



1<sup>st</sup> November 2022

# INFRASTRUCTURE DELIVERY, MANAGEMENT AND STAGING PLAN HYDRAULIC SERVICES RPA HOSPITAL REDEVELOPMENT

## INFRASTRUCTURE DELIVERY, MANAGEMENT AND STAGING PLAN – HYDRAULIC SERVICES RPA HOSPITAL REDEVELOPMENT

A	26 <sup>th</sup> September 2022	Draft issue to TSA for review
B	6 <sup>th</sup> October 2022	Incorporate review comments
C	1 <sup>st</sup> November 2022	Update text per architect requirements
Rev #	Date	Description

### APPROVALS

A	J. Skubevski	Superseded		
B	J. Skubevski	Superseded	T. Wise	D. Power
C	J. Skubevski	Current	T. Wise	D. Power
Rev #	Author	Status	Reviewer	Approver

#### PREPARED BY:

WARREN SMITH CONSULTING ENGINEERS

ABN 36 300 430 126

Level 9, 233 Castlereagh Street

Sydney 2000 NSW Australia

T 02 9299 1312



#### PREPARED FOR:

HEALTH INFRASTRUCTURE

1 Reserve Road

St Leonards 2065 NSW Australia

T 02 9978 5402



Health  
Infrastructure

# PROJECT BACKGROUND

The Royal Prince Alfred (RPA) Hospital campus is located in Sydney’s inner west suburb of Camperdown, within the City of Sydney Local Government Area. The campus is situated between the University of Sydney to the east and the residential area of Camperdown to the west. A north-south arterial road (Missenden Road) divides the campus into two distinct portions, known as the East and West Campuses. The northern boundary of the campus is defined by the Queen Elizabeth II Rehabilitation Centre and the southern extent of the campus is defined by Carillon Avenue.

The works are proposed to both the East and West Campuses, as well as some off-site works occurring within the University of Sydney.

The site comprises the following land titles:

East campus:

- Lot 1000 DP 1159799 (12 Missenden Road, Camperdown, 2050).

West campus:

- Lot 11 DP 809663 (114 Church Street, Camperdown, 2050); and
- Lot 101 DP 1179349 (68-81 Missenden Road, Camperdown 2050).

Off-site works are proposed on University of Sydney land, known as Lot 1 DP 1171804 (3 Parramatta Road, Camperdown, 2050) and Lot 1001 DP 1159799 (12A Missenden Road, Camperdown, 2050).

## Project background

In March 2019, the NSW Government announced a significant \$750 million investment for the redevelopment and refurbishment of the RPA Hospital campus. The Project will include the development of clinical and non-clinical services infrastructure to expand, integrate, transform and optimise current capacity within the hospital to provide contemporary patient centred care, including expanded and enhanced facilities.

The last major redevelopment of RPA Hospital was undertaken from 1998 to 2004 projected to 2006 service needs. Since then, significant growth has been experienced in the volume and complexity of patients, requiring significant investment to address projected shortfalls in capacity and to update existing services to align with leading models of care.

The redevelopment of RPA Hospital has been the top priority for the Sydney Local Health District since 2017 through the Asset Strategic Planning process, to achieve NSW Health strategic direction to develop a future focused, adaptive, resilient and sustainable health system.

## Description of development

- Alterations and additions to the RPA Hospital East Campus, comprising:
  - Eastern wing: A new fifteen (15) storey building with clinical space for Inpatient Units (IPU’s), Medical Imaging, Delivery, Neonatal and Women’s Health Services, connecting to the existing hospital building and a rooftop helicopter landing site (HLS);
  - Eastern extension: A three (3) storey extension to the east the existing clinical services building to accommodate new operating theatres and associated plant areas;
  - Northern expansion: A two (2) storey vertical expansion over RPA Building 89 accommodating a new Intensive Care Unit and connected with the Eastern Wing;
  - Internal refurbishment: Major internal refurbishment to existing services including Emergency Department and Imaging, circulation and support spaces;
  - Enhanced Northern Entry/ Arrival including improved pedestrian access and public amenity;
  - Demolition of affected buildings, structures and trees;
  - Changes to internal road alignments and paving treatments; and
  - Landscaping works, including tree removal, tree pruning, and compensatory tree planting including off-site on University of Sydney land.

- Ancillary works to the RPA Hospital West Campus, comprising:
  - Temporary helicopter landing site above existing multi storey carpark;
  - Re-routing of existing services; and
  - Associated tree removal along Grose Street.

## SEARS Requirements

The below table sets out the Sears requirements that have been addressed in this report and

Sears Requirement / Description	Relevant Section of Report
<b>Utilities &amp; Infrastructure</b>	
Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site	See Section 3 and 4
Identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained	See Section 4
Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated or funded and delivered to facilitate the development	See Section 5
<b>Water related Infrastructure Requirements</b>	
Prepared in consultation with the local council and any other relevant drainage or water authority.	See Section 4.1. Stormwater detailed by Civil Engineer
Outlines the water-related servicing infrastructure required by the development (informed by the anticipated annual and ultimate increase in servicing demand) and evaluates opportunities to reduce water demand (such as recycled water provision).	See Section 3.1 and 6
Details the proposed drainage design (stormwater and wastewater) for the site including any on-site treatment, reuse and detention facilities, water quality management measures, and nominated discharge points.	To be detailed by the Civil Engineer.
Demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse downstream impacts.	To be dealt with by the Civil Engineer.
Where water and drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority	To be dealt with by the Civil Engineer
<b>Hazards and Risks</b>	
If the development is adjacent to or on land in a pipeline corridor, report on consultation outcomes with the operator of the pipeline and prepare a hazard analysis.	See Section 4.2 and 4.3

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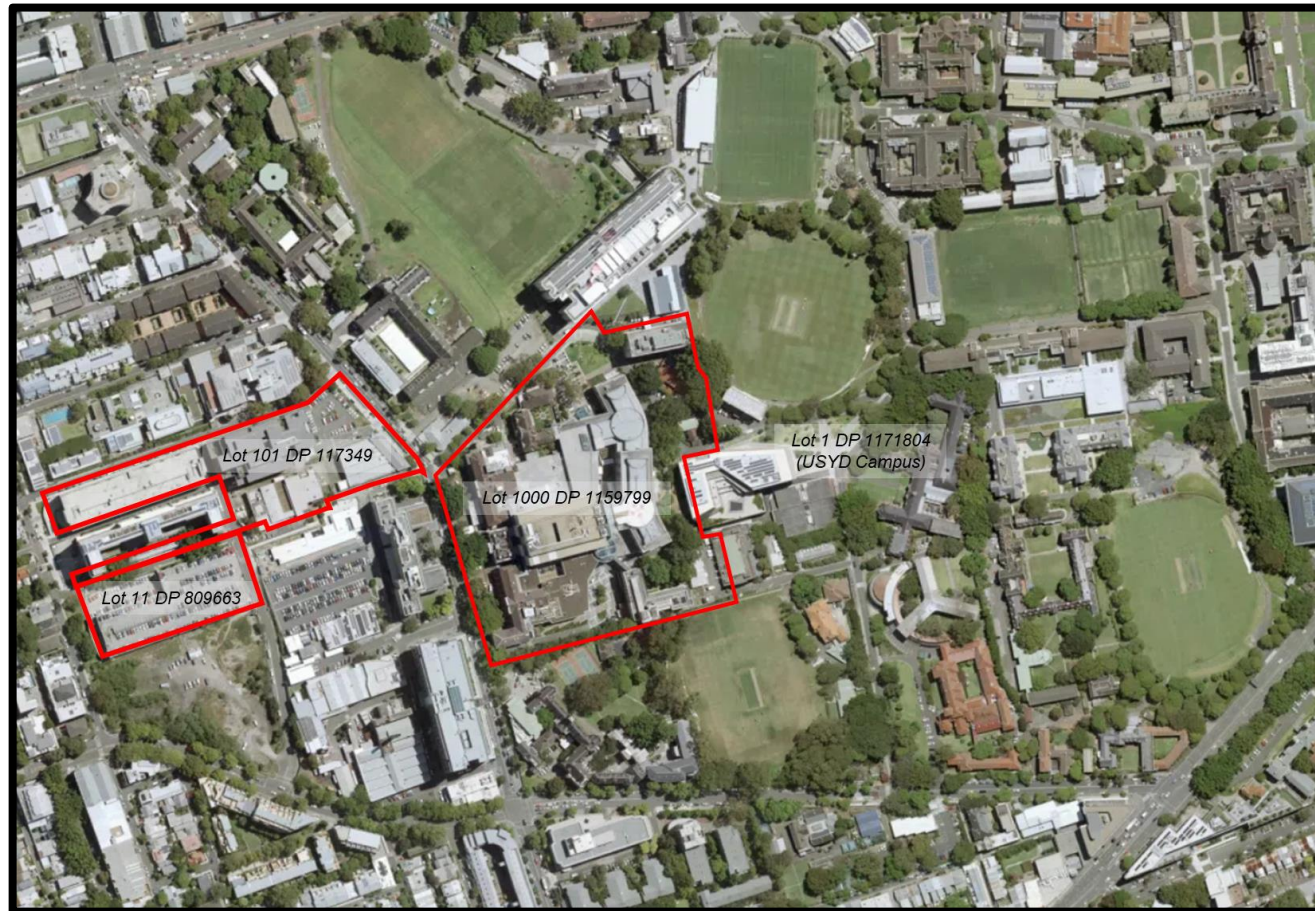
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# 1 INTRODUCTION

Warren Smith Consulting Engineers (WSCE) have been engaged by Health Infrastructure (HI) to prepare an infrastructure delivery, management and staging plan for the proposed redevelopment works at the Royal Prince Alfred Hospital (RPA redevelopment) relating to the hydraulic services.

The RPA redevelopment east campus ("the site") is located at 12 Missenden Road, Camperdown NSW 2050 and is shown in **Figure 1** (approximate site boundary identified in blue). The site is encompassed by Missenden Road to the west, St John's College to the north, University of Sydney to the east and St Andrew's College to the south.



**Figure 1:** Aerial view of property boundary (Source: Architect)

## 2 DEMOLITION

Demolition of the existing buildings (Building 94 – Anatomical Pathology and Building 95 – RPA Chapel) will take place in accordance with the project staging to create space for the proposed redevelopment works. The demolition works will also extend to the existing Lambie Dew Drive roadway which will be realigned to suit as required.

## 3 HYDRAULIC SERVICES DEMAND CALCULATIONS

### 3.1 WATER SUPPLY DEMAND CALCULATIONS

There are a total of 164 proposed additional beds in the new hospital expansion. The numbers were sourced from the architectural bed summary as previously provided to the design team.

The assumption used in determining the average daily drinking water demands for the proposed additional bed numbers was sourced from the Sydney Water table, "Average Daily Water Use by Property Type" and is presented in **Table 1** below. This table has been provided in APPENDIX B – SYDNEY WATER TABLE for reference.

WSCE expects Sydney Water to have historical data of the existing site (629 beds) of which they can use to assess the effect of the additional 164 bed load on the existing infrastructure and ultimately provide advice on the proposed connection location and if any required amplifications or upgrades are required. The preliminary feasibility advice included in APPENDIX A – NETWORK UTILITY OPERATOR (SYDNEY WATER) CORRESPONDENCE confirms the proposed increase will not impact the network. It should be noted however, that this advice is currently outdated and was based on an additional bed increase of 313 which is no longer the case.

**Table 1:** Average daily water demand

Classification	Metric Unit	Average Demand (L/Metric Unit/Day)
Special Use – Hospital	Bed	271.00

Refer to **Table 2** below for the average daily water demand increase calculation which is based on the increase of beds only.

**Table 2:** Average daily water demand increase calculation

Total	Average Demand (L/Metric Unit/Day)	Total Average Daily Water Demand (kL)
164	Bed	44.50

The following flows for the entire site have also been calculated:

- Probable simultaneous demand – 5.0 L/sec (estimated - subject to development of architectural layouts),
- Cooling tower flow rate – 2.5 L/sec (continuous)
- Fire flow for hydrants – 20 L/sec,
- Fire flow for sprinklers and drenchers – 18 L/sec

### 3.2 SEWER DRAINAGE DISCHARGE CALCULATIONS

To determine the average daily sewer discharge for the proposed development, an estimate of the daily sewer discharge in terms of litres/day has been made by adopting information derived by the NSW Water Directorate. Where the standard equivalent tenement figures suggest that a 70% water to sewer discharge factor is appropriate. Refer to **Table 3** below for this calculation.

WSCE expects Sydney Water to have any existing sewer load information of their assets which they can utilise to determine any required amplifications and upgrades to existing infrastructure because of the load induced by the additional 164 beds. The preliminary advice included in APPENDIX A – NETWORK UTILITY OPERATOR (SYDNEY WATER) CORRESPONDENCE does not provide comment on the available capacity within the asset that the design proposes to discharge to, although will be confirmed in the updated Anticipated Section 73 Notice of Requirements once lodged and returned.



**Table 3:** Average daily sewer discharge calculation

Classification	Metric Unit	Average Demand (60% of Water Average Demand) (L/Metric Unit/Day)
Special Use – Hospital	Bed	189.70

Refer to **Table 4** below for the average daily sewer discharge increase calculation which is based on the increase of beds only.

**Table 4:** Average daily sewer discharge demand increase calculation

Total	Average Demand (L/Metric Unit/Day)	Total Average Daily Water Demand (kL)
164	Bed	31.10

### 3.3 NATURAL GAS DEMAND CALCULATIONS

WSCE's current design proposes that natural gas services are not utilised for the heating of hot water, commercial cooking activities and/or the mechanical systems plant. Rather, that electrical options are implemented across the proposed redevelopment works as a means of achieving the projects carbon neutral strategy.

The two buildings that are being demolished to make way for the new east wing building include the Chapel (Building 95) and the Tissue pathology (Building 94). Of the two, the Tissue pathology has an existing natural gas demand of 1084 MJ/hr which will be deleted as part of the main works.

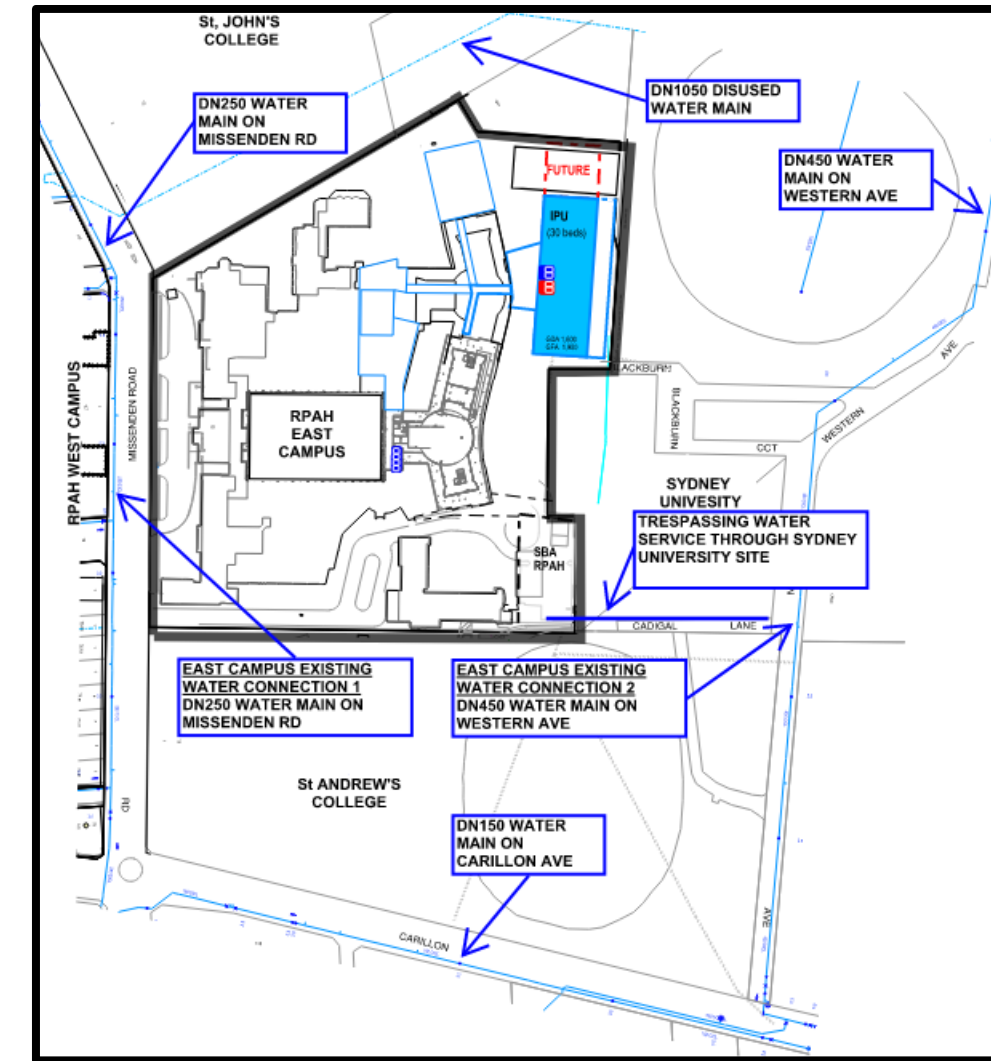
## 4 HYDRAULIC SERVICES CONNECTIONS

### 4.1 WATER

The eastern campus currently has two (2) existing connections to Sydney Water utility mains that surround the site including:

- 250mm diameter service in Missenden Road (pressure and flow included in **Figure 2**) and;
- 450mm diameter service in Western Avenue – the property service (150mm diameter) for RPA extends west from Western Avenue through Cadigal Lane to the backflow assembly and meter set (location identified in red in **Figure 2**) – this is a private service.

These are illustrated in **Figure 2** below.



**Figure 2:** Location of the Sydney Water utility mains surrounding the East Campus

The existing Sydney Water feasibility advice confirmed that the 250mm main in Missenden Road has suitable available capacity to supply the previously advised increase 313 beds. Since lodgement of the feasibility application, the net additional increase of beds has since been revised as 164 beds, which provides reassurance that there is sufficient available capacity in this asset (pending Sydney Water review).

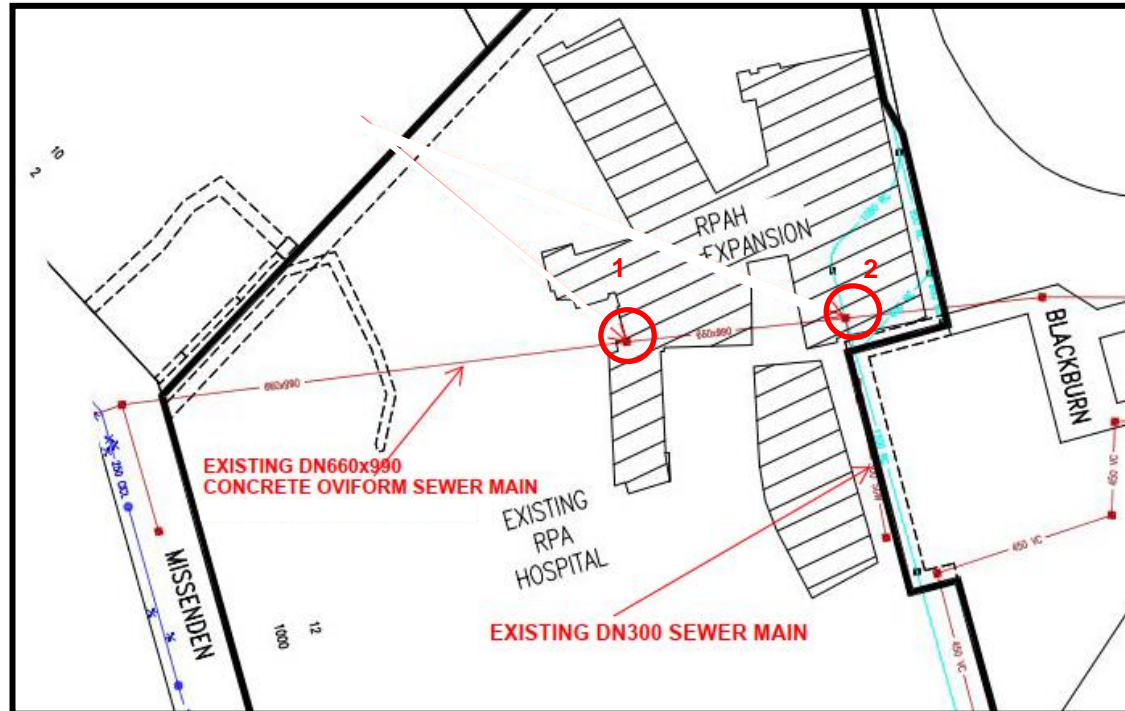
It is the designs intention to utilise the existing water connections (in Missenden Road and Western Avenue) to supply the proposed redevelopment works. WSCE would like to request that Sydney Water assess the available capacity within the 450mm diameter water main to supply the net increase of 164 beds. WSCE is proposing to extend new private cold water infrastructure services downstream of the Western Avenue meter set (identified in **Figure 2**) to reticulate north to supply the new Eastern Wing. The pressure and flow statement for the 450mm diameter water main in Western Avenue has been included in APPENDIX A – NETWORK UTILITY OPERATOR (SYDNEY WATER) CORRESPONDENCE.

As a side note, WSCE are aware that there have been discussions to create a Sydney Water asset along the southern boundary of the property between Western Avenue and Missenden Road that could benefit all property owners, utilising the 150mm diameter private service that has been identified reticulating through Cadigal Lane. This may occur in the future pending further discussion and development.

There are a number of other existing water mains that surround and traverse the western campus, although have not been identified/discussed given the scope of works under this report pertaining mainly to the east campus i.e., that they are not within close proximity of the works.

## 4.2 SEWER

There are currently two Sydney Water authority sewer mains that reticulate within the proposed redevelopment zones including a large 660mm x 990mm concrete oviform that crosses the site in a west to east direction and a 400mm diameter service that extends from the oviform in a southern direction and (tis downsizes to 300mm at a point upstream). The 400mm/300mm asset is located adjacent to the eastern boundary of the RPA East Campus site and also reticulates across the neighbouring property's boundary for a short distance (University of Sydney). These have been identified in **Figure 3** below.

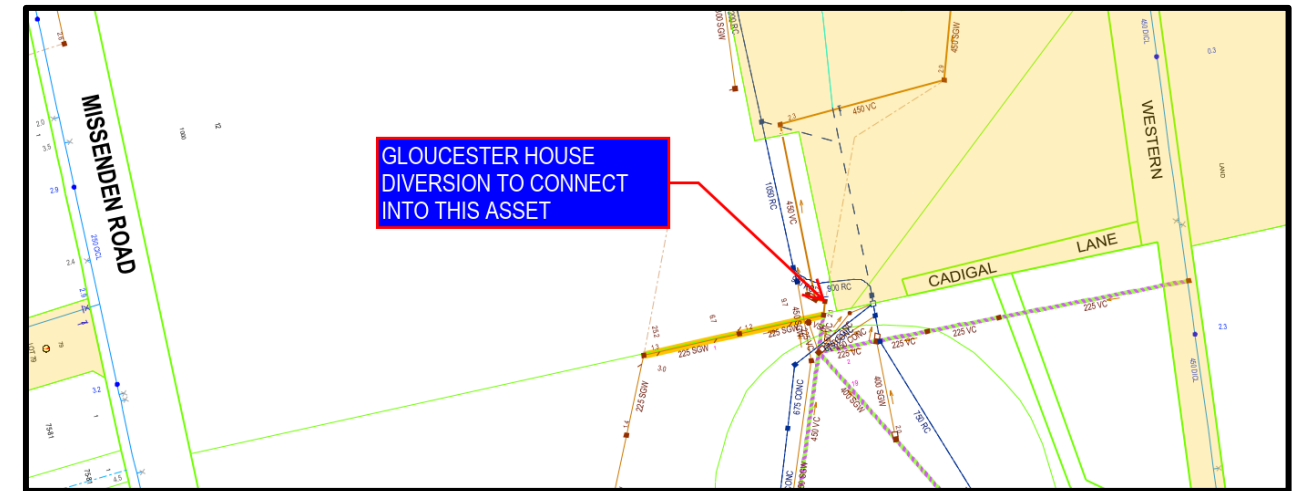


**Figure 3:** location of sewer infrastructure and proposed adjustments

The existing oviform sewer main that traverses from west to east underneath the existing hospital building is approximately 6.5m deep and is considered a critical asset to the Sydney Water network as it services a large catchment. Initially raised in the feasibility advice, there is a proposal to relocate the manhole (identified as 2 in **Figure 3**) that intersects the 400mm/300mm adjacent to the eastern boundary of the east campus on the basis that it is located within the proposed building footprint. This manhole will be relocated further upstream on the main (western direction) at a location within Lambie Dew Drive.

Furthermore, the feasibility also proposed to relocate the manhole (identified as 1 in **Figure 3**), although it was determined during the design that this would no longer be required noting there is no proposed works in this area.

A CCTV survey of the 400mm/300mm diameter sewer main identified that there were no connections from neighbouring properties (St Andrew's College and University of Sydney). This sewer main currently only drains Gloucester House on the RPA property. Given the manhole (2) that intersects this main is to be relocated, it is proposed to disconnect and disuse this main. Gloucester House is proposed to be diverted to the Sydney Water sewer main located in the South-eastern Corner of the property as identified in **Figure 4**.



**Figure 4:** Gloucester House Diversion

This diversion strategy of the private sewer infrastructure services has been included in APPENDIX D – GLOUCESTER HOUSE DIVERSION for reference. It is important to note that there is proposed divertive works associated with this asset that are being undertaken by WSCE under the Case Number 199787 due to the construction of a new building in this region.

There are a number of other sewer mains that surround and traverse the western campus, although have not been identified/discussed given the scope of works under this utility report pertaining mainly to the east campus i.e., that they are not within close proximity of the works.

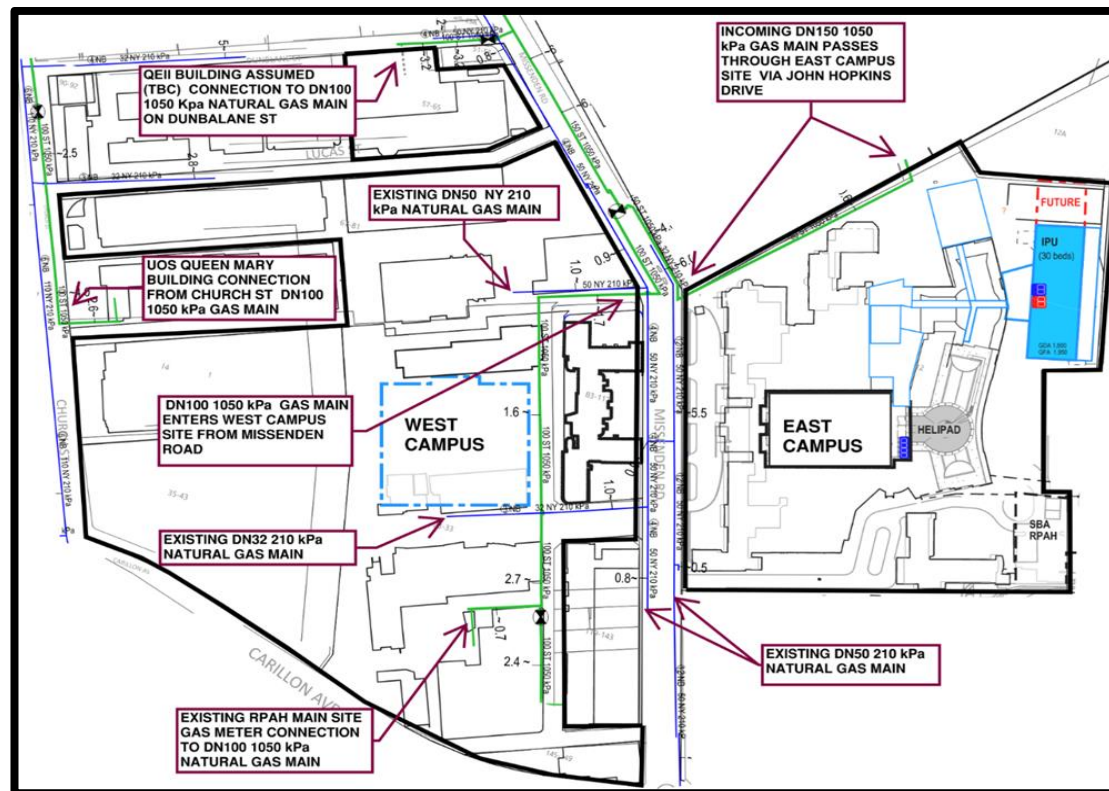
## 4.3 NATURAL GAS

The site has access to multiple Jemena natural gas mains including:

- 150mm diameter 1050kPa in John Hopkins Road,
- 100mm diameter 1050kPa in Missenden Road,
- 100mm diameter 1050Kpa in Susan Street,
- 50mm diameter 210kPa in Missenden Road (east side),
- 50mm diameter 210kPa in Missenden Road (west side), and
- 32mm diameter 210kPa in Rochester Street.

There are a number of existing connections to these natural gas mains shown in **Figure 5** across the site, however the East Campus is currently supplied from the existing connection in Susan Street.

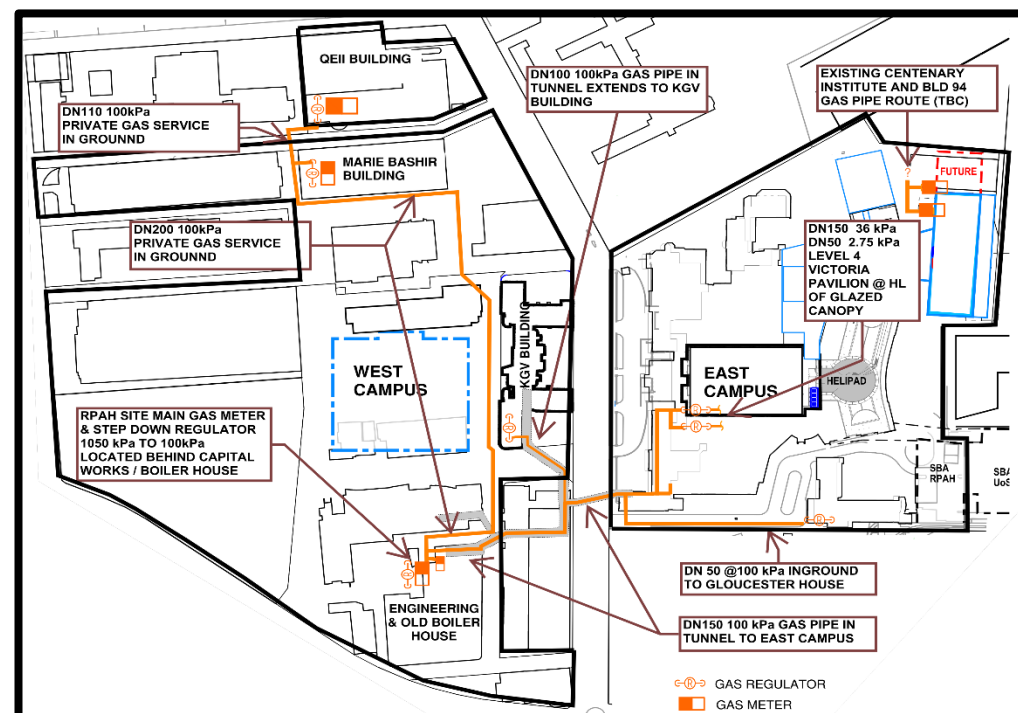




**Figure 5:** Location of Jemena authority natural gas mains

**Figure 6** below illustrates the approximate location of the existing Jemena authority meter sets and private natural gas infrastructure services reticulation pathways. The connections to the natural gas mains and are assumed to be located adjacent to the meter sets as required by the Jemena network operator guidelines.

The 150mm 1050kPa natural gas main along John Hopkins Drive currently reticulates along the northern boundary of the eastern campus. This main has been identified in the design coordination process for the Lambie Dew Drive Road realignment and the Jemena Network Operator Rules have been adhered to for the separation requirements of services from this asset. Refer to APPENDIX C – EARLY WORKS 5 DOCUMENTATION for further information.



**Figure 6:** Location of Jemena authority meter sets private natural gas services infrastructure

Existing data shows a private 100kPa natural gas service traversing from the west campus to the east campus via an underground services tunnel.

There is currently no provision for any additional natural gas connections as the project seeks to electrify all proposed works. Refurbishment works will utilise electric options where possible or extend from the existing private natural gas system as required.

## 5 STAGING

### 5.1 WATER

There are no Sydney Water utility (water) main staging requirements as there are no proposed modification works to occur on their assets.

### 5.2 SEWER

It is proposed to construct the relocated Sydney Water utility (sewer) manhole as part of the early works 5 package and retain the existing manhole and 300mm asset that extends from this (as described in Section 4.2) for the duration of the early works. As part of the main works the 300mm asset is to be privatised and diverted to the location of the relocated Sydney Water manhole within Lambie Dew Drive to ensure Gloucester house maintains continual drainage of wastewater discharge. The existing manhole can then be demolished to permit construction of the new east wing building.

## 6 WATER USAGE REDUCTION

### 6.1 LOW FLOW TAPS

Where possible, potable water usage will be reduced through the use of low flow taps and sanitary fixtures, typically using the following flow rates:

- Shower 9.0L/min,
- Basin 4.5L/min,
- Sink 4.5L/min.

Low flow taps are only to be used if the selected fixtures comply with the HI Design Guidance Notes (DGN) and Engineering Services Guidelines (ESG)

## 6.2 WATER METERING

The development is currently metered via a utility (Sydney Water) owned water meter. The main works zones will all be provided with individual privately owned meters as required by the Environmental Sustainable Design (ESD) initiatives and/or the client.

Privately owned (and read) sub meters shall be provided to meter the usage of the following:

- New eastern wing building,
- Drinking heated water heaters cold water supply (not including the proposed below sink ZIP units),
- New kitchen facilities,

## 6.3 RAINWATER REUSE

Rainwater harvesting is designed to provide an alternative source for non-drinking water uses for the hospital. Implementing a rainwater re-use system will result in the conservation of drinking cold water sources and a reduction in the daily water demand. Rainwater reuse has not been considered for the main works scope of this project for the following reasons:

- The east wing building roof area will be concrete which is not normally captured, treated and re-used on projects given its trafficability. Further, a portion of this roof area will consist of the future helipad and another portion will be open to the plant level below, offering limited area for collection,
- Rainwater re-use for WC flushing in health care buildings is not normally considered on the basis that it could result in risk to public health.
- There are minimal landscaped areas of the new east wing building that will benefit from a dedicated rainwater re-use system, noting the sporadic nature of rainfall, heavy reliance on a drinking water top up would exist.

## 6.4 HYDRANT PUMP TESTING

The hydrant pump test water can be reticulated directly back into the hydrant tank during occasional testing (frequency to be determined in future design phases). This proposal is a great way of conserving water during testing where high flows (approximately 20 L/sec) for extended durations usually discharge directly into the stormwater drainage system.



7 APPENDICES

7.1 APPENDIX A – NETWORK UTILITY OPERATOR (SYDNEY WATER)  
CORRESPONDENCE

Case Number: 190176

August 23, 2021

HEALTH INFRASTRUCTURE NSW  
c/- WARREN SMITH & PARTNERS PTY LTD

### **Feasibility Letter**

**Developer:** HEALTH INFRASTRUCTURE NSW  
**Your reference:** 7141000  
**Development:** Lot 1000 DP1159799 12 MISSENDEN RD, Camperdown  
**Development Description:** Stage 1 Redevelopment of the East Campus at Royal Prince Alfred Hospital  
**Your application date:** June 25, 2021

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what our requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

If you obtain development consent for that development from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (WSC).

We'll then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed)  
or
- Certificate.



These documents will be the definitive statement of our requirements.

There may be changes in our requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development, e.g. the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application
- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

**No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from us and to the extent that it is able, we limit its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.**

## What You Must Do To Get A Section 73 Certificate

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting [Plumbing, building & developing](#) on our website.

1. **Obtain Development Consent from the consent authority for your development proposal.**
2. **Engage a Water Servicing Coordinator (WSC)**

**You must engage your current or another authorised WSC** to manage the design and construction of works that you must provide, at your cost, to service your development. If you wish to engage another WSC (at any point in this process) you must write and tell us.

You'll find a list of WSC's at [Listed providers](#) on our website.

The WSC will be your point of contact with us. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including our costs).

### 3. **Developer Works Deed**

**After** the WSC has submitted your new application, they'll receive the our Notice and Developer Works Deed. You and your accredited Developer Infrastructure Providers (Providers) will need to sign and lodge both copies of the Deed with your nominated Coordinator. After we've signed the documents, one copy will be returned to the WSC.

The Deed sets out for this project:

- your responsibilities
- our responsibilities
- the Provider's responsibilities.

**You must do all the things that we ask you to do in that Deed.** This is because your development does not have water, sewer and storm water services and you must construct and pay for the following works extensions under this Deed to provide these services.

**Note:** The Coordinator must be fully authorised by us for the whole time of the agreement.

## 4. Water and Sewer Works

### 4.1 Water

Your development must have a frontage to a water main that is the right size and can be used for connection.

We've assessed your application and found that:

- Pressure within the DN250 watermain in Missenden Road is adequate to service the normal daily water needs of the proposed expansion of the hospital.
- **More detail will need to be provided regarding the water flow-rate requirements of the air-conditioning.**
- **As part of the Section 73 application we would expect to have more detailed flow estimation for the entire portion of the hospital to be serviced from the existing connection.**
- **If a new connection is proposed, details of that connection and its location must be supplied.**

### 4.2 Sewer

Your development must have a sewer main that is the right size and can be used for connection. That sewer must also have a connection point within your development's boundaries.

We've assessed your application and found that:

- **You must make adjustments within your site due to the redevelopment.** The terms of the Deed define this extension as 'Major Works'.

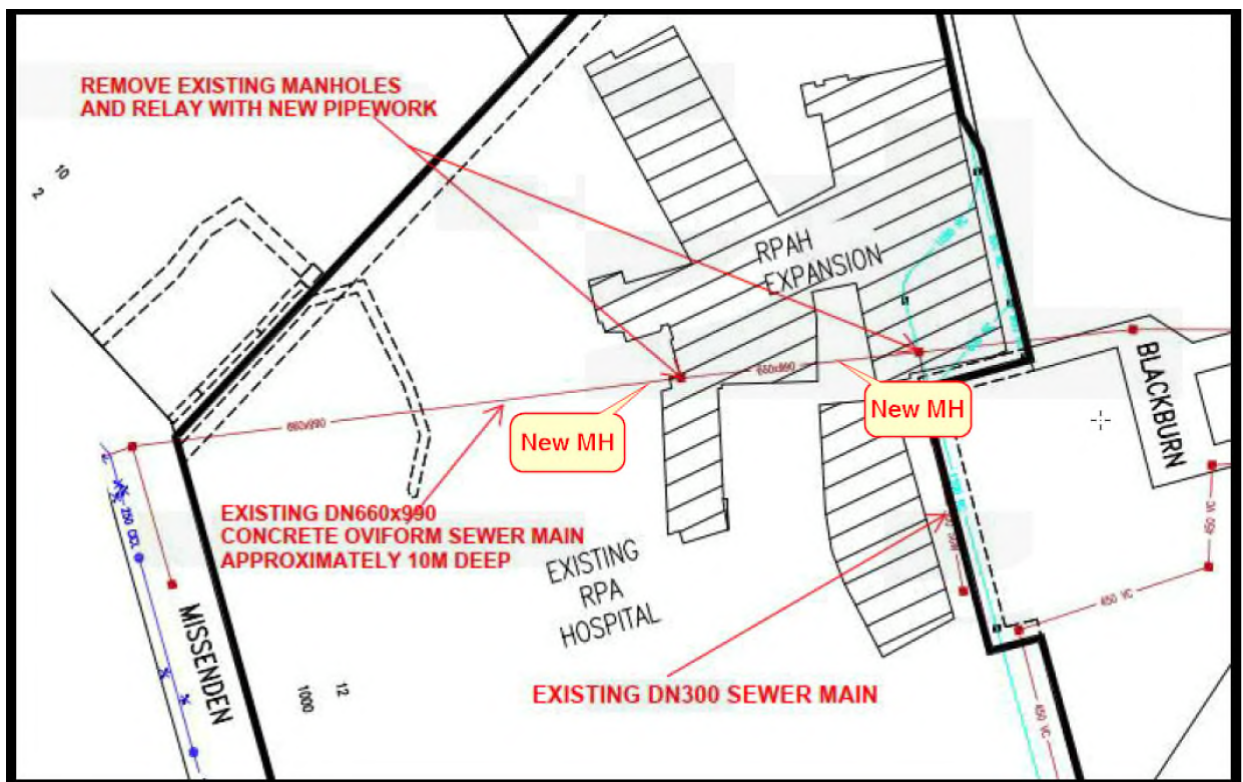


Planning Comments:

- The Oviform wastewater asset within the hospital site is a critical main. Camperdown Branch Submain collects wastewater from a large catchment, more than 30,000 EP.
- **More explanation of the proposed wastewater options b the WSC will be required before a preferred option is selected.**
- Replacing Oviform with a pipe will need transition structures like maintenance holes.
- Details of the proposed undercroft will need to be supplied, together with an access plan.
- Any option for the wastewater would need to be co-ordinated with the stormwater deviation proposed.

Networks Comments:

- Oviform DN660x990mm sewer main:
  - This oviform sewer main is a critical asset. Manholes on oviform sewer main can be disused, if sewer main remains on same grade with no drop. However, two manholes are to be built like for like outside the building, see below diagram.
  - DN300 to be reconnected to new MH.
  - Building plan to be approved in conjunction with design.



- Because your development requires adjustment/deviation of a “live” wastewater main you must work with your WSC to ensure that:
  - Your Building Plans are approved prior to temporary pipework and excavation

- You submit your temporary pipework design (if required) with your permanent wastewater deviation design for approval
- Accept in writing to bonding conditions that will be provided in the Bond Agreement
- Submit your Bond and signed Bond Agreement
- Submit the Construction Commencement Notice for construction of the temporary pipework
- Have your temporary pipework constructed by a listed provider, and then
- Complete your permanent deviation works.

### **4.3 Stormwater Requirements.**

#### **Building over or adjacent to stormwater assets**

Sydney Water's guidelines for building over or adjacent to stormwater assets outline the process and design requirements for such activities. As per the guidelines, the applicant is advised of the following:

- No building or permanent structure is to be proposed over the stormwater channel / pipe or within **1m** from the outside wall of the channel / pipe or within Sydney Water easement whichever is larger. Permanent structures include (but are not limited to) basement car park, hanging balcony, roof eaves, hanging stairs, stormwater pits, stormwater pipes, elevated driveway, basement access or similar structures. This clearance requirement would apply for unlimited depth and height.
- The applicant is required to submit the elevation drawings with the stormwater channel/ pipe, to ensure that the proposed buildings and permanent structures are 1m away from the outside face of the stormwater channel and away from the Sydney Water easement.

Sydney Water has noted the proposed deviation of stormwater pipe for this development to meet the building over and adjacent to stormwater assets requirements. The above clearance requirement would apply to the proposed deviated stormwater pipe.

#### **Stormwater Deviation**

Sydney Water has no objection to the proposed stormwater deviation concept as per the drawing no. "201957 SKC903 P2 Dated 03.06.21".

Proponent need to ensure that the deviation pipe has the same capacity or higher than the existing capacity of the stormwater pipe.

## **600mm Stormwater pipe**

The proposed stormwater deviation may conflict with existing live 600mm stormwater pipe. Even though concept stormwater deviation drawing indicates that this pipe as “redundant”, Sydney Water system indicates this 600mm pipe as live pipe.

Proponent need to investigate whether any stormwater line has been connected to this pipe. If there are any existing connections, then these connections are to be reconnected to proposed deviated pipe and remove this 600mm pipe or sand filled.

## **Liaising with Sydney Water**

As the proposed deviation work is associated with major stormwater trunk drainage system, the proponents and their service providers are required to liaise with Sydney Water continuously until the ownership of the stormwater work is transferred to Sydney Water according to the Asset Creation Process.

## **Flow Management Plan and Safe Work Plan**

It is the constructor's responsibility to ensure to maintain continuous stormwater flow through the existing pipes or through the new deviated stormwater pipe during the construction period. Nominated constructor is required to submit a Flow Management Plan and need to obtain approval prior to commencement of any work on Sydney Water's stormwater assets.

## **Design and Construction**

Design and construction of the work is to be according to the Sewerage Code of Australia, Sydney Water's Technical Specification Civil Version 9 Dated 21/01/2020 / AUS-SPEC as appropriate. Designer is to provide written confirmation that the design including proposed 1,200mm pipe comply with the followings:

- Sydney Water technical specifications require design in accordance with AS3735 (Concrete Structures for retaining liquid).
- Design life of the new Culvert / pipe is to be 100 years.
- Design should comply with Table 10-5 of Technical Specification Civil for minimum durability requirements for typical exposure classifications to AS3735 for 100 year design life

## **Design of the proposed stormwater pipe / culvert/ Access Chamber**



Design of the proposed stormwater pipe/ culvert/ access chamber is to be carried out by Sydney Water accredited providers for stormwater design. Structural aspect of the proposed stormwater deviation is to be design and verify by qualified structural engineers. A copy of the structural engineer's certificate is to be attached with the design drawing. Qualifications of the structural engineers are to be according to the current design competency standard.

Structural details of the deviation of the stormwater pipe are to be submitted with the design drawings and would be referred to Sydney Water's Engineering Services for comments. Any requirements as determined by Engineering Services must be complied with.

### **Changing in Direction**

Minimum internal radius of 6m is to be provided when there is a change in direction to the flow.

### **Construction of the Stormwater work**

Construction of the stormwater work is to be carried out by Sydney Water accredited providers for construction with the capability of S2, W2 or W3.

### **Creation of Easement**

Easement is to be created for the new stormwater pipe / channel in favour of Sydney Water If these new assets are not located in the land dedicated to public. Easement is to be 2m wider (1m either side) than the stormwater assets. Proponent is required to liaise with Sydney Water's property services regarding this easement process.

### **Direct Stormwater Connection**

If direct stormwater connection is required to the Sydney Water's stormwater system, then the connection details should also be included in the design drawings and the connection must satisfy Sydney Water's connection requirements.

Proposed connections that are 300mm or more in diameter require a qualified structural engineer to design the connection details. Structural details of the connections are to be submitted with the design drawing. A structural engineer's certificate is to be attached with the design drawings.

### **Pre- Construction Dilapidation Survey / CCTV Inspection**

Dilapidation survey/ CCTV inspection of the stormwater pipe/ channel in the upstream and downstream end is to be carried out prior to commencement of any work. The length of the inspection is to be at least 5m upstream from the upstream end and 5m downstream from the downstream end.

### **Post - Construction Dilapidation Survey / CCTV Inspection**

Upon completion of the new stormwater pipe/ channel construction and the completion of the construction work at the site, dilapidation survey / CCTV inspection is to be carried out for the full length of the new pipe/ culvert and 5m upstream and downstream ends from new culvert/ pipe.

### **Lodgement of a Bond**

A Bond is required to be submitted prior releasing the design drawings for construction. The value of the Bond cannot be determined until the design is accepted and your providers have submitted their quotations for review. The amount of bond is assessed based on the likely risk to Sydney Water due to the proposed Adjustment /deviation work. Please refer to Sydney Water's Bonding Guidelines/Policy for more information.

Refund of the bond is subject to the acceptance of the Work As Constructed drawing and the review of final CCTV inspection/ dilapidation report which is required to undertake upon completion of the construction work and payment of all outstanding fees.

### **Disconnected Pipes**

Disconnected pipes are to be either completely removed or need to be sand filled. If the proponent decided to sand filled the disconnected pipe, then the ownership of the disconnected pipe/ culvert is to be transferred from Sydney Water to the owner of the property. The proponent is required to follow the transfer of ownership process.

### **Crossing the Services**

Any service crossing across the Sydney Water's stormwater pipe/ culvert is to be perpendicular to the stormwater pipe/ culvert and must have minimum 500mm vertical clearance between the services and Sydney Water's stormwater assets.

### **Review of Design**

Review of the design by Sydney Water shall be not construed as relieving the Designers of their responsibility. Note, Sydney Water examine only the supplied information and provide comment for consideration. Sydney Water does not verify, approve or endorse the design. Design responsibility remains with the Designers.

## **On-site Stormwater Detention (OSD)**

The proposed development will require an OSD system to offset stormwater run-off. To determine the required On Site Detention and Permissible Site Discharge (PSD), the following site specific information is required to be submitted:

- Total site area (m<sup>2</sup>)
- Existing pre-development impervious area (m<sup>2</sup>)
- Proposed post-development impervious area (m<sup>2</sup>)

If a percentage of the site area does not drain into the OSD system, the rate of discharge from the OSD storage must be restricted so that the total flow from the site (from the OSD storage and free runoff) does not exceed the specified PSD.

On Site Detention is to be designed according to the Sydney Water's values and the details of the On Site Detention are to be submitted to Sydney Water for review and approval.

The following details are to be included in your submission for On Site Detention approval:

- Location of the On Site Detention in relation to the development
- Location of the On Site Detention in relation to overall stormwater network of the property
- Plan and Elevation of the On Site Detention tank with all dimensions
- Orifice plate calculation

## **5. Ancillary Matters**

### **5.1 Asset adjustments**

After we issues this Notice (and more detailed designs are available), we may require that the water main/sewer main/stormwater located in the footway/your property needs to be adjusted/deviated. If this happens, you will need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need

to complete it **before we can issue the Certificate**. We'll need to see the completed designs for the work and we'll require you to lodge a security. The security will be refunded once the work is completed.

## 5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use our **Permission to Enter** form(s) for this. You can get copies of these forms from your WSC or our website. Your WSC can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You'll be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

## 5.3 Costs

Construction of these **future** works will require you to pay project management, survey, design, and construction costs **directly to your suppliers**. Additional costs payable to us may include:

- water main shutdown and disinfection
- connection of new water mains to our system(s)
- design and construction audit fees
- contract administration, Operations Area Charge & Customer Redress prior to project finalisation
- creation or alteration of easements etc
- water usage charges where water has been supplied for building activity purposes prior to disinfection of a newly constructed water main.

Note: Payment for any Goods and Services (including Customer Redress) provided by Sydney Water will be required prior to the issue of the Section 73 Certificate or release of the Bank Guarantee or Cash Bond.

Your WSC can tell you about these costs.

## 6. Approval of your Building Plans

You must have your building plans approved **before the Certificate can be issued**. **Building construction work MUST NOT commence until we have granted approval**. Approval is needed because construction/building works may affect our assets (e.g. water and sewer mains).

Your WSC can tell you about the approval process including:

- Your provision, if required, of a “Services Protection Report” (also known as a “pegout”). This is needed to check whether the building and engineering plans show accurately where our assets are located in relation to your proposed building work. Your WSC will then either approve the plans or make requirements to protect those assets before approving the plans
- Possible requirements
- Their Costs
- Timeframes.

We recommend that you apply for Building Plan Approval early as in some instances your WSC may need to refer your building plans to us for detailed review. You’ll be required to pay us for the costs associated with the detailed review.

You can also find information about this process (including technical specifications) on our [Plumbing, building & developing](#) page on our website or call us on 13 20 92.

**Notes:**

- **The Certificate will not be issued until the plans have been approved and, if required, our assets are altered or deviated**
- **You can only remove, deviate, or replace any of our pipes using temporary pipework if you have written approval from us. You must engage your WSC to arrange this approval**
- **You must obtain our written approval before you do any work on our systems. We’ll take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.**

## **OTHER THINGS YOU MAY NEED TO DO**

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement from us in the future because of the impact of your development on our assets. You must read them before you go any further.

### **Disused Sewerage Service Sealing**



Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to our sewer main. This work must meet our standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

### **Soffit Requirements**

Please be aware that floor levels must be able to meet our soffit requirements for property connection and drainage.

### **Requirements for Business Customers for Commercial and Industrial Property Developments**

If this property is to be developed for Industrial or Commercial operations, it may need to meet the following requirements:

#### **Trade Wastewater Requirements**

If this development is going to generate trade wastewater, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. You must wait for approval of this permit before any business activities can commence.

The permit application should be emailed to Sydney Water's Business Customer Services at [businesscustomers@sydneywater.com.au](mailto:businesscustomers@sydneywater.com.au)

It is illegal to discharge Trade Wastewater into the Sydney Water sewerage system without permission.

A **Boundary Trap** is required for all developments that discharge trade wastewater where arrestors and special units are installed for trade wastewater pre-treatment.

If the property development is for Industrial operations, the wastewater may discharge into a sewerage area that is subject to wastewater reuse. Find out from Business Customer Services if this is applicable to your development.

#### **Backflow Prevention Requirements**

Backflow is when there is unintentional flow of water in the wrong direction from a potentially polluted source into the drinking water supply.

All properties connected to Sydney Water's supply must install a testable **Backflow Prevention Containment Device** appropriate to the property's hazard rating. Property with a high or medium hazard rating must have the backflow prevention containment device tested annually. Properties identified as having a low hazard rating must install a non-testable device, as a minimum.

Separate hydrant and sprinkler fire services on non-residential properties, require the installation of a testable double check detector assembly. The device is to be located at the boundary of the property.

Before you install a backflow prevention device:

1. Get your hydraulic consultant or plumber to check the available water pressure versus the property's required pressure and flow requirements.
2. Conduct a site assessment to confirm the hazard rating of the property and its services.  
Contact PIAS at NSW Fair Trading on **1300 889 099**.

For installation you will need to engage a licensed plumber with backflow accreditation who can be found on the Sydney Water website:

<http://www.sydneywater.com.au/Plumbing/BackflowPrevention/>

## Water Efficiency Recommendations

Water is our most precious resource and every customer can play a role in its conservation. By working together with Sydney Water, business customers are able to reduce their water consumption. This will help your business save money, improve productivity and protect the environment.

Some water efficiency measures that can be easily implemented in your business are:

- Install water efficiency fixtures to help increase your water efficiency, refer to WELS (Water Efficiency Labelling and Standards (WELS) Scheme, <http://www.waterrating.gov.au/>
- Consider installing rainwater tanks to capture rainwater runoff, and reusing it, where cost effective. Refer to <http://www.sydneywater.com.au/Water4Life/InYourBusiness/RWTCalculator.cfm>
- Install water-monitoring devices on your meter to identify water usage patterns and leaks.
- Develop a water efficiency plan for your business.

It is cheaper to install water efficiency appliances while you are developing than retrofitting them later.

### Contingency Plan Recommendations

Under Sydney Water's [customer contract](#) Sydney Water aims to provide Business Customers with a continuous supply of clean water at a minimum pressure of 15meters head at the main tap. This is equivalent to 146.8kpa or 21.29psi to meet reasonable business usage needs.

Sometimes Sydney Water may need to interrupt, postpone or limit the supply of water services to your property for maintenance or other reasons. These interruptions can be planned or unplanned.

Water supply is critical to some businesses and Sydney Water will treat vulnerable customers, such as hospitals, as a high priority.

Have you thought about a **contingency plan** for your business? Your Business Customer Representative will help you to develop a plan that is tailored to your business and minimises productivity losses in the event of a water service disruption.

For further information please visit the Sydney Water website at:

<http://www.sydneywater.com.au/OurSystemsandOperations/TradeWaste/> or contact Business Customer Services on **1300 985 227** or [businesscustomers@sydneywater.com.au](mailto:businesscustomers@sydneywater.com.au)

### Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the development and the ability of our system to provide that flow in an emergency. Sydney Water's Operating Licence directs that our mains are only required to provide domestic supply at a minimum pressure of 15 m head.

A report supplying modelled pressures called the Statement of Available pressure can be purchased through [Sydney Water Tap in](#)™ and may be of some assistance when defining the fire fighting system. The Statement of Available pressure may advise flow limits that relate to system capacity or diameter of the main and pressure limits according to pressure management initiatives. If mains are required for fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

## Large Water Service Connection

A water main will be available, once you have completed your drinking water main construction to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

To get approval for your connection, you will need to lodge an application with [Sydney Water Tap in](#)™. You, or your hydraulic consultant, may need to supply the following:

- a plan of the hydraulic layout
- a list of all the fixtures/fittings within the property
- a copy of the fireflow pressure inquiry issued by us
- a pump application form (if a pump is required)
- all pump details (if a pump is required).

You'll have to pay an application fee.

We don't consider whether a water main is adequate for fire fighting purposes for your development. We can't guarantee that this water supply will meet your Council's fire fighting requirements. The Council and your hydraulic consultant can help.

## Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to our water main. This work must meet our standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

## Other fees and requirements

The requirements in this Notice relate to your Certificate application only. We may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs
- the installation of backflow prevention devices
- trade waste requirements

- large water connections and
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your development as soon as possible. Your hydraulic consultant can help you here.)

**No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from us and to the extent that it is able, we limit its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.**

**END OF ADVICE**



# Statement of Available Pressure and Flow

**Michael Cahalane**  
**233 Castlereagh Street**  
**Sydney, 2000**

**Attention: Michael Cahalane**

**Date:** 04/03/2021

**Pressure & Flow Application Number: 1069030**

**Your Pressure Inquiry Dated: 2021-02-18**

**Property Address: 117 Missenden Road, Camperdown 2050**

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

## ASSUMED CONNECTION DETAILS

Street Name: Missenden Road	Side of Street: West
Distance & Direction from Nearest Cross Street	221 metres North from Carillon Avenue
Approximate Ground Level (AHD):	35 metres
Nominal Size of Water Main (DN):	250 mm (Target Point as per sketch provided)

## EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	40 metre head
Minimum Pressure	33 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	33
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	34
	10	34
	15	34
	20	33
	30	32
	40	30
	50	29
	60	27
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	33
	10	32
	15	32
	20	31
	30	29
	40	28
	50	26
	60	24
Maximum Permissible Flow	120	7

(Please refer to reverse side for Notes)

**For any further inquiries regarding this application please email :**

[swtapin@sydneywater.com.au](mailto:swtapin@sydneywater.com.au)

## General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – [www.sydneywater.com.au/tapin/index.htm](http://www.sydneywater.com.au/tapin/index.htm). Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

## Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

# Statement of Available Pressure and Flow

Jane Ciabattoni  
123 Clarence Street  
Sydney, 2000

Attention: Jane Ciabattoni

Date: 21/04/2021

Pressure & Flow Application Number: 1097611

Your Pressure Inquiry Dated: 2021-03-24

Property Address: Wesley College Carillon Avenue, Newtown NSW 2042

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

## ASSUMED CONNECTION DETAILS

Street Name: Western Avenue	Side of Street: East
Distance & Direction from Nearest Cross Street	15 metres North from Cadigal Lane
Approximate Ground Level (AHD):	29 metres
Nominal Size of Water Main (DN):	450 mm

## EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	46 metre head
Minimum Pressure	40 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	40
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	41
	10	41
	15	41
	20	41
	30	40
	40	40
	50	40
	60	40
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	40
	10	40
	15	40
	20	40
	30	39
	40	39
	50	39
	60	39
Maximum Permissible Flow	120	38

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

[swtapin@sydneywater.com.au](mailto:swtapin@sydneywater.com.au)

## General Notes

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2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – [www.sydneywater.com.au/tapin/index.htm](http://www.sydneywater.com.au/tapin/index.htm). Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

## Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

## 7.2 APPENDIX B – SYDNEY WATER TABLE

“AVERAGE DAILY WATER USE BY PROPERTY TYPE”

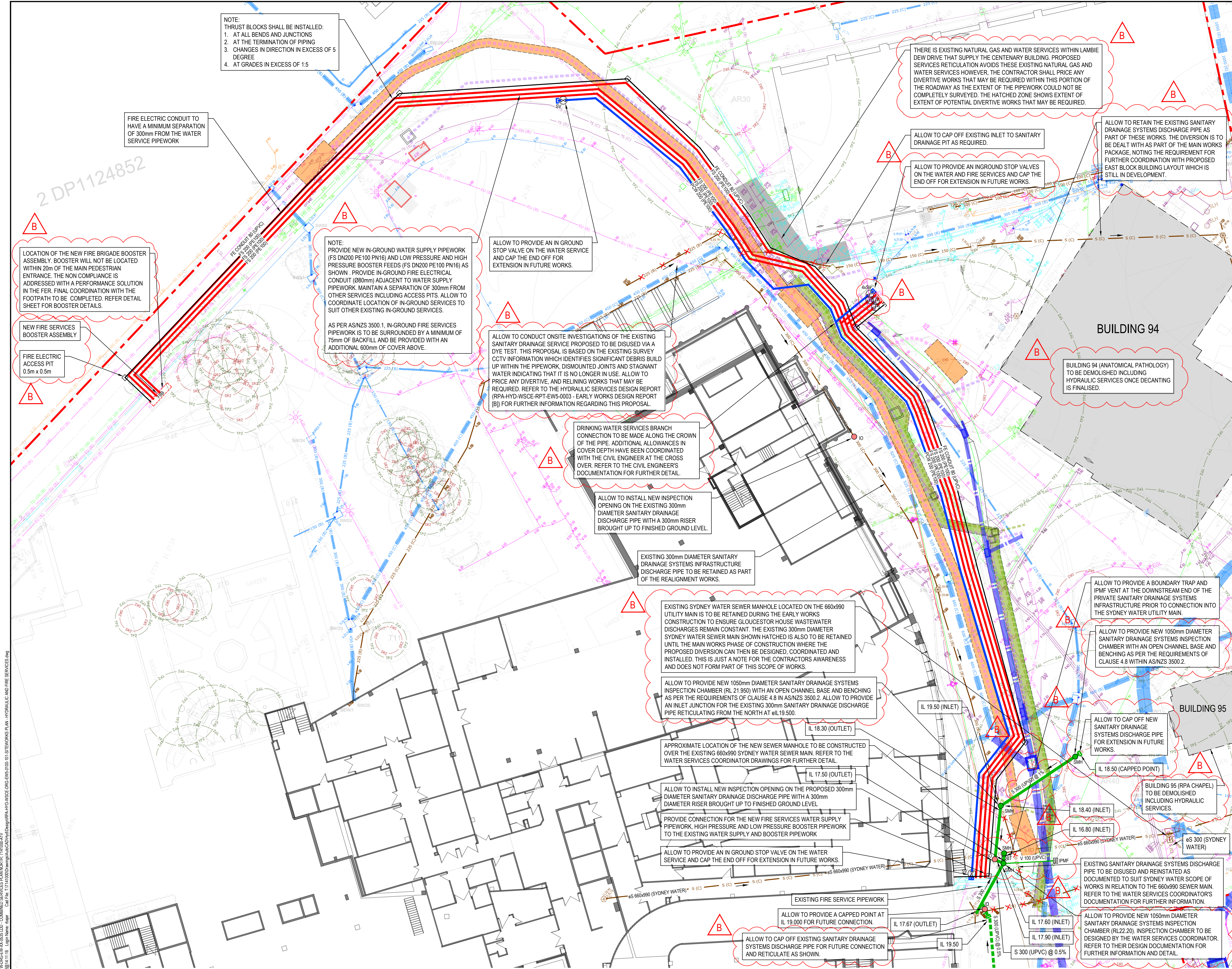
Development Type	Development Sub-Type	Key Metric	Metric Unit	Average Demand (L/Metric Unit / Day)
Residential	Single Lot Torrens	Dwelling	Each dwelling	623.00
	Flats Torrens	Net Floor Area	Square Meter	2.36
	High Rise Units	Net Floor Area	Square Meter	3.34
	Single Lot Community	Dwelling	Each dwelling	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
I 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

Special Uses	Warehousing	Developed floor area	Square Meter	2.82
	Transport / Bus Depot	Site area	Square Meter	0.91
	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



7.3 APPENDIX C – EARLY WORKS 5 DOCUMENTATION





NOTE:  
THRUST BLOCKS SHALL BE INSTALLED:  
1. AT ALL BENDS AND JUNCTIONS  
2. AT THE TERMINATION OF PIPING  
3. CHANGES IN DIRECTION IN EXCESS OF 5 DEGREE  
4. AT GRADES IN EXCESS OF 1:5

FIRE ELECTRIC CONDUIT TO HAVE A MINIMUM SEPARATION OF 300mm FROM THE WATER SERVICE PIPEWORK

LOCATION OF THE NEW FIRE BRIGADE BOOSTER ASSEMBLY. BOOSTER WILL NOT BE LOCATED WITHIN 20m OF THE MAIN PEDESTRIAN ENTRANCE. THE NON COMPLIANCE IS ADDRESSED WITH A PERFORMANCE SOLUTION IN THE FER. FINAL COORDINATION WITH THE FOOTPATH TO BE COMPLETED. REFER DETAIL SHEET FOR BOOSTER DETAILS.

NEW FIRE SERVICES BOOSTER ASSEMBLY

FIRE ELECTRIC ACCESS PIT 0.5m x 0.5m

NOTE:  
PROVIDE NEW IN-GROUND WATER SUPPLY PIPEWORK (FS DN200 PE100 PN16) AND LOW PRESSURE AND HIGH PRESSURE BOOSTER FEEDS (FS DN200 PE100 PN16) AS SHOWN. PROVIDE IN-GROUND FIRE ELECTRICAL CONDUIT (Ø80mm) ADJACENT TO WATER SUPPLY PIPEWORK. MAINTAIN A SEPARATION OF 300mm FROM OTHER SERVICES INCLUDING ACCESS PITS. ALLOW TO COORDINATE LOCATION OF IN-GROUND SERVICES TO SUIT OTHER EXISTING IN-GROUND SERVICES.  
AS PER AS/NZS 3500.1, IN-GROUND FIRE SERVICES PIPEWORK IS TO BE SURROUNDED BY A MINIMUM OF 75mm OF BACKFILL AND BE PROVIDED WITH AN ADDITIONAL 600mm OF COVER ABOVE.

ALLOW TO PROVIDE AN IN GROUND STOP VALVE ON THE WATER SERVICE AND CAP THE END OFF FOR EXTENSION IN FUTURE WORKS.

ALLOW TO CONDUCT ONSITE INVESTIGATIONS OF THE EXISTING SANITARY DRAINAGE SERVICE PROPOSED TO BE DISUSED VIA A DYE TEST. THIS PROPOSAL IS BASED ON THE EXISTING SURVEY CCTV INFORMATION WHICH IDENTIFIES SIGNIFICANT DEBRIS BUILD UP WITHIN THE PIPEWORK, DISMOUNTED JOINTS AND STAGNANT WATER INDICATING THAT IT IS NO LONGER IN USE. ALLOW TO PRICE ANY DIVERTIVE, AND RELINING WORKS THAT MAY BE REQUIRED. REFER TO THE HYDRAULIC SERVICES DESIGN REPORT (RPA-HYD-WSCE-RPT-EW5-0003 - EARLY WORKS DESIGN REPORT [B]) FOR FURTHER INFORMATION REGARDING THIS PROPOSAL.

DRINKING WATER SERVICES BRANCH CONNECTION TO BE MADE ALONG THE CROWN OF THE PIPE. ADDITIONAL ALLOWANCES IN COVER DEPTH HAVE BEEN COORDINATED WITH THE CIVIL ENGINEER AT THE CROSS OVER. REFER TO THE CIVIL ENGINEER'S DOCUMENTATION FOR FURTHER DETAIL.

ALLOW TO INSTALL NEW INSPECTION OPENING ON THE EXISTING 300mm DIAMETER SANITARY DRAINAGE DISCHARGE PIPE WITH A 300mm RISER BROUGHT UP TO FINISHED GROUND LEVEL.

EXISTING 300mm DIAMETER SANITARY DRAINAGE SYSTEMS INFRASTRUCTURE DISCHARGE PIPE TO BE RETAINED AS PART OF THE REALIGNMENT WORKS.

EXISTING SYDNEY WATER SEWER MANHOLE LOCATED ON THE 660x990 UTILITY MAIN IS TO BE RETAINED DURING THE EARLY WORKS CONSTRUCTION TO ENSURE GLOUCESTOR HOUSE WASTEWATER DISCHARGES REMAIN CONSTANT. THE EXISTING 300mm DIAMETER SYDNEY WATER SEWER MAIN SHOWN HATCHED IS ALSO TO BE RETAINED UNTIL THE MAIN WORKS PHASE OF CONSTRUCTION WHERE THE PROPOSED DIVERSION CAN THEN BE DESIGNED, COORDINATED AND INSTALLED. THIS IS JUST A NOTE FOR THE CONTRACTORS AWARENESS AND DOES NOT FORM PART OF THIS SCOPE OF WORKS.

ALLOW TO PROVIDE NEW 1050mm DIAMETER SANITARY DRAINAGE SYSTEMS INSPECTION CHAMBER (RL 21.950) WITH AN OPEN CHANNEL BASE AND BENCHING AS PER THE REQUIREMENTS OF CLAUSE 4.8 IN AS/NZS 3500.2. ALLOW TO PROVIDE AN INLET JUNCTION FOR THE EXISTING 300mm SANITARY DRAINAGE DISCHARGE PIPE RETICULATING FROM THE NORTH AT RL 19.500.

APPROXIMATE LOCATION OF THE NEW SEWER MANHOLE TO BE CONSTRUCTED OVER THE EXISTING 660x990 SYDNEY WATER SEWER MAIN. REFER TO THE WATER SERVICES COORDINATOR DRAWINGS FOR FURTHER DETAIL.

ALLOW TO INSTALL NEW INSPECTION OPENING ON THE PROPOSED 300mm DIAMETER SANITARY DRAINAGE DISCHARGE PIPE WITH A 300mm DIAMETER RISER BROUGHT UP TO FINISHED GROUND LEVEL.

PROVIDE CONNECTION FOR THE NEW FIRE SERVICES WATER SUPPLY PIPEWORK, HIGH PRESSURE AND LOW PRESSURE BOOSTER PIPEWORK TO THE EXISTING WATER SUPPLY AND BOOSTER PIPEWORK

ALLOW TO PROVIDE AN IN GROUND STOP VALVE ON THE WATER SERVICE AND CAP THE END OFF FOR EXTENSION IN FUTURE WORKS.

EXISTING FIRE SERVICE PIPEWORK

ALLOW TO PROVIDE A CAPPED POINT AT IL 19.000 FOR FUTURE CONNECTION.

ALLOW TO CAP OFF EXISTING SANITARY DRAINAGE SYSTEMS DISCHARGE PIPE FOR FUTURE CONNECTION AND RETICULATE AS SHOWN.

THERE IS EXISTING NATURAL GAS AND WATER SERVICES WITHIN LAMBIE DEW DRIVE THAT SUPPLY THE CENTENARY BUILDING. PROPOSED SERVICES RETICULATION AVOIDS THESE EXISTING NATURAL GAS AND WATER SERVICES HOWEVER, THE CONTRACTOR SHALL PRICE ANY DIVERTIVE WORKS THAT MAY BE REQUIRED WITHIN THIS PORTION OF THE ROADWAY AS THE EXTENT OF THE PIPEWORK COULD NOT BE COMPLETELY SURVEYED. THE HATCHED ZONE SHOWS EXTENT OF EXTENT OF POTENTIAL DIVERTIVE WORKS THAT MAY BE REQUIRED.

ALLOW TO CAP OFF EXISTING INLET TO SANITARY DRAINAGE PIT AS REQUIRED.

ALLOW TO PROVIDE AN INGROUND STOP VALVES ON THE WATER AND FIRE SERVICES AND CAP THE END OFF FOR EXTENSION IN FUTURE WORKS.

ALLOW TO RETAIN THE EXISTING SANITARY DRAINAGE SYSTEMS DISCHARGE PIPE AS PART OF THESE WORKS. THE DIVERSION IS TO BE DEALT WITH AS PART OF THE MAIN WORKS PACKAGE, NOTING THE REQUIREMENT FOR FURTHER COORDINATION WITH PROPOSED EAST BLOCK BUILDING LAYOUT WHICH IS STILL IN DEVELOPMENT.

BUILDING 94 (ANATOMICAL PATHOLOGY) TO BE DEMOLISHED INCLUDING HYDRAULIC SERVICES ONCE DEANTING IS FINALISED.

ALLOW TO PROVIDE A BOUNDARY TRAP AND IPMF VENT AT THE DOWNSTREAM END OF THE PRIVATE SANITARY DRAINAGE SYSTEMS INFRASTRUCTURE PRIOR TO CONNECTION INTO THE SYDNEY WATER UTILITY MAIN.

ALLOW TO PROVIDE NEW 1050mm DIAMETER SANITARY DRAINAGE SYSTEMS INSPECTION CHAMBER WITH AN OPEN CHANNEL BASE AND BENCHING AS PER THE REQUIREMENTS OF CLAUSE 4.8 WITHIN AS/NZS 3500.2.

ALLOW TO CAP OFF NEW SANITARY DRAINAGE SYSTEMS DISCHARGE PIPE FOR EXTENSION IN FUTURE WORKS.

IL 18.50 (CAPPED POINT)

IL 18.40 (INLET)

IL 16.80 (INLET)

IL 17.60 (INLET)

IL 17.90 (INLET)

EXISTING SANITARY DRAINAGE SYSTEMS DISCHARGE PIPE TO BE DISUSED AND REINSTATED AS DOCUMENTED TO SUIT SYDNEY WATER SCOPE OF WORKS IN RELATION TO THE 660x990 SEWER MAIN. REFER TO THE WATER SERVICES COORDINATOR'S DOCUMENTATION FOR FURTHER INFORMATION.

ALLOW TO PROVIDE NEW 1050mm DIAMETER SANITARY DRAINAGE SYSTEMS INSPECTION CHAMBER (RL 22.20). INSPECTION CHAMBER TO BE DESIGNED BY THE WATER SERVICES COORDINATOR. REFER TO THEIR DESIGN DOCUMENTATION FOR FURTHER INFORMATION AND DETAIL.

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NORTH POINT

NOTES

1. REFER TO OTHER DISCIPLINES (CIVIL, ELECTRICAL AND WATER SERVICES COORDINATOR) DESIGN DOCUMENTATION TO UNDERSTAND THE EXTENT OF EXISTING SERVICES TO BE DISUSED WITHIN THE ROADWAY.

REVISION	DESCRIPTION	DATE
A	100% DESIGN DEVELOPMENT	22/08/2022
B	100% DESIGN DEVELOPMENT ADDENDUM	15/09/2022

WARREN SMITH CONSULTING ENGINEERS  
SINCE 1981.

NSW  
9/233 Castlereagh St,  
Sydney 2000 NSW Australia  
PH +61 (2) 9299 1312

VIC  
Suite 7.03, 365 Little Collins St  
Melbourne 3000 VIC Australia  
PH +61 (3) 8648 9942

www.warrensmith.com.au

ws@warrensmith.com.au

ACN 002 197 088 ABN 35 900 430 126

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PROJECT

ROYAL PRINCE ALFRED  
HOSPITAL REDEVELOPMENT

TITLE

SITWORKS PLAN NORTH  
HYDRAULIC AND FIRE SERVICES

SCALE

1:200 @ A1  
1:400 @ A3

DRAWN  
RB

DESIGNED  
JS/MJ

CHECKED  
TW

APPROVED  
DP

DATE

Mar 2022

DRAWING No.

RPA-HYD-WSCE-DRG-EW5-0100

REVISION

B

JOB No.

7141000

STATUS

100% DESIGN DEVELOPMENT

Model: RPA-HYD-WSCE-DRG-EW5-0100 - COORDINATED SERVICES (RPA-HYD-WSCE-DRG-EW5-0100-01) - SITWORKS PLAN - HYDRAULIC AND FIRE SERVICES.dwg  
Plot Date: 15/09/2022 14:11:15 Login Name: dmp

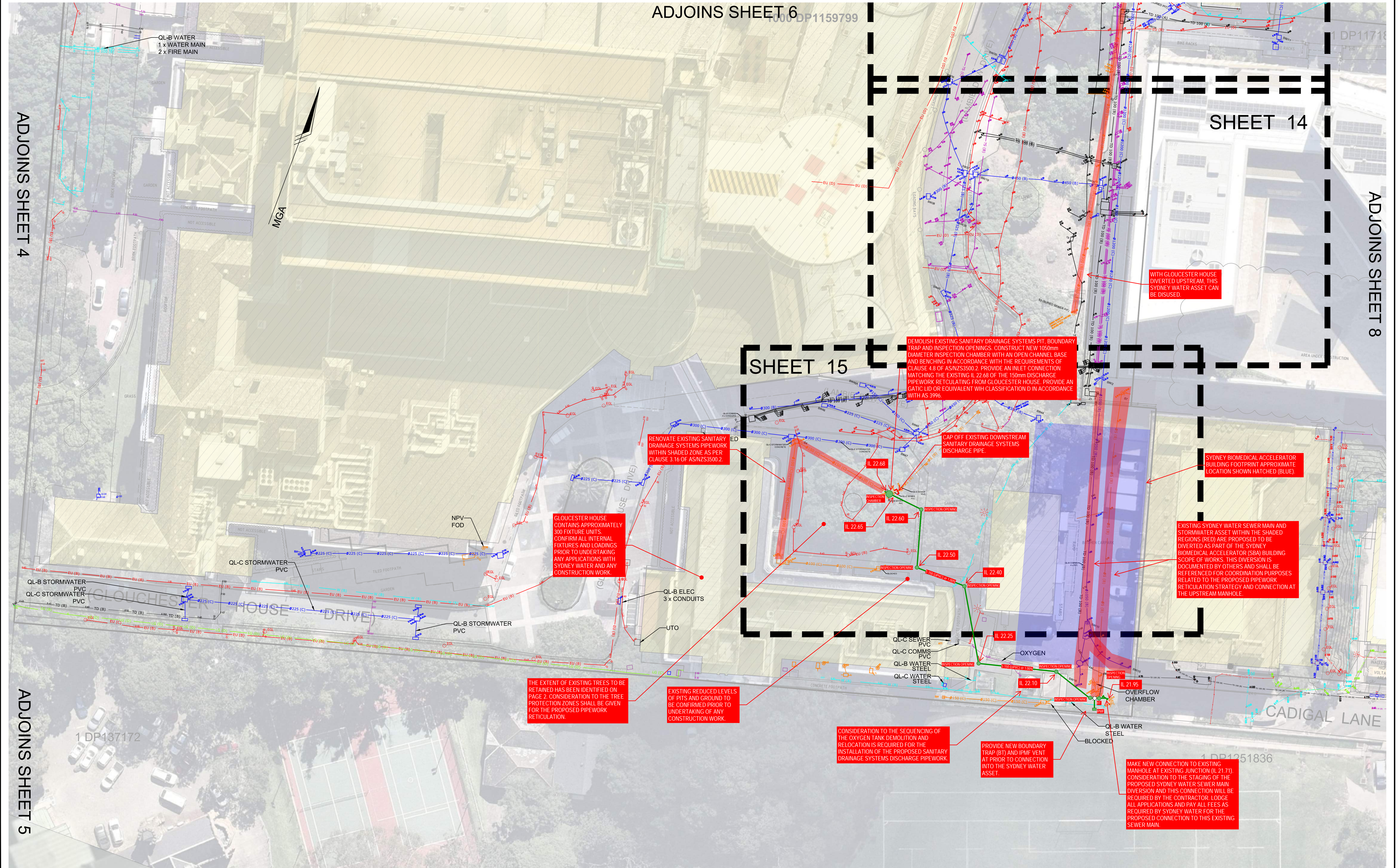
FOR CONTINUATION REFER TO DRAWING RPA-HYD-WSCE-DRG-EW5-0101

SHEET SIZE: A1



7.4 APPENDIX D – GLOUCESTER HOUSE DIVERSION





REVISIONS	E	19.01.2022	ADDITIONAL AND UPDATED UTILITIES. LABELS ADDED	LB	NF	GG
	D	7.10.2021	ADDITIONAL AND UPDATED UTILITIES ADDED (SHEETS 9-15)	LB	NF	GG
	C	14.09.2020	ADDITIONAL UTILITIES INVESTIGATION (SHEET 8)	JMJ	TC	GE
	B	17.09.2019	UTILITIES MODEL WEST OF MISSENDEN ROAD UPDATED	AF	TB / SP	TC
	A	14.05.2019	INITIAL PLAN	JMJ	NF	TC
No.	DATE	REVISION DETAILS	DRAWN	CHK	APP	

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HORIZ. SCALE: 1:300 @ A1

VERT. SCALE: N/A @ A1

COORDINATES: MGA

DATUM: AHD

ORIGIN: PM53458

ORIGIN: PM53458

SCALE IN METRES AT ORIGINAL REDUCTION RATIO

SOME LEVELS ARE NOT INDICATED ON THE PDF. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH CAD FILE.

CLIENT: NSW Health

SURVEY: NF

DRAWN: MJM

CHECKED: NF

APPROVED: TC

DATE OF SURVEY: 24.04.2019

DATE OF PLAN: 14.05.2019

DATE LAST SAVED: 20.01.2022

DATE APPROVED: 14.05.2019

TITLE: UTILITIES INVESTIGATION  
RPA HOSPITAL, MISSENDEN ROAD,  
CAMPERDOWN

DRAWING No: PR142110-UTIL-001-E.dwg

JOB No: PR142110

ISSUE: E

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SHEET 7 OF 8 SHEETS

SIZE: A1

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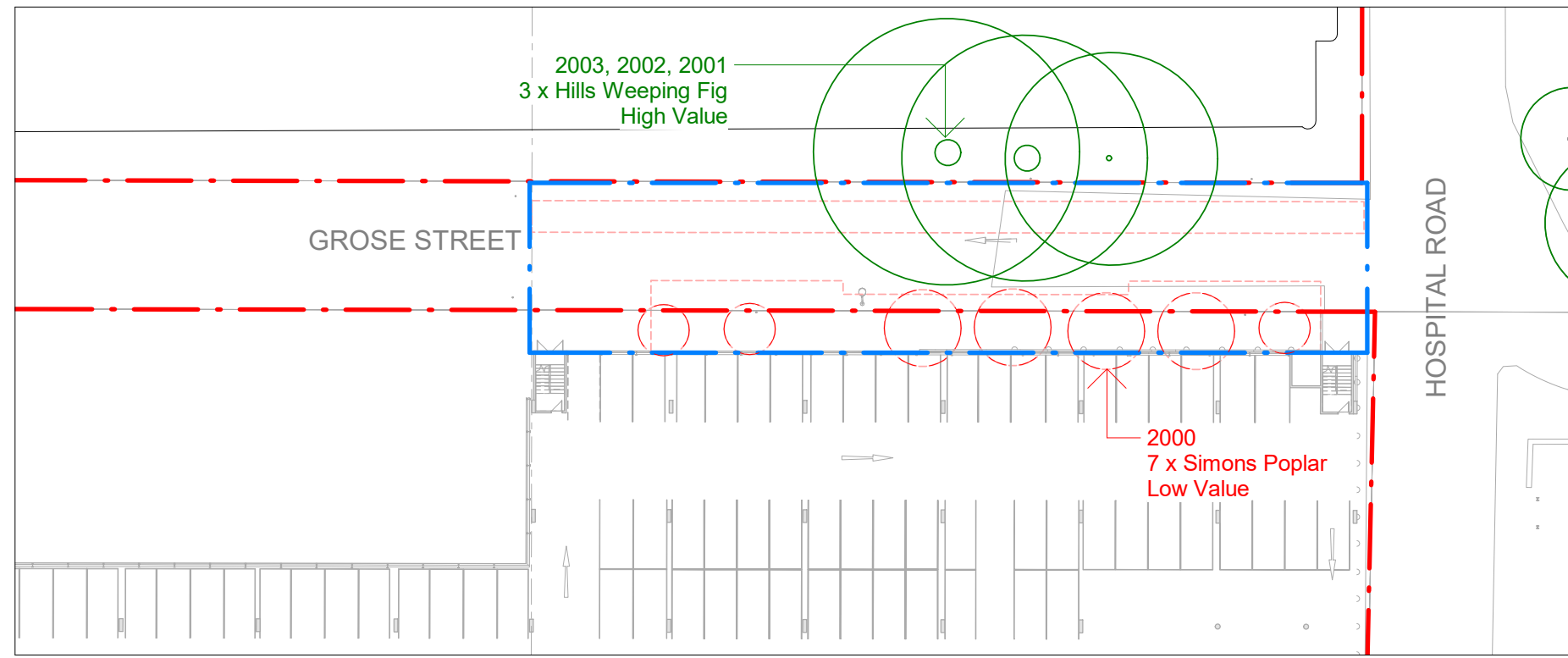
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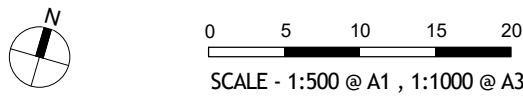
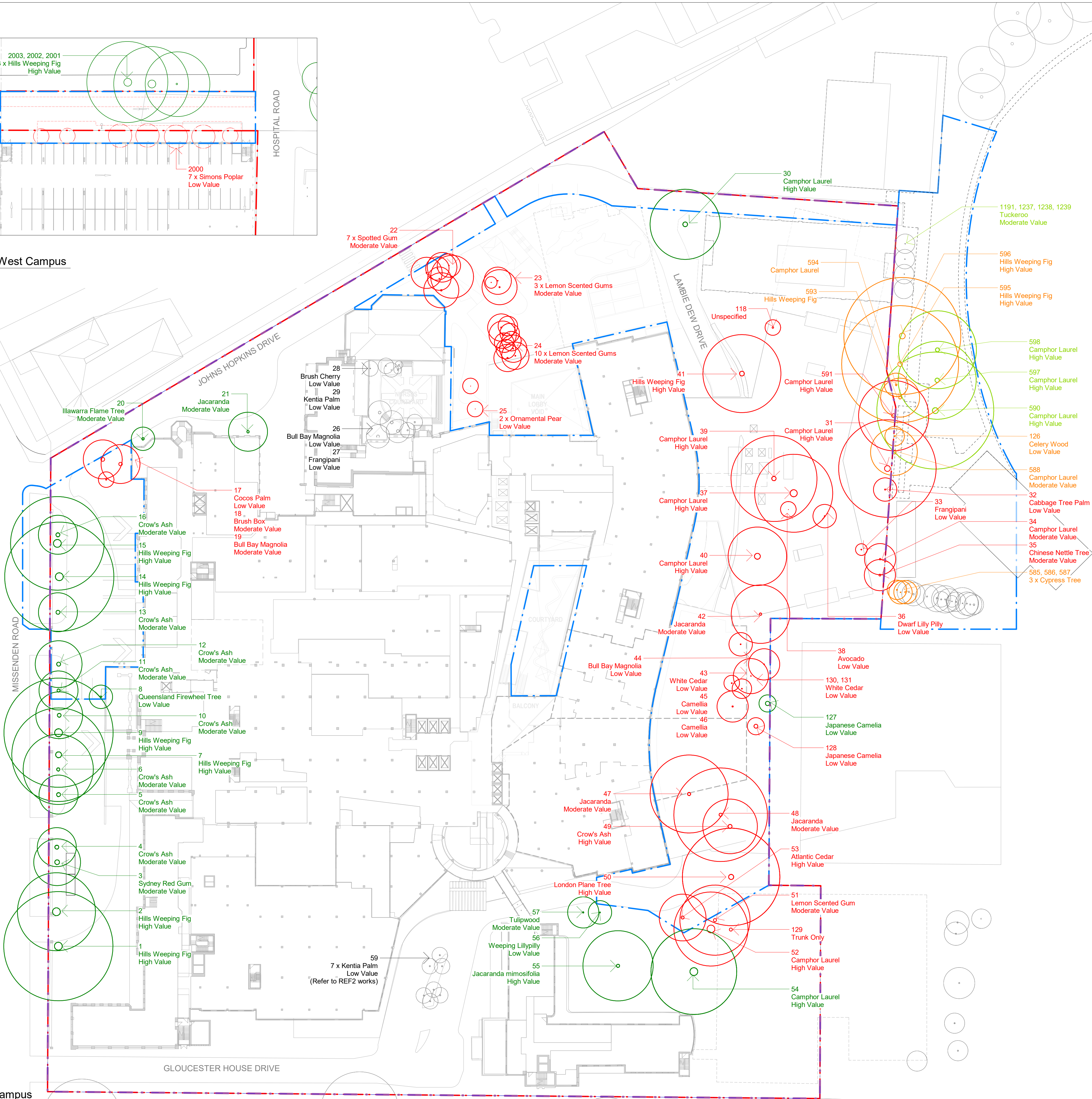
RPS

P:\PR142110 - RPA Hospital, Missenden Road, Camperdown\03 RPS Data\02 CAD\01 Plans\PR142110-UTIL-001-E.dwg 20.01.2022 3:10 PM





2 Tree Management Plan - West Campus  
1 : 500



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NOT FOR CONSTRUCTION

- KEY
- Trees to be removed
  - Trees to be retained
  - USYD trees to be removed
  - USYD trees to be retained
  - Site boundary
  - Extent of landscape works

NOTE: REFER TO ARBORISTS REPORT

D	17/10/2022	SSDA	CO	MC
C	10/10/2022	SSDA	CW/CO	MC
B	04/10/2022	DRAFT SSDA	CW/CO	MC
A	29/09/2022	DRAFT SSDA	CO	MC

Rev Date Description Drawn Checked

**turf**

Turf Design Studio: 35 Wellington St, Chippendale NSW 2008  
Phone (+61 2) 8394 9990  
Email: sydney@turfdesign.com

Client

NSW Health Sydney Local Health District  
NSW Infrastructure

Project  
RPA Hospital Redevelopment

Project No.  
2134

Drawing Title

## Tree Management Plan

Drawing Status

SSDA

Scale: As indicated @A1 Plot Date: 17/10/2022 5:06:24 PM

Drawing No. Revision

RPA-LAN-TDS-DRG-MW-DA0100 D

1 Tree Management Plan - East Campus  
1 : 500

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