BUILDING REGULATION & FIRE SAFETY ENGINEERING CONSULTANTS

Project: **DUBBO BASE HOSPITAL REDEVELOPMENT**

Report: **BCA ASSESSMENT STATEMENT for REF**

Date: 5 July 2012

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		Prepared by:	**Sean Connolly** Building Surveyor	Signature 

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PART 1 BASIS OF ASSESSMENT

1.1 Location and Description

The building development, the subject of this report, is located at the Dubbo Base Hospital site, Myall Street Dubbo.

The scope of the proposed works for the REF include the following:-

- Demolition of various structures including the existing nurses accommodation building and the nearby laundry and boiler house building,
- Construction of a new electrical substation building (including switchboard and generators) and relocation of existing pad mount substation,
- Upgrade and expansion of the existing car park,
- Termination and relocation of existing Hydraulic, water, sewer, gas and electricity infrastructure services across the site,
- Relocation of sheds to accommodate a new link road and construction access road in the northern part of the site,
- Construction of a new building for ICT infrastructure,
- Minor reconfiguration of the Hospital's main entry and front of house areas,
- Provision of new landscaping
- Expansion of the existing pump house.

1.2 Purpose

The purpose of this report is to undertake an assessment of the design proposal against the Deemed-to-Satisfy and or Performance provisions of the BCA, and to clearly identify any BCA compliance issues that require resolution/attention for the proposed development.

Not all details are shown on the drawings therefore the requirements to satisfy the BCA have been provided on a generic basis. These requirements will need to be incorporated into the design for the proposal.

1.3 Building Code of Australia

This report is based on the Deemed-to-Satisfy Provisions of the National Construction Code Series Volume 1 - Building Code of Australia, 2012 Edition (BCA) incorporating the State variations where applicable.

1.4 Limitations

This report does not include nor imply any detailed assessment for design, compliance or upgrading for: -

(a) Existing buildings on the site that do not form part of the proposed works,

(b) The structural adequacy or design of the building;

(c) The inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and

(d) The design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.

(e) The following provisions of the BCA are excluded from this Assessment:-

- The provision for access for persons with a disability – which will be addressed in a separate Access Report.

This report does not include, or imply compliance with:

(a) The National Construction Code – Plumbing Code of Australia Volume 3

(b) The Disability Discrimination Act 1992;

(c) The Access to Premises Standards 2010;

(d) Demolition Standards not referred to by the BCA;

(e) Occupational Health and Safety Act;

(f) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Sydney Water, Electricity Supply Authority, WorkCover, RTA, Council and the like; and

1.5 Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

PART 2 BUILDING DESCRIPTION

For the purposes of the Building Code of Australia (BCA) the development may be described as follows.

2.1 Rise in Storeys (Clause C1.2)

The buildings have a rise in storeys as follows:-

- New Electrical Substation/ Generators - One (1)
- New ICT Centre - One (1)
- Relocation of Sheds - One (1)
- Fire Pump Room - One (1)
- Main Entry/ Front of House - One (1)

2.2 Classification (Clause A3.2)

The buildings have been classified as follows.

Class	Description
9a	Hospital
5	ICT Facility
8	Electrical Substation/ Generators
10a	Sheds & Fire Pump Room

2.3 Effective Height (Clause A1.1)

The buildings have an effective height of less than 25metres.

2.4 Type of Construction Required (Table C1.1)

- Main Hospital - Type A Construction.
- ICT facility - Type C Construction
- Electricity Substation/ Generators - Type C Construction
- Shed & Fire Pump Room - N/A

2.5 Floor Area and Volume Limitations (Table C2.2)

The building is subject to maximum floor area and volume limits of:-

- Class 9a -Maximum Floor Area 5,000m2
  -Maximum Volume 30,000m3
- Class 5 -Maximum Floor Area 3,000m^2
  -Maximum Volume 18,000m^3
- Class 8 &10a -N/A

Further to the above the Class 9a portion of the main hospital building is subject to the following additional floor area limitations in the patient care areas:

- Patient Care Areas – Maximum Fire Compartment - 2 000m^2

- Treatment Area – Maximum Smoke Compartment - 1 000m²

- Ward Areas – Maximum 1 hour Fire Compartment - 1 000m²
- Ward Areas – Maximum Smoke Compartment - 500m²

2.6 Climate Zone (Clause A1.1)

The building is located within Climate Zone 4.

PART 3 BCA ASSESSMENT

The following is a summary of the relevant areas of the Deemed-to-Satisfy Provisions of the Building Code of Australia, (BCA) that will need to be addressed in the detailed design for the proposed development.

3.1 Structure - Section B

3.1.1 Structural Provisions - Part B1

The proposed new work will be required to comply with the following Australian standards (where relevant):

1. AS 1170.0-2002 General Principals
2. AS 1170.1-2002, Including certification for balustrading (dead and live loads)
3. AS 1170.2-2002, Wind loads
4. AS 1170.4-2002, Earthquake Loads
5. AS 3700-2001, Masonry Code
6. AS 3600-2009, Concrete Code
7. AS 4100-1998, Steel Structures and/or
8. AS 4600-2005, Cold Formed Steel
9. AS 2159-1995 or 2009, Piling
10. AS 3600.1-2000, Termite Control (or confirmation no primary building elements are timber.

New glazing must be provided in accordance with the following Australian Standards:

1. B1.4 (h) (iii) - to protect against nickel sulphide inclusions.
2. AS 2407-1999, Windows in buildings.
3. AS 1288-2006, Glass in buildings.

3.2 Fire Resistance - Section C

3.2.1 Type of Construction Required (Clause C1.1)

The proposed new buildings being located more than 3m from a fire source feature result in no fire resistance levels (FRL's) being required under Clause C1.1.

3.2.2 Fire Hazard Properties (Clause C1.10)

The fire hazard properties of all new building materials and assemblies as well as all new floor materials, floor coverings, wall and ceiling lining materials used in the development must comply with the requirements of specification C1.10 of the BCA.

3.2.3 General Floor Area and Volume Limitations (Clause C2.2)

The fire compartment sizes within the existing building as proposed to be extended cannot be larger than the floor area and volumes as listed in Table C2.2 for the classifications involved, ie, the maximum size of each fire compartment within the patient care areas is 5,000m² & 30,000m^3,

3.2.4 Class 9a and 9c Buildings (Clause C2.5)

The following areas of the main hospital building are required to be separated as follows:

- Patient care area are to have a maximum size of each fire compartment of 2,000m²,
- Ward areas required to be divided into 60/60/60 FRL fire compartments with a maximum floor area of 1,000m².
- The ward areas are required to be further divided into smoke compartments with the maximum areas of 500m².
- Treatment areas are required to be divided into floor areas of not more than 1000m^2 by smoke proof walls

The alterations proposed within the 'front of house' area will not reduce the required fire and smoke compartments as necessary in accordance with this clause.

3.2.5 Separation of Equipment (Clause C2.12)

Any of the following equipment must be fire rated with a fire resistance level of 120/120/120 and any doorway have an FRL of not less than --/120/30:

- Battery or batteries having a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours. This may occur in a Comms room also.

If this is the case in the ICT building the Switch &UPS room will require the above fire separation from the remainder of the building.

3.2.6 Electricity Supply System (Clause C2.13)

Any electricity substation is to be fire separated from the remainder of the building with construction achieving an FRL of 120/120/120 with any doors to be –120/30 self closing fire doors.

Any main switchboard sustaining emergency equipment operating in the emergency mode must be separated from the remainder of the building with construction achieving an FRL of 120/120/120 with any doors to be --/120/30 self –closing fire doors.

As the main switch room is a separate stand alone building compliance with this clause is achieved.

3.2.7 Protection of Openings in External Walls (Clause C3.2)

If the external walls of the building are to be located less than 6m from another building on the site (other than a Class 10a building) the openings in the external walls will need to be protected as required by Clause C3.2 by one of the acceptable methods of protection available under Clause C3.4.

No protection of openings are required as part o the subject works.

3.2.8 Openings for Service Installations (Clause C3.15)

Where service installations penetrate the walls or floors required to have an FRL with respect to integrity and insulation they are to be protected by fire seals having an FRL of the building element concerned. Fire seals are required to comply with specification C3.15. Where the mechanical ventilation system penetrates floors or walls that require an FRL the installation is to comply with AS/NZS 1668.1-1998.

3.2.9 Construction Joints (Clause C3.16)

Any construction joints must be fire rated as per the ratings of the building elements within which they are installed.

3.3 Access & Egress - Section D

3.3.1 Number of Exits Required (Clause D1.2)

A minimum of at least two exists must be provided from each storey in addition to any horizontal exits that are provided in patient care areas through the fire walls with an FRL of 120/120/120.

The proposed works achieve compliance with these requirements

3.3.2 Exit Travel Distances (Clause D1.4)

In other non patient care areas, the distance to an exit or a point of choice of two exits does not exceed 20m, in which case the distance to one exit does not exceed 40m.

The proposed works achieve compliance with these requirements

3.3.3 Distances between Alternative Exits (Clause D1.5)

The distance between exits is 45m in a patient care area and 60m in a non patient care area.

The proposed works achieve compliance with these requirements

3.3.4 Dimensions of Exits and Paths of Travel to Exits (Clause D1.6)

Corridors that are likely to be used for the transportation of people in beds are to be a minimum of 1.8m wide. The doorways off such corridors must have with a minimum width of 1200mm if the corridor is less than 2.2m or 1070mm if greater than 2.2m to enable manoeuvring of beds.

The proposed works achieve compliance with these requirements

3.3.5 Discharge from Exits (Clause D1.10)

Where an exit discharges to open space that is at different levels than the public road to which it is connected the path of travel to the road must be a ramp or other incline having a gradient not steeper than 1:8 or 1:14 if an accessible path required by Part D3 in accordance with Clause D1.10.

3.3.6 Horizontal Exits (Clause D1.11)

Horizontal exits may be counted as required exits if the path of travel from a fire compartment leads by one or more horizontal exits directly into another fire compartments which has at least one required exit which is not a horizontal exit.

3.3.7 Installations in Exits and Paths of Travel (Clause D2.7)

No access to service shafts must be provided within fire isolated stairs, passageways or ramps.

Any electrical meters, distribution boards or ducts, central communications distribution boards or equipment or electrical motors must be smoke sealed and enclosed within non-combustible construction with any penetrations smoke sealed.

Gas and other fuel services must not be located within a required exit.

Note that an opening to any chute that or duct that is to convey hot products or combustion from a boiler incinerator, fireplace or like must not be located in any part of a required exit or any corridor, hallway, lobby or the like leading to a required exit.

3.3.8 Pedestrian Ramps (Clause D2.10)

Any pedestrian ramp needs to have a non-slip finish.

3.3.9 Thresholds (Clause D2.15)

The door sill is not to be more than 25mm above the finished floor level to which the door opens

3.3.10 Doorways and Doors (Clause D2.19)

Sliding doors are not permitted in a patient care area.

3.3.11 Swinging Doors (Clause D2.20)

A swinging door in a required exit must swing in the direction of egress and must not encroach by more than 500mm onto the required width of the stairway, ramp or passageway if it is likely to impede the path of travel of people already using the exit.

3.3.12 Operation of Latches (Clause D2.21)

A door in an exit or in a path of travel to an exit must be readily openable without a key from the side of a person seeking egress.

3.4 Services and Equipment - Section E

The Main Hospital building is required to be provided with the following fire safety and emergency services:-

- Fire hydrants (Clause E1.3)
- Fire hose reels (Clause E1.4)
- Portable fire extinguishers (Clause E1.6)
- Emergency lighting (Clause E4.2)
- Exit signs (Clauses E.5 & E4.6)
- Emergency lift (Clause E3.4)
- EWIS (Clause E4.9)
- Automatic fire detection alarm system (Clause E2.2a)
- Automatic shutdown of air-handling systems(Clause E2.2a)

Assessment of the location, capability and suitability of the above systems will need to be undertaken where effected as a result of the subject works so as to ensure compliance is achieved.

3.5 Health and Amenity - Section F

3.5.1 Sarking (Clause F1.6)

Sarking must be installed to roof and walls for weatherproofing as per AS/NZS 4200.1 and 2 -1994.

3.5.2 Waterproofing of Wet Areas (Clause F1.7)

Wet areas in the building are required to comply with AS 3740.

3.5.3 Damp-Proofing (Clause F1.9)

Damp proofing must be provided as per this clause and AS 2904 -1995 or AS 3660.1 - 2000.

3.5.4 Damp-Proofing of Floors on the Ground (Clause F1.10)

A vapour barrier is to be provided in accordance with the relevant requirements of AS 2870.

3.5.5 Facilities in Class 3 to 9 Buildings (Clause F2.3)

Suitable sanitary facilities are required for staff and patients as per Table F2.3.

The proposed works in the front of house area of the main hospital building would not have an impact on the requirement for sanitary facilities.

A single unisex accessible facility would be adequate for the new ICT building if the population was not more than 10.

3.5.6 Construction of Sanitary Compartments (Clause F2.5)

The door to fully enclosed sanitary facilities must open outwards, slide or be readily removable from the outside unless there is a clear space of 1.2 metres measured in accordance with figure F2.5.

3.5.7 Height of Rooms (Clause F3.1)

The minimum floor to ceiling heights in the building must be as follows:-

- patient care areas – 2.4m
- operating theatres or delivery rooms - 3m
- treatment rooms, clinic, waiting room, passageway, corridor or the like – 2.4m
- bathrooms and sanitary compartments, store rooms, tea rooms – 2.1m

3.5.8 Artificial Lighting (Clause F4.4)

Artificial lighting to the building is required in accordance with AS/NZS 1680.0 - 2009.

3.5.9 Ventilation of Rooms (Clause F4.5)

The building is required to be provided with natural ventilation achieving 5% of the floor area of the room served. Where natural ventilation is not provided. AS 1668.2 - 1991 mechanical ventilation is to be provided.

3.6 Energy Efficiency - Section J

3.6.1 Building Fabric (Part J1)

J1.1 Application- All new parts of the building envelope need to comply.

- Does not apply to the Main Switch room if not conditioned

The building envelope for the purpose of Section J is bound by the new external walls, floor and roof of the whole Building and the new external walls of the main Hospital building. ICT

J1.2 Thermal Construction General-

- Insulation must comply with AS/NZS 4859.1, in particular a continuous thermal barrier must be achieved.
- Reflective insulation must be installed with the necessary airspace between the reflective side of the insulation and the lining or cladding.
- Bulk insulation must be installed so that it maintains its position and thickness.
- When selecting insulation caution should be taken to clearly identify the total R-value of the installed roofing and ceiling system or wall system.

J1.3 Roof & Ceiling Construction

a) In this Climate Zone, Table J1.3 requires a minimum total R-value of R3.2 (downwards).

b) Where the area of ceiling insulation is reduced by more than 0.5% because of exhaust fans, flues or down lights, the loss of insulation must be compensated for by increasing the R-value of the insulation.

J1.4 Roof lights – not applicable

J1.5 External Walls

For external walls in this Climate Zone the minimum total R- Value of 2.8 is required.

J1.6 Floors

For a slab on ground in this Climate Zone, Table J1.6 does not require any additional insulation in the floor.

3.6.2 Glazing (Part J2)

J2.4 Glazing

The building must comply with glazing requirements, which satisfy option B calculations of the BCA Vol.1, 2012. In this instance the glazing calculator spreadsheet developed by the ABCB must be utilised to verify compliance.

NOTE: The glazing characteristics referred to are the new NFRC-100 characteristics, any glazing system which has either a ‘U value’ or ‘SHGC value’ EQUAL TO OR LESS THAN that specified, is acceptable.

3.6.3 Building Sealing (Part J3)

J3.3 Roof lights

A roof light must be sealed when serving a conditioned space and must be constructed with an imperforate ceiling diffuser or a weatherproof seal if it is a roof window, or a readily operable shutter system (manual, mechanical or electronic)

J3.4 Windows and doors

All external doors and windows must either have seals to restrict air infiltration or the windows must comply with AS 2047.

J3.5 Exhaust fans

All exhaust fans fitted in a conditioned space must have a sealing device such as a selfclosing damper or the like.

Compliance can be met by:

- Any new exhaust fans to have self-closing dampers, including “miscellaneous exhaust fans”.

J3.6 Construction of roofs, walls and floors

Roofs, walls and floors and any opening such as a window or door must be constructed to minimise air leakage by:

- enclosed or internal lining systems that are close fitting at ceiling, wall and floor junctions or
- sealed by caulking, skirting, architraves, cornices or the like.

3.6.4 A/C & Ventilation Systems (Part J5)

The air-conditioning system requires certification by a Mechanical Engineer, where the size of the air-conditioner is greater than 35kWr. For smaller package or split systems the motor efficiency performance is controlled under the Australian Governments Minimum Energy performance Scheme (MEPS).

A mechanical ventilation system will require certification by a Mechanical Engineer.

J5.3 Time switch

Where a Unit is greater than 10 kWr capacity or 1000L/s, a time switch must be installed in accordance with Specification J6 to control the unit, except where the unit is needed for 24 hour occupancy.

J5.4 Heating and cooling systems

A heater for heating a space other than via water must be

- a solar heater, or
- a gas heater, or
- an oil heater if reticulated gas is not available, or
- a heat pump heater, or
- a heater using reclaimed heat from another process, or
- a combination of any of the above, or
- an electric only heater if
    - reticulated gas is not available and the heater capacity is not more than 55W/m^2 , or
    - if the annual energy consumption for heating is no more than 15W/m^2 for the floor area of the conditioned space.

3.6.5 Artificial Lighting and Power (Part J6)

J6.2 Interior artificial lighting

a) All artificial lighting for the building must not exceed the aggregated maximum Illumination Power Density (IPD) specified in Table J6.2b.

b) The lighting limits do not apply to the following

- Emergency lighting
- Signage and display lighting
- A heater where it emits light
- Lighting for a specialised process nature
- Lighting for performances such as theatrical or sporting
- Lighting or permanent displays in museums or galleries.

J6.3 Interior artificial lighting and power control

Artificial lighting of a room or space must be individually operated by a switch or other control device.

An artificial lighting switch must –

i. Be located in a visible position in the room being switched or in an adjacent room or space from where the lighting being switched is visible,
ii. Not operate lighting for an area greater than 250m^2 except for single function spaces.

These lighting requirements do not apply to emergency lighting requirements or where lighting is required for 24 hours occupancy situations.

J6.4 Interior decorative and display lighting – not applicable

J6.5 Artificial lighting around the perimeter of a building

Artificial lighting around the perimeter of a building, must-

i. Be controlled by either a daylight sensor or a time switch in accordance with specification J6.
ii. When the total perimeter lighting load exceeds 100W, have an average light source efficiency of not less than 60 Lumens/W, or be controlled by a motion detector in accordance with Specification J6
iii. When used for decorative purposes, such as facade lighting or signage lighting, have a separate time switch in accordance with Specification J6

3.6.6 Water Supply (Part J7)

J7.2 Hot Water Supply

All hot water outlets must be fitted with a minimum 3 star water fittings, in this new section of the building.

Should ‘Zip’ type instantaneous water heaters be installed over sinks they must have time clocks installed.

3.6.7 Access for Maintenance (Part J8)

J8.2 Access for maintenance

Access for maintenance must be provided to al new services as they apply to this project, including-

- Time switches and motion detectors,
- Room temperature thermostats,
- Plant thermostats such as on boilers or refrigeration units,
- Motorised air dampers and control valves,
- Reflectors, lenses and diffusers of light fittings,
- Heat transfer equipment, and
- Adjustable or motorised shading devices.
- Plant that receives a concession under JV3(b) for the use of energy obtained from an Onsite renewable energy source or reclaimed energy

J8.3 Facilities for Energy Monitoring –not applicable

PART 4 STATEMENT OF COMPLIANCE

The design documentation as referred to in this report has been assessed against the applicable provisions of the Building Code of Australia 2012 and it is considered that such documentation complies or is capable of complying (as outlined above) with that Code.

Furthermore it should be noted that compliance with the Building Code of Australia may be achieved by either satisfying the Deemed-to-Satisfy provisions of the BCA or by formulating a performance based 'Alternative Solution' that satisfies the relevant Performance Requirements of the Building Code of Australia.

ANNEXURE A

Design Documentation

This report has been based on the following design documentation.

Architectural Plans Prepared by Cox Richardson Architects		
Drawing Number	**Revision**	**Title**
ARC-S1-01-001	01	Cover Sheet
ARC-S1-10-001	03	Site Plan (South)
ARC-S1-10-002	03	Site Plan (North)
ARC-S1-11-001	03	ICT & Substation Location Plan
ARC-S1-15-001	03	Site Demolition Plan
ARC-S1-21-001	02	ICT Centre Floor Plan
ARC-S1-21-002	02	Substation Floor Plan
ARC-S1-21-003	02	Fire Pump Room Floor Plan
ARC-S1-30-001	02	ICT Centre Elevations
ARC-S1-30-002	02	Substation Elevations
ARC-S1-30-003	02	Fire Pump Room Elevations
ARC-S1-40-001	02	ICT Centre Sections
ARC-S1-40-002	02	Substation Sections
ARC-S1-40-003	02	Fire Pump Room Sections
ARC-FH-01-001	02	Cover Sheet
ARC-FH-15-000	02	Ground Floor Existing Demolition Plan
ARC-FH-21-000	02	Ground Floor Proposal