Warren Smith & Partners Pty Ltd

BLACKTOWN MT DRUITT HOSPITAL

Stage 1 expansion and sub acute projects

Description of Works – Hydraulic and Fire Services

BLACKTOWN STAGE 1

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1. HYDRAULIC SERVICES

This brief covers the Hydraulic Services provided to the Blacktown Stage 1 Redevelopment.

1.1 SCOPE

The Hydraulic Services that will be provided for the Blacktown Stage 1 Redevelopment will include:-

- Sub-soil drainage (internal to the building);
- Stormwater drainage (internal to the building);
- Roof water drainage;
- Rainwater downpipes including “Syphonic” downpipe system;
- Sewer drainage;
- Sanitary plumbing and drainage;
- Grease waste plumbing and drainage;
- Grease waste pre-treatment;
- Trade waste plumbing and drainage;
- Trade waste pre-treatment;
- Potable cold water service;
- Potable hot water services;
- Warm water service using thermostatic mixing valves (TMVs);
- Non-potable cold water via localised potable water reduced pressure zone devices (RPZD);
- Non-potable hot water via localised potable water reduced pressure zone devices (RPZD);
- Reverse Osmosis (RO);
- Laboratory quality water;
- Natural gas service;
- Sanitaryware fittings and fixtures;
- Taps and water outlets;
- Metering for Green Star (based on Green Star Health Pilot).

1.2 STANDARDS

The Hydraulic Services will be designed to a minimum of the following Standards:-

- National Construction Code (NCC)
- AS 3500 – Plumbing and Drainage Code
- NSW Code of Practice, Plumbing and Drainage
- AS 5601 – Gas Installation Code
- EPA – Rules and Guidelines
- Sydney Water Trade Waste requirements
- Local Council Stormwater requirements
- TS 11 NSW Health Engineering Services and Sustainable Development Guidelines – 2007
- NSW Health Department Circulars

1.3 SEWER DRAINAGE

Existing site sewer drainage system

The site is serviced by an existing Sydney Water sewer main passing through the North/West corner of the site. A 300mm and 225mm Authority main combine within the site and traverse through to Blacktown Road as a 300mm main. The sewer main gravitates through the site from Marcel Crescent to Blacktown Road. The Hospital has three (3) existing connections to the authority sewer in this area.

The majority of the site drains via a 225mm branch line running along the Blacktown Road frontage of the site from East to West. This site main is reported to have been replaced in 1997. Two (2) smaller 100mm and 150mm connections drain individual buildings in the north / west corner of the site.

This existing 225mm branch drains have sufficient capacity to drain the additional stage 1 & 2 developments.

Health Infrastructure have received a Feasibility Section 73 Application from Sydney Water for this project. Advice from Sydney Water has been received which notes the current infrastructure can support the increased flows projected as a result of the BMDH stage 1 redevelopment.

Sewer Infrastructure Works

Proposed infrastructure works will include extending the two (2) 225mm main branch lines to serve the Stage 1 works. Drainage will be via an individual discharge point and associated branch line reducing the chance of disruption throughout the construction programme. A full fixture unit load calculation will be undertaken in accordance with AS 3500.2.

1.4 RAINWATER DRAINAGE

The internal rainwater drainage system will collect water from metal and concrete roofs and gravitate by downpipes adjacent to building columns and horizontal stormwater drainage pipes to the Rainwater Reuse Tank.

Harvested rainwater will be reused for toilets and urinal flushing, landscape irrigation and wash down.

The internal rainwater drainage system will collect water from trafficable roofs, terrace areas and landscaped areas and gravitate by downpipes adjacent to building columns and horizontal stormwater drainage pipes to the stormwater drainage system designed by the Civil Consultant.

The rainwater drainage system will be sized for a 1:100 year rainfall intensity.

Overflows to roofs will be designed to allow for a full blocked piped stormwater system. The overflows would be through the facades of the building and a piped overflow system would only be considered for internal areas subject to rainfall.

1.5 WATER SERVICES

Existing Site Water Service

Domestic cold water supplies the site via an existing 100mm water connection from the 250mm DICL Sydney Water Corporation water main in Blacktown Road. The supply is via an 80mm water meter and 100mm reduced pressure zone device. Water reticulates via a 100mm water main to two (2) x concrete site water storage tanks located adjacent to the Helipad. The tanks have a total capacity of 64,000 Litres and have recently under gone refurbishment. Domestic water boosting is via an adjacent pump set with a duty of 5.5 L/sec @ 20 m/head. Tank water is reticulated via three (3) off 80mm mains to various buildings within the site.

An existing 150mm connection to the Sydney Water Corporation main in Blacktown Road supplies the existing fire hydrant site service.

The hospital has a maximum peak demand of approximately 5.5 L/sec and an average daily demand of 285 kL for domestic cold water.

The existing Authority water main has sufficient capacity to provide the additional water demand for the stage 1 developments for both domestic and fire services.

Maximum permissible flow from the main is 120 L/sec @ 44m head.

Health Infrastructure has received a Feasibility Section 73 Application from Sydney Water for this project.

Water Services Infrastructure Works Associated with Stage 1

The existing 100mm diameter in ground site water reticulation system will be rationalised (diverted) to allow ongoing hospital operations and new works.

It is proposed to provide a ring main system as recommended by NSW Health Technical Sheet 11. The intention of a ring main is to provide continuity of supply when maintenance is required.

The existing site storage tanks have a combined capacity of 64,000 Litres. The proposed Stage 1 will increase the water storage demand. It is proposed to provide an additional 50,000 Litres water storage tank to meeting the new requirements. This tank will be located in the Roof Plantroom.

A water filtration system would be proposed on the storage tank supply.

Potable Hot & Warm Water Service

The hot water system will consist of a central hot water plant and circulation pipe system.

The hot water plant will consist of polypropylene non pressurised hot water tanks fitted with stainless steel corrugated pipe heat exchangers.

The hot water will be generated in commercial grade condensing hot water heaters with an energy input of 250 MJ/hr each.

Warm Water

Warm water to all patient care and staff area fixtures will be limited using Thermostatic Mixing Valves. Temperature limitation to outlets will be applied as follows:

Staff	50^0C	Disabled Public	43^0C
Public	50^0C	Patient care	43^0C

1.6 NATURAL GAS SYSTEM

The existing natural gas service is reticulated to service the mechanical plant, kitchen and co-generation facility to the existing hospital via a 75mm high pressure Jemena gas main in Blacktown Road. The gas supply is via a regulator and meter set adjacent to the road alignment near the North / East corner of the site. Gas is reticulated within the site via a 100mm main at pressure of 35kPa. A secondary stage regulator is located on the eastern side of the main building within a wire fence enclosure and drops the reticulation pressure to 7kPa for the main building.

Preliminary discussions with the Gas Authorities have taken place in regards to capacity of the existing Authority street main to services the stage 1 works. Advice confirming capacity has not been received at the time of this report. A formal application will be required to the local gas authority in order to accurately determine available capacity within the local gas main infrastructure. Such application can be made once a more established basis of future planning has been identified and documented.

2 FIRE SERVICES

This brief covers the Fire Services provided to the Blacktown Stage 1 Redevelopment.

2.1 SCOPE

The Fire Services that will be provided for the Blacktown Stage 1 Redevelopment will include:-

- Fire Hydrant System;
- Fire Hose Reel System;
- Automatic Fire Sprinkler System;
- AS 1670 Fire Detection and Alarm System;
- Sound System and Intercom System for Emergency Purposes;
- Fire Extinguishers.

2.2 FIRE HYDRANT SERVICE

Site Hydrant Service

The existing fire service to the site is supplied from the 250 mm Sydney Water Corporation water main in Blacktown Road. A 150 mm branch line supplies the site. Supply is via a 150 mm double check detector assembly and 150 mm booster valve located adjacent to the road alignment near the North / East corner of loading dock entry from Blacktown Road. External dual standpipe hydrants and building internal hydrants provide fire protection within the site.

Individual fire hydrant supply connections will be provided for the existing main Hospital Building and Stage 1 building. Further connections will be provided for existing and future building connections.

Main Hospital Building

The Main Hospital Building incorporates electric and diesel fire hydrant pumps located in the Level 5 plant room with reticulation to all internal fire hydrants. Existing hydrants will be relocated or new hydrants will be provided to suit the development works. All new work will comply with AS 2419.1 – 2005. Any existing unmodified hydrant infrastructure not compliant with AS 2419.1 will remain as is.

Stage 1 Building

The Stage 1 new build will be provided with a fire hydrant systems complying with BCA Part E1.3 and AS 2419.1 – 2005. The systems will be fed from the site ring main. A diesel booster pump will be located in the fire pump room adjacent to the new hospital entry off Blacktown Road.

2.3 FIRE HOSE REEL SERVICE

Main Hospital Building

The Main Hospital Building fire hose reels are connected to the domestic cold water system and reticulate to each fire hose reel. An electric fire hose reel pump located in the Level 5 plant room and reticulates to all fire hose reels. Existing hose reels will be relocated or new hose reels will be provided to suit the development works. All new work will comply with AS 2441 – 2005. Any existing unmodified hose reel infrastructure not compliant with AS 2441 will remain as is.

Stage 1 Building

Fire hose reels will be installed throughout the new Stage 1 building to BCA Part E1.4 and AS 2441 - 2005 requirements. The system will incorporate the following:

Fire hose reels located in cupboards within 4.0 m of the building exits. Additional fire hose reels will be located elsewhere within the buildings to provide additional coverage as required.

The fire hose reels will be provided with water from the metered potable water supply.

2.4. AUTOMATIC FIRE SPRINKLER SYSTEM

A fire sprinkler system complying with BCA Part E1.5 and AS 2118.1 - 1999 will be provided throughout the new Stage 1 Healthcare Building and Hospital Street. The detailed requirement for sprinklers over Hospital Street will be as per BCA consultant / Fire Engineer advice.

A new water supply will be provided from the Blacktown Road town main to the new valve room and include a backflow valve, Fire & Rescue NSW booster assembly and site wide booster pumps adjacent to the new site entry from Blacktown Road. A room containing the sprinkler control valves will be provided at Ground Floor (Level 3) of the new Stage 1 building.

An Automatic Fire Sprinkler System would be provided in accordance with Table E2.2a (c) (ii) of the NCC as the Smoke Hazard Management System.

2.5. AS 1670 FIRE DETECTION AND ALARM SYSTEMS

Main Hospital Building

The Main Hospital Building smoke detection system is controlled from a Fire Indicator Panel located in the Level 1 fire control room. Existing smoke detectors will be relocated or new smoke detectors will be provided to suit the development works. All new work will comply with AS 1670.1 – 2004. Any existing unmodified smoke detection infrastructure not compliant with AS 1670.1 will remain as is.

Stage 1 Building

A point smoke detection system will be installed throughout the Stage 1 building to BCA Part E2.2, AS 1670.1 - 2004 and AS/NZS 1668.1 - 1998 requirements. The smoke detection system will incorporate the following:

New addressable main Fire Indicator Panel (FIP) and Fire Fan Control Panel (FFCP) located in the Fire Control Centre on Ground Floor (Level 3). The FFCP will allow manual override of the mechanical services in fire mode if required.

Connection of the existing Sub Fire Indicator Panels (SFIP) throughout the site to the new main Fire Indicator Panel (FIP) located in the Fire Control Centre via a new fibre optic network cable.

Fire alarm zones to align with EWIS zones & fire compartments (Note: multiple fire zones may be required within each EWIS zone).

2.6. SOUND SYSTEM AND INTERCOM SYSTEM FOR EMERGENCY PURPOSES

Main Hospital Building

The Main Hospital Building Emergency Warning and Intercommunication System (EWIS) is controlled from a Master Emergency Control Panel located in the Level 1 fire control room. Existing speakers will be relocated or new speakers will be provided to suit the development works. All new work will comply with the existing AS 2220.2 – 1989 design standard.

Stage 1 Building

A Sound System and Intercom System for Emergency Purposes (SSISEP) will be installed throughout the Stage 1 building to BCA Part E4.9 and AS 1670.4 – 2004 requirements. The system will incorporate the following:

A Master Emergency Control Panel (MECP) located in the Fire Control Centre on Ground Floor (Level 3).

2.7. FIRE EXTINGUISHERS

Fire Extinguishers shall be provided throughout the Hospital in accordance with Table E1.6 including the Nurses and Supervisor Stations.

3 ESD INCLUSIONS

Wat-1: Occupant Amenity Water -

The selection of sanitary fixtures and tapware to be used within the Blacktown Stage 1 will be selected to reduce water consumption against a ‘best practice’ benchmark.

The selection of sanitary fixtures and tapware will be undertaken in consultation with S2F/SKM, the Users and Warren Smith & Partners and their required WELS ratings will be reviewed.

The 'Potable Water Calculator' will be completed at an appropriate time in the project.

Wat-2: Water Meters -

Pulse water meters will be installed on all major users of water and wired to the BMCS for data collection.

The meters will be installed on such items as heating water heaters, hot water generation plant, etc.

Wat-3: Landscape Irrigation -

A 200,000 litre rainwater harvesting tank is proposed to take discharge from all metal roof areas and the reuse water will be used for WC and urinal flushing and landscape irrigation.

Wat-5: Fire System Water

Fire Sprinkler test water will be discharge into the rainwater harvesting tank and will be utilised for WC and urinal flushing and landscape irrigation.

Emi-6: Discharge to Sewer -

The selection of sanitary fixtures and tapware to be used in Blacktown Stage 1 will be selected to reduce water consumption against a ‘best practice’ benchmark.

The selection of sanitary fixtures and tapware will be undertaken in consultation with S2F/SKM, the Users and Warren Smith & Partners and their required WELS ratings will be reviewed.

The 'Sewerage Calculator' will be completed at an appropriate time in the project.

Emi-9: Trade Waste Pollution -

All trade waste discharges will be via pre-treatment devices prior to discharge.