

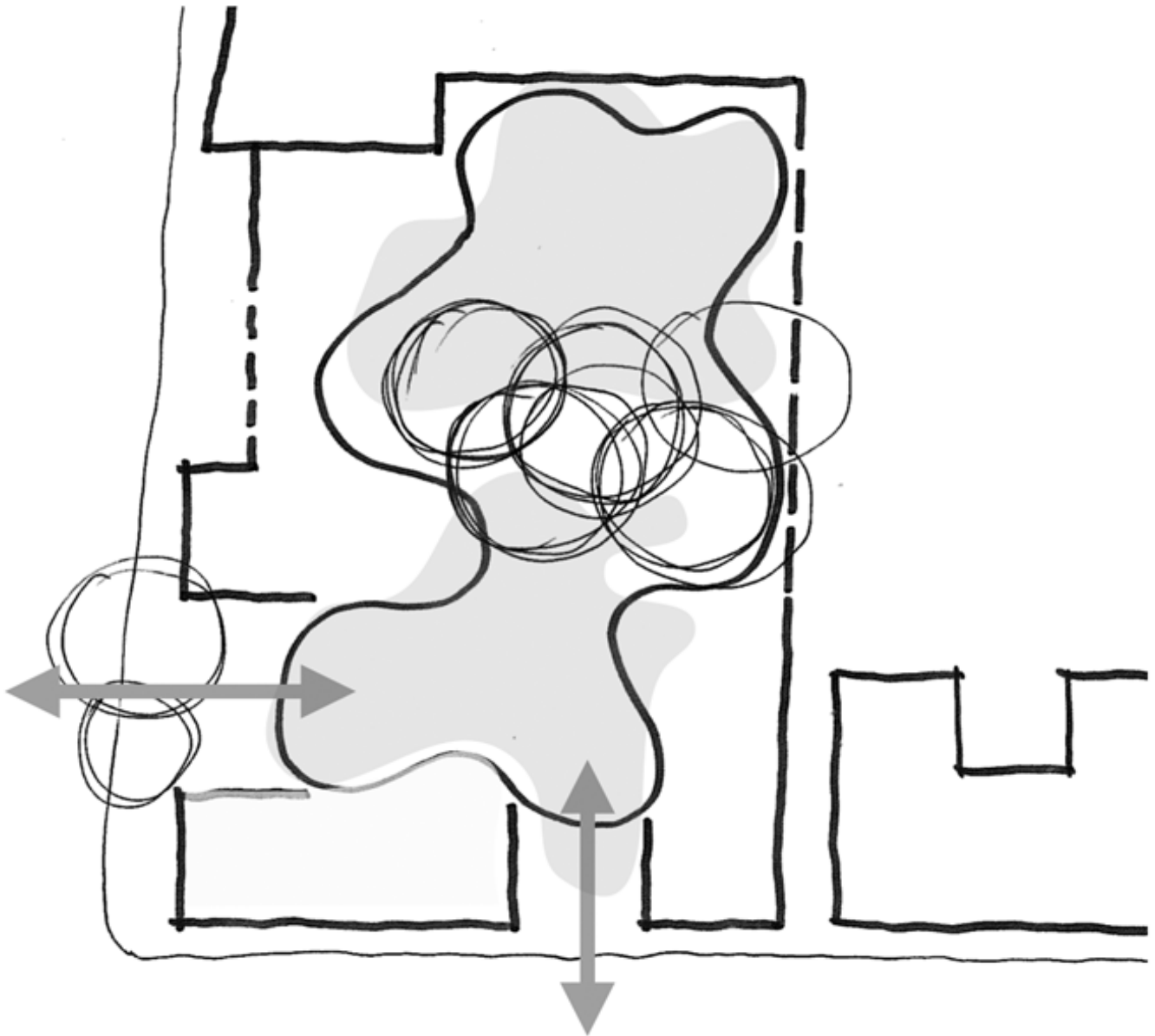
DARLINGTON PUBLIC SCHOOL REDEVELOPMENT

Appendix S — Hazardous Materials Survey

SSD-9914

Prepared by Douglas Partners

For NSW Department of Education





Douglas Partners
Geotechnics | Environment | Groundwater

Report on
Hazardous Building Materials Assessment

Darlington Public School Upgrade
Darlington Public School, Darlington, NSW

Prepared for
Billard Leece Partnership Pty Ltd

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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
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Reviewer  pp for TK	20 April 2018



Executive Summary

Douglas Partners Pty Ltd (DP) was engaged by Billard Leece Partnership Pty Ltd (BLP) to conduct a hazardous building materials (HBM) assessment of the building structures located at Darlington Public School, 417 Abercrombie Street, Darlington, NSW.

The site currently comprises an operational primary school and preschool. Redevelopment / upgrading works are proposed for the school buildings. A HBM assessment is required to identify potential hazardous materials within the buildings so that appropriate controls can be implemented if required.

HBM were identified or assumed present during the survey as summarised in Table 1 below.

Table 1: Summary of Results

Building / Area	Non-Friable Asbestos	Friable Asbestos	SMF	Lead Paint	Lead Dust	ODS	PCB
B00A	✓	✗	✗**	✓	✓	✗	✗*
B00B	✓	✗	✗**	✗	✓	✗	✗*
B00C	✓	✗	✗**	✓	✓	✗	✗*

SMF = Synthetic Mineral Fibre, PCB = Polychlorinated Biphenyls, ODS = Ozone Depleting Substances, ✓ = identified or assumed present, * = not identified, ** = assumed unlikely due to fluorescent lights throughout building in new and good condition, ** = SMF not identified in site inspection however may be present beneath sarking within building ceiling cavities

Limited or no access was available to certain areas of the site. Inaccessible areas should be assumed to contain HBM unless assessment of these areas by a Competent Person confirms otherwise.

HBM should be managed in accordance with the requirements of the NSW Work Health and Safety (WHS) Act 2011 (WHS Act), NSW WHS Regulation 2017 (WHS Regulation) and relevant Codes of Practice, Australian Standards and guidelines.

HBM should be removed prior to any significant disturbance including from maintenance, refurbishment and demolition work.

Limitations apply to this HBM survey and report as outlined in Section 7.

This report should be read in its entirety and may not be reproduced other than in full, except with the prior written approval of DP.

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Report on Hazardous Building Materials Assessment

Darlington Public School Upgrade

Darlington Public School, Darlington, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was engaged by Billard Leece Partnership Pty Ltd (BLP) to conduct a hazardous building materials (HBM) assessment of the building structures located at Darlington Public School, 417 Abercrombie Street, Darlington, NSW (the site).

The site currently comprises an operational primary school and preschool. Redevelopment / upgrading works are proposed for the school buildings. A HBM assessment is required to identify potential hazardous materials within the buildings so that appropriate controls can be implemented if required. The assessment was undertaken to assess the location, extent and condition of the following HBM:

- Asbestos containing materials (ACM);
- Synthetic mineral fibre (SMF);
- Polychlorinated biphenyls (PCBs) in fluorescent light fittings;
- Lead paint systems;
- Lead dust in ceiling cavities; and
- Ozone depleting substances (ODS) comprising refrigerants in air conditioning units.

A drawing that identifies relevant site and lot boundaries and the general location of the school is provided in Appendix A.

The results of the survey, including details of the HBM identified and the results of ACM risk assessments, are provided in the HBM Register (the Register) in Appendix B.

Laboratory analysis certificates for the samples collected and analysed as part of the survey are provided in Appendix C.

Site and building plans are provided in Appendix D.

A photographic record collected during the site inspection and is presented in Appendix E.

Limited or no access was available to certain areas as outlined in the Register and Section 5 of this report.

2. Site Description

The following site description is based on a site inspection completed on 28 February 2018, a hazardous materials inspection completed by DP hygienist Grant Russell on 14 March 2018 and review of Nearmap Imagery.

The site is an irregular shaped property and is accessed via a driveway that leads from Golden Grove Street located to the west of the site and the School gate fronting Abercrombie Street to the south of the site. The site is comprised of two lots as described below.

Lot 592 DP 752049

The lot is roughly square shaped and comprises the majority of the school grounds and buildings. A large two storey rectangular building (Building B00A) is located in the southwest corner of the lot which is used for administrative and schooling purposes and comprises several school offices and class rooms. The building is constructed of brick walls, concrete slab floors and sheet metal roofing. Several interior walls and ceilings of the building appeared to be constructed of fibre cement sheeting (FCS). A court yard is located to the immediate east of the building and is mostly concrete with two small unsealed garden areas containing large trees and shrubs. Another brick building (B00B) is located to the immediate east of the courtyard and is also constructed of brick walls, concrete slab floor and metal sheet roofing. FCS interior walls and ceilings were also observed in portions of the building.

Another 'S' shaped class room building (part of B00B) is located across the central south eastern portion of the lot which is also constructed similarly to the other buildings onsite. The area to the immediate north of the 'S' shaped building is concrete with unsealed gardens and a grassed area located further beyond in the north eastern portion of the lot.

Another large rectangular shaped building is located across the central western portion of the lot (B00C) and comprises the school hall and a number of classrooms. The building is constructed similarly as other buildings onsite. An extension of the building is located to the immediate northwest. An area containing play equipment is located to the immediate east of the building. The play equipment area is sealed with a rubber like safety surface material. A concrete path is located immediately adjacent east of the play area with an unsealed garden located further to the east.

Lot 100 DP 623500

The lot is roughly 'L' shaped and consists mainly of a basketball court and playground area. The lot is elevated slightly above the remainder of the site (adjacent lot to the south) indicating the area has likely been historically filled. The majority of the area is sealed with asphalt and concrete. The far northern portion of the lot is elevated further above the remainder of the lot and is covered with a rubber like safety surface material. Several large trees also exist within the northern portion of the site. An unsealed garden bed is located along the eastern boundary of the lot and contains several small shrubs.

3. Survey Method

The HBM assessment was completed by DP hygienist on 14 March 2018. The survey consisted primarily of a visual inspection of safely accessible areas supplemented by a limited program of sample collection and laboratory analysis.

Relevant information, including asbestos analysis results, contained in the NSW Department of Education asbestos register for Darlington Public School, were incorporated into this assessment and report. The asbestos register is identified as *Asbestos Register (Hazardous Materials and Risk Assessment), Darlington Public School (1735), Sydney, Newtown* reviewed by Parsons Brinckerhoff on 28 February 2017 (PB, 2017).

Samples of suspected ACM were collected by DP using hand tools (e.g. knife or pliers) and analysed for asbestos by a National Association of Testing Authorities (NATA) accredited laboratory. Sample size is typically limited to minimise disturbance of the material and potential structural or aesthetic impacts. The samples were analysed by polarised light microscopy (PLM) with dispersion staining in accordance with AS4964-2004 *Method for the qualitative identification of asbestos in bulk samples*.

Samples of suspected lead paint were collected by DP and analysed for lead by a NATA accredited laboratory using Inductively Coupled Plasma – Atomic Emission Spectrometry/Mass Spectrometry (ICP-AES/MS). Paint samples contained approximately equal portions of all layers of paint at the location sampled, to the extent practicable, and therefore typically reflect the average lead content of the overall paint system at location sampled.

SMF was identified primarily by visual inspection or incidentally as a result of laboratory analysis for asbestos.

Where safe access (i.e. electrical isolation) is provided to DP selected light fittings are partially dismantled to obtain capacitor details. Capacitor details are then compared to the list of PCB - containing and PCB - free equipment in *Identification of PCB-Containing Capacitors: An Information Booklet for Electricians and Electrical Contractors*, 1997 prepared by the Australian and New Zealand Environment and Conservation Council (ANZECC).

Lead dust samples were collected from ceiling or wall cavities or internal areas found to contain significant settled dust loadings. Samples were collected from a specified surface area (normally 100 or 900 cm²) and submitted for laboratory analysis to assess lead content. Analysis was conducted by a NATA accredited laboratory using ICP-AES/MS. The sampling area and laboratory analysis result (total lead in µg) was used to calculate the lead dust loading which is expressed as milligrams of lead per square metre (mg/m²).

Assessment of air conditioning units for ozone depleting substances was limited to a visual inspection of external compliance plates and/or other relevant labelling/signage that may indicate the refrigerant present.

Material sampling and analysis programs are necessarily limited. In the case of similar or repetitive buildings, building elements or rooms/areas representative bulk sampling protocols may be adopted.

4. Asbestos Risk Assessment Method

ACM poses a health risk if asbestos fibres are released to the atmosphere and inhaled. There is also a risk of environmental contamination whenever asbestos is disturbed. The degree of risk associated with any given ACM depends on a range of factors such as the friability, extent, condition, and location/accessibility of the material, the asbestos mineral type(s) present, the nature of site activities and ventilation.

The asbestos risk assessment method employed by DP considers several key factors that influence risk and a numerical score is assigned to each (refer Table 2 below). These scores are then added together to determine an overall risk rating for the ACM (refer Table 3 below). A degree of professional judgement may be applied when determining the final risk rating since it is not practicable to include in Table 2 all risk factors that may be relevant to a given situation.

Risk assessments for ACM should be reviewed on a regular basis including when:

- The Asbestos Management Plan is reviewed;
- Further asbestos or ACM is identified at the workplace;
- Asbestos is removed, disturbed, sealed, enclosed or undergoes any other change in condition;
- There is evidence that the risk assessment is no longer valid;
- There is evidence that control methods are not effective; or
- A significant change is proposed for the workplace or for work practices or procedures relevant to the risk assessment.

An asbestos risk assessment review is to be conducted at least every 5 years. The review is to be performed by a Competent Person.

Table 2: Key Risk Factors

Risk Factor	Score	Description
Friability	0	Non-friable (fibre reinforced vinyls, bituminous materials, adhesives)
	1	Non-Friable (fibre reinforced cement products such as wall and roof sheeting)
	2	Semi-Friable (low density insulation board, millboard, ropes, paper, textiles, gaskets or highly weathered asbestos cement)
	3	Friable (thermal insulation to pipes/boilers, sprayed insulation, loose fill insulation)
Condition	0	Very Good. Very little or no visible indication of damage. Structurally sound. No significant repairs required. Material performs as intended.
	1	Good - Minor damage in small, localised areas. Structurally sound. Minor preventative action may be required as a precaution and/or to prolong material life. Material generally performs as intended.
	2	Fair. Localised damage in various areas. Material is generally structurally sound however local removal and replacement of damaged sections may be required. Material performance may be somewhat impaired in areas.
	3	Poor. Material exhibits significant damage throughout. Overall structural stability may be compromised. Material performance is significantly impaired.

Risk Factor	Score	Description
Treatment	0	Fully enclosed, encapsulated or sealed. ACM is entirely contained and the enclosure/encapsulation/sealing material is in good condition.
	1	Generally enclosed, encapsulated or sealed. ACM is generally contained however enclosure/encapsulation/sealing material may not be completely continuous or exhibits minor damage/penetrations.
	2	Partially enclosed, encapsulated or sealed. ACM is contained in area(s) however enclosure/encapsulation/sealing material is not present, significantly damaged or ineffective in area(s).
	3	Enclosure/encapsulation/sealing material is significantly damaged and/or generally ineffective or there is no treatment.
Accessibility	0	The ACM is not directly accessible to occupants. Contact is highly unlikely unless a significant, dedicated effort is made. Substantial demolition, dismantling and/or special access equipment would be required.
	1	The ACM is generally not accessible to occupants. Contact is unlikely but could be made with special tools or equipment (e.g. elevating work platform) or minor demolition/dismantling.
	2	Some portion(s) of ACM are accessible to occupants. Direct contact may occur periodically but often requires basic tools/equipment (e.g. step ladder).
	3	The majority of the ACM is accessible to occupants. Direct contact is a common occurrence and may be made with minimal or no effort.
Activity	0	Area generally not occupied. Normally very little or no activity. Activities may be highly restricted or area secured. Examples may include subfloor voids, ceiling cavities, confined spaces and other inaccessible areas.
	1	Low level occupancy. Some activity in parts or area only occupied periodically. Examples may include plant rooms and store rooms.
	2	Moderate level occupancy. Activity normally present throughout area. May include offices, laboratories, classrooms, workshops, and warehouses.
	3	High level occupancy. Generally high levels of activity. Activities may be wide-ranging and/or largely unrestricted. Examples may include production/manufacturing areas, construction sites and public areas/thoroughfares.
Ventilation	0	Exterior area where natural ventilation and associated dilution is largely unlimited. Significant retention and/or build-up of airborne contaminants is unlikely.
	1	Interior area. Natural ventilation and dilution is limited but area is not particularly confined. Limited retention and/or build-up of airborne contaminants is possible.
	2	Confined areas where ventilation and associated dilution is significantly limited. Significant retention and/or build-up of airborne contaminants is possible or likely.
	3	Asbestos material subject to direct ventilation (e.g. inside an AC system or near a fan or air exhaust) which may result in disturbance and/or elevated fibre concentrations in air.

Table 3: Risk Rating

Overall Score	Risk Rating	Description
15-18	High (H)	The ACM poses an elevated and typically unacceptable risk of exposure and/or environmental contamination. Controls should generally be implemented as soon as possible to address the risk. Removal of the whole or part of the ACM is typically required. Other controls such as enclosure, encapsulation and/or sealing may also be necessary if portion(s) of ACM are to remain in place. As an interim measure, access to the area should be appropriately restricted. Air monitoring is often recommended to confirm airborne asbestos concentrations and provide a written record for future reference.

Overall Score	Risk Rating	Description
10-14	Moderate (M)	The ACM poses a moderate risk of exposure and/or environmental contamination. Often there has been minor damage or there is potential for disturbance/degradation in the foreseeable future. Consideration should be given to implementing appropriate controls in the short to medium term to address the risk(s) and/or prolong the lifespan of the material. Relevant controls typically include enclosure, encapsulation and/or sealing. Extensive removal is generally not required and the material can generally be managed on site if desired and serving a useful purpose.
0-9	Low (L)	The risk of exposure and environmental contamination is generally low while the material remains undisturbed and in its present condition. The material may generally remain in place without the requirement for significant, material-specific control measures such as removal, enclosure, encapsulation or sealing.

Note: If the ACM is likely to be disturbed (e.g. by maintenance, refurbishment or demolition work) and/or is no longer serving a useful purpose then the ACM should generally be removed. All ACM should be clearly identified with a label where reasonably practicable.

5. Results

The results of the survey, including details of the HBM identified, are tabulated in the Register in Appendix A and summarised in Table 1 in the Executive Summary of this report.

A licensed electrician was not provided to DP to isolate and de-energise light fittings or other electrical plant/services during the survey and therefore it was generally not possible to dismantle and inspect all fluorescent light fittings or other electrical plant/services to confirm the presence/absence of HBM.

A visual inspection of fluorescent light fittings stored in room AR1007 identified lights fittings used for the building as follows:

- Sylvania FL20T12 / 840 - 4000K; and
- Philips TLRS 20W / 840.

The two types of light fittings identified in the store room are not considered to contain PCB capacitors.

Although physical confirmation was not undertaken of all light fittings throughout the buildings the fluorescent lights appeared to be relatively new and in good condition. It is considered unlikely that lights within the buildings house PCB containing capacitors.

Several split system air conditioning unit were observed in the courtyard on the south western portion of the site. The refrigerant used in the units was identified as R410A which is not known as an ozone depleting substance (ODS).

Limited or no access was available to certain areas as outlined in the Register (Appendix A) and Table 4 below.

Table 4: Access Limitations*

Location / Area	Access Type	Reason(s)
Areas/materials at height (e.g. roofs)	Limited	Access limited to safely accessible areas and use of 1.8 m step ladder. Work at height and use of specialised access equipment not included in survey scope.
Plant, equipment and services in general (e.g. electrical panels, HVAC plant etc.)	Limited	Inspection limited to safely accessible exterior surfaces. Isolation and detailed dismantling and/or demolition typically required for further assessment.
Confined spaces	Nil	Not included in survey scope.
Air handling ductwork (interior portion)	Nil	Generally enclosed behind metal linings. Inspection of typically requires isolation by HVAC technician and/or electrician and/or detailed dismantling/demolition.
Ceiling cavities and subfloor voids	Limited	Access generally limited by height, services and clearance within cavity/void. Inspection of crawl spaces not included in survey scope.
Below flooring materials (e.g. carpet, vinyl sheeting etc.)	Limited	Access limited due to ongoing occupation, stored items, fixtures/furnishings and potential for damage to current finish.
Below ceramic tiled surfaces (e.g. walls and floors in wet areas)	Generally nil	Typically requires destructive removal of tiles and damage to current finish.
Enclosed building cavities and voids (e.g. service risers)	Nil	Detailed dismantling/demolition typically required. Access generally impractical.

* Refer also to the Register (Appendix A).

6. Recommendations

A summary recommendation for each HBM identified or assumed present at the site is provided in the Register (Appendix A).

The general recommendations in Section 6.1 onwards are provided for informative purposes and should be considered where the relevant HBM has been identified or assumed present by DP or is subsequently suspected to be present based on reasonable grounds.

The presence of identified and assumed HBM at the site, and the potential presence of any as-yet undetected HBM, should be considered during the risk assessment for any proposed work at the site or site use. Additional targeted inspection, sampling and analysis for HBM should be considered prior to any work that may result in the disturbance of such HBM.

6.1 General

HBM should be managed in accordance with the requirements of the WHS Act, WHS Regulation and subordinate Codes of Practice, Australian Standards and guidelines.

A hazardous materials management plan should be developed to aid compliance with the requirements of the WHS Act and Regulation including those that relate to the identification of hazards and control of associated risks.

HBM should be visually inspected on a regular basis. Any change to the condition of the material or relevant site conditions should be reported.

HBM should be removed prior to any significant disturbance such as maintenance, refurbishment and demolition work.

Prior to any work involving hazardous materials a risk assessment should be conducted and Safe Work Method Statement (SWMS) developed. The SWMS should outline the controls necessary to ensure that the risk of exposure to the hazardous materials is adequately controlled.

Hazardous materials remediation and removal work should be undertaken in controlled conditions.

Waste should be assessed and classified for disposal in accordance with the NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014.

At the completion of hazardous material remediation and removal work a clearance inspection should be conducted by a Competent Person, or in the case of friable asbestos, by a Licensed Asbestos Assessor.

6.2 Asbestos-containing Material (ACM)

ACM must be managed in accordance the WHS Regulation, the Safe Work Australia (SWA) *Code of Practice: How to Manage and Control Asbestos in the Workplace, 2016* and the SWA *Code of Practice: How to Safely Remove Asbestos, 2016*.

Exposure to airborne asbestos in the workplace must be eliminated to the extent that is reasonably practicable. If it is not reasonably practicable to eliminate exposure it must be minimised to the extent that is reasonably practicable.

An Asbestos Management Plan must be developed to enable compliance with the WHS Regulation (Regulation 429).

The presence and location of asbestos or ACM identified at a workplace must be clearly indicated by a label if it is reasonably practicable to do so.

Warning labels and signs should be consistent with the examples provided in the SWA *Code of Practice: How to Manage and Control Asbestos in the Workplace, 2016* and comply with AS1319 *Safety Signs for the Occupational Environment*.

Non-friable ACM that are structurally intact and in good to fair condition may typically remain in place provided that they are not significantly disturbed.

Tools and equipment that generate dust must generally not be used on asbestos. These include high-speed abrasive power and pneumatic tools (e.g. angle grinders, sanders, saws and high-speed drills, brooms and brushes).

Tools and equipment that cause the release of asbestos, including power tools and brooms, may only be used on asbestos if the equipment is enclosed and/or designed to capture or suppress asbestos fibres and/or the equipment is used in a way that is designed to capture or suppress asbestos fibres safely. In such a case, other controls including PPE may also be required based upon the results of a pre-work risk assessment and the SWMS adopted.

The use of high-pressure water sprays and compressed air on asbestos or ACM is specifically prohibited under the WHS Regulation.

If ACM become damaged they should be repaired or removed and replaced with an alternative, non-asbestos building product as soon as possible.

The scope of asbestos removal work should be outlined in a technical specification (i.e. Scope of Work Report) developed by a Competent Person (in the case of non-friable asbestos) or a Licensed Asbestos Assessor (in the case of friable asbestos).

Removal of friable asbestos must only be undertaken by a Class A licensed asbestos removal Contractor.

Removal of 10 m² or more of non-friable asbestos must only be undertaken by a Class A or Class B licensed asbestos removal contractor.

Air monitoring is required during removal of friable asbestos. Air monitoring should also be considered during removal of non-friable asbestos particularly where sensitive receptors exist such as at schools, hospitals and similar sites.

Air monitoring must be undertaken in accordance with the National Occupational Health and Safety Commission (NOHSC) *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition* [NOHSC:3003(2005)].

All air monitoring samples must be analysed by a National Association of Testing Authorities (NATA) Accredited laboratory that holds accreditation for the required analysis.

At the completion of asbestos removal a clearance inspection must be conducted by a Competent Person (for non-friable asbestos removal) or a licensed asbestos assessor (for friable asbestos removal).

Air monitoring and clearance inspections must be performed by person/s independent of the asbestos removal contractor.

All waste should be classified for disposal in accordance with the NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014. Asbestos waste is preclassified as Special Waste under these guidelines.

Asbestos transporters and facilities receiving asbestos waste must report the movement of asbestos waste to the EPA. Entities involved with the transport or disposal of asbestos waste in NSW, or arranging the transport of asbestos waste in NSW, must use the EPA's online tool, WasteLocate.

All asbestos waste must be disposed at a waste collection facility licensed to receive asbestos waste. All disposal receipts should be retained.

A person who relinquishes management or control of the workplace must ensure that the Asbestos Register is given to the person, if any, assuming management or control of the workplace.

6.3 Synthetic Mineral Fibre (SMF)

SMF materials may generally remain in place providing that they are in good condition and unlikely to be disturbed.

To reduce the potential for disturbance, exposure and environmental contamination SMF materials may be encapsulated or enclosed. Higher risk materials, such as loose fill insulation, may also be removed and replaced.

SMF work is to be undertaken in accordance with the requirements of the WHS Regulation and subordinate Codes of Practice, Guidance Notes and other documents. These include:

- National Standard for Synthetic Mineral Fibres [NOHSC:1004(1990)];
- National Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC:2006(1990)];
- WorkCover NSW *Safe management of synthetic mineral fibres (SMF) – glasswool and rockwool*;
- Safe Work Australia *Guide to Handling Refractory Ceramic Fibres*, December 2013; and
- Guidance Note on the Membrane Filter Method for the Estimation of Airborne Synthetic Mineral Fibres [NOHSC:3006(1989)].

Where reasonable concern exists over possible respirable fibre concentrations in any application, the first step shall be to confirm that the work practices, as recommended for the particular product in the schedules to [NOHSC:2006(1990)] are being followed. Air monitoring is not required when it has been clearly established that the work practices outlined in the schedules are being carried out.

Notwithstanding the above, exposures should not exceed the relevant SWA exposure standards outlined in Table 5 below.

Table 5: SWA Exposure Standards for SMF

Standard Name	Time Weighted Average (TWA) Exposure Standard
Glass wool, rock (stone) wool, slag wool and continuous glass filament and low biopersistence Man Made Vitreous Fibres (MMVF)	2 mg/m ³ (inhalable dust)
Refractory ceramic fibres (RCF), special purpose glass fibres and high biopersistence MMVF	0.5 f/mL (respirable) 2 mg/m ³ (inhalable dust)

SMF waste should be disposed at a licensed waste collection facility. Synthetic fibre waste (from materials such as fibreglass, polyesters and other plastics) packaged securely to prevent dust emissions is pre-classified as General Solid Waste (non-putrescible) under the NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014.

All disposal receipts should be retained.

6.4 Polychlorinated Biphenyls (PCBs)

Fluorescent lights were observed throughout the building however they are unlikely to house capacitors that contain PCB capacitors. Identifying criteria for PCB containing capacitors is adapted from ANZECC (1997) and includes:

- Resonant start;
- A capacitor that is cylindrical or rectangular, encased in an aluminium container with a weld running all the way around the top edge with two terminals with quick connect tags;
- A date mark from 1950s, 1960s, or 1970s;
- A capacitor encased in a rectangular tin container with soldered seams; and
- Slightly heavier than similar types of capacitors manufactured after the 1970s (which do not contain PCBs).

Prior to any significant disturbance, such as demolition, refurbishment or maintenance works, fluorescent light fittings should be electrically isolated and inspected in detail for metal canister-type capacitors that may contain PCB's. Any capacitors containing or suspected to contain PCB should be removed by a suitably qualified and experienced contractor.

PCB containing capacitors should be managed in accordance with the general requirements of the WHS Regulation 2017 and the:

- Environmentally Hazardous Chemicals (EHC) Act 2008 and subordinate *Polychlorinated Biphenyl (PCB) Chemical Control Order 1997*; and
- *Polychlorinated Biphenyls Management Plan, Revised Edition, April 2003*, issued by the Environment Protection and Heritage Council (EPHC).

Any PCB containing capacitors that exhibit leakage should be removed and replaced by a suitably qualified and experienced contractor as soon as possible. Access to areas containing leaking capacitors should be suitably restricted.

The conveyance and disposal of PCB material and PCB waste is subject to special requirements outlined in the *Polychlorinated Biphenyl (PCB) Chemical Control Order 1997*.

All disposal receipts should be retained.

6.5 Lead Paint

The potential presence of lead paint(s) at the Site should be considered during the risk assessment for any proposed works. Additional, targeted sampling and analysis for lead paints should be considered prior to any work that may result in significant disturbance of paint system(s).

Lead paints should be managed in accordance with the WHS Regulation including (including Chapter 7, Part 7.2 Lead) and:

- AS4361.1 – 2017, *Guide to hazardous paint management - Lead and other hazardous metallic pigments in industrial applications*; and
- AS4361.2 – 2017, *Guide to hazardous paint management - Lead paint in residential, public and commercial buildings*.

Lead paint that is in sound condition, not directly accessible (e.g. over-painted with lead-free paint) and unlikely to be disturbed may not require any immediate action.

Area(s) of lead paint that are in poor condition (e.g. flaking, delaminating) should generally be removed along with any lead paint debris and associated dust.

Exposed area(s) of lead paint that are intact may be stabilised by over-painting with a lead-free paint, or by covering with a suitable encapsulant. Stabilisation can provide an interim to long-term solution to a lead paint hazard.

The lead paint removal method and control measures adopted should be determined by risk assessment and a detailed knowledge of the workplace and proposed use/activities.

Exposure to airborne lead must be maintained below the relevant SWA exposure standards pertaining to lead. The SWA 8 hour TWA exposure standard for lead (inorganic dusts and fumes) is 0.15 mg/m³. Other exposure standards apply for substances such as lead chromate.

Air monitoring for lead may be required during lead paint remediation works based on risk assessment and the requirements to maintain airborne lead levels below the abovementioned exposure standards.

At the completion of lead paint removal a clearance inspection should be conducted by a Competent Person. The Competent Person should determine the requirements for clearance including any air monitoring or sample analysis that may be required.

Lead paint waste should be assessed and classified for disposal in accordance with the NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014:

- Waste contaminated with lead (including lead paint waste) from residential premises or educational or child care institutions is pre-classified as general solid waste (non-putrescible); and
- Lead paint waste arising otherwise than from residential premises or educational or child care institutions is pre-classified as hazardous waste.

All disposal receipts should be retained.

6.6 Lead Dust

Laboratory analysis results for lead dust should be taken as approximate only since sampling is limited and the concentration of lead in dust may vary considerably between locations within the same general area.

No recognised Australian guidelines have been identified for the direct assessment of lead dust concentrations in ceiling cavities. Notwithstanding this, AS4361.2-1998 *Guide to Lead Paint Management, Part 2: Residential and Commercial Buildings* (superseded) outlined acceptance limits for lead in surface dust after lead paint management activities. These limits were:

- Interior floors: 1 mg/m² (as lead);
- Interior window sills: 5 mg/m² (as lead); and
- Exterior surfaces: 8 mg/m² (as lead).

The United States Environmental Protection Authority (US EPA) 40 CFR Part 745 *Lead; Identification of Dangerous Levels of Lead; Final Rule* establishes the following standards for lead hazard identification:

- Floors - 40 µg/ft² (~0.43 mg/m²) lead; and
- Interior Window sills – 250 µg/ft² (~2.7 mg/m²) lead.

The above acceptance limits may be used as a guide to assessing lead concentrations in settled dust. As a precaution, and due to the sensitive nature of the site (i.e. primary school), a lead concentration of >0.5 mg/m² has used to identify potential hazardous conditions in this assessment.

Where the concentration of lead in in settled dust exceeds 0.5 mg/m² further detailed assessment should be considered along with identification of appropriate control and/or remedial measures via risk assessment and with a detailed knowledge of the workplace and proposed use/activities.

Where ceiling and/or wall cavities that contain lead dust are effectively enclosed and provide very limited or no opportunity for lead dust to enter occupied areas the dust may typically remain in place. In such a case access to the ceiling/wall cavity should be suitably restricted and all entrances signposted with appropriate warning signs.

Any personnel required to enter areas containing elevated concentrations of lead in dust should undertake an appropriate risk assessment and develop a Safe Work Method Statement (SWMS) for the work. The SWMS must identify controls that ensure the risk of exposure to lead remains at an acceptable level for personnel entering the cavity and other building occupants.

Consideration should be given to removal of lead dust when:

- The lead dust is located within occupied areas of a building;
- There is a significant risk of the lead entering into occupied areas; or
- Significant disturbance of lead dust is likely due to maintenance, refurbishment or demolition work or other reason(s); or
- Removal is a reasonably practical means of eliminating the hazard.

Removal of lead dust should be undertaken by a suitably qualified and experienced removal contractor.

The lead dust removal method and control measures adopted should be determined by risk assessment and a detailed knowledge of the workplace and proposed use/activities.

Exposure to airborne lead must be maintained below the relevant SWA exposure standards pertaining to lead. The SWA 8 hour TWA exposure standard for lead (inorganic dusts and fumes) is 0.15 mg/m^3 .

Air monitoring for lead may be required based on the results of the risk assessment and the requirement to maintain airborne lead concentrations below the abovementioned exposure standard(s).

At the completion of lead dust removal a clearance inspection should be conducted by a Competent Person. The Competent Person should determine the requirements for clearance including any air monitoring or sample analysis that may be required.

Lead waste should be assessed and classified for disposal in accordance with the NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014.

All disposal receipts should be retained.

6.7 Ozone Depleting Substances

Ozone depleting substances were not identified during this assessment. In the event that air conditioning units are no longer required on site it is recommended that these units be degassed and removed by a suitably qualified, experienced and licensed contractor.

It is an offence under the *NSW Protection of the Environment Operations Act 1997* to wilfully or negligently cause any controlled substance to be emitted into the atmosphere in contravention of the regulations under the Act and in a manner that harms or is likely to harm the environment.

Controlled substances are defined under the Ozone Protection Act 1989 to include any substance specified in Schedule 1 (Ozone depleting substances) and certain other substances prescribed by the regulations as an ozone depleting substance.

7. Limitations

Douglas Partners Pty Ltd (DP) has prepared this Hazardous Building Materials Assessment report for this project at Darlington Public School, 417 Abercrombie Street, Darlington NSW in accordance with DP's proposal dated 13 March 2018 and acceptance received from Michael Cashell of Billard Leece Partnership Pty Ltd dated 16 March 2018. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Billard Leece Partnership Pty Ltd 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 conditions on the site only at the specific inspection, sampling and/or testing locations, and then only to the extent safely accessible at the time the work was carried out. Site conditions can change and such changes may occur after DP's inspection, sampling and/or 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 site conditions across the site between and beyond the inspection, 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.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been inspected, sampled and/or analysed. This is either due to undetected variations in site conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling, or to occupants, furnishings or stored items preventing access for inspection and/or sampling. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond the inspection, sampling and/or testing locations, and hence no warranty can be given that all HBM have been identified.

Inspections are limited to areas that are safely accessible at the time of the inspection without undue damage to building finishes or disturbance of occupants. Inspections exclude hidden and inaccessible locations such as within building cavities, voids and enclosed sections of risers/shafts as well as materials encased within the building structure or located below the exposed ground surface (e.g. pipes, drains and formwork). In addition, residual asbestos materials (e.g. asbestos lagging to pipes and vessels) may remain undiscovered below newer, asbestos-free materials (e.g. preformed SMF insulation). Such residual asbestos materials may not be identified without extensive intrusive investigation and/or dismantling/demolition work.

Any disturbance of building materials, such as during renovation, maintenance or demolition work, may reveal additional HBM.

Limitations apply to the laboratory analytical methods used. For example, it can be very difficult or impossible to detect the presence of asbestos in some bulk materials (e.g. vinyl tiles) using the polarised light microscopy analytical method, even after ashing or disintegration of samples. This is due to the small length or diameter of asbestos fibres present in the material, or attributed to the fact that very fine fibres have been dispersed individually throughout the material.

While work is undertaken in a professional manner the nature of HBM and the limitations of the method(s) used mean that we cannot guarantee that all HBM have been identified. This report should therefore not be considered a definitive account of all HBM that may be present at the site.

DP personnel are not licenced or accredited quantity surveyors. Any quantities quoted in this report are provided for general guidance only and should not be relied upon. The services of a licenced quantity surveyor should be engaged in order to determine reliable quantities.

The recommendations and conclusions contained in this report shall not abrogate a person of their responsibility to work in accordance with statutory requirements, codes of practice, standards, guidelines, safety data sheets, work instructions or industry best practice.

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

Drawing 1



24.02.57.50.64

Legend

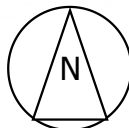
Site Boundary

Lot Boundary

PROJECT No: 92277.00

DRAWING No: 1

REVISION: A



Appendix B

Hazardous Building Materials (HBM) Register

DP Project No: 92277.00
Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation
B00A - R0002	interior	garage walls	brick	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	1	No hazardous material identified.
B00A - R0003	interior	vermiculite in ceiling structure	vermiculite	Refer A1	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0004	interior	ceiling structure	vermiculite	Refer A1	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0005	interior	ceiling structure	vermiculite	Refer A1	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0006	interior	ceiling structure	vermiculite	Refer A1	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	2	No hazardous material identified.
B00A - R0006	interior	flooring material	vinyl tiles	A6	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	3	No hazardous material identified.
B00A - R0007	interior	ceiling structure	vermiculite	Refer A3	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0008	interior	ceiling structure	vermiculite	Refer A3	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0009	interior	flooring material	vinyl tiles	A2	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	4	No hazardous material identified.

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00A - R0010	interior	ceiling structure	vermiculite	Refer A1	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0011	interior	ceiling structure	vermiculite	Refer A1	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	5	No hazardous material identified.
B00A - R0012	interior	ceiling structure	vermiculite	A1	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0013	interior	ceiling structure	flat fibre cement sheeting	R0013 - S1 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Enclose asbestos - Consider enclosing asbestos within a separate and continuous physical barrier. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0014	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R0015	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R0016	interior	ceiling structure	vermiculite	Refer A3	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0017	interior	ceiling structure	vermiculite	A3	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	6	No hazardous material identified.
B00A - R0017	interior	flooring material	vinyl tiles	A4	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	7	No hazardous material identified.

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 Hazardous Building Materials (HBM) Register
 417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation
B00A - R0017	interior	steel bars on windows	paint	L1	lead paint (>0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	refer 7	Lead paint - Areas of damaged/flaking lead paint and any associated debris should be removed by a suitably qualified and experienced contractor. Consider sealing or enclosing any remaining lead paint per AS4361. Reinspect condition on a regular basis. Avoid disturbance.
B00A - R0017	interior	above light fitting	dust	D1	elevated lead (>0.5 mg/m ²)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	refer 6	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00A - R0018	interior	distribution board	-	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R0019	interior	flooring material	vinyl tiles	Refer A4	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0019	interior	hand rails on stairs	yellow paint	L3	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	No hazardous material identified.
B00A - R0020	interior	general store room	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0021	interior	partitions in toilet	compressed fibre cement sheeting	A5	asbestos detected by analysis	1	1	1	2	2	1	8	Low	10	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0022	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	2	2	1	8	Low	9	Enclose asbestos - Consider enclosing asbestos within a separate and continuous physical barrier. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment								Photo No.	Summary Recommendation
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00A - R0023	interior	brick walls	beige paint	L4	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	No hazardous material identified.
B00A - R0024	interior	flooring material	vinyl tiles	AR0009 -S2 in PB (2017)	asbestos detected by analysis	0	1	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0025	interior	flooring material	vinyl tiles	A7	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	12	No hazardous material identified.
B00A - R0026	interior	flooring material	vinyl tiles	AR0027 -S5 in PB (2017)	asbestos detected by analysis	0	1	2	2	2	1	8	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0027	interior	flooring material	vinyl tiles	AR0027 -S5 in PB (2017)	asbestos detected by analysis	0	1	2	2	2	1	8	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00A - R0029	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	2	2	1	8	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0030	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	2	2	1	8	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0030	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0031	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0032	interior	flooring material	vinyl tiles under flooring	AR0009 - S2 in PB (2017)	asbestos detected by analysis	0	0	1	1	2	1	5	Low	13	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R0034	interior	stairs	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0035	interior	timber cornices	white paint	L21	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	No hazardous material identified.
B00A - R0035	interior	manhole	dust	D7	elevated lead (>0.5 mg/m ²)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation
B00A - R0036	interior	ceiling structure	vermiculite	Refer A6	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R0037	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R1001	interior	brick walls	beige paint	L13	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	No hazardous material identified.
B00A - R1002	interior	brick walls	beige paint	L12	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	No hazardous material identified.
B00A - R1002	interior	timber rafters	dust above rafters	D3	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00A - R1002	interior	flooring material	vinyl tiles	A13	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R1003	interior	ceiling structure	fibre cement sheeting	A11	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R1003	interior	timber rafters	brown paint	L11	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16	No hazardous material identified.

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 Hazardous Building Materials (HBM) Register
 417 Abercrombie Street, Darlington NSW

Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00A - R1004	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R1005	interior	flooring material	vinyl tiles under flooring	AR0009 -S2 in PB (2017)	asbestos detected by analysis	0	0	1	1	2	1	5	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1006	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R1007	interior	distribution board	-	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R1008	interior	wall in hallway	gyprock / plaster board type material	A12	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00A - R1008	interior	light fitting	dust above fitting	D11	elevated lead (>0.5 mg/m ²)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00A - R1009	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	1	2	1	7	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1010	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	1	2	1	7	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).

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Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00A - R1011	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00A - R1012	interior	ceiling	fibre cement sheeting	A24	asbestos detected by analysis	1	1	1	1	2	1	7	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1013	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	1	2	1	7	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1013	interior	flooring material	vinyl tiles under flooring	AR0009 - S2 in PB (2017)	asbestos detected by analysis	0	0	1	1	2	1	5	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1014	interior	partitions in toilet	compressed fibre cement sheeting	Refer A5	asbestos (assumed)	1	1	1	1	2	1	7	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1014	interior	flooring material	vinyl tiles under flooring	AR0009 - S2 in PB (2017)	asbestos detected by analysis	0	0	1	1	2	1	5	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1015	interior	ceiling structure	flat fibre cement sheeting	AR1013 - S6 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1016	interior	ceiling structure	flat fibre cement sheeting	AR1013 - S6 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1016	interior	timber cornices	flaking paint	L17	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	No hazardous material identified.

DP Project No: 92277.00
Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment								Photo No.	Summary Recommendation
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00A - R1017	interior	throughout	materials in general	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	17	No hazardous material identified.
B00A - R1018	interior	partitions in toilet	compressed fibre cement sheeting	Refer A14	asbestos detected by analysis	1	1	1	2	2	1	8	Low	18	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1019	interior	partitions in toilet	compressed fibre cement sheeting	A14	asbestos detected by analysis	1	1	1	2	2	1	8	Low	19	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00A - R1020	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.

DP Project No: 92277.00
Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation
B00B - R0001	interior	ceiling structure	vermiculite	Refer A21	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0002	interior	ceiling structure	vermiculite	Refer A21	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0003	interior	ceiling structure	vermiculite	Refer A21	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0004	interior	ceiling structure	vermiculite	Refer A21	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0005	interior	ceiling structure	vermiculite	A21	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0005	interior	concrete ceiling beam	white paint	L23	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0006	interior	flooring material	vinyl tiles under flooring	AR0027 - S5 in PB (2017)	asbestos detected by analysis	0	0	0	1	2	1	4	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B - R0007	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0008	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment								Photo No.	Summary Recommendation
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00B - R0009	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0010	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0011	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0012	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0013	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0014	interior	ceiling structure	vermiculite	A17	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0014	interior	brick walls	blue paint	L20	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0015	interior	timber door	brown paint	L19	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.

DP Project No: 92277.00
Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation
B00B - R0016	interior	within manhole	dust above manhole cover	D6	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NIL	-	Ceiling/floor cavity - Restrict access. Persons entering the area should undertake a risk assessment and implement suitable controls to prevent exposure. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B - R0016	interior	flooring material	vinyl tiles under flooring	A16	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0017	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0018	interior	flooring material	vinyl tiles under flooring	Refer A16	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0019	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0020	interior	flooring material	vinyl tiles under flooring	Refer A16	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0020	interior	timber rafters	blue paint	L24	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	20	No hazardous material identified.
B00B - R0021	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation
B00B - R0022	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0023	interior	wall in hallway	vermiculite	Refer A17	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0024	exterior	awning	flaking yellow paint	L18	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0024	interior	board on wall	fibre material	A20	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R0025	interior	fibre cement sheeting on wall	fibre cement sheeting	A19	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	21	No hazardous material identified.
B00B - R0025	interior	fibre cement sheeting on wall	fibre cement sheeting	A23	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	22	No hazardous material identified.

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 Hazardous Building Materials (HBM) Register
 417 Abercrombie Street, Darlington NSW

Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00B - R0025	interior	fibre cement sheeting on wall	fibre cement sheeting	A18	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	23	No hazardous material identified.
B00B - R1002	interior	flooring material	vinyl tiles under flooring	AR0027 - S5 in PB (2017)	asbestos detected by analysis	0	0	0	1	2	1	4	Low	24	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B - R1003	interior	flooring material	vinyl tiles under flooring	A15	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	25	No hazardous material identified.
B00B - R1003	interior	light fitting	dust above light fitting	D5	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	26	Dust settled on Surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00B - R1004	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R1006	interior	ceiling structure	flat fibre cement sheeting	AR1013 - S6 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B - R1007	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R1008	interior	timber rafters	brown paint	L14	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	27	No hazardous material identified.

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Hazardous Building Materials (HBM) Register
417 Abercrombie Street, Darlington NSW

						Asbestos Risk Assessment								Photo No.	Summary Recommendation
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00B - R1008	interior	brick wall	dust above brick wall	D4	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	Dust settled on Surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00B - R1009	interior	timber cornices near ceiling	paint	L16	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R1010	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00B - R1011	interior	timber skirting board near flooring	yellow paint	L15	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	28	No hazardous material identified.
B00B - R1012	interior	fibre cement sheeting on wall	fibre cement sheeting	Refer A18, A19 and A23	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R1013	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00B - R1014	interior	ceiling structure	white flaking paint	BR1014 - L22	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	29	No hazardous material identified.

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Hazardous Building Materials (HBM) Register
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						Asbestos Risk Assessment								Photo No.	Summary Recommendation (Management Survey)
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00C - R0001	interior	timber door frame	brown paint	AR0001 - L5	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	30	No hazardous material identified.
B00C - R0001	interior	door frame	dust above door frame	D9	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NIL	-	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00C - R0002	interior	timber door frame	brown paint	L9	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	31	No hazardous material identified.
B00C - R0003	interior	flooring material	vinyl tiles under flooring	AR0027 - S5 PB (2017)	asbestos detected by analysis	0	0	1	1	2	1	5	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00C - R0004	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00C - R0005	interior	ceiling structure	fibre cement sheeting	A8	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	32	No hazardous material identified.
B00C - R0005	interior	ceiling structure	dust above water pipe	D12	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NIL	33	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00C - R0006	interior	flooring material	vinyl tiles	A9	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	34	No hazardous material identified.

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 Hazardous Building Materials (HBM) Register
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Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation (Management Survey)
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00C - R0007	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00C - R0008	interior	flooring material	vinyl material under flooring	CR0008 - S8 in PB (2017)	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C - R0010	interior	partitions in toilet	compressed fibre cement sheeting	Refer A14	asbestos (assumed)	1	1	1	1	2	1	7	Low	35	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00C - R0010	interior	partitions in toilet	beige paint	L7	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	No hazardous material identified.
B00C - R0011	interior	partitions in toilet	compressed fibre cement sheeting	Refer A14	asbestos (assumed)	1	1	1	1	2	1	7	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00C - R0013	interior	ceiling structure	ceiling sheeting	A10	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C- R0014	interior	ceiling structure	flat fibre cement sheeting	AR1013 - S6 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00C - R0014	interior	flooring material	vinyl tiles under flooring	CR0008 - S8 in PB (2017)	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C - R0016	interior	flooring material	vinyl tiles under flooring	Refer AR0027 - S5 in PB (2017)	asbestos detected by analysis	0	0	1	1	2	1	5	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).

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Hazardous Building Materials (HBM) Register
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						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation (Management Survey)
B00C - R0017	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00C - R0018	interior	flooring material	vinyl tiles under flooring	CR0008 - S8 in NPB (2017)	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C - R0019	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00C - R0020	interior	timber door	yellow paint	L6	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C - R0021	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C - R0022	interior	door frame	dust above door frame	D2	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00C- R0023	interior	ceiling structure	flat fibre cement sheeting	CR0013 - S9 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00C - R0024	exterior	hand rails	yellow paint	L10	lead paint (>0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36	Lead paint (damaged) - Areas of damaged/flaking lead paint and any associated debris should be removed by a suitably qualified and experienced contractor. Consider sealing or enclosing any remaining lead paint per AS4361. Reinspect condition on a regular basis. Avoid disturbance.

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Hazardous Building Materials (HBM) Register
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Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Asbestos Risk Assessment								Photo No.	Summary Recommendation (Management Survey)
						Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority		
B00C- R0024	interior	ceiling structure	flat fibre cement sheeting	CR0023 - S9 in PB (2017)	asbestos detected by analysis	1	0	1	1	2	1	6	Low	-	Reinspect hazardous material - Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00C - R0025	interior	brick column	dust above column	D10	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	37	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00C - R0029	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	38	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00C - R0030	interior	flooring material	vinyl tiles under flooring	N/A	no asbestos identified visually	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No asbestos/hazardous materials identified in PB (2017) or this assessment.
B00C - R0031	interior	timber door	brown paint	Refer L10	lead paint (>0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	36	Lead paint (damaged) - Areas of damaged/flaking lead paint and any associated debris should be removed by a suitably qualified and experienced contractor. Consider sealing or enclosing any remaining lead paint per AS4361. Reinspect condition on a regular basis. Avoid disturbance.
B00C - R0031	interior	timber door	dust above door frame	D8	elevated lead (>0.5 mg/m2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	Dust settled on surfaces - Consider further investigation of lead concentrations in dust to assess the risk of exposure during building occupation. Lead contaminated dust should be removed by a suitably qualified and experienced contractor and a clearance certificate should be issued by a Competent Person for the removal work.
B00C - R0032	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.

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						Asbestos Risk Assessment									
Building	Location (General)	Location (Specific)	Material	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Recommendation (Management Survey)
B00C - R0033	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.
B00C - R0034	interior	timber door	brown paint	L8	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	39	No hazardous material identified.
B00C - R0035	interior	-	-	-	nil hazardous materials identified	N/A	N/A	N/A	N/A	N/A	N/A	0	NIL	-	No hazardous material identified.

Appendix C

Laboratory Certificate(s) of Analysis and Chain-of-Custody
documentation

CERTIFICATE OF ANALYSIS 187473

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	<u>92277.00, Darlington Public Hazmat Survey</u>
Number of Samples	23 Material, 24 Paint, 12 Swab
Date samples received	16/03/2018
Date completed instructions received	16/03/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	23/03/2018
Date of Issue	23/03/2018
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Jessica Hie
 Authorised by Asbestos Approved Signatory: Lulu Scott

Results Approved By

Jaimie Loa-Kum-Cheung, Senior Chemist
 Long Pham, Team Leader, Metals
 Lulu Scott, Asbestos Supervisor

Authorised By



David Springer, General Manager

Asbestos ID - materials						
Our Reference	UNITS	187473-1	187473-2	187473-3	187473-4	187473-5
Your Reference		A1	A2	A3	A4	A5
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Material	Material	Material	Material	Material
Date analysed	-	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018
Mass / Dimension of Sample	-	12x10x1mm	16x12x4mm	15x12x3mm	23x14x4mm	6x6x1mm
Sample Description	-	Beige crumbly mica material	Blue brittle vinyl tile	Beige crumbly mica material	Blue brittle vinyl tile	Beige fibre cement material
Asbestos ID in materials	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	Chrysotile asbestos detected

Asbestos ID - materials						
Our Reference	UNITS	187473-6	187473-7	187473-8	187473-9	187473-10
Your Reference		A6	A7	A8	A9	A10
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Material	Material	Material	Material	Material
Date analysed	-	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018
Mass / Dimension of Sample	-	20x11x4mm	30x20x2mm	100x20x5mm	25x12x2mm	20x15x3mm
Sample Description	-	Blue brittle vinyl tile	Green flexible vinyl tile	Beige compressed fibre cement material	Green flexible vinyl tile	White crumbly plaster material
Asbestos ID in materials	-	No asbestos detected	No asbestos detected	No asbestos detected Organic fibres detected	No asbestos detected	No asbestos detected

Asbestos ID - materials						
Our Reference	UNITS	187473-11	187473-12	187473-13	187473-14	187473-15
Your Reference		A11	A12	A13	A14	A15
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Material	Material	Material	Material	Material
Date analysed	-	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018
Mass / Dimension of Sample	-	40x25x2mm	50x50x10mm	40x20x3mm	20x14x2mm	47x22x2mm
Sample Description	-	Beige fibrous membrane	Plaster & fibrous membrane	Blue brittle vinyl tile	Beige compressed fibre cement material	Green brittle vinyl tile
Asbestos ID in materials	-	No asbestos detected Organic fibres detected	No asbestos detected Organic fibres detected	No asbestos detected Organic fibres detected	Chrysotile asbestos detected	No asbestos detected

Asbestos ID - materials						
Our Reference	UNITS	187473-16	187473-17	187473-18	187473-19	187473-20
Your Reference		A16	A17	A18	A19	A20
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Material	Material	Material	Material	Material
Date analysed	-	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018
Mass / Dimension of Sample	-	25x18x2mm	15x8x4mm	30x20x3mm	30x10x3mm	10x6x4mm
Sample Description	-	Blue flexible vinyl tile	Beige crumbly mica material	Beige layered fibre cement material	Grey fibre cement material	Woodchip material
Asbestos ID in materials	-	No asbestos detected	No asbestos detected	No asbestos detected Organic fibres detected	No asbestos detected Organic fibres detected	No asbestos detected Organic fibres detected

Asbestos ID - materials				
Our Reference		187473-21	187473-22	187473-23
Your Reference	UNITS	A21	A23	A24
Date Sampled		14/03/2018	14/03/2018	14/03/2018
Type of sample		Material	Material	Material
Date analysed	-	21/03/2018	21/03/2018	21/03/2018
Mass / Dimension of Sample	-	14x12x2mm	40x20x2mm	30x20x3mm
Sample Description	-	Beige crumbly mica material	Grey layered fibre cement material	Beige compressed fibre cement material
Asbestos ID in materials	-	No asbestos detected	No asbestos detected Organic fibres detected	Chrysotile asbestos detected Organic fibres detected

Lead in Paint						
Our Reference	UNITS	187473-24	187473-25	187473-26	187473-27	187473-28
Your Reference		L1	L2	L3	L4	L5
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Paint	Paint	Paint	Paint	Paint
Date prepared	-	19/03/2018	19/03/2018	19/03/2018	19/03/2018	19/03/2018
Date analysed	-	20/03/2018	20/03/2018	20/03/2018	20/03/2018	20/03/2018
Lead in paint	%w/w	0.58	<0.05	0.08	<0.05	<0.05

Lead in Paint						
Our Reference	UNITS	187473-29	187473-30	187473-31	187473-32	187473-33
Your Reference		L6	L7	L8	L9	L10
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Paint	Paint	Paint	Paint	Paint
Date prepared	-	19/03/2018	19/03/2018	19/03/2018	19/03/2018	19/03/2018
Date analysed	-	20/03/2018	20/03/2018	20/03/2018	20/03/2018	20/03/2018
Lead in paint	%w/w	<0.05	<0.05	<0.05	<0.05	0.3

Lead in Paint						
Our Reference	UNITS	187473-34	187473-35	187473-36	187473-37	187473-38
Your Reference		L11	L12	L13	L14	L15
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Paint	Paint	Paint	Paint	Paint
Date prepared	-	19/03/2018	19/03/2018	19/03/2018	19/03/2018	19/03/2018
Date analysed	-	20/03/2018	20/03/2018	20/03/2018	20/03/2018	20/03/2018
Lead in paint	%w/w	<0.05	<0.05	<0.05	<0.05	<0.05

Lead in Paint						
Our Reference	UNITS	187473-39	187473-40	187473-41	187473-42	187473-43
Your Reference		L16	L17	L18	L19	L20
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Paint	Paint	Paint	Paint	Paint
Date prepared	-	19/03/2018	19/03/2018	19/03/2018	19/03/2018	19/03/2018
Date analysed	-	20/03/2018	20/03/2018	20/03/2018	20/03/2018	20/03/2018
Lead in paint	%w/w	<0.05	<0.05	<0.05	<0.05	<0.05

Lead in Paint					
Our Reference	UNITS	187473-44	187473-45	187473-46	187473-47
Your Reference		L21	L22	L23	L24
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Paint	Paint	Paint	Paint
Date prepared	-	19/03/2018	19/03/2018	19/03/2018	19/03/2018
Date analysed	-	20/03/2018	20/03/2018	20/03/2018	20/03/2018
Lead in paint	%w/w	<0.05	<0.05	<0.05	<0.05

Lead in swab						
Our Reference		187473-48	187473-49	187473-50	187473-51	187473-52
Your Reference	UNITS	D1	D2	D3	D4	D5
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Swab	Swab	Swab	Swab	Swab
Date prepared	-	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Lead in Swabs	µg/swab	29	37	12	16	16

Lead in swab						
Our Reference		187473-53	187473-54	187473-55	187473-56	187473-57
Your Reference	UNITS	D6	D7	D8	D9	D10
Date Sampled		14/03/2018	14/03/2018	14/03/2018	14/03/2018	14/03/2018
Type of sample		Swab	Swab	Swab	Swab	Swab
Date prepared	-	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Lead in Swabs	µg/swab	20	14	12	7	55

Lead in swab			
Our Reference		187473-58	187473-59
Your Reference	UNITS	D11	D12
Date Sampled		14/03/2018	14/03/2018
Type of sample		Swab	Swab
Date prepared	-	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018
Lead in Swabs	µg/swab	39	39

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Metals-004	Digestion of Paint chips/scrapings/liquids for Metals determination by ICP-AES/MS and or CV/AAS.
Metals-005	Digestion of Dust wipes/swabs and /or miscellaneous samples for Metals determination by ICP-AES/MS and/or CV-AAS

Client Reference: 92277.00, Darlington Public Hazmat Survey

QUALITY CONTROL: Lead in Paint						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			19/03/2018	41	19/03/2018	19/03/2018		19/03/2018	[NT]
Date analysed	-			20/03/2018	41	20/03/2018	20/03/2018		20/03/2018	[NT]
Lead in paint	%w/w	0.05	Metals-004	<0.05	41	<0.05	<0.05	0	101	[NT]

QUALITY CONTROL: Lead in Paint						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	19/03/2018	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	20/03/2018	[NT]
Lead in paint	%w/w	0.05	Metals-004	[NT]	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: 92277.00, Darlington Public Hazmat Survey

QUALITY CONTROL: Lead in swab						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Lead in Swabs	µg/swab	1	Metals-005	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

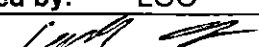

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.


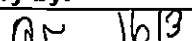
Project Name:	Darlington Public School Hazmat Survey		To:	Envirolab Services	
Project No:	92277.00	Sampler:	Grant Russell		
Project Mgr:	Grant Russell	Mob. Phone:	0418 116 545		
Email:	Grant.Russell@Douglaspartners.com.au		Attn:	Tania Notaras	
Date Required:	Standard		Phone:	(02) 9910 6200	Fax: (02) 9910 6201
			Email:	tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation
			S - Soil M - Material	G - Glass P - Plastic	Asbestos	Lead							
A1	1	14/03/18	M	P	x								
A2	2	14/03/18	M	P	x								
A3	3	14/03/18	M	P	x								
A4	4	14/03/18	M	P	x								
A5	5	14/03/18	M	P	x								
A6	6	14/03/18	M	P	x								
A7	7	14/03/18	M	P	x								
A8	8	14/03/18	M	P	x								
A9	9	14/03/18	M	P	x								
A10	10	14/03/18	M	P	x								
A11	11	14/03/18	M	P	x								
A12	12	14/03/18	M	P	x								
A13	13	14/03/18	M	P	x								

Lab Report No:					
Send Results to:	Douglas Partners Pty Ltd	Address:	18 Waler Crescent, Smeaton Grange 2567	Phone:	(02) 4647 0075
Relinquished by:	LOC	Transported to laboratory by:			
Signed:		Date & Time:	16/3/18	Received by:	ELS Rebecca  16/3/18 18.30


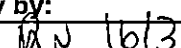

Envirolab Services
 12 Ashley St
 Chatswood NSW 2067
 Ph: (02) 9910 6200
Job No: 187473
Date Received: 16/3/18
Time Received: 18.30
Received by: 
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Project Name:	Darlington Public School Hazmat Survey		To:	Envirolab Services	
Project No:	92277.00	Sampler:	Grant Russell		
Project Mgr:	Grant Russell	Mob. Phone:	0418 116 545		
Email:	Grant.Russell@Douglaspartners.com.au		Attn:	Tania Notaras	
Date Required:	Standard		Phone:	(02) 9910 6200	Fax: (02) 9910 6201
			Email:	tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation						
			S - Soil M - Material	G - Glass P - Plastic	Asbestos	Lead													
A14	14	14/03/18	M	P	x														
A15	15	14/03/18	M	P	x														
A16	16	14/03/18	M	P	x														
A17	17	14/03/18	M	P	x														
A18	18	14/03/18	M	P	x														
A19	19	14/03/18	M	P	x														
A20	20	14/03/18	M	P	x														
A21	21	14/03/18	M	P	x														
A22		14/03/18	M	P	x														
A23	22	14/03/18	M	P	x														
A24	23	14/03/18	M	P	x														
L1	24	14/03/18	M	P		x													
Lab Report No:			187473																
Send Results to:			Douglas Partners Pty Ltd			Address:			18 Waler Crescent, Smeaton Grange 2567			Phone:		(02) 4647 0075		Fax:		(02) 4646 1886	
Relinquished by:			LOC			Transported to laboratory by:													
Signed:						Date & Time:			16/03/2018			Received by:			 16/3				

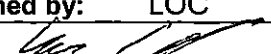
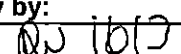
Project Name: Darlington Public School Hazmat Survey		To: Envirolab Services	
Project No: 92277.00	Sampler: Grant Russell	12 Ashley Street, Chatswood NSW 2067	
Project Mgr: Grant Russell	Mob. Phone: 0418 116 545	Attn: Tania Notaras	
Email: Grant.Russell@Douglaspartners.com.au;		Phone: (02) 9910 6200	Fax: (02) 9910 6201
Date Required: Standard		Email: tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation
			S - Soil M - Material	G - Glass P - Plastic	Asbestos	Lead							
L2	25	14/03/18	M	P		x							
L3	26	14/03/18	M	P		x							
L4	27	14/03/18	M	P		x							
L5	28	14/03/18	M	P		x							
L6	29	14/03/18	M	P		x							
L7	30	14/03/18	M	P		x							
L8	31	14/03/18	M	P		x							
L9	32	14/03/18	M	P		x							
L10	33	14/03/18	M	P		x							
L11	34	14/03/18	M	P		x							
L12	35	14/03/18	M	P		x							
L13	36	14/03/18	M	P		x							
L14	37	14/03/18	M	P		x							

Lab Report No: 187473			
Send Results to: Douglas Partners Pty Ltd	Address: 18 Waler Crescent, Smeaton Grange 2567	Phone: (02) 4647 0075	Fax: (02) 4646 1886
Relinquished by: LOC		Transported to laboratory by:	
Signed: 	Date & Time: 16/03/2018	Received by:  16/3	


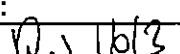
Project Name:	Darlington Public School Hazmat Survey		To:	Envirolab Services	
Project No:	92277.00	Sampler:	Grant Russell		
Project Mgr:	Grant Russell	Mob. Phone:	0418 116 545		
Email:	Grant.Russell@Douglaspartners.com.au		Attn:	Tania Notaras	
Date Required:	Standard		Phone:	(02) 9910 6200	Fax: (02) 9910 6201
			Email:	tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation
			S - Soil M - Material	G - Glass P - Plastic	Asbestos	Lead							
L15	38	14/03/18	M	P		x							
L16	39	14/03/18	M	P		x							
L17	40	14/03/18	M	P		x							
L18	41	14/03/18	M	P		x							
L19	42	14/03/18	M	P		x							
L20	43	14/03/18	M	P		x							
L21	44	14/03/18	M	P		x							
L22	45	14/03/18	M	P		x							
L23	46	14/03/18	M	P		x							
L24	47	14/03/18	M	P		x							
D1	48	14/03/18	M	P		x							
D2	49	14/03/18	M	P		x							
D3	50	14/03/18	M	P		x							

Lab Report No:	187473						
Send Results to:	Douglas Partners Pty Ltd	Address:	18 Waler Crescent, Smeaton Grange 2567	Phone:	(02) 4647 0075	Fax:	(02) 4646 1886
Relinquished by:	LOC		Transported to laboratory by:				
Signed:			Date & Time:	16/03/2018	Received by:		

Project Name:	Darlington Public School Hazmat Survey		To:	Envirolab Services	
Project No:	92277.00	Sampler:	Grant Russell		
Project Mgr:	Grant Russell	Mob. Phone:	0418 116 545		
Email:	Grant.Russell@Douglaspartners.com.au;		Attn:	Tania Notaras	
Date Required:	Standard		Phone:	(02) 9910 6200	Fax: (02) 9910 6201
			Email:	tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes									Notes/preservation
			S - Soil M - Material	G - Glass P - Plastic	Asbestos	Lead								
D4	51	14/03/18	M	P		x								
D5	52	14/03/18	M	P		x								
D6	53	14/03/18	M	P		x								
D7	54	14/03/18	M	P		x								
D8	55	14/03/18	M	P		x								
D9	56	14/03/18	M	P		x								
D10	57	14/03/18	M	P		x								
D11	58	14/03/18	M	P		x								
D12	59	14/03/18	M	P		x								

Lab Report No:	187693				
Send Results to:	Douglas Partners Pty Ltd	Address:	18 Waler Crescent, Smeaton Grange 2567	Phone:	(02) 4647 0075
Relinquished by:	LOC	Transported to laboratory by:			
Signed:		Date & Time:	16/03/2018	Received by:	

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell

Sample Login Details

Your reference	92277.00, Darlington Public Hazmat Survey
Envirolab Reference	187473
Date Sample Received	16/03/2018
Date Instructions Received	16/03/2018
Date Results Expected to be Reported	23/03/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	23 Material, 24 Paint, 12 Swab
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	Ambient
Cooling Method	-
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	Asbestos ID - materials	Lead in Paint	Lead in swab
A1	✓		
A2	✓		
A3	✓		
A4	✓		
A5	✓		
A6	✓		
A7	✓		
A8	✓		
A9	✓		
A10	✓		
A11	✓		
A12	✓		
A13	✓		
A14	✓		
A15	✓		
A16	✓		
A17	✓		
A18	✓		
A19	✓		
A20	✓		
A21	✓		
A23	✓		
A24	✓		
L1		✓	
L2		✓	
L3		✓	
L4		✓	
L5		✓	
L6		✓	
L7		✓	
L8		✓	
L9		✓	



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Sample ID	Asbestos ID - materials	Lead in Paint	Lead in swab
L10		✓	
L11		✓	
L12		✓	
L13		✓	
L14		✓	
L15		✓	
L16		✓	
L17		✓	
L18		✓	
L19		✓	
L20		✓	
L21		✓	
L22		✓	
L23		✓	
L24		✓	
D1			✓
D2			✓
D3			✓
D4			✓
D5			✓
D6			✓
D7			✓
D8			✓
D9			✓
D10			✓
D11			✓
D12			✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

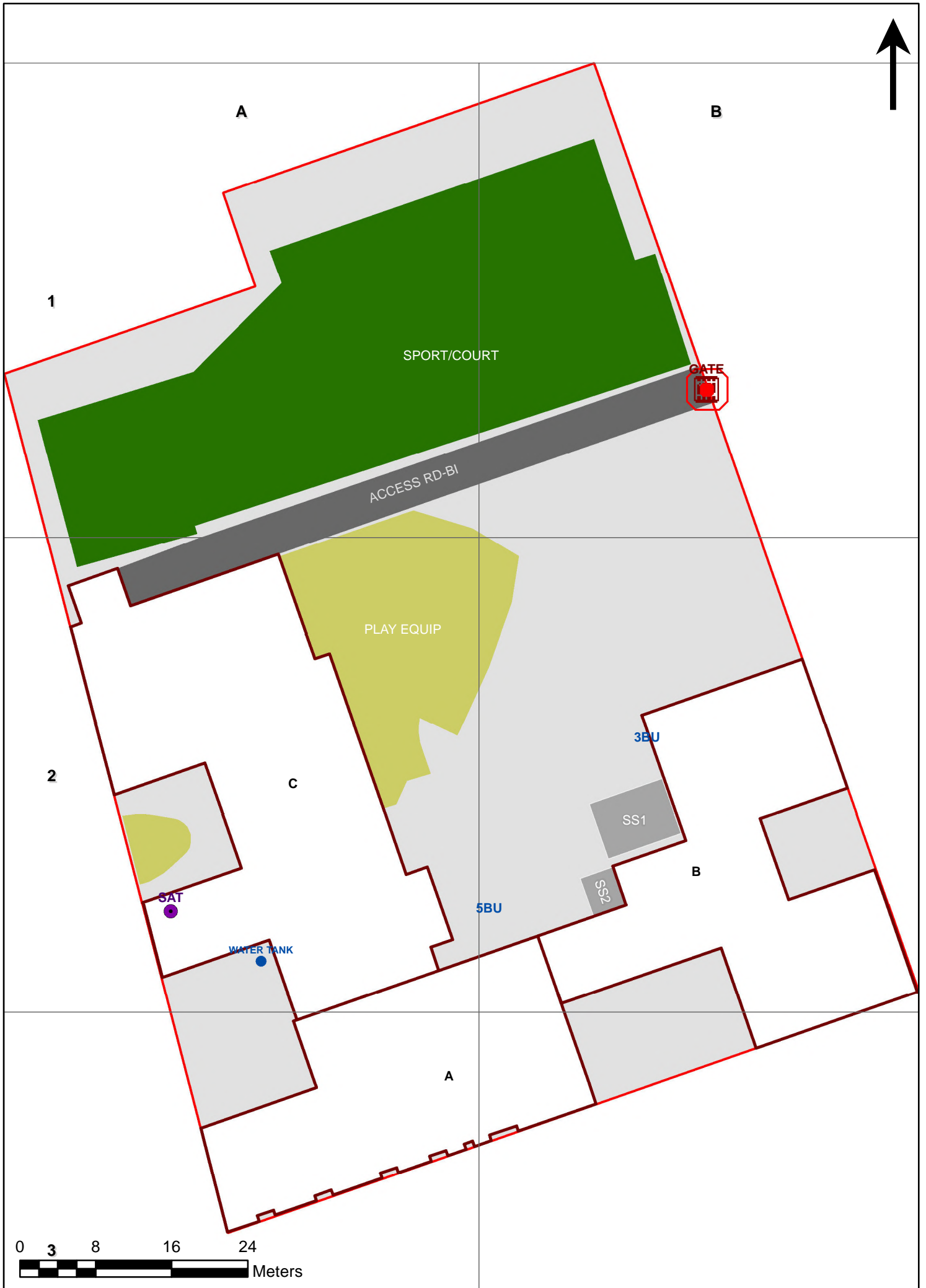
Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Appendix D

Site and Building Plans

1735 - Darlington Public School
Site Plan (11902)



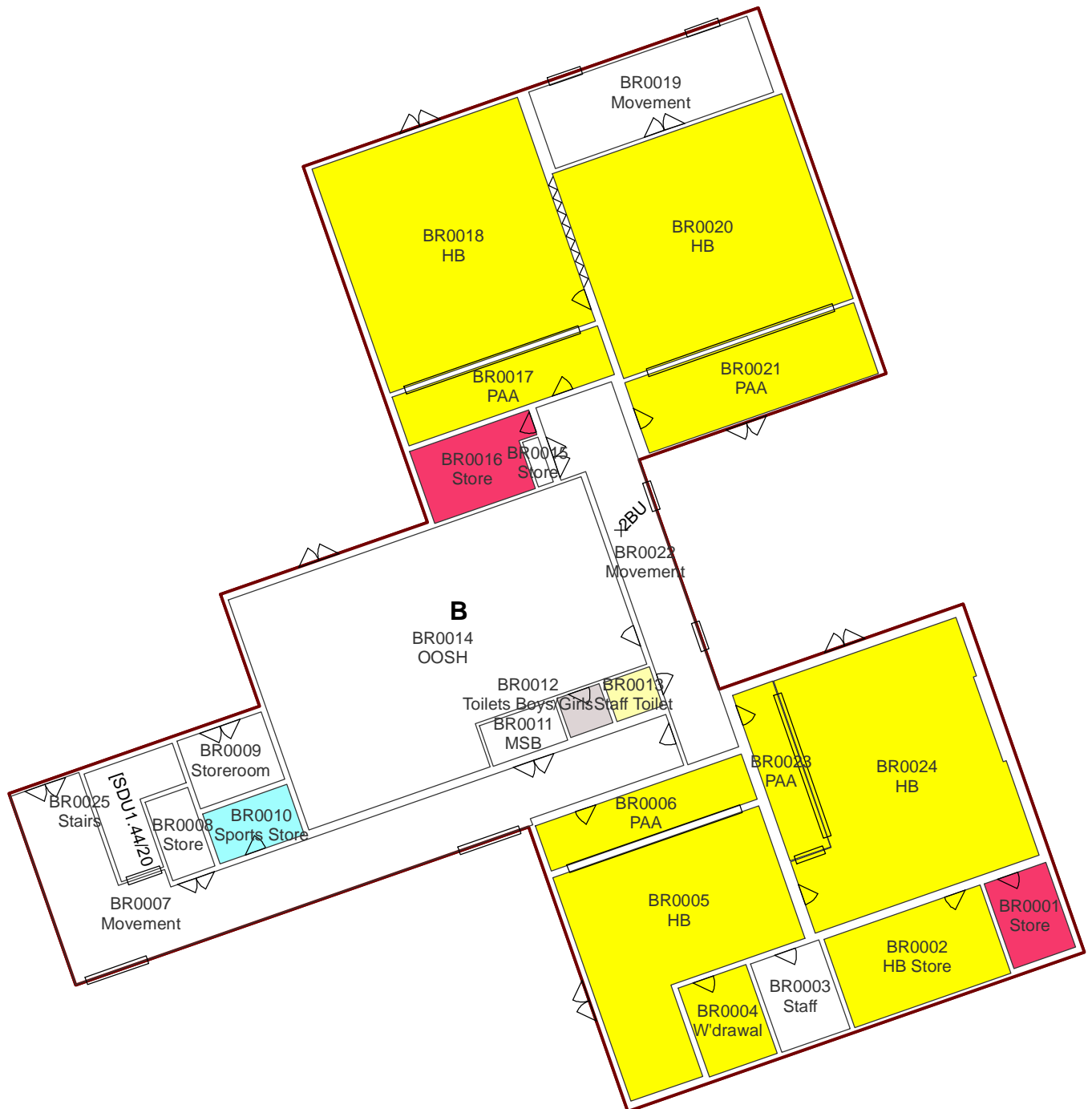
1735 - Darlington Public School
Administration/Library (B00A) - Ground Floor (Room Function)



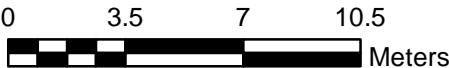
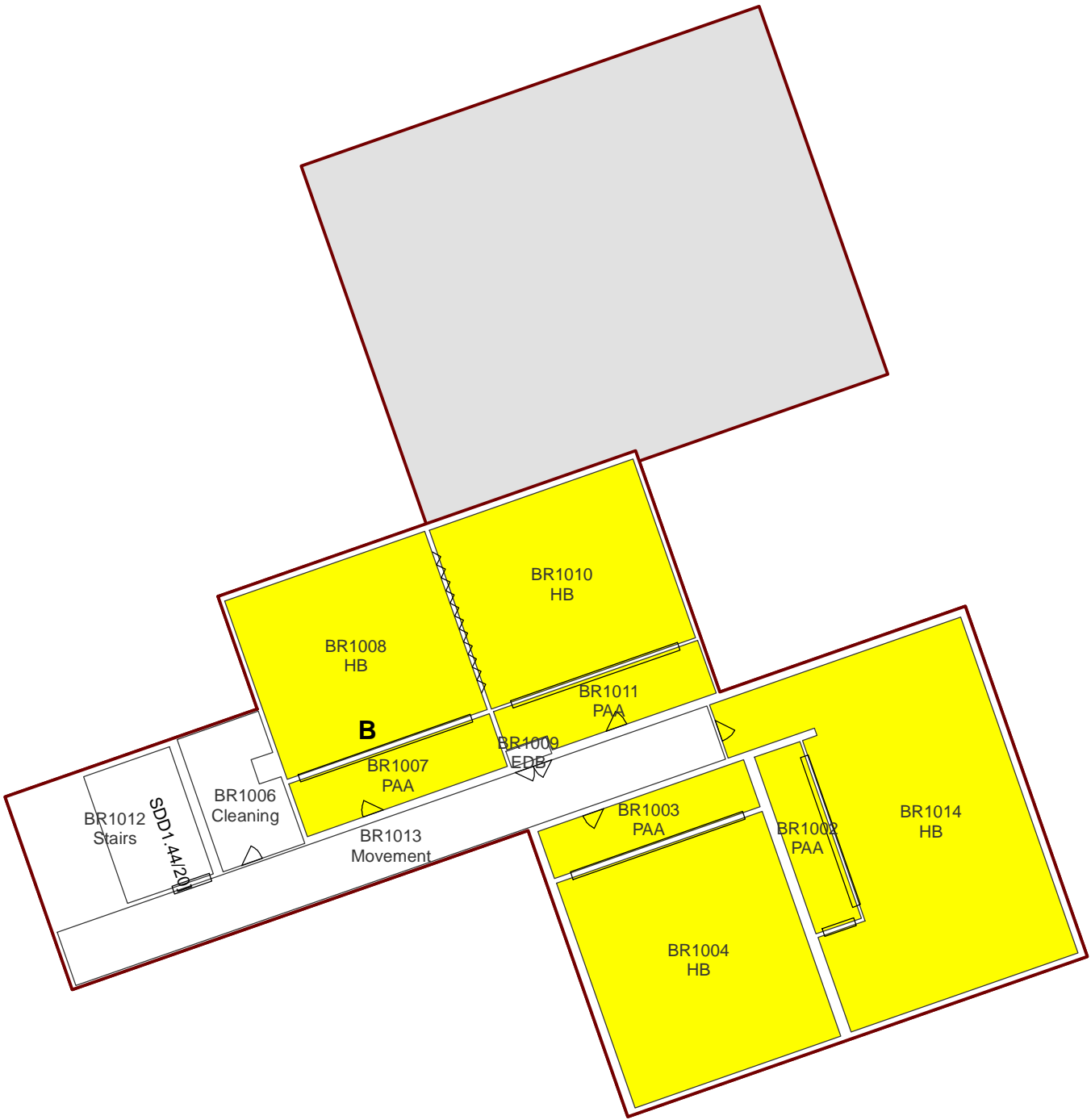
1735 - Darlington Public School
Administration/Library (B00A) - 1st Floor (Room Function)



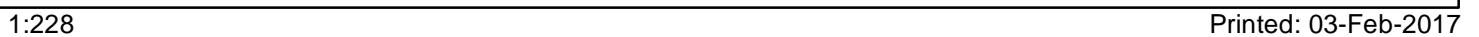
1735 - Darlington Public School
General Learning/Other-After School Care (B00B) - Ground Floor (Room Function)



1735 - Darlington Public School
General Learning/Other-After School Care (B00B) - 1st Floor (Room Function)



General Learning/Communal Facilities (B00C) - Ground Floor (Room Function)



Appendix E


Photographic Plates

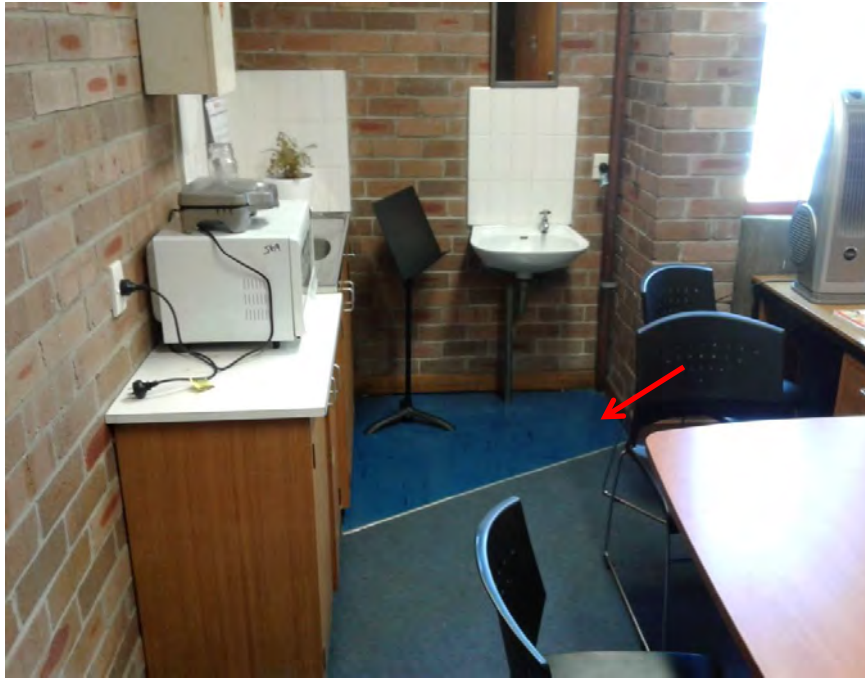


Photograph 1: B00A - R0002, Interior, Garage walls, Brick, nil hazardous materials identified.

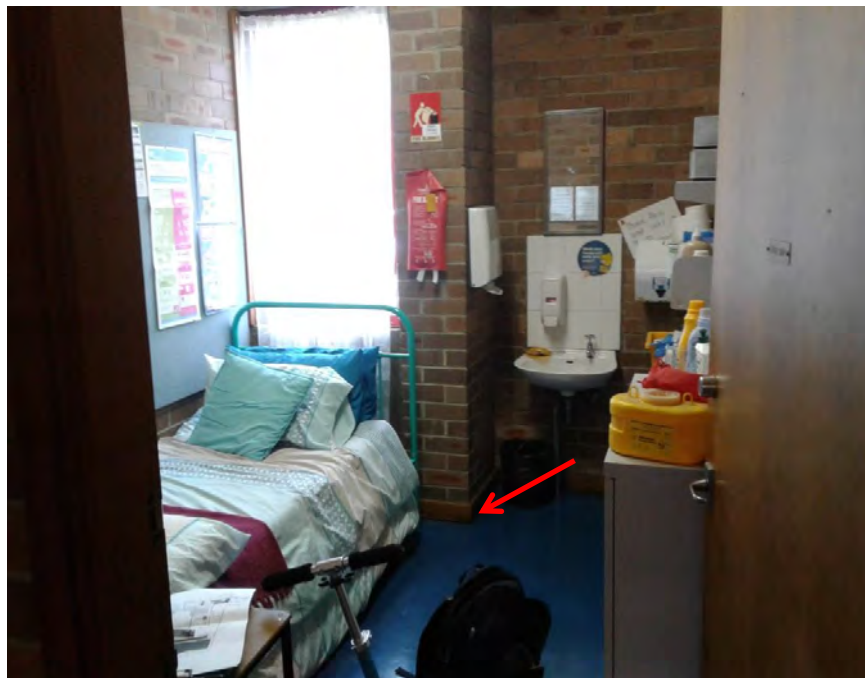


Photograph 2: B00A - R0006, Interior, Ceiling structure, Vermiculite, no asbestos detected by analysis.


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 1
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 3: B00A - R0006, Interior, Flooring material, Vinyl tiles, no asbestos detected by analysis.



Photograph 4: B00A - R0009, Interior, Flooring material, Vinyl tiles, no asbestos detected by analysis.


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 2
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18

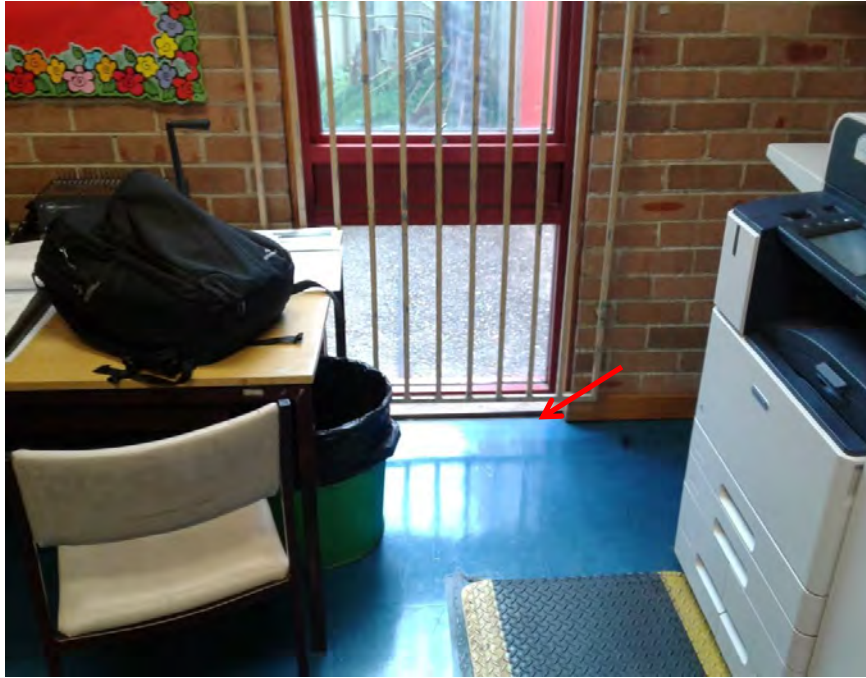


Photograph 5: B00A - R0011, Interior, Ceiling structure, Vermiculite, no asbestos detected by analysis.



Photograph 6: B00A - R0017, Interior, Ceiling structure, Vermiculite, no asbestos detected by analysis.


 Douglas Partners <small>Geotechnics Environment Groundwater</small>	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 3
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 7: B00A - R0017, Interior, Flooring material, Vinyl tiles, no asbestos detected by analysis.



Photograph 8: B00A - R0019, Interior, Hand rails on stairs, Yellow paint, non-lead paint ($\leq 0.1\%$ lead w/w).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 4
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 9: B00A - R0021, Interior, Partitions in toilet, Compressed FCS sheeting, asbestos detected by analysis.



Photograph 10: B00A - R0022, Interior, Partitions in toilet, Compressed FCS sheeting, asbestos detected by analysis.


 Douglas Partners <small>Geotechnics Environment Groundwater</small>	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 5
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 11: B00A - R0023, Interior, Brick walls, Beige paint, non-lead paint ($\leq 0.1\%$ lead w/w).



Photograph 12: B00A - R0025, Interior, Flooring material, Vinyl tiles, no asbestos detected by analysis.


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 6
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18

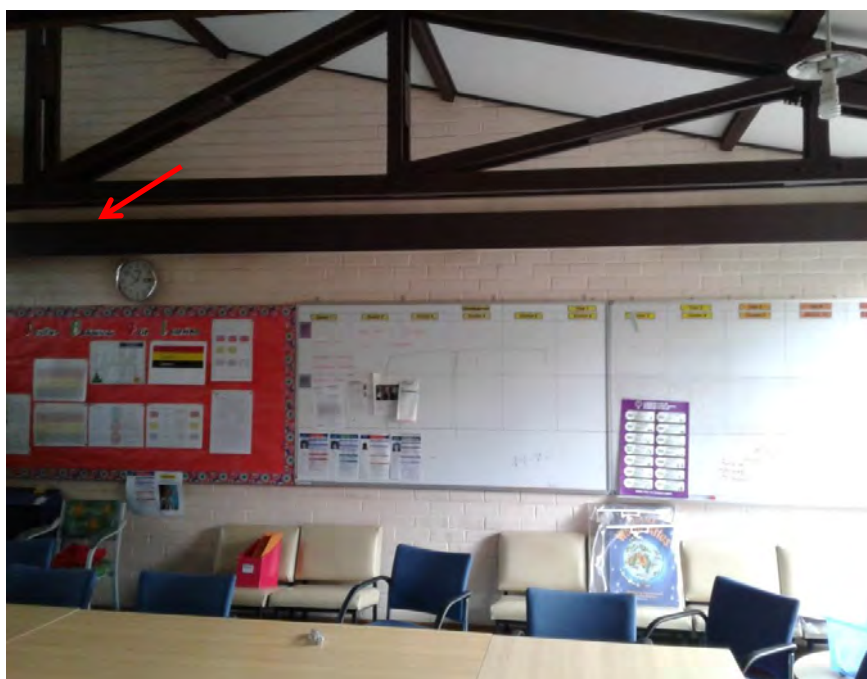


Photograph 13: B00A - R0032, Interior, Flooring material, Vinyl tiles under flooring, asbestos detected by analysis.



Photograph 14: B00A - R1001, Interior, Brick walls, Beige paint, non-lead paint ($\leq 0.1\%$ lead w/w).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 7
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 15: B00A - R1002, Interior, Timber rafters, Dust above rafters, elevated lead (>0.5 mg/m2).

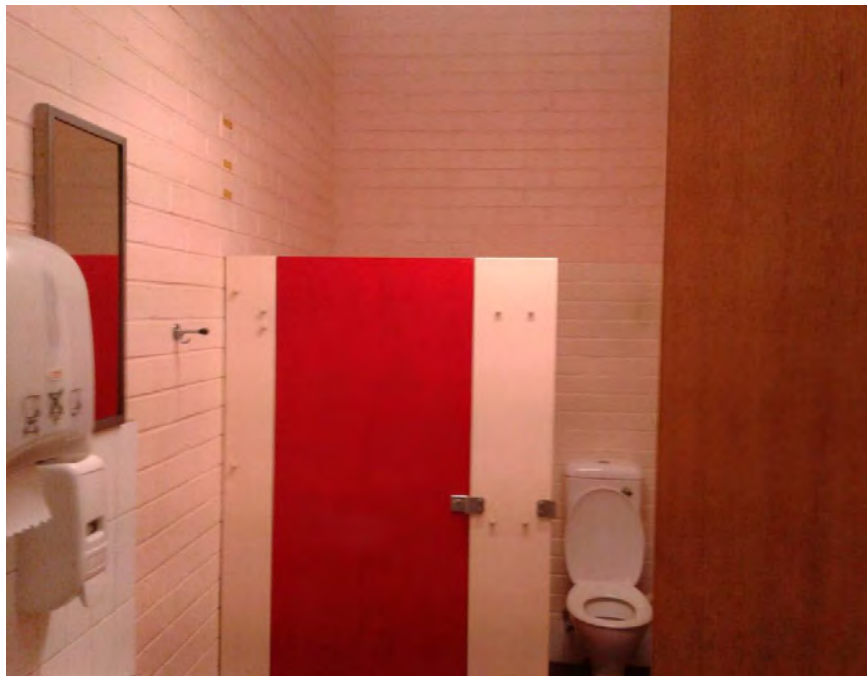


Photograph 16: B00A - R1003, Interior, Timber rafters, Brown paint, non-lead paint ($\leq 0.1\%$ lead w/w).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 8
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 17: B00A - R1017, Interior, -, -, nil hazardous materials identified.




Photograph 18: B00A - R1018, Interior, Partitions in toilet, Compressed FCS sheeting, asbestos detected by analysis.

 Douglas Partners <small>Geotechnics Environment Groundwater</small>	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 9
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 19: B00A - R1019, Interior, Partitions in toilet, Compressed FCS sheeting, asbestos detected by analysis.


	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 10
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 20: B00B - R0020, Interior, Timber rafters, Blue paint, non-lead paint ($\leq 0.1\%$ lead w/w).

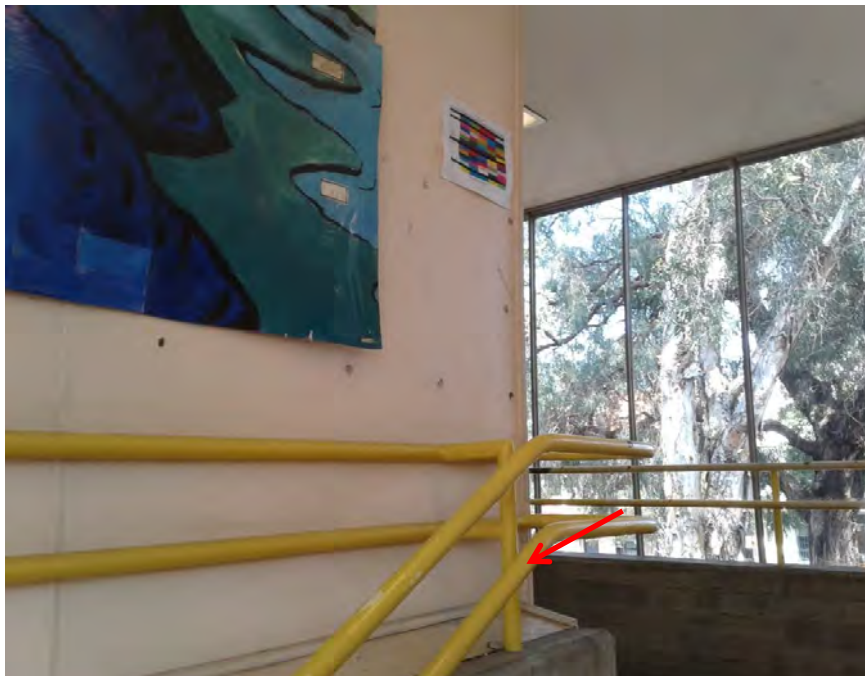


Photograph 21: B00B - R0025, Interior, FCS sheeting on wall, FCS sheeting, no asbestos detected by analysis.


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 11
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 22: B00B - R0025, Interior, FCS sheeting on wall, FCS sheeting, no asbestos detected by analysis.

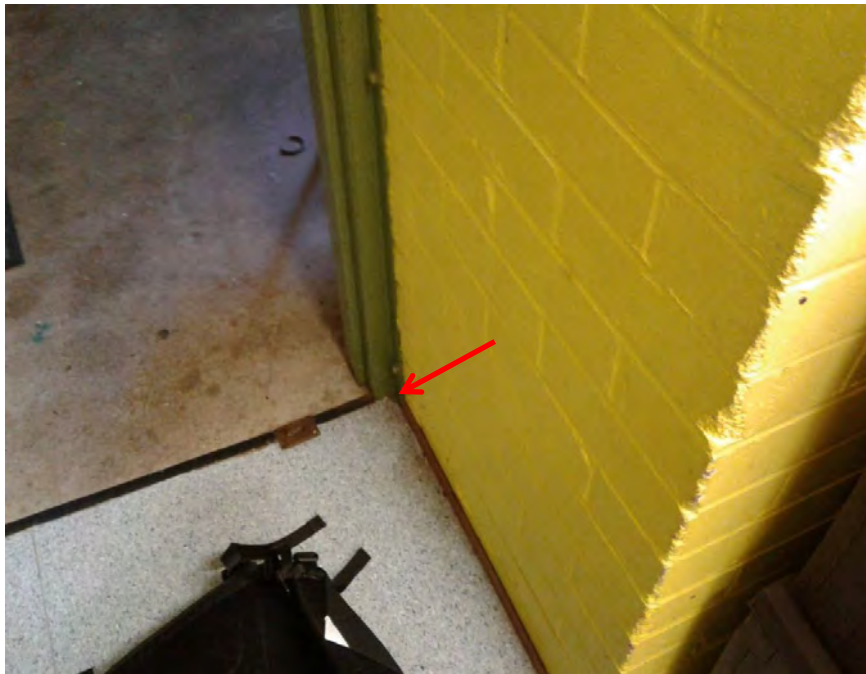


Photograph 23: B00B - R0025, Interior, FCS sheeting on wall, FCS sheeting, no asbestos detected by analysis.


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 12
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 24: B00B - R1002, Interior, Flooring material, Vinyl tiles under flooring, asbestos detected by analysis.



Photograph 25: B00B - R1003, Interior, Flooring material, Vinyl tiles under flooring, no asbestos detected by analysis.

 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 13
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18

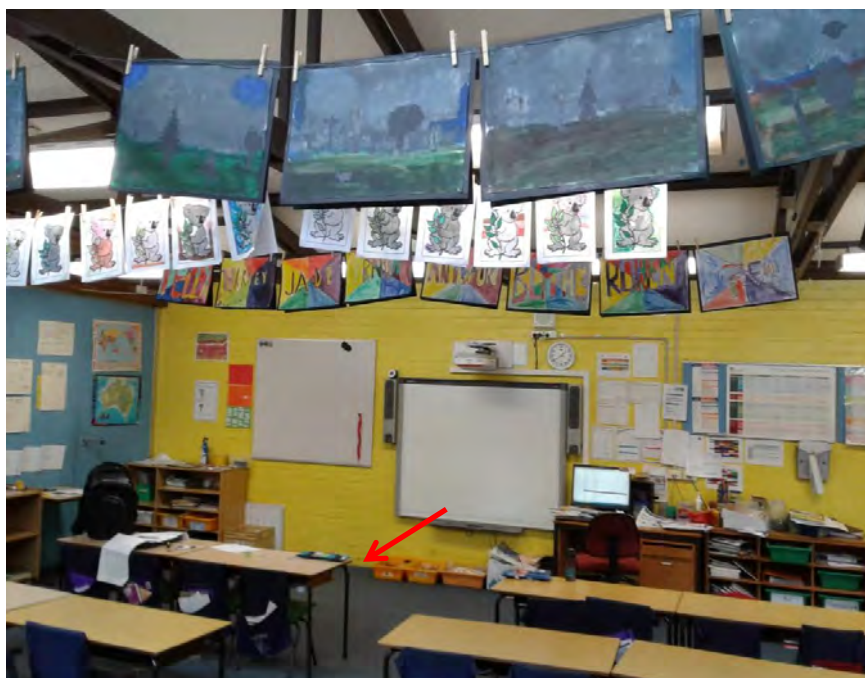


Photograph 26: B00B - R1003, Interior, Light fitting, Dust above light fitting, elevated lead ($>0.5 \text{ mg/m}^2$).



Photograph 27: B00B - R1008, Interior, Timber rafters, Brown paint, non-lead paint ($\leq 0.1\%$ lead w/w).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 14
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18

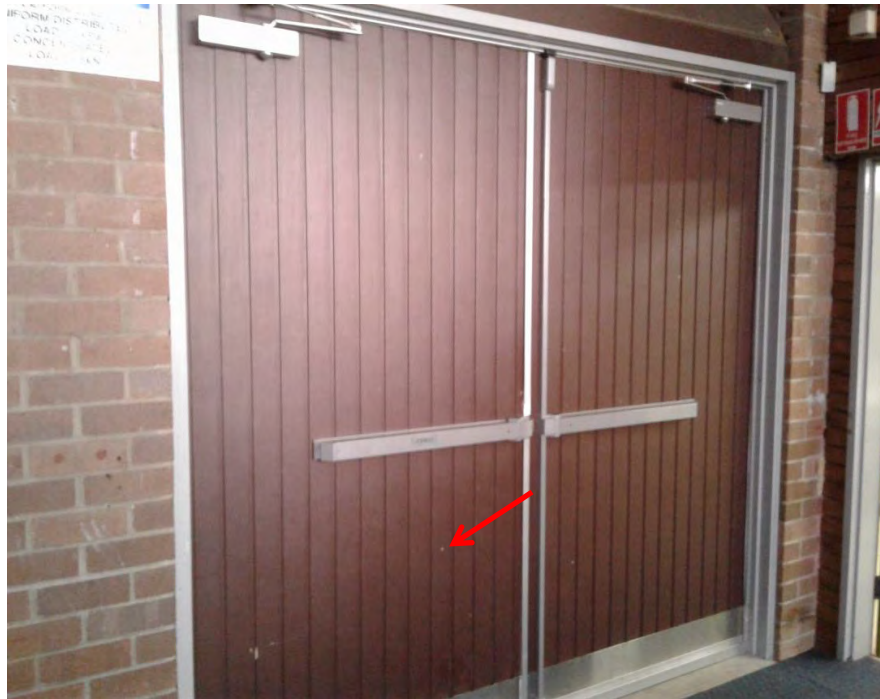


Photograph 28: B00B - R1011, Interior, Timber skirting board near flooring, Yellow Paint, non-lead paint ($\leq 0.1\%$ lead w/w).



Photograph 29: B00B - R1014, Interior, Ceiling structure, White Flaking Paint, non-lead paint ($\leq 0.1\%$ lead w/w).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 15
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 30: B00C - R0001, Interior, Timber door frame, Brown Paint, non-lead paint ($\leq 0.1\%$ lead w/w).

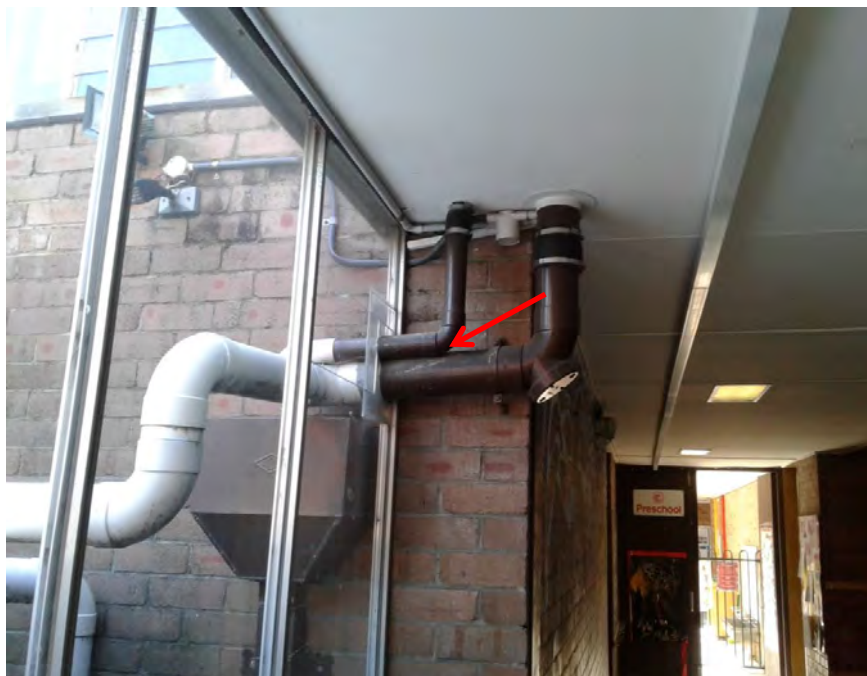


Photograph 31: B00C - R0002, Interior, Timber door frame, Brown Paint, non-lead paint ($\leq 0.1\%$ lead w/w).

 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 16
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



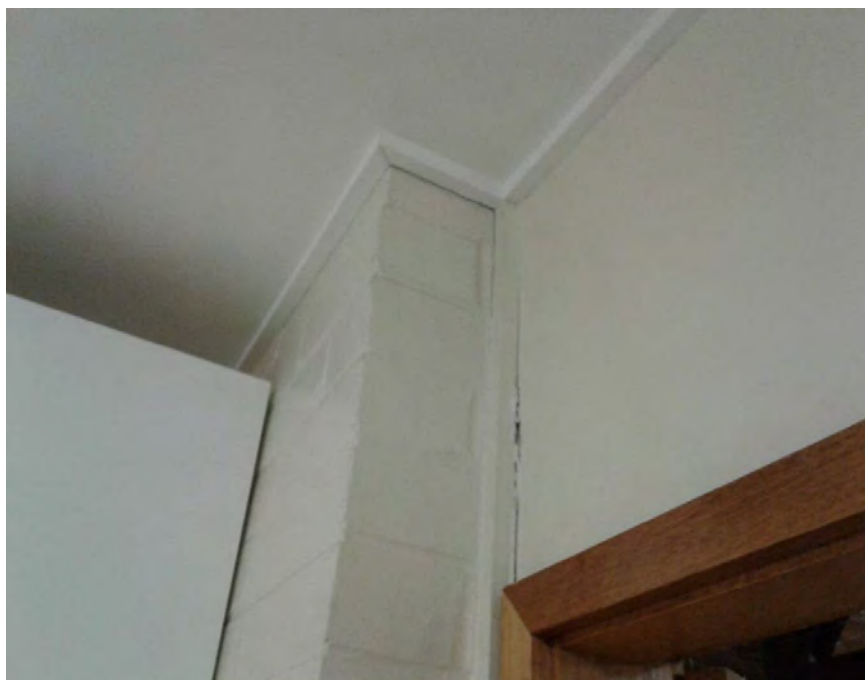
Photograph 32: B00C - R0005, Interior, Ceiling structure, FCS sheeting, no asbestos detected by analysis.




Photograph 33: B00C - R0005, Interior, Ceiling structure, Dust above water pipe, elevated lead ($>0.5 \text{ mg/m}^2$).



Photograph 34: B00C - R0006, Interior, Flooring material, Vinyl tiles, no asbestos detected by analysis.



Photograph 35: B00C - R0010, Interior, Partitions in toilet, Beige Paint, non-lead paint ($\leq 0.1\%$ lead w/w).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 18
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 36: B00C - R0024, Exterior, Hand rails, Yellow Paint, lead paint (>0.1% lead w/w).



Photograph 37: B00C - R0025, Interior, Brick column, Dust above column, elevated lead (>0.5 mg/m2).


 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 19
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18



Photograph 38: B00C - R0029, Interior, Flooring material, Vinyl tiles under flooring, no asbestos identified visually.



Photograph 39: B00C - R0034, Interior, Timber door, Brown Paint, non-lead paint ($\leq 0.1\%$ lead w/w).

 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT: 92277.00
	Hazardous Building Materials (HBM) Register		PLATE No: 20
	417 Abercrombie Street, Darlington NSW		REV: A
	CLIENT: Billard Leece Partnership Pty Ltd		DATE: Mar-18

Appendix F

About This Report

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

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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.



Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 2007. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approximate Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and longer sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m



Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.



Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 - 5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Symbols & Abbreviations

Douglas Partners



Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U ₅₀	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt



Road base



Concrete



Filling

Soils



Topsoil



Peat



Clay



Silty clay



Sandy clay



Gravelly clay



Shaly clay



Silt



Clayey silt



Sandy silt



Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

Sedimentary Rocks



Boulder conglomerate



Conglomerate



Conglomeratic sandstone



Sandstone



Siltstone



Laminite



Mudstone, claystone, shale



Coal



Limestone

Metamorphic Rocks



Slate, phyllite, schist



Gneiss



Quartzite

Igneous Rocks



Granite



Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry