

**Health Infrastructure**

# Cumberland West Mental Health Services Relocation (CWMHSR) REF Report – Hydraulics & Fire Services

## REF Report – Hydraulic Services

Reference: CWMHSR-EW-HS-RP-00002

D | 17/02/2023

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 281847-00

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Signature			

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## Contents

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<b>1.</b>	<b>Introduction</b>	<b>1</b>
1.1	Purpose of Report	1
1.2	Utilities Diversions	1
1.3	Design Standards & Guidelines	1
<b>2.</b>	<b>Acronym definition</b>	<b>3</b>
<b>3.</b>	<b>Impact on Existing Utility and Private Infrastructure</b>	<b>4</b>
3.1	Sydney Water Sewer Service	4
3.2	Westmead Hospital Private Sewer and Trade-waste Services	4
3.3	Westmead Hospital Private Water Service	4
<b>4.</b>	<b>Existing Buildings &amp; Carparks</b>	<b>5</b>
<b>5.</b>	<b>Infrastructure Diversions Details</b>	<b>7</b>
5.1	Sewer Infrastructure Diversions	7
5.2	Westmead Hospital Private Cold Water Service	9

## Tables

Table 1 Relevant design standards	2
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## Figures

Figure 1: Existing Diverted Infrastructure	5
Figure 2: Existing buildings to be demolished	6
Figure 3: Sydney Water Sewer Main Diversion	8
Figure 4: Private Sewer & Trade-waste Diversion	9
Figure 5: Existing Private Cold Water Diversion	9

## Appendices

Appendices	i
A.1 Appendix A: Sydney Water sewer diversion design plan	i
A.2 Appendix B: Private sewer diversion design plan	ii
A.3 Appendix C: Private water services diversion design plan	iii

# 1. Introduction

## 1.1 Purpose of Report

This report has been prepared as part of a Review of Environmental Factors for the Early Works Project at Westmead Hospital which proposes a series of infrastructure improvements to accommodate the future development of the Integrated Mental Health Complex (proposed separately as part of State Significant Development Application SSD-44034342).

The purpose of this report is to assess the potential environmental impacts which could arise from the proposed works, which include:

- Demolition of the existing Brain Injury Rehabilitation Unit building, Casuarina Lodge and office buildings.
- Diversion of existing in-ground sewer, trade waste & water service;
- Construction of a new access way to the P14 staff car park;
- Flood mitigation works; and
- Bulk earthworks and tree removal to accommodate the carrying out of the above works.

The proposed works will be carried out within the boundaries of Westmead Hospital which is located approximately 1.5km north-west of the Parramatta Central Business District (CBD), the primary metropolitan centre of Western Sydney. The site is legally described as Lot 1 DP1194390 and Lot 4 DP 1077852, with works proposed in the central part of the precinct.

The hydraulics & Fire early works scope includes the diversion of private and Authorities infrastructure which transverse through the site, below the proposed IMHC building footprint. These services are summarized below under Clause 1.2 Utilities Diversions:

## 1.2 Utilities Diversions

Existing utilities that cross the site are proposed to be diverted around the future building footprint as part of the early works. The services to be diverted are:

- Private sewer (Ø375) and private trade waste (Ø225) to be diverted around south of the proposed building via directional boring/micro tunnelling
- Sydney Water sewer (Ø300) to be diverted around north of the proposed building. Consultations with Sydney Water regarding this diversion are ongoing.
- Private water main (Ø150) to be diverted around north of the proposed building.

These diversions are shown in Section 5.0

## 1.3 Design Standards & Guidelines

A summary of relevant design standards and guidelines that have been reviewed and considered as part of the early works design is included in Table 1.

**Table 1 Relevant design standards**

Requirement	Relevant Services
National Construction Code (NCC) – 2019 amendment 1	All Services
Plumbing Code of Australia (PCA) – 2019	All Services
AS 3500.1	Water Services
AS 3500.2	Drainage Services
AS 2419.1, AS 2118.1 & AS 2118.6	Fire Services
Sydney Water requirements	Sewer Services

## 2. Acronym definition

BIRS	Brain Injury Rehabilitation Service
CASB	Central Acute Service Building
CCTV	Closed-Circuit Television
CWMHSR	Cumberland West Mental Health Services Relocation
DBYD	Dial Before You Dig
DD	Design Development
ERG	Expert Reference Group
HI	NSW Health Infrastructure
IMHC	Integrated Mental Health Centre
MSCP	Multi-Storey Car Park
PECC	Psychiatric Emergency Care Centre
PSB	Paediatric Services Building
PUG	Professional User Group
WSC	Sydney Water's Water Services Coordinator

### 3. Impact on Existing Utility and Private Infrastructure

This section describes existing utility and private sewer infrastructure located in proximity to the proposed IMHC area, which will be diverted as part of the Early Works package.

#### 3.1 Sydney Water Sewer Service

An existing 300mm salt glazed earthenware Sydney Water sewer main traverses through the proposed site. This main reticulates under the proposed IMHC building footprint, will need to be concrete encased and diverted where impacted by the development. CCTV footage has been completed on this 300mm main which shows that it is generally in good condition, apart from a small number of locations where the lining has become detached.

This diversion has been detailed by the Water Services Coordinator (WSC) and presented to Sydney Water for comments. The diversion route has been agreed in principle and is currently going through more detailed engineering review by Sydney Water.

#### 3.2 Westmead Hospital Private Sewer and Trade-waste Services

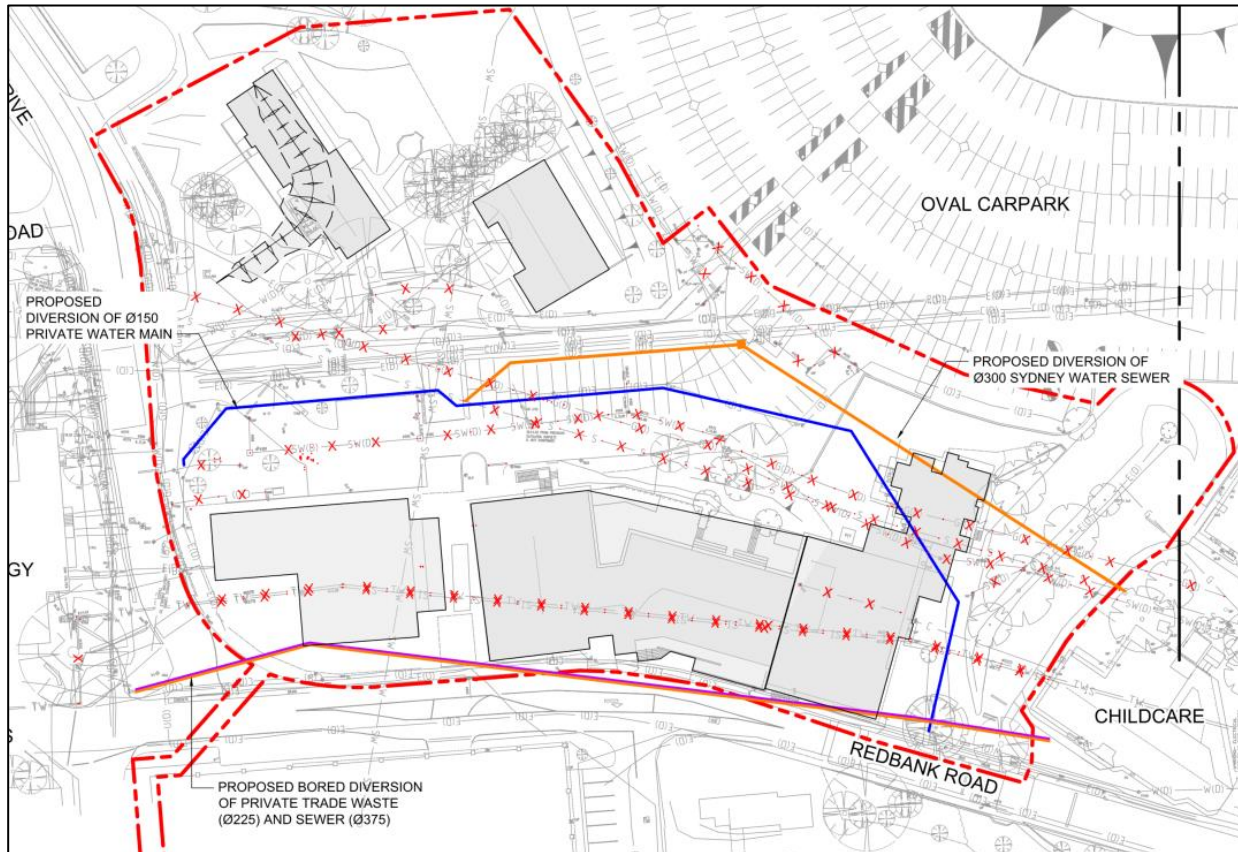
Private 375mm sewer, 225mm trade waste mains and water main traverse through the site; these services are important Westmead Hospital infrastructure and will require major diversion works. The 375mm sewer main services multiple buildings on campus, including the Westmead adult hospital and CASB. The new PSB will also connect into this main. The 225mm trade waste main is laid parallel to the sewer main in a common trench and extends from the Westmead adult hospital to the trade waste treatment plant. It is understood the trade waste main serves a small number of departments in the adult hospital.

These services connect into the Sydney Water 750mm reinforced concrete trunk sewer main, which reticulates alongside Toongabbie Creek. These pipes are approximately 7m deep below the proposed IMHC building footprint and will be diverted around the proposed building footprint to the South of the site via laser boring to minimise disruption to the hospital campus.

#### 3.3 Westmead Hospital Private Water Service

A private 150mm cold water service reticulates through the existing Brain Injury unit under-croft carpark. This supply serves multiple hydrants and buildings downstream, at the Eastern part of the campus. This will need to be diverted North around the proposed building footprint. The service will be diverted below the fingers and has been coordinated with structural pilings and other in-ground services.





**Figure 1: Existing Diverted Infrastructure**

## 4. Existing Buildings & Carparks

On the proposed site, there are a number of buildings and carparks that will be demolished to accommodate the IMHC building, as part of the Enabling Works package. These include:

- Brain Injury Rehabilitation Service (BIRS)
- Casuarina Lodge (Patient's Accommodation)
- Project Office
- Existing Westmead Redevelopment Office
- Carparking

This demolition works will be completed prior to the commencement of Early Works.



**Figure 2: Existing buildings to be demolished**

## 5. Infrastructure Diversions Details

### 5.1 Sewer Infrastructure Diversions

The following infrastructure traverse below and through the proposed IMHC site footprint and will need to be diverted:

- 300mm Sydney Water sewer main
  - Traverses through the Northern part of the site and will require a diversion so it is not located below the proposed on-ground building footprint.
  - The diversion and protection requirements will be stipulated by the Sydney Water WSC.
- Private 375mm sewer & 225mm trade waste mains
  - Traverse through the Southern part of the site.
  - Mains will be diverted so they are not located below the IMHC building footprint.

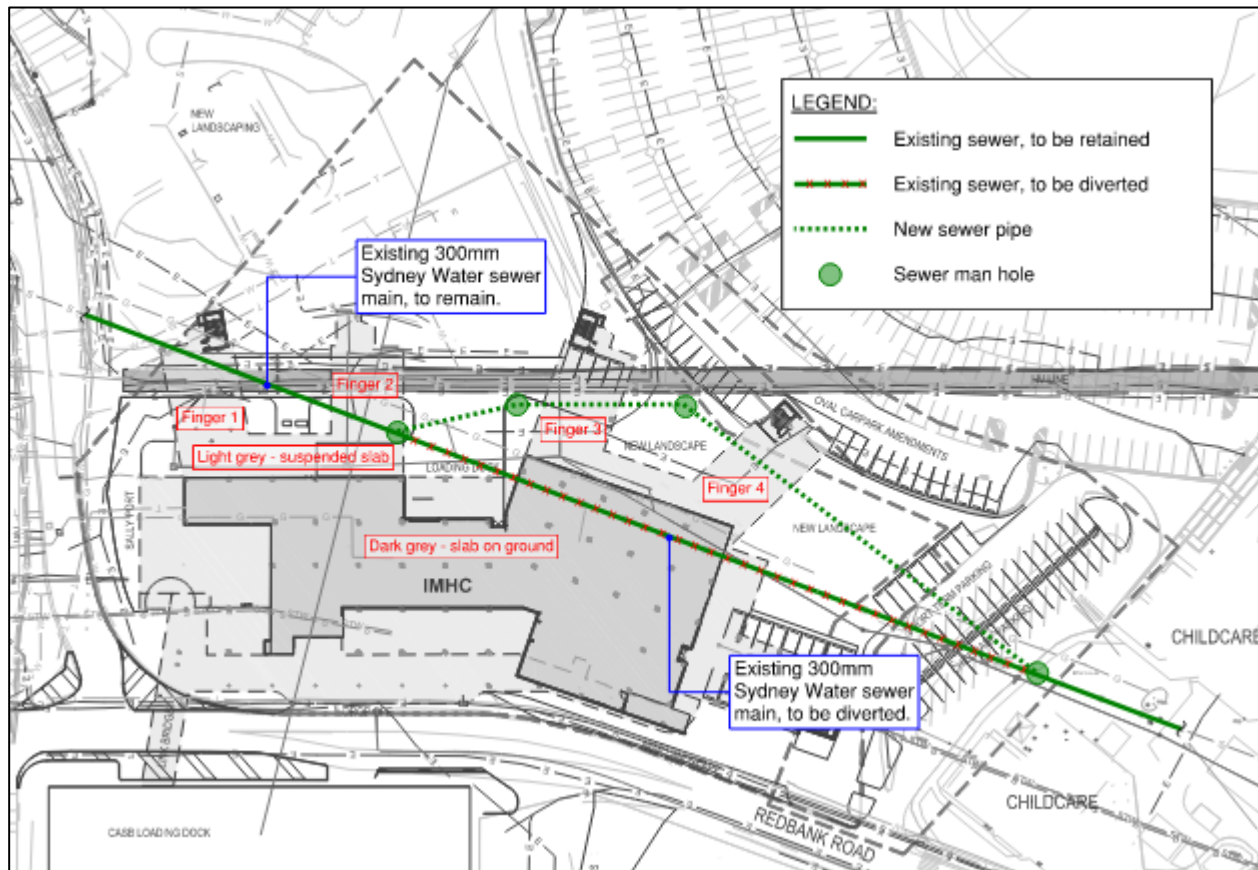
#### 5.1.1 Sydney Water Sewer Main Diversion

The existing 300mm Sydney Water sewer main reticulates across the Northern part of the site and crosses a section of the building on-grade footprint. At this section, it is proposed to divert the main around the footprint, in line with Sydney Water's guidelines. New sewer manholes will be installed at the changes of direction to maintain full access to the service. The section of the diversion which reticulates under the raised building fingers will be concrete encased and considered an unmaintained asset, in line with Sydney Water requirements, as warranted by the limited clearance height.

The route of the diverted service has been coordinated with structural pilings and other in-ground services in the area.

A WSC has completed a preliminary design, which can be found in Appendix A.1.





**Figure 3: Sydney Water Sewer Main Diversion**

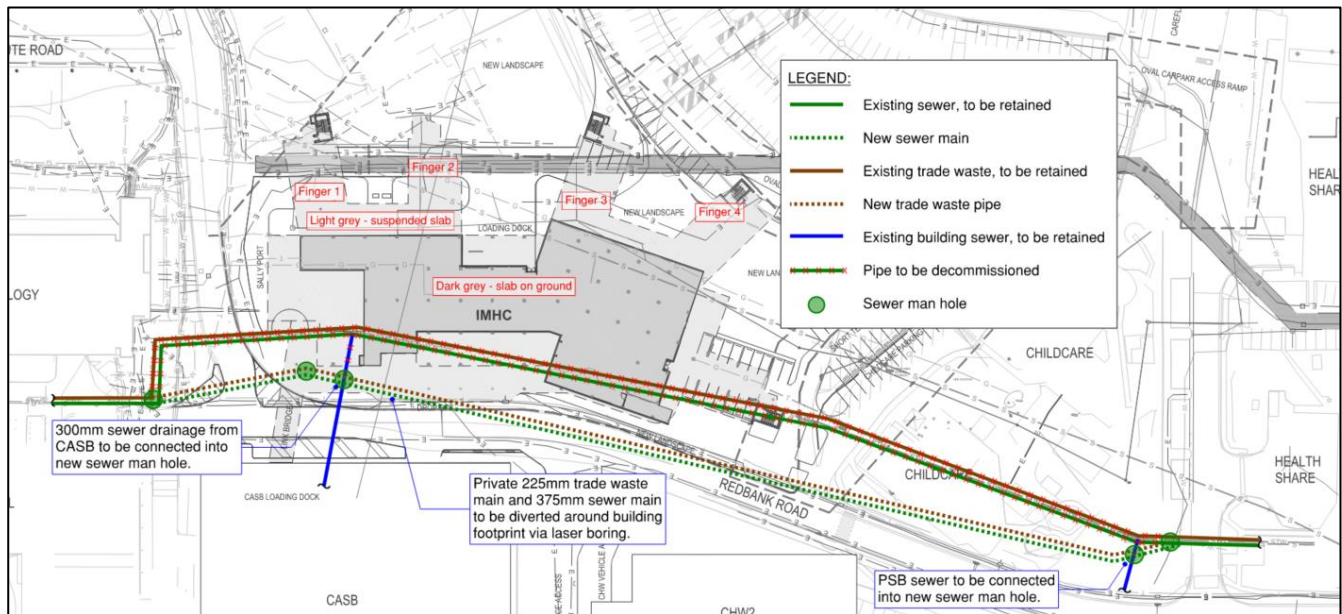
### 5.1.2 Private Sewer & Trade Waste Mains Diversion

It is proposed to divert the 375mm sewer and 225mm trade waste mains around the Southern side of the site using laser boring, as this is safer and more cost effective than open excavation. The diversion works will also include the reconnection of the CASB and PSB sewer mains to the new diverted sewer service.

Multiple launch pits and shoring boxes will be required for the bores to be drilled. These will be located so as to not adversely affect traffic on Redbank Road, as this is a major road through the hospital campus. However, the footpath on Redbank Road is likely to be cordoned off for the works, which will affect pedestrian movements. The diversion works will also be staged to ensure the existing sewers remain fully operational during the installation of the new services. This will ensure minimal impact to hospital operations.

During the diversion works, the area to the East of the Child-care Centre will need to be cordoned off for the excavation of a receiving pit. This area is currently an Emergency Assembly Point for surrounding buildings. To address this, an interim management plan will need to be developed and an alternative Emergency Assembly Point will need to be assigned during the works.

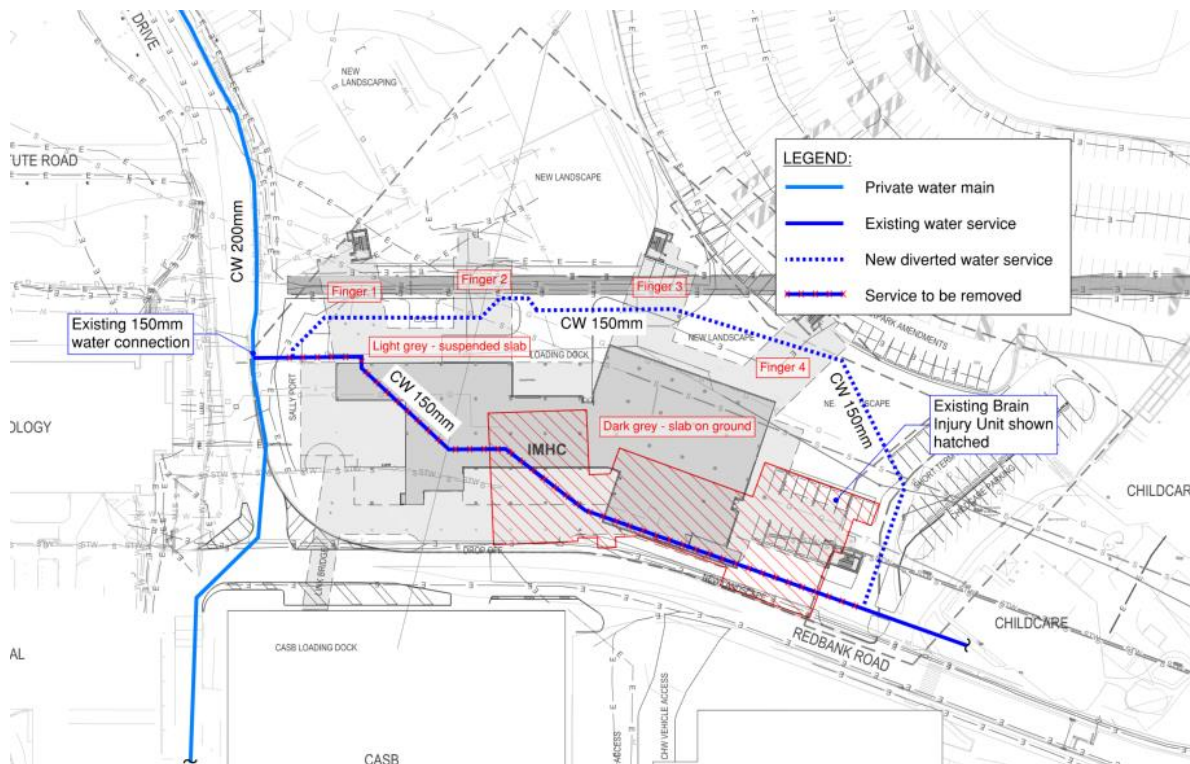
At completion of the diversion works, sewer manholes will be provided at changes in direction and sewer connections as required to maintain access.



**Figure 4: Private Sewer & Trade-waste Diversion**

## 5.2 Westmead Hospital Private Cold Water Service

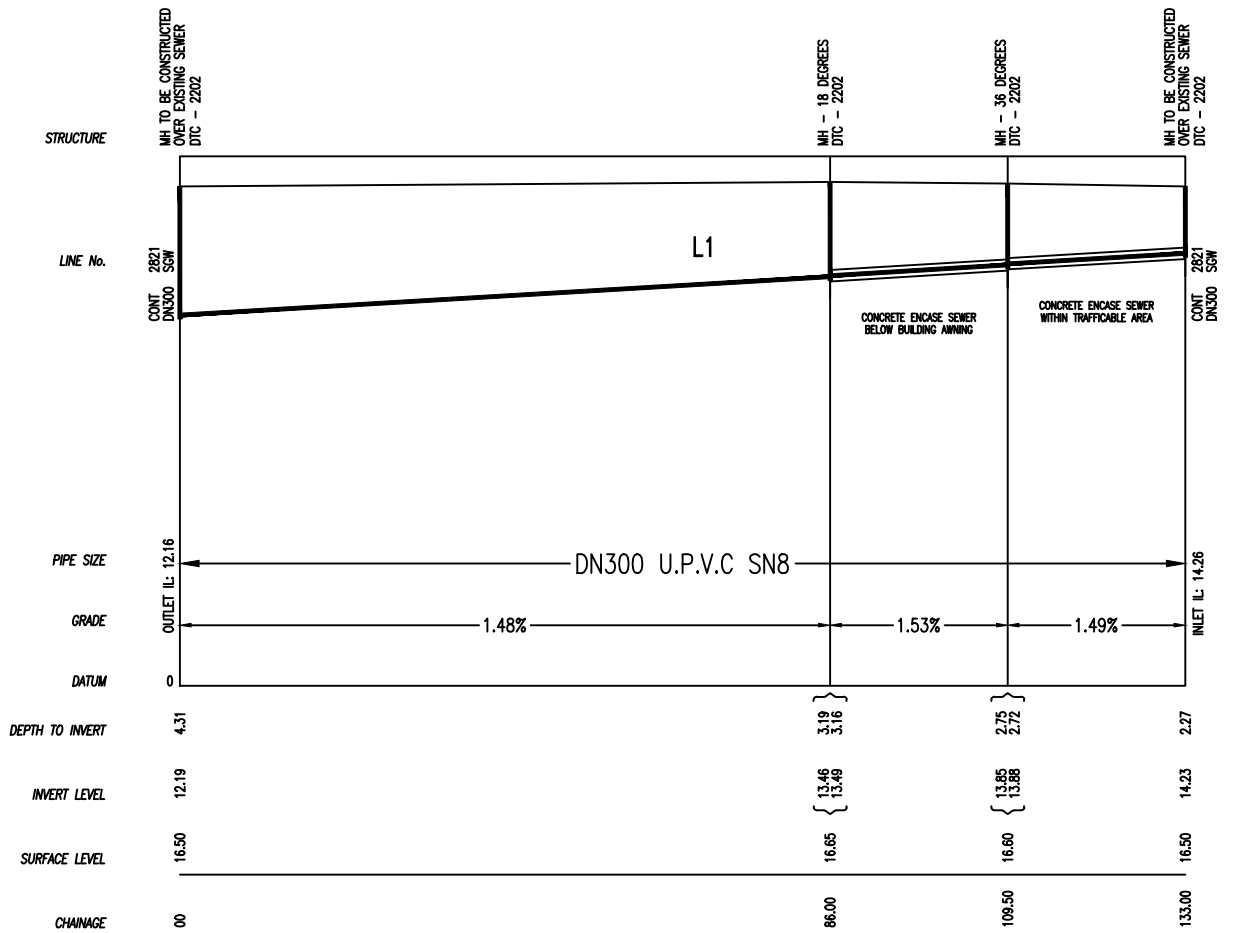
A private 150mm cold water service reticulates through the existing Brain Injury unit under-croft carpark. This supply serves multiple hydrants and buildings downstream, at the Eastern part of the campus. This will need to be diverted North around the proposed building footprint. The service will be diverted below the fingers and will be coordinated with structural pilings and other in-ground services.




**Figure 5: Existing Private Cold Water Diversion**

## Appendices

### A.1 Appendix A: Sydney Water sewer diversion design plan




11. CONNECTIONS TO LIVE SEWERS TO BE CARRIED OUT BY CONSTRUCTOR WHEN APPROPRIATE APPROVAL IS OBTAINED.
14. SURVEY OF ALL NEW SURFACE LID STRUCTURES, INLET AND OUTLET INVERT LEVELS PART OF THIS DESIGN IS REQUIRED PRIOR TO CONNECTION. SURVEY MUST BE TO MGA GDA 2020 AND LEVELS IN AHD. THE CONSTRUCTOR IS REQUIRED TO PROVIDE DEPTH TO INVERT DOCUMENTATION FOR STRUCTURES CONSTRUCTED OVER EXISTING SEWERS PRIOR TO CONNECTION.
15. PIPES TO BE CONCRETE ENCASED SHOWN ACCORDINGLY:-  REFER TO SEW-1205-V
17. APPROX. 124m OF EXISTING DN300 SGW SEWER FROM 'A'-B' TO BE DISUSED, EXHUMED AND DISPOSED OFF SITE.
18. PRIOR TO ANY EXCAVATION ADJACENT TO EXISTING TREES, CONSTRUCTOR IS TO LIAISE WITH COUNCIL AND OBTAIN ANY NECESSARY APPROVALS AS REQUIRED.
19. IT IS THE CONSTRUCTORS RESPONSIBILITY TO PROVIDE THE CHAINAGES FOR THE PCP's, ANY PCS's AND THE LENGTH OF THE PCS's TO THE ACDR CONSULTANTS FOR WORK AS CONSTRUCTED PURPOSES.

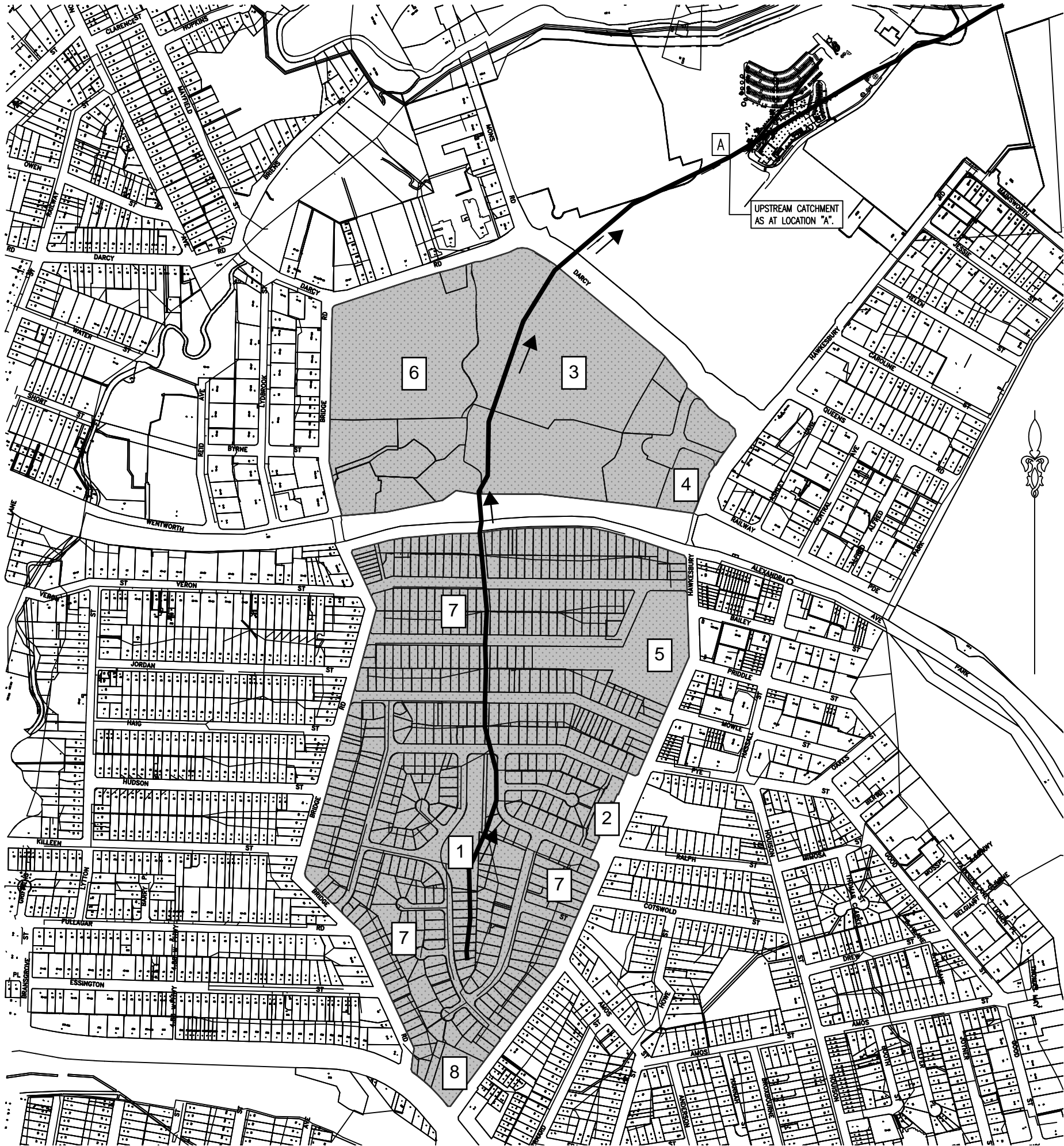
WARNING  
DANGEROUS SERVICES  
IN AREA. SEE NOTE ?

**⚡ CAUTION**

EXISTING SERVICES ALLOCATED IN FOOTPATH RESERVE ARE SUBJECT TO VARIABLE PLACEMENT. THE CONTRACTOR IS REQUIRED TO ACQUIRE LATEST SEARCH INFORMATION AND FIELD CHECK AT TIME OF WORKS.

PLAN TO BE READ IN CONJUNCTION WITH CURRENT SYDNEY WATER STANDARDS SYDNEY WATER CORPORATION		UTILITIES TYPE DATE REF. TYPE DATE REF.						WORK AS CONSTRUCTED CERTIFICATION DEVELOPER WATER SERVICE CO-ORDINATOR CONSTRUCTOR COMPLETED W.A.C. PREPARED DESIGNER I CERTIFY THAT THE WORKS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE WORK AS CONSTRUCTED DRAWINGS.				PIPE SCHEDULE SIZE DN TYPE GLASS LENGTH PIPE JOINING METHOD / NOTES 300 U.P.V.C. SN8 133          DESIGN HEAD . . . m NO BOUNDARY TRAPS REQUIRED.				AUSTRALIAN HEIGHT DATUM SCALES PLAN : 1:500 SECTION { HOR. : 1:500 VERT. : 1:125 CROSS SECTIONS . . . . . NATURAL LENGTHS, DEPTHS & LEVELS ARE IN METRES.		NO AMENDMENTS ARE TO BE MADE TO THIS PLAN WITHOUT REFERENCE TO SYDNEY WATER. THIS PLAN IS NOT NECESSARILY UP TO DATE OR CORRECT AND SYDNEY WATER ACCEPTS NO RESPONSIBILITY.		 SYDNEY WATER CORPORATION	
PRIOR TO COMMENCEMENT OF EXCAVATION FOR PROPOSED AND EXISTING SERVICES CONTACT :- DIAL BEFORE YOU DIG Ph. 1100 ELECTRICITY, AUSGRID Ph. 02 495 10899 GAS, ENEMSA Ph. 1300 880 806 TELECOMMUNICATIONS, TELSTRA Ph. 1800 853 835		GIVING AT LEAST 48 HOURS NOTICE										Case No. 202644		U.B. DIRECTORY . . . MAP 190, GRID N14 (41ST) .		SEWER DEVIATION					
SHEET . 1 . OF . 2 .		File No. N/A																			





WASTEWATER CATCHMENT @ 'A'						
CATCHMENT	CLASSIFICATION	AREA	UNIT	TYPE	LOAD	EP
1	OPEN SPACE	1.9	HA	AREA	20	38
2	MIXED USE	0.6	HA	AREA	300	180
3	EDUCATION	2.8	1261	STUDENTS	0.2	253
4	EDUCATION	4.04	HA	AREA	210	849
5	EDUCATION	11.90	2855	STUDENTS	0.2	571
6	HIGH DENSITY	10.30	572	UNITS	2.5	1430
7	LOW DENSITY	43.03	HA	AREA	80	3442
8	MEDIUM DENSITY	0.6	22	UNITS	3	66
TOTAL					EP	6829
DILUTION FACTOR					F	3.00
ADWF					L/S	9.30
PDWF					L/S	20.41
DESIGN FLOW					L/S	61.23

WORK AS CONSTRUCTED CERTIFICATION

DEVELOPER .....

W.S.C. ....

CONSTRUCTOR .....

COMPLETED .....

W.A.C. PREPARED .....

DESIGNER .....

I CERTIFY THAT THE WORKS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE WORK AS CONSTRUCTED DRAWINGS

Sydney WATER

SYDNEY WATER CORPORATION

Case No. 202644

SHT 2 OF 2 SHTS.

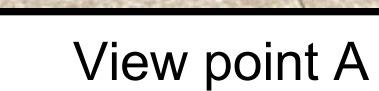
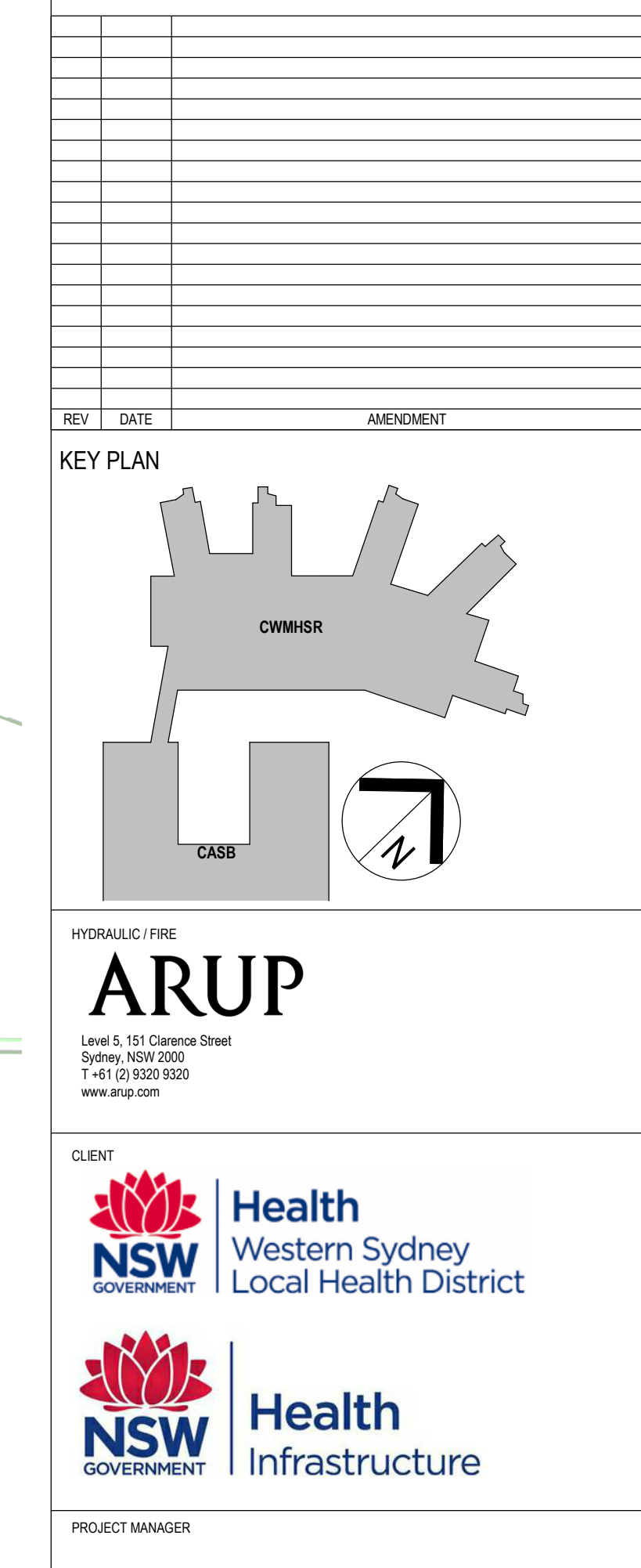
SYDNEY WATER CORPORATION

FOR DETAILS OF SERVICES SEE SHEET 1



## A.2 Appendix B: Private sewer diversion design plan



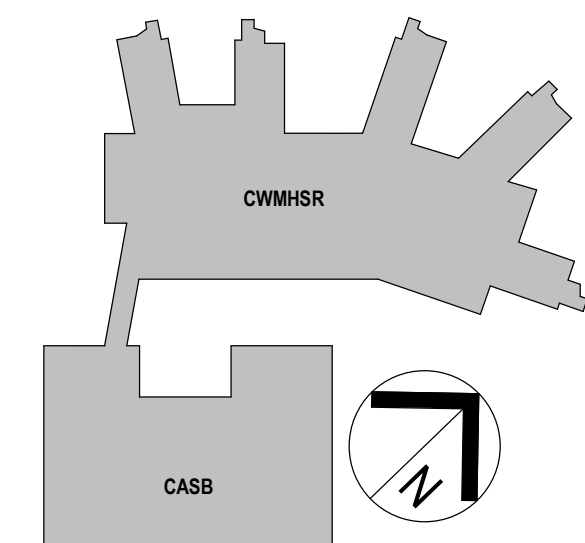
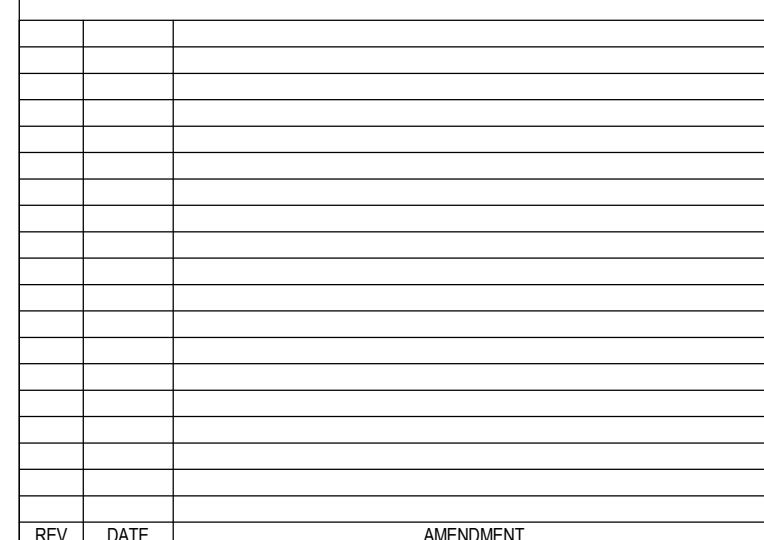




## A.3 Appendix C: Private water services diversion design plan



Below ground services



HYDRAULIC / FIRE

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PROJECT  
**CUMBERLAND WEST MENTAL HEALTH  
SERVICES RELOCATION - INTEGRATED  
MENTAL HEALTH CENTRE**

DRAWING TITLE

HYDRAULIC SERVICES SITE  
PLAN - WATER SERVICES &  
NATURAL GAS

STATUS

**SSDA**

DRAWN <b>SL</b>	DESIGNED <b>MS</b>	CHECKED <b>GK</b>
APPROVED <b>GK</b>	DATE	

SCALE  
1:250 @ A0  
0 2.5 5 7.5 10 12.5m

PROJECT NO. <b>281847</b>	R
DRAWING NO. <b>IMHC-SSDA-HS-DG-20001</b>	

NOT FOR CONSTRUCTION