



Douglas Partners

Geotechnics | Environment | Groundwater

Report on
Hazardous Building Materials Assessment –
Main Works

Dubbo Base Hospital
Myall Street, Dubbo

Prepared for
Health Infrastructure

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Integrated Practical Solutions



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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.

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Report on Hazardous Building Materials Assessment – Main Works

Dubbo Base Hospital

Myall Street, Dubbo

1. Introduction

This report presents the results of a Hazardous Building Materials Assessment associated with the proposed redevelopment works at Dubbo Base Hospital, Myall Street, Dubbo. The work was commissioned by Health Infrastructure, in consultation with TSA Management Pty Ltd.

The redevelopment project involves the demolition of the Maternity building (Building 16) once the Maternity Unit has been transferred into new premises proposed for construction elsewhere on the hospital campus. The numbering scheme is a hospital-wide scheme to identify each building on the campus. The location of the current Maternity building is shown on Drawing MWH1 in Appendix A.

The Hazardous Building Materials Assessment was undertaken to provide information on issues associated with demolition of the buildings and included a review of existing information provided by the Western NSW Local Health District (formerly the Greater Western Area Health Service), a site inspection by an experienced engineer and the preparation of this report.

For the purposes of this report, hazardous building materials can be described as asbestos-containing materials in both bonded and friable form, lead-based paints, phenols associated with electrical fittings, and polychlorinated biphenyls (PCBs) within the capacitors of fluorescent light fittings.

Douglas Partners Pty Ltd has recently been involved in a geotechnical investigation, contamination assessment, groundwater impact assessment, preliminary hazard analysis and hazardous building materials assessment for the early-stage demolition works. Each of these elements are reported separately.

2. Site Description

2.1 General Site

Dubbo Base Hospital is located to the north-east of the city centre and is bounded by Myall Street to the south, the Coonamble-Dubbo Railway line to the west, residential dwellings to the east, and vacant land to the north. The natural ground surface levels at the site appear to fall gently to the south and west.

At the time of the current investigation, the main hospital buildings were located in the southern and central portions of the site. A car park was located in the eastern portion, and the western and northern sections of the site were generally vacant. The building to be demolished during the main works stage of the redevelopment is located in the north-western area of the main hospital campus as shown on Drawing MWH1 in Appendix A.

The portion of the site on which the development works are proposed consists of Lot 12 in DP 1159243 in the Parish of Dubbo, County of Lincoln.

2.2 Building Proposed for Demolition

The Maternity building (Building 16) is a two-storey, free-standing brick building with what is understood to be steel roofing. The ground floor of the building is connected to other buildings via enclosed walkways. A plant room is located on the roof of the building.

3. Potential Hazardous Building Materials

3.1 Asbestos

Asbestos is a naturally occurring mineral rock that was mined in Australia from the 1940s to the late 1980s and was used in a variety of materials and products. Unlike other rocks made up of small particles, asbestos is made up of fibres so thin that they can be invisible to the unaided eye. If asbestos materials or products are disturbed, these fibres can be released into the air and remain for extended periods of time where they can be inhaled into the lungs.

Asbestos was considered a valuable product due to its resistance to fire, moisture, chemicals and heat and also its suitability as an insulation material. Due to asbestos being constructed of fibres, woven asbestos materials and products such as blankets, rope and even clothing were widely used. However, due to the physical properties of the fibres, and the potentially harmful impact on human health, a national ban on asbestos came into effect on 31 December 2003.

The common forms of asbestos include:

- Chrysotile (white asbestos);
- Amosite (brown or grey asbestos); and
- Crocidolite (blue asbestos).

Asbestos has been found in thousands of materials and products throughout Australia. Within a house or a building, asbestos is most commonly found in asbestos cement sheeting, also known as 'fibro'. Asbestos cement sheeting can be found in a flat form in internal and external walls and ceilings. A corrugated form of asbestos cement sheeting, also known as 'super six' or 'super eight', is commonly found on roofs, as fences and sometimes as external wall cladding.

Asbestos is commonly found in other places within buildings including:

- External guttering, downpipes and vent pipes;
- Backing to electrical switchboards in a black product known as Zelemite;
- Bakelite products such as light fittings, switches etc.;
- Vinyl sheeting and vinyl tiles used as floor coverings;

- Insulations to heater banks, air conditioning ducting and pipes;
- Gaskets to pipes and pipe joints;
- Certain paints such as Galbestos;
- Mastics and glues behind wall tiles and vinyl;
- Waterproofing in windows;
- Roof tiles; and
- Woven textile seals to old ovens, grillers and kitchen appliances.

Materials containing asbestos can be referred to as asbestos-containing materials (ACM). Bonded ACM refers to materials in which the asbestos fibres are within a solid matrix and therefore not able to be ingested unless the matrix is broken and the fibres released. Examples of bonded ACM include asbestos cement sheeting, moulded pipes etc.

Friable ACM refers to materials in which the fibres are not bonded within a strong solid matrix and disturbance of the material may readily result in the release of fibres. An example of friable ACM is lagging (insulation) around pipes.

Specific precautions need to be followed when working with ACM and demolition contractors in New South Wales are generally required to be licensed by WorkCover NSW.

3.2 Lead-Based Paints

Paints used in houses and other buildings constructed before 1970 are likely to contain high lead concentrations (typically above 1% w/w). Before 1950, certain paints contained as much as 50% lead. The National Health and Medical Research Council (NHMRC) recommends a maximum lead concentration of 0.1% in domestic paints.

Exposure to lead-based paint only becomes a risk if it is flaking or chalking, or when the paint is disturbed (e.g. removed by sanding). Materials that contain lead-based paints should be, as far as possible, removed or disposed of intact with minimal disturbance of the painted surfaces. Appropriate precautions are required to reduce the risk of ingestion during demolition activities.

3.3 Phenols

The main source of Phenols within buildings is Bakelite products such as light fittings and electrical switches. Bakelite is an early form of plastic formed by a reaction between Phenol and Formaldehyde, and incorporates some form of fibrous product such as paper, cotton, glass and even asbestos. Bakelite should be handled in a similar way to bonded asbestos.

3.4 Polychlorinated Biphenyls (PCBs)

PCBs can range in appearance from colourless oily liquids to yellow and black resins, depending on the chlorine content. PCBs have very high chemical, thermal and biological stability, a very low vapour pressure and high dielectric constants. As a result of these properties PCBs were used during the 1950s, 1960s and 1970s for a variety of purposes including:

- Coolant-insulation fluids in transformers and capacitors;
- Impregnation of cotton and asbestos;
- Plasticisers; and
- Additives for epoxy paints.

The main source of PCBs within buildings are electrical transformers and capacitors in switchboards, generators and fluorescent light fittings.

4. Existing Asbestos Register

An asbestos audit of all buildings on the Dubbo Base Hospital campus was undertaken by the former Greater Western Area Health Service in 2008. The audit report, including the asbestos register prepared during the audit, was provided to Douglas Partners during the current assessment. Visual inspection of the ACM in the Maternity building was undertaken. However, additional sampling and analysis was considered unwarranted, particularly in light of the fact that the building was still in use and sampling for asbestos (and lead-based paint) within a building containing new-born babies was considered imprudent.

5. Current Field Work

The current assessment was undertaken by an experienced engineer on 6 June 2012. The assessment initially involved a discussion with hospital maintenance staff in relation to the existing building and possible hazardous materials within. The asbestos register was also reviewed at this time.

The building was inspected and photographed by the engineer. The asbestos register was used to assess the locations of ACM to confirm that the register was still representative of site conditions.

It was confirmed with maintenance staff that all PCB capacitors in the fluorescent light fittings have been replaced as part of a maintenance programme. As such, all fluorescent light fittings are not expected to contain PCBs.

6. Results of Assessment

6.1 Asbestos

Areas in which ACM has been identified in the Maternity building proposed for demolition, as per the current asbestos register for the site, are listed in Table 1.

Table 1: Asbestos Register – Building 16 – Maternity Building

Location of ACM	Description	Bonded or Friable
External eve lining	Flat asbestos-cement sheeting	Bonded
Room 23 Fire Door	Loose asbestos core	Friable
Plant Room (above Room 23)	Flat asbestos-cement sheeting	Bonded
Lift Motor Room	Lebah switchboard backing	Bonded
Fire hose reel cupboards	Flat asbestos-cement sheeting	Bonded
External window spandrels	Flat asbestos-cement sheeting	Bonded
Main Switchboard	Zelemite switchboard backing	Bonded
Ground floor & stairs	Asbestos vinyl tiles	Bonded
Service trench (external)	Pipe insulation	Friable

The inspections undertaken as part of the current assessment generally confirmed that the ACM listed in the register remain on site. One exception is one of the fire hose reel cupboards in which the ceiling lining has been removed, although potential asbestos cement wall-lining has been exposed. The presence of ACM within the products listed in the register was assumed to be correct; additional laboratory analysis was considered unwarranted.

6.2 Lead-Based Paints

The building was constructed in the early to mid-1970s and, as such, it is recommended that all paint be assumed to be lead-based and appropriate safety precautions (e.g. coveralls, face mask, eye protection etc.) be adopted by the demolition contractor during the removal of painted materials. The upper layers of paint are not likely to be lead-based but it is possible that lead-based paint was used originally and still remains beneath newer paint. Disposal of lead-based painted items should be undertaken at a licensed landfill in a manner that minimises dust generation.

6.3 Phenols

Bakelite light fittings were not observed within the Maternity building and discussions with maintenance staff indicate such fittings are not present. Bakelite electrical switches and components may, however, be present in the electrical switchboards in the building. Bakelite switches contain phenolic compounds and also may potentially contain asbestos fibres.

These products should remain intact and be disposed of at an appropriate landfill facility. The products should not be broken, cut or damaged as the release of fibres is a potential health hazard.

6.4 Polychlorinated Biphenyls (PCBs)

Hospital maintenance staff have confirmed that all PCB-containing capacitors have been removed from light fittings throughout the entire hospital. As such, specific storage and disposal practices should not be required for the light fittings. Confirmation of this status should be made during light fitting removal (i.e. the capacitors within the fittings should be checked unless marked as PCB-free).

It is possible that electrical infrastructure within the buildings and within the lift components will contain PCBs. An assessment of this infrastructure was not possible during the field work due to safety restrictions associated with handling such infrastructure. The electrician engaged to disconnect and remove the electrical items should make an assessment of the presence of PCBs and ensure appropriate storage and handling procedures are employed for the removal works.

7. Recommendations

The removal of ACM from the Maternity building should be carried out prior to the commencement of large-scale demolition activities and in accordance with the requirements of WorkCover NSW and the National Occupational Health and Safety Commission (NOHSC) *Code of Practice for the Safe Removal of Asbestos 2nd Edition* [NOHSC:2002(2005)]. This work will need to be undertaken by a contractor with an appropriate asbestos-removal licence.

At the completion of ACM removal, a visual clearance inspection must be carried out prior to the building being re-opened for demolition. Written certification detailing the results of the visual clearance inspection will need to be provided by an Occupational Hygienist or other experienced consultant.

All fluorescent light capacitors are understood to be PCB-free, as advised by hospital maintenance staff. Specific procedures for the removal of PCB capacitors from the light fittings are therefore likely to be unnecessary. Any PCBs encountered in other electrical infrastructure should be stored in a sealed metal drum for transport to a facility specialising in Base Catalysed Destruction (BCD) technology to destroy the PCB compounds.

Lead-based paint may be present in the building. As previously mentioned, all paint should be conservatively assumed to contain lead and appropriate precautions taken during handling to reduce the risk of dust generation and ingestion. Painted building elements should be disposed of at a licensed landfill.

8. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for a project at Dubbo Base Hospital in accordance with instructions received from Health Infrastructure. The report is provided for the use of Health Infrastructure for this project only and for the purpose(s) described in the report. It should not be used for other projects or by a third party.

The results provided in the report are indicative of the conditions observed at the time of the assessment and only in accessible areas. Conditions may change subsequent to the assessment and therefore the demolition contractor should make its own assessment of hazardous materials on the site. In preparing this report DP has necessarily relied upon information, both verbal and written, provided by the client and/or their agents.

This report must be read in conjunction with all of the attached notes 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 a statement, interpretation, outcome or conclusion given in this report.

This report, or sections from this report, should not be used as 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.

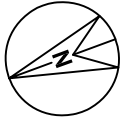
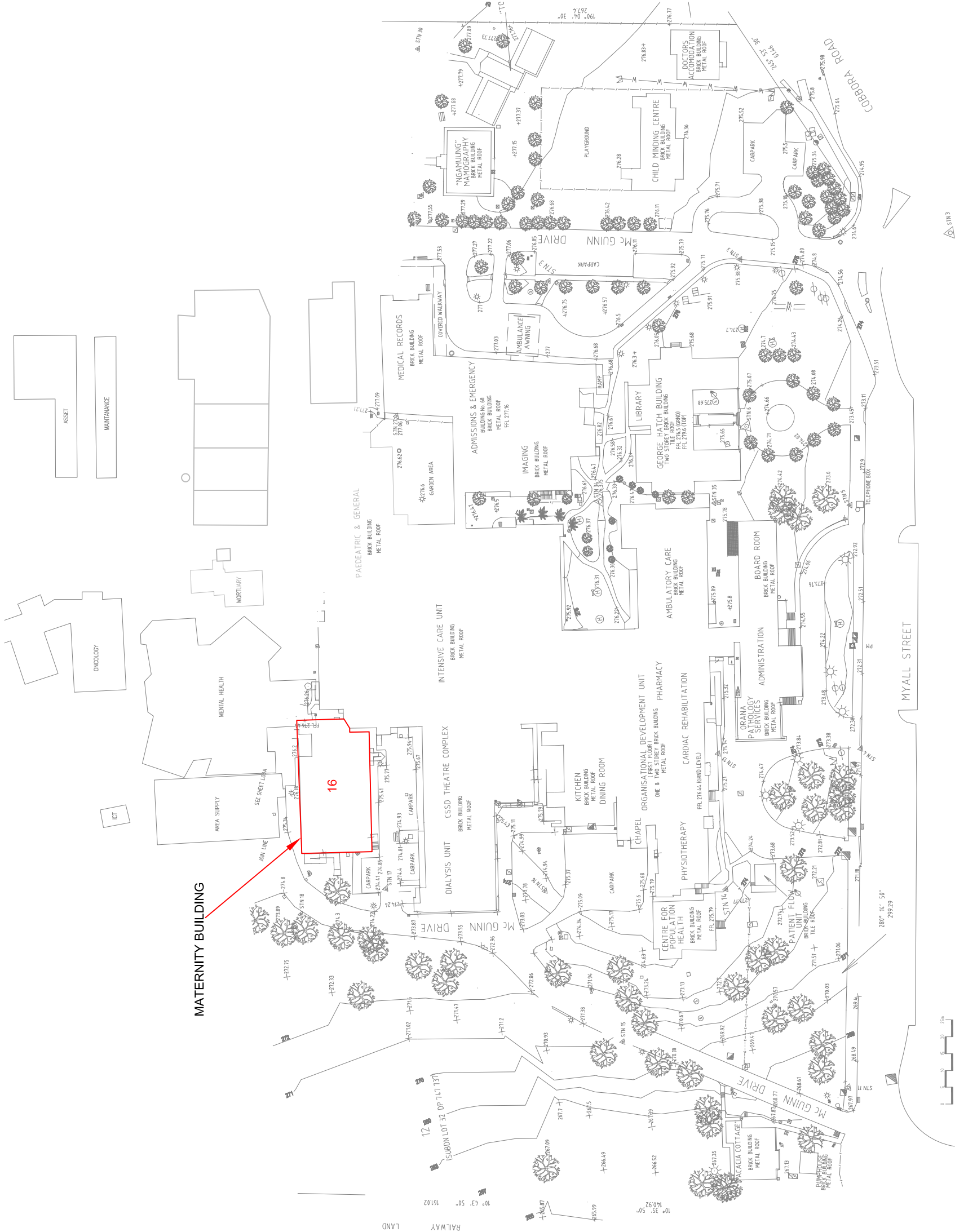
Douglas Partners Pty Ltd

Appendix A

Drawing



Locality Plan



Appendix B

Site Photographs



Photo 16/1 - External view of building



Photo 16/2 - Bonded asbestos eve lining



Site Photographs - Building 16

Maternity Building

Dubbo Base Hospital

CLIENT: Health Infrastructure

PROJECT: 72811.01

PLATE No: 16/1

REV: 0

DATE: 6-Jun-12



Photo 16/3 - Fire door (Room 23) with friable asbestos core



Photo 16/4 - Bonded asbestos lining in plant room (above Room 23)



Photo 16/5 - Bonded asbestos backing-board on lift control panel



Photo 16/6 - Potential asbestos lining above former asbestos ceiling in fire hose cupboard #1



Photo 16/7 - Bonded asbestos ceiling in fire hose cupboard #2



Photo 16/8 - Bonded asbestos window spandrels



Site Photographs - Building 16

Maternity Building

Dubbo Base Hospital

CLIENT: Health Infrastructure

PROJECT: 72811.01

PLATE No: 16/4

REV: 0

DATE: 6-Jun-12



Photo 16/9 - Asbestos vinyl floor tiles

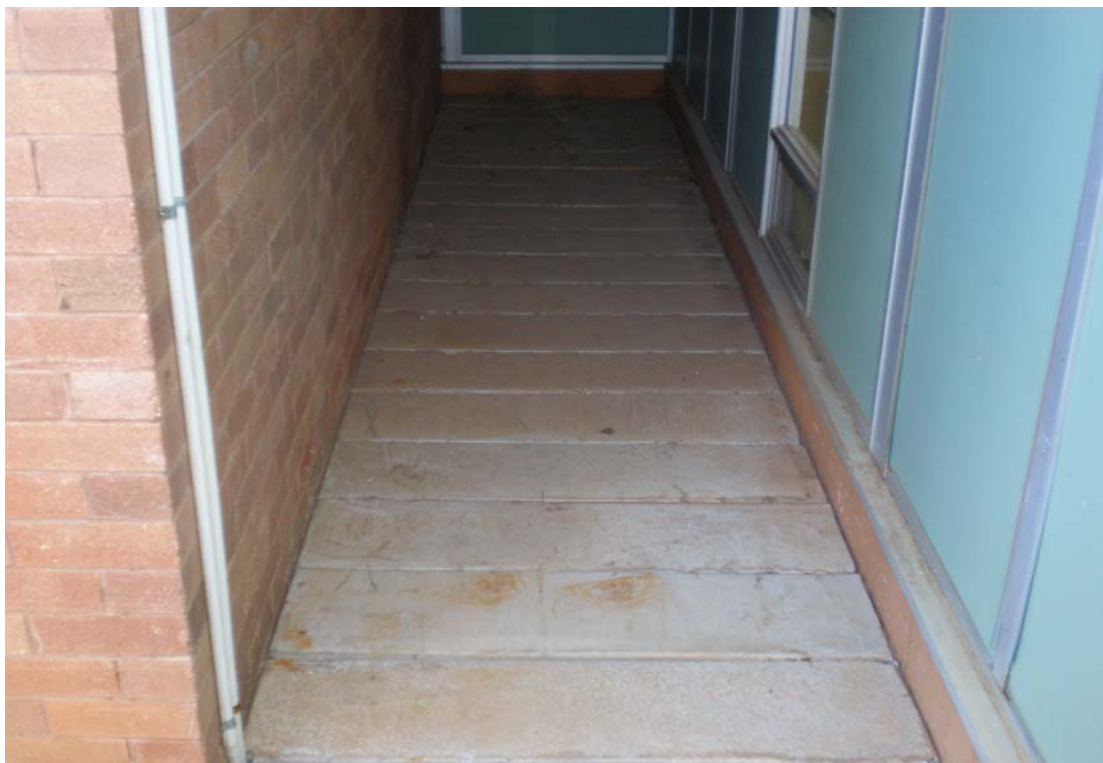


Photo 16/10 - Friable asbestos lagging within service trench



Site Photographs - Building 16

Maternity Building

Dubbo Base Hospital

CLIENT: Health Infrastructure

PROJECT: 72811.01

PLATE No: 16/5

REV: 0

DATE: 6-Jun-12

Appendix C

Notes 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.

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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.