Scottish Hospital

Lot 2 Cooper Street (74 Brown Street)
Paddington

Utility Services Infrastructure Due Diligence Report

Prepared For:

Cerno Management

Prepared By:
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June 2010

DOCUMENT HISTORY

Issue No.	Revision No.	Date	No. of Pages	Comment
A	0	17.06.10	23	Preliminary Issue – Draft Only
A	1	07.07.10	39	Preliminary Issue – Electrical & Communications sections added, Stormwater section updated
A	2	24.09.10	45	Draft Project Application Issue
A	3	06.10.10	49	Project Application Issue

DOCUMENT APPROVAL:

Approved by: _____ Date: 06 October 2010

(Cardno ITC)

Approved by: _____ Date: _____

(Cerno Management)

CONTENTS

1 EXECUTIVE SUMMARY

This document is a utility services infrastructure due diligence for the proposed development located at Lot 2 DP 607572 Cooper Street, Paddington.

Cerno management is currently preparing a project application for the following:

- Alterations and upgrade of the existing heritage building on Cooper St;
- Redevelopment of existing and construction of new buildings for Aged Care and Residential Aged Care use.
- Basement car parking; and
- Landscaping works.

The proposed facility is illustrated below:

The services that were investigated are as follows:

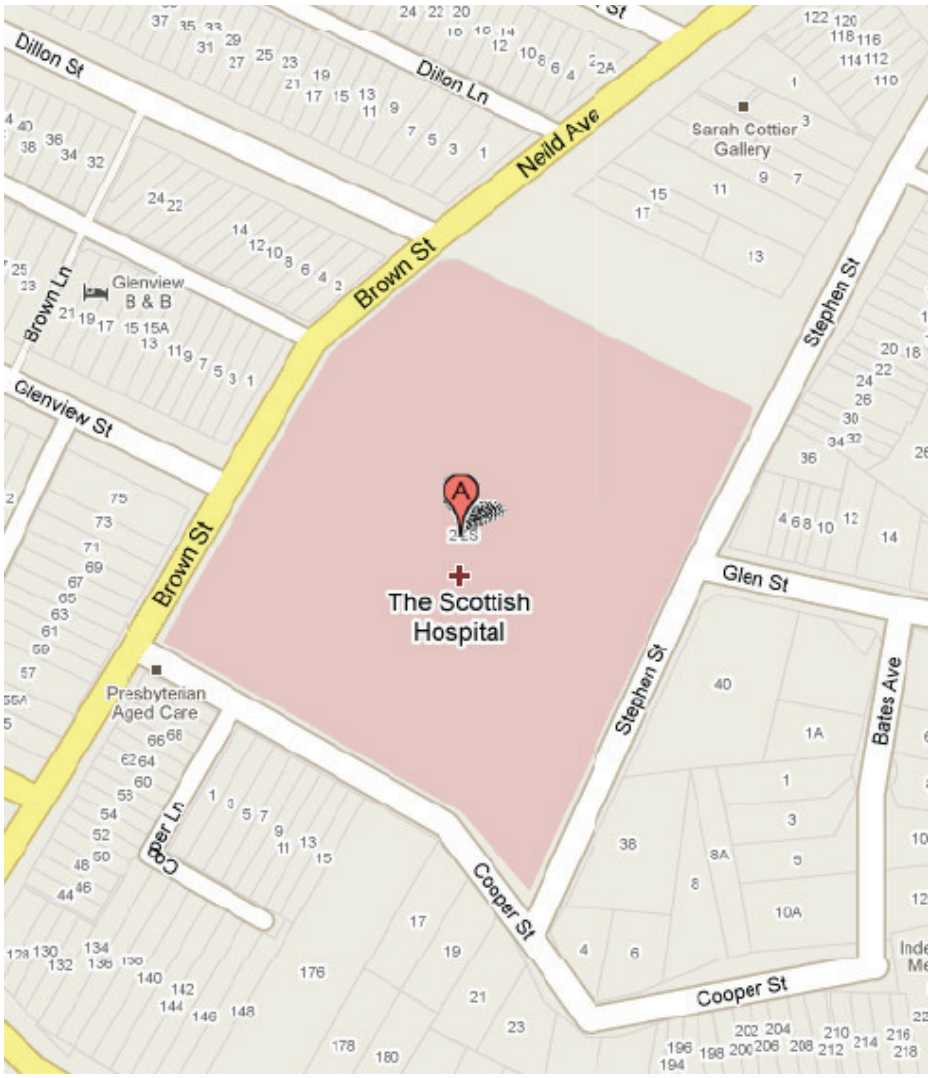
- Electricity;
- Telecommunications;
- Water (Town Mains);
- Gas (Natural);
- Stormwater; and
- Sewerage.

This report assesses the services requirements for the site and investigates whether the services infrastructure in the vicinity can accommodate the proposed development.

The review is preliminary and will need to be confirmed in more detail as part of the next stage of the design.

Although our investigations have not incorporated detailed negotiations with the relevant authorities at this early stage, this proposal is based on previous experience with similar sized developments.

2 SITE LOCATION



RELEVANT AUTHORTIES

Seq No.	Asset Owner	Contact No	Notification Status
18659942	RailCorp - City Region **	0295637920	Notified
18659941	Energyaustralia, Eastern	0249510899	Notified
18659939	Telstra, Port Jackson	1800114918	Notified
18659944	Optus and/or Uecomm, Nsw	1800505777	Notified
18659943	Jemena Gas South	1300880906	Notified
18659940	Sydney Water	0288493800	Notified

3 ELECTRICAL SERVICES

3.1 Estimated Capacity Required

It has been estimated that one (1) 1000kVA kiosk substation will be required to service the site.

This substation will be installed in place of the existing substation currently serving the site.

The maximum demand of the site is 598A/ph. This estimate is based on the following load calculations:

Maximum Demand Calculation
PRESBYTERIAN CHURCH

Job Ref: 10358

Basement Parking (The Terraces)	Area (m2)	No.	VA/m2	VA	I (A)	Subdivided I (A)
Parking Area	2106.25		20	42125	58.5	
						58.5
Ground Floor	**Area (m2)**		**VA/m2**	**VA**	**I (A)**	**Subdivided I (A)**
Floor Space	711.48		25	17787	24.7	
						24.7
Lower Ground Floor	**Area (m2)**		**VA/m2**	**VA**	**I (A)**	
Floor Space	719.04		25	17976	25.0	
						25.0
Level 1	**Area (m2)**		**VA/m2**	**VA**	**I (A)**	
Floor Space	133.84		25	3346	4.6	4.6
Level 1 (The Terraces)	**Area (m2)**		**VA/m2**	**VA**	**I (A)**	
Kitchen	173.19		160	27710.4	38.5	
Retail	104.4		120	12528	17.4	
General	1924.44		25	48111	66.8	
Bedroom	353.05	3	4000	12000	16.7	139.4
Level 2 (The Terraces)	**Area (m2)**		**VA/m2**	**VA**	**I (A)**	
General	193.75		25	4843.75	6.7	
Bedroom	1242.18	11	4000	44000	61.1	67.8
Level 3 (The Terraces)	**Area (m2)**		**VA/m2**	**VA**	**I (A)**	
Bedroom	1496.54	13	4000	52000	72.2	
						72.2

Level 4 (The Terraces)	Area (m2)		VA/m2	VA	I (A)	
Bedroom	1623.04	10	4000	40000	55.6	
						55.6
Level 5 (The Terraces)	Area (m2)		VA/m2	VA	I (A)	
Bedroom	2006.25	10	4000	40000	55.6	
						55.6
Level 6 (The Terraces)	Area (m2)		VA/m2	VA	I (A)	
Bedroom	820.34	6	4000	24000	33.3	
						33.3
Level 7 (The Terraces)	Area (m2)		VA/m2	VA	I (A)	
Bedroom	1132.79	5	4000	20000	27.8	
						27.8
Level 8 (The Terraces)	Area (m2)		VA/m2	VA	I (A)	
Bedroom	478.39	3	4000	12000	16.7	
						16.7
Level 9 (The Terraces)	Area (m2)		VA/m2	VA	I (A)	
Bedroom	454.98	3	4000	12000	16.7	
						16.7
Total	15673.95	64				597.8

3.2 Infrastructure Connection Details

It has been discussed over the phone with Energy Australia that one (1) kiosk substation will be required to service the site.

There is an existing substation located on Cooper Street within the property boundary. This currently has capacity to service the site however it conflicts with the proposed building design and therefore is required to be relocated. The new location of the substation will be on the corner of Cooper and Brown streets.

The existing substation currently services the surrounding network and therefore the decommissioning of this substation will need to be staged such that the new substation is energized prior to decommissioning of the existing substation.

Preliminary discussions have been had with Energy Australia regarding the staging, however a more detailed programme will need to be established prior to construction commencement.

This is to be formally confirmed with Energy Australia once the project proceeds to the design stage.

Energy Australia correspondence below.

Hi Nik.

In response to your email below, the substation that feeds both the network and the Scottish hospital.

There is currently ample capacity on the substation for additional load connection.

The direct distributor to the Scottish hospital is currently showing a max load of 248 on a 630A rated board.

There is also one spare 400A rated distributor on this substation.

Please note you will need to submit an application for your proposed connection for us to further investigate if this spare distributor can be utilised or not.

Hope this helps.

Regards,
Jonathan DeCarlo | NETWORK PLANNING
CBD & Eastern Suburbs
Distribution Operations & Reliability | EnergyAustralia
Lvl1, Bldg 4, 130 Joynton Ave, Zetland
NSW 2017 AUSTRALIA
Ph (02) 9663 9327 | Fax (02) 9663 9499
Email. jdecarlo@energy.com.au

The Energy Australia plan of the site is below.

3.3 Issues to Consider

Lead times need to be considered in relation to negotiations, design, approvals and construction of new substations on the site.

A minimum area of 5.3m x 3.3m is required for the kiosk substation. The substation will be established on the Ground Level and will require direct road access.

3.4 Construction Staging

The existing substation currently servicing the site is required to be decommissioned to make way for the development.

Prior to decommissioning this substation, a new substation will need to be established and the existing network feeds will need to be transferred to the new substation.

Decommissioning of the existing substation will require planning and staging approval from Energy Australia.

4 COMMUNICATION SERVICES

4.1 Estimated Capacity Required

It is assumed that four hundred (400) pairs will be required to the site.

4.2 Infrastructure Connection Details

ITC has undertaken a carrier survey investigation and has identified that there are Telstra, UECOMM and Optus services available locally. It appears that fibre optic infrastructure is also locally available, which is likely to be required by potential tenants within the proposed development.

ITC would suggest that co-ordination and negotiation would be required with the carriers to obtain adequate Telco services to the development, however from our experience there is limited risk associated with the provision of these services.

This is to be formally confirmed with Telstra/Optus once the project proceeds to the design stage.

4.3 Amplification Requirements

Nil.

4.4 Issues to Consider

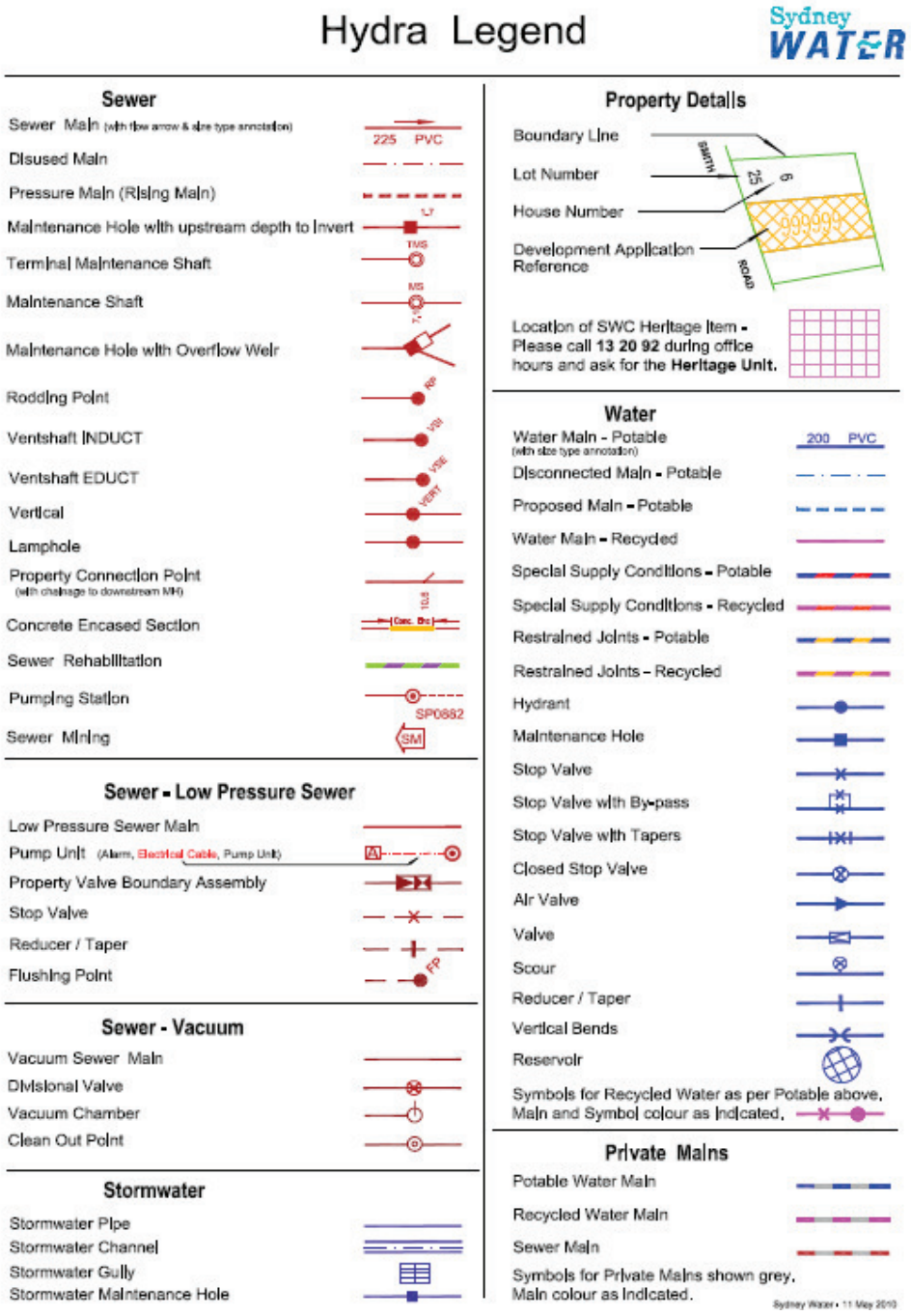
Nil.

5 WATER (TOWNS MAINS)

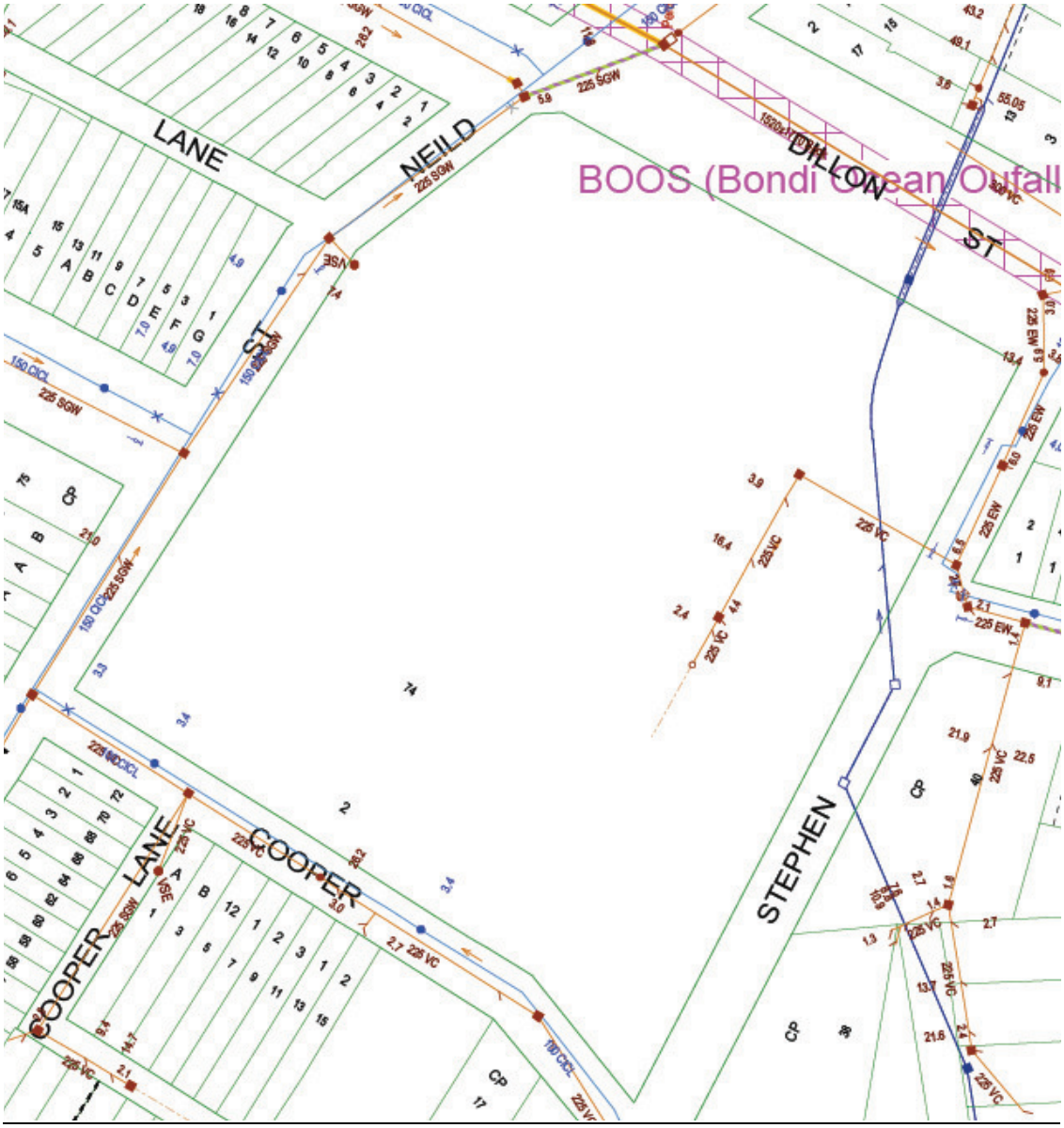
5.1 General

Sydney Water has provided a sewer and water main infrastructure layout, refer below. Water mains are located in Neild Ave, Brown & Cooper Streets, these mains are all 150mm in diameter. The water mains are all external and do not burden the site. The water meter serving the site is located on Brown St.

Sydney Water Infrastructure Legend



Sydney Water Infrastructure Plan



5.2 Amplification Requirements

As the development has frontage to various 150mm water mains we anticipate that an upgrade of the authority water main will be unlikely. To confirm if an aplification is required, an application to Sydney Water for a Section 73 Feasibility Notice can be undertaken, Sydney Water will respond to the application within four weeks.

5.3 Water Main Performance

The results of our water pressure and flow enquiry submitted to Sydney Water confirms that the water main can deliver the required flow of water to the proposed development for domestic water and fire fighting purposes. This document has enabled us to confirm that the installation of on site fire storage tanks are not necessary. Refer to the Sydney Water pressure and flow statement details below.

Statement of Available Pressure and Flow

Sydney WATER

ITC Group
7/33 York St
Sydney, 2000

WMS No: **95946**
Contact No: 88493531
Fax No: 88493111

Attention: Brendon Murr

Date: 17/09/2010

Pressure & Flow Application Number: 2973628
Your Pressure Inquiry Dated: Tue September 14 2010
Property Address: 74 Brown St Paddington 2021

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: Brown St	Side of Street: West
Distance & Direction from Nearest Cross Street	10 metres South from Dillon St
Approximate Ground Level (AHD):	18 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	67 metre head
Minimum Pressure	48 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	48
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10	50
	15	49
	20	48
	25	48
	30	47
	40	44
	50	41
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	10	47
	15	47
	20	46
	25	45
	30	44
	40	41
	50	38
Maximum Permissible Flow	52	37

(Please refer to reverse side for Notes)

Jean Williams

Robert Wickham
FOR **Team Leader**
Asset Planning

Sydney Water Corporation ABN 49 776 225 038
1 Smith St Parramatta 2150 | PO Box 399 Parramatta 2124 | DX 14 Sydney | T 13 20 92 | www.sydneywater.com.au
Delivering essential and sustainable water services for the benefit of the community

5.4 Construction Staging

The existing water meter serving the site from Brown Street will be kept in operation during the construction of the RACF Building (Stage 1). A new water connection and meter will be installed adjacent to the new Brown Street driveway entry at the completion of Stage 1 which will serve the new RACF building and the entire site. Once the new meter is operational the existing meter will be decommissioned and existing buildings reconnected to the new system. Allowance for future connection points for Stage 2 of the development will be included under the Stage 1 construction works.

We do not anticipate any water supply issues in regard to the proposed construction staging of the development.

6 GAS

6.1 General

Jemena has provided a gas main infrastructure layout, refer below. The development has frontage to an existing 32mm, 210kPa authority gas main in Cooper Street and an existing 50mm, 210kPa gas main in both Neild Ave and Brown St.

6.2 Infrastructure Connection Details

It is assumed that the various authority gas mains will be sufficient to serve the site.

Jemena

Network Protection

In reply to your enquiry, there are **High Pressure Gas Mains** at the location of your intended work, as generally illustrated on the attached map. There may also be other gas or other services at the location, as discussed in the warning below. For an explanation of the map, please see the key below. The following excavations guidelines apply:

Excavation Guidelines:
You ***must*** contact a Pipeline Technician to conduct a survey ***before*** commencing any work in this area. You can arrange a survey by contacting the High Pressure Response Coordinator on **1300 665 380**. ***(Please note that two working days notice is required to arrange a survey).*** For all works in the vicinity of High Pressure Gas Mains you are required to arrange for a Pipeline Technician to attend. Charges apply for attendance of any works outside the hours of 7am to 4pm, Monday to Friday (**"Standard Business Hours"**) and for any attendance during Standard Business Hours that is longer than 2 hours.

KEY

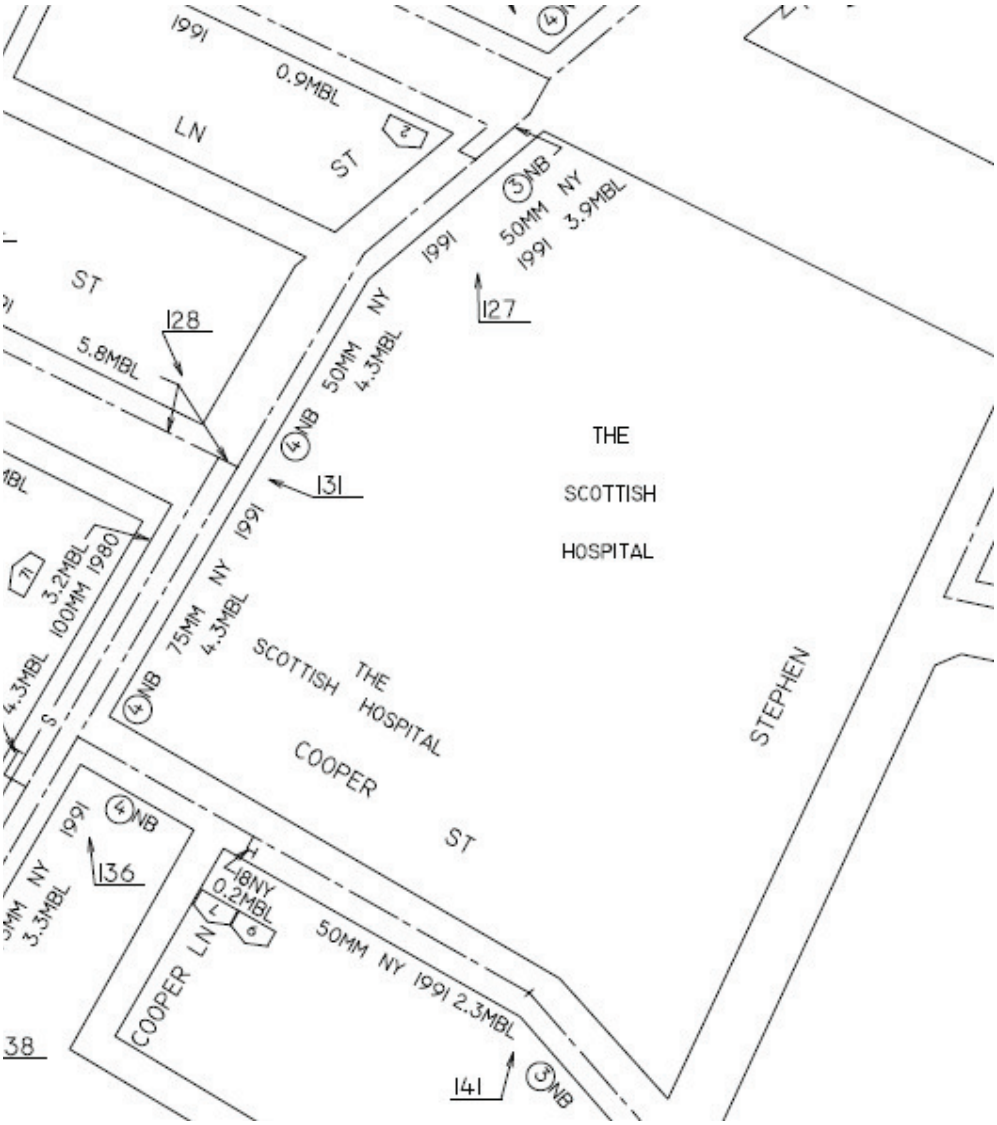
MAXIMUM ALLOWABLE OPERATING PRESSURE			
—T—	TRUNK MAIN	7000 kPa	VALVE
—P—	PRIMARY MAIN	3500 kPa	SYSTEM PRESSURE REGULATOR
—S—	SECONDARY MAIN	1050 kPa	SIPHON
		300 kPa	6 INCH CAST IRON MAIN
		210 kPa	150MM STEEL MAIN
		7 kPa	110MM POLYETHYLENE / NYLON MAIN
—400—		400 kPa	50MM NYLON INSERTED INTO 6 INCH CAST IRON MAIN
—100—		100 kPa	
—30—		30 kPa	DISTANCE IN METRES OF MAIN FROM BUILDING LINE (TOLERANCE OF 0.4M)
		2 kPa	HOUSE NUMBERS
←—→	PROPOSED MAINS		NETWORK BOUNDARY
			NETWORK NODES

6NB
150MM
110MM PE/NY
6 NB 50MM NY
1.2MBL
103
123

Warning: The enclosed plans show the position of Jemena Gas Networks (NSW) Ltd's underground gas mains and installations in public gazetted roads only. **Individual customers' services and services belonging to other third parties are not included** on these plans. These plans have been prepared solely for the use of Jemena Gas Networks (NSW) Ltd and Jemena Asset Management Pty Ltd (together "**Jemena**") and any reliance placed on these plans by you is entirely at your own risk. The plans may show the position of underground mains and installations relative to fences, buildings etc., as they existed at the time the mains etc were installed. The plans may not have been updated to take account of any subsequent change in the location or style of those features since the time at which the plans were initially prepared. Jemena makes no warranty as to the accuracy or completeness of the enclosed plans and does not assume any duty of care to you nor any responsibility for the accuracy, adequacy, suitability or completeness of the plans or for any error, omission, lack of detail, transmission failure or corruption in the information provided. Jemena does not accept any responsibility for any loss that you or anyone else may suffer in connection with the provision of these plans, however that loss may arise (including whether or not arising from the negligence of Jemena, its employees, agents, officers or contractors). The recipient of these plans must use their own care and diligence in carrying out their works and must carry out further surveys to locate services at their work site. Persons excavating or carrying out other earthworks will be held responsible for any damage caused to Jemena's underground mains and equipment.

Marina
02 9397 9103

Jemena Gas Main Plan



6.3 Amplification Requirements

We do not anticipate any amplification works or headworks supply charges.

6.4 Issues to Consider

When approximate gas loads for the development are confirmed an application to the gas authority can be made to determine if headworks charges are applicable.

6.5 Construction Staging

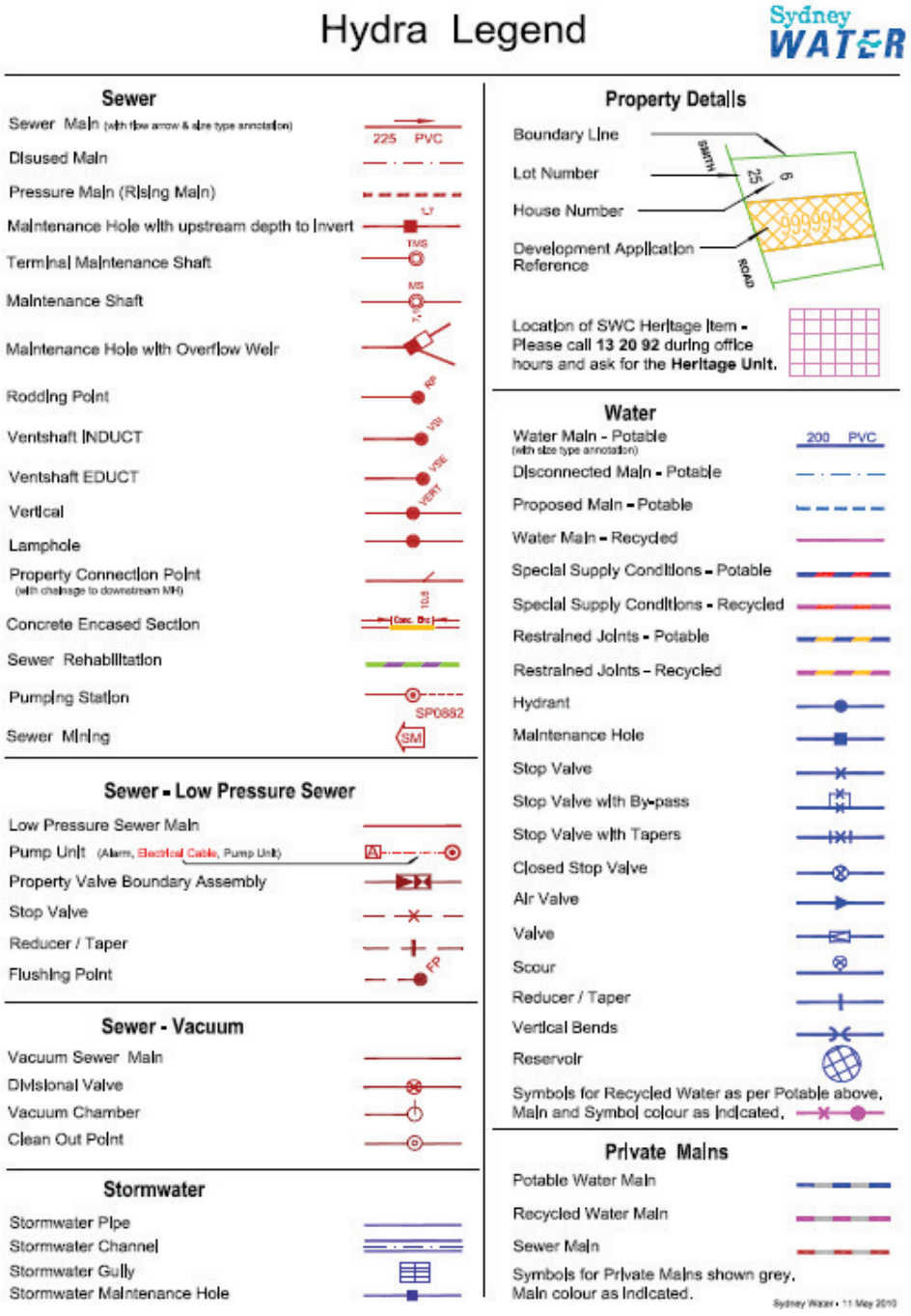
The existing gas meter serving the site will be kept in operation during the construction of the RACF Building (Stage 1). A new gas connection and meter will be installed adjacent to the new Brown Street driveway entry at the completion of Stage 1 which will serve the new RACF building and the entire site. Once the new meter is operational the existing meter will be decommissioned and existing buildings reconnected to the new system. Allowance for future connection points for Stage 2 of the development will be included under the Stage 1 construction works.

We do not anticipate any gas supply issues in regard to the proposed construction staging of the development.

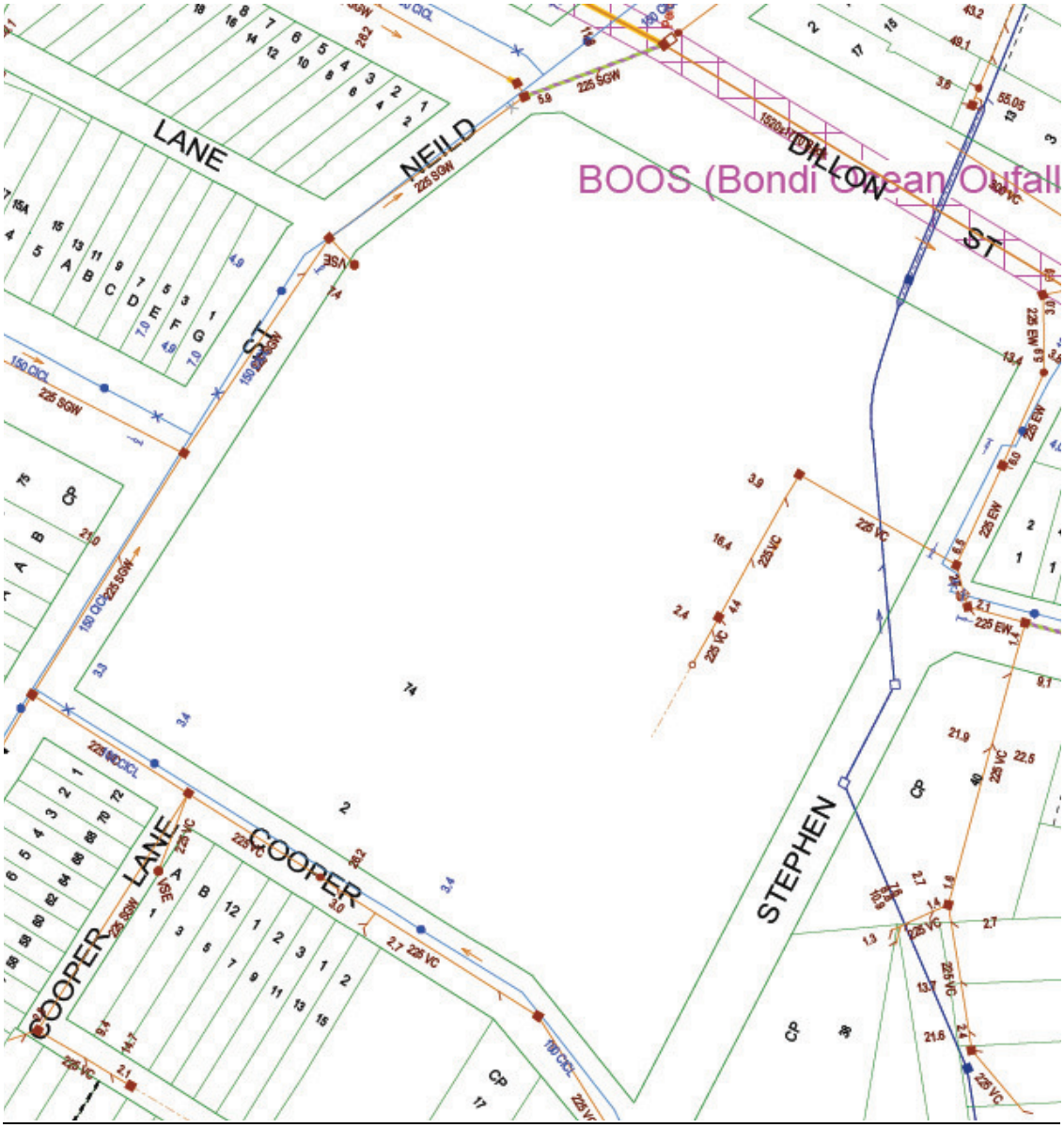
7 SEWERAGE & SYDNEY WATER STORMWATER MAINS

7.1 General

Sydney Water has provided a sewer and stormwater water main infrastructure layout, refer below. The site burdend with a sewer main located opposite to Glen Street (east boundary) and a stormwater main traversing the site from Stephen St down to Dillon St. All systems are gravitational, refer Sydney Water legend for details.



Sydney Water Infrastructure Plan



7.2 Authority Sewer & Stormwater Mains on Site

It is assumed that the existing sewer mains surrounding the site will be sufficient for connection, a new sewer connection to the infrastructure will be required to drain the lowest portion of the proposed development.

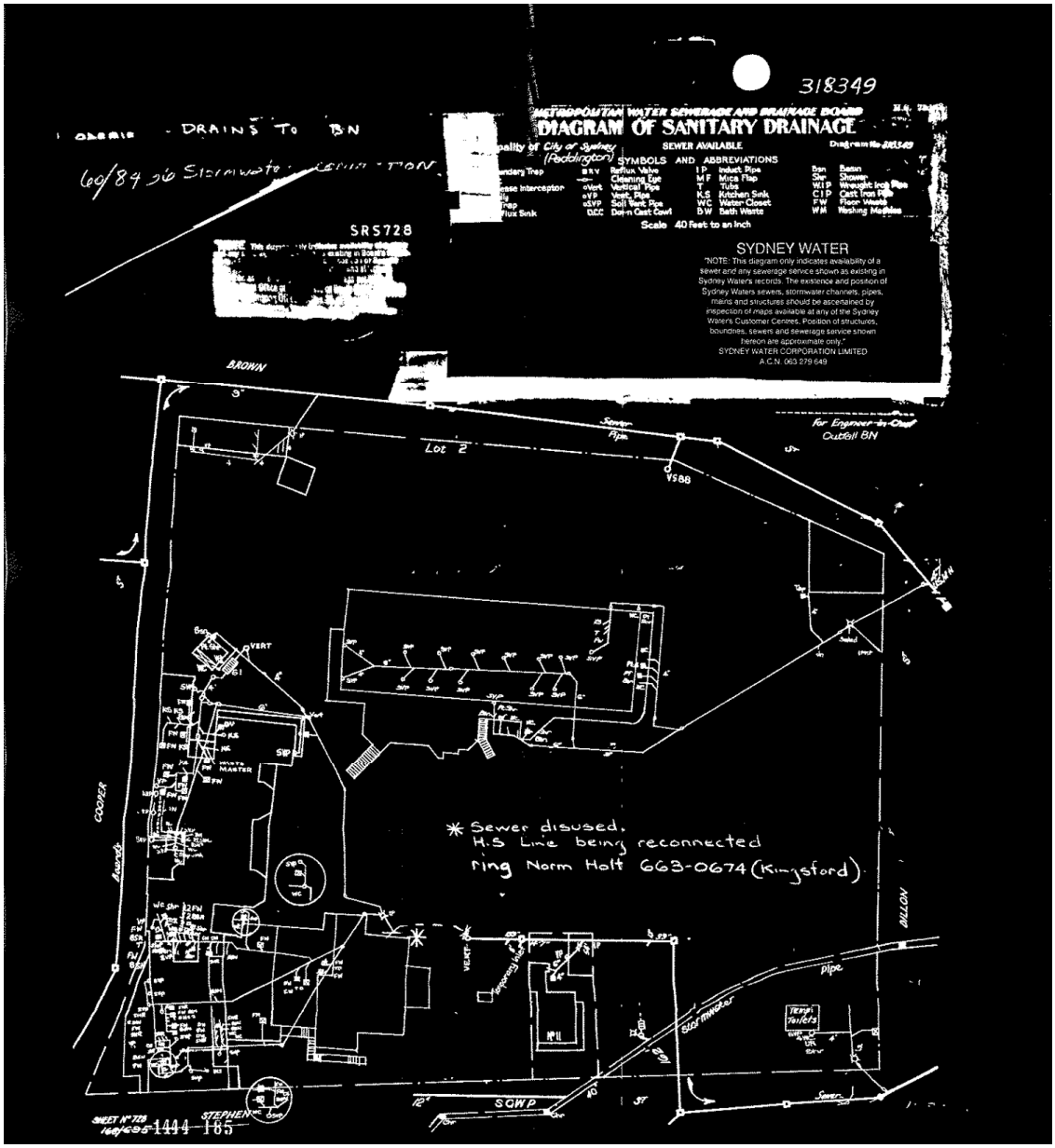
The existing sewer main on site will be removed and disused so that building works can proceed without encumberance.

The authority stormwater main if possible should remain in position, the main appears to be clear of the proposed development building structures. The stormwater main will need to be surveyed in accordance with Sydney Water guildlines should new buildings be built in close proximity to the main.

7.3 Infrastructure Connection Details

The site is serviced by two sewer connections from Brown and Stephen St.

A copy of the Sydney Water internal (private) sewer drainage layout is indicated below



Stormwater connection details are nominated under the stormwater design requirements section of this report.

7.4 Amplification Requirements

We do not anticipate any amplification would be required to the sewer mains.

7.5 Issues to Consider

To be advised pending the results of a S73 Feasibility report provided by Sydney Water.

7.6 Construction Staging

The existing Authority sewer main burdening the site will be disused and terminated at the Stephen St property boundary . This modified connection will service the RACF building, Heritage building and the Gatekeeper's Lodge only (Stage 1) enabling the existing building located along the Brown St frontage to drain under existing conditions without disruption. A second connection to the sewer main in Brown Street will be constructed to service Stage 2 of the development independently.

Under the Stage 1 works, a new stormwater connection will be made to the stormwater main in Brown Street which will be designed to accommodate the flows and the on site detention requirements for the entire development. Stage 2 of the development will connect to this system, refer to the stormwater section of this report and stormwater concept plans for further details.

We do not anticipate any sewer or stormwater supply issues in regard to the proposed construction staging of the development.

8 STORMWATER MANAGEMENT & DESIGN STRATEGY

8.1 Reference Documents

The following documents have been reviewed and used to prepare the stormwater strategy and this section of the report:-

1. Architectural drawings ref. 2006067 prepared by JPR Architects Pty Ltd Revision P1 and dated 07/06/2010;
2. Survey drawing ref. 20619 prepared by Project Surveyors and dated October 2009;
3. Part report – Section F3 by Laidlaw Mason Partners;
4. Drawings for Cooper Street upgrade works reference 14980-01 & 08 prepared by Aspect Australia P/L;
5. MWS & DB drawing for Stephen Street SW renewal & deviation dated 14/08/1957;
6. Rushcutters Bay Catchment Flood Study report dated October 2007 by Webb McKeown & Associates P/L;
7. Letter received from Sydney Water Corporation reference 2006/06141F dated 16.09.2010;
8. Australian Rainfall & Runoff (AR&R) dated 1997 by the Institution of Engineers, Australia;
9. NSW Floodplain Development Manual (April 2005);
10. Woollahra Municipal Council Draft Stormwater Drainage Management DCP Version 1.1 dated 14/12/2006; and
11. Woollahra Municipal Council Draft Flood Risk Management DCP version 1.0 dated 23/08/2004

8.2 Glossary

Annual Exceedance Probability (AEP)

The chance of a flood of a given or a larger size occurring in any one year, usually expressed as a percentage.

Australian Height Datum (AHD)

A common national surface level datum approximately corresponding to mean sea level.

Average Recurrence Interval (ARI)

The long term average number of years between the occurrence of a flood as big as or larger than the selected event.

Catchment

The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.

Flood

Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse.

Flood Liable Land

Land susceptible to flooding by the PMF.

Flood Planning Levels (FPLs)

Are the combinations of flood levels and freeboards selected for floodplain risk management purposes.

Freeboard

Is a factor of safety typically used in relation to the setting of floor levels.

Habitable Room

In industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to damage in the event of a flood.

Peak Discharge

The maximum discharge occurring during a flood event.

Probable Maximum Flood

PMF is the largest flood that could conceivably occur at a placation, usually estimated from probable maximum precipitation.

Probable Maximum Precipitation

PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year.

Runoff

The amount of rainfall which actually ends up as stream flow.

8.3 Site Description

The site is a large block of land identified as Lot 2 of DP 607572 in the suburb of Paddington. The site falls in the Local Government Area of Woollahra Municipal Council (WMC).

The site is located on the northern side of Cooper Street and is bounded by Brown Street to the West, Stephen Street to the East and adjoining properties to the South.

The site has a rectangular shape and is characterised by a steep natural gradient offering a drop in levels of approximately 14 metres between the southern and the northern boundaries.

The site is currently partially developed. The existing buildings are occupied by The Scottish Hospital and the Presbyterian Care. The Hospital building is classified as heritage.

The undeveloped area of the site is densely populated with a large number of trees, some being listed as heritage.

8.4 Development Description

The proposed development is a nine-storey aged care facility with basement car parking labelled “The Terraces”.

The existing hospital building off Cooper Street is retained. The new building is proposed on top of the existing on-grade car park.

The proposed development increases the site’s impervious area by approximately 2000m^2.

8.5 Field Work and Observations

Site visits have been undertaken on the 10th of June 2010 and on the 7th of September 2010 to familiarise with the site and the surrounding areas and to determine site opportunities and constraints.

The visits allowed for visual investigation of the site area and the existing drainage network to be done.

8.6 Authorities Requirements

8.6.1 Woollahra Municipal Council

The Council requirements are detailed in Council's Draft Stormwater Drainage Management DCP and are summarised below:-

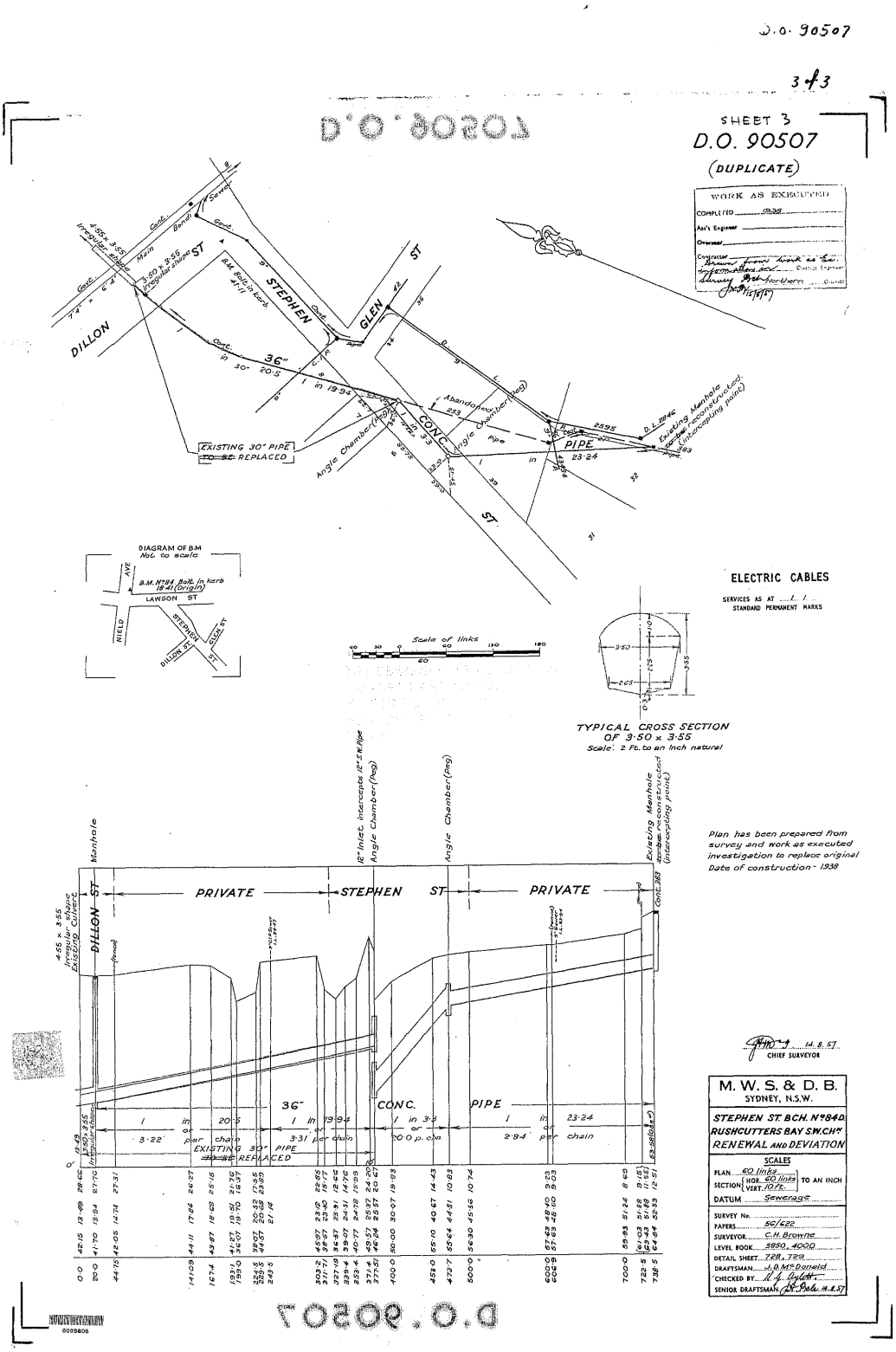
The proposed development is to comply with the Stormwater Drainage Management DCP; and

The proposed development must not have any adverse impact on adjoining developments, Council's infrastructure or elsewhere in the catchment.

A meeting was held with Council Engineer Michael Casteleyn at Council's Chambers, in which Michael handed Council's study for the Rushcutters Bay Catchment and outlined that the On-Site Detention is to be sized using a Time-Area hydrograph model such as "DRAINS" as opposed to Council's pre-determined values noted in the DCP.

8.6.2 Sydney Water Corporation

The site is traversed with a stormwater concrete pipe draining from Stephen Street through the north eastern corner of the site as shown on the extract plan under Section 7.1 above. The pipe is noted on the MWS & DB design plan (dated back to 1957) as a 36" concrete pipe. The pipe has an average slope of 1in20 through the site. Reference should be made to the plan included below.



The requirements received from SWC are summarised as follows (reference is made to the letter received from Sydney Water):-

- SWC does not allow any permanent structure within 1m from the outside face of the Sydney Water stormwater channel;

- Filling should NOT be carried out within 3m from the outside edge of the channel;
- Connection to the SWC channel is allowed;
- Should a connection be made to SWC channel, an On-Site Detention (OSD) will be required. The volume of the OSD is to be 300m^3 and the permissible site discharge is to be 435L/s;
- No machinery should be used within the zone of influence of the stormwater channel which could affect the structural integrity of the channel;
- An appropriate water quality treatment device is to be incorporated prior to the connection to ensure the proposed development meets contemporary water quality discharge requirements. As a minimum, the 1997 NSW Environment Protection Authority guidelines apply. The table below summarises the requirements of the EPA:-

Pollutant	Requirement
Suspended Solids	80% reduction of the average annual load
Total Phosphorous	45% reduction of the average annual load
Total Nitrogen	45% reduction of the average annual load
Litter	Retention of litter greater than 50mm for flows up to 25% of the 1 year ARI peak flows
Coarse Sediment	Retention of sediment coarser than 0.125mm for flows up to 25% of the 1 year ARI peak flows
Oils and Grease	In areas with concentrated hydrocarbon deposition, no visible oils for flows up to 25% of the 1 year ARI peak flow

8.7 Flood Management

The site is located in a catchment known to Council as having flooding issues upstream and downstream of the site. Council Engineer advised that external overland flows from upstream catchment could enter the site from Cooper Street. Under Council's flood management DCP, Approach 2 is to be considered (sites affected by local overland flooding).

The catchment area drained by the piped drainage system in Brown Street extends to the intersection of Brown Street and Walker Lane. The area is predominately residential. It drains part or all of the following areas:-

- Elfred Street;
- Walker Place;
- Glenmore Road (small area only);
- Macdonald Street;
- Cooper Lane; and
- Cooper Street.

The catchment area is characterised with a steep gradient. Hence the piped drainage system and the overland flow paths have steep slopes.

The historical flooding data extracted from the flood study report for Rushcutters Bay catchment indicates that several floodings have occurred at the corner of Brown Street and Cooper Street. The flooding types are identified as localised floods only. The two figures below show the dates and the type of flooding in that area.