Education. These measures could include: repairing the geofabric and providing suitable clean soil or mulch cover in the garden beds; providing clean mulch or other suitable surface covering at the locations where contamination was encountered at the surface; and undertaking a surface pick and clearance of suspected ACM across the wider site area.

9.4 Project Contacts

Emergency procedures and contact telephone numbers should be displayed in a prominent position at the site entrance gate and within the main site working areas. The contact details of key project personnel are summarised in the following table:

Table 9-1: Project Contacts

Role	Company	Contact Details
Project Manager	Johnstaff	8256 0500
Remediation Contractor	To be appointed	-
Environmental Consultant	EIS (at the time of the RAP preparation)	9888 5000
Certifier	To be appointed	-
NSW EPA	Pollution Line	131 555
Emergency Services	Ambulance, Police, Fire	000

9.5 Security

Prior to the commencement of site works, fencing should be installed as required to secure the remediation areas. Warning signs should be erected, which outline the PPE required for remediation work.

9.6 Timing and Sequencing of Remediation Works

Remediation works will be completed concurrently with the construction activities as the proposed development features such as building slabs, walkways, balconies, gardens beds etc will form an integral part of the cap.

9.7 Site Soil and Water Management Plan

The contractor should prepare a detailed soil and water management plan prior to the commencement of site works. Silt fences should be used to control the surface water runoff at all appropriate locations of the site.

All stockpiled materials should be placed within an erosion containment boundary with silt fences and sandbags employed to limit sediment movement. The containment area should be located away from drainage lines, gutters, stormwater pits and inlets and the site boundary. No liquid waste or runoff should be discharged to the stormwater or sewerage system without the approval of the appropriate authorities.

9.8 Noise and Vibration Control Plan

The guidelines for minimisation of noise on construction sites outlined in AS-2460 (2002)[17] should be adopted. Other measures specified in the consent conditions should also be complied with. Noise producing machinery and equipment should only be operated between the hours approved by Council (refer to consent documents).

All practicable measures should be taken to reduce the generation of noise and vibration to within acceptable limits. In the event that short-term noisy operations are necessary, and where these are likely to affect residences, notifications should be provided to the relevant authorities and the residents by the project manager, specifying the expected duration of the noisy works.

9.9 Dust Control Plan

All practicable measures should be taken to reduce dust emanating from the site. Factors that contribute to dust production are:

- Wind over a cleared surface;
- Wind over stockpiled material; and
- Movement of machinery in unpaved areas.

Visible dust should not be present at the site boundary. Measures to minimise the potential for dust generation include:

- Use of water sprays on unsealed or exposed soil surfaces;
- Covering of stockpiled materials and excavation faces (particularly during periods of site inactivity and/or during windy conditions) or alternatively the erection of hessian fences around stockpiled soil or large exposed areas of soil;
- Establishment of dust screens consisting of a 2m high shade cloth or similar material secured to a chain wire fence;
- Maintenance of dust control measures to keep the facilities in good operating condition;
- Concrete surfaces brushed or washed to remove dust;
- Stopping work during strong winds;
- Loading or unloading of dry soil as close as possible to stockpiles to prevent spreading of loose material around the site; and
- The expanse of cleared land should be kept to a minimum to achieve a clean and economical working environment.

If stockpiles are to remain on-site or an excavation remains open for a period of longer than several days, dust monitoring should be undertaken at the site. If excessive dust is generated all site activities should cease until either wind conditions are more acceptable or a revised method of excavation/remediation is developed.

[17] Australian Standard, (2002). *AS2460: Acoustics - Measurement of the Reverberation Time in Rooms.*

Dust is also produced during the transfer of material to and from the site. All material should be covered during transport and should be properly disposed of on delivery. No material is to be left in an exposed, un-monitored condition.

All equipment and machinery should be brushed or washed down before leaving the site to limit dust and sediment movement off-site. In the event of prolonged rain and lack of paved areas all vehicles should be washed down prior to exit from the site, and any soil or dirt on the wheels of the vehicles removed. Water used to clean the vehicles should be collected and tested prior to appropriate disposal under the Waste Classification Guidelines.

9.10 Air Monitoring

Requirements for air monitoring should be considered by the asbestos removal contractor during the remedial works and any demolition works. EIS note that air monitoring is required for any works that disturb the ground in the "asbestos zones" documented in the existing AMP.

9.11 Odour Control Plan

All activities undertaken at the site should be completed in a manner that minimises emissions of smoke, fumes and vapour into the atmosphere and any odours arising from the works or stockpiled material should be controlled. Control measures may include:

- Maintenance of construction equipment so that exhaust emissions comply with the Clean Air Regulations issued under the Protection of the Environment Operations Act (1997)[18];
- Demolition materials and other combustible waste should not be burnt on site;
- The spraying of a solution of an appropriate proprietary product if required to suppress any odours that may be generated by excavated materials; and
- Use of protective covers (e.g. tarpaulins or builder's plastic).

All practicable measures should be taken to reduce fugitive emissions emanating from the site so that associated odours do not constitute a nuisance and that the ambient air quality is not adversely impacted.

9.12 Health and Safety Plan

A site specific WHS plan should be prepared by the contractor for all work to be undertaken at the site. The WHS plan should meet all the requirements outlined in SafeWork NSW WHS regulations.

As a minimum requirement, personnel must wear appropriate protective clothing, including long sleeve shirts, long trousers and steel cap boots. Gloves and dust masks should be worn when working

[18] NSW Government, (1997), *Protection of Environment Operations Act.* (referred to as POEO Act 1997)

on remediation activities (additional asbestos-related PPE is also required as outlined previously in this RAP). Washroom and lunchroom facilities should also be provided to allow workers to remove potential contamination from their hands and clothing prior to eating or drinking.

9.13 Waste Management

Prior to commencement of remedial works and excavation for the proposed development, the contractor should develop a waste management or recycling plan to minimise the amount of waste produced by the site. This should, as a minimum, include measures to recycle and re-use natural excavated material wherever possible.

9.14 Incident Management Contingency

The environmental consultant engaged to undertake the validation assessment should be contacted if any unexpected conditions are encountered at the site. This should enable the scope of remedial/validation works to be adjusted as required. Similarly if any incident occurs on site, the validation consultant should be advised to assess potential impacts on site contamination conditions and the remediation/validation timetable.

9.15 Hours of Operation

Hours of operation should be between those approved by Council under the development approval process. Reference should also be made to any specific conditions imposed by other consent authority/regulatory bodies.

10 CONCLUSION

EIS are of the opinion that the remediation area can be made suitable for the proposed development provided this RAP is implemented accordingly. A site validation report (and EMP) should be prepared on completion of remediation activities and should be submitted to the consent authority.

10.1 Remediation Category

Site remediation can fall under the following two categories outlined in SEPP55:

Table 10-1: Remediation Category

Category	Details
Category 1	Category 1 remediation works are those undertaken in the following areas specified under Clause 9 of SEPP55: • A designated development; • Carried out on land declared to be a critical habitat; • Development for which another SEPP or REP requires a development consent; or • Carried out in an area or zone classified as: ➢ Coastal Protection; ➢ Conservation or heritage conservation; ➢ Habitat protection, or habitat or wildlife corridor; ➢ Environmental protection; ➢ Escarpment, escarpment protection or preservation; ➢ Floodway or wetland; ➢ Nature reserve, scenic area or scenic protection; etc. • Work that is not carried out in accordance with the site management provisions contained in the consent authority Development Control Plan (DCP)/Local Environmental Plan (LEP) etc. Approval is required from the consent authority for Category 1 remediation work. The RAP needs to be assessed and determined either as part of the existing DA or as a new and separate DA. Category 1 remediation work is identified as advertised development work unless the remediation work is a designated development or a state significant development (Part 6 of EPAA Regulation 1994).
Category 2	Remediation works which do not fall under the above category are classed as Category 2. Development consent is not required for Category 2 remediation works, however the consent authority should be given 30 days' notice prior to commencement of works.

EIS understand that there is an item of environmental heritage on site. This may result in the remediation being classed as Category 1, however this should be confirmed by council. It is noted that the RAP is likely to be assessed by council as part of the DA/consent process.

10.2 Regulatory Requirements

The regulatory requirements applicable for the site are outlined in the following table:

Table 10-2: Regulatory Requirement

Document	Applicability
Duty to Report Contamination 2015	These guidelines apply to the site. As noted in the contamination report, EIS recommend that the Department of Education review the data obtained to date and assess their obligations under the Duty to Report Contamination 2015.
Protection of the Environment Operations Act (1997)[19] (and associated waste regulation)	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner. Appropriate waste tracking is required for all asbestos waste that is disposed off-site (this may include a requirement to use the WasteLocate service depending on the quantities of asbestos waste being transported).
WHS Code of Practice (2016)[20]	Sites with asbestos become a 'workplace' when work is carried out there and require a register and asbestos management plan. Appropriate SafeWork NSW notification will be required for asbestos removal works or handling. Contractors are also required to be appropriately licensed for the asbestos works undertaken (i.e. bonded or friable asbestos works). The existing AMP requires a Class A licensed contractor for intrusive works in the asbestos zones.

[19] NSW Government Legislation, (1997). *Protection of the Environment Operations Act 1997.* (referred to as POEO Act 1997)
[20] Safe Work Australia, (2016). *Code of Practice – How to Manage and Control Asbestos in the Workplace.*

11 LIMITATIONS

The report limitations are outlined below:

- EIS accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the EIS proposal; and terms of contract between EIS and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated in the report;
- EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- EIS have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. EIS should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

LIST OF IN-TEXT TABLES

IMPORTANT INFORMATION ABOUT THIS REPORT

These notes have been prepared by EIS to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors:
This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

EIS/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by EIS to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions:
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data:
Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Assessment Limitations:
Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

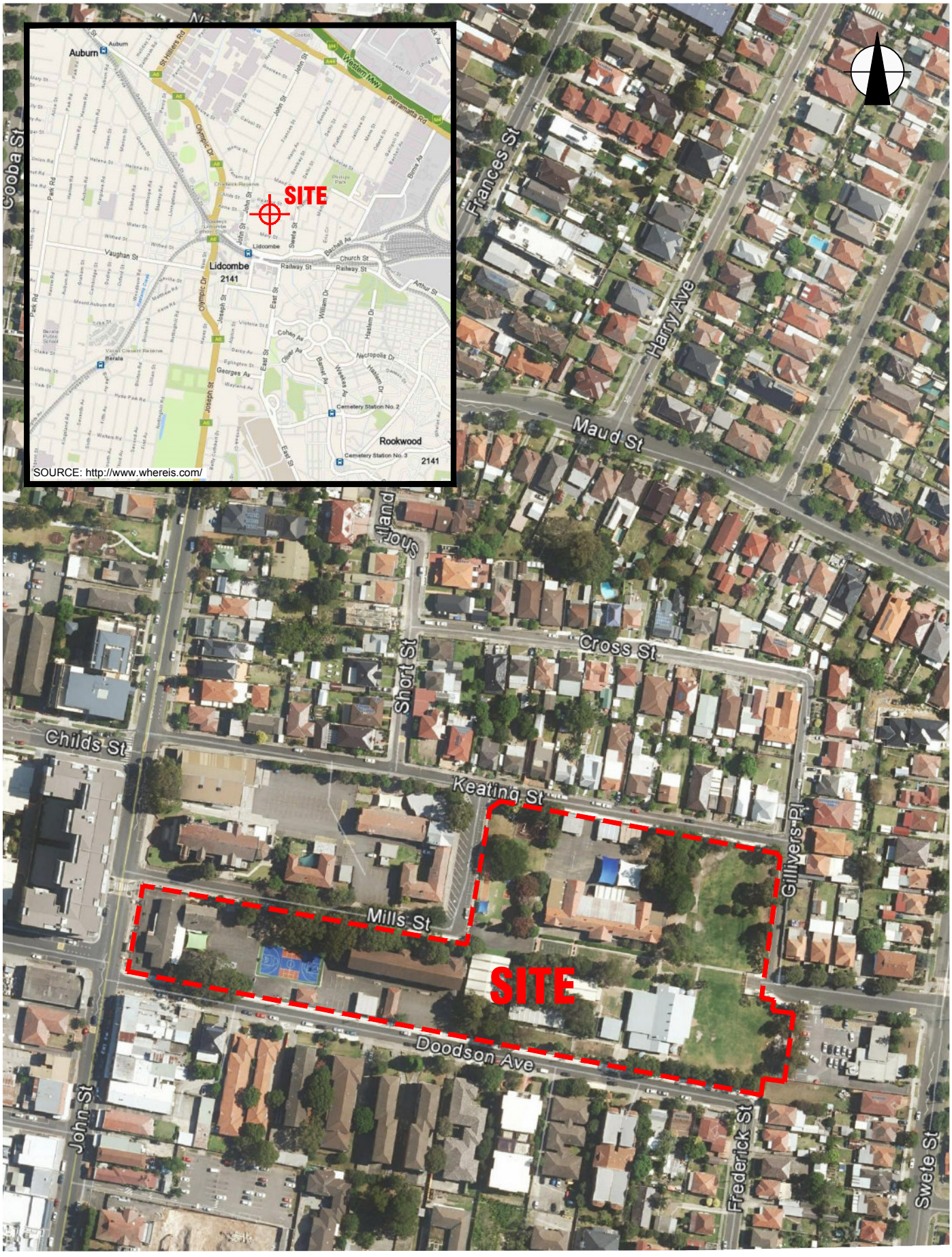
Misinterpretation of Site Assessments by Design Professionals:
Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Assessment Report:
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely:
Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

REPORT FIGURES



AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.5.1557
AERIAL IMAGE ©: 2015 GOOGLE INC.

This plan should be read in conjunction with the EIS report.

Title: **SITE LOCATION PLAN**

Location: LIDCOMBE PUBLIC SCHOOL
MILLS STREET, LIDCOMBE, NSW

Report No: E30429KP

Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

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LEGEND

APPROXIMATE SITE BOUNDARY

BH BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the EIS report.

Title: **SAMPLE LOCATION PLAN**

Location: LIDCOMBE PUBLIC SCHOOL
MILLS STREET, LIDCOMBE, NSW

Report No: E30429KP

Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

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LEGEND

APPROXIMATE SITE BOUNDARY

APPROXIMATE ASBESTOS ZONE

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the EIS report.

Title: **SITE FEATURES PLAN**

Location: LIDCOMBE PUBLIC SCHOOL
MILLS STREET, LIDCOMBE, NSW

Report No: E30429KP

Figure No: 3

ENVIRONMENTAL INVESTIGATION SERVICES

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KEATING STREET

MILLS STREET

BH16(0.6)

BH16	0.1-0.3
LEAD	630

BH1(0.8)

BH14(0.75)

BH15(>0.3)

BH15	0.0-0.2
LEAD	380
ASBESTOS DETECTED	

SECONDARY STAFF ACCESS

NEW 1 STOREY BUILDING

BH13(>0.4)

BH13	0.0-0.3
LEAD	920
B(a)P TEQ	7.5

BH12(>0.4)

BH2(0.7)

BH12	0.2-0.4
B(a)P TEQ	3.3

STUDENTS ENTRY

STUDENTS ENTRY

MAIN ENTRY

EASEMENT

EXISTING ASTROTURF PLAYGROUND

BH4(0.7)

BH11(>0.3)

BH11	0.0-0.3
B(a)P TEQ	10

PLAYGROUND

BH6(0.9)

COLA

NEW DECK

BH10(>0.5)

BH7(>0.5)

NEW 2 STOREY BUILDING

BH9	0.0-0.3
ASBESTOS DETECTED	

BH3	0.1-0.3
B(a)P TEQ	30
$>C_{16}-C_{34}$ (F3)	1,100

BH9(0.6)

BH8(0.7)

BH5(0.8)

BH3(0.8)

BH8	0.0-0.2
B(a)P TEQ	12

LEGEND

APPROXIMATE SITE BOUNDARY

BH BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION (mg/kg)

SOIL CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK

SOIL CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK

0 5 10 15 20 25

SCALE 1:500 @A3 METRES

This plan should be read in conjunction with the EIS report.

Title: **CONTAMINATION DATA PLAN**

Location: LIDCOMBE PUBLIC SCHOOL
MILLS STREET, LIDCOMBE, NSW

Report No: E30429KP

Figure No: 4

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 8/06/2017 3:23:06 PM DWG FILE: S:\5 EIS\5C EIS JOBS\30000'S\E30429KP LIDCOMBE\CAD\E30429KP.DWG

MILLS STREET

DOODSON AVENUE

LOT 1
D.P. 1095075
2.46 HECTARES

EASEMENT

MAIN ENTRY

EXISTING LANDSCAPE TO BE MAKE GOOD AND RETAINED

NEW CONCRETE WALKWAY

NEW RETAINING WALL

NEW PLANTING/ SOFT LANDSCAPE TO ACCEDDATE LEVELS

NEW SOFT LANDSCAPE TO MATCH THE EXISTING LEVELS

EXISTING CONCRETE PAVING

EXISTING BITUMEN FINISH

EXISTING BITUMEN FINISH TO BE MAKE GOOD

EXISTING LANDSCAPE TO BE MAKE GOOD AFTER DEMOUNTABLE REMOVALS

EXISTING BITUMEN TO BE MADE GOOD AFTER DEMOUNTABLE REMOVALS

EXISTING ASTROTURF

EXISTING RETAINING WALL

NEW PATHWAY

NEW CONCRETE WALKWAY

NEW SOFTFALL FINISH

NEW DECK AND TIRED SEATING COMPOSITE TIMBER FINISH

PLAYGROUND WITH SLIDES AND CLIMBING EQUIPMENT

CONCRETE HARDSTAND

ROOF OVER DASHED

STAFF ANNEX

STAFF ROOM

STAFF WC

SEC. STORE

MOVEMENT

CLINIC/COUNCIL

OFFICE

REC. /CLERICAL

VIS. FOY.

INTERVIEW

LIBRARY

ARCHIVE

OFFICE

LIFT

PAN

HB

MALE WC

ACC WC

BALCONY

W/D

LEGEND

APPROXIMATE SITE BOUNDARY

REMEDIATION AREA

0 5 10 15 20 25

SCALE 1:500 @A3 METRES

This plan should be read in conjunction with the EIS report.

Title: **REMEDIATION AREA PLAN**

Location: LIDCOMBE PUBLIC SCHOOL
MILLS STREET, LIDCOMBE, NSW

Report No: E30429KP

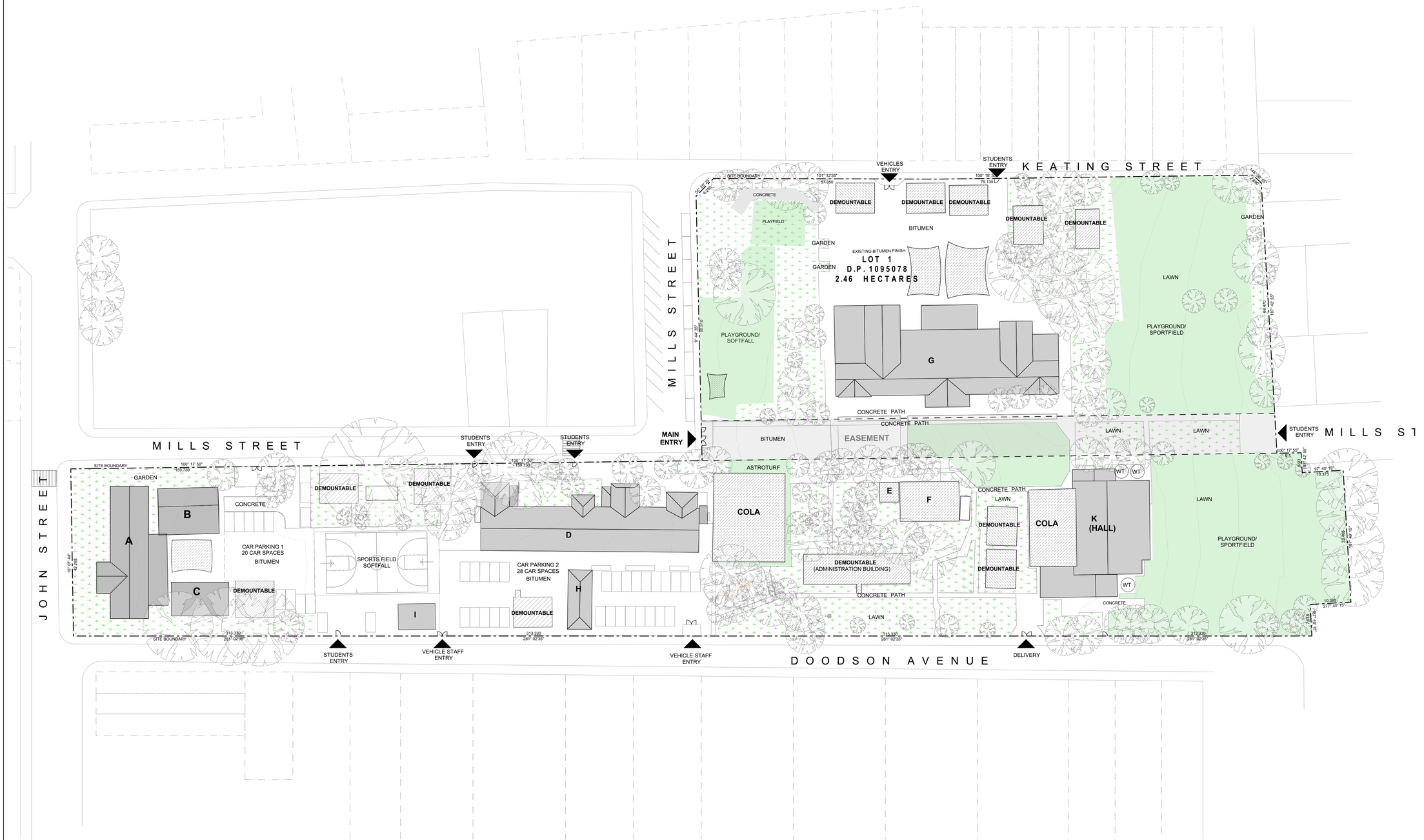
Figure No: 5

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 25/07/2017 3:44:18 PM DWG FILE: S:\5 EIS\5C EIS JOBS\30000'S\E30429KP LIDCOMBE\CAD\E30429KP.DWG

Appendix A: Site Information – Development Plans



Rev	Date	By	Issue Name	CK
01	14-Jun-17	JS	ISSUED TO CONSULTANTS	PW
02	26 - Jun - 17	JS	ISSUED TO CONSULTANTS	PW

EXISTING SITE LEGEND

- EXISTING BUILDINGS
- EXISTING DEMOUNTABLE BUILDING
- EXISTING PLAYGROUND
- EXISTING LAWN
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY
- NEIGHBOURING BOUNDARY
- EXISTING TREE
- SITE ENTRY

Project Manager
JOHNSTAFF

Building Certifier
BLACKETT MAGUIRE+ GOLDSMITH

Mechanical, Electrical, Hydraulic, Structural & Civil Engineering Consultant
JONES NICHOLSON CONSULTING ENGINEERS

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Telephone: 02 9281 8697
www.jdharchitects.com.au

Client
NSW GOVERNMENT Education

Project Name
LIDCOMBE PUBLIC SCHOOL
MILLS STREET
LIDCOMBE

Drawing Title
EXISTING SITE PLAN

Scale :	1:500 @A1	Date :	14-Jul-17
Drawn :	JS	Checked :	PW

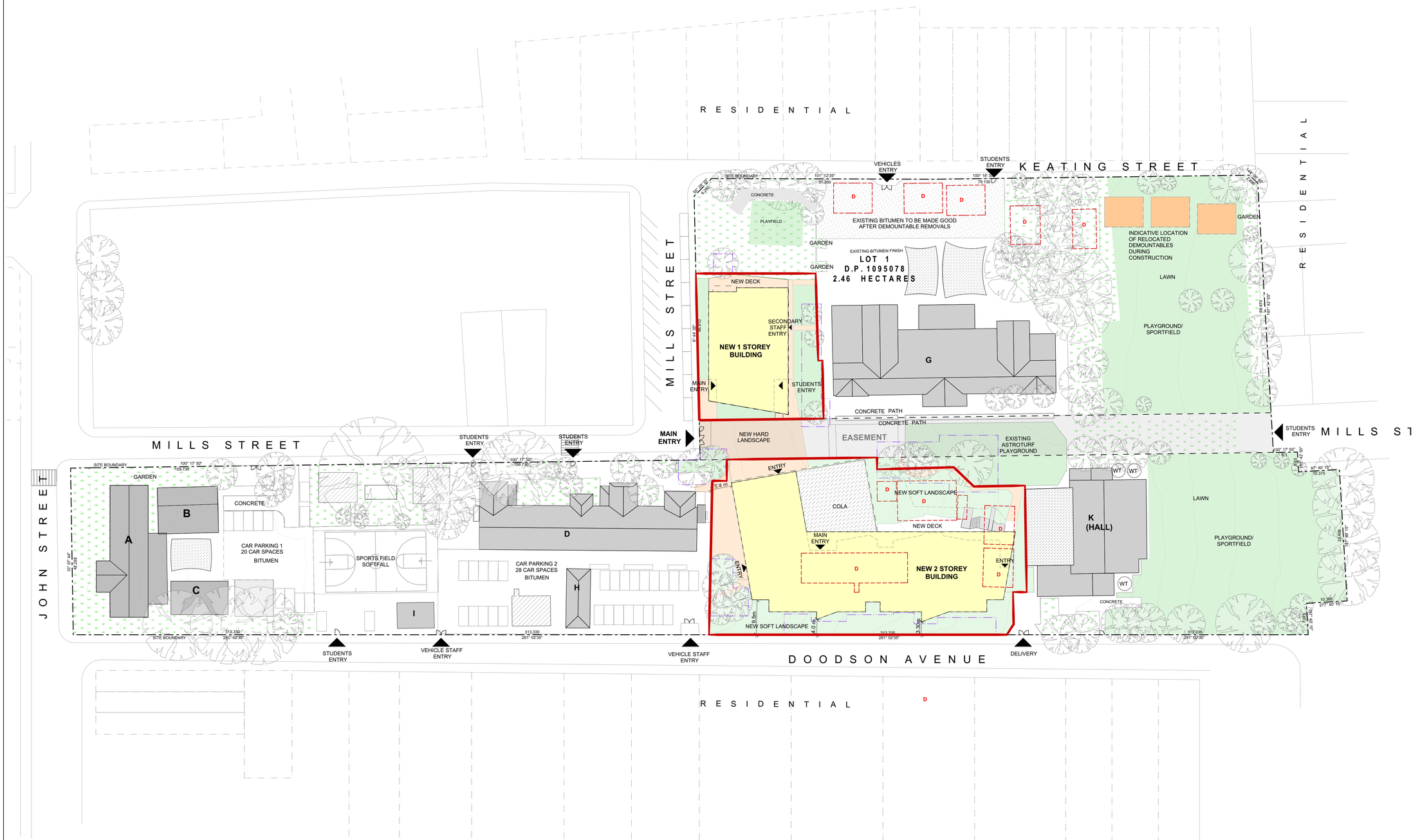
Project No.	Drawing No.	Rev.
996	DA01	02

QUALITY CERTIFIED ISO 9001

INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

Status: PRELIMINARY

Rev	Date	By	Issue Name	CK
01	14-Jun-17	JS	ISSUED TO CONSULTANTS	PW
02	26 - Jun - 17	JS	ISSUED TO CONSULTANTS	PW
03	11-Jul-17	JS	ISSUED TO CONSULTANTS	PW



PROPOSED SITE LEGEND

- EXISTING BUILDINGS
- NEW BUILDING
- REFURBISHED BUILDING
- REFURBISHED BUILDING
- RELOCATED DEMOUNTABLE BUILDINGS
- EXISTING LANDSCAPE TO BE MADE GOOD
- NEW SOFT LANDSCAPE
- NEW HARDSCAPE
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY
- NEIGHBOURING BOUNDARY
- TREE PROTECTION ZONE (TPZ)
- OUTLINE OF REMOVED DEMOUNTABLES

Project Manager
JOHNSTAFF

Building Certifier
BLACKETT MAGUIRE+ GOLDSMITH

Mechanical, Electrical, Hydraulic, Structural & Civil Engineering Consultant
JONES NICHOLSON CONSULTING ENGINEERS

Architect
JDH architects

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Client
NSW GOVERNMENT Education

Project Name
LIDCOMBE PUBLIC SCHOOL
MILLS STREET
LIDCOMBE

Drawing Title
PROPOSED SITE PLAN

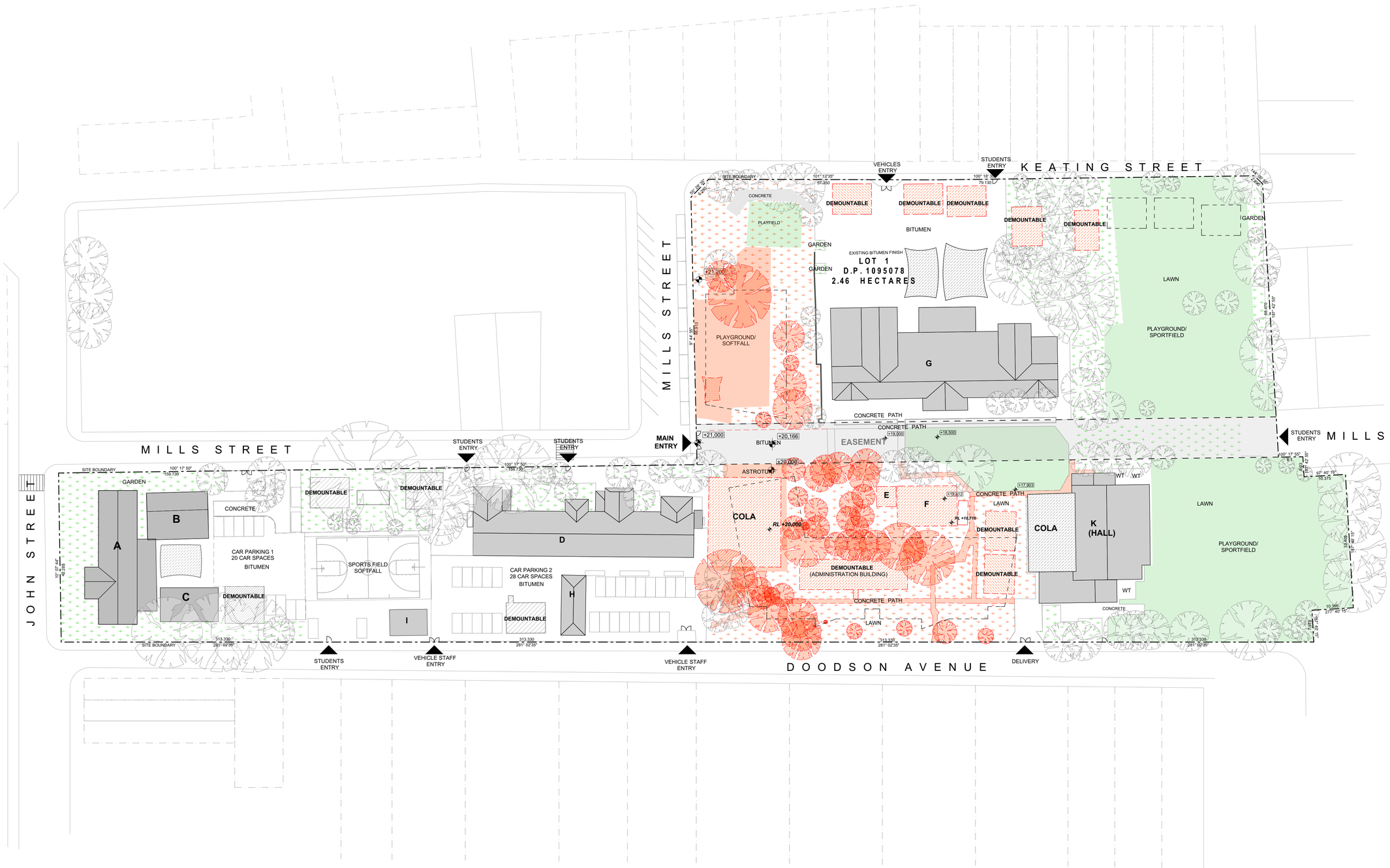
Scale : 1:500 @A1	Date : 14-Jul-17
Drawn : JS	Checked :PW

Project No.	Drawing No.	Rev.
996	DA11	03

QUALITY CERTIFIED ISO 9001
INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

Status: PRELIMINARY

Rev	Date	By	Issue Name	CK
01	14-Jun-17	JS	ISSUED TO CONSULTANTS	PW
02	26 - Jun - 17	JS	ISSUED TO CONSULTANTS	PW



DEMOLITION LEGEND

- EXISTING BUILDINGS
- EXISTING PLAYGROUND
- EXISTING TO BE DEMOLISHED
- BUILDINGS / STRUCTURES TO BE REMOVED / DEMOLISHED
- DEMOUNTABLE BUILDINGS TO BE TEMPORARILY LOCATED
- PROPOSED BUILDING OUTLINE
- SITE BOUNDARY
- INTERNAL LOT BOUNDARY
- NEIGHBOURING BOUNDARY
- EXISTING TREE
- EXISTING TREE TO BE REMOVED

Project Manager
JOHNSTAFF

Building Certifier
BLACKETT MAGUIRE+ GOLDSMITH

Mechanical, Electrical, Hydraulic, Structural & Civil Engineering Consultant
JONES NICHOLSON CONSULTING ENGINEERS

Architect
JDH architects

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Client
NSW GOVERNMENT Education

Project Name
LIDCOMBE PUBLIC SCHOOL
MILLS STREET
LIDCOMBE

Drawing Title
DEMOLITION PLAN

Scale : 1:500 @A1	Date : 14-Jul-17
Drawn : JS	Checked :PW

Project No.	Drawing No.	Rev.
996	DA21	02

QUALITY CERTIFIED ISO 9001
INITIALLING THE 'DRAWN AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

Status: PRELIMINARY

Rev	Date	By	Issue Name	CK
01	14-Jun-17	JS	ISSUED TO CONSULTANTS	PW
02	26 - Jun - 17	JS	ISSUED TO CONSULTANTS	PW

MILLS STREET

PLAYFIELD

EXISTING LANDSCAPE TO BE MAKE GOOD

EXISTING BITUMEN TO BE MADE GOOD AFTER DEMOUNTABLE REMOVALS

EXISTING LANDSCAPE TO BE MAKE GOOD AFTER DEMOUNTABLE REMOVAL

EXISTING BITUMEN FINISH

LOT 1
D.P.1095078
2.46 HECTARES

PLAYGROUND/ SPORTFIELD

+21.000

ROOF OVER DASHED

CONCRETE HARDSTAND 64.0 m2

+20.600

NEW PATHWAY

NEW PLANTING/ SOFT LANDSCAPE TO ACCOMODATE LEVELS

STAFF ANNEX 45.6 m2

STAFF ROOM 101.8 m2

SEC STORE 14.2 m2

ACC WC 7.8 m2

COMMS 6.4 m2

MOVEMENT 27.4 m2

STAFF WC 18.7 m2

CL 3.4 m2

CLINIC/COUNCIL 12.6 m2

DP 13.4 m2

PO 17.5 m2

MOVEMENT 26.4 m2

OFFICE 13.0 m2

DP 26.0 m2

INT. 17.0 m2

REC. /CLERICAL 65.9 m2

RL +20.600

VIS. FOY. 23.9 m2

ST FOY 8.0 m2

SICK 10.0 m2

INTERVIEW 28.3 m2

WC 4.0 m2

1:14 RAMP

NEW CONCRETE WALKWAY

EXISTING RETAINING WALL

NEW PLANTING/ SOFT LANDSCAPE

66.910

9° 44' 35"

MAIN ENTRY

+21.000

NEW HARD LANDSCAPING /PAVING

+20.166

EASEMENT

EXISTING BITUMEN FINISH TO BE MAKE GOOD

+19.000

+18.500

EXISTING ASTROTURF

EXISTING LANDSCAPE TO BE MAKE GOOD/RETAINED

+20.000

RL +19.965

NEW SOFTFALL FINISH 237.9 m2

RL +19.620

1:40 FALL

NEW SOFT LANDSCAPE TO ACCOMODATE NEW LEVELS

NEW SOFT LANDSCAPE TO MATCH THE EXISTING LEVELS

+18.610

+17.903

WALKWAY

NEW DECK AND TIRED SEATING COMPOSITE TIMBER FINISH

PLAYGROUND WITH SLIDES AND CLIMBING EQUIPMENT

RL +18.715

EXISTING CONCRETE PAVING

LIBRARY 260.5 m2

RL +20.000

CONCRETE WALKWAY 138.9 m2

CONCRETE STAIR

OUTDOOR LEARNING 142.0 m2

ROOF OVER DASHED

+19.965

NEW CONCRETE WALKWAY

ARCHIVE 19.0 m2

OFFICE 24.9 m2

OFFICE 13.1 m2

NEW RETAINING WALL

RL +20.000

LIFT 4.5 m2

HB 70.3 m2

PAA 20.9 m2

W/D 12.0 m2

HB 66.0 m2

HB 66.0 m2

FEMALE WC 15.7 m2

STORE 14.7 m2

MALE WC 17.6 m2

PAA 45.0 m2

MOVEMENT 94.9 m2

MOVEMENT 149.1 m2

CONCRETE STAIR

+20.630

AWS WC 3.3 m2

AMB WC 5.0 m2

ACC WC 6.9 m2

CLEANERS 4.3 m2

PUMP 1.9 m2

RISER 0.8 m2

HB 66.0 m2

HB 65.4 m2

W/D 20.6 m2

HB 65.5 m2

PAA 41.0 m2

HB 66.0 m2

W/D 13.3 m2

BALCONY 25.3 m2

NEW SOFT LANDSCAPE

EXISTING CONCRETE PAVING

CONCRETE

313.330

281° 02'30"

LEGEND

- EXISTING RETAINED
- LEARNING AREA
- WITHDRAWAL ROOM
- SERVICES
- UNDERCROFT / COLA
- BALCONY
- SITE AREA TO BE MADE GOOD WITH SOFT LANDSCAPING AT END OF CONSTRUCTION
- NEW SOFT LANDSCAPE
- NEW HARDSCAPE
- SOFTFALL / GRAVEL
- EXISTING WALL
- NEW WALL
- SITE BOUNDARY
- TREE PROTECTION ZONE (TPZ)
- EXISTING TREE
- BUILDING ENTRY
- EXISTING RL (RL +1.000)
- PROPOSED RL (RL +1.000)

Project Manager: JOHNSTAFF

Building Certifier: BLACKETT MAGUIRE+ GOLDSMITH

Mechanical, Electrical, Hydraulic, Structural & Civil Engineering Consultant: JONES NICHOLSON CONSULTING ENGINEERS

Architect

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Client: NSW GOVERNMENT Education

Project Name

LIDCOMBE PUBLIC SCHOOL
MILLS STREET
LIDCOMBE

Drawing Title

PROPOSED GROUND FLOOR

Scale :	1:200 @A1	Date :	14-Jul-17
Drawn :	JS	Checked :	PW

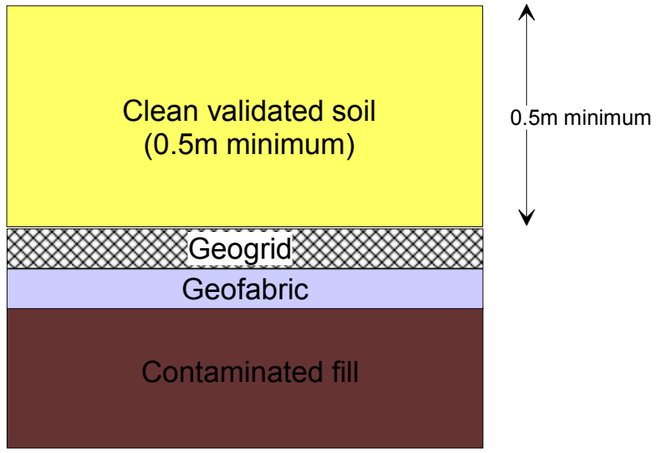
Project No.	Drawing No.	Rev.
996	DA31	02

QUALITY CERTIFIED ISO 9001 — INITIALLING THE 'DRAWN' AND THE 'CHECK' BOXES CONFIRMS THAT THIS DRAWING HAS BEEN PREPARED IN CONFORMITY WITH JDH ARCHITECTS Q.M.S. PROCEDURES.

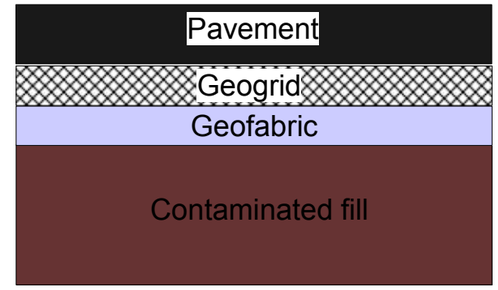
Status: PRELIMINARY

Appendix B: Site Information – General Capping Specification

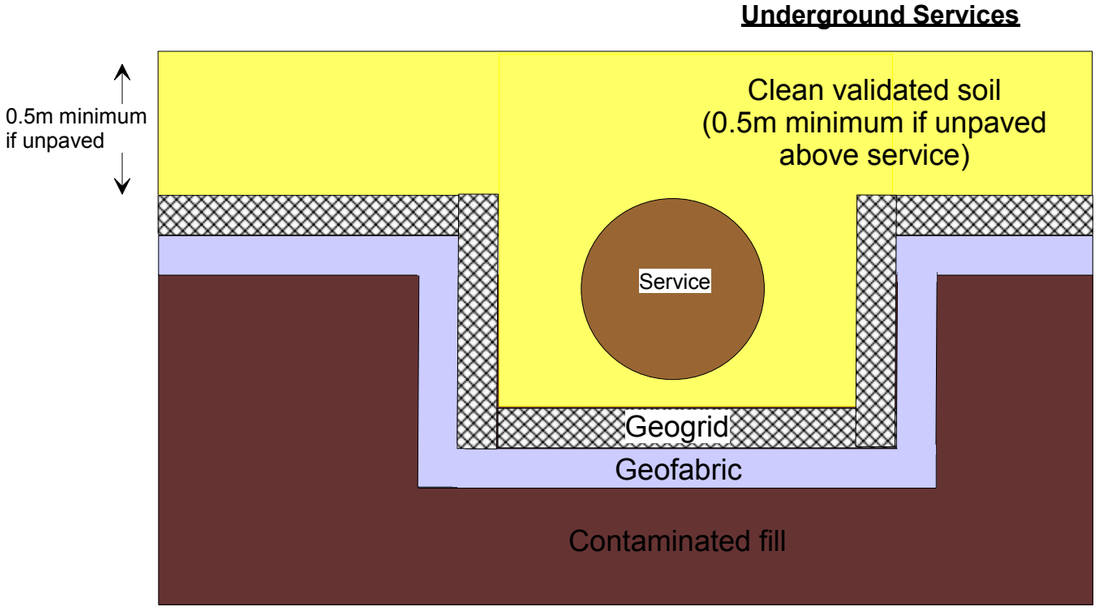
Unpaved Areas (shallow plantings)



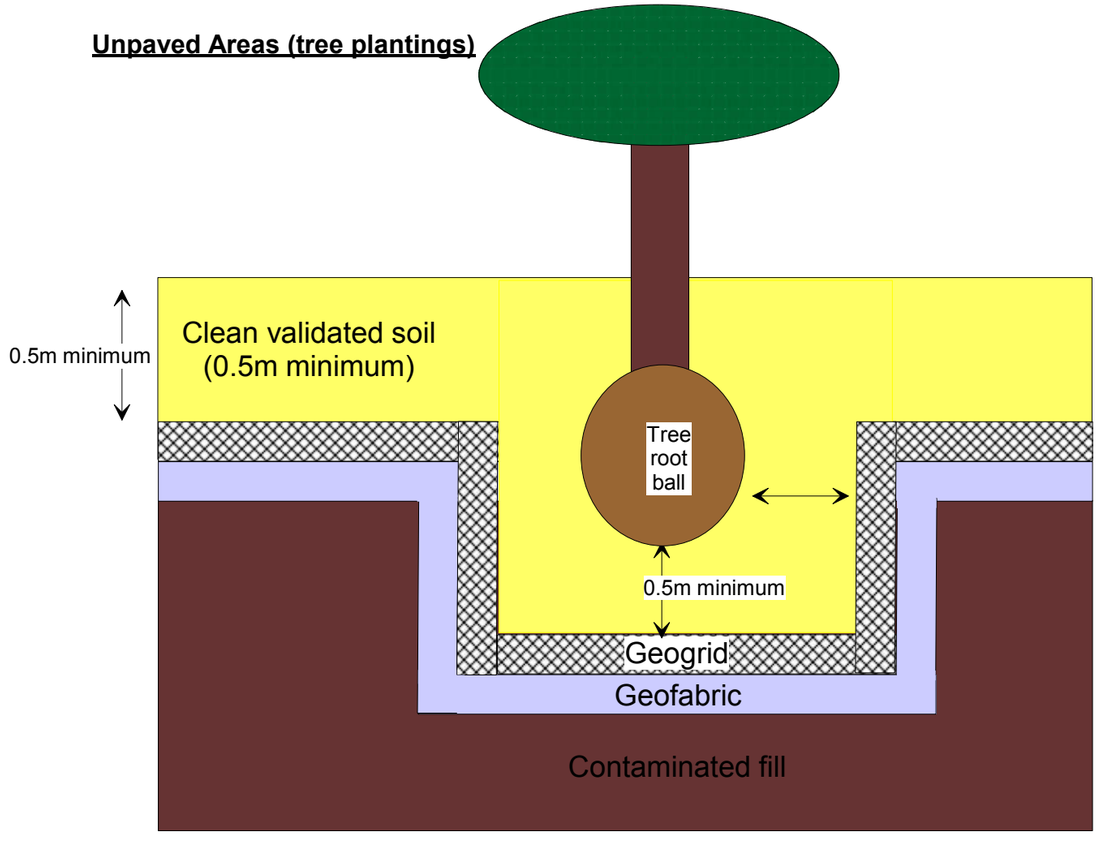
New Hardstand



Underground Services



Unpaved Areas (tree plantings)



Note: not to scale. This plan should be read in conjunction with the EIS report.

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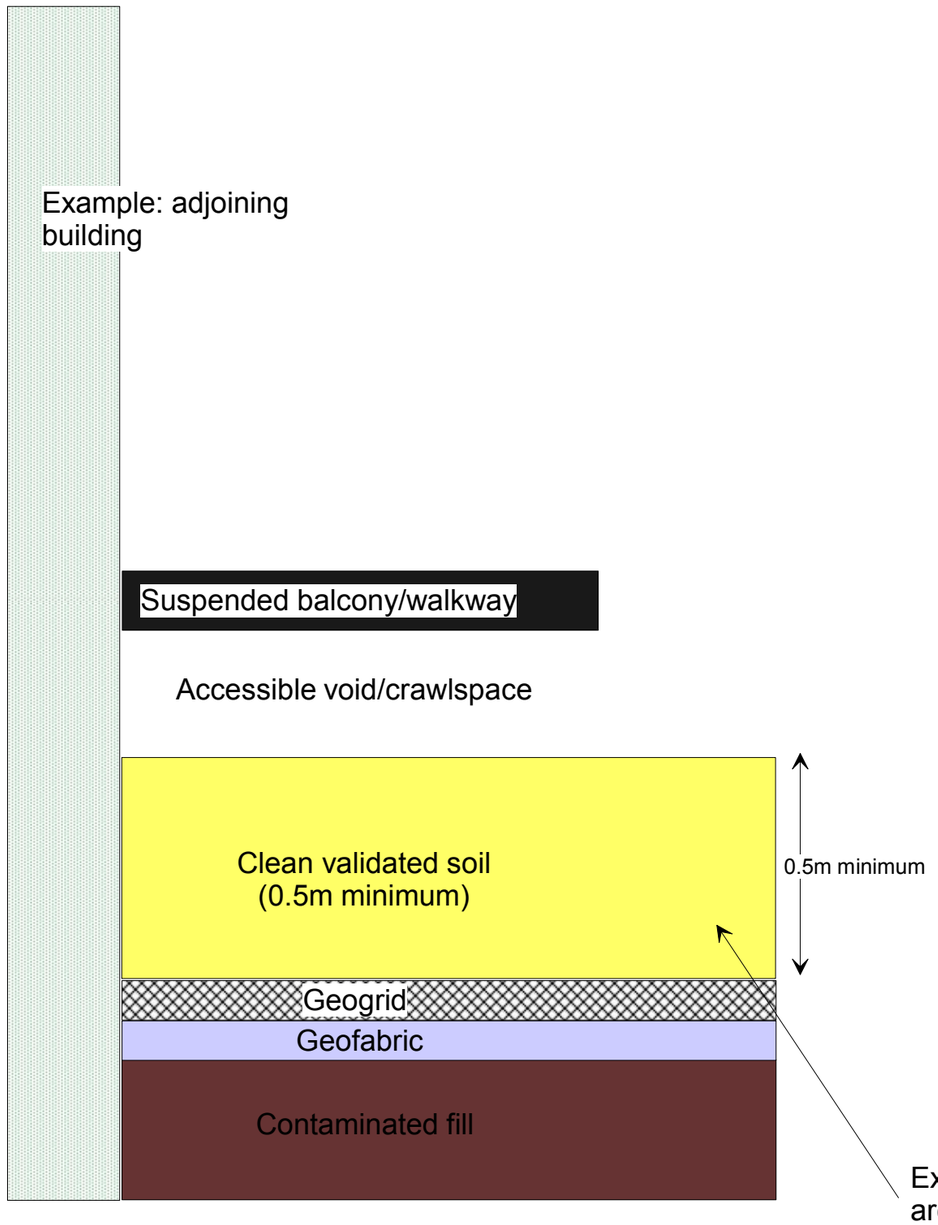
GENERAL CAPPING SPECIFICATION
p1 of 2

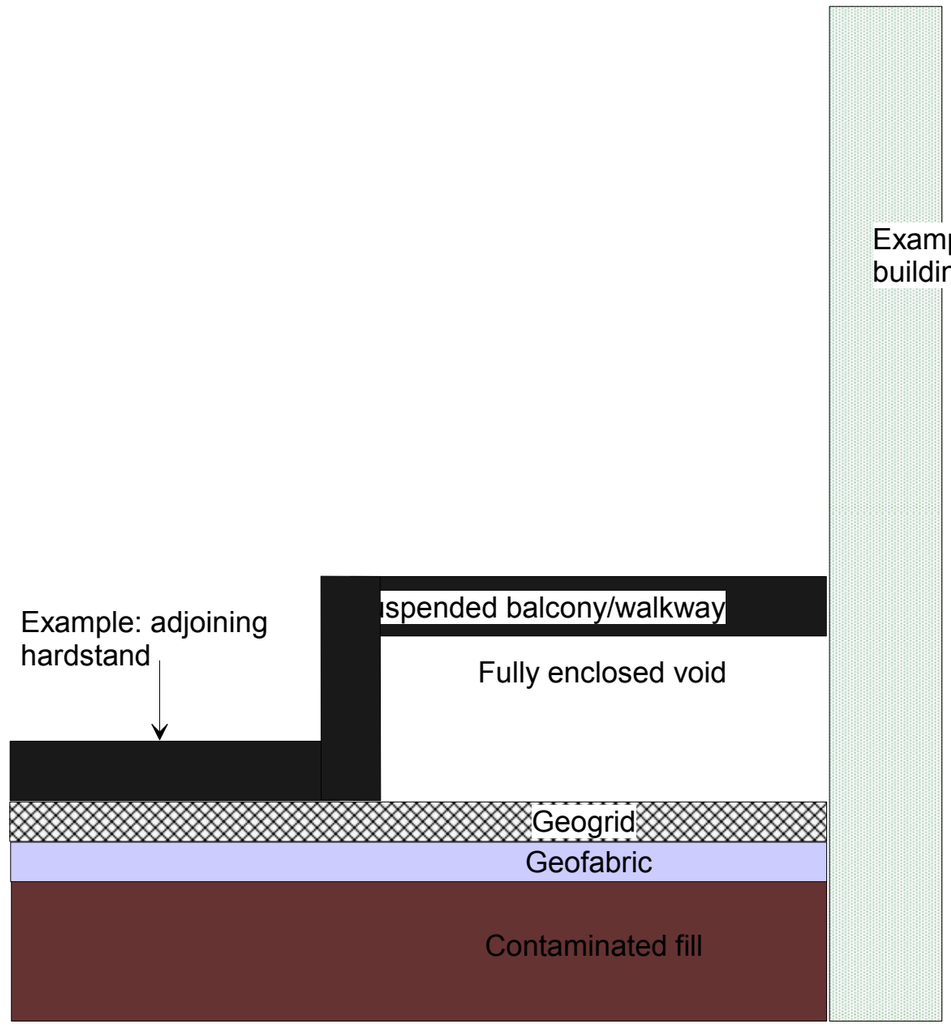
PROJECT ID: E30429KP

APP: B

New Raised/Suspended Walkways and Balconies (assuming accessible crawlspace)



New Raised/Suspended Walkways and Balconies (assuming no accessible crawlspace)



Note: not to scale. This plan should be read in conjunction with the EIS report.

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GENERAL CAPPING SPECIFICATION
p2 of 2

PROJECT ID: E30429KP

APP: B