Matthews, Cameron T

From: Matthews, Cameron T
Sent: Wednesday, 12 February 2025 1:27 PM
To: Perrott, John
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: P00725L01 LGH Ward Block AC Upgrade Fee Proposal.pdf; Apendix 1 - ASC Fee Estimate MATRIX_120225.pdf

Hi John
Are you free to meet at 3.30 with Andrew Sutherland Consultants?

Cheers
Cam

From: Brandon Servant <[redacted]
Sent: Wednesday, 12 February 2025 1:20 PM
To: Matthews, Cameron T <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the information.

Please find the attached fee proposal for the consultancy services. Would it be possible to have a short meeting this afternoon (say 3:30pm) to discuss moving forward with the project?

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Wednesday, 12 February 2025 12:32 PM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland [redacted]>; Perrott, John <[redacted]>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brandon

Based on the discussion yesterday, John was happy to appoint one of our Northern Project Managers and part of that role would include stakeholder engagement.

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Tuesday, 11 February 2025 3:44 PM
To: Toon, Shane A <[redacted] Matthews, Cameron T <[redacted]
Cc: Andrew Sutherland <[redacted]
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Shane & Cameron,

Thanks for taking the time earlier this afternoon to discuss the project. As discussed, we will aim to get a draft program out by tomorrow. Andrew will arrange a time to conduct a site inspection.

Looking ahead to the construction phase, we'd like to understand the expectations around project management and stakeholder engagement. I just wanted to clarify what was discussed at the meeting. Are DoH going to arrange for a project manager, or is this something you'll need to outsource? Andrew and I have been discussing and we feel that Rare may be in the best position to deliver this services given their previous experience with the LGH site, particularly with stakeholder engagement.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M 0423 166 492
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Wednesday, 12 February 2025 1:13 PM
To: Perrott, John
Cc: Toon, Shane A
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi John

Just speaking to Marcy and she said the Hub would be fitted out until mid to late 2025 and the lease has not yet been agreed. (Based on that we might not even be able to decant this year)

Maybe Andrew has a clearer idea of timeframes..

Cheers
cam

From: Matthews, Cameron T
Sent: Wednesday, 12 February 2025 11:31 AM
To: Perrott, John <[redacted]>
Cc: Toon, Shane A <[redacted]>
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

HI John

Please see attached gannt chart. Our only comments are that the program starts in 6D in April but the patients won't be decanted to the Hub by then (unless someone forces the patients to be transferred to other facilities in the interim e.g. District Hospitals, Calvary etc).

Also we would recommend that the sections of the corridors in Ward 4O are undertaken at the same time with the adjoining sections of patient rooms. We don't believe it is feasible to shut the corridor without shutting the patient rooms due to the limited width of the corridors.

Are you able to assist by responding to the queries below?

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Wednesday, 12 February 2025 9:52 AM
To: Toon, Shane A <[redacted] Matthews, Cameron T
<[redacted]>
Cc: Andrew Sutherland [redacted]>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron & Shane,

Please see the attached draft program. At this stage it's looking like the works in the patient areas will push into February 2026. I've nominated the AHU replacement to occur once all patient rooms are done. Would there be any issues if we began discussions with a mechanical services contractor to determine if this can be condensed?

Andrew would also like to bring a representative to the site inspection on Friday, can you please let us know if there are any issues with this?

Kind regards,
Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W E

From: Brandon Servant
Sent: Tuesday, 11 February 2025 3:44 PM
To: Toon, Shane A <[redacted]>; Matthews, Cameron T
[redacted]>
Cc: Andrew Sutherland <[redacted]
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Building Services Engineer

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PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

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Building Services Engineer

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Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Tuesday, 11 February 2025 8:06 AM
To: Perrott, John
Cc: Office of the Deputy Secretary Infrastructure; Hargrave, Andrew J
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 LGH Ward Block Air Conditioning Upgrade_Rev 1.pdf

HI John

I have received revised report for the LGH air conditioning upgrade that now includes an assessment and proposal of Obstetrics 4O.

There is one typo on page 4 that I will get them to change (level 5- Ward 6D should be level 5- Ward 5D)

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 4:07 PM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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Thanks Brandon

Cheers
Cam

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- FCU maintenance
- Circulating pumps
- Control systems

I'll also make the other changes to page 7 as per your notes.

Kind regards,
Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A [redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brendon and Andrew

Thank you for your report and meeting a tight timeframe.

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Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A [redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

No problem. Let us know if you have any comments after reviewing the draft.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **| T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Tuesday, 11 February 2025 11:35 AM
To: Brandon Servant
Cc: Perrott, John; Andrew Sutherland; ASC Engineers
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 LGH Ward Block Air Conditioning Upgrade_Rev 3.pdf

Thanks Brandon

Greatly appreciated

Cheers
cam

From: Brandon Servant <[redacted]
Sent: Tuesday, 11 February 2025 11:22 AM
To: Matthews, Cameron T <[redacted] Andrew Sutherland <[redacted]
Cc: Toon, Shane A <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the feedback. Please see the updated report with the typo corrected.

Kind regards,
Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

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Sent: Tuesday, 11 February 2025 8:07 AM
To: Brandon Servant <[redacted] Andrew Sutherland <[redacted]
Cc: Toon, Shane A <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon
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Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)
Launceston General Hospital, Level 2

PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** 03 [redacted]

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 4:25 PM
To: Brandon Servant <[redacted] Andrew Sutherland <[redacted]
Cc: Toon, Shane A <[redacted]>; ASC Engineers <office@asceng.com.au>; Perrott, John <[redacted]>
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon

Thanks for the revised document. Shane has noticed the following needs amending:

Page 14
Aqua/light blue section is 4N in the document but should be 4O

Page 9
Paediatrics Outpatients & QVOP should be Ward 3D

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)
Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 4:07 PM
To: Matthews, Cameron T <cameron.matthews@health.tas.gov.au>; Toon, Shane A <shane.toon@health.tas.gov.au>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron & Shane,

Pleas see the attached updated report for the LGH air conditioning upgrade. This now includes an assessment and proposal of Obstetrics 4O.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]au>
Sent: Friday, 7 February 2025 10:44 AM
To: Brandon Servant <[redacted]au>; Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon

Cheers
Cam

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:24 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A
<[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

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We will add a section on maintenance. Maintenance will need to be in accordance with AIRAH DA19. This will cover the following equipment:

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- FCU maintenance
- Circulating pumps
- Control systems

I'll also make the other changes to page 7 as per your notes.

Kind regards,
Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

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Mention that additional maintenance will be required for quarterly filter changes etc (as we may need additional staffing)

P7
The ~~existing~~ installed capacity for the common cooling coil is 206 kW ~~with an available~~ but only has an available capacity in the order of 152kW,,, (note reading it sounds like there may be an additional spare capacity of 152kW

Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)
Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE
Tasmanian Government

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No problem. Let us know if you have any comments after reviewing the draft.

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Brandon Servant
Building Services Engineer

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You don't often get email from brandon@asceng.com.au. Learn why this is important

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T 03 6224 2424 F 03 6224 2405 M [redacted]
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TASMANIAN HEALTH SERVICE Tasmanian Government

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Cc: Toon, Shane A <[redacted] ASC Engineers <office@asceng.com.au>; Perrott, John

<john.perrott@health.tas.gov.au>
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

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Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant [redacted]>
Sent: Thursday, 6 February 2025 9:50 AM
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Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

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W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 4:25 PM
To: Brandon Servant; Andrew Sutherland
Cc: Toon, Shane A; ASC Engineers; Perrott, John
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 LGH Ward Block Air Conditioning Upgrade_Rev 1.pdf

Hi Brandon

Thanks for the revised document. Shane has noticed the following needs amending:

Page 14
Aqua/light blue section is 4N in the document but should be 4O

Page 9
Paediatrics Outpatients & QVOP should be Ward 3D

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

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Hi Cameron & Shane,

Pleas see the attached updated report for the LGH air conditioning upgrade. This now includes an assessment and proposal of Obstetrics 4O.

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Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon

Cheers
Cam

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:24 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 0072S LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the email. I can confirm that the report and budget estimate does include 3D (Paediatrics Outpatients & QVOP). The comment regarding levels 4 to 6 will be updated.

We will add a section on maintenance. Maintenance will need to be in accordance with AIRAH DA19. This will cover the following equipment:

- Filters (monthly inspection). Filter cleaning or replacement every 3 months
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- Circulating pumps
- Control systems

I'll also make the other changes to page 7 as per your notes.

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Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]

Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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HI Brendon and Andrew

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Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE
Tasmanian Government

From: Brandon Servant <brandon@asceng.com.au>
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T <cameron.matthews@health.tas.gov.au>; Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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Sent: Thursday, 6 February 2025 9:50 AM
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Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

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Kind regards,

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W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 8:04 AM
To: Brandon Servant; Toon, Shane A
Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon

Andrew was going to update the document to include Ward 4O as well (obstretrics)

Cheers
cam

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

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Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE
Tasmanian Government

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To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

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Building Services Engineer

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Cc: Andrew Sutherland [redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

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M: [redacted] **| T:** 03 [redacted]

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To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
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Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Kind regards,

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Building Services Engineer

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W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 10:41 AM
To: Brandon Servant; Toon, Shane A
Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon

Drawings have sent. A line item for the 4O cost and a total cost of the entire project would be great.

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:27 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Cameron,

We'd be happy to include 4O, but we'll need more information to prepare our assessment:

- Summary of the HVAC issues with this ward
- Mechanical services as installed drawings
- Any other information you can provide that would assist with the assessment

Would you prefer if the budget estimate for 4O was included with the budget for Ward Block D, or would you prefer this to be separate?

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

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To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon

Andrew was going to update the document to include Ward 4O as well (obstretrics)

Cheers
cam

From: Matthews, Cameron T
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Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brendon and Andrew

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Mention that additional maintenance will be required for quarterly filter changes etc (as we may need additional staffing)

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Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

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TASMANIAN HEALTH SERVICE Tasmanian Government

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Matthews, Cameron T

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 10:44 AM
To: Brandon Servant; Toon, Shane A
Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon

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From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:24 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <shane.toon@health.tas.gov.au>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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- Circulating pumps
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Launceston General Hospital, Level 2
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Tasmanian HEALTH SERVICE
Tasmanian Government

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Cc: Andrew Sutherland <andrew@asceng.com.au>; ASC Engineers <office@asceng.com.au>
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TASMANIAN HEALTH SERVICE Tasmanian Government

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Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Matthews, Cameron T

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 10:38 AM
To: Andrew Sutherland; Brandon Servant; Toon, Shane A
Cc: ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: SLGH Build25020709230.pdf

HI

Andrew

Please amend the last dot point to:

- Redundant air conditioning unit located in the Obstetrics plant room is tagged out, original intended purpose is unknown

I have also attached HVAC drawings

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Andrew Sutherland <[redacted]
Sent: Friday, 7 February 2025 9:46 AM
To: Matthews, Cameron T <[redacted] Brandon Servant <[redacted]
Toon, Shane A <[redacted]
Cc: ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hello Cameron.

Notes form our conversation this morning on Ward 40

- Constructed in 1995 with basic facilities for heating and ventilation only with no cooling
- Patient room temperature are excessive and uncontrollable with the facilities as built
- Ventilation via openable window which is unsatisfactory when the ambient outdoor air temperatures are higher than comfortable room temperature ie ambient temps 24°C and over
- External shading to windows on the eastern, western and southern façade window, no shading on windows facing the Chaple courtyard
- Although located on the southern side of the main block, the majority of the patient room windows are solar exposed with the daily progression of the sun resulting in excessively elevated room temperatures.

- Existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms with measured inside glass surface temperatures recorded as high as 30°C
- IXL tactics are installed in each patient room ensuite for the ensuite exhaust, these are to an extent ducted in the ceiling space to an exhaust fan, current as built drawings for these are not available.
- Patient room ventilation is via transfer grille located above the room entry door with borrowed ventilation form the corridor which is unconditioned
- Redundant air conditioning unit located in the false ceiling space is tagged out, original intended purpose is unknown

Let me know if I have captured everything discussed.

Thanks

Kind Regards
Andrew Sutherland
Managing Director

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E [redacted]

From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted]>; ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brendon and Andrew

Thank you for your report and meeting a tight timeframe.

Can you confirm this covers off on 3D as well. As one area it refers to D block four levels and then in another part it talks about level 4, 5 and 6 (page 7).

Mention that additional maintenance will be required for quarterly filter changes etc (as we may need additional staffing)

P7
The ~~existing~~ installed capacity for the common cooling coil is 206 kW ~~with an available~~ but only has an available capacity in the order of 152kW,,, (note reading it sounds like there may be an additional spare capacity of 152kW

Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)
Launceston General Hospital, Level 2

PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

No problem. Let us know if you have any comments after reviewing the draft.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]>
Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted]>; ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted]. Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

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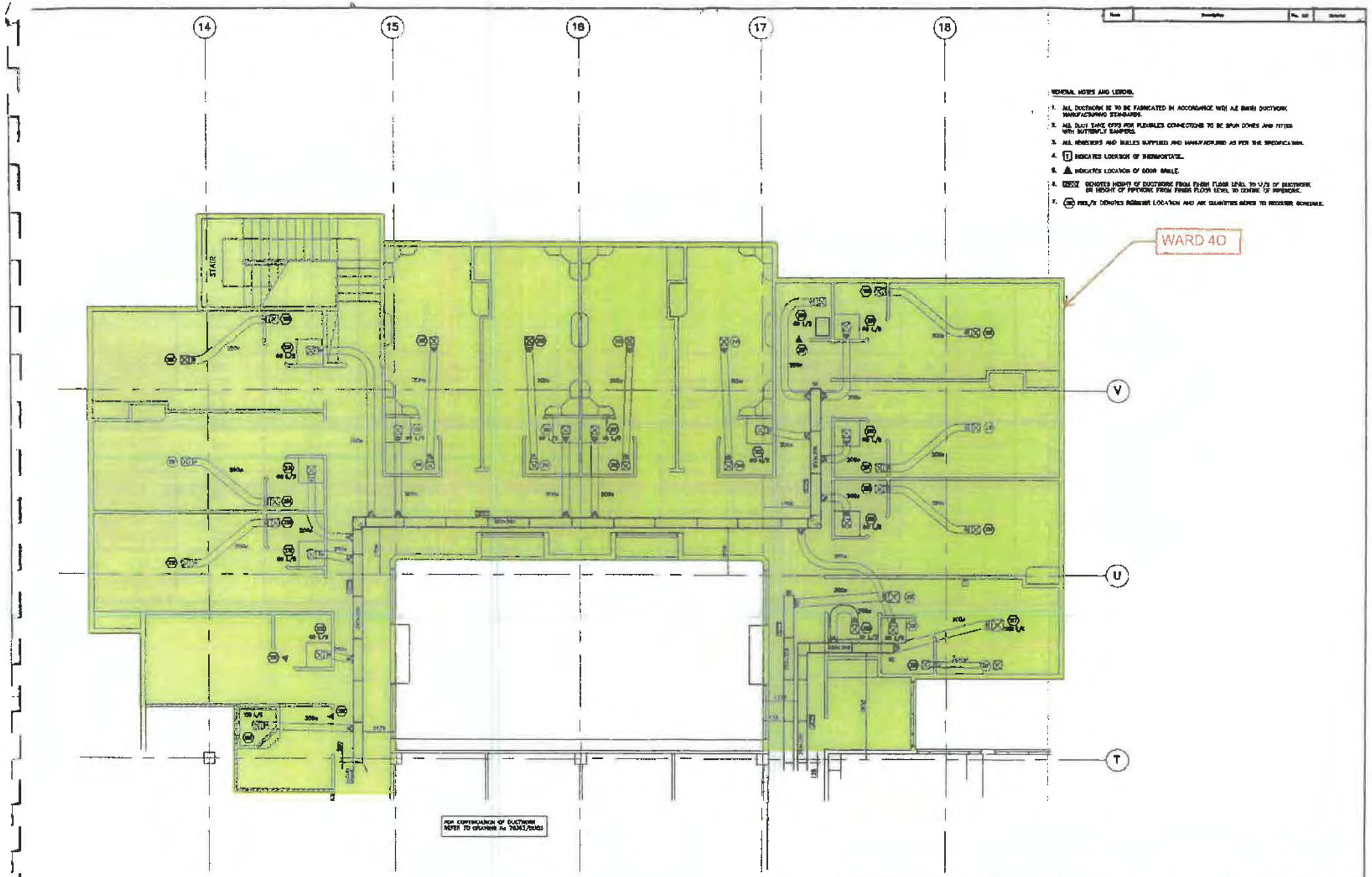


GENERAL NOTES AND LEGEND.

1. ALL DUCTWORK IS TO BE FABRICATED IN ACCORDANCE WITH A.E Smith DUCTWORK MANUFACTURING STANDARDS.
2. ALL DUCT TAKE OFFS FOR FLEXIBLES CONNECTIONS TO BE SPUN CONES AND FITTED WITH BUTTERFLY DAMPERS.
3. ALL REGISTERS AND GRILLES SUPPLIED AND MANUFACTURED AS PER THE SPECIFICATION.
4. T INDICATES LOCATION OF THERMOSTATS.
5. INDICATES LOCATION OF DOOR GRILLE.
6. XXXX DENOTES HEIGHT OF DUCTWORK FROM Finish FLOOR LEVEL TO U/S OF DUCTWORK OR HEIGHT OF PIPEWORK FROM Finish FLOOR LEVEL TO CENTRE OF PIPEWORK.
7. SR/X DENOTES SUPPLY REGISTER LOCATION AND AIR QUANTITIES REFER TO REGISTER SCHEDULE.

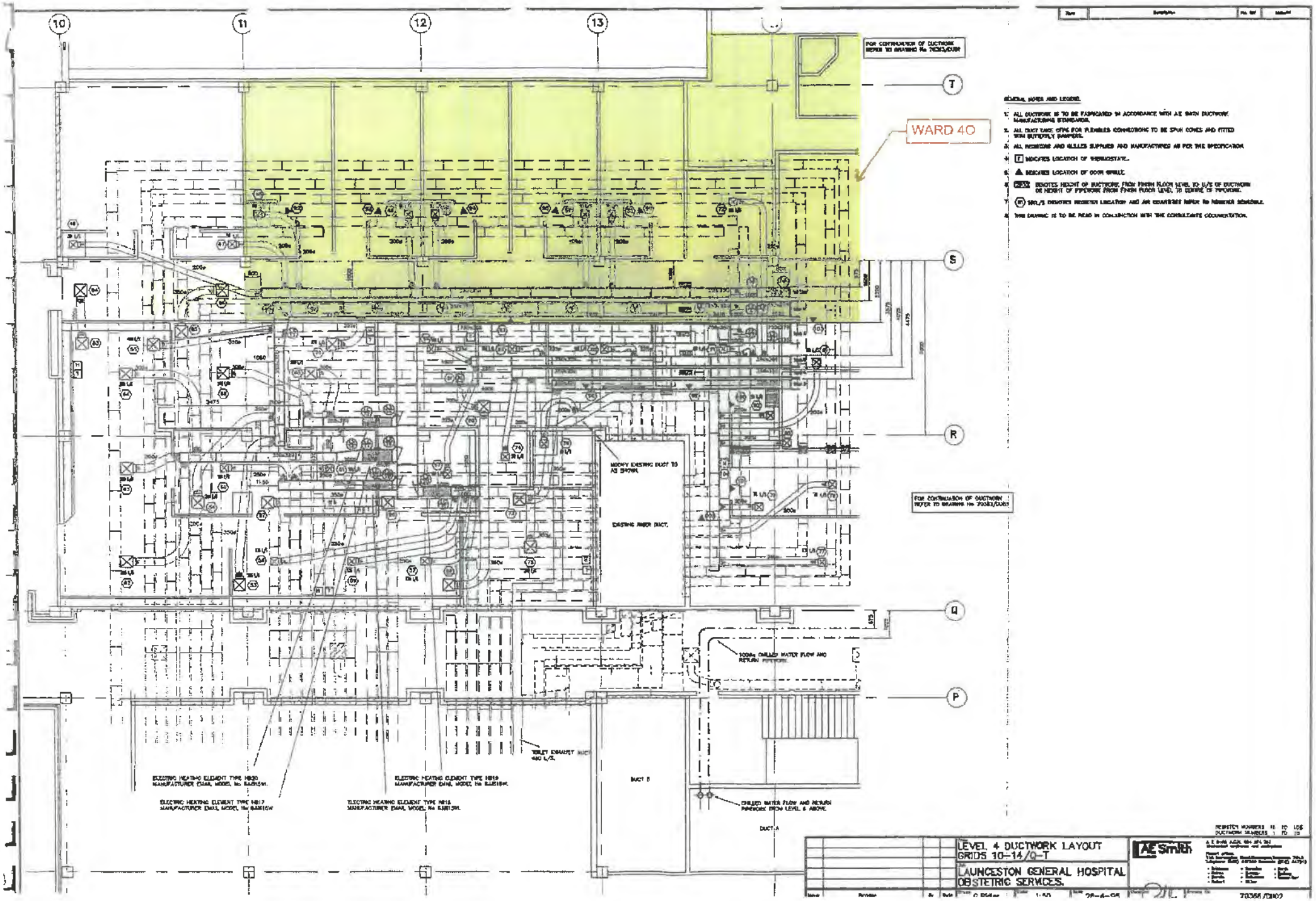
LEVEL 4 DUCTWORK LAYOUT
GRIDS 14-18/T-V

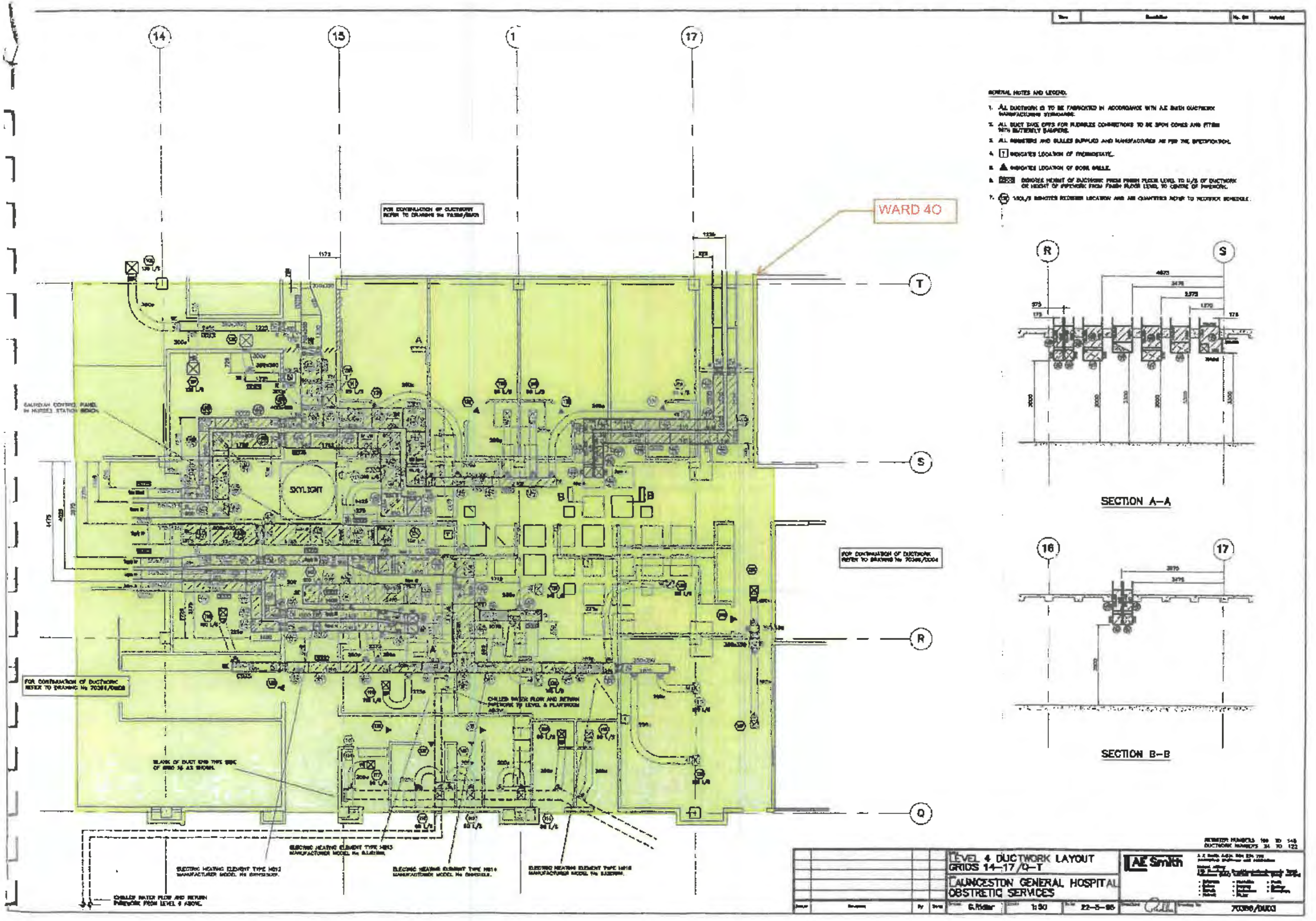
LAUNCESTON GENERAL HOSPITAL
OBSTRETIC SERVICES

A.E Smith

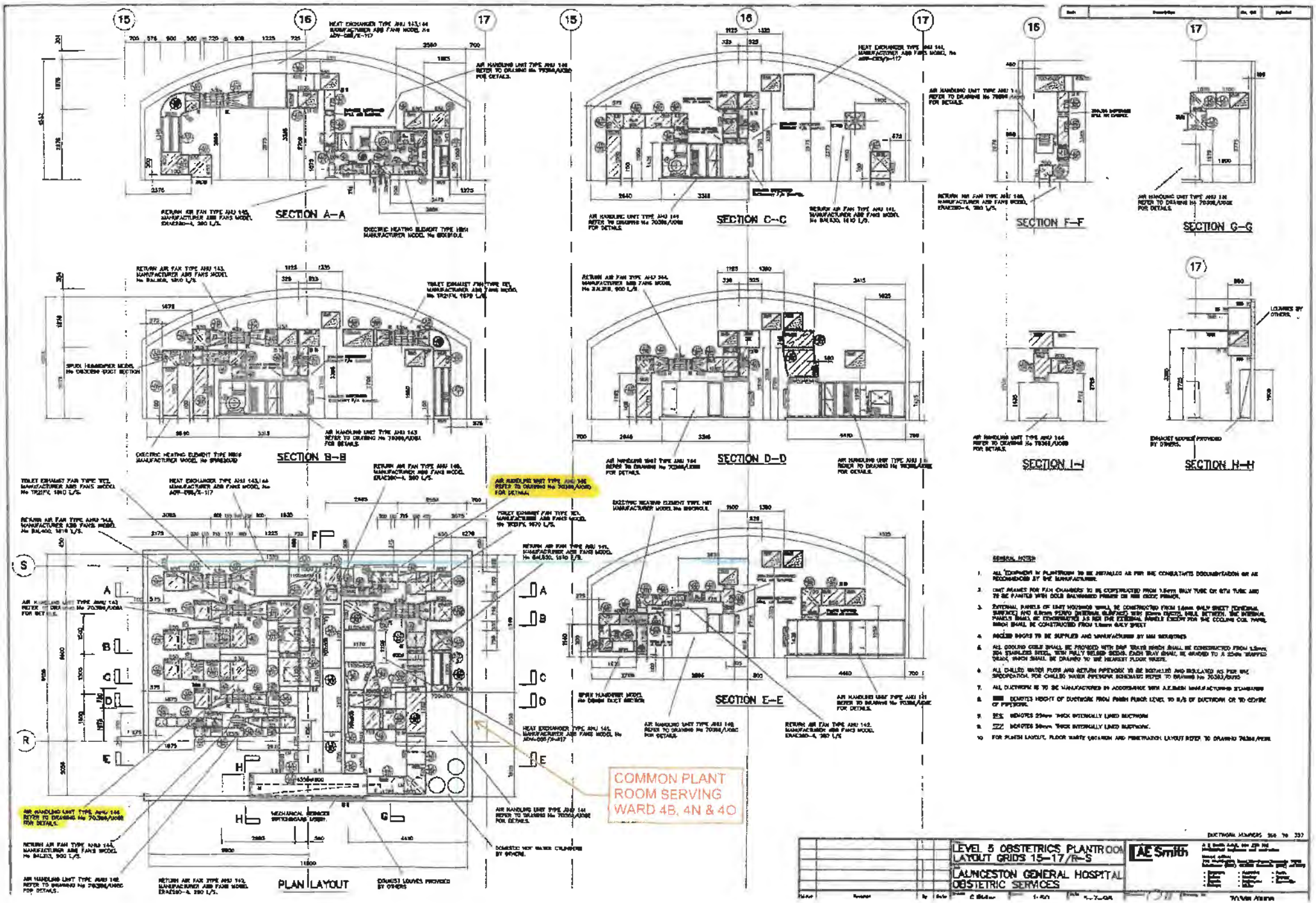
		G.Rider	1:50	29-8-96

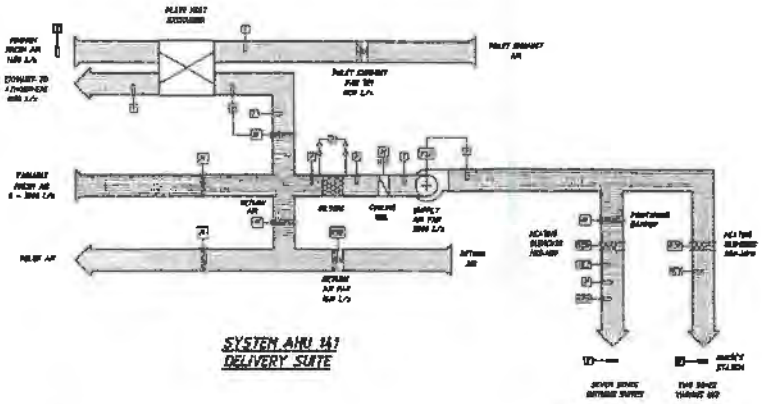
70366/DU01


WARD 40
LEVEL 4 DUCTWORK LAYOUT
GRIDS 10–14/Q–T
LAUNCESTON GENERAL HOSPITAL
OBSTETRIC SERVICES.
AE Smith

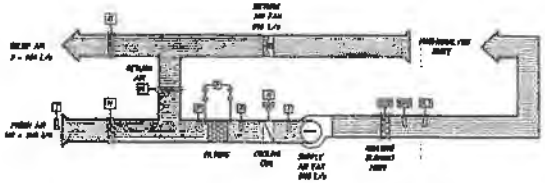


WARD 4O
SKYLIGHT
SECTION A–A
SECTION B–B
LEVEL 4 DUCTWORK LAYOUT
GRIDS 14–17 /Q–T
LAUNCESTON GENERAL HOSPITAL
OBSTRETIC SERVICES
AE Smith
1:50
22-5-95
70390/D003

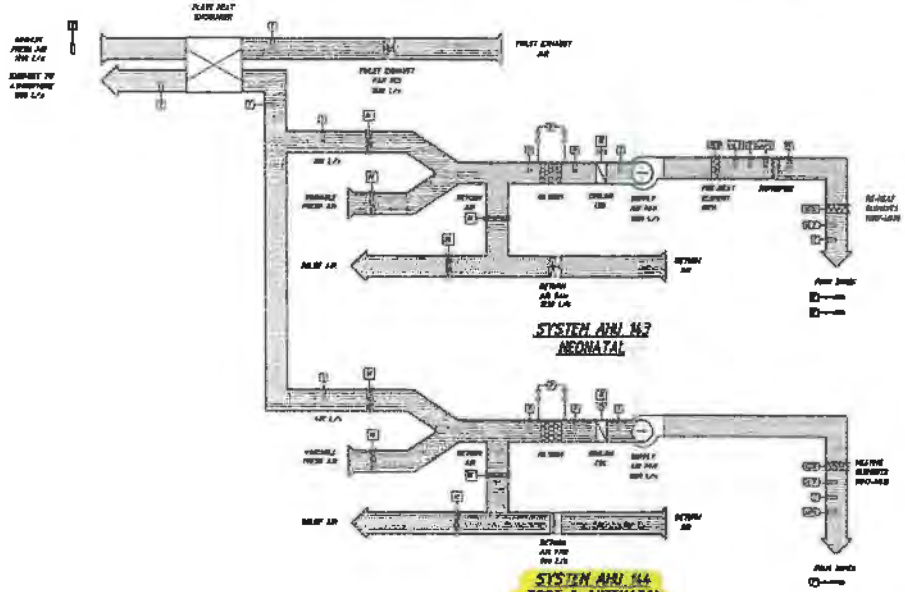

SECTION A–A
SECTION B–B
SECTION C–C
SECTION D–D
SECTION E–E
SECTION F–F
SECTION G–G
SECTION H–H
SECTION I–I
PLAN LAYOUT
COMMON PLANT ROOM SERVING WARD 4B, 4N & 4O
GENERAL NOTES
1. ALL EQUIPMENT IN PLANTROOM TO BE METALLIC AS PER THE CONSULTANTS DOCUMENTATION OR AS RECOMMENDED BY THE MANUFACTURER.
2. UNIT FRAMES FOR FAN CHAMBERS TO BE CONSTRUCTED FROM 1.5mm GALV TUBE OR 67N TUBE AND TO BE PAINTED WITH ZOLB GALVANISED PRIMER OR RED OXIDE PRIMER.
3. EXTERNAL PANELS OF UNIT HOUSINGS SHALL BE CONSTRUCTED FROM 1.6mm GALV SHEET (EXTERNAL SURFACE) AND 0.8mm PERFO (INTERNAL SURFACE) WITH 50mm INSUL. MAT. BETWEEN. INT. INTERNAL PANELS SHALL BE CONSTRUCTED AS PER THE EXTERNAL PANELS EXCEPT FOR THE COOLING COIL PANEL WHICH SHALL BE CONSTRUCTED FROM 1.0mm GALV SHEET
4. ACCESS DOORS TO BE SUPPLIED AND MANUFACTURED BY MM INDUSTRIES
5. ALL COOLING COILS SHALL BE PROVIDED WITH DRIP TRAYS WHICH SHALL BE CONSTRUCTED FROM 1.2mm 304 STAINLESS SHEET WITH FULLY WELDED SEAMS. EACH TRAY SHALL BE GRADED TO A 25mm TRAPPED DRAIN, WHICH SHALL BE DRAINED TO THE NEAREST FLOOR WASTE.
6. ALL CHILLED WATER FLOW AND RETURN PIPEWORK TO BE INSTALLED AND BALANCED AS PER THE SPECIFICATION. FOR CHILLED WATER PIPEWORK SCHEMATIC REFER TO DRAWING No 70383/DW02
7. ALL DUCTWORK IS TO BE MANUFACTURED IN ACCORDANCE WITH A.S.H.R.A.E. MANUFACTURING STANDARDS
8. DENOTES HEIGHT OF DUCTWORK FROM FINISH FLOOR LEVEL TO B/S OF DUCTWORK OR TO CENTRE OF PIPEWORK.
9. DENOTES 25mm THICK INTERNALLY LINED DUCTWORK
10. DENOTES 50mm THICK INTERNALLY LINED DUCTWORK.
11. FOR PLANT LAYOUT, FLOOR WASTE LOCATION AND PENETRATION LAYOUT REFER TO DRAWING 70384/A03E
DUCTWORK NUMBERS 304 TO 337
LEVEL 5 OBSTETRICS PLANTROOM LAYOUT GRIDS 15–17/R–S
LAUNCESTON GENERAL HOSPITAL OBSTETRIC SERVICES
AE Smith



SYSTEM AHU 141
DELIVERY SUITE

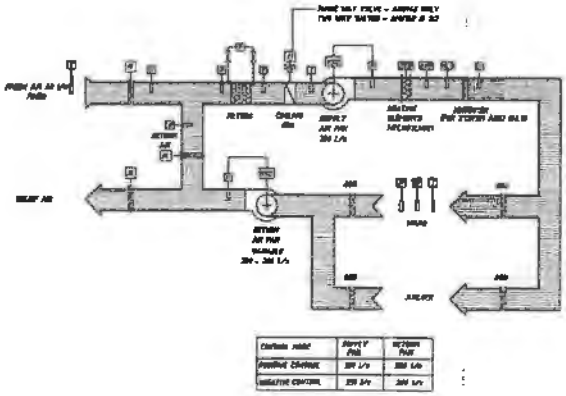


SYSTEM AHU 144
RENAL SUITE (LEVEL 2)



SYSTEM AHU 143
NEONATAL

SYSTEM AHU 144
POST & ANTENATAL



SYSTEM AHU 142, 145 AND 147
ISOLATION WARDS - LEVEL 4 (AHU142 & AHU145)
RENAL SUITE - LEVEL 3 (AHU147)

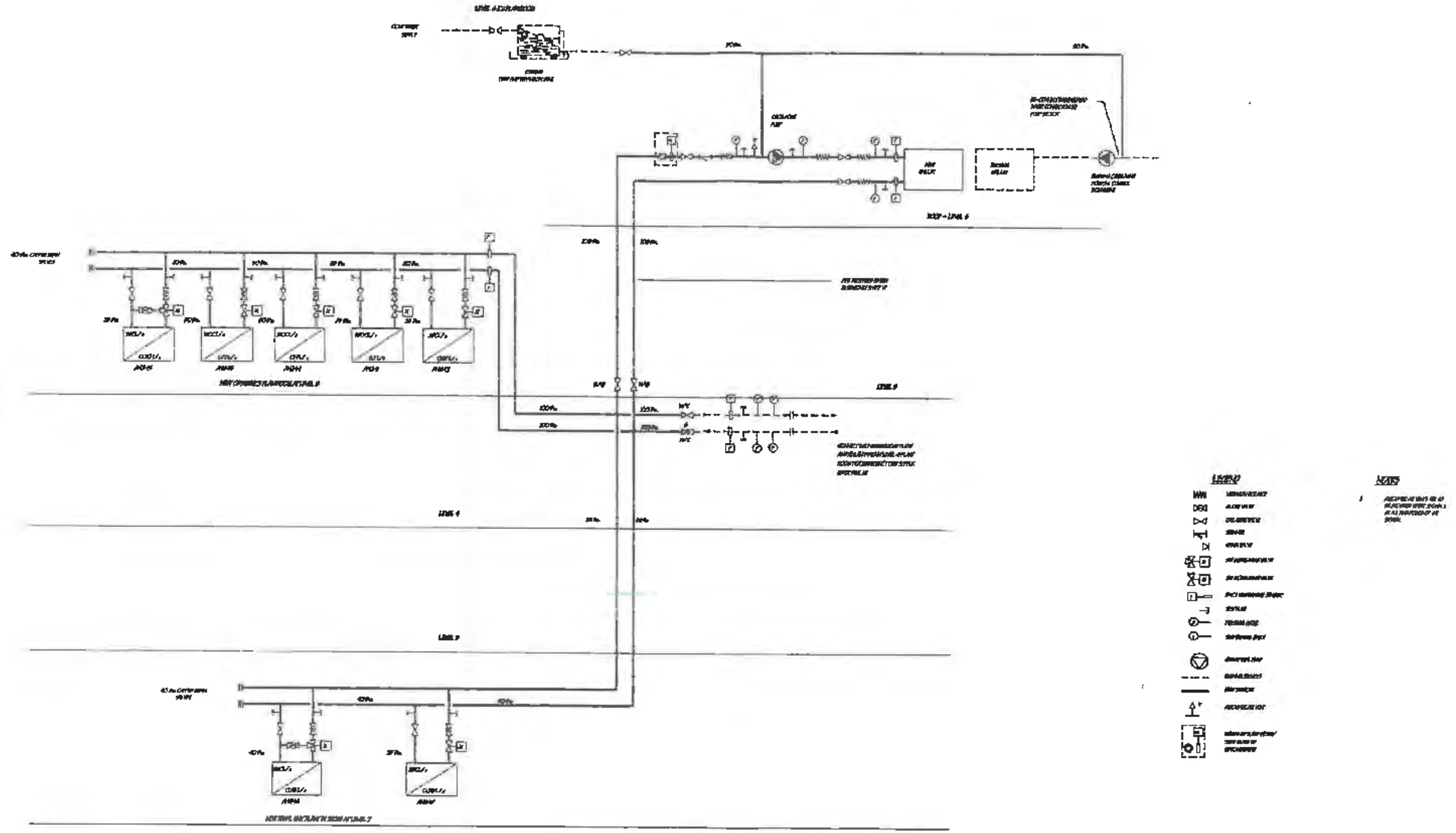
LEGEND

MECHANICAL SERVICES CONTROL DIAGRAMMATIC.

LAUNCESTON GENERAL HOSPITAL OBSTETRIC SERVICES

A.E. Smith

G.Rider	N.T.S.	21-4-95	70386 /DW10

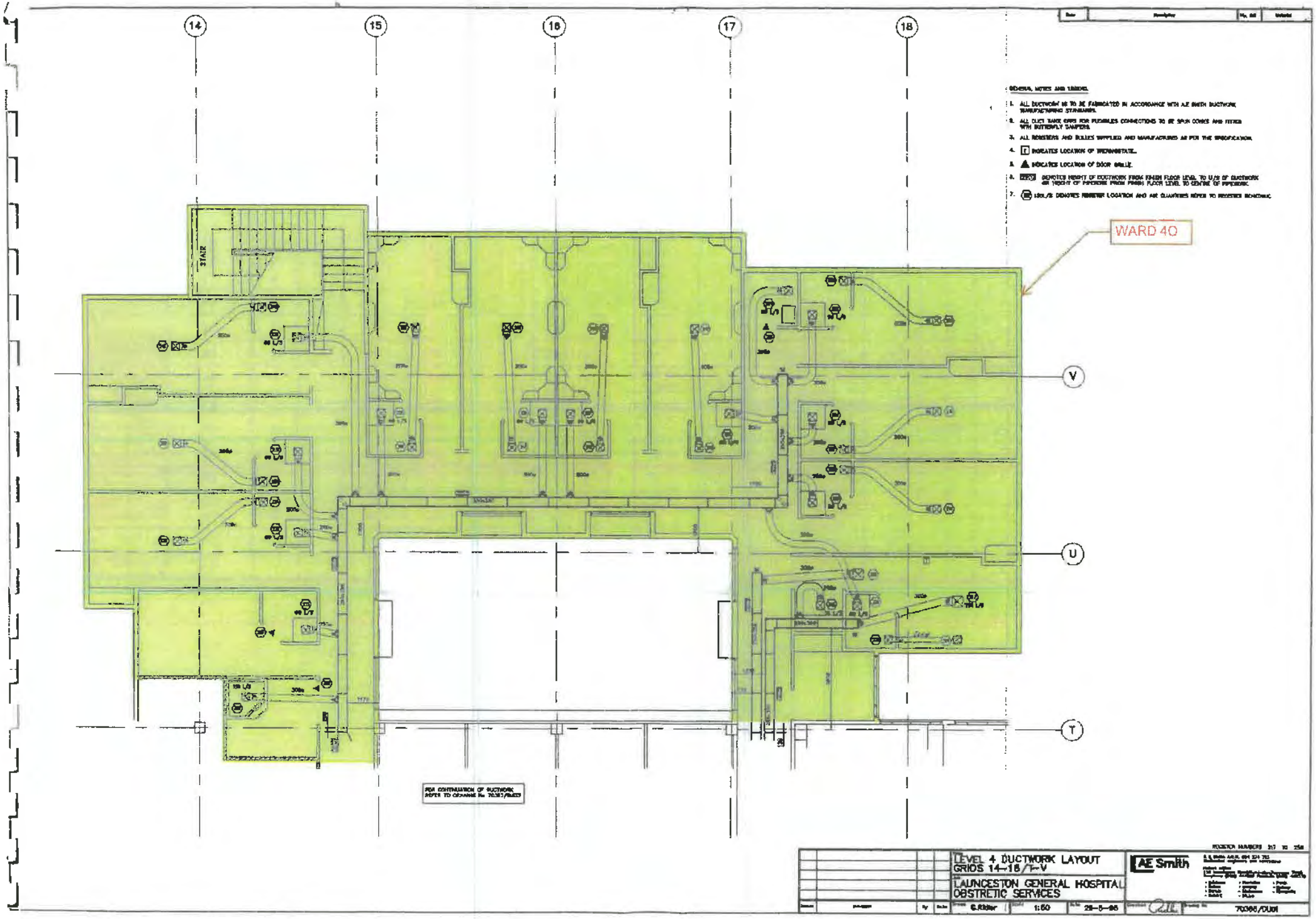


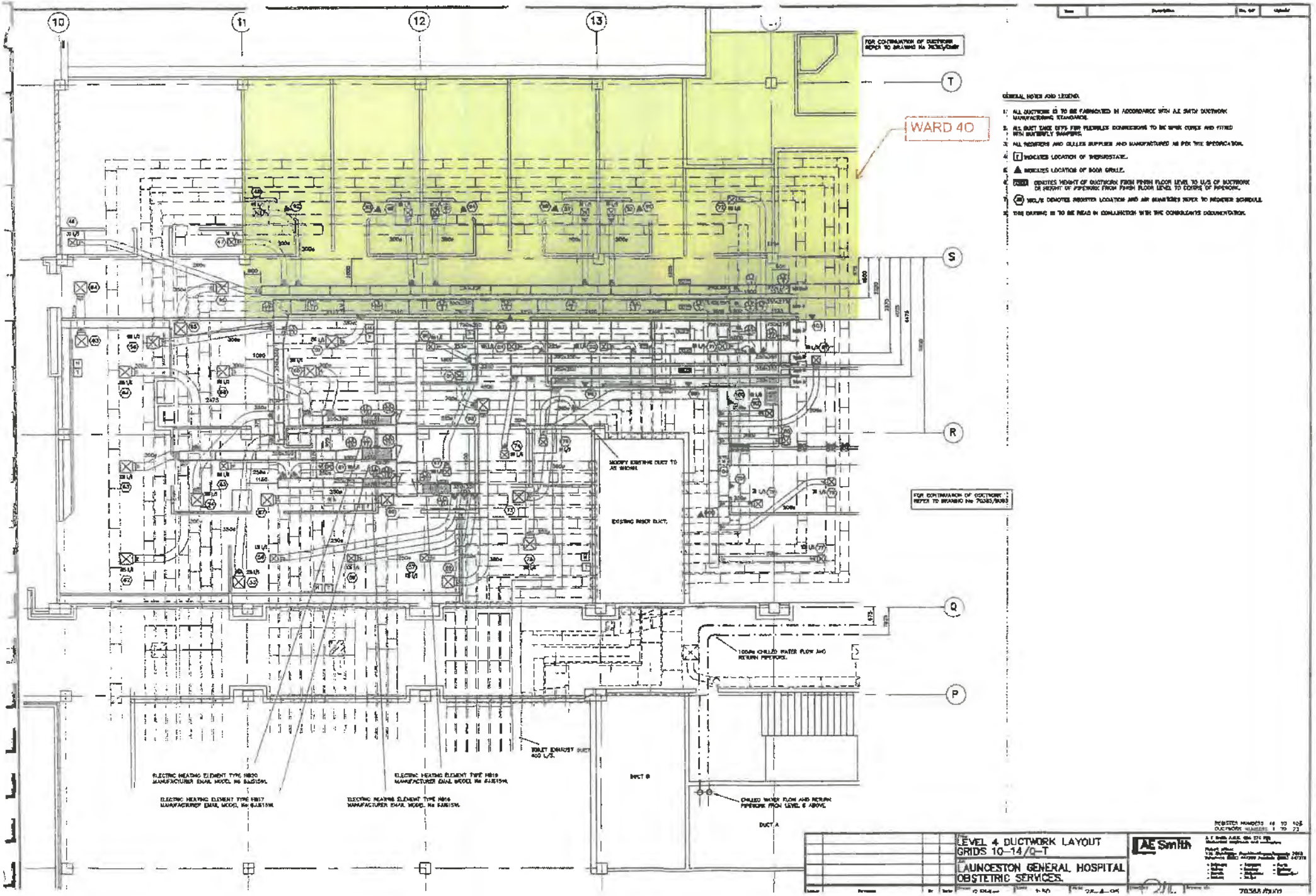
MECHANICAL SERVICES CHILLED WATER DIAGRAMMATIC

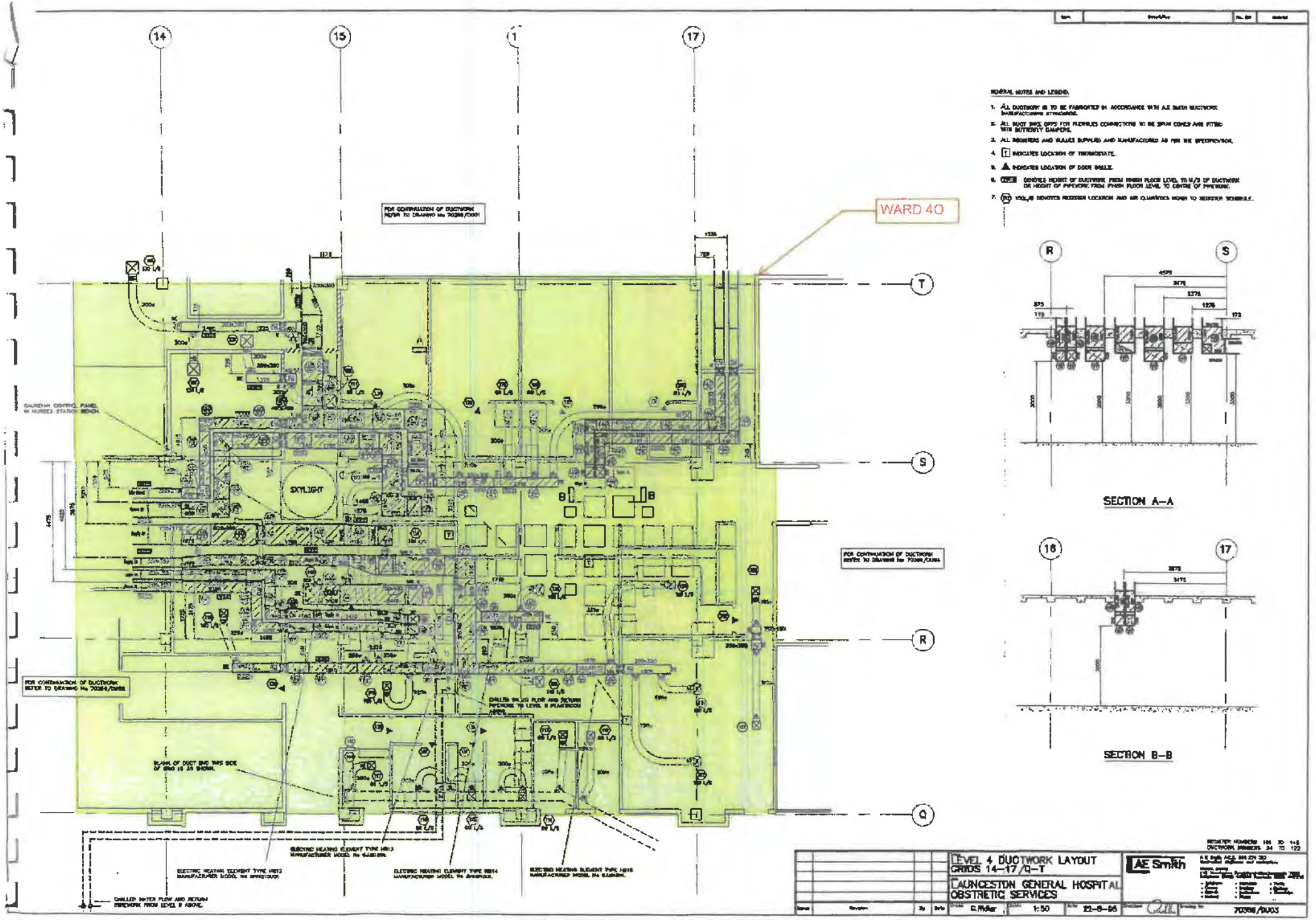
LAUNCESTON GENERAL HOSPITAL OBSTETRIC SERVICES.

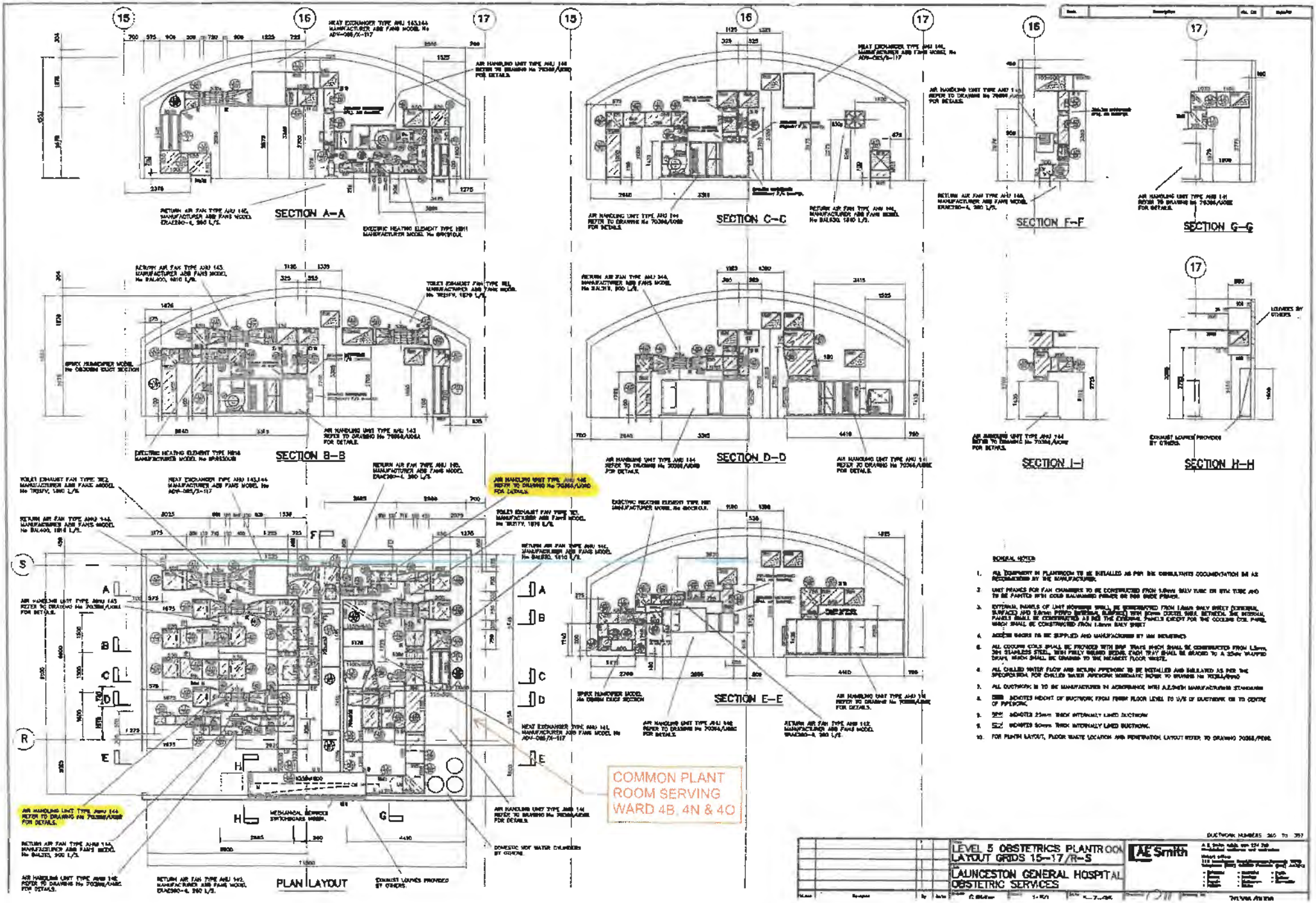
AE Smith

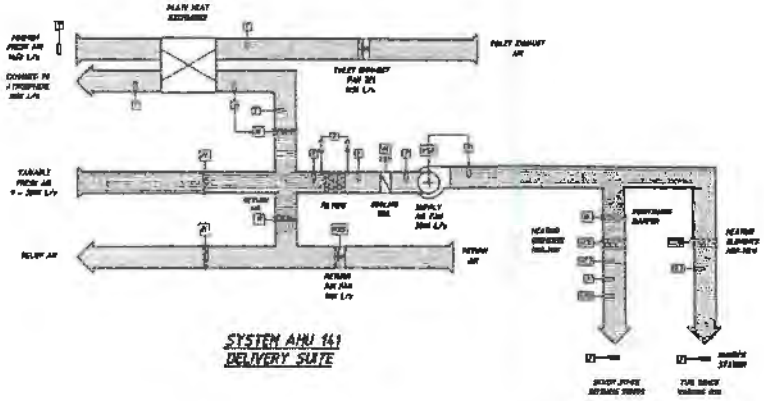
G Rider	N.T.S.	21-4-98	70388/DU11


14
15
16
17
18
V
U
T
STAIR
WARD 40
GENERAL NOTES AND LEGEND
1. ALL DUCTWORK IS TO BE FABRICATED IN ACCORDANCE WITH A.E SMITH DUCTWORK MANUFACTURING STANDARDS.
2. ALL DUCT TAKE OFFS FOR FLEXIBLES CONNECTIONS TO BE SPUN CONES AND FITTED WITH BUTTERFLY DAMPERS.
3. ALL REGISTERS AND GRILLES SUPPLIED AND MANUFACTURED AS PER THE SPECIFICATION.
4. T INDICATES LOCATION OF THERMOSTATS.
5. INDICATES LOCATION OF DOOR GRILLE.
6. 2500 DENOTES HEIGHT OF DUCTWORK FROM FINISH FLOOR LEVEL TO U/S OF DUCTWORK OR HEIGHT OF PIPEWORK FROM FINISH FLOOR LEVEL TO CENTRE OF PIPEWORK.
7. 150L/S DENOTES REGISTER LOCATION AND AIR QUANTITIES REFER TO REGISTER SCHEDULE.
FOR CONTINUATION OF DUCTWORK REFER TO DRAWING No. 70367/PA/003
LEVEL 4 DUCTWORK LAYOUT
GRIDS 14-18/T-V
LAUNCESTON GENERAL HOSPITAL
OBSTRETIC SERVICES
A.E Smith
G.Rider
1:50
28-5-98
70366/DU01

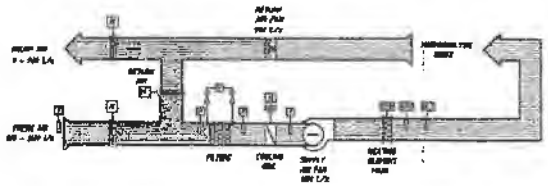

WARD 40
GENERAL NOTES AND LEGEND
ALL DUCTWORK IS TO BE FABRICATED IN ACCORDANCE WITH A.E. SMITH DUCTWORK MANUFACTURING STANDARDS.
ALL DUCT TAKE OFFS FOR FLEXIBLE CONNECTIONS TO BE SPIN CONES AND FITTED WITH BUTTERFLY DAMPERS.
ALL REGISTERS AND GRILLES SUPPLIED AND MANUFACTURED AS PER THE SPECIFICATION.
T INDICATES LOCATION OF THERMOSTATS.
INDICATES LOCATION OF DOOR GRILLE.
DENOTES HEIGHT OF DUCTWORK FROM FINISH FLOOR LEVEL TO U/S OF DUCTWORK OR HEIGHT OF PIPEWORK FROM FINISH FLOOR LEVEL TO CENTRE OF PIPEWORK.
SR1/8 DENOTES REGISTER LOCATION AND AIR QUANTITIES REFER TO REGISTER SCHEDULE.
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE CONSULTANTS DOCUMENTATION.
FOR CONTINUATION OF DUCTWORK REFER TO DRAWING No 70365/SM03
FOR CONTINUATION OF DUCTWORK REFER TO DRAWING No 70365/SM03
MODIFY EXISTING DUCT TO AS SHOWN
EXISTING RISER DUCT.
100dia CHILLED WATER FLOW AND RETURN PIPEWORK.
CHILLED WATER FLOW AND RETURN PIPEWORK FROM LEVEL 6 ABOVE.
DUCT B
DUCT A
ELECTRIC HEATING ELEMENT TYPE HB20 MANUFACTURER EMAIL MODEL No EJE15WL
ELECTRIC HEATING ELEMENT TYPE HB17 MANUFACTURER EMAIL MODEL No EJE15WL
ELECTRIC HEATING ELEMENT TYPE HB16 MANUFACTURER EMAIL MODEL No EJE15WL
ELECTRIC HEATING ELEMENT TYPE HB19 MANUFACTURER EMAIL MODEL No EJE15WL
LEVEL 4 DUCTWORK LAYOUT
GRIDS 10–14 /Q–T
LAUNCESTON GENERAL HOSPITAL
OBSTETRIC SERVICES.
AE Smith
70365/SM09


14
15
1
17
T
S
R
Q
WARD 40
FOR CONTINUATION OF DUCTWORK REFER TO DRAWING No 70386/D001
FOR CONTINUATION OF DUCTWORK REFER TO DRAWING No 70386/D004
FOR CONTINUATION OF DUCTWORK REFER TO DRAWING No 70386/D004
SKYLIGHT
GENERAL NOTES AND LEGEND.
1. ALL DUCTWORK IS TO BE FABRICATED IN ACCORDANCE WITH A.E SMITH MANUFACTURING STANDARDS.
2. ALL SUPPLY DUCT TAKE OFFS FOR FLEXIBLE CONNECTIONS TO BE SPUN CONES AND FITTED WITH BUTTERFLY DAMPERS.
3. ALL GRILLES AND DIFFUSERS SUPPLIED AND MANUFACTURED AS PER THE SPECIFICATION.
4. T INDICATES LOCATION OF THERMOSTATE.
5. INDICATES LOCATION OF DOOR GRILLE.
6. DENOTES HEIGHT OF DUCTWORK FROM FINISH FLOOR LEVEL TO 1/3 OF DUCTWORK OR HEIGHT OF PIPEWORK FROM FINISH FLOOR LEVEL TO CENTRE OF PIPEWORK.
7. (R2) DENOTES REGISTER LOCATION AND AIR QUANTITIES SHOWN TO REGISTER SCHEDULE.
R
S
SECTION A–A
16
17
SECTION B–B
CHILLED WATER FLOW AND RETURN PIPEWORK FROM LEVEL 5 ABOVE.
LEVEL 4 DUCTWORK LAYOUT
GRIDS 14–17/Q–T
LAUNCESTON GENERAL HOSPITAL
OBSTRETIC SERVICES
A.E Smith
1:50
12–8–86
70386/D003

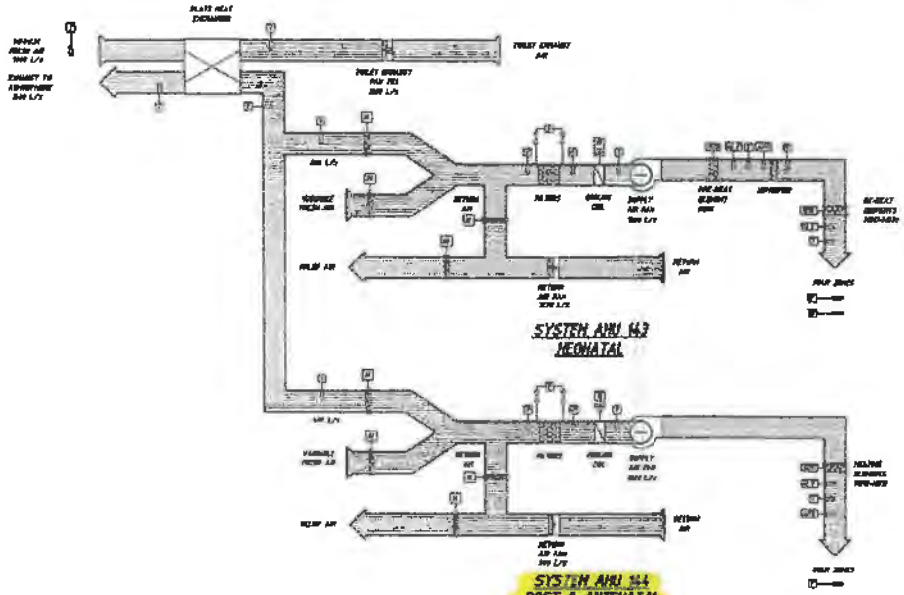

SECTION A–A
SECTION C–C
SECTION F–F
SECTION G–G
SECTION B–B
SECTION D–D
SECTION I–I
SECTION H–H
SECTION E–E
PLAN LAYOUT
COMMON PLANT ROOM SERVING WARD 4B, 4N & 4O
GENERAL NOTES
1. ALL EQUIPMENT IN PLANTROOM TO BE INSTALLED AS PER THE CONSULTANTS DOCUMENTATION AND AS RECOMMENDED BY THE MANUFACTURER.
2. UNIT PANELS FOR FAN CHAMBERS TO BE CONSTRUCTED FROM 1.0mm GALV SHEET OVER STEEL TUBE AND TO BE PAINTED WITH COLD GALVANISING PRIMER OR RED OXIDE PRIMER.
3. EXTERNAL PANELS OF UNIT HOUSINGS SHALL BE CONSTRUCTED FROM 1.6mm GALV SHEET EXTERNAL SURFACE AND 1.6mm PERFO INTERNAL SURFACE WITH 50mm DOUBLE SIDED BETWEEN. ALL INTERNAL PANELS SHALL BE CONSTRUCTED AS PER THE EXTERNAL PANELS EXCEPT FOR THE COOLING COIL PANEL WHICH SHALL BE CONSTRUCTED FROM 1.6mm GALV SHEET
4. ACCESS DOORS TO BE SUPPLIED AND MANUFACTURED BY UNIT SUPPLIERS
5. ALL COOLING COILS SHALL BE PROVIDED WITH DRIP TRAYS WHICH SHALL BE CONSTRUCTED FROM 1.5mm 304 STAINLESS STEEL, WITH FULLY WELDED SEAMS. EACH TRAY SHALL BE GRADED TO A 25mm TRAPPED DRAIN, WHICH SHALL BE CONNECTED TO THE NEAREST FLOOR WASTE.
6. ALL CHILLED WATER FLOW AND RETURN PIPEWORK TO BE INSTALLED AND INSULATED AS PER THE SPECIFICATION FOR CHILLED WATER REFERENCE SCHEMATIC REFER TO DRAWING No 70283/A9440
7. ALL DUCTWORK IS TO BE MANUFACTURED IN ACCORDANCE WITH A.E.SMITH MANUFACTURERS STANDARDS
8. DENOTES HEIGHT OF DUCTWORK FROM FINISH FLOOR LEVEL TO U/S OF DUCTWORK OR TO CENTRE OF PIPEWORK.
9. 25mm DENOTES 25mm THICK INTERNALLY LINED DUCTWORK
10. 50mm DENOTES 50mm THICK INTERNALLY LINED DUCTWORK.
11. FOR PLINTH LAYOUT, FLOOR WASTE LOCATION AND PENETRATION LAYOUT REFER TO DRAWING 70268/P0100.
DUCTWORK NUMBERS 350 TO 357
LEVEL 5 OBSTETRICS PLANTROOM
LAYOUT GRIDS 15–17/R–S
LAUNCESTON GENERAL HOSPITAL
OBSTETRIC SERVICES
A.E.Smith



SYSTEM AHU 141
DELIVERY SUITE

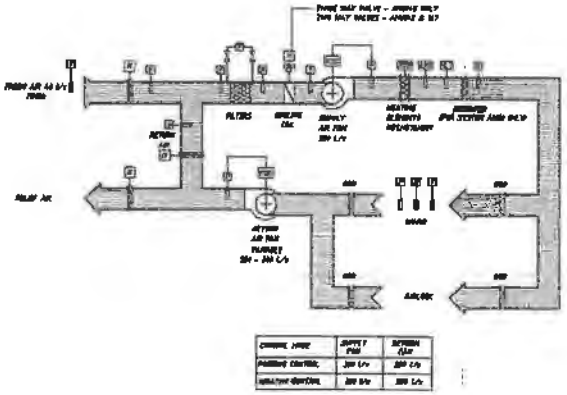


SYSTEM AHU 146
RENAL SUITE (LEVEL 2)



SYSTEM AHU 143
NEONATAL

SYSTEM AHU 144
POST & ANTENATAL



SYSTEM AHU 142, 145 AND 147
ISOLATION WARDS - LEVEL 4 (AHU142 & AHU145)
RENAL SUITE - LEVEL 3 (AHU147)

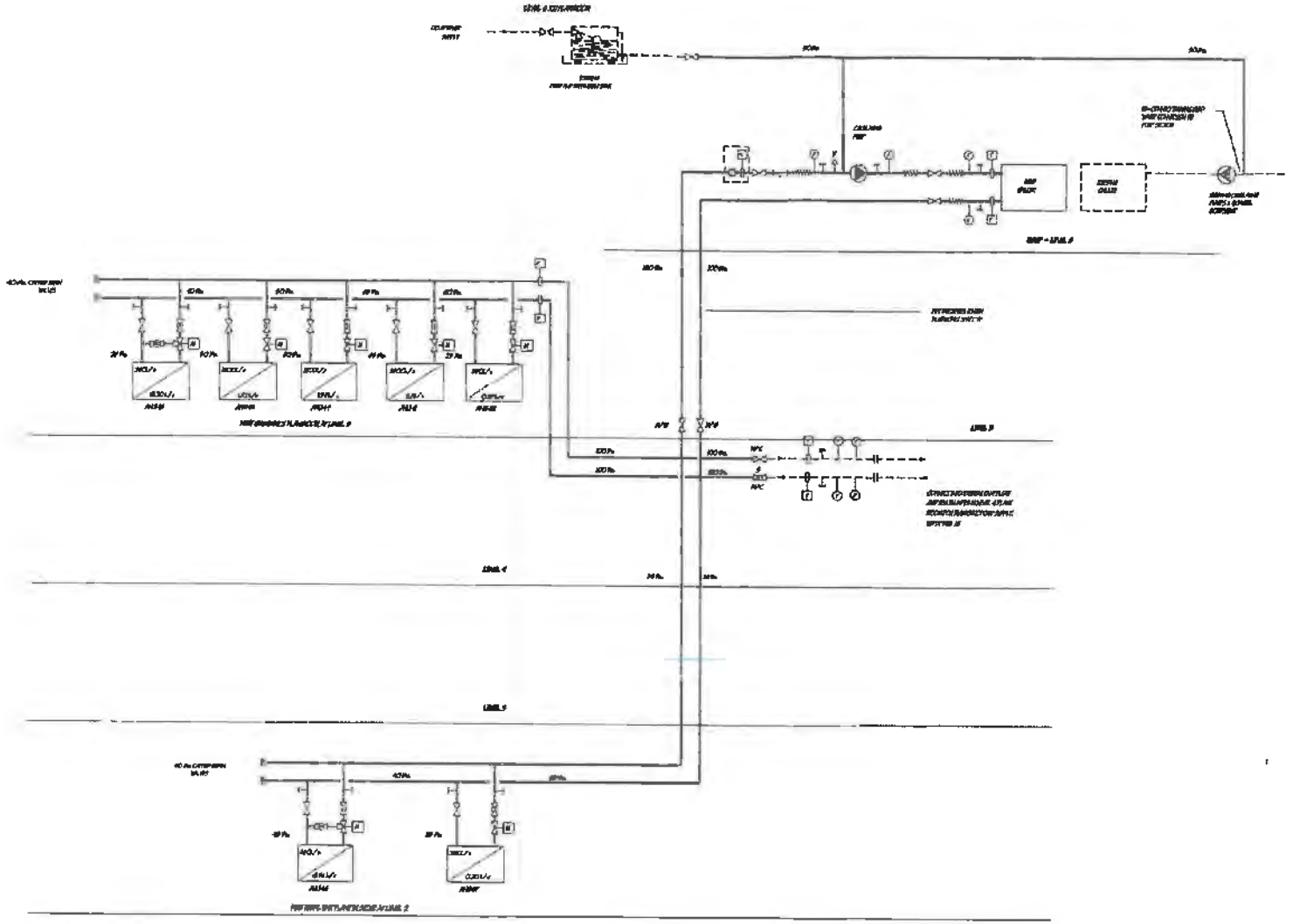
LEGEND

MECHANICAL SERVICES CONTROL DIAGRAMMATIC.
LAUNCESTON GENERAL HOSPITAL
OBSTETRIC SERVICES

A.E. Smith

C.Bailey | N.T.S. | 21-4-95

70368/D018



LEGEND

NOTES

MECHANICAL SERVICES CHILLED WATER DIAGRAMMATIC

LAUNCESTON GENERAL HOSPITAL OBSTETRIC SERVICES.

AE Smith

G Rider | R.T.S. | 21-4-95

70366/DU01

Matthews, Cameron T

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 10:40 AM
To: Matthews, Cameron T; Andrew Sutherland; Toon, Shane A
Cc: ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Cameron.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 10:38 AM
To: Andrew Sutherland <[redacted] Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI

Andrew

Please amend the last dot point to:

- Redundant air conditioning unit located in the Obstetrics plant room is tagged out, original intended purpose is unknown

I have also attached HVAC drawings

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Andrew Sutherland <[redacted]
Sent: Friday, 7 February 2025 9:46 AM
To: Matthews, Cameron T <[redacted]; Brandon Servant <[redacted]>;
Toon, Shane A <[redacted]>
Cc: ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hello Cameron.

Notes form our conversation this morning on Ward 40

- Constructed in 1995 with basic facilities for heating and ventilation only with no cooling
- Patient room temperature are excessive and uncontrollable with the facilities as built
- Ventilation via openable window which is unsatisfactory when the ambient outdoor air temperatures are higher than comfortable room temperature ie ambient temps 24°C and over
- External shading to windows on the eastern, western and southern façade window, no shading on windows facing the Chaple courtyard
- Although located on the southern side of the main block, the majority of the patient room windows are solar exposed with the daily progression of the sun resulting in excessively elevated room temperatures.
- Existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms with measured inside glass surface temperatures recorded as high as 30°C
- IXL tactics are installed in each patient room ensuite for the ensuite exhaust, these are to an extent ducted in the ceiling space to an exhaust fan, current as built drawings for these are not available.
- Patient room ventilation is via transfer grille located above the room entry door with borrowed ventilation form the corridor which is unconditioned
- Redundant air conditioning unit located in the false ceiling space is tagged out, original intended purpose is unknown

Let me know if I have captured everything discussed.

Thanks

Kind Regards
Andrew Sutherland
Managing Director

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E [redacted]

From: Matthews, Cameron T <[redacted]>
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brendon and Andrew

Thank you for your report and meeting a tight timeframe.

Can you confirm this covers off on 3D as well. As one area it refers to D block four levels and then in another part it talks about level 4, 5 and 6 (page 7).

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Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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No problem. Let us know if you have any comments after reviewing the draft.

Kind regards,
Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

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Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]

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Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted]>; Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

CONFIDENTIALITY NOTICE AND DISCLAIMER

Matthews, Cameron T

From: Andrew Sutherland <[redacted]
Sent: Friday, 7 February 2025 9:46 AM
To: Matthews, Cameron T; Brandon Servant; Toon, Shane A
Cc: ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hello Cameron.

Notes form our conversation this morning on Ward 40

- Constructed in 1995 with basic facilities for heating and ventilation only with no cooling
- Patient room temperature are excessive and uncontrollable with the facilities as built
- Ventilation via openable window which is unsatisfactory when the ambient outdoor air temperatures are higher than comfortable room temperature ie ambient temps 24°C and over
- External shading to windows on the eastern, western and southern façade window, no shading on windows facing the Chaple courtyard
- Although located on the southern side of the main block, the majority of the patient room windows are solar exposed with the daily progression of the sun resulting in excessively elevated room temperatures.
- Existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms with measured inside glass surface temperatures recorded as high as 30°C
- IXL tactics are installed in each patient room ensuite for the ensuite exhaust, these are to an extent ducted in the ceiling space to an exhaust fan, current as built drawings for these are not available.
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Managing Director

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Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

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Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

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Building Services Engineer

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W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Thursday, 6 February 2025 9:57 AM

To: Brandon Servant <[redacted]>; Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Brandon Servant <[redacted]>
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

> You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
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W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Brandon Servant <[redacted]>
Sent: Friday, 7 February 2025 8:27 AM
To: Matthews, Cameron T; Toon, Shane A
Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Cameron,

We'd be happy to include 4O, but we'll need more information to prepare our assessment:

- Summary of the HVAC issues with this ward
- Mechanical services as installed drawings
- Any other information you can provide that would assist with the assessment

Would you prefer if the budget estimate for 4O was included with the budget for Ward Block D, or would you prefer this to be separate?

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]>
Sent: Friday, 7 February 2025 8:04 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon

Andrew was going to update the document to include Ward 4O as well (obstretrics)

Cheers
cam

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brendon and Andrew

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Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

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Kind regards,
Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
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Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

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Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Brandon Servant < [redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T < [redacted] Toon, Shane A
< [redacted] >
Cc: Andrew Sutherland < [redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

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Kind regards,

Brandon Servant
Building Services Engineer

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T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:24 AM
To: Matthews, Cameron T; Toon, Shane A
Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the email. I can confirm that the report and budget estimate does include 3D (Paediatrics Outpatients & QVOP). The comment regarding levels 4 to 6 will be updated.

We will add a section on maintenance. Maintenance will need to be in accordance with AIRAH DA19. This will cover the following equipment:

- Filters (monthly inspection). Filter cleaning or replacement every 3 months
- FCU maintenance
- Circulating pumps
- Control systems

I'll also make the other changes to page 7 as per your notes.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

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Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

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Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
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M: [redacted] | **T:** 03 [redacted]

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Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
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Brandon Servant
Building Services Engineer

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W www.asceng.com.au E office@asceng.com.au

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Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

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Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

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T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: 0400 651 139 | **T:** 03 6777 6434

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Upton, Lorinda A
Sent: Friday, 7 February 2025 7:55 AM
To: Matthews, Cameron T
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thank you!

From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 7:51 AM
To: Upton, Lorinda A <[redacted]>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Lorinda

I will get the report amended to reflect your comments.

Cheers
cam

From: Upton, Lorinda A <[redacted]>
Sent: Thursday, 6 February 2025 4:31 PM
To: Matthews, Cameron T <[redacted]
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Can you confirm this covers off on 3D as well. As one area it refers to D block four levels and then in another part it talks about level 4, 5 and 6. As long as it includes level 3 I am happy.

Regards
Lorinda

From: Matthews, Cameron T <[redacted]>
Sent: Thursday, 6 February 2025 2:22 PM
To: Smeaton, Alex <[redacted]>; De Sousa, Fiona M <[redacted]>; Lieutier, Fiona C <[redacted] Office of the Chief Executive, Hospitals North <cehn@ths.tas.gov.au>; Upton, Lorinda A <[redacted]>; Causer, Danielle J <[redacted]>
Cc: Toon, Shane A <[redacted]>; Perrott, John <[redacted]>
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

HI all

Please find attached draft of the D Block air conditioning upgrade. I have asked Andrew Sutherland to add Ward 4O to this report as there will be synergies in undertaken both jobs (even if it is in a staged approach).

Page 9 shows that return air from the patient room moves through and cooled (or heated) by the fan coil unit (through a filter but not a hepa filter) and is supplied to the same patient room at the desired temperature (i.e air moved only within each patient room).

Am happy should you wish to meet to discuss further.

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PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

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To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Kind regards,

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Cc: Toon, Shane A <[redacted] Perrott, John <[redacted]
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

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Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

TASMANIAN HEALTH SERVICE
Tasmanian Government

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted]>; Toon, Shane A
<[redacted]>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email fron [redacted] Learn why this is important

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Building Services Engineer

ASC
Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Lieutier, Fiona C
Sent: Thursday, 6 February 2025 7:18 PM
To: Matthews, Cameron T; Smeaton, Alex; De Sousa, Fiona M; Office of the Chief Executive, Hospitals North; Upton, Lorinda A; Causer, Danielle J
Cc: Toon, Shane A; Perrott, John; Hargrave, Andrew J
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hello Alex, Fiona DS, Lorinda and Danielle,
I note you have all been provided with the draft *LGH Ward Block Air Conditioning Upgrade* report in the below email. This report is in a draft format and the report and any of its contents are not to be shared with anyone outside of this email group. The report is an Infrastructure report and once finalised will be cleared by Infrastructure Services.
Regards,
Fiona

Tasmanian Government

Fiona Lieutier APM
Chief Executive
Hospitals North
Department of Health
(m) [redacted]
[redacted]

CARE | Hospitals North
EXCELLENCE TOGETHER

From: Matthews, Cameron T <[redacted]
Sent: Thursday, 6 February 2025 2:22 PM
To: Smeaton, Alex <[redacted] De Sousa, Fiona M <[redacted]>; Lieutier, Fiona C <[redacted] Office of the Chief Executive, Hospitals North <cehn@ths.tas.gov.au>; Upton, Lorinda A <[redacted]>; Causer, Danielle J <[redacted]>
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Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <cameron.matthews@health.tas.gov.au>; Toon, Shane A <shane.toon@health.tas.gov.au>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 0072S LGH Ward Block Air Conditioning Upgrade

You don't often get email from brandon@asceng.com.au. Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M 0423 166 492
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Matthews, Cameron T

From: Matthews, Cameron T
Sent: Thursday, 6 February 2025 2:22 PM
To: Smeaton, Alex; De Sousa, Fiona M; Lieutier, Fiona C; Office of the Chief Executive, Hospitals North; Upton, Lorinda A; Causer, Danielle J
Cc: Toon, Shane A; Perrott, John
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 LGH Ward Block Air Conditioning Upgrade_DRAFT.pdf

HI all

Please find attached draft of the D Block air conditioning upgrade. I have asked Andrew Sutherland to add Ward 4O to this report as there will be synergies in undertaken both jobs (even if it is in a staged approach).

Page 9 shows that return air from the patient room moves through and cooled (or heated) by the fan coil unit (through a filter but not a hepa filter) and is supplied to the same patient room at the desired temperature (i.e air moved only within each patient room).

Am happy should you wish to meet to discuss further.

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 6777 6434

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <shane.toon@health.tas.gov.au>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,
Brandon Servant
Building Services Engineer

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Matthews, Cameron T

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T; Toon, Shane A
Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

No problem. Let us know if you have any comments after reviewing the draft.

Kind regards,

Brandon Servant
Building Services Engineer

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From: Matthews, Cameron T <[redacted]
Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **| T:** 03 6777 6434

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <cameron.matthews@health.tas.gov.au>; Toon, Shane A <shane.toon@health.tas.gov.au>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Matthews, Cameron T

From: Matthews, Cameron T
Sent: Thursday, 6 February 2025 9:58 AM
To: Office of the Deputy Secretary Infrastructure; Perrott, John
Cc: Hargrave, Andrew J
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 LGH Ward Block Air Conditioning Upgrade_DRAFT.pdf

HI Andrew and John

Report attached

Cheers
Cam

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Cc: Andrew Sutherland; ASC Engineers
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

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Subject: 00725 LGH Ward Block Air Conditioning Upgrade

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Andrew Sutherland Consulting Engineers

DEPARTMENT OF HEALTH
LAUNCESTON GENERAL HOSPITAL

Ward Block Air Conditioning Upgrade
274-280 Charles Street, Launceston

Ingineering Pty Ltd ABN 47 056 855 577 trading as
Andrew Sutherland Consulting Engineers
City Mill Building Level 1 11 Morrison Street Hobart Tasmania Australia 7000
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Issue:	Draft
Date:	06 February 2025
Reference:	00725

1. EXECUTIVE SUMMARY

This report has been prepared by ASC Engineers in response to a request from Department of Health to provide an assessment of the Ward Block (D Block) cooling arrangement at the Launceston General Hospital.

The overheating of D Block during warm summer weather is the result of inadequate cooling capacity and air distribution with the system as installed. With limited opportunity for improvement without substantial redesign for the upgrade and replacement of the existing facilities.

The proposed scope of works includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

The recently upgraded chiller plant is adequately sized to provide cooling for the Ward Block; however, additional pipework would be required to utilise the chiller plant capacity.

The estimated cost for the air conditioning upgrade for the Ward Block is $4.0 - $4.5M.

2. TABLE OF CONTENTS

2.1. List of Appendices

3. GLOSSARY OF TERMS & TERMINOLOGY

AC	Air Conditioning	HHW	Heating Hot Water
AHU	Air Handling Unit	HVAC	Heating, Ventilation & Air Conditioning
APS	Air Pressure Switch	MSB	Main Switch Board
BCA	Building Code of Australia	NCC	National Construction Code
BMS	Building Management System	PAC	Package Air Conditioning Unit
CHW	Chilled Water	PB	Proportional Band (control point)
DB	Dry Bulb	PID	Proportional Integral Derivative (control)
Deadband	Area between Cooling & Heating stages	RAC	Room Air Conditioning
DP	Differential Pressure	RC	Reverse Cycle
DX	Direct Expansion (refrigeration system)	T	Temperature
EEV	Electronic Expansion (valve)	VAV	Variable Air Volume
EPO	Emergency Power Off	VSD	Variable Speed Drive
FCU	Fan Coil Unit	WB	Wet Bulb

4. INTRODUCTION

Ward Bolck D was constructed in 1979 at which time the ambient design conditions were significantly lower than current design parameters. The current design conditions have increased due to elevated summer temperatures. At the time of original construction the provision of air conditioning for patient rooms was not universally adopted as necessary design consideration.

As result of the legacy issues with only indirect cooling for the patient rooms recent hot weather has resulted in excessive indoor temperatures experienced in Ward Block D. The current mechanical services design for this building provides conditioned air only to the corridor spaces, office areas, and nurse stations via a common air conditioning system located in the Level 7/8 plant room. Some supplementary air conditioning units have been provided for special rooms on level 4. As designed, the existing air conditioning system does not have sufficient cooling capacity or adequately sized distribution ductwork to provide satisfactory cooling for the patient rooms.

Figure 4.1 – LGH Site & D Block

The temperatures in patient ward areas of D Block at the Launceston General Hospital (LGH) can exceed typical occupancy comfort conditions in warmer months. The patient rooms rely on cool air from the corridors to be drawn into the occupied space via the negative pressure created by the toilet exhaust system. Due to the limited cooling capacity and modest air flow rate created by the toilet exhaust system the arrangement does not provide effective cooling for the patient rooms.

Air conditioning for the corridors is provided by a single cooling coil that serves all levels. This configuration does not allow for any cooling diversity or facility to adjust for varying cooling loads at individual floor levels.

Heating for the wards is provided by resistive (electric) electric heating in individual zones.

5. EXISTING AIR CONDITIONING ARRANGEMENT

Air conditioning for D Block is primarily provided by a single cooling coil and electric re-heat coils for each zone. The schematic below is an extract from the Honeywell BMS that illustrates the existing configuration.

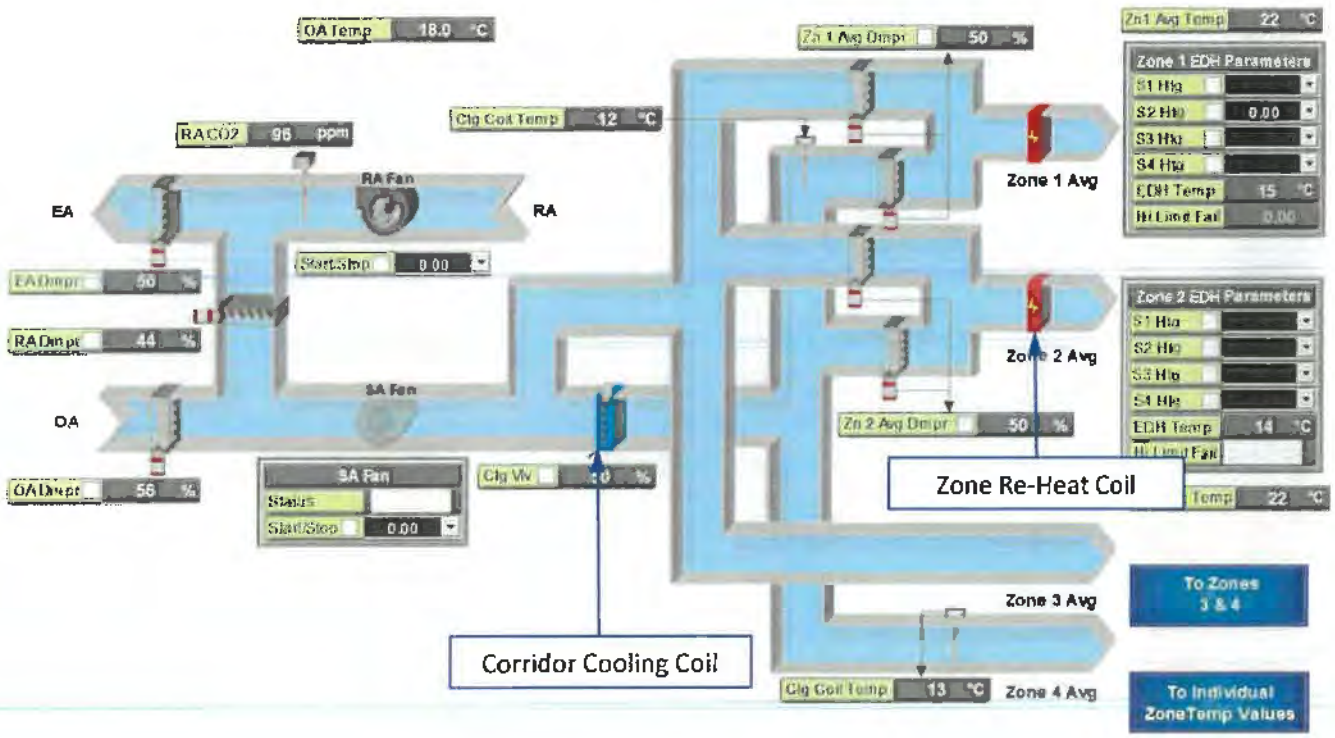

Figure 5.1 – Existing Air Conditioning Schematic

The ward arears rely on air delivered to the corridor to be drawn into the occupied spaces to cool the zones.

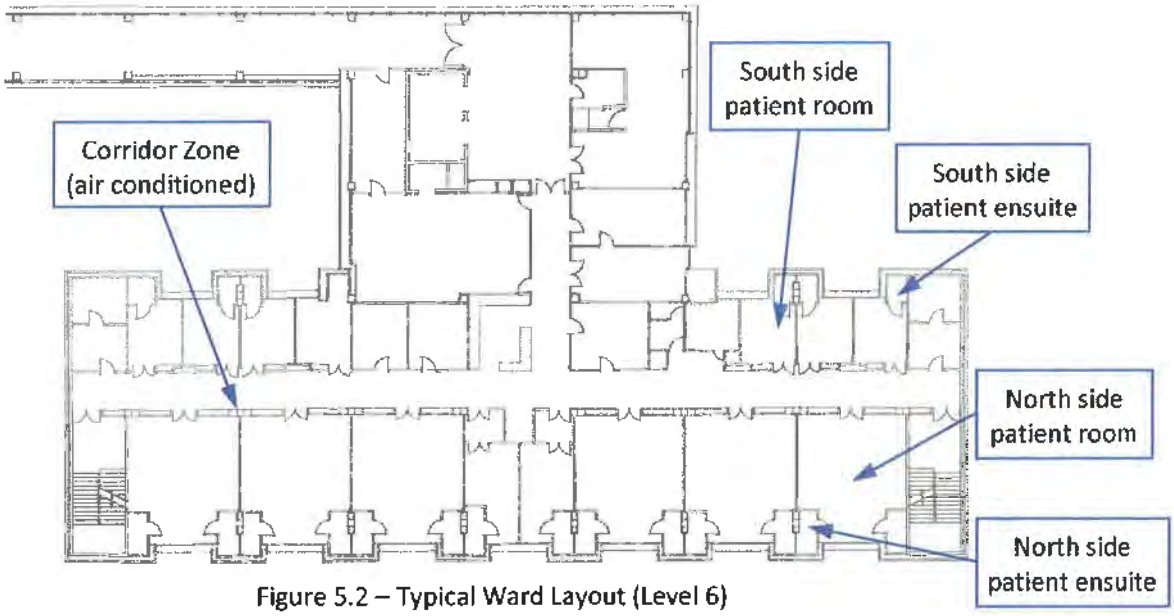

Figure 5.2 – Typical Ward Layout (Level 6)

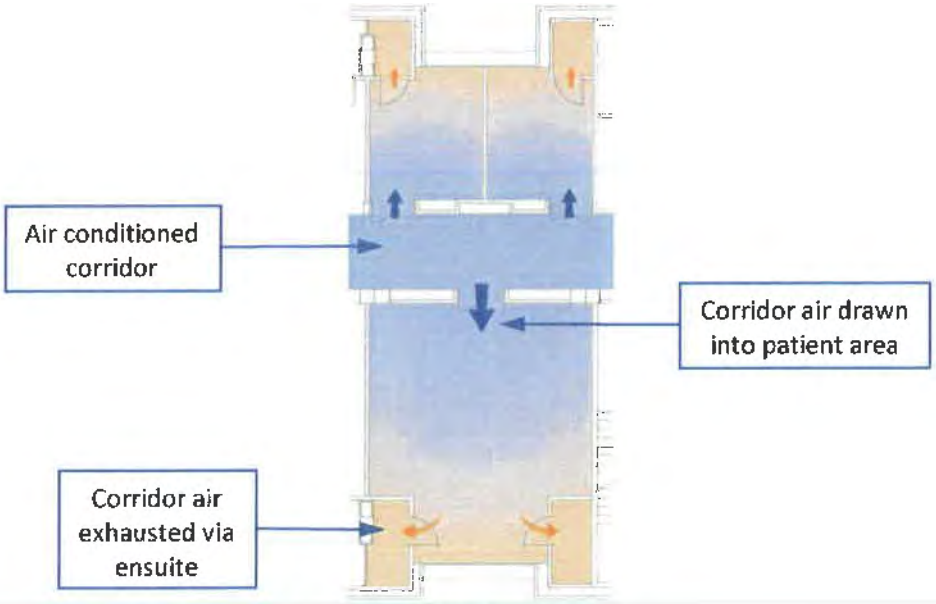

Figure 5.3 – Typical Air Movement Arrangement
(Indirect cooling to Patient rooms)

This configuration does not allow for any variation in the building façade, solar exposure, or vertical diversity.

The existing air flow rate to the patient room is less than 20% of the required air flow rate of conditioned air to meet the patient room cooling requirements

5.1. Existing Cooling Capacity

The existing installed capacity for the common cooling coil is 206 kW with an available capacity in the order of 152 kW because of chilled water flow restrictions in the existing hydraulic network serving this plant.

Preliminary estimation of the cooling load for D Block which has a floor area in the order of 3720 m^2 for the four occupied levels, as summarised below:

Space Type	Area (m^2)
Corridors	560
Large Ward Rooms	1080
Small Ward Rooms & Isolation Rooms	384
Other Clinical & Staff Spaces	1696
TOTAL	**3720**

Design conditions used for this assessment are:

Ambient Conditions	**Summer**	**Winter**
Temperature (degrees °C DB)	35.0	1.5
Temperature (degrees °C WB)	26.0	-

Using a typical average ceiling height of 2.7 meters, and design parameters outlined in the Victorian Health and Human Services Building Authority (VHHSBA), i.e.

- Minimum total air changes per hour (ACPH): 6
- Minimum outdoor ACPH: 2

The peak cooling load is in the order of 330 kW. This suggests there is a cooling capacity shortfall of 178 kW for D Block Level 4, 5 and 6 .

6. CONCEPT DESIGN

To address the legacy cooling deficiency for the Ward Block a number of options have been considered in the preparation of this report and recommendations. Based on the consideration of the optimum patient comfort considerations, minimising disruption to the patient area, system efficiency, existing infrastructure, and building restraints the proposed concept design is recommended.

- Provision cooling and heating to each patient room with individual room control
- Alteration and upgrading of existing ducted air conditioning system to provide floor by floor control
- Upgrading of the level 7/8 air handling system
- Extension of the heating and chilled water pipe work reticulation from the central plant to D Block

The recent refurbishment and expansion of the primary chiller plant (completed 2024) significantly increased the available cooling capacity for the LGH site. Given this available capacity, it would be feasible to provide a dedicated cooling circuit to serve the Ward Block in addition to the chilled water circuit. Consideration should also be given to improving the heating capacity to the ward spaces.

6.1. Chilled and Heating Water

The source for the chilled and heating water supplies would be the main chiller plant and boiler plants. New pipework would be routed externally from the respective plants to the ward block.

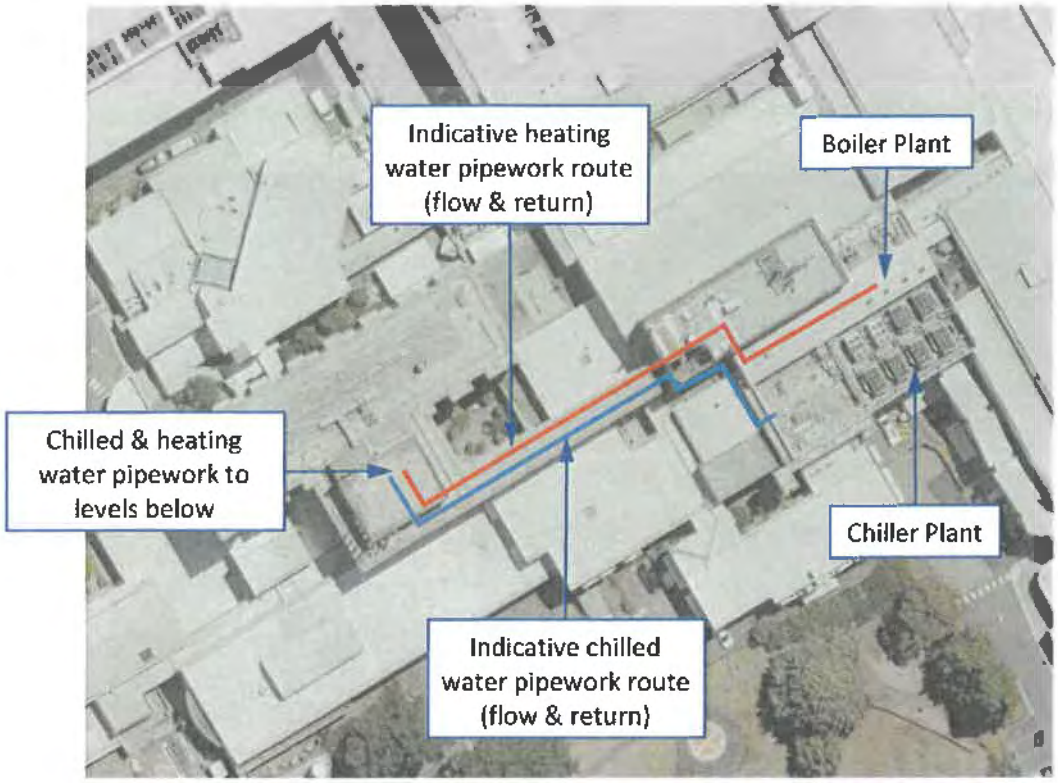

Figure 6.1.1 – Proposed Chiller & Heating Water Pipework Route

New chilled and heating water circulating pumps would need to be provided. The indicative location for this equipment would be the Ward Block roof plantroom. All new pipework would need to be externally clad where exposed to weather and insulated to comply with current NCC requirements.

It is expected that the existing chilled water pipework serving the level 7 air handling unit (AHU) would be preserved. New heating water pipework would be required in the level 7 plantroom to facilitate the replacement of the existing AHU and to provide new heating water coils in lieu of the electric heaters currently installed.

The flow and return pipework would be routed down the Ward Block services riser shaft, with take-offs at each level. Each floor would have a flow and return loop to allow for individual fan coil units to be installed in each patient space.

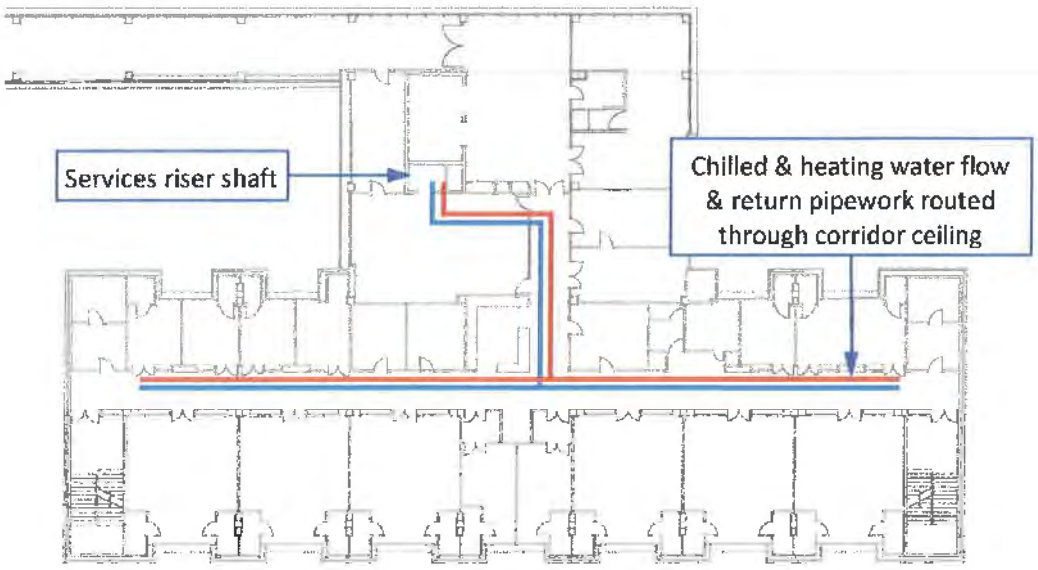

Figure 6.1.2 – Indicative Chilled & Heating Water Pipework

6.2. Patient Rooms

Each patient room would be fitted with a chilled water cooled and hot water heated FCU. These would be installed in the ceiling space within each room. This arrangement is commonly utilised for modern hotel apartments and relies on ventilation from a common source, with heating and cooling provided locally within the occupied space. This configuration would preserve the existing corridor air conditioning and ensuite exhaust and provided individual room control for the patient rooms

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary. The figure below shows an indicative section of the proposed installation in the ward areas.

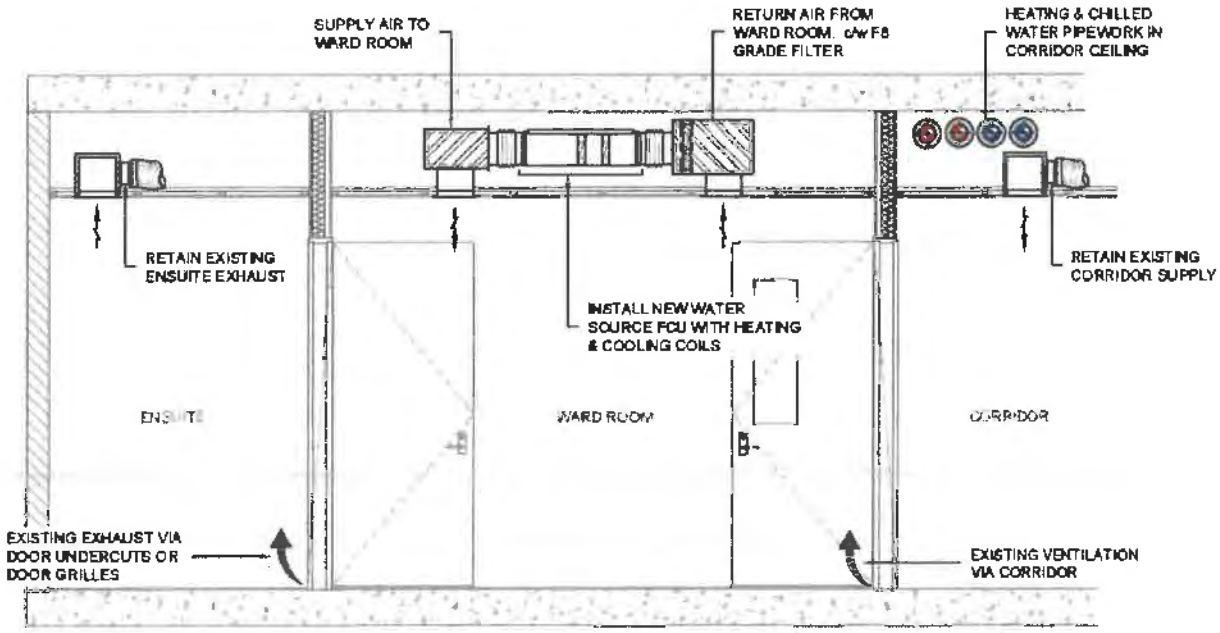

Figure 0.1 – Typical Room Section

Figure 0.2 – Typical Water Source FCU

The indicative FCU selection would be a GJ Walker ALEC unit or similar. There are four models in this product range, with total cooling capacities between 5.7 to 31.2 kW. It would be expected that the smallest ALEC300 unit would be satisfactory for each ward room. The estimated total cooling capacity for a large north facing ward rooms is 3.0-3.5 kW

An alternative water sources FCU selection would be the Temperzone IMDY series. The Temperzone unit are similarly sized and offer comparable capacities.

Alternatively, Temperzone have a low-profile range (IMDL-Y). This range offers similar cooling capacities as the deeper unit; however, the heating capacities are significantly less, and the fan static pressure may not be suitable if high efficiency F8 filtration is used.

The proposed FCUs would are 4 pipe units to avoid the potential for heating and chilled water interconnection which can occur with two pipe units and change over valve arrangements.

6.3. Staff & Clinical FCUs

In addition to the proposed air conditioning upgrades for patient areas, the provision of heating and cooling alterations for staff and clinical spaces air conditioning system should be implemented to improve comfort conditions, system efficiency and reduce running costs. The extent of alteration, zoning, and floor by floor control will be influenced by existing system and building restraints and would resolved in the design development.

6.4. Level 7 AHU Replacement

It is recommended that as part of the Ward Block air conditioning upgrade that the Level 7 AHU be replaced for the following reasons:

- AHU has exceeded it expected service life, the unit has been in operation since 1979 (46 years).
- The use of electric heating is not efficient
- Zones 3 (west staff areas) and 4 (south corridor) do not have any heating capacity

This would have a significant impact on the air conditioning and ventilation for the building. To mitigate the impact caused by the AHU replacement this work should be undertaken when the air conditioning for the ward areas has been completed.

6.5. Controls

The LGH runs a Honeywell EBI BMS. This BMS governs the operation of mechanical services across the LGH site. While ensuring the new Ward Block cooling systems are included in the existing BMS, this control strategy is costly to implement. The extent of the control functionality would require careful consideration to determine the level of control required to ensure satisfactory operation. The minimum control arrangement for each FCU would include:

- Cooling coil valve position
- Heating coil valve position
- Room temperature

Controls for any staff area FCUs will also need to include dedicated start/stop signals. This could either be on a time clock arrangement, or via a local control panel to allow for manual input.

In addition to the controls for the FCU systems, all new chilled and heating water pumps would require BMS control to govern their operation. This would include:

- VSD speed control for heating and chilled water transfer pumps.
- System pressure differential (cooling and heating)
- Start/stop, this would also govern duty/standby and changeover

Start and stop operation could be consolidated to group FCUs together to create zones, i.e. north and south. The following additional control and monitoring points could be considered; however, they are not considered essential for operation of the systems:

- FCU general fault
- Filter pressure drop
- Fan speed
- Chilled and heating water flow temperatures

- Chilled and heating water return temperatures

The replacement of the AHU would require a number of control point to ensure satisfactory operation. The points would include:

- AHU enable
- Fan VSD speed
- Filter pressure drop
- Zone supply air temperature (4 off)
- Cooling coil valve position (4 off)
- Heating coil valve position (4 off)
- Fan fault fault/flow switch

It is expected that the following points would already be available on the BMS and be retained to provide control functionality for the new systems:

- Ambient temperature
- Exhaust air damper position
- Outside air damper position
- Return air damper position
- Exhaust CO_2 level

6.6. Staging

The DoH have indicated that the Ward Block air conditioning upgrade would need to be completed prior to the summer season 2025. This would require the design and documentation phase to commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

It is expected that FCU and AHU procurement would be 12-16 weeks from date of order. Other essential procurement elements would be:

- Circulating pumps
- Pipework, valves and accessories
- Ductwork, diffusers and grilles
- Insulation
- Controls and field devices

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least 50% of each level is decanted to minimise hoarding requirements and excessive staging coordination.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the ward block. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to the Ward Block
2. Installation of circulating pumps and associated controls
3. Running pipework down the services riser. Providing take-off branches at each level
4. Commissioning of circulating pumps and controls
5. Ward work – eight stages (levels 3-6, east and west zones)
    a. Installation of chilled and heating water pipework through corridor
    b. Installation of FCUs in ward rooms
    c. FCU controls
    d. Commissioning of FCUs and control
6. Level 7 AHU replacement

6.7. Budget Estimates

The estimated cost for the Ward Block air conditioning upgrade would be between $4.0 - $4.5M. A detailed summary of the budget estimate in included in Appendix 2. The budget estimate includes the following:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls
- Staging allowances
- Consultancy fees (Engineering, Architect, Building surveyor)
- Project management fees
- Design and construction contingency (10%)

7. OTHER CONSIDERATIONS

The following items were considered in the preparation of this upgrade proposal.

7.1. Refrigerant based systems

Local refrigerant based (direct expansion) systems were considered as an alternative to the water source proposal. The systems include:

- Variable refrigerant flow (VRF) heat pump
- VRF Heat recovery
- Hybrid VRF systems

VRF heat pumps and heat recovery systems rely on indoor air conditioning units connected to dedicated outdoor units. The primary issue with this arrangement is refrigerant concentration. The systems need to be designed so that a refrigerant leak does not result does not result in a major toxic or fire hazard risk. As a consequence of managing refrigerant concentration, smaller VRF groupings are required. These systems also have a sorter service life compared with water source systems. Replacement parts are not typically available beyond 10-15 years from the date of installation. Failure of a few indoor units or an outdoor unit may result in the entire system needing replacement.

Hybrid systems distribute heating and chilled water to the local indoor units. The refrigerant connection is between the outdoor unit and distribution branch box. This arrangement mitigates the issues of refrigerant concentration. Hybrid systems have a similar service life as VRF systems and are challenging to maintain beyond 10-15 years when manufacturers on longer support obsolete systems.

The initial installation costs of VRF and hybrid systems would likely be less than the water source alternative. This is primarily due to the cost of the much larger heating and chilled water pipework. Despite the higher installation cost for the water source proposal, the advantages of this arrangement include:

- Longer service life
- Flexibility for future replacement and modification
- Utilising existing energy infrastructure

7.2. Ceiling cassettes and highwall units

The proposed water source air conditioning upgrade and alternative VRF option would utilise ducted systems. These units allow for improved air conditioning distribution and filtration. Alternative air conditioning indoor units are ceiling cassette and high-wall systems. While these units would reduce the upgrade costs by eliminating the need for distribution ductwork, diffusers, and grilles; the units are not desirable for deployment in patient areas in hospital and health care installations. The VHHSBA guidelines do not recommend the use of ceiling or wall mounted recirculating units because of the cleaning difficulty and potential for buildup of contamination.

7.3. Level and zone diversity

The proposed upgrade of the level 7 AHU will not improve the vertical diversity of the existing system. If improved diversity of the central system is required, this may be achieved by local heating and cooling coils on each level. This upgrade is not considered to be essential as significant improvements to the air conditioning for the ward Block would be achieved by the installation of the proposed local FCU.

7.4. External shading & glazing replacement

The option to consider external shading or glazing upgrade for the building has been considered; however, the reduction in cooling load with these option will not be sufficient to overcome the short fall in the existing indirect cooling for the patient rooms. Glazing replacement to achieve contemporary standards should be included in any future redevelopment of the building.

7.5. Hazmat

The extent of hazardous materials will need to be determined prior to finalising the design documentation. The hazmat register for the LGH would likely identify significant or likely hazardous materials in the Ward Block. The installation contractor would need to manage any know hazardous materials while undertaking the installation works. Any previously unknow hazmat discovered during installation will likely pause construction.
Costs associated with hazmat management are not included in this report or budget estimate, however, some allowances will need to be made to manage this risk.

8. APPENDICES

8.1. Appendix 1 - Limitations

a. This report is based upon a visual inspection of the property and describes its basic construction and state of repair, highlighting the main items requiring repairs, maintenance and replacement. We have not made comment or any structural issues or proposed specific repairs as this is not a building defects or structural defects report and outside the scope of the instruction.

b. We have not inspected those parts of the building or its services which are built in, covered up or otherwise made inaccessible in the normal course of construction or occupation and we are, therefore, unable to state that such parts are free from rot, decay, corrosion or any other defect whatsoever.

c. Except to the extent noted in this report, we have not made enquiries of any statutory authorities concerning the present arrangements within the building or the likely effect of any proposed occupation. We should advise that the complexity of the Building Codes and other statutory enactments can have a material effect on the way in which building may be planned and used and upon the cost on consequential work. It is assumed that professional advice will be sought at the appropriate stage to determine any works which may be necessary due to any planned occupation.

d. We have not, except to the extent mentioned in this report, carried out any tests or made any enquiries concerning particular materials nor have we calculated any floor areas for leasing purposes or reappraised original design criteria.

e. In cases where contractors or consultants are instructed to carry out tests or prepare reports, whilst we will take every care in instructing these contractors or consultants, we cannot accept responsibility for their report and shall not be liable for error or omissions therein. In appointing such contractors or consultants we act only as an agent on behalf of the client, and the contractual rights and obligations lie directly between the client and the relevant contractors or consultants.

f. This report is prepared for the sole use of the intended recipient and ASC can accept no liability for its use by any other party howsoever used. The client shall not be entitled to assign any of its interests in the report (including any report prepared by specialist sub consultants) to any third party without the prior written consent of ASC.

8.2. Appendix 2 – Budget Estimate

All budget estimates presented in this report are high level approximations only. Costs estimates have been prepared using quantity surveying tools applicable to the year of construction and historical information where possible. Construction costs have been interpolated to account for annual fluctuations and CPI inflation where necessary.

SERVICES BUDGET ESTIMATE

Project: LGH Ward Block Air Conditioning Upgrade
Description: Concept design estimate
Job No.: 00725
Revision: 1

ELECTRICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Power				
E01	Pump power supplies	4	each	$630.00	$2,520.00
E02	FCU power supplies	88	each	$265.00	$23,320.00
E03	Alterations to AHU power	1	each	$630.00	$630.00
	Misc				
E04	Isolation of ward lighting	56	each	$220.00	$12,320.00
				Electrical Services Subtotal	**$38,790.00**

MECHANICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	HVAC				
M01	Installation of Ward FCUs (ALEC300)	56	each	$8,800.00	$492,800.00
M02	Ward ductwork, grilles, diffusers & filter (per set)	56	each	$2,750.00	$154,000.00
M03	Installation of staff & clinical FCUs (ALEC300)	32	each	$8,800.00	$281,600.00
M04	Staff & clinical ductwork, grilles, diffusers & filter (per set)	32	each	$3,300.00	$105,600.00
	CHW & HHW Systems				
M05	Chilled water pipework, valves & accessories	208	per m	$363.00	$75,504.00
M06	Heating water pipework, valves & accessories	238	per m	$285.00	$67,830.00
M07	Pipework insulation - mains	446	per m	$112.00	$49,952.00
M08	CHW circulating pumps, including VSDs	2	each	$11,220.00	$22,440.00
M09	HHW circulating pumps, including VSDs	2	each	$8,580.00	$17,160.00
M10	Levels 3-6 CHW pipework, valves & accessories	560	per m	$114.00	$63,840.00
M11	Levels 3-6 HHW pipework, valves & accessories	560	per m	$96.00	$53,760.00
M12	Levels 3-6 CHW pipework insulation	1120	each	$63.00	$70,560.00
	AHU Upgrades				
M13	Replace Level 7 AHU with multi-zone unit	1	each	$165,000.00	$165,000.00
	Misc.				
M14	Controls for ward FCUs	168	per point	$3,000.00	$504,000.00
M15	Controls for staff & clinical FCUs	128	per point	$3,000.00	$384,000.00
M16	Controls for CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M17	Controls for AHU	10	per point	$3,000.00	$30,000.00
M18	Air balancing & commissioning	1	total	$17,600.00	$17,600.00
M19	Workshop drawings	1	total	$40,510.00	$40,510.00
				Mechanical Services Subtotal	**$2,632,156.00**

FIRE SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Fire Detection				
F01	Provision of fire relay to disable FCUs in fire mode	1	each	$3,500.00	$3,500.00
				Fire Services Subtotal	**$3,500.00**

HYDRAULIC SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Drainage				
H01	Condensate drains for FCUs	88	each	$485.00	$42,680.00
				Hydraulic Services Subtotal	**$42,680.00**

SERVICES BUDGET ESTIMATE

PROJECT DETAILS	
Project: LGH Ward Block Air Conditioning Upgrade	**Description:** Concept design estimate
Job No.: 00725	**Revision:** 1

OTHER

Code	Description	Qty	Unit	Rate	TOTAL
A01	Builders work to allow for ceiling access & making good	88	each	$6,000.00	$528,000.00
A02	Builders work for pump installation, main pipework & risers	1	total	$10,000.00	$10,000.00
A03	Staging coordination	10	each	$8,800.00	$88,000.00
A04	Consultancy fees (engineer, architect, building survayor)	1	total	$502,000.00	$502,000.00
A05	Project management fees	1	total	$168,000.00	$168,000.00
A06	Crane lifts (per event)	2	each	$22,000.00	$44,000.00
				Other Subtotal	**$1,340,000.00**

Exclusions

No allowance for council fees associated with plumbing permit
Costs associates with decanting patients
DoH management fees or superintendant services
Upgrades to central heating or cooling plants
No allowance for HAZMAT management

TOTAL *(ex. GST)*	$4,057,126.00
Design & Construction Contingency (10%)	$405,712.60
BUDGET ESTIMATE FOR SERVICES *(ex. GST)*	**$4,462,838.60**

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Monday, 17 February 2025 1:15 PM
To: Dobson, Rachael M
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: P00725L01 LGH Ward Block AC Upgrade Fee Proposal.pdf; Apendix 1 - ASC Fee Estimate MATRIX_120225.pdf; 00725 LGH Ward Block Air Conditioning Upgrade_Rev 3.pdf

Hi Rachael

Great meeting you this morning

Please find attached the latest report and fee proposal

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **| T:** 03 [redacted]

TASMANIAN HEALTH SERVICE Tasmanian Government

From: Brandon Servant <brandon@asceng.com.au>
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted]>; ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

12 February 2025 ASC Reference: **P00725L01**

Department of Health
GPO Box 125
Hobart Tas 7001
Attention: Cameron Matthews

Dear Cameron

We appreciate the opportunity to present our fee proposal for Consulting Engineering Services associated with the project below:

LGH WARD BLOCK & OBSTETRICS AIR CONDITIONING UPGRADE

EXTENT OF PROJECT

The extent of the project is outlined in the ASC report prepared for the Department of Health titled ***Ward Block & Obstetrics Air Conditioning Upgrade*** (revision 3, dated 11th of February 2025) for the Launceston General Hospital.

The scope includes mechanical engineering services for the upgrade and partial replacement of the air conditioning services for Ward Block D and Obstetrics (4O). The deliverables and outcomes include:

- Determination of design parameters collaboratively with the Project Working Group
- Option analysis criteria collaboratively with the Project Working Group
- Refined option analysis
- Concept/schematic design
- Preliminary design
- Detailed design and documentation for tendering
- Technical support throughout the project lifecycle

SCOPE OF CONSULTANCY SERVICE

It is understood that the Department of Health wishes to engage ASC Engineer to provide engineering consultancy services for the Ward Block D and 4O Obstetrics air conditioning upgrade project.

As per the Department's request for sub-consultant management services, we can confirm that our proposal is based on ASC Engineers being engaged as the Principal Consultant with all other nominated consultants or services to be directly engaged and managed by ASC Engineers as the Principal Consultant. A provisional sum for sub-consultant management services has been added to the fee matrix in accordance with this request.

Superintendent and project management services, including change management may be provided directly by the Department of Health.

QUALIFICATIONS

- Documentation and drawing preparation for tender purposes
- Construction drawings shall be limited to tender drawing revisions for the formal contract. The preparation of workshop drawings shall be the responsibility of the successful contractor including the preparation of as built documentation
- Services designs based on NCC Deemed to Satisfy provisions
- Council permits will not be lodged until payment of the associated fee is received in full

EXCLUSIONS

- Project management and superintendent services
- Preparation of workshop drawings, as installed drawing, manuals and co-ordination of services
- REVIT 3D Modelling
- Testing existing fittings for power consumption, power factor and harmonic distortion
- Energy assessments including NABERS

PROJECT TEAM

The following personnel are proposed to participate in the project:

- Andrew Sutherland – Managing Director - Senior Engineer - Project Manager
- Terence Ling – Building Services Engineer – Mechanical and Electrical
- Brandon Servant – Building Services Engineer – Mechanical and Electrical
- Alex Yeung - Project Engineer
- Damian Sieraszewski - Project Engineer

CONSULTANCY SERVICE FEES

Our consultancy services fees are outlined in the attached fee matrix (Appendix 1). The consultancy fees have been prepared on the basis of a blended schedule of rates (SOR) and Fixed Rate as requested.

A breakdown of ASC's fees is provided below:

Engineering Services	Cost (ex GST)
A – Commencement (provisional sum)	$20,675.00
B - Schematic Design (provisional sum)	$46,765.00
C - Design Development	$46,565.00
D - Documentation for Tender	$148,730.00
E - Contract Admin - Construction (provisional sum)	$93,115.00
F - Contract Admin – Practical Completion to Final Completion (provisional sum)	$18,945.00
TOTAL (ex GST)	**$374,795.00**

ASC Engineers reserves the right to review the service fee structure should DOH prefer a partial engagement.

The above service fees:

- Are exclusive of GST and are prepared based on the completion of all components of the project as scheduled.

- Have assumed that the nominated program, extent of project and scope of service is as described above. Should the scope of work and/or nominated trade value vary by more than 15% we reserve the right to revise our service fees accordingly based on the percentage fees nominated or otherwise determined.
- Are valid for 90 days from the date of issue. We reserve the right to revise our service fees accordingly after this period.

ADDITIONAL WORKS

If we are required to perform additional works or to revise our completed documentation our fees for such work will be charged on a time charge basis at hourly rates as stated in the ***Schedule of Time Charges and Additional Services***.

Alternatively, we would be pleased to submit a fixed fee for prescribed additional works.

ADDITIONAL SERVICES

The following highlights some of the additional services which are excluded from the proposal that ASC can provide for a mutually agreed fee should they be required:

- Extension to scope of work
- Upgrading of the existing site services infrastructure
- Site energy audits
- Co-ordination and payment of authority's fees and charges
- Material testing and test report
- Preparation of detailed submissions to authorities for dispensation from regulations
- NABERS assessment
- Project management and superintendents' services
- REVIT 3D Modelling
- Workshop drawings
- As installed drawings and as built manuals

Our proposal allows for us to assist with provision of information to a Building Surveyor to subsequently undertake such tasks.

SCHEDULE OF CHARGES AND ADDITIONAL SERVICES

Engineering Services

Director	$250.00 per hour
Senior Engineer – Project Manager	$220.00 per hour
Senior Engineer – Power Systems	$220.00 per hour
Building Services Engineer	$195.00 per hour
Project Engineer	$175.00 per hour
Engineer - Drafting & Technical Services	$150.00 per hour
Support Staff	$ 95.00 per hour

The above nominated rates exclude GST.
GST will be added at the rate of 10% or other applicable percentage that may be legislated by the Government from time to time.
Our rates will be fixed until 30th June 2025, after which date they may be subject to review.

TERMS OF ENGAGEMENT

COMMENCEMENT OF SERVICES

Fees agreement must be signed and agreed upon prior to the commencement of works.

TERMS OF PAYMENT

30 days from date of invoice.

LIMITATION OF LIABILITY

ASC Engineers is not liable for any indirect or consequential losses or damages (including loss of profit or loss of opportunity) arising from the performance of the services. ASC Engineers' maximum liability to the client arising out of or in accordance with the services and this agreement is the amount of the fee paid by the client to ASC Engineers as at the time such liability arises. ASC Engineers' liability for professional indemnity under this contract shall be limited to $2M or five (5) times the contract fee (whichever is the lesser).

APPROVAL

To the extent there are any inconsistencies between the Consultancy offer and the client brief, the terms of this consultancy's offer are to prevail to the extent of the inconsistency.

I trust that the above Fee Proposal is in line with your expectations and covers the scope of work requested.

Subject to your approval of the Fee Proposal and scope of work outlined, ASC's Quality Assurance ISO 9001:2015 requires confirmation of acceptance of this fee proposal by returning the signed and dated document. This indicates your acceptance of this Fee Proposal and terms of this consultancy offer and authority to commence work.

Signed..... 12/02/2025

Andrew Sutherland | **ASC Engineers**

Signed..... / /

Cameron Matthews | **Department of Health**

Project: **P00725 LGH Ward Block & Obstetrics Air Conditioning Upgrade**

ASC Engineers reserves the right to renegotiate the above fees should the work not be commenced within a reasonable period of time or if the scope of work varies

Andrew Sutherland Consulting Engineers

DEPARTMENT OF HEALTH
LAUNCESTON GENERAL HOSPITAL

Ward Block Air Conditioning Upgrade
274-280 Charles Street, Launceston

Ingineering Pty Ltd ABN 47 056 855 577 trading as
Andrew Sutherland Consulting Engineers
City Mill Building Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T +61 3 6224 2424 F +61 3 6224 2405
E office@asceng.com.au W www.asceng.com.au

Issue: Issue 3
Date: 11 February 2025
Reference: 00725

1. EXECUTIVE SUMMARY

This report has been prepared by ASC Engineers in response to a request from Department of Health to provide an assessment of the Ward Block (D Block) cooling arrangement at the Launceston General Hospital.

The elevated temperatures in Ward Block D during warm summer weather is the result of inadequate cooling capacity and air distribution. There is limited opportunity for improvement without substantial redesign for the upgrade and replacement of the existing facilities.

The proposed scope of works for Ward Block D includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

An additional assessment of the Obstetrics ward (4O) has also been requested by the department. This ward has no air conditioning facilities.

The proposed scope of works for Obstetrics Ward 4O includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (5 off)
- FCU for corridor zone (1 off)
- Controls

The recently upgraded chiller plant is adequately sized to provide cooling for the Ward Block D and Obstetrics; however, additional pipework would be required to utilise the chiller plant capacity.

The estimated cost for the air conditioning upgrade for the Ward Block D and Obstetrics is $4.62 - $5.09M.

2. TABLE OF CONTENTS

2.1. List of Appendices

3. GLOSSARY OF TERMS & TERMINOLOGY

AC	Air Conditioning	HHW	Heating Hot Water
AHU	Air Handling Unit	HVAC	Heating, Ventilation & Air Conditioning
APS	Air Pressure Switch	MSB	Main Switch Board
BCA	Building Code of Australia	NCC	National Construction Code
BMS	Building Management System	PAC	Package Air Conditioning Unit
CHW	Chilled Water	PB	Proportional Band (control point)
DB	Dry Bulb	PID	Proportional Integral Derivative (control)
Deadband	Area between Cooling & Heating stages	RAC	Room Air Conditioning
DP	Differential Pressure	RC	Reverse Cycle
DX	Direct Expansion (refrigeration system)	T	Temperature
EEV	Electronic Expansion (valve)	VAV	Variable Air Volume
EPO	Emergency Power Off	VSD	Variable Speed Drive
FCU	Fan Coil Unit	WB	Wet Bulb

4. INTRODUCTION

This report assesses the existing services and proposed air conditioning upgrades for the following buildings and wards at the Launceston General Hospital:

- Ward Block D
  - Level 3 - Ward 3D
  - Level 4 – Ward 4D
  - Level 5 – Ward 5D
  - Level 6 – Ward 6D
- Block O
  - Level 4 - Obstetrics 4O

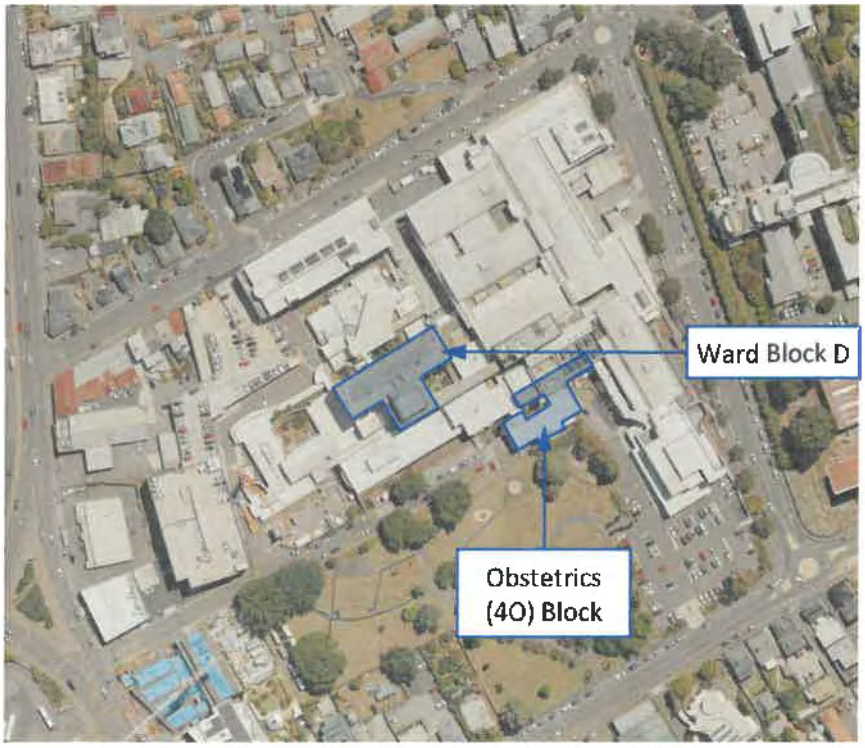

Figure 4.1 – LGH Site Ward Block D & Obstetrics 4O

4.1. Ward Block D

Ward Block D was constructed in 1979 at which time the ambient design conditions were significantly lower than current design parameters. The current design conditions have increased due to elevated summer temperatures. At the time of original construction, the provision of air conditioning for patient rooms was not universally adopted as a necessary design consideration.

Due to these legacy issues with only indirect cooling for the patient rooms, recent hot weather has resulted in excessive indoor temperatures experienced in Ward Block D. The current mechanical services design for this building provides conditioned air only to the corridor spaces, office areas, and nurse stations via a common air conditioning system located in the Level 7/8 plant room. Some supplementary air conditioning units have been provided for special rooms on level 4. As designed, the existing air conditioning system does not have sufficient cooling capacity or adequately sized distribution ductwork to provide satisfactory cooling for the patient rooms.

The temperatures in patient ward areas of Ward Block D at the Launceston General Hospital (LGH) can exceed typical occupancy comfort conditions in warmer months. The patient rooms rely on cool air from the corridors to be drawn into the occupied space via the negative pressure created by the toilet exhaust system. Due to the limited cooling capacity and modest air flow rate created by the toilet exhaust system the arrangement does not provide effective cooling for the patient rooms.

Air conditioning for the corridors is provided by a single cooling coil that serves all levels. This configuration does not allow for any cooling diversity or facility to adjust for varying cooling loads at individual floor levels.

Heating for the wards is provided by resistive (electric) electric heating in individual zones.

4.2. Obstetrics 4O

The 4O Obstetrics ward was constructed in 1995. The facility only has basic facilities for heating and ventilation only with no provisions for cooling.

Patients experience elevated internal temperatures due to solar exposure during the morning and late afternoon. The general corridor receives afternoon solar exposure from the windows in the Chapel courtyard void. Although located on the southern side of the site, the arrangement of the facades results in high solar gain throughout the day resulting in excessively elevated room temperatures.

External shading has been provided for windows on the eastern, western and southern façades. Despite the provision of shading the existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms with measured inside glass surface temperatures recorded as high as 30°C. There is no shading on windows facing the Chapel courtyard.

5. EXISTING AIR CONDITIONING ARRANGEMENT – WARD BLOCK D

Air conditioning for Ward Block D is primarily provided by a single cooling coil and electric re-heat coils for each zone. The schematic below is an extract from the Honeywell BMS that illustrates the existing configuration.

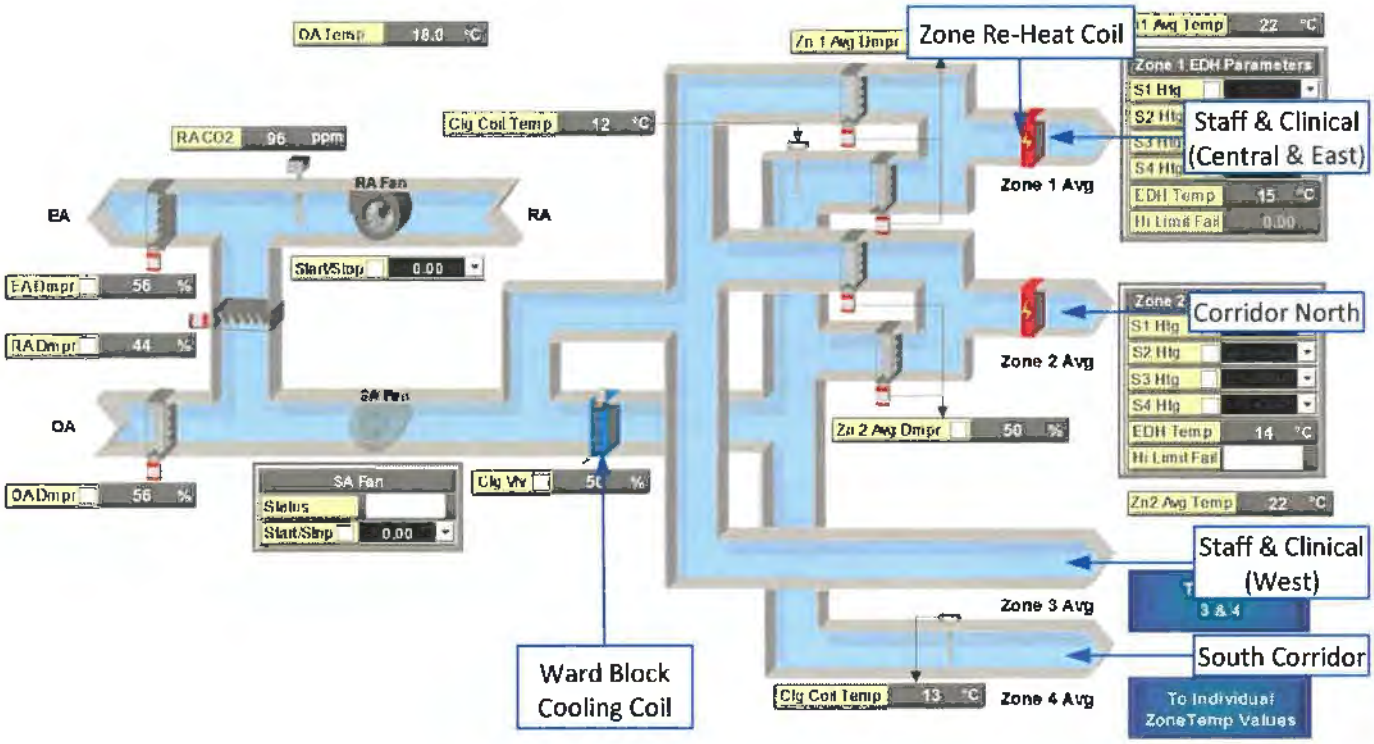

Figure 5.1 – Existing Air Conditioning Schematic

The ward areas rely on air delivered to the corridor to be drawn into the occupied spaces to cool the zones.

Figure 5.2 – Typical Ward Layout (Level 6)

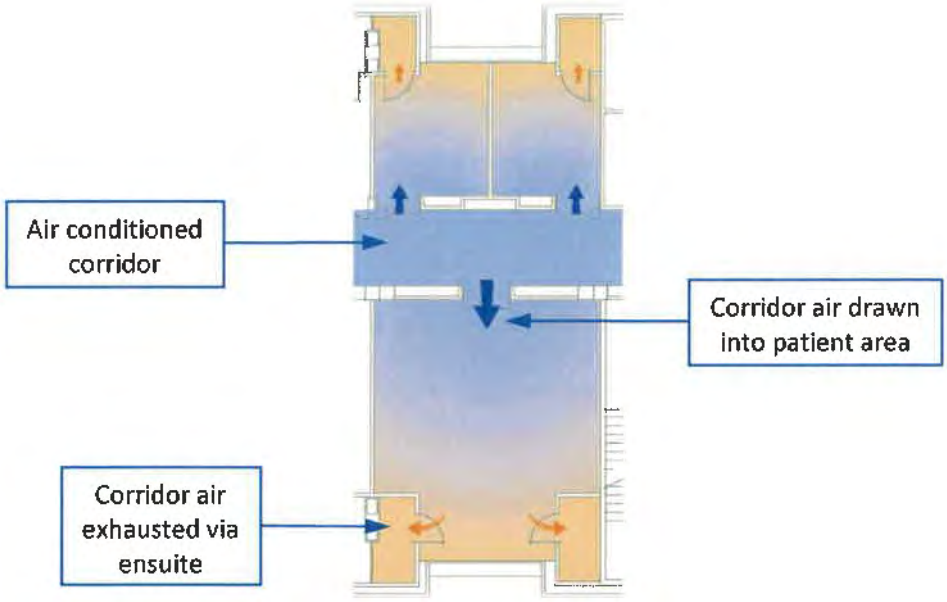

Figure 5.3 – Typical Air Movement Arrangement (indirect cooling to patient rooms)

This configuration does not allow for any variation in the building façade, solar exposure, or vertical diversity.

The existing air flow rate to the patient room is less than 20% of the required air flow rate of conditioned air to meet the patient room cooling requirements

5.1. Existing Cooling Capacity

The installed capacity for the common cooling coil is 206 kW but only has an available capacity in the order of 152 kW because of chilled water flow restrictions in the existing hydraulic network serving this plant.

Preliminary estimation of the cooling load for Ward Block D which has a floor area in the order of 3720 m^2 for the four occupied levels, as summarised below:

Space Type	Area (m^2)
Corridors	560
Large Ward Rooms	1080
Small Ward Rooms & Isolation Rooms	384
Other Clinical & Staff Spaces	1696
TOTAL	**3720**

Design ambient conditions used for this assessment are:

- Summer: 35°C, 49.3% RH
- Winter: -1.5°C

Using a typical average ceiling height of 2.7 meters, and design parameters outlined in the Victorian Health and Human Services Building Authority (VHHSBA), i.e.

- Minimum total air changes per hour (ACPH): 6
- Minimum outdoor ACPH: 2

The peak cooling load is in the order of 330 kW. This suggests there is a cooling capacity shortfall of 178 kW for Ward Block D Level 3 to 6.

6. EXISTING HVAC ARRANGEMENT – OBSTETRICS 4O

Obstetrics Ward 4O has minimal HVAC services. Ventilation for patient spaces is provided via openable windows. This arrangement is unsatisfactory when the ambient outdoor air temperatures are higher than comfortable room temperatures, i.e. ambient temps 24°C and over.

Local heating is provided by heater panels in each room.

Extraction for the patient ensuite amenities is provided by IXL tastic units installed in each suite. These local exhausts are connected to a common duct. The exhaust discharge to atmosphere is via a common exhaust fan. Relief air for the ensuite exhausts is provided by individual transfer air ducts which borrow air from the common corridors. The majority of the corridor spaces are not conditioned.

7. CONCEPT DESIGN – WARD BLOCK D

To address the legacy cooling deficiency for Ward Block D a number of options have been considered in the preparation of this report and recommendations. Based on the consideration of the optimum patient comfort considerations, minimising disruption to the patient area, system efficiency, existing infrastructure, and building restraints the proposed concept design is recommended.

- Provision of cooling and heating to each patient room with individual room control
- Alteration and upgrading of existing ducted air conditioning system to provide floor by floor control
- Upgrading of the level 7/8 air handling system
- Extension of the heating and chilled water pipe work reticulation from the central plant to Ward Block D

The recent refurbishment and expansion of the primary chiller plant (completed 2024) significantly increased the available cooling capacity for the LGH site. Given this available capacity, it would be feasible to provide a dedicated cooling circuit to serve the Ward Block D in addition to the chilled water circuit. Consideration should also be given to improving the heating capacity to the ward spaces.

7.1. Chilled and Heating Water

The source for the chilled and heating water supplies would be the main chiller plant and boiler plants. New pipework would be routed externally from the respective plants to the Ward Block D.

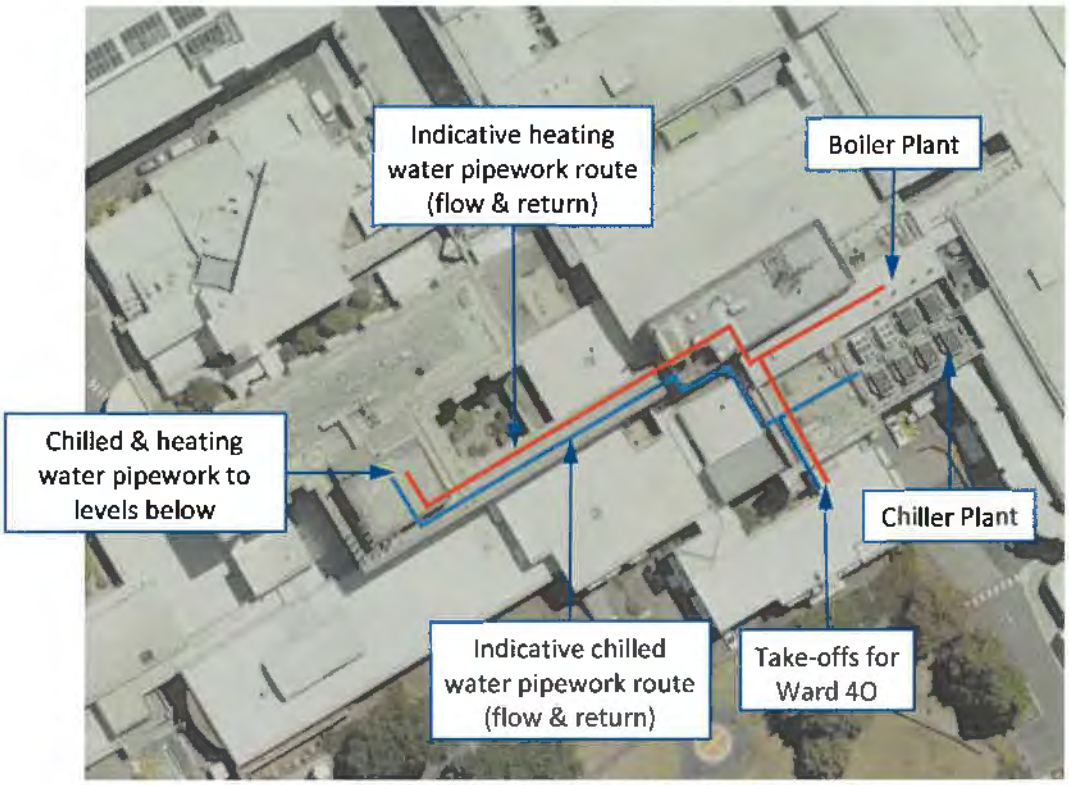

Figure 7.1.1 – Proposed Chiller & Heating Water Pipework Route

New chilled and heating water circulating pumps would need to be provided. The indicative location for this equipment would be the Ward Block D roof plantroom. All new pipework would need to be externally clad where exposed to weather and insulated to comply with current NCC requirements.

It is expected that the existing chilled water pipework serving the level 7 air handling unit (AHU) would be preserved. New heating water pipework would be required in the level 7 plantroom to facilitate the replacement of the existing AHU and to provide new heating water coils in lieu of the electric heaters currently installed.

The flow and return pipework would be routed down the Ward Block D services riser shaft, with take-offs at each level. Each floor would have a flow and return loop to allow for individual fan coil units to be installed in each patient space.

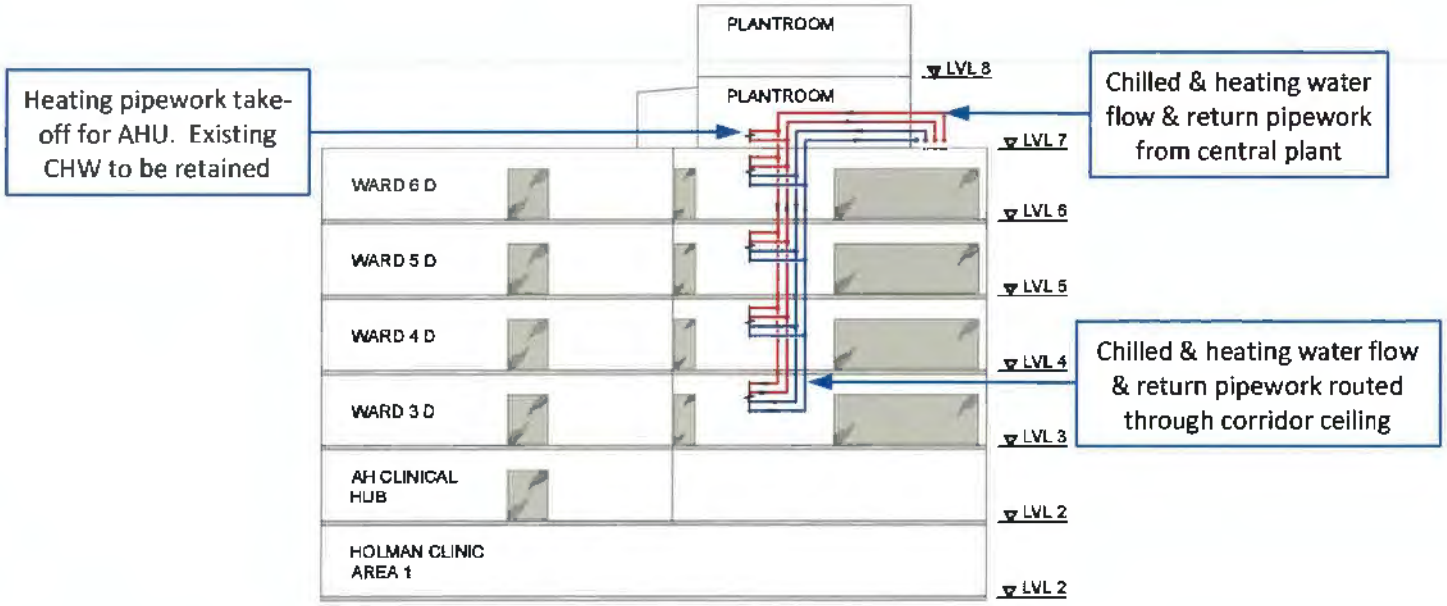

Figure 7.1.2 – Indicative Chilled & Heating Water Pipework (Section)

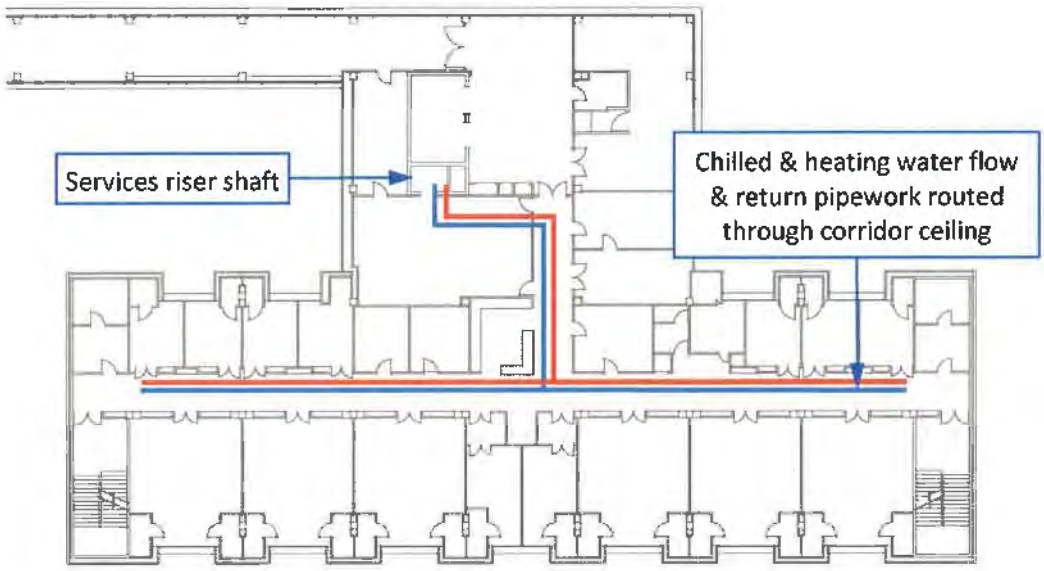

Figure 7.1.3 – Indicative Chilled & Heating Water Pipework (Layout)

7.2. Patient Rooms

Each patient room would be fitted with a chilled water cooled and hot water heated FCU. These would be installed in the ceiling space within each room. This arrangement is commonly utilised for modern hotel apartments and relies on ventilation from a common source, with heating and cooling provided locally within the occupied space. This configuration would preserve the existing corridor air conditioning and ensuite exhaust and provide individual room control for the patient rooms

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary. The figure below shows an indicative section of the proposed installation in the ward areas.

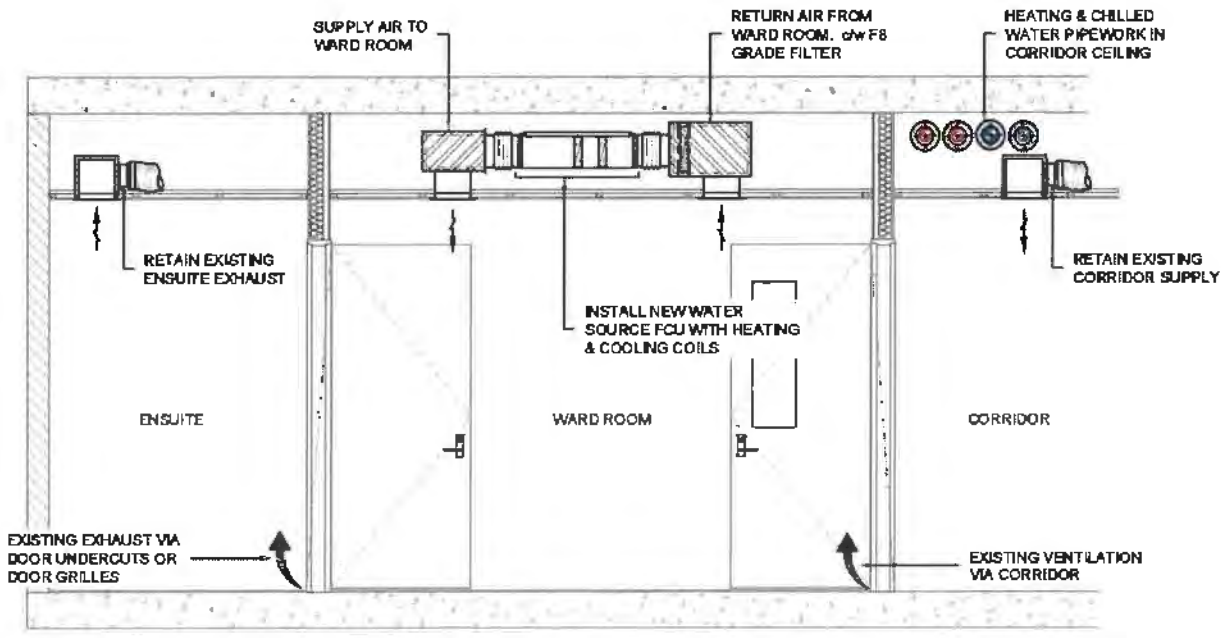

Figure 7.2.1 – Typical Room Section

Figure 7.2.2 – Typical Water Source FCU

The indicative FCU selection would be a GJ Walker ALEC unit or similar. There are four models in this product range, with total cooling capacities between 5.7 to 31.2 kW. It would be expected that the smallest ALEC300 unit would be satisfactory for each ward room. The estimated total cooling capacity for a large north facing ward rooms is 3.0-3.5 kW

An alternative water sources FCU selection would be the Temperzone IMDY series. The Temperzone unit are similarly sized and offer comparable capacities.

Alternatively, Temperzone have a low-profile range (IMDL-Y). This range offers similar cooling capacities as the deeper unit; however, the heating capacities are significantly less, and the fan static pressure may not be suitable if high efficiency F8 filtration is used.

The proposed FCUs are 4 pipe units to avoid the potential for heating and chilled water interconnection which can occur with two pipe units and change over valve arrangements.

7.3. Staff & Clinical FCUs

In addition to the proposed air conditioning upgrades for patient areas, the provision of heating and cooling alterations for staff and clinical spaces air conditioning system should be implemented to improve comfort conditions, system efficiency and reduce running costs. The extent of alteration, zoning, and floor by floor control will be influenced by existing system and building restraints and would be resolved in the design development.

7.4. Level 7 AHU Replacement

It is recommended that as part of the Ward Block D air conditioning upgrade that the Level 7 AHU be replaced for the following reasons:

- AHU has exceeded it expected service life, the unit has been in operation since 1979 (46 years)
- The use of electric heating is not efficient
- Zones 3 (west staff areas) and 4 (south corridor) do not have any heating capacity

This would have a significant impact on the air conditioning and ventilation for the building. To mitigate the impact caused by the AHU replacement this work should be undertaken when the air conditioning for the ward areas has been completed.

7.5. Controls

The LGH runs a Honeywell EBI BMS. This BMS governs the operation of mechanical services across the LGH site. While ensuring the new Ward Block D cooling systems are included in the existing BMS, this control strategy is costly to implement. The extent of the control functionality would require careful consideration to determine the level of control required to ensure satisfactory operation. The minimum control arrangement for each FCU would include:

- Cooling coil valve position
- Heating coil valve position
- Room temperature

Controls for any staff area FCUs will also need to include dedicated start/stop signals. This could either be on a time clock arrangement, or via a local control panel to allow for manual input.

In addition to the controls for the FCU systems, all new chilled and heating water pumps would require BMS control to govern their operation. This would include:

- VSD speed control for heating and chilled water transfer pumps
- VSD fault
- System pressure differential (cooling and heating)
- Start/stop, this would also govern duty/standby and changeover

Start and stop operation could be consolidated to group FCUs together to create zones, i.e. north and south. The following additional control and monitoring points could be considered; however, they are not considered essential for operation of the systems:

- FCU general fault
- Filter pressure drop
- Fan speed
- Chilled and heating water flow temperatures
- Chilled and heating water return temperatures

The replacement of the AHU would require a number of control point to ensure satisfactory operation. The points would include:

- AHU enable
- Fan VSD speed
- Filter pressure drop
- Zone supply air temperature (4 off)
- Cooling coil valve position (4 off)
- Heating coil valve position (4 off)
- Fan fault fault/flow switch

It is expected that the following points would already be available on the BMS and be retained to provide control functionality for the new systems:

- Ambient temperature
- Exhaust air damper position
- Outside air damper position
- Return air damper position
- Exhaust CO_2 level

7.6. Staging

The department of health has indicated that the Ward Block D air conditioning upgrade would need to be completed prior to the summer season 2025. This would require the design and documentation phase to commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

It is expected that FCU and AHU procurement would be 12-16 weeks from date of order. Other essential procurement elements would be:

- Circulating pumps
- Pipework, valves and accessories
- Ductwork, diffusers and grilles
- Insulation
- Controls and field devices

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least 50% of each level is decanted to minimise hoarding requirements and excessive staging coordination.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the Ward Block D. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to the Ward Block D
2. Installation of circulating pumps and associated controls
3. Running pipework down the services riser. Providing take-off branches at each level
4. Commissioning of circulating pumps and controls
5. Ward work – eight stages (levels 3-6, east and west zones)
    a. Installation of chilled and heating water pipework through corridor
    b. Installation of FCUs in ward rooms
    c. FCU controls
    d. Commissioning of FCUs and control
6. Level 7 AHU replacement

8. CONCEPT DESIGN – OBSTETRICS WARD 4O

The proposed air conditioning upgrade for Obstetrics Ward 4O is similar to the proposal for Ward Block D; however, the available ceiling space would allow for larger FCUs to service multiple spaces. The chilled and heating water supply would be a set of branch take-offs from the new proposed pipework serving Ward Block D. The circulating pumps would likely be installed on the roof near the branch take-offs in a space that would be convenient for maintenance.

8.1. Patient Areas

Given the arrangement of the patient rooms in Obstetrics, areas could be grouped to be air conditioned by common chilled water cooled and hot water FCUs. These would be installed in the ceiling space above a nominated room, or in the corridor if there is sufficient space. This configuration would preserve the existing air conditioning for other areas, and ensuite exhaust and provide grouped or averaged temperature control for the patient rooms.

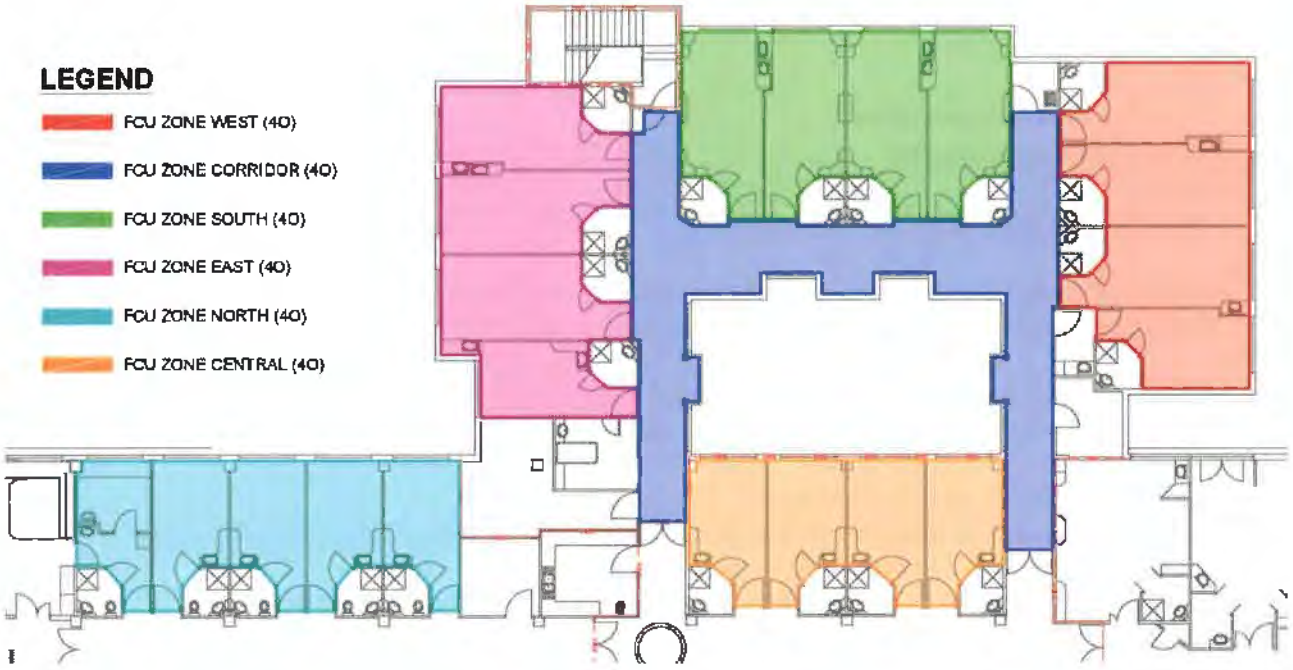

Figure 8.1 – Proposed FCU zoning for Obstetrics 4O

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary.

To avoid the reliance on openable windows for ventilation to the patient areas, dedicated outdoor air applies would need to be included in the installation. It is envisioned that ventilation for the zones would be:

- Individual roof cowls for zones:
  - Zone West (4O)
  - Zone South (4O)
  - Zone East (4O)
  - Corridor (4O)
- Weather louvre through external wall for zones:
  - Zone North (4O)
  - Zone Central (4O)

It is expected that the fire compartment arrangement for the FCU central zone will require a fire damper.

The preliminary air conditioning load estimates for the Obstetrics 4O ward areas are as follows:

Zone	Total Cooling Load (kW)	Heating Load (kW)	Ventilation Rate (l/s)
West (4O)	7.0	7.3	140
South (4O)	7.6	7.9	150
East (4O)	7.2	7.6	145
Central (4O)	5.4	5.6	105
Corridor (4O)	8.6	9.0	170
North (4O)	6.7	7.1	135
TOTAL	42.5	44.5	845

Other than the corridor zone shown in Figure 8.1, other staff and clinical areas would retain their existing HVAC services.

8.2. Controls

The proposed controls would be similar to the proposal for the Ward Block D; however, averaged temperature monitoring would be required due to the zoned arrangement.

8.3. Staging

The proposed works for Obstetrics 4O would need to run concurrently with the staging for Ward Block D if it is desirable to have the works completed prior to the summer season 2025.

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least zone groups are made available for installation of the mechanical services.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the Obstetrics Ward. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to Obstetrics 4O
2. Installation of circulating pumps and associated controls
3. Installation of chilled and heating water pipework through the corridor
4. Commissioning of circulating pumps and controls
5. Ward work – six stages (levels 3-6, east and west zones)
    a. Installation of FCUs in ward rooms
    b. FCU controls
    c. Commissioning of FCUs and control

9. BUDGET ESTIMATES

The estimated cost for the Ward Block D and Obstetrics Ward 4O air conditioning upgrades would be between $4.62 - $5.09M. A detailed summary of the budget estimate in included in Appendix 2. The budget estimate includes the following:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas in Ward Block D (56 off)
- FCUs for staff and clinical areas in Ward Block D (32 off)
- FCUs for the Obstetrics Ward 4O patient areas (5 off)
- FCU for the Obstetrics Ward 4O corridor zone (1 off)
- Ward Block D Level 7 AHU replacement
- Controls
- Staging allowances
- Consultancy fees (Engineering, Architect, Building surveyor)
- Project management fees
- Design and construction contingency (10%)

10. OTHER CONSIDERATIONS

The following items were considered in the preparation of this upgrade proposal.

10.1. Refrigerant based systems

Local refrigerant based (direct expansion) systems were considered as an alternative to the water source proposal. The systems include:

- Variable refrigerant flow (VRF) heat pump
- VRF Heat recovery
- Hybrid VRF systems

VRF heat pumps and heat recovery systems rely on indoor air conditioning units connected to dedicated outdoor units. The primary issue with this arrangement is refrigerant concentration. The systems need to be designed so that a refrigerant leak does not result in a major toxic or fire hazard risk. As a consequence of managing refrigerant

concentration, smaller VRF groupings are required. These systems also have a shorter service life compared with water source systems. Replacement parts are not typically available beyond 10-15 years from the date of installation. Failure of a few indoor units or an outdoor unit may result in the entire system needing replacement.

Hybrid systems distribute heating and chilled water to the local indoor units. The refrigerant connection is between the outdoor unit and distribution branch box. This arrangement mitigates the issues of refrigerant concentration. Hybrid systems have a similar service life as VRF systems and are challenging to maintain beyond 10-15 years when manufacturers no longer support obsolete systems.

The initial installation costs of VRF and hybrid systems would likely be less than the water source alternative. This is primarily due to the cost of the much larger heating and chilled water pipework. Despite the higher installation cost for the water source proposal, the advantages of this arrangement include:

- Longer service life
- Flexibility for future replacement and modification
- Utilising existing energy infrastructure

10.2. Ceiling cassettes and highwall units

The proposed water source air conditioning upgrade and alternative VRF option would utilise ducted systems. These units allow for improved air conditioning distribution and filtration. Alternative air conditioning indoor units are ceiling cassette and high-wall systems. While these units would reduce the upgrade costs by eliminating the need for distribution ductwork, diffusers, and grilles; the units are not desirable for deployment in patient areas in hospital and health care installations. The VHHSBA guidelines do not recommend the use of ceiling or wall mounted recirculating units because of the cleaning difficulty and potential for buildup of contamination.

10.3. Level and zone diversity

The proposed upgrade of the Ward Block D level 7 AHU will not improve the vertical diversity of the existing system. If improved diversity of the central system is required, this may be achieved by local heating and cooling coils on each level. This upgrade is not considered to be essential as significant improvements to the air conditioning for Ward Block D would be achieved by the installation of the proposed local FCU.

10.4. External shading & glazing replacement – Ward Block D

The option to consider external shading or glazing upgrade for the building has been considered; however, the reduction in cooling load with these options will not be sufficient to overcome the short fall in the existing indirect cooling for the patient rooms. Glazing replacement to achieve contemporary standards should be included in any future redevelopment of the building.

10.5. Maintenance

The proposed air conditioning upgrade will require additional maintenance activities to ensure the equipment and services meet the design performance requirements. Maintenance of the equipment is essential to minimise failure and ensuring long service life. The maintenance activities for mechanical services are generally outlined in AIRAH guidelines DA19; however, equipment manufacturers will also nominate specific service and maintenance requirements. A list of generic maintenance activities and intervals is included in appendix 3 for the following equipment:

- Fan coil units
- Filters
- Circulating pumps
- Controls

10.6. Hazmat

The extent of hazardous materials will need to be determined prior to finalising the design documentation. The hazmat register for the LGH would likely identify significant or likely hazardous materials in Ward Block D and Obstetrics. The installation contractor would need to manage any known hazardous materials while undertaking the installation works. Any previously unknown hazmat discovered during installation will likely pause construction.

Costs associated with hazmat management are not included in this report or budget estimate; however, some allowances will need to be made to manage this risk.

11. RECOMMENDATIONS

Due to the urgency of the air conditioning upgrade the design and documentation phase must commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

The proposed scope of works for Ward Block D includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

The proposed scope of works for Obstetrics Ward 4O includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (5 off)
- FCU for corridor zone (1 off)
- Controls

12. APPENDICES

Appendix 1 – Limitations

a. This report is based upon a visual inspection of the property and describes its basic construction and state of repair, highlighting the main items requiring repairs, maintenance and replacement. We have not made comment or any structural issues or proposed specific repairs as this is not a building defects or structural defects report and outside the scope of the instruction.

b. We have not inspected those parts of the building or its services which are built in, covered up or otherwise made inaccessible in the normal course of construction or occupation and we are, therefore, unable to state that such parts are free from rot, decay, corrosion or any other defect whatsoever.

c. Except to the extent noted in this report, we have not made enquiries of any statutory authorities concerning the present arrangements within the building or the likely effect of any proposed occupation. We should advise that the complexity of the Building Codes and other statutory enactments can have a material effect on the way in which building may be planned and used and upon the cost on consequential work. It is assumed that professional advice will be sought at the appropriate stage to determine any works which may be necessary due to any planned occupation.

d. We have not, except to the extent mentioned in this report, carried out any tests or made any enquiries concerning particular materials nor have we calculated any floor areas for leasing purposes or reappraised original design criteria.

e. In cases where contractors or consultants are instructed to carry out tests or prepare reports, whilst we will take every care in instructing these contractors or consultants, we cannot accept responsibility for their report and shall not be liable for error or omissions therein. In appointing such contractors or consultants we act only as an agent on behalf of the client, and the contractual rights and obligations lie directly between the client and the relevant contractors or consultants.

f. This report is prepared for the sole use of the intended recipient and ASC can accept no liability for its use by any other party howsoever used. The client shall not be entitled to assign any of its interests in the report (including any report prepared by specialist sub consultants) to any third party without the prior written consent of ASC.

Appendix 2 – Budget Estimate

All budget estimates presented in this report are high level approximations only. Costs estimates have been prepared using quantity surveying tools applicable to the year of construction and historical information where possible. Construction costs have been interpolated to account for annual fluctuations and CPI inflation where necessary.

SERVICES BUDGET ESTIMATE

PROJECT DETAILS

Project: LGH Ward Block Air Conditioning Upgrade
Description: Concept design estimate
Job No.: 00725
Revision: 2

ELECTRICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Power				
E01	Pump power supplies	8	each	$630.00	$5,040.00
E02	FCU power supplies	94	each	$265.00	$24,910.00
E03	Alterations to AHU power	1	each	$630.00	$630.00
	Misc.				
E04	Isolation of ward lighting	94	each	$220.00	$20,680.00
				Electrical Services Subtotal	**$51,260.00**

MECHANICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	HVAC				
M01	Installation of Ward Block FCUs (ALEC300)	56	each	$8,800.00	$492,800.00
M02	Ward Block ductwork, grilles, diffusers & filter (per set)	56	each	$2,750.00	$154,000.00
M03	Installation of Ward Block staff & clinical FCUs (ALEC300)	32	each	$8,800.00	$281,600.00
M04	Ward Block clinical ductwork, grilles, diffusers & filter (per set)	32	each	$3,300.00	$105,600.00
M05	Installation of Obstetrics FCUs (ALEC500)	6	each	$9,900.00	$59,400.00
M06	Obstetrics ductwork, grilles, diffusers & filter (per set)	6	each	$5,500.00	$33,000.00
M07	Obstetrics roof cowls & ductwork	4	each	$1,220.00	$4,880.00
M08	Obstetrics weather louvres & O/A duct	2	each	$610.00	$1,220.00
M09	Obstetrics fire damper	1	each	$1,050.00	$1,050.00
	CHW & HHW Systems				
M10	Primary chilled water pipework, valves & accessories	20	per m	$436.00	$8,720.00
M11	Primary heating water pipework, valves & accessories	20	per m	$363.00	$7,260.00
M12	Primary pipework insulation	40	per m	$228.00	$9,120.00
M13	Ward D chilled water pipework, valves & accessories - mains	188	per m	$363.00	$68,244.00
M14	Ward D heating water pipework, valves & accessories - mains	218	per m	$285.00	$62,130.00
M15	Ward D pipework insulation - mains	406	per m	$189.00	$76,734.00
M16	Obstetrics CHW water pipework, valves & accessories - mains	54	per m	$204.00	$11,016.00
M17	Obstetrics HHW water pipework, valves & accessories - mains	54	per m	$134.00	$7,236.00
M18	Obstetrics pipework insulation - mains	108	per m	$141.00	$15,228.00
M19	Ward D CHW circulating pumps, including VSDs	2	each	$11,220.00	$22,440.00
M20	Ward D HHW circulating pumps, including VSDs	2	each	$8,580.00	$17,160.00
M21	Obstetrics CHW circulating pumps, including VSDs	2	each	$5,775.00	$11,550.00
M22	Obstetrics HHW circulating pumps, including VSDs	2	each	$5,775.00	$11,550.00
M23	Levels 3-6 CHW pipework, valves & accessories	560	per m	$114.00	$63,840.00
M24	Levels 3-6 HHW pipework, valves & accessories	560	per m	$96.00	$53,760.00
M25	Levels 3-6 CHW pipework insulation	1120	per m	$63.00	$70,560.00
M26	Obstetrics CHW pipework, valves & accessories	100	per m	$114.00	$11,400.00
M27	Obstetrics HHW pipework, valves & accessories	100	per m	$96.00	$9,600.00
M28	Obstetrics CHW pipework insulation	200	per m	$75.00	$15,000.00
	AHU Upgrades				
M29	Replace Level 7 AHU with multi-zone unit	1	each	$165,000.00	$165,000.00
	Misc.				
M30	Controls for Ward Block FCUs	168	per point	$3,000.00	$504,000.00
M31	Controls for Ward Block staff & clinical FCUs	128	per point	$3,000.00	$384,000.00
M32	Controls for Ward Block CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M33	Controls for Ward Block AHU	10	per point	$3,000.00	$30,000.00
M34	Controls for Obstetrics FCUs	24	per point	$3,000.00	$72,000.00
M35	Controls for Obstetrics CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M36	Air balancing & commissioning	1	total	$28,160.00	$28,160.00
M37	Workshop drawings	1	total	$46,280.00	$46,280.00
				Mechanical Services Subtotal	**$2,987,538.00**

SERVICES BUDGET ESTIMATE

PROJECT DETAILS	
Project: LGH Ward Block Air Conditioning Upgrade	**Description:** Concept design estimate
Job No.: 00725	**Revision:** 2

FIRE SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Fire Detection				
F01	Provision of fire relay to disable FCUs in fire mode	2	each	$3,500.00	$7,000.00
				Fire Services Subtotal	**$7,000.00**

HYDRAULIC SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Drainage				
H01	Condensate drains for FCUs	94	each	$485.00	$45,590.00
				Hydraulic Services Subtotal	**$45,590.00**

OTHER

Code	Description	Qty	Unit	Rate	TOTAL
A01	Builders work to allow for ceiling access & making good	94	each	$6,000.00	$564,000.00
A02	Builders work for pump installation, main pipework & risers	2	total	$10,000.00	$20,000.00
A03	Staging coordination	16	each	$8,800.00	$140,800.00
A04	Consultancy fees (engineer, architect, building surveyor)	1	total	$611,000.00	$611,000.00
A05	Project management fees	1	total	$153,000.00	$153,000.00
A06	Crane lifts (per event)	2	each	$22,000.00	$44,000.00
				Other Subtotal	**$1,532,800.00**

Exclusions

No allowance for council fees associated with plumbing permit
Costs associates with decanting patients
DoH management fees or superintendent services
Upgrades to central heating or cooling plants
No allowance for HAZMAT management

TOTAL *(ex. GST)*	$4,624,188.00
Design & Construction Contingency (10%)	$462,418.80
BUDGET ESTIMATE FOR SERVICES *(ex. GST)*	**$5,086,606.80**

Appendix 3 – Maintenance Activities & Intervals

The following equipment maintenance sheets outline the recommendations for preventative maintenance frequency and procedures which should be adopted by the Principal to ensure the most efficient operation of the systems installed.

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
FAN COIL UNITS (FCU)

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Inspect drain trays, ensure drains are clear, trays are clean and drains have a water trap in them.	●			
Switch system back to 'normal' and check that all equipment is in the correct designated mode.		●		
Check for leaks in coils and piping connections. Record and report any leaks.			●	
Check panels, doors and fastenings for security. Record and report any leaks.			●	
Ensure insulation is secure, record/report as necessary.			●	
Inspect flexible connections and record/report as necessary.			●	
Inspect the casing for corrosion and leaks, record/report as necessary.				●

NOTES

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
FILTERS - DRY MEDIA AND PANEL FILTERS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Inspect system filters and determine if maintenance is required.	●			
Advance roll filters when resistance exceeds the design amount.	●			
Check roll filters have adequate media.	●			
Clean dry media regenerable filters when resistance exceeds the design amount.	●			
Clean washable filters when resistance exceeds the design amount. (The design maximum resistance may be less than the filter rated pressure drop).	●			
Order new filters or filter media if required for next service.	●			
Record and report on replacement of flat disposable panel filters when resistance exceeds the design amount.	●			
Record and report on replacement of extended surface panel filters, sock or deep bed filters when resistance is more than the design amount.	●			
Record and report on replacement of HEPA filters when resistance is more than the design amount.	●			
Check for air leakage around media, ensure that media edge is in the channel provided.		●		
Ensure that media is not disintegrating or delaminating.		●		
On plants over 500 l/s take pressure reading across filter		●		
On units less than 500 L/s, visually inspect filters. Clean as specified and as necessary (at least every three months).		●		
Vacuum filter chamber and inlet screens after each filter change.		●		
Check zero setting on manometer.			●	
Lightly lubricate filter drives and check operation.			●	
Inspect HEPA filters (after any maintenance) and test for media or gasket leaks.				●

NOTES

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
PUMPS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Adjust belt tension as necessary, check for wear.	●			
Change over duty pump, where fitted.	●			
Check guards are securely in place.	●			
Check pump and motor for vibration and bearings for noise or overheating. Repair as necessary.	●			
Check that gland well and drains are clear.	●			
If pressure gauges fitted, check operating pressures to ensure strainer is clear and pump vented.	●			
Inspect pump gland and adjust if necessary.	●			
Operate pump suction and discharge valves stop any gland leaks.	●			
Vent Pump.	●			
Visually inspect pump coupling.	●			
Where fitted, check operation of automatic float switch, adjust as necessary.	●			
Lightly grease bright steel.		●		
With pump running lightly lubricate bearings of pump and motor.		●		
Clean and, as necessary, reseat check valves.			●	
Check coupling bushes for wear, if worn record/report and isolate equipment. Motor may need alignment.				●
Clean pump strainer.				●
Inspect exposed surfaces for corrosion, minor repair or paintwork as necessary.				●

NOTES
Replace belts and check motor alignment and couplings as applicable - 36 months

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
AUTOMATIC & SAFETY CONTROLS - ELECTRIC, ELECTRONIC AND DDC CONTROLS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Attend to any reported problems, check and adjust as necessary.	●			
Check temperatures on floors, in rooms or in any areas requiring special conditions.	●			
Check controls for physical damage.		●		
Check location of thermostats, ensure correct location relative to controlled area.		●		
Check operation of control linkages on dampers and valves.		●		
Check & adjust, as necessary, the calibration of principal control sensors.			●	
Check, clean and lubricate with approved lubricant, spindles & linkages.			●	
Check remaining hard disk capacity on BMS PCs			●	
Backup all DDC files.			●	
Check action and settings of time switches.				●
Check drive motor mountings for security.				●
Check linkages for tightness.				●
Check operation of each thermostat for response.				●
Check calibration and condition of general control and monitoring sensors.				●
Check that loading devices function correctly and plant items respond as called.				●
Inspect all controls for operation & cleanliness.				●
Inspect all DDC systems and data gathering panels.				●
Prove correct operation of any safety controls.				●
Check communication between BMS and DDC controllers				●
In conjunction with mechanical services contractor check operation of VAV boxes				●
Building control				
Verify and review operation and settings of control loops, set points, dead bands, overrides, offsets, time and holiday schedules, optimised start/stop, early morning warm-up, economy cycle, duty/standby points, hours run meters, and energy and water meters.			●	
Check that temperatures/relative humidities/CO2 concentrations are maintained within the design intentions of the building.			●	
Check historical trend and event logs.			●	
Check BMS displays are indicating correctly.				●

NOTES

Attachment 1: RFT Fee Matrix Form

Location:	**LGH Ward Block & Obstetrics Air Conditioning Upgrade**
Nominated construction budget:	**$5,086,607**
Date:	**12/02/2025**

Principal Consultant name: ASC Engineers		Fee as % of construction cost, Schedule of Rates (SOR) or Estimate (EST.)	Phase A Project Definition /Brief	Phase B Schematic Design	Phase C Design Development	Phase D Documentation and tender	Phase E Construction Supervision	Phase F Practical Completion to Final Completion	Totals (GST exclusive)		Hourly Rates (GST exclusive)			
									%	Sum	Senior	Engineer	Project	Other
CONSULTANT SERVICES (including subconsultants)														
Services	ASC Engineers				$ 46,565.00	$ 148,730.00				**$195,295.00**	$220.00	$195.00	$175.00	$150.00
Acoustics	NVC													
Quantity Surveyor	WT Partners													
Architectural	Artas													
Structural	Pitt & Sherry													
Building Surveyor	Pitt & Sherry													
Travel Dispersements														
SUB TOTAL A			**$ -**	**$ -**	**$ 46,565.00**	**$ 148,730.00**	**$ -**	**$ -**		**$195,295.00**				
OPTIONAL SERVICES														
ESD consultant	(TBC)													
Site Survey	PDA	EST		$18,200.00						**$18,200.00**				
Architectural 3D Modelling	Artas	EST		$24,200.00						**$24,200.00**				
Ductwork inspections	(TBC)	EST		$9,100.00						**$9,100.00**				
Post occupancy review	ASC Engineers	SOR (EST.)					$24,000.00			**$24,000.00**	$220.00	$195.00	$175.00	$150.00
Reuse/recycling materials	(TBC)													
Other														
SUB TOTAL B			**$ -**	**$ 51,500.00**	**$ -**	**$ -**	**$ 24,000.00**	**$ -**		**$ 75,500.00**				
PROVISIONAL SUM **Estimated cost based on schedule of rates. Budget estimates only**														
Services	ASC Engineers	SOR (EST.)	$ 20,675.00	$ 46,765.00			$ 93,115.00	$ 18,945.00		**$ 179,500.00**	$220.00	$195.00	$175.00	$150.00
Acoustics	NVC	EST.		$2,500.00	$3,700.00	$6,100.00				**$ 12,300.00**				
Quantity Surveyor	WT Partners	EST.		$2,500.00		$4,900.00				**$ 7,400.00**				
Architectural	Artas	EST.		$9,100.00	$10,900.00	$30,300.00	$8,500.00			**$ 58,800.00**				
Structural	Pitt & Sherry	EST		$4,900.00	$6,100.00	$10,900.00	$3,700.00			**$ 25,600.00**				
Building Surveyor	Pitt & Sherry	EST.		$3,700.00		$3,700.00				**$ 7,400.00**				
Project Management	DoH/Rare	EST.		$4,590.00	$7,650.00	$10,710.00	$122,400.00	$7,650.00		**$ 153,000.00**				
Town Planner	MC Planners	EST.				$8,500.00				**$ 8,500.00**				
Statutory approvals		EST.	$6,100.00	$6,100.00		$18,200.00				**$ 30,400.00**				
Travel Dispersements		EST.	$ 704.00	$704.00	$704.00	$1,760.00	$4,576.00	$1,760.00		**$ 10,208.00**				
SUB TOTAL C			**$ 27,479.00**	**$ 80,359.00**	**$ 29,054.00**	**$ 95,070.00**	**$ 232,291.00**	**$ 28,355.00**		**$ 493,108.00**				
TOTAL A+B+C	**Transfer to Lump Sum Price**		**$ 27,479.00**	**$ 132,359.00**	**$ 75,619.00**	**$ 243,800.00**	**$ 256,291.00**	**$ 28,355.00**		**$ 763,903.00**				

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Monday, 17 February 2025 1:15 PM
To: Dobson, Rachael M
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 Gantt Chart_DRAFT_120225.pdf

Hi Rachael

Attached is the proposed timeline

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] **T:** [redacted]

From: Matthews, Cameron T
Sent: Wednesday, 12 February 2025 11:31 AM
To: Perrott, John [redacted]>
Cc: Toon, Shane A <[redacted]
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

HI John

Please see attached gannt chart. Our only comments are that the program starts in 6D in April but the patients won't be decanted to the Hub by then (unless someone forces the patients to be transferred to other facilities in the interim e.g. District Hospitals, Calvary etc).

Also we would recommend that the sections of the corridors in Ward 4O are undertaken at the same time with the adjoining sections of patient rooms. We don't believe it is feasible to shut the corridor without shutting the patient rooms due to the limited width of the corridors.

Are you able to assist by responding to the queries below?

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** [redacted]

From: Brandon Servant <brandon@asceng.com.au>
Sent: Wednesday, 12 February 2025 9:52 AM
To: Toon, Shane A <[redacted] Matthews, Cameron T <[redacted]
Cc: Andrew Sutherland <[redacted]>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron & Shane,

Please see the attached draft program. At this stage it's looking like the works in the patient areas will push into February 2026. I've nominated the AHU replacement to occur once all patient rooms are done. Would there be any issues if we began discussions with a mechanical services contractor to determine if this can be condensed?

Andrew would also like to bring a representative to the site inspection on Friday, can you please let us know if there are any issues with this?

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Brandon Servant
Sent: Tuesday, 11 February 2025 3:44 PM
To: Toon, Shane A <[redacted] Matthews, Cameron T <[redacted]
Cc: Andrew Sutherland <[redacted]>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Shane & Cameron,

Thanks for taking the time earlier this afternoon to discuss the project. As discussed, we will aim to get a draft program out by tomorrow. Andrew will arrange a time to conduct a site inspection.

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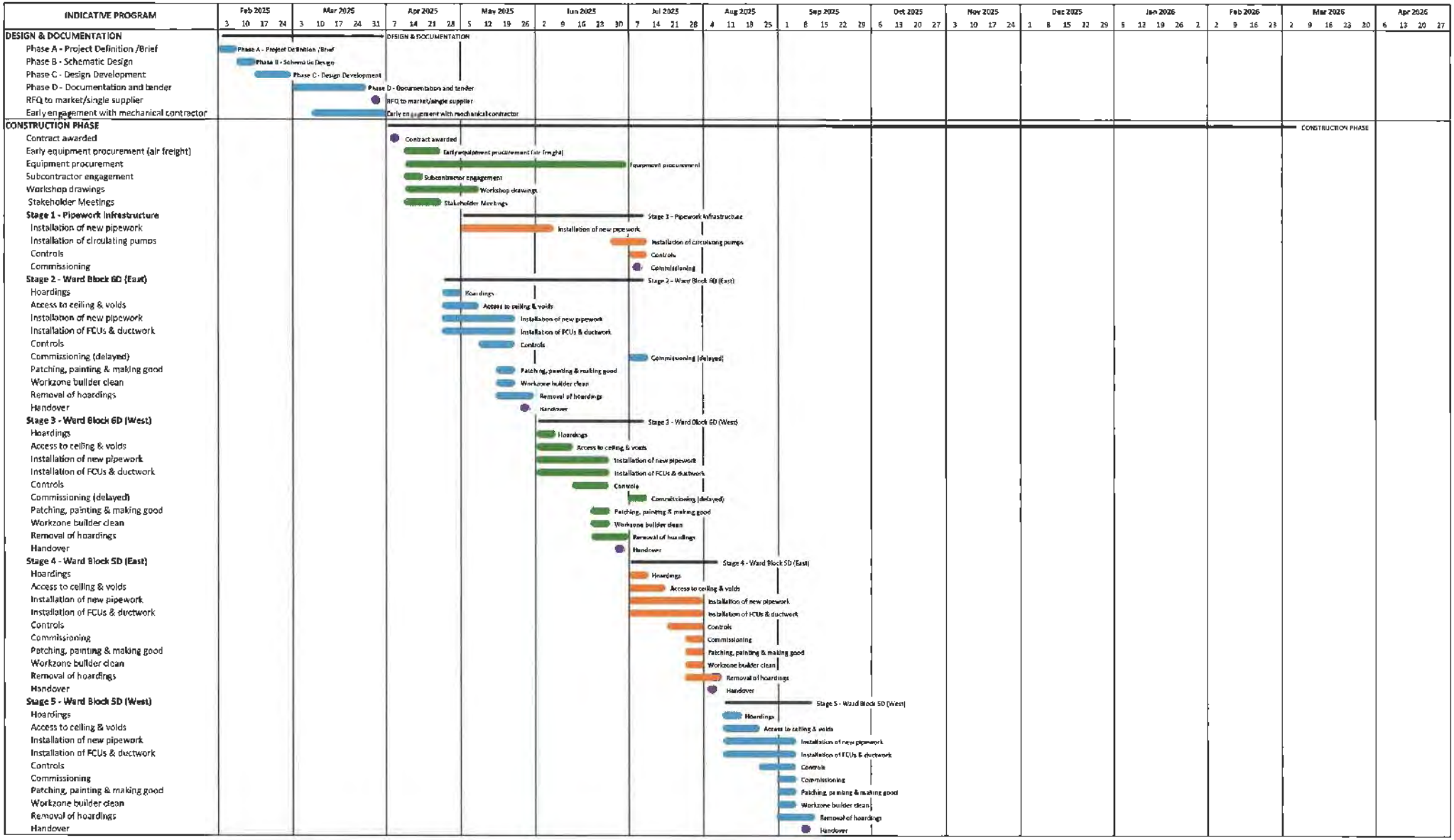
deliver this services given their previous experience with the LGH site, particularly with stakeholder engagement.

Kind regards,

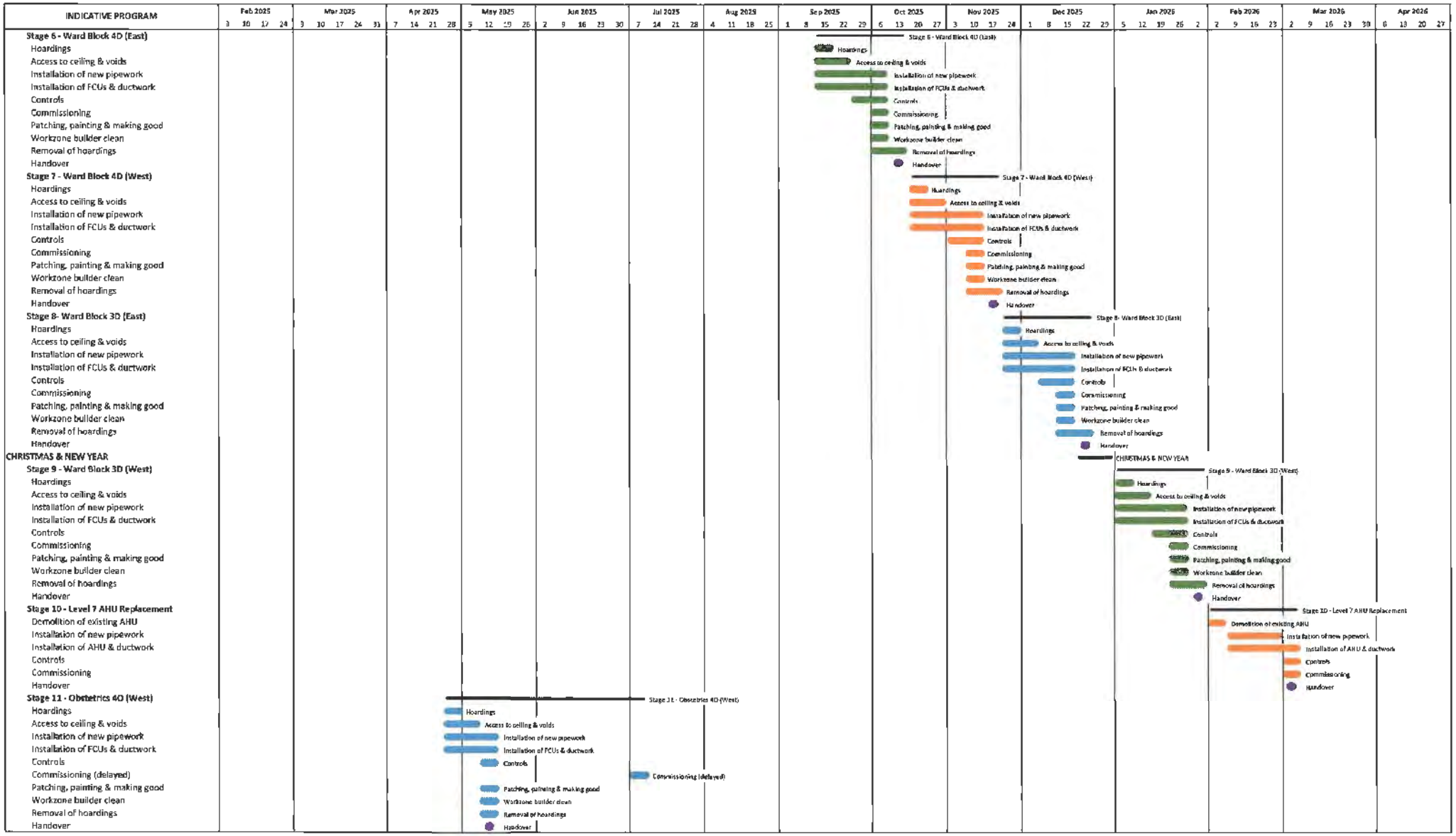
Brandon Servant
Building Services Engineer

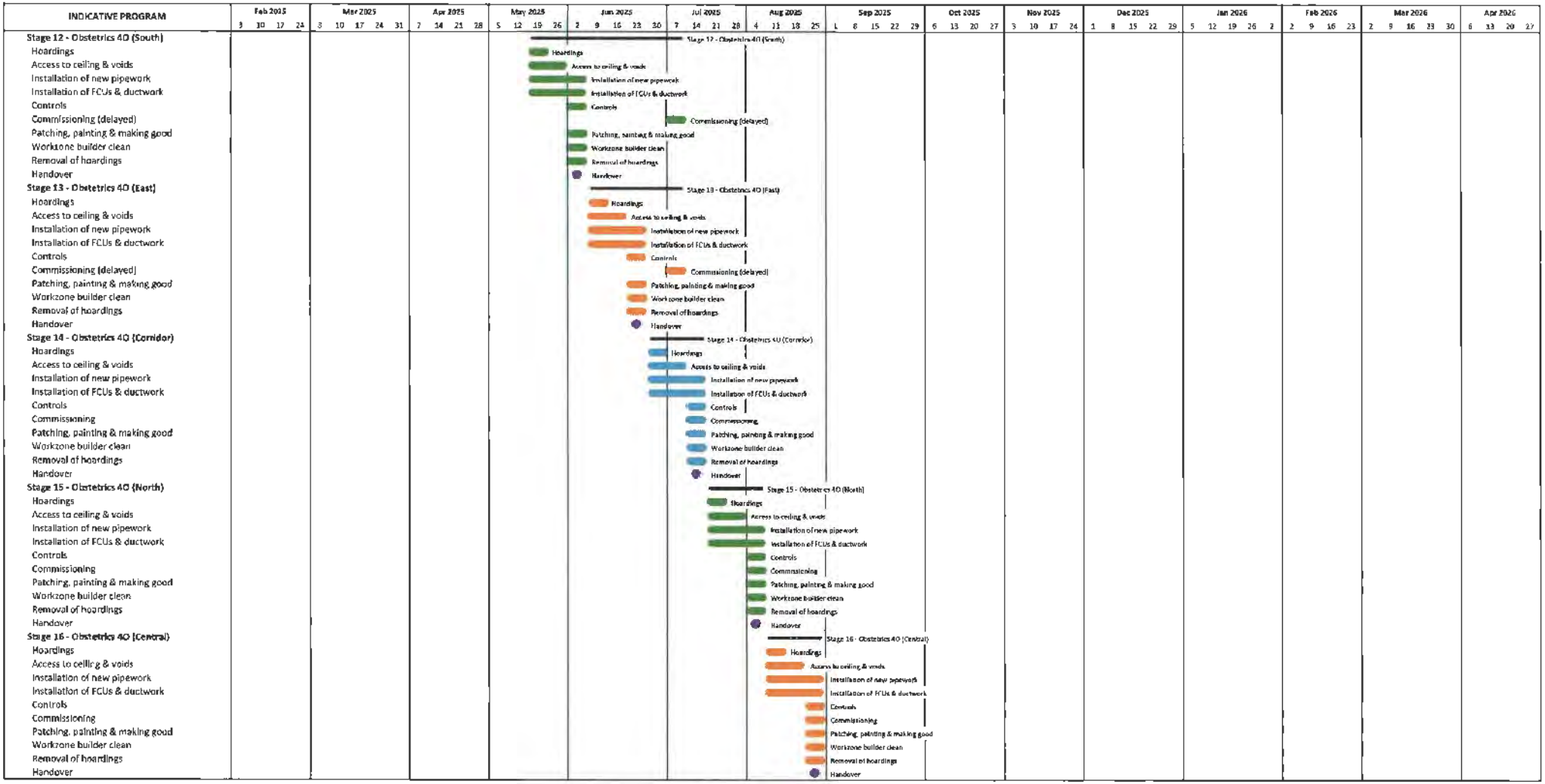
Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

LGH Air Conditioning Upgrade



LGH Air Conditioning Upgrade




INDICATIVE PROGRAM
Feb 2025
Mar 2025
Apr 2025
May 2025
Jun 2025
Jul 2025
Aug 2025
Sep 2025
Oct 2025
Nov 2025
Dec 2025
Jan 2026
Feb 2026
Mar 2026
Apr 2026
Stage 12 - Obstetrics 4O (South)
Hoardings
Access to ceiling & voids
Installation of new pipework
Installation of FCUs & ductwork
Controls
Commissioning (delayed)
Patching, painting & making good
Workzone builder clean
Removal of hoardings
Handover
Stage 13 - Obstetrics 4O (East)
Hoardings
Access to ceiling & voids
Installation of new pipework
Installation of FCUs & ductwork
Controls
Commissioning (delayed)
Patching, painting & making good
Workzone builder clean
Removal of hoardings
Handover
Stage 14 - Obstetrics 4O (Corridor)
Hoardings
Access to ceiling & voids
Installation of new pipework
Installation of FCUs & ductwork
Controls
Commissioning
Patching, painting & making good
Workzone builder clean
Removal of hoardings
Handover
Stage 15 - Obstetrics 4O (North)
Hoardings
Access to ceiling & voids
Installation of new pipework
Installation of FCUs & ductwork
Controls
Commissioning
Patching, painting & making good
Workzone builder clean
Removal of hoardings
Handover
Stage 16 - Obstetrics 4O (Central)
Hoardings
Access to ceiling & voids
Installation of new pipework
Installation of FCUs & ductwork
Controls
Commissioning
Patching, painting & making good
Workzone builder clean
Removal of hoardings
Handover

Matthews, Cameron T

From: Brandon Servant <[redacted]>
Sent: Wednesday, 12 February 2025 9:52 AM
To: Toon, Shane A; Matthews, Cameron T
Cc: Andrew Sutherland
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: 00725 Gantt Chart_DRAFT_120225.pdf

Hi Cameron & Shane,

Please see the attached draft program. At this stage it's looking like the works in the patient areas will push into February 2026. I've nominated the AHU replacement to occur once all patient rooms are done. Would there be any issues if we began discussions with a mechanical services contractor to determine if this can be condensed?

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Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Brandon Servant
Sent: Tuesday, 11 February 2025 3:44 PM
To: Toon, Shane A <[redacted] Matthews, Cameron T <[redacted]>
Cc: Andrew Sutherland [redacted]
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Shane & Cameron,

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Looking ahead to the construction phase, we'd like to understand the expectations around project management and stakeholder engagement. I just wanted to clarify what was discussed at the meeting. Are DoH going to arrange for a project manager, or is this something you'll need to outsource? Andrew and I have been discussing and we feel that Rare may be in the best position to deliver this services given their previous experience with the LGH site, particularly with stakeholder engagement.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T
To: Office of the Deputy Secretary Infrastructure; Perrott, John
Cc: Hargrave, Andrew J
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Date: Thursday, 6 February 2025 9:58:20 AM
Attachments: image001.png
00725 LGH Ward Block Air Conditioning Upgrade_DRAFT.pdf

HI Andrew and John

Report attached

Cheers
Cam

From: Brandon Servant <[redacted]>
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted]>; Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted]>; ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

> You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 **F** 03 6224 2405 **M** [redacted]
W www.asceng.com.au **E** office@asceng.com.au

From: Matthews, Cameron T
To: Brandon Servant; Andrew Sutherland
Cc: Toon, Shane A; ASC Engineers; Perrott, John
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Date: Friday, 7 February 2025 4:24:47 PM
Attachments: image001.png
image002.png
00725 LGH Ward Block Air Conditioning Upgrade_Rev 1.pdf

Hi Brandon

Thanks for the revised document. Shane has noticed the following needs amending:

Page 14
Aqua/light blue section is 4N in the document but should be 4O

Page 9
Paediatrics Outpatients & QVOP should be Ward 3D

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 4:07 PM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron & Shane,

Pleas see the attached updated report for the LGH air conditioning upgrade. This now includes an assessment and proposal of Obstetrics 4O.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 10:44 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon

Cheers
Cam

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:24 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the email. I can confirm that the report and budget estimate does include 3D (Paediatrics Outpatients & QVOP). The comment regarding levels 4 to 6 will be updated.

We will add a section on maintenance. Maintenance will need to be in accordance with AIRAH DA19. This will cover the following equipment:

- Filters (monthly inspection). Filter cleaning or replacement every 3 months
- FCU maintenance
- Circulating pumps
- Control systems

I'll also make the other changes to page 7 as per your notes.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000

T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brendon and Andrew

Thank you for your report and meeting a tight timeframe.

Can you confirm this covers off on 3D as well. As one area it refers to D block four levels and then in another part it talks about level 4, 5 and 6 (page 7).

Mention that additional maintenance will be required for quarterly filter changes etc (as we may need additional staffing)

P7
The ~~existing~~ installed capacity for the common cooling coil is 206 kW ~~with an available~~ but only has an available capacity in the order of 152kW,,, (note reading it sounds like there may be an additional spare capacity of 152kW

Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]>
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T <[redacted]>; Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted]>; ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

No problem. Let us know if you have any comments after reviewing the draft.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 **F** 03 6224 2405 **M** [redacted]
W www.asceng.com.au **E** office@asceng.com.au

From: Matthews, Cameron T <[redacted]>
Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted]>; Toon, Shane A <[redacted]>
Cc: Andrew Sutherland <[redacted]>; ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

> You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 **F** 03 6224 2405 **M** [redacted]
W www.asceng.com.au **E** office@asceng.com.au

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Andrew Sutherland Consulting Engineers

DEPARTMENT OF HEALTH
LAUNCESTON GENERAL HOSPITAL

Ward Block Air Conditioning Upgrade
274-280 Charles Street, Launceston

Ingineering Pty Ltd ABN 47 056 855 577 trading as
Andrew Sutherland Consulting Engineers
City Mill Building Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T +61 3 6224 2424 F +61 3 6224 2405
E office@asceng.com.au W www.asceng.com.au

Issue: Issue 1

Date: 07 February 2025

Reference: 00725

1. EXECUTIVE SUMMARY

This report has been prepared by ASC Engineers in response to a request from Department of Health to provide an assessment of the Ward Block (D Block) cooling arrangement at the Launceston General Hospital.

The elevated temperatures in Ward Block D during warm summer weather is the result of inadequate cooling capacity and air distribution. There is limited opportunity for improvement without substantial redesign for the upgrade and replacement of the existing facilities.

The proposed scope of works for Ward Block D includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

An additional assessment of the Obstetrics ward (4O) has also been requested by the department. This ward has no air conditioning facilities.

The proposed scope of works for Obstetrics Ward 4O includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (5 off)
- FCU for corridor zone (1 off)
- Controls

The recently upgraded chiller plant is adequately sized to provide cooling for the Ward Block D and Obstetrics; however, additional pipework would be required to utilise the chiller plant capacity.

The estimated cost for the air conditioning upgrade for the Ward Block D and Obstetrics is $4.62 - $5.09M.

2. TABLE OF CONTENTS

2.1. List of Appendices

3. GLOSSARY OF TERMS & TERMINOLOGY

AC	Air Conditioning	HHW	Heating Hot Water
AHU	Air Handling Unit	HVAC	Heating, Ventilation & Air Conditioning
APS	Air Pressure Switch	MSB	Main Switch Board
BCA	Building Code of Australia	NCC	National Construction Code
BMS	Building Management System	PAC	Package Air Conditioning Unit
CHW	Chilled Water	PB	Proportional Band (control point)
DB	Dry Bulb	PID	Proportional Integral Derivative (control)
Deadband	Area between Cooling & Heating stages	RAC	Room Air Conditioning
DP	Differential Pressure	RC	Reverse Cycle
DX	Direct Expansion (refrigeration system)	T	Temperature
EEV	Electronic Expansion (valve)	VAV	Variable Air Volume
EPO	Emergency Power Off	VSD	Variable Speed Drive
FCU	Fan Coil Unit	WB	Wet Bulb

4. INTRODUCTION

This report assesses the existing services and proposed air conditioning upgrades for the following buildings and wards at the Launceston General Hospital:

- Ward Block D
  - Level 3 - Paediatric Outpatients and QVOP
  - Level 4 – Ward 4D
  - Level 5 – Ward 6D
  - Level 6 – Ward 6D
- Block O
  - Level 4 - Obstetrics 4O

Figure 4.1 – LGH Site Ward Block D & Obstetrics 4O

4.1. Ward Block D

Ward Block D was constructed in 1979 at which time the ambient design conditions were significantly lower than current design parameters. The current design conditions have increased due to elevated summer temperatures. At the time of original construction, the provision of air conditioning for patient rooms was not universally adopted as a necessary design consideration.

Due to these legacy issues with only indirect cooling for the patient rooms, recent hot weather has resulted in excessive indoor temperatures experienced in Ward Block D. The current mechanical services design for this building provides conditioned air only to the corridor spaces, office areas, and nurse stations via a common air conditioning system located in the Level 7/8 plant room. Some supplementary air conditioning units have been provided for special rooms on level 4. As designed, the existing air conditioning system does not have sufficient cooling capacity or adequately sized distribution ductwork to provide satisfactory cooling for the patient rooms.

The temperatures in patient ward areas of Ward Block D at the Launceston General Hospital (LGH) can exceed typical occupancy comfort conditions in warmer months. The patient rooms rely on cool air from the corridors to be drawn into the occupied space via the negative pressure created by the toilet exhaust system. Due to the limited cooling capacity and modest air flow rate created by the toilet exhaust system the arrangement does not provide effective cooling for the patient rooms.

Air conditioning for the corridors is provided by a single cooling coil that serves all levels. This configuration does not allow for any cooling diversity or facility to adjust for varying cooling loads at individual floor levels.

Heating for the wards is provided by resistive (electric) electric heating in individual zones.

4.2. Obstetrics 4O

The 4O Obstetrics ward was constructed in 1995. The facility only has basic facilities for heating and ventilation only with no provisions for cooling.

Patients experience elevated internal temperatures due to solar exposure during the morning and late afternoon. The general corridor receives afternoon solar exposure from the windows in the Chapel courtyard void. Although located on the southern side of the site, the arrangement of the facades results in high solar gain throughout the day resulting in excessively elevated room temperatures.

External shading has been provided for windows on the eastern, western and southern façades. Despite the provision of shading the existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms with measured inside glass surface temperatures recorded as high as 30°C. There is no shading on windows facing the Chapel courtyard.

5. EXISTING AIR CONDITIONING ARRANGEMENT – WARD BLOCK D

Air conditioning for Ward Block D is primarily provided by a single cooling coil and electric re-heat coils for each zone. The schematic below is an extract from the Honeywell BMS that illustrates the existing configuration.

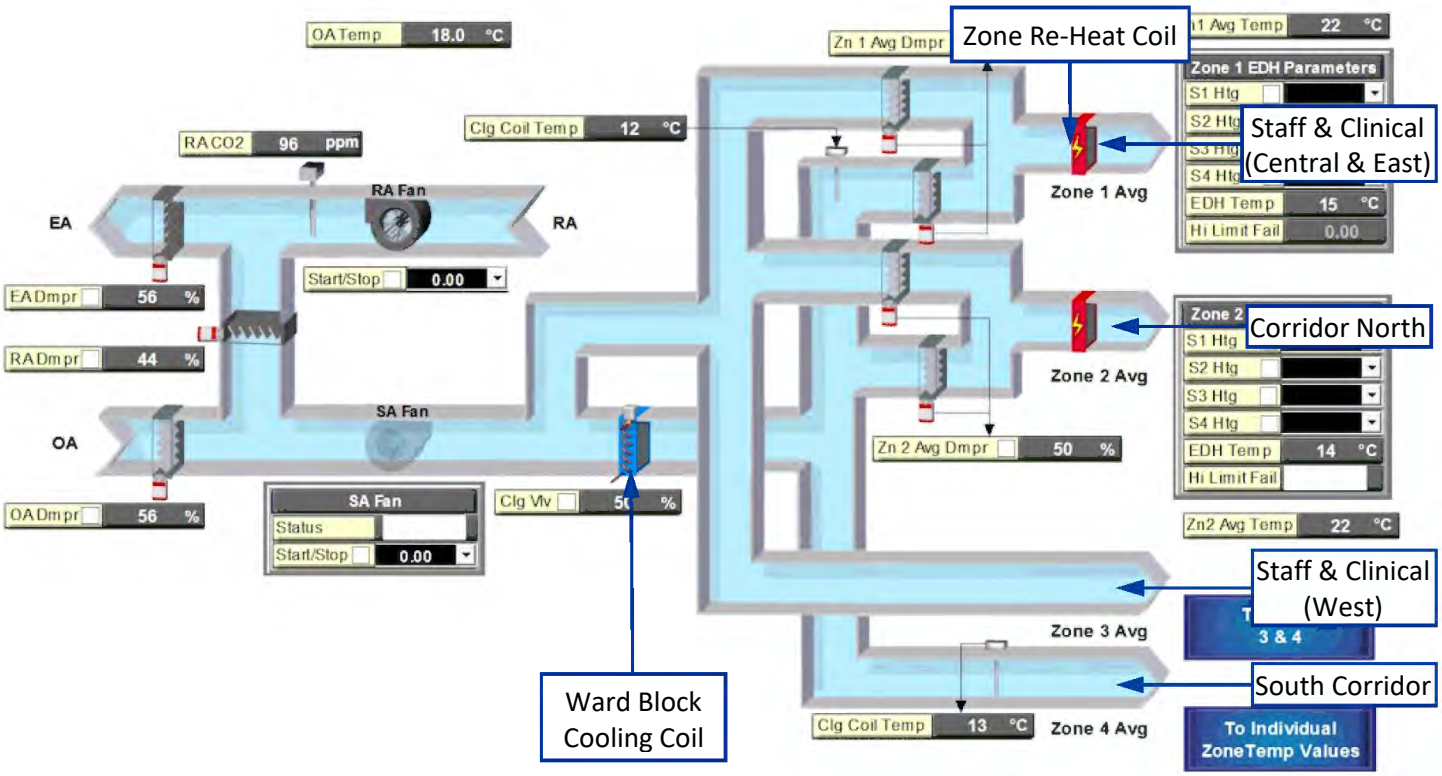

Figure 5.1 – Existing Air Conditioning Schematic

The ward areas rely on air delivered to the corridor to be drawn into the occupied spaces to cool the zones.

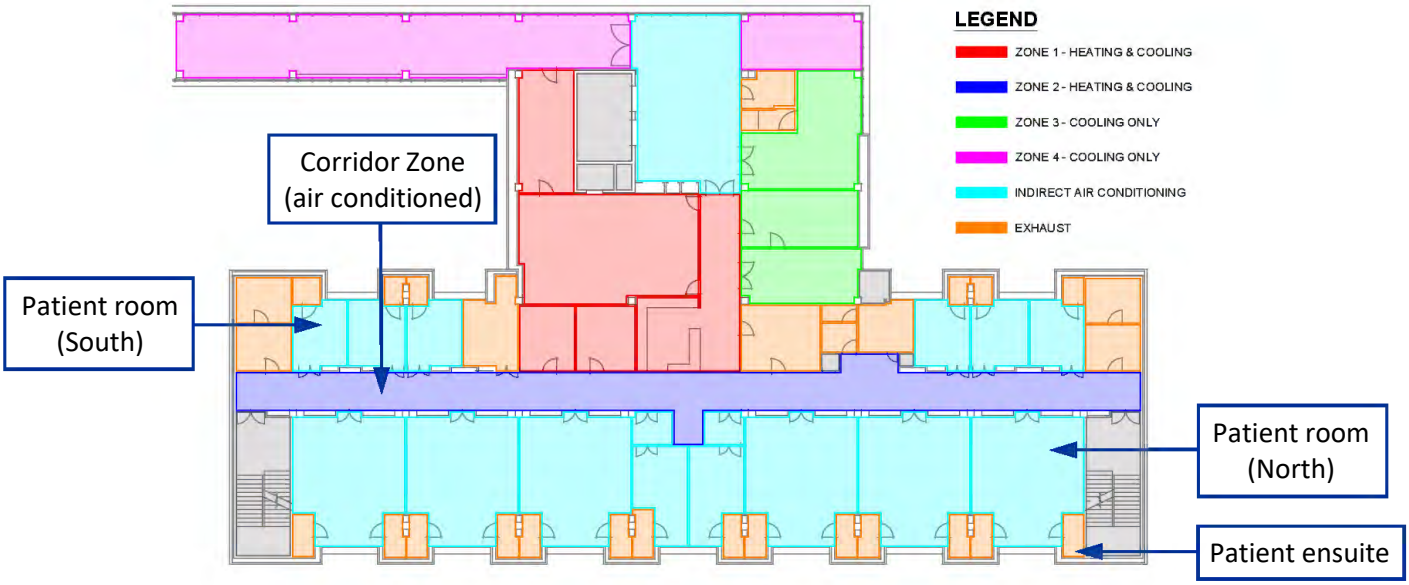

Figure 5.2 – Typical Ward Layout (Level 6)

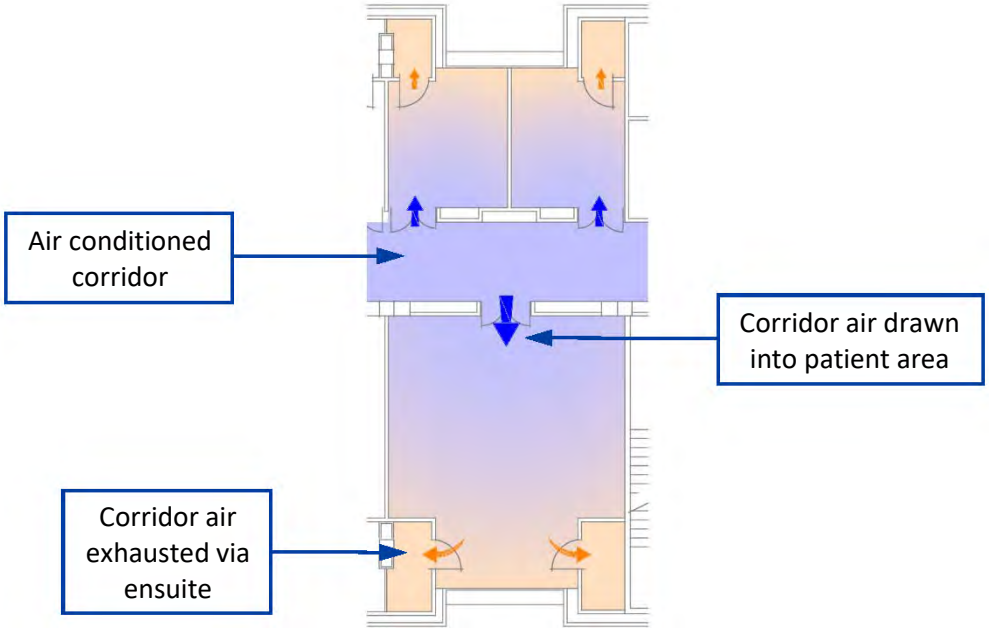

Figure 5.3 – Typical Air Movement Arrangement (indirect cooling to patient rooms)

This configuration does not allow for any variation in the building façade, solar exposure, or vertical diversity.

The existing air flow rate to the patient room is less than 20% of the required air flow rate of conditioned air to meet the patient room cooling requirements

5.1. Existing Cooling Capacity

The installed capacity for the common cooling coil is 206 kW but only has an available capacity in the order of 152 kW because of chilled water flow restrictions in the existing hydraulic network serving this plant.

Preliminary estimation of the cooling load for Ward Block D which has a floor area in the order of 3720 m^2 for the four occupied levels, as summarised below:

Space Type	Area (m^2)
Corridors	560
Large Ward Rooms	1080
Small Ward Rooms & Isolation Rooms	384
Other Clinical & Staff Spaces	1696
TOTAL	**3720**

Design ambient conditions used for this assessment are:

- Summer: 35°C, 49.3% RH
- Winter: -1.5°C

Using a typical average ceiling height of 2.7 meters, and design parameters outlined in the Victorian Health and Human Services Building Authority (VHHSBA), i.e.

- Minimum total air changes per hour (ACPH): 6
- Minimum outdoor ACPH: 2

The peak cooling load is in the order of 330 kW. This suggests there is a cooling capacity shortfall of 178 kW for Ward Block D Level 3 to 6.

6. EXISTING HVAC ARRANGEMENT – OBSTETRICS 4O

Obstetrics Ward 4O has minimal HVAC services. Ventilation for patient spaces is provided via openable windows. This arrangement is unsatisfactory when the ambient outdoor air temperatures are higher than comfortable room temperatures, i.e. ambient temps 24°C and over.

Local heating is provided by heater panels in each room.

Extraction for the patient ensuite amenities is provided by IXL tastic units installed in each suite. These local exhausts are connected to a common duct. The exhaust discharge to atmosphere is via a common exhaust fan. Relief air for the ensuite exhausts is provided by individual transfer air ducts which borrow air from the common corridors. The majority of the corridor spaces are not conditioned.

7. CONCEPT DESIGN – WARD BLOCK D

To address the legacy cooling deficiency for Ward Block D a number of options have been considered in the preparation of this report and recommendations. Based on the consideration of the optimum patient comfort considerations, minimising disruption to the patient area, system efficiency, existing infrastructure, and building restraints the proposed concept design is recommended.

- Provision of cooling and heating to each patient room with individual room control
- Alteration and upgrading of existing ducted air conditioning system to provide floor by floor control
- Upgrading of the level 7/8 air handling system
- Extension of the heating and chilled water pipe work reticulation from the central plant to Ward Block D

The recent refurbishment and expansion of the primary chiller plant (completed 2024) significantly increased the available cooling capacity for the LGH site. Given this available capacity, it would be feasible to provide a dedicated cooling circuit to serve the Ward Block D in addition to the chilled water circuit. Consideration should also be given to improving the heating capacity to the ward spaces.

7.1. Chilled and Heating Water

The source for the chilled and heating water supplies would be the main chiller plant and boiler plants. New pipework would be routed externally from the respective plants to the Ward Block D.

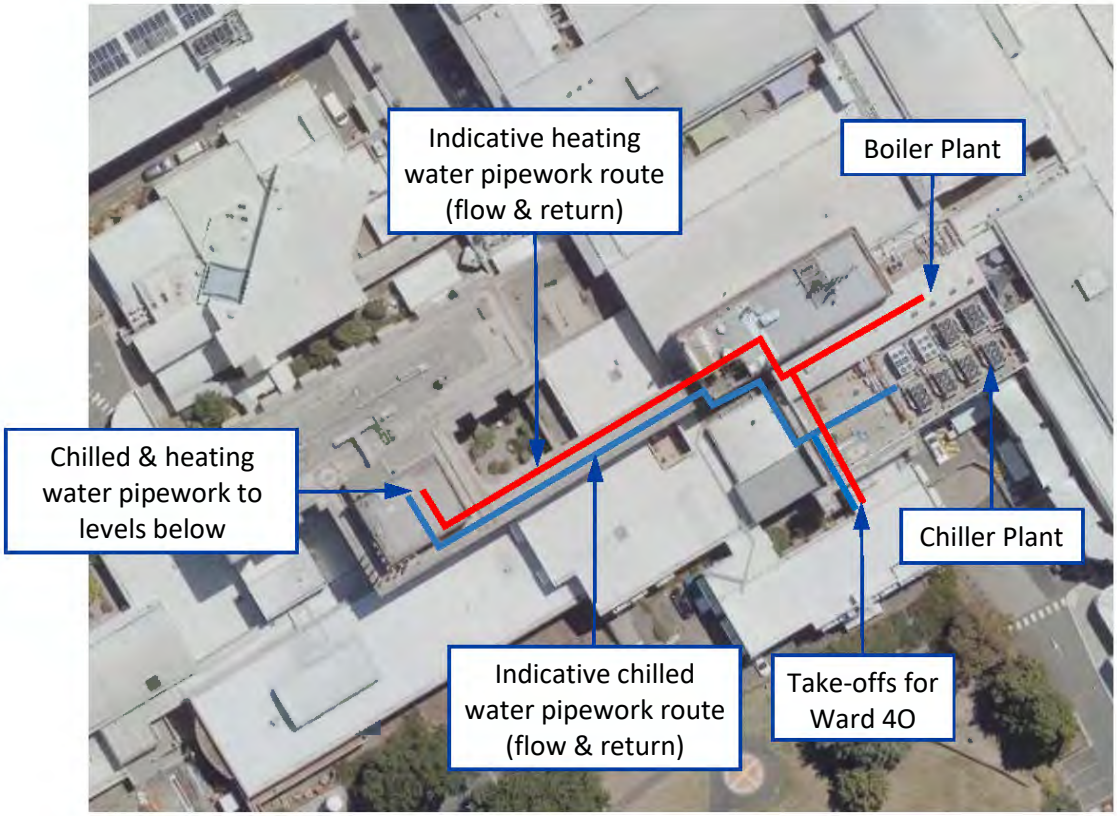

Figure 7.1.1 – Proposed Chiller & Heating Water Pipework Route

New chilled and heating water circulating pumps would need to be provided. The indicative location for this equipment would be the Ward Block D roof plantroom. All new pipework would need to be externally clad where exposed to weather and insulated to comply with current NCC requirements.

It is expected that the existing chilled water pipework serving the level 7 air handling unit (AHU) would be preserved. New heating water pipework would be required in the level 7 plantroom to facilitate the replacement of the existing AHU and to provide new heating water coils in lieu of the electric heaters currently installed.

The flow and return pipework would be routed down the Ward Block D services riser shaft, with take-offs at each level. Each floor would have a flow and return loop to allow for individual fan coil units to be installed in each patient space.

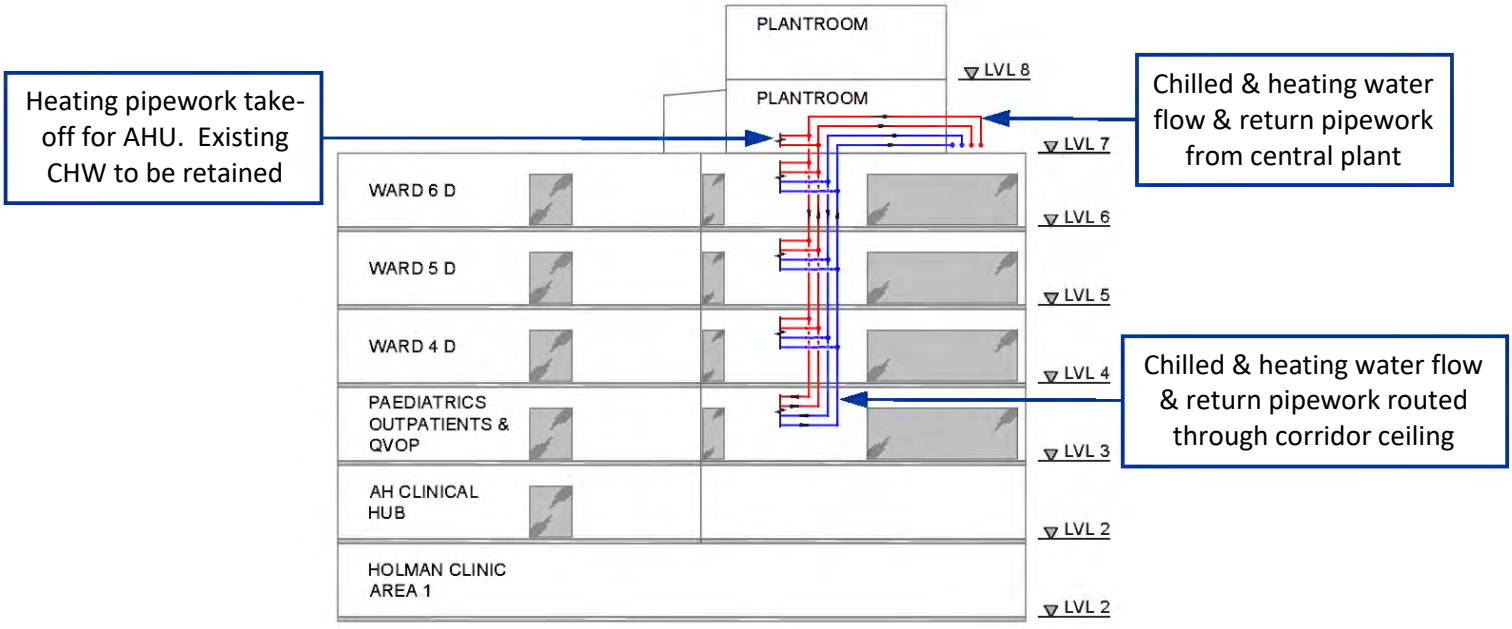

Figure 7.1.2 – Indicative Chilled & Heating Water Pipework (Section)

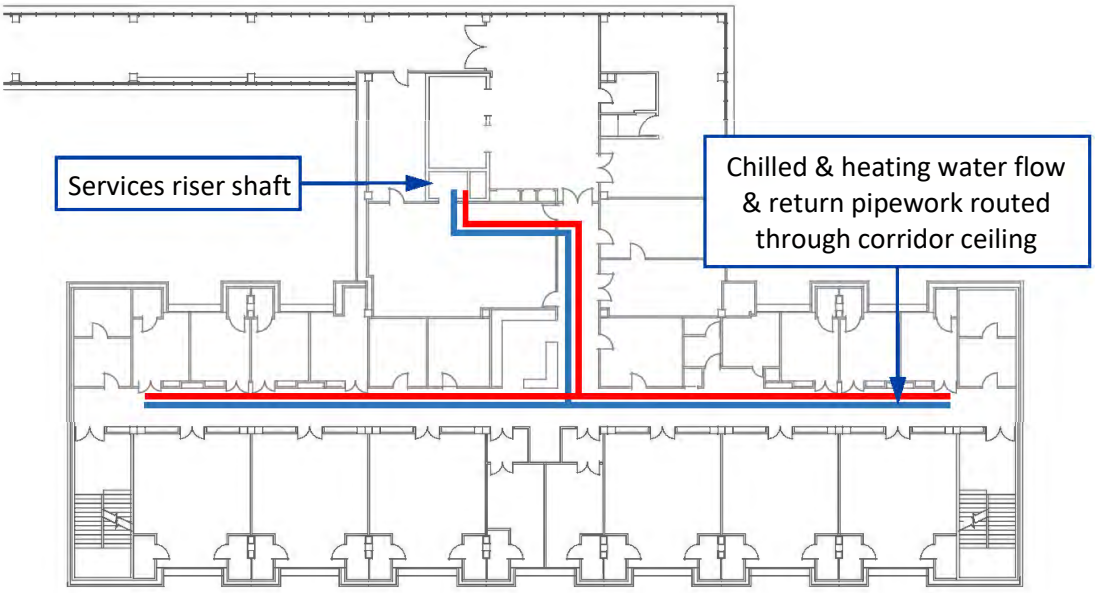

Figure 7.1.3 – Indicative Chilled & Heating Water Pipework (Layout)

7.2. Patient Rooms

Each patient room would be fitted with a chilled water cooled and hot water heated FCU. These would be installed in the ceiling space within each room. This arrangement is commonly utilised for modern hotel apartments and relies on ventilation from a common source, with heating and cooling provided locally within the occupied space. This configuration would preserve the existing corridor air conditioning and ensuite exhaust and provide individual room control for the patient rooms

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary. The figure below shows an indicative section of the proposed installation in the ward areas.

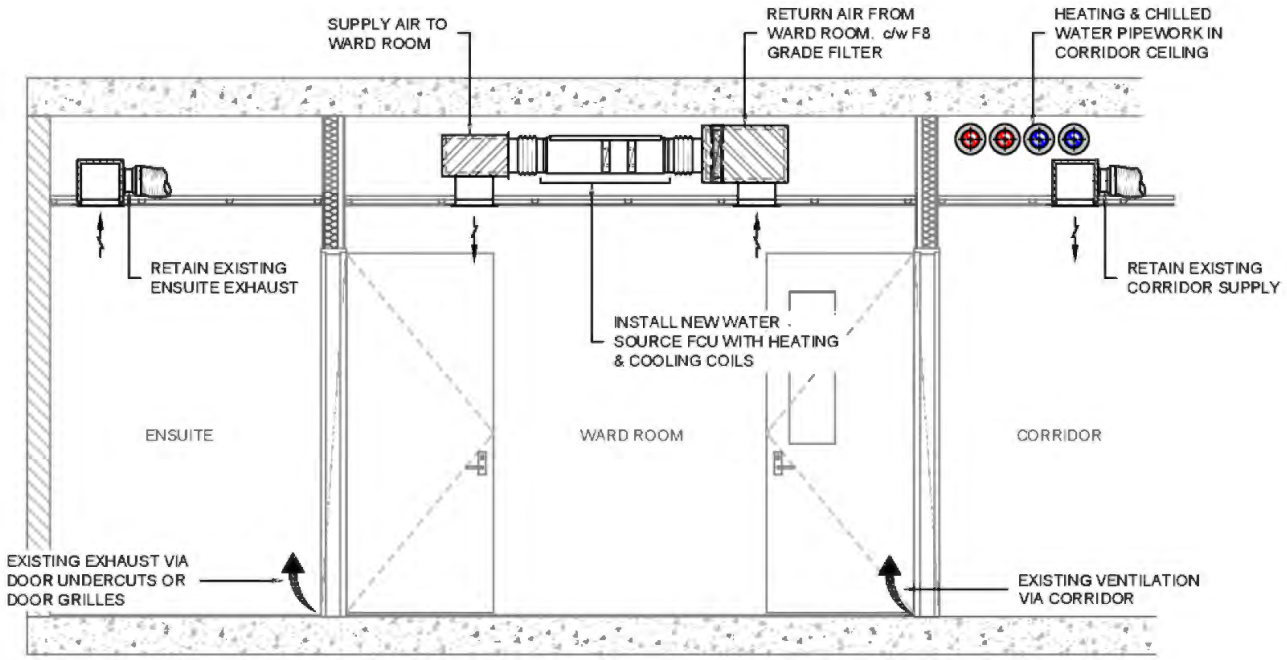

Figure 7.2.1 – Typical Room Section

Figure 7.2.2 – Typical Water Source FCU

The indicative FCU selection would be a GJ Walker ALEC unit or similar. There are four models in this product range, with total cooling capacities between 5.7 to 31.2 kW. It would be expected that the smallest ALEC300 unit would be satisfactory for each ward room. The estimated total cooling capacity for a large north facing ward rooms is 3.0-3.5 kW

An alternative water sources FCU selection would be the Temperzone IMDY series. The Temperzone unit are similarly sized and offer comparable capacities.

Alternatively, Temperzone have a low-profile range (IMDL-Y). This range offers similar cooling capacities as the deeper unit; however, the heating capacities are significantly less, and the fan static pressure may not be suitable if high efficiency F8 filtration is used.

The proposed FCUs are 4 pipe units to avoid the potential for heating and chilled water interconnection which can occur with two pipe units and change over valve arrangements.

7.3. Staff & Clinical FCUs

In addition to the proposed air conditioning upgrades for patient areas, the provision of heating and cooling alterations for staff and clinical spaces air conditioning system should be implemented to improve comfort conditions, system efficiency and reduce running costs. The extent of alteration, zoning, and floor by floor control will be influenced by existing system and building restraints and would be resolved in the design development.

7.4. Level 7 AHU Replacement

It is recommended that as part of the Ward Block D air conditioning upgrade that the Level 7 AHU be replaced for the following reasons:

- AHU has exceeded it expected service life, the unit has been in operation since 1979 (46 years)
- The use of electric heating is not efficient
- Zones 3 (west staff areas) and 4 (south corridor) do not have any heating capacity

This would have a significant impact on the air conditioning and ventilation for the building. To mitigate the impact caused by the AHU replacement this work should be undertaken when the air conditioning for the ward areas has been completed.

7.5. Controls

The LGH runs a Honeywell EBI BMS. This BMS governs the operation of mechanical services across the LGH site. While ensuring the new Ward Block D cooling systems are included in the existing BMS, this control strategy is costly to implement. The extent of the control functionality would require careful consideration to determine the level of control required to ensure satisfactory operation. The minimum control arrangement for each FCU would include:

- Cooling coil valve position
- Heating coil valve position
- Room temperature

Controls for any staff area FCUs will also need to include dedicated start/stop signals. This could either be on a time clock arrangement, or via a local control panel to allow for manual input.

In addition to the controls for the FCU systems, all new chilled and heating water pumps would require BMS control to govern their operation. This would include:

- VSD speed control for heating and chilled water transfer pumps
- VSD fault
- System pressure differential (cooling and heating)
- Start/stop, this would also govern duty/standby and changeover

Start and stop operation could be consolidated to group FCUs together to create zones, i.e. north and south. The following additional control and monitoring points could be considered; however, they are not considered essential for operation of the systems:

- FCU general fault
- Filter pressure drop
- Fan speed
- Chilled and heating water flow temperatures
- Chilled and heating water return temperatures

The replacement of the AHU would require a number of control point to ensure satisfactory operation. The points would include:

- AHU enable
- Fan VSD speed
- Filter pressure drop
- Zone supply air temperature (4 off)
- Cooling coil valve position (4 off)
- Heating coil valve position (4 off)
- Fan fault fault/flow switch

It is expected that the following points would already be available on the BMS and be retained to provide control functionality for the new systems:

- Ambient temperature
- Exhaust air damper position
- Outside air damper position
- Return air damper position
- Exhaust CO_2 level

7.6. Staging

The department of health has indicated that the Ward Block D air conditioning upgrade would need to be completed prior to the summer season 2025. This would require the design and documentation phase to commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

It is expected that FCU and AHU procurement would be 12-16 weeks from date of order. Other essential procurement elements would be:

- Circulating pumps
- Pipework, valves and accessories
- Ductwork, diffusers and grilles
- Insulation
- Controls and field devices

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least 50% of each level is decanted to minimise hoarding requirements and excessive staging coordination.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the Ward Block D. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to the Ward Block D
2. Installation of circulating pumps and associated controls
3. Running pipework down the services riser. Providing take-off branches at each level
4. Commissioning of circulating pumps and controls
5. Ward work – eight stages (levels 3-6, east and west zones)
    a. Installation of chilled and heating water pipework through corridor
    b. Installation of FCUs in ward rooms
    c. FCU controls
    d. Commissioning of FCUs and control
6. Level 7 AHU replacement

8. CONCEPT DESIGN – OBSTETRICS WARD 4O

The proposed air conditioning upgrade for Obstetrics Ward 4O is similar to the proposal for Ward Block D; however, the available ceiling space would allow for larger FCUs to service multiple spaces. The chilled and heating water supply would be a set of branch take-offs from the new proposed pipework serving Ward Block D. The circulating pumps would likely be installed on the roof near the branch take-offs in a space that would be convenient for maintenance.

8.1. Patient Areas

Given the arrangement of the patient rooms in Obstetrics, areas could be grouped to be air conditioned by common chilled water cooled and hot water FCUs. These would be installed in the ceiling space above a nominated room, or in the corridor if there is sufficient space. This configuration would preserve the existing air conditioning for other areas, and ensuite exhaust and provide grouped or averaged temperature control for the patient rooms.

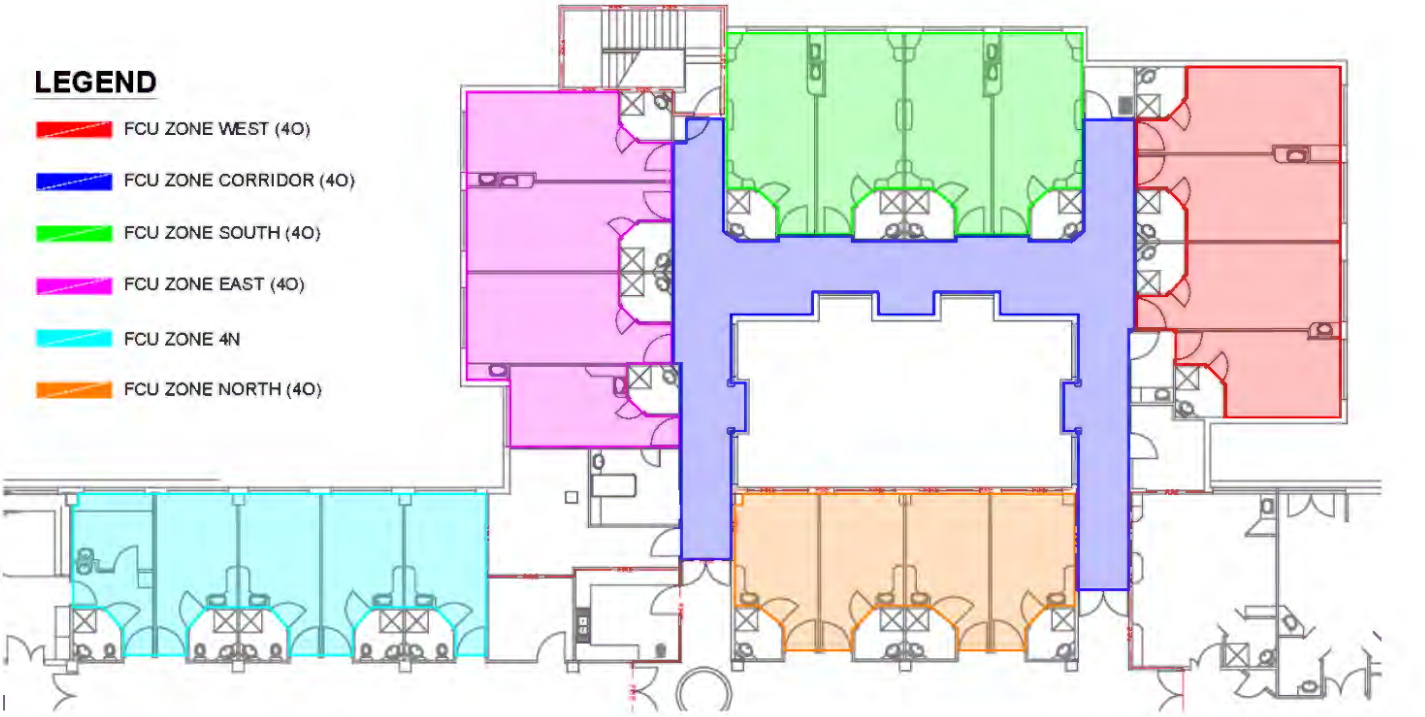

Figure 8.1 – Proposed FCU zoning for Obstetrics 4O

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary.

To avoid the reliance on openable windows for ventilation to the patient areas, dedicated outdoor air applies would need to be included in the installation. It is envisioned that ventilation for the zones would be:

- Individual roof cowls for zones:
  - Zone West (4O)
  - Zone South (4O)
  - Zone East (4O)
  - Corridor (4O)
- Weather louvre through external wall for zones:
  - Zone North (4O)
  - Zone 4N

It is expected that the fire compartment arrangement for the FCU north zone will require a fire damper.

The preliminary air conditioning load estimates for the Obstetrics 4O ward areas are as follows:

Zone	Total Cooling Load (kW)	Heating Load (kW)	Ventilation Rate (l/s)
West (4O)	7.0	7.3	140
South (4O)	7.6	7.9	150
East (4O)	7.2	7.6	145
North (4O)	5.4	5.6	105
Corridor (4O)	8.6	9.0	170
4N	6.7	7.1	135
TOTAL	42.5	44.5	845

Other than the corridor zone shown in Figure 8.1, other staff and clinical areas would retain their existing HVAC services.

8.2. Controls

The proposed controls would be similar to the proposal for the Ward Block D; however, averaged temperature monitoring would be required due to the zoned arrangement.

8.3. Staging

The proposed works for Obstetrics 4O would need to run concurrently with the staging for Ward Block D if it is desirable to have the works completed prior to the summer season 2025.

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least zone groups are made available for installation of the mechanical services.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the Obstetrics Ward. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to Obstetrics 4O
2. Installation of circulating pumps and associated controls
3. Installation of chilled and heating water pipework through the corridor
4. Commissioning of circulating pumps and controls
5. Ward work – six stages (levels 3-6, east and west zones)
    a. Installation of FCUs in ward rooms
    b. FCU controls
    c. Commissioning of FCUs and control

9. BUDGET ESTIMATES

The estimated cost for the Ward Block D and Obstetrics Ward 4O air conditioning upgrades would be between $4.62 - $5.09M. A detailed summary of the budget estimate in included in Appendix 2. The budget estimate includes the following:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas in Ward Block D (56 off)
- FCUs for staff and clinical areas in Ward Block D (32 off)
- FCUs for the Obstetrics Ward 4O patient areas (5 off)
- FCU for the Obstetrics Ward 4O corridor zone (1 off)
- Ward Block D Level 7 AHU replacement
- Controls
- Staging allowances
- Consultancy fees (Engineering, Architect, Building surveyor)
- Project management fees
- Design and construction contingency (10%)

10. OTHER CONSIDERATIONS

The following items were considered in the preparation of this upgrade proposal.

10.1. Refrigerant based systems

Local refrigerant based (direct expansion) systems were considered as an alternative to the water source proposal. The systems include:

- Variable refrigerant flow (VRF) heat pump
- VRF Heat recovery
- Hybrid VRF systems

VRF heat pumps and heat recovery systems rely on indoor air conditioning units connected to dedicated outdoor units. The primary issue with this arrangement is refrigerant concentration. The systems need to be designed so that a refrigerant leak does not result in a major toxic or fire hazard risk. As a consequence of managing refrigerant

concentration, smaller VRF groupings are required. These systems also have a shorter service life compared with water source systems. Replacement parts are not typically available beyond 10-15 years from the date of installation. Failure of a few indoor units or an outdoor unit may result in the entire system needing replacement.

Hybrid systems distribute heating and chilled water to the local indoor units. The refrigerant connection is between the outdoor unit and distribution branch box. This arrangement mitigates the issues of refrigerant concentration. Hybrid systems have a similar service life as VRF systems and are challenging to maintain beyond 10-15 years when manufacturers on longer support obsolete systems.

The initial installation costs of VRF and hybrid systems would likely be less than the water source alternative. This is primarily due to the cost of the much larger heating and chilled water pipework. Despite the higher installation cost for the water source proposal, the advantages of this arrangement include:

- Longer service life
- Flexibility for future replacement and modification
- Utilising existing energy infrastructure

10.2. Ceiling cassettes and highwall units

The proposed water source air conditioning upgrade and alternative VRF option would utilise ducted systems. These units allow for improved air conditioning distribution and filtration. Alternative air conditioning indoor units are ceiling cassette and high-wall systems. While these units would reduce the upgrade costs by eliminating the need for distribution ductwork, diffusers, and grilles; the units are not desirable for deployment in patient areas in hospital and health care installations. The VHHSBA guidelines do not recommend the use of ceiling or wall mounted recirculating units because of the cleaning difficulty and potential for buildup of contamination.

10.3. Level and zone diversity

The proposed upgrade of the Ward Block D level 7 AHU will not improve the vertical diversity of the existing system. If improved diversity of the central system is required, this may be achieved by local heating and cooling coils on each level. This upgrade is not considered to be essential as significant improvements to the air conditioning for Ward Block D would be achieved by the installation of the proposed local FCU.

10.4. External shading & glazing replacement – Ward Block D

The option to consider external shading or glazing upgrade for the building has been considered; however, the reduction in cooling load with these options will not be sufficient to overcome the short fall in the existing indirect cooling for the patient rooms. Glazing replacement to achieve contemporary standards should be included in any future redevelopment of the building.

10.5. Maintenance

The proposed air conditioning upgrade will require additional maintenance activities to ensure the equipment and services meet the design performance requirements. Maintenance of the equipment is essential to minimise failure and ensuring long service life. The maintenance activities for mechanical services are generally outlined in AIRAH guidelines DA19; however, equipment manufacturers will also nominate specific service and maintenance requirements. A list of generic maintenance activities and intervals is included in appendix 3 for the following equipment:

- Fan coil units
- Filters
- Circulating pumps
- Controls

10.6. Hazmat

The extent of hazardous materials will need to be determined prior to finalising the design documentation. The hazmat register for the LGH would likely identify significant or likely hazardous materials in Ward Block D and Obstetrics. The installation contractor would need to manage any known hazardous materials while undertaking the installation works. Any previously unknown hazmat discovered during installation will likely pause construction.

Costs associated with hazmat management are not included in this report or budget estimate; however, some allowances will need to be made to manage this risk.

11. RECOMMENDATIONS

Due to the urgency of the air conditioning upgrade the design and documentation phase must commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

The proposed scope of works for Ward Block D includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

The proposed scope of works for Obstetrics Ward 4O includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (5 off)
- FCU for corridor zone (1 off)
- Controls

12. APPENDICES

Appendix 1 – Limitations

a. This report is based upon a visual inspection of the property and describes its basic construction and state of repair, highlighting the main items requiring repairs, maintenance and replacement. We have not made comment or any structural issues or proposed specific repairs as this is not a building defects or structural defects report and outside the scope of the instruction.

b. We have not inspected those parts of the building or its services which are built in, covered up or otherwise made inaccessible in the normal course of construction or occupation and we are, therefore, unable to state that such parts are free from rot, decay, corrosion or any other defect whatsoever.

c. Except to the extent noted in this report, we have not made enquiries of any statutory authorities concerning the present arrangements within the building or the likely effect of any proposed occupation. We should advise that the complexity of the Building Codes and other statutory enactments can have a material effect on the way in which building may be planned and used and upon the cost on consequential work. It is assumed that professional advice will be sought at the appropriate stage to determine any works which may be necessary due to any planned occupation.

d. We have not, except to the extent mentioned in this report, carried out any tests or made any enquiries concerning particular materials nor have we calculated any floor areas for leasing purposes or reappraised original design criteria.

e. In cases where contractors or consultants are instructed to carry out tests or prepare reports, whilst we will take every care in instructing these contractors or consultants, we cannot accept responsibility for their report and shall not be liable for error or omissions therein. In appointing such contractors or consultants we act only as an agent on behalf of the client, and the contractual rights and obligations lie directly between the client and the relevant contractors or consultants.

f. This report is prepared for the sole use of the intended recipient and ASC can accept no liability for its use by any other party howsoever used. The client shall not be entitled to assign any of its interests in the report (including any report prepared by specialist sub consultants) to any third party without the prior written consent of ASC.

Appendix 2 – Budget Estimate

All budget estimates presented in this report are high level approximations only. Costs estimates have been prepared using quantity surveying tools applicable to the year of construction and historical information where possible. Construction costs have been interpolated to account for annual fluctuations and CPI inflation where necessary.

SERVICES BUDGET ESTIMATE

PROJECT DETAILS

Project: LGH Ward Block Air Conditioning Upgrade
Description: Concept design estimate
Job No.: 00725
Revision: 2

ELECTRICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Power				
E01	Pump power supplies	8	each	$630.00	$5,040.00
E02	FCU power supplies	94	each	$265.00	$24,910.00
E03	Alterations to AHU power	1	each	$630.00	$630.00
	Misc.				
E04	Isolation of ward lighting	94	each	$220.00	$20,680.00
				Electrical Services Subtotal	**$51,260.00**

MECHANICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	HVAC				
M01	Installation of Ward Block FCUs (ALEC300)	56	each	$8,800.00	$492,800.00
M02	Ward Block ductwork, grilles, diffusers & filter (per set)	56	each	$2,750.00	$154,000.00
M03	Installation of Ward Block staff & clinical FCUs (ALEC300)	32	each	$8,800.00	$281,600.00
M04	Ward Block clinical ductwork, grilles, diffusers & filter (per set)	32	each	$3,300.00	$105,600.00
M05	Installation of Obstetrics FCUs (ALEC500)	6	each	$9,900.00	$59,400.00
M06	Obstetrics ductwork, grilles, diffusers & filter (per set)	6	each	$5,500.00	$33,000.00
M07	Obstetrics roof cowls & ductwork	4	each	$1,220.00	$4,880.00
M08	Obstetrics weather louvres & O/A duct	2	each	$610.00	$1,220.00
M09	Obstetrics fire damper	1	each	$1,050.00	$1,050.00
	CHW & HHW Systems				
M10	Primary chilled water pipework, valves & accessories	20	per m	$436.00	$8,720.00
M11	Primary heating water pipework, valves & accessories	20	per m	$363.00	$7,260.00
M12	Primary pipework insulation	40	per m	$228.00	$9,120.00
M13	Ward D chilled water pipework, valves & accessories - mains	188	per m	$363.00	$68,244.00
M14	Ward D heating water pipework, valves & accessories - mains	218	per m	$285.00	$62,130.00
M15	Ward D pipework insulation - mains	406	per m	$189.00	$76,734.00
M16	Obstetrics CHW water pipework, valves & accessories - mains	54	per m	$204.00	$11,016.00
M17	Obstetrics HHW water pipework, valves & accessories - mains	54	per m	$134.00	$7,236.00
M18	Obstetrics pipework insulation - mains	108	per m	$141.00	$15,228.00
M19	Ward D CHW circulating pumps, including VSDs	2	each	$11,220.00	$22,440.00
M20	Ward D HHW circulating pumps, including VSDs	2	each	$8,580.00	$17,160.00
M21	Obstetrics CHW circulating pumps, including VSDs	2	each	$5,775.00	$11,550.00
M22	Obstetrics HHW circulating pumps, including VSDs	2	each	$5,775.00	$11,550.00
M23	Levels 3-6 CHW pipework, valves & accessories	560	per m	$114.00	$63,840.00
M24	Levels 3-6 HHW pipework, valves & accessories	560	per m	$96.00	$53,760.00
M25	Levels 3-6 CHW pipework insulation	1120	per m	$63.00	$70,560.00
M26	Obstetrics CHW pipework, valves & accessories	100	per m	$114.00	$11,400.00
M27	Obstetrics HHW pipework, valves & accessories	100	per m	$96.00	$9,600.00
M28	Obstetrics CHW pipework insulation	200	per m	$75.00	$15,000.00
	AHU Upgrades				
M29	Replace Level 7 AHU with multi-zone unit	1	each	$165,000.00	$165,000.00
	Misc.				
M30	Controls for Ward Block FCUs	168	per point	$3,000.00	$504,000.00
M31	Controls for Ward Block staff & clinical FCUs	128	per point	$3,000.00	$384,000.00
M32	Controls for Ward Block CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M33	Controls for Ward Block AHU	10	per point	$3,000.00	$30,000.00
M34	Controls for Obstetrics FCUs	24	per point	$3,000.00	$72,000.00
M35	Controls for Obstetrics CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M36	Air balancing & commissioning	1	total	$28,160.00	$28,160.00
M37	Workshop drawings	1	total	$46,280.00	$46,280.00
				Mechanical Services Subtotal	**$2,987,538.00**

SERVICES BUDGET ESTIMATE

PROJECT DETAILS

Project: LGH Ward Block Air Conditioning Upgrade
Description: Concept design estimate
Job No.: 00725
Revision: 2

FIRE SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Fire Detection				
F01	Provision of fire relay to disable FCUs in fire mode	2	each	$3,500.00	$7,000.00
				Fire Services Subtotal	**$7,000.00**

HYDRAULIC SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Drainage				
H01	Condensate drains for FCUs	94	each	$485.00	$45,590.00
				Hydraulic Services Subtotal	**$45,590.00**

OTHER

Code	Description	Qty	Unit	Rate	TOTAL
A01	Builders work to allow for ceiling access & making good	94	each	$6,000.00	$564,000.00
A02	Builders work for pump installation, main pipework & risers	2	total	$10,000.00	$20,000.00
A03	Staging coordination	16	each	$8,800.00	$140,800.00
A04	Consultancy fees (engineer, architect, building surveyor)	1	total	$611,000.00	$611,000.00
A05	Project management fees	1	total	$153,000.00	$153,000.00
A06	Crane lifts (per event)	2	each	$22,000.00	$44,000.00
				Other Subtotal	**$1,532,800.00**

Exclusions

No allowance for council fees associated with plumbing permit
Costs associates with decanting patients
DoH management fees or superintendent services
Upgrades to central heating or cooling plants
No allowance for HAZMAT management

TOTAL *(ex. GST)*	$4,624,188.00
Design & Construction Contingency (10%)	$462,418.80
BUDGET ESTIMATE FOR SERVICES *(ex. GST)*	**$5,086,606.80**

Appendix 3 – Maintenance Activities & Intervals

The following equipment maintenance sheets outline the recommendations for preventative maintenance frequency and procedures which should be adopted by the Principal to ensure the most efficient operation of the systems installed.

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
FAN COIL UNITS (FCU)

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Inspect drain trays, ensure drains are clear, trays are clean and drains have a water trap in them.	●			
Switch system back to 'normal' and check that all equipment is in the correct designated mode.		●		
Check for leaks in coils and piping connections. Record and report any leaks.			●	
Check panels, doors and fastenings for security. Record and report any leaks.			●	
Ensure insulation is secure, record/report as necessary.			●	
Inspect flexible connections and record/report as necessary.			●	
Inspect the casing for corrosion and leaks, record/report as necessary.				●

NOTES

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
FILTERS - DRY MEDIA AND PANEL FILTERS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Inspect system filters and determine if maintenance is required.	●			
Advance roll filters when resistance exceeds the design amount.	●			
Check roll filters have adequate media.	●			
Clean dry media regenerable filters when resistance exceeds the design amount.	●			
Clean washable filters when resistance exceeds the design amount. (The design maximum resistance may be less than the filter rated pressure drop).	●			
Order new filters or filter media if required for next service.	●			
Record and report on replacement of flat disposable panel filters when resistance exceeds the design amount.	●			
Record and report on replacement of extended surface panel filters, sock or deep bed filters when resistance is more than the design amount.	●			
Record and report on replacement of HEPA filters when resistance is more than the design amount.	●			
Check for air leakage around media, ensure that media edge is in the channel provided.		●		
Ensure that media is not disintegrating or delaminating.		●		
On plants over 500 l/s take pressure reading across filter		●		
On units less than 500 L/s, visually inspect filters. Clean as specified and as necessary (at least every three months).		●		
Vacuum filter chamber and inlet screens after each filter change.		●		
Check zero setting on manometer.			●	
Lightly lubricate filter drives and check operation.			●	
Inspect HEPA filters (after any maintenance) and test for media or gasket leaks.				●

NOTES

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
PUMPS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Adjust belt tension as necessary, check for wear.	●			
Change over duty pump, where fitted.	●			
Check guards are securely in place.	●			
Check pump and motor for vibration and bearings for noise or overheating. Repair as necessary.	●			
Check that gland well and drains are clear.	●			
If pressure gauges fitted, check operating pressures to ensure strainer is clear and pump vented.	●			
Inspect pump gland and adjust if necessary.	●			
Operate pump suction and discharge valves stop any gland leaks.	●			
Vent Pump.	●			
Visually inspect pump coupling.	●			
Where fitted, check operation of automatic float switch, adjust as necessary.	●			
Lightly grease bright steel.		●		
With pump running lightly lubricate bearings of pump and motor.		●		
Clean and, as necessary, reseat check valves.			●	
Check coupling bushes for wear, if worn record/report and isolate equipment. Motor may need alignment.				●
Clean pump strainer.				●
Inspect exposed surfaces for corrosion, minor repair or paintwork as necessary.				●

NOTES
Replace belts and check motor alignment and couplings as applicable - 36 months

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
AUTOMATIC & SAFETY CONTROLS - ELECTRIC, ELECTRONIC AND DDC CONTROLS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Attend to any reported problems, check and adjust as necessary.	●			
Check temperatures on floors, in rooms or in any areas requiring special conditions.	●			
Check controls for physical damage.		●		
Check location of thermostats, ensure correct location relative to controlled area.		●		
Check operation of control linkages on dampers and valves.		●		
Check & adjust, as necessary, the calibration of principal control sensors.			●	
Check, clean and lubricate with approved lubricant, spindles & linkages.			●	
Check remaining hard disk capacity on BMS PCs			●	
Backup all DDC files.			●	
Check action and settings of time switches.				●
Check drive motor mountings for security.				●
Check linkages for tightness.				●
Check operation of each thermostat for response.				●
Check calibration and condition of general control and monitoring sensors.				●
Check that loading devices function correctly and plant items respond as called.				●
Inspect all controls for operation & cleanliness.				●
Inspect all DDC systems and data gathering panels.				●
Prove correct operation of any safety controls.				●
Check communication between BMS and DDC controllers				●
In conjunction with mechanical services contractor check operation of VAV boxes				●
Building control				
Verify and review operation and settings of control loops, set points, dead bands, overrides, offsets, time and holiday schedules, optimised start/stop, early morning warm-up, economy cycle, duty/standby points, hours run meters, and energy and water meters.			●	
Check that temperatures/relative humidities/CO2 concentrations are maintained within the design intentions of the building.			●	
Check historical trend and event logs.			●	
Check BMS displays are indicating correctly.				●

NOTES

From: Matthews, Cameron T
To: Brandon Servant
Cc: Perrott, John; Andrew Sutherland; ASC Engineers
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade
Date: Tuesday, 11 February 2025 11:35:24 AM
Attachments: image001.png
image002.png
00725 LGH Ward Block Air Conditioning Upgrade_Rev 3.pdf

Thanks Brandon

Greatly appreciated

Cheers
cam

From: Brandon Servant <[redacted]
Sent: Tuesday, 11 February 2025 11:22 AM
To: Matthews, Cameron T <[redacted] Andrew Sutherland <[redacted]
Cc: Toon, Shane A <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the feedback. Please see the updated report with the typo corrected.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 **F** 03 6224 2405 **M** [redacted]
W www.asceng.com.au **E** office@asceng.com.au

From: Matthews, Cameron T <[redacted]
Sent: Tuesday, 11 February 2025 8:07 AM
To: Brandon Servant <[redacted] Andrew Sutherland <[redacted]
Cc: Toon, Shane A <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon
There is one typo on page 4, can you please amend (level 5- Ward 6D should be level 5- Ward 5D)

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: 0400 651 139 | **T:** 03 6777 6434

From: Matthews, Cameron T
Sent: Friday, 7 February 2025 4:25 PM
To: Brandon Servant <[redacted]Andrew Sutherland <[redacted]
Cc: Toon, Shane A <[redacted]ASC Engineers <office@asceng.com.au>; Perrott, John <[redacted]
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Brandon

Thanks for the revised document. Shane has noticed the following needs amending:

Page 14
Aqua/light blue section is 4N in the document but should be 4O

Page 9
Paediatrics Outpatients & QVOP should be Ward 3D

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]

Sent: Friday, 7 February 2025 4:07 PM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron & Shane,

Pleas see the attached updated report for the LGH air conditioning upgrade. This now includes an assessment and proposal of Obstetrics 4O.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
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From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 10:44 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon

Cheers
Cam

From: Brandon Servant <[redacted]
Sent: Friday, 7 February 2025 8:24 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cameron,

Thanks for the email. I can confirm that the report and budget estimate does include 3D (Paediatrics Outpatients & QVOP). The comment regarding levels 4 to 6 will be updated.

We will add a section on maintenance. Maintenance will need to be in accordance with AIRAH DA19. This will cover the following equipment:

- Filters (monthly inspection). Filter cleaning or replacement every 3 months
- FCU maintenance
- Circulating pumps
- Control systems

I'll also make the other changes to page 7 as per your notes.

Kind regards,

Brandon Servant
Building Services Engineer

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From: Matthews, Cameron T <[redacted]
Sent: Friday, 7 February 2025 8:03 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

HI Brendon and Andrew

Thank you for your report and meeting a tight timeframe.

Can you confirm this covers off on 3D as well. As one area it refers to D block four levels and then in another part it talks about level 4, 5 and 6 (page 7).

Mention that additional maintenance will be required for quarterly filter changes etc (as we may need additional staffing)

P7
The ~~existing~~ installed capacity for the common cooling coil is 206 kW ~~with an available~~ but only has an available capacity in the order of 152kW,,, (note reading it sounds like there may be an additional spare capacity of 152kW

Change the DB and WB to something that is more commonly referred to (ie. RH relative humidity)

Change the winter degrees from 1.5 to -1

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
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From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 11:21 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

No problem. Let us know if you have any comments after reviewing the draft.

Kind regards,

Brandon Servant
Building Services Engineer

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Sent: Thursday, 6 February 2025 9:57 AM
To: Brandon Servant <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Brandon and Andrew

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <[redacted]
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

> You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

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Andrew Sutherland Consulting Engineers

DEPARTMENT OF HEALTH
LAUNCESTON GENERAL HOSPITAL

Ward Block Air Conditioning Upgrade
274-280 Charles Street, Launceston

Ingineering Pty Ltd ABN 47 056 855 577 trading as
Andrew Sutherland Consulting Engineers
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Issue:	Issue 3
Date:	11 February 2025
Reference:	00725

1. EXECUTIVE SUMMARY

This report has been prepared by ASC Engineers in response to a request from Department of Health to provide an assessment of the Ward Block (D Block) cooling arrangement at the Launceston General Hospital.

The elevated temperatures in Ward Block D during warm summer weather is the result of inadequate cooling capacity and air distribution. There is limited opportunity for improvement without substantial redesign for the upgrade and replacement of the existing facilities.

The proposed scope of works for Ward Block D includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

An additional assessment of the Obstetrics ward (4O) has also been requested by the department. This ward has no air conditioning facilities.

The proposed scope of works for Obstetrics Ward 4O includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (5 off)
- FCU for corridor zone (1 off)
- Controls

The recently upgraded chiller plant is adequately sized to provide cooling for the Ward Block D and Obstetrics; however, additional pipework would be required to utilise the chiller plant capacity.

The estimated cost for the air conditioning upgrade for the Ward Block D and Obstetrics is $4.62 - $5.09M.

2. TABLE OF CONTENTS

2.1. List of Appendices

3. GLOSSARY OF TERMS & TERMINOLOGY

AC	Air Conditioning	HHW	Heating Hot Water
AHU	Air Handling Unit	HVAC	Heating, Ventilation & Air Conditioning
APS	Air Pressure Switch	MSB	Main Switch Board
BCA	Building Code of Australia	NCC	National Construction Code
BMS	Building Management System	PAC	Package Air Conditioning Unit
CHW	Chilled Water	PB	Proportional Band (control point)
DB	Dry Bulb	PID	Proportional Integral Derivative (control)
Deadband	Area between Cooling & Heating stages	RAC	Room Air Conditioning
DP	Differential Pressure	RC	Reverse Cycle
DX	Direct Expansion (refrigeration system)	T	Temperature
EEV	Electronic Expansion (valve)	VAV	Variable Air Volume
EPO	Emergency Power Off	VSD	Variable Speed Drive
FCU	Fan Coil Unit	WB	Wet Bulb

4. INTRODUCTION

This report assesses the existing services and proposed air conditioning upgrades for the following buildings and wards at the Launceston General Hospital:

- Ward Block D
  - Level 3 - Ward 3D
  - Level 4 – Ward 4D
  - Level 5 – Ward 5D
  - Level 6 – Ward 6D
- Block O
  - Level 4 - Obstetrics 4O

Figure 4.1 – LGH Site Ward Block D & Obstetrics 4O

4.1. Ward Block D

Ward Block D was constructed in 1979 at which time the ambient design conditions were significantly lower than current design parameters. The current design conditions have increased due to elevated summer temperatures. At the time of original construction, the provision of air conditioning for patient rooms was not universally adopted as a necessary design consideration.

Due to these legacy issues with only indirect cooling for the patient rooms, recent hot weather has resulted in excessive indoor temperatures experienced in Ward Block D. The current mechanical services design for this building provides conditioned air only to the corridor spaces, office areas, and nurse stations via a common air conditioning system located in the Level 7/8 plant room. Some supplementary air conditioning units have been provided for special rooms on level 4. As designed, the existing air conditioning system does not have sufficient cooling capacity or adequately sized distribution ductwork to provide satisfactory cooling for the patient rooms.

The temperatures in patient ward areas of Ward Block D at the Launceston General Hospital (LGH) can exceed typical occupancy comfort conditions in warmer months. The patient rooms rely on cool air from the corridors to be drawn into the occupied space via the negative pressure created by the toilet exhaust system. Due to the limited cooling capacity and modest air flow rate created by the toilet exhaust system the arrangement does not provide effective cooling for the patient rooms.

Air conditioning for the corridors is provided by a single cooling coil that serves all levels. This configuration does not allow for any cooling diversity or facility to adjust for varying cooling loads at individual floor levels.

Heating for the wards is provided by resistive (electric) electric heating in individual zones.

4.2. Obstetrics 4O

The 4O Obstetrics ward was constructed in 1995. The facility only has basic facilities for heating and ventilation only with no provisions for cooling.

Patients experience elevated internal temperatures due to solar exposure during the morning and late afternoon. The general corridor receives afternoon solar exposure from the windows in the Chapel courtyard void. Although located on the southern side of the site, the arrangement of the facades results in high solar gain throughout the day resulting in excessively elevated room temperatures.

External shading has been provided for windows on the eastern, western and southern façades. Despite the provision of shading the existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms with measured inside glass surface temperatures recorded as high as 30°C. There is no shading on windows facing the Chapel courtyard.

5. EXISTING AIR CONDITIONING ARRANGEMENT – WARD BLOCK D

Air conditioning for Ward Block D is primarily provided by a single cooling coil and electric re-heat coils for each zone. The schematic below is an extract from the Honeywell BMS that illustrates the existing configuration.

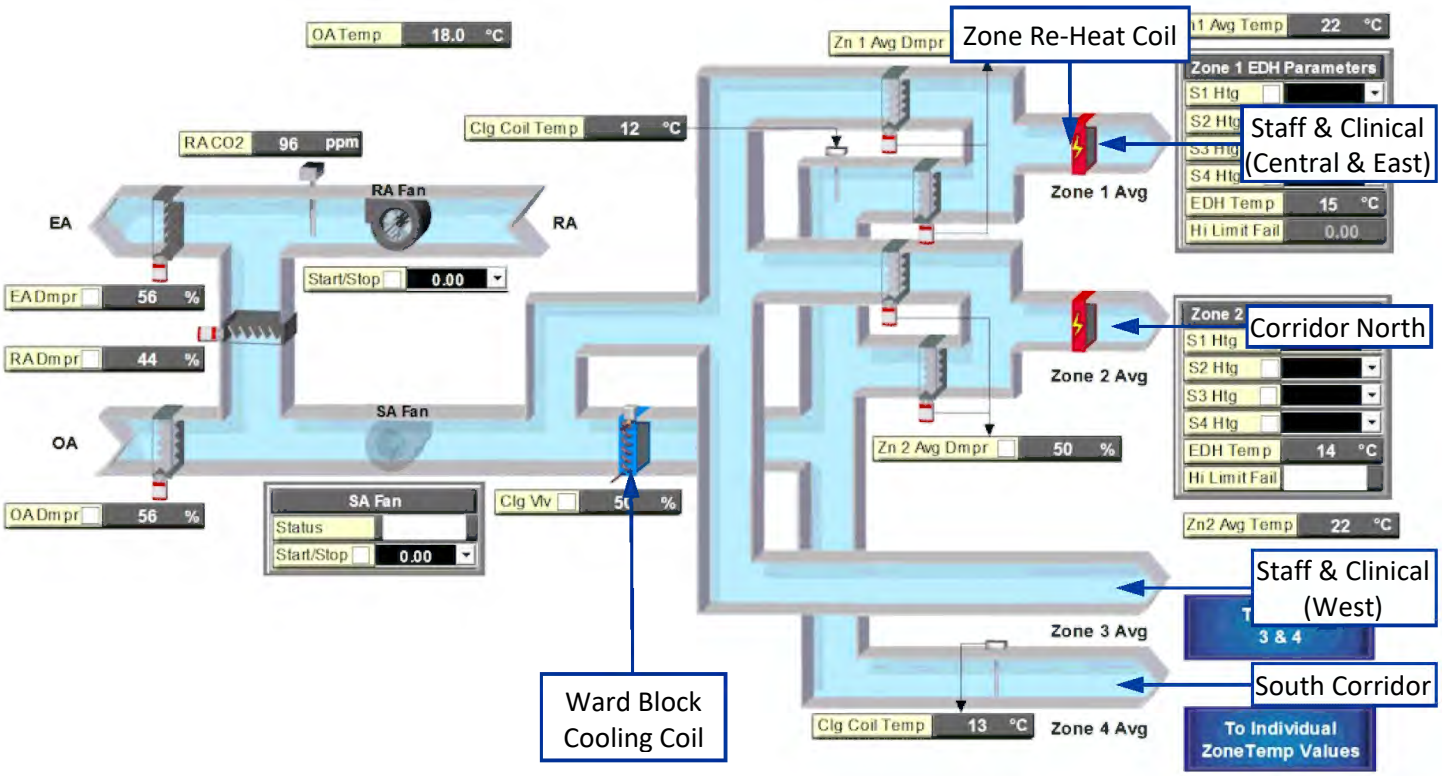

Figure 5.1 – Existing Air Conditioning Schematic

The ward areas rely on air delivered to the corridor to be drawn into the occupied spaces to cool the zones.

Figure 5.2 – Typical Ward Layout (Level 6)

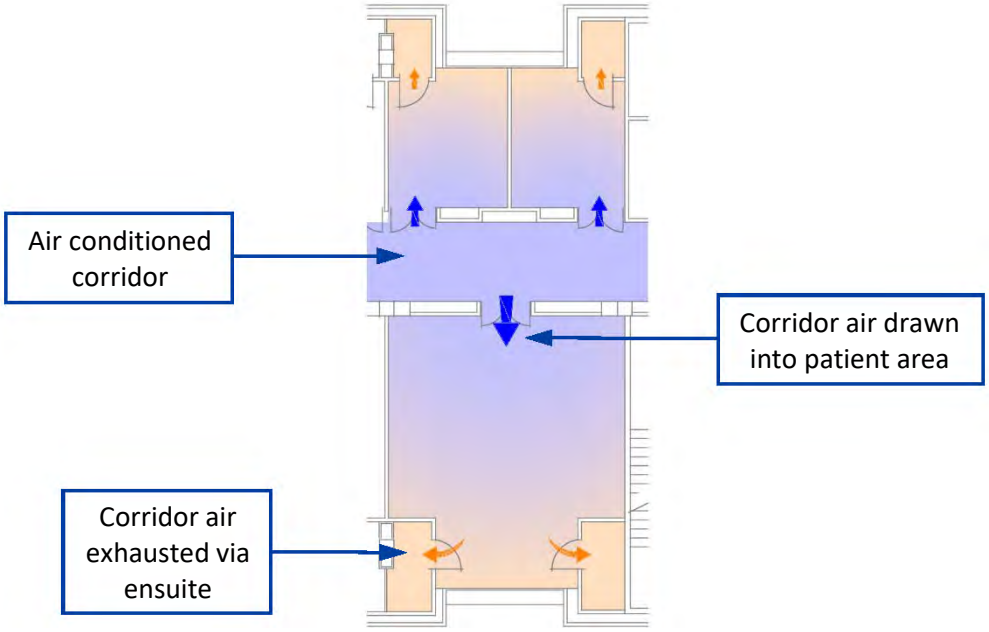

Figure 5.3 – Typical Air Movement Arrangement (indirect cooling to patient rooms)

This configuration does not allow for any variation in the building façade, solar exposure, or vertical diversity.

The existing air flow rate to the patient room is less than 20% of the required air flow rate of conditioned air to meet the patient room cooling requirements

5.1. Existing Cooling Capacity

The installed capacity for the common cooling coil is 206 kW but only has an available capacity in the order of 152 kW because of chilled water flow restrictions in the existing hydraulic network serving this plant.

Preliminary estimation of the cooling load for Ward Block D which has a floor area in the order of 3720 m^2 for the four occupied levels, as summarised below:

Space Type	Area (m^2)
Corridors	560
Large Ward Rooms	1080
Small Ward Rooms & Isolation Rooms	384
Other Clinical & Staff Spaces	1696
TOTAL	**3720**

Design ambient conditions used for this assessment are:

- Summer: 35°C, 49.3% RH
- Winter: -1.5°C

Using a typical average ceiling height of 2.7 meters, and design parameters outlined in the Victorian Health and Human Services Building Authority (VHHSBA), i.e.

- Minimum total air changes per hour (ACPH): 6
- Minimum outdoor ACPH: 2

The peak cooling load is in the order of 330 kW. This suggests there is a cooling capacity shortfall of 178 kW for Ward Block D Level 3 to 6.

6. EXISTING HVAC ARRANGEMENT – OBSTETRICS 4O

Obstetrics Ward 4O has minimal HVAC services. Ventilation for patient spaces is provided via openable windows. This arrangement is unsatisfactory when the ambient outdoor air temperatures are higher than comfortable room temperatures, i.e. ambient temps 24°C and over.

Local heating is provided by heater panels in each room.

Extraction for the patient ensuite amenities is provided by IXL tastic units installed in each suite. These local exhausts are connected to a common duct. The exhaust discharge to atmosphere is via a common exhaust fan. Relief air for the ensuite exhausts is provided by individual transfer air ducts which borrow air from the common corridors. The majority of the corridor spaces are not conditioned.

7. CONCEPT DESIGN – WARD BLOCK D

To address the legacy cooling deficiency for Ward Block D a number of options have been considered in the preparation of this report and recommendations. Based on the consideration of the optimum patient comfort considerations, minimising disruption to the patient area, system efficiency, existing infrastructure, and building restraints the proposed concept design is recommended.

- Provision of cooling and heating to each patient room with individual room control
- Alteration and upgrading of existing ducted air conditioning system to provide floor by floor control
- Upgrading of the level 7/8 air handling system
- Extension of the heating and chilled water pipe work reticulation from the central plant to Ward Block D

The recent refurbishment and expansion of the primary chiller plant (completed 2024) significantly increased the available cooling capacity for the LGH site. Given this available capacity, it would be feasible to provide a dedicated cooling circuit to serve the Ward Block D in addition to the chilled water circuit. Consideration should also be given to improving the heating capacity to the ward spaces.

7.1. Chilled and Heating Water

The source for the chilled and heating water supplies would be the main chiller plant and boiler plants. New pipework would be routed externally from the respective plants to the Ward Block D.

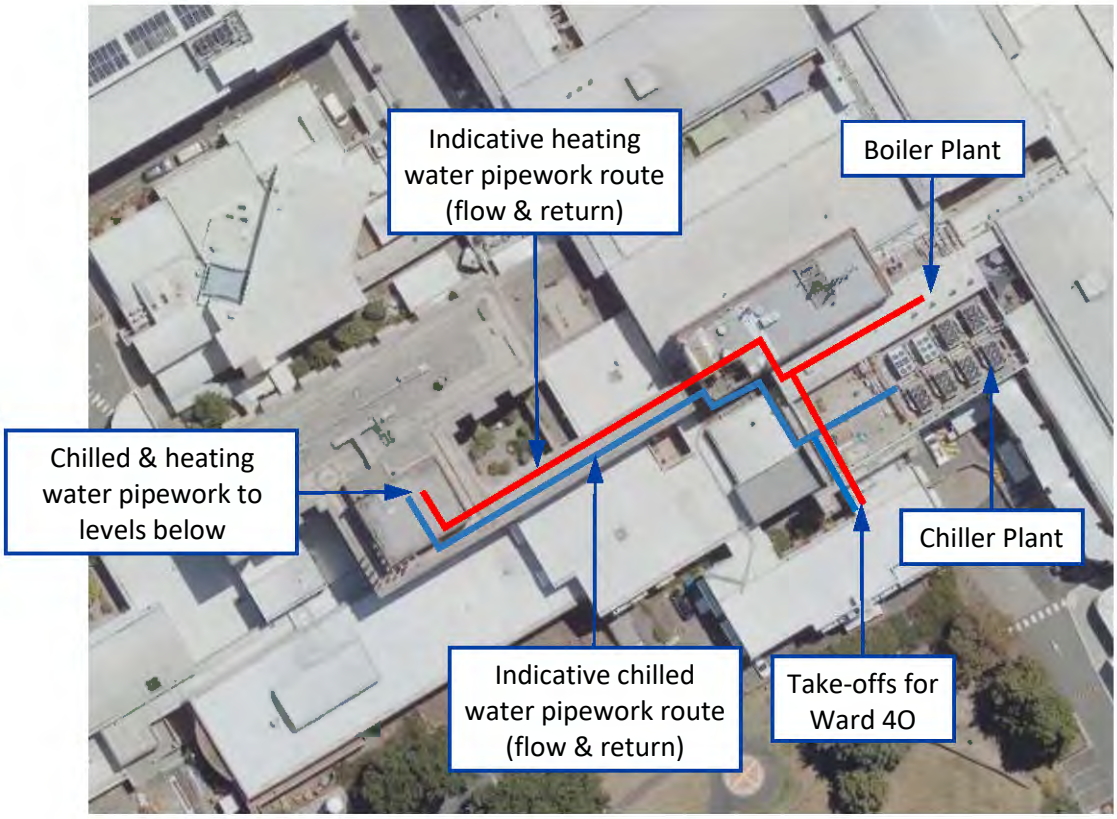

Figure 7.1.1 – Proposed Chiller & Heating Water Pipework Route

New chilled and heating water circulating pumps would need to be provided. The indicative location for this equipment would be the Ward Block D roof plantroom. All new pipework would need to be externally clad where exposed to weather and insulated to comply with current NCC requirements.

It is expected that the existing chilled water pipework serving the level 7 air handling unit (AHU) would be preserved. New heating water pipework would be required in the level 7 plantroom to facilitate the replacement of the existing AHU and to provide new heating water coils in lieu of the electric heaters currently installed.

The flow and return pipework would be routed down the Ward Block D services riser shaft, with take-offs at each level. Each floor would have a flow and return loop to allow for individual fan coil units to be installed in each patient space.

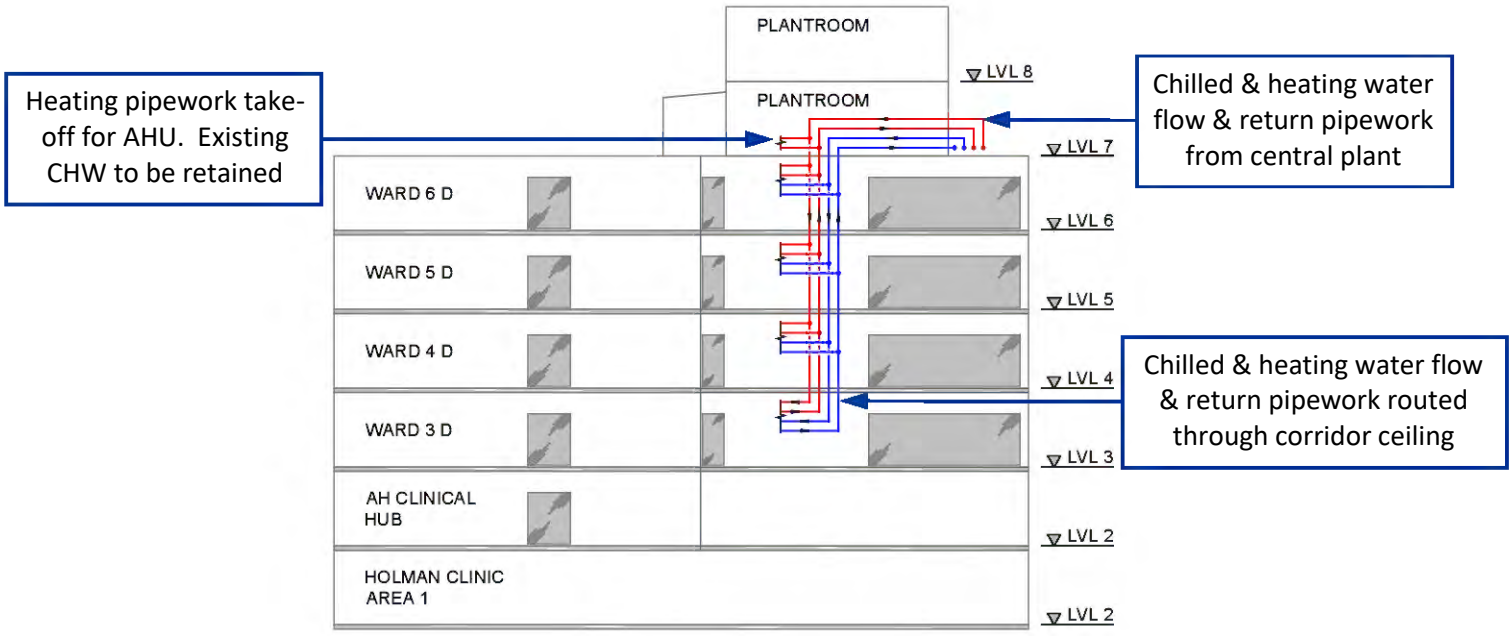

Figure 7.1.2 – Indicative Chilled & Heating Water Pipework (Section)

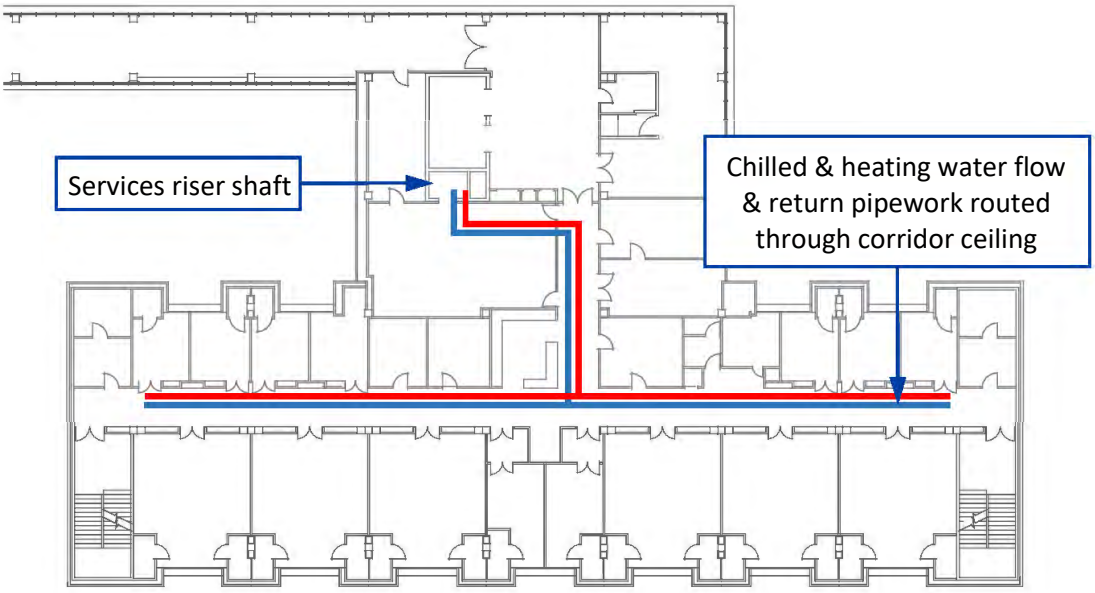

Figure 7.1.3 – Indicative Chilled & Heating Water Pipework (Layout)

7.2. Patient Rooms

Each patient room would be fitted with a chilled water cooled and hot water heated FCU. These would be installed in the ceiling space within each room. This arrangement is commonly utilised for modern hotel apartments and relies on ventilation from a common source, with heating and cooling provided locally within the occupied space. This configuration would preserve the existing corridor air conditioning and ensuite exhaust and provide individual room control for the patient rooms

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary. The figure below shows an indicative section of the proposed installation in the ward areas.

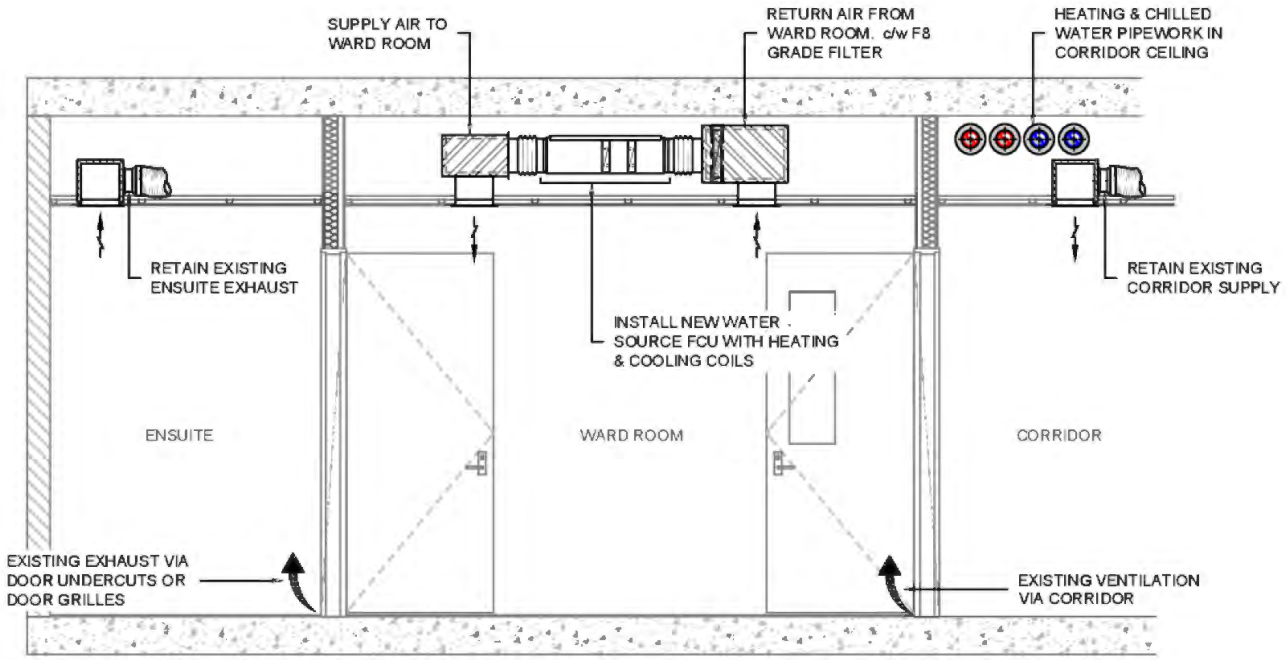

Figure 7.2.1 – Typical Room Section

Figure 7.2.2 – Typical Water Source FCU

The indicative FCU selection would be a GJ Walker ALEC unit or similar. There are four models in this product range, with total cooling capacities between 5.7 to 31.2 kW. It would be expected that the smallest ALEC300 unit would be satisfactory for each ward room. The estimated total cooling capacity for a large north facing ward rooms is 3.0-3.5 kW

An alternative water sources FCU selection would be the Temperzone IMDY series. The Temperzone unit are similarly sized and offer comparable capacities.

Alternatively, Temperzone have a low-profile range (IMDL-Y). This range offers similar cooling capacities as the deeper unit; however, the heating capacities are significantly less, and the fan static pressure may not be suitable if high efficiency F8 filtration is used.

The proposed FCUs are 4 pipe units to avoid the potential for heating and chilled water interconnection which can occur with two pipe units and change over valve arrangements.

7.3. Staff & Clinical FCUs

In addition to the proposed air conditioning upgrades for patient areas, the provision of heating and cooling alterations for staff and clinical spaces air conditioning system should be implemented to improve comfort conditions, system efficiency and reduce running costs. The extent of alteration, zoning, and floor by floor control will be influenced by existing system and building restraints and would be resolved in the design development.

7.4. Level 7 AHU Replacement

It is recommended that as part of the Ward Block D air conditioning upgrade that the Level 7 AHU be replaced for the following reasons:

- AHU has exceeded it expected service life, the unit has been in operation since 1979 (46 years)
- The use of electric heating is not efficient
- Zones 3 (west staff areas) and 4 (south corridor) do not have any heating capacity

This would have a significant impact on the air conditioning and ventilation for the building. To mitigate the impact caused by the AHU replacement this work should be undertaken when the air conditioning for the ward areas has been completed.

7.5. Controls

The LGH runs a Honeywell EBI BMS. This BMS governs the operation of mechanical services across the LGH site. While ensuring the new Ward Block D cooling systems are included in the existing BMS, this control strategy is costly to implement. The extent of the control functionality would require careful consideration to determine the level of control required to ensure satisfactory operation. The minimum control arrangement for each FCU would include:

- Cooling coil valve position
- Heating coil valve position
- Room temperature

Controls for any staff area FCUs will also need to include dedicated start/stop signals. This could either be on a time clock arrangement, or via a local control panel to allow for manual input.

In addition to the controls for the FCU systems, all new chilled and heating water pumps would require BMS control to govern their operation. This would include:

- VSD speed control for heating and chilled water transfer pumps
- VSD fault
- System pressure differential (cooling and heating)
- Start/stop, this would also govern duty/standby and changeover

Start and stop operation could be consolidated to group FCUs together to create zones, i.e. north and south. The following additional control and monitoring points could be considered; however, they are not considered essential for operation of the systems:

- FCU general fault
- Filter pressure drop
- Fan speed
- Chilled and heating water flow temperatures
- Chilled and heating water return temperatures

The replacement of the AHU would require a number of control point to ensure satisfactory operation. The points would include:

- AHU enable
- Fan VSD speed
- Filter pressure drop
- Zone supply air temperature (4 off)
- Cooling coil valve position (4 off)
- Heating coil valve position (4 off)
- Fan fault fault/flow switch

It is expected that the following points would already be available on the BMS and be retained to provide control functionality for the new systems:

- Ambient temperature
- Exhaust air damper position
- Outside air damper position
- Return air damper position
- Exhaust CO_2 level

7.6. Staging

The department of health has indicated that the Ward Block D air conditioning upgrade would need to be completed prior to the summer season 2025. This would require the design and documentation phase to commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

It is expected that FCU and AHU procurement would be 12-16 weeks from date of order. Other essential procurement elements would be:

- Circulating pumps
- Pipework, valves and accessories
- Ductwork, diffusers and grilles
- Insulation
- Controls and field devices

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least 50% of each level is decanted to minimise hoarding requirements and excessive staging coordination.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the Ward Block D. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to the Ward Block D
2. Installation of circulating pumps and associated controls
3. Running pipework down the services riser. Providing take-off branches at each level
4. Commissioning of circulating pumps and controls
5. Ward work – eight stages (levels 3-6, east and west zones)
    a. Installation of chilled and heating water pipework through corridor
    b. Installation of FCUs in ward rooms
    c. FCU controls
    d. Commissioning of FCUs and control
6. Level 7 AHU replacement

8. CONCEPT DESIGN – OBSTETRICS WARD 4O

The proposed air conditioning upgrade for Obstetrics Ward 4O is similar to the proposal for Ward Block D; however, the available ceiling space would allow for larger FCUs to service multiple spaces. The chilled and heating water supply would be a set of branch take-offs from the new proposed pipework serving Ward Block D. The circulating pumps would likely be installed on the roof near the branch take-offs in a space that would be convenient for maintenance.

8.1. Patient Areas

Given the arrangement of the patient rooms in Obstetrics, areas could be grouped to be air conditioned by common chilled water cooled and hot water FCUs. These would be installed in the ceiling space above a nominated room, or in the corridor if there is sufficient space. This configuration would preserve the existing air conditioning for other areas, and ensuite exhaust and provide grouped or averaged temperature control for the patient rooms.

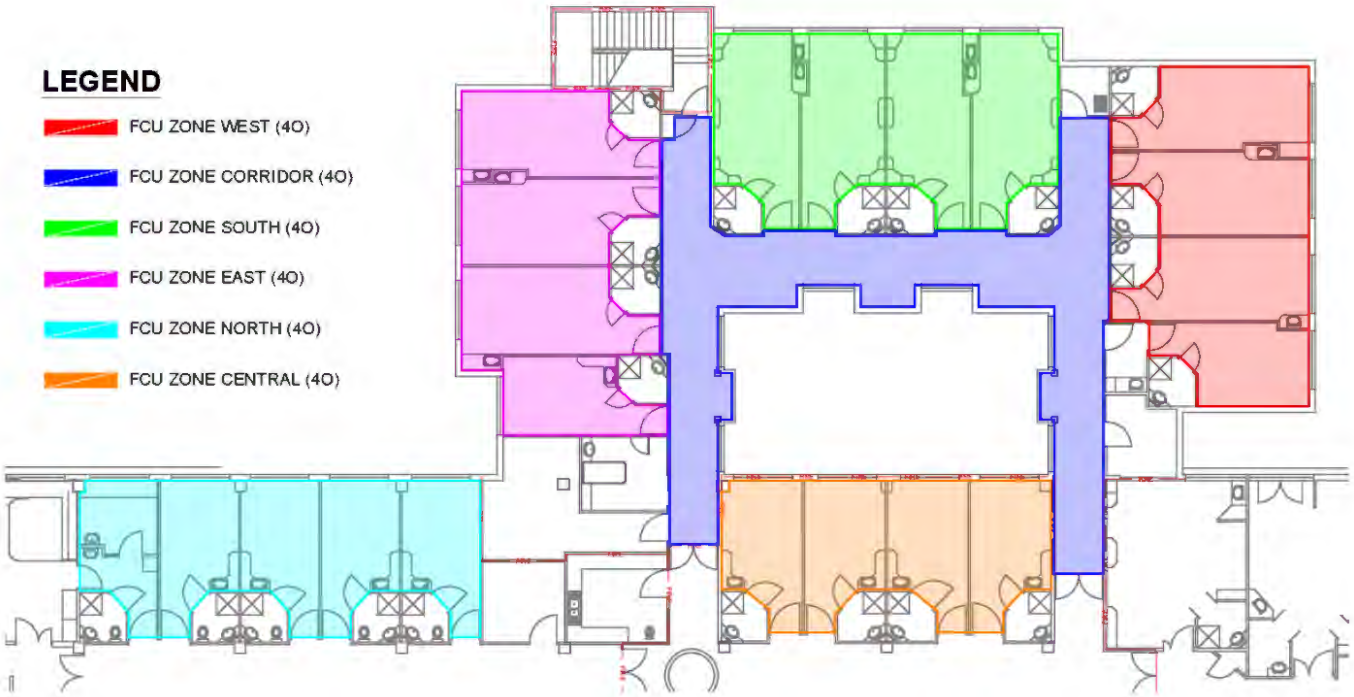

Figure 8.1 – Proposed FCU zoning for Obstetrics 4O

Further investigation would be required to determine if the FCUs could be installed within the existing ceiling void. If there is insufficient space to accommodate a FCU and associated ductwork then ceiling bulkheads may be necessary.

To avoid the reliance on openable windows for ventilation to the patient areas, dedicated outdoor air applies would need to be included in the installation. It is envisioned that ventilation for the zones would be:

- Individual roof cowls for zones:
  - Zone West (4O)
  - Zone South (4O)
  - Zone East (4O)
  - Corridor (4O)
- Weather louvre through external wall for zones:
  - Zone North (4O)
  - Zone Central (4O)

It is expected that the fire compartment arrangement for the FCU central zone will require a fire damper.

The preliminary air conditioning load estimates for the Obstetrics 4O ward areas are as follows:

Zone	Total Cooling Load (kW)	Heating Load (kW)	Ventilation Rate (l/s)
West (4O)	7.0	7.3	140
South (4O)	7.6	7.9	150
East (4O)	7.2	7.6	145
Central (4O)	5.4	5.6	105
Corridor (4O)	8.6	9.0	170
North (4O)	6.7	7.1	135
TOTAL	42.5	44.5	845

Other than the corridor zone shown in Figure 8.1, other staff and clinical areas would retain their existing HVAC services.

8.2. Controls

The proposed controls would be similar to the proposal for the Ward Block D; however, averaged temperature monitoring would be required due to the zoned arrangement.

8.3. Staging

The proposed works for Obstetrics 4O would need to run concurrently with the staging for Ward Block D if it is desirable to have the works completed prior to the summer season 2025.

The decanting of patients will be crucial to allow for the installation of the FCUs. It would be preferable that at least zone groups are made available for installation of the mechanical services.

The chilled and heating water infrastructure could progress without having significant impact on the occupancy of the Obstetrics Ward. This work could progress while other major equipment is being procured.

The concept staging program would be as follows:

1. Installation of chilled and heating water pipework from chiller and boiler plant to Obstetrics 4O
2. Installation of circulating pumps and associated controls
3. Installation of chilled and heating water pipework through the corridor
4. Commissioning of circulating pumps and controls
5. Ward work – six stages (levels 3-6, east and west zones)
    a. Installation of FCUs in ward rooms
    b. FCU controls
    c. Commissioning of FCUs and control

9. BUDGET ESTIMATES

The estimated cost for the Ward Block D and Obstetrics Ward 4O air conditioning upgrades would be between $4.62 - $5.09M. A detailed summary of the budget estimate in included in Appendix 2. The budget estimate includes the following:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas in Ward Block D (56 off)
- FCUs for staff and clinical areas in Ward Block D (32 off)
- FCUs for the Obstetrics Ward 4O patient areas (5 off)
- FCU for the Obstetrics Ward 4O corridor zone (1 off)
- Ward Block D Level 7 AHU replacement
- Controls
- Staging allowances
- Consultancy fees (Engineering, Architect, Building surveyor)
- Project management fees
- Design and construction contingency (10%)

10. OTHER CONSIDERATIONS

The following items were considered in the preparation of this upgrade proposal.

10.1. Refrigerant based systems

Local refrigerant based (direct expansion) systems were considered as an alternative to the water source proposal. The systems include:

- Variable refrigerant flow (VRF) heat pump
- VRF Heat recovery
- Hybrid VRF systems

VRF heat pumps and heat recovery systems rely on indoor air conditioning units connected to dedicated outdoor units. The primary issue with this arrangement is refrigerant concentration. The systems need to be designed so that a refrigerant leak does not result in a major toxic or fire hazard risk. As a consequence of managing refrigerant

concentration, smaller VRF groupings are required. These systems also have a shorter service life compared with water source systems. Replacement parts are not typically available beyond 10-15 years from the date of installation. Failure of a few indoor units or an outdoor unit may result in the entire system needing replacement.

Hybrid systems distribute heating and chilled water to the local indoor units. The refrigerant connection is between the outdoor unit and distribution branch box. This arrangement mitigates the issues of refrigerant concentration. Hybrid systems have a similar service life as VRF systems and are challenging to maintain beyond 10-15 years when manufacturers no longer support obsolete systems.

The initial installation costs of VRF and hybrid systems would likely be less than the water source alternative. This is primarily due to the cost of the much larger heating and chilled water pipework. Despite the higher installation cost for the water source proposal, the advantages of this arrangement include:

- Longer service life
- Flexibility for future replacement and modification
- Utilising existing energy infrastructure

10.2. Ceiling cassettes and highwall units

The proposed water source air conditioning upgrade and alternative VRF option would utilise ducted systems. These units allow for improved air conditioning distribution and filtration. Alternative air conditioning indoor units are ceiling cassette and high-wall systems. While these units would reduce the upgrade costs by eliminating the need for distribution ductwork, diffusers, and grilles; the units are not desirable for deployment in patient areas in hospital and health care installations. The VHHSBA guidelines do not recommend the use of ceiling or wall mounted recirculating units because of the cleaning difficulty and potential for buildup of contamination.

10.3. Level and zone diversity

The proposed upgrade of the Ward Block D level 7 AHU will not improve the vertical diversity of the existing system. If improved diversity of the central system is required, this may be achieved by local heating and cooling coils on each level. This upgrade is not considered to be essential as significant improvements to the air conditioning for Ward Block D would be achieved by the installation of the proposed local FCU.

10.4. External shading & glazing replacement – Ward Block D

The option to consider external shading or glazing upgrade for the building has been considered; however, the reduction in cooling load with these options will not be sufficient to overcome the short fall in the existing indirect cooling for the patient rooms. Glazing replacement to achieve contemporary standards should be included in any future redevelopment of the building.

10.5. Maintenance

The proposed air conditioning upgrade will require additional maintenance activities to ensure the equipment and services meet the design performance requirements. Maintenance of the equipment is essential to minimise failure and ensuring long service life. The maintenance activities for mechanical services are generally outlined in AIRAH guidelines DA19; however, equipment manufacturers will also nominate specific service and maintenance requirements. A list of generic maintenance activities and intervals is included in appendix 3 for the following equipment:

- Fan coil units
- Filters
- Circulating pumps
- Controls

10.6. Hazmat

The extent of hazardous materials will need to be determined prior to finalising the design documentation. The hazmat register for the LGH would likely identify significant or likely hazardous materials in Ward Block D and Obstetrics. The installation contractor would need to manage any known hazardous materials while undertaking the installation works. Any previously unknown hazmat discovered during installation will likely pause construction.

Costs associated with hazmat management are not included in this report or budget estimate; however, some allowances will need to be made to manage this risk.

11. RECOMMENDATIONS

Due to the urgency of the air conditioning upgrade the design and documentation phase must commence as soon as possible. Ideally, the upgrade works package would be issued to tenderers in March 2025, and a successful contractor being nominated in April 2025.

The proposed scope of works for Ward Block D includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (56 off)
- FCUs for staff and clinical areas (32 off)
- Level 7 AHU replacement
- Controls

The proposed scope of works for Obstetrics Ward 4O includes:

- New chilled and heating pipework, including valve and accessories
- Chilled and heating water circulating pumps
- FCUs for the patient areas (5 off)
- FCU for corridor zone (1 off)
- Controls

12. APPENDICES

Appendix 1 – Limitations

a. This report is based upon a visual inspection of the property and describes its basic construction and state of repair, highlighting the main items requiring repairs, maintenance and replacement. We have not made comment or any structural issues or proposed specific repairs as this is not a building defects or structural defects report and outside the scope of the instruction.

b. We have not inspected those parts of the building or its services which are built in, covered up or otherwise made inaccessible in the normal course of construction or occupation and we are, therefore, unable to state that such parts are free from rot, decay, corrosion or any other defect whatsoever.

c. Except to the extent noted in this report, we have not made enquiries of any statutory authorities concerning the present arrangements within the building or the likely effect of any proposed occupation. We should advise that the complexity of the Building Codes and other statutory enactments can have a material effect on the way in which building may be planned and used and upon the cost on consequential work. It is assumed that professional advice will be sought at the appropriate stage to determine any works which may be necessary due to any planned occupation.

d. We have not, except to the extent mentioned in this report, carried out any tests or made any enquiries concerning particular materials nor have we calculated any floor areas for leasing purposes or reappraised original design criteria.

e. In cases where contractors or consultants are instructed to carry out tests or prepare reports, whilst we will take every care in instructing these contractors or consultants, we cannot accept responsibility for their report and shall not be liable for error or omissions therein. In appointing such contractors or consultants we act only as an agent on behalf of the client, and the contractual rights and obligations lie directly between the client and the relevant contractors or consultants.

f. This report is prepared for the sole use of the intended recipient and ASC can accept no liability for its use by any other party howsoever used. The client shall not be entitled to assign any of its interests in the report (including any report prepared by specialist sub consultants) to any third party without the prior written consent of ASC.

Appendix 2 – Budget Estimate

All budget estimates presented in this report are high level approximations only. Costs estimates have been prepared using quantity surveying tools applicable to the year of construction and historical information where possible. Construction costs have been interpolated to account for annual fluctuations and CPI inflation where necessary.

SERVICES BUDGET ESTIMATE

PROJECT DETAILS

Project: LGH Ward Block Air Conditioning Upgrade
Description: Concept design estimate
Job No.: 00725
Revision: 2

ELECTRICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Power				
E01	Pump power supplies	8	each	$630.00	$5,040.00
E02	FCU power supplies	94	each	$265.00	$24,910.00
E03	Alterations to AHU power	1	each	$630.00	$630.00
	Misc.				
E04	Isolation of ward lighting	94	each	$220.00	$20,680.00
				Electrical Services Subtotal	**$51,260.00**

MECHANICAL SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	HVAC				
M01	Installation of Ward Block FCUs (ALEC300)	56	each	$8,800.00	$492,800.00
M02	Ward Block ductwork, grilles, diffusers & filter (per set)	56	each	$2,750.00	$154,000.00
M03	Installation of Ward Block staff & clinical FCUs (ALEC300)	32	each	$8,800.00	$281,600.00
M04	Ward Block clinical ductwork, grilles, diffusers & filter (per set)	32	each	$3,300.00	$105,600.00
M05	Installation of Obstetrics FCUs (ALEC500)	6	each	$9,900.00	$59,400.00
M06	Obstetrics ductwork, grilles, diffusers & filter (per set)	6	each	$5,500.00	$33,000.00
M07	Obstetrics roof cowls & ductwork	4	each	$1,220.00	$4,880.00
M08	Obstetrics weather louvres & O/A duct	2	each	$610.00	$1,220.00
M09	Obstetrics fire damper	1	each	$1,050.00	$1,050.00
	CHW & HHW Systems				
M10	Primary chilled water pipework, valves & accessories	20	per m	$436.00	$8,720.00
M11	Primary heating water pipework, valves & accessories	20	per m	$363.00	$7,260.00
M12	Primary pipework insulation	40	per m	$228.00	$9,120.00
M13	Ward D chilled water pipework, valves & accessories - mains	188	per m	$363.00	$68,244.00
M14	Ward D heating water pipework, valves & accessories - mains	218	per m	$285.00	$62,130.00
M15	Ward D pipework insulation - mains	406	per m	$189.00	$76,734.00
M16	Obstetrics CHW water pipework, valves & accessories - mains	54	per m	$204.00	$11,016.00
M17	Obstetrics HHW water pipework, valves & accessories - mains	54	per m	$134.00	$7,236.00
M18	Obstetrics pipework insulation - mains	108	per m	$141.00	$15,228.00
M19	Ward D CHW circulating pumps, including VSDs	2	each	$11,220.00	$22,440.00
M20	Ward D HHW circulating pumps, including VSDs	2	each	$8,580.00	$17,160.00
M21	Obstetrics CHW circulating pumps, including VSDs	2	each	$5,775.00	$11,550.00
M22	Obstetrics HHW circulating pumps, including VSDs	2	each	$5,775.00	$11,550.00
M23	Levels 3-6 CHW pipework, valves & accessories	560	per m	$114.00	$63,840.00
M24	Levels 3-6 HHW pipework, valves & accessories	560	per m	$96.00	$53,760.00
M25	Levels 3-6 CHW pipework insulation	1120	per m	$63.00	$70,560.00
M26	Obstetrics CHW pipework, valves & accessories	100	per m	$114.00	$11,400.00
M27	Obstetrics HHW pipework, valves & accessories	100	per m	$96.00	$9,600.00
M28	Obstetrics CHW pipework insulation	200	per m	$75.00	$15,000.00
	AHU Upgrades				
M29	Replace Level 7 AHU with multi-zone unit	1	each	$165,000.00	$165,000.00
	Misc.				
M30	Controls for Ward Block FCUs	168	per point	$3,000.00	$504,000.00
M31	Controls for Ward Block staff & clinical FCUs	128	per point	$3,000.00	$384,000.00
M32	Controls for Ward Block CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M33	Controls for Ward Block AHU	10	per point	$3,000.00	$30,000.00
M34	Controls for Obstetrics FCUs	24	per point	$3,000.00	$72,000.00
M35	Controls for Obstetrics CHW & HHW pumps	12	per point	$3,000.00	$36,000.00
M36	Air balancing & commissioning	1	total	$28,160.00	$28,160.00
M37	Workshop drawings	1	total	$46,280.00	$46,280.00
				Mechanical Services Subtotal	**$2,987,538.00**

SERVICES BUDGET ESTIMATE

PROJECT DETAILS

Project: LGH Ward Block Air Conditioning Upgrade
Description: Concept design estimate
Job No.: 00725
Revision: 2

FIRE SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Fire Detection				
F01	Provision of fire relay to disable FCUs in fire mode	2	each	$3,500.00	$7,000.00
				Fire Services Subtotal	**$7,000.00**

HYDRAULIC SERVICES

Code	Description	Qty	Unit	Rate	TOTAL
	Drainage				
H01	Condensate drains for FCUs	94	each	$485.00	$45,590.00
				Hydraulic Services Subtotal	**$45,590.00**

OTHER

Code	Description	Qty	Unit	Rate	TOTAL
A01	Builders work to allow for ceiling access & making good	94	each	$6,000.00	$564,000.00
A02	Builders work for pump installation, main pipework & risers	2	total	$10,000.00	$20,000.00
A03	Staging coordination	16	each	$8,800.00	$140,800.00
A04	Consultancy fees (engineer, architect, building surveyor)	1	total	$611,000.00	$611,000.00
A05	Project management fees	1	total	$153,000.00	$153,000.00
A06	Crane lifts (per event)	2	each	$22,000.00	$44,000.00
				Other Subtotal	**$1,532,800.00**

Exclusions

No allowance for council fees associated with plumbing permit
Costs associates with decanting patients
DoH management fees or superintendent services
Upgrades to central heating or cooling plants
No allowance for HAZMAT management

TOTAL *(ex. GST)*	$4,624,188.00
Design & Construction Contingency (10%)	$462,418.80
BUDGET ESTIMATE FOR SERVICES *(ex. GST)*	**$5,086,606.80**

Appendix 3 – Maintenance Activities & Intervals

The following equipment maintenance sheets outline the recommendations for preventative maintenance frequency and procedures which should be adopted by the Principal to ensure the most efficient operation of the systems installed.

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
FAN COIL UNITS (FCU)

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Inspect drain trays, ensure drains are clear, trays are clean and drains have a water trap in them.	●			
Switch system back to 'normal' and check that all equipment is in the correct designated mode.		●		
Check for leaks in coils and piping connections. Record and report any leaks.			●	
Check panels, doors and fastenings for security. Record and report any leaks.			●	
Ensure insulation is secure, record/report as necessary.			●	
Inspect flexible connections and record/report as necessary.			●	
Inspect the casing for corrosion and leaks, record/report as necessary.				●

NOTES

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
FILTERS - DRY MEDIA AND PANEL FILTERS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Inspect system filters and determine if maintenance is required.	●			
Advance roll filters when resistance exceeds the design amount.	●			
Check roll filters have adequate media.	●			
Clean dry media regenerable filters when resistance exceeds the design amount.	●			
Clean washable filters when resistance exceeds the design amount. (The design maximum resistance may be less than the filter rated pressure drop).	●			
Order new filters or filter media if required for next service.	●			
Record and report on replacement of flat disposable panel filters when resistance exceeds the design amount.	●			
Record and report on replacement of extended surface panel filters, sock or deep bed filters when resistance is more than the design amount.	●			
Record and report on replacement of HEPA filters when resistance is more than the design amount.	●			
Check for air leakage around media, ensure that media edge is in the channel provided.		●		
Ensure that media is not disintegrating or delaminating.		●		
On plants over 500 l/s take pressure reading across filter		●		
On units less than 500 L/s, visually inspect filters. Clean as specified and as necessary (at least every three months).		●		
Vacuum filter chamber and inlet screens after each filter change.		●		
Check zero setting on manometer.			●	
Lightly lubricate filter drives and check operation.			●	
Inspect HEPA filters (after any maintenance) and test for media or gasket leaks.				●

NOTES

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
PUMPS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Adjust belt tension as necessary, check for wear.	●			
Change over duty pump, where fitted.	●			
Check guards are securely in place.	●			
Check pump and motor for vibration and bearings for noise or overheating. Repair as necessary.	●			
Check that gland well and drains are clear.	●			
If pressure gauges fitted, check operating pressures to ensure strainer is clear and pump vented.	●			
Inspect pump gland and adjust if necessary.	●			
Operate pump suction and discharge valves stop any gland leaks.	●			
Vent Pump.	●			
Visually inspect pump coupling.	●			
Where fitted, check operation of automatic float switch, adjust as necessary.	●			
Lightly grease bright steel.		●		
With pump running lightly lubricate bearings of pump and motor.		●		
Clean and, as necessary, reseat check valves.			●	
Check coupling bushes for wear, if worn record/report and isolate equipment. Motor may need alignment.				●
Clean pump strainer.				●
Inspect exposed surfaces for corrosion, minor repair or paintwork as necessary.				●

NOTES
Replace belts and check motor alignment and couplings as applicable - 36 months

MAINTENANCE ACTIVITY SCHEDULE

EQUIPMENT:
AUTOMATIC & SAFETY CONTROLS - ELECTRIC, ELECTRONIC AND DDC CONTROLS

ACTIVITY & DESCRIPTION	M	3M	6M	12M
Attend to any reported problems, check and adjust as necessary.	●			
Check temperatures on floors, in rooms or in any areas requiring special conditions.	●			
Check controls for physical damage.		●		
Check location of thermostats, ensure correct location relative to controlled area.		●		
Check operation of control linkages on dampers and valves.		●		
Check & adjust, as necessary, the calibration of principal control sensors.			●	
Check, clean and lubricate with approved lubricant, spindles & linkages.			●	
Check remaining hard disk capacity on BMS PCs			●	
Backup all DDC files.			●	
Check action and settings of time switches.				●
Check drive motor mountings for security.				●
Check linkages for tightness.				●
Check operation of each thermostat for response.				●
Check calibration and condition of general control and monitoring sensors.				●
Check that loading devices function correctly and plant items respond as called.				●
Inspect all controls for operation & cleanliness.				●
Inspect all DDC systems and data gathering panels.				●
Prove correct operation of any safety controls.				●
Check communication between BMS and DDC controllers				●
In conjunction with mechanical services contractor check operation of VAV boxes				●
Building control				
Verify and review operation and settings of control loops, set points, dead bands, overrides, offsets, time and holiday schedules, optimised start/stop, early morning warm-up, economy cycle, duty/standby points, hours run meters, and energy and water meters.			●	
Check that temperatures/relative humidities/CO2 concentrations are maintained within the design intentions of the building.			●	
Check historical trend and event logs.			●	
Check BMS displays are indicating correctly.				●

NOTES

From: Perrott, John
To: Hargrave, Andrew J
Subject: FW: Emailing: RISK ASSESSMENT - Heat in Medical Wards V3 Dec 2024.docx
Date: Friday, 24 January 2025 9:25:00 AM
Attachments: RISK ASSESSMENT - Heat in Medical Wards V3 Dec 2024.docx

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Hi Andrew,

FYI essentially recommends risk treatments we have tried to progress.

A positive document but suspect IC LGH may push back. I spoke to Loren (WHS in the Nth)this morning and she indicated this has the endorsement of the CRO and Brendan is reviewing with a view to potentially delivering a guidance based on this doc.

We met with Fiona yesterday re the SIIRP bid. We can accelerate some of the issues such as the ice machine, updating kitchen quite quickly, whilst we work on the SIIRP bid. Fiona is happy with this proposed approach.

Cheers,
John

-----Original Message-----
From: Matthews, Cameron T <[redacted]>
Sent: Friday, January 24, 2025 8:31 AM
To: Perrott, John <[redacted]>; Toon, Shane A <[redacted]>; Reid, David J <[redacted]>
Subject: FW: Emailing: RISK ASSESSMENT - Heat in Medical Wards V3 Dec 2024.docx

HI all

This an interesting development..

Cheers
Cam

-----Original Message-----
From: Taylor, Loren M [redacted]>
Sent: Friday, January 24, 2025 8:11 AM
To: Matthews, Cameron T <[redacted]>
Subject: Emailing: RISK ASSESSMENT - Heat in Medical Wards V3 Dec 2024.docx

Hi Cam

Based on our discussion this week regarding heat etc. Here is a copy of our risk assessment approved by the Chief Risk Officer, which I have been permitted to distribute.

This will enable staff to undertake risk assessments on their wards and consider the actions that can be implemented. There are guidelines within Fiona De Sousa's document regarding ways in which fans can be used to reduce risk of infection.

Looking forward to seeing these implemented and some improvement.

I will be forwarding to NUMs tomorrow for their consideration.

Regards,
Loren

Your message is ready to be sent with the following file or link attachments:

RISK ASSESSMENT - Heat in Medical Wards V3 Dec 2024.docx

Note: To protect against computer viruses, email programs may prevent you from sending or receiving certain types of file attachments. Check your email security settings to determine how attachments are handled.

Tasmanian Government

Department of Health

TASMANIAN HEALTH SERVICE

WHS Risk Assessment Template

Business Unit:	**Hospitals Statewide**	**Assessment Date:**	18.12.2024	**Last Review Date:**	N/A
Task/Issue to be assessed: Throughout Tasmanian's Acute Hospitals excessive heat impacts upon the ability of workers to perform their assigned duties and patient comfort. The excessive heat is caused by outdated or inefficient air conditioning systems, north facing windows and a lack of effective air circulation. This issue is especially problematic in D Block at the LGH and A Block at the RHH.					

Risk Assessment Team	Position	Signature
Mitchell Chivers	WH&S Consultant	
Loren Taylor	WH&S Consultant	
Leah van Someren	CNC – Infection Control	
Maria Lessels	Clinical Coordinator	
Michelle Vout	CNC – Facilities and Redevelopment Infection Control	
Paul Wilkins	Senior Coordinator	

How to complete this risk assessment:

1. Describe the steps involved to complete the task
2. Identify the potential hazards
3. Access the risk of completing the task with no controls in place using the attached risk matrix
4. List all the control measures that can be put in place to minimise the risk of getting hurt using the hierarchy of control
    a. Can the task/issue be eliminated?
    b. Can the task/issue be substituted for something else?
    c. Can engineering controls be put in place to minimise the risk?
    d. Can administrative controls be put in place to minimise the risk?
    e. Can PPE be used?
5. Now reassess completing the task with the control measures in place. (For each consequence consider the likelihood in the terms of the most likely outcome and not the absolute worst case)

How to assess the risk:

1. Select the potential CONSEQUENCE of the hazard
2. Select the LIKELIHOOD of the consequence occurring
3. Find the risk rating (i.e. EXTREME, HIGH, MEDIUM OR LOW)
4. Follow the applicable Control strategy

Task / Step	**Hazard** (What can hurt me or others)	**Inherent Risk** (excluding controls)			**Control Measures** (Elimination, substitution, engineering, isolation, PPE, administration)	**Residual Risk** (including controls)		
		Likelihood	**Consequence**	**Risk**		**Likelihood**	**Consequence**	**Risk**
Excessive heat and lack of airflow within Medical Wards of Tasmania's acute hospitals	Heat, lack of airflow. Risk of heat related illness. Regular workplace temperature above 25 degrees.	**Almost certain**	**Major**	**Extreme**	**Existing Control Measures** Inadequate air-conditioning systems providing fresh air at appropriate temperature. Provision of wet towels, bottled water and Icey poles.	**Almost Certain**	**Major**	**Extreme**

Task / Step	Hazard (What can hurt me or others)	Inherent Risk (excluding controls)			Control Measures (Elimination, substitution, engineering, isolation, PPE, administration)	Residual Risk (including controls)		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
					Proposed Control Measures Elimination – replace the existing air-conditioning systems with new modern designed and installed systems. This would require a significant lead time to design, manufacturer, install and require a significant amount of financial expenditure. This proposed control measure in not recommended.	**Rare**	**Negligible**	**Low**
					Proposed Control Measures Substitution, Engineering – installing portable air-conditioning units in the corridors of Wards to blow cooled air along the corridors and vent warm air into the existing air-conditioning return vents or out through a window. **This is the recommended control measure.**	**Possible**	**Minor**	**Medium**
					Proposed Control Measures Substitution, Engineering – installing window mounted air-	**Possible**	**Minor**	**Medium**

Task / Step	Hazard (What can hurt me or others)	Inherent Risk (excluding controls)			Control Measures (Elimination, substitution, engineering, isolation, PPE, administration)	Residual Risk (including controls)		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
					conditioning units in each of the patient rooms where the current air-conditioning system fails to adequately cool the air. It is important to note that these units do not replenish or remove air within the building. The units will most likely have little to no affect upon the working environment for workers within the ward corridors and offices. This proposed control measure in not recommended.			
					Proposed Control Measures Substitution, Engineering – the use of portable fans do not provide any new air to the work area or physically cool the air. But they do provide a degree of cooling through the movement of the air throughout the worksite. Portable fans will result in a worksite which is safer to work in. Portable fans may be considered	**Possible**	**Minor**	**Medium**

Task / Step	Hazard (What can hurt me or others)	Inherent Risk (excluding controls)			Control Measures (Elimination, substitution, engineering, isolation, PPE, administration)	Residual Risk (including controls)		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
					on a case-by-case basis using a risk-based approach, balancing the risks of enhancing transmission of respiratory viruses (including SARS-CoV-2) with the benefits of using fans. The consideration of highlight points within NUM De Sousa's literature review, below, should be undertaken in any case-by-case risk assessment.			

For the purposes of this risk assessment a Domain Portable 6.2 Kw system was reviewed.https://www.domainappliances.com.au/assets/brochures/CPR62B.pdf

It is important to note that the use of fans, or similar, devices does potentially increase the of the spread of respiratory diseases – including COVID 19.
Fiona De Sousa, NUM Infection Prevention and Control Unit – Launceston General Hospital, has provided a literature review relating to the use of fans in medical wards.

2024 Updated - Fan Use and COVID-19 Ev

The literature review predominately highlights issues relating to air flow to/from patient rooms and between patients in rooms. It is recommended through this risk assessment that the portable A/C units only be placed in corridors and direct any airflow towards the ceiling or other unoccupied areas, wall spaces or corners.

The portable A/C units assist with the ventilation of the area as the direct approximately 2/3 of their output, about 26m3 per minute, away from the work unit and into an external void, like an existing air-conditioning return vent or open window.

The portable A/C units do not have HEPA filters, there are no known units available which incorporated a HEPA filter. The units do have a removable air filter which can be cleaned daily.

The Department of Health must do what is reasonably practicable to provide a safe workplace and safe systems of work. Section 18 of the Work Health and Safety Act 2012 states:

> ***"18. What is reasonably practicable in ensuring health and safety***
> *In this Act –*
> ***reasonably practicable**, in relation to a duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including –*
> *(a) the likelihood of the hazard or the risk concerned occurring; and*
> *(b) the degree of harm that might result from the hazard or the risk; and*
> *(c) what the person concerned knows, or ought reasonably to know, about –*
> *(i) the hazard or the risk; and*
> *(ii) ways of eliminating or minimising the risk; and*
> *(d) the availability and suitability of ways to eliminate or minimise the risk; and*
> *(e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk."*

Information relating to the use of portable fans in workplaces –


Portable_Fans_Restrictions.pdf


if-hp-ipc-info-sheet-portable-fans.pdf

Information relating to working in heat:

- Working in heat - Working in heat | Safe Work Australia
- Working Rights in Heat | Health and Safety | Australian Unions.

Legislation is the overriding authority in relation to safety issues, which is supported by subordinate instruments such as Industry Code and Australian Standards. Whilst the use of fans and air-conditioners may well not be recommended by the various Codes and Standards in NUM De Sousa's literature review, ultimately the obligations imposed by the Act takes precedence. If the provisions of portable air-conditioning units

reduce the impact of heat on both the Departments workers and patients, then it is the strong recommendation of this risk assessment that they be procured and implemented immediately.

Action Plan

Control | Action	Responsible Person	Due Date	Completed | Comments
Workers within work units should continue to report incidents of excessive heat. For the purposes of this risk assessment, excessive heat should be classified as any period where the heat on the work unit exceeds 25°C for sixty minutes. One SRLS should be lodged per shift.	Individual workers in worksites	Ongoing	
If workers feel that excessive heat levels are causing personal distress or discomfort an SRLS can be lodged and assistance may be discussed with their supervisor/manager.	Individual workers in worksites	Ongoing	

Communication Strategies

Communication	Audience	Responsible Person	Due Date	Completed | Comments
Distribution to the Chief Risk Officer for consideration and transmission to Chief Executives – Hospitals South, North and North West for their consideration, review and understanding of the risk associated with excessive heat within their workplaces. It is important to note, that as the current work environment situation is assessed as extreme, this activity may only proceed with written authorisation by Senior Management or delegated authority.	**Chief Risk Officer** **Chief Executive – South, North and North West**	Ruth Sullivan Manager WHS	23 December 2024	

Risk Assessment Review

This risk Assessment must be reviewed on 21 January 2025 or if a significant incident occurs.

Department of Health Risk Matrix

Likelihood	Consequences				
	Negligible *An incidental workplace injury*	**Minor** *Minor workplace injury requiring minimal treatment*	**Moderate** *An event causing injuries requiring medical treatment*	**Major** *An event with potential to cause significant injuries*	**Extreme** *An event with potential to cause multiple major injuries (possibly including death(s)*
Almost certain *Is expected to occur in most circumstances. Occurring frequently.*	**Medium**	**High**	**Extreme**	**Extreme**	**Extreme**
Likely *Will probably occur in most circumstances. Once a year.*	**Medium**	**High**	**High**	**Extreme**	**Extreme**
Possible *Aware of instances that have occurred at some time. Once every 3 years.*	**Low**	**Medium**	**High**	**High**	**Extreme**
Unlikely *Could occur at some time. Once every 10 years.*	**Low**	**Medium**	**Medium**	**High**	**High**
Rare *May occur only in exceptional circumstances. Once every 20 years or more.*	**Low**	**Low**	**Low**	**Medium**	**Medium**

Risk Rating	Control Strategy
Extreme	• Activity may only proceed with Senior Management/delegated authority authorisation • Further controls identified to reduce the risk as far as reasonably practicable • Extreme level risk will monitored and reviewed monthly and escalated to the appropriate corporate governance group
High	• Activity may only proceed with Senior Management/delegated authority authorisation • High level risks will be monitored and reviewed quarterly, unless more frequent monitoring is determined upon escalation to the appropriate corporate governance group
Medium	• Medium level risks will be monitored and reviewed bi-annually
Low	• Low level risks will be monitored and reviewed annually
All	• Workers are to be aware of all existing control measures in place to measure risk

Hierarchy of Control

	Control	Hierarchy of Controls Examples
1.	Eliminate	Repair damaged equipment; replace a chemical process with a mechanical or physical one. If this is not practical then:
2.	Substitute	With a safer alternative. Break larger loads into smaller, lighter loads; use a less toxic material. If this is not practical, then:
3.	Isolate	Install barriers to restrict access to hazardous work areas, isolate equipment. If this is not practical, then:
4.	Engineering	Place a guard on dangerous parts, extract fumes, dust, use a lifting device to do all lifting in workplace. If this is not practical, then:
5.	Administrate	Rotate jobs to reduce time spent on a single task, train staff in safe work procedures, documented procedures, rules. If this is not practical, then:
6.	PPE	Use safety footwear, helmets, earmuffs etc. These rely on appropriate human behaviour to minimise the risk

From: Matthews, Cameron T
To: Wilson, Ronald
Subject: EST LGH HVAC Review- Phase A Chilled Water Systems Report
Date: Tuesday, 18 February 2025 10:09:54 AM
Attachments: SLGH Buildi25021808580.pdf

Hi Ron

Please see
Development of short, mid and long term options Page 12
Recommended options page 15

Cheers Cam
Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)
Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | T: 03 [redacted]

-----Original Message-----
From: konicaminolta_mfd@health.tas.gov.au <konicaminolta_mfd@health.tas.gov.au>
Sent: Tuesday, 18 February 2025 9:59 AM
To: Matthews, Cameron T <[redacted]>
Subject: Message from LGH Building & Engineering

Scanned Document

23001 - LGH HVAC Review - Phase A Chilled Water Systems Report

REPORT FOR

Department of Health

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DOCUMENT CONTROL

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File Path	C:\Users\Engineering Solution\Box\EST\Jobs\2023\23001 - LGH – HVAC Review\OUT\REPORTS\ Phase A - Chilled Water System
Client	Department of Health

Record of Report					
Issue	Reason	Revision	Date	Prepared By	Approved By
P	Preliminary	1	6/3/2023	J.D.N	S.J.B

Distribution Report			
Company	Name & Address	Contact	Copies
Scott Ellis	Level 6, 22 Elizabeth Street, Hobart	scott.ellis@health.tas.gov.au	Electronic

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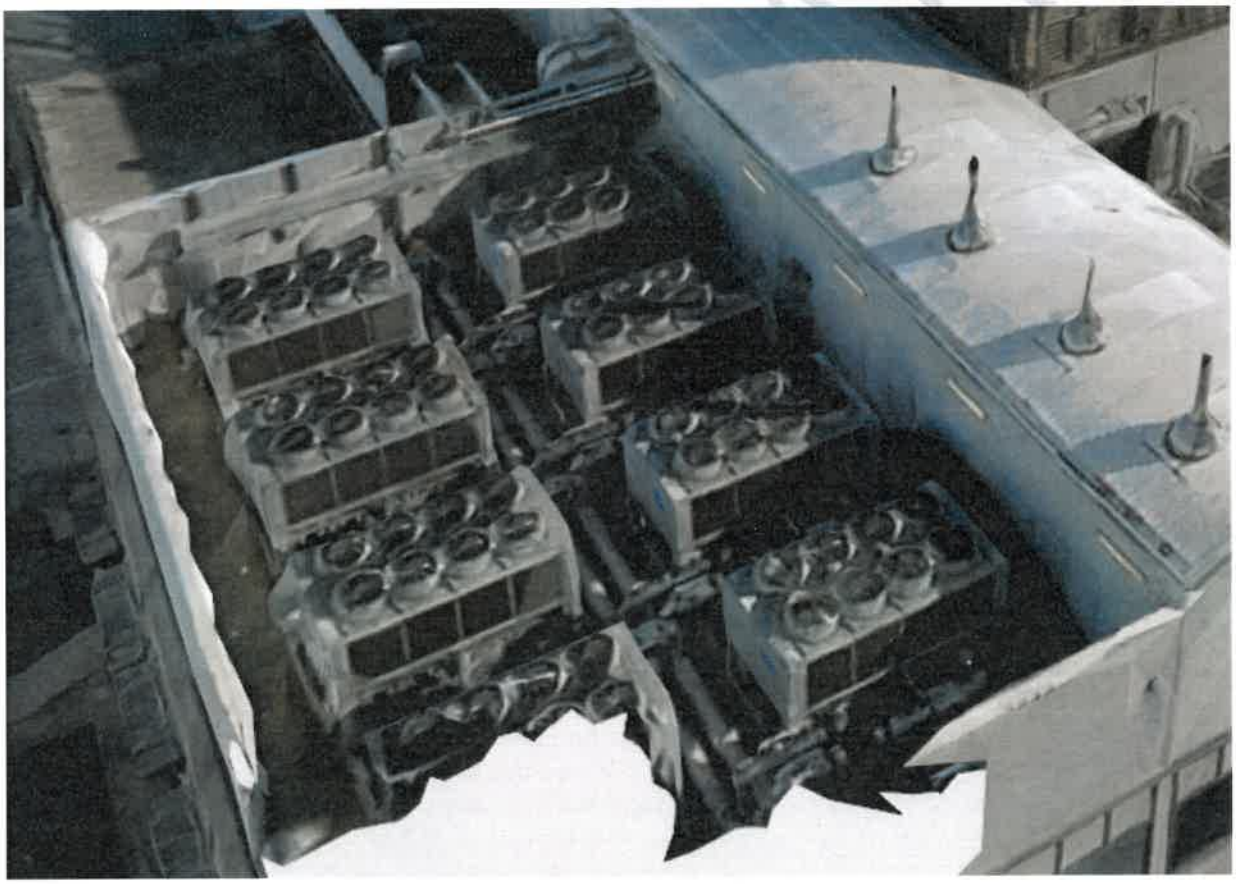
SCOPE OF REPORT

General

The intent of this report is to review and provide a report and recommendations on the existing Heating, Ventilation, Air Conditioning and Refrigeration (HVAC-R) systems across the Launceston General Hospital (LGH) campus bounded by Charles, Frankland, Wellington and Howick Streets.

The review of existing HVAC-R systems across the LGH campus with current issues and limitations identified, and short, mid and long-term planning sufficient to commission budget submissions and concept design documentation. These works will be a staged commission across various buildings and systems.



Existing Level 6 Chiller Deck

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SITE INVESTIGATION

Chilled Water Systems

The chilled water system serving the main site consists of 8 off 400kW Carrier air cooled chillers with each unit having 6 off hermetic compressors, effectively providing 48 steps of cooling. However, the chillers are controlled as whole units, leaving 8 steps of effective control. The chillers are now over 25 years old and operating on R134A refrigerant. The chillers have become very unreliable and are no longer capable of providing sufficient cooling for the site, both because of reliability and expansion of the system.

Each chiller has a single primary circulation pump which feeds chilled water flow to the main storage tank in the level 1 plantroom via the chilled water flow / return primary pipework. From there, a duty/standby secondary circulation pump system distributes chilled water across the site. Various other chilled water flow / return connections have been added to the original chilled water flow / return primary pipework over the years, causing flow imbalances to certain areas of the hospital.

Refer to the Appendix 1 for photos from the various site investigations including review of the Honeywell BMS.

As part of the site investigation, we also reviewed the available hard copy archive and electronic drawings. A current copy of the Chilled Water System schematic was not found to be available. Refer to the Appendices for the previous drawing No. MM14 - Chilled Water & Heating Water Pipework Isometric, dated Oct. 1991 that was found however this is outdated with various modifications occurring to the system since this was produced but typically only detailed at the connection point or area of works during that project and not a full update to the site isometric or schematic completed.

SYSTEM & OPERATION REVIEW

Level 6 plant deck

There are 8 off air cooled chillers located in 2 rows complete with flow / return pipework including single primary circulation pump, valves, strainers with connection to the main flow / return header pipework ran centrally between the chillers. The chillers are located approximately 500mm AFL on steel I-beams and ant-vibration mounts. The chiller area is enclosed on all 4 sides via the existing boiler house and 3 sides of solid acoustic walls greatly reducing airflow to the chillers. Part of the acoustic wall on the western side has been removed at low level however we believe ethe entire solid wall will need to be replaced in the future with a product that allows better airflow into the chiller area. One wall has recently been removed to improve the air flow to the area.

Level 1 plant room

The level 1 plant room contains the chilled water storage vessel and secondary circulation pump duty / standby set as well as the heating water storage, DHW storage, heat exchangers, the back-up generator plant and medical gas systems. There is sufficient room to add additional equipment to the area, however, head heights are limited in certain areas. The chilled water storage tank is also considered near the end of its useful operating life.

STAKEHOLDERS CONSULTATION

Site Consultation

Consultation on site has been in conducted with various staff within the Building & Engineering department including but not limited to:

- Cameron Matthews - Director Corporate Services
- Shane Toon - Team Leader Engineering Services
- Steven Flett – Site Coordinator
- Varotee Banerjee - System Administrator
- Craig Brooks – Mechanical Trade leaded

CONDITION ASSESSMENT

Condition Assessment Report

The condition assessment report will detail each asset or system components current status in accordance with the Department's Building Condition Assessment Requirements framework, with photographic evidence. The document referenced will be the 'Asset Management - Condition Assessment Requirements' Version: 1.0, dated 9th August 2022.

Refer to the Appendix 2 for the Asset Data table for the main Chilled Water System located on the level 6 plant deck and within the level 1 plantroom.

Condition Grading

The condition grading of each asset or system component shall be completed in accordance with the below table:

Table 01 - General Definitions for Condition Scores

Score	Condition	Description of Condition or Performance
1	Very Good	Asset is new or in "as new" condition with no defects or signs of use. Scheduled routine maintenance is required.
2	Good	Asset is in sound condition with occasional defects and minor signs of use. Scheduled routine maintenance is required. Occasional unplanned maintenance is required.
3	Fair	Asset is acceptable condition with obvious signs of use and defects occurring regularly. Scheduled routine maintenance is required. Unplanned maintenance is required.
4	Poor	Asset is in a degraded condition which is reducing the level of service it is providing. Increased scheduled routine maintenance is required. High levels of unplanned maintenance are required.
5	Very Poor	Asset is in a severely degraded condition which is limiting the level of service it can provide. Increased scheduled routine maintenance is required. High levels of unplanned maintenance are required. Planned asset renewal is required.
6	End of Life	Asset is no longer capable of providing any useful service and may be unsafe. Scheduled routine maintenance is no longer required as it provides no benefit. Unplanned maintenance is required to manage risk exposure. Asset may need to be closed and/or demolished.

Intervention Timing

The intervention timing of each asset or system component shall be reviewed in accordance with the below table:

Table 02 - Intervention Timing

Risk Category	Failing to rectify the defect:	Estimate of timing	Action
Negligible	Does not present a significant safety or service delivery risk and will not expose the organisation to risks of further deterioration that would increase the risk or the cost of the rectification.	Up to 5 years	Identify follow-up inspections required to monitor the defect. Inspector to note any suggested mitigation measures in condition assessment report. The condition assessment report shall be submitted for approval by the Department of Health's Senior Asset Analyst within 14 calendar days Minor of the inspection
Minor	May potentially increase minor health and safety risks, incurring additional costs for the repairs, some minor but manageable impact on service delivery.	Up to 3 years	
Moderate	Will require mitigation measures to be put in place over the short-medium term if required while awaiting repairs, but these measures are unlikely to be viable for >24 months.	Within 12 months	As above, and Inspector to notify Department of Health's Senior Asset Analyst of the defect and suggested mitigation measures no later than 2 days after the inspection. The follow up inspections, mitigation measures and the rectification will be corrected in the works program by the relevant Facility Manager
Major	Will require mitigation measures to be put in place over the short term if required while awaiting repairs, but these measures are unlikely to be viable for >12 months.	Within 6-12 months	
Extreme	Could result in failure of the asset with potential for personal injury, significant cost, or significant impact on service delivery.	As soon as practicable	As above, and Report immediately to the Department of Health Senior Asset Analyst Asset Management and relevant Facility Manager for immediate mitigation measures and coordination of repairs as soon as practicable.

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Table 03 - Typical Useful Life Figures

Scale name	Applicable asset class/type	Material / Component	Useful Life
Mechanical	Equipment	Boiler	30
		Chiller	30
		Domestic hot water	15
		AHUs, ductwork, heat exchangers etc	30
		Fan coil units, AC, CRAC, evaporative units etc	15
		Fans, range depending on use, location, and	15 – 30

Note: all other equipment not listed above in the DoH guideline will be referenced from the AIRAH Handbook 2013 - Table 2.1: Economic (service) life of equipment.

Table 04 – AIRAH Table 2.1: Economic (service) life of equipment

Equipment	Useful Life
Refrigeration Chillers – Screw / Scroll	20-25
Pumps	20-25
Pipework and valves	20-25
Tanks	20-30
Heat Exchangers	20-25

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ANALYSIS OF ISSUES, RISKS, CONSTRAINTS & OPPORTUNITIES

Analysis

There are several issues with the existing chiller water systems onsite. Firstly the 8 existing chillers are end-of-life and need replacing. There have been several failures within the chillers including unit compressors. Some replacement parts are now unavailable for the aging chiller units.
The next issue is capacity of the chilled water system, which is now exceeds the capacity of the site. However, the actual site capacity has not yet been estimated. Other issues are inadequate airflow to the chiller deck which will need to be greatly improved prior to the replacement chillers being installed.

Risks

The main risk to the site is over temperature in hospital which in-turn affects the staff and patient's thermal comfort. Currently the chillers are operating above the preferred chilled water setpoint of 7deg C at closer to 10deg C. This in-turn reduces the cooling capacity at each air handling or local fan coil unit. Until further chiller capacity is available, the chilled water system will continue to struggle to operate at the design condition during summer and above average temperature days.

Constraints

The main constraint for the site is the available plant area, age & capacity of the chilled water pipework and ability to adequately balance the chilled water system to ensure all ward areas get sufficient cooling capacity delivered to them. Further investigations may indicate the requirement of additional chilled water reticulation pipework from the current chiller plant area is required to adequately serve all areas of the hospital as some areas currently don't have any cooling plant installed.

Some ward areas are current only partly cooled putting additional load on the local cooling systems. Crane access is now reduced to access the level 6 plant deck due to additional new buildings. The final weight of any new equipment will need to be reviewed to ensure that a suitable crane is available to lift the equipment from ground level to the level 6 plant deck prior to finalising any replacement or new works.

The existing DB 6 (Chiller Power Supply) is supplied by two 1.5MVA as two dedicated Feeds. Each feeder is capable of delivering 2000amps. A combined capacity of capacity of 4000 amps could be achieved under this arrangement. However, a Bus Tie has been provided to allow maintenance of a transformer where a maximum of 2000amps could be drawn. Refer to the below schematic.

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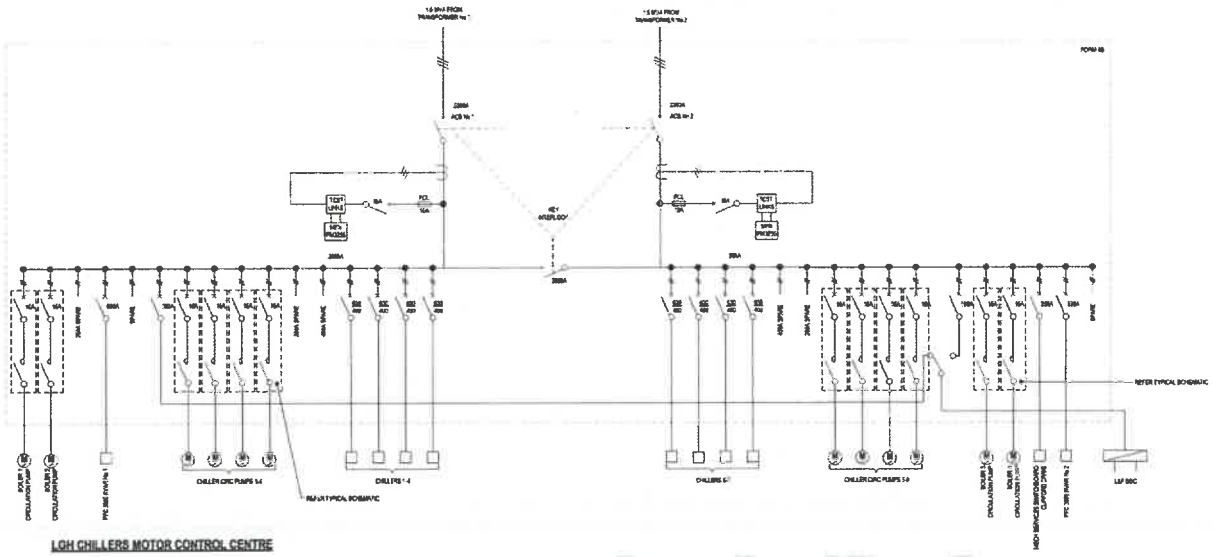

Opportunities

Opportunities in the cooling system upgrade would be to future proof the system for any future upgrades to both the existing and any future building as indicated in master planning documents. This may include the duplication or augmentation of the existing pipework to enable full servicing of the precinct. This would need a final assessment based on the current and future cooling loads currently being determined.

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DEVELOPMENT OF SHORT, MID & LONG TERM OPTIONS

Short Term options

- Investigate hire options for the temporary replacement of any chiller that fails in the short term
- Fix any cross-contamination issues between the heating and chilled water systems as identified onsite with Building & Engineering
- Ensure the chilled water system is adequately chemically dosed and routinely checked in the future to ensure minimal corrosion in the system.
- Complete a detailed audit of the existing chilled water pipework, secondary circulation pumps, valves and storage tanks including deconstructive testing of existing pipework for review of any internal corrosion
- Completed a detailed audit of all new pipework added to the original system and produce an up-to-date full schematic of the chilled water system with water flow information shown. On completion of the new chilled water schematic, a contactor shall complete a full water balance of the system to confirm design water flow information.
- Investigate removing part of the existing solid acoustic wall surrounding the chillers for improved airflow and increased performance of the chillers

Mid Term options

- Design and install 8 Off new 400kW air-cooled chiller units to replace all existing chillers and their associated primary circulation pumps, pipework and valves with connection to existing primary flow / return headers.
- Design and install an extension to the chilled water system (1600kW) with a series of new air-cooled chiller units to provide additional capacity to the current system. It would be proposed that the new units shall be located on the adjacent roof deck area where the redundant Co-gen heat rejection plant is currently located (once removed) and include modifications to the primary flow / return headers to connect the new chillers. The new chillers shall increase the capacity of the current system by up to 50% and provide available cooling during the replacement of the existing chillers.
- Design and install new acoustic louvres for 3 sides of the current and future chiller deck to replace the existing 4 sided acoustic wall.

Long Term options

- Replace all necessary pipework, secondary circulation pumps, valves and storage tanks from the findings of the short-term audits.

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DEVELOPMENT OF BUDGETS & CONTINGENCIES

Short Term Budgets

Rectification of existing cross-contamination issues between the heating and chilled water systems is understood to be in the order of $6,000.00

Full Chemical dosing of the chilled water system is understood to be in the order of $25,000.00

The actual hire cost of a replacement chiller shall be confirmed if required based on the system failure.

Further details are required to confirm the cost of any additional audits.

Mid Term Budgets

Refer to the below Mechanical Services budget for the mid-term options recommended including design costs and contingency at 30%.

REPLACEMENT CHILLERS (8 OFF)		
MECH INSTALLATION COST		$3,105,000.00
DESIGN COST	10%	$310,500.00
MECH SUB TOTAL (INSTALLATION & DESIGN)		$3,415,500.00
CONTINGENCY	30%	$1,024,650.00
TOTAL MECH COST		$4,129,650.00

NEW CHILLERS FOR ADDITIONAL CAPACITY		
MECH INSTALLATION COST		$2,090,000.00
DESIGN COSTS	10%	$209,000.00
MECH SUB TOTAL (INSTALLATION & DESIGN)		$2,299,000.00
CONTINGENCY	30%	$689,700.00
TOTAL MECH COST		$2,779,700.00

Final acoustic louvre replacement works to be determined by a suitable structural engineer, acoustic engineer and architect.

Long Term Budgets

Further details are required to confirm the cost of any replacement works required from the findings from the mid-term audit including but not limited to existing pipework, secondary circulation pumps, valves and storage tanks.

Note that the above Mechanical Service estimates do not include the following that will need to be provided by a qualified Building Surveyor based on the final design outcome:

- builders works
- access to any new / existing services if inadequate
- plant platforms or plant rooms
- other services affected by works including electrical, wet & dry fire, hydraulics, structural
- planning costs
- seismic restraints (if required)
- All other items listed above

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RECOMMENDED OPTIONS

Based on our review, the immediate recommended actions are:

- Replace the existing chiller capacity
- Increase the existing capacity by adding additional chillers to the system.
- Prior to the new or additional chillers being installed resolve any remaining cross-contamination issues so adequate chemical dosing of the chilled water system can commence.
- Increasing ventilation to the plant deck shall resolved ready for the new chillers.

We would recommend design works commence immediately so as the equipment with long lead times can be purchased as soon as possible.

Upon further HVAC audits for the site, the current cooling loads for the existing buildings shall be determined to confirm the required cooling load for all existing areas. From this information the final chilled water plant size shall be confirmed to ensure the upgraded cooling plant is sufficient for both current and future cooling loads.

Long term options for the chilled water plant would include detailed audits of the site to determine any pipework, valves or plant that need to be replaced in the future.

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APPENDICES

Appendix 1 - Photos

Appendix 2 - Condition Assessment

Appendix 3 – Existing Drawing

Appendix 4 – Area & Plant Deck Drawing

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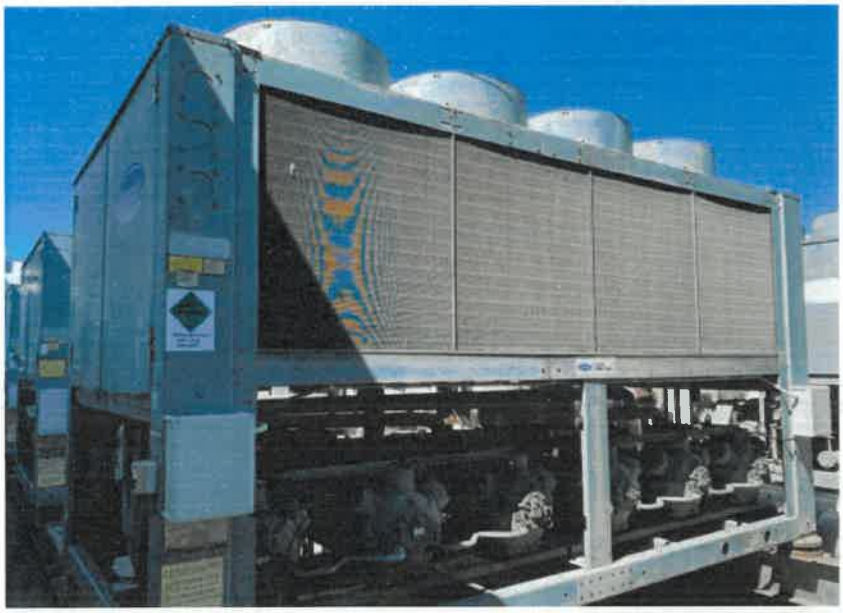
Appendix 1 - Photos



Typical - Air Cooled Chiller (1 of 8) – Carrier 30GU-400-L-911---03

Typical - Air Cooled Chiller Primary including Flow / Return pipework, Valves and Circulation Pump

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Typical - Air Cooled Chiller Circulation Pump

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Primary Flow / Return pipework Headers at ground level with connection to all Air Cooled Chillers

Example of solid acoustic walls around 3 sides of the plant area with the boiler house at one end

Primary Flow / Return pipework Headers to building (note: partly removed solid acoustic wall at one end of plant area to improve airflow)

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Chilled Water Vessel located in the level 1 plant room including connection to the Condenser Water / Chilled Water Heat Exchanger

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Chilled Water Vessel, Secondary Circulation Pumps and associated VSD's and Switchboards

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Chilled Water Secondary Circulation Pumps

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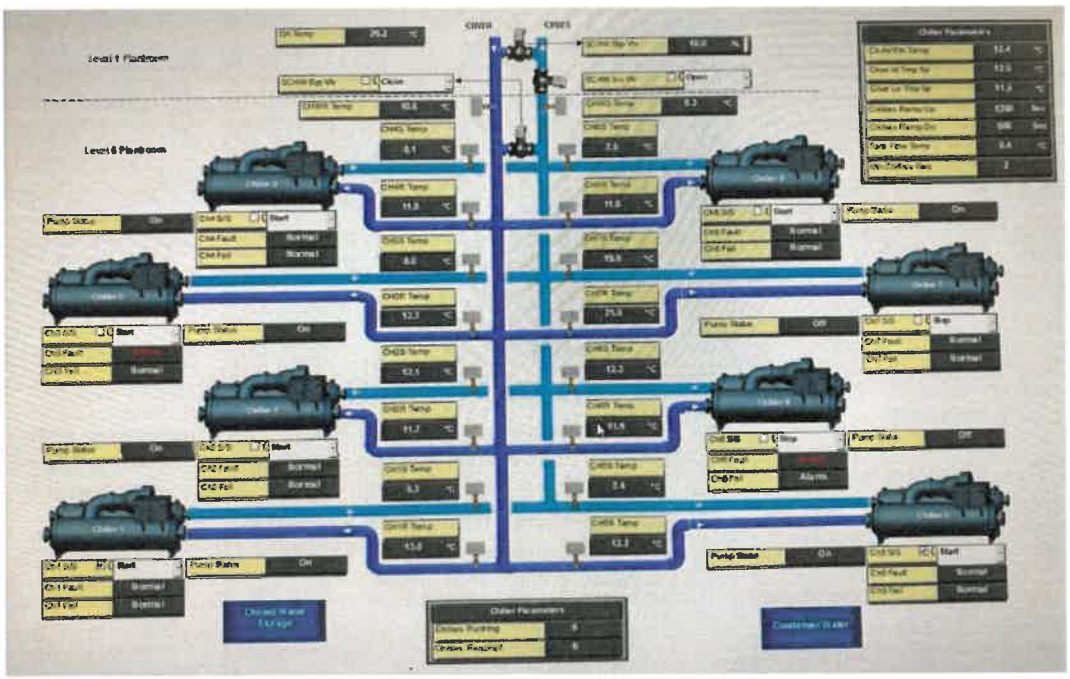
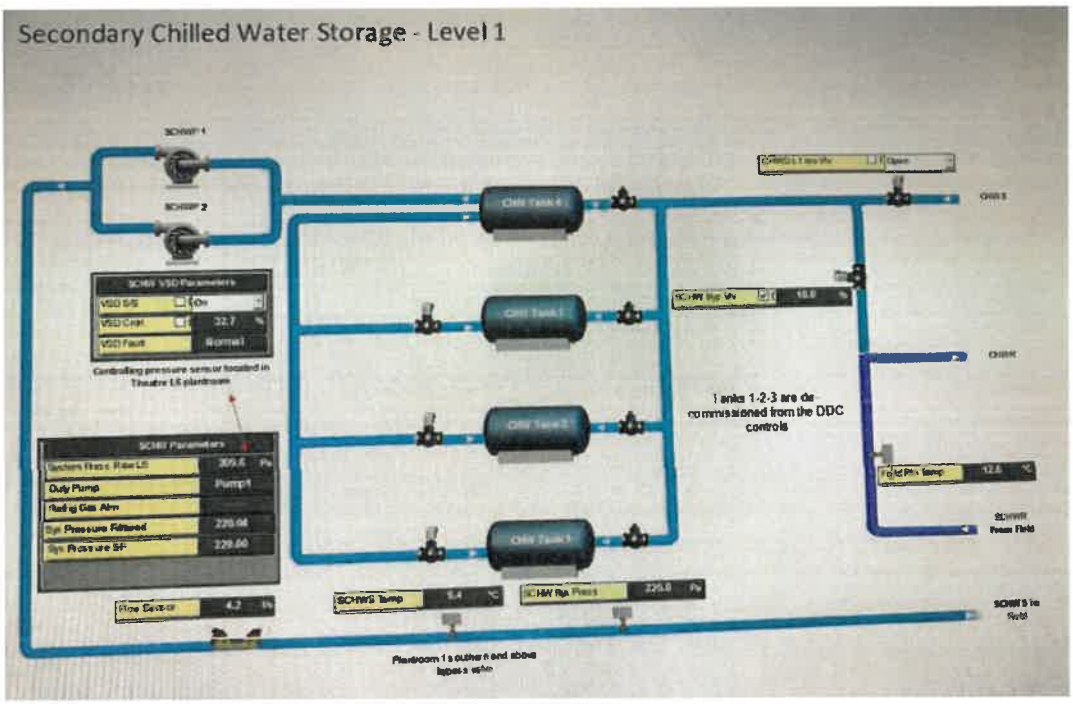
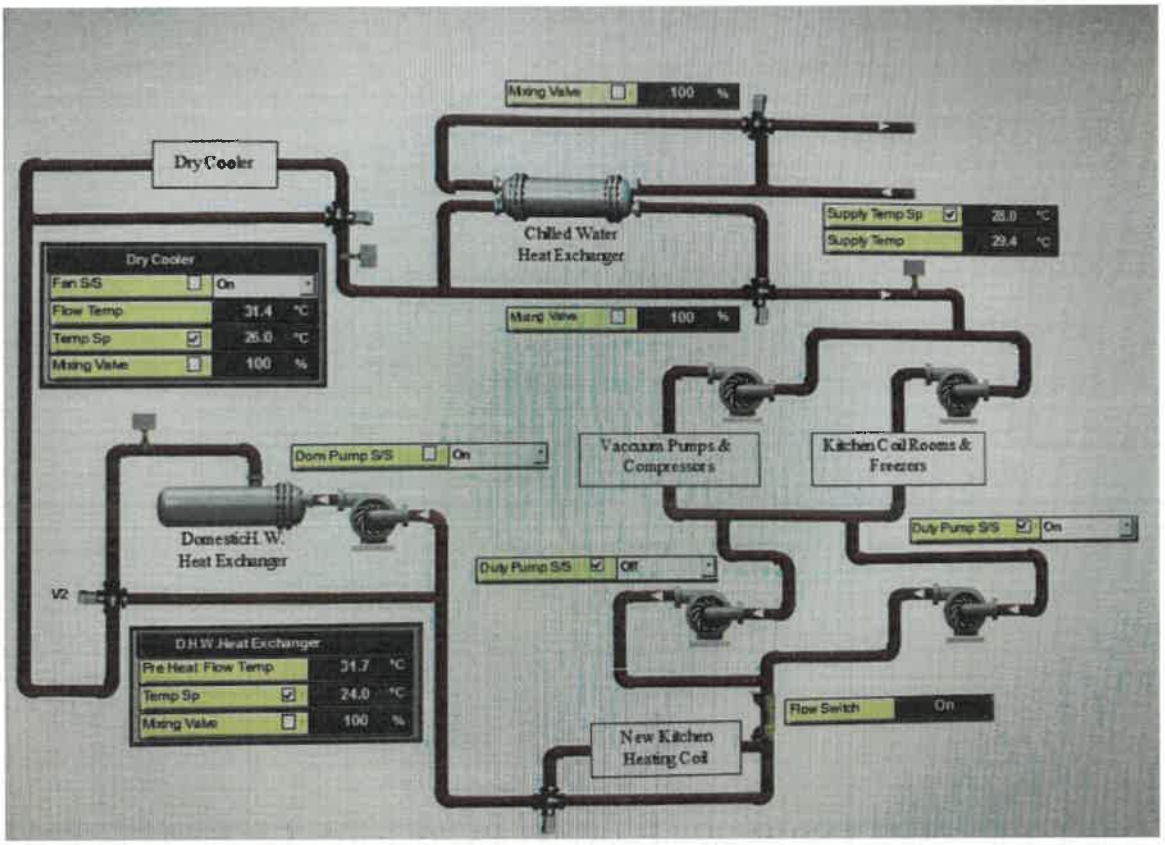


Honeywell BMS Front-end graphics page - Chilled Water system – Level 6 plant area



Honeywell BMS Front-end graphics page - Chilled Water Storage – Level 1 plant room

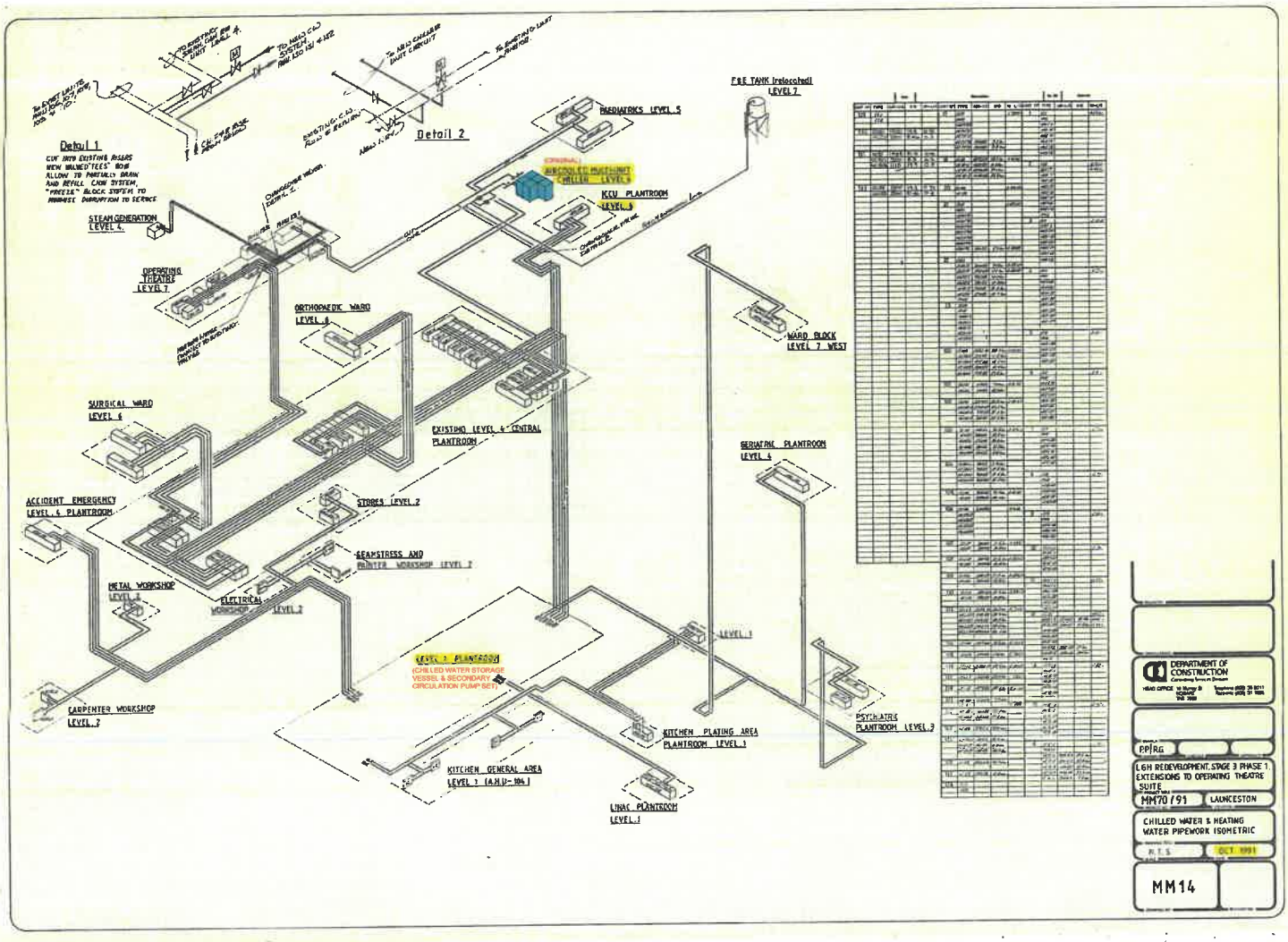


Honeywell BMS Front-end graphics page - Condenser Water system – Level 1 plant room

Appendix No 2
Site: LGH
Building: Main
Level: 1 & 6
Ward / Area: Roof & plantroom
Room: Var.

Asset Hierarchy Level of Assessment	Asset / Component	Asset No. (0####)	Make	Unit Size	Model Number	Serial Number	Manufacture Date	Installation Date	Other Information	Overall Assessed Condition Rating		Severity of the Worst Defect		Extent of the Worst Defect	Photo Ref.	Quantity and units	Statutory obligations (as req.)	Intervention Timing Estimate	
										Score	Condition	Score	Defect					Score (1-5)	Risk Category
L02	No 1 Chiller	1708	Carrier	400kW	30GU-400-L-911---03	3897W09249	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 2 Chiller	1710	Carrier	400kW	30GU-400-L-911---03	3897W09247	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 3 Chiller	1712	Carrier	400kW	30GU-400-L-911---03	3897W09252	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 4 Chiller	1714	Carrier	400kW	30GU-400-L-911---03	3897W09250	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 5 Chiller	1716	Carrier	400kW	30GU-400-L-911---03	3897W09248	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 6 Chiller	1718	Carrier	400kW	30GU-400-L-911---03	3897W09246	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 7 Chiller	1720	Carrier	400kW	30GU-400-L-911---03	3897W09251	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 8 Chiller	1722	Carrier	400kW	30GU-400-L-911---03	3897W09253	22/09/1997	Unknown	R134A refrigerant	5	Very Poor	5	chiller over-temp lockout	entire chiller offline	App1	1	N/A	5	Extreme
L02	No 1 Chiller Pump	1709	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 2 Chiller Pump	1711	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 3 Chiller Pump	1713	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 4 Chiller Pump	1715	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 5 Chiller Pump	1717	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 6 Chiller Pump	1719	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 7 Chiller Pump	1721	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 8 Chiller Pump	1723	Grundfos	130mm IMPELLAR	LP100-125/130 A-F-A-BUUE	#	Unknown	Unknown	Primary Pump	4	Poor	N/A	N/A	N/A	App1	1	N/A	5	Extreme
L02	No 1 Secondary Chilled Water Pump	1732	Southern Cross	315mm IMPELLAR	PSHJ4C	13A9BA12	Unknown	Unknown	Pump casing	3	Fair	N/A	N/A	N/A	App1	1	N/A	3	Moderate
L02	No 2 Secondary Chilled Water Pump	1734	Southern Cross	315mm IMPELLAR	PSHJ4C	13A9BA13	Unknown	Unknown	Pump casing	3	Fair	N/A	N/A	N/A	App1	1	N/A	3	Moderate
L02	No 1 Secondary Chilled Water Pump Motor	1733	CMG	75kW	SGA 280S-4	972	Unknown	Unknown	Pump motor	3	Fair	N/A	N/A	N/A	App1	1	N/A	3	Moderate
L02	No 2 Secondary Chilled Water Pump Motor	1735	CMG	75kW	SGA 280S-4	971	Unknown	Unknown	Pump motor	3	Fair	N/A	N/A	N/A	App1	1	N/A	3	Moderate
L02	Chilled Water Vessel	unknown	custom	#	#	#	Unknown	Unknown	Storage tank	3	Fair	N/A	N/A	N/A	App1	1	N/A	3	Moderate

** refer Appendix 1 for photos*



DEPARTMENT OF CONSTRUCTION

PP/RG

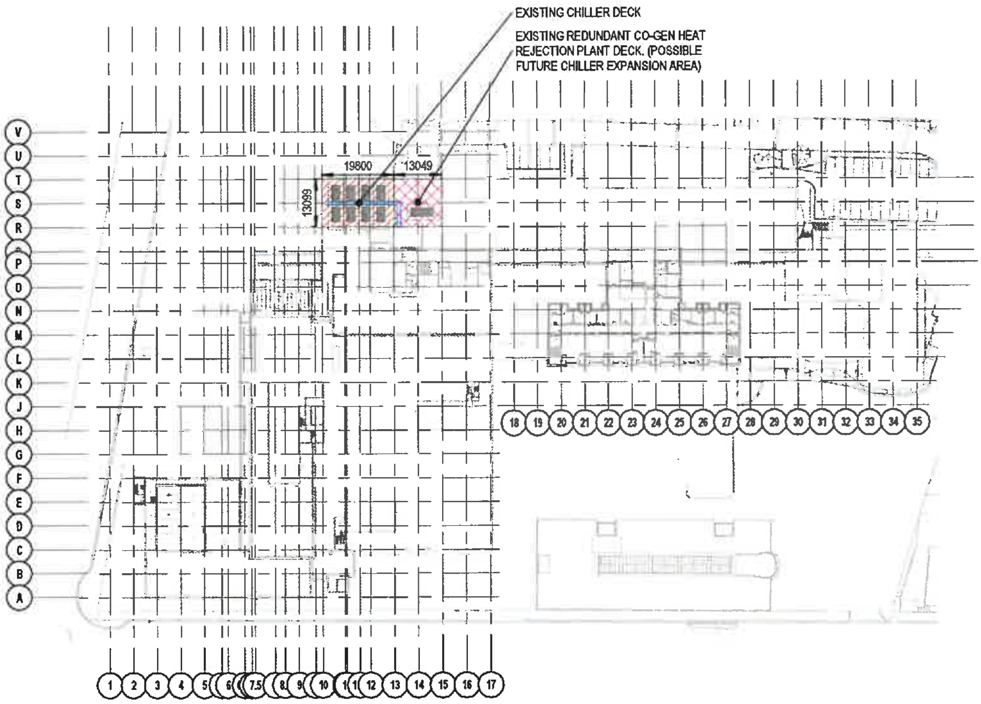
LGH REDEVELOPMENT. STAGE 3 PHASE 1 EXTENSIONS TO OPERATING THEATRE SUITE

MM70/91 LAUNCESTON

CHILLED WATER & HEATING WATER PIPEWORK ISOMETRIC

N.T.S. OCT 1991

MM14



LEVEL 6 - CHILLED WATER SYSTEM

1 : 1000

SCALE
1:1000 10 20 30 40 50m

PRELIMINARY
THIS DRAWING IS NOT FOR TENDER OR CONSTRUCTION AND IS NOT TO BE USED TO BUILD OR MANUFACTURE OFF.

By	Date	Revision Description	Rev
J.D.N	24/02/23	PRELIMINARY	P1

REVISIONS

ENGINEERING SOLUTIONS TASMANIA

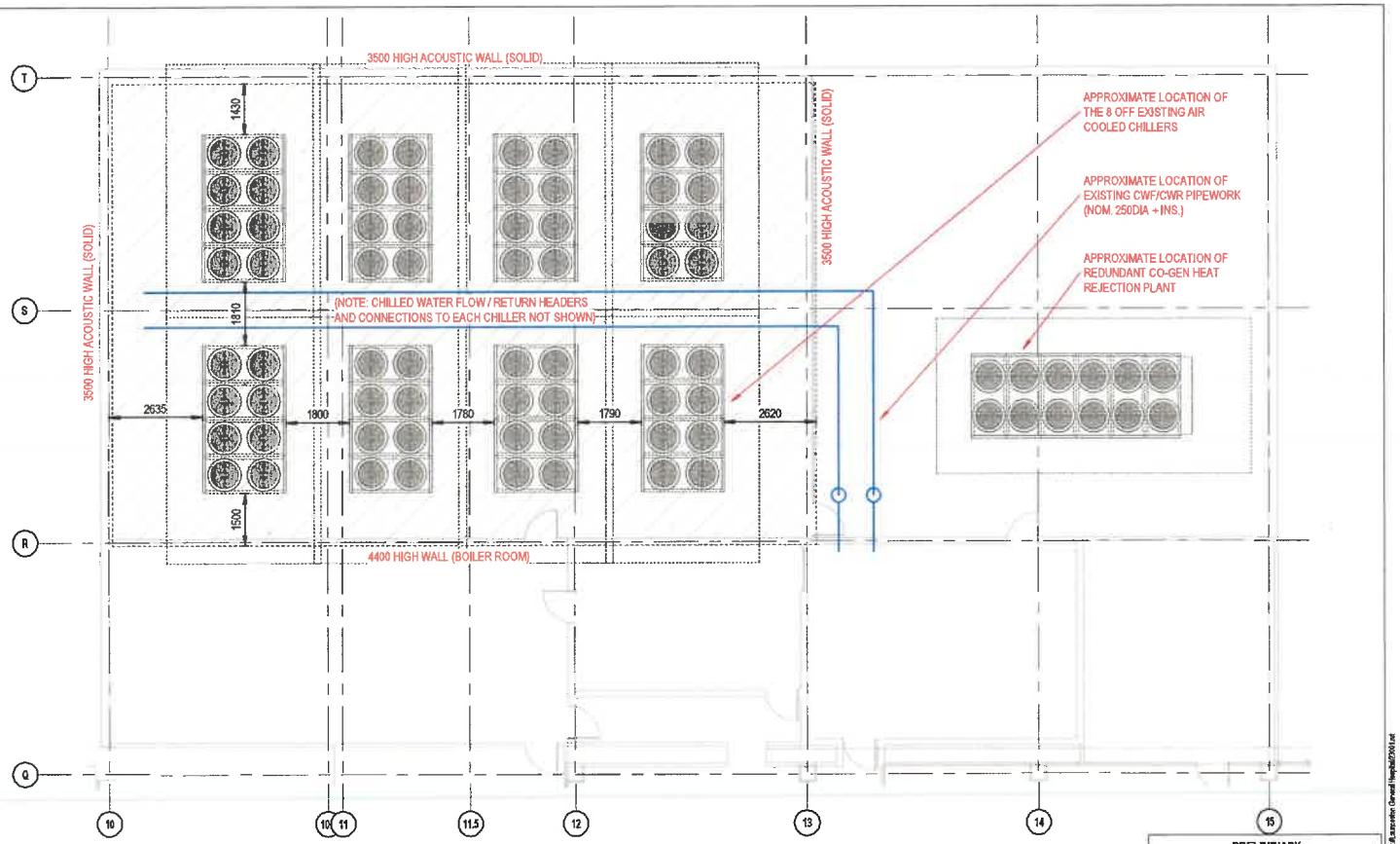
Client: DEPARTMENT OF HEALTH

Project: LAUNCESTON GENERAL HOSPITAL - HVAC REVIEW

Sheet Title: LEVEL 6 - CHILLED WATER SYSTEM

MECHANICAL SERVICES

Designed	J.D.N	Drawn	J.D.N
Checked	-	Revision	P1
Scale : 1000 @ A3		Drg No.	23001-M-A-01



LEVEL 6 - EXISTING MAIN CHILLER DECK

1 : 100

PRELIMINARY

THIS DRAWING IS NOT FOR TENDER OR CONSTRUCTION AND IS NOT TO BE USED TO BUILD OR MANUFACTURE OFF.

SCALE 1:100 (1 2 3 4 5m)

By	Date	Revision Description	Rev
J.D.N	24/02/23	PRELIMINARY	P1

REVISIONS

ENGINEERING SOLUTIONS TASMANIA

Client: DEPARTMENT OF HEALTH

Project: LAUNCESTON GENERAL HOSPITAL - HVAC REVIEW

Sheet Title: LEVEL 6 - EXISTING CHILLED WATER SYSTEM

MECHANICAL SERVICES

Designed	J.D.N	Drawn	J.D.N
Checked	-	Revision	P1
Scale	1 : 100 @ A3	Drg No.	23001-M-A-02

From:	Wilson, Ronald
To:	Office of the Chief Executive, Hospitals North
Subject:	RE: Urgent: Project Initiation Brief - LGH HVAC Improvements
Date:	Thursday, 20 February 2025 1:09:00 PM
Attachments:	image001.png image002.png

You're amazing Angeline, thanks for turning that around so quickly!!

Ron Wilson
Director – Asset Management Services
0475 397 652

From: Office of the Chief Executive, Hospitals North <cehn@ths.tas.gov.au>
Sent: Thursday, 20 February 2025 1:08 PM
To: Wilson, Ronald <[redacted]>
Cc: Hughson, Jon [redacted]>; Rainbird, Richard <[redacted]>; Katsman, Nataliya <[redacted]>
Subject: RE: Urgent: Project Initiation Brief - LGH HVAC Improvements

Hi Ron,

Please find attached approved by the Chief Executive Hospitals North.

Thank you.

Angeline Hiscox
Executive Assistant to Chief Executive Hospitals North
Executive Assistant to Executive Director of Operations and Performance
Launceston General Hospital, Level 3, Charles St, Launceston TAS 7250
phone: 03 [redacted] | ext: 76043 | email: cehn@ths.tas.gov.au | www.health.tas.gov.au/hospitals

From: Wilson, Ronald <[redacted]>
Sent: Thursday, 20 February 2025 10:53 AM
To: Office of the Chief Executive, Hospitals North <cehn@ths.tas.gov.au>
Cc: Hughson, Jon <[redacted]>; Rainbird, Richard <[redacted]>; Katsman, Nataliya <[redacted]>
Subject: Urgent: Project Initiation Brief - LGH HVAC Improvements
Importance: High

Hi,

Please see attached Project Initiation Brief for the D Block and Maternity HVAC Improvements for clearance by Fiona.

Please note this is urgent due to the extremely tight timeframes and significant public interest generated by the issue. The project manager has already commenced.

Please let me know if I can be of any assistance.

Kind regards,

Ron Wilson
Director – Asset Management Services
Department of Health Infrastructure Services
Level 7, 22 Elizabeth Street, Hobart TAS 7000 | [redacted]

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Wednesday, 19 February 2025 8:41 AM
To: Wilson, Ronald
Cc: Dobson, Rachael M
Subject: Project Initiation Brief - HVAC Upgrade (D Block and Ward 4O) Project
Attachments: Capital Works Project Initiation Brief - LGH HVAC Upgrade (D Block and Ward 4O).docx

HI Ron

Please find attached Project Initiation Brief for the HVAC Upgrade (D Block and Ward 4O) Project for your consideration.

Special shout out to Rachael for her assistance with the brief.

Cheers
Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250

TASMANIAN HEALTH SERVICE
Tasmanian Government

M: [redacted] | **T:** 03 [redacted]

Matthews, Cameron T

From: Dobson, Rachael M
Sent: Tuesday, 18 February 2025 4:17 PM
To: Andrew Sutherland
Cc: Brandon Servant; Matthews, Cameron T
Subject: RE: 00725 LGH Ward Block Air and 4O Air Conditioning Upgrade

Thanks Cam.

Hi Andrew,

We are still working through some project initiation / governance pieces but aiming to proceed with a direct engagement with ASC and have something to you next week. On that basis, if you want to progress with site investigations and preliminary concepts, per the scope within the proposal you sent to Cam last week, we are comfortable with that. Please let me know if you need anything else.

Thanks
Rach

Tasmanian Government

Rachael Dobson
Project Manager

Infrastructure Services – Programming and Delivery
Department of Health
Level 2, 39 Frankland Street, Launceston TAS 7250
Email: [redacted]
Mobile: [redacted]

From: Matthews, Cameron T <[redacted]
Sent: Tuesday, 18 February 2025 1:54 PM
To: Dobson, Rachael M <[redacted]
Cc: Brandon Servant <[redacted] Andrew Sutherland <[redacted]
Subject: RE: 00725 LGH Ward Block Air and 4O Air Conditioning Upgrade

Hi Rachael

Can you please respond to Andrew's email below.
As discussed I will complete the project initiation brief (including sections of the documents that you have already completed).

Cheers
Cam

From: Andrew Sutherland <[redacted]
Sent: Tuesday, 18 February 2025 11:05 AM
To: Matthews, Cameron T <[redacted]
Cc: Brandon Servant [redacted]>
Subject: RE: 00725 LGH Ward Block Air and 4O Air Conditioning Upgrade

Thanks for taking the time earlier this afternoon to discuss the project. As discussed, we will aim to get a draft program out by tomorrow. Andrew will arrange a time to conduct a site inspection.

Looking ahead to the construction phase, we'd like to understand the expectations around project management and stakeholder engagement. I just wanted to clarify what was discussed at the meeting. Are DoH going to arrange for a project manager, or is this something you'll need to outsource? Andrew and I have been discussing and we feel that Rare may be in the best position to deliver this services given their previous experience with the LGH site, particularly with stakeholder engagement.

Kind regards,

Brandon Servant
Building Services Engineer

ASC Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Matthews, Cameron T
Sent: Tuesday, 18 February 2025 2:19 PM
To: Dobson, Rachael M
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Rach 😊

From: Dobson, Rachael M <[redacted]
Sent: Tuesday, 18 February 2025 1:59 PM
To: Matthews, Cameron T <[redacted]
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Cam,

Thanks for your call. Attached is a (half completed) first draft of the Project Brief for the LGH HVAC Upgrade (D Block) project.

If you could direct any questions from Andrew to me, that'd be great. We will set up a project kick-off meeting with you (or a delegate), Andrew, etc. as soon as the brief is endorsed.

Thanks again
Rach

Tasmanian Government

Rachael Dobson
Project Manager

Infrastructure Services – Programming and Delivery
Department of Health
Level 2, 39 Frankland Street, Launceston TAS 7250
Email: [redacted]
Mobile [redacted]

From: Matthews, Cameron T <[redacted]
Sent: Monday, 17 February 2025 1:29 PM
To: Dobson, Rachael M [redacted]
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Rachael

ASC have previous experience on site and they provided the report based on prior knowledge and conducted a site visit on Friday. Due to media pressure for a timely response we rang ASC to undertake these works.

Cheers
cam

From: Dobson, Rachael M <[redacted]
Sent: Monday, 17 February 2025 1:25 PM

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

Matthews, Cameron T

From: Dobson, Rachael M
Sent: Tuesday, 18 February 2025 1:59 PM
To: Matthews, Cameron T
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade
Attachments: Capital Works Project Initiation Brief - LGH HVAC Upgrade (D Block).docx

Hi Cam,

Thanks for your call. Attached is a (half completed) first draft of the Project Brief for the LGH HVAC Upgrade (D Block) project.

If you could direct any questions from Andrew to me, that'd be great. We will set up a project kick-off meeting with you (or a delegate), Andrew, etc. as soon as the brief is endorsed.

Thanks again
Rach

Tasmanian Government

Rachael Dobson
Project Manager

Infrastructure Services – Programming and Delivery
Department of Health
Level 2, 39 Frankland Street, Launceston TAS 7250
Email: [redacted]
Mobile: [redacted]

From: Matthews, Cameron T <[redacted]
Sent: Monday, 17 February 2025 1:29 PM
To: Dobson, Rachael M <[redacted]
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Hi Rachael

ASC have previous experience on site and they provided the report based on prior knowledge and conducted a site visit on Friday. Due to media pressure for a timely response we rang ASC to undertake these works.

Cheers
cam

From: Dobson, Rachael M <rachael.dobson@health.tas.gov.au>
Sent: Monday, 17 February 2025 1:25 PM
To: Matthews, Cameron T <cameron.matthews@health.tas.gov.au>
Subject: RE: 00725 LGH Ward Block Air Conditioning Upgrade

Thanks Cam!

Did you provide ASC with a brief prior to them generating these responses? We are still working on the project brief so it would be helpful to build from something.

Thanks again
Rach

Rachael Dobson
Project Manager

Infrastructure Services – Programming and Delivery
Department of Health
Level 2, 39 Frankland Street, Launceston TAS 7250
Email: [redacted]
Mobile: [redacted]

From: Matthews, Cameron T <[redacted]
Sent: Monday, 17 February 2025 1:15 PM
To: Dobson, Rachael M <[redacted]
Subject: FW: 00725 LGH Ward Block Air Conditioning Upgrade

HI Rachael

Great meeting you this morning

Please find attached the latest report and fee proposal

Cheers Cam

Cameron Matthews | Regional Manager- Facilities Management and Engineering Services (North)

Launceston General Hospital, Level 2
PO Box 1963, Launceston TAS 7250
M: [redacted] | **T:** 03 [redacted]

From: Brandon Servant <[redacted]
Sent: Thursday, 6 February 2025 9:50 AM
To: Matthews, Cameron T <[redacted] Toon, Shane A <shane.toon@health.tas.gov.au>
Cc: Andrew Sutherland <[redacted] ASC Engineers <office@asceng.com.au>
Subject: 00725 LGH Ward Block Air Conditioning Upgrade

You don't often get email from [redacted] Learn why this is important

Hi Cameron & Shane,

Please see the attached draft version of the LGH Ward Block air conditioning upgrade report for discussion. Let me know if you have any questions.

Kind regards,

Brandon Servant
Building Services Engineer

Level 1 11 Morrison Street Hobart Tasmania Australia 7000
T 03 6224 2424 F 03 6224 2405 M [redacted]
W www.asceng.com.au E office@asceng.com.au

PLAN

Infrastructure Services

Project Initiation Brief

Launceston General Hospital

HVAC Upgrade (D Block and Ward 4O) Project

Department of Health

Tasmania

Document Acceptance and Release Notice

This document is authorised for release once all signatures have been obtained.

Prepared by	Cameron Matthews	Regional Manager, FMES	[redacted]	
Through	Ron Wilson	Director, Asset Management	[redacted]	19/02/2024
Endorsed by	Fiona Lieutier	Chief Executive Hospitals North	[redacted]	20/2/24
Noted	Andrew Hargrave	Chair: Infrastructure Oversight Committee		

NOTE:

This document is prepared to support the initial handover of a project. The information contained within is intended to represent a point of time and may require refinement or development by the Project Manager.

Capital Works
Project Initiation Brief

The Department's health facility planning, and delivery process is used to guide all capital projects (see Infrastructure Services intranet site).

The process involves a series of planning steps and decision gateways, designed to ensure that all new and upgraded health facilities are fit for purpose, future focused and enable high quality and safe care.

The Project Initiation Brief is prepared to hand the project from the Strategy, Planning and Performance Team to the Capital Programming and Delivery Team

Project Name *This project name MUST be used for all project documents*	LGH HVAC Upgrade (D Block and Ward 4O)
CM Folder *A project folder must be created in Content Manager*	G25/84
Program Name *Is the project part of a broader program of works? (e.g. masterplan)*	LGH Redevelopment – Stage 2
Project Sponsor	Fiona Lieutier- Chief Executive, Hospitals North
Business Owner	Regional Manager, Facilities Management & Engineering Services (North)
Project Cost Estimate	Design: $400,000 Other Consultancies: $200,000 Construction: $5.6 million Total: $6.2 million
Budget Allocation	$6.2 million
Funding Source *This should be the budget output from the capital program*	LGH Redevelopment Stage 2
Cost Centre	920420- XXXX-210
Project Code *A project code must be included in this document*	Has been requested, to be advised on completion.

Project Goal/Objective *The Project Goal is the clinical or end user objective of the project.* *This section should start with a clear definition of this objective.*	The project goal is to upgrade the Heating, Ventilation and Air Conditioning (HVAC) systems to the D Block and Ward 4O to enable air conditioning directly into patient rooms, improving patient comfort in high ambient temperatures and managing potential risks to staff and patients.
Proposed Project Scope *Current understanding of the proposed scope. This scope must be further tested by the Capital Programming and Delivery Team*	The proposed scope of works for Ward **Block D** includes: • New chilled and heating pipework, including valve and accessories • Chilled and heating water circulating pumps • Fan Coil Units (FCUs) for the patient areas (56 off) • FCUs for staff and clinical areas (32 off) • Level 7 Air Handling Unit replacement • Controls The proposed scope of works for **Obstetrics Ward 4O** includes: • New chilled and heating pipework, including valve and accessories • Chilled and heating water circulating pumps • FCUs for the patient areas (5 off) • FCU for corridor zone (1 off) • Controls The recently upgraded chiller plant is adequately sized to provide cooling for the Ward Block D and Obstetrics, however additional pipework would be required to utilise the chiller plant capacity. These works are to be delivered as per recommendations in Attachment 1: Ward Block Air Conditioning Upgrade by Andrew Southerland Consulting Engineers NOTE: Asset Management Services has commenced approval for direct sourcing a principal contractor and engagement of consulting engineer is underway.
First Steps *This section describes both the standard first steps a PM should follow when receiving an initiation brief, in addition to any first steps that might be critical to the project*	**Critical First Steps** • Due to the urgency of the air conditioning upgrade the design and documentation phase must commence as soon as possible. **Standard First Steps** • Ensure a copy of this approved Capital Project Initiation Brief has been provided to the Senior Project Manager - Scheduling, Risk and Performance to allow the creation of the project program in the departments Master Schedule • Ensure a copy of this approved Capital Project Initiation Brief has been provided to Infrastructure Contracts at

	infrastructure.contracts@health.tas.gov.au to provide the contracts team notice that a new project has been created • Ensure a copy of this approved Capital Project Initiation Brief has been provided to the Principal Business Analyst responsible for Infrastructure Services to allow the Budget Allocations to be updated • Arrange for a handover meeting with the Manager, Strategy Planning and Performance
Australasian Health Facility Guidelines	Compliance with the Australasian Health Facility Guidelines (AusHFG) is mandatory for DoH Projects. Any departures from the guidelines should be captured and progressed for approval through the Project Sponsor on the Department's AusHFG Departure Form (D23/60841). Project managers should note that compliance with the AusHFG extends to the full suite of materials available, including Parts A through F, the Health Planning Units (HPU) and Standard Components. The AusHFG can be accessed at: https://healthfacilityguidelines.com.au/ Office accommodation projects must reference the Treasury and Finance Office Accommodation Fitout Guidelines.
Project Background *What is the background of the project and rationale for implementing it now?* *Include reference to any strategic drivers.*	**D Block** D Block was constructed in the early 1980's at which time the ambient design conditions were significantly lower than current design parameters. At the time of original construction, the provision of air conditioning for patient rooms was not universally adopted as a necessary design consideration. Furthermore, as designed, the existing air conditioning system does not have sufficient cooling capacity or adequately sized distribution ductwork to provide satisfactory cooling for the patient rooms. Due to these legacy issues, recent hot weather has resulted in excessive indoor temperatures experienced in D Block. The current mechanical services design for this building provides conditioned air only to the corridor spaces, office areas, and nurse stations via a common air conditioning system located in the Level 7/8 plant room. The patient rooms rely on cool air from the corridors to be drawn into the occupied space via the negative pressure created by the toilet exhaust system. Due to the limited cooling capacity and modest air flow rate created by the toilet exhaust system the arrangement is not effective for cooling in the patient rooms. Some supplementary air conditioning units have been provided for special rooms on level 4. Initial efforts to improve limited cooling capacity included the delivery of the $4 million Launceston General Hospital heating, ventilation, and air conditioning system (HVAC) Chiller Replacement Project. The project, completed in early June 2024, saw the replacement of 8 existing chiller units with 10 new units. Actual improvement to patient comfort as a result of these works has been limited, but it is expected that this new plant will now have capacity to support improvements in air handling.

	4O Maternity ward was constructed in 1995. The facility only has basic facilities for heating and ventilation only, with no provisions for cooling. Patients experience elevated internal temperatures due to solar exposure during the morning and late afternoon. The general corridor receives afternoon solar exposure from the windows in the Chapel courtyard void. Although located on the southern side of the site, the arrangement of the facades results in high solar gain throughout the day resulting in excessively elevated room temperatures. External shading has been provided for windows on the eastern, western and southern façades. Despite the provision of shading the existing window frames and glazing provides a minimal reduction in the solar loads on the patient rooms. There is no shading on windows facing the Chapel courtyard. As a result, improvements to patient comfort have not been realised.
Exclusions *What has been specifically excluded from the project?*	The Project is limited to D Block and Ward 4O only.
Cashflow *Is there a pre-defined cash flow for the project*	Cash flow will be fully expended in the 2025-2026 year.
Critical Dates *Include any dates that* *- have been committed to (internally or publicly)* *- impact on another project* *- impact on ongoing operations*	Project timeframes are highly critical to address the risks associated with high temperatures next summer. Project timeframes have also been publicly committed at a high level. Design to be completed: February 2025 Start Construction: April 2025 Completed: March 2026 Please see Attachment 2: ASC Gant Chart for further information.
Risks *Any risks to the project that have been identified. This is not intended to be a comprehensive analysis of risk*	The decanting of patients will be critical to allow for the installation of the fan cool units in the patient rooms. Should the hospital be unable to decant patients as required it will result in significant delays to the project.
Relevant Policies	It is the Project Managers responsibility to review the Strategic Document Management System (SDMS) and consult key stakeholders for any policies, plans or other documents that might be relevant.
Other Information	The current state of air-conditioning at the LGH has led to recent complaints from patients, staff, visitors and unions. These complaints have been well

	publicised in the media and has resulted in a commitment from Government to address the issue as soon as possible.
Governance Structure	Infrastructure: Project Manager, Senior Project Manager, Director Programming and Delivery, Deputy Secretary Infrastructure. LGH D Block: Ward Nurse Unit Manager, Nursing Director - Acute & Inpatient Services, Executive Director of Nursing & Midwifery - Hospitals North, Chief Executive Hospitals North LGH Ward 4O: Ward 4O Nurse Unit Manager, Director of Nursing and Midwifery Womens and Childrens Services, Executive Director of Nursing & Midwifery - Hospitals North, Chief Executive Hospitals North
Stakeholders	• HVAC Consultant • Principal Contractor • Chief Executive, Hospitals North and LGH Executive • Ward Nurse Unit Manager (D Block and Ward 4O), • Nursing Director - Acute & Inpatient Services, • Executive Director of Nursing & Midwifery - Hospitals • Director of Nursing and Midwifery Womens and Childrens Services • Facilities and Engineering – North • Nurse Manager - Infection Prevention & Control Unit Hospitals North • Director Asset Management • LGH Staff, Patients & Visitors
Assumptions	It is assumed that delays with sourcing equipment and the availability of contractors will not unduly delay the project. That a suitable decanting strategy can be developed.
Related Projects	LGH Chiller Upgrade Project completed 2024
Attachments	00725 LGH Ward Block Air Conditioni Apendix 1 - ASC Fee Estimate MATRIX_12 P00725L01 LGH Ward Block AC Upgi 00725 Gantt Chart_DRAFT_12022