Preliminary Infrastructure Planning Study for Sarina Hospital

Volume 1 of 2
August 2010

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Addendum covering increase in bed numbers from 16 to 25 and revised cost estimate for Option 3.

Since the completion of the Preliminary Infrastructure Planning Study for Sarina Hospital, a Service Profile has been prepared based on population service need for the region. This has identified that by 2021/22 Sarina Hospital will require a total of 25 inpatient beds. This is an increase of nine beds.

It has been found that this increase in beds could be achieved in both Option 2 (refurbishment) and Option 3 (demolish and re-build). These are referred to as Option 2A and Option 3A respectively.

**Option 2A** would involve a new wing incorporating 11 extra beds in single and two-bed rooms, with shared en-suite bathrooms and new clean and dirty utility rooms. An existing 2-bed ward opposite the nurse station would be converted to a corridor to provide access to the new wing, thus there would be a nett increase of 9 beds. The new wing would have a floor area of approximately 450 Square metres and be located between the existing building and Hospital Street. It would be at the same floor level as the existing wards, so that it would span over the car park at a high level. There would be an additional 5 car parking spaces. The estimated cost of this option is approximately $9.1 million, excluding GST.

This estimate assumes that the existing kitchen and laundry facilities could cope with the increased numbers of beds, and it makes allowances for upgrades to electrical power and water supplies and to drainage.

**Option 3A** would be similar to Option 3, but have its floor area increased by 400 square metres to incorporate 9 extra beds with en-suite bathrooms plus necessary ancillary spaces. There would also be an increase in car parking of 5 spaces. The estimated cost of this option is approximately $18.8 million, excluding GST.

**Option 3.** In the process of preparing Option 3A, the design and estimate for Option 3 has been refined. This has resulted in a reduction of the estimated cost from $18.77 million to approximately $16.88 million, excluding GST.

**Options analysis**

Option 2A would have most of the same advantages and disadvantages as Option 2, apart from the higher cost. It would still leave some risks unresolved, as for Option 2, and would involve major disruption to existing services. The different standards between the new and older parts of the building might give rise to criticism.

Option 3A would have the same advantages and disadvantages as Option 3, but would offer an upgraded service at higher cost.
About this study

The Preliminary Infrastructure Planning Study for Sarina Hospital was commissioned by Queensland Health on 12 January 2010. This study investigates future infrastructure for Sarina Hospital based on the options endorsed by Queensland Health’s Planning and Coordination Branch.

This Preliminary Infrastructure Planning Study was undertaken from 12 January to 8 March 2010 and was prepared by Project Services under the direction of Queensland Health. Every effort has been made by Project Services to investigate and document in sufficient detail—and within the timeframe—the infrastructure issues, gaps and requirements for Queensland Health in relation to Sarina Hospital’s future service provision.

Assumptions

In accordance with verbal advice from Queensland Health’s Health Planning and Infrastructure Division, this study has been prepared on the basis that the existing services at Sarina Hospital are to continue.

This study covers the main hospital building and staff accommodation building only. The relatively new community health building and any minor structures on site are excluded.
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1 Executive summary

This study was commissioned by Queensland Health to facilitate informed decision making on the short, medium and long-term maintenance of Sarina Hospital to produce cost-effective outcomes.

The infrastructure assessment process consisted of:

- site inspections by a number of building professionals
- interviews of key members of hospital staff
- comparison of the existing facilities with standards
- assessment of existing risks

The community health centre and outbuildings were excluded.

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.

The site inspections were conducted by the following building specialists from Project Services: architects, structural engineer, building surveyor, hydraulics consultant, electronics/fire consultant, electrical engineer and mechanical engineer in the presence of a representative of the District Engineer and Director of Nursing. The inspections were aimed at identifying immediate and future risks, and short and medium term solutions to those risks.

This study confirms that there are significant problems with the built environment at Sarina Hospital. The most serious problems are not primarily due to lack of maintenance, but arise from the unsuitability of buildings of this age, type and siting for current purposes and to meet today’s standards. These serious fundamental problems include:

- fire safety issues
- air-conditioning and air quality issues
- site access and egress issues.

These and other identified risks are detailed later in this study.

Option 1 looks for a quick solution to some risks at minimum cost. It involves alterations to the existing buildings estimated to cost $2.84 million.

Option 2 is aimed at extending the life of the facility for another 10 to 15 years. Most of the risks are resolved, although some would still remain. This option consists of alterations and minor extensions plus site works estimated to cost $5.88 million.

Option 3 shows that new buildings, to current standards, but providing the same services as now, would cost approximately $18.77 million.

Options analysis

Option 1 has the advantages of low initial cost and rapid execution, but it would involve disruptions to existing services and still leave some serious risks unresolved.

Option 2 involves moderate cost, but still leaves some risks unresolved and would involve major disruption to existing services.

Option 3 has the potential to resolve all risks with minimum disruption to existing services, but at highest cost.
2 Introduction

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 Sarina locality
Sarina is a town of approximately 3,200 inhabitants and the local government area that it serves has about 12,000 persons. It is situated about 35 kilometres south of Mackay and 13km from the coast, in North Queensland. The main north-south coastal road, the Bruce Highway, runs through Sarina and forms its main street. It has a tropical climate, with high rainfall in the summer and it is subject to cyclonic winds. About 9% of the population is aged over 65, and 22% is under 15. Population is increasing by about 3% per annum.

Sarina hospital lies within the Mackay Health Services District.
3.2 Sarina Hospital site

Sarina Hospital is situated on a block of land of approximately 3 hectares on the Western side of Hospital Street near its junction with Anzac Street, approximately 600 metres west of the town centre. The site is near to low-density residential areas on the north, east and south, and to bushland on the west.

The site slopes down from west to east with the buildings situated in the eastern half of the site, where gradients are in the range 1 in 2 to 1 in 15. The western half of the site is heavily timbered.

Buildings on site consist of the main hospital building and staff accommodation building, each of which is placed to follow contours running approximately north west to south east. A steep driveway leads up to the hospital and staff building from Hospital Street. There is a relatively new community health building between the main hospital building and Hospital Street, which has its own access and parking off the street. There are a number of other small structures.

The aerial photograph below gives an overview of the site from the north east. The largest block is the main hospital. The building in the background is the staff quarters and the smaller building in the foreground is the community health building (not covered by this study). The main hospital entrance from the street is just out of picture near the top left corner. The car park in the foreground serves the community health centre. To the right is an area of undeveloped site in Queensland Health ownership.

A site plan of the existing facility follows overleaf.
3.4 Hospital building history

- The main building was constructed in 1960 as a 10-bed hospital (all 2-bed wards) with an operating theatre / delivery room.
- A staff accommodation building was constructed at the same time, consisting of a matron's flat and single bedrooms for six nursing or domestic staff with shared bathrooms and laundries.
- The main building was extended in 1971 to provide an improved operating theatre with separate delivery room and an extra two-bed ward.
- At some time between 1971 and 1994, a further extension was added to provide a dining room and kitchen and in 1994 this extension required underpinning.
- There was a major renovation of the main building in 1998, mainly to wards. The operating theatre and delivery room were eliminated and converted for other uses.
- The community health building was added recently and is not part of this study.

3.5 Existing built environment

The main building currently accommodates:

- day time entrance with reception and waiting room
- outpatient consulting / treatment rooms
- emergency treatment room with direct ambulance access
- x ray room
- pharmacy
- seven 2-bed wards and two 1-bed wards
- nurse station
- after hours entrance
- rehabilitation day area and physiotherapy room.
- kitchen
- staff room
- offices
- meeting room
- toilets and bathrooms for patients, staff and visitors
- store rooms
- plant rooms

All parts of the building are in use and it is air-conditioned throughout.

The staff accommodation building currently contains three flats (two with 2-bedrooms each and one with one bedroom). Each flat is self-contained with its own kitchen, bathroom and laundry. The flats have split-system and room air-conditioners. There is a large covered communal deck to the rear of the building, which appears to be relatively newly constructed.

Access to the main hospital from the flats is via external steps and walkways.

Floor plans of the existing main building and staff accommodation are included in volume 2 of this study.
3.6 District maintenance issues
The Mackay Health Service District has expressed concern about some deterioration, including:

- rusting of reinforcement in stumps with consequent spalling of concrete
- decay of building exteriors, which are substantially of timber
- uneven and possibly structurally unsound floors
- deterioration of internal wall, floor and ceiling finishes
- hygiene concerns over kitchen and bathrooms
- roof leaks
- presence of asbestos materials
- calcification of plumbing pipes.

There is a part-time handyman employed on site. All other maintenance is performed by contractors.

3.7 Development proposals
It is understood that:

- installation of a new emergency generator is imminent
- there is a proposal for an accommodation building for James Cook University (5 beds, 2 storeys) at the back of the site behind the existing staff accommodation building.

3.8 Site constraints

3.8.1 Heritage issues
There are no heritage issues on State or local heritage registers.

3.8.2 Town planning issues
The site is shown in the Sarina Shire Planning Scheme as a “Community Precinct” which covers “the ongoing functions of all levels of government and community service organisations”.

3.9 Consultation
In preparing this study, consultation has taken place with:

- Ms Sue Farrell, Director of Nursing, Sarina Hospital
- Mr Cliff Pollock, Maintenance Manager, Mackay Health Service District
- Ms Jinx Miles, Heritage Architect, Project Services.
4 Health services

4.1 Design and functionality of facility
The facility is a hospital and primary health care centre, providing the following services:

**Acute & Sub Acute Inpatient Care**
- Medical; Post natal; Palliative Care

**Non Acute Inpatient Care**
- Respite Care, Aged Care, Rehabilitation, Alcohol Detoxification

**Ambulatory**
- Emergency & Trauma; Treatment; accident retrieval; telephone triage primary health; medical follow up; X-ray; Opportunistic immunisation; Pathology Specimen collection; Physiotherapy; Occupational therapy; Social Work; Dietician.

**Community Health Program**
- Extended Midwifery; Antenatal Education; Community Mental Health (Mackay outreach); Dental (Mackay outreach); Life Diseases Health promotion; Child Health Care (Mackay outreach); Needle & Syringe program; ATODS; Day Stay Caters for parents of children up to 1 year of age with feeding and sleep issues

There are 16 in-patient beds with an occupancy rate of 50 – 60 %. Rehabilitation patients often have long stays. Sarina beds may be used for step-down from Mackay Hospital during the forthcoming re-building at Mackay.

There is a 24 hour accident and emergency service. Although there is no operating theatre at Sarina, staff advise that ambulances bring patients in to be stabilised at Sarina before being transferred to Mackay. The treatment room has video conferencing with Mackay accident and emergency department. The X-ray room is staffed part-time.

Sarina hospital is in the Mackay Health Services District and is an outreach of Mackay Base Hospital.

4.2 Future health services
The brief for this study assumed that existing services would be maintained for the foreseeable future.

4.3 Infrastructure gaps
The outpatient department is very busy. It is used by some patients as an alternative to a GP service. Staff report that currently there is a two to three day wait to see a private GP, and none of them in the town bulk bill.
5 Inspection reports

5.1 Method
The site inspection took place on the 28 January 2010, and was conducted by the following building specialists from Project Services:

- Architects
- Structural engineer
- Building surveyor
- Hydraulics consultant
- Electronics / fire consultant
- Electrical engineer
- Mechanical engineer

Mr Cliff Pollock, Maintenance Manager for the Mackay Health Service District was in attendance, and provided information, as did the Director of Nursing, Ms Sue Farrell.

Reports from each of the specialists are included as appendices in Volume 2 of this study. These reports refer to the standards used as criteria for each assessment. In some cases compliance with those standards is mandatory. In other cases, particularly some of the Building Act standards, while they would be mandatory in a building constructed today, there is no legal requirement to upgrade an existing building to current standards, unless it is being substantially altered. Nevertheless, where failure to meet current standards is exposing Queensland Health to risk, upgrading to current standards, as far as is practicable, is included in this study.

5.2 Exclusions
Apart from some testing of electrical, mechanical and hydraulic systems mentioned in the specialist reports in Volume 2, the inspections were visual only of parts accessible without any dismantling. The community health centre and outbuildings are excluded. Site works are excluded except as specifically mentioned in individual reports.

5.3 Overlap
There is some overlap between specialist reports, where the same problem has been identified by different specialists. This has been taken into account in the summaries in the earlier sections of this study, so the cost for such items has only been allowed for once.

5.4 Current site and infrastructure condition
This study confirms that there are problems with the built environment at Sarina Hospital. The most serious problems are not primarily due to lack of maintenance, but arise from the unsuitability of buildings of this age and type and their siting, for current purposes and to meet today’s standards. These serious fundamental problems include:

- fire safety issues
- air-conditioning and air quality issues
- site access and egress issues.

These and other identified risks are detailed later in this study.

5.5 Building viability
The number and severity of current risks necessitate some urgent work. This is detailed later under Option 1. Further work detailed in Option 2 could extend the life of the existing buildings for another 10 to 15 years.
6 Current risks

Volume 2 of this study contains contributions from a number of building specialists following a site visit on 28 January 2010. Those specialists identified a number of problems, from which the following risks have been summarised. It should be noted that some risks arise from more than one cause, and some problems are giving rise to more than one risk.

Risk mitigation strategies that may be in place at an operational level have not been taken into account in this study.

6.1 Risks to life and property from fire

There are a number of aspects where the current situation falls short of current standards, as specified by the Building Code of Australia, thereby creating potential risks to life and property.

- In both the main hospital and staff accommodation, there is insufficient fire compartmentation by means of fire-resistant walls, ceilings and floors. For example, the plant room contains both gas and electrical equipment in the same space, providing a risk of fire starting or explosion. This plant room is underneath the main hospital and there is no fire-rated construction to the floor between them.

- Much of the main hospital and staff accommodation are of timber construction and lined with combustible timber based linings (hardboard) on which many layers of paint have been applied over the years. Current standards require non-combustible finishes. This has created an environment where fire could take hold and spread quickly.

- Safe escape routes might be compromised by the presence of items such as unsealed electrical switchboards in paths of travel, and deficiencies in electrical switchboards have been identified which could lead to overheating, with the switchboards themselves becoming a source of fire.

- If a fire were to start, there could be a delay in the alarm being raised, due to inappropriate or insufficient detectors in offices, public areas, rehabilitation deck, building undercrofts and the generator room.

- Evacuation of people in the event of a fire could be compromised by insufficient exit signage and emergency lighting, and once outside the buildings, it would be difficult for them to reach a place of safety away from burning buildings because the only route from the main hospital level down to the street is by way of a steep rough driveway, past a large gas tank, and in the event of a fire, this driveway would have to be shared with emergency vehicles.

- Fire fighting could be compromised by the lack of pillar hydrants, by the incorrect location of fire hose reels, and questionable water pressure.

- Current standards require medical records to be kept in fire-resistant enclosures. This is not the case at Sarina.

In summary then, there is a serious risk that fire would take hold and spread quickly. There might be insufficient warning of the presence of fire, and evacuation could be difficult, particularly at night. Effective fire fighting could be compromised, and damage to buildings and contents could be severe, including loss of medical records.
6.2 Risks to life from delays in emergency access

Access to the hospital emergency facilities could be delayed due to deficiencies in site access.

- All access roads to the hospital pass over railway level crossings. It is understood that this has caused delays to ambulances in the past, especially in the cane-cutting season.

- Signs in the town centre direct traffic to the hospital up Anzac Street. Approach from this direction could cause confusion and delays, because the most obvious entrance to the hospital is not the one that leads to the emergency department, only to community health. To reach the emergency department from that direction it is necessary to drive past the required entrance and perform a u-turn, as there is no right turn possible because of a traffic island.

- Once in the driveway, more delays are possible because cars park directly off the driveway and could block it while manoeuvring in and out of parking bays. Delivery and garbage trucks also block the driveway, as there are no dedicated bays for them.

6.3 Risks of accidents in external spaces

Potential causes of accidents have been identified in the external spaces near buildings.

- In particular, there are risks to staff moving between the staff accommodation building and the main hospital. The steps leading down from the staff building are uneven, providing trip hazards. They discharge directly on to a driveway in to the path of traffic. A walkway runs along the front of the staff building adjacent to tops of retaining walls, in parts without balustrading. One of the timber stairs leading to a staff flat appears to be close to collapse, through lack of maintenance to timber work.

- Generally there are a number of places in the driveway and car park areas with rough, loose, steep or slippery surfaces and trip hazards making trips and slips by pedestrians probable. There are places where water ponds and slime has developed.

- There is no dedicated pedestrian walkway leading to the hospital entrance. The sharing of the main driveway by pedestrians, cars, delivery trucks and ambulances, and the need for cars and trucks to reverse and manoeuvre in those spaces provides further risks.

- All of the above risks would be exacerbated at night time or in rain, and are not helped by the currently inadequate external lighting.
6.4 Infection risks
Examination of the air-conditioning system has revealed that conditions of temperature and humidity exist in the hospital that are highly conducive to microbial growth. The cause is the incompatibility of the air-conditioning system with buildings that were constructed for natural ventilation and are neither sealed nor insulated adequately. This is compounded by the risk of microbial ingress from a major air-intake to the system which draws air in over damp soil under the building. Another source of contamination in the air is a defective toilet ventilation system which, in certain circumstances, can allow contaminated air from toilets to flow into ward areas.

Food and drink contamination risks arise from the presence of some unhygienic finishing materials in the kitchen, and from mould caused by condensation from the incorrectly insulated cold room. Contamination of drinking and washing water could also occur because of inadequate backflow prevention valves on hose reels, dishwasher and ice maker.

Other hygiene risks arise from dirt build up in worn and torn vinyl flooring and in damaged wall, door and fixture surfaces, including bathroom tiling.

6.5 Other risks of compromised patient care
Possible system failures through lack of maintenance have been identified, which could compromise patient care. These systems are:

- nurse call
- heating and cooling
- telephones
- medical suction.

Inadequate lighting in ward areas and the need to turn off all lights regularly to test emergency lighting could also compromise care.

Risks also exist from failure of power supply due to switchboard and circuitry problems and from inadequate emergency generator capacity.

6.6 Personal attack risks
Risks to staff and others from violent, intoxicated or drug-affected persons have been identified by District staff, arising from such issues as:

- lack of access control of building perimeters and within buildings
- aggravation by the overcrowded waiting room
- isolation of the emergency treatment room from ward areas
- inadequate external lighting.
6.7 Other health and safety risks
Other health and safety risks have been identified:

- slips due to condensation drips on floors and trips on towels placed to mop them up
- trips on worn or torn vinyl floors
- trips on uneven floors caused by movement in timber sub-floors
- personal injury from rough surfaces where walls, doors and fixtures have been damaged or where tiling is failing
- heavy lifting by kitchen staff because of mis-matched heights of kitchen benches and dishwasher
- scalding from use of hand basins which do not have thermostatic mixing valves
- danger to contractors working on faulty switchboards
- danger to electrical workers due to confusion of circuitry, making it difficult to know which parts are live
- danger to all building users due to the lack of sufficient safety switches
- dangers to patients from lack of electrical “body protection” in specific areas
- dangers of trips, slips, collisions and mistakes arising from the need to turn off all lights to conduct regular tests of emergency lights
- dangers from contact with asbestos-containing materials

6.8 Disadvantage of persons with disability
Current access provision could disadvantage persons with disabilities and lead to action under the Disability Discrimination Act. Issues include:

- lack of a wheelchair accessible pathway from the street to the hospital entrance
- car parking for persons with disabilities, and access from car parking to the building entrance having steep and rough surfaces
- lack of a wheelchair accessible reception desk
- insufficient wheelchair accessible bathrooms and toilets
- no disability access to the staff accommodation building.

6.9 Staff, patient and visitor dissatisfaction
Issues under this heading include:

- insufficient on site sealed car parking
- lack of under-cover patient pick-up and drop-off at the main entrance
- gloomy institutional-style ward rooms
- lack of separation of in-patient and out-patient areas (including night-time disturbance by emergencies)
- insufficient toilets and bathrooms, lack of en-suite bathrooms and long walking distance to bathrooms
- locations of waste bins visible at entrances to the site and to the main building
- visible results of condensation from air-conditioning system (mould, wet floors, peeling paint etc.)
- unsightly damaged surfaces to walls, doors, tiling etc.
- personal thermal discomfort from inefficient air-conditioning and lack of insulation
- lack of sound insulation between units in staff accommodation
- insufficient staff toilets and lack of differentiation between male and female
- the need to turn off all electricity to the main hospital to allow safe maintenance work, due to the confusion of circuitry
- old and discoloured lights and other electrical components
6.10  **Staff dissatisfaction and inefficiencies**

This risk could arise from:

- under-sized consulting rooms.
- under-sized ward rooms.
- small size and inefficient plan of the reception area.
- insufficient office space, especially for visiting doctors.
- location of some offices (including Director of Nursing) in a separate building.
- the inconvenience of mechanical access control locks on doors rather than prox card electronic ones.
- the need to turn off all lights to conduct regular tests of emergency lights.

6.11  **Deterioration of building fabric**

Risks of deterioration of the buildings and site works, and in extreme cases, structural failure arise from such issues as:

- rusting of reinforcement and concrete spalling in stumps under buildings
- condensation and mould growth generally (including in hidden spaces) due to the incompatibility of the air-conditioning system with these buildings
- condensation and mould growth under the kitchen cold room, due to inadequate insulation under the cold room
- cracking of retaining walls below the staff accommodation building, from various causes, including possible lack of drainage
- erosion of un-retained excavated ground below the main building
- damage to buildings and grounds from vehicle impact, due to lack of defined truck loading areas, bin stores and protective bollards
- termite attack especially where timber buildings are in contact with, or close to, the ground, and where ant caps have corroded
- water problems, including erosion from inadequate external drainage, allowing water to flow under buildings or on to building materials
- structural failure in high wind conditions of the verandah behind the staff accommodation building, due to inadequate design and construction
- failure in high winds of stumps/posts under the old infilled verandah to the main hospital building due to inadequate design and construction
- failure in a significant cyclonic event of roof and wall structures due to tie-down and bracing being to less than current standards
- failure of front steps to the staff quarters due to lack of maintenance
- deterioration of staff quarters due to lack of paintwork maintenance
- failure of the rusty water tank in the plant room resulting in local flooding and damage to adjacent equipment.

6.12  **Excessive running costs**

Excessive running costs are likely, due to:

- excessive energy consumption by inefficient air-conditioning system and lack of insulation
- excessive running of kitchen cold room to compensate for lack of floor insulation
- inefficient light fittings.
6.13 Failure of building services systems

Risks include:

- premature failure of air-conditioning system components, due to the system frequently running at or near capacity
- blocking of drains due to lack of a grease trap on the kitchen drain
- failure of the telephone system due to lack of maintenance on the battery
- failure of the nurse call system due to lack of maintenance
- failure of the CCTV security monitoring system due to its being of domestic quality only
- failure of the patient TV system due to it not being ready for the change over to digital broadcasts
- failure of the electrical system due to switchboard faults
- failure of the electrical supply in an emergency due to inadequate generator capacity
- failure of medical suction due to lack of maintenance.

6.14 Legal action

Possible causes include:

- inadequate disability access (Disability Discrimination Act)
- failure to obtain approval under the Building Act for structures such as the staff verandah
- various workplace health and safety issues listed above
- civil action in the case of personal injury

6.15 Compromising of future development on the site

It is understood that there is a proposal to construct an accommodation building on the site for James Cook University. Any such proposal needs to be considered in conjunction with a master plan for the site, to maximise future opportunities.
7 Options

7.1 Option 1 – Minimum work to maintain status quo

7.1.1 Scope of this option.
This option attempts to address the main current risks in the short term, but it does not solve the fundamental problems of this facility. It can be regarded at best as a short term temporary “quick fix”. The measures suggested here are intended to reduce the fire safety risks, air-conditioning problems and other problems as far as is practicable within a limited time and limited budget, but significant risks will still remain. This option should only be considered as an interim solution until one of the more long-term options could be implemented.

Most of the items listed below are common to both Option 1 and Option 2. The items listed in *italics* are replaced in Option 2 by more permanent solutions.

Because of the limitations of what building work can achieve under this option, some management changes need to be considered to complement it.

Work covered by this option would consist of:

**Management**
- Review fire evacuation procedures
- Review night time security procedures and staffing for emergency treatment room
- Establish a master plan for future development at this site
- Establish biological monitoring regime for indoor air quality.

**Fire upgrade**
- Provide a fire sprinkler system throughout the main building and staff accommodation building as an alternative solution to the lack of fire separation and other fire safety problems, as modifications to the building structure would not be feasible
- Carry out flow and pressure test on town's main to ensure sufficient hydrant performance for the hospital. Hydrant pump, water tank and brigade booster assembly may be required if the systems fail to meet minimum requirements
- Upgrade the hydrant system to include double outlet hydrant standpipes
- Install additional fire hose reel to meet code requirement and coverage
- Replace heat detectors in offices and public areas with smoke detectors
- Provide heat detectors to both buildings’ undercrofts and on the rehabilitation deck
- Provide smoke detectors in the generator room.

**Air-conditioning system (main building only)**
- Upgrade bathroom and cleaner’s room extract systems to prevent infiltration of outside air
- Provide a dedicated air intake to the kitchen
- Provide localised cooling to the kitchen
- Install dampers where ducts cross the fire/smoke wall
- Provide a new air intake for the plant room to eliminate air pollution from the crawl space
- *Reinstate zoned control of ducted air-conditioning system.*
Building work to support air-conditioning upgrade
- Provide new, well-sealed, self-closing doors to the kitchen and doors in the corridor outside to form an air lock
- Provide new sealed, self-closing external doors, with additional doors to form air locks at each entry point to the main hospital building
- *Check main building envelope and seal up any obvious major points of air infiltration*
- Install ceiling insulation.

Other mechanical services
- Provide a dedicated exhaust for the suction compressor.

Cold room
- Demolish and rebuild the cold room and damaged adjacent structure.

Electrical work
- Upgrade external lighting to main driveway, car parking and area between main hospital and staff quarters
- Upgrade fire exit lights and emergency lights to current standards (not including upgrade of testing system)
- Upgrade lighting in ward rooms
- Upgrade electrical switchboards to eliminate risks listed in electrical engineer’s report
- Provide safety switches to bring the system up to current standards
- Install body protection to bring the system up to current standards
- Upgrade the emergency generator (it is understood that this is currently being organised by Mackay District).

Electronic work
- Upgrade TV system to accept digital broadcasts.

Plumbing work
- Install appropriate check valves to hose reels, dishwasher and ice maker
- Install thermostatic mixing valves to remaining hand wash basins
- Remove rusty water tank in plant room.

Building work generally
- Repair and replace damaged stumps under buildings (see structural engineer’s report in Volume 2 for details)
- Upgrade back verandah to staff accommodation building to meet current codes and obtain approval under the Building Act
- Excavate and regrade ground adjacent to verandah deck to eliminate water and termite problems
- Upgrade benches in kitchen and remove unhygienic materials
- *Internal minor refurbishment of ward rooms to make them more “user friendly”*
- Remove any asbestos materials disturbed by the work.

External works
- Rebuild steps, walkways and rails in front of the staff accommodation building, to provide safe access
- *Provide dedicated truck unloading area (by means of signage only) where trucks will not block emergency access*
- Provide bollards to prevent building damage by vehicles
• Improved signage and other measures to avoid access confusion and improve safety on site
• Provide piped stormwater drainage from all downpipes and other measures to direct stormwater away from buildings and walkways and to minimise erosion
• *Resurface sealed road and walkway surfaces to eliminate trip and slip hazards, control stormwater and incorporate markings to better segregate pedestrians and vehicles*
• *Incorporate improved access for persons with disabilities.*

**General maintenance**

• Check roof for leaks and repair
• *Selectively replace worn and torn floor vinyl*
• Replace damaged doors
• Repair damaged door frames and cover with frame guards
• Repair and repaint damaged walls and ceilings
• *Replace failing wall tiles with more suitable materials*
• Partial external painting of staff accommodation building.
• Replace damaged timber to landing outside staff accommodation building
• Establish maintenance regime for medical suction system
• Establish regular termite inspections
• Establish regular maintenance of nurse call system and telephone system

### 7.1.2 Capital cost

The capital cost of this option is estimated at $2.84 million. This is a Category 2 estimate of the gross project cost, at current prices, including fees etc, but excluding GST. A copy of the quantity surveyor’s detailed estimate can be found in Volume 2.

### 7.1.3 Whole-of-life costs

A saving in energy costs can be expected from the increased efficiency of the air-conditioning system and the cold room, but increased costs can be expected from the additional maintenance regimes required.

### 7.1.4 Advantages

Apart from lower capital cost, the only advantages this option has over Option 2 is that it is likely to be less disruptive to the running of the hospital, and it could be implemented more quickly.

### 7.1.5 Disadvantages

The main disadvantage of this option is the continued exposure to substantial problems, including:

• possibilities of delays to emergency access
• some continued fire risks and difficulties in evacuation
• disadvantage of persons with disabilities
• cramped and badly laid out waiting and out-patient areas
• shortage of office accommodation
• small size of ward rooms and consulting rooms
• problems with lack of separation between in-patients and out-patients
• personal safety and security risks especially with the emergency treatment room at night
• Numbers and locations of patient bathrooms
• Numbers and locations of hand-wash basins
• Numbers of staff toilets
• Unsightly locations of waste bins
• Shortage of sealed car parking and lack of covered pick-up / drop-off
• Possible structural failure (from high winds or unretained excavation)
• Excessive energy consumption
• Remaining asbestos would require ongoing risk management.
7.2 Option 2 – Refurbishment

7.2.1 Scope of this option

This option aims to address the current risks, as far as practicable while keeping the existing structures and maintaining current services with the aim of extending the life of the facility to 10-15 years. It includes all the work listed for Option 1, except items in *italics*. Those items are replaced in this option with more permanent solutions.

**Air-conditioning system (main building only)**
- Convert existing ducted air-conditioning system to supply air only (humidity controlled).
- Provide split system reverse-cycle air-conditioners throughout the hospital.

**Building work to support air-conditioning upgrade**

To main building only (not staff accommodation):
- Remove timber wall cladding and associated windows, replace with insulated panels and double glazed windows
- Insulate timber floor.

**Main entry and outpatient area**
- Extend and remodel the entry, outpatient and emergency room areas
- Incorporate additional staff toilets and wheelchair accessibility
- Incorporate better separation between in-patient and out-patient areas
- Incorporate better access to the emergency room for both day and night use

**Ward areas**
- Convert 6 two-bed wards to 3 four-bed wards and provide en-suite bathrooms utilising the old enclosed verandah space.
- Provide en-suite bathrooms to the other wards
- Provide a hand wash basin in each ward room
- Convert redundant bathrooms to offices
- Relocate the nurse station to better supervise entry to the ward and the emergency treatment room.
- Incorporate additional office space and improved ambulance access.

**Main building generally**
- Generally replace internal fixtures fittings and finishes (including all floor finishes), including a complete internal repaint
- Remove asbestos where disturbed by the works
- Incorporate improved wind tie-down in altered areas
- Additional repair and replacement of damaged stumps under buildings (see structural engineer’s report in Volume 2 for details)

**External works**
- Provide a patient pick-up / drop off area under cover
- Provide ramped access from the street to the main building suitable for evacuation of patients and wheelchair access
- Provide a dedicated truck unloading area and dedicated screened bin storage
- Reconfigure driveway to reduce risk of blocking of ambulance access
- Reconfigure car parking to provide more sealed parking not directly off the main driveway
- Resurface those areas not affected by alterations
• Provide better lighting to car parks and driveway
• Provide a retaining wall to bank between main building and community health building

Plans illustrating this option follow overleaf.

7.2.2 Capital cost

The capital cost of this option is estimated at $5.88 million. This is a Category 2 estimate of the gross project cost, at current prices, including fees etc, but excluding GST. A copy of the quantity surveyor’s detailed estimate can be found in Volume 2.

7.2.3 Whole-of-life costs

• A saving in energy costs can be expected from the increased efficiency of the air-conditioning system and increased insulation.
• Some savings in maintenance costs can be expected from renewed materials, for example the external insulated panels will not require painting.

7.2.4 Advantages

This option addresses more of the risks than does Option 1 at much less cost than Option 3.

7.2.5 Disadvantages

This option is more likely to disrupt the running of the hospital than Options 1 or 3.

This Option does not completely solve the following problems:

• Possibilities of delays to emergency access
• Some continued fire risks and difficulties in evacuation
• Some areas still not accessible to persons with disabilities
• Small size of consulting rooms
• Possible structural failure (from high winds or unretained excavation)
• Remaining asbestos will require ongoing risk management.
7.3 Option 3 – Significant redevelopment

7.3.1 Scope of this option

This option consists of the demolition of the existing main hospital building and staff quarters and rebuilding on the same site, leaving the community health building untouched. Demolition and rebuilding would be staged so as to provide an uninterrupted service. Associated car parking and site works are included.

The location proposed for the hospital building is the north west corner of the site, where the ground is less steep than in other areas. A single-storey building is proposed with some undercroft parking for made possible by the slope of the land.

The proposal is based on a facility providing the same services as at present, but to current standards. The 16 bed multi-purpose service unit in the Australasian Health Facilities Guidelines has been used. Extracts from this guideline are attached as appendix 10 in Volume 2. This indicates that the new building will have a floor area of approximately 2000 square metres, which is considerably larger than the existing hospital. The plan shown is based on this floor area. Further detailed work would be required in the next phase to determine department areas within the building.

This option also includes staff accommodation consisting of five self-contained one-bedroom units, located on part of the site vacated after demolition of the main hospital.

Refurbishment was rejected as part of this option given the fundamental problems existing with the buildings and their siting. It was considered that refurbishment options had been exhausted with Option 2.

This option also gives the opportunity to re-build on a new site. This could give a number of advantages, including:

- A flatter site
- Better access, particularly avoiding delays from railway crossings.

It is expected that rebuilding on a new site would cost about the same as on the existing site, assuming that the old site could be sold for the same price as the cost of a new one.

A site plan illustrating this option follows overleaf.

7.3.2 Capital cost

The capital cost of this option is estimated at $18.77 million. This is a Category 2 estimate of the gross project cost, at current prices, including fees etc, but excluding GST. A copy of the quantity surveyor’s detailed estimate can be found in Volume 2.

7.3.3 Whole-of-life costs

Maintenance costs may be expected to fall initially as a result of the total renewal in this option. Energy costs should fall as a result of more efficient systems, but this would be offset by the increased floor area and the need for lifts.

7.3.4 Advantages

- Minimisation of risks.
- Minimum disruption to hospital service during construction.

7.3.5 Disadvantages

- Capital cost.
# 8 Options analysis

**Table 1: Option 1**

<table>
<thead>
<tr>
<th>Option features</th>
<th>Minimal work to address some current risks in short term.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>A relatively quick and inexpensive interim measure.</td>
</tr>
<tr>
<td>Benefits</td>
<td>Speed, low cost and minimal disruption to hospital.</td>
</tr>
<tr>
<td>Risks</td>
<td>Continuing risks to health, safety, energy consumption and function.</td>
</tr>
<tr>
<td>Assumptions</td>
<td>To be followed by option 2 or 3.</td>
</tr>
<tr>
<td>Criticality</td>
<td>Addresses most serious risks in shorter time than other options.</td>
</tr>
<tr>
<td>Resource implications</td>
<td>Some savings in energy costs, but increased maintenance costs otherwise.</td>
</tr>
<tr>
<td>Capital cost</td>
<td>$2.84 million</td>
</tr>
</tbody>
</table>

**Table 2: Option 2**

<table>
<thead>
<tr>
<th>Option features</th>
<th>Major upgrade of existing structures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>Addresses more risks than option 1 but at much less cost than option 3.</td>
</tr>
<tr>
<td>Benefits</td>
<td>Increases the life of the facility to 10-15 years.</td>
</tr>
<tr>
<td>Risks</td>
<td>Some continuing risks to health, safety and function, and disruption to existing hospital.</td>
</tr>
<tr>
<td>Assumptions</td>
<td>To be followed by option 3 after 10-15 years.</td>
</tr>
<tr>
<td>Criticality</td>
<td>Addresses most risks but needs longer time than option 1.</td>
</tr>
<tr>
<td>Resource implications</td>
<td>Some savings in energy and maintenance costs.</td>
</tr>
<tr>
<td>Capital cost</td>
<td>$5.88 million</td>
</tr>
</tbody>
</table>

**Table 3: Option 3**

<table>
<thead>
<tr>
<th>Option features</th>
<th>Demolition and re-building of main building and staff accommodation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>Resolves problems that can not be resolved by options 1 and 2.</td>
</tr>
<tr>
<td>Benefits</td>
<td>Can address all risks and extend the facility life, with minimum disruption to existing facility.</td>
</tr>
<tr>
<td>Risks</td>
<td>None foreseen.</td>
</tr>
<tr>
<td>Assumptions</td>
<td>Continuity of existing service but to current building standards.</td>
</tr>
<tr>
<td>Criticality</td>
<td>Potential to address all risks but longer time to complete than other options.</td>
</tr>
<tr>
<td>Resource implications</td>
<td>Higher running costs due to larger buildings.</td>
</tr>
<tr>
<td>Capital cost</td>
<td>$18.77 million</td>
</tr>
</tbody>
</table>
## Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATODS</td>
<td>Alcohol, Tobacco and Other Drugs Service</td>
</tr>
<tr>
<td>GP</td>
<td>General (medical) Practitioner</td>
</tr>
<tr>
<td>GST</td>
<td>Goods and Services Tax</td>
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</tbody>
</table>