

APPENDIX G

Authority Utility Supply Report



Authority Utility Supply Report

Hydraulic Engineering & Fire Protection Services

St George Hospital Redevelopment Acute Services Building and Associated Works

ENGINEERS

MANAGERS

INFRASTRUCTURE
PLANNERS

DEVELOPMENT
CONSULTANTS

Prepared for: DGR Submission

Revision: C

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Revision	Revision Description	Date
A	For Review	17/10/2014
B	Updated :- Revised additional Stage 2 bed numbers incorporated in calculations Jemena Correspondence included	22/10/2014
C	Project reference changed to Acute Services Building	27/03/2015

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1 Executive Summary

The St George Hospital Acute Services Building Project (STGH ASB Project) will be provided with 'fit for purpose' hydraulic services systems.

This report addresses authority utility supply services available for the STGH ASB Project.

Scope of services covered within this report include:-

- Sewerage systems provided by Sydney Water
- Potable and Fire Water supplies provided by Sydney Water
- Natural gas supply provided by Jemena

Authority supply services can be summarised as follows:

1. Consultation with Sydney Water has commenced to verify the condition, capacity, compliance reliability and efficiency of the existing Sydney Water sewer mains and have found them suitable for the proposed development.

Formal application to Sydney Water required after planning approval for Section 73 Certificate Notice of Requirements to confirm exact requirements.

Stage 2 building works will connect to the existing hospital sewer drainage systems provided under previous Stage 1 works.

2. Consultation with Sydney Water has commenced to verify the condition, capacity, compliance and reliability of existing water mains infrastructure.

Sydney Water pressure / flow computer model on 25th June 2014 confirming that water main amplification in Gray Street from 150mm to 250mm is required for fire-fighting purposes.

Note: Sydney Water letter of acceptance for main amplification was received 3rd September 2014.

Water storage and booster pumps for domestic water and fire-fighting purposes will be provided to ensure adequate water supply security in accordance with industry best practice and NSW Health TS-11 guidelines.

Water supply provided for domestic purposes will be in accordance with Australian drinking water guidelines. Based on health industry "best" design practice, centralized, additional water filtration plant is recommended.

3. Consultation with Jemena has commenced to verify the condition, capacity, compliance reliability and efficiency of the existing Jemena gas mains infrastructure and have found them to be acceptable for the proposed development.

Correspondence received from Jemena on 21st October 2014, however, formal application to Jemena via nominated gas supply retailer to confirm need for existing gas meter and regulator set augmentation is required.

Existing and proposed hospital gas loads have been assessed and will form the basis for the formal application.

2 Introduction

The proposed St George Hospital ASB development works comprises of:

- New Acute Services Building with additional 68 patient care beds and Helipad, all constructed directly above existing Emergency Department on Gray Street, completed in October 2014
- Demolition of existing redundant Emergency Department on Kensington Street and construction of new car park and building entry foyer
- Construction of additional level to Multi Storey Car Park / Helipad to create additional car parking spaces
- General existing hospital internal refurbishment works

New building works are generally proposed to be serviced as shown on the site services 'masterplans'.

This utility supply report describes the existing hydraulic and fire services and the Authority infrastructure capacity to service the proposed STGH ASB Project with additional sewage, water and natural gas loads.

Hydraulic and fire services include:

- Sewerage
- Domestic water supply
- Fire protection water supply (Fire Hydrant and Fire Sprinkler Protection)
- Natural gas supply

This report does not consider stormwater or electrical supply. See the following reports for these:

- Civil Engineering Report
- Electrical Utilities Supply Report

3 Utility Supply Description

Authority services adequacy is summarized within the tables below

3.1 Sewerage

Item	Description
Supply Authority Name and Contact	Sydney Water Alex Ross Sydney Water Services Coordinator (02) 9451-7555
Existing Sewer Main Details	The St George hospital campus sewer drains to the east to a 587 x 825 concrete trunk main (approximately 50 m east of Princes Highway) in three separate locations. Belgrave / South Street 225 mm sewer main Princes Highway 225 mm sewer main Chapel / Short Street 225 mm sewer main. 225 mm main in Kensington Street 'Kensington Lane (Draining north / west) is currently not connected to the hospital.
Existing Connection Details	The sanitary drainage for St. George Public Hospital precinct has fourteen (14) connections to the Sydney Water sewer system. The connections are listed below; <ul style="list-style-type: none"> • 2 x 225 mm connections in Short Street • 2 x 150 mm connection in Chapel Street • 1 x 225 mm connection in Chapel Street • 1 x 150 mm connections in Princes Highway (via Private hospital site) • 1 x 225 mm connection in Belgrave Street • 4 x 150 mm connection in Belgrave Street • 2 x 150 mm connection in South Street • 1 x 150mm authorities vent connection in Chapel Street. <p>The proposed STGH STG2 project will connect to the existing 225 mm main connection in Chapel street via the existing internal hospital sewerage system provided under the Stage 1 development works.</p>
Existing Sewage Loads	Current (492 hospital beds) Equivalent Population (EP) based on WSA 02 Table A1 (Equivalent population for synchronous discharges) $3.4EP \text{ per bed} \times 492 = 1,672.8EP$ Equivalent Tenements (ET based on WSA 02) = $492 \times 1.43 = 703.56ET$

Item	Description						
	<p>ET x 0.0021 = Average Dry Weather Flow =approximately 1.50 L/sec</p> <p>Peak Dry Weather Flow = ADWF x 5 = 7.5L/sec</p> <p>As the site is substantially “built up” a factor for ground water and rainwater infiltration is conservatively estimated at 20% additional flow.</p> <p>Therefore total precinct estimated design flow is 7.5 x1.2 = 9.0 L/sec (Note Total load is distributed to a number of sewer catchments).</p>						
Proposed Additional Sewage Loads	<p>Proposed Additional Beds (68 hospital beds for STGH STG2)</p> <p>Equivalent Population (EP) based on WSA 02 Table A1 (Equivalent population for synchronous discharges)</p> <p>3.4EP per bed x 68 = 231.2EP</p> <p>Equivalent Tenements (ET based on WSA 02) = 231.2 X 1.43 = 330.616ET</p> <p>ET X 0.0021 = Average Dry Weather Flow =0.7 L/sec</p> <p>Peak Dry Weather Flow = ADWF x 5 = 3.5L/sec</p> <p>As the site is substantially “built up” a factor for ground water and rainwater infiltration is conservatively estimated at 20% additional flow.0.0021 X ET = Peak Dry Weather Flow</p> <p>Therefore total estimated additional design flow is 3.5 x 1.2 = 4.2 L/sec</p>						
Capacity	<p>Masterplanning feasibility application has been submitted to Sydney Water.</p> <p>Based on Water Supply Authority code (WSA 02 Sewerage 2002) Table 4.3 minimum pipe sizes for reticulation sewer and property connections, for commercial and industrial lots exceeding 300 m2 is 225 mm.</p> <p>Based on Water Supply Authority code (WSA 02 Sewerage 2002) Table 4.4 EP capacity limitations for reticulation sewers as follows:-</p> <table border="1"> <thead> <tr> <th>Pipe Size</th><th>Maximum Allowable EP per Connection</th></tr> </thead> <tbody> <tr> <td>225</td><td>1600 (Equivalent to 470 beds)</td></tr> <tr> <td>300</td><td>3200 (Equivalent to 941 beds)</td></tr> </tbody> </table> <p>Branch and trunk sewer main sizes are dependent on total area catchment flow estimation in accordance with (WSA 02 Sewerage 2002) Appendix B.</p> <p>Based on indicative sewer discharge catchment zones and sewer load shedding around the site, to independent sewer mains and proposed additional bed numbers, it is estimated that there is adequate capacity to accommodate the proposed Stage 2 for the reticulation sewer and branch connections.</p> <p>Section 73 Certificate Submission to Sydney Water, to determine network capacity, must be undertaken at every stage due to possible authority's policy changes and impact to existing infrastructure due to</p>	Pipe Size	Maximum Allowable EP per Connection	225	1600 (Equivalent to 470 beds)	300	3200 (Equivalent to 941 beds)
Pipe Size	Maximum Allowable EP per Connection						
225	1600 (Equivalent to 470 beds)						
300	3200 (Equivalent to 941 beds)						

Item	Description
	<p>surrounding future development works.</p> <p>Grease Waste Capacity</p> <p>Note: As the bed numbers increase within the hospital campus, it is likely that food service arrangement may need to be augmented to cater for additional demand.</p> <p>Depending if food is cooked on site or prepared off site with “heat / chill” facility within hospital, the existing grease arrestor may need additional grease arrestor(s) installed for increased capacity.</p>

3.2 Domestic Water

Item	Description
Supply Authority Name and Contact	Sydney Water Alex Ross (02) 9451-7555
Water Main Details	The existing hospital campus has the following water mains surrounding the site: <ul style="list-style-type: none"> ■ Sydney Water 250 mm water main in Kensington Street ■ Sydney Water 150 mm water main in Belgrave Street ■ Sydney Water 150 mm water main in South Street ■ Sydney Water 150 mm water main in Gray Street ■ Sydney Water 100 mm water main in Short Street ■ Sydney Water 100 mm water main in Chapel Street
Existing Domestic Water Supply Loads	Current (492 hospital beds) Equivalent Tenement (ET)= $492 \times 0.90 = 443\text{ET}$ $1\text{ET} = 0.73 \text{ kL/day}$ Total Load = $443\text{ET} \times 0.73 \text{ kL/day} = 323.40 \text{ kL/day}$ Probable Simultaneous Flow – 8.0 L/sec
Proposed Additional Domestic Water Supply Loads	Proposed Additional beds (68 hospital beds for STGH STG2) Equivalent Tenement (ET)= $68 \times 0.90 = 61.2\text{ET}$ $1\text{ET} = 0.73 \text{ kL/day}$ Total Load = $61.2\text{ET} \times 0.73 \text{ kL/day} = 45\text{kL/day}$ Total Site Probable Maximum Simultaneous Flow = 10 L/sec Based on The Institute of Plumbing Australia – Selection and Sizing of Copper Tubes for Water Piping Systems" published 1985.
Water Supply Available Flow and Pressure	Water supply flow and pressure test results provided by Sydney Water at Gray Street, Cnr Belgrave Street, Kensington Street and Short Street validate that adequate flow for domestic purposes is available. Booster pumps are required for the Stage 2 building works due to building height and elevated storage tanks requirements.
Capacity	Based on existing authority's street mains pipe sizes, load diversity and proposal to install on site water storage tanks, there is adequate capacity to accommodate the proposed STGH STG2 project. Note: Section 73 Certificate Submission to Sydney Water, to determine network capacity, must be undertaken after Planning approval.
Condition and Reliability	Good No reports of major failures. Additional emergency water storage for STGH STG2 building works will be constructed to provide temporary water supply security. During water main failure Sydney Water would implement emergency repairs and temporary measures to allow hospital to operate normally.

3.3 Fire Service Water Supply

Item	Description
Supply Authority Name and Contact	Sydney Water Alex Ross Sydney Water Services Coordinator (02) 9451-7555
Water Main Details	The existing hospital campus has the following water mains surrounding the site: <ul style="list-style-type: none"> ■ Sydney Water 250 mm water main in Kensington Street ■ Sydney Water 150 mm water main in Belgrave Street ■ Sydney Water 150 mm water main in South Street ■ Sydney Water 150 mm water main in Gray Street ■ Sydney Water 100 mm water main in Short Street ■ Sydney Water 100 mm water main in Chapel Street
Fire Water Supply Main Connection Details	The existing hospital campus has the following fire water mains connections. (Refer also existing site diagram) <ul style="list-style-type: none"> ■ 2 x 100 mm Fire Hydrant connections to water main in Kensington Street ■ 1 x 100 mm Fire Hydrant connection to water main in South Street ■ 1 x 100 mm Fire Sprinkler connection to water main in South Street ■ 2 x 100 mm Fire sprinkler connections to water main in Gray Street ■ 1 x 100 mm Fire hydrant connection to water main in Short Street (Note: To be made redundant as part of STGH STG2 works) ■ 1 x 100 mm Fire Hydrant connection to water main in Chapel Street
Existing Fire Water Supply Loads	Fire Service 20 L/sec Fire Hydrant 20 L/sec Fire Sprinklers
Proposed Fire Water Supply Loads	Fire Service 20 L/sec Fire Hydrant 20 L/sec Fire Sprinklers Based on AS2419-2005 and AS2118-1999. Note: STGH STG2 project to incorporate new main connection to Gray Street.

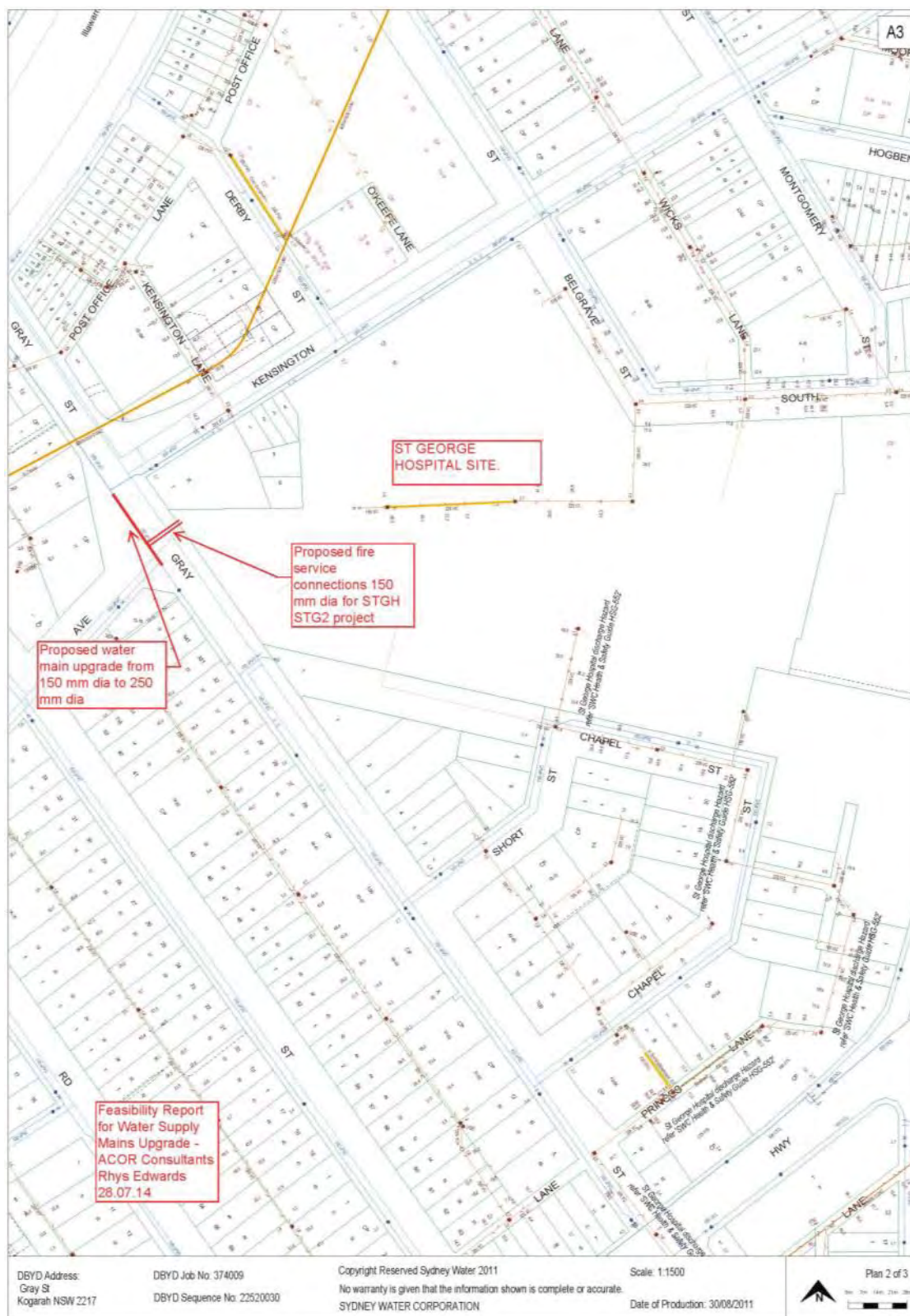
Item	Description
Water Supply Available Flow and Pressure	<p>Water supply flow and pressure test results provided by Sydney Water at the existing 150 mm main in Gray Street validate that adequate flow is not available for concurrent hydrant and sprinkler flows. To achieve concurrent flows, the existing 150 mm water main to be amplified to 250 mm (Refer Sydney Water fire flow information and acceptance letter)</p> <p>Storage tanks booster pumps are required due to the effective height of the building being over 25 m.</p>
Condition and Reliability	<p>Good</p> <p>No reports of major failures.</p> <p>Additional emergency fire water storage for STGH STG2 building works will be constructed as required by statutory building codes for a building over 25 m in effective height.</p> <p>During water main failure Sydney Water would implement emergency repairs and temporary measures to allow hospital to operate normally.</p>

3.4 Natural Gas

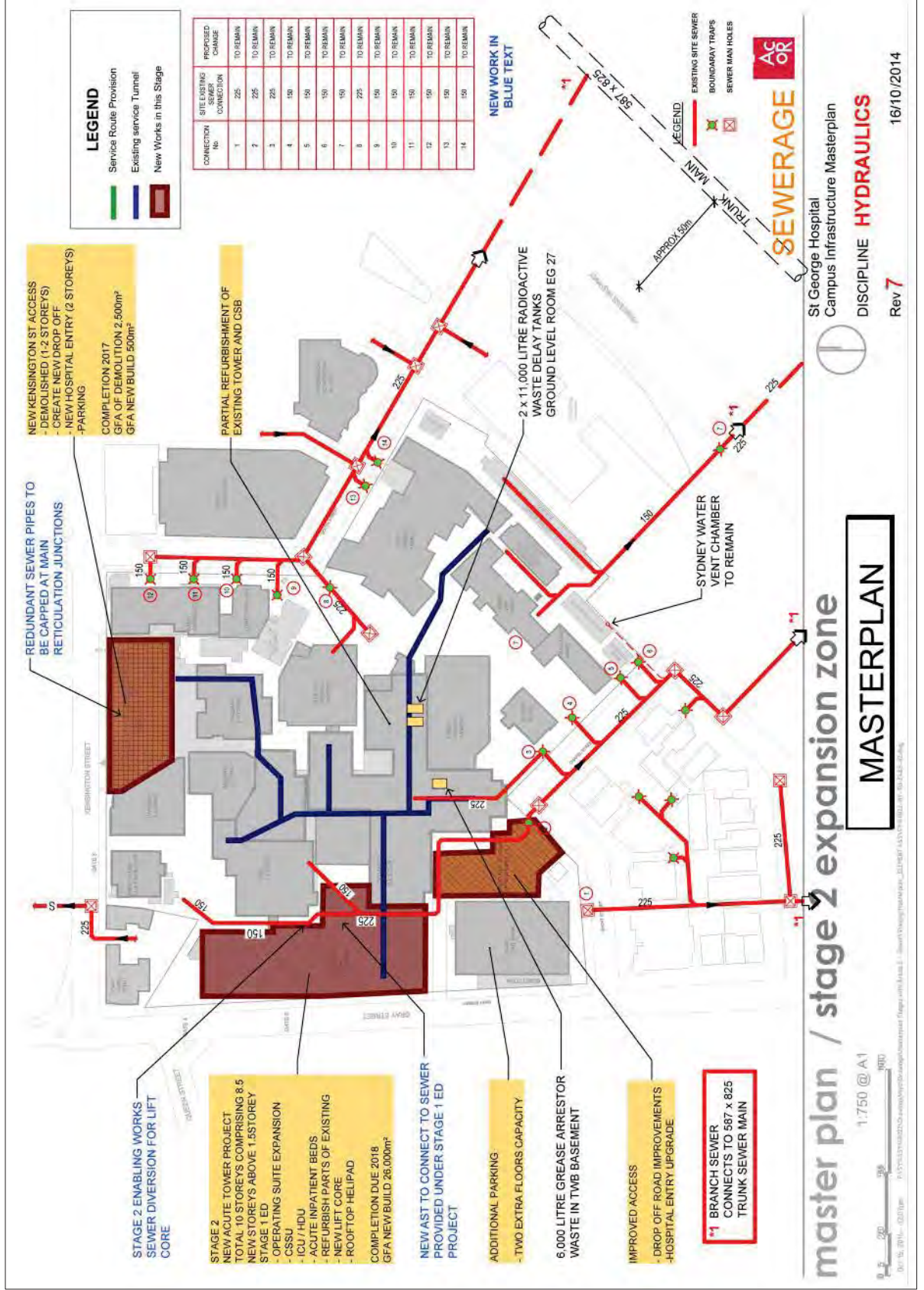
Item	Description
Supply Authority Name and Contact	Jemena Brad Gee Jemena Network Manager (02) 9397-9000
Existing Gas Main Details	<p>The existing hospital campus has the following natural gas mains surrounding the site.</p> <ul style="list-style-type: none"> ■ Jemena 32 mm Nylon 210 kPa gas main in Kensington Street ■ Jemena 50 mm Nylon 210 kPa gas main in Belgrave Street ■ Jemena 50 mm Nylon 210 kPa gas main in South Street ■ Jemena 50 mm Nylon 210 kPa gas main in Gray Street ■ Jemena 50 mm Nylon 210 kPa gas main in Short Street ■ Jemena 50mm Nylon 210 kPa gas main in Chapel Street ■ Jemena 150 mm Copper 210 kPa gas in in Princes Highway ■ Jemena 110 mm Nylon 1050 kPa secondary gas main in Princes Highway
Existing Gas Main Connection Details	<p>The natural gas supply for St. George Public Hospital currently has four (04) connections to the Jemena main system. (Refer also site diagrams).</p> <p>The connections are listed below as follows:</p> <ul style="list-style-type: none"> ■ 1 x 50 mm connection in Kensington street (2.75 kPa outlet Pressure) ■ 2 x 40 mm connection in Belgrave Street. (2.74 kPa outlet Pressure) ■ 1 x 150 mm connection in Princes Highway (100 kPa outlet Pressure) Note proposed STGH STG2 new gas supply will connect to the hospital gas supply connecting to this 150 mm 100 kPa system <p>Refer existing gas supply site plan indicating connection points and indicative service zones.</p>
Existing Main Gas Supply Loads	Existing total site load approximately 22,000 MJ/hr maximum load. Current total capacity based on meter outlet pressure, 150mm supply and index length is 45,000MJ/hr
Proposed Additional Natural Gas Supply Loads	<p>Based on estimated mechanical and hydraulic gas maximum demand, subject to detail design and final equipment selections.</p> <p>Stage 2 = 11,171 MJ/hr say 12,000mj/hr</p>
Capacity	<p>Based on existing internal hospital pipe sizes and pressure, there is adequate capacity to accommodate the proposed additional gas loads for the site for Stage 2.</p> <p>Note: Formal application to Jemena, to determine network capacity, must be undertaken at every stage due to authority's policy changes and surrounding future development works which may impact on</p>

Item	Description
	available supply.
Condition and Reliability	<p>Good</p> <p>No reports of major failures or delivery issues.</p> <p>If the gas authority was unable to supply gas to the site, gas fired plant for domestic hot water and mechanical heating would not be available until repaired.</p> <p>During gas main failure Jemena would implement emergency repairs and temporary measures to allow hospital to operate normally as soon as possible.</p>

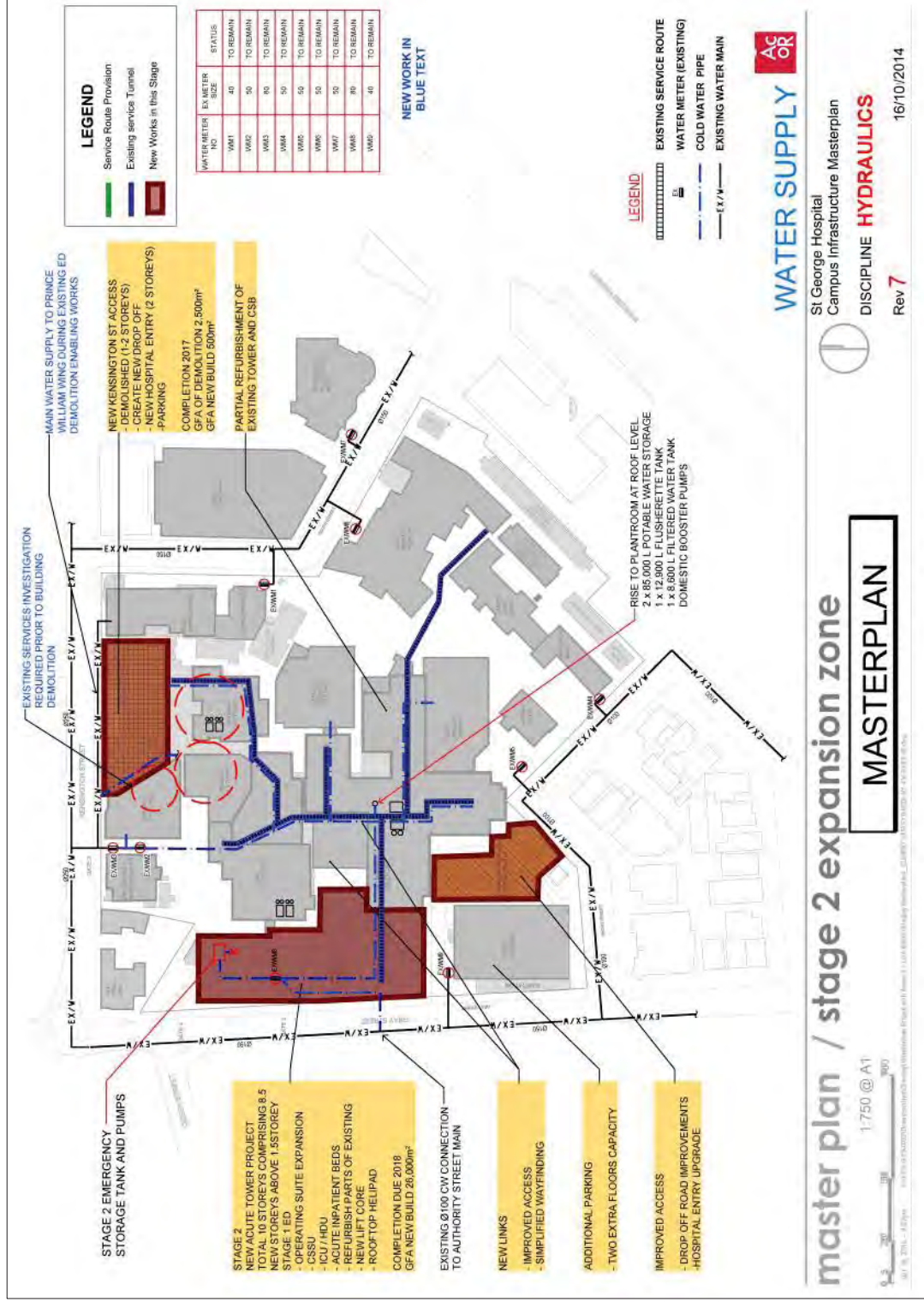
A Appendix A – Sydney Water Hydroplot



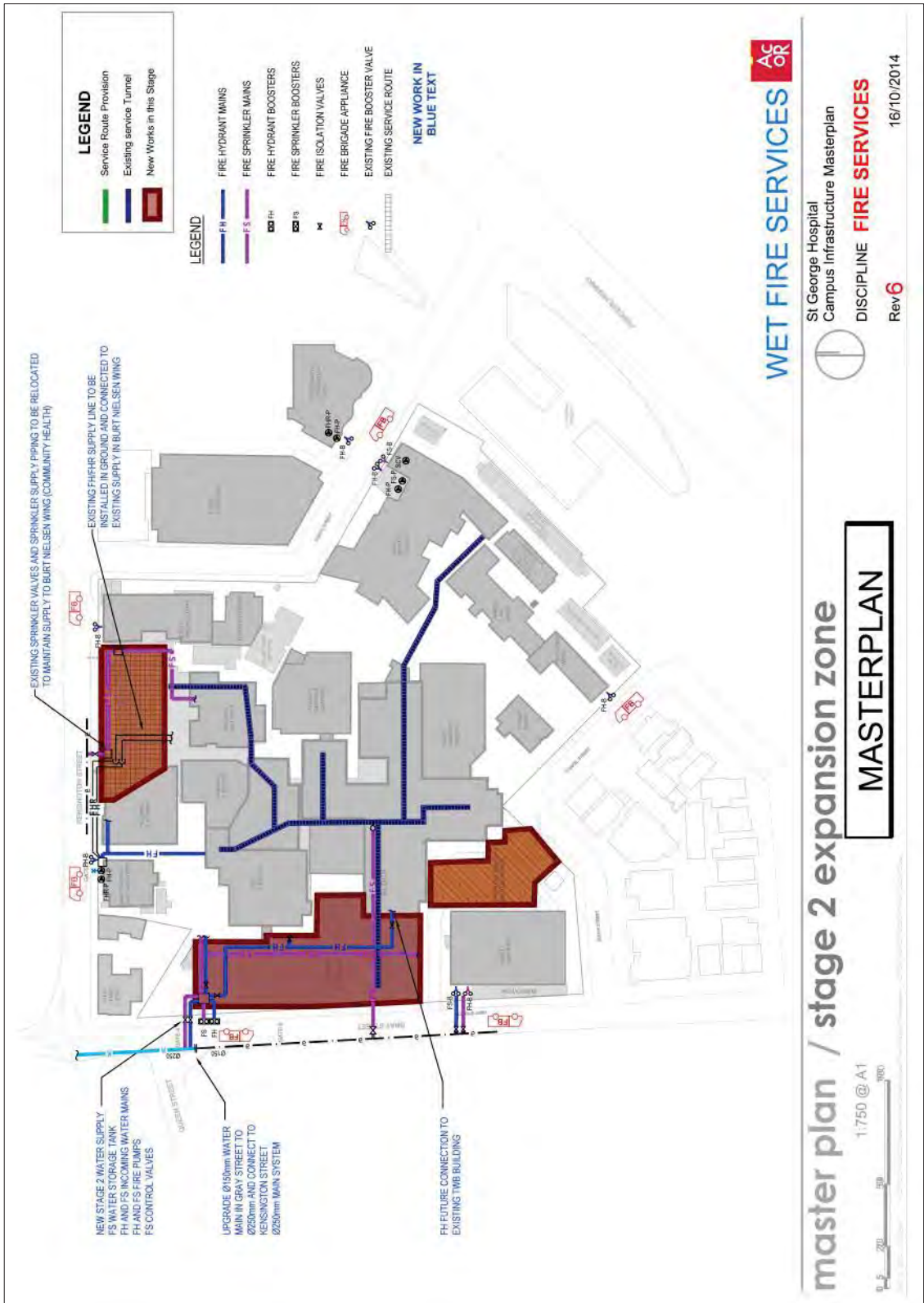




C Appendix C – Hospital Water Diagram



D Appendix D – Hospital Wet Fire Diagram



E Appendix E – Sydney Water Main Amplification Acceptance Letter



Case Number: 140778

3 September 2014

ACOR CONSULTANTS
c/- P.R & C.M DRAFTING PTY LIMITED

FEASIBILITY LETTER

Developer: ACOR CONSULTANTS
Your reference: 14194
Development: Lot 1 DP 791072, GRAY ST, Kogarah
Development Description: Upgrade of potable water main from a 150mm to a 250mm
Your application date: 21 August 2014

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's 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 (Coordinator).

Sydney Water will then send you either a:

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

These documents will be the definitive statement of Sydney Water's requirements.

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

- if you change your proposed development eg the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application; and
- 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 Sydney Water and to the extent that it is able, Sydney Water limits 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 In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land development.

1. Obtain Development Consent from the consent authority for your development proposal.

2. Engage a Water Servicing Coordinator (Coordinator).

You must engage your current or another authorised Coordinator 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 Coordinator (at any point in this process) you must write and tell Sydney Water.

For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call 13 20 92.

The Coordinator will be your point of contact with Sydney Water. 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 Sydney Water costs).

3. Developer Works Deed

After the Coordinator has submitted your new application, they will receive the Sydney Water 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 Sydney Water has signed the documents, one copy will be returned to the Coordinator.

The Deed sets out for this project:

- your responsibilities;
- Sydney Water's responsibilities; and
- 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 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. Potable Water 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.

Sydney Water has assessed your application and found that:

- It is understood that the developer requires the 150mm drinking water main in Gray Street to be upsized to a 250mm main for firefighting purposes.
- Based on the information provided Planning has no objection to the proposed main upsizing at the developers cost.
- Planning recommends that a Statement of Available Pressure and Flow be carried out on the proposed scenario before approaching the detailed design phase.
- **You must construct a water main amplification to serve your development.** These works must be constructed by a constructor with the appropriate capability. Your Coordinator will be able to provide further advice about this.

5. Ancillary Matters

5.1 Asset adjustments

After Sydney Water issues this Notice (and more detailed designs are available), Sydney Water 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**. Sydney Water will need to see the completed designs for the work and we will 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 Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator 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 will 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 Sydney Water may include:

- water main shutdown and disinfection;
- connection of new water mains to Sydney Water system(s);
- design and construction audit fees;

- contract administration, Operations Area Charge & Customer Redress prior to project finalisation;
- creation or alteration of easements etc; and
- 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 Coordinator can tell you about these costs.

OTHER THINGS YOU MAY NEED TO DO FOR PROPOSED HOSPITAL DEVELOPMENT

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

Stamping and approval of your building plans

Please note that your building plans must be stamped and approved. This can be done at a Quick Check agency. For an agency list visit www.sydneywater.com.au > Plumbing, building & developing > Building > Quick Check agents or call 13 20 92.

This is not a requirement of the Certificate but the approval is needed because construction/ building works may impact on existing Sydney Water assets (e.g. water and sewer mains). In any case, these works MUST NOT commence until Sydney Water has granted approval.

Your Coordinator can tell you about the approval process including:

- Possible requirements;
- Costs; and
- Timeframes.

Note: You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will 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*.

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 a Sydney Water sewer main. This work must meet Sydney Water's 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 Sydney Water's 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](mailto:businesscustomers@sydneywater.com.au) at 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

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 Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's 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 any Quick Check agent 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 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 a Quick Check Agent. 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 Sydney Water;
- A pump application form (if a pump is required);
- All pump details (if a pump is required).

You will have to pay an application fee.

Sydney Water does not consider whether a water main is adequate for fire fighting purposes for your development. We cannot 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 a Sydney Water water main. This work must meet Sydney Water's 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. Sydney Water 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 Sydney Water and to the extent that it is able, Sydney Water limits 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

F Appendix F – Sydney Water Fire Flow Results



Statement of Available Pressure and Flow

Acor Consultants
24 Falcon Street
Crows Nest, 2065

WMS No: **330132**
Contact No: 88493531
Fax No: 88493071

Attention: Kimberley Aquilina

Date: 25/03/2014

Pressure & Flow Application Number: 8709422
Your Pressure Inquiry Dated: Mon March 17 2014
Property Address: 16 Kensington St Kogarah 2217

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: Kensington Street	Side of Street: South
Distance & Direction from Nearest Cross Street	0 metres South from Gray Street
Approximate Ground Level (AHD):	31 metres
Nominal Size of Water Main (DN):	250 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	85 metre head
Minimum Pressure	25 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	25
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10	29
	15	29
	20	28
	25	28
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	10	24
	15	24
	20	23
	25	23
Maximum Permissible Flow	40	21

(Please refer to reverse side for Notes)

Robert Wickham
Principal Planner
Urban Growth - Asset Services

E-MAIL
25/06/2014
Ce

G Appendix G – Jemena



Network Protection

High Pressure - Assets Affected

In reply to your enquiry, there are **High Pressure Gas Mains** in the vicinity of your intended work, as generally illustrated on the attached map. There may also be other mains or 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:

Prior to **any** excavations in this area, you **must** contact the High Pressure Response Coordinator on **1300 665 380**. **(Please note that a minimum two working days notice is required)** to arrange a survey. For all works in the vicinity of High Pressure Gas Mains you must arrange for a Pipeline Technician to attend and supervise all excavations. 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.

In accordance with clause 34(5) of the Gas Supply (Safety and Network Management) Regulation 2013 (NSW), you should be informed that all excavation, (including pot-holing by hand to confirm the location of pipes) should be performed in accordance with "**Work Near Underground Assets Guideline**" published in 2007 by the Work Cover Authority.

A copy of this Guideline is available at: www.workcover.nsw.gov.au



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. Jemena advises that you may be required to carry out pot-holing by hand if required by a Pipeline Technician to confirm the location of Jemena's main and installations. This must also be performed by you under the supervision of a Pipeline Technician and be carried out in accordance with the Working Near Underground Assets Guideline published in 2007 by Work Cover Authority

In case of Emergency Phone 131 909 (24 hours)

Admin
1300 880 906

Jemena Asset Management Pty Ltd ABN 53 086 013 461
for and on behalf of Jemena Gas Networks (NSW) Ltd ABN 87 003 004 322

High Pressure Gas Coversheet (Jemena) 2013.docx

From: [Gruber, Robert - ACOR](#)
To: [Hilton, Neale; Brad.Gee@jemena.com.au](#)
Cc: [Edwards, Rhys - ACOR](#)
Subject: St George Hospital Stage 2 - New Acute Services Tower (AST)
Date: Monday, 13 October 2014 6:47:09 AM
Attachments: [image001.png](#)
[SY140022-HY-G-E48.5-02.pdf](#)

Neil / Brad.

Acor Consultants are providing hydraulic engineering services on behalf of Health Infrastructure, for the planning of the above project.

As a part of the planning submission, approval process, to the Director Generals department, we are required to make contact with all the relevant supply authorities and confirm availability, capacity, condition / reliability of the existing infrastructure.

The proposed building will contain an additional 190 beds, and is to be constructed over the existing (recently constructed) emergency department on Gray Street.
The existing emergency department is to be demolished, with new on grade car park constructed.

We are not proposing to make new connection to the street main, as the existing hospital supply has sufficient capacity for the proposed Stage 2 works

Can you advise, if you see any issues with below and attached.

Natural Gas

Item	Description
Supply Authority Name and Contact	Jemena Brad Gee phone (02) 9397-9000 Jemena Network Manager
Existing Gas Main Details	<p>The existing hospital campus has the following natural gas mains surrounding the site.</p> <ul style="list-style-type: none"> • Jemena 32mm Nylon 210kpa gas main in Kensington Street. • Jemena 50mm Nylon 210kpa gas main in Belgrave Street. • Jemena 50mm Nylon 210kpa gas main in South Street. • Jemena 50mm Nylon 210kpa gas main in Gray Street. • Jemena 50mm Nylon 210kpa gas main in Short Street. • Jemena 50mm Nylon 210kpa gas main in Chapel Street. • Jemena 150mm Copper 210kpa gas in in Princes Highway. • Jemena 110 Nylon 1050kpa secondary gas main in Princes Highway.
Existing Gas Main Connection Details	<p>The natural gas supply for St. George Public Hospital currently has four (04) connections to the Jemena main system. (refer also site</p> <p>The connections are listed below as follows:</p> <ul style="list-style-type: none"> 1 x 50mm connection in Kensington street (2.75kpa outlet Pressure) 2 x 40mm connection in Belgrave Street. (2.74kpa outlet Pressure) 1 x 150mm connection in Princes Highway (100kpa outlet Pressure) Note proposed St George Hospital Stage 2 AST new gas supply will connect to the existing hospital gas supply connecting to this 150mm 100kpa system. <p>Refer existing gas supply site plan indicating connection points and</p>

	indicative service zones.
Existing Main Gas Supply Loads	Existing total site load approximately 19,000mj/hr maximum load – no diversity
Proposed Additional Natural Gas Supply Loads	Based on estimated mechanical and hydraulic gas maximum demand, subject to detail design and final equipment selections. Stage 2 - 13,000mj / hr
Capacity	Based on existing internal hospital pipe sizes and pressure, there is adequate capacity to accommodate the proposed additional gas loads for the site for Stage 2. Note: Formal application to Jemena, to determine network capacity, must be undertaken at upon State Planning approval due to authorities policy changes and surrounding future development works which may impact on available supply.
Condition and Reliability	Good No reports of major failures or delivery issues. If the gas authority was unable to supply gas to the site, gas fired plant for domestic hot water and mechanical heating would not be available until repaired. During gas main failure Jemena would implement emergency repairs and temporary measures to allow hospital to operate normally as soon as possible.

Regards

Rob.

Robert Gruber
Director



ACOR Consultants Pty Ltd

Level 1, 24 Falcon St
Crows Nest NSW 2065

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ENGINEERS | MANAGERS | INFRASTRUCTURE PLANNERS | DEVELOPMENT CONSULTANTS

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21 October 2014

Acor Consultants P/L
Level, 24 Falcon St
CROWS NEST NSW 2065
Attn. R. Gruber.

Dear Rob,

**RE: PROPOSED SUBDIVISION OF
ST. GEORGE HOSPITAL - KOGARAH**

Natural Gas is available adjacent to the above subdivision and could be extended to supply any proposed development at this site depending upon it's commercial viability. Currently the High Pressure 1050Kpa Natural Gas network can supply the additional load requested on your proposal. To receive a formal offer for any additional supply you are required to contact the consumers current Energy Retailer with this submission.

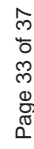
Caution should be exercised when carrying out any road works that may expose the Natural Gas mains existing in this location. Contact Dial B4 you Dig ph 1100 to confirm their location.

We appreciate the opportunity to be involved in the forward planning of this development. If further information or assistance is required, please do not hesitate to contact me on 0402 060 151.

Yours faithfully,

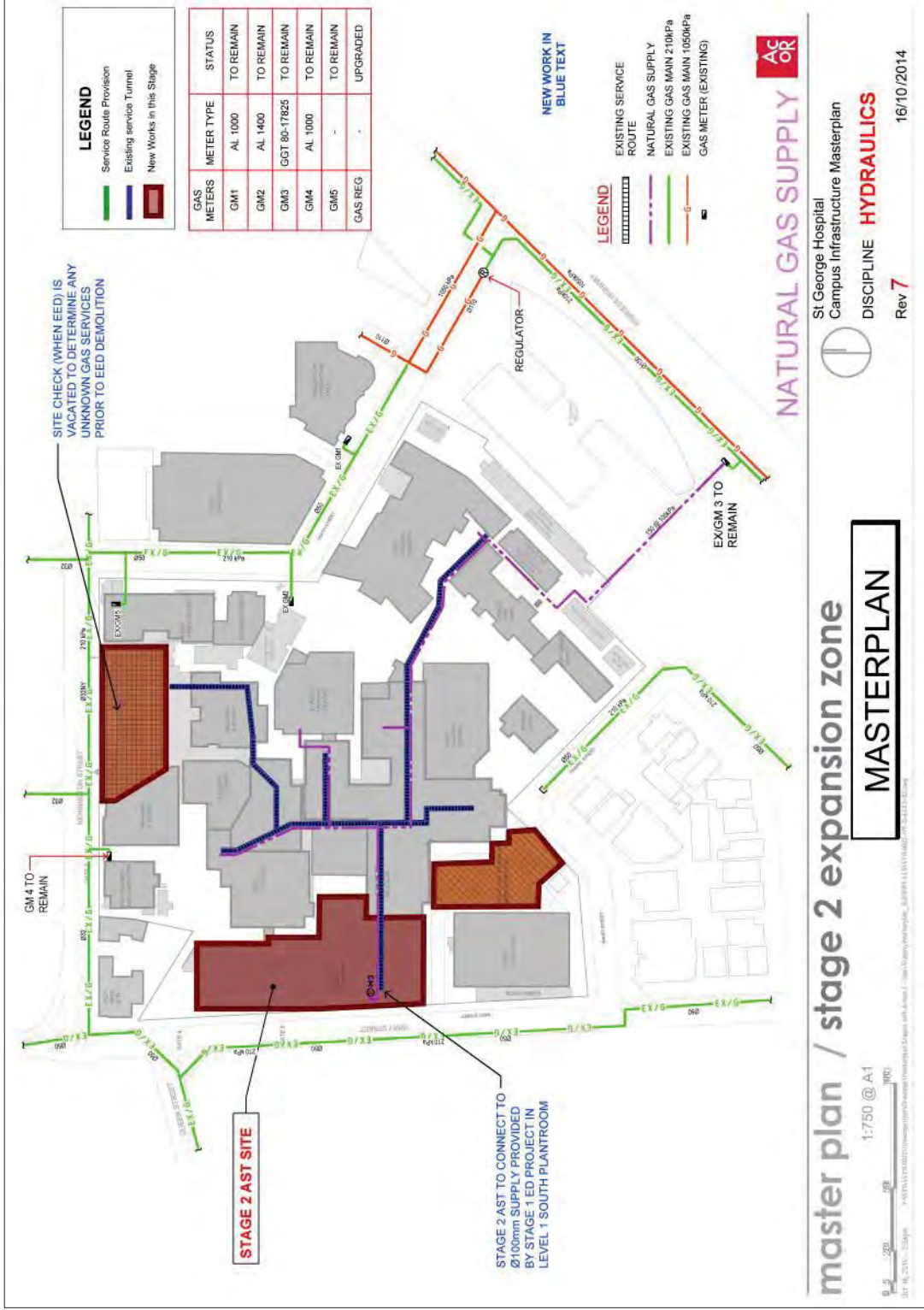
Neale Hilton

Neale Hilton
Network Development Manager





H Appendix H – Hospital Gas Diagram



Natural Gas Load Calculator

Customer Address	St George Hospital Stage 2 Gray St Kogarah NSW
Robert Gruber (Acor consultants) 02 9438 5098	

Gas Main Pressure - KPA 100

Appliance / load Description	Design Rate MJ/hr	Operating Capacity (Include %)	Hours per Day	MDQ MJ's	Days per Week	Weeks per Year	Total Annual Load MJ's	Comment
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Retained load								
Nil retained load	22,000	15%		24	79,200	7	52	28,828,800
Existing Retained Total	22,000							
Proposed								
Mechanical Heating	6,120	15%		24	22,032	7	23	3,547,152
Steam boilers	1,600	15%		24	6,480	7	52	2,358,720
Domestic Hot Water	2,235	15%		24	8,046	7	52	2,928,744
Provision for future expansion (10%)	1,016	15%		24	3,656	7	52	1,330,711
Proposed new loads	11,171				40,214			10,165,327

As advised by mechanical
As advised by mechanical
Subject to detailed design

Totals								
MHQ	33,171			MDQ	119,414		ACQ (MJ's)	10,165,327
MHQ with Diversity								

Mechanical heating generators	2,400 kW
	9,600 MJ/h
Steam boilers	500 kW
	2,000 MJ/h
Total Mechanical services	2,900
	11,600 MJ/h

I Appendix I – Authority Consultation Schedule

AUTHORITIES CONSULTATION

ACOR CONSULTANTS PTY LTD

Proposed Consultation List	Authority Contact	ACOR Project Team Member Responsible	Comments
Sydney Water Water and Sewer Supply Mains	Dial before you dig	Robert Gruber	Site main drawings received 20 th March 2014
Telstra Communications Supply Mains	Dial before you dig	Robert Gruber	Site main drawings received 20th March 2014
Optus Communications Supply Mains	Dial before you dig	Robert Gruber	Site main drawings received 20th March 2014
Jemena Gas Supply Mains	Dial before you dig	Robert Gruber	Site main drawings received 20th March 2014
Energy Australia Electrical Supply Mains	Dial before you dig	Robert Gruber	Site main drawings received 20th March 2014
Sydney Water Water supply	Robert Wickham	Robert Gruber	Application for additional water supply pressure and flow availability issued 27th September 2014 Awaiting response
Sydney Water Water main amplification request	Via Water Services Coordinator PR &CM Drafting Pty Limited.	Robert Gruber	Acceptance letter received 3 rd September 2014
Jemena Gas Supply	Bradley Gee Neal Hilton	Robert Gruber Robert Gruber	Email to Jemena (Bradley Gee and Neale Hilton 13 th October 2014 Jemena response dated 21 st October 2014