**About this study**

The Preliminary Infrastructure Planning Study for Emerald Hospital was commissioned by Queensland Health through the Project Services Department of Public Works on 24 March 2010. This study investigates future infrastructure for Emerald Hospital based on the options endorsed by Queensland Health’s Integrated Policy and Planning Executive Committee on 15 March 2010.

This Preliminary Infrastructure Planning Study undertaken from early April to mid June 2010 was prepared by Woodhead Pty Ltd and sub-consultants under the direction of Queensland Health’s Planning and Coordination Branch. Every effort has been made by Woodhead Pty Ltd and sub-consultants to investigate and document in sufficient detail, and within the timeframe, the infrastructure issues, gaps and requirements by Queensland Health in relation to the Emerald Hospital’s future service provision.

**Assumptions**

The study has been prepared on the basis of available information provided with regards to the condition of existing buildings, the level of service to be provided with in the new development based on service profile information provided by Queensland Health, bed numbers based on information provided by Queensland Health and information provided in sub-consultant’s reports.
## Contents

1. **Executive summary** ................................................................. 7
2. **Introduction** ........................................................................... 9
   2.1 Objective .................................................................................. 9
3. **Study context** ........................................................................ 10
   3.1 Locality ..................................................................................... 10
   3.2 Emerald Hospital site ................................................................. 10
   3.3 Emerald Hospital building history ............................................ 10
   3.4 Existing built environment ....................................................... 10
      3.4.1 Main Hospital site buildings ............................................ 12
   3.5 Emerald Hospital maintenance issues ..................................... 13
      3.5.1 Buildings .......................................................................... 13
      3.5.2 Landscape .......................................................................... 13
      3.5.3 Normal waste .................................................................... 14
      3.5.4 Chemical waste ................................................................. 14
      3.5.5 Insects ................................................................................ 14
      3.5.6 Asbestos ............................................................................. 14
   3.6 Emerald Hospital development proposals ................................ 14
   3.7 Site constraints ......................................................................... 14
      3.7.1 Heritage issues ................................................................... 14
      3.7.2 Town planning/designation issues ...................................... 14
   3.8 Consultation ............................................................................ 15
4. **Health services** ..................................................................... 16
   4.1 Design and functionality of Emerald Hospital ....................... 16
      4.1.1 Current service provision of Emerald Hospital ............... 16
   4.2 Future health services ............................................................. 17
   4.3 Infrastructure gaps .................................................................. 23
      4.3.1 Emergency Department services .................................... 23
      4.3.2 Inpatient/medical services .............................................. 23
      4.3.3 Maternity services ........................................................... 23
      4.3.4 Surgical/Peri Operative .................................................... 23
      4.3.5 Clinical support services ................................................ 23
5. **Inspection reports** ................................................................. 24
   5.1 Method ...................................................................................... 24
   5.2 Exclusions ............................................................................... 24
   5.3 Overlap .................................................................................... 24
   5.4 Current site and infrastructure condition ............................... 24
   5.5 Building viability ................................................................. 25
6 Current Risks........................................................................................................26
6.1 Building life ....................................................................................................26
  6.1.1 Compromised patient care due to infrastructure conditions ..........26
  6.1.2 Fire risks ..................................................................................................26
  6.1.3 Risk of accidents ....................................................................................27
  6.1.4 Infection control risks ...........................................................................27
  6.1.5 Health and safety risks ..........................................................................27
  6.1.6 Security risks ..........................................................................................27
  6.1.7 Disadvantages to persons with a disability ............................................27
7 Options .............................................................................................................28
7.1 Staff accommodation ....................................................................................28
7.2 Option 1 – status quo (minimum requirements) .........................................29
  7.2.1 Scope of this option .................................................................................29
  7.2.2 Capital cost .............................................................................................31
  7.2.3 Whole-of-life costs .................................................................................31
  7.2.4 Advantages ..............................................................................................31
  7.2.5 Disadvantages ..........................................................................................31
7.3 Option 2 – refurbishment or expansion at existing site ................................35
  7.3.1 Scope of this Option ................................................................................35
  7.3.2 Capital cost .............................................................................................35
  7.3.3 Whole-of-life costs ..................................................................................36
  7.3.4 Advantages ..............................................................................................36
  7.3.5 Disadvantages ..........................................................................................36
7.4 Option 3 – significant redevelopment ............................................................41
  7.4.1 Scope of this option ................................................................................41
  7.4.2 Capital cost .............................................................................................41
  7.4.3 Whole-of-life costs ..................................................................................42
  7.4.4 Advantages ..............................................................................................42
  7.4.5 Disadvantages ..........................................................................................42
8 Options analysis .................................................................................................45
List of Tables
Table 1: Current and future bed requirements for Emerald Hospital (bed projections) .......19
Table 2: Emergency Department treatment spaces required at Emerald Hospital ..........21
Table 3: Option 1 analysis ..........................................................................................45
Table 4: Option 2 analysis ..........................................................................................45
Table 5: Option 3 analysis ..........................................................................................45
Table 6: Construction analysis table .............................................................................46

List of Diagrams
Diagram 1: Emerald Hospital building relationship....................................................11
Diagram 2: Emerald Hospital site plan...........................................................................33
Diagram 3: Emerald Hospital Option 1 ..........................................................................34
Diagram 4: Emerald Hospital Option 2 ground floor.......................................................37
Diagram 5: Emerald Hospital Option 2 level one ............................................................38
Diagram 6: Emerald Hospital Option 2 staff accommodation...........................................39
Diagram 7: Emerald Hospital Option 3 refurbishment and phase 2 (scale 1:1000) ..........43
Diagram 8: Emerald Hospital Option 3 refurbishment and phase 2 (scale 1:750) ...........44
1 Executive summary

This study has been prepared on behalf of Queensland Health to assess the condition of Emerald Hospital to provide the future service requirements through to 2021/22 and beyond. The study will provide three options for the future development of Emerald Hospital. Option 1 will establish the minimum requirements to allow the facilities to continue running in their current form (Status Quo), Option 2 will provide a redevelopment option for the current site (Brownfield) and Option 3 will propose a major redevelopment or new-build scheme (Greenfield).

For the preparation of this study assessments were made on the infrastructure of the Emerald Hospital, including condition of existing buildings, presence of asbestos, condition of building services, building life, compliance with relevant current codes and standards and site constraints. 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.

In preparing this study inspections were carried out by structural and civil engineers, building surveyors, architects, hydraulic engineers, electronic engineers, mechanical engineers and electrical engineers. The assessments provided by the nominated professionals were used to assess the condition of the current facilities and develop the options for redevelopment.

The Emerald Hospital site currently consists of several existing buildings including the main Hospital building constructed circa 1950 and redeveloped during 1997-1999 including the addition of a new ward block. Issues with the current site infrastructure include compliance with current standards, provisions for persons with a disability, asbestos and the condition of buildings.

Option 1: ‘Status Quo’ aims to address serious risks or infrastructure issues to allow the current services to be provided. It will not resolve the level 3 service requirements nor achieve full compliance of the facility to current standards. Broadly Option 1 will address key issues with the current infrastructure including upgrades to facility entrances to allow for improved disabled access, essential fire safety and essential mechanical and electrical services upgrades. Other improvements include new staff accommodation and removal of infrastructure in poor condition. Option 1 is estimated to cost $7.545 million (Category 2 cost estimate at June 2010).

Option 2 seeks to further address the risks and delivery of health services whilst maximising the use of existing infrastructure. The option incorporates a significant percentage of new build as well as refurbishment of the existing building to meet the anticipated service demand. Option 2 retains a two level building with continued reliance on vertical circulation for access to Allied Health and Administration areas. Improvements to staff accommodation are also included in Option 2. Option 2 is estimated to cost $60.875 million (Category 2 cost estimate at June 2010).

Option 3 develops further on Option 2. Within this option all services are delivered from a single storey building. The advantage of this option is the maximisation of new build infrastructure as well as achieving full compliance with current standards and potential for in-built flexibility within the design. As with Options 1 and 2 improvement and additions to staff accommodation is included. Option 3 is estimated to cost $68.610 million (Category 2 cost estimate at June 2010).
Options analysis has been incorporated within the study which reviews the benefits and risks of each option. It is important to note that Option 1 will not meet the level 3 services nor will it achieve full compliance to current standards. Option 2 and 3 provide viable solutions to address non compliance and future health services needs. Option 3 is considered to have less whole-of-life building costs given the significant proportion of new build, it also will present less risk in the long term due to removal of reliance on vertical circulation.
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
Emerald Hospital lies 900km to the southeast of Brisbane Central Business District approximately 10.5 hours drive.

The distance from Emerald Hospital to main referral hospitals are Rockhampton Hospital 268km and The Royal Brisbane and Women's Hospital 900km.

Emerald hospital falls within the Central Health Service District, there are four other hospitals in the district within proximity of Emerald, these are Capella at 55km to the north and approximately 40 minutes drive; Blackwater at 75km to the east approximately one hour drive; Springsure at 70km to the south and approximately 50 minutes drive and finally Gemfields at 45km to the west and approximately 30 minutes drive, however these are smaller hospital facilities.

3.2 Emerald Hospital site
The Emerald Hospital site is bounded by Egan Street to the north, Creek Street to the west, Cypress Drive to the south, and Hospital Access Road off the Gregory Highway to the east. Its primary access is off the Gregory Highway. The current Hospital site is approximately 1km north from the town centre and adjacent a shopping centre to the south.

3.3 Emerald Hospital building history
The existing main Hospital building was opened in 1955 and was of brick and concrete construction. This building joined a number of other buildings on site that have since been demolished. The new wing was added in 1999 to the north of the existing Hospital and a new Morgue just to the south. A metal clad shed was also added in 2004 to house the medical records.

To the south of the main Hospital complex is a Community Services Building. This was originally built in the mid 1950s as a Nurses' Quarters and was redeveloped in 2005 as offices and consultation rooms for community health. Five new two bedroom staff quarters were added to the north west corner of the site at this time to replace the existing quarters.

To the north of the main Hospital are three residential buildings with street front access off Egan Street. These are of varying ages with the eldest being of circa 1970. There are no drawings available of these buildings.

3.4 Existing built environment
The Emerald Hospital is a collection of various buildings built in different periods. A general overview of each building and its functions is provided below.

In addition to the report below, a photographic survey of the buildings at Emerald Hospital is contained in Volume 2, Appendix 13 of the Preliminary Infrastructure Planning Study for the Emerald Hospital.

The following diagram shows the current relationship and identification of the buildings at the Hospital site.
Diagram 1: Emerald Hospital building relationship

1. WARD BUILDING
2. ORIGINAL HOSPITAL BUILDING
3. LAUNDRY
4. BULK STORE
5. LIFT
6. OPERATING THEATRES
7. STAFF ACCOMMODATION 1
8. STAFF ACCOMMODATION 2
9. STAFF ACCOMMODATION 3
10. STAFF ACCOMMODATION 4
11. MORTUARY
12. COMMUNITY HEALTH
13. ARCHIVE STORE/EQUIPMENT STORE
14. RED CROSS ACCOMMODATION (NOT PART OF THIS ASSESSMENT)
15. AMBULANCE STAFF QUARTERS (NOT PART OF THIS ASSESSMENT)
16. AMBULANCE STATION (NOT PART OF THIS ASSESSMENT)

EXISTING SITE PLAN
EMERALD HOSPITAL
3.4.1 Main Hospital site buildings

1 - Ward building
The ward building, built in 1999, was an extension to the north of the original Hospital. It currently facilitates the following departments:

- Emergency Department
- Outpatients, Maternity and Birthing
- Mental Health
- Palliative Care
- General ward including Paediatrics and observation beds.

The ward is serviced by a corridor to Nurses’ stations, stores, clean and dirty utilities. Each ward, other than the observation ward, opens out onto a verandah or courtyard.

2 - Original Hospital Building
The original Hospital building still provides the main access to the Hospital and provides a secondary access for the allied health facilities in the southern wing. It consists of two levels of clinical services including:

The first floor contains the following departments:

- Imaging including Ultrasound
- Pathology
- Physiotherapy with gymnasium
- Reception
- Pharmacy
- Kitchen
- Allied Health
- Laundry and linen
- Maintenance stores.

The second floor contains the following departments:

- Surgical and Central Sterilising Service Department
- Plant
- Administrative services including conference and board room.

3 - Laundry
The linen (laundry) room contains two industrial washing machines, two industrial dryers, sorting benches and mending area. It is easily accessible from the wards and the loading dock area.

4 - Bulk store
The bulk store services both the Emerald Hospital and the wider community. The building also houses a switch room and administration space.

5 - Lift
The new lift services levels 1 and 2 and has an external access to the lift motor room from the level 2 lobby. It provides the primary access to the Operating Theatre from Emergency Department and the wards. A secondary lift is located adjacent the kitchen and allied health departments.
6 - Operating Theatres
The Operating Theatres are an extension to the original Hospital building estimated to be 25-30 years old.

7 - Staff accommodation 1 – old Doctors Residence
The old Doctors Residence are unsuitable for staff occupation. The quarters were not accessible at the time of inspection but believe that they are current occupied.

8 - Staff accommodation 2
Staff accommodation 2 consists of a domestic timber framed duplex in sound condition and deemed to be fit for purpose and believed to be currently occupied.

9 - Staff accommodation 3
Three elevated single storey buildings built in 2005 are considered to be in very good condition and fit for purpose and believed to be currently occupied.

10 - Staff accommodation 4
Two elevated single storey buildings built in 2005 are considered to be in very good condition and fit for purpose and believed to be currently occupied.

11 – Morgue
The Morgue is a single storey structure renovated in 1999. The structure appears fit for the current service provision.

12 - Community Health building
The Community Health Building was converted in 2005 from Nurses’ quarters to offices and consulting rooms. At that time, the lower verandah was enclosed to provide more offices and interview rooms.

13 - Archive store/equipment store
The archive shed lies just to the west of the linen store. It is a metal clad shed with both roller door and personnel doors.

The equipment store is similar in construction to, although newer than, the archive store. It houses redundant or rarely used equipment from the Hospital.

3.5 Emerald Hospital maintenance issues
3.5.1 Buildings
- maintenance issues are experienced on site due to the presence of asbestos
- leaks to roofs and ceilings are an annual problem
- no other major building maintenance issues are noted by the Hospital maintenance officer
- it is noted that the area is subject to floods, water rising from the north west side of the site.

3.5.2 Landscape
Landscaping needs an overhaul. Mulch intended for water retention has been removed as a fire hazard. A plastic membrane with pebbles on top is being considered as a replacement.
3.5.3 Normal waste
Waste disposal is through the local town waste disposal system. The waste contractor, removes 3m waste skip three times per week. No problems have come to light with this service.

3.5.4 Chemical waste
Clinical and related waste is transported in yellow 240 litre wheelie bins, cytotoxic in purple 240 litre wheelie bins, pharmaceutical and body parts yellow/orange lid or white bins for pharmaceuticals.

Clinical and related waste are covered by the waste contractor, Regwaste. Storage is required for one month period. Clinical waste is transported in yellow 240 litre wheelie bins to Rockhampton with clinical waste, inclusive of sharps, being sent to Townsville for treatment in their autoclave facility with the treated waste then become landfill.

Related waste items sent to Brisbane for treatment using high temperature incineration. Related waste items include pharmaceuticals, body parts, cytotoxic waste, chemical wastes. These require colour coded segregation with use of bins and bags as outlined in Schedule 4 of the Environmental Protection (Waste Management) Regulation 2000.

3.5.5 Insects
Mosquitoes breed in the open drains along the site’s western boundary.

Other pest problems such as pigeons, rats and possums are subject to continuing control programs.

3.5.6 Asbestos
The presence of asbestos is confirmed in a wide range of materials and buildings at Emerald Hospital. Maintenance and larger scale work are hampered by asbestos containing materials.

A survey of the site to identify asbestos was undertaken 2006 and an asbestos register is now maintained by the Hospital and is available upon request.

3.6 Emerald Hospital development proposals
The Central Queensland Health Service District advised that there are no major capital works proposals/programs for this site.

3.7 Site constraints
3.7.1 Heritage issues
The Information Kit for the Infrastructure Renewal Project for Rural and Remote Projects prepared by Queensland Health notes no heritage listed facilities on the site.

3.7.2 Town planning/designation issues
The Information Kit for the Infrastructure Renewal Project for Rural and Remote Projects prepared by Queensland Health notes that the site is not designated for community infrastructure. The implication is that any proposal for development or redevelopment on the site will require Town Planning advice to consider if a ‘Material Change of Use’ will occur as a result of proposed development – if so fees will be incurred. If a ‘Material Change of Use’ is deemed to occur, planning approval through the Local Authority may be required. Alternatively the site can be designated for Community Infrastructure or in the case of workers or staff accommodation can proceed through the public housing exemption process under Chapter 9 of the Sustainable Planning Act 2009.
3.8 Consultation

Consultation was undertaken with the nominated sub-consultants, the Central Queensland Health Service District staff and Queensland Health. The consultation process was used to inform Options for redevelopment set out in this study.
4 Health services

4.1 Design and functionality of Emerald Hospital

The current Emerald Hospital provides key healthcare services for the local rural community as set out below. The current facilities however suffer from compromised departmental functionality issues including:

- non compliant surgical facilities to Australasian Health Facility Guidelines 2009 standards
- non compliant sanitary facilities to Australian Standard 1428.1/2 for disabled building users.
- poor inter-departmental relationships and related staffing issues based on current evidence based design research.

4.1.1 Current service provision of Emerald Hospital

The Hospital is within the western portion of Queensland Health’s Central Queensland Health Service District and provides a range of services to the town of Emerald and its rural environs. The services currently provided by Emerald Hospital are listed below.

Clinical - Surgical

- day procedure unit/pre admission clinic
- Operating Theatre - Gynaecology
- general surgery
- operating rooms
- Central Sterilising and Supply Department

Clinical - Medical

- Acute Medical
- General Medicine
- Gastroenterology
- Rehabilitation
- Specialist Clinics
- Respiratory
- Diabetes education
- pacemaker checking
- Pathology
- Paediatric
- Palliative
- Chemotherapy

Clinical Support

- Anaesthetics
- Emergency Department
- Radiography
- Pathology
- Red Cross Blood Bank
- Allied Health
- Physiotherapy
- Occupational Therapy
- Speech Therapy
- Social Work
- Dietetics

Maternity Services
- Maternity/Nursery and extended midwifery service

Operational Services
- housekeeping and linen
- ward services
- food services
- grounds and maintenance services

4.2 Future health services

Emerald Hospital is anticipated to provide a core level of services based on the Clinical Services Capability Framework V3. As a primary hub service, the facility will provide a minimum suite of Level 3 services in key areas including emergency, medical, surgical and birthing.

Bed requirements for Emerald Hospital are based on projected activity levels for services at the Hospital, and calculated using endorsed Queensland Health planning benchmarks. Emerald Hospital activity includes all residents accessing services at the Hospital (including those from the statistical local areas of Bauhinia, Duaringa, Emerald and Peak Downs).

Bed requirements were calculated using the Queensland Health recommended occupancy rates for rural facilities. Occupancy rates are a measure of bed utilisation in relation to total bed capacity of a service, ward or Hospital. Bed projections identify the number of beds needed to support projected activity, and may not correspond with physical beds or the configuration of beds for different services as this is determined by the Central Queensland Health Service District see Table 1.

Note that the count of beds for admitted care in Table 1 does not include Category B Emergency Department treatment spaces, which are used either predominantly or exclusively for non-admitted patients. Emergency Department treatment spaces are shown in Table 2.
The following table shows current and future bed requirements for Emerald Hospital. They are categorised according to definitions in the *Review of the More Beds of Hospital Strategy* including overnight beds (medical/surgical beds, maternity and paediatric beds), same day beds and bed alternatives. Two sets of projections are shown:

1. Queensland Health endorsed statewide bed planning occupancy rates.
2. Seventy percent occupancy rate, as rural hospitals usually manage inpatient services at lower annual occupancy rates than metropolitan services, to accommodate peaks in occupancy when specialists visit.

### Table 1: Current and future bed requirements for Emerald 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 2011/12</td>
<td>2016/17</td>
</tr>
<tr>
<td><strong>A.1. Overnight Beds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>medical and surgical (incl. palliative)</td>
<td>- (data unavailable)</td>
<td>85%</td>
<td>13.5</td>
</tr>
<tr>
<td>paediatric</td>
<td>- (data unavailable)</td>
<td>75%</td>
<td>0.7</td>
</tr>
<tr>
<td>maternity</td>
<td>- (data unavailable)</td>
<td>75%</td>
<td>4.1</td>
</tr>
<tr>
<td>mental health - acute</td>
<td>- (data unavailable)</td>
<td>85%</td>
<td>0.1</td>
</tr>
<tr>
<td>sub- and non-acute (DEM) (included in medical beds)</td>
<td>- (included in medical beds)</td>
<td>90%</td>
<td>-</td>
</tr>
<tr>
<td>Emergency Department short stay</td>
<td>ICU/PICU/HDU</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total overnight beds</strong></td>
<td>multi-purpose beds</td>
<td>36</td>
<td>18.4</td>
</tr>
</tbody>
</table>

| **A.2. Same Day Beds** | | | | | | |
| medical (including obstetrics, paediatrics and oncology / chemotherapy) | | 2.5 | 3.2 | 4.1 | |
| surgical (including obstetrics and paediatrics surgery) | | 3.2 | 2.4 | 2.6 | |
| mental health | - | N/A | - | N/A | - | N/A | - | N/A |
| sub- and non-acute | - | N/A | - | N/A | - | N/A | - | N/A |
| **Total same day beds** | | 4.7 | 5.6 | 6.7 | |

| **A.3. Bed Alternatives** | | | | | | |
| Stage 2 recovery bays (chairs) | 5 chairs | 10 minutes to meet demand for day surgery lists | No change | No change |
| Antenatal Day Assessment Unit chairs | - (to be informed by District as this is local data - assume level of activity does not warrant these chairs) | N/A | N/A | N/A | N/A |
| Chemotherapy chairs / trolleys (data will show levels of activity for chemo, but District needs to inform numbers of chairs required according to numbers of chemo cases scheduled for visiting oncologist) | 0 chairs (no visiting oncologist) | No change | No change | No change |
| Renal Dialysis chairs / trolleys (self care) (renal dialysis benchmark currently being finalised TBA) | 0 (currently 0 activity) | No change | No change | No change |
| Emergency Department chairs / trolleys (For admitted patients that require a brief period of observation. Not counted in overnight beds and not considered as short stay beds) | Part of ED treatment space numbers see category B below. | No change | No change | No change |
| **Total bed alternatives** | 5 | 10 | No change | No change |

| **Totals for Category A** | | | | | | |
| Total A1 Overnight beds | 36 multi-purpose beds | 18.4 | 20.5 | 23.1 | 21.8 | 24.3 | 27.6 |
| Total A2 Same day beds | 0 | 4.7 | 5.6 | 6.7 | |
| Total A3 Bed alternatives | 5 | 10.0 minimum | 10.0 minimum | 10.0 minimum | |
| **Total beds** | 41 | 32.1 | 36.1 minimum | 39.6 minimum | |

Source: Queensland Health
### Category B: Emergency Department treatment spaces*

<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>Emergency bays (observation areas) for Triage Categories 1–3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1 resuscitation cubicle with two trolley spaces for Triage Category 1)</td>
<td></td>
<td>No change</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>(2 trolley spaces for Triage Categories 2–3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 treatment spaces in total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultation rooms for Triage Categories 4–5</td>
<td>5</td>
<td></td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>(excludes treatment, plaster and eye rooms)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total emergency treatment spaces</td>
<td>9</td>
<td>15</td>
<td>21</td>
<td>24</td>
</tr>
</tbody>
</table>

### Category C: Operating/Intervention Rooms

#### using Victorian Benchmarks

<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>Medical imaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 x-ray room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 ultrasound room</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Operating Theatre – major</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1/100 overnight surgical separations per theatre)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 major theatre</td>
<td></td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Operating Theatre – minor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1/100 same day surgical separations per theatre)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 procedural/smaller theatre</td>
<td></td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Stage 1 recovery (less than 4 theatres)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requires 2 recovery bays per Operating Theatre</td>
<td></td>
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</tr>
<tr>
<td>4 recovery bays</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment procedure rooms/delivery suites</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(250 births per room &lt; 300 separations) + antenatal consultation room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 main delivery suite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 secondary suite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 antenatal treatment/procedure/assessment room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 room with bath</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternity / women's health / gynaecology consultation rooms + antenatal consultation room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 consultation rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 child-friendly waiting room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 multipurpose staff/antenatal/postnatal education room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well Baby nursery cots</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1 nursery cot per 3 obstetric beds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 cot spaces +</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 resuscitation bay/bed for back transfers/low risk/qualified babies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category D: Consultation/Treatment/Procedure Rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipurpose consultation rooms (ambulatory care), includes specialist and general practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>excludes Emergency Department activity</td>
<td>0</td>
<td>7</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Allied health areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation rooms</td>
<td>--</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>7</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

---

Data source: All data using mid-year 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*

Source: Queensland Health
Table 2 shows Emergency Department treatment spaces required at Emerald 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 are required for rural and remote hub hospitals with associated benchmarks to be applied. The right-hand column shows current requirements for Emerald Hospital based on the core set of Emergency Department treatment spaces required.

<table>
<thead>
<tr>
<th>Treatment spaces required for rural and remote hub hospitals</th>
<th>Existing spaces at Emerald Hospital</th>
<th>Needs met?</th>
<th>Current treatment spaces required by Emerald 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 room with two trolley spaces for Triage Category 1</td>
<td>☑️</td>
<td>1 resuscitation space with two trolley spaces for Triage Category 1, with clear view from central staff desk required</td>
</tr>
<tr>
<td>2 trolley spaces for Triage Categories 2-3</td>
<td></td>
<td></td>
<td>2 additional trolley spaces for Triage Categories 2-3 (can be used as observation beds)</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</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</td>
</tr>
<tr>
<td>• consult/treatment room</td>
<td>5 consultation rooms used for both ED and OPD</td>
<td>☑️</td>
<td>5 multipurpose consultation rooms, including: - sufficient consultation rooms to manage Triage Categories 4–5 - 1 quiet/grieving room (can also be used as an interview room)</td>
</tr>
<tr>
<td>• examination room</td>
<td>1 treatment room</td>
<td>☑️</td>
<td>(11 additional consultation rooms required by 2021/22)</td>
</tr>
<tr>
<td>• procedure and interview room (with telehealth facilities available)</td>
<td>1 interview room</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td><strong>Total emergency treatment spaces</strong> (1 emergency treatment space per 1300 ED presentations (all ages) — allocated from total spaces for CSCF Levels 1–6)</td>
<td>11</td>
<td>☑️</td>
<td>13* (18,415/1300 ACFM ED presentations Triage Categories 1–5) (24 by 2021/22)</td>
</tr>
<tr>
<td>Plaster room</td>
<td>1</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>0 Does not require a paediatric treatment space (1 paediatric space required by 2021/22)</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 Australian Health Facilities Guidelines²</td>
</tr>
<tr>
<td>Waiting room chairs (3 seats per patient treatment space)</td>
<td>30</td>
<td>☑️</td>
<td>39 waiting room chairs (13 Emergency treatment spaces x 3) (72 required by 2021/22)</td>
</tr>
</tbody>
</table>

Based on CSCF v6.0 Emergency Care Centre requirements
Australian College of Emergency Medicine (ACEM) benchmarks applied
Data source: aHM projections and Queensland Health Admitted Patient Data Collection (April 2010)
²For patients requiring a brief period of observation, excludes short stay ward beds and ED treatment bays for non-admitted patients (More Beds definition)

Source: Queensland Health
4.3 Infrastructure gaps

The following information summarises the deficiencies in the existing infrastructure in meeting the projected service demand as highlighted in Section 4.2. Further detail on infrastructure gaps is incorporated in Volume 2, Appendix 16 of the Preliminary Infrastructure Planning Study for the Emerald Hospital.

In assessing and identifying infrastructure gaps the Australasian Health Facility Guidelines 2009 have been utilised to determine non compliance.

4.3.1 Emergency Department services

The Emergency Department is acutely deficient in a number of critical infrastructure spaces and requirements including:

- no dedicated isolation/decontamination room, procedural room or plaster room
- lacking key department infrastructure including equipment storage, hand wash bays and facilities for people with a disability
- significantly lacking in required department adjacencies including co-located ambulance services and adjacencies to operating facilities.

4.3.2 Inpatient/medical services

Infrastructure deficiencies include lack of key department infrastructure including Australasian Health Facility Guidelines 2009 compliant clean utility and dirty utility, general storage and hand wash bays.

4.3.3 Maternity services

Infrastructure deficiencies include:

- lack of key associated services and storage to delivery suites
- no consultation rooms currently provided in Maternity Department.

4.3.4 Surgical/Peri Operative

- Operating Theatre located on first floor level requiring reliance on vertical movement
- the current facility lacks key departmental infrastructure, including: holding bays, anesthetic induction room, scrub, clean up and set up room.

4.3.5 Clinical support services

- Infrastructure deficiencies include no dedicated Pathology Department with the current facility.
5 Inspection reports

5.1 Method
The site inspection for the Emerald Hospital and Community Health building was conducted on 13 April 2010. It involved the assessment of the structural and civil conditions by Cardno Alexander Browne (Cardno), the services assessment (hydraulic, electronic, electrical, and mechanical) by Cushway Blackford and Associates, the building surveyor’s assessment by Philip Chun and Associates (Philip Chun) and the architectural assessment by Woodhead Pty Ltd.

5.2 Exclusions
A visual inspection included all buildings on each site except the following:

- ambulance station to the south west
- ambulance staff accommodation to the north west.

Some areas were off limits due to staff and patient movements including parts of the staff accommodation.

5.3 Overlap
There is some overlap between building specialist reports where the same problem has been identified by different specialists. This occurs where the architect has identified issues pertaining to other consultants’ reports – Building Code of Australia 2009, structural and services.

5.4 Current site and infrastructure condition
During the inspections carried out by the various specialist sub-consultants key existing infrastructure issues were identified by the various disciplines including:

Key issues raised from the building surveyor’s report in Volume 2, Appendix 4 of the Preliminary Infrastructure Planning Study for the Emerald Hospital:

- Handrails/balustrades/ramps/stairway throughout rectified to meet compliance with Building Code of Australia 2009 Part D.
- Ensure all exit door hardware meets compliance with Building Code of Australia 2009 Part D2.20/21 provisions to ensure safe escape of occupants (i.e. all exit doors required to be readily open able without a key, by single downward action).
- Ensure adequate sanitary facilities in particular those for people with disabilities are provided and meet compliance with Building Code of Australia 2009 and Australian Standard 1428.1 requirements.
- Fire/Smoke alarm detection system upgraded to meet compliance with Australian Standard 1670.1 specifications.
- A review of the fire safety installations should be undertaken to ensure all systems are being maintained in accordance with Australian Standard 1851.
- Signage throughout facility generally does not comply with current standards (i.e. illuminate exit signs, sanitary facilities, fire indicator panel, portable fire extinguishers, fire hose reels etc).
Access throughout entire Hospital precinct generally does not comply with current codes and standards. The buildings should be rectified to ensure facilities and features are accessible for a person with a disability. This includes the accessible car parking spaces, provision of tactile indicators, braille and tactile signage and accessible sanitary facilities.

Ongoing maintenance and rectification works should be undertaken to fire hydrants, fire hose reels and fire extinguishers to ensure compliance with current codes.

Identification of hazardous material on site (i.e. asbestos) to be removed by suitably qualified contractors.

Over the past few years, there has been a great deal of attention placed on the community and industry to provide suitable amenity for a person with a disability. The facilities provided for people with a disability within the building do not comply with the provisions of the Building Code of Australia 2009, however, care should also be taken in providing and locating reasonable amenities for a person with a disability in the building. Attention is directed to the fact that both The Disability Discrimination Act (1992) and The Anti Discrimination Act QLD may impact on the operation of the building.

5.5 Building viability

The Hospital was redeveloped during 1997-99. The original main Hospital building is now over 60 years old. The majority of building structures on the Hospital site are in excess of 25 years old.

A brief summary of major building conditions at Emerald Hospital include:

- ward building – excellent
- original Hospital Building - fair
- new staff accommodation – excellent
- old Nurses’ quarters – extremely poor
- laundry – excellent
- Community Health Building – fair.

Also refer to Volume 2, Appendix 4 of the Preliminary Infrastructure Planning Study for the Emerald Hospital.
6 Current Risks

6.1 Building life

The estimated remaining life of the current site infrastructure cannot be accurately determined from the information provided by Queensland Health and the nominated sub-consultants, however condition of the buildings based on structural surveys are listed below:

- Main Hospital Building – it is unlikely the structure could be made compliant to current standards economically. In particular unreinforced masonry parapets would not comply with current standards and although some remedial roof tie down works occurred in 1991 the timber roof structure appears inadequate compared to modern standards.

- Ward Building - the building is generally considered to be in excellent structural condition and likely to conform to current requirements of the *Building Code of Australia 2009*.

- Laundry facilities - the building was considered to be in excellent structural condition. The building is fit for purpose and appears structurally serviceable for the long term. The building is likely to conform to current structural requirements within the *Building Code of Australia 2009*.

- Operating Theatres - the structure appears relatively sound throughout but is unlikely to conform to current structural requirements within the *Building Code of Australia 2009*. The building is generally in good condition.

- Staff Accommodation 1 - structure was considered to be in poor condition, unsuitable as staff accommodation and unlikely to conform to current *Building Code of Australia 2009* requirements. Consideration should be given to replacing this structure.

- Staff accommodation 2 - building appears fit for purpose and in sound condition.

- Staff accommodation 3 - building appears fit for purpose and in very good condition.

- Staff accommodation 4 - building appears fit for purpose and in very good condition.

Following building surveys and assessment, several risks were found to be associated with the deterioration of the buildings and site works. The associated risks include security, fire, health and safety and disadvantages to building patrons with a disability.

6.1.1 Compromised patient care due to infrastructure conditions

The following compromises to patient care are present in the current facility:

- Emergency Department facilities were deemed to be inadequate to provide triage and Emergency services due to size and current departmental configuration as noted by Central Queensland Health Service District staff.

- building access does not comply with *Australian Standard 1428.1*

- door and corridor widths inadequate for health care facilities

- stepped access throughout the current facility.

6.1.2 Fire risks

The following fire risks are present in the current facility:

- inadequate fire hydrant risers

- limited provision of fire safety equipment including access to fire hose reels and fire fighting equipment. Fire hydrants are non compliant with *Australian Standard 1428.1*

- smoke and fire doors not evident during *Building Code of Australia 2009* survey

- lack of enclosed and protected internal vertical escape routes.
6.1.3 Risk of accidents

The following accident risks are present in the current facility:

- irregular stair tread depths to building entrances and escape routes
- lack of handrails to entrances and patient areas leading to increased risk of patient and visitor falls
- inadequate non slip floor surfaces in patient and staff wet areas
- non illuminated and inadequate escape route signage
- removal of asbestos or contamination during repairs and refurbishment
- deteriorating site interior roads.

6.1.4 Infection control risks

The following infection control risks are present in the current facility:

- lack of clinical hand wash facilities within clinical zones
- insufficient departmental support facilities including clean and dirty utilities, disposal holds, and sanitization facilities
- inadequate waste management facilities
- presence of asbestos
- leaks in the roof are contaminating roof surfaces.

6.1.5 Health and safety risks

The following health and safety risks are present in the current facility:

- lack of pedestrian footpaths to and around site facilities
- limited egress routes from internal courtyards
- presence of asbestos

6.1.6 Security risks

The following security risks are present in the current facility:

- lack of designated pedestrian routes
- lack of adequate lighting to external areas, entrances and parking.

6.1.7 Disadvantages to persons with a disability

The following disadvantages to persons with a disability are present in the current facility:

- access to and around the facility non compliment with Australian Standard 1428.1/2 including door sizes, corridor widths and clearance zones to clinical spaces
- current lift facility non compliment for disabled access and provides insufficient turning circle distances
- height of signage non compliment for disabled facility users
- lack of compliant ramped access.
7 Options

7.1 Staff accommodation

Queensland Health provides housing to staff who deliver essential services to rural, remote and regional centres. Emerald Hospital currently utilises eight units of accommodation to 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 the Emerald Hospital 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 (Options 1-3) detailed below include the provision of an additional 11 housing units of accommodation. Housing accommodation for Emerald Hospital includes:

- eleven new units of accommodation to be built on site which includes replacement of three units of accommodation
- demolition of three units of accommodation due to poor standard and condition.

The footprint allowance and costing for the additional 11 units (including the replacement of substandard accommodation) has been based on accepted standards for Queensland Health staff housing (recently constructed at Roma Hospital).

Emerald Hospital additional Information provided by the Central Queensland Health Service District.

- existing staff accommodation located on campus needs to be larger. Given the high requirement of locum medical staff, the shared apartments are not always shared, therefore decreasing the ten apartments to five.
- Egan Street accommodation is in desperate need of upgrade – possible site for future redevelopments of accommodation.
7.2 Option 1 – status quo (minimum requirements)

7.2.1 Scope of this option

Option 1 will address most issues related to access and disabilities within the existing buildings, yet it will not be able to satisfy the Level 3 service required.

The main issues to be addressed in this option are the condition of the Nurses’ quarters and the Community Health Building. The next issue to be addressed is the presence of asbestos. The eradication of this material is essential in order to extend the life of the buildings and their maintenance.

No department is modified in order to achieve Level 3 of services or to comply with Australasian Health Facility Guidelines 2009. In this case around 20 percent of the rooms are non compliant whether by the area they have or the components.

The Ward Building having been built in 1999 is in excellent condition and thus will set the parameters for the explorations of Options 2 and 3.

Retaining the operating theatres in level one can be considered as well one of the major disadvantages of this option. The lift is not reliant and the motor room not compliant with current regulations. A strategy to add a second lift and improve the existing one should be addressed.

The original Hospital Building is in fair condition as far as internal and external envelope but the structure is reaching the end of its usable life and is unlikely that can be made compliant.

The description below details the points targeted in order to improve the existing condition and extend the possibility of use of the existing fabric in the short term.

- Compliance with service Level 3 will not be pursued in this option. This implies that all services within the current facilities will not achieve the required Level 3 service plan as described in Section 3.2 - Emerald Hospital Future Health Services.
- Compliance with Australasian Health Facility Guidelines 2009 components (e.g. elements of a unit) and area has been identified via the schedule of existing accommodation and representative plans provided in Volume 2, Appendix 13 of the Preliminary Infrastructure Planning Study for the Emerald Hospital. The upgrade of services to meet current Australasian Health Facility Guidelines 2009 standards would imply major redevelopment within the existing envelopes from the maternity to the theatre suite. These will not be addressed in Option 1.
- Existing condition of buildings means that the following buildings can no longer provide adequate facilities for a healthcare facility and must be replaced:
  - Nurses’ Quarters.
  - Community Health Building deemed to be in fair condition but is anticipated that the building would not conform with current structural building codes. Need for the services to be on site plus the current condition of building fabric makes the relocation of services to the main Hospital site an essential component of Option 1.
  - If any existing building is to be altered in more than 50 percent of its footprint, compliance with current standards is mandatory.
- Fire resistance and stability: the kitchen exceeds 30m² and as such needs to be separated by a 60/60/60 compartmentation. This will not be pursued in Option 1.
- Access and egress:
  - Doors servicing the kitchen and egress corridor provide inadequate clearance, less than 750mm clear width. To allow for safe building operation this must be rectified in Option 1.
- Access lift motor rooms are non compliant. Compliant access ladder/stairs to Building Code of Australia 2009 and Australian Standard 1657 standards must be provided in Option 1.

**Construction of exits:**
- All electrical cupboards in corridors to be provided with smoke seals and of non combustible construction.
- Riser, going and landings to external stairs to main Hospital inconstant with Part D of the Building Code of Australia 2009. Replacement of external access stairs to comply with current standards to be undertaken during Option 1
- Balustrades to balconies are non compliant. Balustrades to external balconies to be replaced during Option 1.
- Handrails to all stairs of two or more risers. Handrails to be provided to all stairs of two or more risers in Option 1.
- Maintenance or replacement required to door hardware. Option 1 will repair or replace all non compliant door hardware.

**Disabled facilities**
- Large glass door servicing executive office in the main building will be replaced to reduce force required to open door.
- Accessible car park spaces of minimum 3.2m clear and associated signage not provided. Spaces to be provided in Option 1.
- No tactile indicators evident within and around facility. Tactile indicators to be provided in Option 1 in accordance with Australian Standard 1428.21.

**Services and equipment:**
- Fire hydrants are non compliant due to booster system assembly, location, flow and pressure. Hydrant valve locations to be rectified in Option 1.
- The smoke detection alarm is non compliant and will be brought up to standards in Option 1.
- Signage to portable fire fighting equipment non compliant. All signage to be relocated or installed at 2m above finished floor level in Option 1.

**General exit lighting will be rectified to ensure it is illuminated at all times and type of signage upgraded in accordance with Australian Standard 2293.1 in Option 1.**

**Sanitary provision did not comply with Australian Standard 1428.1 but this issue will not be addressed in Option 1.**

**Energy efficiency is not achieved in the existing buildings due to their construction date and condition. A real assessment needs to be undertaken to see if there is any scope of improvement beyond addressing the mechanical components. This would mean major works that cannot be considered in Option 1. Alternative power sources are not included in this Option 1.**

**Asbestos:** a decision whether to remove the asbestos from site is required. The recommendation in this Option 1 is to address the issue and remove. The implications are the temporary decanting of services, patients and associated costs.

**No structural upgrade is considered in this Option. The buildings within critical life span are demolished and any structural refurbishment works would incur high cost implications.**

**Surfaces to wet areas for staff and patients to be upgraded to non slip surface materials.**
Infection control issues where possible will be addressed in Option 1 including addition of wash hand basins, gel wash stations and other minor alterations. Serious consideration to this point is required. The works as a consequence would be significant and would call for an Option 2 scenario.

Signage to improve wayfinding is required to improve patient flows and diminish stress in the patient experience of the service.

Staff accommodation to be demolished and replaced by the units recommended in the schedule of accommodation and staff accommodation in Volume 2, Appendix 13 of the Preliminary Infrastructure Planning Study for the Emerald Hospital.

Community Health Building to be moved on site. No data has been received on capacity required or demands for future provision. This will need to be addressed in detail to allow accurate assessment of cost and service provision.

7.2.2 Capital cost

Option 1 costs are based on the upgrading of existing building fabric and services to allow for the ongoing provision of healthcare services from the existing facilities. Category 2 cost estimates based of the aforementioned and including consultant fees and contingency allow for an estimated cost of $7.545 million.

7.2.3 Whole-of-life costs

Option 1 will address all key infrastructure problems and all works undertaken will improve the current facilities and be carried out to the highest of standards, however Option 1 continues to utilise the majority of aged assets with minimal refurbishment. It can be expected that running and maintenance of the current facilities will continue to increase into the future.

7.2.4 Advantages

The key advantages to the Status Quo option include:

- lower cost
- maximum use of recent investment into infrastructure.

7.2.5 Disadvantages

The key disadvantages to the Status Quo option includes:

- Area of the Emergency Department non compliant to current / future demand requirements
- inadequate staff accommodation
- fragmented Hospital services
- inadequate interdepartmental functional relationships e.g. proximity of mental health to paediatric services.
7.3 Option 2 – refurbishment or expansion at existing site

7.3.1 Scope of this Option

Option 2 addresses most of the issues for a Level 3 service and improves the adjacencies between the different departments. The main advantage of this option is that the theatre suite is brought to ground level and the Emergency Department is expanding in order to accommodate the increased demand.

The expanded areas will be fully compliant with Australian Standards and Australasian Health Facility Guidelines 2009. The existing areas will be targeted to achieve the same degree of compliance though it may not be fully achievable.

The main entrance and Emergency Department entrance will be clearly identified as separate entrances. The Emergency Department and Outpatient Department will expand significantly into the current maternity area that is displaced towards the west end of the building adjacent to the theatres and with access to the outdoors if required.

As in Option 1 this option replaces the old north staff accommodation with pre-fabricated exemplars detailed in Volume 2, Appendix 13 of the Preliminary Infrastructure Planning Study for the Emerald Hospital. There is a second staff residence that could be replaced. The exact condition requires further detail. It was built in 2005 but complaints have been received from residents.

Key elements of work include:

- new entrance to Emergency Department and enhancement of the main entrance.
- Imaging department enlarged to absorb, if decided, the incorporation of a CT scan
- Pathology lab re-located and built to allow Imaging expansion
- Operating theatres moved to ground level within a new footprint in connection with the ward expansion and the new Hospital street
- Pharmacy will expand
- the most important feature of this Option is that, if properly planned, it allows for a phased expansion that results in a fully new built Option with the exception of the wards built in 1999 that have a 20+ years usable life ahead if properly maintained and used
- the Community Health Building is considered as in fair condition though its life span is questioned and replacement in this Option is proposed
- the main old Hospital is retained and its uses kept in the majority of the cases as they are with upgrades to match current legislation.

7.3.2 Capital cost

Option 2 costs are based on the provision of refurbishment and expansion of existing infrastructure to meet the future service requirements of Emerald Hospital. Option 2 provides approximately 4222m$^2$ of refurbishment of existing fabric and 4200m$^2$ of new build fabric. Category 2 cost estimates based of the aforementioned areas including furniture, fittings and equipment, consultant fees and contingency allow for an estimated cost of $60.875 million.
7.3.3 Whole-of-life costs

All new build stock will be designed and built to maximise opportunities of performance in energy, water, waste etc while attending to the detail design in order to minimise maintenance requirements and guaranteeing the lasting qualities of the fabric and systems. While considering refurbishment, although the pursuit of quality and performance is the main objective it must be mentioned that the maintenance cost and issues due to the overall aging of buildings and systems not replaced will have an impact in recurring costs as well as continued maintenance.

Option 2 maximises use of existing infrastructure and incorporates extension and some significant refurbishment. It can be expected that significant maintenance issues and costs will be reduced and effectively the operational life of the facilities will be extended over the short to medium term.

7.3.4 Advantages

- improved interdepartmental functional relationships
- expanded Hospital services to meet future demand
- Operating theatres relocated to ground floor
- reuse of existing infrastructure
- improved inpatient department flows.

7.3.5 Disadvantages

- substantial infrastructure redevelopment
- cost of upgrading existing infrastructure to meet current standards
- staging of works and disruption to current services.
7.4 Option 3 – significant redevelopment

7.4.1 Scope of this option

Option 3 is an extension of Option 2 for it takes into account the expansion that can be achieved in this previous phase and build on. The operating theatres and wards are to be new builds or incorporate the existing wards which are in excellent condition, thus worth keeping.

The most important step in this option is the demolition of the existing original Hospital, the Community Health building together with the stores and laundry. What this allows is for a model that concentrates and improves the links in between the different components. All of them developed once more around the courtyard concept in shallow plans that allow for daylight and views to landscape to be experienced.

The decanting and staging for the demolition and building of the new blocks can be easily achieved by allowing the old building to remain while the stores and laundry are demolished and new blocks built. In turn, the stores and laundry (new ones) can be already in place.

The level 1, now empty from the displacement of theatres is remodeled to accommodate administration, easing the pressure on the vertical circulation. Regardless, the compliance with current standards and performance must be reviewed and actioned.

An Emergency Department entrance is maintained as is the location of the main entrance. The main entrance is now within a new block and through smart design; it can become the beginning of an easy wayfinding strategy. Allied Health and the Community Services can enjoy, if required, an independent access.

Key elements of work include:

- Ward area refurbished together with maternity in phase 1
- Operating theatres moved to ground level in phase 1
- Imaging expanded in phase 1 but relocated in phase 2
- Emergency Department enlarged in phase 1, entrance defined together with drop off zone
- level 1 converted to administration so no clinical services remain dependant on lifts
- demolition of original Hospital Building in order to enable the new building to occur. Phasing and programming of this event will be critical to the success of this option
- existing Community Health Building is to be demolished and the services moved to the main blocks. Independent access, as mentioned, is possible.
- the design and orientation of the new buildings is intended to favour environmentally sustainable design initiative
- expansion areas are allowed for in the design not only at ground level, but the alternative of level 1 could be explored
- this option also has new Pathology, Allied Health, medical records, Morgue, Pharmacy, front of house area and stores.

7.4.2 Capital cost

Option 3 costs are based on the provision of minor refurbishment and expansion of existing infrastructure and new build facilities to meet the future service requirements of Emerald Hospital. Option 3 provides approximately 2180m² of refurbishment of existing fabric and 6240m² of new build fabric. Category 2 cost estimates based of the aforementioned areas including furniture, fittings and equipment, consultant fees and contingency allow for an estimated cost of $68.610 million.
7.4.3 Whole-of-life costs

All new build stock will be designed and built to maximise opportunities of performance in energy, water, waste etc while attending to the detail design in order to minimise maintenance requirements and guaranteeing the lasting qualities of the fabric and systems. While considering refurbishment, although the pursuit of quality and performance is the main objective it must be mentioned that the maintenance cost and issues due to the overall aging of buildings and systems not replaced will have an impact in recurring costs as well as continued maintenance.

Options 3 incorporates significant redevelopment and new build components. This option would effectively extend the operational life of the facility with an anticipated improved performance in the running and maintenance costs.

7.4.4 Advantages

- optimized interdepartmental functional relationships
- compliance with Part J and Queensland Health Energy Efficiency Guidelines
- expansion of Option 2 refurbishment or expansion of existing site
- reuse of recently redeveloped infrastructure and capital investment
- single storey clinical facility
- new build infrastructure to current standards.

7.4.5 Disadvantages

Option 3 is the most costly solution.
Diagram 8: Emerald Hospital Option 3 refurbishment and phase 2 (scale 1:750)
## 8 Options analysis

### Table 3: Option 1 analysis

<table>
<thead>
<tr>
<th>Option features</th>
<th>• Existing site and infrastructure retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>• Minimum impact</td>
</tr>
<tr>
<td></td>
<td>• Minimum cost</td>
</tr>
<tr>
<td></td>
<td>• Reuse of recent capital investment</td>
</tr>
<tr>
<td>Benefits</td>
<td>• No cost of obtaining new site</td>
</tr>
<tr>
<td>Risks</td>
<td>• Departmental functional inadequacies</td>
</tr>
<tr>
<td></td>
<td>• Clinical services including surgical on upper floor</td>
</tr>
<tr>
<td></td>
<td>• Staff morale/recruitment and retention</td>
</tr>
<tr>
<td>Assumptions</td>
<td>• Current services can continue to be provided from a two storey development</td>
</tr>
<tr>
<td>Criticality</td>
<td>• Short term solution to providing future clinical services</td>
</tr>
<tr>
<td>Resource implications</td>
<td>• Risks to staff retention/recruitment and morale</td>
</tr>
<tr>
<td></td>
<td>• Heavy resourcing due to fragmented services</td>
</tr>
<tr>
<td>Cost</td>
<td>• Overall indicative cost of Option 1 $7,545,000</td>
</tr>
</tbody>
</table>

### Table 4: Option 2 analysis

<table>
<thead>
<tr>
<th>Option features</th>
<th>• Reuse and adaption of current facilities/infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• New build construction</td>
</tr>
<tr>
<td></td>
<td>• Optimisation of departmental functionality</td>
</tr>
<tr>
<td></td>
<td>• Single level facility for clinical services</td>
</tr>
<tr>
<td>Rationale</td>
<td>• Maximised use of retainable existing infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Low level use of inadequate current infrastructure</td>
</tr>
<tr>
<td>Benefits</td>
<td>• Improved departmental functionality</td>
</tr>
<tr>
<td></td>
<td>• New/expanded clinical services and departments</td>
</tr>
<tr>
<td></td>
<td>• Phased construction</td>
</tr>
<tr>
<td>Risks</td>
<td>• Disruption to current services during phasing and construction</td>
</tr>
<tr>
<td>Assumptions</td>
<td>• N/A</td>
</tr>
<tr>
<td>Criticality</td>
<td>• Areas of high priority addressed</td>
</tr>
<tr>
<td>Resource implications</td>
<td>• New staff accommodation</td>
</tr>
<tr>
<td></td>
<td>• Improved staff morale / recruitment and retention</td>
</tr>
<tr>
<td>Cost</td>
<td>• Overall indicative cost of Option 2 $60,875,000</td>
</tr>
</tbody>
</table>

### Table 5: Option 3 analysis

<table>
<thead>
<tr>
<th>Option features</th>
<th>• Organic growth / evolution of Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>• Organic growth of facilities</td>
</tr>
<tr>
<td></td>
<td>• Construction phasing</td>
</tr>
<tr>
<td>Benefits</td>
<td>• New build facility to current standards and regulations</td>
</tr>
<tr>
<td></td>
<td>• Optimised departmental functionality</td>
</tr>
</tbody>
</table>
- Single storey clinical services

**Risks**
- Refurbishment of existing fabric for Emergency Department, Outpatients and Inpatients.

**Assumptions**
- N/A

**Criticality**
- Areas of high priority addressed

**Resource implications**
- New staff accommodation
- Improved staff morale/recruitment and retention

**Cost**
- Overall indicative cost of Option 3 $68,610,000

---

**Table 6: Construction analysis table**

<table>
<thead>
<tr>
<th>SITE</th>
<th>DEPARTMENT</th>
<th>AREA M2 (WITH CIRC)</th>
<th>OPTION 2</th>
<th>OPTION 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerald</td>
<td>Front of house reception</td>
<td>100.1</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>ED / OPD</td>
<td>851.5</td>
<td>Refurb</td>
<td>Refurb</td>
</tr>
<tr>
<td></td>
<td>Inpatient / Medical Services</td>
<td>1158.96</td>
<td>Refurb</td>
<td>Refurb</td>
</tr>
<tr>
<td></td>
<td>maternity</td>
<td>460.2</td>
<td>70R/30N</td>
<td>40R/60N</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>492.75</td>
<td>New Build</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Peri Operative</td>
<td>180.9</td>
<td>New Build</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>CSSD</td>
<td>188.1</td>
<td>New Build</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Rehab Allied Health</td>
<td>319.25</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Pathology</td>
<td>118.75</td>
<td>New Build</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Medical Imaging</td>
<td>268.71</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Pharmacy</td>
<td>153.75</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Mortuary</td>
<td>96.25</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Kitchen</td>
<td>96.25</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Staff Accom Shared</td>
<td>133.75</td>
<td>20R/80N</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Shared Accom</td>
<td>208.75</td>
<td>20R/80N</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Staff Accom</td>
<td>800</td>
<td>50R/50N</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Community Health</td>
<td>375</td>
<td>Refurb</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>External Accommodation</td>
<td>1165</td>
<td>50R/50N</td>
<td>New Build</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>1254.4</td>
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</tr>
<tr>
<td></td>
<td>Total Area</td>
<td>8422.37</td>
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</table>