APPENDIX F

Civil and Building Services Report

Wagga Wagga Base Hospital Redevelopment

CIVIL & BUILDING SERVICES PROJECT APPLICATION REPORT

- Rev 01
- 23 August 2011

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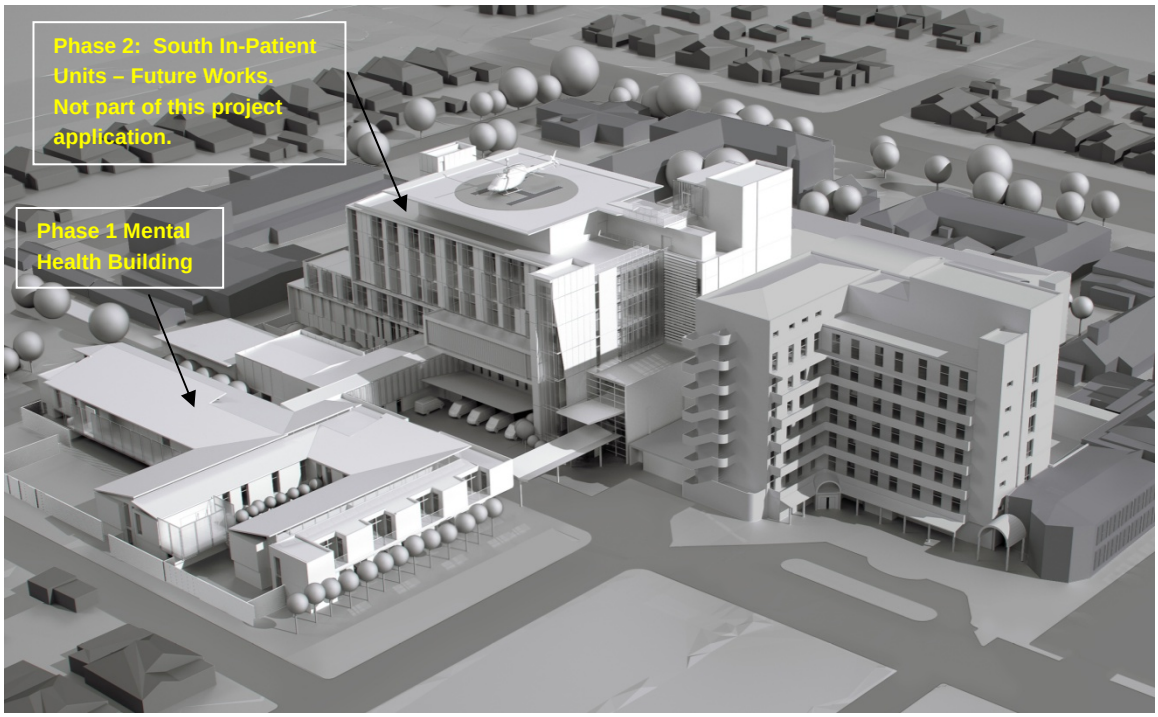
Executive Summary

The project application for the Wagga Wagga Base Hospital (WWBH) sets out a long term development strategy for the site. This project application is based on the 4,528m^2 gross floor area for the Mental Health building. This report focuses on the overall services achieved for Mental Health building only. The overall development including Mental Health is outlined below in figure 1-1.

- **Figure 1-1 Wagga Wagga Base Hospital**



Flooding

The existing hospital is located within the Murrumbidgee floodplain area. The Wagga Wagga Base Hospital review of Flooding Aspects report prepared by WMAwater dated March 2011 states that essential community facilities (such as hospitals) should be positioned above the Probable Maximum Flood (PMF) level. The WMAwater report also states that economic and practical considerations prohibit this in some locations. On this basis, the proposed phase 1 Mental Health Building ground Finished Floor Level (FFL) is constrained to be below the PMF level. The WMAwater report also states that a floor level of 182.58m AHD provides the site with approximately 750 year ARI protection including an allowance for 0.5m freeboard. Thus the proposed Phase 1 Mental Health ground Finished Floor Level of 183.175 affords flood protection

to the 750 year ARI with approximately 1.095m freeboard. Furthermore at 183.175 the proposed phase 1 Mental Health development FFL is 0.875m above the 1000 year ARI flood level but below the PMF level of 183.6.

Stormwater Drainage

The management of the stormwater runoff from the adjacent catchments to south and east of the site and the maintenance of the existing overland flow path regimes will be one the key issues for the redevelopment of the Wagga Wagga Base Hospital (WWBH).

In order to address these issues, SKM have undertaken an assessment of four main conceptual systems, these include:

- Diversion of upstream catchment to Docker Street firstly via the continuation of Yathong Street and then via grassed swale south of Lewis House.
- Provide an underground On Site Detention (OSD) system at the corner of the proposed new Link Road and Yabtree Street underneath the new car park north of the new Mental Health Building..
- Provide a minor drainage pipe system within the new road proposed east of the Mental Health building from Yathong Street and linking this drainage up with Council's existing stormwater network in Edward Street.
- Diversion of Overland Flow (OLF) from adjacent catchment from Yathong Street, Yathong Lane and Yabtree Street away from main hospital entrance through doctor's car park requiring the section of kerb to be removed and the re-grading of the car park to convey the flow.

It is likely that the final drainage solution that addresses the overland flow (OLF), will incorporate elements of all the flood mitigation systems discussed SKM – Overland flow report (rev 4) to achieve the best permanent solution that will benefit the operators, users of the site and the community at large. The exact location of OSD provision will be reviewed in the detailed design phase of the development.

Electrical

The electrical service will require additional sub-stations and communications facilities for the new development. The power for the new development will be provided by an indoor Central Energy Sub-station and associated Main Switch room. HV feeders will be available to provide firm supplies to the new development from the HV network to be expanded/modified following negotiations with Essential Energy. New emergency diesel generators and a tri-generation will form part of the central energy services with automatic synchronisation and control. The tri-Generation will come online in Phase 2 of the project.

Power factor correction, uninterruptible power supplies, surge protection equipment and lightning protection would be incorporated.

Lighting and power supplies would be provided in accordance with all relevant standards.

A new Campus Distributor Room and Carrier Room will be provided, in the initial stages, to contain cross-connect equipment to link with Carriers' equipment and other buildings within the new development including the existing parts of Wagga Wagga Base Hospital. A fibre optic based structured cabling system would be implemented, with Category 6a STP minimum cabling for floor distribution.

At each level, Floor Distributors (FD) in sufficient number to ensure that no technical outlet is in excess of ninety metres, will be provided. Where multiple levels are involved, these Floor Distributors (approx. 7 metres x 4 metres) would be stacked on an identical footprint for security of infrastructure.

Voice Over Internet Protocol (VoIP), Wi-Fi with integration to nurse call and security systems will be considered.

Mechanical

The Mental Health building will be air conditioned via central air handling units appropriately zoned to comply with BCA Section J energy efficiency requirements and AS1668.2. All air handling plant will be located in a dedicated plant room located on Level 2 of the Mental Health building accessed through public areas of the building to minimise interaction between contractors and patients.

The Mental Health building will be provided with toilet exhausts and laundry exhaust systems. All obnoxious exhausts will be exhausted at roof level in accordance with AS1668.2-1991.

The air handling systems for the Mental Health building will shutdown in the event of a fire in accordance with AS1668.1-1998. Stair pressurisation is not required.

Cooling and heating will be provided via pipework from the proposed central energy plant a water cooled chillers, natural gas fired boilers and cooling towers located on the Wagga Wagga Base Hospital campus in the vicinity of Yathong Street. In future stages, the central energy plant will be expanded to provide the full heating and cooling for the hospital and incorporate a tri-generation system. The chillers will contain non ozone depleting refrigerant and be located in an enclosed plant room to contain both noise and any refrigerant leaks. The cooling towers will be acoustically treated to meet both the hospital internal noise requirements and those at the property boundary. Heating for domestic hot water will be provided via a plate to plate heat exchanger from the main heating system.

This central plant location ensures that exhaust flues will not affect the proposed helicopter flight path (Phase 2), separates heavy maintenance activities from clinical areas and locates the cooling towers at the maximum possible distance from any existing or new outside air louvres.

Hydraulic

The hydraulic services include potable water, fire water supply, non-potable water, sanitary and trade waste drainage and natural gas supply will be provided to the hospital. Where existing connections to Authorities services are found to be suitable for reuse this will be maintained, otherwise new connections will be required.

The new development will reuse the existing sanitary drainage connections with new PVC pipe work extending to all areas requiring sanitary drainage. This will include on-site treatment of grease and trade waste to local Authorities requirements.

A new upsized connection to the existing main in Docker Street will be provided and reticulated to all new fixture, plant and equipment requiring potable cold water. In addition to the new connection, storage of water, pumps and on-site treatment of water may also be conducted at a single point, downstream of the upsized connection. Once connected the redundant water service connections will be capped off to Authority’s requirements.

Hot and warm water systems for the development would include a hot water plant co-existing with the mechanical plant. Warm water will be controlled by thermostatic mixing valves (TMV’s) that would be installed adjacent single or groups of fixtures.

The development will have a new mains connection in Docker Street to supply fire water for both fire hydrants and fire sprinklers.

Fire hose reels are to be connected to the new potable cold water service.

The existing 50mm mains connection and meter assembly will be retained to supply the demands of the new development. The natural gas service downstream of the main meter assembly will require upsizing of pipe work to suite the new demands of the development.

Fire

The fire services includes the installation of essential services to suit the new development

A new smoke detection system complying with BCA Part E2.2 and AS 1670.1 – 2004 will be provided throughout the new Mental Health building. The system will be controlled from a Sub Fire Indicator Panel (SFIP) located in the main entry lobby of the building.

Smoke detectors will be provided to suit the mechanical services in accordance with AS 1668.1 - 1998 requirements with fire fan controls located on the SFIP. The fire fan controls will allow the Fire Brigade manual control of the mechanical services under fire mode if required.

A new fibre optic network cable will connect the Mental Health building SFIP with the existing Ward Building's FIP during Phase 1 works and the connection will be relocated to the new MFIP in the Fire Control Centre during Phase 2 works.

A new Sound System and Intercom System for Emergency Purposes (SSISEP) will be provided throughout the Mental Health building. The system will be controlled from a new Master Emergency Control Panel (MECP) located the main entry lobby of the Mental Health building.

Portable fire extinguishers will be provided throughout the building.

Security

The Mental Health building will be provided with a new integrated security management system.

The Security Management System will allow all electronic security systems to be totally integrated so that it can function as a complete and seamless system that will allow control, administration and management from a single user interface. Security sub-systems include an extension of the Main Hospital's existing Electronic Access Control and Intruder Alarm System (Concept 4000), a new full IP CCTV System, new Hard Wired and Wireless Duress Alarm Systems and a new Video Intercom system. Generally, the new security management system shall be provided in accordance with AS4485 parts 1-2 requirements.

The new Security Management System for the Mental Health building will have administration, management and monitoring capabilities from a new Security Operator Workstation located at the Reception Desk of the Mental Health Main Entry. There shall be space provision for at least 1 security personnel to perform security monitoring functions from this location. In future stages, the monitoring and administration of the new Security Management System will be possible from other nominated security monitoring points connected to the security communications network.

A new fibre optic security communications backbone shall be provided around the Mental Health building to allow security communications from each floor's communications node to be reported and monitored at the new Security Operator Workstation. Generally, the new security communications network shall follow the proposed communications infrastructure layout.

The existing Concept 4000 system Electronic Access Control System shall be extended to facilitate access for authorised personnel through restricted areas of the Mental Health building. The system shall comprise 13.56 MHz smart cards, smart card readers and electronic locks and be administered and managed from the nominated Security Operator Workstation. As part of the Concept 4000 system, an integrated Intruder Alarm system shall also be provided to high risk areas of the Mental Health building and be comprised of reed switches, volumetric detectors and remote arming stations to permit arming/disarming of the system. The system will be provided in accordance with AS2201 parts 1-5 requirements.

A new IP CCTV system will allow video surveillance of key areas around the Mental Health building for the purposes of staff and patient safety and overall security of the nominated areas. The system will be comprised of a combination of fixed full body, fixed dome and pan, tilt and zoom cameras and be monitored from the Security Operator Workstation for post-incident analysis. The system shall be provided in accordance with AS4806 parts 1-4 requirements.

Hard wired duress alarm points will be provided within the Mental Health building to areas where staff members are generally alone with patients or the public. A wireless duress alarm system shall also be provided for staff working in high risk areas of the Mental Health building. Generally, duress alarms shall be provided in accordance with TS11 2007 and Australian Health Facility guidelines.

A new video intercom system shall be provided for the Mental Health building to permit audio and visual communication for visitors/contractors to gain access to restricted areas. The video intercom system shall consist of door stations in the field and master stations at nominated Reception Desks, Staff Stations and the like. The new video intercom system shall be capable of calling and escalating other master stations during after-hours periods. Video intercom door stations shall be provided to all nominated afterhours access points as per TS11 2007 guidelines.

Vertical Transportation

The Mental Health building will have two (2) lifts serving G to 1 to cater for bed transport and hospital staff in the Major and Minor Mental Health area.

1. Introduction

SKM have been engaged by Health Infrastructure to provide technical input into the development of the Part 3A Project Application report for the Mental Health building. SKM has been engaged to provide technical advice on the following services:

- Civil services;
- Traffic;
- Structural services;
- Electrical services (including communications);
- Mechanical services;
- Medical Gas services
- Hydraulic services;
- Fire services;
- Security services;
- Vertical Transportation

The new building services and infrastructure will be able to have capacity for all future stages. The new Central Energy Plant room will be in a centralised area to accommodate future stages and expansion.

This project application report outlines the overall services for the Mental Health building. The project application report will focus on the Director General Requirements for civil, traffic and building services.

2. Civil Services

2.1. Introduction:

This assessment identifies the issues and requirements for drainage and storm water management associated with the redevelopment of the Wagga Wagga Base Hospital. The assessment includes the reviews concerning flood management as the site is subject to flooding both from the Murrumbidgee River (to the north-west of the hospital) and the storm water flows from the adjacent catchments (south-east of the hospital) bounded by Rawson Lane and Murray Street. It also addresses concerns relating to the management of the storm water generated within the site that connects to the existing drainage infrastructure of Wagga Wagga Council.

Key Issues

The following key issues will form part of the main aspect of the hospital redevelopment:

- Improved storm water drainage system to manage the runoff generated within the proposed development, which incorporates the principles in Water Sensitive Urban design (WSUD).
- Installation of On-Site-Detention as part of the storm water drainage system to mitigate the discharges into the existing Wagga Wagga drainage infrastructure.
- Management of the storm water runoff from the contributing adjacent catchments between the hospital site, Murray Street and Rawson Lane.
- Adjustment of the existing adjoining minor roads (east of the hospital site) to redirect the existing overland flow regime in order to keep the storm water runoff away from the hospital.

2.2. Storm water Drainage and Flooding Assessment

Based on the Wagga Wagga Base Hospital Review of Flooding Aspects by WMA water dated March 2011 the proposed hospital is above the 1 in 100 year flood yet, the overall site is within the 1 in 500 years and PMF flood levels. The assessment, mitigation strategies and information related to drainage and storm water discussed in this report have been performed by Sinclair Knight Merz of which at this stage has been undertaken through desktop study with reference to the 2m contour, layout of the existing and proposed hospital and council's existing infrastructure. Detailed hydrologic study and hydraulics modelling is to be undertaken.

Preliminary assessment indicates that runoff from the adjacent local catchments is draining northwest through the existing internal minor roads within the vicinity of the hospital. The proposed redevelopment will require provision for a storm water passage between the new hospital and the existing buildings located northeast of the hospital site.

2.3. Aspects of Drainage Design

There are a number of aspects to be considered for the design of drainage systems including, site drainage (pits, pipes and provision for overland flow), discharging water quality, flood management and control measures, onsite detention, serviceability requirements for vehicles and pedestrians in the design event, larger storms and water sensitive urban design. Comments on these aspects related to the proposed upgrade to the Wagga Wagga Hospital are given in the following sections which draw on requirements of the Wagga Wagga Council's design standards, plans and specifications.

2.4. Existing Catchment and Drainage Systems

The existing site condition is predominantly impervious in nature. It consists of roadways, car parks, buildings and other paved areas. Based on the 2 metre contour obtained from the Wagga Wagga council, the site indicates that the existing south-eastern catchment bounded by the Rawson Lane and Murray Street generally flows towards the river through the existing internal minor roads in the hospital site and the intersection of Edward and Docker Streets.

Following the preliminary discussion with Council, a review of the preliminary survey and a site inspection it is identified that the existing drainage networks surrounding the site including the adjacent roads are likely inadequate to cater for the proposed full development of the base hospital. More detailed information of the existing storm water drainage system will be obtained for detailed storm water design to determine the most appropriate drainage strategy for the site. This is to consider the current Wagga Wagga Council Engineering Guidelines for Subdivisions and Development Standards Part 3 (Storm water Drainage Design – Draft December 2008) which indicates that a design storm of 1 in 20 years ARI has to be considered and a check for the 1 in 100yr ARI be performed to ensure that a minimum freeboard of 300mm is attained.

As per the Review of Flooding Aspects by WMA water dated March 2011, the site will be impacted by the flooding of Murrumbidgee River. The study indicates that the hospital site will have flood levels as follows:

Table 1: Selected Design Flood Levels at Wagga Wagga Base Hospital (Reference: Review of Flooding Aspects by WMAwater , 2011)

Table 1Flood Recurrence Interval	2005 Design Flood Level (m AHD)	2010 Riverine Flood Level (m AHD)
100 Year ARI	177.4	177.4
200 Year ARI	181.3	180.6
500 Year ARI	182.2	181.8
1000Y ARI	183.1	182.3
Probable Maximum Flood (PMF)	186.0	183.6

The above table which indicates the flood levels for the respective storms would likely dictate as the tail water levels for consideration in the design.

SKM notes the existing finished floor levels (FFL) at various locations within the hospital are:

- RL 182.525 – Emergency department ground floor
- RL 182.425 - Ambulance bay
- RL 182.525 - Loading dock in front of Mortuary

The Wagga Wagga City Council normally requires a 500mm freeboard to be adopted above the PMF for a development of this kind. Similarly, WMAwater's report dated March 2011 also indicates that essential community facilities (such as hospitals) should be positioned above the Probable Maximum Flood (PMF) level however, their report also acknowledges that economic and practical considerations prohibit this in some locations. On this basis, the proposed phase 1 Mental Health Building ground Finished Floor Level (FFL) is constrained to be below the PMF level. The WMAwater report also states that a floor level of 182.58m AHD provides the site with approximately 750 year ARI protection including an allowance for 0.5m freeboard. Thus the proposed Phase 1 Mental Health ground Finished Floor Level of 183.175 affords flood protection to the 750 year ARI with approximately 1.095m freeboard. Furthermore at 183.175 the proposed phase 1 Mental Health development FFL is 0.875m above the 1000 year ARI flood level but below the PMF level of 183.6.

2.5. Stormwater Flows from Adjacent Local Catchments

As discussed in section 2.4 the storm water runoff from the south-eastern catchment bounded by Rawson Lane and Murray Street is currently flowing north-west towards the vicinity of the hospital. The runoff concentrations are currently conveyed overland though the existing Lewis Lane, Yathong Street, Yathong Lane, Yabtree Street and Doris Roy Lane which all fall towards the

hospital site. With the proposed Wagga Wagga Base Redevelopment an appropriately sized storm water overland flow path along the eastern boundary of the hospital site is to be provided to direct the major flows from the south-eastern catchment towards Edward Street.

For additional discussion regarding the overland flow management of the stormwater runoff from the adjacent catchments to south and east of the site and the maintenance of the existing overland flow path regimes refer to SKM – Overland Flow Report (rev 4).

It is likely that the final drainage solution that addresses the OLF will incorporate elements of all overland flow mitigation systems discussed in the report to achieve the best permanent solution that will benefit the operators, users of the site and the community at large.

2.6. Hospital Site Storm water Drainage System

The storm water drainage of the proposed Base Hospital redevelopment will be managed through the installation of pit and pipe drainage systems in accordance with the Wagga Wagga Council Engineering Guidelines (Part 3 - Storm water Drainage Design, Draft December 2008). The proposed drainage system will be connected to the existing drainage infrastructure of Wagga Wagga council located along the Edward Street and Docker Street. The capacity of the piped drainage system for the hospital is to be designed for the 1 in 20 year ARI storm event. It is envisaged that existing drainage infrastructures will be utilised where possible and that redundant storm water infrastructures within the site will be removed.

The storm water runoff for minor events up to the design storm will be handled by the pit and pipe drainage systems. Excess flows due to storms higher than the design ARI will be conveyed through the site as overland flows along roadways and foot paths. For additional discussion regarding to the underground drainage system refer to SKM – Overland Flow Report (rev 4).

2.7. On-Site Detention System

On-Site Detention (OSD) is to be incorporated as part of the storm water drainage systems, to ensure that the peak discharge from the proposed hospital is less than or equal to that from the existing development.

This may include underground devices and possibly some parts of the car park areas which could also be utilised to achieve similar result to form part of the overall OSD system. It is expected that the OSD requirements can be accommodated within the site considering that the impervious areas of the proposed hospital redevelopment are only slightly greater than that of the existing condition. OSD is to be designed for the 1 in 20 and 1 in 100 year events. For additional discussion regarding to the OSD system refer to SKM – Overland Flow Report (rev4).

2.8. Water Sensitive Urban Design

Wagga Wagga Council Engineering Guidelines, Part 3 requires the principles of Water Sensitive Urban Design to form part of the development. The guideline draws a requirement that the WSUD be in accordance with the general principles outlined in the references listed (i.e. WSUD – Melbourne Water 2005, Australian Runoff Quality – A guide to water sensitive urban design, etc). The guideline which encourages protection of the receiving waters and possible retention of the storm water on site will be considered in the detailed storm water design.

The incorporation of the WSUD in the detailed design will be coordinated with the architectural and landscaping design of the overall WWBH redevelopment to allow the treatment of site stormwater to improve the quality of stormwater leaving the site.

The proposed WSUD elements will set up in “treatment trains”, whereby stormwater from impervious areas is treated through a series of linked treatment devices before discharging to Council’s existing storm water system in Edward Street.

The WSUD devises will include:

- Buffer Strips
- Vegetated swales
- Bio-retention systems or rain-gardens

Other water quality devices such as Gross Pollutant Traps (GPT), rainwater storages and permeable type paving, will also be considered within the detailed design of the hospital redevelopment.

3. Environmental Sustainable Design

Wagga Wagga Base Hospital will be designed to meet a ‘best practice’ level of sustainable design. ESD measures will include a natural gas fired tri-generation plant located at the back of the hospital. Tri-generation plant serving Mental Health will be brought online at the next phase of the hospital development.

Wagga Wagga Base Hospital will be designed to meet the requirements of the Building Code of Australia Section J – Energy Efficiency.

4. Building Services

4.1. Electrical Services

The expansion of the existing Base Hospital would see an increase in staff, patients and facilities. Accordingly, the electrical load and the communications traffic would be increased significantly.

The existing High Voltage (HV) feeders, transformers and switchgear including communications facilities and space are such that very little expansion is possible. Therefore, additional sub-stations and communications facilities are proposed for the new development.

At present, two HV feeders supply the existing sub-station, from Docker Street and Edward Street, via Lewis Avenue. The route of the latter feeder falls within the footprint of the new build. This may be diverted around the new works to be incorporated into the new sub-station or, should the connection to the existing HV network prove impractical, may be decommissioned and a new feeder sought. This will be the subject of future negotiation with Essential Energy.

It is proposed that a new Central Energy sub-station and associated Main Switch room would provide the majority of power to the development. Indications from Essential Energy (EE) is that recent upgrades to their zone sub-stations would show that separate HV feeders would be available to provide firm supplies to the new development, subject to network usage and utilisation. EE has expressed concern that the area is prone to flooding and recent events in Wagga Wagga have endorsed this high flood risk. Particular care would have to be taken in the final design with regard to the location of any sub-station and associated switch rooms/equipment rooms, with regard to protection/isolation from any risk of flooding.

Power supplies will be distributed from main switchboards via moulded case circuit breakers protecting sub-mains cabling, fire-rated for essential services, to sub boards and distribution boards and major equipment.

A dedicated sub-main switchboard will be provided within the Mental Health block to control sub-mains within that particular building.

New emergency diesel-driven generators would form part of the central energy services with automatic synchronisation and control. Where Tri-generation forms part of the central energy plant, the need for conventional diesel generators would prevail to support times of Tri-Gen failure, down-time for maintenance or during a quiescent state.

Power Factor correction, uninterruptible power supplies, surge protection equipment and lightning protection will be incorporated.

Lighting and power supplies will be provided in accordance with all relevant standards, including AS 3000, 3003, 1680 and the recommendations of TS11 and BCA, Section J.

With regard to Communications, a new campus distributor room and carrier's room will be provided in the initial stage of construction to contain cross-connect equipment to link with carriers' equipment and other buildings within the new development including the existing parts of WWBH.

A fibre optic based structured cabling system will be implemented, with Category 6a STP cabling as a minimum for horizontal floor distribution.

At each level, floor distributors (FD) for local horizontal floor distribution will be provided. A sufficient number of FDs will be provided to ensure that no technical outlet is more than 90 metres from the nearest FD. Where multiple levels are involved, these floor distributors (approx. 7 metres x 4 metres) will be stacked on an identical footprint for security of infrastructure.

VoIP telephony, Wi-Fi with integration to nurse call and security systems will be considered.

4.2. Mechanical Services

The Mental Health building will be air conditioned via central air handling units appropriately zoned to comply with BCA Section J energy efficiency requirements and AS1668.2. All air handling plant will be located in a dedicated plant room located on Level 2 of the Mental Health building accessed through public areas of the building to minimise interaction between contractors and patients.

It is proposed to provide activated carbon filters on all minimum outside air intakes. When a helicopter approach is detected by the Building Management System, all outside air dampers with exception of the minimum requirements will be closed to prevent aviation fuel smells from infiltrating the hospital through the air conditioning system.

The Mental Health building will be provided with toilet exhausts and laundry exhaust systems. All obnoxious exhausts will be exhausted at roof level in accordance with AS1668.2-1991.

The air handling systems for the Mental Health building will shutdown in the event of a fire in accordance with AS1668.1-1998. Stair pressurisation is not required.

Cooling and heating will be provided from the proposed central energy plant containing water cooled chillers, natural gas fired boilers and cooling towers located on the Wagga Wagga Base Hospital campus in the vicinity of Yathong Street. The chillers will contain non ozone depleting refrigerant and be located in an enclosed plant room to contain both noise and any refrigerant leaks. The cooling towers will be acoustically treated to meet both the hospital internal noise

requirements and those at the property boundary. Heating for domestic hot water will be provided via a plate to plate heat exchanger from the main heating system.

In future stages, the central energy plant will be expanded to provide the full heating and cooling for the hospital and incorporate a tri-generation system. When the tri-generation plant is installed, base load heating and cooling will be generated by the waste heat from the on site electricity generation. This central plant location ensures that exhaust flues will not affect the future proposed helicopter flight path (Phase 2), separates heavy maintenance activities from clinical areas and locates the cooling towers at the maximum possible distance from any existing or new outside air louvres.

Chilled water and hot water will be reticulated underground from the Central Energy Plant to the Mental Health building where it will then be reticulated through the ceiling spaces to the relevant plant rooms.

4.3. Hydraulic Services

Wagga Wagga Base Hospital hydraulic services include potable hot water services with localised TMV's , cold water, fire water supply, non-potable cold water, sanitary and trade waste drainage/plumbing and natural gas supply. Where existing connections to Authority's services are found to be suitable for reuse they will be maintained, otherwise new connections will be required.

Wagga Wagga hospital campus is provided with existing sanitary and trade waste drainage, domestic water, fire water and gas infrastructure reticulation. All services are supplied from Authority mains from the site's surrounding streets.

Sanitary/trade waste Drainage:
The sanitary drainage for Wagga Wagga Base Hospital has four (4) main connections to the Councils sewer system. The connections are listed below;

- 150mm connection in Lewis Street
- 150mm connection in Lewis Street
- 150mm connection in Lewis Street
- 150mm connection in Edward Street

The existing sanitary drainage is a gravity system which collects sanitary waste from fixtures, plant and equipment requiring sanitary drainage. The gravity drainage generally follows the natural fall of the ground and traverses the site from west to east and south west to north east. The drainage pipe materials are predominantly vitrified clay pipe (VCP) with the newer sections being installed in Polyvinylchloride (PVC).There are a number of onsite pre-treatment pits. These pits are located

around the clinical services building and include – cooling pits, grease arrestors, and dilution pits for the decontamination showers.

The new development will reuse the existing sanitary drainage connections with new PVC pipe work extending to all areas requiring sanitary drainage. This will include on-site treatment of grease and trade waste to local Authorities requirements. All works to be in accordance with the requirements of NSW Health guidelines, Australian Standards and associated codes and practices.

Potable Cold Water:

Wagga Wagga Base Hospital (WWBH) existing potable cold water system includes five (5) metered water supplies with pipe work reticulating through the facility to the various buildings to serve the fixtures plant and equipment requiring potable water.

The potable water connections are listed below;

- 150mm connection to Councils water main in Docker Street – main supply
- 100mm connection to Councils water main in Edward Street – serving the Multi-story building.
- 80mm connection to Councils water main in Docker Street – serving Lewis House/Community Health, Stores and engineering
- 20mm connection to Councils water main in Docker Street - serving the Dental Clinic
- 20mm connection to Councils water main in Lewis Street – serving Gissing house

Backflow prevention devices are installed on all connections providing containment protection in accordance with the Councils requirements and the devices appear to be maintained in a working condition. The 100mm connection on Edward Street supplies potable water to a roof top tank located in the plant room of the existing multi-storey building.

The new development works will consolidate the hospital site water supply by providing a single connection to the exiting Authorities main in Docker Street which will reticulate to all new fixtures, plant and equipment. In addition to the new connection; storage of water, pumps and on-site treatment of water will also be provided. Ancillary site connections will be capped of as building staging and demolition works allow.

A new non-potable water service is being considered to supply the sanitary fixtures requiring flushing (water closets and urinals) and in addition assist in the supply of irrigation demand. This system would harvest roof water from selected roofs and stored and treated on site if economically

viable. The treatment of harvested rainwater will include filtration and sterilization to the requirements of NSW Health guidelines, Australian Standards and associated codes and practices.

Potable Hot/Warm Water:

Hot and warm water systems for the development will include a hot water plant co-existing with the mechanical plant. Hot water will be reticulated as a flow and return system to all fixtures, plant and equipment. Localised TMV's will provide warm water to ablution fixtures.

Fire Hydrant/Fire Hose Reel Service:

The existing fire hydrants for the site are supplied from an existing connection to the Authority's water main in Docker Street incorporating a backflow containment device and mains model booster valve assembly located adjacent the main building. Internal and external fire hydrants are located throughout the site.

It is noted that the existing installations are non-compliant with current standards and as such the development will view the site holistically with provision made for a new mains connection in Docker Street to supply fire water for both fire hydrants and fire sprinklers.

Fire hose reels are to be connected to the new potable cold water service to the requirements of AS2441.

Natural Gas:

The existing Natural gas system for Wagga Wagga Base Hospital extends from the main gas meter assembly located adjacent to Rawson Lane. Incoming pressure is reported to be 1050kPa with reticulation pressure at 110kPa. The system reticulates through the facility to all buildings requiring natural gas energy to supply mechanical services hot water demands and kitchen services. The existing 50mm mains connection and meter assembly is considered adequate to supply the demands of the proposed development. This will also take into consideration the redundant demand of demolished buildings.

The natural gas service downstream of the main meter assembly will require upsizing of pipe work to suit the new demands of the development.

Existing External Authority's Services Mains
External hydraulic service mains exist on/near the vicinity of the re-development site that currently serves the existing hospital facilities.

Subject to detailed design of the proposed development and consultation with the Authority's, existing connections to the Authority's mains may be reused. Amplification of Authority's mains may be required.

Furthermore, consultation must be undertaken where the proposed development encroaches on existing Authority's mains to detail any proposed diversions, capping off or other proposed works to service the needs of the development.

These existing service mains surrounding the site;

- Council's sewer in Rawson Lane
- Council's sewer in Edward Street
- Council's sewer in Lewis Drive (requires diversion/relocation to clear future buildings/super structure)
- Council's water main in Docker Street
- Council's water main in Edwards Street
- Council's water main in Lewis Drive (requires diversion/relocation to clear future buildings)
- Council's medium gas main in Edward Street
- Council's high pressure gas main in Docker Street

4.4. Fire Services

The project application for the fire services includes the installation of essential services to suit the new Mental Health building.

A new smoke detection system complying with BCA Part E2.2 and AS 1670.1 – 2004 will be provided throughout the Mental Health building. As the building consists of two occupied levels and plant room, no zone smoke control system or fire sprinklers system will be required as per BCA Certifiers advice.

The system will be controlled from a Sub Fire Indicator Panel (SFIP) located in the main entry lobby of the Mental Health building.

Smoke detectors will be provided to suit the mechanical services in accordance with AS 1668.1 - 1998 requirements with fire fan controls located on the SFIP. The fire fan controls will allow the Fire Brigade manual control of the mechanical services under fire mode if required.

A new fibre optic network cable will connect the Mental Health building SFIP with the existing Ward Building's FIP during Phase 1 works and the connection will be relocated to the new MFIP in the Fire Control Centre during Phase 2 works.

A new Sound System and Intercom System for Emergency Purposes (SSISEP) complying with BCA Part E4.9 and AS 1670.4 – 2004 will be provided throughout the mental health buildings. The system will be controlled from a Master Emergency Control Panel (MECP) located inside the main entry lobby of the Mental Health building.

Portable fire extinguishers will be provided throughout the building in accordance with BCA Part E1.6, AS 2444 – 2001 and NSW Health guidelines.

4.5. Security Services

The Mental Health building will be provided with a new integrated security management system.

The Security Management System will allow all electronic security systems to be totally integrated so that it can function as a complete and seamless system that will allow control, administration and management from a single user interface. Security sub-systems include an extension of the Main Hospital's existing Electronic Access Control and Intruder Alarm System (Concept 4000), a new full IP CCTV System, new Hard Wired and Wireless Duress Alarm Systems and a new Video Intercom system. Generally, the new security management system shall be provided in accordance with AS4485 parts 1-2 requirements.

The new Security Management System for the Mental Health building will have administration, management and monitoring capabilities from a new Security Operator Workstation located at the Reception Desk of the Mental Health Main Entry. There shall be space provision for at least 1 security personnel to perform security monitoring functions from this location. In future stages, the monitoring and administration of the new Security Management System will be possible from other nominated security monitoring points connected to the security communications network.

A new fibre optic security communications backbone shall be provided around the Mental Health building to allow security communications from each floor's communications node to be reported and monitored at the new Security Operator Workstation. Generally, the new security communications network shall follow the proposed communications infrastructure layout.

The existing Concept 4000 system Electronic Access Control System shall be extended to facilitate access for authorised personnel through restricted areas of the Mental Health building. The system

shall comprise 13.56 MHz smart cards, smart card readers and electronic locks and be administered and managed from the nominated Security Operator Workstation. As part of the Concept 4000 system, an integrated Intruder Alarm system shall also be provided to high risk areas of the Mental Health building and be comprised of reed switches, volumetric detectors and remote arming stations to permit arming/disarming of the system. The system will be provided in accordance with AS2201 parts 1-5 requirements.

A new IP CCTV system will allow video surveillance of key areas around the Mental Health building for the purposes of staff and patient safety and overall security of the nominated areas. The system will be comprised of a combination of fixed full body, fixed dome and pan, tilt and zoom cameras and be monitored from the Security Operator Workstation for post-incident analysis. The system shall be provided in accordance with AS4806 parts 1-4 requirements.

Hard wired duress alarm points will be provided within the Mental Health building to areas where staff members are generally alone with patients or the public. A wireless duress alarm system shall also be provided for staff working in high risk areas of the Mental Health building. Generally, duress alarms shall be provided in accordance with TS11 2007 and Australian Health Facility guidelines.

A new video intercom system shall be provided for the Mental Health building to permit audio and visual communication for visitors/contractors to gain access to restricted areas. The video intercom system shall consist of door stations in the field and master stations at nominated Reception Desks, Staff Stations and the like. The new video intercom system shall be capable of calling and escalating other master stations during after-hours periods. Video intercom door stations shall be provided to all nominated afterhours access points as per TS11 2007 guidelines.

4.6. Vertical Transportation

Mental Health Building Lifts

Near the proposed open courtyard area, there are proposed to be two (2) lifts serving G to 1 to cater for bed transport and hospital staff in the Major and Minor Mental Health area. These lifts will be sized as Bed/Passenger Lifts.

The lifts will be specified as per TS11 guidelines.

It is proposed each lift will be geared or gearless AC drive machine-roomless lifts having a minimum of 2500 kg load or 33 persons capacity operating at a speed of 1.0 metres per second.