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Preliminary Infrastructure Planning Study for Caboolture Hospital

Volume 1 of 2

August 2010

Endorsed by HIPEC

Please note:

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Information contained within this study is valid as at the date of issue only.

About this study

The Preliminary Infrastructure Planning Study for Caboolture Hospital was commissioned by Queensland Health through Project Services Department of Public Works on 28 May 2010. This study investigates future infrastructure for Caboolture Hospital based on the Service Activity Data Report endorsed by Queensland Health's Integrated Policy and Planning Executive Committee on 21 June 2010.

This Preliminary Infrastructure Planning Study was undertaken from 2 July 2010 to 16 August 2010 and was prepared by Peddle Thorp Architects with assistance from Cushway Blackford & Associates, Bligh Tanner Consulting Engineers, Rider Levett Bucknall, Crest Building Approvals under the direction of Queensland Health's Planning and Coordination Branch. Every effort has been made by Peddle Thorp Architects to investigate and document in sufficient detail—and within the timeframe—the infrastructure issues, gaps and requirements for Queensland Health in relation to Caboolture Hospital future service provision.

Assumptions

- Community Health Services Building is outside the scope of this study.
- The Mental Health Services Building (existing and proposed) are outside of the scope of this study except for impacts on site infrastructure
- The Caboolture Private Hospital operated by Ramsay Health is a Build, Own, Operate and Transfer scheme. The contract commenced in May 1998 for a 25 years period (2023) with a 20 year option (2043). This building is able to be considered for reuse but not for demolition.
- Redevelopment options have been developed to meet 2026/27 projections from Queensland Health Service Activity Data Report. Options have not been developed for intermediate (for example 2016) service demands.
- Queensland Health will be able to acquire the use of land on the southern boundary currently used by Caboolture State High School.
- Queensland Health will be able to facilitate secondary access to the site at the south eastern corner from the roundabout at Mewett Street and Morning View Drive.
- Extended pathology requirements including potential provision of anatomical pathology require further review and therefore are not included in the options contained within the study. This will require further consideration and review in the next phase of planning.
- Current draft Clinical Service Capability Framework version 3.0 service levels are assumed.

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Note: Volume 2 provides detailed support information covering engineering and building condition assessment and comparison of areas to the Australasian Health Facility Guidelines.

Acknowledgements

In preparing the Preliminary Infrastructure Planning Study the consultants acknowledge the planning contained in the *Caboolture Hospital Site Development Plan 2009* (Peddle Thorp Architects) and *Hospital Scoping Study* (Carla Cranny and Associates 2008).

The study has been prepared by Peddle Thorp Architects with input from the following sub-consultants:

- Bligh Tanner Consulting Engineers
- Cushway Blackford & Associates Pty Ltd
- Crest Building Approvals
- Rider Levett Bucknall

The study has been prepared under the direction of:

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with the assistance of:

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- John Singleton, Manager Building Engineering and Maintenance Services, Metro North Health Service District
- David Smith, Engineering Building Engineering and Maintenance Services, Metro North Health Service District
- Judy Marshall, Director, Capital Delivery Program, Queensland Health
- Di Morgan, Project Manager – Metro North, Capital Delivery Program, Queensland Health

Key project team members who have worked on this study are recorded in Volume 2, Appendix 1.

The time, interest, care and comments of all those involved are greatly appreciated.

Commercial-in-confidence

This document may contain commercial-in-confidence information. The document has been produced for the sole use of Queensland Health, and should not be provided to external organisations without the written approval of the Deputy Director-General, Health Planning and Infrastructure Division, Queensland Health.

1 Executive summary

This study has been prepared in order to provide Queensland Health with a summary of existing Queensland Health infrastructure on the Caboolture Hospital site and the proposal and evaluation of three options to meet the predicted service demand of 2026.

Site visits, reviews of existing documentation, photography, discussions with Hospital personnel and enquiries to Moreton Bay Regional Council were undertaken to establish current state of infrastructure on the Caboolture Hospital Campus.

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.

Input from Structural, Civil, Electrical, Hydraulic and Mechanical Engineers was incorporated into the study as well as a review by a Building Surveyor and Architect.

The three options explored were reviewed against existing site conditions and infrastructure. Site density, access and car parking requirements emerged as significant issues impacting the development of the site.

When addressing the supplied projections of bed numbers required at Caboolture Hospital by 2026, it is apparent that the Hospital will experience significant expansion from 199 to 578 beds (including same day beds and bed alternatives). This expanded service will result in a number of operational and clinical support services currently at capacity requiring expansion if the Hospital is to meet the increased activity.

The scale of expansion required at Caboolture Hospital to meet the service needs of 2026 is such that there is no possibility of meeting it within the existing building stock.

The current permanent buildings are largely sound but typical inpatient accommodation is a ward of approximately 776m² which falls well short of the average ward areas suggested by Australasian Health Facility Guidelines of approximately 1,200m².

The Emergency Department has already been identified as having urgent need for more space, noting that some of this requirement will be addressed with a marginal increase through current funded Queensland Health works.

Option 1 (Status Quo) – delivers only on the “make safe and keep operating” promise but does not permit any increase in service provision that accommodates future health service need. To maintain status quo a number of requirements will need to be undertaken including; addressing upgrading of demountable accommodation, replacement of the analogue Master Antenna Television system, stabilization of the current Information Communications and Technology system, provision of signage and bollards to alleviate unsafe parking practice and replacement of kitchen equipment to increase the capacity of the existing kitchen. The projected service levels for 2026 cannot be met in the current facilities and will therefore not be addressed in Option 1.

Cost estimates prepared for Option 1 total \$1.403 million (excluding GST) (Category 2 cost estimate at July 2010).

Option 2 (multi-stage redevelopment) – is a progression from the previous site development planning carried out in 2009 and comprises substantial refurbishment and extensions and reconstructs the Hospital over a series of stages. It starts with the creation of a new Outpatient and Allied Health building and the construction of the first level of a future four storey building. This level is proposed to house Administration, Education and Training and Medical Officer Workplace Facilities. The combination of both of these buildings will allow for the relocation of these services from the existing building enabling the relocation and expansion of the Emergency Department into vacated Outpatient space and the refurbishment of Level 3 Administration into Inpatient accommodation.

These initial stages would require a major commitment to the provision of alternative car parking areas. The increase in inpatient beds places more immediate pressure on operational support functions (for example, kitchen) and therefore consideration has been given to rebuild and expand these services at an early phase of this Option. Future stages of this Option revolve around the provision of nine new build 30 bed wards and the extensive refurbishment and extension of existing Level 2 Operating Theatre floor to provide Intensive Care Unit, expanded Coronary Care Unit, recovery and Day Surgery / procedure areas.

Cost estimates prepared for Option 2 total \$548.511million (excluding GST) (Category 2 cost estimate at July 2010).

Option 3 (significant new build) – represents a significant new build and extensive refurbishment of the existing main hospital building. In order to progress this Option the early construction of car parking would be required. This Option is sited to the east of the site and wraps around the existing Private Hospital.

The proposed new multi-storey building will accommodate Emergency Department, Medical Imaging, Operating Theatres, Intensive Care Unit, Central Sterilising Department and other “hot floor” departments are planned immediately above the Emergency Department. There are also 10 new inpatient wards, Education and Training and new entry and admissions.

The existing main Hospital building is retained and used to house a mixture of clinical and non-clinical activities such as Administration, Allied Health, sub-acute inpatient accommodation (for example, palliative care, rehabilitation, geriatric management unit), birthing suites and special care nurseries on Level 2 which link to the new building “hot floor”.

The existing Private Hospital could provide for outpatient and medical records once it comes out of contract in 2023 (noting that this contract has a further 20 year option which can be considered).

Cost estimates prepared for Option 3 total \$611.698 million (excluding GST) (Category 2 cost estimate at July 2010).

These three options represent varying degrees of accommodation when measured against the Service Activity Data Report and the Australasian Health Facility Guidelines.

Option 1 (Status Quo) does not address the current pressure and future service demands at this site. Pursuing this Option may result in a breakdown of services even in the short term with the inevitable pressure of the additional committed Mental Health beds. Car parking and the resurfacing of car park and pathways also appears to be a pressing requirement.

Option 2 would largely accommodate all the space requirements with the exception of some Community Health services which would require further consideration of relocation.

Option 3 completely accommodates the space requirements generated by the Service Activity Data Report and the Australasian Health Facility Guidelines, although some of the sub-acute inpatient ward areas refurbished in the existing building may be slightly compromised. The proximity of the Emergency Department to Mental Health would require some protocol decision making on the transfer of patients between the two areas.

An options analysis has been incorporated within the study which reviews the benefits and risks of each option. It is important to stress that Option 1 will not meet future service demands nor will it achieve full compliance to current standards. Option 2 and 3 provide viable solutions to address non compliance and the scale of future health service needs, noting that Option 3 will fully meet both the Australasian Health Facility Guidelines and the projected requirements within the Service Activity Data Report.

2 Introduction

Caboolture (particularly Caboolture West) has been identified as a high growth area in the *South East Queensland Regional Plan 2009-31*. Significant growth in demand for health services is occurring in this area due to high population growth.

The total estimated resident population of Caboolture Local Government Area in 2008 was 127,486. The population is projected to increase by 72,672 persons to a total of 200,158 (an increase of 57 per cent) between 2008 and 2021. The highest percentage growth will occur in the 65+ age group—projected to grow by 30,802 people—an increase of 164 per cent.

The population growth, particularly in the 65+ age group, will add significant pressure on an already constrained health service. The following health service increases at Caboolture Hospital will be required:

- Overnight beds will need to grow from current physical capacity of 180 to 482 by 2026/27 (an increase of 167 per cent)
- Same day beds/bed alternatives will need to grow from current physical capacity of 20 beds to 70 beds by 2026/27 (an increase of 250 per cent). Increases in same day activity in 2026/27 will be for diagnostic gastrointestinal endoscopy, orthopaedics and non-subspecialty surgery.
- Emergency Department treatment bays will need to grow from its current 26 bays to 63 bays by 2026/27 (an increase of 142 per cent)
- Kilcoy Hospital will need to growth from its current physical capacity of 21 beds to 27 beds by 2026/27.

The Preliminary Infrastructure Planning Study aims to identify infrastructure options to address the identified health service requirements at Caboolture Hospital to 2026/27. The Preliminary Infrastructure Planning Study incorporates an assessment of the condition of the buildings and building services, the impacts on the delivery of health services on the existing campus and identification of options to address infrastructure gaps.

2.1 Objectives

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 service requirements as identified by Queensland Health
- 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

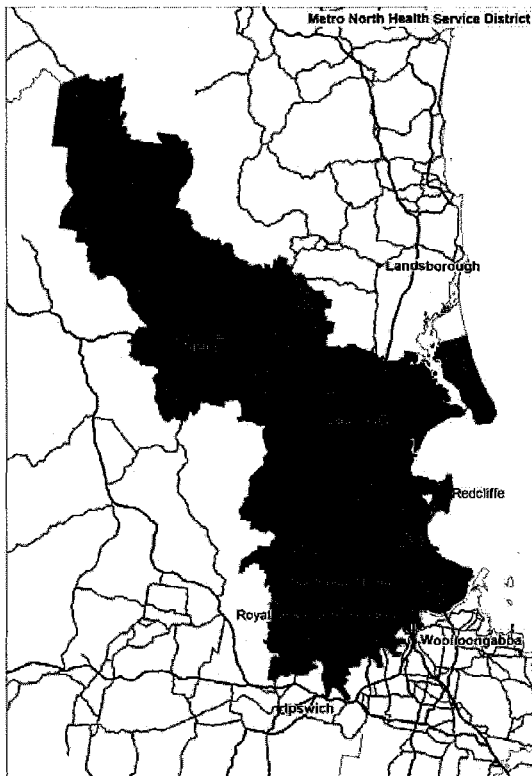
The Metro North Health Service District covers an area of 4157 square kilometres and extends from the Brisbane River to north of Kilcoy. A range of health services is provided by the District including services at the Royal Brisbane and Women's, The Prince Charles, Redcliffe, Caboolture and Kilcoy Hospitals.

The Caboolture Hospital site comprising of 9.56 hectares is located approximately two kilometres from the Caboolture Business District and three kilometres from the Bruce Highway which provides the principal road link to Brisbane.

Caboolture is located north of metropolitan Brisbane in the Moreton Bay Regional Council area. The Caboolture Hospital geographic catchment consists of the following Statistical Local Areas: Bribie Island, Burpengary–Narangba, Caboolture Central, Caboolture East, Caboolture Midwest, Caboolture Hinterland and Morayfield. Although the Statistical Local Area of Deception Bay is currently included in the Caboolture Hospital catchment, data analysis indicates that approximately 90 per cent of Deception Bay patients flow to Redcliffe Hospital, therefore for planning purposes it has not been included in the Caboolture catchment.

Kilcoy is located in the western area of the District, its geographic catchment is that of the Kilcoy Statistical Local Area. The Kilcoy Hospital is managed by the Executive of Caboolture Hospital due to its geographic proximity and complementary role to Caboolture Hospital in the provision of primary health, sub-acute, ambulatory care and rehabilitation services.

Diagram 1: Map of the Metro North Health Service District

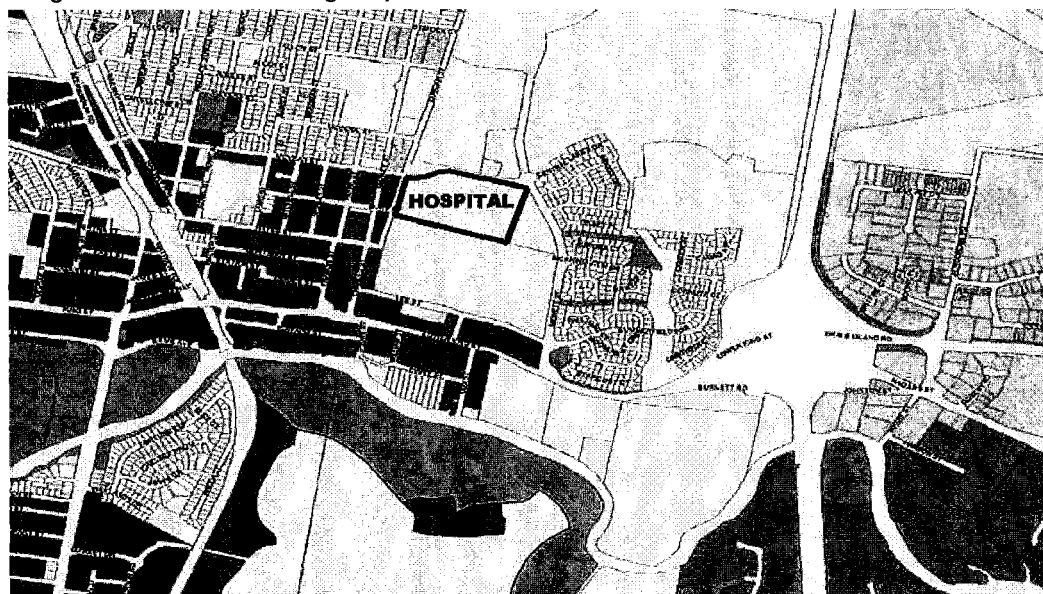


Source: QHEPS

3.2 Caboolture Hospital site

The Hospital site is bounded to the north by McKean Street with a private school opposite; to the east by a Nursing Home; to the south by a public school; and to the west by a residential street. The southern boundary is dominated by school playing fields for some considerable distance. The northern aspect dominated by the private school is characterized by low density buildings and a shopping centre under construction. To the east and west, the residential neighbourhoods are low density, typically single houses. Refer **Error! Reference source not found.**

Diagram 2: Town Planning Map

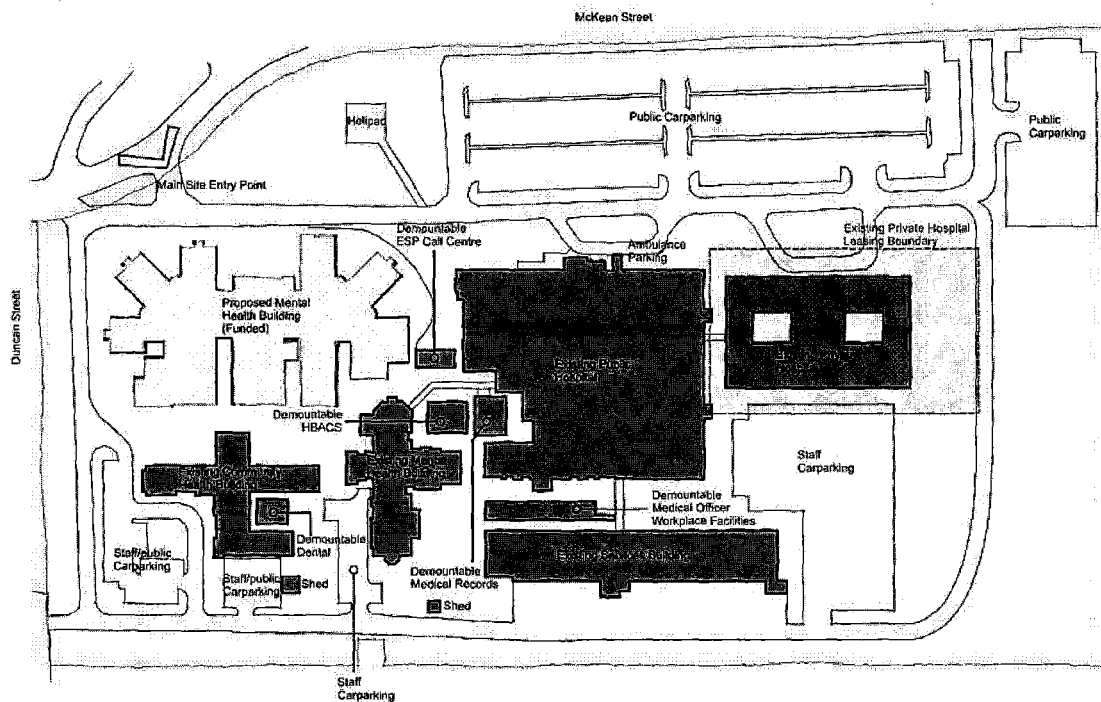


The site is generally flat but a natural water course / overland flow path across the site from west to east of the site causes issues during heavy rainfall with the ground becoming saturated and standing surface water remaining on site.

Whilst the buildings on the site are above flood level the road network is subject to inundation and there may be difficulty for patients seeking health services and staff travelling to work from some areas.

There is a Private Sector Hospital operated on a leased parcel of land contained within the Caboolture Hospital site which is a significant planning constraint. Refer Diagram 3 over page.

Diagram 3: Existing Site Plan



3.2.1 Vehicle access

The main entry is from the north-west corner off McKean Street near Duncan Street. A secondary access is located near the Community Health Buildings off Duncan Street near Bury Street.

This existing vehicle access to the acute Hospital is considered poor, whilst it is unambiguous with access to the site from two vehicular entry points, there are conflicts between private and emergency vehicles. The majority of public car parking with an estimated capacity of 705 vehicles is provided on-grade to the north and west of the Hospital buildings.

3.3 Caboolture Hospital building history

The Department of Public Works, Project Services, published the Caboolture Hospital Space Utilisation Audit on 30 November 2007 (Space Utilisation Audit). This document included an analysis by area of each of the buildings constructed on site as at November 2007 with an approximate date of the Building assessment number, an analysis by area of each clinical unit within the Hospital and a Building Act compliance Assessment.

The Space Utilisation Audit indicates original building construction in 1976 (Community Health and Building 7 – Demountable) followed by the Clinical and Ward Building in 1992. Significant expansion and construction was then undertaken in 1998 which included the main Hospital building. A number of demountables have also been constructed on the site with the most recent being added in 2007.

3.4 Existing built environment

The Caboolture Hospital site consists of various buildings between one to four storeys in height. Each of the buildings is interconnected with paths and walkways. Single storey

temporary demountable buildings have been located around and between the main buildings. The majority of the buildings on the site have been constructed at different stages over the last 18 years, with the original Clinical Building and Ward Building built in 1992 with a major extension to the main Hospital built to the East of the existing buildings in 1998. This subsequent development served to create an internal courtyard to the main Hospital area which is currently being used as a breakout area and holds the Chapel.

The buildings located within the boundary of the Caboolture Hospital campus include:

- Existing Private Hospital – single storey building – (out of scope of this study)
- Adult Mental Health unit – single storey building
- Community Health Centre – single storey building – (out of scope of this study)
- Services building – single storey
- Central Plant
 - Facilities Management
 - Kitchen and Staff Dining areas
 - Stores and Linen
- Main Public Hospital building – interconnected multi-storey buildings
 - Emergency Department
 - Outpatients Department
 - Medical Imaging
 - Allied Health
 - Maternity
 - Patient Wards
 - Operating Theatres
 - Administration and Education
- Chapel – single storey building, located within the courtyard area bounded by the main Hospital buildings.
- Human Resources Services building – single storey temporary demountable
- Hospital Based Acute Care Services building – single storey temporary demountable
- Medical Records building - single storey temporary demountable
- Mental Health and Medical Officer Accommodation – single storey temporary demountable

3.5 Caboolture Hospital maintenance issues

No major maintenance issues were uncovered except for the Private Automatic Branch Exchange (telephone system) and Hospital television system both are covered by Information Communication and Technology and generally out of scope of this study. Replacement of the patient entertainment television system has been included within Option 1 as the current system will become obsolete when the analogue television broadcast signal is withdrawn.

3.6 Caboolture Hospital development proposals

Recent endorsed infrastructure assessments and concept plans and any current commitments (government and other) for capital, including infrastructure and significant equipment are noted below:

- Caboolture Adult Acute Mental Health Unit (\$24.7 million) – in construction on site
- Caboolture Paediatric expansion (\$9.7 million) – in construction on site
- Caboolture Education and Training (\$9.6 million) – recent Commonwealth announcement under the Innovative Clinical Teaching and Training Grant scheme.

3.7 Site constraints

3.7.1 Heritage issues

The Queensland Heritage Register, maintained by the Environmental Protection Agency under the *Queensland Heritage Act 1992* does not list any heritage listed buildings on the Caboolture Hospital site.

3.7.2 Town planning / designation issues

The site is located within the region of the recently amalgamated local authority Moreton Bay Regional Council.

A new town plan for the Caboolture has been released which designates the site as “Special Uses”. This is an appropriate zoning for the continued future development of the Caboolture Hospital.

General Town Planning requirements which affect the site include:

- building height
- building scale and bulk
- set-backs.

In the broader context, the *South East Queensland Regional Plan 2009 – 2031* was released on the 28 July 2010. It confirms the status of West Moreton and Caboolture West, adjacent to the Caboolture Urban Footprint, in particular as an Identified Growth Area, and also acknowledges health education and technology as key areas of employment.

3.8 Consultation

Peddle Thorp Architects have consulted extensively with Queensland Health representatives throughout the development of this study. In particular contribution from Caroline Weaver, Executive Director, Caboolture and Kilcoy Hospitals, Metro North Health Service District is acknowledged.

The consultants met with the onsite District representatives at an initial site visit and have had ongoing meetings with the Project Review Group, which has reviewed the development of the study.

Other key Hospital staff have also been consulted regarding health service provision and current infrastructure.

4 Health services

4.1 Design and functionality of facility

The existing Hospital facility is located in the centre of the site with a logical public interface area facing the street and the support services including loading dock, stores, Building Engineering and Maintenance Services and kitchen facilities, located at the rear of the site. The principal multi-level building contains the Outpatients Department, Emergency Department, Medical Imaging and Allied Health at ground level known as Level 1. There is a "hot" floor, with Operating Theatres, Critical Care, Birthing Suites, Maternity, Special Care Nursery and Surgical Inpatient Wards located on Level 2. Level 3 houses inpatient wards and Level 4 accommodates Administration and Training Facilities in what was previously ward accommodation. In summary there is an orthodox functional arrangement of key areas which works but has reached the limit of its capacity to deliver health services. The advantages for expansion of locating the building in the centre of the site have been thwarted by the development of the Mental Health Unit and Community Health Unit to the west and the Private Hospital to the east.

4.2 Future health services

Bed requirements for Caboolture Hospital were calculated using endorsed Queensland Health service planning benchmarks where available. Where no endorsed benchmarks are available, benchmarks have been drawn from various sources including Queensland Health Statewide Health Service Plans, Victorian Capital Planning Benchmarks and Australian College of Emergency Medicine. Current models of care, referral patterns and admission practices were applied.

The bed types and treatment spaces set out in Table 1 reflect the categories according to definitions in the *Review of the More Beds for Hospitals Strategy* including overnight beds, same day beds and bed alternatives.

Table 1: Current and future bed requirements (bed projections)

Item	Current capacity	Proposed capacity by 2014	Requirements 2016/17	Requirements 2021/22	Requirements 2026/27
Category A: Beds					
A1. Overnight Beds					
Medical	58	58	112	141	164
Medical Assessment Planning Unit	0	0	12	12	18
Surgical	26	26	29	34	39
Orthopaedics Medical/Surgical Ward	0	0	35	44	53
Obstetrics	26	26	27	31	32
Paediatrics	21	21	12	13	14
Intensive Care Unit/High Dependency Unit	0	2*	4	4	6
Coronary Care Unit	8	8	5	7	8
Special Care Nursery Level 2	12	12	15	17	18
Emergency Department Short Stay Unit beds (Adult)	0	0	12	14	16
Emergency Department Short Stay Unit beds (Paediatric)	0	5**	5	5	5
Sub- and Non-Acute – Rehabilitation	0	0	17	23	31
Sub- and Non-Acute – Geriatric Evaluation Management	0	0	16	22	29

Item	Current capacity	Proposed capacity by 2014	Requirements 2016/17	Requirements 2021/22	Requirements 2026/27
Sub- and Non-Acute – Palliative Care	0	0	4	6	8
Total overnight beds (excluding mental health)	151	158	305	373	441
A2. Same Day Beds					
Endoscopy Day Unit	3	3	4	5	5
Surgical	4	4	7	8	9
Antenatal Assessment Unit beds	4	4	4	4	4
Antenatal Assessment Unit chairs	0	0	2	2	2
Total same day beds	11	11	17	19	20
A3. Bed Alternatives					
Chemotherapy Chairs/Trolleys (dependent on Cancer Care Centre and Metro North Health Service District strategic directions)	0	0	10	10	10
Renal Dialysis Chairs/Trolleys	2	2	11	17	26
Dental Chairs	7	7	12	12	14
Total bed alternatives	9	9	33	39	50
Totals for Category A					
Total A1 Overnight beds	151	158	305	373	441

Item	Current capacity	Proposed capacity by 2014	Requirements 2016/17	Requirements 2021/22	Requirements 2026/27
Total A2 Same day beds	11	11	17	19	20
Total A3 Bed alternatives	9	9	33	39	50
Total overnight, same day beds and bed alternatives	171	178	355	431	511
Category B: Emergency Department treatment spaces					
Total emergency treatment spaces (including adult and paediatric spaces)	26	34**	50	57	63
Category C: Operating/Intervention Rooms					
Medical Imaging – Computed Tomography (CT) Scan	1	1	3	3	3
Medical Imaging – General X-Ray	2	2	4	5	5
Medical Imaging – Mammography	1	1	2	2	2
Medical Imaging – Ultrasound	3	3	5	6	6
Medical Imaging – Magnetic Resonance Imaging (MRI)	1	1	2	2	2
Fluoroscopy	0	0	2	2	2
Operating Theatre + one Procedure Room	5	5	5	6	7
Endoscopy Procedure Room	1	1	1	1	1
Endoscopy Recovery Bays	0	0	6	6	6

Item	Current capacity	Proposed capacity by 2014	Requirements 2016/17	Requirements 2021/22	Requirements 2026/27
Theatre Recovery Bays (Stage 1=8; Stage 2=4)	12	12	10	12	14
Delivery Suites	7	7	7	10	10
Category D: Consultation/Treatment/Procedure Rooms					
Outpatient /Ambulatory care unit clinics	30	34**	56	65	71

Source : Queensland Health. Note: Mental Health and associated bed requirements are not within the scope of the Preliminary Evaluation. By 2011/12 there will be 67 overnight beds on the Caboolture Hospital campus. * Current funding submission for two Intensive Care Unit beds pending decision. ** The South East Queensland Paediatric Planning Report Implementation Plan 2009–2014 includes 8 Paediatric Emergency Department spaces, 4 outpatient department consult rooms, 5 short stay beds.

4.3 Infrastructure gaps

Caboolture Hospital is under significant pressure with current service demand already exceeding built capacity. Increases to service demand are predicted to continue with the infrastructure gap substantially widening and without significant expansion the infrastructure gap is anticipated to be broadly 42,400m² by 2026/27 (existing measured against benchmark Australasian Health Facility Guidelines).

In reviewing the Service Activity Data Report to 2026 all levels of activity except for Paediatric Inpatient and Mental Health activity are above the level supported by current capacity of the infrastructure.

With regard to building services, the required expansion to meet the projected needs in 2026 will necessitate significant upgrading of services, as outlined in the sub-consultant's reports in Volume 2.

Similarly for car parking, additional on-grade parking and / or multi-level parking will be required.

Some ward accommodation could be achieved if storage areas for larger items were provided. However it must be noted that the current ward areas fall below recommendations of Australasian Health Facility Guidelines for inpatient areas.

5 Inspection reports

5.1 Method

Site visits were conducted throughout the consultancy to ascertain detail on existing infrastructure and to assist in the development of options. Specific site visits are detailed below.

Architect: Peddle Thorp Architects

Architectural Staff: David Porgand – Director and Senior Architect
Elisa Knowlman – Senior Architect
Dustin Johnston – Architectural Assistant

Site Visits: 10 June 2010; 24 June 2010; 19 July 2010

Structural Engineering Consultant: Bligh Tanner Consulting Engineers

Engineering Staff: Rod Bligh – Director and Principal Engineer
Simon Kochanek – Senior Structural Engineer

Site Visit: 10 June 2010 – General overview of all buildings, review and copy of all available site documentation and detail building condition review.

Site Visit: 28 June 2010 – Follow-up site inspection to document building condition and review and inspect buildings not covered in initial inspection

Civil Engineering Consultant: Bligh Tanner Consulting Engineers

Engineering Staff: Daron Kraatz – Principal Civil Engineer

Site Visit: 10 June 2010 – General overview of site, site restraints, boundary conditions and buildings.

Building Certifier: Crest Building Approvals

Certifying Staff: John Tunney – Building Certifier

Site Visits: 9 July 2010; 10 July 2010

Electrical Engineering Consultant: Cushway Blackford Consulting Engineers

Electrical Staff: David Blackford
John Grace

Site Visits: 10 June 2010; 8 July 2010

Hydraulic Engineering Consultant: Cushway Blackford Consulting Engineers

Hydraulic Staff: David Blackford
Chris Tritton

Site Visits: 10 June 2010; 8 July 2010

Mechanical Engineering Consultant: Cushway Blackford Consulting Engineers

Mechanical Staff: David Blackford

Site Visits: 10 June 2010; 8 July 2010

5.2 Exclusions

Visual, non-destructive and non-invasive inspections were completed of the existing buildings.

The Structural Engineer (Bligh Tanner) has reported only on visible aspects of the buildings and their condition based on these visual inspections. All structural elements that were not visible due to existing surface finishes, wall linings, ceiling linings, floor linings or that were covered by other structural elements or hidden below ground have not been inspected and as such the structural serviceability and performance have not been documented in this study.

Structural exclusions include:

- Private Hospital Building
- Community Health Care building
- structural assessment and serviceability of structural elements not visible.

5.3 Current site and infrastructure condition

- General age of the buildings at the Caboolture Hospital is less than 20 years old.
- Permanent buildings on-site were observed to be in good condition and performing well in service.
- The Medical Records demountable building required urgent structural repairs and modifications and was reported by sub-consultants as unsafe for use in its current state. Queensland Health subsequently ceased use of the demountable pending full structural audit.
- With the exception of the Medical Records Building, general maintenance activities and regimes are expected to be sufficient in the short term to ensure the ongoing structural serviceability of the buildings.

Refer to the Structural Infrastructure Review document (Volume 2) for additional information and discussion of the structural condition of the buildings at the Caboolture Hospital site.

5.4 Building viability

Whilst the permanent structures on the Caboolture Hospital campus are viable, the change in area standards over the last 20 years results in most clinical areas not meeting all of the current standards.

The main buildings on the Caboolture Hospital site are less than 20 years old with the original Clinical and Ward building being completed in 1992 with a major extension following in 1998. From a structural perspective the buildings are currently performing in a serviceable state with no major defects observed throughout the site inspections. It would be expected that without any major improvements, and carrying out general standard maintenance activities and regimes that the building structures will continue to perform in a serviceable state for the next 30 years. (This assumes that the buildings continue to be used in accordance with their original specifications).

It is recommended that audits and inspections be carried out intermittently to identify at the earliest possible time any problems, defects or maintenance requirements that could lead to larger problems in the future. This would be in line with Queensland Health mandatory condition assessment audit process which is undertaken on a triennial basis.

The building structures for the single storey residential type construction (Adult Mental Health buildings) and the demountable buildings on site (Hospital Based Acute Care Services, Mental Health and Medical Officer accommodation), are expected to continue to perform adequately in service for the next 20 years. It is expected that these buildings will require a higher level of ongoing maintenance with increased superficial damage likely to occur over this time period as these buildings have been founded on high level footings and raft foundations (residential type construction), and will be more susceptible to seasonal movement from the highly reactive soils. The types of damage that would be expected to occur over the next 20 years that may require maintenance and repair include:

- cracking to external concrete areas and rectification of steps and trip hazards
- cracking to perimeter brickwork walls which require repair and possible underpinning of footings.

Refer to the Structural report (Volume 2) for recommendations and suggestions to minimise the seasonal movement to buildings with high level footings which will assist in minimising the long term damage to the structure.

6 Current risks

6.1 Building life

The main Hospital building was built in 1998. It is a building code requirement that where there is new building works and particularly changes of classification within any redevelopment project, the new work must be assessed against compliance with current standards. Generally, the permanent buildings on site are in good condition and can be expected to serve their current function.

The Medical Records demountable building is unsafe, overloaded and appears to have no termite barrier provisions. Following inspection, Queensland Health have closed this demountable building pending further structural assessment.

Current use of ward areas as storage proves that provision of appropriate storage is inadequate on most of the inpatient wards particularly on Paediatric, 2A and 3A Levels.

6.2 Fire

The provision of smoke control systems in accordance with Building Code of Australia Clause E2.2 – Pressurisation of exit stairs and fire sprinkler systems or zone smoke control system, requires that any refurbishment or change of use of significance must consider smoke control requirements. It is envisaged that this would impact all fire isolated stairways (except Stair No 8 which has a stair pressurisation system).

Attached walkways from demountable buildings to the main Hospital are not constructed in non-combustible material and may represent a fire escape hazard.

Lift shaft fire separation has not been inspected and it is suggested that a further study by a lift company consultant be undertaken to inspect and report on compliance.

The current demountables are below the recommended ceiling height of 2400mm and also are generally located within six metres of the main building, technically deemed a fire source feature to the main Hospital. The District is reviewing a possible fire engineering risk assessment approach for these buildings.

6.3 Accident

The condition of external paved walkways and roadways represent a trip hazard as they are uneven and in poor repair in places.

The restricted parking facilities have encouraged opportunistic parking on grassed areas around the loading dock area which brings smaller vehicles and additional pedestrians into conflict with larger goods vehicles and presents an accident risk.

6.4 Infection control

Frequency, position and number of handwash basins are below the current Queensland Health recommendations. Any new or refurbishment work would need to comply with current guidelines.

6.5 Security

Current staff car parking provisions could be improved to provide well lit and secure access to and from the Hospital.

6.6 Disadvantage to persons with a disability

Tactile and Braille signage and other indicators need to be reviewed if future work is undertaken in order to comply with new provisions of disabled access, identification and accessibility to sanitary facilities.

6.7 Staff, patient and visitor dissatisfaction

- Anecdotal evidence of dissatisfaction with sizes of patient waiting areas particularly in Outpatients and Emergency Department.
- Provision of secure child play areas.
- Staff canteen space.
- Emergency Department waiting times.
- Public canteen or coffee shop space.
- Public and staff car parking as demonstrated by the amount of opportunistic parking on grassed areas.

6.8 Other Issues

- This study has not addressed the provisions of service to bariatric patients and associated infrastructure impacts around access, accommodation and transportation, to body storage, including consideration of both visitors and patients. This issue will need further consideration within planning for any new work.
- Medical records – storage off site is an ongoing cost and the immediate necessity of providing replacement storage for unsafe demountable.
- Private Automatic Branch Exchange (telephone system) – Information Communication and Technology is outside the scope of this study but responses from the Hospital indicate that the system is fragile and at capacity.
- Master Antenna Television – analogue system will require conversion to digital with the broadcast of analogue signals being phased out in 2013. In modern installations, patient entertainment and nurse call are an integrated system. Discussion of Information Communication and Technology options at this level is outside the scope of this study.

7 Options

7.1 Option 1 – status quo (minimum requirements)

The facilities at the Caboolture Hospital are under pressure from current service demands, most strikingly in the Emergency Department and general Adult Inpatient accommodation.

When the predicted service figures for 2026 are extrapolated with the area requirements of the Australasian Health Facility Guidelines, there is no capacity to meet these within the existing floor space. Table 2 illustrates existing areas against projected 2026 area requirements.

Table 2: Existing Areas against projected 2026 area requirements

Department	Area Requirements*	Option 1 (Existing)	Option 2	Option 3
Total	42,879	14,275 plus 1250 Education and Training Facility**	Total 39,245 (23,415 New Build 15,150 Refurbished 680 Existing)	Total 43,405 (27,040 New Build 16,635 Refurbished)
Plus Travel and Engineering Services	15,007	Not incl.	11,665	14,366
Grand Total	57,886	15,525	50,910	57,771

* Area requirements to meet 2026 Service Activity Data Report based on Australasian Health Facility Guidelines.

** Recently funded through Commonwealth Innovative Clinical Teaching and Training Grant scheme.

Refer Volume 2 for detailed table.

7.1.1 Scope of this option

The following plans illustrate the existing Hospital campus and the required expansion to accommodate the areas generated by the 2026 projections. It should be noted that these requirements will not be met within a Status Quo Option.

As a minimum to maintain the Status Quo, the following issues must be addressed:

- removal or reconstruction of demountable accommodation
- upgrade of the current Information Communication and Technology which although outside of the scope of this study has best been described as fragile
- provision of an alternative solution to the improvised staff car parking along the loading dock area which places pedestrians and goods vehicles in conflict.
- sundry and minor code compliance issues that may be triggered by other work.

In general terms the existing engineering services that serve the Hospital will continue to serve the Hospital for the foreseeable future. However there is a limited space capacity within these systems to allow for changing requirements. In particular the existing electrical systems (substations, switchboards and generators are near full utilisation). Additionally the existing cooling system (chillers, towers, pumps etc) is also near full utilisation.

The Master Antenna Television system, which is currently an analogue system will not be suitable when the analogue signal is withdrawn and therefore the Master Antenna Television system should be replaced with a digital system.

The estimated construction time frame for Option 1 is 18 months.

7.1.2 Capital cost Estimate

The cost estimate has been prepared by Peddle Thorp Architects in association with Rider Levett Bucknall for Queensland Health.

The capital cost estimate is \$1.403 million (excluding GST) (Category 2 cost estimate at July 2010). This cost estimate excludes major building work, cost escalation after July 2010, land costs, land holding costs, headworks charges and Goods and Services Tax. The scope and cost estimate of this Option has been defined in greater detail in Volume 2.

7.1.3 Whole-of-life costs

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

In addition with service demand significantly exceeding built capacity it is considered likely that the deterioration of assets would be accelerated over standard predictions.

7.1.4 Advantages

The key advantage to the Status Quo option is lower build capital cost.

7.1.5 Disadvantages

The key disadvantages to the Status Quo option include:

- inability of infrastructure to meet service demand for 2011 and beyond
- non compliances to Australasian Health Facility Guidelines, Building Code and other standards across the Hospital infrastructure
- staff retention difficulties due to ageing infrastructure and inadequate environment to provide service provision
- lack of infrastructure which responds to contemporary good practice models of care and allows for innovation or change
- escalating maintenance costs due to age and deteriorating condition of infrastructure.

7.2 Option 2 – Refurbishment or expansion at existing site

This Option is a progression from previous site development planning carried out in 2009 that was based on a hospital services and scoping study completed in October 2008. To accommodate the space requirements generated from the Service Activity Data Report of June 2010, there has been further development and design of this scheme.

7.2.1 Scope of this option

This Option reconstructs the Hospital over a series of stages starting with the construction of a multi-storey car park in the north east corner of the site and an alternative access road from the roundabout at Mewett Street and Morning View Drive. The alternative access road will require the purchase of land from other State Government authorities.

This is followed by the construction of the new Outpatient and Allied Health building that will allow the vacated space of Outpatients to be extended and fitted out for Emergency Department and allowing Medical Imaging to expand into vacated Allied Health space.

During the course of this development and at the earliest possible stage, consideration will be given to the expansion or rebuild of kitchen facilities.

The recently announced Education and Training building will form the first level of a future four storey building accommodating Education and Training and Administration on the first level. With the completion of this stage and the decanting of those departments, areas on Level 3 of the main building could be refurbished to accommodate new inpatient beds.

Further stages of work include the development of three levels of ward accommodation (nine x 30 beds) above the Administration and Education departments and links into the existing building.

The existing Caboolture Private Hospital would be reused and extended to accommodate Maternity Inpatient, Birthing Suites, Special Care Nursery and Antenatal Clinic.

Other considerations, inclusions and exclusions:

- relocated helipad
- construction of multi-storey staff car park
- relocation and expansion of mortuary and autopsy facilities
- Alcohol, Tobacco and Other Drugs Services have not been accommodated within this Option and its location will need to be considered within the next phase.

From a structural perspective there are no underlying difficulties associated with completing the new Education and Training building proposed for the south-west corner of the site. This new building could be constructed with minimal impact to the existing facility. The multi-storey car park could also be constructed without significant difficulty, however provisions would have to be made for the displaced car park bays that would be lost during the construction of the new car park.

There may be some limitations as to the extent of openings to the extended face of the existing buildings, particularly with the south-west extension.

As already noted, there is limited spare capacity within the existing engineering systems. Thus under this Option all of the existing engineering systems will be upgraded to suit the upgraded requirements. This will include:

- a new substation to service the expanded areas
- new main switchboard to service the expanded areas
- new generator to service the expanded areas
- new Uninterrupted Power Supply systems

- extension of the Information Communication and Technology system
- extension/replacement of the security system
- replacement of the Master Antenna Television system
- new nurse call systems to service the expanded areas
- extension replacement of the fire alarm and fire protection systems
- new vertical transportation systems
- new chiller system to service the expanded areas
- new and upgraded ventilation systems
- new medical gas systems to service the expanded areas
- new plumbing and drainage systems including rain water harvesting to service the expanded areas
- extension upgrading of hot water generation systems
- new fire hydrants and hose reels to service the expanded areas.

There does not appear to be any existing services which will be adversely impacted by this Option.

Additional negotiations will be required, particularly with Energex, to ensure that the additional load of the Hospital can be accommodated. In addition, discussions will need to take place with the local authority to determine capacity and flow rates of water supply to the site and these discussions may result in a requirement for water storage and pump systems.

While subject to direction from the Building Certifier, it is likely that the Energy Efficiency requirements of the Building Code of Australia will apply to both refurbished and expanded areas.

7.2.2 Capital cost estimate

The cost estimate has been prepared by Rider Levett Bucknall for Queensland Health.

The capital cost estimate is \$548.511 million (excluding GST) (Category 2 cost estimate at July 2010). This cost estimate excludes architectural enhancements to existing buildings, cost escalation after July 2010, land costs, land holding costs, headworks charges and Goods and Services Tax.

The estimated construction time frame for Option 2 is six years.

Further detail on capital cost estimate is contained in Volume 2.

7.2.3 Whole-of-life costs

As noted in Option 1, there is limited spare capacity within the existing engineering systems. Thus under this Option all of the existing engineering systems will have to be upgraded. As noted within Section 7.2.1

With the significant new build and refurbishment it is considered likely that maintenance and infrastructure running costs will be within an acceptable range and able to be managed within the Queensland Health maintenance funding policy of 2.15 per cent asset replacement value per annum.

7.2.4 Advantages

- The proximity of the Emergency Department to the Mental Health Unit is maintained in this Option.
- Staging allows for smaller scaled construction projects which can result in a speedier start to the resolution of current space limitations and immediately address and alleviate problems.
- Staged development provides the opportunity to tailor the design during the process to take advantage of new technology and improved work practices as the project progresses.

7.2.5 Disadvantages

- Continual disruption over an extended period of time is the principle disadvantage of this Option. Changing access and wayfinding can be disorientating and cause significant discord with Hospital staff, patients and visitors.
- The construction to the north of the existing main building is two storey and therefore does not maximise the density of site. Extensions to the single storey Private Hospital are also single level therefore taking a valuable footprint for minimum site development.
- Dental and Alcohol, Tobacco and Other Drugs Services are not accommodated in the main building but could perhaps be accommodated in Community Services Building which is not in scope of this study.
- The structural disadvantages with Option 2 are associated with the complications that could arise with extensions which interconnect with the existing buildings. At these locations modifications to the existing building to ensure the bracing and stability of the building is maintained may be costly, complicated in the general planning sense and disruptive to the current operation of the Hospital.
- The extensions to the north of the site are not expected to be overly complicated from a structural perspective with the existing building documentation clearly indicating that existing wall framing and floor slabs are supported on perimeter edge beams. This will allow for the new buildings to be interconnected and walls removed without significant complications. The structural works associated with interconnecting the new Paediatric extension to the existing building may be significantly complicated if it is confirmed that the interconnecting walls are in fact load bearing walls that also provide lateral stability – this would need to be investigated in subsequent planning stages.
- Piling of new building extensions and general construction works will be noisy and may be disruptive to the operations of the Hospital at these locations.
- Construction noise, vibration, activity and dust infiltration has to be dealt with over an extended period of time.
- Larger interface connection between existing and new areas which can cause problems if there is even slight differential movement.
- New designs locked into existing floor to floor heights which may be suboptimal for the reticulation of services.

7.3 Option 3 – significant redevelopment and refurbishment

This Option concentrates most of the site development in an 'L' shaped building around the Private Hospital. The highly clinical and technical areas of Medical Imaging, Emergency Department, Operating Theatres and Acute Inpatient areas are all accommodated in new building stock which will inherently present fewer design compromises than refurbishment of existing areas as new 'high end' clinical space.

7.3.1 Scope of this option

Stage one of this Option would still involve the construction of a multi-storey car park in the north west corner and the relocation of the helipad to the school sporting fields adjacent to the site.

The new road access from the roundabout at Mewett Street and Morning View Drive is fundamental to improve access for Emergency vehicles to the Emergency Department. The new alternative access road will require the purchase of land from other State Government authorities.

Inpatient accommodation is designed in a three level 'T' configuration around a central core. Each floor comprises three, 30 bed wards. Paediatric Inpatient ward is sited above the Intensive Care Unit on Level 3. The existing Private Hospital is refurbished to house Outpatients and Medical Records.

In this Option, two of the existing Operating rooms have been retained as part of the refurbished birthing suite. The number of Operating Theatres included in the new clinical building has not been reduced in the preliminary infrastructure plan. The balance of birthing theatres and new theatres will need to be reviewed in a later stage.

The new kitchen is constructed and links at all levels back into the existing Hospital building. Reuse of the existing main Building allows for the accommodation of ancillary and support services, sub-acute inpatient accommodation, Allied Health, Dental, Alcohol, Tobacco and Other Drugs Services and Birthing Suites, Special Care Nursery and Administration.

From a structural perspective there are no underlying difficulties associated with completing the buildings as proposed for Option 3 which would be considered more challenging or costly than a typical hospital building located at another site. The new buildings structures associated with Option 3 are expected to be as follows:

- multi-storey car park
- new free standing Hospital buildings
- east-west linking multi-storey corridor.

Connection of the link way into the western side of the existing building is expected not to require any significant structural modification to the existing building. The link way will be free standing and connect into the existing Hospital concrete edge beam with a non-load bearing expansion/contraction joint. New concrete and brick lintel beams may be required to be installed to support structural wall elements above the connection points.

From a services perspective, the following would be accommodated within Option 3:

- a new substation to service the expanded areas
- new main switchboard to service the expanded areas
- new generator to service the expanded areas
- new Uninterrupted Power Supply systems
- extension of the IT system
- extension/replacement of the security system

- replacement of the Master Antenna Television system
- new nurse call systems to service the expanded areas
- extension/replacement of the fire alarm and fire protection systems
- new vertical transportation systems
- new chiller system to service the expanded areas
- new and upgraded ventilation systems
- new medical gas systems to service the expanded areas
- new plumbing and drainage systems including rain water harvesting to service the expanded areas
- extension/upgrading of hot water generation systems
- new fire hydrants and hose reels to service the expanded areas.

There does not appear to be any existing services which will be adversely impacted by this Option.

Additional plant rooms, risers, etc. will be required to service the expanded areas.

Authority negotiations will be required, particularly with Energex, to ensure that the additional load of the Hospital can be accommodated. In addition, discussions will need to take place with the local authority to determine capacity and flow rates of water supply to the site and these discussions may result in a requirement for water storage and pump systems.

While subject to direction from the Building Certifier, it is likely that the Energy Efficiency requirements of the Building Code of Australia will apply to both refurbished and expanded areas.

7.3.2 Capital cost

The cost estimate has been prepared by Rider Levett Bucknall for Queensland Health.

The capital cost estimate is \$611.698 million (excluding GST) (Category 2 cost estimate at July 2010). This cost estimate excludes architectural enhancements to existing buildings, cost escalation after July 2010, land costs, land holding costs, headworks charges and Goods and Services Tax.

The estimated construction timeframe for Option 3 is five years, however the major building work is separate to the existing Hospital, therefore the impact of construction activity will be reduced over that indicated in Option 2.

Further detail on capital cost estimate is contained in Volume 2.

7.3.3 Whole-of-life costs

As with Option 2, this Option would effectively extend the operational life of the facility to 2026 and beyond. However as noted in Option 1, there is limited spare capacity within the existing engineering systems. Thus under this Option all of the existing engineering systems will have to be upgraded as noted within Section 7.3.1.

With the significant new build and refurbishment it is considered likely that maintenance and infrastructure running costs will be within an acceptable range and able to be managed within the Queensland Health maintenance funding policy of 2.15 per cent asset replacement value per annum.

7.3.4 Advantages

- New Paediatric unit above Emergency Department and Operating Theatres means the existing Paediatric Unit could be used for Rehabilitation unit and provide optimal outdoor access for patients.

- Increased area of new build allows for greater optimisation of structure including column grid setout and floor to floor heights.
- The construction of new clinical treatment and diagnostic areas facilitates the incorporation of Australasian Health Facility Guidelines and new technologies and practices.
- Defined building sites minimise disruption.
- Potential differential movement between existing and new floor space is more easily accommodated with walkway links.
- Ability to stage construction to allow some early relief to current problems with inpatient bed numbers.
- Structurally the new building can be constructed without significant disruption to the ongoing operation of the existing building. The new buildings can be built in stages or as part of one development.
- Increased ability to accommodate ecologically sustainable development principles within the design.
- The minimised number of connections into the existing Hospital reduces the complexity and costs associated with structurally modifying the existing buildings to accommodate the connection points. The structure to the multi-storey connection link to the east of the existing facility will be free standing and not require any structural modification to the buildings at the connection point and could be completed without the need to vacate this portion of the Hospital for any significant period of time.

7.3.5 Disadvantages

- The relative positions of the Emergency Department and Mental Health unit would require some decisions on the protocol relating to the transfer of patients from one area to another.
- Highest capital cost investment.

8 Options analysis

Options analysis has been undertaken in comparison to the principles as stipulated within the terms of reference for the Preliminary Infrastructure Planning Study:

- make maximum use of current infrastructure through refurbishment, refit, reconfigure and expansion, and if required, new infrastructure
- compliance with the current access code requirements including provision of the *Disability Discrimination Act 1992*
- achieve value for money in capital and recurrent costs without compromising service provision
- any proposed program of works shall not minimise the existing functionality of the facilities and not compromise the future development
- all options will consider, allow for and include environmentally sustainable design principles
- preferred option must demonstrate future proofing as a key principle.

Table 3: Option 1

Option features	<ul style="list-style-type: none"> • Continuation of existing level of service from existing buildings.
Rationale	<ul style="list-style-type: none"> • Current health care services continue to be delivered without modification to the buildings but should this occur the facilities will not meet the projected service demands.
Benefits	<ul style="list-style-type: none"> • Low capital expenditure.
Risks	<ul style="list-style-type: none"> • Functionality compromised due to increase service demand and inability to address demand within existing built capacity. • Service delivery will not be possible at Caboolture Hospital.
Assumptions	<ul style="list-style-type: none"> • Projected service demand is not met at Caboolture Hospital.
Criticality	<ul style="list-style-type: none"> • Not applicable as no major action taken.
Resource implications	<ul style="list-style-type: none"> • \$1.403 million (excluding GST) (capital cost investment)

Table 4: Option 2

Option features	<ul style="list-style-type: none"> • Refurbishment of diagnostic and treatment spaces, new build inpatient areas, staged construction. New multi-storey car parking.
Rationale	<ul style="list-style-type: none"> • Maximise reuse of existing infrastructure where possible and seeks to address service demand to 2026.
Benefits	<ul style="list-style-type: none"> • Makes maximum use of current infrastructure. • Ensures compliance with access code requirements. • Quicker resolution to pressing problems due to construction staging.
Risks	<ul style="list-style-type: none"> • Extensive and prolonged construction disruption, large interface of existing building to new build areas. • Allocation of funding.
Assumptions	<ul style="list-style-type: none"> • New road access from Mewett Street and acquisition of part of High School playing fields.
Criticality	<ul style="list-style-type: none"> • Date of transfer of Private Hospital.

Resource implications	<ul style="list-style-type: none"> • \$548.511 million (excluding GST) (Capital cost).
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Table 5: Option 3

Option features	<ul style="list-style-type: none"> • New build diagnostic and treatment areas, new build inpatient areas, reuse and refurbishment of existing Hospital building – new multi-storey car parking.
Rationale	<ul style="list-style-type: none"> • Maximises site density. Reuse of existing infrastructure largely for sub-acute and less clinical units .
Benefits	<ul style="list-style-type: none"> • Easier incorporation of Australasian Health Facility Guidelines and new technologies and practices into clinical diagnostic and treatment spaces. • Defined building sites minimise disruption. • Differential movement more easily handled in links between old and new and structural design optimised.
Risks	<ul style="list-style-type: none"> • Allocation of funding.
Assumptions	<ul style="list-style-type: none"> • New road access from Mewett Street and acquisition of part of High School playing fields. Relocation of Helipad.
Criticality	<ul style="list-style-type: none"> • Date of transfer of Private Hospital.
Resource implications	<ul style="list-style-type: none"> • \$611.698 million (excluding GST) (capital cost).

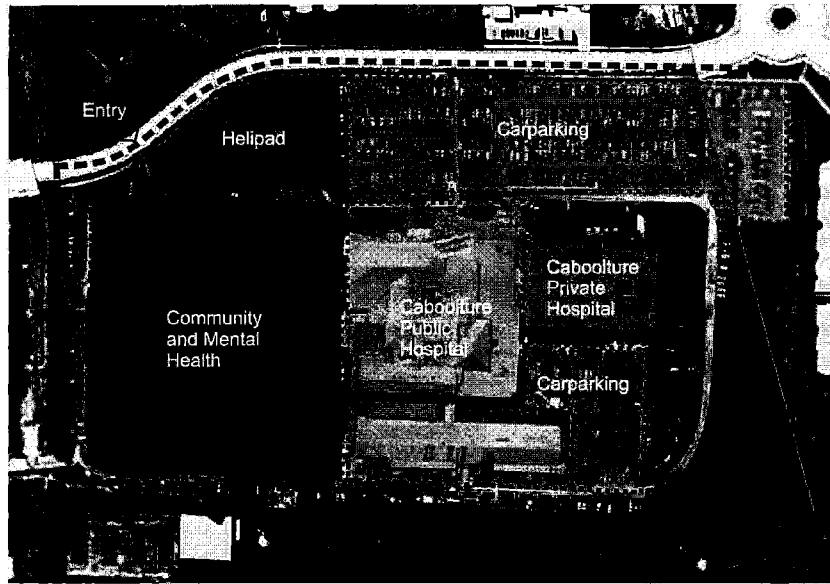


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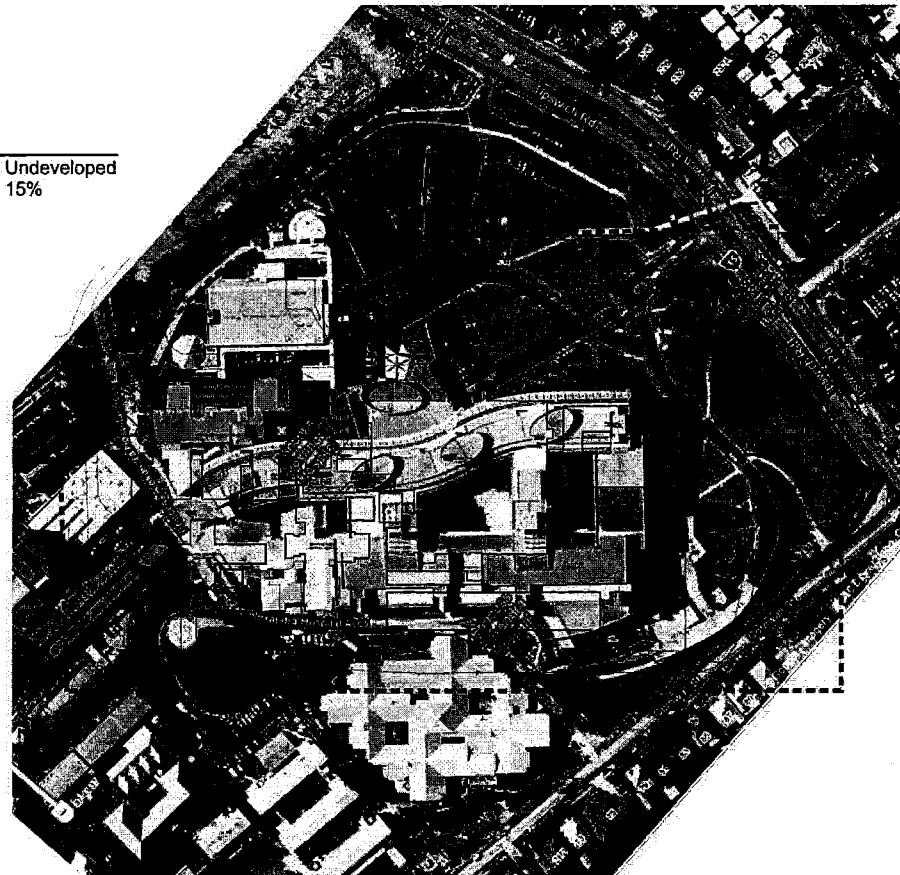
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Client: Queensland Health
 Project: Caboolture Hospital
 Title: Infrastructure Planning Study
 Site Location

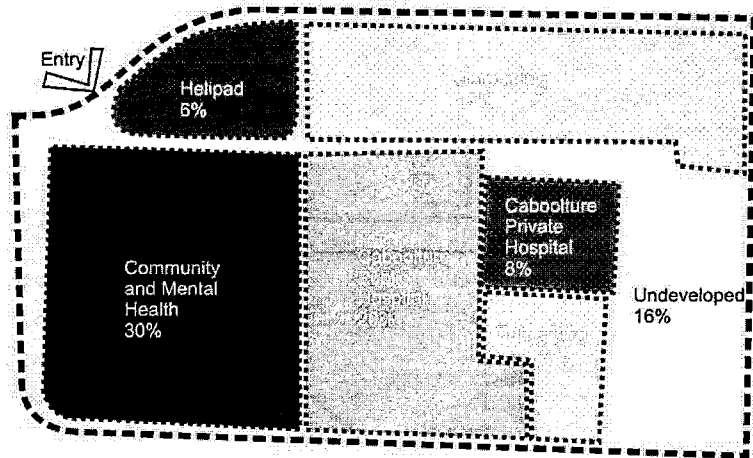
Project Number: 10.2379
 Date: June 2010
 Drawing Number: Mp001
 Revision: 1



Undeveloped
15%



Overlay of existing Caboolture Hospital site plan over the existing Princess Alexandra Hospital site satellite image



Total site area
approx 9.56 hectares



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CLIENT
Queensland Health

PROJECT
**Caboolture Hospital
Infrastructure Planning Study**

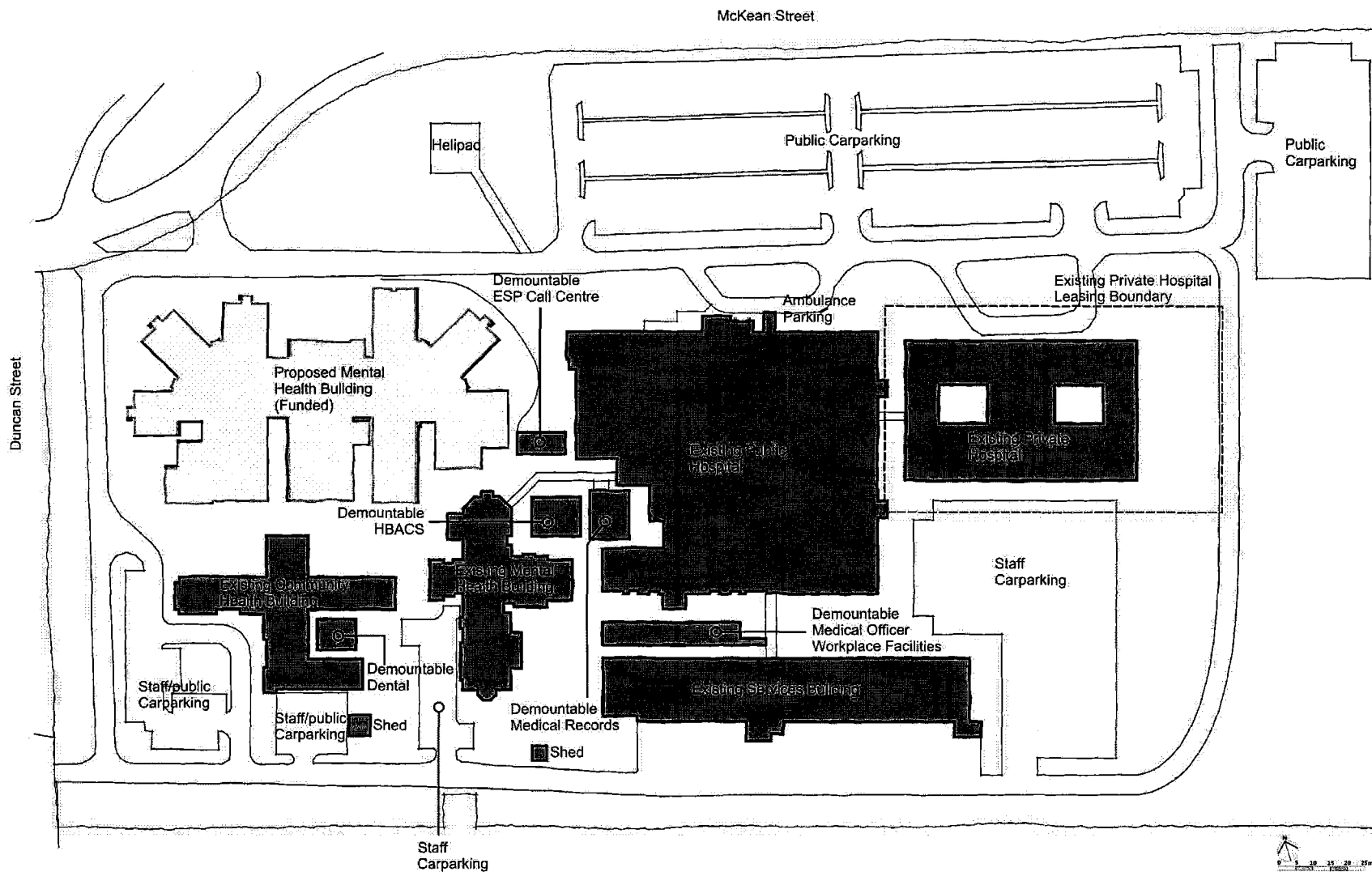
TITLE
Existing - Site Zoning

Project Number
10.2379

DATE
June 2010

DRAWING NUMBER
Mp002

REVISION
1



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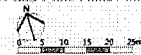
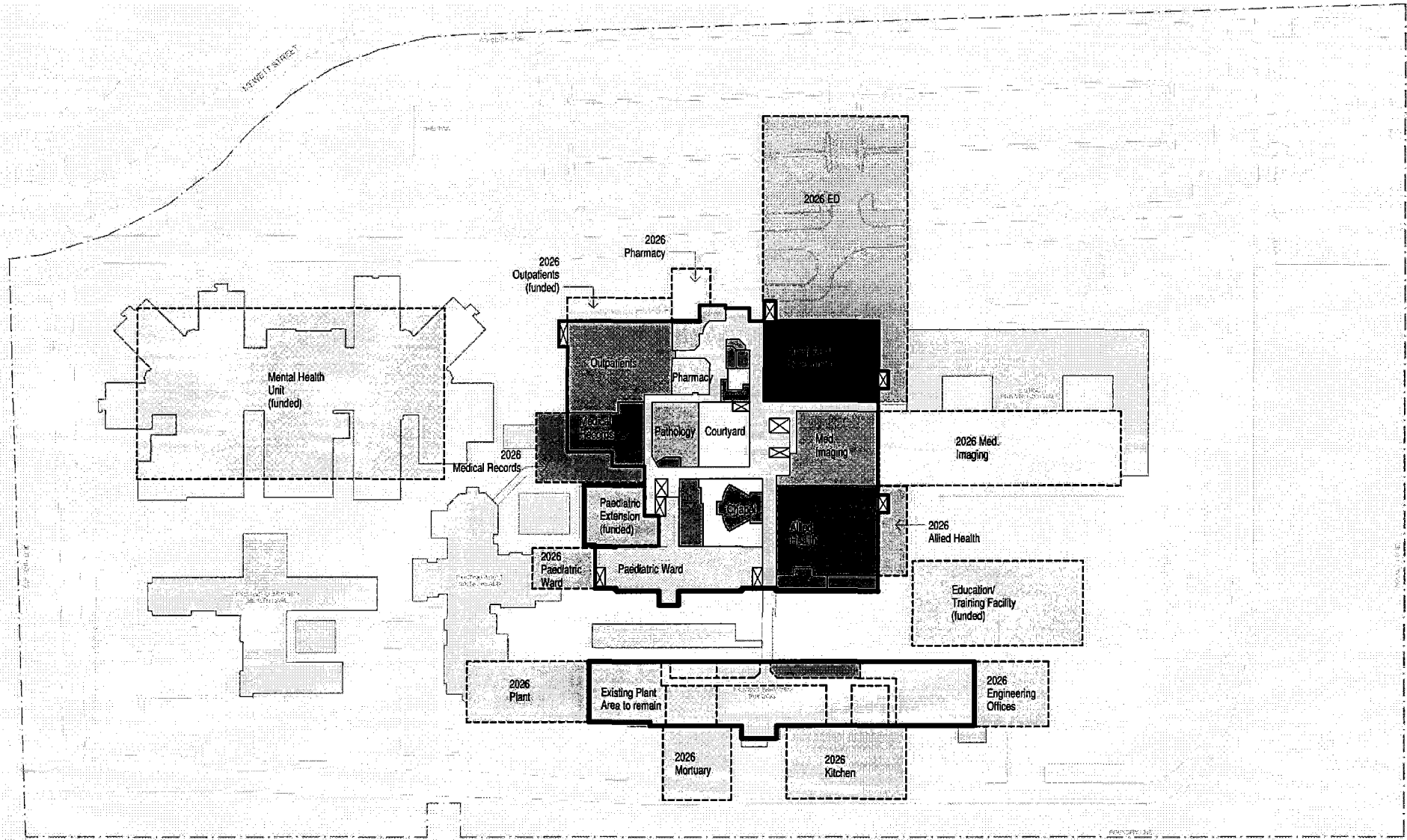
PROJECT
**Caboolture Hospital
 Infrastructure Planning Study**

DATE
Existing - Site Plan

PROJECT NUMBER
 10.2379

DATE
 June 2010

DRAWING NUMBER
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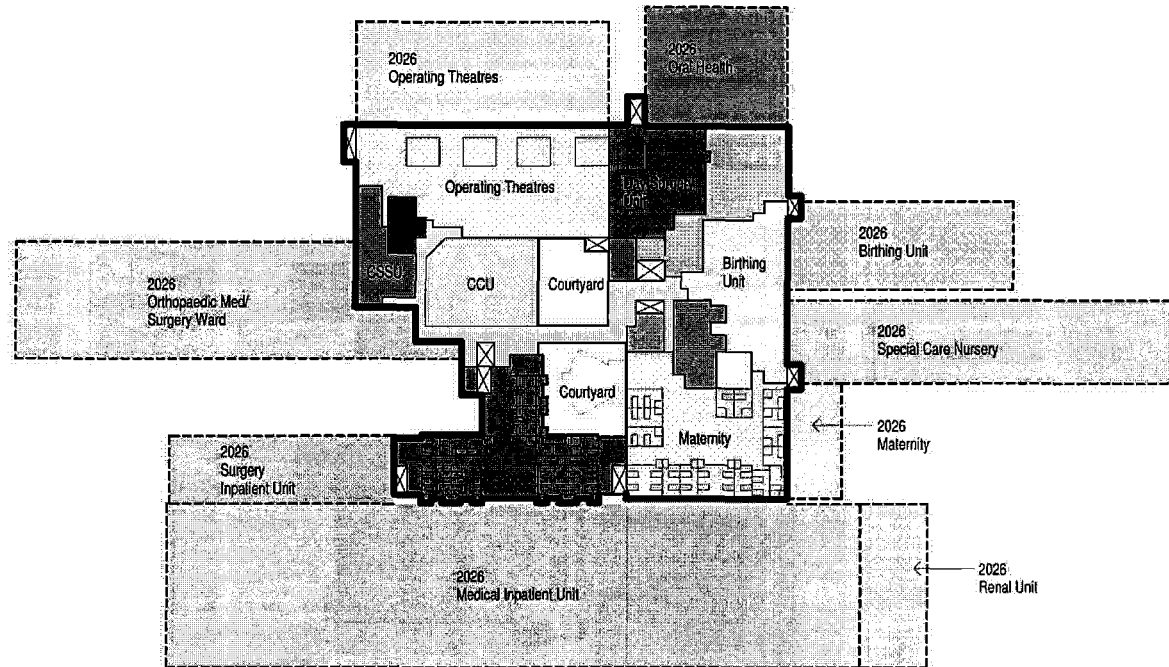
PROJECT
Caboolture Hospital
Infrastructure Planning Study

TITLE
Option 1
Level 01 - Graphic Representation

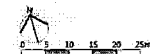
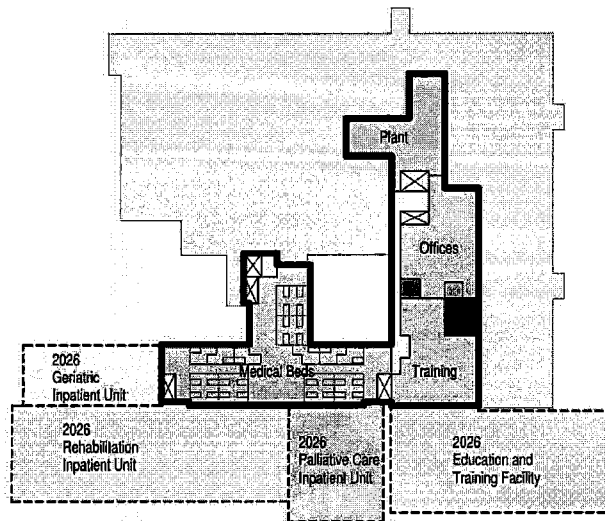
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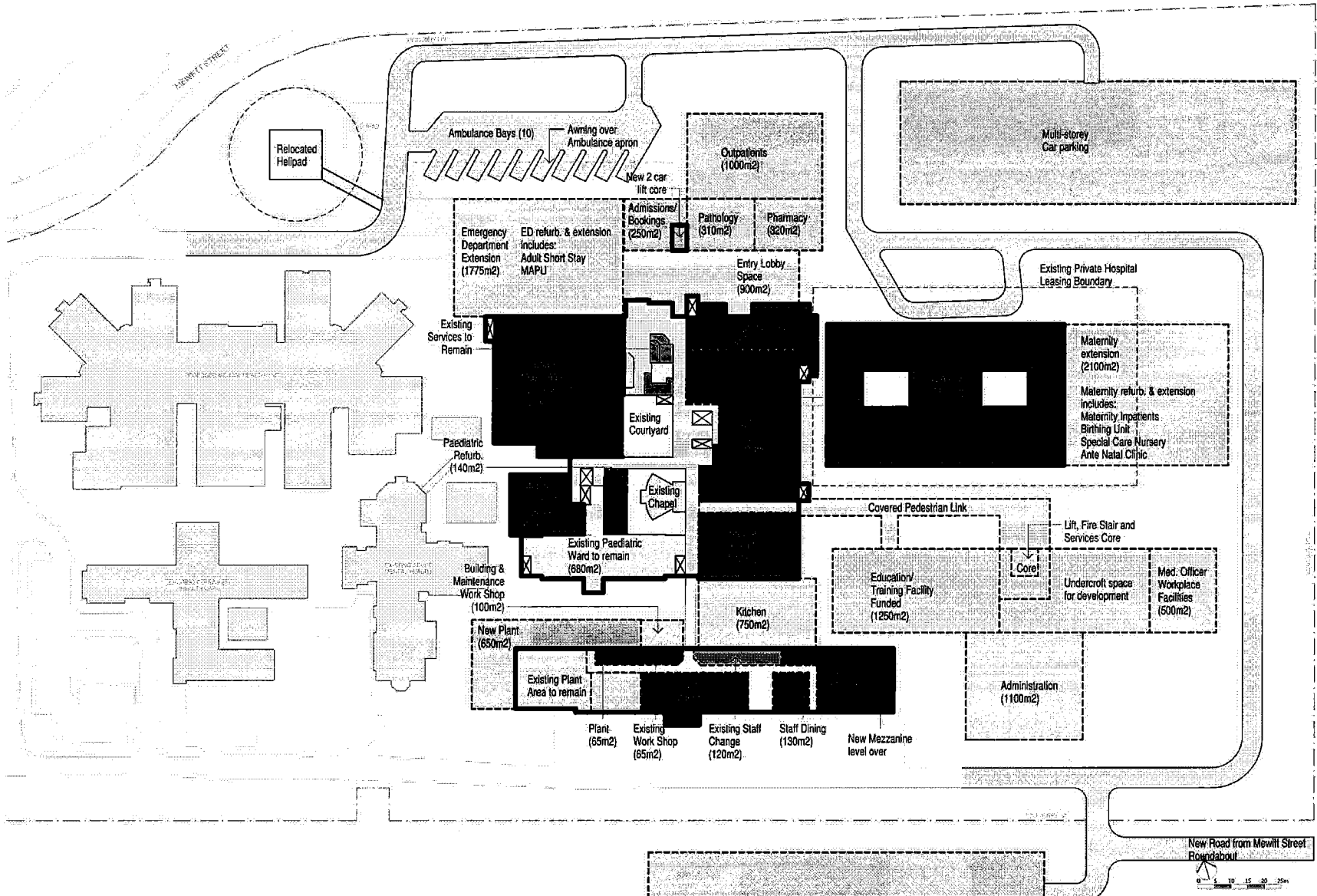
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CLIENT
Queensland Health

PROJECT
**Caboolture Hospital
 Infrastructure Planning Study**

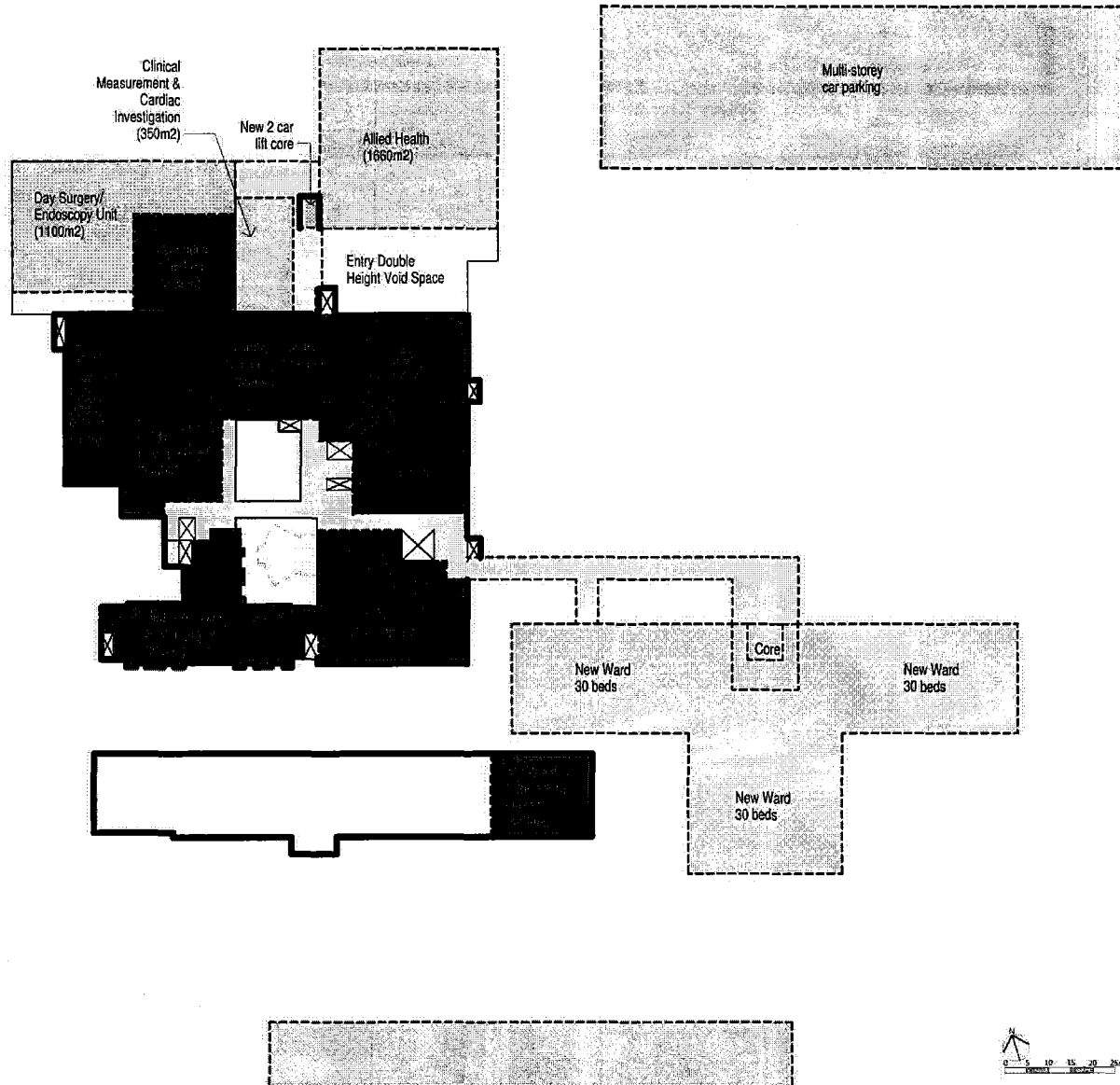
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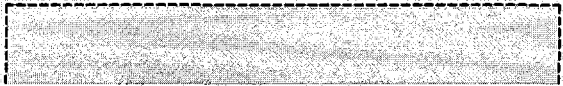
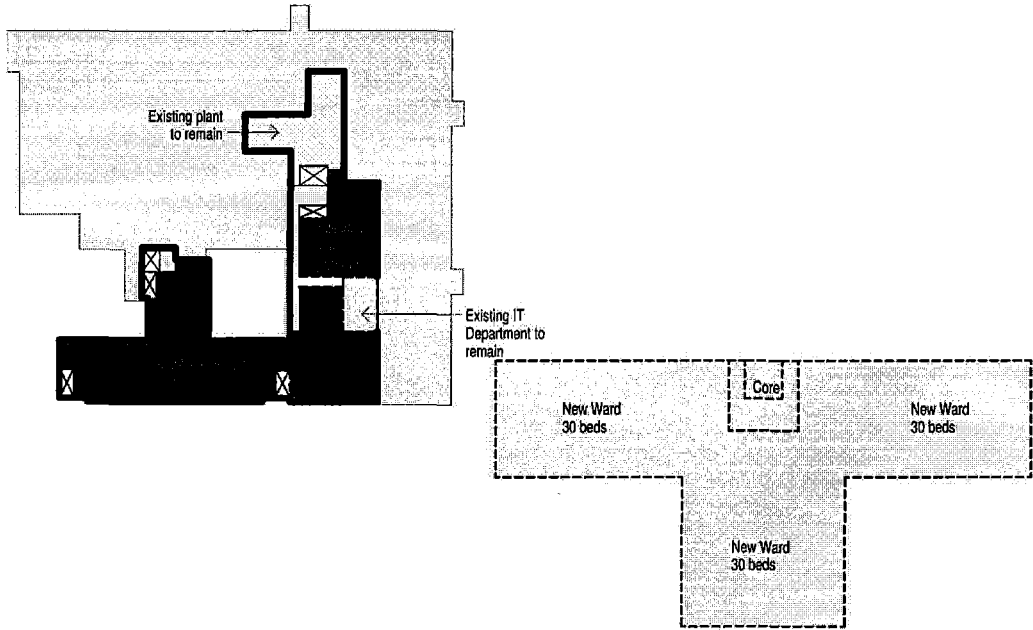
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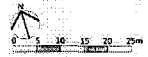
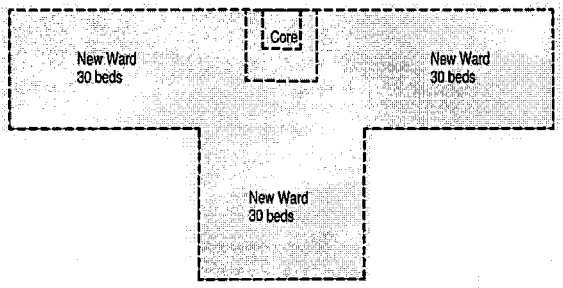
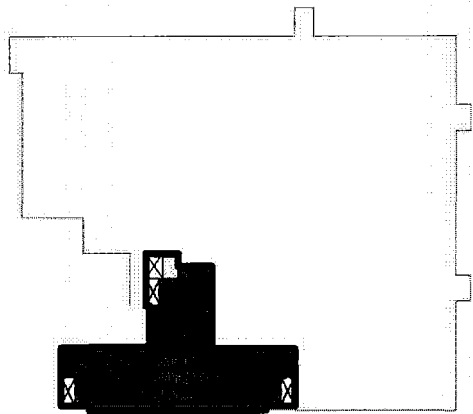
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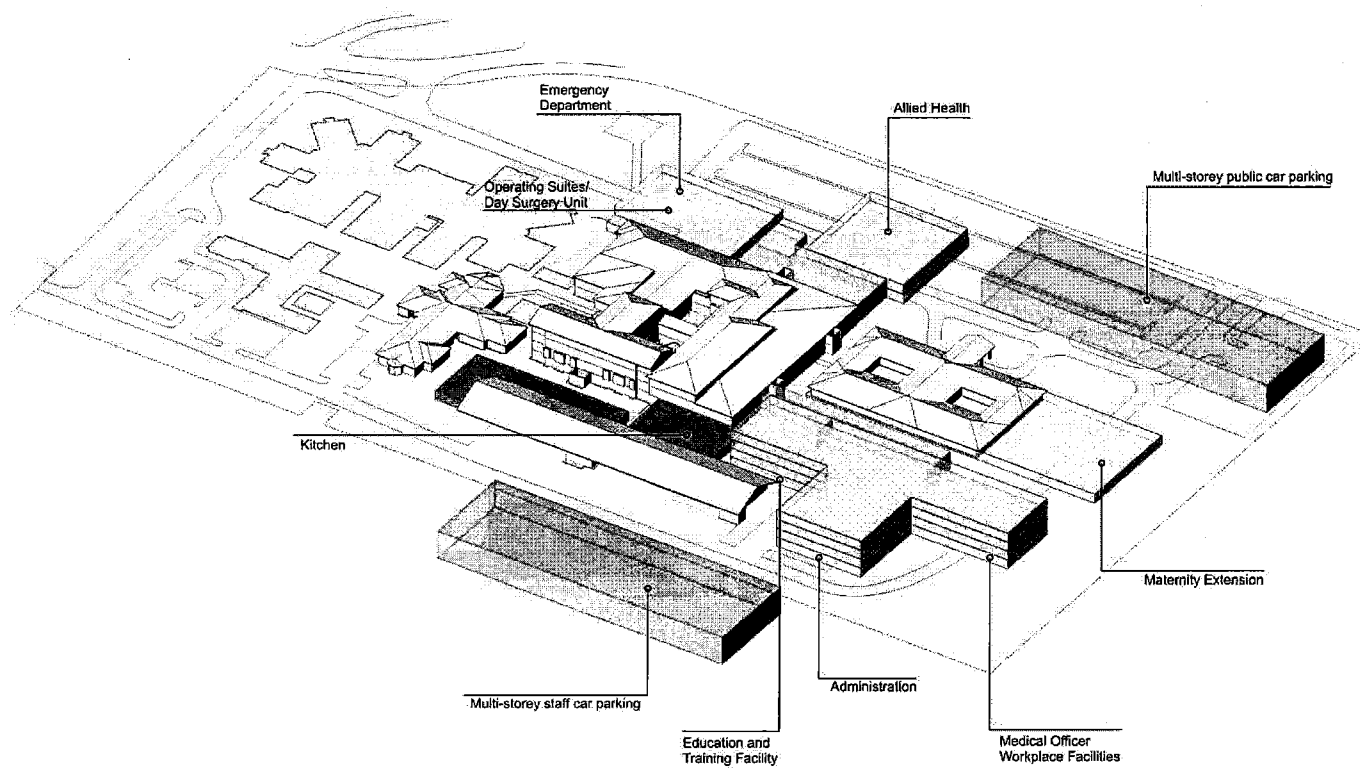


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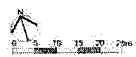
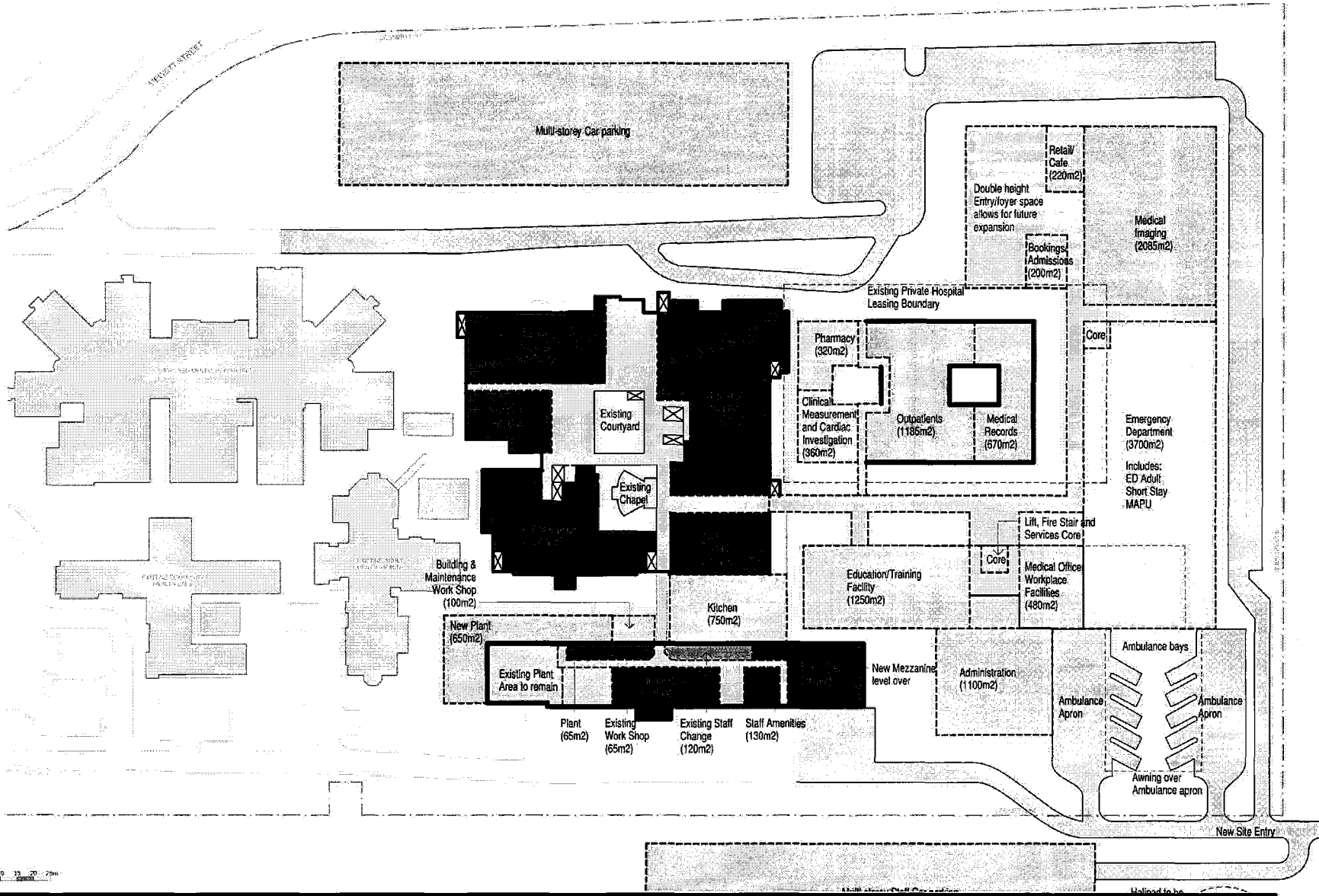
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Option 2 - Brown Field Site

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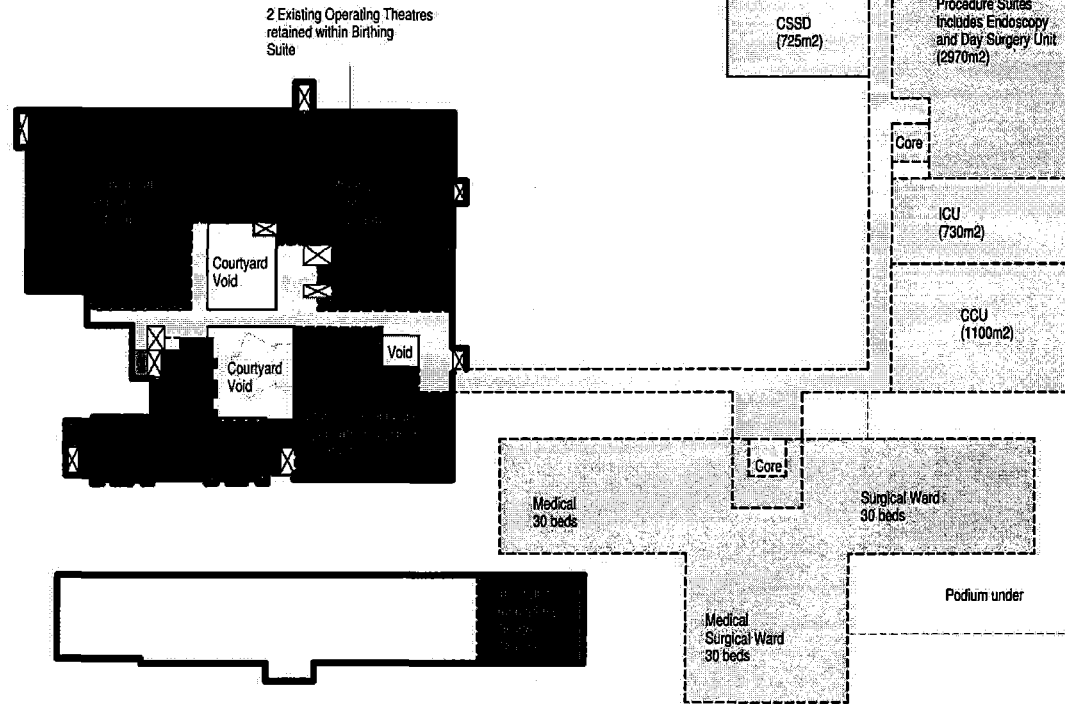
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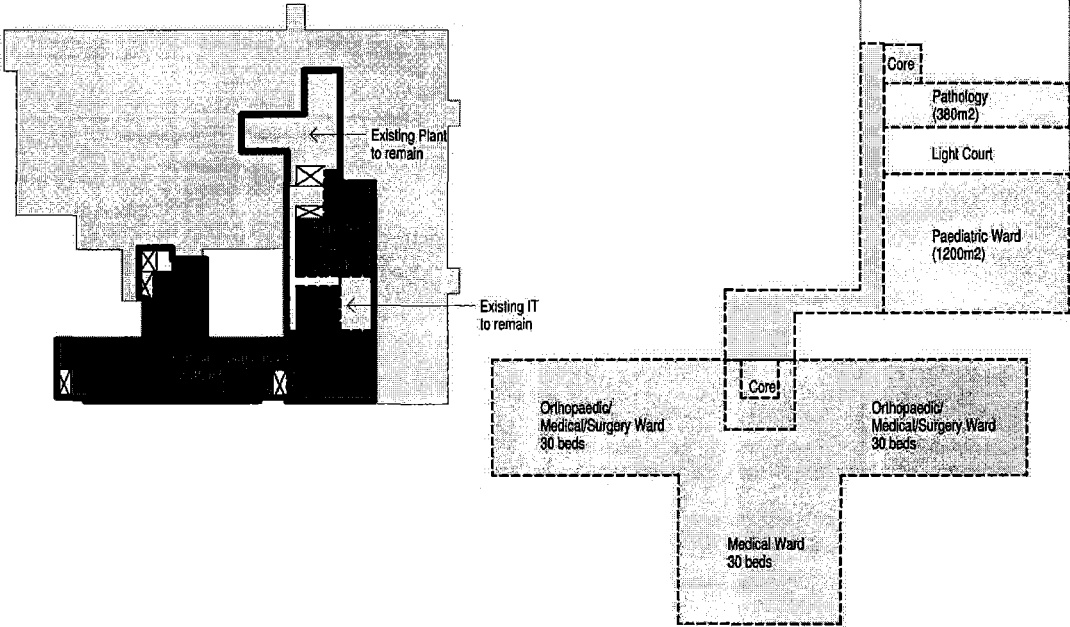
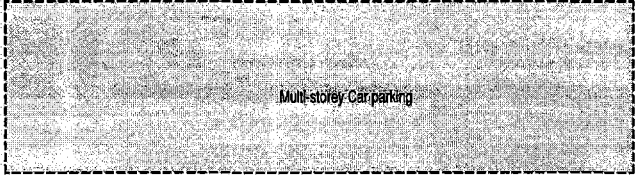
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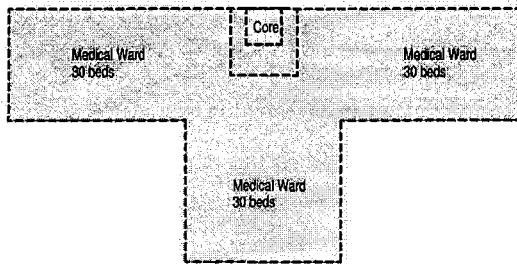
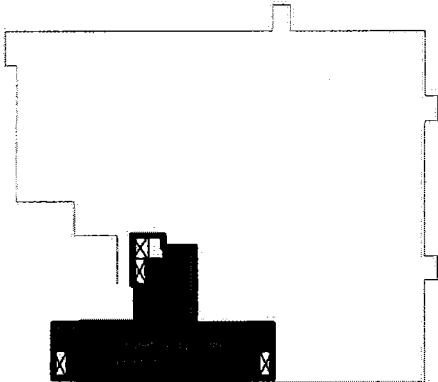
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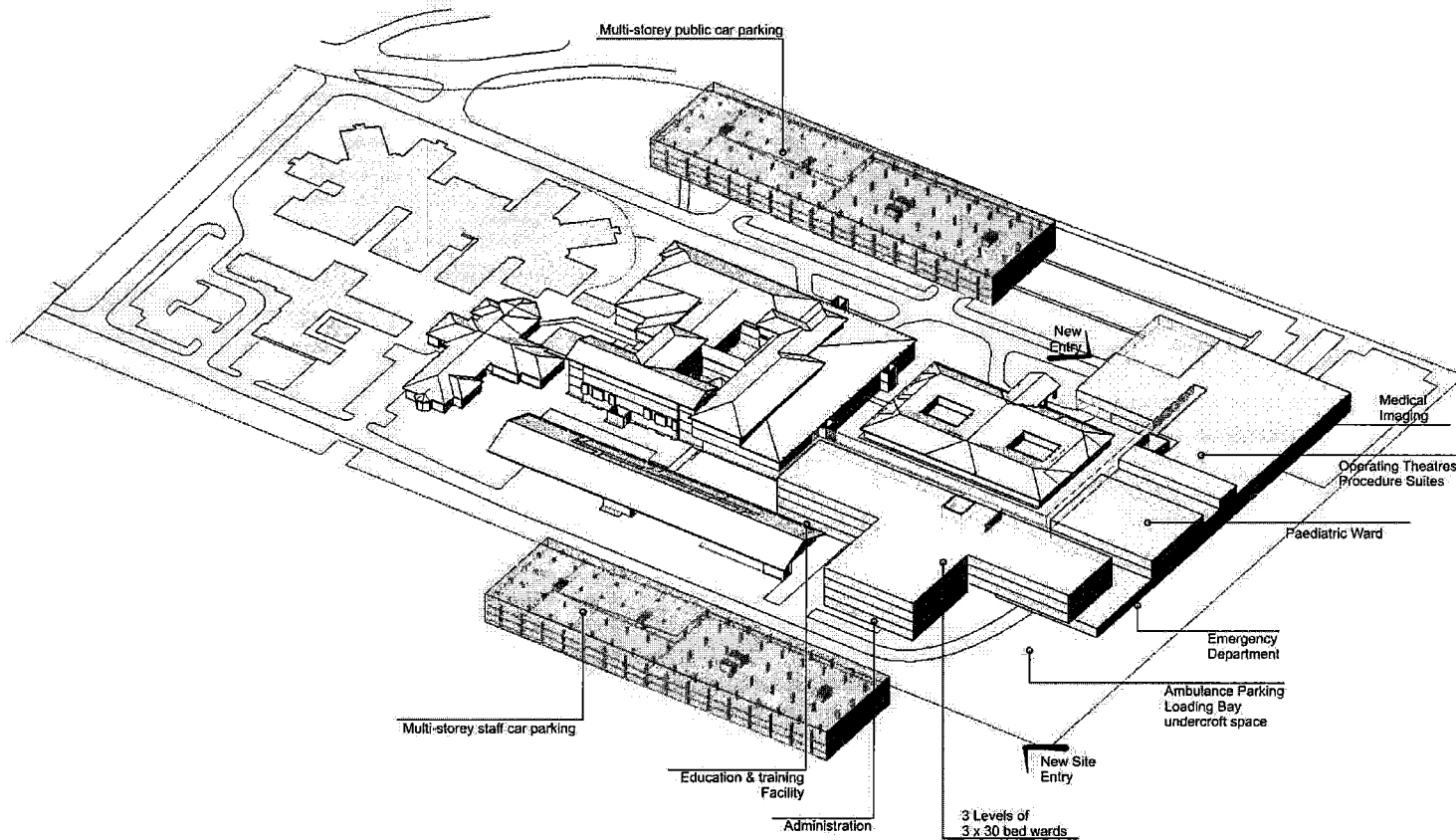


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	Multi-level Staff Car parking						



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Option 3 - Green Field Site



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Preliminary Infrastructure Planning Study for Caboolture Hospital

Volume 2 of 2

September 2010

Endorsed by HIPEC

Please note:

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1 Key project team members

1.1 Architect

Peddle Thorp Architects

- David Porgand
- Elisa Knowlman
- Dustin Johnston

1.2 Structural Engineer

Bligh Tanner Pty Ltd Consulting Engineers

- Rod Bligh
- Simon Kochanek

1.3 Building Surveyor

Crest Building Approvals Pty Ltd Consulting Building Surveyors

- John Tunney

1.4 Hydraulic Engineer

Cushway Blackford & Associates Consulting Engineers

- Chris Tritton

1.5 Electrical Engineer

Cushway Blackford & Associates Consulting Engineers

- David Blackford
- John Crace

1.6 Mechanical Engineer

Cushway Blackford & Associates Consulting Engineers

- David Blackford

1.7 Quantity Surveyor

Rider Levett Bucknall

- Colin Laidler - Rider Levett Bucknall

1.8 Civil Engineer

Bligh Tanner Consulting Engineers

- Daron Kraatz

2 Architect's report

2.1 Scope

This study evaluates the current infrastructure of the Caboolture Hospital as a guide for the formulation of three options to address the forecasted increase in service requirements of the catchment by 2026.

2.2 Objective

The objective of the study is to establish the current state of infrastructure at the Caboolture Hospital site and examine how it is currently utilised. This study will provide some assessment of the anticipated life of the building and site with regard to the future expansion of the size and range of service delivered on campus.

2.3 Method

This report has been compiled using information and observations from the following:

Site Visits on:

- 10 June 2010
- 24 June 2010
- 19 July 2010
- Plans access from E-Plan
- Interviews with Hospital and District personnel
- Caboolture Hospital Space Utilisation Audit 30 November 2007 prepared for Queensland Health Capital Works and Asset Management Branch by Project Services including an analysis by area of the buildings on site as at November 2007.

2.4 Exclusions

The report does not encompass the Community Health Buildings on the site as these were specifically excluded from scope in accordance with instruction by Queensland Health.

The Private Hospital and its site are also excluded from the .The Caboolture Private Hospital is leased and operated by Ramsey Health under a Build Own Operate and Transfer (BOOT) scheme due to expire in 2023.

A number of construction projects have been funded and are yet to be delivered and these have been accommodated and highlighted in the option studies but have not been evaluated.

2.5 Standards used

- The Building Code of Australia (BCA as amended)
- Australasian Health Facility Guidelines (AHFG)
- AS 1428 Parts 1 and 4 Disabled Access and Mobility
- The Building Act of Queensland 1975

2.6 Issues

Existing Site Density

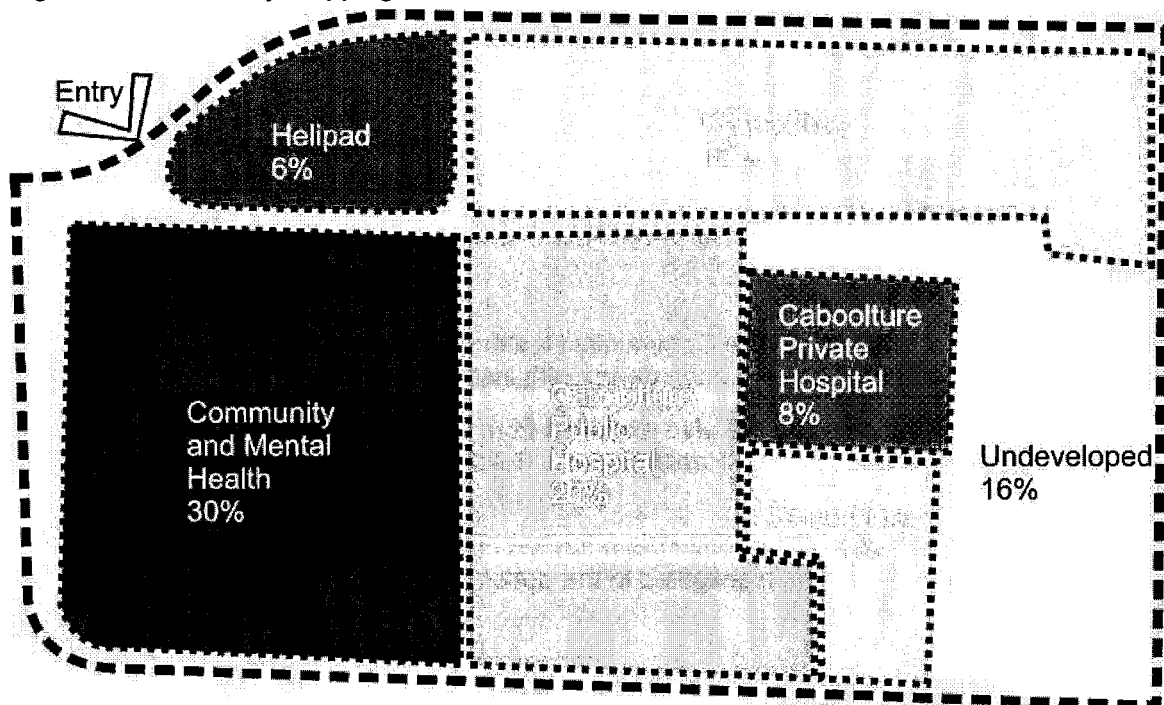
In reviewing the site area available for redevelopment, it is apparent that whilst the site is large, 9.5 hectares, it is already divided into distinct usage zones for functional (access, building bulk and car parking), policy (Mental Health / Community Health) and legal (Private Sector lease) uses.

The percentage proportions listed below are approximate:

- Community and Mental Health 30 per cent
- Caboolture Public Hospital 20 per cent
- Helipad and Clearance Zones six per cent
- Private Sector Lease – Caboolture Private Hospital eight per cent
- Car parking and Circulation 20 per cent
- Undeveloped Site 16 per cent

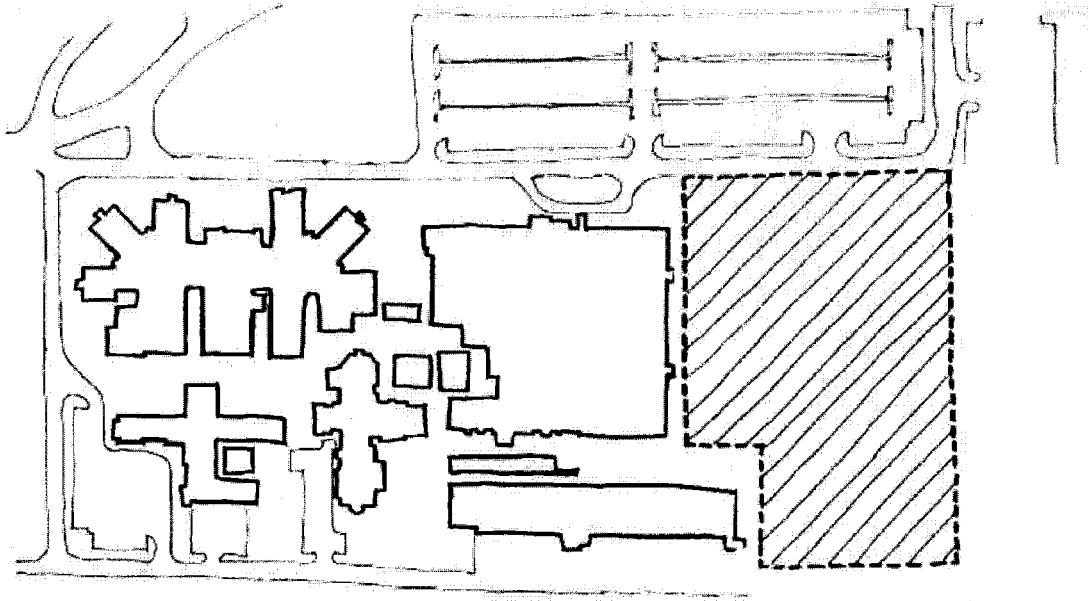
Figure 1 below provides a graphic representation of the site zoning. Except for parts of the Main Public Hospital Building all the development on site is single storey construction. This results in much of the site being monopolised with low rise construction and minimises the capacity for maximum development of the site. The perceived reluctance to demolish existing infrastructure compounds this problem and limits both the potential sites for option 3 and the areas for expansion and connectivity of option 2.

Figure 1: Site Density Mapping



Source: Peddle Thorp Architects

Figure 2: Development Site A



Source: Peddle Thorp Architects

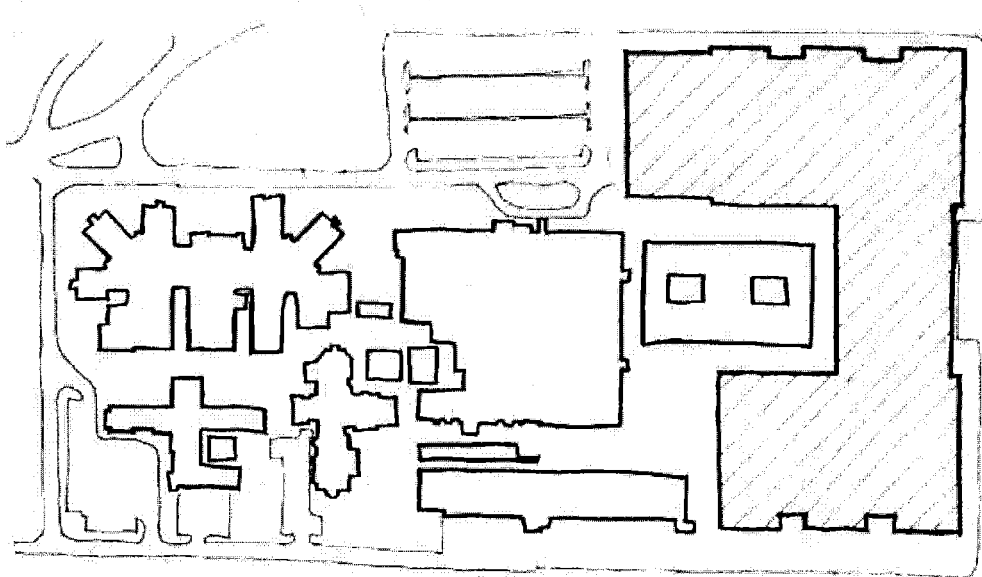
Advantages

- Larger, contiguous site area allows flexibility in design and could enhance Emergency Department link to Mental Health.

Disadvantages

- Requires demolition of Caboolture Private Hospital Building.

Figure 3: Development Site B



Source: Peddle Thorp Architects

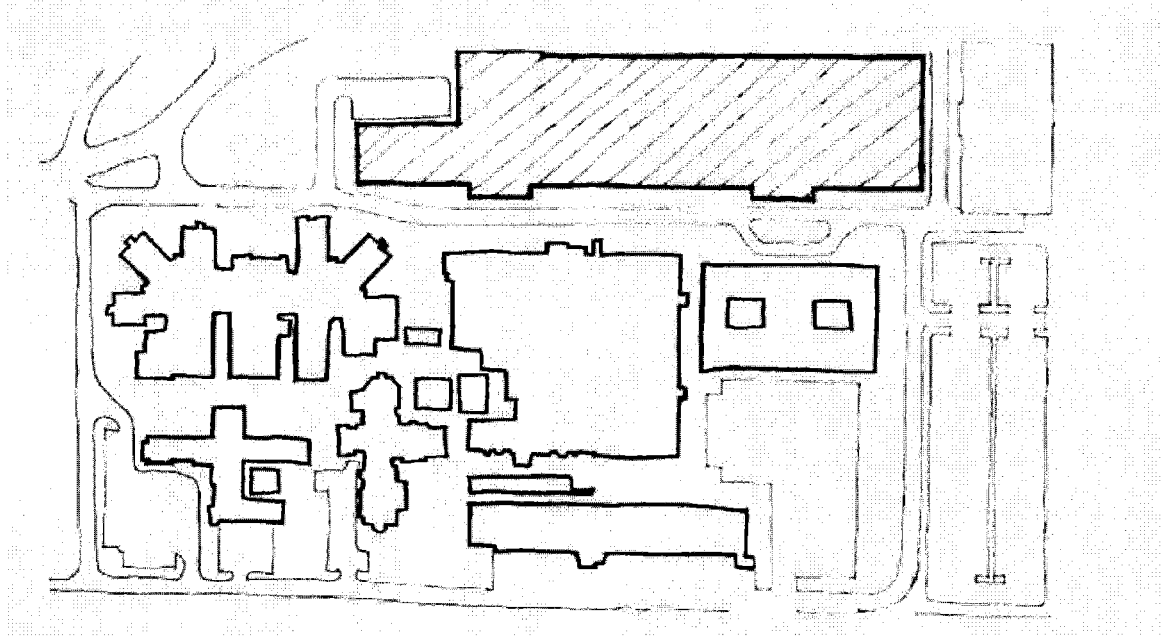
Advantages

- Requires no acquisition of Caboolture Private Hospital Site until out of BOOT scheme.

Disadvantages

- Encapsulates Private Hospital and limits expansion opportunities.

Figure 4: Development Site C



Source: Peddle Thorp Architects

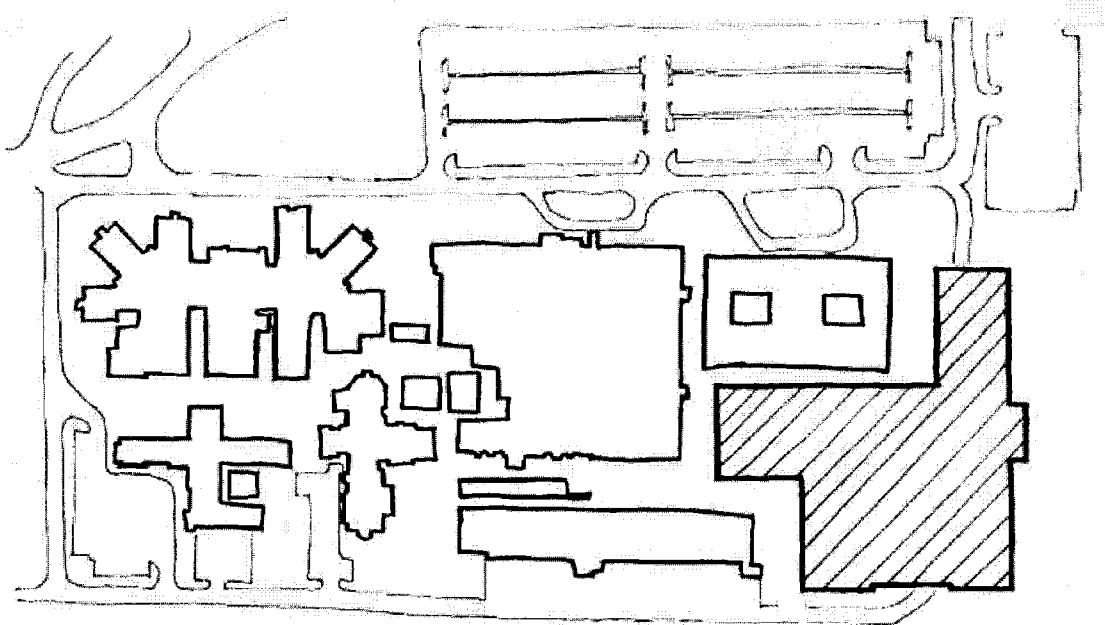
Advantages

- Discreet construction site.

Disadvantages

- Sub-optimal plan aspect ratio
- Maximum disconnect from service area
- Separated by road from existing Hospital at Level 01
- Requires relocation of car park and this would disconnect visitors from Main Hospital area.

Figure 5: Development Site D



Source: Peddle Thorp Architects

Advantages

- Public face of Hospital remains unchanged. This allows continued hospital entry operation, maintaining the familiar public face for wayfinding and public recognition.
- Minimal disruption to current parking and circulation areas.

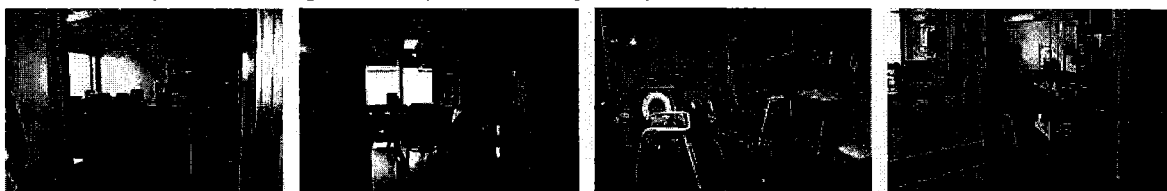
Disadvantages

- Public face of Hospital remains unchanged. For the amount of expenditure, while there is improved service, there is not obvious superficial improvement. The face of the hospital could become visually outdated, inconsistent with the upgraded facilities.

2.6.1 Storage Issue

- Storage areas located on wards for large equipment is severely limited and is reflected both in the practical situation on site by 'clutter' and in a theoretical comparison between the actual planning units and the AHFG recommended sizes. Photos in *Figure 6* illustrate examples of this in Paediatric Inpatients and ward areas on Levels 3 and 4.
- Medical Records storage on-site is constantly under pressure. Exacerbating this issue further, the link from the Mental Health corridor to the Medical Records demountable has been found (during this study) to be structurally inadequate. The currently proposed and funded Paediatric Short Stay upgrade will provide a compensatory area of 135m² for Medical Records (currently in the demountable).

Figure 6: Examples of storage shortage in existing Hospital



Source: Peddle Thorp Architects site visit

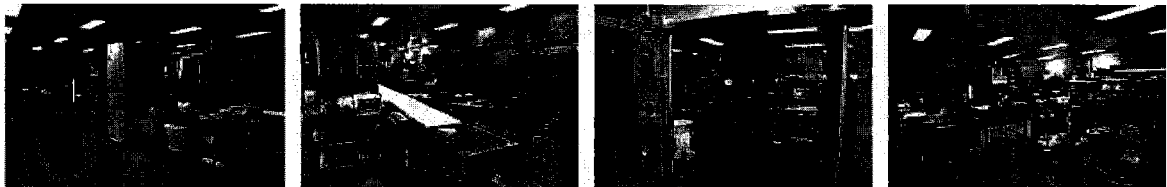
2.6.2 Car Parking Issue

- The number of existing constructed car parks on site is 701. This figure incorporates car parks for visitors and staff, persons with disabilities and Q-Fleet cars and vehicles, and excludes official Ambulance car parks and services.
- The primary car park for visitors and staff is located to the north of the site. This main car park shares space with the adjacent Private Hospital. This main car park is a mix of general parking and some designated staff parking. It has a capacity for 482 spaces, including disabled parking and staff parking. A car park to the south of the Private Hospital holds 113 cars and to the west, two areas hold a total of 96 cars.
- It has been noted that there is incidental parking on the grass to the east of the Private Hospital as well as to the south of the services block.
- Dedicated car parks for persons with disabilities are provided in various locations. There are 16 in the main park to the north, three for the Community Health building and one for the Mental Health building.
- With the future new Mental Health building providing an additional 43 beds and generating proportional increased numbers of staff, patients and visitors, it can be expected that the current difficulties and pressure of car parking will be significantly and negatively impacted.
- It is anticipated that at peak load (e.g. at daytime shift change over), over 700 staff car park spaces will be required. Considering the incidental parking already occurring, and the dramatic increase in population and service provision at the Hospital, it is anticipated that there will be a requirement for an excess of 700 additional car park spaces.

2.6.3 Kitchen Capacity Issue

- The current food preparation and delivery system copes with existing service requirements, however with the addition of 43 Mental Health Unit beds, impacts will be experienced in ordering, food preparation, delivery and washing up after every service. Additional servery, dishwashing and storage space will be needed.
- Further to this, the anticipated Service Activity Data Report (SADR) 2026 service of the Hospital indicates a dramatic increase in inpatient services that will require kitchen service. It is anticipated that by 2026 the current kitchen facilities will be inadequate.

Figure 7: Existing kitchen facilities



Source: Peddle Thorp Architects site visit

2.6.4 Emergency Department Issue

- The Emergency Department has outgrown its current departmental area and its expansion is somewhat constrained by the Private Hospital to the east and the Medical Imaging Department to the south. Any expansion in its current location is problematic as the continuing operation and accessibility for Ambulances while achieving substantial footprint expansion provides an insoluble challenge.

2.6.5 ICT Issue

- This has been described by Hospital representatives as “fragile and at capacity” but is outside the scope of this report and will be identified separately by others.

2.6.6 Australian Health Facility Guidelines (AHFG) Issue

- These guidelines represent the current best standard for space and services to clinical and non-clinical areas. When the current built 30 bed ward space at Caboolture Hospital is compared to AHFG the areas indicate a shortfall of around 400m². This deficiency can often be identified in the provision of storage and staff facilities as well as handover areas and office space. Future refurbishment of existing ward areas may need to consider reducing the number of beds in a ward, or extending the ward limits to include extra space for these activities.

Figure 8: Existing cramped staff lunch room/amenities



Source: Peddle Thorp Architects site visit

- The summary of areas generated by the SADR and AHFG is attached and the capacity of Options 2 and 3 to accommodate them is noted.

2.6.7 External Circulation Issue

- At present, pathways from the car parks and the paving in the car parks themselves are in poor condition with potholes and uneven surfaces common.
- Some areas of particular pedestrian/vehicular conflict exists that will worsen with the future expansion of numbers of patient, staff, visitors, services, cars and other vehicles. Of particular hazard are the areas around the services buildings and crossing the main access road to both the Public and Private Hospitals. This can be expected to be exacerbated when the new Mental Health Building is constructed as it will also have an address to that access road.

2.7 Conclusions and recommendations

Existing site density should be critically reviewed. The wisdom of single storey extensions should be robustly debated as they tend to monopolise site area with minimum development density. If services are to be provided and expanded to accommodate 511 beds (existing 171 overnight beds or same day and bed alternatives) maximising the site density or substantially expanding the site boundaries will need to be undertaken.

In the early stages of redevelopment, consideration should be given to:

- A multi-storey car park facility to allow for the creation of a properly designated construction site and somewhat alleviate the confusion associated with disjointed car parking areas.
- New or extended kitchen facilities
- Expanding the Emergency Department to reflect AHFG recommendations
- The creation of more inpatient accommodation by freeing up space currently inappropriately used for storage.

As indicated by other consultants, the permanent buildings on site appear to be in good condition. However it is unlikely that the current Hospital building stock will cope with any increase in bed numbers or service and comply with documented standards without significant expansion.

3 Structural engineer's report

3.1 Scope

The scope of this report has been to:

- Describe the existing structural systems used for the buildings on the site
- Report on the structural condition and dilapidation of the buildings on the Caboolture Hospital site
- Discuss the expected future maintenance requirements for each of the buildings.
- Report on and discuss the ease at which each building on the site can be altered or extended to suit the option 2 and 3 scenarios.

3.2 Method

Site inspections were conducted on the Caboolture Hospital to assist in the preparation of this report. A detailed site inspection was conducted on 10 June 2010 with a follow-up inspection conducted on 28 June 2010. The inspections were made to gain a clear understanding of the structural systems adopted for each of the buildings on the site. Inspections were also made to enable comment on the condition of the buildings and the expected future maintenance requirements.

Existing structural documentation for each of the buildings was obtained through copies of the available information from the facilities management department on site. The Project Services, Department of Public Works EPlan website was also used to obtain additional building documentation. This existing structural documentation was used in combination with the visual inspection to report on the ability of the buildings to be altered and modified as part of any upgrade works that might occur at the Hospital.

Existing geotechnical reports that had been conducted on the site were obtained from soil surveys.

3.3 Exclusions

The existing private health building to the west of the site is out of the scope of this report.

Inspections conducted on the site and discussions within the report on the condition of the buildings and the expected future maintenance requirements of the structures are based on a visual non-invasive inspection only. Where structural elements of the building were covered with ceiling, floor or wall linings, the condition of the structural elements has not been commented on and is unknown. Detailed structural analysis has not been conducted to confirm the existing buildings comply with current Australian Standards.

3.4 Standards used

The below list of Australian standards were referred to and used in the preparation of this report:

- AS1170.0 - Structural design actions: Part 0 : General principals
- AS1170.1 - Structural design actions: Part 1 : Permanent, imposed and other actions
- AS1170.2 - Structural design actions: Part 2 : Wind actions
- AS3600 – Concrete Structures
- AS4100 – Steel Structures

- AS1720.1 - Timber Structures: Part 1 Design methods
- AS2159 – Piling design and installation
- AS2870 – Residential slabs and footings – construction.

3.5 Site

The Caboolture Hospital site consists of various buildings between one to four storeys in height. Each of the buildings is interconnected with paths and walkways. Single storey temporary demountable buildings have been located around and between the main buildings. The majority of the buildings on the site have been constructed at different stages over the last 18 years, with the original two, three and four storey Clinical Building and Ward Building built in 1992 with a major extension to the main Hospital built to the East of the existing buildings in 1998. This subsequent two, three and four storey development served to create an internal courtyard to the main Hospital area which is currently being used as a breakout area and holds the Chapel.

The buildings located within the boundary of the Caboolture Hospital include:

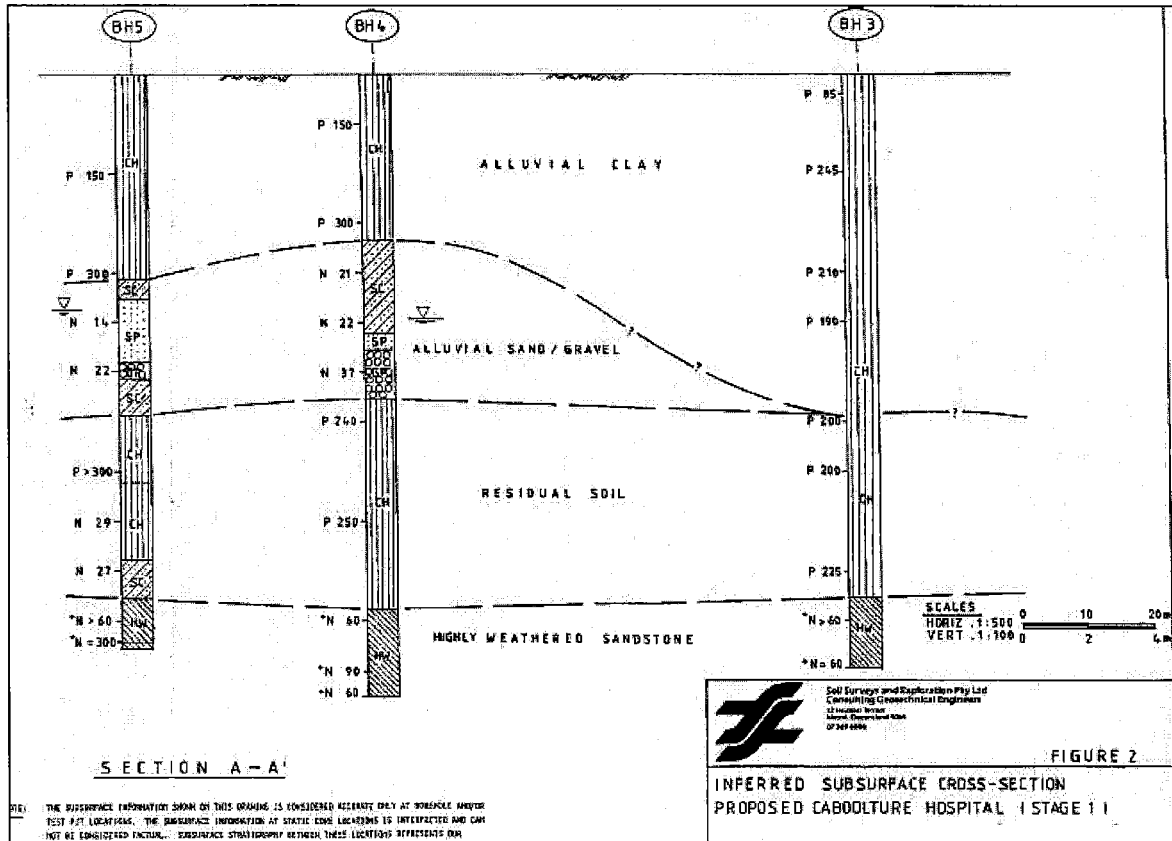
- Existing Private Hospital – Single storey building – (Out of scope report)
- Adult Mental Health unit – Single storey building
- Community Health Centre – Single storey Building – (Out of scope of report)
- Services Building – Single storey
 - Central Plant
 - Facilities Management
 - Kitchen and Staff Dining areas
 - Stores and Linen
- Main Public Hospital Building – Interconnected two, three and four storey buildings
 - Emergency department
 - Outpatients department
 - Medical imaging
 - Allied health
 - Maternity
 - Patient Wards
 - Operating theatres
 - Administration and Education
- Chapel – Single storey building, located within the courtyard area bounded by the main Hospital buildings.
- Human Resources (HR) Services Building – Single storey temporary demountable
- Home Based Acute Care Services (HBACS) Building – Single storey temporary demountable
- Medical Records Building - Single storey temporary demountable
- Mental Health & Medical officer Accommodation – Single storey temporary demountable

3.6 Ground Conditions and Building Foundations

The Caboolture Hospital site is situated on an old river terrace which overlies the Nambour Basin sandstone. The available geotechnical investigations for the site which have been conducted over the last 20 years indicate a subsurface profile which consists of a deep layer of alluvium overlying weathered sandstone bedrock. The previous geotechnical reports indicate that the highly weathered sandstone is located at approximately 16.0-20.0m below

ground level. The upper level alluvium varies in consistency, however generally consists of an alluvial clay or alluvial clay/sand-gravel layer, overlying a residual soil (extremely weather rock) layer which extends down to the highly weathered sandstone. Figure 9 shows a plot of the BH3, BH4, & BH5 borelogs from the 1991 investigation which runs diagonally through the original Caboolture Hospital development.

Figure 9: Inferred Subsurface Cross-Section for the Caboolture Hospital (1992 development)



Source: Geotechnical Site Investigation Report: Site No. 30964 'Main Hospital building' soil report dated 22/11/1991, Job No. 91M/688

Any new extension or building development for the Caboolture Hospital will require a site and location specific geotechnical investigation to be conducted. The discussion below is based on the assumption that the new development on the Caboolture Hospital site will have a subsurface profile consistent with the profile from the earlier logs recorded for the site.

3.7 Expected Building Foundations: ≥ 2 storeys

(or single storey buildings which are settlement sensitive)

For new Hospital buildings greater than two storeys and single storey settlement sensitive buildings, deep foundations extending into the highly weathered rock at 16.0m-20.0m deep are expected to be required (for cost estimate purposes a pile length of 20m should be allowed for). Deep foundations could take the form of driven precast concrete piles or bored and cast-in-situ concrete piles. Both alternatives appear to have been used successfully on the site previously. Proprietary piling systems such as "Frankipiles" or similar would also be acceptable. This approach is consistent with the foundations that have been installed to the existing building.

3.8 Expected Building Foundations: Single Storey

Existing geotechnical borelogs indicate that the upper alluvial layer varies in consistency, thickness and layers, with alternate layers varying between stiff, very stiff, hard, medium dense and dense. Generally the upper layer, which varies between 2.0m to 4.0m in the existing reports, is a stiff clay layer. However this varies markedly between reports with some localised reports indicating medium dense sand and others indicating an upper level of fill.

For single storey buildings which are not settlement or movement sensitive, it is likely that a deep raft foundation would be suitable for a single storey building founding in the natural alluvial layer. This appears to have been successfully adopted for the Chapel and the Adult Mental Health Centre. Although the reactivity of the upper level clays is expected to vary across the site, the existing reports that were available indicate that the site is typically a class 'H' site (highly reactive), with surface movements in the range of 40mm to 70mm.

Where new buildings are proposed to be suspended or in locations where uncontrolled fill is identified, high level piled foundations extending into the hard clay layers may be the most economical approach.

3.9 Existing Buildings – Structural Systems

Generally the single storey permanent buildings located at the Caboolture Hospital site have been constructed on high level raft foundations with standard residential construction techniques using timber roof trusses and internal timber load bearing walls and external brick veneer. The exception to this is the single storey services building which is a suspended reinforced concrete floor and structural steel roof.

The multistorey main buildings have been built and extended at different stages over the last 20 years. Generally the main multistorey buildings are constructed on deep piles or driven pier foundations, with suspended reinforced concrete floors and structural steel roofs. Facades and wall claddings are generally external brick cladding which is tied back to an inner block wall forming a cavity brick/block wall framing system.

3.10 Adult Mental Health building

- Residential type framing system
- High level raft slab foundation system with brick veneer wall framing, timber roof trusses and timber wall framing.

3.11 Services Building (Single Storey)

- Suspended reinforcement concrete floor, with reinforced concrete beams and slabs – Designed to suit a 5kPA live load
- Deep bore pier foundations
- Structural steel roof
- Mix of brick, block and steel wall framing.

3.12 HR Services Building

- Light weight temporary structure
- Footings – high level pads
- Floor - steel and timber.

3.13 HBACS building

- Light weight temporary structure
- Footings – high level pads
- Floor - steel and timber.

3.14 Medical Records Building

- Light weight temporary structure
- Footings – high level pads
- Floor - steel and timber.

3.15 Main Public Hospital Building

Although minor extensions have been made at various times over the 19 year life of the Main buildings to the Caboolture Hospital, two main construction phases have been undertaken with the main Hospital building. The first stage of construction was undertaken in 1992 and consisted of what was originally called the Clinical Building and the Ward Block. This development was completed in conjunction with the construction of the first stage of the services building. The first stage of the Caboolture Hospital development completed in 1992 forms what is now the westerly portion of the main Hospital. It is currently being used for, Medical records, Outpatient department, Pathology, Paediatrics Ward, Operating Theatre and Critical Care Unit Patient Wards. The second stage of the development occurred in 1998 and was called the Main Building and formed the westerly extension to the existing facility. The western extension served to enclose and create an inner courtyard between the buildings. The 1998 extension is currently being used for the Emergency Department, Medical Imaging, Allied Health, Birthing, Maternity and Administration and Education.

All of the buildings within the main portion of the Hospital vary between two and four storeys in height and consist of a similar structural system and construction approach.

3.15.1 Roof

The roofs to the buildings are Colorbond steel with each of the different buildings varying in roof pitch. Steep roof pitches have generally been adopted at the two roof top plant locations, whereby the cavity in the roof formed by the steep roof pitch has been used to contain the plant. Roof structures to the buildings are constructed in structural steel with purlins and universal beam rafters.

3.15.2 Suspended Floors

Each of the floors to the main Hospital has been constructed using conventional reinforced concrete slabs with drop panels provided to internal columns and perimeter reinforced concrete edge beam adopted to support the external walls. Slab thicknesses vary throughout the buildings according to the loads applied at each of the areas and the columns and support spacing's. Generally column supports have been positioned in an 8.0m x 8.0m grid however this column and grid arrangement varies due to the irregular shape of the buildings. Throughout the suspended floors, thicknesses vary with existing documentation indicating some floor slabs are 175mm, 195mm, 240mm, and 260mm thick. Drop panels varying depth and size with between 450mm and 550mm deep. Edge and internal beams vary in size and depth throughout the building with depths varying between 450mm to 950mm deep depending on the spans and loads at each location.

3.15.3 Foundations

Existing building foundations are deep piled foundations which extend into the highly weathered sandstone. The original development in 1992 has been constructed using driven concrete piles while the second extension in 1998 appears to have been documented with cast-in-situ piles using a displacement auger.

3.15.4 Columns, Walls, Stairs, Lift Cores and External Facade

Load bearing walls, stairs and Lift Cores are all reinforced concrete. External walls vary in construction however are generally reinforced block work with outer brick cladding tied back to the inner cavity. Stairs are constructed from reinforced concrete with the majority of stairs located on the outer perimeters to the buildings. All columns to the buildings are reinforced concrete.

3.16 Building Condition Report (Maintenance Requirements)

Generally all permanent buildings on the Caboolture Hospital site observed during the site inspections are structurally sound and performing adequately in service. With the exception of the Medical records building which is discussed below, all buildings in their current state appear to be structurally sound with no signs of foundation movement or brickwork/concrete cracking observed to any of the buildings which would be potential indicators of longer term structural problems or higher maintenance requirements.

It should be noted that the visual inspections of the existing structural performance of the buildings was limited to a perimeter inspection of each building, inspection of all exposed steelwork (plant rooms) and under slab and floor inspection at the location which permitted access under the buildings. Where the existing structure was covered with floor, wall or ceiling linings, visual inspection was not possible. There is a possibility that existing claddings and facades could be hiding potential structural problems, however if structural problems do exist, these would typically manifest themselves through the wall and floor linings with cracks and superficial damage through the linings.

The following section of this report reviews each of the buildings on the site and discusses the current condition of each of the building structures and potential future and ongoing maintenance and repairs that may be required. A projected service timeframe of 2026 has been used for the discussion on longer term maintenance requirements as per the requirements of the brief.

3.17 Adult Mental Health building

Generally the building was observed to be performing well in service with no significant structural concerns or problems observed. The perimeter brickwork was observed to be fully intact with no cracks or movement observed in the external walls and brickwork. The perimeter concrete pavements were generally in good condition and crack free.

Some weathering and minor degradation of external exposed timber to the entry feature and the external timber awning was observed. It is expected that some minor maintenance and protection of the facades at these entry locations will be required in the next 5-10 years.

General standard maintenance type activities would be expected to be undertaken to the building up to 2026, including such items as replacement of external unprotected timber, repair to superficial facades and claddings and possible localised repairs, for example gutters and roof cladding repairs.

Ongoing termite inspections and maintenance of perimeter barriers protection systems will be required around the building. The core structure to the building is expected to perform in a serviceable condition up to 2026 without significant structural repairs, so long as the building remains watertight. Consideration should be made to providing a continuous concrete apron

or foot path around the building at areas currently broken by planter beds. This will assist in controlling the moisture levels of the under slab soil and assist in reducing the seasonal movement of the ground and building. Trees and planter areas should be excluded from the perimeter of the building.

3.18 Services Building (Single Storey)

Generally the building was observed to be performing well in service with no significant structural concerns or problems observed. The perimeter brickwork and walls were observed to be fully intact with no cracks or movement observed in the external walls and brickwork. Where accessible the slab and supporting beams underneath the service building were inspected. No signs of excessive slab deflection or cracking were observed and the floor slab was generally in good condition.

The structural steel roof structure was visually inspected and found to be in good condition throughout with the protective coating to the steelwork intact and no signs of rusting observed. Some signs of wear and tear were observed to the loading dock area and this area will require some ongoing maintenance due to regular use of the area with forklifts and trucks.

Elements such as bollards and protective timber edge boards etc will require ongoing maintenance and repair similar to the procedures undertaken in the past 10 years. Some minor cracking was observed to the floor slab at one doorway to the service building. This may require some minor patching and concrete repair in the next 10 years. Overall the building structure to the services building is expected to perform well in service up to 2026 with no major structural repairs being required.

3.19 HR Services Building

This single storey demountable building was observed in reasonable condition and is currently fit for purpose. Full access under the building was not available as the perimeter of the building was boarded up. Generally no immediate repairs are required to the building however ongoing maintenance of this building will be required should it remain on site until 2026.

Periodic repairs should be expected to the external exposed timber decks and structural steel linking walkways, which are showing signs of rusting. Application of protective coating and painting systems will assist in extending the lifespan of these elements in lieu of having to fully replace them.

Ongoing termite maintenance and general visual inspections of this building are recommended to ensure the timber elements remain separated from contact with the ground. The proximity of one side of this building to an open channel will also require ongoing visual inspection to ensure that the discharge flow of water along this channel does not affect or compromise the building footings in the long term.

3.20 HBACS Building

This single storey demountable building was observed to be in reasonable condition and is currently fit for purpose. Full access under the building was not available as the perimeter of the building was boarded up. Generally no immediate repairs are required to the building however ongoing maintenance of this building will be required should it remain on site until 2026.

Periodic repairs should be expected to the external exposed timber decks, and structural steel linking walkways which is showing signs of rusting. Application of protective coating and painting systems will assist in extending the lifespan of these elements in lieu of having to fully replace them. Ongoing termite maintenance and general visual inspections of this

building is recommended to ensure the timber elements remain separated from contact with the ground.

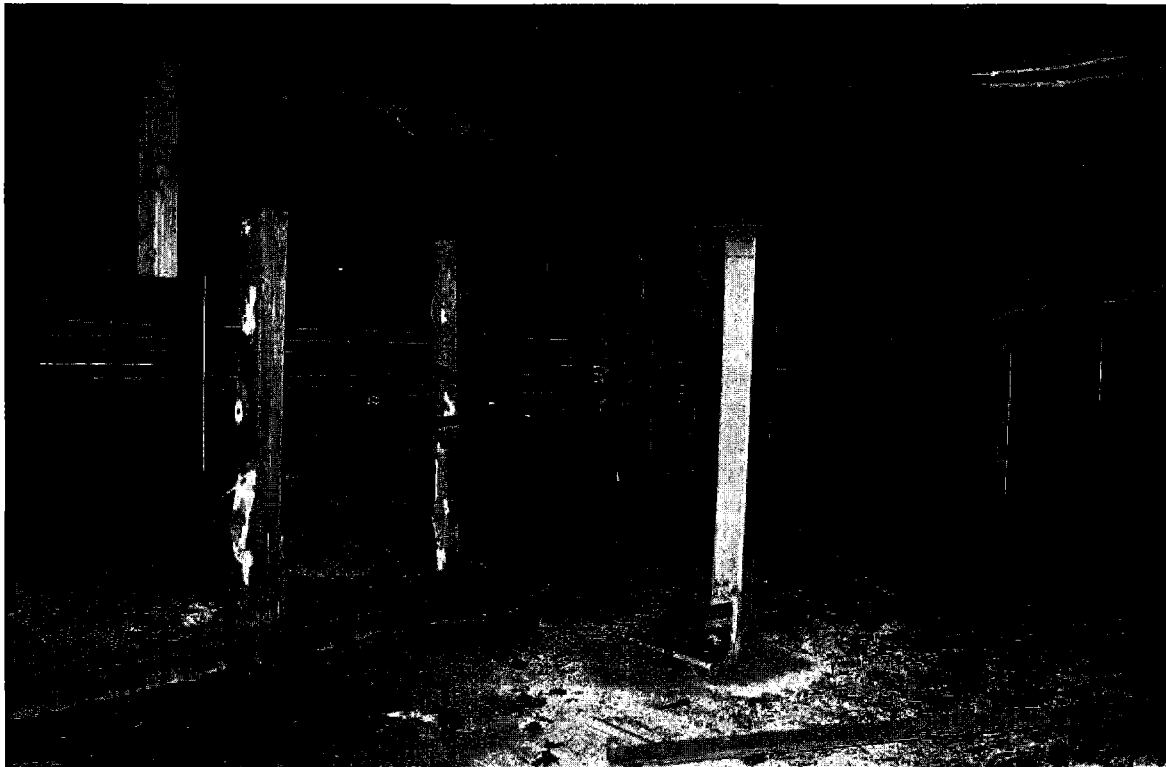
3.21 Medical Records Building

Based on the site inspection conducted on 10 June 2010, this temporary building was found to be structurally unsound and noncompliant with general good building practise. An urgent full structural review of the building is recommended with associated structural repairs being undertaken. It is recommended that access to the building be limited until a full structural audit has been undertaken.

Inspection under the building indicated that various timber stud walls have been temporarily installed to support floor joists and floor elements. These timber supports were in direct contact with the ground with no specific footings provided for support. Refer to Figure 10 below. Significant sagging was observed in the existing floor joists and generally the structure did not appear to comply with sound structural principles or good building practise. Various load bearing timber studs were in direct contact with the ground and had no termite protection. The external veranda and deck was also in poor condition with significant deflection observed under the external deck boards. The structural steel veranda and associated balustrade also appear to be in poor condition with rusting observed throughout the steelwork.

Generally it is not considered that even with immediate structural repairs being undertaken to ensure the safe use of this building that the structure should be considered as part of the long term plans for the Caboolture Hospital (even in the 'status quo' scenario), up to the year 2026.

Figure 10: Medical Records Building Subfloor Framing



Source: Site Visit Bligh Tanner Consulting Engineers

3.22 Mental Health and Medical Officer Accommodation

This demountable building was installed in 2007 and is in good condition with no current repairs required. It is expected that only general maintenance and repairs will be required with this building up to 2026. This would be expected to include, re-application of paint finishes and protective coatings, possible repair and replacement of gutters and localised roof sheet. Reinstatement of termite protection barrier and regular visual inspection to ensure no timber is in contact with the ground should also be undertaken.

3.23 Main Public Hospital Building

The main buildings forming the enclosed courtyard for the Hospital were observed to be in good condition and performing well in service. The external brickwork facade and walls were in good condition with no cracks observed to any brickwork around the perimeter of the building or within the courtyard area. It is expected that these brickwork facades will continue to perform adequately in service for the foreseeable future.

Where the ground floor was elevated above the natural ground level and accessible: the soffit to the slab was inspected. No excessive slab or beam deflection or excessive cracking was observed and generally the exposed visible concrete work was in good condition and performing well in service.

Viewed from within the courtyard area, it was observed that some minor cracking and weathering of the eaves soffit was occurring in some corners. Generally this was only superficial wear and tear from weathering to the high level fibre cement (FC) facade. Generally these items were non-structural elements however it should be expected that some minor repairs would be expected to these FC eaves linings over the next 15 years. Minor rusting and damage to some roof downpipes was also observed in the courtyard area between the main buildings and although these are non-structural building elements repair to these downpipes is likely to be required in the next few years.

The northern courtyard was observed to contain a number of planter beds with topsoil and mulch up against the brickwork to the main buildings. It is recommended that a perimeter concrete apron be considered to these areas to separate the planter areas from the buildings. This will assist in keeping the buildings dry and waterproof in the longer term and assist in reducing the likelihood of rising damp. It is noted that the southern courtyard around the chapel has recently been addressed to provide a drainage barrier around the perimeter walls to the building and a similar detail would also be suitable for the Northern courtyard.

Roof steelwork was inspected at various locations to the main buildings for the Hospital. Accessible locations were primarily associated with the plant areas where the roof was raised to accommodate the plant. Generally all of the steelwork observed to the roof steel was in good condition, performing well in service and rust free. It is not expected that any significant maintenance of the steelwork to the main buildings will be required over the next 15 years if the building remains dry and waterproof.

Overall based on the visual inspections conducted, no major structural work or maintenance is expected to be required in the period up to 2026. The building is expected to continue to perform in a similar serviceable state for the foreseeable future. It is expected that facades and exposed building cladding elements will require normal maintenance and repair requirements over the next 15 years.

3.24 Extensions and Alterations

3.24.1 Adult Mental Health building

General this building can be extended altered and modified easily without difficulty or significant cost. Alterations that could easily be accommodated include new openings, penetrations or alterations to internal layouts and load bearing walls. It would be very difficult and costly to add additional levels to the existing structure. In this case it is recommended that the existing building be demolished with a new multistorey building is constructed with new foundations.

3.24.2 Services Building (Single Storey)

Generally this building could be readily extended outwards using a similar structural system. The existing structural steel roof will readily allow alterations and extensions to be completed without significant cost. Extensions will require similar deep piled or driven foundations to be installed. The existing suspended floor will not readily allow for significant voids or penetrations to be installed and this should be avoided where possible. Generally new service penetrations less than say 2.0m x 2.0m should be able to be accommodated without significant structural strengthening or alterations.

The suspended floor has been designed to suit 5kPa plant or live load. This should be suitable for most future uses, however should additional loads be required to this building beyond 5kPa, this would be difficult and expensive to accommodate. New openings and penetrations to existing walls will be able to be accommodated. Adding additional levels on top of the services building would be very difficult and is not seen as cost effective or feasible, with the construction of an entirely new multistorey building expected to be a more cost effective solution if an additional level or levels are required.

3.24.3 HR Services Building (Single Storey Temporary Demountable)

Extensions and alterations to expand on this structure could easily be achieved, however the temporary lightweight construction of this building would only serve to provide a temporary solution if it were to be further expanded. It would not be practical to extend this building by providing an additional level or levels above.

3.24.4 HBACS building

Extensions and alterations to expand on this structure could easily be achieved; however the temporary lightweight construction of this building would only serve to provide a temporary solution if it were to be further expanded. It would not be practical to extend this building by providing an additional level or levels above.

3.24.5 Medical Records Building

Extensions and alterations to expand on this structure could easily be achieved; however the temporary lightweight construction of this building would only serve to provide a temporary solution if it were to be further expanded. It would not be practical to extend this building by providing an additional level or levels above.

3.25 Main Public Hospital Building

3.25.1 Extending Upwards – (Additional levels above)

It is not seen as feasible to add additional levels onto any of the main Hospital buildings (two, three and four) without demolishing the existing building or buildings. The limiting structural factors are the building foundations which have not been designed to suit the additional loads that would be incurred from the extra levels. Strengthening the existing foundations to cater for the increased floor loads would be extremely difficult if not impossible to achieve economically.

An additional light weight steel mezzanine is expected to be able to be accommodated over different zones of the existing building; however fire rating and other compliance related issues would need to be reviewed for this scenario. This mezzanine would be suitable for items such as plant requirements.

3.25.2 Extending outwards

Generally the existing main Hospital buildings could be extended outwards without significant structural difficulty. The new extensions would be designed essentially as free standing structures in their own right and be interconnected and tied to the existing buildings as required. Consideration would need to be made with respect to foundation systems adopted against the existing structures, with displacement type piling systems used in preference to driven piling systems due to the noise, vibration and potential influence that driven piles could have on the existing buildings. It is noted that the main Hospital buildings have been successfully extended to double its original size in the 1998 development.

3.25.3 New Voids and Penetrations

Generally small voids (<4.0m in each direction) in the existing suspended concrete floor slabs should be able to be accommodated with the introduction of locally stiffening and strengthening or addition of steel beams. Due to the irregular shape and varying loads and steps throughout the buildings, each of the proposed penetration locations will need to be fully reviewed and modelled to assess the design requirements and potential implications to the building. Large penetrations extending between existing columns will be difficult to accommodate without the introduction of additional posts and supports in adjacent slab spans and should be avoided.

3.25.4 Removal of existing load bearing walls and columns

Removal of any existing main structural concrete columns to the buildings is not recommended as part of any refurbishment or alteration options. The additional structural requirements to support the floor slabs at the locations of the removed columns would be significant and are likely to encroach on the minimum ceiling clearances.

Removal of significant lengths of load bearing walls (for example >4.0m) is not recommended as the structural requirements to achieve these openings will become increasingly complicated and expensive in relation to increasing the width of openings. New doorways and small openings in load bearing walls should generally be able to be accommodated without significant complications or expense.

3.26 Conclusions and recommendations

The permanent buildings on the Caboolture Hospital site were observed to be in good condition and performing well in service. These buildings are expected to continue to perform in a serviceable state for the foreseeable future with stand maintenance regimes implemented. No significant structural issues were observed to the permanent buildings on site.

Minor maintenance and repair activities should be expected for the single storey residential type structures and the non structural claddings and facades to the main Hospital buildings. Maintenance and repairs will be typically associated with the weather exposed claddings and external timber.

The demountable, temporary buildings which include the HR services building, HBACS, Medical Records building and Mental Health and Medical Officer accommodation, vary in their condition and integrity. The Medical Records building requires urgent structural repairs and modifications and is unsafe in its current state. A full structural audit is recommended for this building and its associated covered link. Various structural elements for this building do not comply with current building practises and Australian Standards.

Consideration should be made as to whether the existing demountable and temporary buildings on the Caboolture Hospital site can be integrated successfully and economically in any future extensions, expansions and renovations for the Caboolture Hospital or whether these structures should be replaced with permanent structures which will reduce maintenance requirements, improve continuity of the site and better utilise the associated space taken up by the temporary structures.

Broadly speaking, additional storeys cannot be economically accommodated on the existing buildings and should be avoided. All existing buildings on the Caboolture Hospital site can be extended outwards without significant structural complications.

3.27 References

1. Geotechnical Site Investigation Report: Site No. 30964 'Main Hospital building' soil report dated 22/11/1991, Job No. 91M/688
2. Geotechnical Site Investigation Report: Site No. 30964, 'Acute Care and Medium Secure Units. Report dated 31/03/2009, Ref: 3-2855, 2009-03-19, BR
3. Geotechnical Site Investigation Report: Site No. 30964 'Proposed Caboolture Private Hospital', soil report dated 08/11/1997, Job No. 397-0960

4 Building surveyor's report

4.1 Scope

The scope of this report has been to identify the existing building works that have been carried out in the past for the use of the buildings on the site, including:

- report on compliance and non-compliance issues of the buildings on the Caboolture Hospital site
- general areas where non-compliance was noted and should be addressed with any re-development
- discuss any expected future maintenance requirements for each of the buildings
- attempt to identify any issues which may arise if particular non-patient/non-clinical area were to be redeveloped.

4.2 Method

Site inspections were conducted on the Caboolture Hospital site to assist in the preparation of this report. The site inspection was conducted on 9 July 2010 with a follow-up inspection conducted on 10 July 2010. The Hospital building is a Class 9(a) Hospital (health care building) with class 5 professional offices to the ground and third floor, class 9(b) chapel and reception rooms on Level 1. The inspections were used to gain a clear understanding of the current building compliance and fire safety standards that will need to be addressed with any further redevelopment, change of use or refurbishment of areas within the buildings.

Caboolture Hospital would have been designed and constructed to comply with the previous building legislation in accordance with the Building Act 1975.

Dates of previous building compliance assessment and reports for the construction of these buildings on the site, on behalf of Queensland Health as a public hospital, have not been able to be ascertained from Project Services, Department of Public Works.

It cannot be determined whether the buildings at the time of the erection, may have complied with the intent of legislation. In theory however, the physical construction of critical fire resistance elements have been constructed to the required or intended standard required under the present legislation.

4.3 Exclusions

The existing private health building to the east of the site is out of the scope of this report.

As this report is based upon a visual inspection, it is difficult in some instances to ascertain the full extent of compliance due to the particular portion under assessment being concealed or inaccessible. In these instances it is assumed that the element or item complied at the time of its construction or installation.

Construction of the fire resistance elements or other parts of the structure, which are covered, unexposed or inaccessible have not been inspected. Therefore it cannot be confirmed that any such part of the structure is free from defect. Detailed structural analysis has not been conducted to confirm the existing buildings comply with current Building Code and Australian Standards. Detailed structural analysis has not been conducted to confirm the existing buildings comply with current Building Code and Australian Standards.

It should be noted that other issues and non-compliances which need to be corrected, may be identified in more detailed and specific investigations, which identifies areas and proposed uses on this site.

It should be noted that the non-compliances which are identified, are in relation to current building regulations. It is assumed that all buildings were compliant at the time of construction or at the last refurbishment considering that transitional provisions may have applied.

4.4 Standards used

The list of Queensland Statutory building requirements were referred to and used in the preparation of this report:

- The Building Act of Queensland 1975
- The Standard Building Regulations
- The Building Code of Australia (BCA as amended)
- AS1428 – Part 1 & Part 4 Disabled Access & Mobility
- AS1670 – Location of Fire Detection Alarm & Sounders for Emergency Purposes
- AS2293 – Location of Emergency Lighting & Illuminated Exit Signs
- AS2419 – Location of Fire Hydrant Installation
- AS2441 – Location of Installed Fire Hose Reels.

4.5 Issues

The Caboolture Hospital site consists of various buildings between one to four storeys in height. Each of the buildings is interconnected with paths and covered walkways. Single storey temporary demountable buildings have been located around and between the main buildings. The main Hospital building consists of three storeys on the eastern side and four storeys on the western side. It contains approximately 13,873m² in floor area and is of Type A Construction consisting of reinforced concrete columns, floors, lift and stair shafts, masonry construction and steel roof. The building has had major refurbishments from the mid 1990's, including the installation of sprinklers protecting window openings around the internal courtyard and in other locations. Floors are separated into fire and smoke compartments.

The chapel is located in the main Hospital building within the Level 1 internal courtyard.

The buildings located within the boundary of the Caboolture Hospital include:

- Existing Private Hospital – Single storey building – (Out of scope of this report)
- Main Public Hospital Building – Interconnected two, three and four storey buildings (floor area approximately 13,873m² – Class 9(a), 9(b) & 5 building of Type A construction)
 - Emergency Department
 - outpatients department
 - medical imaging
 - allied health
 - maternity
 - patient wards
 - operating theatres
 - administration and education
 - chapel
- Adult Mental Health unit – Single storey building (floor area approximately 1,310m² – Class 9(a) & 5 building of Type C construction)

- Services Building – Single storey building (floor area approximately 3,059m² – it is similar to Type C construction – Class 8, 7b & 5)
 - central plant
 - facilities management
 - kitchen and staff dining areas
 - stores and linen
 - District supply department
- Workplace, Health and Safety Building – Single storey temporary demountable (floor area approximately 136m² – it is similar to Type C construction – Class 5)
- HBACS Building – Single storey temporary demountable (floor area approximately 136m² – it is similar to Type C construction – Class 5)
- Medical Records Building (Condemned as unsafe) - Single storey temporary demountable (floor area approximately 180m² – it is similar to Type C construction – Class 7)
- Mental Health Offices and Medical Officer building – Single storey temporary demountable (floor area approximately 430m² – it is similar to Type C construction – Class 5) adjacent and parallel to the Engineering Workshop building.

The sections below review each of the buildings on the site and discuss the current and potential future building code compliance of each building and structures.

4.5.1 Main Hospital Building

Rise in storeys

Clause C1.2

The building has a rise in storeys of three and four connected Class 9a health care building with Emergency Department, outpatients department, medical imaging, allied health, maternity, patient wards, operating theatres, administration and education and chapel consisting of building classes 9(a), 9(b) assembly areas and 5 professional offices.

Type of Construction

Clause C1.1

The building is of Type A construction due to configuration. Rise in storeys 4 health care building class 9a.

The building has had major refurbishments from the mid 1990's, part of which included the installation of sprinklers protecting window openings around the internal courtyard and in other locations. Floors are separated into fire and smoke compartments, which are generally compliant.

The provision of smoke controls systems in accordance with BCA E2.2 (pressurisation of exit stairs and fire sprinkler systems or zone smoke control system) is an essential part of maintaining adequate fire safety within Health Care Buildings. Any refurbishment or change of use of significance must consider the smoke control requirements.

The internal fire isolated stairway number 8 within the existing Hospital building is the only fire isolated stairway that has a stair pressurisation system. All the other fire isolated stairways within this building are non-pressurised.

Floor Area Limitations

Clause C2.2

The building appears to comply with the floor area limitation for the type of construction applicable and is fitted with an automatic fire detection system and alarm system (further investigation of the alarms status would be required).

Fire Resistance

Clause C2.5

The Building Code of Australia (BCA) Section C (Fire Resistance) C2.5 requires a class 9a health care building to:

- (a) A Class 9a Health care building must comply with the following:
 - (1) Patient care areas must be divided into fire compartments not exceeding 2000m².
 - (2) Ward Areas-
 - (A) Where the floor area exceeds 1000m², must be divided into floor areas not more than 1000m² by walls with a Fire Resistance Level (FRL) of not less than 60/60/60; and
 - (B) Where the floor area exceeds 500m², must be divided into areas not more than 500m² by smoke proof walls complying with Specification C2.5;and
 - (C) Where division of ward areas by fire-resisting walls under (1) or (2) (A) is not required, any smoke proof wall required under (2) (B) must have an FRL of not Less than 60/60/60.
 - (3) Treatment areas must be divided into floor areas not more than 1000m² by smoke-proof walls complying with Specification C2.5.

Specification C 2.5 outlines the requirements for smoke-proof walls and incipient spread of fire ceilings and the construction of these elements. Caboolture Hospital currently has walls and ceilings that comply with the required conditions outlined in the Fire Resistance section of the Building Code of Australia.

Specification C1.1 of BCA

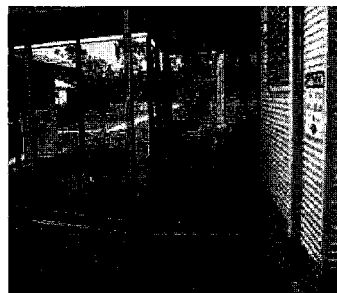
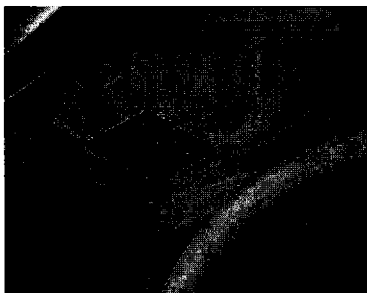
The classes 9a, 9b & 5 buildings when erected attracted fire resistance levels of 120/120/120, as they are separated from each other as fire source features.

Fire compartments are provided between main Hospital buildings and appear to achieve the fire wall resistance level of 120/120/120.

Fire compartment is provided between the chapel/link and the Hospital building with a fire wall resistance level of 120/120/120 and openings protected by non-openable glazing and fire sprinkler protection to openings in Hospital building of internal courtyard.

However, the attached walkways from the demountable buildings to the main Hospital appear to be in timber roofed structures instead of non-combustible material (i.e. steel frame for roof covering and access ways) see photos below.

Figure 11: Demountable walkway links



Source: Site Visit Crest Building Approvals

Separation of Lift shaft

Clause C2.10

Any lift in a patient care area in a class 9a health care building or resident use area (i.e. aged care facility) must be separated from the remainder of the building by a shaft have an FRL of not less than 120/120/120. In addition, an emergency lift must be contained within a fire resistant shaft.

The doorways in a lift shaft is required to be protected by -/60- fire doors compliant with the Australian Standard and remain closed except when discharging or receiving passengers.

Inspection of any of these shafts or doors was not able to be carried out at the time of the inspection, because they were covered, unexposed or inaccessible. Therefore it is unable to be confirmed whether any such part of the structure is free from defect. A lift company consultant should be engaged to inspect and report on compliance with these aspects.

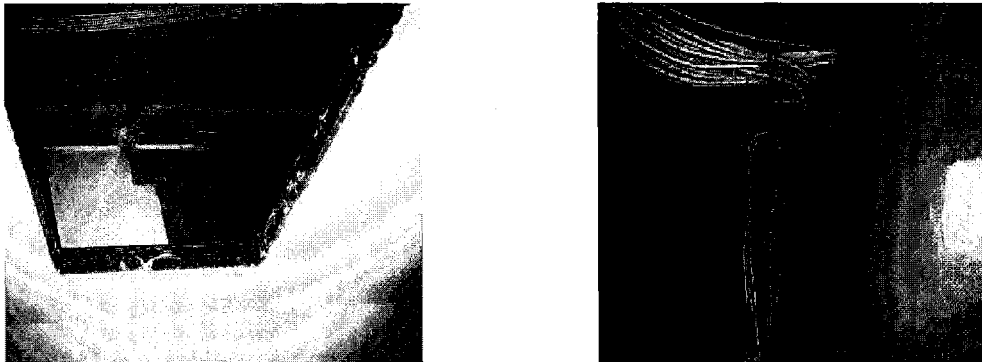
Fire Separation

Protection of openings

Clause C3.2

The openings in the fire walls in the compartments within the building and ceilings are sealed and conform to the tested approved systems for fire and smoke walls manufacturers.

Figure 12: Fire wall sheeting to underside concrete slab



Source: Site Visit Crest Building Approvals

In some locations, the installation of firestop from the top of the fire wall sheeting to the underside of the concrete slab is required to complete the fire wall separation.

Figure 13: Openings in external wall



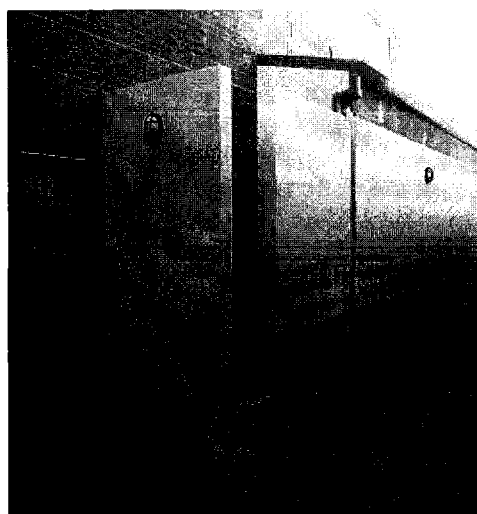
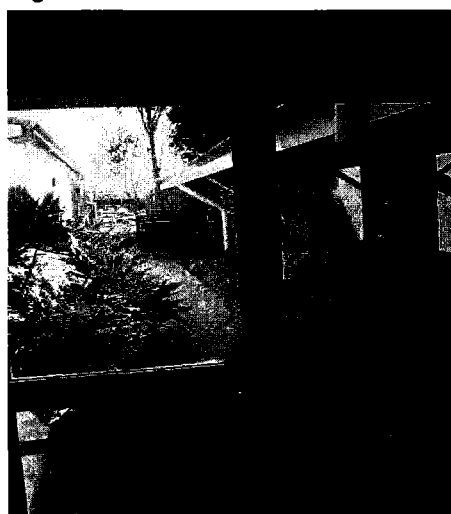
Source: Site Visit Crest Building Approvals

Clause C3.2

Openings in an external wall required to have a FRL must be protected in accordance with Clause C3.4 of the BCA (i.e. windows permanently closed in the Private Hospital building with external wall wetting sprinklers) if the distance between the opening and the fire source feature (another building) to which it is exposed is less than 6m from another building on the allotment that is a Class 10 building (walls opposite).

Protection is required for people exiting from fire isolated stairway number 6 at the eastern end of the main Hospital building at ground floor level adjacent to the single storey Private Hospital, see photos.

Figure 14: Exit from fire isolated stairway number 6



Source: Site Visit Crest Building Approvals

Provision for escape

Clauses D1.2 and D1.4

Exit travel distances appear to comply with the above clauses.

Fire isolated exits – connect not more than 2 consecutive storeys unless pressurised is required to comply with clause D1.3.

Travel distances – patient care areas 12m to point of choice 30m maximum to 1 exit from starting point complies with clause D1.4.

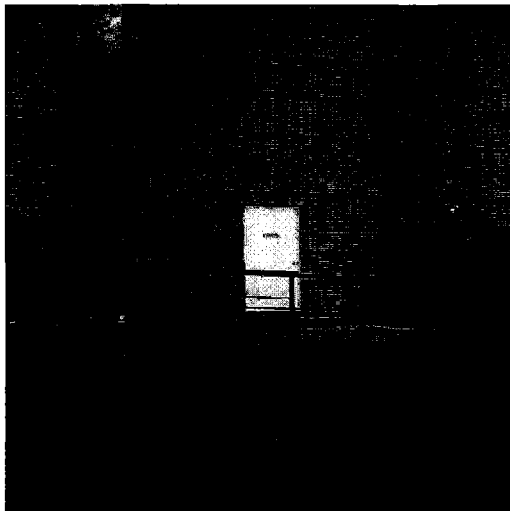
Distance between alternate exits – 45m apart, maximum complies with clause D1.5.

Clause D1.10 Discharge from Exits and D2.15 Thresholds

The discharge to open space from the fire-isolated exits generally complies with current and previous legislation however, discharge door from fire isolated stairway No 5 western end of main Hospital building to ground level incorporates 160mm step at the door sill. There should be a landing on the outside of this doorway for people to step down onto the concrete pathway, see photo attached.

Discharge path from the fire isolated stairway number 2 adjacent to the front entry of the main Hospital building is less than 1m wide due to the temporary construction fence and equipment from contractors working on the front of the emergency ambulance bay, see photo below.

Figure 15: Exit from fire isolated stairway number 2



Source: Site Visit Crest Building Approvals

Clauses D2.20 & D2.21

A door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900 mm and 1.2 m from the floor.

Door fittings on exit doors generally comply. However there are instances where lever action handles are installed below the 900mm. This needs to be identified and rectified.

Signage on fire doors, exit doors and smoke doors to the main Hospital building are generally compliant.

Access for persons with disabilities

Clause D3.2

The main Hospital building is primarily Class 9a usage. Access to the building is generally graded due to the age of the building and within the requirements of the Australian Standard for disabled persons. Equitable and dignified access for disabled persons is available and generally complies.

If any renovations or additions are to be carried out within these buildings, upgrades to disabled access, including identification and accessibility to sanitary facilities with tactile/braille and other indicators, will need to be carried out to comply with standards, particularly in regard to the pathways and access stairs to the demountable office work buildings.

Fire fighting Equipment

Clause E1.3 & Clause E1.4

In the main Hospital building, the location of fire hydrants and fire hose reels comply with the Australian Standards. It is recommended that the Queensland Fire and Rescue Service (QFRS) be consulted to confirm it is satisfied with how these services operate. It is also recommended that a Hydraulic Engineer carry out flow pressure test on these appliances.

Portable Fire Extinguishers

Clause E1.6

In the main Hospital building, portable fire extinguishers are installed and tagged throughout this building. It is recommended that the correct type and location is checked by a competent fire safety consultant.

Clause E1.8

No fire control centre facility was evident at the time of inspection. A check of the Hospitals Fire and Evacuation procedure is required to ascertain the procedures in an emergency. The fire indicator panels (FIP) are at the main entrance to the 4 storey Hospital building.

Smoke Hazard Management

Clause E2.2

The main Hospital building appears to have an air-handling system installed. A Mechanical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed. It could not be ascertained whether the air-handling systems recycle air from one fire compartment to another fire compartment, shut-down in alarm mode or operate as smoke control in accordance with the Australian Standard.

It was observed that the building has smoke detection and alarm systems installed. An Electrical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed in accordance with the Australian Standard. The alarm system needs to sound an occupant warning, be connected back to the FIP and local fire brigade.

Lift Installations

Clause E3.2 to E3.8

A lift company consultant should be engaged to inspect and report on compliance regarding all aspects of the lift installations.

Emergency lighting, Exit signs

Clauses E4.2 & E4.5

Emergency lighting and illuminated exit signs within the buildings generally comply with current legislation.

An Electrical Engineering consultant should be engaged to carry out an inspection and report on the compliance of the existing system including wiring.

An exit sign must be clearly visible to persons approaching the exit, and must be installed on, above or adjacent to each-

- (a) door providing direct egress from a storey to-
 - (i) an enclosed stairway, passageway or ramp serving as a required exit; and
 - (ii) an external stairway, passageway or ramp serving as a required exit; and
 - (iii) an external access balcony leading to a required exit; and
- (b) door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space; and
- (c) horizontal exit; and
- (d) door serving as, or forming part of, a required exit in a storey required to be provided with emergency lighting in accordance with E4.2.

The buildings generally comply with Clause E4.2 as emergency lighting is required in Buildings with a floor area in excess of 300m² and in particular areas stated in Clause E4.2.

An emergency lighting system must be installed-

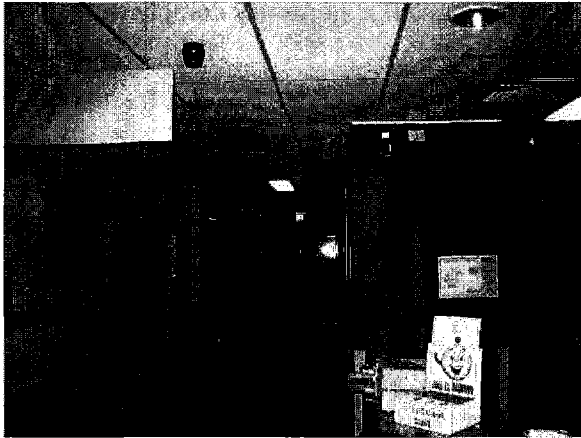
- (a) in every fire-isolated stairway, fire-isolated ramp or fire-isolated passageway; and
- (b) in every storey of a Class 5, 6, 7, 8 or 9 building where the storey has a floor area more than 300 m²-
 - (i) in every passageway, corridor, hallway, or the like, that is part of the path of travel to an exit; and
 - (ii) in any room having a floor area more than 100 m² that does not open to a corridor or space that has emergency lighting or to a road or open space; and
 - (iii) in any room having a floor area more than 300 m²

Clause E4.6

If an exit is not readily apparent to persons occupying or visiting the building, exit signs with directional arrows (if new signs are installed these should feature the 'running person' symbol) must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a required exit.

Directional exit signage is installed in the buildings. However in some locations illuminated exit signs are obscured due to in-ward Hospital signage, see photo below.

Figure 16: Obscured exit signage



Source: Site Visit Crest Building Approvals

Room sizes

Clause F3.1

In the main Hospital building the areas and height of the rooms inspected generally comply with current and previous legislation.

Sanitary and other facilities

Clauses F2.3

The toilet and bathroom facilities in all the buildings are old but generally comply with numbers of population. The current requirements are listed in part F2 of BCA.

I have not carried out a compliance inspection of all the sanitary and bathroom facilities in the buildings as these rooms were occupied at the time of our inspection.

A check with the Local Authority Plumbing and Drainage Department and a Hydraulic Consultant would be advised to ascertain the extent of approvals and compliance under the Water Supply and Sewerage Act and Health Act.

4.5.2 Adult Mental Health Building

Type of Construction and Rise in Storeys

Clause C1.1 and C1.2

Adult Mental Health unit – Single Storey building (floor area approximately 1,310m² – Class 9(a) & 5 building of Type C construction)

Clauses D2.20 and D2.21

This is the following non-compliance issue addressed in this building:

A door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900 mm and 1.2 m from the floor.

Door furniture to exits doors generally comply. However there are instances where lever action handles are installed below the 900mm. These areas should be identified and rectified.

Fire Fighting Equipment

Clause E1.3 and Clause E1.4

In the Adult Mental Health Unit building the location of fire hydrants and fire hose reels comply with the Australian Standards. The external fire hydrant protecting this building is located raised pillar cock adjacent to the southern end, approximately 7 metres from the rear of this building.

It is recommended that the QFRS be consulted to ensure it is satisfied with how these services operate. It is recommended that a Hydraulic Engineer undertakes an out flow pressure test on these appliances.

Portable Fire Extinguishers

Clause E1.6

In the Adult Mental Health Unit building portable fire extinguishers are installed and tagged throughout this building. It is recommended that the correct type and location of this equipment is checked by a competent fire safety consultant.

Smoke Hazard Management

Clause E2.2

It was observed that the Adult Mental Health Unit building has an air-handling system installed. A Mechanical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed. It could not be ascertained whether the air-handling systems recycle air, shut-down in alarm mode or operate as smoke control in accordance with the Australian Standard.

It was also observed that the building has smoke detection and alarm systems installed. An Electrical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed in accordance with the Australian Standard. The alarm system needs to sound an occupant warning, be connected back to the FIP and local fire brigade.

Room sizes

Clause F3.1

In the Adult Mental Health Unit building the areas and height of the rooms inspected generally comply with current and previous legislation.

Sanitary and other facilities

Clauses F2.3

The toilet and bathroom facilities in all the buildings are old but generally comply with numbers of population. The current requirements are listed in part F2 of BCA.

Compliance inspection was not carried out for all the sanitary and bathroom facilities in the buildings as these rooms were occupied at the time of our inspection.

A check with the Local Authority Plumbing and Drainage Department and a Hydraulic Consultant would be advised to ascertain the extent of approvals and compliance under the Water Supply and Sewerage Act and Health Act.

4.5.3 Services Building

Type of Construction and Rise in storeys

Clause C1.1 and C1.2

Services Building – Single storey building (floor area approximately 3,059m² – it is similar to Type C construction – Class 8, 7b & 5)

- central plant
- facilities management
- kitchen and staff dining areas
- stores and linen
- District supply department

Access could not be gained to the District supply department section within the Services Building as Security did not having key access. Therefore compliance of the department could not be assessed.

Provision for escape

Clauses D1.2 and D1.4

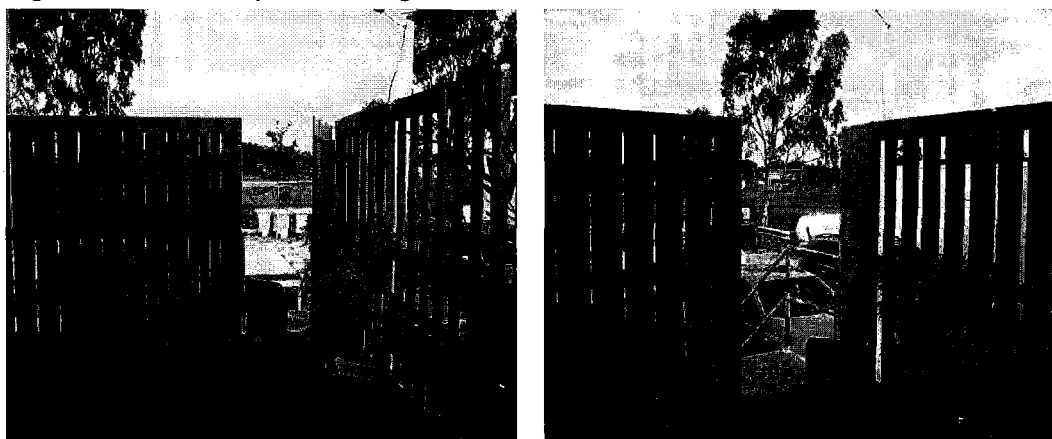
Non-compliance issues addressed in this building are outlined below.

Exit travel distances in the Services building from the Kitchen area through the outside staff area of this building appear to be non-compliant with the above clause D1.4.

The doors in the path of travel through the staff area to the rear exit door and stairs do not swing in the direction of egress and no lever action handle on the rear exit door. The required exit door from the kitchen area to the rear loading ramp and stairs does not swing in the direction of egress. Doors in the path of travel to exit (outside staff area) from the kitchen staff room to the external stairs have no lever action handle on exit door/gate in loading ramp. In addition, the exit doors from main kitchen on the southern side open inwards against egress to outside, see photos below.

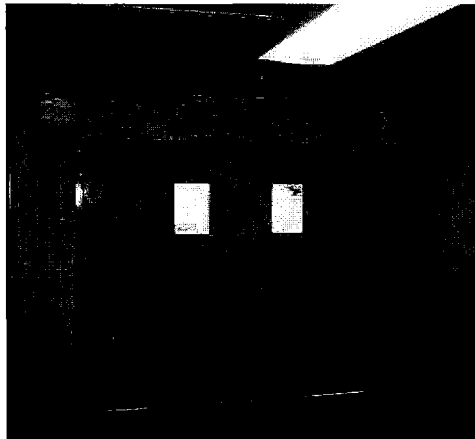
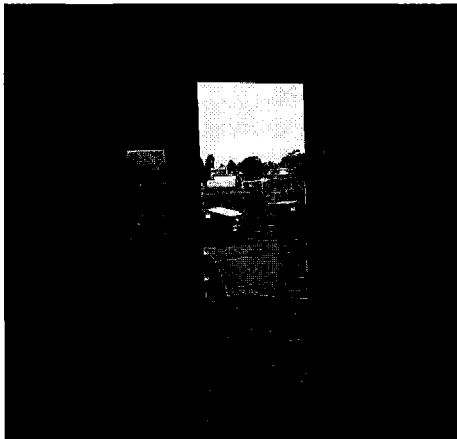
The kitchen area is approximately 360m² within this building.

Figure 17: Non-compliant exit egress



Source: Site Visit Crest Building Approvals

Figure 18: Non-compliant exit doors



Source: Site Visit Crest Building Approvals

Clauses D2.20 and D2.21

A door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900 mm and 1.2 m from the floor.

Door furniture to exits doors generally comply. However there are instances where lever action handles are installed below the 900mm. These areas should be identified and rectified.

Fire fighting Equipment

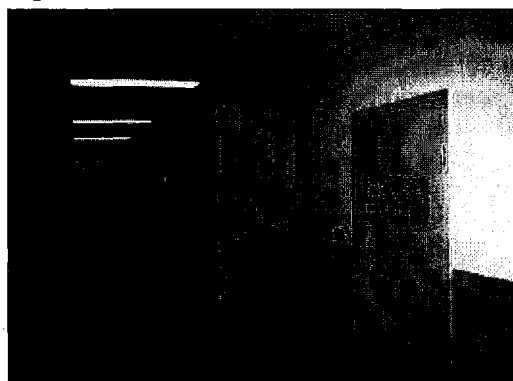
Clause E1.3 & Clause E1.4

In the Services building the location of fire hydrants comply with the Australian Standards. The external fire hydrant protecting this building is located raised pillar cock adjacent to the southern end some 10 metres from the rear of this building.

The internal fire hose reel location in this building does not comply as it is more than 4m from an exit.

It is recommended that the QFRS be consulted to ensure it is satisfied with how these services operate. It is recommend that a Hydraulic Engineer undertakes an out flow pressure test on these appliances.

Figure 19: Internal Fire Hose Reel Location



Source: Site Visit Crest Building Approvals

Portable Fire Extinguishers

Clause E1.6

In the community health care centre building portable fire extinguishers are installed and tagged throughout this building. It is recommended that the correct type and location is checked by a competent fire safety consultant.

Smoke Hazard Management

Clause E2.2

It was observed that the Services building did not have an air-handling system installed. A Mechanical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed.

It was observed that the building has smoke detection and alarm systems installed. Thermal detection is noted in the kitchen area. An Electrical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed in accordance with the Australian Standard. The alarm system needs to sound an occupant warning, be connected back to the FIP and local fire brigade.

Room sizes

Clause F3.1

In the Services building the areas and height of the rooms inspected generally comply with current and previous legislation.

Sanitary and other facilities

Clauses F2.3

The toilet and bathroom facilities in all the buildings are old but generally comply with numbers of population. The current requirements are listed in part F2 of BCA.

A compliance inspection was not carried out of all the sanitary and bathroom facilities in the buildings at the time of inspection.

A check with the Local Authority Plumbing and Drainage Department and a Hydraulic Consultant would be advised to ascertain the extent of approvals and compliance under the Water Supply and Sewerage Act and Health Act.

4.5.4 Workplace Health & Safety Building

Type of Construction & Rise in storeys

Clause C1.1 and C1.2

This demountable building is located 3.5m off the southern side of the main Hospital building adjacent an exit door from the Hospital. This demountable building should be located 6m away from the main Hospital building so it is not a fire source feature. In its present location this demountable building does not comply as it is a fire source feature to the main Hospital and the access ramp and roofed covered walkways are timber construction not non-combustible construction (i.e. steel frame construction). It is recommended that this building be relocated or removed.

It was observed that this demountable building has smoke detection and alarm systems installed. An Electrical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed in accordance with the Australian Standard. The alarm system needs to sound an occupant warning, be connected back to the FIP and local fire brigade.

4.5.5 HBACS Building

Type of Construction & Rise in storeys

Clause C1.1 and C1.2

HBACS Building – Single storey temporary demountable (floor area approximately 136m² – it is similar to Type C construction – Class 5).

This demountable building is located off the southern side of the main Hospital building and connected by an access ramp and roofed covered walkways of timber construction.

This demountable building is used as offices for Home Assist and does not comply as the minimum finished floor to ceiling height is only 2.37m in lieu of the required 2.4m floor to ceiling height. It is recommended that this building be relocated or removed.

It was observed that this demountable building has smoke detection and alarm systems installed. An Electrical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed in accordance with the Australian Standard. The alarm system needs to sound an occupant warning, be connected back to the FIP and local fire brigade.

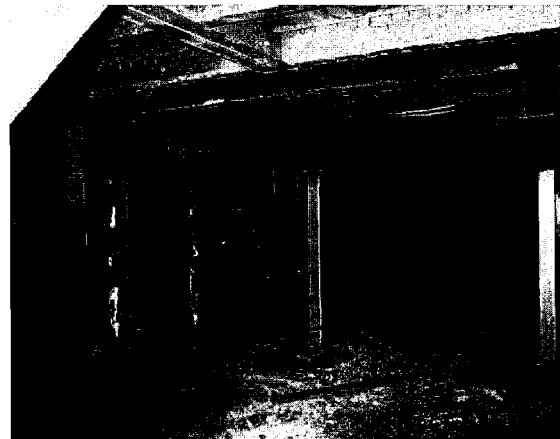
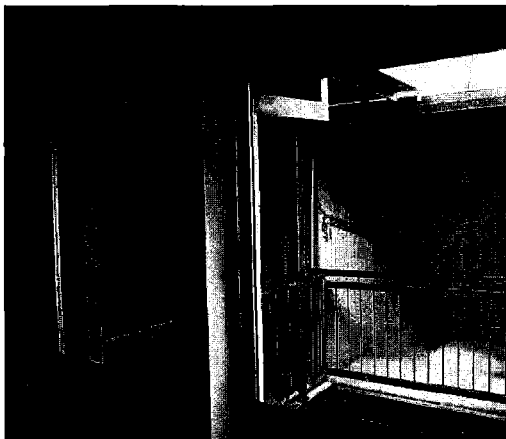
4.5.6 Medical Records Building

Type of Construction & Rise in storeys

Clause C1.1 and C1.2

Medical Records Building (condemned as unsafe) - Single storey temporary demountable (floor area approximately 180m² – it is similar to Type C construction – Class 7)

Figure 20: Medical Records demountable



Source: Site Visit Crest Building Approvals

This demountable building is located off the southern side of the main Hospital building and connected by an access ramp and roofed covered walkways of timber construction.

This portion of the demountable building is condemned and the adjacent to building used as offices for Home Assist. It is recommended that this building be removed as it is non-compliant and considered unsafe.

4.5.7 Mental Health Offices & Medical Officer Building

Type of Construction & Rise in storeys

Clause C1.1 and C1.2

Mental Health Offices and Medical Officer building – Single storey temporary demountable (floor area approximately 430m² – it is similar to Type C construction – Class 5) adjacent and parallel to the Engineering Workshop building.

This demountable building is located between the main Hospital building southern end, 4m from the wall of the main Hospital building and 3.0m from wall of demountable building to wall of the services engineering building.

This demountable building should be located 6m away from the main Hospital building and 6m from the services engineering building so it is not a fire source feature to either building. In its present location this demountable building does not comply as it is a fire source feature to the main Hospital and the services engineering building.

This demountable building is used as offices for Mental Health and the Medical Officer and does not comply as the minimum finished floor to ceiling height is only 2.37m in lieu of the required 2.4m floor to ceiling height. It is recommended that this building be relocated or removed.

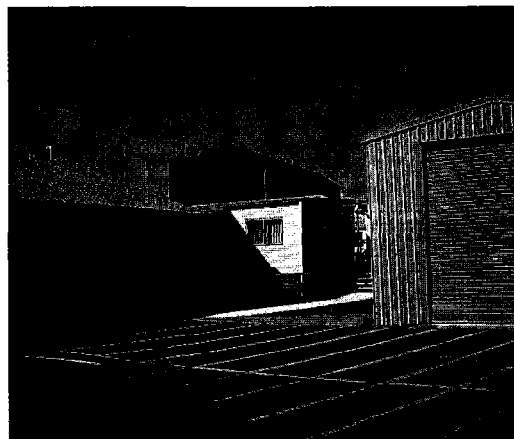
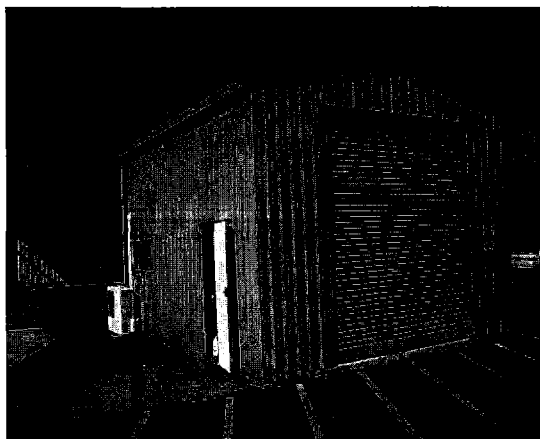
It was observed that this demountable building has smoke detection and alarm systems installed. An Electrical Engineering consultant should be engaged to carry out an inspection and provide a compliance report on the systems installed in accordance with the Australian Standard. The alarm system needs to sound an occupant warning, be connected back to the FIP and local fire brigade.

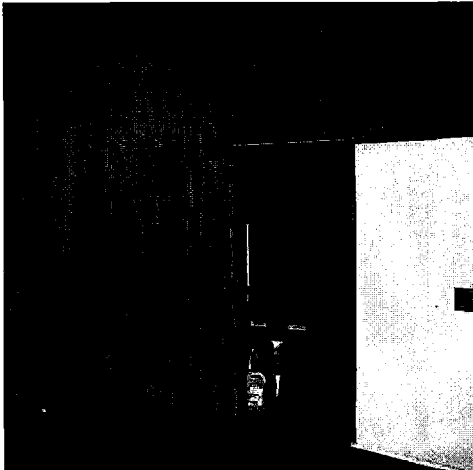
4.5.8 Single Storey Pre-fab Colorbond Steel Sheds

Type of Construction and Rise in storeys

This single storey pre-fabricated Colorbond steel frame shed is located off the southern end of the Community Health Centre building and has a compactus installed containing dental health clinic records, see photos below.

Figure 21: Dental Health Clinic records shed





Source: Site Visit Crest Building Approvals

Similarly, the single storey pre-fab Colorbond steel frame sheds are presently used for storage of medical health files and equipment.

It was not determined whether these structures have had building approval on this property. A search of Queensland Government Project Services, Department of Public Works records will need to be carried out to ascertain whether any building approvals have been obtained for the erection and use of these sheds.

In general, all permanent buildings on the Caboolture Hospital site observed during the site inspections are structurally sound and appear to meet building code compliance, with the exception of those details noted in this report.

It should be noted that the visual inspections of the existing permanent buildings was limited to internal public spaces and perimeter inspection of each building to determine building code compliance.

4.6 Conclusions and Recommendations

4.6.1 Main Hospital Building - Building Code Compliance

The main Hospital building generally complies with the Building Code and it is feasible to extend onto the western and southern end of the main three and four storey Hospital building without demolishing the existing main Hospital building. The new extensions will be designed, compartmentalised and interconnected with the existing main Hospital building.

The provision of smoke controls systems in accordance with BCA E2.2 (pressurisation of exit stairs and fire sprinkler systems or zone smoke control system) is an essential part of maintaining adequate fire safety within Health Care Buildings. Any refurbishment or change of use of significance must consider the smoke control requirements.

4.6.2 Adult Mental Health Unit Building - Building Code Compliance

This building generally complies with the building code and can be extended outwards and compartmentalised through openings in existing walls. It would not be feasible to building upwards or building over this existing building. Care would also need to be taken with regard to proximity (fire source features from other new buildings adjacent to other new building if this building is to be retained).

4.6.3 Service Building - Building Code Compliance

The size of this building will automatically require fire compartmentation if any alterations and additions are carried out on this existing building. The present building is constructed of a minimum type C construction, however, the present BCA floor area limitations requires the existing building to be built in type B construction. Under the Transitional Provisions of the Building Act this building if not alteration or extended can remain in type C construction. Any further additions will require the whole of this building will be required to be upgraded to type A construction or fire compartmentation as separate buildings. This would have additional implications for fire hydrant and fire hose reel coverage.

4.6.4 Mental Health Offices & Medical Officer Building (Demountable) - Building Code Compliance

The location of these demountable buildings generally does not comply as they are located within 6m of the complying permanent buildings on this property. Also, the internal floor to ceiling heights within these offices as workplaces does not comply with the BCA. Therefore, it would be practicable to remove these demountable buildings off this property and make provision in future development for permanent complying buildings.

In general, all permanent buildings on the Caboolture Hospital site observed during the site inspections are structurally sound and appear to meet building code compliance, with the exception of those details noted in this report.

It should be noted that the visual inspections of the existing permanent buildings was limited to internal public spaces and perimeter inspection of each building to determine building code compliance.

With regular maintenance the permanent existing buildings will maintain their service ability and compliance in the foreseeable future. The main Hospital building on the Caboolture Hospital site can be extended outwards and be inter-connected with the existing Hospital by fire and smoke compartmentation.

The provision of smoke controls systems in accordance with BCA E2.2 (pressurisation of exit stairs and fire sprinkler systems or zone smoke control system) is an essential part of maintaining adequate fire safety within Health Care Buildings. Any refurbishment or change of use of significance must consider the smoke control requirements.

The demountable buildings cannot be integrated into the new development with their non-compliant status and form of construction under the BCA. Therefore, it is recommended that the use of these structures be terminated and removed from site.

4.7 References

1. Peddle Thorp Architects drawing SK001 dated June 2010
2. Queensland Government Queensland Health drawing CH Level 1 Part C Revised 2005 dated 30 May 2005
3. Queensland Government Queensland Health drawing CH Level 1 Part D Revised 2005 dated 30 May 2005
4. Queensland Government Queensland Health drawing CH Level 2 Part C Revised 2005 dated 30 May 2005
5. Queensland Government Queensland Health drawing CH Level 2 Part D Revised 2005 dated 30 May 2005
6. Queensland Government Queensland Health drawing CH Level 3 Part D Revised 2005 dated 30 May 2005

7. Queensland Government Queensland Health drawing CH Level 4 Main Block dated 30 May 2005
8. Queensland Government Queensland Health drawing CH Services Block Part B Revised 2005 dated 30 May 2005

5 Hydraulic engineer's report

5.1 Scope

Inspections at the Hospital were carried out in June 2010. This inspection was undertaken by Cushway Blackford and Associates.

The scope of the inspection included all buildings on the site with the exception of the Private Hospital.

5.2 Method

The method of inspection was to review all available existing documentation (both EPlan and local), visually review each building, photograph where appropriate and discuss with the Hospital Maintenance personnel.

5.3 Exclusions

5.4 Standards used

The standards used in determining this report include:

- AS 3500 –Plumbing and Drainage
- AS 2419-Fire Hydrant Installations
- AS 2441-Fire Hose Reels
- Building Code of Australia.

5.5 Issues

The hydraulic services are generally in reasonable condition considering the building has been in operation since 1993.

Domestic water is connected into the local infrastructure in the entrance roadway on the north side of the site and an alternate supply from the eastern end of the site

The pressure is such that water feeds to levels 1 and 2 through mains pressure and level 3 via a break tank and domestic pressure pump.

Gas fired hot water units are provided in three locations throughout the site to provide necessary hot water. Thermostatic mixing valves are installed in patient areas of the Hospital where controlled hot water temperature is required.

A fire hose reel and hydrant system has been provided throughout the buildings and includes a set of electric fire pumps to ensure correct flows and pressures. The booster valve assembly has been located adjacent to the main entrance.

There is no rainwater reclamation from the site. However the Hospital now uses recycled water for landscape watering, cooling tower makeup, and services building toilets.

The existing Hospital is connected to the local authority sewer pump station at the southern side of the services building.

An existing LP gas tank feeds the site and is used for kitchen and hot water generation.

The following are items of concern:

- there are no obvious items of concern that were noticed or brought to our attention during the inspection
- all pipework that could be seen appeared to be in good condition.

5.6 Conclusions and recommendations

As the building services age, additional service and maintenance will be required to be carried out.

6 Electronic engineer's report

6.1 Scope

The scope of the inspection included all buildings on the site with the exception of the Private Hospital.

6.2 Method

Inspections at the Hospital were carried out in June 2010. These inspections were undertaken by Cushway Blackford and Associates Pty Ltd.

The method of inspection was to review all available existing documentation (both EPlan and local), visually review each building, photograph where appropriate and discuss with the Hospital Maintenance personnel.

6.3 Exclusions

During the walk-through inspection visits, there was no or minimal access to ceiling or roof spaces, building ducts, and underground services. Information on existing conditions were gleaned from the visual inspection carried out, the drawings that were available, and discussions on site with available staff.

6.4 Standards used

The standards used in determining this report include:

- Queensland Government ICT Cabling Standard IS32 and associated Technical Standards
- AS 3080 – Telecommunication Installations, Integrated Telecommunication Cabling Systems for Commercial Premises
- AS 3084 – Telecommunications Installations, Telecommunications Pathways and Spaces for Commercial Buildings
- Building Code of Australia.

6.5 Issues

The following is a brief summary of the various aspects of the electronic services installation:

Main Communications Room

The main communications room is on the Ground Floor adjacent to the paediatric outpatients department and houses the following equipment:

- Telephone main distribution frame (MDF)
- Telstra equipment
- Telephone PABX system
- Miscellaneous equipment
- The main server room is located on Level 3
- The MDF and associated PABX are suitable for the present use, but will need to be expanded and relocated should any further expansion to the Hospital occur.

Communications Cabling

Communications cabling consists of a fibre optic and copper backbone cabling between the main communications cabinet and cabinets in each wing. Cat 5 UTP cabling is provided throughout the buildings.

The installation is in good condition and appears suitable for reuse.

Security System

The security system provides access control to various areas of the Hospital. It is an Inner Range Concept 3000 model, and is quite old. It is likely that this system will need to be upgraded to a Concept 4000 series system.

Nurse Call System

The nurse call system is of Sedco manufacture, and is reasonably maintained. The original section of the Hospital is hard wired, whilst the latest part of the building has an electronic system installed.

6.6 Conclusions and recommendations

The main components of the electronics installation are generally in good order and well maintained.

However, due to their age and nature of technology, various systems should be considered for replacement over time, particularly if there is significant development of the site.

7 Electrical engineer's report

7.1 Scope

Inspections at the Hospital were carried out in June 2010. These inspections were undertaken by Cushway Blackford and Associates Pty Ltd.

The scope of the inspection included all buildings on the site with the exception of the Private Hospital.

7.2 Method

The method of inspection was to review all available existing documentation (both EPlan and local), visually review each building, photograph where appropriate and discuss with the Hospital Maintenance personnel.

7.3 Exclusions

During the walk-through inspection visits, there was no or minimal access to ceiling or roof spaces, building ducts, and underground services. Information on existing conditions were gleaned from the visual inspection carried out, the drawings that were available, and discussions on site with available staff.

7.4 Standards used

The standards used in determining this report include:

- AS/NZS 3000 – S.A.A. Wiring Rules
- AS/NZS 3008.1.1 – Electrical Installations – Selection of cables
- AS.NZS 2293.1 – Emergency Evacuation Lighting in Buildings
- Building Code of Australia.

7.5 Issues

The following is a brief summary of the various aspects of the electrical installation.

Electricity Supply

The existing Hospital is fed from a single high voltage supply to two substations located in the services building and a standalone padmount substation for the Community Health building.

Emergency Supply

Emergency supply to the Hospital is from 2 x diesel generators one located in an acoustically treated room adjacent to the chiller plantroom and main switchboard, and the second in a weatherproof acoustically treated enclosure adjacent the services building. Nominal generator capacity is 750 kVA (1000A per phase) for the first and 1000 kVA (1340A per phase).

Main Switchboard

There are two main switchboards with a bus tie arrangement between and reticulation via various stacks of circuit breakers for general light and power, mechanical services and essential services.

The switchboard is in good condition.

Reticulation

Electricity reticulation is generally via submains in an underground conduit and pit system to mechanical services switchboards in plantrooms and electrical distribution boards in each wing. There is some spare capacity in conduits.

Distribution Boards

Distribution boards (DB's) are of a panelboard type with separate circuit breaker chassis for essential and non-essential services.

DB's are generally in very good condition with some spare space.

General Lighting

Lighting is generally from recessed fluorescent troffers and downlights and is in good condition.

Emergency Lighting

Emergency lighting and exit signs are of the single point type connected to a Nexus monitoring system. They appear to be of good condition, however now due to the age of the facility, regular failures are to be expected.

Fire Alarm System

The fire alarm system comprises thermal and smoke detectors throughout in accordance with the requirements of AS 1670.1 which are connected to a new addressable fire indicator panel at the main entry. The thermal and smoke detectors are gradually being upgraded to suit the new addressable FIB.

The system has reasonable capacity for expansion.

7.6 Conclusions and recommendations

The installation is of good standard and has been well maintained.

8 Mechanical engineer's report

8.1 Scope

Inspections of the Hospital were carried out in June 2010. This inspection was undertaken by Cushway Blackford and Associates.

The scope of the inspection included all buildings on the site with the exception of the Private Hospital.

8.2 Method

The method of inspection was to review all available existing documentation (both EPlan and local), visually review each building, photograph where appropriate and discuss with the Hospital Maintenance personnel.

8.3 Exclusions

During the walk-through inspection visits, there was no or minimal access to ceiling or roof spaces, building ducts, and underground services. Information on existing conditions were gleaned from the visual inspection carried out, the drawings that were available, and discussions on site with available staff.

8.4 Standards used

The standards used in determining this report include:

- AS 1668 Parts 1 and 2 –Air conditioning and Ventilation
- Building Code of Australia
- AS 3666.

8.5 Issues

The major component of the Hospital (main buildings) are air conditioned by a system of chilled water consisting of three (3) water cooled chillers distributing chilled water to local air handling plantrooms throughout the facility. The systems are generally in good condition.

The chillers are all of York manufacture and consist of:

- 1500 KW centrifugal
- 1250 KW centrifugal
- 400 KW reciprocating

With connection to a three (3) cooling towers adjacent the chiller plant room.

Increased maintenance and replacement will increase as the equipment increases in age..

A specific smoke control system is provided throughout the facility, consisting of smoke exhaust fans to each smoke compartment.

Steam is generated via electrical heated steam boilers located on the second floor plantroom and used for CSSD sterilization requirements.

Medical gases consisting of oxygen, suction and medical air are reticulated throughout the facility.

Suction and Compressed air are generated by packaged machines. A bulk oxygen tank provides oxygen to the site.

The mechanical services are in reasonable condition.

8.6 Conclusions and recommendations

The chillers are presently fully loaded during peak summer conditions. Therefore any major expansion to the site would require an increase in the chiller capacity.

9 Civil engineer's report

9.1 Scope

The scope of this report has been to:

- describe the existing stormwater drainage and sewerage systems used to drain the site
- describe the existing access and parking provisions for the site
- report on the condition and capacity of the stormwater and sewerage systems
- report on the condition of the existing traffic pavements
- report on the capacity of the existing stormwater and sewer systems to cater for future expansion of the Hospital
- report on the capacity of the existing carpark and access to cater for future expansion.

9.2 Method

Site inspections were conducted on the Caboolture Hospital to assist in the preparation of this report. A detailed site inspection was conducted on the 10th of June 2010 with a follow-up inspection conducted on the 3rd of July 2010.

The Project Services Department of Public Works EPlan website was used to obtain survey data and plans of works previously carried out on site. Dial Before You Dig enquiries and enquiries to Moreton Bay Regional Council were made to obtain relevant information about existing services on site and in the surrounding region.

Existing geotechnical reports that had been conducted on the site were obtained from Soil Surveys.

9.3 Exclusions

The discussion on stormwater drainage infrastructure is limited to trunk systems external to the buildings and the stormwater systems immediately external to the site into which these systems connect.

The discussion on the sewerage system is limited to the pump station servicing the site and the rising main into which it connects. This report does not address sanitary drains within and external to the buildings.

Discussion on the condition of existing pavements is based on visual evidence alone, no testing has been carried out.

Discussion on car parking and access is limited to brief observations and anecdotal evidence only. Detailed traffic studies or monitoring have not been carried out.

We understand that a significant extension of the existing complex by way of the construction of a new Mental Health Unit is planned to commence in the near future. The effects of this new building on existing site services and traffic and any proposed upgrading and amendment of these is unknown at this stage.

No calculations of existing or future stormwater and sewerage flows or capacity of existing drainage systems have been carried out.

9.4 Standards used

9.5 Issues

9.5.1 Site Development

The main Hospital clinical building and ward building are located in the centre of the site with the services building immediately to the south. A Private Hospital is located immediately to the east of the main building. The Adult Mental Health Unit is south west of the main building, with the community health building to the west of this. There are several smaller demountable and domestic type structures set amongst these buildings.

To the north, and extending along the northern side of the site to the north east corner, is the main car park. There is another to the south of the Private Hospital, and several smaller car parks are accessed off the main ring road in the south west of the site. There is parking directly off the side of the ring road along the western and southern sides of the site.

A helipad is located to the north west of the main building in an undeveloped area of the site. Currently the area to the west of the main building is undeveloped but there are plans to construct a new mental health hospital on this site in the near future. The eastern side of the site is also undeveloped.

9.5.2 Access and Traffic

The Caboolture Hospital site is bounded on the north side by McKean Street and to the west by Duncan Street which is an unformed road but contains an open stormwater drain and various services. To the south are school playing fields and to the east an aged care facility. There are two access points; one off McKean Street into the north west corner of the site and the other into the south west corner of the site from an extension of Bury Street across Duncan Street.

There is an internal ring road within the Hospital site which connects to these two access points. The ring road also provides access to all the Hospital buildings and several car parks as well as providing for service vehicles. Ambulances share the ring road and accesses with other traffic.

There are several car parks within the site for visitors and staff. Use of the car parks is not restricted by times or user types and there is no charge or permits required for parking. There is also unrestricted on-street parking on both sides of McKean Street with a pedestrian path connection to the Hospital through the main Hospital car park.

The McKean Street entrance forms the main entry to the Hospital and the Hospital car parks. It is a simple tee intersection without designated turn lanes or traffic signal control. Visibility is good mainly due to the absence of vegetation or structures within the Hospital site and road verge on the eastern side of the access. The access road intersects with the internal ring road within a very short distance from McKean Street. On the opposite side of McKean Street there are several uncontrolled accesses to/from the St Columban's School and a bus stop within close proximity to the Hospital entry.

The access formed by the extension of Bury Street is the primary service vehicle entry but also links to the ring road and therefore provides access to all vehicular areas of the site.

The north east corner of the site abuts a roundabout which forms the intersection of Mewett Street, McKean Street, and Central Lakes Drive however there is no access to the site from this roundabout.

The current access arrangements for the Hospital appear to be working well with minimal delays. It is not expected that upgrading of the access would be required if no further development occurred.

Parking demand for available spaces appears to be high but coping. An increase in parking space numbers is unlikely to be required for the current development.

The proposed construction of the mental health unit may adversely affect the existing situation however this would be subject to further evaluation.

The condition of the car park pavement to the north of the main building is poor and in need of some maintenance work, which should consist of resurfacing as a minimum. The ring road and service vehicle manoeuvring area on the southern side is also in poor condition. The ring road and parking along the eastern side of the site is in reasonable condition.

The adequacy of the current access arrangements for the Hospital would need to be evaluated in conjunction with planned expansion of the facility and predicted future growth of traffic numbers on McKean Street. Increased traffic from the site combined with likely traffic increases on McKean Street due to ongoing development of the surrounding area could put the existing McKean Street access under pressure. There are a number of traffic conflict points within close proximity to each other near this access, both within the site and externally, which limit available queuing lengths and have the potential to interact and cause problems with the functioning of the access in its current uncontrolled configuration.

The geometry of the existing McKean Street/Mewett Street roundabout adjacent to the north east corner of the site suggests that it may be feasible to construct a fifth leg off the roundabout to serve as an access into the Hospital. This is an option that could be investigated as an alternative or supplementary access for the site to cater for future expansion.

It is very likely parking demand would exceed current supply with any further expansion of the site. Additional car parking or measures to reduce the demand for parking would need to be looked at. There are however undeveloped areas of the site that could be utilised for additional car parking.

9.5.3 Stormwater Drainage

The site is very flat and trunk site drainage is generally via open drains due to the lack of sufficiently deep receiving drains downstream of the site. These open drains are a mixture of concrete lined drains and turfed swales. Wherever possible it appears that drainage from vehicular pavement areas has been designed to drain via sheet flow across the pavements and into the open drain network. There are very few catch pits and underground pipes across the site. Where water is piped, reinforced concrete box culverts have generally been used due to the lack of cover.

The site is generally split into two stormwater catchments with the common boundary of the catchments running approximately through the centre of the main Hospital clinical and ward building in a north to south direction.

Water from the western side of the site is conveyed via open drains to a large local authority controlled open drain which runs adjacent to the site's western boundary in Duncan Street. This drain conveys stormwater to the north and into Lagoon Creek. There is also a concrete lined open drain which runs just inside the northern boundary of the site and collects runoff from the northern car parks. This also discharges to the west into the Duncan Street open drain.

The eastern side of the site drains via open drains to a point along the eastern boundary near the south east corner of the site. From here it discharges to the east and then to the south through the nearby residential estate before eventually discharging to the Caboolture River.

Due to the lack of fall across the site and the difficulty of ensuring a continuous gradient on finished ground levels some local drainage problems and shallow ponding, particularly in turfed areas, would be expected following rain. Site observations did not reveal significant sedimentation of the open drains or die off of vegetation due to prolonged ponding of water.

Although the ground on the site becomes very saturated as a result of wet weather, the stormwater conveyance swales appear to be adequate to convey the flows originating from the site. The drains do not have noticeable sediment deposit build-up or excessive ponding of water following rain. The vegetation cover of turfed drains seems good. The proposed mental health unit construction will significantly affect the existing drainage swale system in the north west area of the site however proposals for dealing with this are unknown at this time.

There appears to be an issue with the capacity of the council controlled drain in Duncan Street to the west of the site during heavy and prolonged rain and water backs up onto the site but does not affect buildings. This is not something that is likely to be able to be improved by works on the Hospital site as it is likely to be a result of the capacity limitations of the Duncan Street drain and Lagoon Creek to the north. This does not appear to affect the functioning of the Hospital.

9.5.4 Flooding

Flood levels for the site are still being sought from Moreton Bay Regional Council. Anecdotal evidence from Hospital staff is that during flood events water backs up the Duncan Street open drain and along the southern side of the Hospital site, including over the ring road, but does not threaten buildings.

Flood levels for the site are likely to be influenced by Lagoon Creek flooding and/or local flood levels in the Duncan Street drain. In the absence of better information it would be prudent to assume that flood levels associated with the Duncan Street drain culverts under McKean Street will be the minimum that should be allowed for. The level of McKean Street over these culverts is approximately 11.0m AHD and assuming approximately 200mm of flow across this road in a major flood event, the minimum design flood level for the site would be approximately 11.2m AHD. This would need to be confirmed by detailed calculations in conjunction with creek and river flooding information. It does however give a “feel” for the minimum flood levels to be expected.

A review of survey information for the site indicates that the existing buildings are set above this level however much of the undeveloped parts of the site and the ring road and parking areas along the western and southern side of the site are below this level. This finding is in accordance with the anecdotal evidence of flood inundation from Hospital staff.

9.5.5 Sewerage

Sewage from the site is discharged via a local authority owned sewage pumping station located on the southern side of the site towards the western end. This station pumps via a 200mm diameter discharge pipe into a 375mm diameter council sewer rising main which runs adjacent to and just outside of the southern site boundary. The pump station well is 1.5m diameter and 3.4m deep. There are twin 13.5kw pumps able to pump a maximum 44l/s.

The existing sewerage pump station appears to be working adequately and of sufficient capacity to service the current development on the site. Further information is still being sought from the local authority but upgrades of the sewerage system should not be required for a continuation of current operations.

9.6 Conclusions and recommendations

Current civil engineering aspects of the Hospital site appear to be adequate and require little or no upgrading and only routine maintenance to keep operating satisfactorily. The most immediate work recommended is a refurbishment by way of minor repairs and a reseal of the northern car park.

Flooding of lower areas on the site, particularly some sections of the ring road and some car parking, appear to be an infrequent inconvenience but does not affect the operation of the Hospital.

Before undertaking any further development on the site it is recommended that the following activities be undertaken:

- Carry out further survey or searches of available records to determine accurate and current location, size and levels of downstream drainage structures and roads to determine available falls for drainage pipes and swales.
- Obtain flood level information for Lagoon Creek, Caboolture River, the Duncan Street open drain, and the culverts and open drain at Mewett Street to determine accurate flood levels for the site. If this information can not be obtained from the local authority investigation work may have to be commissioned.
- Carry out a traffic, access and parking analysis and investigation of upgrade options for the site taking into account current and predicted traffic numbers generated by the Hospital site and on surrounding streets.

Obtain more detailed information from the local authority about the spare capacity of the existing sewage pump station and assess this against predicted additional flows from proposed on-site development.

10 Cost Estimates

Cost estimates detailed below (Section 10.1 to 10.3) have been developed by PeddleThorp Architects and Rider Levett Bucknall. These costs estimates have been subsequently reviewed by Department of Public Works and adjustments made in order to achieve Category 2 cost estimate level. Overall cost estimates, endorsed by Department of Public Works, for the options are:

Option 1 – \$1.4 million

Option 2 – \$548 million

Option 3 – \$611 million

10.1 Option 1 Opinion of Probable Cost

PRELIMINARY INFRASTRUCTURE PLAN OPTION 1		CASUALTY Opinion of Probable Cost	
New Building Works	n/a	Project Cost Forecast	
Refurbishments	see below m2	Opinion of Probable Cost	
Cars	n/a		
Gross Floor Area	n/a	\$1,000,000	JULY 2010
CONSTRUCTION WORKS		£	
REFURBISHMENTS (Refer plan MP003)			
1	Demountable HBACS	25,000	
2	Demountable ESP Call Centre	20,000	
3	Replace ailing MATV (required by 2013) Figure confirmed with supplier.	420,000	
4	Minimal upgrade of kitchen for Mental Health increase. Equipment upgrade only.	150,000	
5	Sundry Code Compliance	204,090	
6	Cars (signage and bollards to alleviate unsafe parking practice)	20,000	
Construction Costs		\$ 839,090	
CONSTRUCTION CONTINGENCY			
Construction Contingency		20,000	
PROFESSIONAL FEES AND AUTHORITIES		15,000	
CLIENT COSTS		35,000	
PROJECT RESERVE			
Project Contingency 10.00%		90,910	
FORECAST COST @ JULY 2010		\$1,000,000	
ESCALATION PROVISION			
Cost Escalation		Excl	
FORECAST PROJECT COST @ JULY 2010		\$1,000,000	

Exclusions

- Architectural enhancements to existing buildings
- Cost Escalation after July 2010
- Land Costs
- Land Holding Costs
- Headworks Charges
- Goods and Services Tax (GST)

Note:

The existing Medical Records building which has been deemed unsafe is replaced in a funded project and has been omitted from this option. Additional carparking to alleviate the opportunistic and unsafe parking on grassed areas has not been provided.

10.2 Option 2 Cost Analysis

RLB [unclear] [unclear]

PRELIMINARY INFRASTRUCTURE PLAN OPTION 2		CABOULTURE - INDICATIVE COST	
ASSESSMENT		Project Cost Forecast	
New Building Works	32,015 m ²	INDICATIVE COST ASSESSMENT	
Refurbishments	18,895 m ²		
Cars 1,470 No.	44,100 m ²		
Gross Floor Area	95,010 m ²	\$504,037,000	July 2010
CONSTRUCTION WORKS		\$	
Site Preparation/Enabling Works		904,000	
Central Energy expansion		16,098,000	
New Building Works	32,015 m ²	141,831,000	
Refurbishments	18,895 m ²	62,793,000	
Carparking	1,470 No.	37,485,000	
External Works		10,998,000	
Net Trade Costs	95,010 m²	\$ 270,110,000	
Locality Factor	2.0%	5,403,000	
Design Contingency	5.0%	13,606,000	
Managing Contractors Fees	12.5%	33,765,000	
Novated Consultants	8.6%	22,960,000	
Construction Costs		\$ 345,753,000	
CONSTRUCTION CONTINGENCY			
Construction Contingency	5.0%	17,288,000	
PROFESSIONAL FEES AND AUTHORITIES			
Consultant Fees	6.5%	22,474,000	
DPW Fees	0.8%	2,593,000	
QBSA Financial Review		4,000	
Q-Laava Levy		2,026,000	
CLIENT COSTS			
Q Health Costs (incl decanting)		21,569,000	
FF&E + ICT		60,328,000	
PROJECT RESERVE			
Project Contingency	5.00%	24,002,000	
FORECAST COST @ JULY 2010		\$504,037,000	
ESCALATION PROVISION			
Cost Escalation			Excl
FORECAST PROJECT COST @ JULY 2010		\$504,037,000	

Exclusions

- Architectural enhancements to existing buildings
- Cost Escalation after July 2010
- Land Costs
- Land Holding Costs
- Hardworks Charges
- Goods and Services Tax (GST)

10.3 Option 3 Cost Analysis

RLB | Project | Assessment | Indicative Cost

PRELIMINARY INFRASTRUCTURE PLAN OPTION 3		ASSESSMENT	CABOOLTURE - INDICATIVE COST	
			Project Cost Forecast	
New Building Works		38,576 m2		
Refurbishments		19,195 m2		
Cars	1,470 No.	44,100 m2		
			INDICATIVE COST ASSESSMENT	
Gross Floor Area		101,871 m2	\$562,064,000	July 2010
CONSTRUCTION WORKS			\$	
Site Preparation/Enabling Works			904,000	
Central Energy expansion			19,288,000	
New Building Works		38,576 m2	177,357,000	
Refurbishments		19,195 m2	55,489,000	
Car parking	1,470 No.	44,100 m2	97,485,000	
External Works			10,898,000	
Net Trade Costs		101,871 m2	\$ 301,521,000	
Locality Factor		2.0%	- 6,031,000	
Design Contingency		5.0%	15,078,000	
Managing Contractors Fees		12.5%	37,681,000	
Notated Consultants		8.5%	25,628,000	
Construction Costs			\$ 385,348,000	
CONSTRUCTION CONTINGENCY				
Construction Contingency		5.0%	19,298,000	
PROFESSIONAL FEES AND AUTHORITIES				
Consultant Fees		6.5%	25,087,000	
EPW Fees		0.8%	2,895,000	
QBSA Financial Review			4,000	
Q-Leave Levy			2,261,000	
CLIENT COSTS				
Q Health Costs (Incl decanting)			17,453,000	
FF&E + ICT			82,353,000	
PROJECT RESERVE				
Project Contingency		5.00%	26,785,000	
FORECAST COST @ JULY 2010			\$562,064,000	
ESCALATION PROVISION				
Cost Escalation				Excl
FORECAST PROJECT COST @ JULY 2010			\$562,064,000	

Exclusions

- Architectural enhancements to existing buildings
- Cost Escalation after July 2010
- Land Costs
- Land Holding Costs
- Headworks Charges
- Goods and Services Tax (GST)

11 Comparison of options to Australasian Health Facility Guidelines

Table 1: Comparison of options to Australasian Health Facility Guidelines

Department	AusHFG To meet 2026 SADR	Option 1 (Existing)	Option 2	Option 3
In-patient Units				
Medical In-patients	6600	776	9 x 30 bed wards total unallocated by speciality	6600 new build (164 beds)
Surgical In-patients	1200	795		1200 new build (39 beds)
Orthopaedic Med/Surgery	2400	n/a		2400 new build (53 beds)
Paediatric	1248 (1 Ward)	680	Total 1170 (1 Ward) (680 Existing, 140 Refurbished) 350 New Build (Funded)	1200 New Build (1 Ward)
Maternity	1155	856	Total 4780 (2100 New Build 2680 Refurbished) Includes: Special Care Nursery, Antenatal Clinic and Birthing Unit	1780 Refurbished Includes: Antenatal Clinic
Special Care Nursery	1753	181	Included in Maternity Area	1800 Refurbished
Renal	512	n/a	n/a	800 Refurbished
Mental Health Unit	n/a		Area provided in funded project on site	
Medium Secure Unit	n/a		Area provided in funded project on site	
Sub-Acute Units				
Rehabilitation	1218 (1 Ward)	n/a	1185 Refurbished (1 Ward)	1200 Refurbished (1 Ward)
Geriatric Management	1185 (1 Ward)	n/a	800 Refurbished (1 Ward)	1185 Refurbished (1 Ward)
Palliative Care	265	n/a	300 Refurbished	300 Refurbished
Emergency Department	3590 Includes: ED Adult Short Stay and MAPU	840	Total 3375 (1775 New Build 1600 Refurbished) Includes: ED Adult Short Stay and MAPU	3700 New Build Includes: ED Adult Short Stay and MAPU

Department	AusHFG To meet 2026 SADR	Option 1 (Existing)	Option 2	Option 3
ED Adult Short Stay	Included in ED Area (272)		Included in ED Area	Included in ED Area
MAPU	Included in ED Area (320)		Included in ED Area	Included in ED Area
Endoscopy Day Unit	n/a	440	1100 New Build	Included in Operating Suites / Procedures
Day Surgery Unit	1075			
Administration	1100	400	1100 New Build	1100 New Build
Admissions and Bookings	200	305	250 New Build	200 New Build
Allied Health	1730	865	1660 New Build	1820 Refurbished
Antenatal Clinic	454	n/a	Included in Maternity Area	Included in Maternity Area
ATODS	428	n/a	n/a	430 Refurbished
Birthing Unit	1420	553	Included in Maternity Area	1520 Refurbished
CCU (Coronary Care Unit)	1122	449	1100 Refurbished	1100 New Build
Clinical Measurement & Cardiac Investigation	346	n/a	350 New Build	360 New Build
CSSD (Existing TSU only)	684	210	640 Refurbished CSSD	725 New Build CSSD
Engineering & Maintenance Workshop Unit	373	151	100 New Build 65 Refurbished	100 New Build 65 Refurbished
FM Offices	430	120	430 new build mezzanine	430 new build mezzanine
Health Education & Training Facility	1200	385	1250 New Build (Funded)	1250 New Build (Funded)
ICU - Intensive Care Unit /HDU	733	435	680 Refurbished	730 New Build
Kitchen	750	395	750 New Build	750 New Build
Medical Imaging	2077	540	1980 Refurbished	2085 New Build
Medical Officer Workplace Facilities	500	n/a	500 New Build	480 Refurbished
Medical Records	670	406	470 Refurbished	670 Refurbished
Mental Health Executive & Acute Care Team	278	Area provided in funded project on site		
Mortuary	378	125	420 Refurbished	420 Refurbished
Operating Suite / Procedures	2272	1850	540 New Build 1990 Refurbished	2970 New Build Includes: Endoscopy Day Unit and Day Surgery Unit

Department	AusHFG To meet 2026 SADR	Option 1 (Existing)	Option 2	Option 3
Out Patient Unit	995	750	1000 New Build	1185 Refurbished
Pathology	300	262	310 New Build	380 Refurbished
Pharmacy	320	122	320 New Build	320 Refurbished
Stores Unit	408	430	500 Refurbished	500 Refurbished
Dental unit	920	n/a	n/a	920 Refurbished
Staff Amenities	590	250	600 Refurbished	590 Refurbished
Total	42879	14,275 + 1,250 Education and Training Facility (Funded)	Total 39,245 (23,415 New Build 15,150 Refurbished 680 Existing)	Total 43,405 (27,040 New Build 16,635 Refurbished)
Plus Travel & Engineering Services	15,007	Not incl.	11,665	14,366
Grand Total	57,886	15,525	50,910	57,771

	Cells indicate department areas not derived from Australasian Health Facility Guidelines.
	Indicate currently funded projects.

