ACT Government | Canberra Health Services

Our reference: **FOI20/23**

[redacted]

Dear [redacted]

DECISION ON YOUR ACCESS APPLICATION

I refer to your application under section 30 of the *Freedom of Information Act 2016* (FOI Act), received by Canberra Health Services (CHS) on Tuesday 28 July 2020.

This application requested access to:

"Engineering reports for Building 1:

1. *Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Issue 02*
2. *Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Appendix A*
3. *Canberra Hospital Building 1 - Facade Inspections - Appendix A – North*
4. *Canberra Hospital Building 1 - Facade Inspections - Appendix A – East*
5. *Canberra Hospital Building 1 - Facade Inspections - Appendix A – South*
6. *Canberra Hospital Building 1 - Facade Inspections - Appendix A - West*
7. *ACT Health: Canberra Hospital Building 1 - Facade Rectification Strategy - Issue 02*
8. *Performance solution report - Health Infrastructure Services - Building 1 Central stair, Canberra Hospital - Revision R1.0*
9. *Building 1 The Canberra Hospital - Fire Services Condition Assessment Report*
10. *HVAC & Mechanical Services Condition & Recommendations Report - The Canberra Hospital Building 1 Cooling Towers*
11. *Canberra Hospital Building 1&12 – Medical Air Plant Initial Review B*
12. *ACT Health TCH UPS investigation regarding fire rating - electrical and fire services."*

I am an Information Officer appointed by the Chief Executive Officer of Canberra Health Services (CHS) under section 18 of the FOI Act to deal with access applications made under Part 5 of the Act. CHS was required to provide a decision on your access application by **Tuesday 15 September 2020**.

Please note that reports at reference 3- 6 are duplicated in report 2 – *Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Appendix A* and have not been included in this response.

I have identified 8 documents holding the information within scope of your access application. These are outlined in the schedule of documents included at Attachment A to this decision letter.

Decisions
I have decided to:

- grant part access to 8 documents.

My access decisions are detailed further in the following statement of reasons and the documents released to you are provided as Attachment B to this letter.

In reaching my access decision, I have taken the following into account:
- The FOI Act;
- The contents of the documents that fall within the scope of your request;
- The views of relevant third parties; and
- The *Human Rights Act 2004*.

Partial Access
I have decided to grant partial access to all 8 documents. Documents at reference 1-6 and 8 contain information that is partially comprised of information, the disclosure of which, could reasonably be expected to endanger the security of a building. The information is therefore taken to be contrary to the public interest to release under Schedule 1, 1.14 (1)(h). I determined the information identified is contrary to the public interest and I have decided not to disclose this information.

Documents at reference 1, 3, 4, 7 and 8 contain information that I consider, on balance, to be contrary to the public interest to disclose under the test set out in section 17 of the Act as the information contained in these folios is partially comprised of personal information, such as contact details and signatures of non-government employees.

Documents at reference 1, 3 and 4 contain information that I consider, on balance, to be contrary to the public interest to disclose under the test set out in section 17 of the Act as the information contained in these folios is partially comprised of information that could be reasonable expected to prejudice the competitive and commercial activities, trade secrets and business affairs of non-government third party businesses.

Public Interest Factors Favouring Disclosure
The following factors were considered relevant in favour of the disclosure of the documents:

- Schedule 2.1(a)(i) promote open discussion of public affairs and enhance the government's accountability; and
- Schedule 2.1 (a) (ii) contribute to positive and informed debate on important issues or matters of public interest.

Public Interest Factors Favouring Non-Disclosure
The following factors were considered relevant in favour of the non-disclosure of the documents:

- Schedule 2.2(a)(ii) prejudice the protection of an individual's right to privacy, or any other right under the *Human Rights Act 2004*;
- Schedule 2.2(a)(xi) prejudice trade secrets, business affairs or research of an agency; and
- Schedule 2.2(a)(xiii) prejudice the competitive commercial activities of an agency.

On balance, I determined the information identified is contrary to the public interest and I have decided not to disclose this information. As specified against each document in the schedule, disclosure of this information would have the detrimental effect in reducing the Government's ability to engage external contractors and prejudice the right to privacy of the stakeholders involved.

Charges
Processing charges are not applicable to this request.

Disclosure Log
Under section 28 of the FOI Act, CHS maintains an online record of access applications called a disclosure log. The scope of your access application, my decision and documents released to you will be published in the disclosure log not less than three days but not more than 10 days after the date of this decision. Your personal contact details will not be published.

https://www.health.act.gov.au/about-our-health-system/freedom-information/disclosure-log.

Ombudsman review
My decision on your access request is a reviewable decision as identified in Schedule 3 of the FOI Act. You have the right to seek Ombudsman review of this outcome under section 73 of the Act within 20 working days from the day that my decision is published in ACT Health's disclosure log, or a longer period allowed by the Ombudsman.

If you wish to request a review of my decision you may write to the Ombudsman at:

The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601
Via email: ACTFOI@ombudsman.gov.au
Website: ombudsman.act.gov.au

ACT Civil and Administrative Tribunal (ACAT) review
Under section 84 of the Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to the ACAT for review of the Ombudsman decision. Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal
Level 4, 1 Moore St
GPO Box 370
Canberra City ACT 2601
Telephone: (02) 6207 1740
http://www.acat.act.gov.au/

Further assistance
Should you have any queries in relation to your request, please do not hesitate to contact the FOI Coordinator on (02) 5124 9831 or email HealthFOI@act.gov.au.

Yours sincerely

Colm Mooney
Executive Group Manager
Infrastructure and Health Support Services

15 September 2020

Canberra Health Services

FREEDOM OF INFORMATION SCHEDULE OF DOCUMENTS

Please be aware that under the *Freedom of Information Act 2016*, some of the information provided to you will be released to the public through the ACT Government's Open Access Scheme. The Open Access release status column of the table below indicates what documents are intended for release online through open access.

Personal information or business affairs information will not be made available under this policy. If you think the content of your request would contain such information, please inform the contact officer immediately.

Information about what is published on open access is available online at: http://www.health.act.gov.au/public-information/consumers/freedom-information

APPLICANT NAME	WHAT ARE THE PARAMETERS OF THE REQUEST	FILE NUMBER
[redacted]	Engineering reports for Building 1: 1. Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Issue 02 2. Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Appendix A *3.* Canberra Hospital Building 1 - Facade Inspections - Appendix A – North *(duplicated in report no.2)* *4.* Canberra Hospital Building 1 - Facade Inspections - Appendix A – East *(duplicated in report no.2)* *5.* Canberra Hospital Building 1 - Facade Inspections - Appendix A – South *(duplicated in report no.2)* *6.* Canberra Hospital Building 1 - Facade Inspections - Appendix A – West *(duplicated in report no.2)* 7. ACT Health: Canberra Hospital Building 1 - Facade Rectification Strategy - Issue 02 8. Performance solution report - Health Infrastructure Services - Building 1 Central stair, Canberra Hospital - Revision R1.0 9. Building 1 The Canberra Hospital - Fire Services Condition Assessment Report 10. HVAC & Mechanical Services Condition & Recommendations Report - The Canberra Hospital Building 1 Cooling Towers 11. Canberra Hospital Building 1&12 – Medical Air Plant Initial Review B 12. ACT Health TCH UPS investigation regarding fire rating - electrical and fire services	FOI20/23

Ref Number	Page Number	Description	Date	Status Decision	Factor	Open Access release status
1.	1-38	Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Issue 02	17/06/2020	Partial release	Schedule 2.2(a)(ii) prejudice the protection	Yes

					of an individual's right to privacy or any other right under the *Human Rights Act 2004;* Schedule 1, 1.14(1)(h) endanger the security of a building, structure or vehicle; Schedule 2.2(a)(xiii) prejudice the competitive commercial activities of an agency;	
2.	39-337	Canberra Hospital Building 1 - Facade Inspection Report (2020 Update) - Appendix A	2020	Partial release	Schedule 1, 1.14(1)(h)	Yes
3.	338-350	ACT Health: Canberra Hospital Building 1 - Facade Rectification Strategy - Issue 02	10/07/2018	Partial release	Schedule 2.2(a)(ii) Schedule 1, 1.14(1)(h) Schedule 2.2(a)(xiii)	Yes
4.	351-376	Performance solution report - Health Infrastructure Services - Building 1 Central stair, Canberra Hospital - Revision R1.0	01/09/2017	Partial release	Schedule 2.2(a)(ii) Schedule 1, 1.14(1)(h) Schedule 2.2(a)(xi) prejudice trade secrets, business affairs or research of an agency;	Yes
5.	377-455	Building 1 The Canberra Hospital - Fire Services Condition Assessment Report	July 2017	Partial release	Schedule 1, 1.14(1)(h)	Yes
6.	456-474	HVAC & Mechanical Services Condition & Recommendations Report - The Canberra Hospital Building 1 Cooling Towers	June 2019	Partial release	Schedule 1, 1.14(1)(h)	Yes
7.	475-481	Canberra Hospital Building 1&12 – Medical Air Plant Initial Review B	13/12/2018	Partial release	Schedule 2.2(a)(ii)	Yes

8.	482-498	ACT Health TCH UPS investigation regarding fire rating - electrical and fire services	01/11/2019	Partial release	Schedule 2.2(a)(ii) Schedule 1, 1.14(1)(h)	Yes
Total Number of Documents						
8.						

Canberra Health Services

Canberra Hospital Building 1

Facade Inspection Report
(2020 Update)

251532-00

Issue 02 | 17 June 2020

Job number 251532-00

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Arup Pty Ltd ABN 18 000 966 165

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ARUP

Document Verification

ARUP

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Contents

1 Executive Summary

Arup was engaged by Canberra Health Services to undertake a facade inspection of Building 1 located within the Canberra Hospital Campus in Garran ACT as part of an annual inspection program to monitor the general condition of the facades of this building. This report is an update for the façade condition audit undertaken in 2017.

The Canberra Hospital's Building 1 is an eleven-storey building, typically constructed of reinforced concrete framework. The building facades generally consist of cavity brick walls complete with "Plasteel" windows. The outer skin of the brick façade passes the concrete slab edges and appears to be supported by steel shelf angles fixed to the concrete slab edge. The pre-cast concrete head and sill beams appear to be directly supported on the brick skins. The main roofs consist of a proprietary metal deck system such as 'Kliplok' slopped to a central box gutter.

Arup have previously carried out façade inspections during 2016 and 2017. This report is an annual follow-up and should be read in conjunction with the following previous documentation:

- 2016 Façade Inspection - *Canberra Hospital Building 1 Façade Inspection Report* issued 8 May 2017
- 2017 Façade Inspection - *Canberra Hospital Building 1 Façade Inspection (2017)* issued 2 March 2018

Our scope of works generally included the following:

- Review of available documentation such as drawings and previous condition audit reports.
- Visual inspection of the roof areas and building facades via Rope Access techniques.
- Preparation of a façade inspection report including recommendations for the required façade repairs or upgrade options.

Sam Milojevic and Liam O'Hehir of Arup carried out the inspection from 29 - 31 January 2020. These inspections were visual in nature and are intended to cover most of the building facade and roof areas.

The intention of this report aims to update the general condition of the façade areas, the deterioration rate of façade defects noted in the 2017 Façade Inspection Report and to confirm the anticipated repairs and recommended timeframes to address such facade defects.

A compilation of façade defects for each elevation is included in *Appendix A*.

[redacted]

1.2 Recommendations

The budget estimates have been updated from the 2016 and 2017 reports taking into account the observed condition and any additional defects.

It is important to note that these estimated costs are indicative only and therefore a quantity surveyor experienced in façade conservation works should be engaged for greater confidence in pricing. Table 1 summarises the updated budgets.

[redacted]

Based on the recommended work, we believe that there are three facade intervention options as summarised in Table 2 below:

[redacted]

We continue to recommend the following procedural items in keeping with the 2016 and 2017 reports report:

- Implement a programme of annual inspections until the preferred intervention approach has been confirmed by Canberra Health Services
- Develop a technical specification to complete any of the intervention approaches listed above be developed by an experienced façade consultant prior to undertaking any façade remediation and/or upgrade works on site.
- Localised destructive investigation works should be carried out to assess the condition of concealed facade and structural components prior to the documentation of the required facade stabilisation works.
- Thorough technical monitoring of the undertaking of any remedial works

We would be pleased to meet with Canberra Health Services to discuss this report and the intervention options in greater detail. This would assist to confirm the desired intervention approach and agree on further stages of this remedial project.

2 Introduction

2.1 Scope of Review

Arup was engaged by Canberra Health Services to undertake a facade inspection of Building 1 located within the Canberra Hospital Campus in Garran ACT.

Our scope of works generally included the following:

- Review of available documentation such as drawings (architectural, structural, shop etc.), previous condition audit reports and the like.
- Carrying out a visual inspection of the facades and roofs of this building including the following:
    - Visual inspection of the building facades and roofs from readily available and safe vantage points
    - Visual inspection of the building facades by our in-house team of engineers trained in Industrial Rope Access techniques (commercial abseiling)
- Preparation of a façade inspection report including our overall findings, existing conditions, conclusion and recommendation including façade upgrade options.
- Discussion of the potential options for façade repairs considering immediate capital expenditure, likely future capital expense in the context of a 10 to 15-year residual lifespan and the potential for façade upgrade or refurbishment to meet Canberra Hospital’s future plans.

<u>Note:</u>

It is important to note that the estimated costs included in this report are indicative only. A quantity surveyor experienced in façade conservation works should be engaged if a detailed costing is required for greater confidence in pricing.

We have not taken any samples for hazardous materials testing. We therefore take no responsibility in relation to any hazardous materials that are present on the site.

2.2 Building Description

The Canberra Hospital's Building 1 is an eleven-storey building, typically constructed of reinforced concrete framework. The building has an adjacent lift core which is two stories higher. The roof areas of the lift core have a substantial quantity of radio frequency transmission equipment.

The building facades generally consist of cavity brick walls; each brick skin is tied to each other and to the structural columns. The cavity width appears to vary and is relatively wider immediately adjacent to columns, presumably to cater for the 'mitred' profile of the façade brickwork at these locations.

The outer skin of the brick façade passes the concrete slab edges and is supported by steel shelf angles fixed to the concrete slab edge.

The pre-cast concrete head and sill beams appear to be directly supported on the brick skins. These pre-cast concrete units have an applied exposed aggregate finish. It is not clear if this was post-applied, or more likely a facing mix placed in the forms at the time of casting.

The windows generally consist of 'Plasteel' framing and include single glazed panels. This type of window has a PVC sleeve which covers the steel framing elements. It is evident that the windows on the east and west elevation, including the top row of the north elevation, have been replaced with aluminium framed components.

The main roofs consist of a proprietary metal deck system such as 'Kliplok' slopped to a central box gutter. The lift core roof has a membrane with a protective wearing slab.

Figure 1: General view of Canberra Hospital's Building 1

3 The Investigation

3.1 Inspection Methodology

The inspection was carried out utilising Industrial Rope Access techniques. Sam Milojevic and Liam O’Hehir of Arup carried out the inspection from 29 - 31 January 2020. These inspections were visual in nature and are intended to cover most of the building facade and roof areas.

The visual assessment of the existing façade and associated building elements focused on the current condition of the brickwork, pre-cast concrete elements and windows mainly to confirm whether any deterioration now presents an imminent safety concern.

These inspections were visual in nature and are intended to cover most of the building facades, roof and internal areas with the aim to provide an indication of their existing condition to determine the extent of the required repairs to this building’s facades.

3.2 Limitations

The works are limited to those described above.

This report has been prepared for Canberra Health Services and should not be relied upon by any third party. No responsibility is undertaken to any third party in the use of this report.

No detailed calculations or quantitative assessments of the adequacy or compliance of the building to current design codes or the National Construction Code (NCC) were carried out as part of this survey, nor was any physical materials testing carried out or enquiries made of statutory authorities in connection with the building. No statistical analysis was undertaken in the determination of trends noted.

Whilst this report is based on a reasonably detailed visual inspection of the areas of the property shown to us and described in the report, we do not purport to have discovered or seen every hidden defect or structural condition in existence. The inspection has been made without the removal of any parts of the structure and has been limited to areas where reasonable and safe access is available.

Arup's services do not extend to advising on asbestos and Arup shall have no liability for any claims arising out of or in connection with asbestos.

Arup's services do not extend to advising on Aluminium Composite Panels (ACP) and other combustible façade materials and Arup shall have no liability for any claims arising out of or in connection with aluminium composite panels.

6 Prognosis

[redacted]

We also continue with our recommendation to adopt a managed maintenance strategy which may include a minimal, moderate and high intervention approaches depending on the long-term plans for this building. The suggested intervention approaches are tabulated in the following page and are of similar nature to those included in the 2016 and 2017 reports.

Ongoing monitoring is still recommended until any of the proposed façade remedial works are carried out.

As noted in our 2016 and 2017 reports, even if the recommended annual façade monitoring programme is implemented, a façade of this nature is likely to deteriorate over time. This strategy should also prevent instances of major detachment but may not prevent minor instances of small material detachments between inspections.

With the appropriate implementation of remedial works, in combination with ongoing monitoring and maintenance, we anticipate that the facades of this building are likely to remain structurally serviceable for the next 15-20 years depending on the preferred intervention approach.

We have made minor modifications to the façade upgrade strategy included in the 2016 Report; the changes mainly relate to the scope of works and estimated budget costs to the moderate intervention approach as follows:

INTERVENTION APPROACH	ADVANTAGES	DISADVANTAGES
Minimal [redacted] -Installation of a façade access system [redacted] -Continued monitoring. -Ongoing make safe -Reactive remedial measures.	Cost effective option. Easy to carry out. Aesthetics of building are not changed and/ or compromised. Minimal disruption to building users.	Exhaustive management exercise. Least aesthetic appeal. Façades likely to further deteriorate over time. Minor detachment risks still remain. Public liability exposure is mitigated only but not eliminated.
Moderate [redacted]	More durable solution. Proactive approach. Moderate disruption to building users.	Moderate cost due to façade access. Difficult to implement effectively. It may affect the external appearance of the building. Limited predicted design life (i.e.10 to 15 years). Public liability exposure is further mitigated but not completely eliminated.
High [redacted]	New upgraded image to existing building. Potential to improve the existing appearance and performance. 25-30 year design life. Public liability exposure is nearly eliminated.	High cost due to major scope of works. Potential D.A. compliance issues. High disruption to building occupants. Although it may be achievable while operational.

7 Conclusions & Recommendations

We have carried out a visual inspection of the northern, southern, eastern, and western elevations of the Building 1 facades located within the Canberra Hospital Campus in Garran ACT. [redacted]

We maintain our opinion that some remediation will need to be undertaken to mitigate public liability risk associated with this building. [redacted]

[redacted]

[redacted]

The roof areas consist of a proprietary metal deck system such as 'Kliplok' which is generally aged and faded though no leaks were reported by building management.

The thermal performance of the building facades is likely to be relatively low by current standards and opportunities to improve the current performance have been identified.

We have now suggested remediation and/ or replacement timeframes for the different façade elements based on the deterioration rate of these elements during the 2017 inspection as follows:

- [redacted] [redacted]
- [redacted] [redacted]
- [redacted] [redacted]
- [redacted] [redacted]
- [redacted] [redacted]
- [redacted] [redacted]

Our proposed façade stabilisation approach for this building includes minor modifications to the façade upgrade strategy included in the 2016 and 2017 reports; the final order however, would still need to be determined to suit the preferred Canberra Health Services intervention approach and capital expenditure allowances:

7.1 Minimal Intervention Approach

Continued Façade Monitoring

Some of the façade elements across the building facades have the potential to become safety risks. [redacted]

Based on the façade defects found and the observed deterioration rate, we continue with our recommendation for Canberra Health Services to implement an annual inspection program to monitor the general condition of the building facades. This program would also allow building management to respond to any developing safety risks in a timely manner.

Similar to our last inspection, 80% of the building façades would be inspected every year including a 'high-level' review of other façade areas occurring at the same time.

An updated budget of approximately [redacted] per year for this building should be considered to complete the suggested annual inspections.

A budget of [redacted] should also be allocated to carry out the required make safe works that may be required after the façade inspection.

Façade Access

Adequate access to the building facades is still considered to be inadequate. This condition continues to both discourage and impede on the required inspections and/or maintenance works. We maintain our opinion that Rope Access is the most efficient manner to inspect and maintain the facades of this building but at present there are not enough certified anchor points installed to facilitate efficient access.

We therefore still recommend that a specialist height safety/building access consultant be engaged to inspect the roof configurations and develop a specification that is compliant with AS/NZS1891 'Industrial Fall Arrest Systems and Devices', AS/NZS4488 'Industrial Rope Access Systems' and AS1657 'Fixed Platforms, Walkways and Ladders – Design and Installation'.

As noted in our 2016 Report, this is likely to include the installation of anchor points for rope access, walkways and ladders. The operational manuals that will accompany the installation of the various façade access elements will set out the requirements for yearly testing and certification to avoid any safety risks and facilitate safe and efficient façade access.

Following our 2020 inspection, we believe that a budget of approximately [redacted] should be set aside to install the required anchor points and associated elements to facilitate facade inspections and repairs using rope access techniques.

7.2 Moderate Intervention Approach

This option mainly includes stabilisation of [redacted] precast concrete elements and the replacement of [redacted] This proactive approach would offer a more durable solution with a predicted design life of approximately 10 to 15 years.

We maintain our view that this option would be difficult to implement and may have a further impact on the building's appearance due to the localised repairs throughout the facades. We also anticipate to have a moderate disruption to building users based on the nature of the required façade stabilisation works (i.e. noisy works).

We believe that a budget of approximately [redacted] should be considered to complete the suggested scope of works.

7.3 High Intervention Approach

This option involves the over-cladding of the building facades with new materials, the replacement of all [redacted]

This option would offer a more durable solution, including an improved appearance and performance with a predicted design life of approximately 25 to 30 years.

Although we believe that this approach is the most appropriate, it would include a major capital expenditure due to the scope of works. High disruption to building users is likely based on the required façade access system.

We believe that the previously estimated budget of approximately [redacted] is still adequate to complete the suggested scope of works.

We continue to recommend that a technical specification to complete any of the intervention approaches listed above be developed by an experienced façade consultant prior to undertaking any façade remediation and/ or upgrade works on site. Localised destructive investigation works should be carried out to assess the condition of concealed facade and structural components prior to the documentation of the required facade stabilisation works.

Engaging an appropriately skilled contractor to carry out the required repairs to the building facades is also considered important and thus still recommended.

Further to the above, we still recommend that a thorough technical monitoring of the proposed remedial Works be implemented while being executed by the preferred Contractor. This will help to achieve the desired outcome and address latent conditions discovered during the course of the remedial Works.

We would be pleased to meet with Canberra Health Services to discuss this report and the intervention options in greater detail. This would assist to confirm the desired intervention approach and agree on further stages of this remedial project.

Appendix A - Extent of Façade Defects

Canberra Hospital Façade Inspections Building 1

CLIENT:
ACT Health

ADDRESS:
Yamba Dr
Garran ACT 2605
Australia

YEAR:
2020

CONTACT:
Nicky Foote

TYPE:
General Inspection

METHOD:
Visual inspection of :

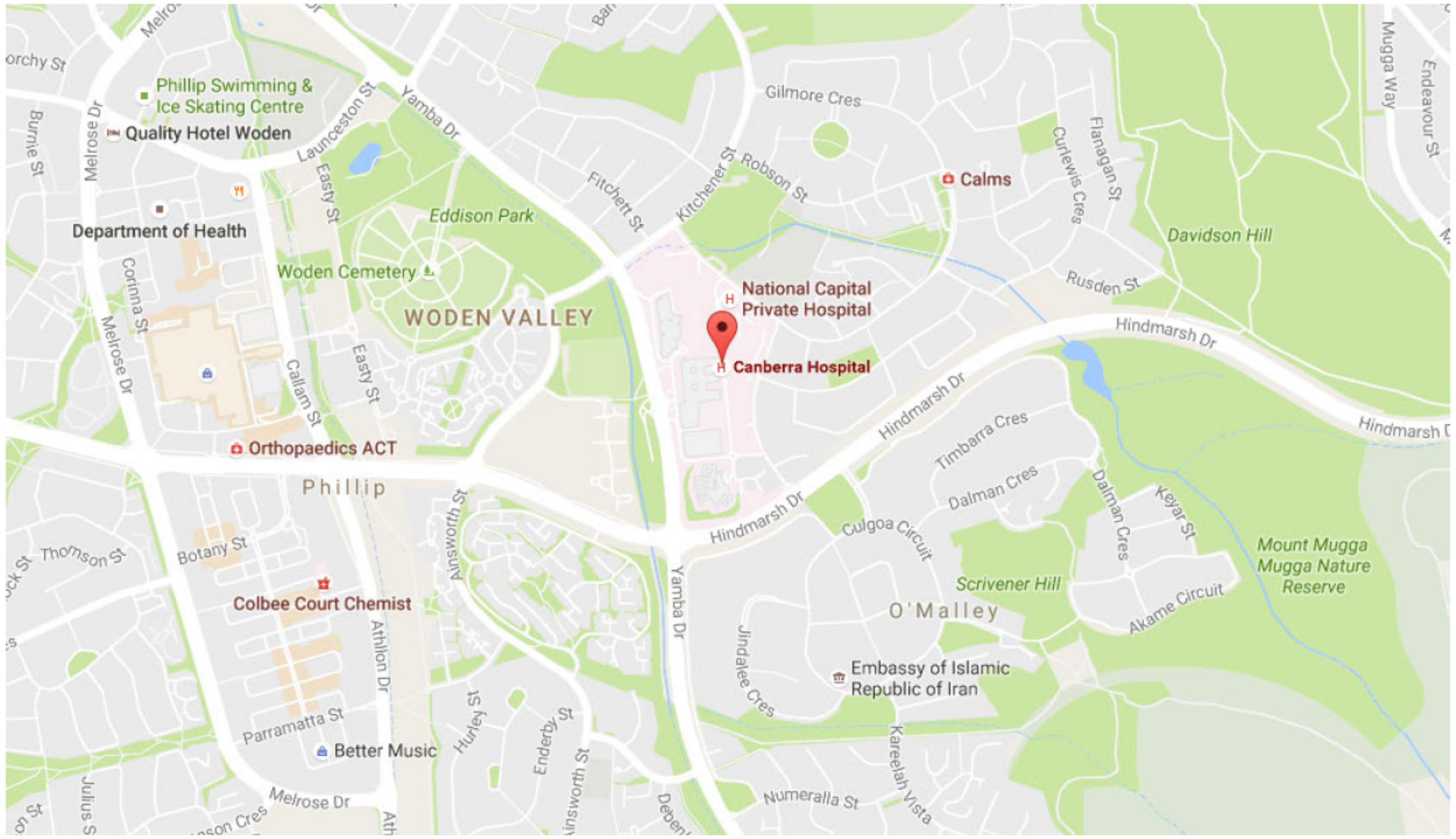
-Facade components
-Framing components
-Glazing panels

AREAS REVIEWED:
Façade Areas

DATE:
2020

INSPECTED BY:
Arup

DESCRIPTION :
Façade inspection to determine current condition and residual public liability risks.



Map data ©2016 Google

GENERAL NOTES:

- The building is in fair condition considering its age.
- [redacted]

ACT Health

Canberra Hospital Building 1

Facade Rectification Strategy

251532-00

Issue 2 | 10 July 2018

Job number 251532-00

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Arup Pty Ltd ABN 18 000 966 165

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ARUP

Document Verification

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Job title		Canberra Hospital Building 1			**Job number** 251532-00
Document title		Facade Rectification Strategy			**File reference**
Document ref		251532-00			
Revision	**Date**	**Filename**	Issue 01 ACT Health Canberra Hospital Bldg 1 - Facade Rectification Strategy .docx		
Issue 1	9 July 2018	***Description***	*Issue 1*		
			Prepared by	Checked by	Approved by
		Name	[redacted]	[redacted]	[redacted]
		Signature			
Issue 2	10 Jul 2018	**Filename**	Issue 02 ACT Health Canberra Hospital Bldg 1 - Facade Rectification Strategy .docx		
		Description	Updated Busget Estimates		
			Prepared by	Checked by	Approved by
		Name	[redacted]	[redacted]	[redacted]
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			

Issue Document Verification with Document ✓

Contents

Appendices

No table of contents entries found.

1 Introduction

Arup was engaged by ACT Health to progressively inspect and record the ongoing deterioration of the external façade fabric of Building 1 of the Canberra Hospital Campus in Garran ACT.

Based on recent discussions and a site meeting on Monday 18 June, we understand that due to budget constraints and sensitivity of performing intrusive works ACT Health would like to consider an ongoing façade maintenance and rectification plan to address safety and to improve the overall stability of the original brick facade.

Arup previously performed an inspection of Building 1 in October 2016 and again in May 2017. Based on our understanding of the façade construction as well as the type, location, severity and safety implication of a façade defects we envisage that the following building elements be considered for repair and stabilisation in the very near future. These e as follows;

- [redacted]
- [redacted]
- [redacted]

We note that the remainder of the façade defects outline in previous reports do not necessarily relate to immediate safety concerns or are directly affecting the structural stability of the external envelope. However, if left unattended the defects will manifest themselves into durability and overtime inevitably structural issues. It is therefore our recommendation that a 'long-term' façade strategy be developed to address the suites at a later date.

Sections below describe the nature of each defects, its safety and structural implications as well as the proposed rectification and/or investigative scope.

2 Limitations

This document has been prepared for ACT Health and should not be relied upon by any third party. No responsibility is undertaken to any third party in the use of this report.

The intent of this document is to provide indicative budget cost estimates, works staging and prioritisation of works to suite budgetary constraints. For all backlround information this document should be read in conjunction with all previous records façade inspections carried out on Building 1.

Reference material used in the development of indicative budget cost estimates are recent competitive tenders coordinated by our office.

All enclosed estimates are subject to determination of the final design and detailing of the various work items, access strategies, works methodologies and site-specific constraints.

It is important to note that the attached costs are indicative only. A suitably qualified Quantity Surveyor experienced in façade construction will need to be engaged if a detailed costing is required for greater confidence in pricing.

[redacted]

4 Proposed Staging of Works and Budgets

4.1 Staging of works

Based on the varying severity of defects we would recommend that the criteria for staging and prioritising of the works should be determined as follows;

- Risk of façade displacement and dislodgement
- Risk to public associated with falling debris
- Extent and severity of defects

Based on our knowledge and the review of conditions report compiled to date we would propose that the façade project be undertaken in total of seven stages. The staging layout provided in Figure 01 has been selected based on the above-mentioned criteria with stage 1 works to be commenced initially. Refer to Figure 02 to 05 for elevations.

Figure 01. Proposed Staging Plan

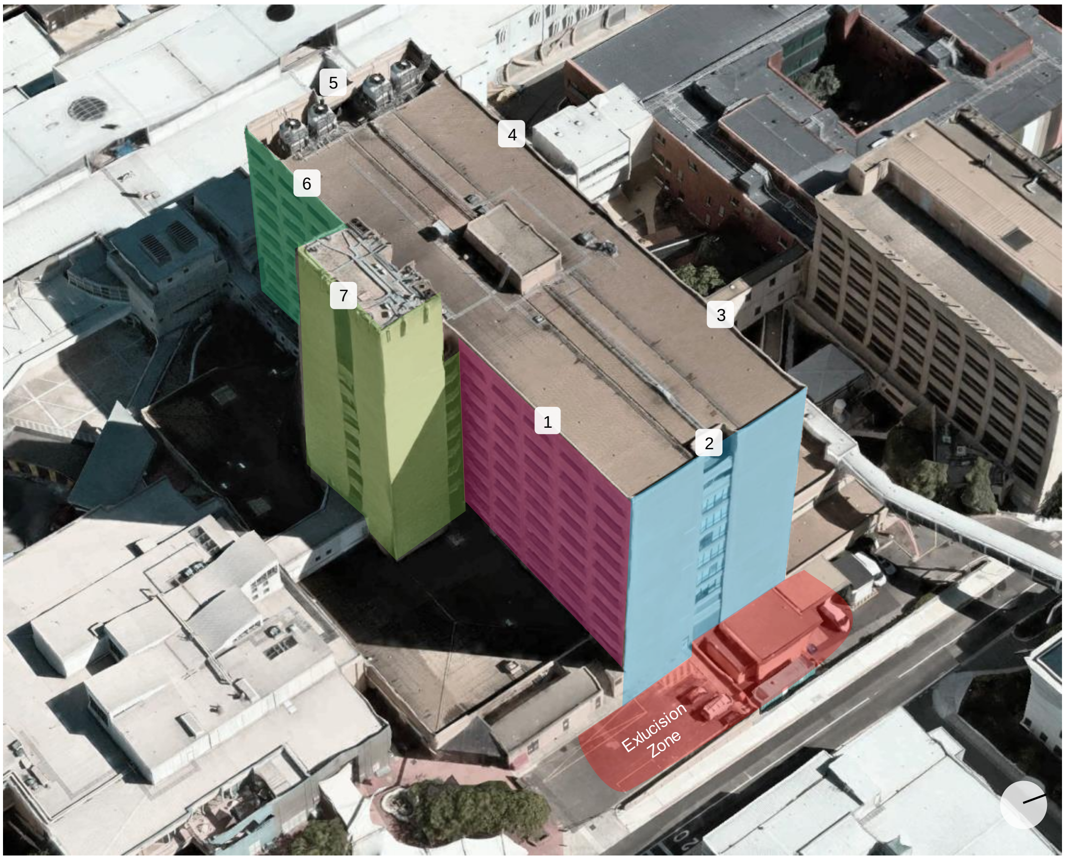


Figure 02. South-East elevations

Figure 03. North-East elevations

Figure 04. North-West elevations

Figure 05. South-West elevations

We also recommend that prior to any works taking place a detail investigation be undertaken to confirm the cause of façade defects which will in turn allow for a design of site specific remediation strategies.

Further to above, during the works stage intervals we strongly recommend that a regular inspection regime be upheld to monitoring performance of façade sections which not subject to the works. This is aimed at continuous and progressive risk mitigation strategy.

Façade Access

Based on the sensitivity around access, noise and public perception we would recommend that the facade be accessed via means of a suspended works scaffold (i.e. Swing-stage).

Swing-stages are light duty suspended scaffold systems that consist of a cradle supported by a row of suspension ropes. The swingstage is connected to two roof mounted cantilevered outriggers. Refer to Figure 06 and 07 for reference.

Figure 06. General view of the working platform/cradle.

Figure 07. General view of roof mounted outriggers

The above described access methodology is an industry standard means of access. All working loads, layouts, minimum requirements and specifications are developed in accordance with AS 1576.4 Scaffolding—Suspended Scaffolding.

Rope Access

Industrial Rope Access is a specialist service which aims to provide the fastest and most cost-effective façade access method for all kinds of buildings and other structures. It involves gaining access via vertically suspended ropes.

Figure 04. Façade resealing works in progress.

Specialists are typically trained to an industry standard such as the Industrial Rope Access Trade Association (IRATA), the leading training authority.

Rope access does not incur costly plant hire and authority permits required with traditional access methods. However, we note that the feasibility of using rope access as the preferred method for access will largely depend on the final and confirmed scope of works associated with the brick infills.

Scaffolding

This means of access provide most appropriate platform in terms of access where a largescale replacement of façade elements is required. Scaffolding accommodates for greater load concentration and therefore a substantial increase in allowable labour which means most improved programme.

Typically built with aluminium fasted with metal-form or cast clamps. New scaffolding must ne design and constructed in accordance with *AS/NZS 4576 Guidelines* for scaffolding and the *AS/NZS 1576 Scaffolding* series.

4.2 [redacted]

Factor – Per each project stage	$ k
1. Preliminaries	[redacted]
2. Local Authority Permits (where applicable)	
3. 'B' Class Hoarding (only applicable to northern elevation)	
4. Facade Access (Industrial Rope Access)	
5. Facade Access (Temporary Swing Stage)	
6. Facade Access (Fixed Full-Face Scaffold / Mast Climbers)	
7. Hazardous Material Removal	
8. Façade make safe works	
9. [redacted]	
10. Design and documentation of Facade works selected by ACT Health	
11. [redacted]	
12. [redacted]	
13. [redacted]	
14. [redacted]	
15. [redacted]	
Sub-Total	
PM Fees [redacted]	
Consultancy Fees [redacted]	
Contingency [redacted]	
Indicative Total Budget Cost Estimate For each Project Stage	

Note that the above estimates is for each works project stage.

If multiple stages are combined into a single project, cost savings in the form of amalgamated project administration, consultancy and access fees would apply, providing a lower overall cost to ACT Health.

Defire
Innovative fire safety

Australia's leading fire safety engineering consultancy

Performance solution report

Health Infrastructure Services

Building 1 Central stair, Canberra Hospital, Garran, ACT

CA170031

Revision R1.0 | 1 September 2017

Amendment schedule

Version	Date	Information relating to report			
R1.0	01/09/2017	Reason for issue	Report issued to Health Infrastructure Services, Dysen and ACT Fire & Rescue for review and comment. A building certifier will need to be engaged to ensure that the building works resulting from this report are in accordance with the building approval and certificate of occupancy requirements of ACT building legislation.		
			Prepared by	Reviewed by	Approved by
		Name	[redacted]		
		Signature			
		Reason for issue			
			Prepared by	Reviewed by	Approved by
		Name			
		Signature			
		Reason for issue			
			Prepared by	Reviewed by	Approved by
		Name			
		Signature			
		Reason for issue			
			Prepared by	Reviewed by	Approved by
		Name			
		Signature			

Executive summary

This report documents the findings of a fire safety engineering assessment undertaken to determine whether the decommissioning of the existing deluge system protecting the central stair 3 at Building 1, Canberra Hospital, Garran ACT complies with the relevant performance requirements of the National Construction Code 2016 Volume One – Building Code of Australia (BCA). Defire undertook the assessment in accordance with the International Fire Engineering Guidelines (IFEG) at the request of Health Infrastructure Services.

The report also documents the works required to improve the existing level of fire safety with respect to the discharge location of the central stair at Building 1. This is discussed in the fire engineering brief documented in section 2. The intent of the fire safety upgrade works for the stair is to upgrade it where practically possible considering the constraints imposed by the existing nature of the building. It is not the purpose of this part of the report to assess and demonstrate full compliance with the performance requirements of the BCA as issues such as the stair discharge are existing conditions.

Building 1 at the Canberra Hospital consists of fifteen floors (level 0 to level 14) with plant on level 0 and on the top three floors (levels 12 to 14). The building houses a broad range of clinical functions covering outpatients, consultants rooms and wards.

[redacted]

[redacted] The assessments documented in this report are not considered to affect or be affected by the findings of the previous fire safety engineering reports.

The fire safety engineering assessment found that the design of the building achieves compliance with the relevant performance requirements of the BCA, subject to the following recommendations:

- This report and the fire safety measures listed in section 5 are essential services that must be implemented into the design and identified on the essential services maintenance schedule for the building. They must be maintained and certified in accordance with the relevant Australian standards.
- If there are building alterations or additions, a change in use or changes to the fire safety system in the future, a reassessment will be needed to verify consistency with the assessment contained in this report.

Contents

1. Introduction

This report documents the findings of a fire safety engineering assessment undertaken to determine whether the decommissioning of the existing deluge system protecting the central stair 3 at Building 1, Canberra Hospital, Garran ACT complies with the relevant performance requirements of the National Construction Code 2016 Volume One – Building Code of Australia (BCA)[1]. Defire undertook the assessment in accordance with the International Fire Engineering Guidelines (IFEG)[2] at the request of Health Infrastructure Services.

This report documents the recommended works required to improve the existing level of fire safety with respect to the discharge location of the central stair at Building 1. The intent of the fire safety upgrade works for the stair is to upgrade it where practically possible considering the constraints imposed by the existing nature of the building.

2. Fire engineering brief

The purpose of the fire engineering brief (FEB) is to consult with the relevant stakeholders to define the scope of the project and to agree on the objectives, fire safety measures, methods of analysis and acceptance criteria for the performance solutions. The IFEG states that the scope of the project and the method by which it will receive regulatory approval dictates the extent of the FEB process required.

[redacted]

[1] National Construction Code 2016, Volume One – Building Code of Australia, Australian Building Codes Board, Australia.
[2] International Fire Engineering Guidelines – Edition 2005, Australian Building Codes Board, Australia.
[3] Review of Deluge System Protecting the Central Staircase Building No. 1 report by Dysen dated 9 October 2014.

[redacted]

3. Description of the building and performance solutions

3.1 Building description

The project involves the central stairway – stair 3 – within building 1 at the Canberra Hospital. The location of building 1 and the stairway configuration on a typical level is shown in Figure 1 and Figure 2 respectively.

Building 1 consists of fifteen floors (level 0 to level 14) with plant on level 0 and on the top three floors (levels 12 to 14). The building houses a broad range of clinical functions covering outpatients, consultants rooms and wards. Previous documentation[4] lists the following occupancy classifications for building 1:

- Plantroom – Level 0
- Class 7b and 8 – Level 01 (class 5 parts <10% of floor area of storey, hence they are not classified separately)
- Class 5 and 9a – Level 02
- Class 5 and 9a – Level 03
- Class 9a – Level 04
- Class 9a – Level 05
- Class 9a – Level 06
- Class 9a and 9b – Level 07
- Class 9a – Level 08
- Class 9a – Level 09
- Class 5 and 9a – Level 10
- Plantrooms – Levels 12 to 14

The project is limited to the assessment of the decommissioning of the existing deluge sprinkler system within the lift lobbies adjacent to central stair 3. This is based on the information within the Review of Deluge System Protecting the Central Staircase Building No. 1 report by Dysen dated 9 October 2014.

[4] Defire (formerly Stephen Wise & Associates. Fire Safety Compliance Audit: Report 2005/C101 R1.0, dated May 2005

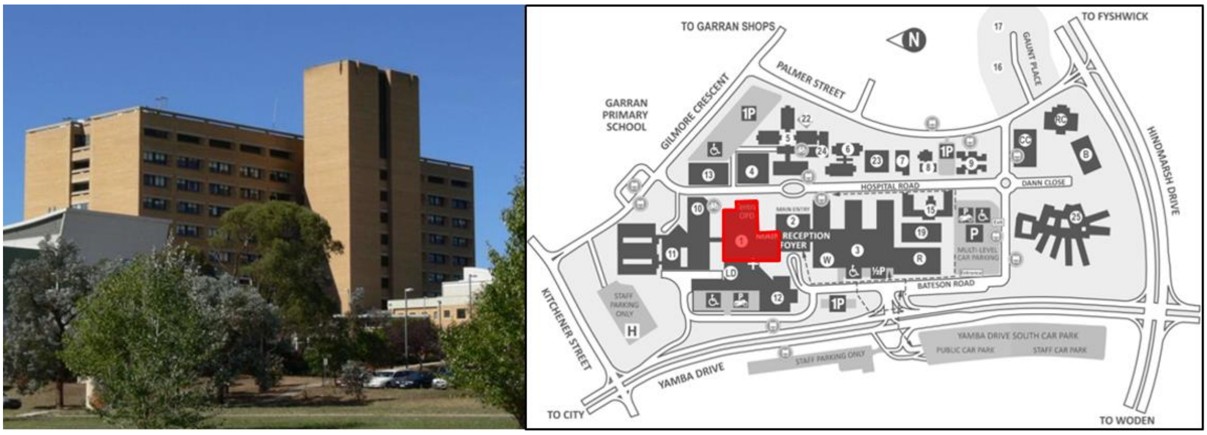
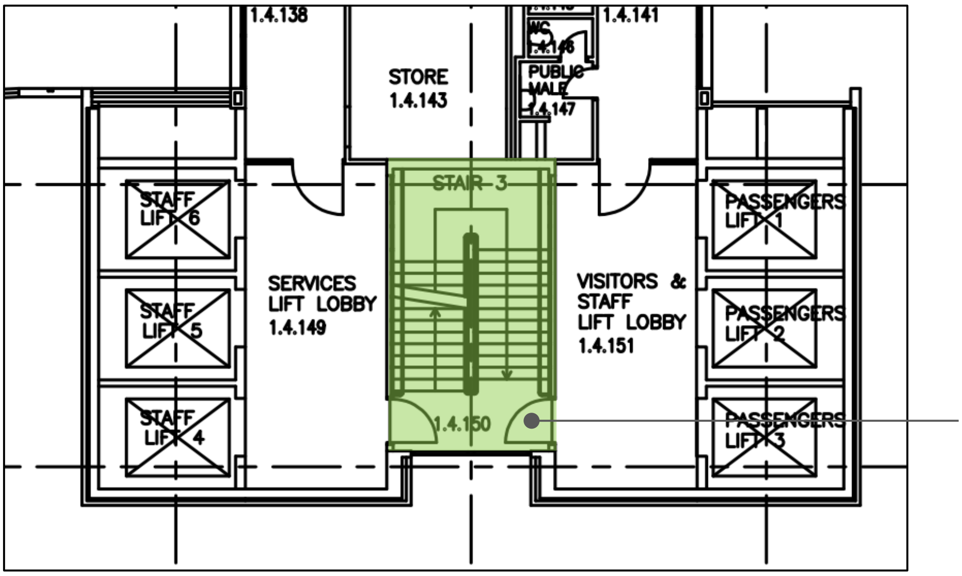


Figure 1 Building 1



Central stair (stair 3)

Figure 2 Central stair (stair 3) – typical level

Table 3[5] shows the main characteristics of the building for determining compliance with the BCA. Table 4 shows the proposed use and classification of the building or part in accordance with clause A3.2 of the BCA.

Characteristic	BCA provision	Description
Effective height	A1.1	Greater than 25m
Type of construction required	C1.1	Type A
Rise in storeys	C1.2	13
Levels contained	-	15

Table 3 Main building characteristics

[5] Defire (formerly Stephen Wise & Associates. Fire Safety Compliance Audit: Report 2005/C101 R1.0, dated May 2005.

Part of building	Use	Classification (A3.2)
Level 00	Plantroom	-
Level 01	Storage and processing	Class 7b and 8(class 5 parts <10% of floor area of storey, hence they are not classified separately)
Level 02	Office and hospital	Class 5 and 9a
Level 03	Office and hospital	Class 5 and 9a
Level 04	Hospital	Class 9a
Level 05	Hospital	Class 9a
Level 06	Hospital	Class 9a
Level 07	Hospital and assembly	Class 9a and 9b
Level 08	Hospital	Class 9a
Level 09	Hospital	Class 9a
Level 10	Office and hospital	Class 5 and 9a
Level 11	Roof and plantrooms	-
Levels 12 to 14	Plantrooms	-

Table 4 Use and classification

3.2 Occupant characteristics

The characteristics of the occupants expected to be in the building are listed in Table 5.

Characteristic	Description
Familiarity	Occupants are expected to be primarily patients and visitors who may not be familiar with the layout of the building and location of fire exits. Staff are also expected to be present who are familiar with the layout of the building and trained in emergency situations in accordance with AS 3745-2010.
Awareness	Patients may be asleep at the time of a fire which could delay their response time for evacuation. Staff and visitors are expected to be awake and alert to a potential emergency event such as a fire in the building.
Mobility	Occupants will have varying degrees of mobility with some being non ambulant and reliant on staff in the event of an evacuation. Staff are expected to be present at all times and aware of the level of assistance required by residents in the event of an evacuation.
Age	Occupants of all ages may be present within the building.
Language	Although occupants may have English as their second language, they are expected to understand signs and verbal instructions in English to the degree necessary to not adversely impact upon evacuation.
Occupant load	The population has not been calculated because it is not directly used for the assessments in this report.

Table 5 Occupant characteristics

[redacted]

4. Scope, objective and assumptions

4.1 Scope and objective

- The scope of this report is limited to the performance solutions described in section 3.3.
- The objective of this report is to demonstrate compliance with the fire safety aspects of the performance requirements of the BCA. Matters such as property protection (other than protection of adjoining property), business interruption, public perception, environmental impacts and broader community issues – such as loss of a major employer and impact on tourism – have not been considered as they are outside the scope of the BCA.
- This report considers fires involving a single ignition point. Arson or destructive acts involving:
  - large amounts of accelerants which significantly change the expected burning behaviour of materials
  - multiple ignition sources
  - terrorism

  are not considered in the scope of this assessment.
- The scope of our works is limited to considering evacuation and fire safety issues for people with disabilities to the same degree as the DTS provisions of the BCA. Specifically, the evacuation from the building of people with disabilities under the provisions of the Disability Discrimination Act 1992 is excluded.
- If there are building alterations or additions, a change in use or changes to the fire safety systems in the future, a reassessment will be needed to verify consistency with the assessment in this report.
- The data, methodologies, calculations and conclusions documented in this report specifically relate to the building and must not be used for any other purpose.
- The documentation that forms the basis for this report is listed in Appendix A.
- This report has been prepared based on information provided by others. Defire has not verified the accuracy and/or completeness of this information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.

4.2 Assumptions

- The existing building complied with the applicable building standard at the time of construction. All new works comply with the current DTS provisions of the BCA relating to fire safety except for the specific performance solutions described in section 3.3.
- The design must comply with the requirements of the following existing reports:
  - The Canberra Hospital, Building 1, Level 5 Refurbishment, fire engineering report no. rp140123c0011 revision 1.0 dated 6 June 2014 prepared by Normal Disney and Young.
  - Level 5, Building 1, Canberra Hospital, Garran, ACT, alternative solution report no. CA130071 revision 1.1 dated 27 May 2014 prepared by Defire
  - Levels 4, 9 and 10, Building 1, Canberra Hospital, Garran, ACT, alternative solution report no. CA140007 revision 1.1 dated 14 January 2016 prepared by Defire.
- All the fire safety systems are assumed to be designed, installed and operated in accordance with the appropriate Australian standards, other design codes, legislation and regulations relevant to the project unless specifically stated otherwise.
- For a satisfactory level of fire safety to be achieved, regular testing and maintenance of all fire safety systems and measures – including management-in-use systems – is essential and is assumed in the conclusion of this assessment.

6. Base building fire safety measures

The following additional fire safety measures are recommended to improve the existing level of fire safety for the discharge of central stair 3 in Building 1. These measures do not form part of the performance solution assessed in this report for the fire separation of stair 3.

[redacted]

6.2 Fire safety management and training

The emergency management plan for the building must be updated to address evacuation procedures for the building when the existing sliding doors on level 2 adjacent to central stair 3 are closed.

Once the emergency management plan is updated, it is to be implemented with exercises, periodic audits, and suitable procedures to maintain safety. This should include training under simulated fire emergency conditions for all relevant personnel.

7. Safety in design

Our scope of works is to assess the level of fire safety and demonstrate the design achieves compliance with the relevant performance requirements of the BCA. A preliminary safety in design review was undertaken as part of our assessment. The review considered whether the recommended fire safety measures in section 5 could reasonably be expected to introduce unique or unusual hazards that would not otherwise be present in the construction, installation and/or maintenance of building. The fire safety measures in section 5 are performance specifications for other consultants to incorporate into their designs. The detailed designers retain discretion over where and how systems and structures are installed and are therefore responsible for the safety in design for the detailed design. It is important to note that the outcomes of our review are limited to issues that could reasonably be foreseen by a fire safety engineer within our limited scope and involvement in the project. It is likely that other parties involved in detailed design, installation and/or maintenance will identify additional issues.

No unique or unusual hazards that would not otherwise be present in the construction, installation and/or maintenance of building have been identified in relation to the performance solution as a result of our preliminary safety in design review.

Note: Residual risks are to be considered and addressed by appropriate persons within the design, construction and maintenance teams who have duties under the health and safety legislation.

8.2.2 Clause D1.3

The Guide to the BCA states that the intent of clause D1.3 is *'to indicate when fire-isolated stairways and ramps are required to enable safe egress in case of a fire*'. The guide expands further that *'fire-isolated exits are required in multi-storey buildings to enable people to evacuate past a storey on fire. They also help the fire brigade carry out search and rescue for fire-fighting.*

Such exits minimise the distance people need to travel in a fire-affected area before accessing a "safe place", such as a fire-isolated stairway'.

D1.3(b)(i) permits class 9a buildings to have non-fire-isolated exits provided they do not connect, pass through or pass by more than two consecutive storeys in areas other than patient care areas.

8.3 Methodology

The approach and method of assessment used to determine whether the performance solution meets the performance requirements of the BCA are summarised in Table 9.

Assessment approach	
Method of meeting performance requirements of the BCA	Clauses A0.3(a)(ii) and A0.3(b): Demonstrating equivalence to the DTS provisions
BCA assessment methodology	Clause A0.5(d): Comparison to the DTS provisions
Type of assessment	Qualitative comparative
Fire safety sub-systems addressed	Sub-system B – Smoke development and spread and control Sub-system C – Fire spread and impact and control Sub-system D – Fire detection, warning and suppression Sub-system E – Occupant evacuation and control

Table 9 Performance solution approach and method of assessment

8.4 Acceptance criteria

The acceptance criteria for the assessment are:

- That the risk of fire and smoke spread via the stair 3 shaft is mitigated equivalent to a fire-isolated stair or fire-rated service shaft.
- The stair must not represent an undue hazard to occupants evacuating the building.

[redacted]

[redacted]

8.7 Conclusion

The assessment demonstrates that the risk of fire and smoke spread via the central stair 3 on levels 2 to 10 is mitigated equivalent to a fire-isolated stair or fire-rated service shaft. The stair is not considered to represent an undue hazard to occupants evacuating the building. The proposed design of the building is therefore considered to achieve compliance with performance requirements CP2, DP4, DP5 and EP2.2 of the BCA, subject to compliance with the fire safety measures given in section 5.

Appendix A Drawings and information

Drawing title	Dwg no	Date	Drawn
Level LG – basement floor	B1-000 rev A	19/06/2002	The Canberra Hospital Facilities Management Services
Level 01	B1-001 rev A	03//04/2000	The Canberra Hospital Facilities Management Services
Level 02	B1-002 rev B	02/08/2001	The Canberra Hospital Facilities Management Services
Level 03	B1-003 rev A	06/06/2000	The Canberra Hospital Facilities Management Services
Level 04	B1-004 rev B	31/10/2001	The Canberra Hospital Facilities Management Services
Level 05	B1-005 rev A	07/04/2000	The Canberra Hospital Facilities Management Services
Level 06	B1-006 rev B	07/11/2001	The Canberra Hospital Facilities Management Services
Level 07	B1-007 rev B	13/03/2003	The Canberra Hospital Facilities Management Services
Level 08	B1-008 rev B	14/03/2003	The Canberra Hospital Facilities Management Services
Level 09	B1-009 rev A	07/04/2000	The Canberra Hospital Facilities Management Services
Level 10	B1-010 rev A	05/03/2000	The Canberra Hospital Facilities Management Services
Level 11 – plant room floor	B1-011 rev A	06/03/2000	The Canberra Hospital Facilities Management Services
Level 12, 13 and 14 – plant room floors	B1-012	-	The Canberra Hospital Facilities Management Services

Other information	Ref no	Date	Prepared by
[redacted]			

ACT Government
Chief Minister, Treasury and Economic Development

ACT Government
Health

Building 1

The Canberra Hospital

Fire Services Condition Assessment Report

Address: Yamba Drive, Garran ACT
Customer: Chief Minister, Treasury and Economic Development Directorate
Date: July 2017

Pyrosolv

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Table of Contents

1 Introduction

The report has been commissioned by the Chief Ministers, Treasury and Economic Development Directorate, Facilities Management to identify the condition of the existing fire systems and shortfalls in those systems at Building 1, The Canberra Hospital.

1.1 Overview

The building was constructed prior to the introduction of the BCA when requirements for building design and construction were contained in the Building Manual ACT. The building was constructed for the Australian Government's Department of Housing and Construction who at that time were not bound to comply with the regulations.

Generally the systems installed are of a high standard and appropriate for the risk and therefore are considered adequate.

Fire safety systems have been upgraded including a retrofit of an automatic wet pipe sprinkler system and upgrading of the FIP and EWIS panels.

All systems must be maintained in accordance with AS 1851 to ensure correct operation in the event of a fire or other emergency.

A long term strategic plan is required for the future upgrading of specific buildings and the sites fire safety package with a clear direction relative to the types and capabilities of any new systems to be installed. This may include addressable and networked system to be able to more efficiently manage the maintenance of the system and effective management of a fire or other emergency within the hospital. Building 1 has been recently upgraded to start this process as a new addressable FIP has been installed which has the networking capabilities.

1.2 Limitations

This report has been prepared in good faith and due care and has been based on a walk through inspection and review of the available documentation. Some areas were locked and not available for inspection at the time of survey.

Verification of design, disassembly of equipment, or inspection of services in concealed spaces has not been included.

The standards used and referred to in this report were in applicable at the time of installation of the equipment. Where the equipment does not meet current standards, this is noted in the report. We note that any new and some replacement works required are to be in accordance with all current standards and the Building Code of Australia.

The audit was undertaken on the date of this report and issues that may have arisen after that date have not been included in this report.

2 The Building

This facility was purpose designed and constructed as a hospital, to a high standard relative to fire safety.

According to the BCA/ NCC 2014 Part A3, this building is;

- **Class 9a – a health-care building including those parts of the building set as a laboratory**

This Class 9a Facility/ Building with an EFFECTIVE BUILDING HEIGHT ABOVE GROUND LEVEL GRETAER THAN 25m, greater than two stories, plus having a Total Floor Area greater than 1000m2 requires the following fire safety measures;

- **Detection to AS 1670.1-2004, Spec E2.2a Clause 4.**
- **ASE to AS 1670.3-2004, Spec E2.2a Clause 7**
- **EWIS to AS 1670.4-2004, Part E4.9**
- **Sprinklers to AS 2118.1-1999, Spec E1.5**
- **Hydrants to AS 2419.1-2005, Spec E1.3**
- **Extinguishers to AS 2444-2001, Spec E1.6**
- **Fire Hose Reels to AS 2441-2005, Spec E1.4**
- **Exit & Emergency Lighting to AS 2293.1-2005, Part E4.2**

It has the following constructional characteristics:

Summary of Construction Determination		Results
Classification		Class 9a
Number of storeys contained		12
Year of construction		1970s
Type of construction required		Type A
Block 1	Section 58	Garran

2.1 Maintenance

The fire safety systems in the facility are being maintained by Form One Fire Services

3 Fire Systems Summary

	Provided	Adequacy	BCA	
Fire Indicator Panel	Yes	Yes	Compliant	[redacted]
Thermal and Smoke Detectors	Smoke & Thermal Detection	Yes	Compliant	
Sprinkler Systems	Yes	Yes	Compliant	
Fire Hose Reels	Throughout	Yes	Acceptable	
Fire Hydrants	Throughout	Yes	Compliant	
Fire and Smoke Doors and Barriers	Yes	Yes	Compliant	
Fire Extinguishers and Blankets	Throughout	Yes	Compliant	
Evacuation and Warning Systems	Yes	Yes	Compliant	
Emergency Lighting and Exit Signs	Yes	Yes	Compliant	
Emergency Exit Routes	Yes	Yes	Compliant	
Exit Door Locking Devices	Yes	Yes	Compliant	
Fire Systems Interface Test	Yes	Yes	Compliant	
General Housekeeping	Satisfactory	Yes	Compliant	
Maintenance Records	Yes	Yes	Compliant	

4 Fire Indicator Panel

[redacted]

The system is connected via the required dual path to the Tyco / ADT Fire Monitoring service, which in the event of an alarm relays the signal to the ACT Fire Brigade.

The onsite log book states that the system is being maintained to the requirements of AS 1851 by [redacted] and tested monthly.

The block plans clearly identify the areas covered by the system.

[redacted]

Network (Node) Panel

Recent building upgrade projects on Level's 4 & 5 required the addition of a network node that is installed in the riser located off the north-east corridor section leading away from the public lifts. These floors now are fully addressable. This same riser houses [redacted] and is also utilised for the associated fire rated cabling loops.

The requirement for this network node was due to the project consultants' design of a detection system to AS1670 specifications and subsequent installation of the detection throughout level 5. It is unknown as to the reason for smoke detection to be installed to AS1670 in a sprinkler protected building as the BCA and Australian Standards indicates a requirement for a skeletal smoke detection system only.

Fire Fan Control Panel

Incorporated within the FIP is the Fire Fan Control Panel (FFCP) which allows for automatic operation of smoke control, exhaust, supply air fans and stair pressurisation fans. This panel also provides a facility for the Fire Brigade to manually stand and/or stop specific fans.

As this system upgrade is relatively new it is assumed the FFCP controls and indications were tested and commissioned on completion of the project, however no documentation was evident on site

5 Thermal and Smoke Detectors

As mentioned above levels [redacted] have been refurbished and now contain Analogue Addressable Smoke and Thermal detection.

Throughout the remainder of the building, recently the older existing original OLSEN detection was upgraded to SYSTEM SENSOR conventional smoke and thermal detectors have been installed throughout most of the building to the requirements of AS 1668 (skeletal layout). [redacted]

It is understood that all detectors are connected to the new Fire Indicator Panel. [redacted] module boxes have been installed in a riser on each level of the building where the existing conventional detection zones have been terminated

[redacted]

[redacted]

6 Fire Sprinkler Systems

An automatic wet pipe sprinkler system has been installed throughout the building, generally to the requirements of AS 2118. An Alternative Solution has been applied to the building due to the retro-fit nature of the sprinkler and drencher systems installation.

The system is controlled by valve sets in the sprinkler valve room, which is located between the Fire Control Room and the Sprinkler/Hydrant Pump Room. This causes concern due to the noise levels that could be expected in the area in a fire situation making control of the emergency in the control room somewhat difficult.

The following valve sets control the system:

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

The onsite log books indicate that the last six-monthly and Annual tests have been conducted as required. All alarm valve assemblies appear to have been replaced within the last 2 years therefore the valve overhauls are up to date.

The centre stairwell in-between the lifts has a drencher system installed on levels 2 – 10. Isolation valves for this system are located on each level in a riser on the west side of the short corridor leading away from the staff lifts with exception to Level 2 where the valve is located in the corridor on the north side of the stairwell. These risers are accessible with an ACT fire brigade key.

Water Supply

The water supply for the sprinkler and hydrant services are supplemented by tanks on Level 13 which are delivered by diesel and electric pumps in the pump room.

Details relative to the maintenance of the tanks and/or pumps was not available on site at the time of survey.

[redacted]

Maintenance

The monthly servicing and maintenance of the diesel / electric hydrant and/or sprinkler pump are carried out monthly as per Australian Standards, However, it is unknown as to the last annual test date, pump servicing or upper routines.

7 Fire Hose Reels

Fire hose reels are strategically located throughout the building and provide adequate coverage for occupants to reach all areas of the floor in the event of a fire. Water supply for this system is taken off the hydrant service.

Locations are as detailed on the plans at item 18 of this report.

Generally, Fire Hose Reels are co-located within cupboards with a Fire Hydrant and a CO2 fire extinguisher.

Water supply for this service is taken directly off the Hydrant service.

[redacted]

8 Fire Hydrants

Internal hydrants are installed to provide firefighting water to the ACT Fire Brigade.

Locations are as detailed on the plans at item 18 of this report.

Generally, Fire Hydrants are co-located within cupboards with a Fire Hose Reel and a CO2 fire extinguisher.

Fire Hydrants are tagged as having been maintained as required.

[redacted]

Ball valve and pillar street hydrants are available which will provide adequate coverage externally of the building. [redacted]

Storz couplings have been fitted to hydrants to facilitate ease of connection of Fire Brigade equipment. [redacted]

[redacted]

[redacted]

9 Fire and Smoke Doors and Barriers

The building consists of nine levels above ground floor with a fire isolated stair at each end and a central smoke isolated stair which has been upgraded with drenchers discharging to Level 1 and their open air via a fire isolated corridor. The central stair has a fire rated barrier with fire doors provided at each level to each of the east and west wings.

[redacted]

Other fire barriers have been strategically located throughout the complex to divide the area into smaller fire compartments. The concept of these barriers is illustrated in the drawing in this report.

[redacted]

[redacted]

Fire Doors

Fire doors in compliance with the BCA and AS1905 have been installed and are subject to regular inspection and testing as required by AS1851.

Fire doors on electrical switchboard cupboards throughout the building have de-rating labels on the spines of the doors. All tags and fire door signage should be removed from these doors with exception to the de-rating tag.

[redacted]

[redacted]

Fire Dampers

Fire dampers have been installed in fire walls and barriers throughout the complex.

Australian Standards require dampers to be inspected, tested and serviced every 10 years.

[redacted]

10 Fire Extinguishers and Blankets

Portable special risk fire extinguishers are installed throughout to provide facilities for occupant to attack a fire in the building.

Generally, CO2 fire extinguishers are co-located within cupboards with a Fire Hose Reel and a Fire Hydrant and are considered the most appropriate in this situation. Locations are as detailed on the plans at item 18 of this report.

Portable fire extinguishers have been strategically located throughout the facility are considered adequate in number, type and locations.

[redacted]

A 5.0kg C02 fire extinguisher was in the level 2 west side egress passageway behind the Pharmacy which was not indicated as belonging there. It was empty and severely overdue for servicing and pressure testing. This unit does not appear to be required and should be removed.

Fire extinguisher location signs require updating in some areas to the requirements of AS2444, in plant room areas.

11 Evacuation and Warning Systems

[redacted] Emergency Warning and Communications system is installed within this facility with the MECP located adjacent to the FIP in the Fire Control Room. Previous comments regarding noise is repeated regarding the noise levels that could be expected in the area in a fire situation making control of the emergency in the control room somewhat difficult.

The onsite log book states that the system is being maintained to the requirements of AS 1851 by SMI Fire Services/ Form One Fire and tested monthly. It is unknown as to the date of the last annual test.. The EWIS batteries are due for replacement.

The system is connected to the FIP and operates automatically on fire alarm.

Flush speakers are installed throughout levels 5 and 2 and it is understood that these can be heard in all areas. Horn speakers have been installed in plant rooms and service areas. Strobe lights have been installed in the level 11 plant room.

The occupant warning system was purpose designed in accordance with A1670 on levels 3 – 10 (with exception of level 4 & 5) and allowed for the deletion of audible warning in patient areas. Some audible tones have been replaced or supplemented with visual warning system (strobe lights).

Warden Intercommunications Phones (WIP) are strategically located throughout the facility to assist in the coordination of an emergency of fire within. [redacted]

[redacted]

12 Emergency Lights and Exit Signs

Emergency lighting and illuminated exit signs are provided throughout all areas of the facility. Generally, the fittings appear to be in good order and condition and are considered serviceable.

[redacted]

13 Emergency Exit Routes

The emergency exit routes provided were in accordance with the requirements of the BCA and were clear and available at the time of survey.

General lighting needs to be maintained in the stairwells; in particular the level 1 area of the centre west stairwell.

14 Exit Doors and Locking Devices

Generally the locking devices fitted to exit doors were satisfactory at the time of survey. Blue break glass facilities were installed on some exit door controlled by electric locks which need to be tested as soon as possible to ensure correct operation and release in the event of a fire.

[redacted]

Test all electric locks as part of the annual fire test.

15 Fire Systems Interface Test

The installed system was tested during the survey and the FIP provided the required signal to:

- EWIS
- ADT Fire Monitoring (ACT Fire Brigade)

Due to the operation needs of the hospital it was not possible to test the operation of:

- Fire Fan Control Panel
- Fire Doors
- Electric Locks

[redacted]

16 General House Keeping

Generally the level of housekeeping was considered satisfactory for most areas. Although where issues and hazards are present, there are recommendations for the rectification of them ASAP.

Fire Control Room

[redacted]

[redacted]

The room complies with the requirements as a fire control room on most points including construction and egress requirements, ventilation and emergency and general lighting, however for full compliance with the BCA Specification E1.8 requirements for a Fire Control Room the Code also requires:

- A sloping plan bench
- A pin board and a white board both 1200mm wide and 1000mm high.
- An external sign the states "FIRE CONTROL ROOM"
- An operational fire brigade lock on the door

A site hydrant map folder is located in the fire control room on the EWIS panel.

[redacted]

The natural ventilation of the room is restricted by a timber sheet fixed to the inside of the entry door. This sheet needs to be removed.

The noise from the sprinkler control room and sprinkler/hydrant pump room is unknown in the fire control room. At the next annual pumps and sprinkler tests it would be recommended to take sound level readings to confirm compliance with the BCA.

House Keeping throughout the floors is satisfactory. However, the areas of the plantrooms etc require works.

[redacted]

17 Maintenance Records

The maintenance records in this facility were log books for the FIP and EWIS panels which are considered satisfactory. Hydrants, Fire Hose Reels, Fire Blankets, fire and smoke doors and Fire Extinguishers all had maintenance tags however no log books or summary records were available on site for these disciplines.

[redacted]

[redacted]

The Fire Services maintenance provider is to rectify maintenance records according to AS 1851 as part of routine service and maintenance.

Benmax GROUP | driven by pride established 1986

HVAC & MECHANICAL SERVICES CONDITION & RECOMMENDATIONS REPORT

THE CANBERRA HOSPITAL BUILDING 1 COOLING TOWERS

June 2019

Commercial in confidence

Executive Summary

This report examines the condition of the existing cooling towers installed at roof level of Building 1 at The Canberra Hospital, of which Benmax has recently commenced a new maintenance contract. It provides an assessment of the existing condition of the cooling towers along with rectification recommendations, costings and recommended timing.

A site review of each equipment item has been undertaken and rated in accordance with the Condition Assessment Criteria detailed in Section 1.4.

[redacted]

Contents

1. Report Objective

1.1 Purpose

The purpose of this report is to provide an overall review of the cooling towers (and some of the associated system's equipment) that are the responsibility of Benmax. The gathering of data for this report allows Benmax the opportunity to review the plant and equipment condition (as a result of existing maintenance activities) together with the immediate identification of critical issues for the attention of our clients and key stakeholders. The report also extends to identify options and opportunities for further operational and efficiency improvements that, where reasonably possible within the scope of this report, extends beyond the plant and equipment in to more overall facility operations.

The asset condition and opportunities identified are based on information reasonably obtainable during our site inspection and may not cover all existing conditions at the facility. Contained in this report are items of concern that could, or have the potential to, impact on the operations of the building and tenant comfort. Additionally, issues that have potential Workplace Health, Safety and Environmental (WHS&E) ramifications have been detailed for review.

Recommendations with associated indicative costing have been provided. Where formal costing with respect to any recommendations made within this report is required, Benmax will prepare and submit quotations. All estimates are exclusive of Goods and Services Tax (GST).

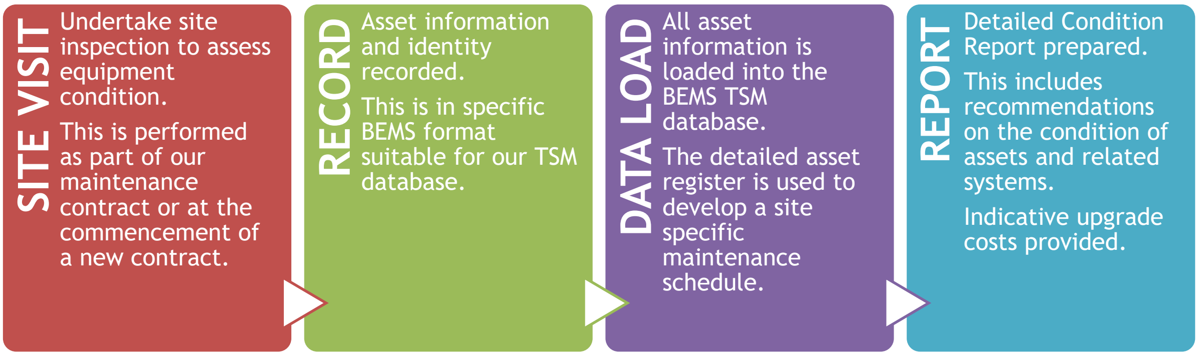
1.2 Building Overview

Building 1 at The Canberra Hospital is a ten-storey health care facility which provides various services and care for the needs of patients. There are four open circuit cooling towers installed at the western end of the building at roof level – cooling tower replacement was carried out circa 1996. It is understood that these cooling towers serve only the main chilled water plant, although early in the life of the building this system may have served other ancillary systems such as cool room condensers.

Benmax mechanical are currently carrying out a staged replacement of the main chilled water plant and as such a complete assessment of the condenser water system is limited due to the transient works.

1.3 Methodology

The methodology used to develop this report is based on the following approach:



1.4 Condition Assessment Criteria

Benmax has established a structured condition rating criteria per the following table:

Table 1

Asset Rating	Condition Description	Priority	Priority Definition
A	Repairs	Urgent	Items that require immediate attention that will extend the life of the asset, prevent further damage resulting in unforeseen and costly downtime, or improve plant condition. Asset Preservation.
B	Repairs	Non-urgent	Items that require attention to avoid any issues with the ongoing operation of the building HVAC system.
C	Routine Repairs	Non-urgent	Repairs that have no immediate impact on the facility such as painting, cleaning of ductwork and grilles, replacement of lamps.
D	Future Works/Upgrades	Urgent	Items that are at the end of their economic life cycle and are no longer operating at full capacity/at all. These assets need to be replaced/upgraded.
E	Future Works/Upgrades	Budget	Items that are at the end of their economic life cycle and should be programmed to be replaced/upgraded. Enhance Energy Efficiency & Sustainability. Improve the HVAC system design and maximise equipment functionality.
F	No works required/for information	None	Items that are in new condition or are still well within their economic lifecycle.
G	• Detailed audit required • Asset unserviceable or OHS&E risk • Compliance Issue	• Operational Risk • OH&S • Statutory	• Equipment not operating effectively due to system design issue and requires a more detailed engineering evaluation. • Items that pose an OH&S Risk • Items, installations, or designs that are not compliant with Statutory requirements (BCA/NCC).
H	Opportunities for Efficiency and Operational Improvements	Sustainability, Longevity, Cost-Savings, Budget, Opportunity	Opportunities identified that can be implemented outside of equipment replacement schedules.

2. Previous Maintenance and Service

The table below identifies all maintenance and service works on record with Benmax in relation to Building 1 condenser water system.

Table 2

Job #	Logged	Job Description	Job Type	Completed
46501	07/06/2019 10:40	Lev 11 Plantroom - CTA1101 Cooling Tower No1	MAINT	18/06/2019 15:09
46502	07/06/2019 10:42	Lev 11 Plantroom - CTA1102 Cooling Tower No2	MAINT	18/06/2019 15:11
46589	12/06/2019 13:10	Cooling Tower - TCH1SNCW - Repair plantroom grille on the left as	CALLOUT	13/06/2019 14:35
46592	12/06/2019 13:43	Lev 11 Plantroom - PUA1114 Pump Dosing	MAINT	19/06/2019 15:33
46594	12/06/2019 13:47	Lev 11 Plantroom - CTA1104 Cooling Tower No4	MAINT	18/06/2019 15:14
46596	12/06/2019 13:50	Lev 11 Plantroom - CTA1103 Cooling Tower No3	MAINT	18/06/2019 15:13
46601	12/06/2019 13:59	Lev 11 Plantroom - PUA1104 Pump Condenser Water No1 (Chiller)	MAINT	19/06/2019 15:26
46602	12/06/2019 14:00	Lev 11 Plantroom - PUA1106 Pump Condenser Water No3 (Chiller)	MAINT	19/06/2019 15:32
46603	12/06/2019 14:02	Lev 11 Plantroom - PUA1105 Pump Condenser Water No2 (Chiller)	MAINT	19/06/2019 15:31

In addition to the above works it is understood that the following current or recent work related to the cooling tower systems:

- Cooling tower fan motor belts replaced early 2019.
- The tender for replacement of the cooling tower fill is currently in progress as broken fill material has been found in the condenser water pump strainers.

3. Findings and Recommendations

3.1 Specific recommendations and observations

This section reviews the mechanical plant and provides recommendations and criticality as per Table 1

[redacted]

[redacted]

5. Expenditure Forecast

5.1 Maintenance Items

This section details suggested timeframe in which to undertake maintenance to extend useful life or budget for capital replacement. These items are typically assessed on a like-for-like basis off replacement where applicable. 'List No.' references directly recommendations given in Section 3.1.

[redacted]

[redacted]

Canberra Hospital Building 1&12 – Medical Air Plant Initial Review

Date: ***13 December 2018***

Prepared By
Barmco Mana McMurray Pty Limited
December 2018

Revision	Title	Date
A	Original Issue	18/12/18
B	Final Issue	15/01/19

Copy Control

Copy No.	Issued to	Date Issued
1	[redacted]	18/12/19

Approved by: _[redacted]

Senior Consultant

Contents

1 Introduction

Barmco Mana McMurray Pty Limited (BMM) has been engaged by Infrastructure Management and Maintenance at the Canberra Hospital to complete an initial review of the Medical Air Compressor plant and Medical Suction plant that serves the campus. This initial report deals with the current state of the Medical Air installation and focuses on plant located in Level 1 Building 1, Level 1 Building 12.

2 Background

Recent unscheduled outages in the Building 1 Medical Vacuum system have bought focus to the operation of various plant systems associated with Medical Gas services including the Medical Air system servicing Building 1 and 12.

This report provides high level advice on the current system and potential infrastructure enhancement to improve reliability and extend system capacity.

3 Stakeholder Engagement

In completing this initial review BMM sought advice from the following TCH key stakeholders:

- Chris Tarbuck - Facilities Director - Infrastructure Management and Maintenance.
- John Kilday - Asset Manager - Infrastructure Management and Maintenance.
- Brett Petherbridge – Project Officer - Capital Project Team Delivery.
- Joseph Cassar - BOC Limited (see Appendix A).
- Greg Watt - Control & Electric Pty Limited.

Discussions with these stakeholders and site inspections 27 November 2018, 4 December 2018, and 13 December 2018 form the basis of the information for this report.

4 Current Installation – Medical Air Compressors

Building 1

The current Building 1 systems consist of 3 off Atlas Copco ZT 37 VSD Oil Free Compressors. Two units in a lead/lag configuration labeled Compressor 1 and Compressor 2 and a third smaller capacity unit labelled Compressor 3 providing limited additional capacity to the system to assist in maintenance. The compressor 1 and 2 combination is of sufficient capacity to serve the Medical Air requirements of both Buildings 1 and 12 with one unit operating.

To manage pressure dewpoint within the system drying of air supplies is managed by two Atlas Copco FD120 refrigerated dryers to maintain a lower dew point more appropriate to a Medical Air installation. The dryer operating configuration, i.e., lead/lag or duty/standby could not be determined. The operation of the system was indicative of lead/lag but should be confirmed.

A review of the electrical supplies to the Building 1 plant indicates:

- Medical Air Compressor 1: Served by MS1-2E
- Medical Air Compressor 2: Served by MS1-2N

- Medical Air Compressor 3: Serviced by MS1-2N.

It is noted that Compressor 2 is fitted with a dedicated automatic transfer switch permitting transfer to a Building 1 essential service in the event of loss of normal supply.

Building 12
The Building 12 system dates from the original construction in the 1990's and has been disabled and inoperative for an extended period. The FY 2011/2012 changes were intended to be inclusive of capacity requirements for Building 12.

5 Current Installation – Piping Infrastructure

The Building 1 and 12 systems are interconnected enabling the total infrastructure to be served by the plant located at Building 1 Level 1.

6 Status of Plant Operation

Building 1
Medical Compressor 1
The last major service to this plant was completed 29 August 2018 and at that time had a total run time of 23,165 hours. The next service being due 29 February 2019 and next major service due 29 August 2019.

Medical Compressor 2
The last major service to this plant was completed 29 August 2018 and at that time had a total run time of 23,324 hours. The next service being due 29 February 2019 and next major service due 29 August 2019.

Medical Compressor 3
From stakeholder discussions it has been confirmed that Compressor 3 is intended to provide a percentage of system capacity to assist overall demand in the event of failure of Compressor 1 or 2. This plant remains in operation however it does not form part of the primary lead/lag arrangement. The next service being due 29 February 2019 and next major service due 29 August 2019.

Building 12
As noted above the Building 12 is disabled and inoperative and has been in that condition for an extended period.

7 Observations

Building 1 Compressor 3
Following replacement of Compressors 1 and 2, understood to have been undertaken on or about FY 2011/2012, one of the replaced compressors has been retained to provide additional standby capacity now referred to as Compressor 3. Considering the reasoning for the original replacement was aging equipment the current condition of Compressor 3 is unclear. It is noted that advice was provided in March 2010 that this compressor required replacement of its main screw elements, rewinding of its electric motor as well as refurbishment of minor components. It is not known if this work has taken place.

Building 1 Power Supplies

In reviewing supplies to Building 1 Medical Air Compressor 2 the installation is inclusive of an automatic transfer switch (ATS) enabling, in the event of normal supply failure. The original intention of providing an alternative essential supply from Building 12 has been replaced with a Building 1 essential supply.

Air Receivers
The current receivers are dating from the 1970's construction of the original facility and have now been retained through three sets of Medical Air Compressor plant inclusive of the current arrangement. The current condition and certification of these receivers is unknown.

Air Dryers
At the time of inspection both air dryers were in operation.

Building Management System and Compressor Control
Control of the medical air compressors is independent of the campus building management system with lead/lag control of the compressor sets through integrated controls within the compressor sets. This control includes rotating operation of the sets which is evidenced by the approximately equal run hours of compressors 1 and 2. Anecdotal advice, although not confirmed, is that Compressor 3 is manually operated in the event of failure of either Compressor 1 or 2.

The building management system involvement in the system is one of monitoring only of system pressure and air dew point.

8 Recommendations

Recommendation 1
With all plant located at Building 1 Level 1 the risk exists should that area be out of commission due to fire, flood and similar events loss of Medical Air to Building 1 and Building 12 is possible. Consideration should be given to the removal of redundant equipment from Building 12 and replace with a third Compressor set, associated dryer, receiver/s etc equal to one of FYI 2011/2012 sets. In addition, the aged Compressor 3 can be removed from the infrastructure.

Recommendation 2
Reinstate the Building 12 essential supply to Medical Air Compressor 2 ATS improving diversity of essential services supplies to the Building 1 plant. It should also be confirmed that the 2 x FD120 driers are provided with separate power supplies as per compressor 1 and 2. Ideally each compressor and dryer set should be served from different essential supply switchboards to improver fault tolerance and redundancy.

Site observations indicate that electrical supply works are in progress are taking place in the area currently and hence it is possible this maybe in progress.

Recommendation 3
Complete a condition assessment of Building 1 Air receivers repair and recertify as required and if necessary, replace.

Recommendation 4
Review the current air dryer arrangement to confirm intended operating methodology. AS2896 requires that the if one dryer is removed for service the remaining unit shall be capable of sustaining the system.

Recommendation 5
Review current work as executed information for accuracy, modify and update as required.

9 System Summary

From the initial reviews undertaken it appears, subject to completion of required maintenance and component certification, that the current Building 1/12 installation has the capacity to comply with related statutory requirements for the total required capacity of those buildings. However, in the event of Building 1 not becoming occupiable it is possible to lose Medical Air supplies to Buildings 1/12.

Report

ACT Health TCH – UPS Investigation Regarding Fire Rating

Electrical and Fire Services

For: ACT Health

Report Number: R118041E1 – A

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Rev No	Reason for Issue	Author		Approver for Issue	
		Name	Date	Name	Date
A	Issue	[redacted]	01/11/2019	[redacted]	01/11/2019

Contents

Section 1 - Executive Summary

1.1 Requirement

Rudds Consulting Engineers have been engaged by ACT Health to investigate the existing Uninterruptible Power Supply (UPS) systems and report on the existing UPS locations. This report assesses the requirements of the UPS to be fire separated according to the current National Construction Code (2019), the previous National Construction Code (2016 Amendment 1) as well as the following information:

- the battery type, number of blocks per string and number of strings
- if the UPS room is fire rated by checking the doors for compliance plates.
- any breaks in the fire penetrations if a fire door is installed (above and below floor as well).
- the presence of ventilation ducts.
- the presence of fire detection and/or suppression (smoke detectors, VESDA, sprinklers etc).

A series of site surveys were conducted by Power Protect during late 2018 and 2019 to record the information above.

A total of [redacted] were identified for survey. Six of these locations were identified as locations where the UPS units no longer existed. Six locations were not surveyed because access was not available to the sites.

Data was recorded for the remaining [redacted]

The results of these surveys are presented in Appendix A.

1.2 Relevant Standards – Fire Rating of Battery Accommodation

The NCC 2016 required that battery systems with voltage less than 24V or capacity less than 10 Ah must be fire separated with construction complying with a FRL level of 120/120/120. Based on this version of the NCC, 71 of the total 170 battery locations would have required 2-hour fire separation. The survey confirms that a total of 22 battery systems are located in fire rated rooms.

The NCC 2019 revised the requirement for fire separation of batteries considerably. The revised requirement is for batteries with storage capacity in excess of 200 kWh to be fire separated with construction complying with a FRL level of 120/120/120.

Based on the NCC 2019, none of the surveyed battery systems at Canberra Hospital are required to be located in fire rated rooms.

It should be noted that the criteria for batteries to comply with NCC 2016 and AS 3011.2 are the same. NCC 2016 addresses the level of fire separation required while AS 3011.2 addresses more specific requirements for the installation of the batteries.

1.3 Results and Recommendations

1.3.1 Fire Rating

For the 158 locations of the survey Rudds reports that none of these sites are required to be fire separated under the requirements of the NCC 2019. On this basis the accommodation for all of the UPS systems surveyed is considered adequate, noting that six locations could not be assessed.

1.3.2 AS 3011.2 Battery Accommodation

For the 158 locations of the survey, the battery survey results were assessed against the physical enclosure, and ventilation requirements of AS 3011.2. This assessment did not include assessment of the electrical compliance against AS 3011.2 as this is beyond the scope of the report.

The following observations are made:

- The battery ventilation in 17 locations may not be adequate. Additional inspection is required to verify compliance with AS 3011.2.
- The batteries in eight locations are greater than 100 kWh and according to AS 3011.2 require safety signage to warn of the battery risk. Additional inspection is required to verify compliance with AS 3011.2.

- There were six battery room locations not accessible to the survey team. Additional inspection is required to assess battery capacities and compliance in these locations.

1.3.3 Recommendations

1. Rudds recommends that the battery ventilation in the 17 identified locations be checked and verified as adequate or rectified.
2. Rudds recommends that the safety signage in eight locations identified be checked and verified as adequate or rectified.
3. Rudds recommends the six locations that were not accessible for inspection be further inspected to verify battery size and adequacy of the battery room accommodation.

Section 2 - Investigation

2.1.1 Investigation

ACT Health has a number of UPS (Uninterruptible Power Supply). This is a device that provides battery backup when the electrical power fails or drops to an unacceptable voltage level. Small UPS systems provide power for a few minutes; enough time to power down the computer in an orderly manner, while larger systems have enough battery for several hours. UPS systems are a crucial part of the hospital and are used for many purposes requiring continuity of power.

There are many components in a UPS, a part of the UPS addressed by the NCC (National Construction Code) is the batteries. Section C2.12 (v) of the NCC addresses the criteria in which fire separation of the batteries is required.

Rudds Consulting Engineers engaged Power Protect, the current electrical services maintenance provider to survey the UPS systems, locations and battery configurations. This information was delivered in a spreadsheet. This spreadsheet has then been modified to deliver the information required for this report.

Each asset is assessed against the following sections and forms a single spreadsheet containing all relevant information.

Asset Information				
Asset ID	Asset Custodian	Asset	Make/Model	Comments

Location				
Building	Level	Location Description	Door Number	Own room Yes No

Maintenance										
Battery Type	V	Ah	# Battery Blocks	# Battery Strings	Battery Age	Bypass switch Yes/No	Status (Needs work?)	Indication of Fire Rating. (Door Tag and Inspection Date)	Presence of Ventilation	Presence of Fire Detection/ Suppression

Report			
Does this UPS need separation to NCC2019? Yes/No	Does this UPS need separation to NCC2016 Amendment 1? Yes/No	UPS and Battery enclosure description	Category in Report

2.1.2 NCC Assessment overview

In carrying out this assessment Rudds have assessed the battery accommodation at The Canberra Hospital against the current NCC requirements and confirm that none of the battery systems at the Canberra hospital are large enough to require fire separation.

The assessment was carried out against both NCC 2019 and NCC 2016 for the purposes of assessing fire rating of battery rooms and enclosures. In doing this we have categorised the battery sites as follows.

Category A – Very small battery systems that are fully contained within UPS units specifically designed for under desk application in office environments. These all contain batteries below the threshold for fire rating nominated in both revisions of the NCC.

Category B – Small battery systems that are fully contained in cabinet style UPS units typically designed for use in communications cabinets within office environments. These all contain batteries below the threshold for fire rating nominated in both revisions of the NCC.

Category C – Small to medium sized systems that are fully contained cabinet style UPS units. These units have larger battery capacities than the units of Category A and B. The batteries in these units are above the threshold for fire rating of battery enclosures as defined in NCC 2016 but are below the threshold defined in the current version of the building code NCC 2019.;

Category D – Medium to large sized UPS systems that are currently located rooms and have battery capacities above 100 kWh. The batteries in these units are above the threshold for fire rating of battery enclosures as defined in NCC 2016 but are below the threshold defined in the current version of the building code NCC 2019. These are specifically separated to allow assessment against the Australian Standard for Battery Accommodation see section 3.1.5 below.

In addition to the above categories we have identified locations where it was not possible to review the batteries either because the units have been removed from service or access was not available to the audit team.

2.1.3 Australian Standard for Battery Accommodation overview.

For batteries that fall within the required fire separation in NCC 2016 and noted in AS 3011.2 we have reported only on the fire separation requirements of the batteries systems against the NCC 2016. We have not assessed electrical compliance to AS 3011.2 as this is beyond the scope of this report and because the individual UPS installations would by necessity have been certified by the licenced electrical installers at the times they were commissioned.

In overview, our assessment against the requirements of AS 3011.2 are summarised as follows.

1. The battery ventilation in 17 locations may not be adequate. Rudds recommends that the battery ventilation in these locations be checked and verified as adequate or rectified.
2. The batteries in 8 locations are greater than 100 kWh and according to AS 3011.2 require safety signage to warn of the battery risk. Rudds recommends that the safety signage in these 8 locations be checked and verified as adequate or rectified.
3. There were 6 battery room locations not accessible to the survey team. Rudds recommends that these locations be further inspected to verify battery size and adequacy of the battery room accommodation.

2.2 Battery Accommodation Review Results

As discussed, the UPS units and their batteries fall into 4 categories of compliance these are presented below.

2.2.1 Category A – Small Under Desk or Rack Mount Style UPS

These are small self-contained UPS equipment with internal batteries.

Battery systems with voltage less than 24V or capacity less than 10 Ah.

The locations for these units vary from office spaces, equipment rooms plant spaces and communications rooms and cupboards.

These batteries are associated with small capacity UPS units 2.2 kW in rating or less. The batteries are contained with the UPS units in commercial pre-engineered enclosures. These units are either designed as under desk UPS units designed for use in office environments or small rack mounted self-contained units designed for installation in ICT equipment racks that may be either in equipment rooms or racks within offices.

The batteries are enclosed within the UPS equipment and provided with electrical protection in accordance with the UPS equipment standards.

These fall below the requirements for fire rating defined by both editions of the NCC and also do not fall within the scope of AS 3011.2 and therefore do not need further enclosure.

A large majority, 85 in number, of the UPS units containing batteries fall into this category.

All 85 units in this category do not need special rooms or built enclosures and do not need special services or signage.

2.2.2 Category B – Small Cabinet Style UPS

These are small sized UPS units fitted into vertical cabinets with integral battery modules contained in the cabinet. These are associated with UPS units of rating between 2.2 kW and 10 kW

These units are located either on communications rooms or equipment rooms associated with clinical spaces.

These are larger engineered UPS units either designed to be located under desk or designed to be located in communications rooms or communications cabinets. The two larger units in this category are engineered to be similar in size to ICT equipment racks and can be co-located with the IT racks.

The nine units in this category also have battery systems with voltage less than 24V or capacity less than 10 Ah.

These UPS units have small battery capacities and are contained in pre-engineered cabinets.

These fall below the requirements for fire rating defined by both editions of the NCC and also do not fall within the scope of AS 3011.2 and therefore do not need further enclosure or treatment as for the units in Category A.

All nine units in this category do not need special rooms or built enclosures and do not need special services or signage.

2.2.3 Category C – Small to Medium Sized Cabinet style UPS

These are small to medium sized UPS systems that have larger capacity batteries installed and are all pre-engineered with batteries installed in purpose-built battery enclosures. The battery enclosures either take the form of modular plug in batteries contained within the pre-engineered UPS cabinets or, for the larger, units the batteries are contained within pre-engineered cabinets of similar construction but separate to the UPS cabinets.

These have voltages greater than 24V or capacities greater than 10A.h but less than the NCC 2019 limit of 200kWh

The majority of the units range in UPS capacity between 1.5 kVA and 10 kVA. Two units located in the PABX room are rated at 30 kVA.

The locations for these units vary considerably and include plant spaces, equipment rooms, communications rooms, equipment rooms related to clinical areas and some office areas.

These units fall within the scope of AS 3011.2 and would have required fire separation to the superseded 2016 edition of the NCC but do not require separation under the current 2019 edition of the NCC.

A total of 57 units fall into this category. Of these 23 are in dedicated rooms and the remainder are located in communications rooms, plant spaces and office areas.

A total of 40 locations have adequate ventilation as required by AS 3011.2, 53 have smoke detection or fire suppression, 23 are located in dedicated rooms of which 9 of are fire rated.

The remainder are located in various locations including plant rooms, communications rooms, storerooms, service corridors and office spaces.

As our scope of survey is the assessment of fire rating requirements for UPS batteries. We have not carried out assessments of the electrical wiring or protection for the UPS units. We note that these units would have required electrical certification either by the equipment suppliers or the electrical contractors that installed them.

We have reviewed the fire safety requirements for these units as follows:

- Based on the current revision of the NCC 2019 none of these units are required to be fire separated.

Based on the requirements of AS3011.2 we comment as follows:

- Enclosure – The batteries for all these units are correctly enclosed to prevent contact with live terminals as required by AS 3011.
- [redacted]

[redacted]

2.2.4 Category D – Medium Sized UPS with Larger Batteries

These are medium sized UPS systems that have larger capacity batteries.

Units in this category are either pre-engineered with batteries installed in purpose-built battery enclosures or the UPS units are located in dedicated UPS rooms.

These have voltages greater than 24V or capacities greater than 10Ah but less than the NCC 2019 limit of 200kWh.

The battery capacities are in excess of 100 kWh. This is the limit defined in AS 3011.2 where safety signage is required in battery accommodation to warn staff and persons of the potential danger of the batteries.

A total of eight UPS units fall into this category and they are associated with UPS units rated between 30 kVA and 160 kVA.

Seven of these have batteries located in dedicated rooms and one unit is located in a PABX room.

The rooms that house six of the battery systems in this category are fire rated and fitted with adequate ventilation and fire detection or fire suppression systems. These measures would have been provided to meet the 2016 edition of the NCC.

Two of the smallest units in this category are located in the two communications rooms within the Building 25 Acute Mental Health Inpatient Unit. These are recently installed, based on the battery age, and may have been commissioned under NCC2019

Based on the current revision of the NCC 2019 none of these units are required to be fire separated therefore the battery accommodation for these is considered adequate.

We have reviewed the fire safety requirements for these units as follows.

2.2.4.1 Enclosure

The batteries for all these units are correctly enclosed to prevent contact with live terminals as required by AS 3011.2.

2.2.4.2 Ventilation

We confirm that ventilation is provided to six units in this category. [redacted]

[redacted]

2.2.4.3 Safety Signage

We recommend that additional safety signage be confirmed for all eight of these locations and provided where deficient.

[redacted]

2.2.5 Battery Systems not Accessible for Inspection

A total of 12 battery systems were not accessible for various reasons.

[redacted] these are listed as no longer existing. These are listed in Appendix A as “No Category”.

[redacted]

[redacted]

[redacted]

APPENDIX A – [redacted]