Preliminary Infrastructure Planning Study for Mareeba Hospital

Volume 1 of 2

July 2010

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About this study

The Preliminary Infrastructure Planning Study for Mareeba Hospital was commissioned by Queensland Health through the Project Services Department of Public Works on 28 May 2010. This study investigates future infrastructure for Mareeba Hospital based on the options endorsed by Queensland Health’s Integrated Policy and Planning Executive Committee in March 2010.

This Preliminary Infrastructure Planning Study was undertaken from 6 May 2010 to 30 June 2010 and was prepared by Suters Architects and sub-consultants under the direction of Queensland Health’s Planning and Coordination Branch. Every effort has been made by consultants and sub-consultants to investigate and document in sufficient detail—and within the timeframe—the infrastructure issues, gaps and requirements for Queensland Health in relation to Mareeba Hospital future service provision.

Assumptions

The study has been prepared based on site inspections, discussions with Queensland Health representatives and previous reports made available by Queensland Health.

The option studies are based on the requirements for current and future projections contained in the Service Profile for Mareeba Hospital (draft) provided by Queensland Health.
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1 Executive Summary

The Infrastructure Renewal Project for rural and remote areas is a Deputy Premier priority project for 2010. The aim is to review current Hospitals infrastructure and plan for the future in a proactive manner. Mareeba Hospital is one of the selected Hubs for its geographical area.

In May 2010 Suters Architects with a team of engineering specialist consultant was commissioned to undertake a Preliminary infrastructure Plan for Mareeba Hospital. The objective was to review the existing Hospital infrastructure and review its suitability for provision of services for the current and future expansion requirements for the Hospital based on the Services Profile up to 2021/22.

This included a site visit, review of existing reports and discussions with District and Queensland Health planning staff to prepare this report.

An audit of all existing buildings on site was undertaken to evaluate their existing physical condition and suitability for functions of the existing Hospital and future expansion plans in accordance with the Service Profile.

Although the Hospital was functioning adequately as a facility, because of the older age of the building stock it was found that the spaces and building services were generally found to be deficient in:

- Lack of compliance with current building regulations in terms of the Building Code of Australia (BCA), Disabilities Discrimination Act (DDA), Australian Standards (AS), and technical codes.
- The Australasian Health Facility Guidelines (AHFG), developed in recent times also meant most spaces were below the minimum sizes although occasionally some were larger.
- Service provision - A number of rooms types were also missing from departments as requirements have changed over time e.g. Mental Health consulting room.
- Occupational and Health safety issues for patients, staff and visitors.

In general Mareeba Hospital exhibited similar problems in terms of lack of space and facilities in the Emergency Department, lack of space, poor room sizes in the wards and the need for more consultancy rooms generally.

A number of risks were identified. These risks cover building life, compromised patient care, fire, accidents, security, health and safety, disadvantages to persons with a disability, dissatisfaction, running costs, failure of building services systems and legal risks. In identifying risks associated with infrastructure, mitigation strategies that may be in place at an operational level were not incorporated within the risk identification and assessment.

Each consultant visited the site and prepared a report detailing their findings and recommendations for action, these are contained in Volume 2. The findings have been summarised and compiled in Volume 1.

The Assessment Team comprised the following:

- Architects – Suters Architects
- Structural/Civil Engineers - Bornhorst and Ward
- Electrical/Fire/Mechanical Engineers – DMA Professional Engineers
- Hydraulic Engineers – MRP
- Quantity Surveyor/Building Surveyor/Access Consultant – Davis Langdon

Following assessment of the existing infrastructure reviewed against the Service Profile requirements for future capacity of the Hospital. Upgrades to existing services such as
electrical, fire, mechanical and hydraulic were determined. Plan layouts were developed to address current and future requirements of the Hospital. Options were developed based on minimum to maximum intervention to address the above.

Conceptual planning studies were developed to address the three options in conjunction with review and discussions with the District and the Queensland Health planning team.

Option 1 Status Quo – minimum requirements includes the minimal work to protect patient and staff safety, meet partial BCA requirements, meet minimum access codes, ensure health services are provided albeit in not an optimal manner. It excludes upgrade to AHFG. The main advantages of this option are that it is minimal cost and maintains Hospital operation. The main disadvantages are that spaces generally do not comply with AHFG, it does not provide sufficient space to meet the Service Profile and does not address most of the current problems in the existing infrastructure. The project cost is $10–$12 million (category 2 estimate level).

Option 2 provides for the refurbishment and expansion of the Emergency Department and Staff Accommodation building. In addition this would include some replanning of the wards, refurbishment of the administration/reception area, community and other minor works around the facility. The main advantages are the re-use of existing building stock being less expensive than a new build Hospital, compliances with building regulations and the AHFG. It also provides an expanded floor area to meet requirements of the Service Profile. The main disadvantages are a less efficient layout due to reuse of existing buildings, possible latent building costs in refurbishing existing buildings and disruptions to the functioning of areas of the existing building as repair and/or strengthening works are carried out to the existing structure. The project cost is $17–$21 million (category 2 estimate level).

Option 3 is the same as Option 2 but would include a new build of the Emergency Department and Theatre. Additional works would be undertaken to remove the offices that now occupy ward spaces (return into wards), as a result new outpatient/administration building would be required. The likely project cost is $18–$22 million (category 2 estimate level).

Option 3a allows for a total new build for any accommodation requirements –project cost $21–$26 million (category 2 estimate level).

Following review of the proposed options, an options analysis was undertaken addressing the following issues: rationale, benefits, risk, assumptions, criticality, resource implications and comparisons to the AHFG.

All proposed Options are viable from a construction perspective, however only Options 2 and 3 enable the realisation of service requirements as identified by Queensland Health and in accordance with current building standards and facility guidelines.
2 Introduction

The Queensland Health Infrastructure Renewal Project for Rural and Remote Areas aims to define a rural model of health service delivery at specific service hubs across Queensland. Queensland Health have identified 12 rural health service hubs from where core health services will be provided—including service support to their associated health service partners (spokes).

Intrinsic to the Infrastructure Renewal Project for Rural and Remote Areas is the assessment of existing infrastructure, and identification of any subsequent infrastructure refurbishment or redevelopment requirements to adequately support identified rural health services.

The Preliminary Infrastructure Planning Study assesses the condition of the buildings and building services and the impacts on the delivery of health services for rural and remote Hospital sites in a number of ways including:

- Inefficient and outmoded layouts
- Lack of compliance with current building codes, accreditation and safety standards
- Workplace health and safety issues
- Staff recruitment and retention issues as a result of the work environment and staff accommodation
- Inability to provide the required health services due to the age and quality of facilities.

As part of the study, options have been developed to address identified risks associated with the condition of the infrastructure and gaps in service delivery resulting from inadequate or non-existent infrastructure.

2.1 Objective

The key objectives of the study are to:

- Provide a brief review of the adequacy of existing infrastructure arrangements and facilities as it relates to the core service requirements.
- Identify options for the future development of infrastructure to meet the core service requirements.
- Develop concept plans and options costing including:
  - provision of a cost effective and efficient concept plan
  - identification of the capital cost impacts of the preferred option
  - undertake broad analysis across all options to assist Queensland Health determine a preferred option.
3 Study Context

3.1 Locality

Mareeba and Atherton are the hub hospitals for the Hinterland region of the district. The township is located 63 kilometres west of Cairns. The town is 417 meters (1,368 feet) above sea level on the confluence of the Barron River, Granite Creek and Emerald Creek.

The Mareeba Hospital catchment has a population of 20,340 people in 2008 with a projected population of 21,452 by 2021.

3.2 Mareeba Hospital Site

The Mareeba Hospital is located on the corner of Lloyd and Dunlop Street on the Eastern edge of the township. The Hospital is located against the Barron River.

The Mareeba Hospital site is positioned on a relatively flat site. The buildings are spread around the site with large areas of unutilised land available to the rear.
3.3 Mareeba Building History

The existing Main Hospital building was designed in 1976. The main building has seen minor renovation works throughout its life. The main building consists of five separate buildings linked via corridors.

Other main buildings on the site include:

- Staff accommodation – built circa 1946
- Dental demountable building – this is a recent construction
- Mental Health building
- Other ancillary buildings include the mortuary, stores, goods receiving, laundry, and maintenance workshop and offices that have been constructed throughout the life the Hospital.

A Residential Aged Care Facility is also located further north of the Hospital building which does not form part of this study.

3.4 Existing Built Environment

An audit was undertaken of the existing campus with comments noted below. Please also refer to accompanying concept drawings and detailed consultant reports contained in Volume 2.

The existing Hospital buildings are all generally older stock and do not comply with current access standards AS 1428.1 or the current BCA. This relates to doorways and clearances, PWD, ensuites and WC’s in general.

A number of functional issues and workflow relationships are not optimum. The rooms generally do not comply with the AHFG. These are identified in detail in the Architects report, Volume 2.

The existing building services, especially Mechanical and Electrical have a number of issues which need addressing and are generally non-compliant with current regulations.

The buildings are generally in good condition but there are some general issues:

- There are some minor cracks in some walls, non-structural but unsightly and continuing to move with soil changes.
- Lack of suitable signage makes way-finding very difficult in a labyrinth of corridors. Of particular concern is lack of signage to access the Emergency Department.
- Roof gutters require cleaning out – there is a maintenance schedule being completed to maintain the gutters and replace downpipes.
- Bathrooms to the ward areas are in need of upgrade to comply with the relevant standards.
- Water tanks are rusting and will require replacement.
- The Staff Accommodation building is structurally in good condition but it is in need of refurbishment to ensure the Hospital attracts and retains nursing staff.

3.5 Mareeba Hospital Maintenance Issues

Major maintenance issues highlighted by District staff are:

- plasterboard walls in wards can get damaged easily
- storage requirements are poor
- additional staff parking required
• water egress into Staff Accommodation in some areas
• water leaks through floor in bathrooms
• external paint needs redoing as a part of repairs
• asbestos throughout buildings
• numerous cracks in walls to Mental Health building
• HEPA filters in theatre required
• Access to roof – no safety anchor points on roof
• Air conditioning to major Theatre does not have enough air changes and does not have compliant HEPA filtration.

3.6 Mareeba Hospital Development Proposals

Queensland Health has advised that the following works have funding approval:

• Painting to Block A – Administration Wing
• Provision of HEPA Filters to Theatre
• New walk-in fridges to Kitchen to be provided
• Minor renovation works to the Staff Accommodation building in the bathrooms (circa $900K). This has been discussed but confirmation that the funding is allocated was not provided.

3.7 Site Constraints

• There are no Heritage issues that we are aware of at the time of this study
• The Main Hospital site is currently not a designated site and consequently requires a Development Approval for works from the local council.

3.8 Consultation

Consultation was undertaken with District staff, Queensland Health Officers and Project Services Department of Public Works staff.
4 Health Service

4.1 Design and Functionality of Current Facility

The Main Hospital has five interconnected wings built in 1976 on one level with support buildings to the north and west. The buildings are generally in good physical condition. There has been some minor refurbishment over time. The spaces are generally well sized but mainly do not comply with contemporary building standards and facility guidelines. The design generally functions well within the wings. Upgrade to signage and way-finding elements would assist in navigating the Hospital for visitors and patients.

The staff accommodation building located to the south, built in 1946 requires a substantial refurbishment to be upgraded to contemporary standards or demolished and new accommodation built.

The Dental Department is located in a demountable building which has poor access within the building.

Support buildings are located on the western side, in reasonable condition.

Current health services are listed below:

- General medical/surgical acute inpatient care
- Obstetrics and gynaecology (midwife-led maternity service)
- 24 hour emergency care
- one operating theatre
- Specialist outpatient clinics medical, surgical, obstetrics and gynaecology, diabetes education, mental health, aged care and memory, paediatrics including child safety
- Community Health services located within the Hospital (see below)
- Primary paediatric care
- Sub-acute care, palliative care, rehabilitation
- Speech pathology, physiotherapy, occupational therapy, social work, dietetics and nutrition
- Support services including pharmacy, diagnostic imaging and pathology.

Outreach Services from Mareeba:

Medical and Allied Health outreach services are provided to Dimbulah and Chillagoe.

Visiting Services from Cairns:

Specialist services are generally provided by visiting services from Cairns Base Hospital largely funded through the Medical Specialist Outreach Program, services include:

- Paediatric outreach
- Surgical
- Anaesthetics
- Psychiatry
- Red Cross Blood Service.
4.2 Future Health Services

Any future planning of the health services for the Mareeba Hospital must be considered in relation to the Atherton Hospital. These Hospitals are only a short distance apart and are reviewed together in the Service Profile for Atherton Hospital with additional information on Mareeba Hospital (April 2010).

The following table shows current and future bed requirements for Mareeba Hospital. Bed requirements are categorised into overnight beds (medical/surgical beds, maternity and paediatric beds), same day beds and bed alternatives. There are also categories for emergency bays, operating rooms and consultation rooms.
### 6.1.2 Mareeba Hospital

The following table shows current and future bed requirements for Mareeba Hospital. They are categorised according to definitions in the *Review of the More Beds for Hospital Strategy* including overnight beds (medical/surgical beds, maternity and paediatric beds), same day beds and bed alternatives (Attachment C). Two sets of projections are shown:

1. At Queensland Health endorsed statewide bed planning occupancy rates
2. At 70 per cent occupancy rate, as requested by the Project Steering Committee.

#### Table 33: Current and future bed requirements for Mareeba Hospital (Bed projections)

<table>
<thead>
<tr>
<th>Item</th>
<th>Current</th>
<th>Projection 1: Endorsed Occupancy Rate</th>
<th>Projection 2: 70% Occupancy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rate</td>
<td>2011/12</td>
</tr>
<tr>
<td>Category A: Beds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1. Overnight Beds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overnight beds including:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>medical and surgical (incl. palliative)</td>
<td>34</td>
<td>85%</td>
<td>23.7</td>
</tr>
<tr>
<td>paediatric</td>
<td>4</td>
<td>75%</td>
<td>1.9</td>
</tr>
<tr>
<td>maternity</td>
<td>8</td>
<td>75%</td>
<td>2.3</td>
</tr>
<tr>
<td>mental health - acute</td>
<td>- N/A</td>
<td>85%</td>
<td>1.1</td>
</tr>
<tr>
<td>sub- and non-acute (GEM)</td>
<td>- (included in medical beds)</td>
<td>90%</td>
<td>6.1</td>
</tr>
<tr>
<td>Total overnight beds</td>
<td>46 multi-purpose beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2. Same Day Beds*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same day beds including:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>medical (including obstetrics, paediatrics and oncology / chemotherapy)</td>
<td>2.1</td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td>surgical (including obstetrics and paediatrics surgery)</td>
<td>0.1</td>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td>mental health</td>
<td>0.1</td>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td>sub- and non-acute</td>
<td>- N/A</td>
<td></td>
<td>- N/A</td>
</tr>
<tr>
<td>Total same day beds</td>
<td>2.3</td>
<td></td>
<td>2.7</td>
</tr>
<tr>
<td>A3. Bed Alternatives*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 2 recovery bays (chairs)</td>
<td>0 chairs</td>
<td>X to meet demand for day surgery lists, X times per week</td>
<td></td>
</tr>
<tr>
<td>Antenatal Day Assessment Unit chairs</td>
<td>- N/A (to be informed by District as this is local data - assume level of activity does not warrant these chairs)</td>
<td>- N/A</td>
<td>- N/A</td>
</tr>
<tr>
<td>Chemotherapy chairs / trolleys (no visiting oncologist or chemotherapy services)</td>
<td>- N/A</td>
<td></td>
<td>- N/A</td>
</tr>
<tr>
<td>Renal Dialysis chairs / trolleys (self care)</td>
<td>- Part of ED treatment space numbers – refer category B below.</td>
<td>0 (currently 9 activity, referred to Atherton)</td>
<td>0</td>
</tr>
<tr>
<td>Emergency Department chairs / trolleys</td>
<td>- Part of ED treatment space numbers – see category B below.</td>
<td>0 (to be informed by District as this is local data - assume level of activity does not warrant these chairs)</td>
<td>0</td>
</tr>
<tr>
<td>Total bed alternatives</td>
<td>0</td>
<td></td>
<td>To meet demand for day surgery lists</td>
</tr>
</tbody>
</table>

#### Totals for Category A

| Total A1 Overnight beds | 46 multi-purpose beds | 35.1 | 39.9 | 44.8 | 42.2 | 48.4 | 54.8 |
| Total A2 Same day beds | 2.3 | 2.7 | 3.2 |
| Total A3 Bed alternatives | 0 | To meet demand for day surgery lists |
| Total beds | 46 | 37.4 | 42.6 | 48.0 | | | | |
Table 33 continued: Current and future bed requirements for Mareeba Hospital

<table>
<thead>
<tr>
<th>Item</th>
<th>Current number</th>
<th>2011/12</th>
<th>2016/17</th>
<th>2021/22</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category B: Emergency Department treatment spaces</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further details, see Table 34, page 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Emergency bays (observation areas) for Triage Categories 1-3</td>
<td>3 (resuscitation bay + 2 trolley spaces)</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>• Consultation rooms for Triage Categories 4-5</td>
<td>5 consultation rooms (includes 1 treatment room + 1 procedure room)</td>
<td>10</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Total emergency treatment spaces</td>
<td>8</td>
<td>14</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td><strong>Category C: Operating/Intervention Rooms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>using Victorian Benchmarks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical imaging</td>
<td>2 x-ray rooms</td>
<td>1 x-ray room</td>
<td>1 ultrasound room</td>
<td>No further change expected, based on current and projected activity</td>
</tr>
<tr>
<td>Operating Theatre – major (1100 overnight surgical separations per theatre)</td>
<td>1 major theatre</td>
<td>No further change expected, based on current and projected activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Theatre – minor (1900 same day surgical separations per theatre)</td>
<td>- N/A</td>
<td>- N/A</td>
<td>- N/A</td>
<td>- N/A</td>
</tr>
<tr>
<td>Stage 1 recovery (less than 4 theatres) Requires 2 recovery bays per Operating Theatre</td>
<td>1 recovery bay (currently requires 2)</td>
<td>2 recovery bays</td>
<td>No further change expected, based on current and projected activity</td>
<td></td>
</tr>
<tr>
<td>Treatment procedure rooms/delivery suites (250 births per room &lt; 300 separations) + antenatal consultation room</td>
<td>1 delivery suite</td>
<td>1 delivery suite/antenatal/procedure room</td>
<td>1 room with bath</td>
<td>No further change expected, based on current and projected activity</td>
</tr>
<tr>
<td>Maternity / women's health / gynaecology consultation rooms + antenatal consultation room</td>
<td>1 midwifery consult room</td>
<td>1 visiting specialist consultation room</td>
<td>1 child-friendly waiting room</td>
<td>1 multipurpose staff/antenatal/education room</td>
</tr>
<tr>
<td>Well Baby nursery cots (1 nursery cot per 3 obstetric beds)</td>
<td>2 cot spaces + 1 resuscitation bay/cot for back transfers/low risk qualified babies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category D: Consultation/Treatment/Procedure Rooms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipurpose consultation rooms (ambulatory care), includes specialist and general practice, excludes Emergency Department activity</td>
<td>0 (currently use ED consultation rooms)</td>
<td>To meet demand for visiting specialist OPD clinics</td>
<td>To meet demand for visiting specialist OPD clinics</td>
<td>To meet demand for visiting specialist OPD clinics</td>
</tr>
<tr>
<td>Allied health areas</td>
<td>(data not available)</td>
<td>(data not available)</td>
<td>(data not available)</td>
<td>(data not available)</td>
</tr>
<tr>
<td>Investigation rooms</td>
<td>- N/A</td>
<td>- N/A</td>
<td>- N/A</td>
<td>- N/A</td>
</tr>
<tr>
<td>Total consultation/treatment/procedure rooms</td>
<td>0</td>
<td>To meet demand for visiting specialist OPD clinics</td>
<td>To meet demand for visiting specialist OPD clinics</td>
<td>To meet demand for visiting specialist OPD clinics</td>
</tr>
</tbody>
</table>

Data source: aIM data using medium series projections and Queensland Health Admitted Patient Data Collection (April 2010)

*Definitions applied from More beds for hospitals – need reference

*Victorian Benchmarks applied – need reference
Table 34 shows Emergency Department treatment spaces required at Mareeba Hospital. In rural hospitals a core number of Emergency Department treatment spaces are required regardless of the level of activity, despite the majority of Emergency Department presentations being Triage Categories 4–5. Rural hospitals must have the capacity to manage patients presenting in all Triage Categories. This means that the range of treatment spaces essential for emergency patient care may be in excess of the activity-based requirements.

In rural facilities treatment spaces can be used for a number of purposes. To reflect this, the left-hand column of the table identifies a core set of Emergency Department treatment spaces required for rural and remote hub hospitals with associated benchmarks to be applied. The right-hand column shows current requirements for Mareeba Hospital based on the core set of Emergency Department treatment spaces required.

### Table 34: Emergency Department treatment spaces required at Mareeba Hospital

<table>
<thead>
<tr>
<th>Treatment spaces required for rural and remote hub hospitals</th>
<th>Existing spaces at Mareeba Hospital</th>
<th>Needs met?</th>
<th>Current treatment spaces required by Mareeba Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triage room/desk. Requires clear view of waiting area (to categorise triage patients)</td>
<td>1 triage room/desk, with inadequate view</td>
<td>☐</td>
<td>1 triage room/desk with clear view of waiting area</td>
</tr>
<tr>
<td>Central staff desk/computer space. Requires clear view of Emergency treatment spaces</td>
<td>1 central desk/computer space, with inadequate view</td>
<td>☐</td>
<td>1 central staff desk/computer space, with clear view of emergency treatment spaces</td>
</tr>
<tr>
<td>Emergency treatment spaces including:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• resuscitation space (1 resuscitation space required per 500 Triage Category 1 presentations)</td>
<td>1 resuscitation space</td>
<td>☝</td>
<td>1 resuscitation space with two trolley spaces for Triage Category 1–3, with clear view from central staff desk</td>
</tr>
<tr>
<td></td>
<td>2 trolley spaces for Triage Categories 1–3</td>
<td>☝</td>
<td>(1 acute cubicle with trolley spaces/observation beds* for Triage Categories 2–3 required by 2021/22)</td>
</tr>
<tr>
<td>• isolation and decontamination (1 room per 10,000 attendances - to be subtracted from total treatment places)</td>
<td>0</td>
<td>☐</td>
<td>1 isolation/decontamination room required (1 additional required by 2021/22)</td>
</tr>
<tr>
<td>• psychiatric treatment space, requires 2 entry/exit doors (multipurpose room able to be used for mental health purposes)</td>
<td>0</td>
<td>☐</td>
<td>1 psychiatric treatment space (could use 1 consultation room, provided mental health guidelines are met)</td>
</tr>
<tr>
<td>• consult/treatment room • examination room • multipurpose room • procedure and interview room (with telehealth facilities available)</td>
<td>3 consultation rooms (currently has 1 treatment room, 1 procedure room not counted in total)</td>
<td>☝</td>
<td>7 multipurpose consultation rooms, including:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- sufficient consultation rooms to manage Triage Categories 4–5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- 1 quiet/grieving room (can also be used as an interview room)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- 1procedural/treatment space</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2 additional consultation rooms required by 2021/22)</td>
</tr>
<tr>
<td>Total emergency treatment spaces (1 emergency treatment space per 1300 ED presentations (all ages) – allocated from total spaces for CSCF Levels 1–5)</td>
<td>6</td>
<td>☐</td>
<td>14* (17,658 /1300 ACEM ED presentations Triage Categories 1–5) (18 by 2021/22)</td>
</tr>
<tr>
<td>Plaster room</td>
<td>0</td>
<td>☐</td>
<td>1 plaster room</td>
</tr>
<tr>
<td>Paediatric spaces (No requirement for a separate paediatric area until there are &gt; 16,000 presentations)</td>
<td>0</td>
<td>☐</td>
<td>1 paediatric treatment space (included in total emergency treatment spaces*)</td>
</tr>
<tr>
<td>Clean and dirty rooms, utility rooms, and patient, public and staff toilet/bathroom facilities</td>
<td>TBC</td>
<td>☐</td>
<td>As per requirements in the Australasian Health Facilities Guidelines6</td>
</tr>
<tr>
<td>Waiting room chairs (3 seats per patient treatment space)</td>
<td>30</td>
<td>☐</td>
<td>42 waiting room chairs (14 Emergency treatment spaces x 3) (54 required by 2021/22)</td>
</tr>
</tbody>
</table>

Based on CSCF v3.0 Emergency Care Centre requirements
Australian College of Emergency Medicine (ACEM) benchmarks applied
Data source: aIM projections and Queensland Health Admitted Patient Data Collection (April 2010)

*For patients requiring a brief period of observation, excludes short stay ward beds and ED treatment bays for non-admitted patients (More Beds definition)
4.3 Infrastructure Gaps

The main Hospital is functioning in the existing facility however not optimally as there are significant issues in relation to conditions and lack of facilities generally and in the following departments:

Emergency Department
- Lack of adequate signage to the Emergency Department
- The triage cannot view the waiting area
- The waiting area is undersized
- No waiting for eye patients after treatment
- Lack of consultant rooms
- Lack of storage for trolleys and equipment
- No room for relatives
- Inadequate staff station
- Inadequate size and number of bays
- Only one ambulance bay to the rear of the facility
- No secure room
- No isolation room

Allied Health
- Inadequate sized rooms
- Office areas occupying ward spaces – lack of suitable fit out
- Lack of consulting rooms
- Signage inadequate
- Dental Health
- Cramped facilities
- Lack of access if patient requires emergency egress

Wards
- No secure room
- Lack of compliant toilets and showers
- Existing shower/toilets in poor condition
- Lack of storage
- Proximity of staff stations to wards is not good

Theatres
- No cardiac protection to theatre
- No HEPA filters
- No waiting area for outpatients.

Refer to the previous section that compares the current facilities with the projected requirements.
5  Inspection Reports

5.1  Method

In conjunction with our consultant team, a review of the available drawings of the buildings on campus, an inspection of the buildings on site and discussion with Cairns and Hinterland Health Service District and Queensland Health planning staff to assess current issues and future requirements has been undertaken.

Site inspections were undertaken on 6 and 7 May 2010 by the following consultant team.

Architects       Suters Architects
Structural and Civil engineers Bornhorst Ward
Electrical and Mechanical engineers DMA professional engineers
Hydraulic engineers MRP
Building surveyor and access consultants Davis Langdon

5.2  Exclusions

Areas of the buildings were inspected which were visible from normally accessible positions from the ground or floor level, permanent stairways, ladders etc. No ceiling areas were opened up or claddings removed to view the concealed structure behind.

The interiors and exteriors of all buildings were inspected with the exception of the two Storage Sheds, the Bush Hut and adjacent store, the Emergency Generator building and the Flammable liquid store where only the exteriors were viewed.

5.3  Overlap

There is some overlap between building specialist reports, where the same problem has been identified by different specialists. This generally occurs in fire upgrade requirements and the building fabric. The cost for rectification of identified issues has only been allowed for once.

5.4  Current site and infrastructure condition

This section summarises and identifies the main issues as highlighted within the building specialist’s assessment of existing infrastructure and provides a brief outline of current site and infrastructure condition. Refer to Volume 2 for more detailed information from specialist consultant reports.

The buildings on the Main Hospital site are generally well maintained but have a variety of issues:

- The existing Hospital buildings are all generally older stock and do not comply with access standards AS 1428.1 and the DDA. Upgrades are required to doorways and clearances, PWD, ensuites and WC’s in general. A number of level changes are experienced throughout the Hospital complex.
- The existing Hospital buildings do not comply with the current BCA. This especially relates to fire egress and fire fighting equipment.
- The buildings also do not generally comply with AHFG space requirements, although in the main are functional albeit not ideally planned. Refer to Section 4 for shortfalls in terms of functionality.
- All buildings were in a reasonable structural condition with the majority of the buildings only having minor cracking or other defects.
The other issues identified during the inspection were maintenance issues and should be added to a maintenance schedule for the campus.

From a structural perspective, there were no identified issues that would prevent any building on site from being re-used, refurbished, reconfigured or expanded so long as the alternate uses are within the load capacities of the original buildings.

Any work on the Nurses Accommodation building may require further determination and verification of structural elements, their extent and their sizes, in order to assess the building's ability to accommodate the proposed changes.

In the main Hospital building the age and condition of the central chilled water plant varies considerably due to replacement of a chiller and cooling tower set approximately four years ago. The two remaining original chiller and cooling tower sets have a number of replacement components, but are well outside their economic life and should be replaced.

Maintenance access to cooling tower fans does not comply with current workplace health and safety regulations and BCA Section J Part J8. A permanent access ladder and platform is required to service the three cooling towers. Although it is preferable this be resolved immediately, if access is made available using alternative means (i.e. cherry-picker) in the interim, installation of an access platform or similar can wait until the old towers are replaced.

Based on communication with BEMS, redundant heating water pipework has asbestos insulation support blocks. When refurbishment works are next carried, appropriate removal of this pipework will need to be carefully considered to avoid asbestos exposure to contracting staff, Hospital staff and patients.

The majority of ducted chilled water air conditioning systems serving the main Hospital buildings are in a fair condition. Some remedial maintenance work is required to increase air quality, fan and air conditioning unit conditions in general.

All air conditioning ductwork serving treatment and ward areas appears to be internally insulated, which does not comply with current Queensland Health infection control guidelines.

Medical gas systems comprising pump suction, oxygen and nitrous oxide are generally in good condition. With the exception of medical gas alarm panels, which do not comply with AS2896, the medical gas systems appear to be satisfying the Hospital's current needs.

The medical gases storage room requires an extension to adequately protect from weather and vandalism any spare cylinders in accordance with AS2896 and local regulatory authorities.

The operating theatre is air conditioned by a chilled water ducted system with poor levels of outdoor and supply air filtration. Although operational, the system is not truly fit for purpose and does not comply with current standards or infection control guidelines.

The air conditioning system does not appear to have a substantial pressure gradient between dirty and clean areas. Although outdoor air introduction exists, it would not comply with current air change rates nominated in Queensland Health infection control guidelines. Supply air is via ceiling mounted diffusers with return air from low level. However, no terminal or duct mounted HEPA filters exist.

Although the Morgue building does not appear to be regularly used for autopsies, if in future it were to continue, the wall air conditioner is not suitable for this application and should be replaced with a ducted system to comply with AS1668.2 and BCA ventilation and air quality requirements.

The existing building has a number of unprotected openings and vents to outside that should be provided with vermin and insect proof mesh/filters.

The ducted DX split air conditioning system serving some areas of the Dental Clinic building is in fair to good condition.
• The wall air conditioner serving the staff lunch room and cassette split system serving the Laboratories do not comply as means of mechanical ventilation to these spaces. Ducted air conditioning systems or an alternate mechanical method of providing permanent filtered outdoor air to comply with AS1668.2 and BCA ventilation and air quality requirements should be incorporated.
• The wet pump suction system and compressed air system dedicated to the Dental Clinic building are in good condition.
• Ducted DX split air conditioning systems serving the Mental Health building are in fair to good condition.
• Maintenance access to ducted fan coil units located above ceilings is inadequate and dangerous. The entire access method does not comply with current workplace health and safety regulations or BCA Section J Part J8. A permanent access ladder, catwalks and support points are required as a minimum recommendation to upgrade the current installation to an acceptable level.
• The Hospital electrical and electronic infrastructure has been installed to varying standards over the life of the Hospital.
• Some sections of the Hospital have systems which incorporate original wiring and protection equipment and are outdated for the requirements of modern Hospital medical equipment and service delivery requirements.
• The Hospital electrical and electronic infrastructure generally has limited expansion capability.
• The Hospital site electrical and electronic infrastructure has a number of non compliance issues. These non conformances relate to safety issues, current standards and AHFG compliance.
• The Hospital has a large number of distribution boards throughout the Hospital. Most switchboards have limited or no spare capacity for additional circuits.
• The wiring systems throughout the Hospital vary in standard of installation but is generally in reasonable condition. Wiring in buildings is generally installed in ceiling spaces with some wiring in building undercroft areas and installed in floor slabs in metal conduits.
• The provision of socket outlets throughout the Hospital varies in adequacy.
• Body Protected Areas in the Hospital include Operating Theatre Suite, Accident and Emergency, Delivery, some Consulting Rooms, Dental and selected East Ward rooms.
• The Hospital lighting is generally of an ‘institutional and 1970’s commercial’ standard and generally incorporates fluorescent or discharge lighting sources.
• External lighting is provided but many areas are generally poorly lit and below current codes.
• The Hospital comprises generally single point illuminated exit signs and emergency evacuation lighting points.
• The Hospital main communication room is located near the Administration Section and houses the site telephone MDF, Data Equipment Racks, PABX controller, Telstra Fibre Optic Termination Panels, UPS’s and Paging Controller, Duress Controller and Security Panels.
• Existing data and voice services from the main communications room are distributed in copper and fibre optic backbone cabling to equipment racks in seven locations throughout Hospital.
• The existing security systems in Mareeba Hospital includes CCTV, after hours intercom, and Duress systems.
• Nurse call systems in many areas of the Hospital are outdated push button and buzzer type systems. A number of areas including the recently refurbished West Wing Ward are current systems.
• The emergency call system comprises a buzzer and push button system in Community Health, West Wing Ward, Maternity Ramp, Maternity Ward, OPD and Kitchen with panels in the East Wing Ward.
• The Hospital is provided with a radio paging system.
• The current television reticulation system comprises a number of smaller MATV antenna systems on the Hospital site to such areas as East Ward, West Ward and Maternity with individual television systems where required for miscellaneous receivers.
• The Hospital is provided with a thermal and smoke detection system including manual call points, electro-magnetic door holders, WIP's and emergency warning system with visual indicators and speakers in the main Hospital buildings. A detection system and sub fire indicator panel is provided in the Staff Accommodation Building.

5.5 Building Viability

The Hospital buildings are in a reasonable condition but are showing signs of physical deterioration of the building fabric and are in need of maintenance upgrade to extend their useable life.

This is especially evident in the electrical and mechanical services areas where maintenance and replace of old equipment is needed urgently as old equipment will potentially fail, replacement parts become difficult and current safety regulations are not met. The following issues should be addressed to extend its useful life.

The following issues related to the physical conditions of the infrastructure should be addressed to extend its useful life and ongoing operation:

• General roof maintenance for gutters and downpipes is required.
• External painting of the building should take place to preserve the facade fabric from further deterioration.
• Upgrade of the bathrooms to the ward areas.
• Undertake a detailed investigation (structural engineer) and repair all existing cracking in brick walls.
• Undertake regular termite inspections and eradication. Visible areas of termite damage should also be repaired.
• Given their age, the buildings on site were in a reasonable condition structurally. With proper maintenance and localised repairs, where required, the buildings should continue to perform their intended structural functions. The majority of the cracking in the buildings is minor and is due to floor deflection, foundation movement or a combination of both. Further movements due to floor deflection should be small. Given the reactive nature of the founding materials, further movements in foundations are likely.
• The main Hospital hydraulic services are generally in reasonable condition and are generally suitable, other than the problem that the backup water storage tank and pump condition and the fire hydrant system been not in accordance with current requirements, to be altered and extended to suit any proposed redevelopment and refurbishments.
• The hydraulic services are in reasonable condition based on our visual inspections and existing records made available.
• The majority of mechanical systems are original and range in age between 10 to 32 years old.
Despite the age of the building and systems, relatively little modifications have taken place. Plant and equipment have been replaced as they deteriorate or fail, with current in fair to good condition. In general terms, systems and plant are just operating satisfactorily to meet the current needs of the Hospital. However, there are a number of non-compliances with current day codes, standards and guidelines.

If significant alterations to each building use and functionality are implemented or areas refurbished generally, it would be prudent to replace systems as part of these works to achieve compliance and provide longer life expectancies.

An additional life expectancy of five years is foreseeable whilst carrying out an appropriate level of maintenance and replacement or refurbishment of air conditioning system components as they deteriorate or fail.

The remaining original chilled water production plant is unlikely to operate efficiently for much longer and is expected to require complete replacement within two years.

In the absence of a refurbishment or upgrade, it would be expected that as individual systems or components fail, that they will be swapped out with like systems, extending the life expectancy in the order of 10 to 15 years, however not addressing any system non-conformances.

Air conditioning units serving the Mental Health building are at most 10 years old. Systems remain as installed and based on the age, plant condition is good. With continued regular maintenance, the air conditioning plant is expected to have an economic life of approximately 10 years left.

An important aspect to consider is that all DX ducted split systems in this building operate on refrigerant R22, which is to be phased out in coming years. At this stage, year of completion is most likely between 2014 and 2016.

The primary fuses are nearing maximum capacity.

The generator and transfer switch is nearing rated capacity.

Distribution Boards throughout the Hospital and remote buildings generally have limited space capacity and have compliance issues with current regulations.

The switchboard in the residence needs upgrading.

Locating the battery cubicles in a separate fire rated room needs to be investigated.

Body protection electrical systems are provided in some areas of the Hospital.

No cardiac protection was sited.

Lighting levels are below standard in a number of interior spaces and the use of clinical observation lamps is contrary to lighting codes in many areas.

External lighting is poor generally and presents security and safety issues. Helipad landing lights need upgrading.

Surgical and examination lights are located in theatres, recovery and miscellaneous treatment areas.

Most surgical lights (except theatre) appear to have been installed with the original building and are antiquated by modern standards.

Exit and evacuation lighting is provided to most areas. There are numerous anomalies with current codes such as testing facilities, spacing, pictogram diagrams, viewing distances and directional signage.

The voice and data system is distributed extensively throughout the Hospital via fibre optic and copper backbone cabling to equipment racks within the Hospital buildings and some remote buildings.

The internal horizontal cabling systems and outlets are limited in quantity in some areas.

There are numerous anomalies with current ICT codes.

CCTV system coverage and monitor locations is limited should be expanded.
• The duress system requires upgrading to current AHFG and remote monitoring for off campus staff.
• A number of nurse call systems and the emergency call system are antiquated bell and buzzer systems and should be upgraded.
• The Hospital is provided with a detection system in the main Hospital buildings and the Staff Accommodation.
• The fire detection system has a number of anomalies with current code requirements.

Issues with other buildings on site;

• Staff Accommodation building – renovation of the building is required to ensure that Nursing staff are attracted and retained to the facility.
• Mental Health building – cracking of the walls requires further investigation.
• Dental Health building – review of patient access for emergency situations.
• Existing water tanks are rusting – ongoing maintenance is being undertaken.
• In the Dental Clinic buildings room and cassette split type air conditioning units without outdoor air introduction will continue to serve the occupied spaces until a major refurbishment or upgrade is done to the building, or parts of the building. It is expected that code compliant systems would be installed with outdoor air introduction at that point.
6 Current Risks

The risks have been identified based on compliance with the following:

- Australasian Health Facility Guidelines
- Building Code of Australia 2009
- Queensland Health Guidelines
- Relevant Australian Standards and technical codes.

6.1 Building life

The following risks are associated with the deterioration of the buildings and site works that affect the life of the buildings include:

- General roof maintenance for gutters and downpipes is required.
- External painting of the building should take place to preserve the facade fabric from further deterioration.
- Upgrade of the bathrooms to the ward areas to ensure that waterproofing is maintained.
- Cracking to walls internally and externally – Main Hospital building.
- Appropriate ongoing maintenance – for the building fabric and services.
- Corroding reinforcing steel within concrete elements and the resulting concrete spalling could reduce the strength of structural elements and cause injury to building users.
- Only one area of localised spalling was identified during our inspection and we would recommend that that area is treated to repair the spalled concrete and associated reinforcing steel.
- Given the age of the majority of buildings is well within their design life of 50 years, we would not anticipate spalling would be a problem in those buildings, however, the Nurses Quarters and Store Buildings could be susceptible in the future.
- Mitigation strategies would involve repairing current areas of spalled concrete and an annual visual inspection of the older buildings for any signs of spalling.
- If repaired properly, ongoing spalling of the repaired areas should not be a problem, however, the potential for spalling in the remaining non-repaired areas will increase with time.
- Corroding structural steelwork could reduce the strength of structural steel elements causing greater than expected deformations within or collapse of those members and associated collateral damage to neighbouring portions of the building.
- Minor corrosion is present throughout the campus, but we did not witness any steel sections in danger of collapse in the near future.
- Mitigation strategies would involve the cleaning of the steelwork to remove the corroding areas and then the application of a suitable protective paint system.
- Provided this is done thoroughly, the steel should continue to perform adequately.
- Timber elements may become more susceptible to rot or termite attack. We did not inspect load bearing timber elements during our inspection as they were concealed by claddings or in inaccessible locations.
- We did not see any evidence of termite attack during our inspection.
- To mitigate any risk of termite attack or rot, regular inspections of the timber elements in the Nurses Quarters and Store Buildings should be undertaken on a regular basis by a termite control company.
- Following any identification of termite activity, rectification strategies could be determined.
The Hydraulic Services fixtures, fittings, pipe work etc will need to be maintained and replaced as necessary to maintain the system and site conditions. Based on our site inspections general maintenance has been ongoing and depending on the future use of the facilities the base back bone hydraulic services systems will be suitable for use in the short to medium term.

6.2 Compromised patient care (due to infrastructure inefficiencies)

The existing Hospital buildings are all generally older stock and do not comply with access standards AS 1428.1 or the current BCA. This relates to doorways and clearances, PWD, ensuites and WC's in general. A number of level changes are experienced to the outside of the Hospital complex generally linked with footpaths and covered ways.

The Staff Accommodation building is a two storey building and has some compliancy issues. It is generally in reasonable order but does require a significant update to finishes and layout. It does not have a lift access to the upper level or ramp access to the ground floor level.

The Mental Health building is a two storey building and has some compliant issues. It is generally in reasonable order. It does not have a lift or ramp access to the upper level.

The following risks associated with patient care due to infrastructure inefficiencies:

- Emergency Department hard to find – lack of way finding signage or design to flow patients to the Triage desk.
- Emergency Department is not large enough in terms of physical space requirements and lack of certain rooms.
- Emergency Department does not have a dedicated room for mental health patients.
- After hours entrance to the Emergency Department – staff and patient security and safety is an issue.
- No public sanitary facilities for people with disabilities provided to the main Hospital.
- Toilets in the wards are not large enough for wheelchairs or assistance.
- No person with a disability shower available in the wards.
- Operating Theatres are body protected not cardiac protection as per health code requirements.
- Ward spaces have been turned into offices or meeting rooms. These offices are non-compliant with current regulations.
- Insufficient space in Ward block to provide adequate patient lounge.
- Sanitary facilities are undersized, cramped and fixtures located within circulation spaces providing difficulty with patient manoeuvrability and transfers.

6.3 Fire risks

The fire risks associated with current buildings at the Hospital site are:

- Fire and smoke walls do not go to the underside of the roof sheeting (advice provided on site).
- Fire doors do not comply with current regulations.
- Electrical switchboards not fire separated in compliance with the BCA.
- Fire hose reels located too far from exits (beyond 4m).
- Fire detector spacing is non compliant and some are missing or not provided.
- Fire separation between compartments to be provided.
- Infrared scans of main switchboards and distribution boards should be carried out regularly for cracked insulation, hot wiring and contacts which could result in fire. It was advised that this is carried out annually by BEMS.
• Lightning protection systems and line protection devices need to be upgraded.
• Fire alarm systems need to be upgraded to code requirements.
• Electrical fit out in hazardous areas needs to be upgraded to current code requirements.

6.4 Risks of accidents
The following personal injury risks associated with the deterioration of the buildings and site works at the Hospital site are:

• No unisex accessible toilet for people with disabilities – other toilets are too small and staff advise that if a patient collapses it is difficult to get them out easily.
• Deterioration to paths between buildings that are a trip hazard.
• No adequate pedestrian link to staff car park from Hospital buildings.
• Surface treatment to staff car park has deteriorated causing trip hazards.
• Floor finish in public toilets of ward block has deteriorated causing possible trip hazard.
• Trip hazards to external area around the Laundry and workshop.
• Stairs that have open risers or do not have visual nosings can be a tripping hazard.
• On street parking for people with disabilities is not provided with a kerb ramp adjacent to the bay for safe transfer and transfer is via the road.
• Uneven surfaces in the car park are a trip hazard.
• Corridor handrail heights vary.
• Communication cupboards spread throughout the complex, often in rooms with unprotected backs to doors with loose wires visible – could be disconnected.
• Current switchboard drawings should be included in switch room for system operating procedures and emergency switching.
• Locks on switchboard doors and pole fillers should be upgraded on some switchboards.
• Lighting sub-circuit should be upgraded to Residual Circuit Device (RCD), (and unprotected power sub-circuits where not provided).
• Clearances in switchboard cupboards to be upgraded.
• Electrical equipment in hazardous areas to be upgraded.
• Lighting to be upgraded to helipad.

6.5 Infection risks
The following risks associated with the deterioration of the buildings and site works include:

• A number of areas have minimum number of basins and often with inappropriate tapware.
• The minor operations Theatre has no HEPA filter.
• Inadequate toilet and bathing facilities within the ward spaces.
• Toilet pans are not of disabled pan design therefore at risk of spillage.

6.6 Security risks (incorporating personal attack risks)
The following risks associated with the deterioration of the buildings and site works include:

• Lighting levels are below the required standards in car parks, walkways and some internal areas.
• The spread out nature of campus buildings means buildings are accessed by open walkways which can pose a security issue to staff, especially during night time hours.
• Emergency Department access afterhours for patients and staff.
• Lack of security to the Pharmacy – a security camera both inside and outside the Department would improve staff safety and monitoring of the Pharmacy after hours.

• Add duress system as a priority security risk. Further details are presented in the report Occupational Violence Risk Assessment – for Mareeba District Hospital (Oct 2009).

• Lighting levels are below the required standards in car parks, walkways and some internal areas.

• Duress alarm and CCTV system be upgraded to AHFG requirements.

6.7 **Health and safety risks**

The following Occupational Health and Safety risks associated with the buildings and site include:

• Uneven surfaces in the car park.
• Inadequate storage space in medical records long term storage.
• Access within dental treatment rooms difficult particularly for emergency egress.
• Asbestos lining within the facility (if disturbed).
• Nurse call systems need to be upgraded with event recording equipment.
• Extent of backup power to the entire facility.
• Sanitary facilities are cramped and fixtures located within circulation spaces providing difficulty with patient manoeuvrability and transfers.

• Trip hazards to the area around the laundry and workshop.

6.8 **Disadvantage to persons with a disability**

The following disadvantages to persons with a disability occur at the Hospital site include:

• Parking numbers for disability are inadequate for the site.
• Doors generally undersized.
• Ward block ensuites and doors undersized.
• Parking generally not adequately signed.
• No braille and tactile signage.
• No ramp access to Staff Accommodation and no lift access to upper level.
• No compliant Person with disability or ambulant person toilet to entire Hospital building.
• Disability lighting in car parks is inadequate.
• AS1428 light switch and socket outlet heights are non-compliant.
• Inadequate sanitary facilities for people with disabilities.
• Permanent Hearing Augmentation Listening Systems are not provided.
• Visual alarms are not provided.
• Location and design of parking inadequate as noted above.
• Not all areas of the site and/or buildings are accessible.
• Door widths undersized and handles too high.
• Lower section of counter not provided to public counters.

6.9 **Staff, patient and visitor dissatisfaction**

The following risks associated with the deterioration of the buildings and site works include:

• Ward bathrooms inadequate in size.
• Distance from staff stations to wards.
- Inadequate number of consultation rooms in Emergency Department contributing to lack of privacy.
- Shared patient and utility area in the pan room in Emergency Department i.e. patients wash their hands after using the toilet in a clinical sink – infection control and Workplace Health and Safety issue.
- Inadequate disabled patient access to toilet in Emergency Department – Workplace Health and Safety Issue.
- Lack of room for further expansion of services to meet growth in demand.
- Clinic and emergency areas all in one affecting patient flow.
- No security presence and lack of suitable afterhours access to Emergency Department.
- Signage throughout the facility a problem (particularly to the Emergency Department).
- Lack of adequate sanitary facilities.

6.10 Excessive running costs
The following issue associated with the deterioration of the buildings that may contribute to excessive running costs include:

- New government regulations on energy efficiency relating to electricity usage for heating and cooling are very difficult to achieve in the existing buildings.
- Running costs associated with inefficient air conditioning and mechanical ventilation plant.
- A significant number of systems are required to operate continuously to satisfy the Hospital’s requirements. However, ancillary and minor systems can be turned off to some extent to suit space and functional requirements.
- Electronic and electro-mechanical controls currently on site are unable to increase system performance or reduce energy consumption during times of reduced demand or occupancy.
- Irregular maintenance causes additional costs due to inefficient operation. Effective and regular maintenance also needs to be provided to ensure that filters are cleaned regularly, fan belts are suitably tensioned, fan bearings replaced, coils cleaned, etc to ensure that plant is operating in an efficient manner. Maintenance should also include the correct setting and tuning of temperature control to achieve efficient operation.
- The existing plant is over 30 years old and relatively inefficient. The efficiency of individual components or systems can only be fundamentally changed by major plant and controls replacement. Replacement with a modern plant and control systems will provide greater flexibility during times of reduced demand, and consequently higher system efficiencies.
- The absence of a BMS throughout the Hospital increases the maintenance cost as services need to be checked physically by the Hospital Staff on regular basis.
- The lack of data monitoring system for evacuation lights increases maintenance time as evacuation lights need to be checked physically.
- No lighting installation energy saving measures to BCA Section J6 or engineering services guidelines is evident.
- Nurse call system and emergency call system is antiquated and parts are difficult to obtain.
- Patient radio system is inoperative and should be deleted.

6.11 Failure of building services systems
The following risks associated with the deterioration of the buildings and site works include:
• Ergon primary fuses and generator are nearing maximum capacity and will require upgrading if steady load growth occurs.
• Sealing of fire and smoke wall penetrations and switchboard smoke door sealing is required.
• Lightning protection and surge diversion needs to be upgraded to protect occupants, building and equipment.
• Antiquated nurse call systems should be upgraded.
• A number of hydraulic services are beginning to fail or are unsuitable for this facility and for any future redevelopment.
• Fire hydrant system needs upgrade to current Australian Standard compliance requirements.
• Potable water supply and backup systems need replacement (old storage tanks in poor condition).
• No temperature control is provided for the majority of the hot water outlets.
• Minimal or no backflow prevention devices in place on the potable water supply.
• No rainwater harvesting is in place.
• It is not inconceivable that with effective ongoing maintenance, the air handling units could be kept in a serviceable condition for another five to eight years, with component and/or system replacement prior to or at time of failure.

6.12 Legal action lists
The disadvantages to persons with disabilities as noted above, could lead to a legal action under the DDA at any time.
7 Options

7.1 Staff Accommodation

Queensland Health provides housing to staff who deliver essential services to rural, remote and regional centres. Mareeba Hospital currently utilises an existing old building built in 1946, for units of accommodation. The accommodation is very unsuitable and does not provide appropriate, safe and secure housing for rural and remote officers.

The provision of appropriate, safe and secure staff housing in rural areas is broadly acknowledged as a vital element in the ongoing attraction and retention of staff and the provision of safe and sustainable health services.

In relation to Mareeba site, the provision of appropriate housing has been flagged as an essential element to ensure the ongoing viability of the health service.

As a result all options (Option 1 through to 3a) detailed below include the provision of an additional 30 number of housing units of accommodation. Housing accommodation for Mareeba site includes:

- Option 1,2 and 3: Refurbishment to provide twenty four units (conversion from 42 existing small rooms) in the existing building and six new units of accommodation to be built on site
- Option 3a: Demolition of the existing Staff Accommodation building due to poor standard and condition and construction of 30 new units of accommodation.

The footprint allowance and costing for the additional units (including the replacement of substandard accommodation) has been based on accepted standards for Queensland Health staff housing (recently constructed at Roma).
7.2 Option 1 – Status Quo (Minimum Requirements)

7.2.1 Scope of this option
The service plan can be met with this option which includes minimal work to protect patient and staff safety, meet BCA requirements, meet minimum access codes and meet fire requirements of the BCA.

It would exclude upgrade to AHFG.

Currently the following issues have been identified include:

- Fire services upgrade.
- Upgrade disabled toilet in Hospital building to comply with Australian Standards.
- Develop a DDA Action Plan which considers all aspects of the Mareeba Health sites operations.
- Signage upgrade at a minimum to identify access to the Emergency Department.
- Upgrade primary fuses.
- Upgrade generator and transfer switch.
- Fix some existing distribution boards throughout the Hospital in particular provide pole fillers, upgrade extent of RCD protection to lighting sub-circuits.
- Upgrade the switchboard in the residence.
- Upgrade extent of essential supply distribution.
- Provide switching drawings in switch room.
- Upgrade body and cardiac protection electrical systems.
- Upgrade lighting for the use of clinical observation lamps where required by codes.
- Upgrade external lighting and Helipad lighting.
- Locate the battery cubicles in a separate fire rated room.
- Rectify existing duress system configuration and operation.
- Upgrade nurse call and emergency call systems.
- Fix miscellaneous cracked light switches and socket outlets.
- Rectify exit and evacuation lighting code anomalies.
- Rectify anomalies in fire detection system in Hospital and Staff Accommodation buildings.
- Seal cable penetrations in fire and smoke rated walls.
- Upgrade lightning protection facilities.
- Testing and certification of the fire hydrant and fire hose reel systems.
- Rectify temperature control of the hot water use.
- Address age and condition of potable water backup systems.
- General maintenance to prolong the life of existing structural elements including;
  - Treatment of rust on all corroding steelwork
  - Treatment of areas of spalling concrete
- Provide terminal HEPA filters to the Operating Theatres air conditioning system.
- Upgrade filters on all treatment and ward air conditioning units.
- Flyscreens on Operating Theatres air conditioning unit outdoor air intake.
- Upgrade of medical gases alarm system.
- Upgrade access to air conditioning units in Mental Health building ceiling space to comply with Work Place, Health and Safety requirements.
• Replace remaining original cooling towers.
• Replace remaining original water cooled reciprocating chillers.
• Air conditioning to new six person module building.

7.2.2 Capital cost
The cost plan is based on the conceptual planning studies. A full list of information and methodology used in the preparation of this report is located in Cost report, Volume 2.

This cost plan is based up on a 'Category 2 Estimate Level' as defined in the 'Capital Works Management Framework' with a level of confidence 'Low'.

The cost plan has been priced at current Brisbane rates (2Q 2010) with allowance for a locality factor but no allowance for cost escalation.

The capital cost range is $10,000,000 to $12,000,000 excluding escalation.

7.2.3 Whole-of-Life costs
Based on asset replacement value, backlog maintenance and gross floor area it is estimated that whole-of-life-costs will be $202,988 per annum.

Operating Income, Statutory Charges and Operating Expenses (with the exception of building repairs and maintenance) are excluded.

7.2.4 Advantages
Advantages anticipated to be achieved through Option 1 include:

• Has the least cost compared to other options.
• Less interruption to existing services.
• Upgrading of some existing electrical and electronic services to current codes.
• This assists Queensland Health to describe its policies and strategies to ensure a non-discriminatory, inclusive environment, improve services, decrease the likelihood of complaints under the DDA, increase the likelihood of successfully defending complaints, and allow for a planned approach to the development of inclusive facilities and services.
• Addresses the compliance issues with current Australia Standard and local authority requirements including hot water temperature control, fire hydrant and fire hose reel compliance.
• This will prolong the serviceable life of the building.
• Upgrades of existing operating theatre air conditioning filtration to comply with current codes and reduce exposure and risk of patient infections.
• Increased chilled water production system efficiency by introducing more efficient chillers and cooling towers with greater control and performance/energy monitoring.
• Reduced risks associated with maintenance of air conditioning plant in the Mental Health building.

7.2.5 Disadvantages
Disadvantages with Option 1 include:

• The installation has limited building management and automation technology and in order to support the existing outdated services infrastructure, expensive and frequent system facilities management is necessary to maintain the services.
• Partial upgrade to existing systems does not offer the benefit of full system upgrade because it does not take advantages of available modern building management systems. Also, partial system upgrade has limited life expectancy.
• It is currently possible to meet all the requirements of the Building Code of Australia (BCA) and yet still not provide an environment that is free from discrimination under the Disability Discrimination Act (DDA).
• There is no ability to address existing hydraulic issues.
• There are high capital costs for replacement chilled water production plant.
• Does not address non-compliances with other air conditioning systems in the Hospital, which would be expected to be addressed during future refurbishment works or as plant fails.
7.3 Option 2 – Refurbishment or Expansion at Existing Site

7.3.1 Scope of this option

The service plan can be met with the refurbishment and extension of existing infrastructure. Refer to drawings of proposed scheme plan layouts.

The project will need to be staged to ensure continued Health service provision throughout the construction work.

The aim would be to build the new extension to the Emergency Department first, to free up space in the existing building for decanting of areas as the building is gradually refurbished in stages.

The Emergency Department will then be refurbished and expanded to meet its current and future needs. This would be a staged process to allow continual operation of the department.

The movement of offices to the rear wing again frees up space within the existing building for refurbishment and reuse as consultant rooms.

New Staff Accommodation should be built first to allow the decanting of the existing Staff Accommodation building and then to allow refurbishment progressively.

The Option is summarised below and in the accompanying concept drawings:

- Emergency Department – replan and extend existing area.
- Signage to entire facility.
- Improve afterhours access to facility.
- Staff accommodation – build new accommodation and refurbish entire existing building.
- Wards - minor replanning.
- Theatre – add one recovery bay.
- Reception/Administration – refurbish to provide new consulting rooms and reception area.
- Pharmacy – add CCTV cameras to both external and internal areas.
- Doors, PWD to comply with current codes.
- Community – replan and expand.
- Provide adequate public and patient sanitary facilities for people with disabilities.
- Upgrade existing sanitary facilities for people with disabilities.
- Widen doorways and lower door hardware.
- Improve statutory signage.
- Provide adequate parking located adjacent to main entrances in a safe and flat location to Main Hospital, Community Health and Adult Mental Health.
- Remove trip hazards.
- Provide permanent hearing augmentation listening systems to main reception counter.
- Installation of new hydraulic services infrastructure to suit the refurbished and new areas of the Hospital.
- Address issues with potable water supply and backup.
- Address hot water temperature control issues to AS3500.
- Ensure fire hose reel and hydrant system is fully compliant to the BCA and AS2419.
- Rectify any damaged hydraulic services infrastructure required to accommodate changes and additions.
- Provide new construction for the areas of the buildings to be extended.
• Investigate the existing function of the walls to be removed in the Store and Staff Accommodation buildings and provide additional support (in the form of new beams, columns and foundations) or bracing capacity as required.

• With the exception of costs associated with air conditioning the new six person module building, cost of items included in Option 1 will be included with this Option, unless they are unnecessary following Option 2 works having been implemented.

• No specific mechanical works relate to this option. Costs associated with the architectural works items listed above in this section however exist.

7.3.2 Capital Cost
For introduction and methodology please refer to Capital Cost Option 1 – Status Quo.

The capital cost range is $17,000,000 to $21,000,000 excluding escalation.

7.3.3 Whole-of-Life costs
For introduction and methodology please refer to whole-of-life Costs Option 1 – Status Quo

Based on asset replacement value, backlog maintenance and gross floor area it is estimated that whole-of-life costs will be $208,205 per annum.

Operating Income, Statutory Charges and Operating Expenses (with the exception of building repairs and Maintenance) are excluded.

7.3.4 Advantages
Advantages anticipated to be achieved through Option 2 include:

• Emergency Department workflow will improve
• Outpatients separated from the Emergency Department patients
• Improve amenity for staff and patients
• Improve independence, equality and dignity of people with disabilities when visiting the site
• Improve public and staff satisfaction
• Improve patient care
• Reduce risk of DDA compliant; risk to health and safety and accidents
• Demolition of existing building or buildings which have non-compliance issues
• Utilising existing site electrical and electronics infrastructure for new refurbishments
• Upgrading existing electrical and electronic services current codes
• Provide opportunity to upgrade some infrastructures for future expansion
• Address the compliance issues with current Australia Standard and local authority requirements including hot water temperature control
• Upgrade fire hydrant and fire hose reel system to make fully compliant
• Ability to address the potable water backup store, pump and reticulation issues
• Ability to rectify age and condition of existing hydraulic services infrastructure
• Increasing life expectancy of air conditioning plant by replacing old with new compliant models
• Maintenance costs for refurbished or replaced systems will be reduced due to the lower age of the equipment and corresponding lower failure rates of key components and systems.

7.3.5 Disadvantages
Disadvantages with Option 2 include:
• Higher cost than Option 1.
• Impact on service provision during works.
• Additional electrical work required to be carried out throughout the Hospital site to accommodate the new buildings which add more load on electrical infrastructure.
• Partial upgrade to existing systems does not offer the benefit of full system upgrade because it does not take advantages of available modern building management systems. Also, partial system upgrade has limited life expectancy.
• Substantial capital cost outlay for partial site air conditioning upgrades that do not address non-compliance issues on the remaining site.
• Partial upgrade to existing control systems does not offer the benefit of full system upgrade, because it does not take advantage of available modern building management systems.
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**Legend**

- Project
- Drawing
- Client
- Location
- Drawing Number
- Project Number
- Scale
- Date Drawn
- File Name
- Issue
- Description
- Date
- Chk
- Auth

**Issue Description**

- A FIRST ISSUE 16.06.10 AE PA
- B SECOND ISSUE 09.07.10 JA PA

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**Ground Floor - Nurse Headquarters - Proposal Department Queensland Health**

**Master Plan - Mareeba Hospital**

02468 1 0 2 0
7.4 Option 3 – Significant Redevelopment

The service plan can be met with the refurbishment and extension of existing infrastructure and provision of a new build. Refer to drawings of proposed scheme plan layouts.

7.4.1 Scope of this Option

Option 3 includes the previous Option 2 components but in addition includes construction of an extended Dental Department. Option 3a is provided which further adds by the demolition of the existing Staff Quarters and the complete new build for all staff accommodation.

7.4.2 Capital cost

For introduction and methodology please refer to Capital Cost Option 1 – Status Quo.

The capital cost range for Option 3 is: $18,000,000 to $22,000,000 excluding escalation.

Option 3a has been expanded to include for the replacement of the existing Nurses Accommodation Building in lieu of refurbishment. The existing building is demolished under this option.

The capital cost range for Option 3a is: $21,000,000 to $26,000,000 excluding escalation.

7.4.3 Whole-of-Life costs

For introduction and methodology please refer to whole-of-life costs Option 1 – Status Quo.

Based on asset replacement value, backlog maintenance and gross floor area it is estimated that whole-of-life costs will be $136,348 per annum.

Operating Income, Statutory Charges and Operating Expenses (with the exception of building repairs and maintenance) are excluded.

7.4.4 Advantages

Advantages anticipated to be achieved through Option 3 in addition to Option 2 include:

- Improve access to Dental Department
- Provide new building for staff accommodation (Option 3a)

7.4.5 Disadvantages

Disadvantages anticipated to be achieved through Option 3 include:

- Additional Cost
- Construction time frame
- Minor impact on existing Hospital operations;
## Options Analysis

Review of the three Options presented in Section 5.

### Option 1

| Option features | Address need to do safety upgrades  
|                 | Provide equal access to all buildings  
|                 | Refurbishment of existing nurses quarters  
|                 | Addresses standard and guideline compliance issues with the Operating Theatre air conditioning system  
|                 | Addresses filter compliance issues on air conditioning units serving treatment and ward areas  
|                 | Addresses replacement of original 32 year old chiller and cooling tower sets to reduce ongoing future maintenance costs.  
|                 | Address Workplace Health and Safety issues with access to Mental Health Building air conditioning plant  
| Rationale       | Address safety issues  
|                 | Ensure health services are provided to all.  
|                 | Address major Workplace Health and Safety aspects, infection risks and energy efficiency in critical areas  
| Benefits        | Minimal costs  
|                 | Maintains existing infrastructure  
|                 | Plan of action to address areas of non-compliance suggests Queensland Health is proactive and willing to provide inclusive services and facilities for people with disabilities  
|                 | Reduce maintenance risks  
|                 | Reduce risk of plant failure during critical situations  
|                 | Reduce infection risks in the operating theatre  
|                 | Increase energy efficiency of chilled water system.  
|                 | Reduced Capital costs compared to main works (45) – (60%) of cost of Option 2, 3 and 3A  
| Risks           | Not providing sufficient required facilities to the community  
|                 | Facilities do not meet current AHFG and code  
|                 | Lowers risk of compliant under DDA  
|                 | All buildings do not meet all current code and guideline building services requirements  
|                 | Will not prolong life of partially refurbished building services  
| Assumptions     | Based on visual site inspections, drawings and discussions with BEMS on site  
| Criticality     | Urgent safety upgrade  
|                 | Some electrical and electronic upgrades are critical - refer main report  
|                 | Some mechanical upgrades are necessary – refer main report  
| Resource implications | Higher ongoing maintenance costs due to deteriorating infrastructure and maintaining redundant buildings  
|                 | Possible higher turn-over due to low grade facilities  

Higher ongoing maintenance costs with partial upgrades than if whole system was replaced
- Capital Cost: $10,000,000 to $12,000,000

**Option 2**

<table>
<thead>
<tr>
<th>Option features</th>
<th>Rationale</th>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Department refurbished and expanded</td>
<td>Refurbish within the existing building fabric, providing spaces and services to suit the AHFG</td>
<td>Re-use of existing building stock</td>
<td>Less efficient layout due to reuse of existing buildings</td>
</tr>
<tr>
<td>Consultant rooms upgraded</td>
<td>Extend minor areas where required – Theatres and Emergency Department</td>
<td>Less expensive than a new build Hospital</td>
<td>Possible latent building costs in refurbishing existing buildings</td>
</tr>
<tr>
<td>Needs to address all hydraulic services compliance issues</td>
<td>Address some electrical and electronic safety issues</td>
<td>Complies with AHFG</td>
<td>Disruptions to the functioning of areas of the existing building as repair and/or strengthening works are carried out to the existing structure.</td>
</tr>
<tr>
<td>Some electrical and electronic upgrades are critical - refer main report</td>
<td>Demolish redundant electrical and electronic building services to reduce ongoing costs</td>
<td>Needs to address all hydraulic services compliance issues</td>
<td>Disruptions to existing electrical and electronic building services during construction.</td>
</tr>
<tr>
<td>Refurbishment of existing Staff Accommodation building</td>
<td>Same rationale as nominated in Option 1</td>
<td>Improves amenity for staff and patients</td>
<td>Facilities do not meet all current AHFG and codes electrical</td>
</tr>
<tr>
<td>All features nominated in Option 1</td>
<td></td>
<td>Maintains some existing electrical and electronic building services</td>
<td></td>
</tr>
<tr>
<td>Addresses standard and guideline compliance issues with the air conditioning systems serving the Medical Imaging Department/Emergency Department/Administration building</td>
<td></td>
<td>Reduce maintenance risks</td>
<td></td>
</tr>
<tr>
<td>Addresses standard and guideline compliance issues with the air conditioning systems</td>
<td></td>
<td>Reduce risk of plant failure during critical situations</td>
<td></td>
</tr>
<tr>
<td>Refurbish within the existing building fabric, providing spaces and services to suit the AHFG</td>
<td></td>
<td>Reduce infection risks in the operating theatre</td>
<td></td>
</tr>
<tr>
<td>Extend minor areas where required – Theatres and Emergency Department</td>
<td></td>
<td>Increase energy efficiency of chilled water system</td>
<td></td>
</tr>
<tr>
<td>Address some electrical and electronic safety issues</td>
<td></td>
<td>Provide adequate staff living quarters</td>
<td></td>
</tr>
<tr>
<td>Demolish redundant electrical and electronic building services to reduce ongoing costs</td>
<td></td>
<td>Less expensive than a new build Hospital</td>
<td></td>
</tr>
<tr>
<td>Same rationale as nominated in Option 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
and electronic building services requirements
- Will not prolong life of partially refurbished electrical and electronic building services
- Disruptions to the functioning of areas of the existing building as repair and/or strengthening works are carried out to the existing structure
- All buildings do not meet all current code and guideline building services requirements
- Will not prolong life of partially refurbished building services

**Assumptions**
- Based on projections as per Services Profile
- Air conditioning would be requested by Queensland Health in refurbished Staff Accommodation Building
- Based on visual site inspections, drawings and discussions with BEMS on site

**Criticality**
- Upgrades facilities to current guidelines
- Emergency Department – High
- Consultant rooms - High
- Wards – Low
- Some electrical and electronic building services upgrades are critical - refer main report
- That the existing Nurse Quarters building renovation is cost effective
- Some mechanical upgrades are necessary – refer main report

**Resource implications**
- Maintenance costs reduced in demolishing redundant building, and refurbishing Main Hospital building
- Staff – better retention due to improved facilities
- Higher ongoing maintenance costs with partial upgrades than if whole system was replaced
- Added maintenance required to service new plant associated with refurbished Staff Accommodation Building
- Capital Costs: $17,000,000 to $21,000,000

**Option 3**

**Option features**
- New build for Emergency Department and Outreach/Administration
- Update of all ward spaces
- Renovation of existing Nurses Quarters
- Addresses code and BCA compliance issues to a number of electrical and electronic building services
- All features nominated in Option 1 and 2.
- Addresses standard and guideline compliance issues with the air conditioning systems serving the Staff/Storage building
- Provides improve ambient conditions in Staff Accommodation Building

**Rationale**
- Address issues within existing Emergency Department
- Relocate offices and Allied Health to release existing wards currently used as offices.
<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Address some electrical and electronic safety issues</td>
<td>• Funding for new build</td>
</tr>
<tr>
<td>• Demolish redundant building services to reduce ongoing costs</td>
<td>• Disruptions to the functioning of areas of the existing building as repair and/or strengthening works are carried out to the existing structure</td>
</tr>
<tr>
<td>• Same rationale as nominated in Option 1</td>
<td>• Risk of compliant under DDA is all but eliminated.</td>
</tr>
<tr>
<td>Benefits</td>
<td>Risks</td>
</tr>
<tr>
<td>• Reduces use of beds in Emergency Department for Categories 4 and 5 and pressures on number of patients seen</td>
<td>• Disruptions to the functioning of areas of the existing building as repair and/or strengthening works are carried out to the existing structure</td>
</tr>
<tr>
<td>• More appropriate use of medical resources (E.g. existing wards currently used as offices)</td>
<td>• Facilities do not meet all current AHFG and codes electrical and electronic building services requirements</td>
</tr>
<tr>
<td>• Efficient layout of space in new building</td>
<td>• Disruptions to the functioning of areas of the existing building as repair and/or strengthening works are carried out to the existing structure</td>
</tr>
<tr>
<td>• Can address all of the site hydraulic services issues including renewal of the aging services</td>
<td>• All buildings do not meet all current code and guideline building services requirements</td>
</tr>
<tr>
<td>• Provides compliant, equal, dignified, independent services and facilities for staff and patients</td>
<td>• Will not prolong life of partially refurbished building services</td>
</tr>
<tr>
<td>• Maintains some existing electrical and electronic building services</td>
<td>Assumptions</td>
</tr>
<tr>
<td>• Reduce maintenance risks</td>
<td>• Based on visual site inspections and load readings from site</td>
</tr>
<tr>
<td>• Reduce risk of plant failure during critical situations</td>
<td>• Based on projections as per Services Profile</td>
</tr>
<tr>
<td>• Reduce infection risks in the operating theatre</td>
<td>• That the existing Staff Accommodation Building renovation is cost effective</td>
</tr>
<tr>
<td>• Increase energy efficiency of chilled water system</td>
<td>• Air conditioning would be requested by Queensland Health in refurbished or new Staff Accommodation building.</td>
</tr>
<tr>
<td>• Provide adequate staff living quarters</td>
<td>• Based on repeated drawings and discussions with BEMS on site</td>
</tr>
<tr>
<td>Benefits</td>
<td>Criticality</td>
</tr>
<tr>
<td>• Reduces use of beds in Emergency Department for Categories 4 and 5 and pressures on number of patients seen</td>
<td>• Upgrades facilities to current guidelines</td>
</tr>
<tr>
<td>• More appropriate use of medical resources (E.g. existing wards currently used as offices)</td>
<td>• Some building services upgrades are critical - refer main report</td>
</tr>
<tr>
<td>• Efficient layout of space in new building</td>
<td>• Some mechanical upgrades are necessary – refer main report</td>
</tr>
<tr>
<td>• Can address all of the site hydraulic services issues including renewal of the aging services</td>
<td>Resource implications</td>
</tr>
<tr>
<td>• Provides compliant, equal, dignified, independent services and facilities for staff and patients</td>
<td>• Higher ongoing maintenance costs with partial upgrades than if</td>
</tr>
<tr>
<td>• Maintains some existing electrical and electronic building services</td>
<td>Assumptions</td>
</tr>
<tr>
<td>• Reduce maintenance risks</td>
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</tr>
<tr>
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<td>• Air conditioning would be requested by Queensland Health in refurbished or new Staff Accommodation building.</td>
</tr>
<tr>
<td>• Provide adequate staff living quarters</td>
<td>• Based on repeated drawings and discussions with BEMS on site</td>
</tr>
</tbody>
</table>
whole system was replaced
- Higher ongoing maintenance costs with partial upgrades than if whole system was replaced
- Added maintenance required to service new plant associated with refurbished Staff Accommodation Building
- Capital Costs Option 3: $18,000,000 to $22,000,000

Option 3a

| Option features | • New build for staff accommodation |
| Rationale       | • Address issues of existing Staff Accommodation Building |
| Benefits        | • New building to attract and retain staff |
| Risks           | • Funding for new build |
|                 | • Disruptions to the functioning of the existing building |
| Assumptions     | • Based on Queensland Health projections for Staff Accommodation. |
| Criticality     | • Urgent upgrade or new build to staff accommodation building |
| Resource implications | • Improvement in staff retention |
|                 | • Capital Costs $21,000,000 to $26,000,000 |

The cost variance over a 30 year life cycle demonstrates that the option which provides greatest value is option 2 or 3.

**Table 3: Cost Variance**

<table>
<thead>
<tr>
<th>Option</th>
<th>Capital Costs</th>
<th>WoL costs (30 years)</th>
<th>Total cost</th>
<th>% variance over option 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>10,545,833</td>
<td>6,089,643</td>
<td>16,635,476</td>
<td>-</td>
</tr>
<tr>
<td>Option 2</td>
<td>17,867,178</td>
<td>6,202,683</td>
<td>24,069,861</td>
<td>144.69%</td>
</tr>
<tr>
<td>Option 3</td>
<td>18,590,018</td>
<td>5,804,380</td>
<td>24,394,399</td>
<td>146.64%</td>
</tr>
<tr>
<td>Option 3A</td>
<td>22,295,923</td>
<td>5,834,988</td>
<td>28,130,910</td>
<td>169.10%</td>
</tr>
</tbody>
</table>

Options 1 and 2 does not allow for a significant redevelopment within the 30 year life cycle. It only allows for maintaining current facilities to existing standards (except where noted).
8 Acronyms and Abbreviations

ACF   Aged Care Facility
AHFG  Australasian Health Facility Guidelines
ARV   Asset Replace Vaws
AS    Australian Standard
BCA   Building Code of Australia
BEMS  Building and Equipment Maintenance Service
BMS   Building Maintenance System
CCTV  Close Circuit Television
CWMF  Capital Works Management Framework
DDA   Disabilities Discrimination Act
ED    Emergency Department
EWIS  Emergency Wardens Intercom System
FAPA  Filters to Air Conditioning Supply
FFandE Furniture Fittings and Equipment
FIP   Fire Indicator Panel
GFA   Gross Floor Area
GP    General Practitioner
GST   Goods and Services Tax
HEPA  Type of filter for Air conditioning
ICT   Inter Communications and Telecommunications Cabling
KVA   Kilo Volts Amps
LV    Low Voltage
MATV  Master Antennae for Television
MDF   Main Distribution Frames
MSB   Master Switch Board
MSSB  Mechanical Services Switch Board
PA    Per Annum
PABX  Private Automatic Branch Exchange
PWD   Person with Disabilities Toilet and/or Shower
RA    Return Air
RCD   Residual Circuit Device
UPS   Uninterrupted Power Supply
WC    Water Closet (Toilet)
WOL   Whole of Life
9 List of Drawings

Option 1:
   A 101 Site Plan Option 1

Option 2:
   A 102 Site Plan Option 2
   D 201 Proposed - Emergency Department
   D 206 Proposed – Administration and Outpatients
   D 213 Proposed – New Offices and Storage
   D 246 Proposed – Staff Accommodation Ground Floor
   D 251 Proposed – Staff Accommodation First Floor

Option 3:
   A 103 Site Plan Option 3
   A 104 Site Plan Option 3A