

Liverpool Health & Academic Precinct

Main Works Integrated Water Management Plan



MAIN WORKS INTEGRATED WATER MANAGEMENT PLAN

Liverpool Hospital Redevelopment

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APPROVALS

01	V. Gopakumar	SS	J. Mousdell	
02	V. Gopakumar	SS	J. Mousdell	
03	J. Mousdell	Current		
Rev #	Author	Status	Reviewer	Approver

PREPARED BY:

WARREN SMITH & PARTNERS PTY LTD

Consulting Engineers

ACN 002 197 088 **ABN** 36 300 430 126

1st Floor, 123 Clarence Street

Sydney 2000 NSW Australia

T 02 9299 1312 **F** 02 9290 1295



PREPARED FOR:

HEALTH INFRASTRUCTURE NSW

Level 6, 77 Pacific Highway

North Sydney 2060 NSW Australia

T 02 9978 5402 **F** 02 8904 1377



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UTILITY SERVICES

1 GENERAL

Warren Smith & Partners (WS+P) have been engaged by Health Infrastructure to prepare an Integrated Water Management Plan for the proposed development at the Liverpool Health and Academic Precinct, Corner of Elizabeth and Goulburn Streets, Liverpool, 2170 (Figure 1).

This report is for the main works stage of the project and the purpose is to identify that suitable servicing arrangements are available and discuss any expected upgrade and augmentation requirements.



Figure 1: Aerial view of property boundary.

Liverpool Hospital is located within the Liverpool Central Business District (CBD), on the corner of Elizabeth Street and Goulburn Streets, Liverpool. The hospital campus includes land east and west of the Main Southern Railway, which forms an eastern and western campus. The proposed works are located in the western portion of the western hospital campus. The site is legally described as Lot 501 in DP1165217.

The application seeks consent for the construction and operation of a new multi-storey Integrated Services Building providing new treatment and support services that will integrate with the existing hospital. The works also include the refurbishment of certain existing hospital facilities. For a detailed project description refer to the EIS prepared by Ethos Urban.

2 PROPOSED BUILDING MAIN WORKS

2.1 DEMAND CALCULATIONS

2.1.1 WATER DEMAND CALCULATIONS

The average daily potable water demands for the proposed 187 new beds were taken from the Sydney Water table, "Average Daily Water Use by Property Type" and is presented in Table 1 below. Please refer to *Schedule 1* for the Sydney Water table.

Table 1: Average Daily Water Demand

Development Type	Metric Unit	Average Demand (L/Metric Unit/Day)
Hospital		
Hospital	187 Beds	271L/bed/day

Please refer to Table 2 below for the average daily water demand calculation.

Table 2: Average Daily Water Demand Calculation

Total Units	Average Demand (L/Metric Unit/Day)	Total Average Daily Water Demand (kL)
Hospital		
50,677	271L/bed/day	50.67kL

The following flows have also been calculated for Tower Building 1 for additional information:

- Probable simultaneous flow – 10 L/sec
- Cooling towers flow – 5 L/sec
- Fire flow for hydrants and sprinklers – 40 L/sec

2.1.2 SEWER DEMAND CALCULATIONS

In order to express the results in a total daily sewer discharge, an estimate of the average daily sewer discharge in terms of L/Day has been made by adopting information derived by the NSW Water Directorate. Where the standard equivalent tenement figures suggest that a 60% water to sewer discharge factor is appropriate. Refer to Table 3 below for this calculation.

Table 3: Sewer discharge calculation

Total Units	Average Sewer Discharge 60% of L/metric unit/day	Total Average Daily Sewer Discharge (kL)
Hospital		
187	60% of 271L/bed/day	30.40kL

2.1.3 GAS DEMAND CALCULATION

Load calculations for both peak and daily loads have been calculated based on number of beds (187) and using the following methods.

- Daily; Building thermal model and daily domestic hot water usage with a diversity factor
- Peak; Building heat up load and hourly domestic hot water usage

Annual

Appliance	Total (MJ/year)
Boilers (Heating and DHW)	10,400,000
Kitchen	630,000
Total	11,030,000

Daily

Appliance	Total (MJ/day)
Boilers (Heating and DHW)	52,000
Kitchen	3,150
Total	55,150

Peak

The following table is a breakdown of the peak natural gas loads for the proposed building:

Appliance	Burner Capacity (MJ/hr)
Boilers (Heating and DHW)	16,500
Kitchen	1000
Total	16,800

2.2 CONNECTIONS

2.2.1 WATER AND SEWER

The proposed connections are as follows;

Water – The proposed connection is to DN 300mm CICL water main in Elizabeth Street

Sewer – The proposed connection is to DN 400mm existing sewer near the railway corridor

There is an existing Sydney Water sewer main which traverses the site. The project team are currently coordinating the diversion of these two sewer mains with Sydney Water. Once the sewer mains are diverted, the pipe that runs through the site will become privatised. This is subject to separate approval that is being managed by the early works contractor.

Refer to Figure 2 below for details on both water and sewer discharge connection points

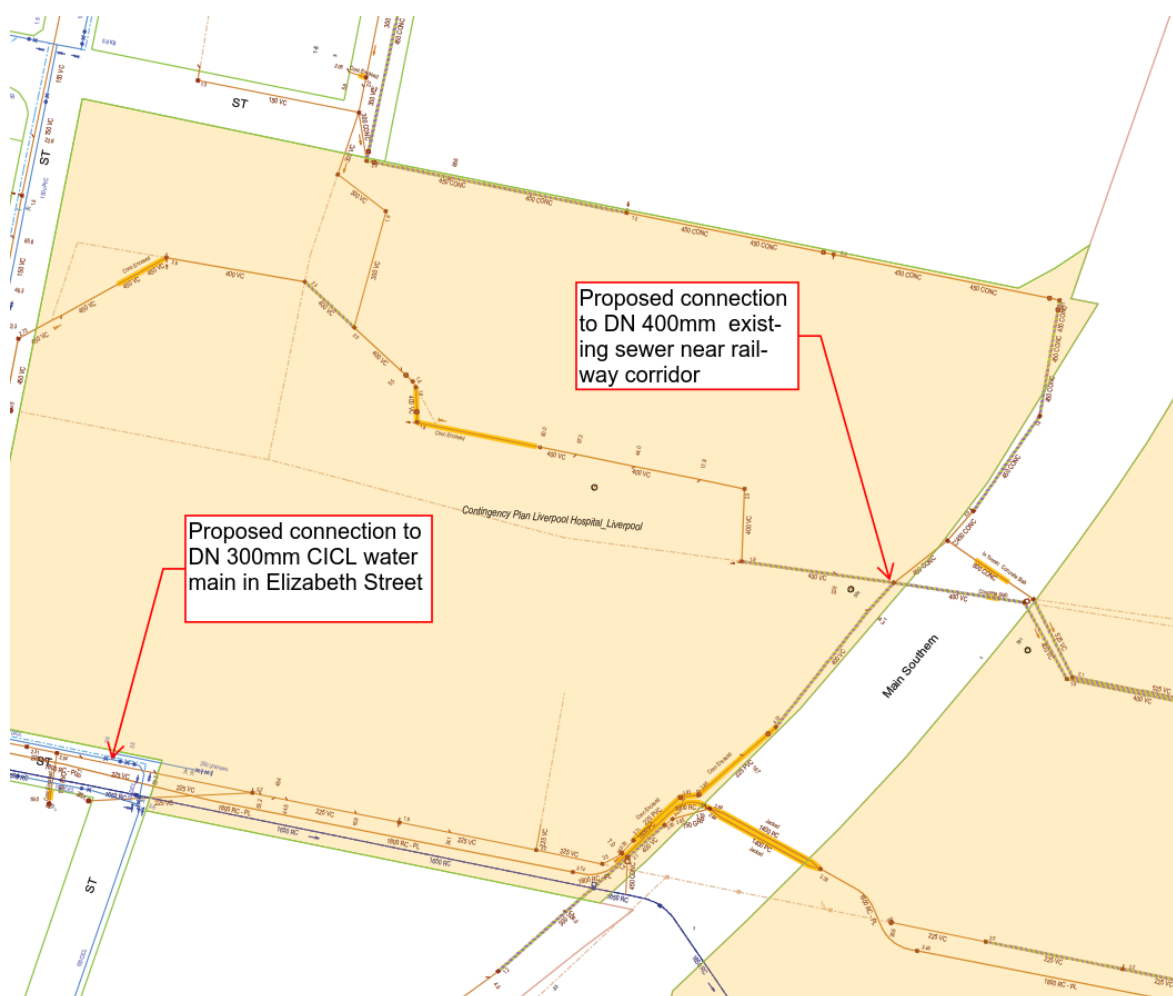


Figure 2: Proposed water supply and sewer connection points

2.2.2 GAS

For the main works, it is proposed to provide a supply to the new building downstream from a new meter set. There will be a new connection made to the 200mm 1050kPa natural gas main in Campbell Street.

Figure 3 shows the initial proposed development concept strategy for natural gas.

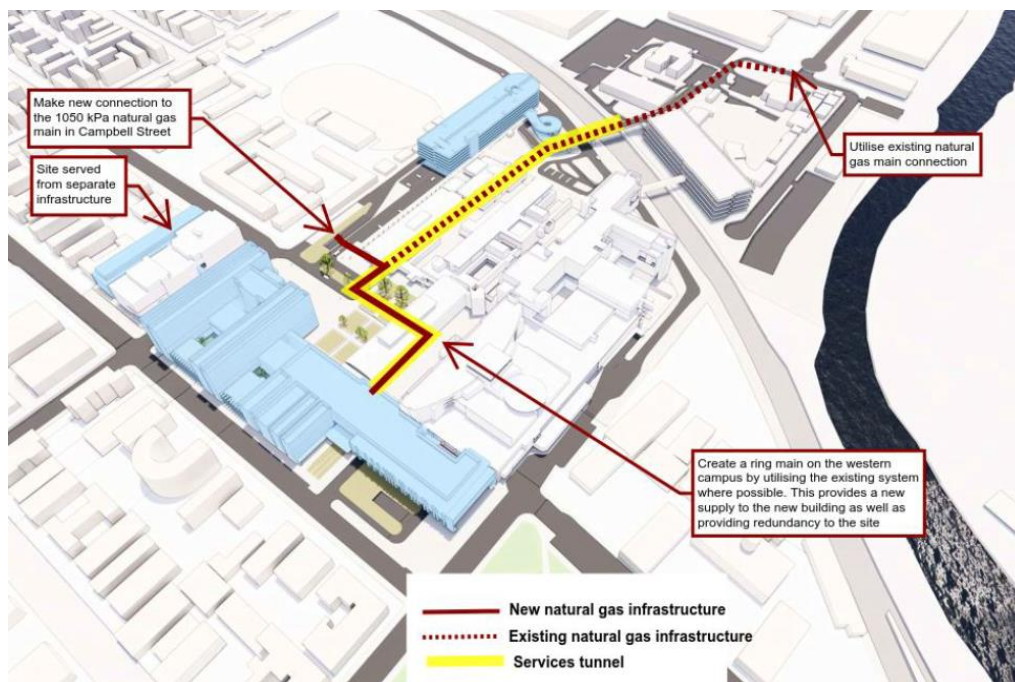


Figure 3: Natural gas main connection location

3 WATER USAGE REDUCTION

3.1 LOW FLOW TAPS

Where possible, potable water usage will be reduced by the use of low flow taps and sanitary Fixtures. Low flow taps are to be provided by the architect.

3.2 WATER METERS

The development will be metered with both utility owned water meters at the property boundary, and client owned and read water meters. These water meters will have the capability for connection a BMCS via pulse read-out and therefore be water demand and leak monitored.

3.3 RAINWATER REUSE

There will likely be no private rainwater reuse collection to supply the building, this is due to the typical requirements for maintenance and poor payback periods along with the potential health hazards to patients. Given that the site is a clinical environment the prevention of infection is a priority. The storage of collected rainwater may contain or breed legionella, dead animals, mosquitoes, chemicals, microbial hazards and escherichia coli.

However, an option that is being explored is to extend the Sydney Water Rainwater Reuse main approximately 650m to serve the irrigation and cooling towers on site. This is subject to further discussions with the hospital.

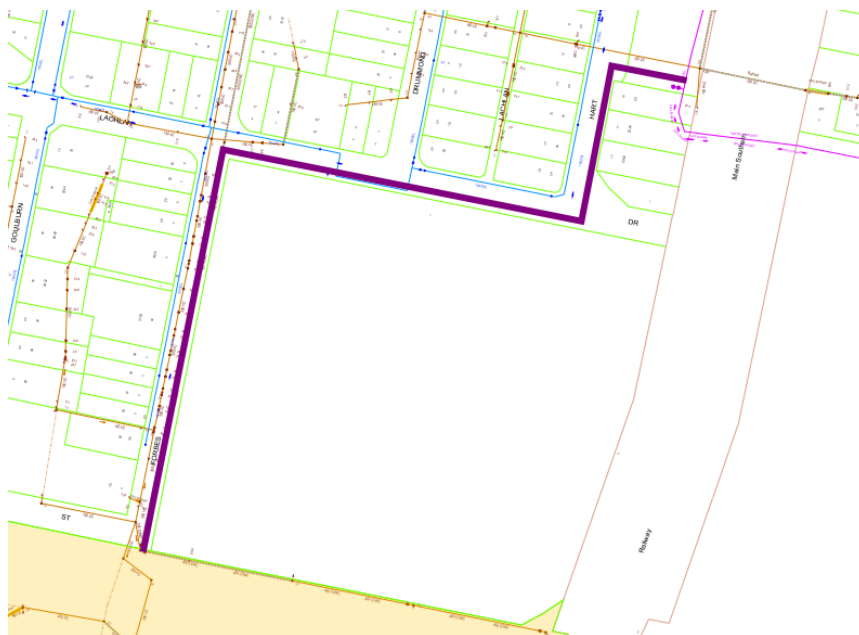


Figure 4: Potential Rainwater Reuse Main Extension

4 SCHEDULE 1 SYDNEY WATER TABLE

“AVERAGE DAILY WATER USE BY PROPERTY TYPE”

Development Type	Development Sub-Type	Key Metric	Metric Unit	Average Demand (L/Metric Unit / Day)
Residential	Single Lot Torrens	Dwelling	Each dwelling	623.00
	Flats Torrens	Net Floor Area	Square Meter	2.36
	High Rise Units	Net Floor Area	Square Meter	3.34
	Single Lot Community	Dwelling	Each dwelling	623.00
Mixed	Residential / Commercial	Combined Floor Area	Each dwelling / Square Meter	Use separate rates for each component
	Commercial / Industrial	Combined Floor Area	Square Meter	Use separate rates for each component
Commercial	Aged Accom - Self Care	Net Floor Area	Square Meter	2.50
	Aged Accom - Hostel	Bed	Each bed	271.00
	Aged Accom - Full Care	Bed	Each bed	271.00
	Childcare	Net Floor Area	Square Meter	3.60
	Hotel / motel / serviced apartments	Room	Each room	359.94
	Office	Net Floor Area	Square Meter	2.27
	Shopping Centre	Net Floor Area	Square Meter	3.00
	Laundry / Dry Cleaner	Net Floor Area	Square Meter	10.50
	Café / Fast Food / Butcher / Deli	Net Floor Area	Square Meter	2.48
	Retail Units	Net Floor Area	Square Meter	2.48
	Medical / Veterinary	Net Floor Area	Square Meter	2.48
	Mechanical Repair	Net Floor Area	Square Meter	2.48
	Car / Boat Sales	Net Floor Area	Square Meter	2.48
	Car Wash	Net Floor Area	Square Meter	9.40
	Club	Net Floor Area	Square Meter	3.77
Industrial	Heavy Process		As required	
	Chemical Manufacturing		As required	
	Printing Manufacturing		As required	
	Beverage Manufacturing		As required	
	Light Factory Unit	Developed floor area	Square Meter	2.82
	Warehousing	Developed floor area	Square Meter	2.82
	Transport / Bus Depot	Site area	Square Meter	0.91
Special Uses	University	Student	Each student	20.00
	School	Student	Each student	20.00
	Hospital	Bed	Each bed	271.00
	Religious assemblies	Developed floor area	Square Meter	1.30
	Government Depot	Site area	Square Meter	0.91
	Community Centre / Library	Floor area	Square Meter	1.84
	Sport Fields with Amenities		As required	
	Park & Reserves		As required	
	Services - Police / Ambulance etc.	Floor area	Square Meter	1.40

WARREN SMITH & PARTNERS PTY LTD
CONSULTING ENGINEERS

ACN 002 197 088

Level 9, 233 Castlereagh Street
SYDNEY NSW 2000

EMAIL: wsp@warrensmith.com.au

TELEPHONE: 61 2 9299 1312

FACSIMILE: 61 2 9290 1295