Preliminary Infrastructure Planning Study for Atherton Hospital

Volume 1 of 2

June 2010
About this Study

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

This Preliminary Infrastructure Planning Study was undertaken from 24 March 2010 to 30 June 2010 and was prepared by GHD and sub-consultants under the direction of Queensland Health’s Planning and Coordination Branch. Every effort has been made by GHD and sub-consultants to investigate and document in sufficient detail—and within the timeframe—the infrastructure issues, gaps and requirements for Queensland Health in relation to Atherton Hospital’s future service provision.

Assumptions

The study has been prepared on the basis of available information both written and verbal that was provided prior to, during and post the site assessments. Information included:

Service profile information provided by Queensland Health. The study has been informed by:

- Hub and Spoke Definition Paper - March 2010
- Atherton Hospital Service Profile - May 2010
- Atherton Hospital’s registers and data including but not limited to – Asbestos Registers, Asset Registers, OH&S Registers, Incident forms, Maintenance Registers
- Verbal feedback from hospital staff and management teams during site assessments.
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1. Executive Summary

This study has been prepared in order to provide Policy, Planning and Asset Services in Queensland Health a summary of the key infrastructure issues and their impact (if any) on service delivery at Atherton Hospital. Information on the hospital will cover infrastructure actual and potential risks, general condition, functionality, and service profile requirements. Information contained in this study is to be used as a guide to assist key decision makers with the determination of prioritisation for infrastructure renewal at this site.

The infrastructure assessment involved the onsite assessment of nominated structures (as determined by Queensland Health and documented in the Terms of Reference paper dated May 2010), the interviewing of key hospital and district staff and the reviewing of relevant documentation as it was made available. Issues such as, existing staffing models and the recruitment and retention of staff were considered when formulating options. This study does not reflect on funding models, the adequacy of supply of medical equipment or supplies, or the systems and processes implemented for health service delivery. Further, where infrastructure and resulting operational risks were identified, GHD did not investigate mitigation strategies deployed or planned to manage risk impact.

The GHD team of consultants included a Clinical Health Planner, Architect, Mechanical and Electrical Engineer, Civil and Hydraulic Engineer, Structural Engineer, Building Certifier and a Quantity Surveyor. Analysis of the collective findings from each discipline formed the basis of the Option Analysis for Atherton Hospital. Options were discussed and developed in consultation with Queensland Health Policy Planning and Asset Services and hospital staff. Options have been developed to mitigate or reduce actual or potential infrastructure risks and to facilitate functional relationships between service departments in order to meet service profile obligations.

Atherton Hospital is a 53 bed facility that has been constructed in various stages over a 100 year period. The age of the buildings reflect their out-dated designs, layouts and general condition. Generally, buildings on this campus do not comply with building code requirements causing a number of concerns around fire safety, security, infection control, disability access and occupational health and safety.

Option 1: ‘Status Quo’ addresses the serious risks around security, fire and infection control. Option 1 only addresses the actual or potential serious risk issues, and non compliance to relevant building codes, Acts and/or Legislation. It does not address the overall operational functionality of the campus or the general condition and/or defects of the internal environment. Option 1 does not enable the existing infrastructure to comply with the Australasian Health Facility Guidelines. Cost estimations for Option 1 total $26 million.

Option 2: ‘Refurbishment’ is an extensive refurbishment of the Pioneer Building and construction of new hospital infrastructure in order to mitigate the risks identified in Option 1 as well as a number of the operational deficiencies throughout the campus. Option 2 addresses the functional limitations of existing structures, the extensive presence of asbestos in the existing materials and the large number of the internal defects. Option 2 would ensure compliance with Australasian Health Facility Guidelines. Cost estimations for Option 2 total $87 million.

Option 3 is an extension of Option 2 that includes a full staged rebuild of the entire hospital campus with priority given to essential services of the Emergency Department, Operating Theatres, X-ray, Maternity, General Wards and Medical Records. Stage two of Option 3 includes the construction of offices for Administration and Primary Health services. It is proposed the redevelopment be placed on the Greenfield land adjacent to the existing infrastructure and that existing buildings (exception of the Pioneer building) are demolished and materials removed from site. The Pioneer building and the James Cook University School of Medicine may be refurbished for extra administration or conference rooms. Cost estimations for Option 3 total $89 million.
For all options presented, critical consideration is given to the mitigation of actual or potential risks and to the non-compliance to Building Codes, Legislation and Best Practice Guidelines. There are varying degrees of advantages and disadvantages with all Option strategies, however, only Options 2 and 3 addresses functional arrangements within departments in order to positively impact on operational efficiency and staffing models.

Staff accommodation is considered and costed separately to the refurbishment of the existing hospital infrastructure; however, it is discussed in line with the Options. It is proposed that the additional accommodation be constructed on the Greenfield land as detailed in the Concept Drawings. Information on the number and type (one or two bedrooms) of dwellings has been provided by Queensland Health’s Policy Planning and Asset Services. Cost estimates for additional accommodation on the Atherton campus total $11 million.

Conclusions reached on the basis of this study should recognise the limitations inherent in such a study, including the limited field inspection time and the basic design analysis completed. Any funding decisions using the order of costs expressed in this study should include for an appropriate contingency given the level of detail informing those estimates.
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

The Atherton Hospital is located within the hinterland region of the Cairns and Hinterland Health Service District. It is 81 kilometres to the south-west of the District’s major referral hospital Cairns Base Hospital. Atherton Hospital is the major hub service providing services for residents of Atherton, Croydon, Eacham and Herberton (Queensland Health, Planning and Coordination Branch, Policy Planning and Asset Services, Draft Atherton Service Profile 2010:

Figure 1 Cairns and Hinterland Health Service District

Source: Queensland Health, Planning and Coordination Branch, Policy Planning and Asset Services, Draft Ayr Service Profile 2010:7

In 2008, the estimated resident population for the Atherton Hospital catchment was 25,233 equating to 10.6 per cent of the total Cairns and Hinterland Health Service District population. The largest population age group was the 45-69 years (or 35% of the total catchment) and the 15-44 year group (or 33% of total catchment). Consistent with an ageing population in many areas in Queensland, greatest proportional increases in this district will occur in older age groups. The greatest percentage increase (132%) between 2008 and 2026 is projected for the 70+ age group (Queensland Health, Planning and Coordination Branch, Policy Planning and Asset Services, Draft Atherton Service Profile 2010: 7-8).
Table 1: Atherton Hospital catchment estimated resident population and projections by age range for the areas of Atherton, Croydon, Eacham and Herberton 2006-2021

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<tbody>
<tr>
<td>0-14</td>
<td>5,184</td>
<td>5,053</td>
<td>5,118</td>
<td>5,359</td>
<td>5,655</td>
<td>21%</td>
<td>9%</td>
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<tr>
<td>15-44</td>
<td>8,291</td>
<td>8,348</td>
<td>8,504</td>
<td>8,737</td>
<td>9,245</td>
<td>33%</td>
<td>12%</td>
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<tr>
<td>45-69</td>
<td>8,950</td>
<td>9,699</td>
<td>10,316</td>
<td>10,474</td>
<td>10,356</td>
<td>35%</td>
<td>16%</td>
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<tr>
<td>70+</td>
<td>2,808</td>
<td>3,306</td>
<td>4,280</td>
<td>5,387</td>
<td>6,512</td>
<td>11%</td>
<td>132%</td>
</tr>
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<td>TOTAL</td>
<td>25,233</td>
<td>26,406</td>
<td>28,218</td>
<td>29,957</td>
<td>31,768</td>
<td>26%</td>
<td></td>
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<tr>
<td>Growth</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
<td>6%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Queensland Health, Planning and Coordination Branch, Policy Planning and Asset Services, Draft Ayr Service Profile 2010:8
3.2 Atherton Hospital Site

Atherton Hospital is located on the corner of Louise and Jack Streets Atherton. The site is on a 3.668 ha land parcel with 1.7 ha currently utilised for the existing campus. There are 2 ha of Greenfield land available for development.

The entrance of the hospital fronts Jack Street as does the Emergency Department, Endoscopy Theatre, Dental, X-ray and the Administration building. The General Wards, Operating Theatre, and Maternity departments are located behind. The Primary Health Centre, staff car park and helipad area is accessed via Louise Street and is located adjacent to the available 2 hectares of Greenfield land.
3.3 Atherton Hospital Building History

The Atherton hospital was built over a period of time to meet the increasing health service needs of the district. The below diagram shows the decade and the infrastructure expansion and demonstrates how the change of use for some of buildings came about.

Figure 3 Atherton Building Development History
3.4 Existing Built Environment

The following site map details the existing infrastructure on the Atherton Hospital campus, and also identifies the Greenfield land available for redevelopment.

Figure 4 Atherton Existing Site Infrastructure

3.5 Atherton Hospital Maintenance Issues

The ongoing maintenance concerns reported by hospital staff are prevalent across many of the departments. Concerns include:

- Generally across the Atherton Hospital Campus
  - failing air conditioning units
  - poor condition on internal surfaces (floor tiles lifting, walls in poor condition, paint peeling off ceilings etc)
  - faulty nurse call bell system in general wards
  - corrosion of copper waste pipes
  - roof sheeting in poor condition
  - poor external water drainage
- Specific to Primary Health Building
– timber window frames are weathered and are rotting and staff reported that they are unable to be opened
– water ingress during wet periods causing damage to internal walls, equipment and supplies
– fire alarm being set off for no apparent reason (at least on a monthly basis)
– gutters are rusted and holed and in areas are congested hence ineffective

- Specific to Pioneer Building
  – ongoing dampness associated with the light well

3.6 Atherton Hospital Development Proposals

To date Atherton Hospital has suspended refurbishment to the Medical Ward bathrooms and the extension of the X-ray department (installation of the CT Scanner) due to the presence of asbestos in existing building materials. GHD has not received information on whether refurbishments will be completed at this time. Upgrades to the helipad are planned; works include lighting and fencing.

3.7 Site Constraints

There are a number of site constraints that require consideration when analysing a way forward for the Atherton Hospital site. These include:

- Asbestos - the extensive presence of asbestos in the existing structures has to date prevented refurbishments being undertaken and/or completed (for example the medical ward bathrooms and the extension of the X-ray Department for the inclusion of the CT Scanner).
- The age and internal condition of the buildings are considered to be ‘beyond-end-of-life’ and as such refurbishment would be extensive and subsequently costly and would not necessarily address the functional arrangement and operational flow issues associated with the current site.
- Disability access to and within the site is inadequate and requires extensive reconfiguration to address non-compliance to Building Codes and access and safety concerns.
- Compliance to fire standards and codes is severely inadequate across the site and requires extensive refurbishment to bring to required standard.
- Compliance to the Australasian Health Facility Guidelines is severely inadequate.

3.7.1 Heritage Issues

After searching the National or State Heritage Registers it was found that there are no buildings on the Atherton Hospital campus site that are listed on the either of the registers.

3.7.2 Town planning / Designation Issues

After searching the Department of Infrastructure and Planning’s community infrastructure database it was found that Atherton Hospital is not designated for community infrastructure. Proposals for development or redevelopment on this site will require Town Planning advice to consider if a ‘Material Change of Use’ is occurring as a result of the proposed development. Fees for these investigations would apply. If a ‘Material Change of Use’ is considered to be occurring planning approval through a Development Application to the local authority may be required. Alternatively the sites can be designated for Community Infrastructure or in the case of workers/staff accommodation can proceed through the public housing exemption process under Chapter 9 of the Sustainable Planning Act 2009, (Project Services, Information ‘Kit’ for the Infrastructure Renewal Project for Rural and Remote Projects, (IRPRRA) 2010).
4. Atherton Hospital Health Service

4.1 Design and Functionality of Current Facility

Atherton Hospital was constructed in various stages over a 100 year period. The campus expanded to accommodate the health service requirements for the Tablelands district. Buildings were designed fit for purpose at the time of their construction, however, overtime original functions of buildings ceased and buildings adapted for alternate use. It is commonly found across the campus that building structures, designs and layouts no longer meet present functions or service requirements causing a high number of operational inefficiencies and functional relationship issues. Operational inefficiencies are detailed in Section 4.3 below, however, it is to be noted that across all departments the general condition of internal finishes, the condition of services, and the disability access is considered to be extremely poor.
4.2 Future Health Services

Information on current and future bed requirements has been determined by Queensland Health’s Policy and Planning Branch and is documented in Queensland Health’s, Planning and Coordination Branch, Policy Planning and Asset Services, Draft Atherton Service Profile 2010. An extract from the Service Profile identifying current and future bed requirements for Atherton Hospital is below.

The following table shows current and future bed requirements for Atherton Hospital. They are categorised according to definitions in the Review of the More Beds for Hospital Strategy\(^4\) including overnight beds (medical/surgical beds, maternity and paediatric beds), same day beds and bed alternatives (Attachment C). Two sets of projections are shown:

At Queensland Health endorsed statewide bed planning occupancy rates.

At 70 per cent 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.

<p>| Table 2: Current and future bed requirements for Atherton Hospital (Bed projections) |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Category A: Beds                |                                 |                                 |         |         |         |         |         |         |         |         |
| A1. Overnight Beds              |                                 |                                 |         |         |         |         |         |         |         |         |
| Overnight beds including:       |                                 |                                 |         |         |         |         |         |         |         |         |
| • medical and surgical (incl. palliative) | 51 (including 6 monitored beds – 4 monitored and 2 telemetry) | 85% | 37 | 43.2 | 49.6 | 70% | 44.9 | 52.4 | 60.2 |
| • paediatric                    | 0                               | 75%                             | 1.3     | 1.2    | 1.3    | 70%    | 1.4    | 1.3    | 1.4    |
| • maternity                      | 6                               | 75%                             | 3.2     | 3.2    | 3.3    | 70%    | 3.4    | 3.5    | 3.5    |
| • mental health - acute          | -                               | N/A                             | 85%     | 1.8    | 2.0    | 2.2    | 70%    | 2.2    | 2.5    | 2.7    |
| • sub- and non-acute (GEM)       | -                               | (included in medical beds)      | 90%     | 5.6    | 7.0    | 8.6    | 70%    | 7.2 TBC | 8.1 TBC | 11.1 TBC |
| • Emergency Department short stay | -                               | N/A                             | -       | N/A    | N/A    | N/A    | -      | N/A    | N/A    | N/A    |
| • ICU/PICU/HDU                   |                                 |                                 |         |         |         |         |         |         |         |         |
| • CCU                            |                                 |                                 |         |         |         |         |         |         |         |         |
| • neonatal (NICU/SCN)            |                                 |                                 |         |         |         |         |         |         |         |         |
| • mental health - non-acute      |                                 |                                 |         |         |         |         |         |         |         |         |
| Total overnight beds             | 57 multi-purpose beds           |                                 | 48.9    | 56.6   | 65     | 59.1   | 68.8   | 78.9   |
| A2. Same Day Beds*               |                                 |                                 |         |         |         |         |         |         |         |         |
| Same day beds including:         |                                 |                                 |         |         |         |         |         |         |         |         |
| • medical (including obstetrics, paediatrics and oncology / chemotherapy) |                                 | 4.8                             | 5.8    | 6.7    |
| • surgical (including obstetrics and paediatrics surgery) |                                 | 0.8 | 1.0 | 1.1 |
| • mental health                  | -                               | N/A                             | 0.1     | 0.1    | 0.1    |
| • sub- and non-acute             | -                               | N/A                             | N/A     | N/A    | N/A    |
| Total same day beds              | 20                              |                                 | 5.7     | 6.9    | 7.9    |
| A3. Bed Alternatives*            |                                 |                                 |         |         |         |         |         |         |         |         |
| Stage 2 recovery bays (chairs)   | 10                              |                                 | 2       | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    |
| chairs trolley spaces (located next to small procedure room, and used for chemotherapy 2 days per week) | | | 10 minimum to meet demand for day surgery lists | | | No change | No change | | |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Current</th>
<th>Projection 1 Rate</th>
<th>Endorsed Occupancy Rate 2011/12</th>
<th>2016/17</th>
<th>2021/22</th>
<th>Projection 2 Rate</th>
<th>70% Occupancy 2011/12</th>
<th>Rate 2016/17</th>
<th>2021/22</th>
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<tr>
<td>Antenatal Day Assessment Unit chairs</td>
<td>N/A</td>
<td>- N/A</td>
<td>N/A</td>
<td>- N/A</td>
<td>- N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemotherapy chairs/trolleys (data will show levels of activity for chemo, but District to inform numbers of chairs required according to numbers of chemo cases scheduled for visiting oncologist)</td>
<td>0</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Renal Dialysis chairs/trolleys (self care)</td>
<td>8</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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)</td>
<td>Part of ED treatment space numbers – refer category B below.</td>
<td>Part of ED treatment space numbers – see category B below.</td>
<td>Part of ED treatment space numbers, see category B</td>
<td>Part of ED treatment space numbers, see category B</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Total bed alternatives</td>
<td>20</td>
<td>10.4 minimum</td>
<td>10.5 minimum</td>
<td>10.6 minimum</td>
<td></td>
<td></td>
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<tr>
<td>Totals for Category A</td>
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<tr>
<td>Total A1 Overnight beds</td>
<td>57</td>
<td>46.9</td>
<td>56.6</td>
<td>65.0</td>
<td>59.1</td>
<td>68.8</td>
<td>78.9</td>
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<tr>
<td>Total A2 Same day beds</td>
<td>20</td>
<td>5.7</td>
<td>6.9</td>
<td>7.9</td>
<td></td>
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<tr>
<td>Total A3 Bed alternatives</td>
<td>20</td>
<td>10.4 minimum</td>
<td>10.5 minimum</td>
<td>10.6 minimum</td>
<td></td>
<td></td>
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<tr>
<td>Total beds</td>
<td>97</td>
<td>65.0 minimum</td>
<td>74.0 minimum</td>
<td>83.5 minimum</td>
<td></td>
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</table>
4.3 Infrastructure gaps

The following information summarises the functionality of each of the departments and highlights the deficiencies that contribute to the inefficiency of the department. The ‘non-compliance’, ‘lack of’ or ‘inadequate provision’ statements are in reference to one or more of the following: Australasian Health Facility Guidelines | Building Codes of Australia | Schedule of Australian and New Zealand Standards | Infection Control Best Practice Guidelines | Medical Records – Management and Disposal Guidelines | Fire Act | Occupational Health and Safety Act | The Privacy Act 1988 | The Drug and Poisons Act 1981 | Disability Discrimination Act (Commonwealth).

4.3.1.1 Department - Emergency

- Inadequate provision of security for staff
- Inadequate provision of security for medical equipment
- Inadequate provision of security for medical records
- Lack of storage
- Inadequate provision for patient observation
- Inadequate disability access
- Lack of privacy
- Lack of consulting rooms
- Obstruction of corridors
- Overcrowding of work areas
- Poor ambulance access
- Inadequate provision of a tearoom for staff
- Inadequate provision of a nurse call system
- Inadequate supply of medical gases to treatment beds
- Inadequate number of power outlets
- Poor access to other departments

4.3.1.2 Department - Outpatients

- Inadequate provision of security for staff – no CCTV, no surveillance
- Inadequate provision of security for medical equipment
- Inadequate provision of security for security medical records
- Lack of storage
- Inadequate disability access
- Lack of available consulting rooms
- Insufficient air conditioning
- Inadequate earth leakage protection
- Inadequate nurse call system
- Inadequate number of power outlets
- Compromised Infection control – no provision of an isolation room
- Inadequate patient waiting area

4.3.1.3 Department – Medical Records (Primary Storage)

- Insufficient air conditioning
- Insufficient storage
- Overcrowding of work area
- Inadequate earth leakage protection

4.3.1.4 Department – Medical Records (Secondary Storage)

- Inadequate provision of fire detectors
- Area not fire separated
- Lack of storage
- Inadequate security for medical records
- Inadequate access to records – poor retrieval
- Inadequate power outlets
- Inadequate earth leakage protection
- Inadequate temperature control
- Occupational risk accessing highly stacked records

4.3.1.5 Department – Front of House (entrance)
- Inadequate disability access
- Lack of seating
- Toilet amenities inadequate – no disability access
- Inadequate provision of security for staff
- Inadequate earth leakage protection

4.3.1.6 Department – Endoscopy Theatre/Chemotherapy Room
- Inadequate filtration to air conditioning unit
- Lack of storage
- Inadequate pre operative patient waiting area

4.3.1.7 Department – X-ray
- Overcrowding of work areas
- Lack of storage
- Inadequate provision of air-conditioning
- Inadequate earth leakage protection
- Inadequate number of power outlets

4.3.1.8 Department – Dental
- Overcrowding of work areas
- Lack of storage
- Inadequate layout
- Exhaust system not effective
- Inadequate provision of air-conditioning
- Inadequate number of power outlets
- Lack of privacy

4.3.1.9 Department – Operating Theatre
- Poor condition of air-conditioning unit
- Inadequate layout of department
- Inadequate number of power outlets
- Lack of storage
- Lack of privacy – for patients
- Lack of privacy – for staff when changing
- Inadequate filtration to air conditioning unit – theatre
- Compromised Infection Control – relating to poor air quality
- Inadequate number of power outlets
- Insufficient tearoom provision for staff
- Insufficient office space
• Inadequate patient waiting area – pre operative
• Over crowding CSD department – inadequate storage and work areas
• Inadequate provision of ventilation in CSD - dust particles discharging from air-conditioning unit

4.3.1.10 Department – Maternity
• Overcrowding of work areas
• Lack of storage
• Lack of privacy

4.3.1.11 Department – General Wards
• Inadequate provision of security for staff
• Inadequate provision of security for medical equipment
• Inadequate provision of security for security medical records
• Lack of storage
• Inadequate disability access
• Infection control – no provision isolation room
• Lack of privacy
• Lack of consulting rooms
• Obstruction of corridors
• Overcrowding of work areas
• Inadequate nurse station for staff
• Inadequate bathrooms (medical ward)
• Inadequate nurse call system
• Inadequate provision of fire detectors
• Insufficient supply of medical gases to treatment beds
• Inadequate air conditioning to wards
• Inadequate earth leakage protection
• No visitor toilet provided on medical ward

4.3.1.12 Department – Primary Health Services (Old Nurse’s Quarters Building)
• Overcrowding of work areas
• Inadequate air conditioning provision
• Inadequate provision of privacy for patients and staff
• Inadequate provision of work stations for staff
• Lack of storage
• Inadequate disability access
• Inadequate provision of security for staff
• Inadequate provision of security for medical equipment
• Inadequate provision of security for security medical records
• Inadequate earth leakage protection
• Inadequate number of power outlets
• Inadequate water proofing through louvres – water penetration
• Fire alarm system is faulty (false alarms once a month)

4.3.1.13 Department – Staff Accommodation
• Inadequate privacy
• Inadequate storage
• Inadequate air conditioning provision – no fresh air
• Inadequate earth leakage protection
• Inadequate power supply and power points

4.3.1.14 Department – Administration
• Inadequate storage
• Inadequate office space
• Overcrowding of work areas
• Insufficient air conditioning provision
• Inadequate earth leakage protection
• Inadequate power outlets
• Inadequate provision of security for staff
• Inadequate provision of security for medical equipment
• Inadequate provision of security for security medical records

4.3.1.15 Department – Pharmacy
• Overcrowding of work areas
• Inadequate storage
• Inadequate layout of department
• Inadequate earth leakage protection
5. Inspection Studies

5.1 Method

The campus assessment of Atherton Hospital was undertaken on the 12 to 13 April 2010. An entry meeting was conducted with local and district staff prior to the assessment of the site and infrastructure. A site orientation tour was conducted with local and district health managers followed by a detailed inspection of each area within every building. Hospital staff were questioned on service issues related to their work area. Feedback to key district and site personnel on the team’s findings was provided in the exit meetings held prior departure of the hospital.

The GHD team of consultants covered the areas of Clinical Health Planning, Architecture, Mechanical Engineering, Electrical Engineering, Civil Engineering, Structural Engineering, Hydraulic Engineering, Building Certification and Quantity Surveying.

Analysis of the collective findings from each discipline formed the basis of the Option Analysis for Atherton Hospital. Options were discussed with key personnel from Project Services, Queensland Health – Policy Planning and Asset Services, District Hospital Managers and onsite Managers for client and stakeholder input. Options have been developed to mitigate or reduce actual or potential infrastructural risks and to facilitate functional relationships between service departments in order to meet service profile obligations.

5.2 Exclusions

- Auditing and inspections were only sufficient for a general overview and impression of the hospital, facilities, departments and individual areas, supported by general discussions with staff.
- No in-depth testing or analysis of the design and functionality, materials and finishes, medical flows, drawings and site plans, compliance and impression of findings.
- No removal of linings and ceiling tiles, access hatches, furniture, storage items to obtain behind impressions.
- Inspection sufficient for a general overview of site and building services condition only.
- No testing of services or materials was undertaken.
- No linings were removed or buried services excavated during the inspection. Only existing visible services were examined.
- Elevated services (eg, contained within ceiling spaces) were only inspected from ground level or other safe vantage points.
- No calculations or design were undertaken to verify capacities, equipment sizing, etc.
- No interruption of the system operation was undertaken for the inspection. All items were inspected while working in their normal operation.

5.3 Overlap

Overlap in issues identified by GHD primarily pertained to the areas of fire safety, infection control, disability access and occupational health and safety. The overlap of issues have been recognised and accounted for in the cost for rectification.
5.4 Current Site and Infrastructure Condition

Atherton Hospital is made up of a number of structures that were constructed over a period of 100 years. The condition of buildings and services are extremely poor presenting a number of serious risks issues to staff, patients and visitors. The main issues identified are detailed below.

5.4.1.1 Clinical

- Compromised operational flow for the delivery of medical and clinical services in the emergency department, medical and surgical wards is due to:
  - the layout of existing structures
  - the lack of disability access
  - the deficiency in storage areas - inadequate storage across all service areas within Atherton Hospital leading to risks in safety of staff and to breaches of legislation. Areas compromised for storage space include Medical Records (primary and secondary storage), Medical/Surgical wards, Pharmacy, Operating Theatre and the Emergency Department.

- Inadequate security provision for staff, in particular, after hours.

- Inadequate provision of privacy to patients and staff.

- Compromised ability to maintain effective infection control practices.

5.4.1.2 Architectural

- The hospital was developed with little master planning which has led to a number of inefficiencies and wastage of site. This has resulted in lack of disability access and fire egress of various departments and their individual areas.

- The condition of internal finishes is extremely poor. This includes flooring materials, condition and integrity of walls and ceilings surfaces, doors, bathrooms amenities etc.

- The circulation around the hospital compromises staff work flows, pedestrian access and egress, vehicle access, inter-relationships of juxtaposed facilities and departments, egress of and access for waste disposal and collection, car parking and security.

- Many of the departments are in excess of 40 years old and contain asbestos. The presence of asbestos throughout the campus will hinder future refurbishments.

5.4.1.3 Structural

- General degradation of timber around the site is an issue.

- Capacity of timber floors may be lacking generally, depending on floor use, in particular the X-ray department.

- Precast sunshades on Main Ward block require more detailed inspection to check safety of connections.

5.4.1.4 Mechanical

- No air conditioning is provided in some key areas such as offices and consulting rooms.

- Generally the filtrations of the air-conditioning systems are of poor quality.

- The CSD area for the surgical theatre is fitted with an outdoor air supply and a ducted exhaust system. The outdoor air supply system is fitted with low efficiency air filtration and the internals of ductwork is dirty (33 years old). The system is allowing particles to be passing through the system and are depositing throughout the CSD department. CSD staff cannot use the benches below the grills as a result of this issue.

- The number of outlets for oxygen, nitrous oxide, medical air and vacuum is insufficient in various departments in the hospital.

- Fume cupboards do not appear to comply with relevant standards and have not been tested recently as required by code.
5.4.1.5 Electrical and Communications
- Majority of the electrical distribution switchboards for the hospital are not fitted with earth leakage protection and there is inadequate supply of power outlets to the site.
- Main switchboard for the site is original (i.e. over 30 years of age) and may need to be replaced.
- Majority of the lighting in the complex is original for the areas in which they are installed (e.g. ward blocks are 33 years old). Generally a full upgrade of lighting is required.
- Insufficient number of smoke detectors are installed across the hospital.

5.4.1.6 Hydraulics
- Tap ware and associated services are in average to poor condition and generally lack maintenance. No Queensland Health recommended water saving (flow restrictors) devices are fitted.
- Fire hoses are well past the recommended effective life date.
- Corrosion of copper water services presents an ongoing maintenance issue.
- Poor external surface drainage.

5.4.1.7 Building Certification
- Numerous fire separation issues are prevalent within the hospital infrastructure.
- The plant room above the ward area has an excessive travel distance to a single exit.
- Generally dimensions of exits do not comply with relevant standards.
- Some exit doors have incorrect door hardware, are kept locked and are unable to be opened in an emergency.
- Disabled access to the buildings is generally poor, and not in accordance with relevant building codes and standards.
6. Current Risks

6.1 Building Life

The buildings that make up the Atherton Hospital campus are considered to be ‘beyond end-of-life’ and are not compliant with current Building Codes or the Australasian Health Facility Guidelines. The GHD team identified a number of extreme, high and medium rated risks using the AS/NZ 4360 Risk Management Framework (refer to Volume 2). Risks are directly related to the age and configuration of existing infrastructure. Risks are actual and potential and are impacting on the following areas:

- **Compromised Patient Care** - issues compromising overall patient care include:
  - poor layout of existing departments
  - lack of disability access
  - inadequate provision of suitable storage areas for medical equipment and supplies
  - inadequate security for staff, patients and visitors, equipment and medical records
  - inadequate provision of privacy
  - compromised ability to maintain effective infection control practices (lack of isolation rooms, incorrect configuration of ventilation systems in the Operating Theatre and CSD and poor condition of general surfaces).

- **Fire Risks** – across the hospital campus there are numerous fire separation issues in the existing infrastructure. Generally dimensions of exits do not comply with relevant standards and there are insufficient numbers of fire and smoke detectors installed. Overall, disability access is non-compliant to building code requirements and some evacuation pathways do not lead to desired assembly areas.

- **Risk of Accidents** – staff, patients and visitors are at risk of sustaining an injury as a result of an accident due to one or more of the following:
  - failing condition of existing infrastructure (including inadequate ventilation systems)
  - poor disability access
  - inadequate provision of suitable storage areas for medical equipment and supplies
  - inadequate security for staff
  - poor configuration of existing departments
  - overcrowding of work areas.

- **Infection Risks** – best practice in infection control is compromised due to:
  - lack of correctly configured isolation rooms (as per AHFG) - Emergency Department and Medical Ward
  - incorrect configuration of ventilation systems in the Operating Theatre and Central Sterilizing Department
  - inadequate provision of toilet amenities in the general wards (Medical Ward in particular)
  - overall poor condition of internal surfaces.

- **Security Risks** – staff, patients, visitors and medical equipment are exposed to security risks due to:
  - inadequate provision of security and monitored surveillance systems across the site (including staff car parking areas)
  - lack of secure storage for medical records and for medical equipment
  - lack of secure double barrier entry to the main entrance and Emergency Department (after hours is most at risk).
• **Health and Safety Risks** – health and safety risks are present due to:
  – the failing condition of existing infrastructure (including inadequate ventilation systems)
  – poor disability access
  – inadequate provision of suitable storage areas for medical equipment and supplies
  – inadequate security for staff
  – the poor configuration of existing departments
  – overcrowding of work areas.

• **Disadvantage to Persons with Disability** – non compliances to building codes and standards in relation to disability access include:
  – inadequate configuration of toilet amenities
  – inadequate access within and outside the campus
  – inadequate dimensions of corridors and exits
  – inadequate provision of car parking areas suitable for disabled persons.

• **Staff, Patient and Visitor Dissatisfaction** – factors contributing to staff, patients’ and visitors’ dissatisfaction include:
  – poor condition of the existing infrastructure
  – overcrowding of staff work areas and patient waiting areas
  – inadequate configuration of the service departments (in particular: Emergency Department, Outpatients Department, Medical Ward, Medical Records, Operating Theatre, CSD and the Primary Health Centre)
  – inadequate provision of security for staff; patients, visitors and equipment
  – inadequate provision of safe and secure parking areas
  – poor disability access across the site.

• **Excessive Running Costs** – ongoing repair and maintenance costs are directly related to the age and poor condition of the existing infrastructure and related services. Further, repair and maintenance activities and costs are elevated due to the extensive presence of asbestos throughout the campus.

• **Failure of Building Services Systems** – mechanical and electrical (for example, ventilation systems and nurse call systems) services are deteriorating and are impacting on staff and patient safety in terms of the provision of a secure and safe environment.

• **Legal Action Risks** – potential risk of personal injury and/or adverse medical condition to staff, patients or visitors related to:
  – failing infrastructure and overcrowding of work areas
  – poor disability access
  – high fire dangers
  – inadequate provision of security
  – presence of asbestos in building materials
  – inadequate ventilation systems.
  – inadequate storage of medical records and the resulting lack of privacy.

Further details on the issues contributing to the identified risks are contained in Volume 2 – Building Life Risk.
7. Options

7.1 Staff Accommodation

Queensland Health provides housing to staff who deliver essential services to rural, remote and regional centres. Atherton Hospital currently utilises five 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 Atherton 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 (Option 1 through to 3) detailed below include the provision of 48 of housing units of accommodation. Housing accommodation for Atherton Hospital includes:

- 48 new units of accommodation to be built on site which includes replacement of 5 units of accommodation
- Demolition of 5 units of accommodation due to poor standard and condition

The footprint allowance and costing for the additional 48 units (including the replacement of substandard accommodation) has been based on accepted standards for Queensland Health staff housing (recently constructed at Roma).

The staff accommodation has been reviewed for Atherton with a total provision of 48 pax utilising the standard two-storey accommodation design, it is estimated at a cost of $11 million.

7.2 Option 1 – Status Quo

For Atherton Hospital Option 1 is extensive and addresses the serious risks around security, fire and infection control. Option 1 only addresses the actual or potential serious risk issues, and non-compliance to relevant Building Codes, Acts and/or Legislation. It does not address the overall operational functionality of the campus or the general condition and/or defects of the internal environment. This option does not address the extensive non-compliance to the Australasian Health Facilities Guidelines.

7.2.1 Scope of this Option

Option 1 involves the rectification of the existing non-compliance to Building Codes, Standards, Acts or Legislation. This will involve reviewing services (eg air conditioning) and undertaking structural reconfiguration to ensure disability access, and adequate egress for fire safety.

7.2.2 Address Area of Concern - Fire Risk

- Upgrade fire panels to addressable type.
- Fit more fire detectors throughout the hospital as per building code requirements.
- Fit more evacuation speakers throughout the hospital.
- Fit more smoke detectors throughout the hospital.
- Replace fire hoses and locate fire hose reels in appropriate and compliant areas of hospital.
- Relocate the Brigade Hydrant Booster (too close to substation).
- Relocate external hydrants to ensure they are 10m clear of the buildings they protect.
- Create fire separation. Due to the connection of the ward building to the Administration/Pioneer rooms etc via the Maternity corridor/lounge and there being no fire separation in the area, this requirement has been compromised.
- Install smoke walls in the wards to the ground and first floors.
- Reconstruct the existing infrastructure to ensure fire wall provision across the campus meets building code requirements.
- Reconstruct the emergency area and adjacent day procedure theatre to ensure fire separation.
- Provide fire separation to the primary and secondary medical records storage areas.
- Tag doors to meet building code requirements. Fire doors and frames are required to be tagged per AS 1905.1.
- Upgrade pathways to meet building code requirements. A number of exits discharge to poor pathways or no pathways.
- Reconstruct stairs (Primary Health Care building and Pioneer Ward) to meet building code requirements (refer to Building Certifier’s Report).
- Reconstruct to meeting building code requirements. The middle flight to the main stair in the Primary Health Care building have tapered treads, this is not permitted in an exit stair.
- Refit doors to meeting building code requirements (refer to Building Certifier’s Report).
- Review system to ensure consistency in alarm and detector types.
- Provide uniformity with direction to exits and the use of non-illuminated exit signs in some areas.
- Replace toilet doors with inward opening doors and fit with lift-off hinges.

7.2.3 Address Area of Concern - Security Risks
- Provide locking mechanisms to clinical nurse stations.
- Provide locked cupboards for the storage of medical records in the Medical Ward.
- Provide security surveillance and monitoring to external entries/exits/carparks etc.
- Provide double barrier security to the main entry of the hospital and in particular to the emergency department afterhours entry.
- Provide secure storage for medical equipment.
- Provide secure storage areas for staff handbags/personal belongings.

7.2.4 Address Area of Concern - Health and Safety Risks
- Refurbish all toilet and shower amenities throughout the hospital to ensure disability access to bathrooms and amenities.
- Replace all hold-down bolts on the steel columns supporting walkway to main ward block.
- Undertake examination and repairs where necessary of the precast sunshades on the theatre, maternity and general ward blocks.
- Replace the timber flooring in the Primary Heath Care centre both internally and on verandahs to meet current Australian Standards requirements for strength and deflection.
- Undertake review and servicing of all fume cupboards and exhaust ventilation requirements for Dental and Pathology.

7.2.5 Address Area of Concern - Compromised Patient Care Related to Infrastructure Inefficiencies
- Install CCTV cameras into the resuscitation room and emergency department.
- Review the call nurse system and reinstall (if necessary) to the resuscitation room, emergency department and general ward areas.
- Install wall supply of oxygen and suction to treatment bays in emergency department and to ward areas where required.
• Provide toilet amenities separate from dirty utility area in the Emergency Department.
• Provide a separate dirty utility area for the Emergency/Outpatients Departments.
• Undertake bathroom refurbishments of medical ward as planned.

7.2.6 Address Area of Concern - Disadvantage to Persons with a Disability

• Provide onsite disability car parking and general access to the hospital.
• Refurbish disable toilet amenities in order to comply with standards.
• Install inward opening doors to disable facilities with lift-off hinges.
• Connect car parking areas to the building via accessible pathways.
• Install Braille/tactile signage to toilets, lifts or other accessible areas. Way-finding for people with vision impairments is non-existent.
• Install tactile ground surface indicators at changes of slope, stairs or ramps.

7.2.7 Address Area of Concern - Infection Risk

• Provide an isolation room fitted with a negative pressure air ventilation system for patients presenting with contagious/infectious diseases in the Emergency and Outpatient Departments.
• Replace air-conditioning unit in the Chemotherapy room and Endoscopy Theatre.
• Replace the air-conditioning unit in the Operating Theatre.

7.2.8 Address Area of Concern - Failure of Building Service Systems

• Fit earth leakage protection throughout the hospital.
• Upgrade/replace the load centres of the switchboards.
• Address water intrusion issue in the Allied Health Building.
• Install switch socket outlets to meet current service requirements to the Primary Health Building and Pioneer Building.
• Install switch socket outlets to meet current service requirements to the Surgical Ward kitchenette.
• Install switch socket outlets to meet current service requirements for doctor’s residence (Red Brick Residence).
• Review the main power supply.
7.2.9 Capital Cost
The immediate concerns for Atherton Hospital as noted in Option 1 have been costed individually to arrive at a broad order of costs totalling $25.7 million + staff housing. This estimate of costs takes into account provision for staging and decanting (due to the disruptive nature of refurbishments on a live hospital), furniture, fittings and equipment. A detailed breakdown is included in the appendix.

7.2.10 Whole of Life Costs
Option 1 does not address the recurrent or maintenance aspects of the hospital. The typical existing condition throughout this facility determines that significant costs would be required to re-engineer the facility into proactive maintenance regime rather than reactive. Many of the building structures are over 50 years old and nearing end of life to deliver the health model of care.

7.2.11 Advantages
The advantages of this option are that the serious risks identified during the assessment of the campus would be mitigated and/or reduced to a safe level. Option 1 is the lowest direct capital cost of the three Options.

7.2.12 Disadvantages
The disadvantages of Option 1 are that the option does not address the operational flow issues or the inefficiencies in the functional arrangements of the departments. It does not alleviate staff dissatisfaction with overcrowded work areas nor will it address the ongoing maintenance issues associated with ongoing deterioration of existing structures. Option 1 does not allow for cost effective staffing models. Undertaking Option 1 will cause considerable disruption to service delivery. There is a high risk of escalation of costs due to unforeseen building issues and/or latent conditions. Option 1 will require careful planning over a period of time to deliver. Option 1 does not make the hospital infrastructure compliant with the Australasian Health Facility Guidelines.

7.3 Option 2 – Refurbishment or Expansion at Existing Site

7.3.1 Scope of this Option
Option 2 is the partial development of the main hospital departments on the available Greenfield land adjacent to the existing hospital. The development would include the construction of Emergency and Outpatient Departments, Operating Theatres (Major and Minor), CSD, X-ray, Maternity, 78 bed General Wards, Medical Records, Pathology, Pharmacy, Kitchen, and relocation of the helipad and services. The general hospital will not require decanting as the new construction will not impact on existing infrastructure. The existing Pioneer Ward will be refurbished for Dental and for Primary Health Services. Decanting of this building will be minimal however it will impact Administration, Pharmacy and Primary Health Services. It is proposed that Administration and Primary Health services are decanted into existing ward space during the refurbishment of the Pioneer Ward. Administration services are to be moved into the ground floor of the existing ward building.
Figure 6 Option 2 Concept Plan
7.3.2 Capital Cost

Option 2 costings are a standalone staged approach to a new facility and does not include any of Option 1 works. This option provides over 11,500m$^2$ of completely new facility with 2,300m$^2$ of carparking. In comparative terms, it provides the similar total floor area compared to the existing facility. The broad order of costs for this option totals $87 million procured under a two stage managing contract form. The costs do not rely on building services being supported by the existing facility and are standalone extensions. This estimate of costs takes into account provision for staging, decanting, furniture, fittings and equipment. A detailed breakdown is included in the appendix.

The location and factors affecting construction of a facility of this size in Atherton has been taken into account, as well as the availability of local suppliers and manufacturers in the area. Although there are some local trades available, it is envisaged a Tier 1 contractor and similarly sized subcontractors from Cairns (90 mins drive) would be required to deliver a project of this significance.

7.3.3 Whole of Life Costs

The new facility should be designed with Green Star developments at the time of construction and it would be anticipated the all new facility would produce significant efficiencies in recurrent costings and ongoing capital expenditure. The weather in regional locations of Far North Queensland would require diligent investigations to contend with humidity, high rainfall, wind (cyclones), heat and availability of skilled maintenance personnel in regional locations.

7.3.4 Advantages

*Option 2* will address the all the departments that are most at risk and will ensure their compliance with the Australasian Health Facility Guidelines. It will mitigate existing risks to staff, patients and visitors and will increase general efficiency throughout all of the departments. There will be little impact on core health service delivery to the departments during the refurbishment. *Option 2* will allow for cost effective staffing models and does not require the capital expenditure of Option 3.

7.3.5 Disadvantages

*Option 2* will not resolve all functional inefficiencies across the departments of administration and Primary Health Services. It does not address the ongoing maintenance issues associated with ongoing deterioration of existing structures therefore continued increases are anticipated as the remaining buildings continue to deteriorate. Similarly to Option 1, there may some unforeseen costs due to the age and condition of existing remaining infrastructure. Other disadvantages may include the disruption to service due to noise and decanting of some departments during refurbishment.
7.4 Option 3 – Significant Redevelopment

7.4.1 Scope of this Option

Option 3 is a full staged rebuild of the entire hospital campus on the Greenfield land adjacent to the existing infrastructure. Phase 1 of the development will give priority to essential services of the Emergency Department, Operating Theatres, X-ray, Pathology, Pharmacy, Maternity, General Wards and Medical Records. There is no requirement for decanting of hospital services during Phase 1, however, the helipad and the existing staff car park are relocated (on campus) for site development.

The administration building would be constructed in the second phase of the development as would the refurbishment of the Pioneer Ward for Primary Health and Dental services. Phase 2 of development will involve the decanting of Administration and Primary Health Services into either demountables or existing ward space.

Existing buildings (exception of the Pioneer building) are demolished and materials removed from site. The available Brownfield land is to be converted into parkland with facilities that compliment health promotion and healing. The park would add value to the patients, visitors and staff.
Figure 7  Option 3 Concept Plan
7.4.2 Capital Cost

Option 3 is similar to Option 2 though provides new administration space adding a further 650m² with carparking remaining the same. This option has a broad order of costs of $88.9 million. The heritage buildings have been retained for re-use though the remaining buildings are demolished at completion of each decanting phase in both Options 2 and 3. This estimate of costs takes into account provision for staging, decanting, furniture, fittings and equipment. A detailed breakdown is included in the appendix.

7.4.3 Whole of Life Costs

As with Option 2, the remaining component of the masterplan provides for new spaces designed with Green Star initiatives and remaining heritage buildings to be refurbished to extend their life for administration and allied health purposes.

7.4.4 Advantages

Option 3 will ensure the hospital complies with the Australasian Health Facility Guidelines and will provide for better management the hospital’s ongoing operating expenditure through reducing energy and maintenance requirements. It will improve the overall efficiency and safety of health service delivery to the Atherton and surrounding service and outreach regions and will be a positive influence in attracting medical staff to the region. This Option will provide for minimal disruption to service delivery and will free up the Pioneer Building for administration or community office use.

7.4.5 Disadvantages

Option 3 is the highest capital investment and will require significant upfront financial commitment. There will be minor disruption in access to the staff car park and the helipad. The helipad will need to be temporarily relocated until building construction is complete. There may also be some minor disruption due to noise during certain phases of construction.
### 8. Options Analysis

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9. Acronyms and Abbreviations

Throughout this study various terms, definitions and abbreviations are used in relation to findings and are contained in the following list:

CSD – Central Sterilising Department
CCTV – Closed Circuit Television
AHFG – Australasian Health Facility Guidelines
SSO – Switch Socket Outlets
HEPA - High Efficiency Particle Filter
BCA - Building Codes of Australia