



IGS INTEGRATED
GROUP
SERVICES



**MELROSE PARK
19 HOPE ST & 69-77 HUGHES AVE,
MELROSE PARK**

**Engineering Services
Desktop Due Diligence Report**

Job Number: EN – N20_280
December 2020
Rev 3.0

Suite 1.11 – 75 Mary Street
St Peters, NSW 2044
Phone: +61 2 8488 4600
Fax: +61 2 9475 4588
Email: admin@igs.com.au
Web: www.igs.com.au
 [linkedin.com/company/3213174](https://www.linkedin.com/company/3213174)
ABN: 68 163 019 029

Document Control

Version	Date	Author		Reviewer	
1.0	20 th November 2020	Oudai Awad	OA	Mays Chalak	MC
2.0	1 st December 2020	Oudai Awad	OA	Mays Chalak	MC
3.0	4 th December 2020	Oudai Awad	OA	Mays Chalak	MC

"© 2020 IGS Pty Ltd All Rights Reserved. Copyright in the whole and every part of this document belongs to IGS Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person without the prior written consent of IGS Pty Ltd."

CONTENTS

1.	INTRODUCTION	1
1.1	GENERAL	1
1.2	THE SITE	1
1.3	END USE.....	2
1.4	BCA CLASSIFICATION	2
1.5	MANDATORY BCA ENERGY EFFICIENCY REQUIREMENTS	2
2.	UTILITY ENGINEERING SERVICES	3
2.1	UTILITIES SERVICES REVIEW / ANALYSIS	3
2.2	CAPACITY CALCULATION ASSUMPTIONS	3
3.	ELECTRICAL.....	4
3.1	ELECTRICAL MAXIMUM DEMAND	4
3.2	EXISTING SERVICES	5
3.3	NEW SUBSTATION OPTIONS FOR THE DEVELOPMENT	7
3.4	SUMMARY & CONCLUSIONS	9
4.	NATURAL GAS	11
4.1	GAS MAXIMUM DEMAND	11
4.2	EXISTING SERVICES	11
4.3	JEMENA INFRASTRUCTURE IN THE VICINITY OF THE SITE.....	11
4.4	SUMMARY AND CONCLUSIONS.....	12
5.	TELECOMMUNICATIONS.....	13
5.1	TELECOMMUNICATIONS INFRASTRUCTURE IN THE VICINITY OF THE SITE.....	13
5.2	EXISTING SERVICES	13
5.3	SUMMARY AND CONCLUSIONS.....	14
6.	MAINS WATER.....	15
6.1	WATER MAXIMUM DEMAND	15
6.2	EXISTING SERVICES	15
6.3	MAINS WATER INFRASTRUCTURE IN THE VICINITY OF THE SITE	15
6.4	SUMMARY AND CONCLUSIONS.....	16
7.	SEWER	17
7.1	SEWER MAXIMUM DEMAND	17
7.2	EXISTING SERVICES	17
7.3	SEWER INFRASTRUCTURE IN THE VICINITY OF THE SITE	17
7.4	SUMMARY & CONCLUSIONS	17

1. INTRODUCTION

1.1 General

M Projects has commissioned IGS to issue building engineering services due diligence report for the proposed new mixed-use development proposed for Melrose Park.

This report has been prepared solely for M Projects. No warranty is provided to third parties who rely on this report for any other purpose.

1.2 The Site

The site is approximately 7,941 m² in size (Figure 1) and situated at 19 Hope St and 69 – 77 Hughes Ave.



Figure 1 – Site Plan (Source: Six Maps 2020)

1.3 End Use

The proposed mixed use development will consist of:

- residential units;
- commercial/retail space; and
- underground basement carparking.

It is assumed that the carpark will be underground and will require carpark ventilation. The effective building height(s) is assumed to be in excess of 25m in height, therefore **it will** require stair pressurisation, smoke management systems, EWIS, sprinkler protection throughout sprinkler/hydrant tanks and emergency lifts to comply with the BCA.

This report presents the findings of a desk study review with respect to:

- Utility infrastructure (electrical, mains water, natural gas, sewer, telecommunications) assessment.

1.4 BCA Classification

BCA classification(s) of the development are proposed as follows:

BCA Classification	Class 2 Residential/Apartments Class 7a Carpark Class 5 Commercial Class 6 Retail
Rise in Storeys	TBC
Type of Construction	Type A Construction
Effective Height	TBC

1.5 Mandatory BCA Energy Efficiency Requirements

Mandatory BCA Energy Efficiency requirements are as follows:

- Part J1 – Building Fabric;
- Part J2 – External Glazing;
- Part J3 – Building Sealing;
- Part J5 – Air Conditioning and Ventilation;
- Part J6 – Lighting and Power;
- Part J7 – Hot Water Supply.

Additional Requirements:

- Parramatta Council Requirements;
- BASIX (residential);
- NaTHERS (residential);
- Apartment Design Guide (residential);
- Section J (NCC).

2. UTILITY ENGINEERING SERVICES

2.1 Utilities Services Review / Analysis

A utilities review has been carried out in consultation with the relevant local authorities to identify the existing utilities at the site.

Dial Before You Dig (DBYD) requests were submitted on the 20th November 2020 to investigate the presence of existing utilities such as natural gas, water, stormwater, sewer, and telecommunications.

The following utilities with interests/assets in the vicinity of the site were notified in this process:

Seq. No.	Authority Name	Phone	Status
104082091	Ausgrid	0249510899	NOTIFIED
104082090	Endeavour Energy	0298534161	NOTIFIED
104082098	FibreconX Pty Ltd	0420985185	NOTIFIED
104082094	Jemena Gas North	1300880906	NOTIFIED
104082096	NBN Co, NswAct	1800626329	NOTIFIED
104082093	Optus and/or Uecomm, Nsw	1800505777	NOTIFIED
104082095	Sydney Water	132092	NOTIFIED
104082092	Telstra NSW, Central	1800653935	NOTIFIED
104082089	TPG Telecom (NSW)	1800786306	NOTIFIED
104082097	Viva Energy Australia Ltd (Gore Bay)	1800945223	NOTIFIED

Figure 2 – Dial Before You Dig Responders

2.2 Capacity Calculation Assumptions

The following assumptions have been made in carrying out this assessment with regards to the proposed development:

- Site area 7,941 m²;
- Average population of 2.5 persons per apartment;
- Water demand 75 kL/day;
- Sanitary / Sewer Discharge 70 kL/day;
- Gas 6000 MJ/h diversified load;
- Fire Sprinkler System 18 L/s;
- Fire Hydrant System 20 L/s.

3. ELECTRICAL

3.1 Electrical Maximum Demand

Based on our preliminary electrical maximum demand calculations, the new development will require approximately 1942.9 A, or 1346 kVA. This load is subject to final residential numbers, retail spaces intended use and General/Back of House areas. Assuming that the cooktops will be gas and not electric.

The detailed maximum demand calculation is presented below:

Electrical Maximum Demand Calculation							
19 Hope St & 69-77 Hughes Av, Melrose Park							
180 Unit Residential Development							
1500m ² of Commercial/Retail							
Job No: EN - N20_280							
Residential							
Basements	Area (m ²)	Quantities	VA/m ²	VA	I (A)	Subdivided I (A)	
Carpark (Mechanically Ventilated)	16000		5	80000	114.3		
Common Space				0	0.0		
Carpark Lighting	16000		5	80000	114.3		
						228.6	
General	Area (m ²)	Quantities	VA/m ²	Load (A)	VA	I (A)	Subdivided I (A)
Common Space	5000		5		25000	35.7	
Communal Space	5000		5		25000	35.7	
Landscape Lighting	5000		5		25000	35.7	
Lifts		8		60		300.0	
						407.1	
Apartments	Area (m ²)	Quantities	VA/Bed		VA	I (A)	Subdivided I (A)
2 Bed (Average)		180	3000		540000	771.4	
						771.4	
Commercial							
Commercial	Area (m ²)		VA/m ²		VA	I (A)	Subdivided I (A)
Office/Retail	1500		250		375000	535.7	535.7
Total (without ADMD)							1942.9

Figure 3 - Preliminary Maximum Demand

The redevelopment of the site will most likely necessitate two (2) new onsite substations.

To accommodate the new development load 2 x 1,000 kVA transformer substations will be required.

Based on maximum demand calculations, following substation arrangements need to be considered:

Option 1 – 2 x kiosk substation;

Option 2 – 1 x chamber substation;

3.2 Existing Services

Based on infrastructure plans provided by Endeavour Energy, existing HV infrastructure is located on the southern side of the site within Hope St which will be most likely be the point of connection for the new on-site substations.

The capacity of this feeder will be determined once an application for connection has been lodged to the authorities. However the it is envisaged that the HV feeders will have the capacity to service the projected development load.



Figure 4 – HV infrastructure in the vicinity of the Site (source: Endeavour Energy)



Figure 5 – LV infrastructure in the vicinity of the Site (source: Endeavour Energy)



Figure 6 – HV Transmission in the Site (source: Six Maps)



Figure 7 – HV Transmission in the Site (source: Google Maps)

It is noted that there is HV transmission lines and towers reticulating through the site. It is envisaged that the transmission towers and overhead lines are remaining in place “as is” and that the development will be planned around these assets.

3.3 New Substation Options for the Development

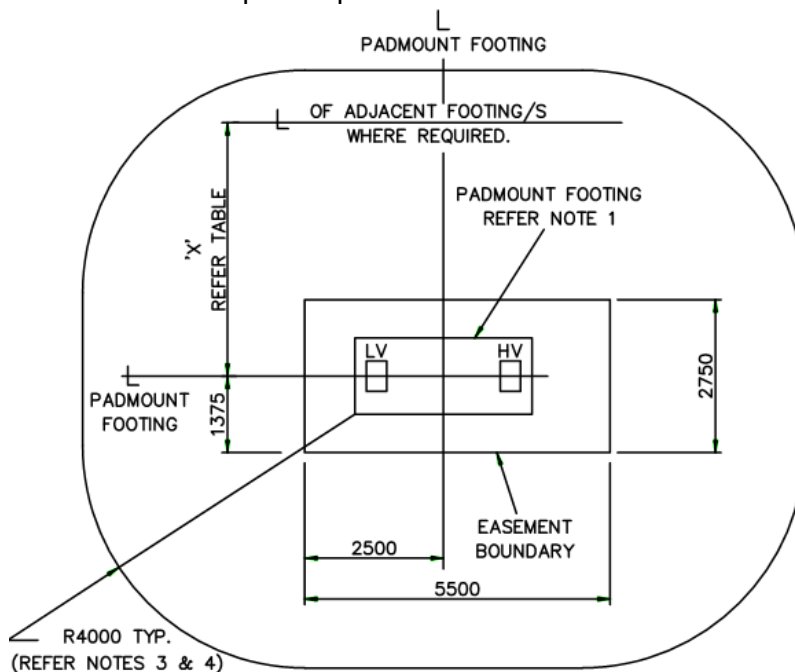
3.3.1 Option 1 – Kiosk Substation

Quantity Required

If kiosk substations are considered, then two (2) would be required of 1,000kVA capacity each.

Spatial Requirements

Below are some spatial options for kiosk substations:



Special Requirements

Kiosk substations have the following special requirements:

- The substation easement is most preferred to be flushed against the property boundary;
- No overhead structures; electrical/civil/architectural are allowed above the substation Easement;
- Easement must be located as such that the substation cubicle is 3m from the neighbouring Boundary;
- 24/7 access to the substation must be provided with parking at the frontage of the substation;
- Any building structure within 3m of the substation cubicle must be 3hr fire rated and 2kPa blast resistant;
- Minimum 6m clearance must be maintained from the substation cubicle to any opening/ventilation duct of any surrounding building;
- No fixed glass/windows within 3m of substation cubicle;
- No utilities, other services or any foreign structures are allowed to encroach the substation easement (no water tank or telco pits within 5m of substation);
- The easement must comply with 1:100 year floor level.

Advantages

The following are advantages associated with kiosk substations:

- More flexible with respect to splitting up and locating closer to the respective loads rather than one main substation;
- Cost effective;
- Space efficient;
- No construction costs associated for special purpose rooms.

Disadvantages

The following are disadvantages associated with kiosk substations:

- Not aesthetically pleasing;
- Segregation constraints.

3.3.2 Option 2 – Chamber Substation

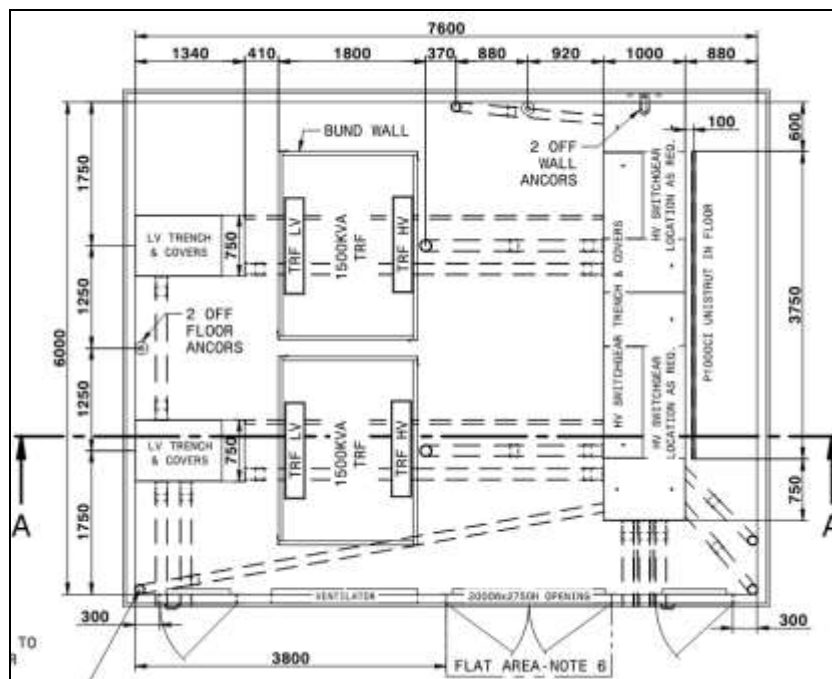
Quantity Required

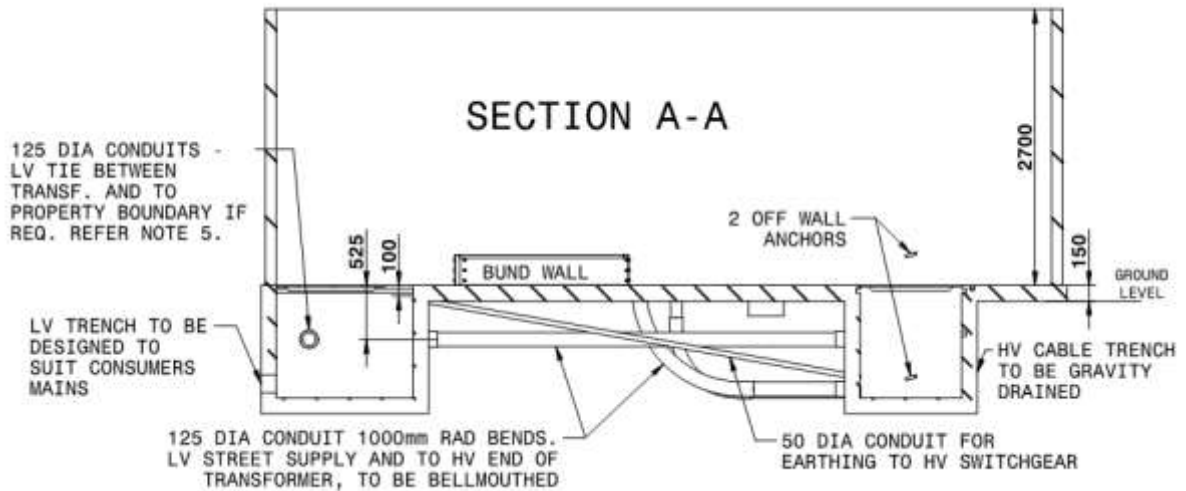
If a chamber substations is considered, then one (1) would be required of 2 x 1,000kVA transformer capacity.

Spatial Requirements

A room of approximately 46m² is required for a chamber substation.

Below is an example of this installation:





Special Requirements

Chamber Substations have the following special requirements:

- Must be located off vehicular road for direct street access by Endeavour Energy trucks.
- Can be sited on suspended slabs;
- Front door louvres must be 6m (stringline) from any openable windows;
- Front door louvres be 6m (stringline) blast zone from apartments and/or balconies;
- Any walls must be 3hr fire rated; and
- Minimum 3m floor to ceiling space.

Advantages

The following are advantages associated with mini subs:

- Aesthetically pleasing;
- Reduced blast zones.

Disadvantages

The following are disadvantages associated with the chamber substation:

- Construction costs associated with building the special purpose space;
- More expensive than kiosks because rooms will be required and individual equipment (ie. switchgear, transformers, boards, etc.) will require onsite installation.

3.4 Summary & Conclusions

The following items will need to be further considered with respect to the electrical services associated with the site:

- Connecting to existing HV feeders;

-
- Undergrounding of existing overhead assets on Hughes Ave (subject to Council DA Conditions);
 - Existing transmission cables to be coordinated with proposed overall building design as well as future EMI / EMR studies.

4. NATURAL GAS

4.1 Gas Maximum Demand

The gas maximum demand has been estimated at:

- 8,000 MJ/h diversified load.

This is based on the Heating Ventilation and Air Conditioning (HVAC) System being a reverse cycle, split, air cooled, type system. It has been assumed that centralised hot water plant, cook tops and food retail units will require gas.

4.2 Existing Services

There are no existing gas services on site that will require decommissioning or diversion.

4.3 Jemena Infrastructure in the Vicinity of the Site

There is an existing 32mm NY 210 kPa medium pressure gas mains running through Hughes Ave and a 50mm NY 210kPa medium pressure gas main traversing through Hope St.



Figure 8 – Jemena Natural Gas Infrastructure

4.4 Summary and Conclusions

Jemena have sufficient infrastructure in the vicinity of the site and can easily cater for the proposed new development.

The existing 32mm 210kPa Natural Gas main is the most likely point of connection, subject to Jemena approval.

5. TELECOMMUNICATIONS

5.1 Telecommunications Infrastructure in the Vicinity of the Site

Response from the respective Telecommunication suppliers and NBN shows a 100mm pit and pipe fibre services extending on Hope St fronting the proposed development.

The telecommunications services identified in the vicinity of the site are expected to have the carrying capacity to suit the needs of the proposed development.

It is noted that NBN is applicable to this site.

5.2 Existing Services

There are existing overhead telecommunications assets on the Hope Street frontage of the proposed development.

There are also underground NBN assets in the vicinity of the site. Refer below:



Figure 9 – NBNco infrastructure in the vicinity of the site

5.3 Summary and Conclusions

The following items will need to be further considered with respect to the telecommunication services associated with the site:

- NBNCo has high bandwidth infrastructure in the vicinity of the site and can easily cater for the proposed new development.

6. MAINS WATER

6.1 Water Maximum Demand

Water maximum demand has been estimated as follows:

- Cold Water 30 kL/day;
- Fire Hydrant System 20 L/s;
- Fire Sprinkler System 18 L/s;

6.2 Existing Services

There are no major water services within the site that will need to be decommissioned and/or diverted. Any minor water services within the site, if present, can be readily decommissioned during site works/demolition.

6.3 Mains Water Infrastructure in the Vicinity of the Site

Sydney Water is the responsible authority for the provision of potable water to the site. There is a 100 mm CACL potable water main located in Hope Street and Hughes Ave. In addition to this, there are major 900 and 1200mm CACL water trunk mains in Hope Street.

There is also a 200mm water main at the intersection of Hope and Waratah Street.

Figure 10 below indicates the above-mentioned Sydney Water infrastructure in the vicinity of the site.

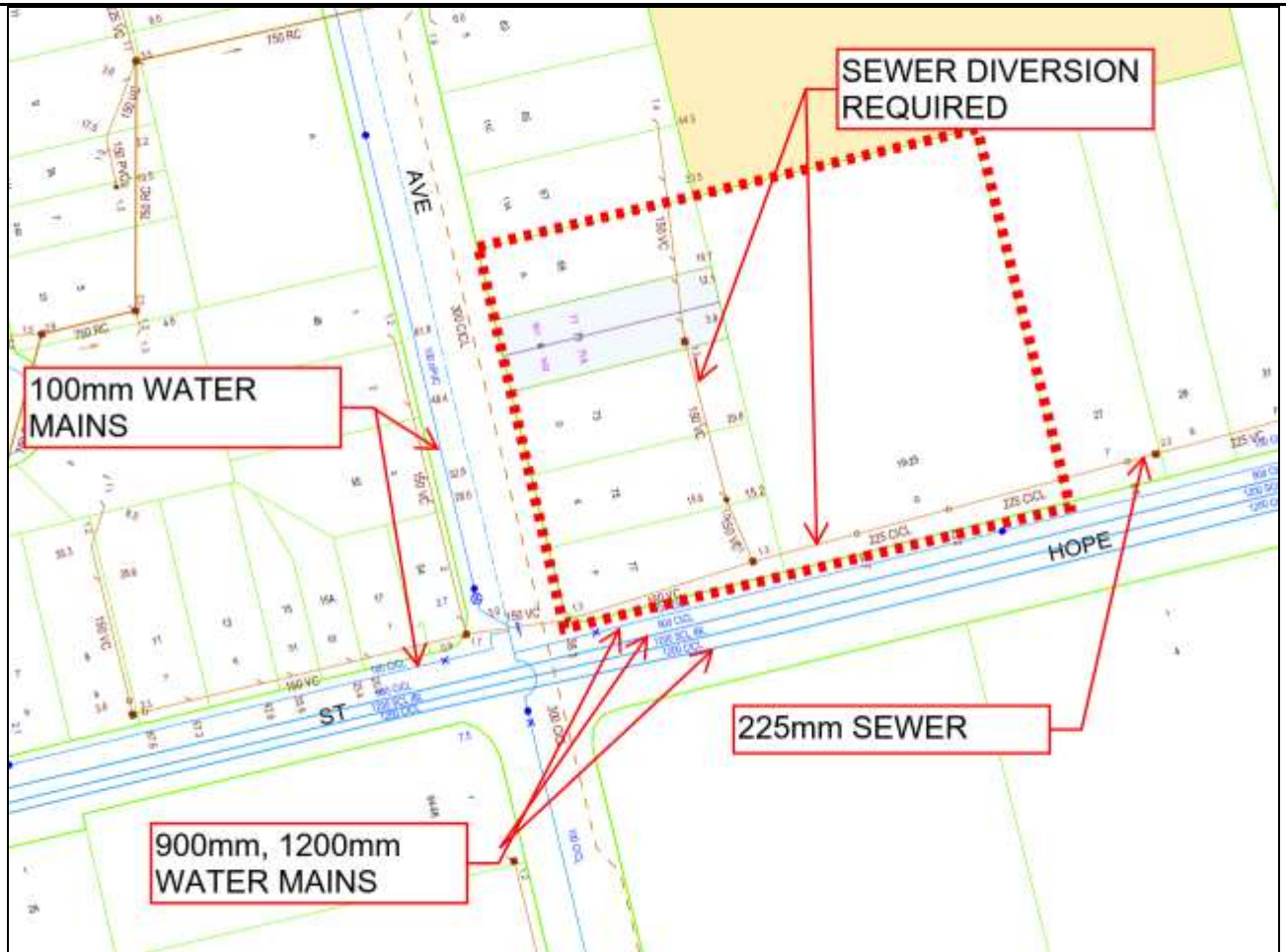


Figure 10 – Sydney Water - Water Infrastructure Map

6.4 Summary and Conclusions

The 100mm mains on Hope Street and Hughes Ave will not be sufficient and the 900 and 1200mm trunk mains in Hope Street are too large.

The nearest suitable water main to connect into is located at the corner of Hope and Waratah Street.

It is likely that a water main upgrade will be necessary to reticulate 200mm water mains to site from the corner of Hope and Waratah Street.

This will be major works and subject to Sydney Water Section 73 – Notice of Requirements (NOR). It is not likely that there will be any issues with servicing the site from the Sydney Water infrastructure in the vicinity of the site.

7. SEWER

7.1 Sewer Maximum Demand

Sewer maximum demand has been estimated as follows:

- Sanitary / Sewer Discharge 25 kL/day.

7.2 Existing Services

There are 150mm and 225mm sewer mains reticulating within the site.

Refer to Figure 10 above for further details.

7.3 Sewer Infrastructure in the Vicinity of the Site

The 150mm and 225mm sewer mains reticulating within the site will require diversion and / or coordination with the proposed new development design.

7.4 Summary & Conclusions

Diversion of the sewer mains within the site are required and can be readily achieved.

The 225mm sewer main in the vicinity of the site will be sufficient to connect the proposed new development into.

This will be major works and subject to a Sydney Water Section 73 – Notice of Requirements (NOR).

PAGE INTENTIONALLY LEFT BLANK