Alterations and Additions to the Stevenson Library Building The Scots College

Environmental Impact Statement
Infrastructure Management Plan
Utilities - Electrical Services

Revision A

6 April 2018

UMEA

Document Status

Rev	Date	Status	Author
A	6 April 2018	Issued to Client	MM

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Contents

1. Introduction

1.1 General

Application Number: SSD 8922

Proposal name: Major alterations and additions to the Stevenson Library Building at the Scots College, 29 – 53 Victoria Road, Bellevue Hill.

This report is written to satisfy the Electrical Services requirements of Clause 14 – Utilities, of the Secretary's Environmental Assessment Requirements.

Clause 14 requires that an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation and easement requirements of the development be undertaken.

Ausgrid as the relevant electrical supply authority were consulted with the resulting outcomes detailed herein.

It is envisaged that the necessary works required to bring the Library up to contemporary standards and expectations with respect to telecommunication services will originate from the existing internal infrastructure.

1.2 The Author

This document has been prepared by;

Manny Martin, BEng (Hons), MIEAust, CPEng. NER.

Director, UMEA Pty Ltd, Electrical Building Services Consulting Engineers.

I declare that the information has been prepared to comply with Clause 14 – Utilities, of the SEAR identified above and furthermore the information contained herein is neither false nor misleading.

2. Electrical Infrastructure

2.1 Existing

The existing electrical services infrastructure supplying the College consist of an Ausgrid kiosk substation located on College property line of Victoria Road. The 600 kVA substation is known to Ausgrid as S6628 Victoria Ginahgulla, is classified as an aged E-type kiosk which are no longer supported by Ausgrid.

The high voltage supply to the kiosk is via underground cables using the specifically installed underground conduits along Victoria Road.

The substation in turn supplies the College low voltage main switchboard located adjacent to the kiosk. Underground sub-main cables are reticulated to the individual buildings within the College grounds.

2.2 Ausgrid

We have consulted with Ausgrid, the electrical network authority for Bellevue Hill, who have advised that the existing Ausgrid substation does not have the capacity to connect the proposed Library.

The proposed Library building will require an electrical supply in the order of 600 Amperes to adequately provide for the installed services which far exceeds the available capacity of the existing substation.

An extension / augmentation of the Ausgrid High Voltage network will be required to supply a new sub-station. It is proposed that a new L Type substation, rated at 800 kVA, be installed.

To proceed this matter further with Ausgrid a written application is required to be submitted to Ausgrid. Refer to Ausgrid correspondence in Appendix B.

Ausgrid Reference Number for this project is 700004670.

2.2.1 New Substation Siting

The College is to decide the final position of the new substation, however it is expected to be in the immediate vicinity of the existing substation location. The new location must be level and clear of all construction. No services such as drains, electrical or communications cables, water pipes and the like are to be located within the substation footprint.

Access to the proposed site will require all weather access by a mobile crane and truck. This will be required for the initial installation and when access may be necessary to replace a faulty transformer or during maintenance. The unloading of the substation from the truck by the crane will be undertaken on Victoria Road for which a traffic management plan will be implemented.

Depending on the location and orientation of the substation the L type substations require an easement footprint of 5.3 m x 3.3 m, or with Ausgrid approval, 5.3 m x 2.05 m.

The siting of the new substation shall be as detailed in Ausgrid drawing No. 151572 and Network Standards document NS141 Site Selection and Site Preparation Standards for Kiosk Type Substations.

2.2.2 Substation High Voltage Cables

Ausgrid have verbally indicated that the existing high voltage circuit supplying substation S6628 should be capable of supporting the additional load imposed by a new substation. To extend the high voltage cable between the existing substation and the new substation location any spare conduits available in the footpath will be used as permitted by Ausgrid. However, these parameters will need to be verified by an Accredited Service Provider once commissioned. As such, the close proximity of the supply cable to the new substation location will ensure that any trenching works on public land will be minimised and restricted to the eastern side footpath of Victoria Road (ie, the same side as the proposed Library and the existing substation).

No roadway trenching is envisaged hence Victoria Road will not need to be opened and as such disruption to traffic is not expected.

Backfilling of excavations shall be undertaken to restore the sub-grade to its original condition and shall be compacted as required by Ausgrid Standards. Reinstatement of the pavement will be to local council requirements to match the existing surfaces.

Temporary steel plates will be used as needed to ensure the safety of the site for pedestrians and vehicular traffic.

All works will be undertaken at a selected time and day to cause minimal disruption to the public.

There will not be any street furniture that requires removal for the trenching.

The installation of high voltage cabling and associated works such as trenching, backfilling, etc will be governed by Ausgrid Network Standards document NS130 Specification for Laying Underground Cables up to and including 11kV.

2.2.3 Easements

The siting of the new sub-station will be on College grounds and will require a suitable easement to be created and registered.

Close liaison with Ausgrid's Property Group negotiation officers will be undertaken in this matter following Ausgrid Network Standards document NS143 Easements, Leases and Rights of Way.

Ausgrid's high voltage underground network distribution assets located in the public road (Victoria Road) as defined in Section 45 of the Electricity Supply Act 1995 and as such Ausgrid relies on its statutory rights to occupy these spaces and does not acquire any registered interests in the land.

2.3 Accredited Service Provider

The College will commission a Level 3 Accredited Service Provider to design the contestable works of the Ausgrid network, including the design of the extension / augmentation of the underground cables and conduits.

All installation works on public infrastructure shall be carried out by a Level 1 Accredited Service Provider with suitable field, technical and engineering staff experienced in projects of this nature.

3. Communications Service

3.1 Introduction

The communications services consist of telephone and information technology for the transmission of voice and data. The existing services supplying the College are undergrounded and terminate within a main frame / data server room.

From this main server room optical fibre and / or copper cabling are reticulated to the server room located within each individual building of the College.

3.2 Proposal

The Stevenson Library Building will be provided with a main data room where incoming services will be terminated. The main service will originate from the existing College infrastructure and will therefore not necessitate public road closures and the like.

The Library communications cabling will be reticulated internally using dedicated risers and ducts specifically set aside for this purpose

The existing communications services provided to the College do not require augmentation by the services provider beyond the property boundary.

It is envisaged that the necessary works required to bring the Library up to contemporary standards and expectations will originate from the existing internal services.

4. Appendix A

4.1 Ausgrid Correspondence

Ausgrid Contestability Section,

Level 1, Building 4, 130 Joynton Avenue,

Zetland NSW 2017

Reference Number 700004670.

Refer to correspondence on the following pages

Address all relevant correspondence to:

Ausgrid Contestability Section
Level 1, Building 4, 130 Joynton Avenue
Zetland NSW 2017

E: Contestability@ausgrid.com.au

27/03/2018

Attention: Manny Martin
Suite 5 186-190 Kingsgrove Rd
KINGSGROVE NSW 2008

Email: m.martin@umea.com.au

Reference Number: 700004670

Dear Manny

Preliminary Enquiry: Scotts College 29-53 Victoria Rd Bellevue Hill

I refer to your preliminary enquiry regarding the electricity connection at the above address and provide the following information.

- ❑ The Ausgrid network does not have the capacity to connect the proposed 610 amp 3 phase low voltage electricity connection. An extension/augmentation of the Ausgrid network is required. Following is the likely work(s) required to provide the request capacity.
  - Installation of a 800kVA substation..
- ❑ An extension/augmentation of the Ausgrid network is Contestable and requires the customer to engage accredited service providers to undertake the design and construction of the required works. Information on how to connect to the Ausgrid network can be found on our website at the following link: http://www.ausgrid.com.au/Common/Customer-Services/Business-and-commercial/Connecting-to-the-network/How-do-I-connect-to-the-network.aspx#
- ❑ Ausgrid is unable to provide costs or timeframes for Contestable works. However, accredited service providers may be able to provide the information.
- ❑ The electrical connection will require Ausgrid to provide auxiliary services that only Ausgrid can provide. The auxiliary services and the associated fee are detailed in the Ausgrid document ***Connection Policy – Connection Charges***. The document is available on our website at the following link: http://www.ausgrid.com.au/Common/Customer-Services/Business-and-commercial/Connecting-to-the-network/Charges-for-Customer-Connection-Services.aspx#
- ❑ Alterations to the existing Ausgrid network (ie relocation works) is also Contestable as detailed above and is fully funded by the applicant.
- ❑ Substation S6628 Victoria Ginahgulla is a 600kVA KE substation with a non-firm rating of 755amps. The substation loading is in the order of 576amps.17/09/2015
- ❑ At substation S6628 Victoria Ginahgulla, low voltage distributor LVF:2 supplies Scotts College. This distributor fuse-way is rated at 800 amps with a 800amp fuse installed. An MDI reading on this distributor indicates a load of 660 amps.11/02/2006 and 405 amps 26/02/2013
- ❑ Ausgrid does not provide maximum demand readings for individual installations that connect to low voltage network shared with other customers. You will need to engage the services of electrically qualified persons to undertake the load study.
- ❑ Information regarding the private installation such as service fuse size, private protection settings, cable size(s) and so forth requires you to arrange suitably trained electrical persons to obtain the desired information about the private installation. Gathering this information may also require you to make arrangements for an interruption of electricity to the customer(s) connected to the private installation.

- Being an older installation where a connection offer is yet to be made under NECF the approved connection capacity is not readily available. It should be noted that when the maximum connection capacity is not utilised by the customer it is reduced to actual maximum demand and any subsequent surplus can be or may have been used by Ausgrid to supply others.
- To proceed further in obtaining a new or altered electrical connection to the property a Connection Application will need to be submitted. The various application forms are available on our website at the following link: http://www.ausgrid.com.au/Common/Customer-Services/Business-and-commercial/Connecting-to-the-network/How-do-I-connect-to-the-network/Connection-application-forms-and-guides.aspx#

It should be noted that the above advise is based on Ausgrid's polices and network status as of today and are subject to change.

Connections to the Ausgrid network are governed by a set of laws and rules referred to as the National Energy Customer Framework (NECF). Included in the NECF is the National Electricity Rules (NER). Under these rules, a binding contract may only be formed after a connection application is lodged and Ausgrid has made a connection offer in response to that application. Accordingly, to make arrangements for the electricity connection of the development to the Ausgrid network you should lodge a completed connection application.

Should you require any further information please contact me.

Yours sincerely,

Craig Platts
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 02 9663 9299
Email: cplatts@ausgrid.com.au

End of Document

Infrastructure Management Plan

The Scots College Stevenson Library

53 Victoria Road, Bellevue Hill NSW 2023

REPORT

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Ref: SY173015-HR01
Rev: 1
Date: 15.03.2018

INFRASTRUCTURE MANAGEMENT PLAN

Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
15.03.2018	1	For Review	S.Astorga	A.Muralidharan

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EXECUTIVE SUMMARY

This Infrastructure Management Plan (IMP) report for Hydraulic services has been prepared by Northrop Consulting Engineers Pty Ltd (Northrop)[1] on behalf of Impact Group for the Scots College Stevenson Library Redevelopment project.

This IMP outlines the existing infrastructure, detailing information on the existing capacity and any augmentation to the aforementioned services required for the proposed development. The report also details records of consultation with relevant agencies. The details within this report are preliminary and based on currently available information and correspondence undertaken at the time of writing.

This report is provided in response to the Secretary's Environmental Assessment Requirements (SEARs) and subsequent Environmental Impact Statement (EIS) requirements, as per the advice from the Department of Planning. This IMP addresses the Infrastructure Management Plan requirements held within Item 14 (utilities) of the SEARs.

[1] The Consulting Engineer responsible for sewer, water and gas services is Northrop. The Consulting Engineer responsible for Electrical services is UMEA. Northrop has compiled third party information into this singular report and shall not be held responsible for the correctness or accuracy of third party information prepared by others.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Interpretation

1.1.1 Abbreviations

General: For the purposes of this report the following abbreviations apply:

- *AAAC:* All Aluminium Alloy Conductor.
- *AAC:* Aerial Aluminium Conductor.
- *DBYD:* Dial Before You Dig.
- *DN:* Diameter Nominal.
- *EE:* Endeavour Energy.
- *HV:* High Voltage.
- *kPa:* Kilopascals.
- *MJ:* Mega Joule.
- *NY:* Nylon.
- *SWC:* Sydney Water Corporation
- *WSC:* Water Servicing Coordinator.

1.2 Report Overview

Northrop Consulting Engineers has been engaged by Impact Group to prepare an Infrastructure Management Plan to support assessment of proposed development at Scots College Stevenson Library, located at 53 Victoria Rd, Bellevue Hill NSW 2023.

The investigations for this Infrastructure Management Plan primarily focused on the following objectives:

- Identify potential opportunities and site constraints;
- Identify the location, size and capacity of all existing services within the vicinity of the proposed site;
- Identify utility confirmation for the subject site;
- Identify options to service the site to support the proposed development.

1.3 Limitations and Exclusions

- The following assessment is based upon Dial Before You Dig (DBYD) documentation as well as correspondence with relevant authorities.

1.4 SEARs Issues Addressed

This report addresses how the proposed project addresses Item 14 of the SEARs and outlines strategies relating to Utilities. These requirements are outlined below alongside where the response to each can be found within this report;

Item	Action to Address the Requirement	Report Location
Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation requirements of the development for the provision of utilities including staging of infrastructure.	This IMP report details the existing hydraulic services infrastructure available to service the proposed Scots College Stevenson Library Redevelopment. This report also includes details regarding any augmentation / amplifications required to service the proposed development.	Section 4 & 5.
Prepare an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.	The water sensitive urban design (WSUD) strategy (by Civil Engineer) proposed to be used within the proposed school to offset the use of potable water services. Sections 4 & 5 of this report describe proposed alternative water supplies and potable/non-potable end use.	Section 4 & 5. The WSUD is to be prepared by the Civil Engineer.

2. EXISTING SITE CONDITIONS

2.1 Site Description

The site is located at 53 Victoria Rd, Bellevue Hill NSW 2023 and is situated within the Woollahra Municipal Council (Figure 1). The subject site is the existing Stevenson Library within Scots College that will be redeveloped with a proposed design by JCA Architects.

Figure 1 - Site Location (sourced from Google Maps)

3. EXISTING SERVICES INFRASTRUCTURE

Northrop has performed desktop investigations in regards to the existing site conditions and additional loading from the proposed development onto the existing utility infrastructure available for connection to the site.

Our assessment has been based on information provided by the relevant water, sewer and natural gas utility authorities.

3.1 Existing Sewer Infrastructure

Existing Sydney Water sewer assets currently surrounding the subject site, as follows:

- DN225 concrete encased SWC sewer main within Victoria Road;
- DN225 SWC sewer main within Victoria Road;
- DN225 SWC sewer main with Cranbrook Road (currently receiving Scot's College property sewer discharge);
- DN150 private sewer service currently serving the existing Stevenson Library (as per SWC sewer service diagram obtained by NCE).

Refer to Appendix A for details.

3.2 Existing Water Infrastructure

Existing Sydney Water sewer assets currently surrounding the subject site, as follows:

- DN250 SWC water main within Victoria Road.
- DN150 SWC water main within Victoria Road.

NCE understands the existing Stevenson Library has an incoming potable cold water service to serve existing hydraulic fixtures. The hydraulic contractor is to further investigate this service on site.

Refer Appendix A for details.

3.3 Existing Natural Gas Infrastructure

Existing Jemena natural gas assets currently do not extend to the subject site, as follows:

- DN110 NY 210kPa Jemena natural gas main within Victoria Road.
- DN50 NY 210kPa Jemena natural gas main within Cranbrook Road.

Refer Appendix B for details.

4. DEMAND CALCULATIONS

4.1 Authority Infrastructure

The proposed development is a multi-purpose facility, forming part of the Scots College currently defined to cater for approximately 1200 students. This demand calculation assumes there are no additional students, using Sydney Water average demand data. These calculations are based on the following guidelines:

- WSA 02-2002-2.2 – Sewerage Code of Australia
- WSA 03-2011-3.1 – Water Supply Code of Australia
- AS 5601.1:2013 – Gas Installations

4.1.1 Sewer Infrastructure (SWC)

TABLE 4.4

EP CAPACITY LIMITATIONS FOR RETICULATION SEWERS

Pipe size DN	Maximum allowable EP
150	600
225	1600
300	3200

Figure 2 - Extract from WSA 02-2002-2.2 - Sewerage Code of Australia, page 72

Sanitary Plumbing and Drainage			
No. of Students*	**EP per Student**	**Total Demand****	**Supply Size Required**
1200	0.2	EP 240	DN150

4.1.2 Potable Cold Water Infrastructure (SWC)

TABLE 3.1

MINIMUM PIPE SIZES FOR PARTICULAR DEVELOPMENTS

ZONING/DEVELOPMENT	MINIMUM PIPE SIZE (DN)	
	Cast iron outside diameter series	ISO series[3]
Low and medium density residential	100 [1]	125 [1]
High density residential (≥ 4 storeys)	150	180
Multiple developments of high density residential (≥ 8 storeys)	200 or 225 [2]	250 or 280 [2]
Industrial and commercial	150	180

NOTES:

1 *The Water Agency may authorise smaller pipe sizes to address issues such as water quality, provided that requirements for fire fighting supply are otherwise met.*

2 *The Water Agency to nominate the preferred size.*

3 *For steel (SCL) and polyethylene (PE) pipes only.*

Figure 3 - Extract from WSA 03-2011-3.1 -Water Supply Code of Australia, page 82

The redevelopment, and overall Scots College as a whole can be considered as a commercial development. The required minimum SWC infrastructure pipe size required to serve the facility DN150.

4.1.3 Natural Gas Infrastructure (Jemena)

Natural Gas		
Application	**Total Demand***	**Supply Size Required**
Gas fired hot water plant	410 MJ/hr*	DN32

4.2 Private Property Infrastructure

The anticipated demand is based upon the expected water, gas and sewer drainage loads for the proposed library redevelopment. The calculations factor in probable simultaneous demands of fixture usage during peak periods.

4.2.1 Sewer Infrastructure (Private)

Sanitary Plumbing and Drainage	
Fixture Unit Loading*	**Minimum Supply Size Required**
143	DN100

*Based on AS 3500.2:2015 – Sanitary Plumbing and Drainage

4.2.2 Potable Cold Water Infrastructure (Private)

Potable Cold Water		
Fixture Unit Loading**	**Total Demand**	**Supply Size Required**
105	1.1 L/s	DN40

**Based on AS 3500.1:2015 – Water Services

4.2.3 Natural Gas Infrastructure (Private)

Natural Gas		
Application	**Total Demand***	**Supply Size Required*****
Gas fired hot water plant	410 MJ/hr*	DN32

***Based on AS 5601.1:2013 – Gas Installations

5. PROPOSED SERVICES

Section 5 of this report identifies the existing infrastructure and services within the vicinity of the subject site at this point in time. Existing services infrastructure currently serving the existing Stevenson library will likely be adequate to serve the redevelopment.

5.1 Sewer Infrastructure

Further to demand calculations in Section 4 and extracts from WSA-02, it is evident that a minimum DN100 private sewer main is required to service the proposed redevelopment and discharge to a minimum DN150 Sydney Water sewer main.

The DN100 property sewer main will make connection to the existing DN150 property sewer infrastructure, before using the existing connection to the DN225 SWC sewer main within Cranbrook Lane to discharge to SWC infrastructure (as shown on the sewer service diagram provided by SWC). Northrop advises existing property sewer to be undergo a CCTV inspection in order to determine the current state of the pipework, and determine whether or not it is required to be replaced.

Hence, the existing infrastructure appears to be adequate to serve the proposed redevelopment. A Sydney Water accredited Water Servicing Coordinator (WSC) would need to be engaged to approve the additional discharge from the redevelopment, due to the additional proposed amenities blocks. Through the WSC, a section 73 application with Sydney Water will need to be lodged (subject to DA requirements) to determine Sydney Water's infrastructure plans for the area, and receive approval for the additional sewer discharge requirements as per the latest architectural design. This design would depend on the invert level of the existing sewer main in question and the general site contour to confirm if sewer drainage can be achieved by gravity.

5.2 Potable Water Infrastructure

Further to demand calculations in Section 4 and extracts from WSA-03, it is evident that a DN40 cold water service is required to serve the new amenities within the redeveloped Stevenson Library. The existing cold water connection to the existing Stevenson Library development is to be assessed and amplified to this size if necessary. The hydraulic contractor will be required to assess the location of the incoming cold water service to the existing building, and extend/redirect to suit the proposed hydraulic design. Current pressure and flow requirements will need to also be assessed in order to determine if cold water pressure boosting pumps are required to service the Stevenson Library redevelopment.

NCE's assessment suggests the surrounding SWC water infrastructure is sufficient to serve the minimal increase in water demand. A Sydney Water accredited Water Servicing Coordinator (WSC) would need to be engaged to approve the additional discharge from the redevelopment. A section 73 application with Sydney Water will need to be lodged (subject to DA requirements) to determine Sydney Water's infrastructure plans for the area, and receive approval for the additional water usage requirements as per the latest architectural design.

5.3 Gas Infrastructure

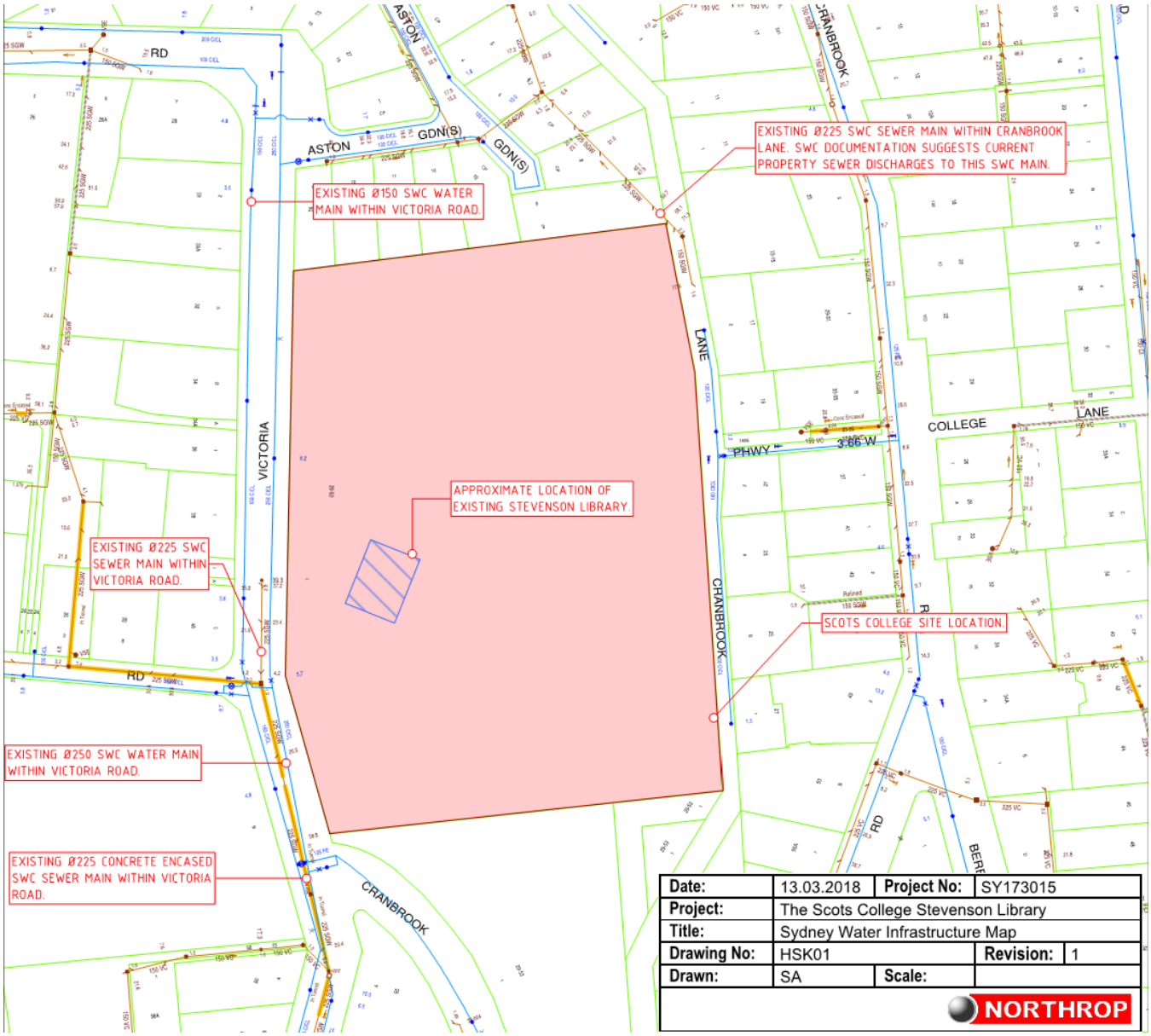
The existing Jemena natural gas infrastructure surrounding the proposed site location, as documented in Appendix B, is likely to have adequate capacity to service the proposed redevelopment. Confirmation on proposed hot water plant gas load requirements will be needed in order to submit a final application to Jemena. This will confirm if the additional gas loads for the redevelopment are acceptable with existing Jemena infrastructure.

6. CONCLUSIONS

In summary, this report demonstrates that the proposed redevelopment is capable of being serviced through the existing services currently serving the existing Stevenson Library. Requirement for augmentation and amplification of the existing property services will need to be confirmed onsite, with final connections to be approved by the appropriate authorities:

- Sewer Infrastructure – Northrop's assessment suggests the existing SWC water infrastructure is sufficient to service the proposed redevelopment, subject to onsite assessment of existing property sewer services and final SWC approval.
- Water Infrastructure – Northrop's assessment suggests the existing SWC water infrastructure is sufficient to service the proposed redevelopment, subject to onsite assessment of existing property potable water services and final SWC approval.
- Gas Infrastructure – Northrop's assessment suggests the existing Jemena gas infrastructure is sufficient to service the proposed redevelopment, subject to onsite assessment of existing property gas services and final Jemena approval.

7. APPENDIX A – SYDNEY WATER INFRASTRUCTURE MAP



8. APPENDIX B – JEMENA GAS INFRASTRUCTURE MAP