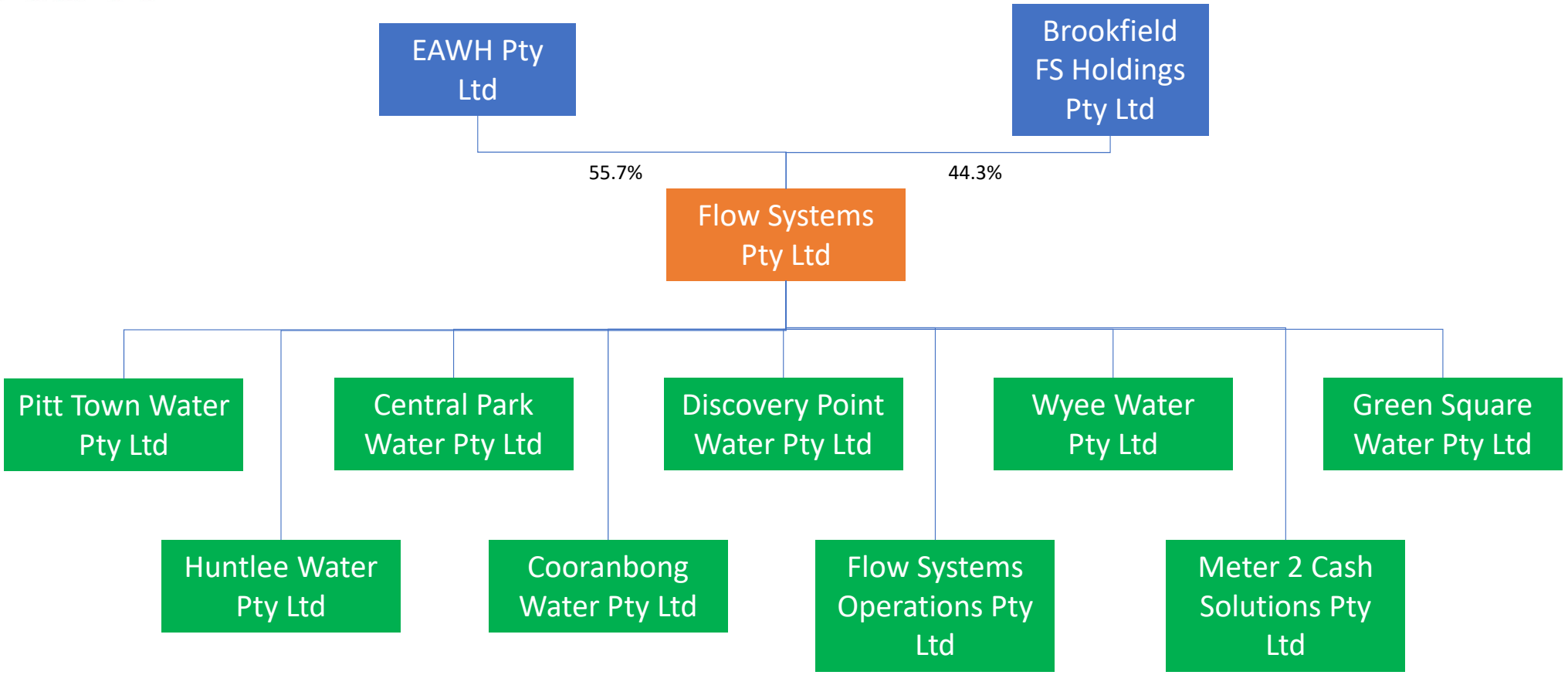
Ownership Structure



Position Description

Position Title	Managing Director/Chief Executive Officer
Reporting to	Board of Directors
Functional team	Executive
Location	Sydney

PURPOSE OF ROLE

The primary purpose of this role is to manage the Flow Systems* Group including its businesses, senior executive staff, and key business relationships to implement the strategies required to achieve the corporate objectives as set out in the Business Plan.

(*to be read as including all Flow Systems' subsidiaries)

KEY RELATIONSHIPS

Direct Reports

- Chief Operating Officer
- Exec Manager Business Development
- Exec Manager Communications & Marketing

Internal stakeholders

- Flow Systems Exec team
- Brookfield Infrastructure
- Board members

External stakeholders

- Clients
- Government
- Regulatory bodies
- Public Utilities
- Regulators (IPART, EPA)
- Key contractors & suppliers

WHS ACCOUNTABILITIES

- Executing a duty of care that ensures the health, wellbeing and safety of self and others at all times
- As a member of the Executive, demonstrating leadership in safe workplace practices consistent with Flow Systems' WHS Policy and Management System procedures
- Proactively identifying unsafe workplace conditions and/or practices and taking preventive and corrective actions as applicable

KEY RESPONSIBILITIES

- Ensure ongoing re-appraisal and updating of Flow Systems' Business Plan and annual budgets
- Provide leadership and direction to the Executive management team to meet the Business Plan targets and objectives
- Review existing corporate policy and develop new policy in conjunction with the Board and in consultation with major stakeholders
- Coordinate and manage key strategic issues related to decentralised utility networks and retail regulation
- Manage the preparation and delivery of reports, consultation papers, guidelines and decisions on matters relating to project origination, network operation and retail businesses

- Plan and implement strategic consultation processes involving key stakeholders such as developers, customers and their representatives, other regulators, government departments and ministers, industry bodies, and other interested parties
- Provide assistance and input into the planning, scoping and management of the work program undertaken by Flow Systems
- Provide support to the Executive team in budgeting, resource and corporate planning and management
- Ensuring the Flow Systems businesses are conducted in accordance with all relevant laws, regulations, and ethical standards and otherwise in line with best market practice
- Represent Flow Systems at meetings of State and Federal development bodies
- Advocate in media and political forums for the efficient use of water through recycled water applications, and the evolution of the private water utility sector in Australia
- Represent Flow Systems on relevant industry associations at board or committee level to determine new initiatives, opportunities, and to enhance the company profile
- Chief spokesperson for the Flow Systems Group
- Increase the profile of Flow Systems by monitoring all opportunities to ensure optimum promotion of the organisation, and represent Flow Systems at a wide variety of events

SKILLS AND EXPERIENCE

- Entrepreneurial, with a vision for the Australian water sector
- Highly developed leadership skills including the ability to maintain positive working relationships
- High-order strategic management skills, together with a proven record of success in the strategic management of other organisations
- Highly developed advocacy, negotiation and stakeholder management skills
- Ability to develop a workplace culture that balances teamwork and independent initiative in a small enterprise environment
- Ability to improve business performance through change management
- Strong skills in troubleshooting, problem-solving, and conflict resolution
- Ability to contribute to a workplace environment that fosters learning, teaching, personal and professional growth, risk-taking, innovation and fun
- Straight forward, self-confident and high self-awareness

KNOWLEDGE AND QUALIFICATIONS

- A strong background and understanding of the water and/or utilities industry
- Highly developed knowledge of the legislative and regulatory frameworks for the water and utilities industries
- At least 15 years' general experience in all aspects of management at a senior level including senior management roles in infrastructure development and delivery projects
- Relevant tertiary qualifications

Position Description

Position Title	Chief Operating Officer
Reporting to	Managing Director/Chief Executive Officer
Functional team	Executive
Location	Sydney

PURPOSE OF ROLE

The primary purpose of this role is to manage all operational activities of the Flow Systems* Group ensuring the implementation of overall organisational strategy.

(*to be read as including all Flow Systems' subsidiaries)

KEY RELATIONSHIPS

Direct Reports

- Exec Manager Project Delivery
- Exec Manager Utility Ops
- Exec Manager Retail Ops
- Finance Manager
- Chief Technology Officer

Internal stakeholders

- Flow Systems Exec team
- Brookfield Infrastructure
- Board members

External stakeholders

- Clients
- Government
- Regulatory bodies
- Public Utilities
- Regulators (IPART, EPA)
- Key contractors & suppliers

WHS ACCOUNTABILITIES

- Executing a duty of care that ensures the health, wellbeing and safety of self and others at all times
- As a member of the Executive, demonstrating leadership in safe workplace practices consistent with Flow Systems' WHS Policy and Management System procedures
- Proactively identifying unsafe workplace conditions and/or practices and taking preventive and corrective actions as applicable

KEY RESPONSIBILITIES

- Support the MD/CEO with ongoing re-appraisal and updating of Flow Systems' Business Plan and annual budgets
- Providing strategic direction, leading, managing and directing all operational activities of the organisation
- Accountability for the overall profitability of the operational activities of the organisation
- Building and aligning the organisational capability to deliver on the Business Plan strategy
- People development, risk and quality management, and innovation to drive growth
- Ensuring all corporate and business unit strategies and plans are aligned, reviewed and successfully implemented – taking remedial action where necessary
- Building relationships between all business units and ensuring the business units receive

adequate operational support

- Providing support and assistance to the MD/CEO on corporate and group issues where required
- Communicating with the MD/CEO to ensure he/she remains fully informed of all significant operating issues
- Acting, as required or in the absence of the MD/CEO, as the chief spokesperson for the organisation
- Directing and motivating direct reports to achieve agreed targets
- Provide support to the Executive team in budgeting, resource and corporate planning and management
- Ensuring the Flow Systems businesses are conducted in accordance with all relevant laws, regulations, and ethical standards and otherwise in line with best market practice
- Oversight of all regulatory compliance monitoring and reporting associated with the respective group businesses
- Develop and support any business relationships vital to the success of Flow Systems
- Ambassador for maintaining/improving the Flow Systems brand to all stakeholders including clients, customers, supply chain, and regulators

SKILLS AND EXPERIENCE

- High-order skills in strategic planning, resource management, financial management, reporting and analysis
- Highly developed advocacy, negotiation and stakeholder management skills
- Excellent communication and presentation skills
- Ability to foster a workplace culture that balances collaboration and independent initiative in a small enterprise environment
- Ability to improve business performance through motivation and change management
- Strong skills in troubleshooting, problem-solving, and conflict resolution
- Ability to contribute to a workplace environment that fosters learning, teaching, personal and professional growth, risk-taking, innovation and fun
- Straight forward, self-confident and high self-awareness

KNOWLEDGE AND QUALIFICATIONS

- A strong background and understanding of business management and corporate processes
- Well-developed knowledge of the legislative and regulatory frameworks for the water and utilities industries
- At least 15 years' general experience in all aspects of business management at a senior level
- Relevant tertiary qualifications

Position Description

Position Title	Executive Manager Project Delivery
Reporting to	Chief Operating Officer
Functional team	Project Delivery
Location	Sydney based, with travel to all site locations as required

PURPOSE OF ROLE

The primary purpose of this role is to manage the Project Delivery function of the Flow Systems* business, with overall accountability for project planning, procurement, contract management, design, construction, and project management of all new water industry facilities and network infrastructure delivered by Flow Systems.

(*to be read as including all Flow Systems' subsidiaries)

KEY RELATIONSHIPS

Direct Reports

- Project Managers
- Project Engineers

Internal stakeholders

- Flow Systems Exec team
- Brookfield Infrastructure
- Board members

External stakeholders

- Property Developers
- Other clients (eg. Councils)
- Contractors & Suppliers
- Public Utilities
- Regulators (IPART, EPA)

WHS ACCOUNTABILITIES

- Executing a duty of care that ensures the health, wellbeing and safety of self and others at all times
- As a member of the Executive, demonstrating leadership in safe workplace practices consistent with Flow Systems' WHS Policy and Management System procedures
- Proactively identifying unsafe workplace conditions and/or practices and taking preventive and corrective actions as applicable
- Leading contributor to workplace safety improvements, particularly in relation to infrastructure design, construction and commissioning practices

KEY RESPONSIBILITIES

- CAPEX cost estimating and project delivery methodology and program input to business development and proposals
- Determine the resources needed to achieve project deliverables
- Oversee project program, cost and risk controls to maintain or better the budgeted margin
- Contract management to protect the company's commercial position with both client and supply chain
- Effectively communicate project expectations to team members and stakeholders

- Effectively liaise with project stakeholders on an ongoing basis
- Prepare and present management reports that concisely and accurately provide relevant information concerning the status of projects in delivery phase to the Executive and Board
- Close liaison with Utility Operations and Retail Operations functional teams to provide inputs to project delivery process
- Develop and keep current the systems, standards, policies and procedures required to enable and support industry best practice in all Project Delivery activities
- Educate staff and contractors to ensure implementation of Flow Systems' corporate systems, standards, policies and procedures to meet HSE and QA requirements
- Coordination of all regulatory compliance monitoring and reporting associated with the design and construction of all Flow Systems infrastructure
- Develop and support any business relationships vital to the success of Flow Systems
- Ambassador for maintaining/improving the Flow Systems brand to all stakeholders including clients, customers, supply chain, and regulators

SKILLS AND EXPERIENCE

- Advanced project portfolio/program management, organisational and delegation skills to oversee activities carried out across multiple projects and sites
- Advanced procurement and commercial management skills for large value contracts
- Ability to identify and mitigate risks associated with the delivery of infrastructure
- General understanding of supporting activities and relative sequencing associated with the design and construction of water industry infrastructure (eg. commissioning, metering, customer billing and administration)
- Extensive experience in stakeholder management in a project delivery context
- Ability to work independently in a small enterprise environment
- Ability to improve business performance through change management
- Strong skills in troubleshooting, problem-solving, and conflict resolution
- Ability to contribute to a workplace environment that fosters learning, teaching, personal and professional growth, risk-taking, innovation and fun
- Straight forward, self-confident and high self-awareness

KNOWLEDGE AND QUALIFICATIONS

- A strong background and understanding of the water and/or utilities industry
- Advanced knowledge of statutory and regulatory frameworks for the design and construction of water industry infrastructure and associated utilities
- At least 15 years' experience in project management of infrastructure projects
- At least 10 years' experience in the design and construction of urban infrastructure
- Relevant tertiary qualifications

Position Description

Position Title	Executive Manager Utility Operations
Reporting to	Chief Operating Officer
Functional team	Utility Operations
Location	Sydney based, with travel to all site locations as required

PURPOSE OF ROLE

The primary purpose of this role is to manage the Utility Operations area of the Flow Systems* business, with overall accountability for the commissioning, operation and maintenance of Flow Systems' water industry facilities and network infrastructure.

(*to be read as including all Flow Systems' subsidiaries)

KEY RELATIONSHIPS

Direct Reports

- Utility Operations staff

Internal stakeholders

- Flow Systems Exec team
- Brookfield Infrastructure
- Board members

External stakeholders

- Property Developers
- Public Utilities
- Local Councils
- Regulators (IPART, EPA)
- Contractors & Suppliers

WHS ACCOUNTABILITIES

- Executing a duty of care that ensures the health, wellbeing and safety of self and others at all times
- As a member of the Executive, demonstrating leadership in safe workplace practices consistent with Flow Systems' WHS Policy and Management System procedures
- Proactively identifying unsafe workplace conditions and/or practices and taking preventive and corrective actions as applicable
- Leading contributor to workplace safety improvements, particularly in relation to commissioning, operation and maintenance activities

KEY RESPONSIBILITIES

- Operational input to design, construction and commissioning of all Flow Systems infrastructure
- Approval for handover acceptance and ownership of all Flow Systems infrastructure upon satisfactory completion of inspection/test/commissioning
- Validation and verification of all Flow Systems infrastructure as appropriate
- Coordination of day to day operation and maintenance of all Flow Systems infrastructure
- Close liaison with Retail Operations functional team in support of customer enquiries of a technical nature

- Develop and keep current the systems, standards, policies and procedures required to enable and support industry best practice in all Utility Operations activities
- Coordination of all regulatory compliance monitoring and reporting associated with the operation and maintenance of all Flow Systems infrastructure
- Develop and support any business relationships vital to the success of Flow Systems
- Ambassador for maintaining/improving the Flow Systems brand to all stakeholders including clients, customers, supply chain, and regulators

SKILLS AND EXPERIENCE

- Advanced workforce management, organisational and delegation skills to oversee activities carried out across multiple Utility Operations sites
- Ability to identify, implement and manage all forms of technology associated with water industry infrastructure
- Understanding of project delivery activities and sequencing so as to provide timely and relevant input to ensure future commissioning, operations and maintenance of new assets are optimised
- Extensive experience in customer liaison and service delivery
- Ability to work independently in a small enterprise environment
- Ability to improve business performance through change management
- Strong skills in troubleshooting, problem-solving, and conflict resolution
- Ability to contribute to a workplace environment that fosters learning, teaching, personal and professional growth, risk-taking, innovation and fun
- Straight forward, self-confident and high self-awareness

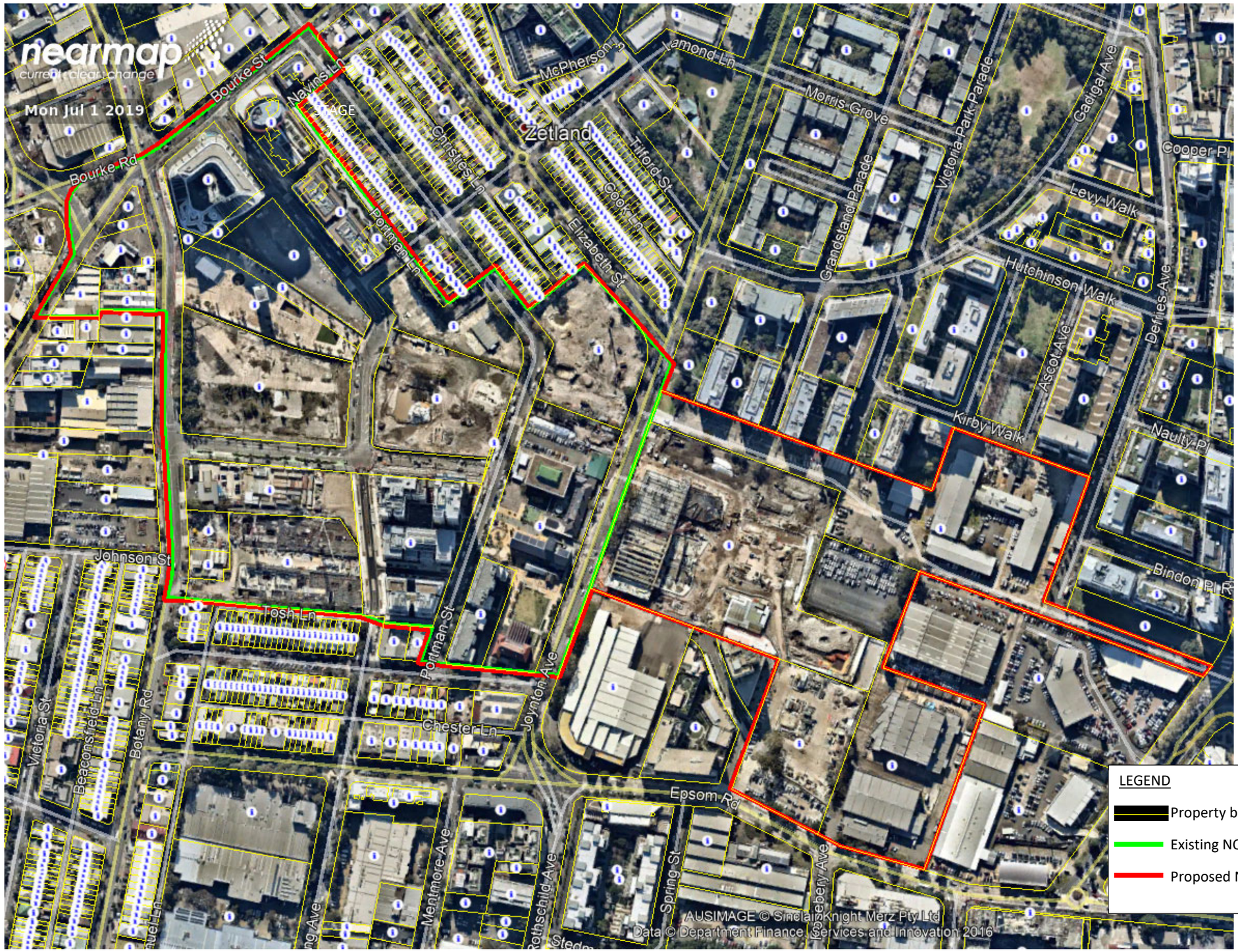
KNOWLEDGE AND QUALIFICATIONS

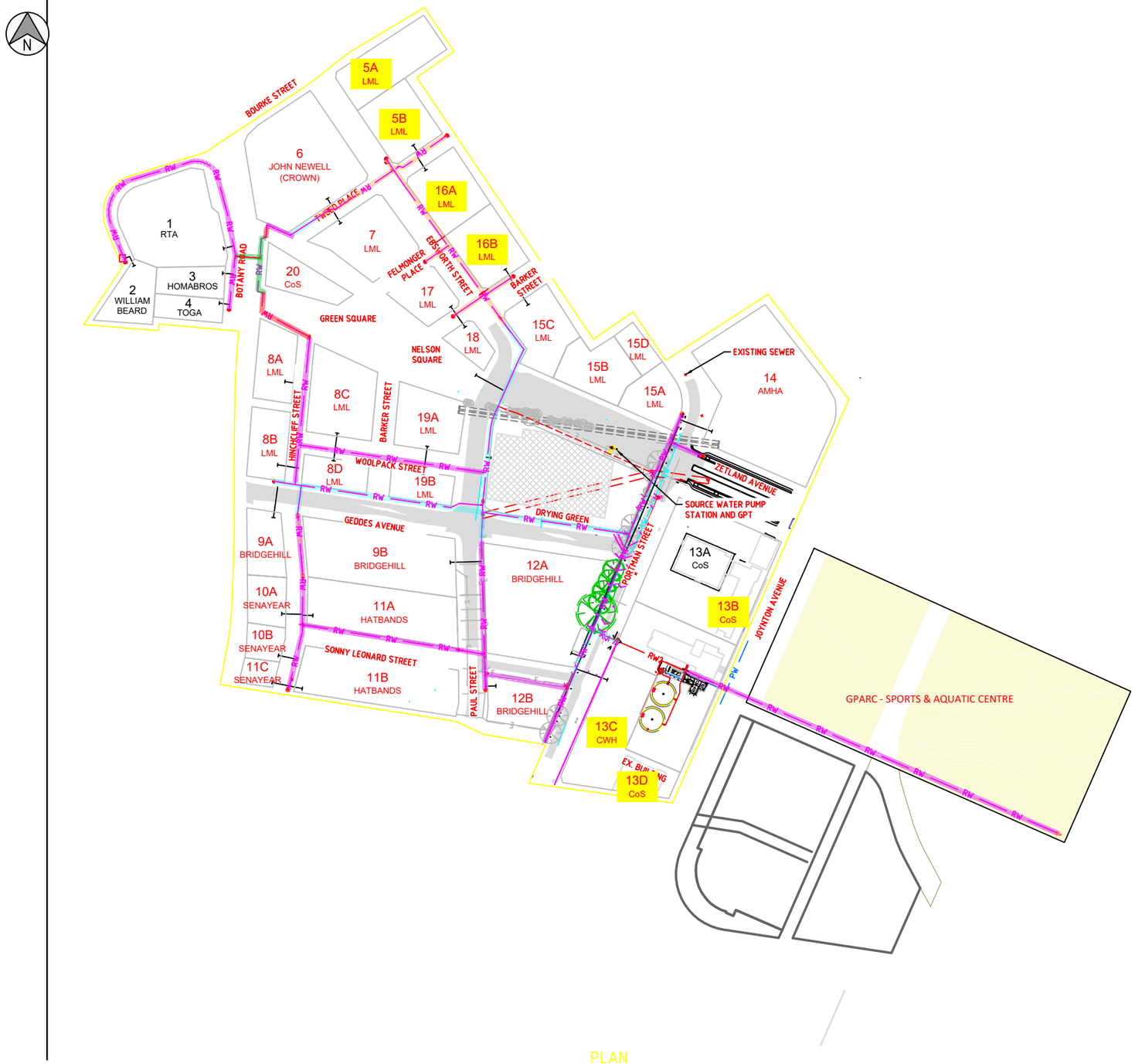
- A strong technical background and understanding of the water and/or utilities industry
- Advanced knowledge of statutory and regulatory frameworks for the operation of water industry infrastructure and associated utilities
- At least 15 years' experience in the operation and maintenance of sewage and recycled water treatment facilities
- At least 10 years' experience in the operation and maintenance of water and sewerage reticulation systems
- Relevant tertiary qualifications

Flow Systems Utilities

PROJECT NO.	PROJECT NAME	RSL Status	LOCATION			SERVICES				CLIENT DETAILS		UTILITY DETAILS					
			LOCATION	STATE	LGA	WASTEWATER	RECYCLED WATER	DRINKING WATER	ULTIMATE RESIDENTIAL CAPACITY	CLIENT	Construction to commence	UTILITY NAME	NETWORK OPERATOR	WICA NOL No.	RETAILER	WICA RSL No.	DATE OF RSL VARIATION
1	PITT TOWN	Confirmed	Pitt Town	NSW	Hawkesbury	W	R		943	JPG	2010 Q4	Pitt Town Water	Pitt Town Water P/L	10_014	Flow Systems P/L	13_001R	11/11/2010
2	DISCOVERY POINT	Confirmed	Wolli Creek	NSW	Rockdale	W	R	D	1,654	FRASERS	2014 Q1	Discovery Point Water	Discovery Point Water P/L	13_025	Flow Systems P/L	13_001R	7/07/2014
3	CENTRAL PARK	Confirmed	Chippendale	NSW	City of Sydney	W	R	D	2,166	FRASERS	2013 Q2	Central Park Water	Central Park Water P/L	12_022	Flow Systems P/L	13_001R	17/04/2013
4	WYEE	Confirmed	Wyee	NSW	Lake Macquarie	W	R	D	818	WYEE DEV'T FUND	2014 Q1	Wyee Water	Wyee Water P/L	14_026	Flow Systems P/L	13_001R	20/10/2014
5	HUNTLEE	Confirmed	North Rothbury	NSW	Cessnock & Singleton	W	R	D	7,500	LWP	2016 Q2	Huntlee Water	Huntlee Water P/L	15_030	Flow Systems P/L	13_001R	27/08/2015
6	GREEN SQUARE TOWN CENTRE	Confirmed	Zetland	NSW	City of Sydney		R		4,100	CITY OF SYDNEY	2015 Q1	Green Square Water	Green Square Water P/L	15_031	Flow Systems P/L	13_001R	27/08/2015
7	COORANBONG	Confirmed	Cooranbong	NSW	Lake Macquarie	W	R	D	2,104	JPG	2017 Q1	Cooranbong Water	Cooranbong Water P/L	15_033	Flow Systems P/L	13_001R	22/05/2015
8	BELLBIRD	Submitted	Bellbird	NSW	Cessnock	W	R	D	1,650	JPG	2019	Bellbird Water	Flow Systems Operations P/L	TBC	Flow Systems P/L	13_001R	TBC
9	BOX HILL	Confirmed	Box Hill	NSW	The Hills	W	R		4,100	CELESTINO	2016 Q2	Box Hill Water	Flow System Operations P/L	16_037	Flow Systems P/L	13_001R	12/05/2016
10	SHEPHERDS BAY	Confirmed	Meadowbank	NSW	Ryde	W	R	D	1,786	HOLDMARK, BROOKFIELD	2016 Q3	Shepherds Bay Plus	Flow Systems Operations P/L	17_042	Flow Systems P/L	13_001R	13/10/2017
11	GLOSSODIA	Submitted	Glossodia	NSW	Hawkesbury	W	R	?	580	CELESTINO	2019	Glossodia Water	Flow Systems Operations P/L	TBC	Flow Systems P/L	13_001R	TBC

Green Square Town Centre





PLAN
SCALE 1:1250

0 12.5 25 37.5 50 62.5m
SCALE IN METRES (1:1250 AT A1)

Q:\Engineering\Reticulation\01 Masterplan\Green Square Water Reuse Scheme Overall Site Plan Rev H.dwg

LOT No.	STAGE	CONNECTION DATE
1	2	JAN-23
2	2	JAN-23
3	2	JAN-23
4	2	JAN-23
5A	1A	APR-18
5B	1A	APR-18
6	1A	DEC-18
7	1A	OCT-19
8A	2	MAY-20
8B	2	MAY-20
8C	2	APR-26
8D	2	FEB-26
9A	2	SEP-19
9B	1B(2)	SEP-19
10A	1B(1)	SEP-19
10B	1B(1)	MAY-19
11A	1B(1)	DEC-19
11B	1B(1)	JAN-20
11C	1B(1)	JUN-19
12A	1C	DEC-18
12B	1B(2)	DEC-18
13A	1C	JAN-20
13B	1C	APR-18
13C	1C	JAN-16
13D	1C	APR-18
14	1C	JAN-20
15A	1A	FEB-22
15B	1A	DEC-21
15C	1A	DEC-21
15D	1A	DEC-21
16A	1A	OCT-16
16B	1A	OCT-16
17	1A	JUNT-20
18	1A	JUN-20
19A	2	SEP-23
19B	2	FEB-24
20	1C	18/06/2018

ALL DESIGN BY GREEN SQUARE WATER

CUSTOMER CONNECTION POINT (INDICATIVE ONLY)

FUTURE CUSTOMER CONNECTION POINT (INDICATIVE ONLY)

DEAD END WITH FLUSHING POINT AND POTENTIAL FUTURE EXTENSION POINT

STAGE 1A INSTALLED BY MIRVAC

STAGE 1C INSTALLED BY FLOW

STAGE 2 - BOTANY RD INSTALLED BY ERTECH

STAGE 2 - LIBRARY PLAZA - INSTALLED BY JHG

NOT INSTALLED

NOT FOR CONSTRUCTION

REV.	ZONE	REVISION	DATE	APP'D
G				
F		DETAILED DESIGN	01/15	SMM
E		UPDATED STAGE TABLE AND LEGEND	08/14	SMM
D		CONCEPT DESIGN - FINAL	07/14	SMM
C		RETICULATION ALIGNMENTS UPDATED	07/14	SMM

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DESIGNED	DRAWN	PROJECT MGR.
S. MORRIS 10/13	A. DODSON 10/13	D. WHARTON
DESIGN CHECK	DRAFT CHECK	
M. SALES 07/14	K. PATEL 07/14	
APPROVED		
S. MORRIS		

Green Square Water

GREEN SQUARE TOWN CENTRE - SYDNEY
GREEN SQUARE WATER REUSE SCHEME
OVERALL SITE PLAN

DO NOT SCALE
AS SHOWN
DRAWING NUMBER
GSW-130912-1140-OSP
NUMERAL | REV

The original drawing was signed by persons marked (*)

CMP Filename:http//turtle/drawing/archives/sewerage/tplants/native/##########.dwg

A1

GREEN SQUARE WATER

WATER BALANCE SUMMARY REPORT

PREPARED BY KINESIS FOR FLOW SYSTEMS

7 AUGUST 2015

Prepared by Kinesis
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Sydney, 2000 NSW
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Document Version
Final

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Cover Image Credits
Flow, 2015

Note: This report is provided subject to some important assumptions and qualifications:

The results presented in this report are modelled estimates using mathematical calculations. The data, information and scenarios presented in this report have not been separately confirmed or verified. Accordingly, the results should be considered to be preliminary in nature and subject to such confirmation and verification.

Energy, water and greenhouse consumption estimates are based on local climate and utility data available to the consultant at the time of the report. These consumption demands are, where necessary, quantified in terms of primary energy and water consumptions using manufacturer's data and scientific principles.

Generic precinct-level cost estimates provided in this report are indicative only based on Kinesis's project experience and available data from published economic assessments. These have not been informed by specific building design or construction plans and should not be used for design and construct cost estimates.

The Kinesis software tool and results generated by it are not intended to be used as the sole or primary basis for making investment or financial decisions (including carbon credit trading decisions). Accordingly, the results set out in this report should not be relied on as the sole or primary source of information applicable to such decisions.

CONTENTS

EXECUTIVE SUMMARY

The Green Square development is a proposed residential development near Alexandria in the local government area of the City of Sydney. Green Square Water proposes to provide recycled water to **4,320** apartments on **15 ha** and include **156,000 m²** of retail, commerce and office space and **1.6 ha** of public gardens and plazas.

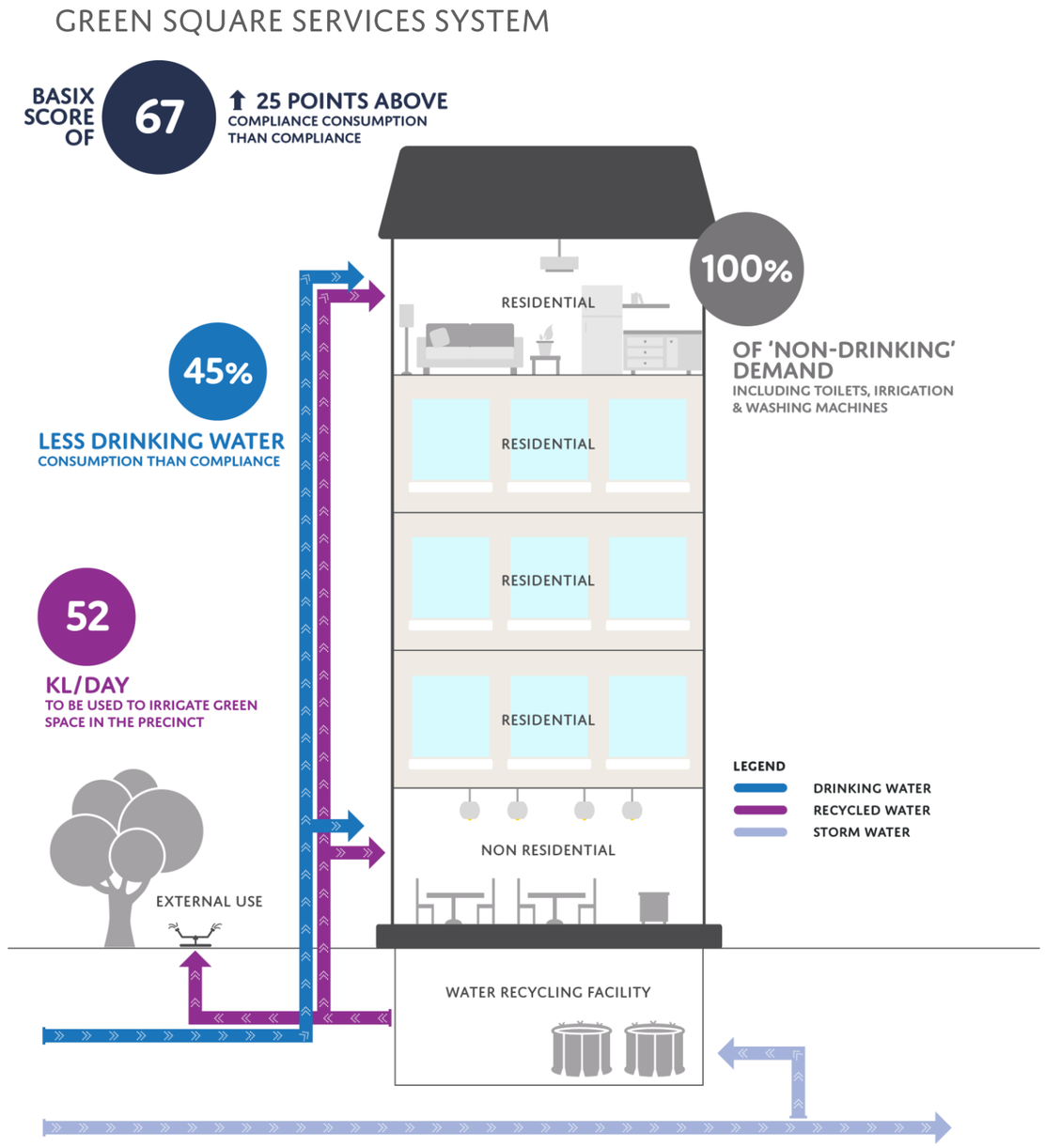
Green Square Water will operate a recycled water scheme that incorporates a combined membrane bioreactor and ultrafiltration system with a **1 ML** storage tank. The system will take inflows from two stormwater culverts and provide recycled water for:

- Residential use in
  - Toilets
  - Washing Machines (cold only)
  - Car washing

- Non-residential use in
  - Toilets
  - Washing machines (cold only)
  - Irrigation
  - Washdown, and
  - Water features.

These end-uses will be supplied by **100% recycled water**, with no potable top-up required.

With the recycled water scheme, dwellings in the precinct are expected to achieve, on average, a **BASIX Water score of 67**. Furthermore, to achieve BASIX Water targets without the recycled water scheme, dwellings at Green Square would be required to install centralised rainwater tanks connected to both toilet flushing and external use.



1. PROJECT DETAILS

This report documents the water balance analysis of Green Square development in order to inform the delivery of a recycled water scheme.

The Green Square development is a proposed residential development near Alexandria in the local government area of the City of Sydney. Ultimately it will comprise 4,320 apartments on 15 ha and include 156,000 m^2 of retail and commerce/office space and 1.6 ha of public gardens. Analysis in this report outlines the results and performance outcomes for Green Square. This analysis is undertaken based on figures provided by Flow Systems (see Figure 1 and Table 1) using Kinesis's C^{CAP} Precinct modelling tool. C^{CAP} Precinct is a land use and planning tool that models key environmental, economic, social and infrastructure implications and requirements for precinct-scale development projects.

The report is structured as follows:

- Summary of Outcomes and Benefits
- Water Demands
- Source Water Production
- Recycled Water System Performance
- Project Staging

Land Use	Area
Total Development Area	**15 ha**
Public Space	
Road area	1.7 ha
Public Gardens	0.8 ha
Public Plazas	0.8 ha
Total public space	**5.2 ha**
Non-Residential Land Use	
Retail	14,092 m^2
Commerce/Office	141,668 m^2
Total non-residential	**155,760 m^2**
Residential Dwellings	
Apartments	4,320
Total dwellings	**4,320**

Table 1: Dwelling yield and floor space for the Green Square Precinct.

GREEN SQUARE MASTER PLAN

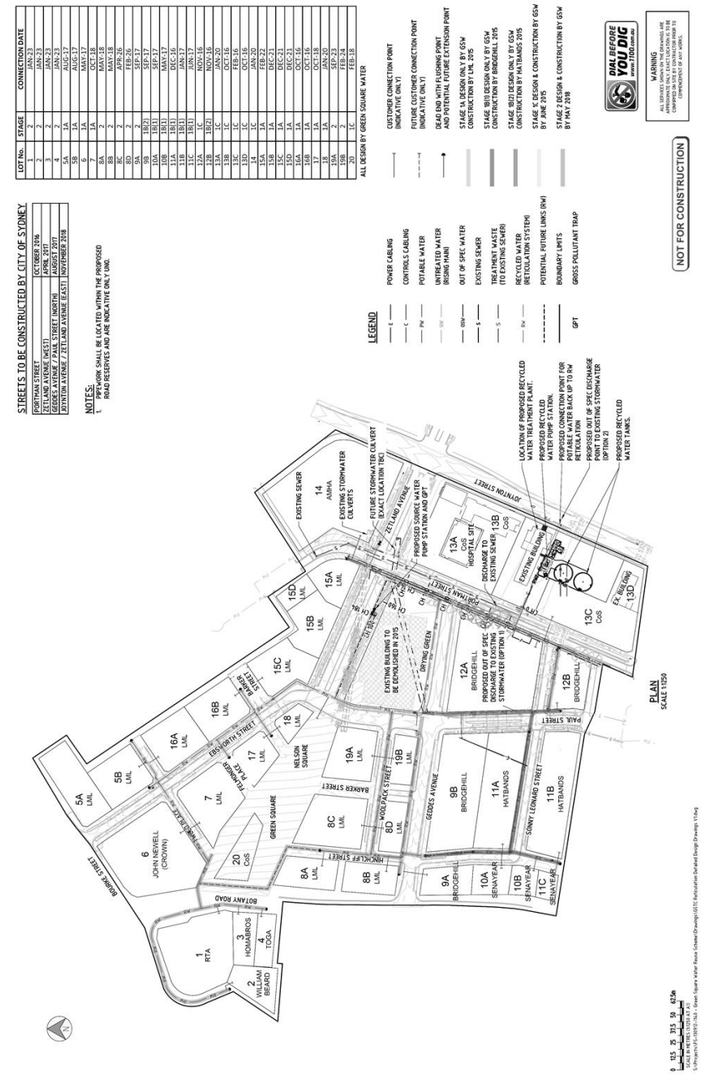


Figure 1: Green Square Master Plan

2. WATER DEMANDS

2.1 RESIDENTIAL WATER DEMANDS

Residential water demands were calculated based on the specific residential building types proposed for the Green Square development. The details of the dwelling type configuration are outlined in Tables 2 and 3. Monthly total and daily average residential water demands by end use are outlined in Figures 3 and 4. Month to month variation is evident due to changes to irrigation water demands based on rainfall and evaporation profiles. Monthly internal total demands vary slightly due to differences in the number of days per month.

APARTMENT DAILY WATER BALANCE

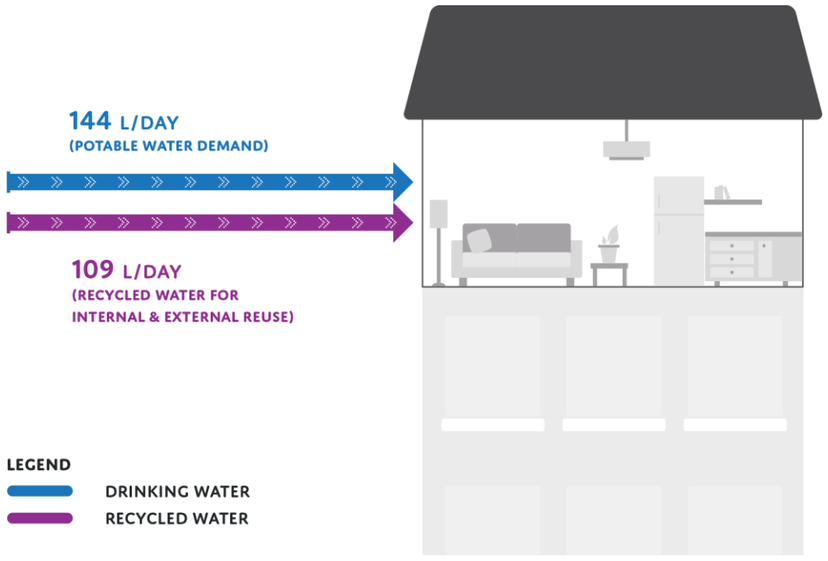


Figure 2: Schematic showing a single apartment's expected daily drinking and recycled water consumption.

NOTE: Wastewater is discussed further in Section 3 - Source Water Production.

RESIDENTIAL DWELLING SPECIFICATIONS

Dwelling type	Number	Bedrooms	Occupancy	EP
Apartments				
3-bedroom	432	3	2.57	1108
2-bedroom	2160	2	1.99	4300
1-bedroom	1728	1	1.32	2275
TOTAL	**4,320**	**-**	**-**	**7,684**
AVE. DWELLING		**1.7**	**1.78**	

Table 2: Residential dwelling specifications used in the analysis

RESIDENTIAL END USE SPECIFICATIONS AND AVERAGE DEMANDS

Water End Use	Technology	Per Person Demand L/day			Development Demand kL/day		
		DW	RW	Total	DW	RW	Total
Shower	4 star WELS	28.5	-	28.5	218.6	-	218.6
Kitchen Sink	5 Star WELS	7.0	-	7.0	54.0	-	20.5
Bathroom Basin	5 Star WELS	1.4	-	1.4	10.7	-	4.0
Dishwasher	2.5 Star WELS	3.0	-	3.0	23.1	-	8.7
Laundry trough	-	5.0	-	5.0	38.4	-	38.4
Bath	-	8.7	-	8.7	66.8	-	66.8
Leaks	-	20.5	-	20.5	157.5	-	157.5
Toilet	4 star WELS	-	17.5	17.5	-	134.7	51.0
Washing Machine	2 star WELS	6.9	39.2	46.1	53.1	301.1	134.1
Fire Test	-	-	0.3	0.3	-	2.6	2.6
Car Washing + External	-	-	4.0	4.0	-	30.7	30.7
TOTAL	**-**	**81.0**	**61.1**	**142.0**	**622.2**	**469.1**	**733.0**
AVE. DWELLING		**144.0**	**108.6**	**252.6**			

Table 3: Residential dwelling end use specifications and average per person daily demands used in the analysis
(DW = Drinking water demand, RW = Recycled water demand)

TOTAL RESIDENTIAL WATER DEMANDS

Figure 3: Total residential total water demands by end use, by month

AVERAGE DAILY RESIDENTIAL WATER DEMANDS

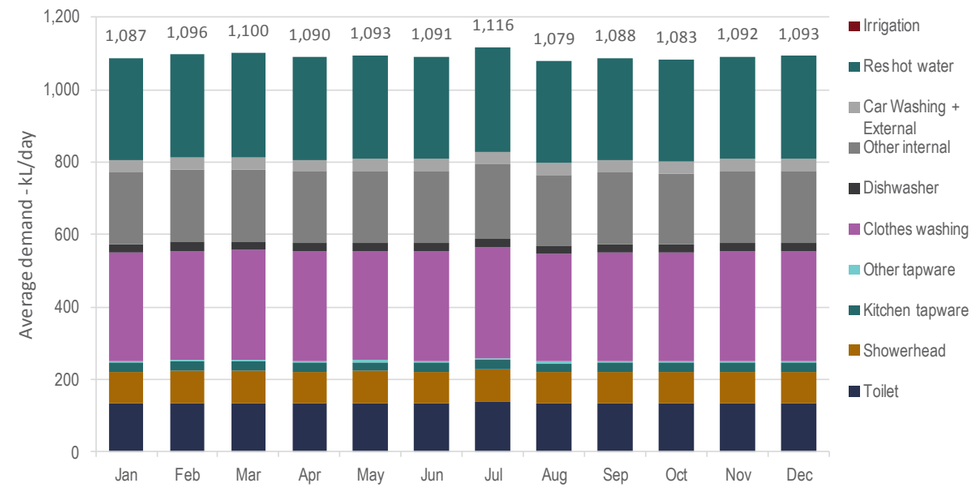


Figure 4: Average daily residential water demands by end use, by month

TEMPERATURE AND RAINFALL EVAPORATION AT GREEN SQUARE

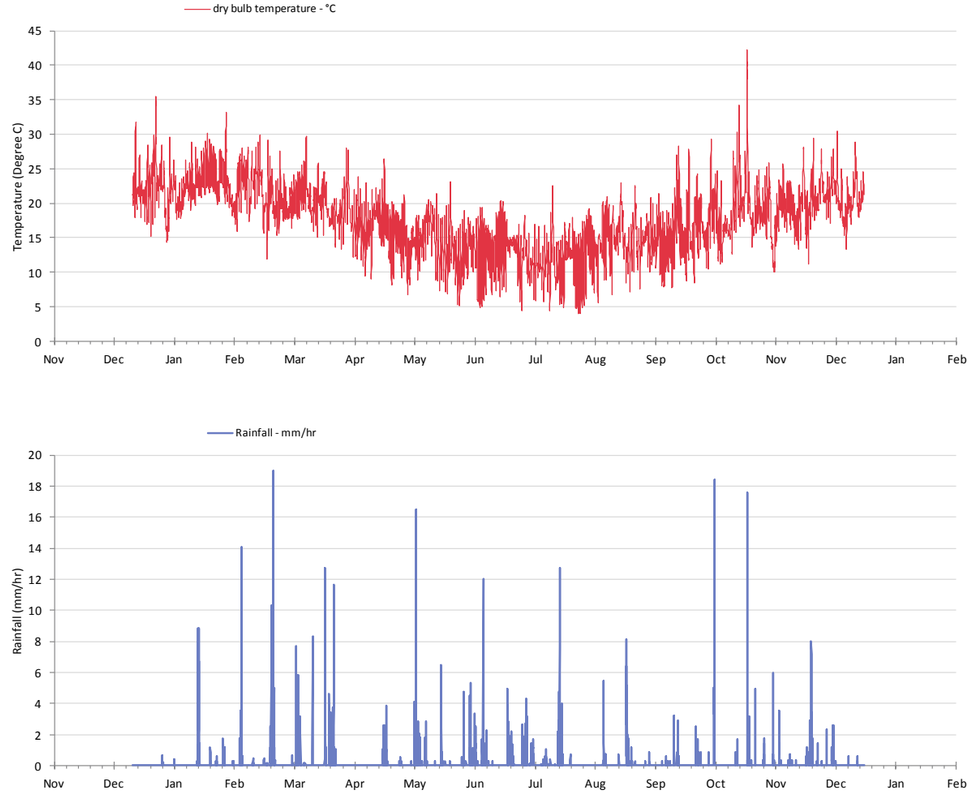


Figure 5: Dry bulb temperature, historic average rainfall and pan evaporation for local climate zone.

2.2 NON-RESIDENTIAL WATER DEMANDS

Non-Residential water demand was calculated based on the specific retail, community and open space proposed for the Green Square development.

Details of the building type configuration are outlined in Table 4. Median Practice is assumed to be current average practice and is derived from various sources, including Sydney Water Best Practice Guidelines for water conservation in commercial office buildings and shopping centres (see Appendix).

Monthly total and daily average non-residential water demands by end use are outlined in Figures 6 and 7. Monthly internal total demands vary due to differences in the number of days per month. Month to month variation is only evident in changes to irrigation water demand based on rainfall and evaporation profiles.

NON-RESIDENTIAL SPECIFICATIONS - TOTAL

Demand Hierarchy	Water End Use	Area (m2)	Per m2 demand L/day			Development Demand kL/day		
			DW	RW	Total	DW	RW	Total
1	Retail	14,000	1.4	0.4	1.8	7.0	1.8	8.8
2	Commerce/Office	142,000	0.5	1.3	1.8	0.0	32.6	32.6
3	Public Plazas	8,000	0.0	0.1	0.1	0.0	0.8	0.8
4	Public Gardens	8,000	0.0	1.5	1.5	0.0	11.6	11.6
5	Other Irrigation	29,000	0.0	1.4	1.4		39.6	39.6
				TOTAL		7.0	86.5	93.5

Table 4: Non-Residential specifications and average annual demands used in the analysis
DW = Drinking water demand, RW = Recycled water demand

TOTAL NON-RESIDENTIAL WATER DEMANDS

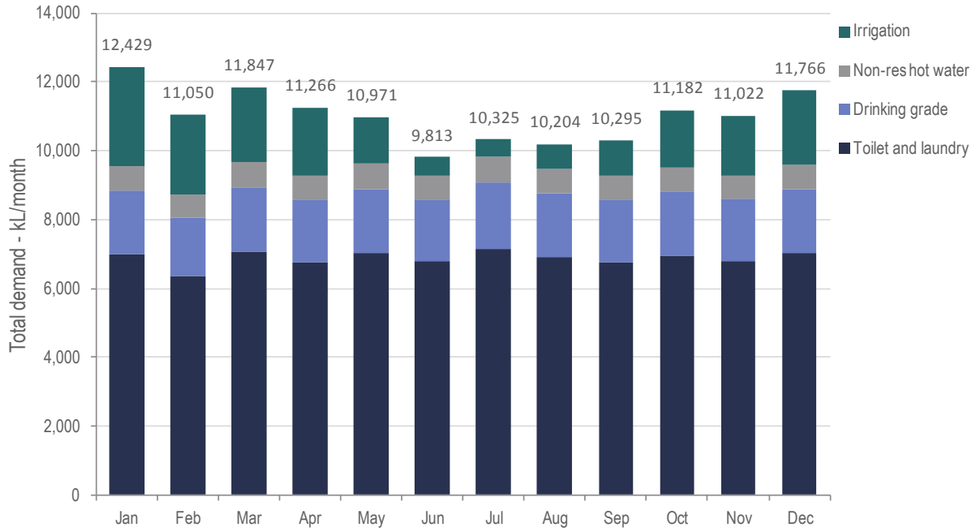


Figure 6: Non-Residential total water demands by end use, by month

AVERAGE DAILY NON-RESIDENTIAL WATER DEMANDS

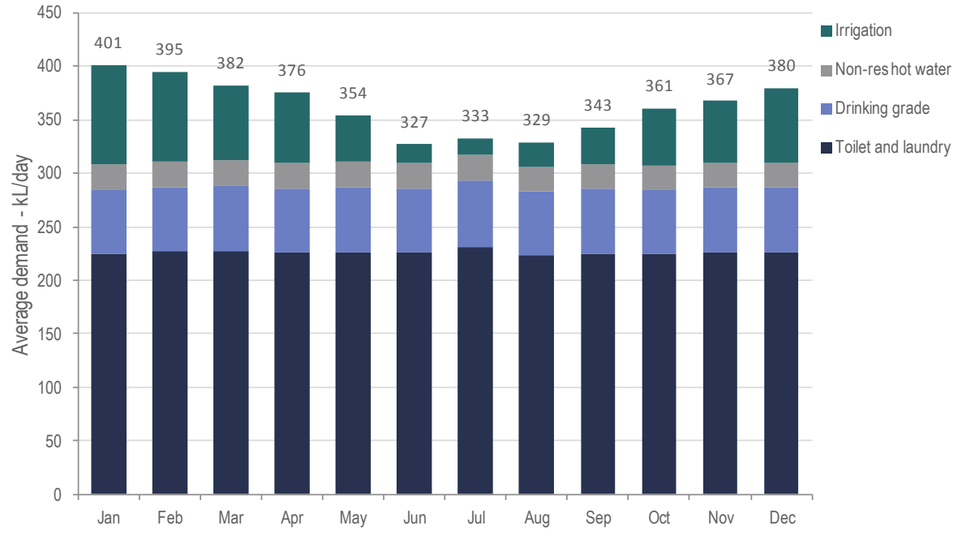


Figure 7: Average daily Non-Residential water demands by end use, by month

2.3 TOTAL AND PEAK WATER DEMANDS

Total water consumption, drinking water demand and recycled water demands are outlined in Tables 5 to 7, showing both total and peak demands for each use.

Total water demands are outlined in Figures 8 to 10 (monthly totals) and Figures 11 to 13 (daily average), summarising the results of the residential and non-residential demands for both drinking and recycled water demands.

As with the individual residential and non-residential demands, month to month variation is predominantly due to changes in irrigation demands. The irrigation demand analysis takes into account hourly rainfall data and cumulative period since the last rain event and irrigation, to predict the time and water use of the next irrigation event. Predictions are also calibrated against real irrigation data for better alignment and accuracy (See Key Data Sources in Appendix).

Peak water demand (kilolitres per hour) for each month is provided in Figure 14. Peak demands for drinking and recycled water are also shown separately in Figures 15 and 16. The peak demand was determined based on the hourly maximum demand for each month, calculated based on the following variables:

- Hourly internal water demands based on a standard hourly internal water demand profile for each end use and building type.
- Hourly irrigation demands based on the irrigation area and local hourly rainfall and evaporation rates.

Due to the fact that internal water demand is relatively consistent over time, in all cases, outdoor irrigation demand is the key contributor towards peak water demands. It should also be noted that peak demands for drinking water and recycled water (Figures 15 and 16) do not necessarily add up to the total peak demand (Figure 14) as the individual peak demands may occur at different times.

TOTAL WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand - kL/d	1,092	362	1,454
Peak day - kL/d	1,574	595	2,169
Peak hour – kL/hr	165	61	226

Table 5: Demand profile for the Green Square development

DRINKING WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand - kL/d	623	84	706
Peak day - kL/d	898	121	1,018
Peak hour – kL/hr	94	13	107

Table 6: Demand profile for the Green Square development

RECYCLED WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand - kL/d	469	278	748
Peak day - kL/d	677	482	1,151
Peak hour – kL/hr	71	48	119

Table 7: Demand profile for the Green Square development

TOTAL WATER DEMAND

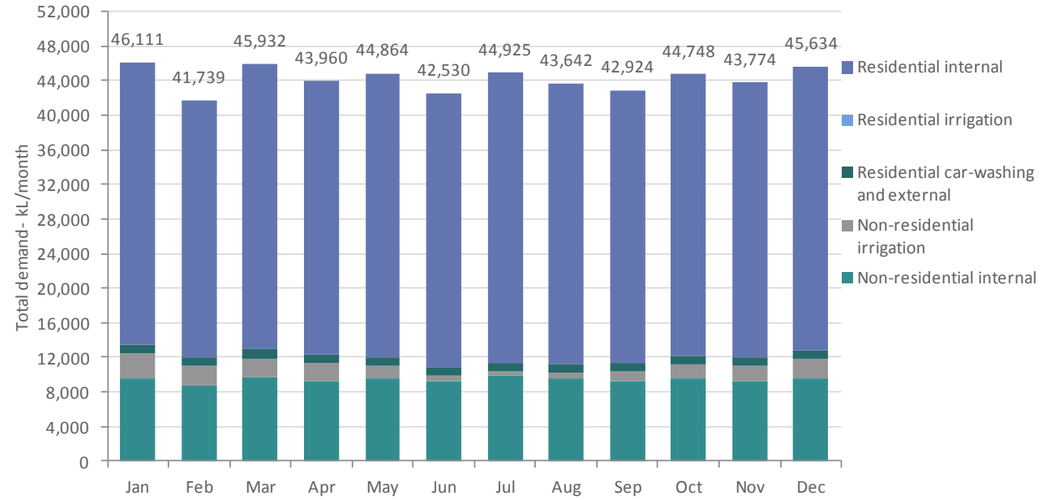


Figure 8: Total water demand by month

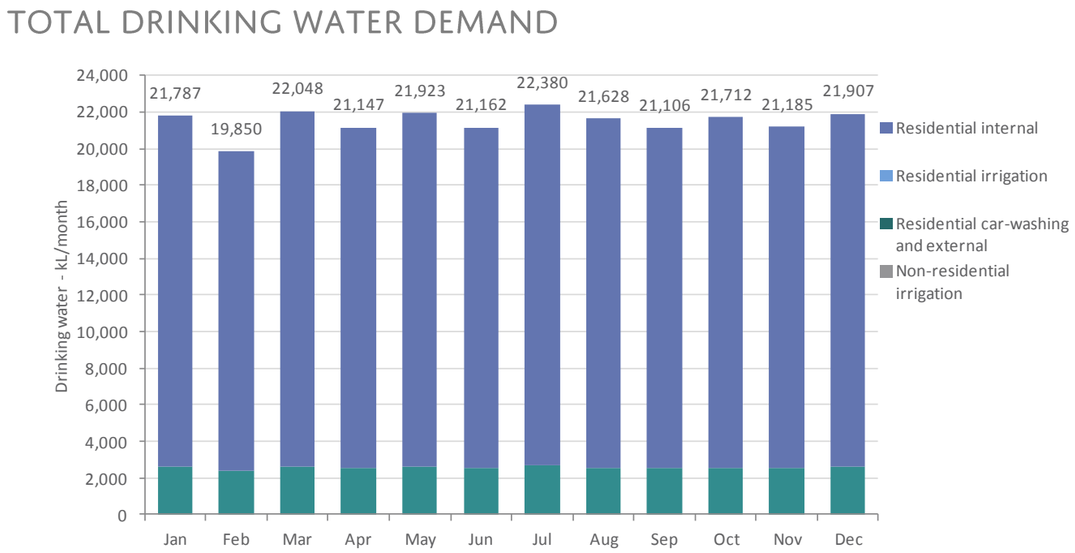


Figure 9: Total drinking water demand by month

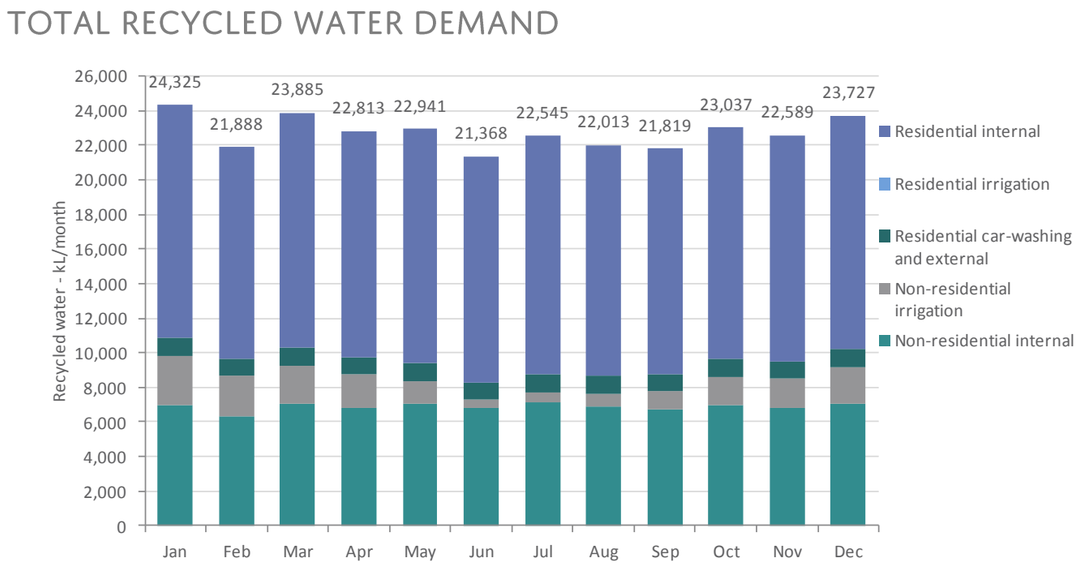


Figure 10: Total recycled water demands by month

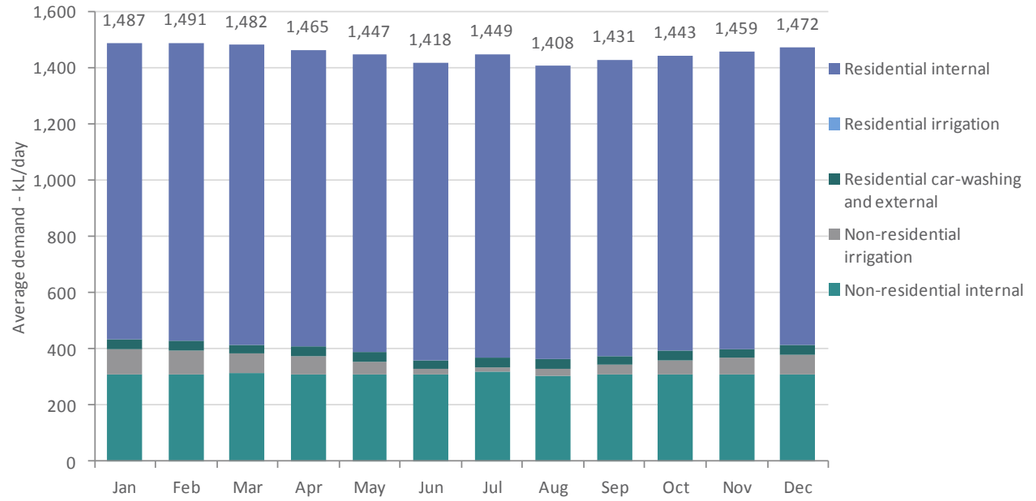


Figure 11: Daily average total water demands by month

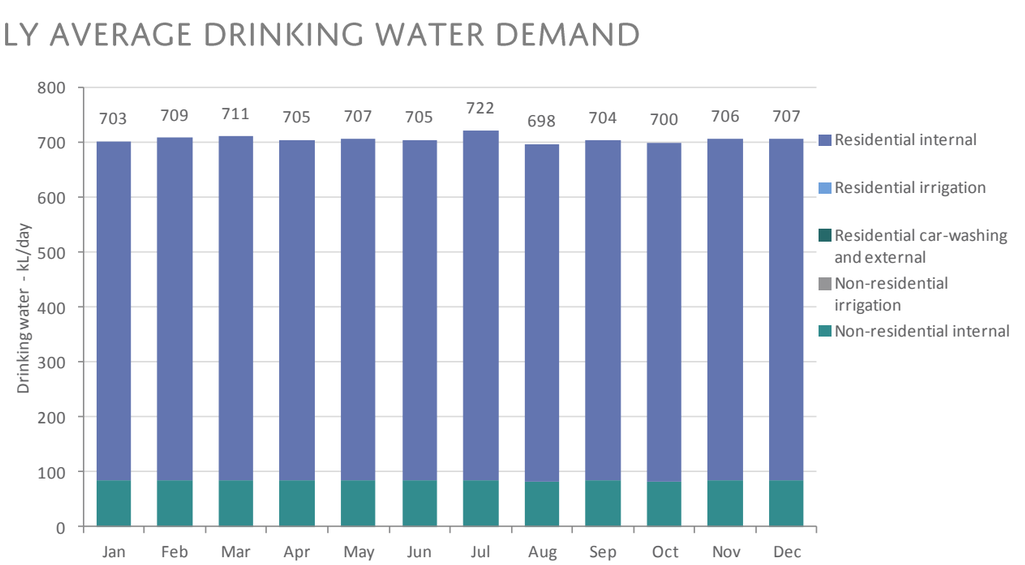


Figure 12: Daily average drinking water demand by month

DAILY AVERAGE RECYCLED WATER DEMANDS

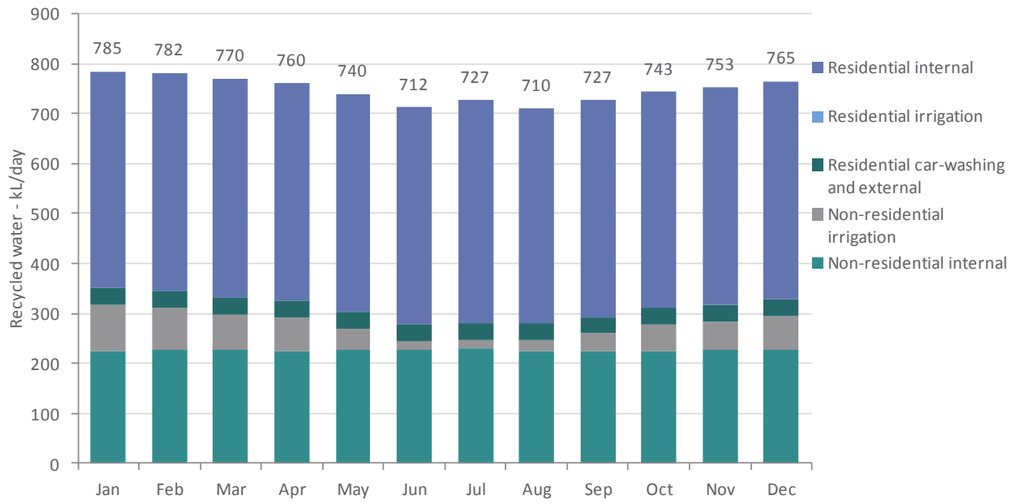


Figure 13: Daily average recycled water demand by month

PEAK RECYCLED WATER DEMANDS

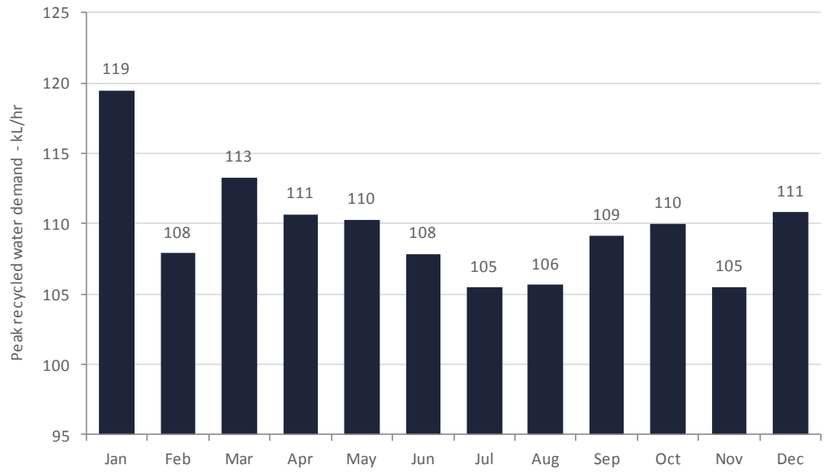


Figure 15: Peak recycled water demands by month

PEAK TOTAL WATER DEMANDS

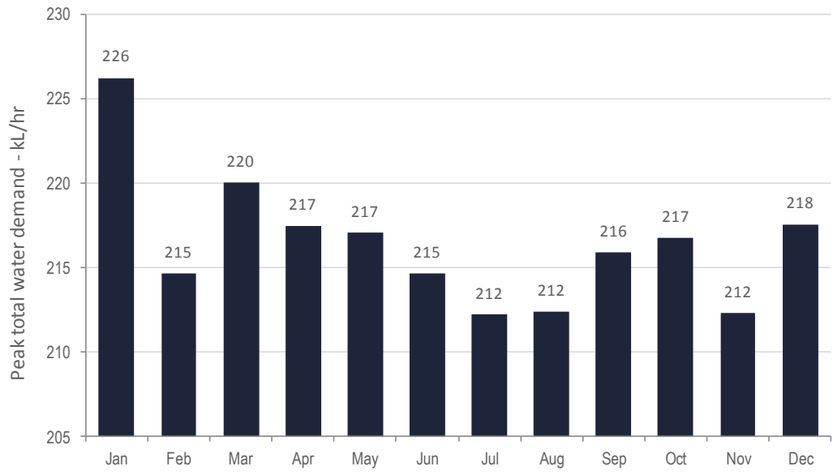


Figure 14: Peak total water demand by month

PEAK DRINKING WATER DEMANDS

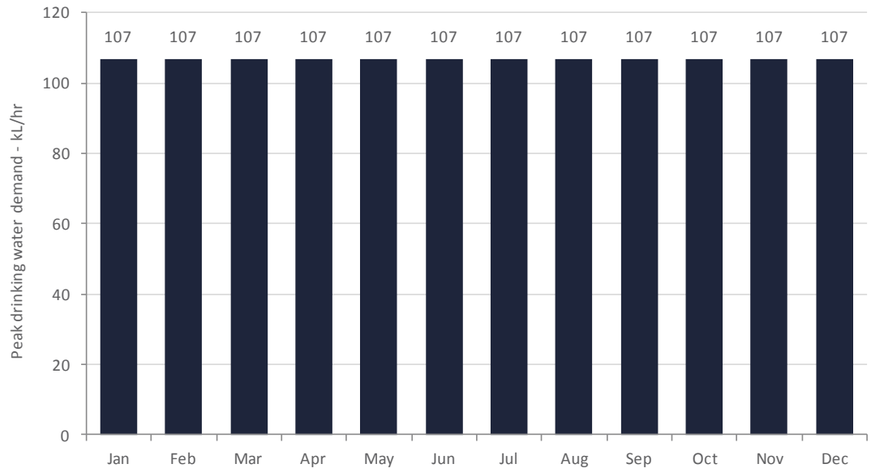


Figure 16: Peak drinking water demand by month

NOTE: Peak demands for drinking water and recycled water (Figures 15 and 16) do not necessarily add up to the total peak demand (Figure 14) as the individual peak demands may occur at different times.

3. SOURCE WATER PRODUCTION

3.1 SOURCE WATER PRODUCTION

Source water for the recycled water scheme is sourced from two storm water culverts. A continuous flow of 19.3 L/s has been identified as available with high reliability.

Measurements of storm water flow in L/s were made every five minutes for 181 days in February to August of 2014. The frequency and cumulative distribution of flow measurements is shown in Figure 17 and key statistics in Table 8. A flow rate of 19.3 L/s or greater was observed in 99% of measurements.

In general, 19.3 L/s will be more than sufficient to service the recycled water demand of Green Square. Figure 18 shows the total monthly quantities of storm water expected to be harvested.

STORM WATER FLOW STATISTICS

Statistics	Value
Number of measurements	44713
Minimum	14.0 L/s
Maximum	9000 L/s
Mean	109.1 L/s
Standard Deviation	448.2
Median	28.1 L/s
Mode	24.7 L/s

Table 8: Key statistical results of storm water monitoring

STORM WATER AVAILABILITY

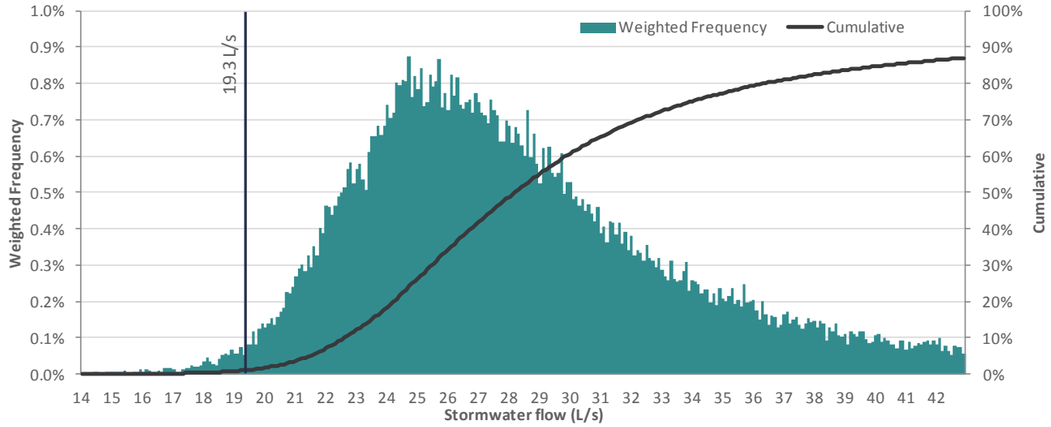


Figure 17: Frequency distribution of storm water availability. The modal flow is 24.7 L/s, and 19.3 L/s or more was available in 99% of measurements.

MODELLED STORM WATER HARVEST

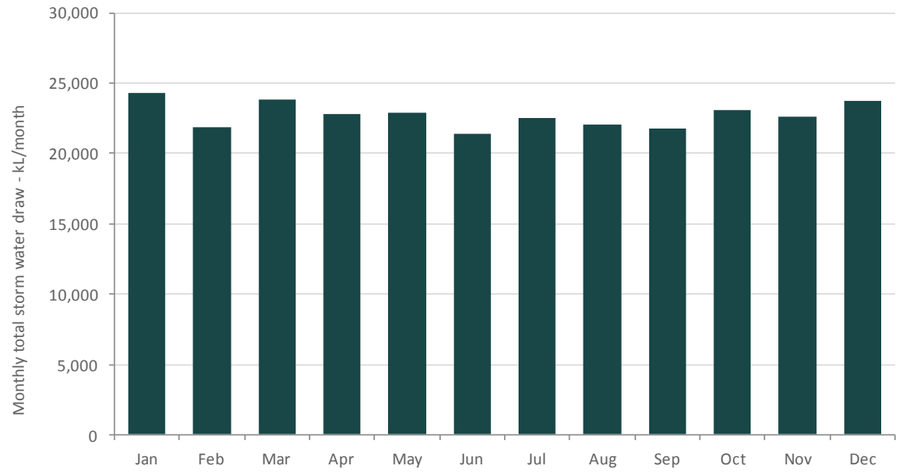


Figure 18: Modelled storm water harvest

4. RECYCLED WATER SYSTEM PERFORMANCE

4.1 RECYCLED WATER SYSTEM CONFIGURATION

The recycled water system for Green Square was configured as follows:

- Connection to all dwellings for toilet and washing machine (cold tap)
- Connection to car washing bays in the carpark
- Connection to all non-residential buildings for irrigation and toilet flushing
- Connection to all open space for irrigation
- Storage tank is sized at 1 ML
- Accepted inflow volume is calculated as the sum of end-use demand and missing storage volume, analysed on an hourly basis.
- A 2% volume loss is also considered for the UF treatment process.

4.2 WATER BALANCE

The average daily performance of the recycled water system at full build out of Green Square is in Figure 19 and the key water results are shown in

Water Source	ML per year
Total Precinct Water Demand	531
Recycled Water Demand	273
Recycled Water Demand Met	273
Water Import for Recycled Water Use	0
Drinking Water Demand	258

Table 9: Estimated development average water balance with recycled water system at full build out

Water Import for Recycled Water Use

The model shows that, at full build out, no mains water top-up (water import) will be required as daily sewage production will be greater than the daily recycled water demand.

ANNUAL AVERAGE DAILY FLOWS IN KL/DAY

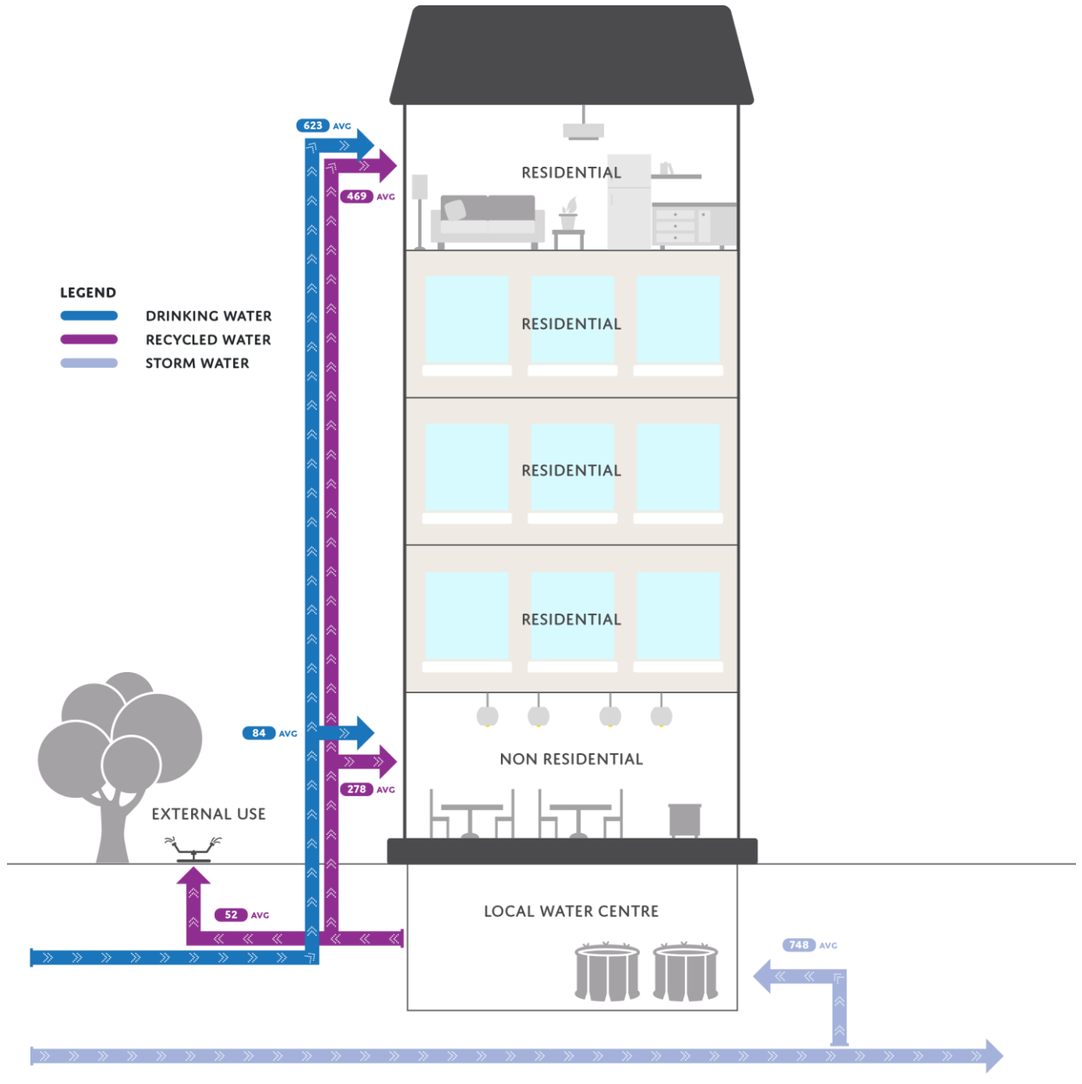


Figure 19: Schematic of the recycled water system showing annual average daily flows in kL/day.

Note - The sum of monthly recycled water use and discharge to sewerage does not always equal the total sewage production, due to the hourly analysis run by CCAP Precinct and the storage tank actively accepting and supplying water in order to minimize top-up, e.g. sewage production in excess of the recycled water demand is kept in the flow balance or recycled water is kept in the recycled water storage tanks, for periods where sewage production cannot meet the recycled water demand.

RECYCLED WATER SYSTEM PERFORMANCE AT FULL BUILD OUT

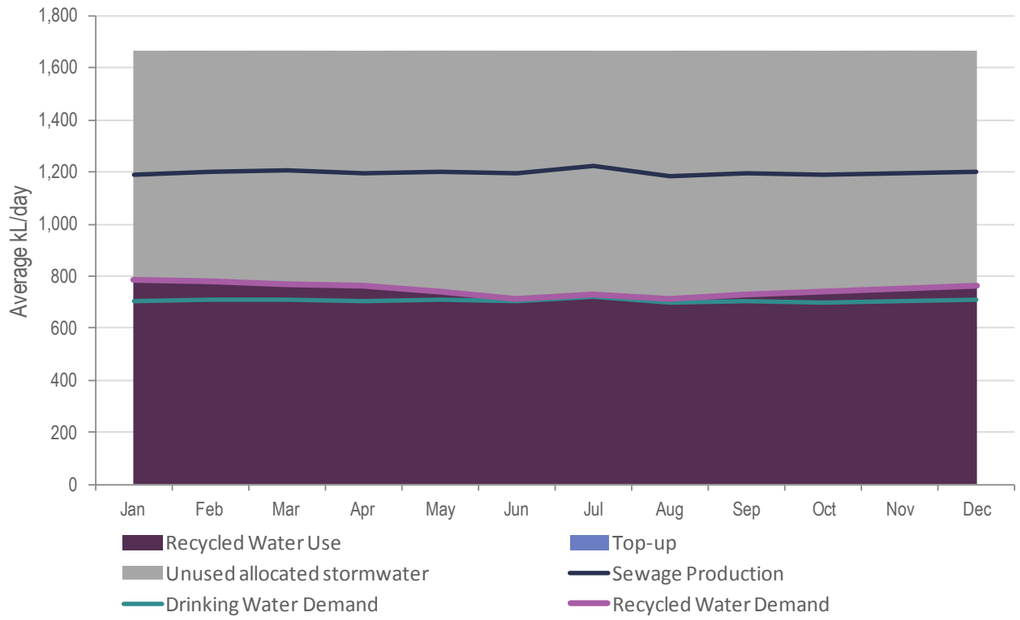


Figure 20: Recycled water system performance showing monthly recycled water use, demand and off-site use

Recycled Water System Stored Volume

Figure 21 outlines the hourly recycled water storage volume over the year, reflecting the low variability in both recycled water production and use throughout the year. On average, the daily stored volume in the recycled water system tanks is just below full at about 970 kL.

RECYCLED WATER STORED VOLUME

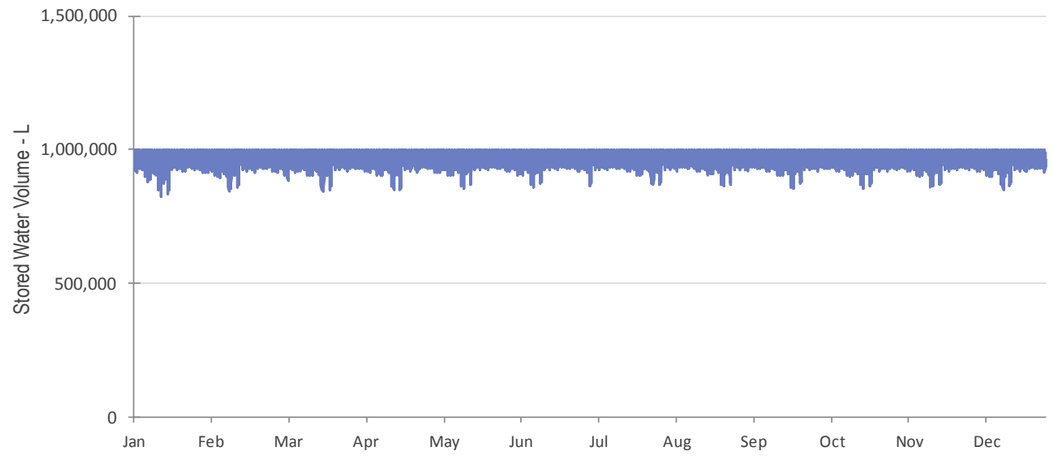


Figure 21: Hourly recycled water stored volume for the recycled water system

4.3 BASIX COMPLIANCE

With connection to the recycled water system, residential dwellings at Green Square are estimated to achieve an average **BASIX water score of approximately 65**.

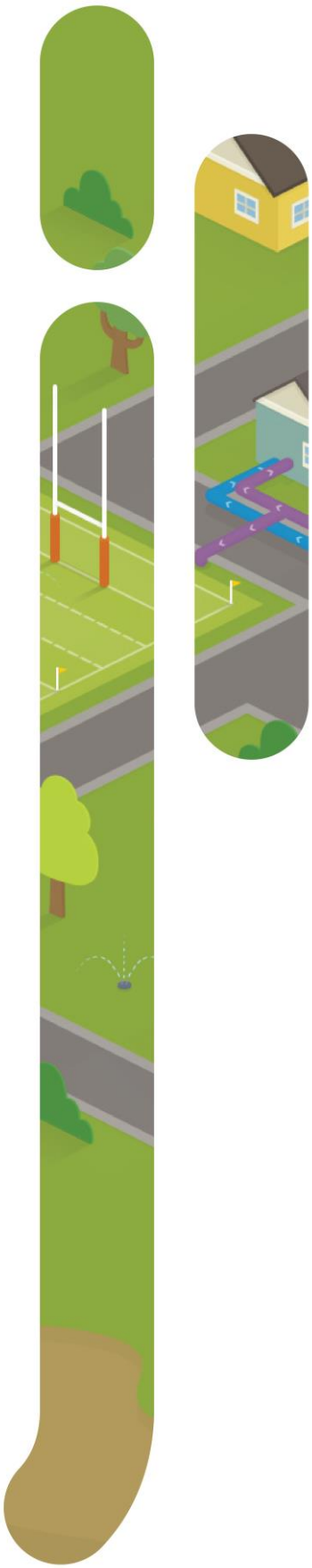
APPENDIX

KEY DATA SOURCES

- ACADS-BSG Australian Climatic Data (Reference Meteorological Year, RMY) for hourly temperature, insulation and humidity.
- Bureau of Meteorology local rainfall and evaporation data (station 066037 – SYDNEY AIRPORT AMO, 15 km from development, synthesized RMY), see Figure 25:
  - The weather station is selected to represent the climate zone (NatHERS zone 56) of the project.
  - The RMY (Representative Meteorological Year) is synthesized from a composite of 12 typical meteorological months that best represent the historic average of the specified location using post-1986 data in addition to the earlier weather data for each of the 69 climate zones in Australia. The total rainfall and evaporation for this climate zone is:
  - Annual rainfall (mm) – 1,012
  - Annual evaporation (mm) – 1,810
- Department of Resources, Energy and Tourism, 2010, Energy in Australia – 2010, ABARE, Canberra
- Kinesis 2014, Additional water end use breakdowns derived from first principle analysis of residential and non-residential building types.
- National Water Commission, 2011, National performance report 2009-2010: urban water utilities, National Water Commission, Canberra
- NSW Department of Planning, BASIX Residential Water Consumption Data (2010)
- Sydney Water Best Practice Guidelines for water conservation in commercial office buildings and shopping centres (2007), http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdu0/~edisp/dd_054580.pdf
- Sydney Water Best Practice Guidelines for holistic open space turf management (2011), https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq1/~edisp/dd_045253.pdf
- Flow 2015, Storm water flow monitoring at Green Square. Data provided to Kinesis for analysis by Flow. Unpublished.

Green Square Water

A local utility from flow



Technical Note –

Gunyama Park Aquatic & Recreation Centre

Impact on Green Square Town Centre

Water Balance Model

1 Purpose

The purpose of this technical note is to assess the impact on the water balance model previously prepared for the existing scheme, as a result of the proposed inclusion of Gunyama Park Aquatic and Recreation Centre (GPARC) to the scheme supply area.

2 Background

Green Square Town Centre (GSTC) is an existing Flow Systems operated scheme, which produces high quality recycled water (RW) from harvested stormwater for supply with the Green Square Town Centre development for toilet flushing, washing machine use, cooling towers, car washing and irrigation.

The most recent version of the water balance report to describe recycled water and source water supply and demand for GSTC was finalised on 7th August 2015. Following this a letter advice on the impact of this additional demand to the existing scheme was prepared by the consultant CMP on 27th April 2016.

3 Technical Assumptions

This document builds on the assumptions made in the respective documents:

- 'Green Square Water Balance Report' dated 7th August 2015 – Kinesis (Water Balance Report)
- Letter: 'Proposed Extension of Recycled Water Reticulation Feasibility Analysis' dated 27th April 2016 - CMP Consulting Group (CMP Letter)

4 Water Balance Amendments

The water balance report for the GSTC area has been scrutinized to understand the impact of the extension area (GPARC) comprising:

- Aquatic Centre
- Gunyama Park

The demand flows serving the GSTC from the water balance (figure 1) have been extracted as below.

Figure 1 GSTC RW Demands

RECYCLED WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand - kL/d (L/s)	469 (5)	229 (3)	698 (8)
Peak day - kL/d (L/s avg)	677 (8)	358 (4)	1,034 (12)
Peak hour – kL/hr (L/s avg)	71 (20)	37 (10)	108 (30)

Table 7: Demand profile for the Green Square Town Centre development

The extension area demands have been summarised in table 1 CMP letter and repeated below. These values have originally been sourced by the City of Sydney in respective documents as outlined.

Figure 2 GPARC Extension Area Loadings

Table 1: Demands provided by CoS

Site	Demands	Estimated Visitors	Irrigation Area	References
Aquatic centre	Toilet flushing 2,238 L/d (avg) / (817 kL PA) Green roof 181 kL PA Laundry (crèche) - TBC Landscape irrigation (around building) 82 kL PA	1,049 per weekday 449 per weekend day	Green Roof: 851 m^2 Any other landscaping/ Berms: 383 m^2	C16113 - GPGSAC - User Projections_CH.pdf 20151106 R15-13299-251-04 GPGSAC Irrigation Strategy and Water Balance Report.pdf
Gunyama Park	Toilet flushing 1,467 L/d (536 kL PA) Irrigation 480 kL PA turf + 53 kL PA garden	1,866 per day	Natural grass: 944 m^2 Garden: 249 m^2	150701_GPGSAC_@leisure Input to Population Study.pdf 20151106 R15-13299-251-04 GPGSAC Irrigation Strategy and Water Balance Report.pdf

Demands have been split into building demands and irrigation demands, and converted into kL/day. Table 2 summarises the Peak Day Demands (PDD) used in the hydraulic model.

This loading translates to peak day demands with a peak day factor (PDF) value of 1.5 applied on building demand only as below.

Figure 3 GPARC Extension Area Demands

Table 2: Peak Day Demands for Hydraulic Model Input

Site	Building Demand	Irrigation Demand	Comment
Aquatic centre	5.883 kL/day	0.225 kL/day	Building demand includes a Peak Day Factor of 1.5 Building demand takes into account additional visitors on a weekday. A 20% increase has been included to account for the crèche.
Gunyama Park	2.203 kL/day	1.460 kL/day	Building demand includes a Peak Day Factor of 1.5

The demand valves for peak demands of GSTC and GPARC have been combined in the following table.

Figure 4 GSTC & GPARC Combined Demands

RW Network Demand	Peak Daily Demand (PDD)	Peak Hourly Demand (PHD) *
	kL/day	L/s
GSTC Total	1034	30
Aquatic Centre	6.1	0.29
Gunyama Park	3.7	
TOTAL	**1043.8**	**30.29**
% Increase	≈ 1%	

* In order to calculate peak hourly demand (PHD) a peak hour factor of approximately 2.5 has been applied by CMP consulting to the peak daily demand to yield 0.29L/s per the model output. This same rate has also been applied in the water balance report for GSTC. It is important to note the peak hourly demand is considered conservative as no diversity has been applied with actual values in practice that are expected to be of lesser magnitude.

There is an increase in values for peak daily demand and in turn peak hourly demand by approximately 1% with the addition of GPARC. This has a minimal impact on the original GSTC network, existing infrastructure and water balance.

5 Conclusion & Recommendation

The alteration of the water balance due to the GPARC extension has been quantified and assessed as negligible. Furthermore, the existing recycled water infrastructure has sufficient capacity to accommodate the additional extension area with no material impact upon the supply of the previously approved GSTC licensed area of operations. There are various redundancy measures in place and options that have been outlined which can be pursued if an increase in capacity is warranted for specific infrastructure elements.

In view of the relatively small increase in network demand caused by GPARC, a revision to the entire water balance model is not warranted. It is recommended that the water balance report prepared by Kinesis only be updated when a substantial variation to supply and/or demand within the scheme area warrants it. Further variations will be assessed in conjunction with any previous variations (this being the first).

CMP CONSULTING GROUP

27 April 2016

Our ref: FS-130912-1140

Flow Systems Pty Ltd
18/828 High St
Kew East VIC 3102

Attn: Mike Dahl

Dear Mike

Proposed Extension of Recycled Water Reticulation Feasibility Analysis

1 Introduction

Flow Systems and its wholly-owned subsidiary Green Square Water (GSW) has been engaged by City of Sydney Council (CoS) to design, construct, commission, operate, maintain and administer a stormwater harvesting and reuse project for the Green Square Town Centre (GSTC) development area in Sydney, NSW.

The reticulation network that will supply recycled water (RW) to the GSTC area has been designed and is under construction. CoS has now requested an investigation into whether the RW supply has capacity to supply some additional users to the east of GSTC without reducing the reliability of supply to GSTC. Flow Systems has engaged CMP to undertake this feasibility analysis.

The scope of the analysis was initially a larger network as indicated in the Figure 1 below. However, during the analysis CoS confirmed that only 2 of the sites will require RW. These sites are the Aquatic Centre and Gunyama Park.

CMP Consulting Group Pty Ltd
ABN 52 133 162 357
Phone (03) 9188 3620

Office 5, Level 2.
799 Springvale Road,
Mulgrave. VIC. 3170

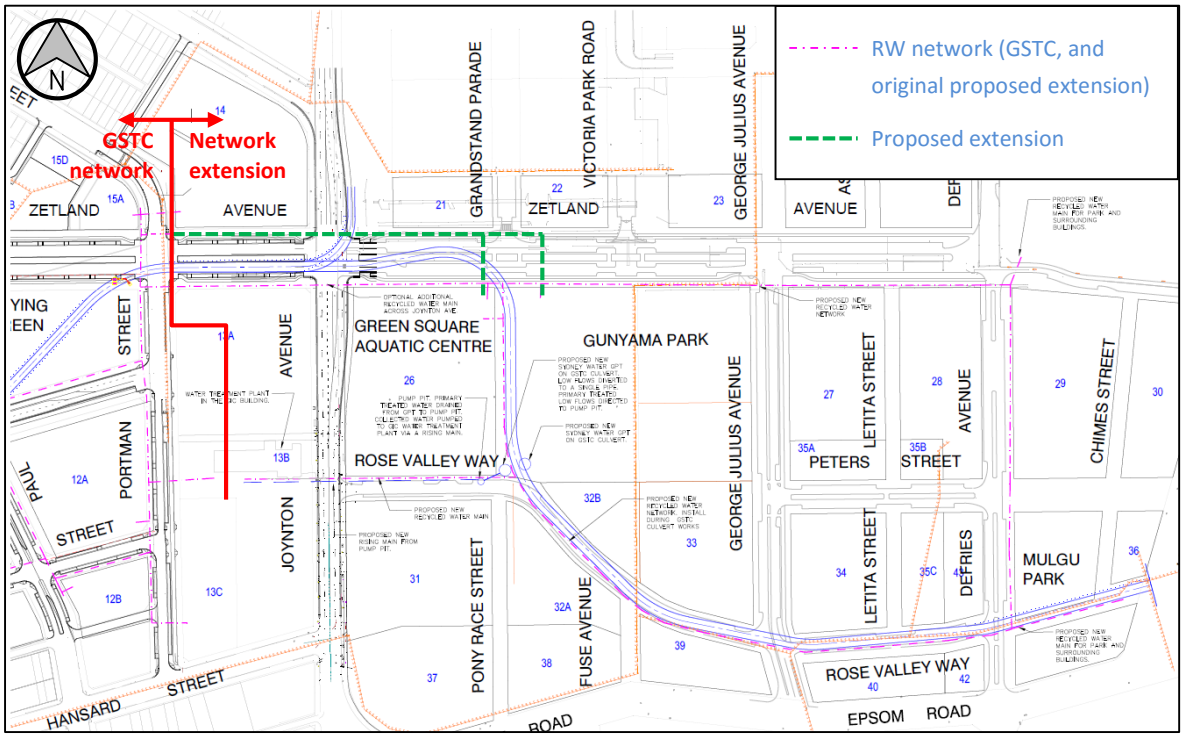


Figure 1: Proposed RW Network Extension

2 Methodology

The methodology used in this feasibility analysis was as follows:

1. Establish demands for sites on the new reticulation network, based on information provided by CoS for irrigation areas and types of water use.
2. Expand existing GSTC hydraulic model to include the proposed network extension, using EPAnet software (an industry standard, public domain software for the modelling of water distributions systems).
3. Assess impact of additional demand on the supply to GSTC – a high level analysis of reliability of supply to the new network. If there is not enough capacity in the current RW supply system for the additional demands from the network extension, the following will also be needed:
    a. A concept design of controls that would be needed to ensure the GSTC users can still have priority of supply.
    b. Starting with the design Peak Day Demand (PDD), provide the number of hours in a day for which demand from the proposed network cannot be met. This would be a table of results with the demand scaled (90% of PDD, 80% of PDD etc.) from the PDD down to the approx. average day demand.

3 Demands

Demands were provided by CoS, as outlined in Table 1:

Table 1: Demands provided by CoS

Site	Demands	Estimated Visitors	Irrigation Area	References
Aquatic centre	Toilet flushing 2,238 L/d (avg) / (817 kL PA) Green roof 181 kL PA Laundry (crèche) - TBC Landscape irrigation (around building) 82 kL PA	1,049 per weekday 449 per weekend day	Green Roof: 851 m^2 Any other landscaping/ Berms: 383 m^2	C16113 - GPGSAC - User Projections_CH.pdf 20151106 R15-13299-251-04 GPGSAC Irrigation Strategy and Water Balance Report.pdf
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Gunyama Park	2.203 kL/day	1.460 kL/day	Building demand includes a Peak Day Factor of 1.5

Diurnal curves used to account for the Peak Hour Demand (PHD) are shown in Figure 2 below (based on commercial and retail curves used for the GSTC network modelling). Curves are averaged to 1 over a 24 hour period so that demands can be applied at network nodes in units of L/s over a day.

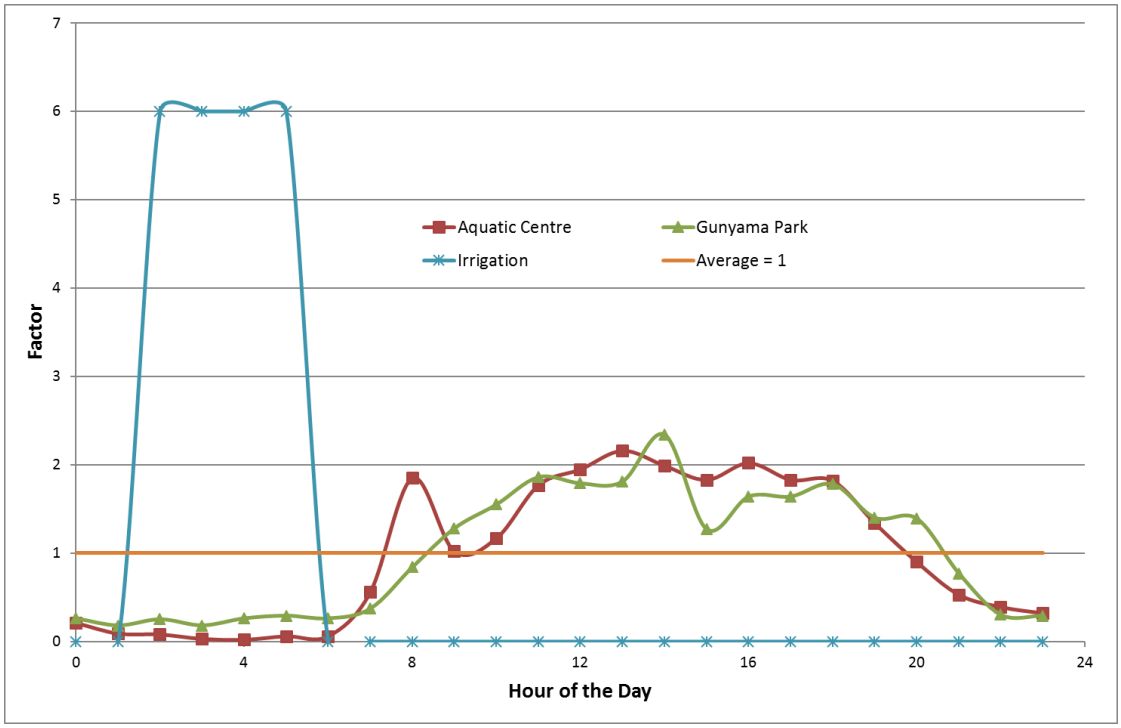


Figure 2: Diurnal Curves

4 Assumptions

Assumptions made in the feasibility analysis are as follows:

- Only 2 sites need RW (Aquatic Centre and Gunyama Park) and the network won't be expanded further.
- All irrigation has been modelled as 4 hours overnight (2-6am).
- The network extension to the Aquatic Centre is approx. 210m, and a further 30m to Gunyama Park. We have assumed that this would be extended from the offtake which is part of Stage 1C construction, on the north side of Zetland Avenue.

5 Results and Conclusions

The completed model is shown in Figure 3 below.

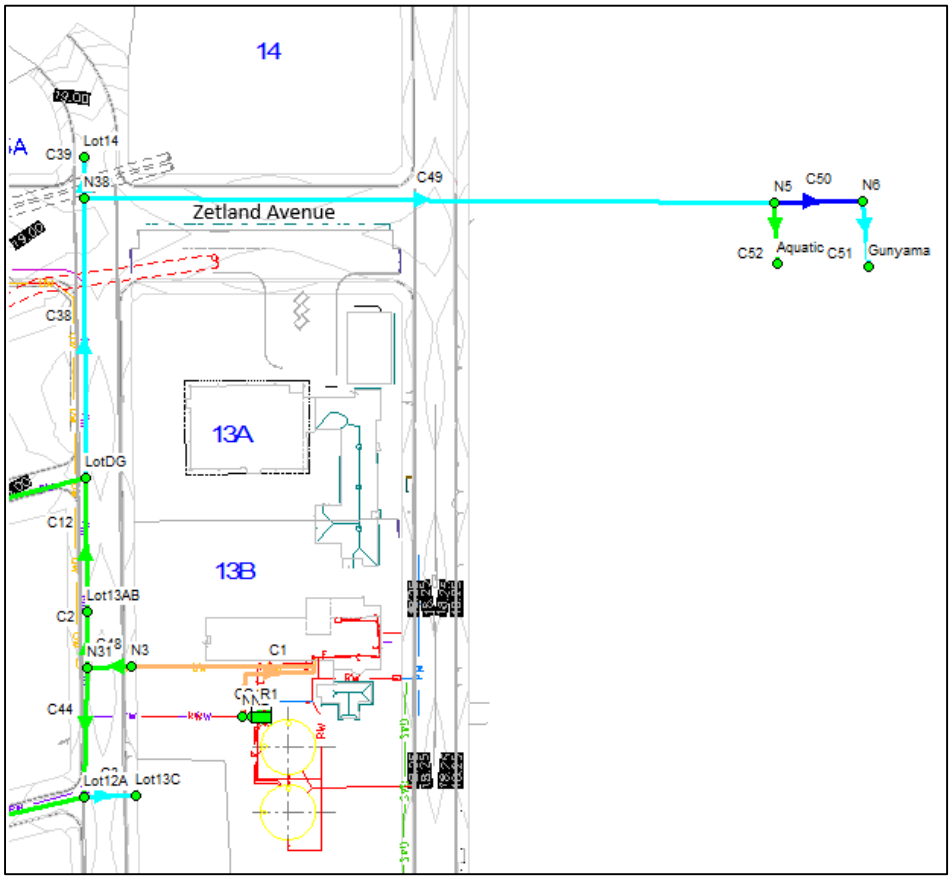


Figure 3: Screenshot of the Completed Hydraulic Model

The model showed that the Peak Hour Demand into the extended network is approx. 0.29 L/s.

This PHD is insignificant compared to the peak duty of the pumps of 28.5 L/s, and the existing RW system has capacity to service these 2 sites without affecting the reliability of supply to the GSTC area. Therefore, there is no need to consider how to provide priority of supply to the GSTC area.

Based on the low PHD, a DN100 pipe would be suitable for the extension of the network.

6 Next Steps

The feasibility analysis has showed that the proposed RW network extension can proceed without impacting the supply to the existing GSTC area. The detailed design of the RW network extension can be started following CoS approval.

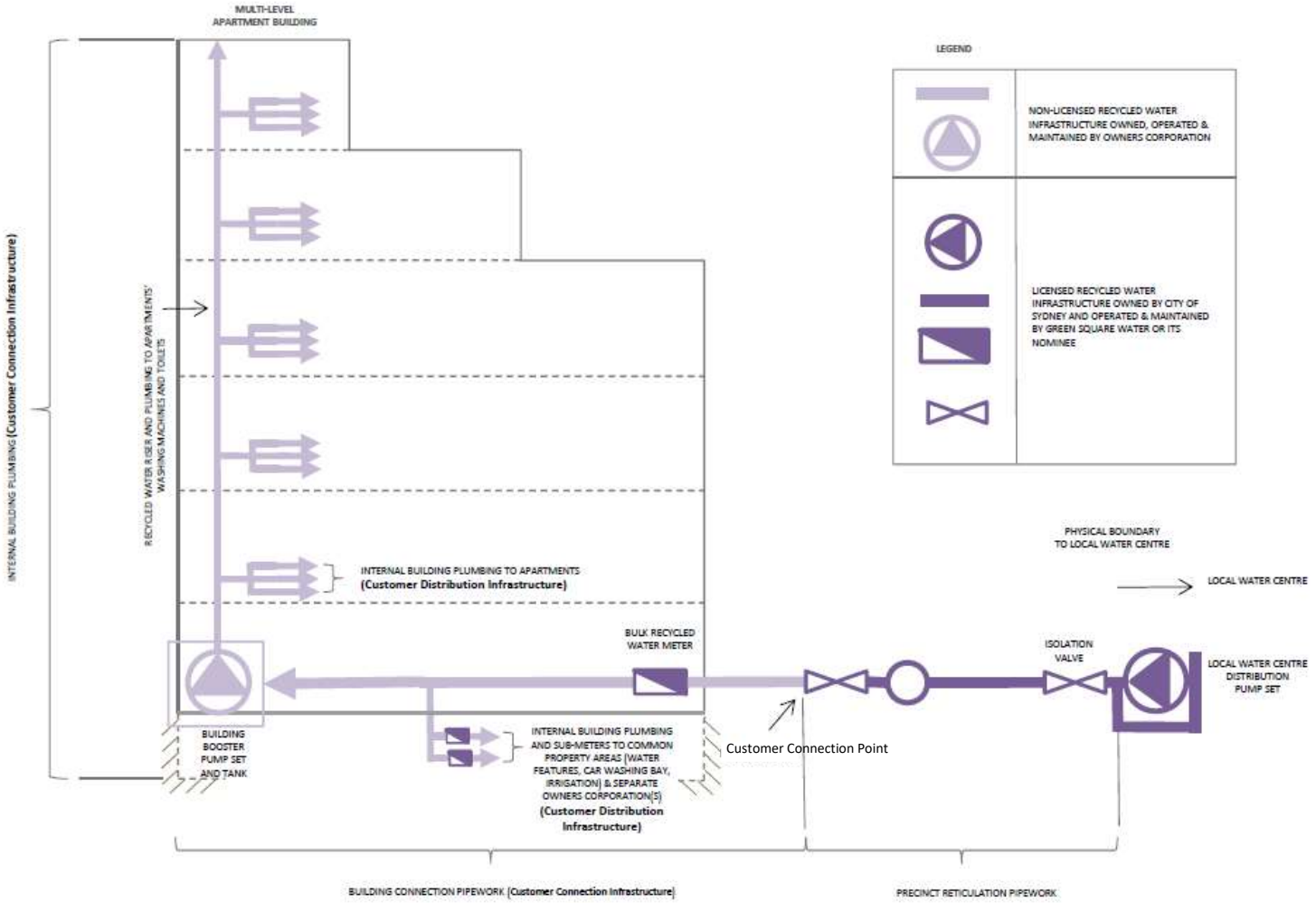
If you need any further information regarding this letter, please contact the undersigned.

Yours faithfully

Andrew Dodson
(03) 9188 3624

Green Square Water

RECYCLED WATER INFRASTRUCTURE – TYPICAL OWNERSHIP, O+M RESPONSIBILITY SCHEMATIC



Green Square Water

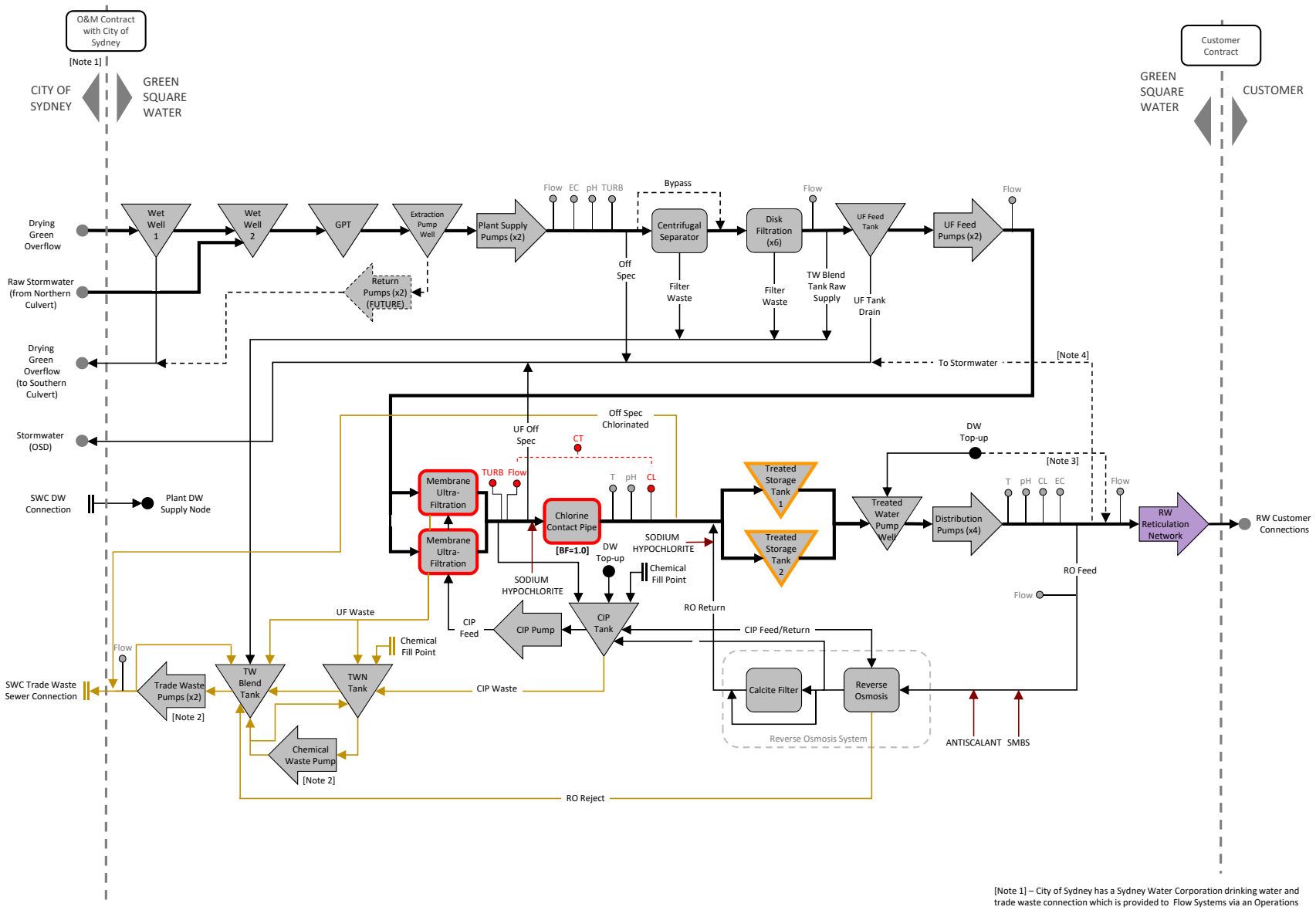
A local utility from flow

Green Square
Scheme Management Plan
(Scheme MP)

Contents

Tables

Figures



[Note 1] – City of Sydney has a Sydney Water Corporation drinking water and trade waste connection which is provided to Flow Systems via an Operations and Maintenance Contract.
[Note 2] – These pump(s) are dual function recirculation mixing and transfer.
[Note 3] – Valves normally closed.
[Note 4] – Not used. Installed and used only for commissioning purposes.

WATER SOURCES

DRINKING WATER (DW)	
PWU	Sydney Water Corporation
Supply System	Prospect &/or Kurnell
Chlorination	N
Chloramination	Y
INFEED	
Municipal Stormwater	

WATER USES

RECYCLED WATER (RW)	
Irrigation	Street Cleaning
Toilet Flushing	Car washing
Cooling Tower Make-up	General washdown
Washing Machines (Cold tap only)	Process water at recycled water treatment plant
Water Features	Dust suppression

ABBREVIATIONS

BF	Baffle Factor
CCP	Critical Control Point
CIP	Clean In Place
CL	Chlorine (total)
CT	Contact Time (Chlorine)
FCR	Free Chlorine Residual
GPT	Gross Pollutant Trap
MBR	Membrane Bioreactor
QCP	Quality Control Point
OSD	Onsite Stormwater Detention
RAS	Return Activated Sludge
RO	Reverse Osmosis
RW	Recycled Water
STP	Sewage Treatment Plant
T	Temperature
TDS	Total Dissolved Solids
TURB	Turbidity Monitoring
TW	Trade Waste
TWN	Trade Waste Neutralisation
UV	Ultraviolet
UVI	Ultraviolet Intensity
UVT	Ultraviolet Transmissivity

LEGEND

CCP
QCP
Storage Element
Transport
Treatment Process
Contract
Contract Document
Responsibility Delineation
Node
Connection Interface
Major
Process Stream
Minor/Ancillary
Waste Stream
Offline
Chemical
Odour Stack / Air Vent
Odour
XXX
Instrument Monitoring Point

Rev	Date	DRW	APVD	Description of Changes
A1	2-10-19	AK	DW	NOLV1 submission – NOT APPROVED

Green Square Water

Process Flow Diagram Recycled Water

REV A1

DATE 3/10/2019

flow

GS-WAT-NSW-DR-PRD-2837

NEW SOUTH WALES GOVERNMENT

WATER INDUSTRY COMPETITION ACT 2006
(NSW)

NETWORK OPERATOR'S LICENCE

Green Square Water Pty Ltd

ACN 163 432 906

New South Wales

***Water Industry Competition Act 2006* (NSW)**

Grant of network operator's licence
Licence no. 15_031

I, The Hon Niall Blair MLC, Minister for Lands and Water, under section 10 of the *Water Industry Competition Act 2006* (NSW), grant a network operator's licence to:

Green Square Water Pty Ltd ACN 163 432 906

to construct, maintain and operate water industry infrastructure, subject to:

(i) the conditions imposed by the *Water Industry Competition Act 2006* (NSW);

(ii) the conditions imposed by clause 9(a) and set out in Parts 1 and 2 of Schedule 1 to the *Water Industry Competition (General) Regulation 2008* (NSW);

(ii) the conditions imposed in the attached Schedule A, being special Ministerially-imposed licence conditions for Green Square Water Pty Ltd's network operator's licence; and

(iii) the conditions imposed in the attached Schedule B, being standard Ministerially-imposed licence conditions for all licensed network operators.

.....

Minister for Lands and Water

Dated this 25th day of September 2015

SCHEDULE A - SPECIAL MINISTERIALLY-IMPOSED LICENCE CONDITIONS FOR GREEN SQUARE WATER PTY LTD'S NETWORK OPERATOR'S LICENCE

This schedule sets out the conditions which the Minister imposes pursuant to section 13(1)(b) of the Act. In addition to these special Ministerially-imposed conditions, the Licensee is subject to obligations imposed by the Act, the Regulation and the standard Ministerially-imposed licence conditions set out in Schedule B. The Minister may vary the conditions in this schedule or impose new conditions, provided there is no inconsistency with the conditions imposed on the Licensee by the Act or the Regulation.

A1 Activities authorised - non-potable water

A1.1 This Licence authorises the Licensee and any authorised persons specified in Table 1.1 to construct, maintain and operate the water industry infrastructure specified in Table 1.2:

a) to the extent that such infrastructure:
   i) as at the date of grant of this Licence, has been granted development consent under the EPA Act; or
   ii) is exempt development under the EPA Act and may be carried out without development consent under section 76(3)(a) of the EPA Act; or
   iii) is described in a review of environmental factors and has, as at the date of grant of this Licence, been assessed by the City of Sydney Council under Part 5 of the EPA Act,
b) for one or more of the authorised purposes specified in Table 1.3; and
c) within the area of operations specified in Table 1.4,

subject to the conditions imposed by or under the Act, the Regulation and this Licence.

Table 1.1 Authorised persons

Flow Systems Pty Ltd (ACN 136 272 298)
City of Sydney Council (ACN 636 550 790)

Table 1.2 Water industry infrastructure

1) A treatment plant for non-potable water and other water infrastructure used, or to be used, in connection with the treatment plant, where components of the treatment plant or the other water infrastructure may also be used for one or more of the following:
   a) production of non-potable water;
   b) treatment of non-potable water;
   c) filtration of non-potable water;
   d) storage of non-potable water; and
   e) conveyance of non-potable water.
2) A reticulation network for non-potable water and other water infrastructure used, or to be used, in connection with the reticulation network, where components of the reticulation network or the other water infrastructure may also be used for one or more of the following:
   a) storage of non-potable water;
   b) conveyance of non-potable water; and
   c) treatment of non-potable water.

Table 1.3 Authorised purposes

Toilet flushing, washing machines (cold water tap), cooling tower make-up, irrigation, water features and street cleaning.

Table 1.4 Area of operations

1) The areas identified in the map at Attachment A to this Licence as Green Square Town Centre; and
2) the section of Joynton Avenue, Zetland situated between the intersection of:

a) Joynton Avenue and Elizabeth Street, Zetland; and
b) Joynton Avenue and Hansard Street, Zetland.

A2 Activities authorised – drinking water

[Not applicable]

Table 2.1 Authorised persons

[Not applicable]

Table 2.2 Water industry infrastructure

[Not applicable]

Table 2.3 Authorised purposes

[Not applicable]

Table 2.4 Area of operations

[Not applicable]

A3 Activities authorised – sewerage services

[Not applicable]

Table 3.1 Authorised persons

[Not applicable]

Table 3.2 Water industry infrastructure

[Not applicable]

Table 3.3 Authorised purposes

[Not applicable]

Table 3.4 Area of operations

[Not applicable]

A4 Special Condition

A4.1 If a party to an Agreement proposes to:

a) terminate the Agreement;

b) novate the Agreement;

c) assign or transfer any of its rights or obligations under the Agreement to any other person; or

d) alter the Agreement in any way that materially reduces the Licensee's technical, financial or organisational capacity to carry out the activities authorised by this Licence,

the Licensee must provide IPART with written notice as soon as practicable, but no later than 3 months, before the time when the proposed action is to occur. The written notice must include details of how the service provided under the Agreement will be provided subsequent to the proposed termination, novation, assignment, transfer or alteration.

INTERPRETATION AND DEFINITIONS

Interpretation

In this Schedule A, unless the context requires otherwise:

(i) the singular includes the plural and vice versa;
(ii) headings are used for convenience only and do not affect the interpretation of this Schedule A;
(iii) a reference to a document includes the document as modified from time to time and any document replacing it;
(iv) a reference to a person includes a natural person and any body or entity whether incorporated or not;
(v) a reference to a clause is to a clause in this Schedule A;
(vi) a reference to a schedule is to a schedule to this Licence;
(vii) a reference to a law or statute includes regulations, rules, codes and other instruments under it, and consolidations, amendments, re-enactments or replacements of them; and
(viii) explanatory notes do not form part of this Licence, but in the case of uncertainty may be relied on for interpretation purposes.

Definitions

Expressions used in this Schedule A that are defined in the Act or the Regulation have the meanings set out in the Act or the Regulation.

In this Schedule A:

Act	means the *Water Industry Competition Act 2006* (NSW).

Agreement	means any agreement or deed provided to IPART in connection with the Licensee's application for this Licence.
EPA Act	means the *Environmental Planning and Assessment Act 1979* (NSW).
IPART	means the Independent Pricing and Regulatory Tribunal of New South Wales established under the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW).
Licence	means this network operator's licence granted under section 10 of the Act.
Licensee	means the person to whom this Licence is granted under section 10 of the Act.
Minister	means the Minister responsible for Part 2 the Act.
Regulation	means the *Water Industry Competition (General) Regulation 2008* (NSW).

SCHEDULE B - STANDARD MINISTERIALLY-IMPOSED LICENCE CONDITIONS FOR ALL LICENSED NETWORK OPERATORS UNDER THE ACT

This schedule sets out the standard conditions which the Minister imposes on the Licensee and all other licensed network operators pursuant to section 13(1)(b) of the Act. In addition to these standard Ministerially-imposed conditions, the Licensee is subject to obligations imposed by the Act, the Regulation and the special Ministerially-imposed licence conditions set out in Schedule A. The Minister may vary the conditions in this schedule or impose new conditions, provided there is no inconsistency with the conditions imposed on the Licensee by the Act or the Regulation.

B1 Ongoing capacity to operate

B1.1 The Licensee must have the technical, financial and organisational capacity to carry out the activities authorised by this Licence. If the Licensee ceases to have this capacity, it must report this to IPART immediately in accordance with the Reporting Manual.

B2 Obtaining appropriate insurance

B2.1 Before commencing to commercially operate the Specified Water Industry Infrastructure under this Licence, the Licensee must:

a) obtain insurance that is appropriate for the size and nature of the activities authorised under this Licence;

b) provide a copy of each certificate of currency of the insurance obtained to IPART; and

c) demonstrate that the insurance obtained is appropriate for the size and nature of the activities authorised under this Licence by providing a report to IPART from an Insurance Expert that:

i) certifies that in the Insurance Expert's opinion, the type and level of the insurance obtained by the Licensee is appropriate for the size and nature of the activities authorised under the Licence; and

ii) is in the form prescribed by the Reporting Manual.

B2.2 *[Not Applicable]*

B3 Maintaining appropriate insurance

B3.1 The Licensee must maintain insurance that is appropriate for the size and nature of the activities authorised under this Licence.

B3.2 The Licensee must provide a copy of each certificate of currency of the insurance maintained by the Licensee to IPART in accordance with the Reporting Manual.

B3.3 If there is to be a change in:

a) the insurer or underwriting panel in respect of an insurance policy held by the Licensee; or

b) the type, scope or limit on the amount of insurance held by the Licensee,

in relation to the activities authorised under this Licence, the Licensee must provide a report to IPART in accordance with the Reporting Manual.

B3.4 From time to time when requested in writing by IPART, the Licensee must provide a report to IPART, in the manner, form and time specified by IPART, from an Insurance Expert certifying that in the Insurance Expert's opinion the type, scope or limit on the

amount of the insurance held by the Licensee is appropriate for the size and nature of the activities authorised under this Licence.

[Note: The situations in which IPART may request a report under clause B3.4 include (but are not limited to) the following:

- *when IPART has reason to believe that there may be a change in the type, scope or limit on the amount of insurance held by the Licensee in relation to activities authorised under this Licence;*
- *where there is a change in the type or extent of activities authorised under this Licence; or*
- *when IPART or an approved auditor has reason to believe that the type, scope or limit on the amount of insurance held by the Licensee may not be appropriate for the size and nature of the activities authorised under this Licence.]*

B3.5 The Licensee must maintain professional indemnity insurance during the Design Phase and for a minimum period of 6 years from the date of the completion of the Design Phase.

B4 Complying with NSW Health requirements

B4.1 The Licensee must carry out the activities authorised by this Licence in compliance with any requirements of NSW Health that:

a) IPART has agreed to; and

b) are notified from time to time to the Licensee by IPART in writing.

B5 Complying with Audit Guidelines from IPART

B5.1 The Licensee must comply with any Audit Guidelines issued by IPART.

B6 Reporting in accordance with the Reporting Manual

B6.1 The Licensee must prepare and submit reports in accordance with the Reporting Manual.

B7 Reporting information in relation to the Register of Licences

B7.1 Within 14 days of any change in relation to the following, the Licensee must notify IPART, and provide IPART with details, of the change in accordance with the Reporting Manual:

a) any source from which the water handled by the Specified Water Industry Infrastructure is derived;

b) the Authorised Purposes of the water handled by the Specified Water Industry Infrastructure;

c) the identity of each licensed retail supplier or public water utility that has access to the infrastructure services provided by the Specified Water Industry Infrastructure for the purpose of supplying water to its customers;

d) any other water infrastructure to which the Specified Water Industry Infrastructure is connected; and

e) *[Not Applicable]*

f) *[Not Applicable]*

g) the arrangements for the disposal of waste from the Specified Water Industry Infrastructure.

B8 Monitoring

B8.1 The Licensee must undertake any monitoring that is required for the purposes of this Licence, any Plan, the Act or the Regulation in accordance with this clause B8.

B8.2 The Licensee must keep the following records of any samples taken for monitoring purposes specified in the Water Quality Plan:

a) the date on which the sample was taken;
b) the time at which the sample was collected;
c) the point or location at which the sample was taken; and
d) the chain of custody of the sample (if applicable).

B8.3 The Licensee must ensure that analyses of all samples taken for the purposes of Verification Monitoring are carried out by a laboratory accredited for the specified tests by an independent body that is acceptable to NSW Health, such as the National Association of Testing Authorities or an equivalent body.

B9 Provision of copy of Plan

B9.1 Whenever the Licensee makes a significant amendment to a Plan, the Licensee must provide a copy of the amended Plan to IPART at the same time that it provides a copy to the approved auditor engaged to prepare a report as to the adequacy of the amended Plan, as required under the Regulation.

B10 Delineating responsibilities – interconnections

B10.1 If a code of conduct has not been established under clause 25 of the Regulation, the Licensee must (by a date specified by IPART) establish a code of conduct (**Licensee's Code of Conduct**) in accordance with this clause B10.

B10.2 The Licensee's Code of Conduct must set out the respective responsibilities of:

a) the Licensee; and
b) each licensed network operator, licensed retail supplier and/or public water utility that supplies water, provides sewerage services or constructs, maintains or operates any other water industry infrastructure in the Specified Area of Operations,

by, at a minimum, providing for:

c) if the Specified Water Industry Infrastructure is connected to any other water industry infrastructure, who is responsible for repairing, replacing or maintaining any pipes, pumps, valves, storages or other infrastructure connecting the Specified Water Industry Infrastructure to the other water industry infrastructure;
d) who is responsible for water quality;
e) who is liable in the event of the unavailability of water;
f) who is liable in the event of failure of the Specified Water Industry Infrastructure;
g) the fees and charges payable in respect of the use of the Specified Water Industry Infrastructure; and
h) who is responsible for handling customer complaints.

B10.3 Before the Licensee brings the Specified Water Industry Infrastructure into commercial operation or by a later date specified by IPART (if any), the Licensee's Code of Conduct must be agreed in writing between the Licensee and the other licensed network

operators, licensed retail suppliers and/or public water utilities referred to in clause B10.2.

B10.4 *[Not Applicable]*

B10.5 The Licensee must not contravene the Licensee's Code of Conduct to the extent that it makes the Licensee responsible or liable for the matters set out in it.

B11 Notification of changes to end-use

B11.1 If the Licensee proposes to operate the Specified Water Industry Infrastructure to supply water for an end-use which is not set out in the most recent Water Quality Plan provided to IPART, the Licensee must notify IPART in writing at least 3 months before commencing such operation.

B12 Notification of changes to Authorised Person

B12.1 If an Authorised Person ceases, proposes to cease, or receives notification to cease providing any of the services relating to the activities authorised by this Licence, the Licensee must provide IPART with written notice as soon as practicable but no later than 28 days before the date of cessation of the services. The written notice must include details of how the services previously undertaken by the Authorised Person will continue to be undertaken.

B13 Notification of commercial operation

B13.1 This clause B13 applies each time the Licensee has brought any of the Specified Water Industry Infrastructure into commercial operation.

B13.2 The Licensee must:

a) notify IPART in accordance with the Reporting Manual that it has brought the relevant Specified Water Industry Infrastructure into commercial operation; and

b) provide such notification within 10 days after it has brought the relevant Specified Water Industry Infrastructure into commercial operation.

INTERPRETATION AND DEFINITIONS

Interpretation

In this Schedule B, unless the context requires otherwise:

i) the singular includes the plural and vice versa;
ii) headings are used for convenience only and do not affect the interpretation of this Schedule B;
iii) a reference to a document includes the document as modified from time to time and any document replacing it;
iv) a reference to a "person" includes a natural person and any body or entity whether incorporated or not;
v) a reference to a clause is to a clause in this Schedule B;
vi) a reference to a schedule is to a schedule to this Licence;
vii) a reference to a law or statute includes regulations, rules, codes and other instruments under it, and consolidations, amendments, re-enactments or replacements of them; and

viii) explanatory notes do not form part of this Licence, but in the case of uncertainty may be relied on for interpretation purposes.

Definitions

Expressions used in this Schedule B that are defined in the Act or the Regulation have the meanings set out in the Act or the Regulation.

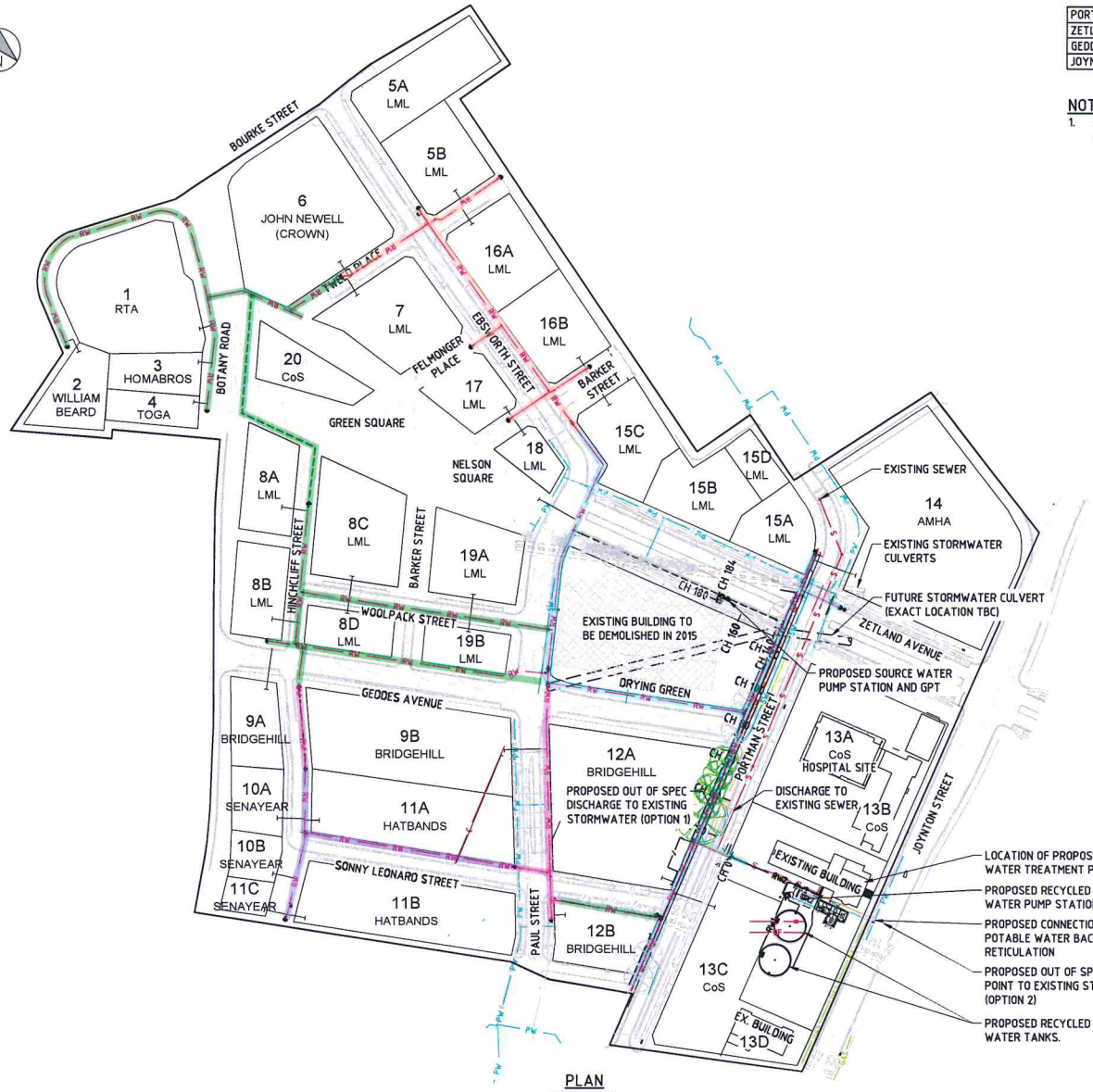
In this Schedule B:

Act	means the *Water Industry Competition Act 2006* (NSW).
Audit Guidelines	means the document entitled "Audit Guideline – Water Industry Competition Act 2006" which is prepared by IPART and is available on IPART's website at www.ipart.nsw.gov.au, and any other guidelines issued by IPART in relation to audits under the Act.
Authorised Person	means the authorised persons specified in, as applicable: i) Schedule A, clause A1, Table 1.1; ii) Schedule A, clause A2, Table 2.1; and iii) Schedule A, clause A3, Table 3.1.
Authorised Purposes	means the authorised purposes specified in, as applicable: i) Schedule A, clause A1, Table 1.3; ii) Schedule A, clause A2, Table 2.3; and iii) Schedule A, clause A3, Table 3.3.
Insurance Expert	means an insurance broker which holds an Australian financial services licence under Part 7.6 of the *Corporations Act 2001* (Cth) that authorises the broker to provide financial product advice for, and deal in, contracts of insurance within the meaning of Chapter 7 of that Act.
IPART	means the Independent Pricing and Regulatory Tribunal of New South Wales established under the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW).
Licence	means this network operator's licence granted under section 10 of the Act.
Licensee	means a person to whom this Licence is granted under section 10 of the Act.
Licensee's Code of Conduct	has the meaning given in clause B10.1.
Minister	means the Minister responsible for Part 2 of the Act.
NSW Health	means the Water Unit of NSW Ministry of Health and any of the local health districts as defined by the NSW Ministry of Health.
Plan	means any infrastructure operating plan, water quality plan or sewage management plan that the Licensee is required to prepare under the Regulation.
Regulation	means the *Water Industry Competition (General) Regulation 2008* (NSW).

Reporting Manual	means the document entitled "Network Operator's Reporting Manual" which is prepared by IPART and is available on IPART's website at www.ipart.nsw.gov.au.
Specified Area of Operations	means the area of operations specified in, as applicable: i) Schedule A, clause A1, Table 1.4; ii) Schedule A, clause A2, Table 2.4; and iii) Schedule A, clause A3, Table 3.4.
Specified Water Industry Infrastructure	means the water industry infrastructure specified in, as applicable: i) Schedule A, clause A1, Table 1.2; ii) Schedule A, clause A2, Table 2.2; and iii) Schedule A, clause A3, Table 3.2.
Verification Monitoring	means verification monitoring as described in the document entitled "Australian Drinking Water Guidelines" or the document entitled "Australian Guidelines for Water Recycling" as the case may be.
Water Quality Plan	means the water quality plan that the Licensee is required to prepare under the Regulation.

Attachment A – Area of operations

Drawing No	Revision	Date
GSW-130912-1140-OSP	G	March 2015



PLAN
SCALE 1:1250

0 12.5 25 37.5 50 62.5m
SCALE IN METRES (1:1250 AT A1)

S:\Projects\FS-130912-1140 - Green Square Water Reuse Scheme\Drawings\GSTC Reticulation Detailed Design Drawings V1.dwg

STREETS TO BE CONSTRUCTED BY CITY OF SYDNEY

PORTMAN STREET	OCTOBER 2016
ZETLAND AVENUE (WEST)	APRIL 2017
GEDDES AVENUE / PAUL STREET (NORTH)	AUGUST 2017
JOYNTON AVENUE / ZETLAND AVENUE (EAST)	NOVEMBER 2018

NOTES:

1. PIPEWORK SHALL BE LOCATED WITHIN THE PROPOSED ROAD RESERVES AND ARE INDICATIVE ONLY UNO.

LOT No.	STAGE	CONNECTION DATE
1	2	JAN-23
2	2	JAN-23
3	2	JAN-23
4	2	JAN-23
5A	1A	AUG-17
5B	1A	AUG-17
6	1A	MAY-17
7	1A	OCT-18
8A	2	MAY-18
8B	2	MAY-18
8C	2	APR-26
8D	2	FEB-26
9A	2	SEP-17
9B	1B(2)	SEP-17
10A	1B(1)	SEP-17
10B	1B(1)	MAY-17
11A	1B(1)	DEC-16
11B	1B(1)	JAN-17
11C	1B(1)	JUN-17
12A	1C	NOV-16
12B	1B(2)	NOV-16
13A	1C	JAN-20
13B	1C	OCT-16
13C	1C	FEB-16
13D	1C	OCT-16
14	1C	JAN-20
15A	1A	FEB-22
15B	1A	DEC-21
15C	1A	DEC-21
15D	1A	DEC-21
16A	1A	OCT-16
16B	1A	OCT-16
17	1A	OCT-18
18	1A	JAN-20
19A	2	SEP-23
19B	2	FEB-24
20	1C	FEB-18

ALL DESIGN BY GREEN SQUARE WATER

LEGEND

- E — POWER CABLING
- C — CONTROLS CABLING
- PW — POTABLE WATER
- UW — UNTREATED WATER (RISING MAIN)
- GSW — OUT OF SPEC WATER
- S — EXISTING SEWER
- S — TREATMENT WASTE (TO EXISTING SEWER)
- RW — RECYCLED WATER (RETICULATION SYSTEM)
- POTENTIAL FUTURE LINKS (RW)
- BOUNDARY LIMITS
- GPT — GROSS POLLUTANT TRAP
- CUSTOMER CONNECTION POINT (INDICATIVE ONLY)
- FUTURE CUSTOMER CONNECTION POINT (INDICATIVE ONLY)
- DEAD END WITH FLUSHING POINT AND POTENTIAL FUTURE EXTENSION POINT
- STAGE 1A DESIGN ONLY BY GSW CONSTRUCTION BY LML 2015
- STAGE 1B(1) DESIGN ONLY BY GSW CONSTRUCTION BY BRIDGEHILL 2015
- STAGE 1B(2) DESIGN ONLY BY GSW CONSTRUCTION BY HATBANDS 2015
- STAGE 1C DESIGN & CONSTRUCTION BY GSW BY JUNE 2015
- STAGE 2 DESIGN & CONSTRUCTION BY GSW BY MAY 2018

DIAL BEFORE YOU DIG www.1100.com.au

WARNING
ALL SERVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. EXACT LOCATION IS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORKS.

NOT FOR CONSTRUCTION

REV.	ZONE	REVISION	DATE	APP'D
G		CONNECTION DATES UPDATED	03/15	SMM
F		DETAILED DESIGN	01/15	SMM
E		UPDATED STAGE TABLE AND LEGEND	08/14	SMM
D		CONCEPT DESIGN - FINAL	07/14	SMM
C		RETICULATION ALIGNMENTS UPDATED	07/14	SMM

CMP CONSULTING GROUP
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Tel : 61 3 9188 3620 Web : www.cmpgroup.com.au

DESIGNED: S. MORRIS 10/13	DRAWN: A. DODSON 10/13	PROJECT MGR.: D. WHARTON
DESIGN CHECK: M. SALES 07/14	DRAFT CHECK: K. PATEL 07/14	
APPROVED: S. MORRIS		

Green Square Water

GREEN SQUARE TOWN CENTRE - SYDNEY
GREEN SQUARE WATER REUSE SCHEME
OVERALL SITE PLAN

DO NOT SCALE
AS SHOWN
DRAWING NUMBER
GSW-130912-1140-OSP G
NUMERAL REV

New South Wales

Water Industry Competition Act 2006 (NSW)

Notice of approval to bring new infrastructure into commercial operation

I, The Hon. Niall Blair, MLC, Minister for Lands and Water, have considered the request by Green Square Water Pty Ltd (ACN 163 432 906) (**Green Square Water**) for approval to bring new infrastructure into commercial operation under the *Water Industry Competition Act 2006* (NSW). The new infrastructure is for non-potable water as specified in Table 1.2, described in Schedule A of Green Square Water's network operator's licence (licence no. 15_031) (**Licence**).

I have considered a report prepared by an 'approved auditor' within the meaning of the *Water Industry Competition (General) Regulation 2008* (NSW) (**Regulation**). The report is included as **Attachment A**. I am satisfied that the report indicates that the new infrastructure:

1. complies with the requirements of the Regulation and the conditions of the Licence; and
2. is capable of operating safely and in accordance with Green Square Water's infrastructure operating plan and water quality plan (non-potable water).

I therefore give my approval under Schedule 1, clause 2 of the Regulation for Green Square Water to bring the new infrastructure into commercial operation.

.....

The Hon. Niall Blair, MLC
Minister for Lands and Water

Dated this 15th day of June 2016

New South Wales

Water Industry Competition Act 2006 (NSW)

Notice of approval to bring new infrastructure into commercial operation

I, The Hon. Don Harwin, MLC, Minister for Energy and Utilities, under clause 2 of Schedule 1 to the *Water Industry Competition (General) Regulation 2008* (NSW) **(Regulation),** approve Green Square Water Pty Ltd (ACN 163 432 906) **(GSW)** to bring into commercial operation, all new infrastructure which:

1. is infrastructure to which GSW's network operator's licence (licence no.15_031) **(Licence)** applies;
2. existed as at 11 February 2018; and
3. is of the kind described in Table 1.2 of the Licence.

I have considered the request from GSW for this approval, as well as the following report, which was prepared by an 'approved auditor' within the meaning of the Regulation.

1. "New Infrastructure Audit (Recycled Water Scheme – Storm Harvesting and Treatment), Green Square Water", dated 11 April 2018 (included as **Attachment A).**

I am satisfied that the report indicates that the new infrastructure:

1. complies with the requirements of the Regulation and the conditions of the Licence; and
2. is capable of operating safely and in accordance with GSW's infrastructure operating plan and water (non-potable) quality plan.

The Hon. Don Harwin, MLC
Minister for Energy and Utilities

Dated this 17th day of May 2018

Environmental Approvals Summary Table

Green Square

July 2019

Table 1 Environmental approvals summary table

Infrastructure Component	Part 3A applicable?[1]	Part 4 consent required or given?[2]	Part 5 applicable?[3]	Status
Reticulated recycled water across Joynton Avenue **- Green Square Town Centre Essential Infrastructure**	N/A	In 2008, the City of Sydney Council (Council) approved a Development Application (D/2008/1195) for Essential Infrastructure at Green Square Town Centre (the Town Centre). Since this time, the City reviewed its planning controls in response to changes to development plans as proposed by the main landowners, which also resulted in changes to the road layout. Development Application D/2012/1175 was lodged on 06/08/12 which has since been modified to **D/2012/1175/F which was approved on the 06/11/15.** The approved development includes the provision of essential infrastructure for the Green Square Town Centre, including demolition of minor structures and tree removal, construction of new roads and associated infrastructure, concept landscaping and streetscape design, provision of above and below ground services (including stormwater, non-drinking recycled water, sewer, water, waste collection, thermal energy, electrical and telecommunications) and staged construction. The Statement of Environmental Effects (SSE) prepared to support the application for development consent D/2012/1175) identifies the development site in Figure 3. The SEE (Section 4.1) assesses a slightly amended road layout which includes the 'Green Infrastructure' works which includes the underground pipes and wires that will provide electricity, non-drinking recycled water, waste collection and thermal energy to future residential and commercial development in the Green Square Town Centre.	No	**Approved**

Recycled water servicing GPARC - **Gunyama Park Aquatic and Recreation Centre**	N/A	The approved development **(D/2016/824 approved on 22/06/16 and latest modification D/2016/824/F approved on the 30/05/19)** is the staged construction and use of the "Gunyama Park Aquatic and Recreation Centre" comprising an indoor and outdoor aquatic and recreation centre and public park. The proposed works include demolition of existing structures, earthworks and construction of the new facilities. Utility services including the provisioning of recycled water are considered ancillary to any development application. The Statement of Environmental Effects (SEE) prepared to support the application for development consent D/2016/824) identifies the development site in Figure 1. The Hydraulic & Fire Services Design Statement (Appendix 39 of the SEE) prepared by CJ Arms & Associates details the scope of utility services approved under the DA. This states that additional recycled water supply will be available from a future authority recycled water supply (page 2). Whilst the specific recycled water infrastructure that will service the development is not specifically stated, the inclusion of the recycled water reticulation infrastructure required by Flow as the authority is included in the approved SEE and therefore approved under the DA.	No	**Approved**
Stormwater connection to second stormwater source	N/A	The stormwater connection to second stormwater source is also within the footprint of the approved GPARC development **(D/2016/824 approved on 22/06/16 and latest modification D/2016/824/F approved on the 30/05/19).** Utility services including the provisioning of recycled water are considered ancillary to any development application. The SEE references the Stormwater Management Provisions including the onsite stormwater management required (pg 30). The Hydraulic & Fire Services Design Statement (Appendix 39 of the SEE) prepared by CJ Arms & Associates details the scope of utility services approved under the DA. This states that additional recycled water supply will be available from a future authority recycled water supply (page 2). Whilst the specific stormwater connection not specifically stated, the inclusion of the additional stormwater connection to provide a second stormwater source would allow greater security of recycled water available for the GPARC development. This is required by Flow as the authority and is included in the approved SEE and therefore approved under the DA.	No	**Approved**

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24 May 2017

City of Sydney
Attention: Mr. John O'Shea
456 Kent Street,
SYDNEY NSW 2000

NOTICE OF DETERMINATION - APPROVAL
APPLICATION NO: D/2016/824

Dear Sir,

Please find enclosed the Notice of Determination and advisory notes relating to your development application for 130, 132-140 Joynton Avenue and 94-104 & 106-116 Epsom Road, Zetland – Gunyama Park Aquatic and Recreation Centre.

A copy of the planning report by the Council officer, who assessed the proposal is available on Council's website
http://www.cityofsydney.nsw.gov.au/Council/MeetingsAndCommittees/SearchMeetings.asp

When the search screen appears via the link, type in address and choose the Minutes or Planning Committee agenda for the reports.

If further information is required, please contact **Russell Hand ph. 9246 7321, email rhand@cityofsydney.nsw.gov.au.**
Yours faithfully

BRIDGET MCNAMARA
A/Area Planning Manager

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CITY OF SYDNEY

Notice of Determination - Approval *issued under Section 80(1)(a) of the Environmental Planning and Assessment Act 1979*

Development Application No.	D/2016/824
Applicant	THE COUNCIL of THE CITY of SYDNEY
Land to be developed	132-140 JOYNTON AVENUE , ZETLAND NSW 2017, 130 JOYNTON AVENUE , ZETLAND NSW 2017, 94-104 EPSOM ROAD , ZETLAND NSW 2017, 106-116 EPSOM ROAD , ZETLAND NSW 2017 LOT 100 DP 1200645, LOT 2 DP 850686, LOT 1 DP 850686, LOT 101 DP 1200645, LOT 100 DP 1220949
Approved development	Demolition of existing structures (including Council Depot at 94-104 Joynton Ave) and staged construction and use of the “Gunyama Park Aquatic and Recreation Centre” comprising an indoor and outdoor aquatic and recreation centre and public park.
Cost of development	$87,162,396
Determination	The application was determined by Central Sydney Planning Committee and was granted consent **subject to the conditions** in Schedules 1 and 2 and the **Terms of Approval** in Schedule 3.
Other Approvals	Before commencing *building work* or *subdivision work*, a relevant Construction Certificate must be obtained from Council or an Accredited Certifier. Council must be appointed the Principal Certifying Authority for any *subdivision work* under the Act.
Consent is to operate from	11 May 2017
Consent will lapse on	11 May 2022

Sydney2030/Green/Global/Connected

Reasons for conditions

Unrestricted consent may affect the environmental amenity of the area and would not be in the public interest.

Right of appeal

If you are dissatisfied with this decision, Section 97 of the Environmental Planning and Assessment Act 1979 gives you the right to appeal to the Land and Environment Court within six (6) months after the date on which you receive this notice.

Section 82A of the Environmental Planning and Assessment Act 1979 provides that the applicant may request the Council to review the determination. The request must be made in writing (or on the review application form) together with payment of the appropriate fee. The review must be lodged and determined within six (6) months of the date in which you received this notice.

Note: To enable the section 82A review to be considered within the six (6) month time frame prescribed under the Environmental Planning and Assessment Act 1979, it is advisable to lodge the application for review under Section 82A as soon as possible (within 4 months) to facilitate the statutory timeframes.

Section 82A does not apply to complying development, designated development, integrated development or a determination made by Council under Division 4 in respect of Crown applications. For further information please contact **Russell Hand on ph. 9246 7321.**

per
GRAHAM JAHN AM
Director - City Planning, Development & Transport

CONDITIONS OF CONSENT

SCHEDULE 1A

APPROVED DEVELOPMENT/DESIGN MODIFICATIONS/COVENANTS AND CONTRIBUTIONS/USE AND OPERATION

Note: Some conditions in Schedule 1A are to be satisfied prior to issue of a Construction Certificate and some are to be satisfied prior to issue of Occupation Certificate, where indicated.

SCHEDULE 1A

Approved Development/Design Modifications/Covenants and Contributions/Use and Operation

Note: Some conditions in Schedule 1A are to be satisfied prior to issue of a Construction Certificate and some are to be satisfied prior to issue of Occupation Certificate, where indicated.

(1) APPROVED DEVELOPMENT

(a) Development must be in accordance with Development Application No. D/2016/824 dated 22 June 2016 and the following drawings prepared by Andrew Burgess Architects, Grimshaw Architects and T.C.L Landscape Architects:

Drawing Number	Drawing Name	Date
ARC-DA-001 Rev A	Cover Sheet	31/05/16
ARC-DA-002 Rev A	Site Analysis Diagrams	31/05/16
ARC-DA-011 Rev B	Site Plan	28/10/16
ARC-DA-012 Rev B	Site Plan Interim Stage Surrounding Public Domain	28/10/16
ARC-DA-101 Rev A	Basement Plan	31/05/16
ARC-DA-102 Rev A	Ground Floor Plan	31/05/16
ARC-DA-104 Rev A	First Floor Plan	31/05/16
ARC-DA-105 Rev A	Main Roof Plan	31/05/16
ARC-DA-201 Rev A	Elevations Overall	31/05/16
ARC-DA-301 Rev A	Sections Overall	31/05/16
ARC-DA-401 Rev A	Park Amenities Building	31/05/16
ARC-DA-501 Rev A	Materials Board 01	31/05/16
ARC-DA-502 Rev A	Materials Board 02	31/05/16
ARC-DA-511 Rev A	Photomontages	27/05/16
ARC-T-DA-001 Rev A	Drawing List and Context Plan	27.05.16
ARC-T-DA-002 Rev B	Landscape Legend & Materials	4.11.16
ARC-T-DA-003 Rev A	Tree Protection & Removal Plan	27.05.16
ARC-T-DA-004 Rev B	General Arrangement Plan	14.10.16
ARC-T-DA-005 Rev B	Furniture & Fixtures Plan	14.10.16
ARC-T-DA-006 Rev A	Grading Plan	27.05.16
ARC-T-DA-007 Rev A	Planting Strategy	27.05.16
ARC-T-DA-008 Rev A	Long Sections & Elevation	27.05.16
ARC-T-DA-009 Rev A	Sections	27.05.16
ARC-T-DA-010 Rev B	Detailed Playground Plan	4.11.16

ARC-T-DA-011 Rev B	Detailed Playground	4.11.16
ARC-T-DA-012 Rev A	Detailed Playground	27.05.16

and as amended by the conditions of this consent.

In the event of any inconsistency between the approved plans and supplementary documentation, the plans will prevail.

(2) NO APPROVAL FOR LICENSED PREMISES

No approval is granted as part of this consent for the use of any part of the development as a licensed premises.

(3) HOURS OF OPERATION

The hours of operation are restricted as outlined below:

Aquatic and Recreation Centre (including fitness area) – indoor and outdoor	
<u>Staff setting up and closing</u> Monday to Friday Saturday, Sunday and Public Holidays	 5.00am – 11.30pm 5.30am – 9.30pm
<u>Customers using the building:</u> Monday to Friday (indoor) Monday to Friday (outdoor) Saturday, Sunday and Public Holidays	 5.30am – 11.00pm 5.30am – 10.00pm 6.00am – 9.00pm
Café – indoor and kiosk	
<u>Staff setting up and closing</u> Monday to Friday Saturday, Sunday and Public Holidays	 6.00am – 11.30pm 6.00am –9.30pm
<u>Customers using the building:</u> Monday to Friday Saturday, Sunday and Public Holidays	 6.30am – 10.00pm 7.00am – 8.00pm
Sportsfield lighting	8.00am – 10.00pm

(4) COMPLIANCE WITH SUBMITTED MATERIALS AND SAMPLES BOARD

The design details of the proposed building facade including all external finishes, colours and glazing must be in accordance with the materials schedule and sample board, and specifications prepared by Andrew Burgess Architects, Grimshaw Architects and T.C.L Landscape Architects, Drawing No's ARC-DA-501 and ARC-DA-502 dated 31 May 2016.

(5) FLOOR SPACE RATIO - ALL OTHER AREAS

The following applies to Floor Space Ratio:

(a) The Floor Space Ratio for the business use must not exceed 0.19:1 calculated in accordance with Sydney Local Environmental Plan 2012. For the purposes of the calculation of FSR, the Gross Floor Area of the business component is 5,545sqm.

(b) Prior to an Occupation Certificate being issued, a Registered Surveyor must provide certification of the total and component Gross Floor Areas (by use) in the development, utilising the definition under [insert applicable planning instrument], applicable at the time of development consent, to the satisfaction of the Principal Certifying Authority.

(6) BUILDING HEIGHT

(a) The height of the main roof of the aquatic centre building must not exceed RL 30.4 (AHD) to the top of the building.

(b) Prior to an Occupation Certificate being issued, a Registered Surveyor must provide certification that the height of the building accords with (a) above, to the satisfaction of the Principal Certifying Authority.

(7) RETENTION OF EXISTING BRICK WALLS ON JOYNTON AVE

(a) The existing brick walls and piers on Joynton Ave boundary are to be retained and incorporated into the landscaping design in the setback (easement area);

(b) As Joynton Ave is to be elevated, additional courses may be added on the affected section of the retained wall, so that the original relation of the wall and the footpath is maintained. The additional brickwork should match the existing wall;

(c) If the retention of these walls cannot be achieved, an alternative, interpreting the existence of these historical features, should be incorporated in the landscaping design. The details are to be provided to and approved by council's area planning manager prior to CC.

(8) ECOLOGY

(a) At least 14 Corymbia citriodora trees are to be planted as replacement food trees for Grey-Headed Flying-Foxes on-site

(b) Any existing hollows are to be salvaged where possible and retained on-site. At least 4 nest boxes are to be installed on-site (2 x micro-bat and 2 x medium size), and

(c) A qualified ecologist be present on site during removal of potential possum habitat and that at least 1 ring tail possum dray substitute be placed on site when landscape planting is dense enough to provide adequate habitat.

(9) CONTROL OF LIGHT INTO THE ENVIRONMENT

Lighting installed in the open and/or public spaces must comply with AS1158 series-lighting for roads and public spaces. The design and placement must be so that lighting does not create a nuisance or negatively affect the amenity of

the surrounding neighbourhood, for that purpose lighting must comply with AS4282-1997 control of obtrusive effects of outdoor lighting.

(10) LIGHTING FOR SPORTS FIELDS

Lighting associated with the sports fields must comply with AS2560 series-sports lighting, in particular the recommendations for obtrusive lighting released into the environment. The design and placement must be so that lighting does not create a nuisance or negatively affect the amenity of the surrounding neighbourhood, for that purpose lighting must also comply with AS4282-1997 control of obtrusive effects of outdoor lighting.

(11) PLAN OF MANAGEMENT AND SECURITY MANAGEMENT PLAN

The use must always be operated / managed in accordance with the Plan of Management, prepared by City Operations Revision 7.0 (City of Sydney) signed and dated 4 January 2017 that has been approved by Council and the Security Management Plan prepared by City Operations (City of Sydney) signed and dated April 2016 . In the event of any inconsistency, the conditions of this consent will prevail over the Plan of Management and Security Management Plan.

(12) SURVEILLANCE CAMERAS

(a) CCTV surveillance cameras shall be strategically installed, operated and maintained throughout the premises with particular coverage to:

(i) principal entrance/s and exits;

(ii) all areas within the premise occupied by the public (excluding toilets);

(iii) staircases in multilevel premises; and

(iv) the area within a 10m radius external to the public entrance(s) to the premise.

(b) Suitable and clearly visible signage shall be displayed at the principal entrance(s) to the premise and in a prominent position on each floor accessible to the public, in lettering not less than 50mm in height with the words “Closed Circuit Television in use on these premises”.

(c) All CCTV recording equipment and cameras shall be of high grade digital quality capable of establishing the population and identification of patrons, offenders and incidents within the depth of field view of the cameras. In this respect each surveillance camera shall be capable of recording a minimum rate of 10 frames per second and at high resolution.

(d) CCTV recording discs or hard drive recordings shall be retained for 28 days before being re-used, destroyed or deleted. Time and date shall be auto recorded on the disc or hard drive. The CCTV recording equipment shall be capable of reproducing a CD, DVD or other appropriate digital copy of recorded footage on demand of Council or Police Officers either immediately or within 12 hours of the request being made. Copy discs must be handed to Council, Police Officer or Special Inspectors as required.

(e) All CCTV recording devices and cameras shall be checked daily to ensure the equipment is operating correctly. The Licensee shall record this daily checking activity in the security/incident register book that meets the standards required by the Licensing Police and Council. If it is discovered at any time that the equipment is not in full operating order all reasonable steps must be taken to repair the system as soon as practicable. Where the system will not be functioning in full operating order for a period of longer than 24 hours the manager/licensee is to notify the relevant Local Area Commander of the NSW Police.

(f) All CCTV recording devices and cameras shall be operated at all times when the premises are open to the public and, where premises do not operate 24 hours a day, continuously for at least 1 hour prior to opening and closing times of the premises.

(g) The CCTV recording device shall be secured within the premises and only be accessible to senior management personnel so as to maintain the integrity of the recorded footage. When the premises is operating there must be at least one staff member present at the premises who is authorised to access the CCTV system and able to immediately review recordings and produce copies.

(h) Camera views are not to be obstructed by temporary or permanent structures, signage or other impediments.

(13) NOISE - GENERAL

(a) The emission of noise associated with the use of the premises including the cumulative operation of any mechanical plant and equipment, and air conditioning shall comply with the following:

(i) The $L_{Aeq,\ 15\ minute}$ noise level emitted from the use must not exceed the project specific noise level for that receiver as determined in accordance with the *NSW EPA Industrial Noise Policy*. Noise must be measured in accordance with the Industrial Noise Policy and relevant requirements of Australian Standard AS 1055-1997 Acoustics – Description and measurement of environmental noise.

(ii) Project specific noise levels shall be determined by establishing the existing environmental noise levels, in complete accordance with the assessment $L_{A90,\ 15\ minute}$ / rating $L_{A90,\ 15\ minute}$ process to be in accordance with the requirements for noise monitoring listed in the *NSW EPA Industrial Noise Policy* and relevant requirements of Australian Standard AS1055-1997 Standard AS 1055-1997 Acoustics – Description and measurement of environmental noise.

(iii) Modifying factors in Table 4.1 of the *NSW EPA Industrial Noise Policy* are applicable.

(b) An $L_{Aeq,15\ minute}$ noise level emitted from the use must not exceed the $L_{A90,\ 15\ minute}$ noise level by more than 3dB in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) when assessed inside any habitable room of any affected residence or noise sensitive commercial premises provided that;

(i) Where the $L_{A90,\ 15\ minute}$ noise level is below the threshold of hearing, Tf at any Octave Band Centre Frequency as defined in Table 1 of International Standard ISO 226 : 2003- Normal Equal-Loudness-Level Contours then the value of Tf corresponding to that Octave Band Centre Frequency shall be used instead.

(ii) The $L_{Aeq,15\ minute}$ noise level and the $L_{A90,15\ minute}$ noise level shall both be measured with all external doors and windows of the affected residence closed;

(iii) The relevant background noise level ($L_{A90,\ 15\ minute}$) is taken to mean the day, evening or night rating background noise level determined in complete accordance with the methodology outlined in the *NSW EPA Industrial Noise Policy* and Australian Standard AS1055.1997 Acoustics – Description and measurement of environmental noise.

(iv) Background noise shall be established in the absence of all noise emitted from the use but with the ventilation equipment normally servicing the affected residence operating. Background noise measurements are to be representative of the environmental noise levels at the affected location.

(v) Modifying factors in Table 4.1 of the *NSW EPA Industrial Noise Policy* are applicable. Internal Noise measurements are not to be corrected for duration.

(14) NOISE - ENTERTAINMENT NOISE INCLUDING LOUD SPEAKERS

(a) The $L_{A10,\ 15\ minute}$ noise level emitted from the use must not exceed the background noise level ($L_{A90,\ 15minute}$) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) by more than 5dB between the hours of 7.00am and 12.00 midnight when assessed at the boundary of any affected residence.

(b) The $L_{A10,\ 15\ minute}$ noise level emitted from the use must not exceed the background noise level ($L_{A90,\ 15\ minute}$) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) between the hours of 12.00 midnight and 7.00am when assessed at the boundary of any affected residence.

(c) Notwithstanding compliance with (a) and (b) above, noise from the use when assessed as an $L_{A10,\ 15\ minute}$ enters any residential use through an internal to internal transmission path is not to exceed the existing internal $L_{A90,\ 15\ minute}$ (from external sources excluding the use) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) when assessed within a habitable room at any affected residential use between the hours of 7am and 12midnight. Where the $L_{A10,\ 15\ minute}$ noise level is below the threshold of hearing, Tf at any Octave Band Centre Frequency as defined in Table 1 of International Standard ISO 226 : 2003- Normal Equal-Loudness-Level Contours then the value of Tf corresponding to that Octave Band Centre Frequency shall be used instead.

(d) Notwithstanding compliance with (a), (b) and (c) above, the noise from the use must not be audible within any habitable room in any residential use between the hours of 12.00 midnight and 7.00am.

(e) The $L_{A10,\ 15\ minute}$ noise level emitted from the use must not exceed the background noise level ($L_{A90,\ 15\ minute}$) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) by more than 3dB when assessed indoors at any affected commercial premises.

Note: The $L_{A10,\ 15\ minute}$ noise level emitted from the use is as per the definition in the Australian Standard AS1055-1997 Acoustics – Description and measurement of environmental noise. The background noise level $L_{A90,\ 15\ minute}$ is to be determined in the absence of noise emitted by the use and be representative of the noise sensitive receiver. It is to be determined from the assessment L_{A90} / rating L_{A90} methodology in complete accordance with the process listed in the NSW EPA Industrial Noise Policy and relevant requirements of AS1055.1997.

(15) NOISE LIMITERS

(a) Prior to the commencement of use of the premises, all sound amplification equipment must comply with the following

(b) All sound amplification equipment used in the venue must be controlled by a Root Mean Square (RMS) noise limiter with an attack time constant not exceeding 0.5 seconds, a release time constant not less than 1 second and a compression ratio greater than or equal to 20:1. The limiter shall be set by a suitably qualified acoustic consultant* in accordance with the manufacturer's specification to ensure that resultant amplified sound complies with the Council's noise criteria for entertainment noise.

(c) The limiter and all post-limiter equipment including power amplifiers must be tamper proof and only operable by the acoustic consultant, licensee and business owner.

(d) Prior to the commencement of use of the premises, the acoustic consultant must submit a Noise Limiter, Compliance & Installation Report to the written satisfaction of the Area Planning Manager. This report will certify that the limiter/s were installed, tested and calibrated such that amplified noise will comply with the NOISE – ENTERTAINMENT NOISE INCLUDING LOUDSPEAKERS Condition and any relevant requirements of the COMPLIANCE WITH THE ACOUSTIC REPORT PRIOR TO CONSTRUCTION & OCCUPATION CERTIFICATES condition. The report will be prepared in accordance with the following requirements:

(i) An initial calibration of the operation of the limiter with the sound amplification equipment is to be undertaken and reported on following receipt of the occupation certificate and prior to commencement of business. This assessment shall include setting of the amplification system in addition to a documented overview of the system so that compliance is achieved with the noise criteria as referenced in parts (a) to (c) above.

(ii) The settings of the limiter and subsequent equipment shall be benchmarked at the time of the above operational assessment. Pink noise shall be fed into the amplification system and the level of the

noise signal increased until the limiter operates continuously. The L_{Aeq} and L_{Ceq} (1/1 octave bands - 31.5 Hz to 8 kHz centre frequencies) levels shall be measured at a reference location in the centre of the patron area in addition to the centre of the relevant dance area (if present) and other required locations, with the premise empty other than essential staff. Additionally, correlating L_{Aeq} and L_{Ceq} measurements at identified nearby noise sensitive receivers are to be conducted whilst pink noise is being generated. The results shall be recorded and reported on such that compliance with the above noise control requirements will be achieved.

(iii) Following the above, music shall be played through the sound system(s) with the limiter(s) in continuous operation. The $L_{Aeq\ 10\ minute}$ and $L_{A10\ 10\ minute}$ 1/1 octave band (31.5 Hz through 8 kHz centre frequencies inclusive) levels shall be measured at the same nominated internal and external reference locations as above. The results shall be recorded and reported on and demonstrated to comply with the above noise control requirements.

(iv) The report will address the limiter installed within the premise (including but not limited to its brand, type specifications and location) including the noise control levels the limiter was set to (including a copy of the software configuration file for any digital signal processing device used). Furthermore, all post limiter equipment will be photographed, documented and catalogued in the report including location on a layout drawing.

(e) Following submission of the report to Council and receipt of written approval by the Area Planning Manager, a copy of the report is to be kept on the premises at all times, signed and dated by the operator r. From this point forward the operator will be responsible for the following:

(i) The upkeep of the system and ensuring that it is not tampered with or unauthorised modifications made. Repairs and replacements may be made to the system as necessary with any like component that does not increase the permitted noise amplification levels.
(ii) That no additional amplification equipment is to be brought onsite.
(iii) That part (a) of this condition is complied with.

(f) Modifications to the system are not to be undertaken unless authorised in writing by the Council's Area Planning Manager. Any terms given in writing at this time will form part of this consent as part of this condition. At a minimum, re-evaluation of parts (a) through (c) of this condition will be required unless otherwise specified.

Note: Suitably qualified Acoustic Consultant means a consultant who possesses the qualifications to render them eligible for membership of the Australian Acoustics Society, Institution of Engineers Australia or the Association of Australian Acoustic Consultants at the grade of member.

(16) COMPLIANCE WITH THE ACOUSTIC REPORT PRIOR TO CONSTRUCTION AND OR OCCUPATION CERTIFICATES

(a) All performance parameters, requirements, engineering assumptions and recommendations contained in the acoustic report prepared by Arup, dated 31 May 2016, reference 240516-00, titled Gunyama Park Aquatic & Recreation Centre, Council Reference 2016/337136 must be implemented as part of the detailed design assessment and implemented into the design drawings prior to the commencement of the use of the premises in accordance with the requirements of (b) and (c) below and to the satisfaction of the certifying authority.

(b) Prior to the issue of a Construction Certificate, the construction drawings and construction methodology must be assessed and certified by a suitably qualified acoustic consultant* (see definition below) to be in accordance with the requirements of the DA acoustic report set out below. Specifically, the consultant will prepare a written Acoustic Certification Report with reference to drawings, to the satisfaction of the Area Planning Manager which addresses the requirements specified within the approved report as given in part (a) above.

(c) Prior to the issue of an Occupation Certificate, a suitable qualified acoustic consultant is to provide a written Acoustic Verification Report to the satisfaction of the Area Planning Manager that the development complies with the requirements set out in the Report and in (a) and (b) above.

Note: Suitably qualified Acoustic Consultant means a consultant who possesses the qualifications to render them eligible for membership of the Australian Acoustics Society, Institution of Engineers Australia or the Association of Australian Acoustic Consultants at the grade of member.

(17) DEMOLITION, EXCAVATION AND CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

A site specific noise management plan shall be submitted to the Council for comment and approval prior to issue of any Construction Certificate.

The Plan must be prepared by a suitably qualified person who possesses the qualifications to render them eligible for membership of the Australian Acoustic Society, Institution of Engineers Australia or the Australian Association of Acoustic Consultants.

The plan must include but not be limited to the following:-

(a) identification of noise sensitive receivers near to the site.

(b) A prediction as to the level of noise impact likely to affect the nearest noise sensitive receivers from the use and proposed number of high noise intrusive appliances intended to be operated onsite. A statement should also be submitted outlining whether or not predicted noise levels will comply with the noise criteria stated within the *City of Sydney Construction Hours /Noise Code of Practice 1992* for the typical construction hours of 07.00am to 7.00pm. Where resultant site noise levels are likely to be in exceedance of this noise criteria then a suitable proposal must be given

as to the duration and frequency of respite periods that will be afforded to the occupiers of neighbouring property.

(c) A representative background noise measurement ($L_{A90,\ 15\ minute}$) should be submitted, assessed in the vicinity of any potentially affected receiver locations and measured in accordance with AS 1055:1.2.1997.

(d) Confirmation of the level of community consultation that has/is and will be undertaken with Building Managers/ occupiers of the main adjoining noise sensitive properties likely to be most affected by site works and the operation of plant/machinery particularly during the demolition and excavation phases.

(e) Confirmation of noise monitoring methodology that is to be undertaken during the main stages of work at neighbouring noise sensitive properties in order to keep complaints to a minimum and to ensure that noise from site works complies with the noise criteria contained within City's Construction Noise Code.

(f) What course of action will be undertaken following receipt of a complaint concerning offensive noise.

(g) Details of any noise mitigation measures that have been outlined by an acoustic consultant or otherwise that will be deployed on site to reduce noise impacts on the occupiers of neighbouring noise sensitive property to a minimum.

(h) What plant and equipment is to be used on site, the level of sound mitigation measures to be undertaken in each case and the criteria adopted in their selection taking into account the likely noise impacts on the occupiers of neighbouring property and other less intrusive technologies available.

(18) COMPLIANCE WITH DEMOLITION, EXCAVATION & CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

(a) All works conducted on site which form part of this development must be carried out in accordance with the submitted and approved Demolition, Excavation and Construction Management Plan.

(b) Where all such control measures have been implemented and the resultant noise and/ or vibration levels at any sensitive receiver still exceed the council's applicable criteria stated in the Construction Hours/Noise Code 1992 and are giving rise to sustained complaints then the contractor must provide regular, appropriate and sustained periods of respite in consultation with Council's Health and Building unit. Approval to vary the authorised noise and vibration levels must be received in writing by the proponent from Council prior to activities being undertaken that exceed sanctioned emission levels. (Use where respite periods not specified under the approved DEC NMP)

Such periods must be set and agreed to by Council's Health and Building Unit.

(19) ON SITE LOADING AREAS AND OPERATION

All loading and unloading operations associated with servicing the site must be carried out within the confines of the site, at all times and must not obstruct other properties/units or the public way.

At all times the service vehicle docks, car parking spaces and access driveways must be kept clear of goods and must not be used for storage purposes, including garbage storage.

(20) DEPARTMENT OF EDUCATION AND COMMUNITIES

(a) A service approval to operate the crèche, if required, must be obtained from the Department of Education and Communities prior to commencement of operations at the child care centre.

(b) Full compliance with any service approval requirements of the Department of Education and Communities is required.

(21) EMERGENCY EVACUATION PLAN PRIOR TO OCCUPATION CERTIFICATE

Prior to issue of an Occupation Certificate the owner/operator must have in place an emergency evacuation plan that encompasses the requirements of Fire and Rescue NSW and outlines the procedures by which staff will be trained in emergency procedures.

(22) CAPACITY

The total number of children at the creche at any one time must not exceed 90.

The total number and age break down may be subject to approval by the Department of Education and Communities (DEC) and any change to the figures may require the lodgement of a Section 96 application to modify this consent to reflect the final numbers approved by DEC.

(23) REFLECTIVITY

The Certifying Authority must ensure that the visible light reflectivity from building materials used on the facade of the building does not exceed 20% prior to issue of the Construction Certificate.

(24) AIR CONDITIONERS GENERALLY

No air-conditioning equipment is to be visible from the public domain. Equipment and associated wiring shall:

(a) Not be located on awnings or attached to the face of the building

(b) Not be located on roofs in such a way that it is visible from any street, footpath or park

(c) Be visually screened if located 1.8 metres above ground level in other locations

(d) Wiring shall be fully concealed.

(25) ASSOCIATED ROADWAY COSTS

All costs associated with the construction of any new road works including kerb and gutter, road pavement, drainage system and footway shall be borne by the developer. The new road works must be designed and constructed in accordance with the City's "Sydney Streets Technical Specification" including amendments and "Sydney Streets Design Code".

(26) BICYCLE PARKING AND END OF TRIP FACILITIES

(a) The minimum number of bicycle parking spaces and end of trip facilities to be provided for the development must comply with the table below.

Bicycle Parking Type	Total	Requirements
Staff	18	Spaces must be Class 2{i) bicycle facilities
Non-residential Visitor for the Aquatic Centre (including fitness centre)	130 (Refer ii)	Spaces must be Class 2 or Class 3 (i) bicycle facilities
End of Trip Facility Type		
Showers with change area	1	
Personal lockers	8	

Notes:

i. Australian Standard AS 2890.3:2015 refers to class 1 as class 'A', class 2 as class "B', and class 3 as class 'C'.

ii. Space for an additional 70 bicycle parking spaces has been identified. The demand for the provision of additional parking spaces will be monitored over time and additional spaces provided as the Green Square area develops.

(b) The layout, design and security of bicycle facilities must comply with the minimum requirements of Australian Standard AS 2890.3:2015 Parking Facilities Part 3: Bicycle Parking Facilities.

(27) CHANGES TO KERB SIDE PARKING RESTRICTIONS

A separate submission must be made to the Local Pedestrian, Cycling and Traffic Calming Committee via the City Infrastructure and Traffic Operations Unit seeking the City's approval for any changes to kerb side parking arrangements. There is no guarantee kerb side parking will be changed, or that any change will remain in place for the duration of the development use.

The submission must include two plans. One showing the existing kerb side parking restriction signs and stems, the second showing the proposed kerb side parking restriction signs and stems. Both plans must include changes to all signs and stems from the kerb line of the nearest intersection.

All costs associated with the parking proposal will be borne by the developer.

(28) COST OF SIGNPOSTING

All costs associated with signposting for any kerbside parking restrictions and traffic management measures associated with the development shall be borne by the developer.

(29) TRAFFIC WORKS

Any proposals for alterations to the public road, involving traffic and parking arrangements, must be designed in accordance with RMS Technical Directives and must be referred to and agreed to by the Local Pedestrian, Cycling and Traffic Calming Committee prior to any work commencing on site.

(30) COMMISSIONING EMISSION MONITORING-GAS FIRED POWER PLANT

(a) The operator must inform the Council's Area Planning Manager of their intention to commence operation of the plant no more than 7 days before the plant becomes operative at email address:

hbapplications@cityofsydney.nsw.gov.au

(b) Within 1 month of commencement of operation of the gas fired plant and emission control equipment, air emission monitoring and recording must be carried out by a suitably qualified air quality consultant on the exhaust emissions emanating from the plant.

(c) The monitoring, recording and reporting must include emission velocity, flow, rate, temperature, water vapour concentration and Nitrogen Oxides and any other relevant pollutants, which shall be carried out in accordance with the NSW Environment Protection Authority (EPA), publication "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales" and Schedule 7 of the Protection of the Environment Operations (Clean Air) Regulation 2010.

(d) The report must assess emissions against the standards of concentration for non-scheduled premises set out in Schedule 6 of the Protection of the Environment Operations (Clean Air) Regulation 2010 and the NSW EPA best available technology (BAT) emission standard for natural gas fired reciprocating internal combustion engines (Nitrogen dioxide (NO2) or nitric oxide (NO) or both, as NO2 equivalent).

(31) ENGINE AND GENERATOR- GAS FIRED POWER PLANT

The power generation system must comply with the following:-

(a) Lean burn Low NOx Engine

The generator engine shall incorporate lean burn, low NOx design technology to generate NOx emissions not exceeding 250ugm-3 prior to other emission control equipment.

The generator shall comply with the requirements of Australian Standard for Industrial and Commercial Gas-fired appliances AS3814.2005.

(b) Certification

Certification shall be provided by a suitably qualified consultant certifying the engine and generator has been installed in accordance with the above requirements.

(c) Maintenance and Servicing

The generator engine shall be serviced and maintained in accordance with the above requirements.

(d) Records

Records of all servicing and maintenance to be carried out on the generator engine are to be kept and made available on request by Council.

(32) ENGINE SPECIFICATION-GAS FIRED POWER GENERATION PLANT

This approval for power generation is restricted to 260 kWe gas engine generator set located on the rooftop of the approved building as indicated on the approved drawings.

(33) FUEL BURNING

Fuel burnt in the gas fired power generator engine must only be reticulated natural gas.

(34) QUARTERLY EMISSION MONITORING

(a) Following the first emission monitoring report, quarterly emission monitoring and recording by an air quality consultant shall be conducted of the exhaust stack. The quarterly monitoring and recording must include emission velocity, flow, rate, temperature, water vapour concentration and Nitrogen Oxides.

(b) The monitoring must include emission velocity, flow, rate, temperature, water vapour concentration and Nitrogen Oxides and any other relevant pollutant, which shall be carried out in accordance with the testing methods outlined within which shall be carried out in accordance with the NSW Environment Protection Authority (EPA), publication "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales" the testing methods outlined within Schedule 7 of the Protection of the Environment Operations (Clean Air) Regulation 2010.

(c) Upon written request from Council the results of the quarterly monitoring shall be made available in a written report to the Area Planning Manager within 7 days. Reports will be to the written satisfaction of the Area Planning Manager.

(d) The report must assess emissions against the standards of concentration for non-scheduled premises set out in Schedule 6 of the Protection of the Environment Operations (Clean Air) Regulation 2010 and the NSW EPA best available technology (BAT) emission standard for natural gas fired reciprocating internal combustion engines (Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent).

(e) The Operator shall retain emission monitoring reports required in (a) above for a minimum period of two years and must make them available for inspection by an authorised Council Officer upon request.

(35) SPILLAGE-MATERIALS AND EQUIPMENT TO CONTAIN & CLEAN UP

Appropriate materials and equipment are to be available on site at all times to contain and clean up spills of potentially polluting materials. An inventory of all clean up and containments materials and equipment, and clean up procedures must be kept on site.

(36) SUBMISSION OF OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN (OEMP)

Prior to operation of the gas-fired plant an Operational Environmental Management Plan must be submitted to the Council's Area Planning Manager for review. Operation of the plant must not commence until the submitted plan has been reviewed and approved in writing by the Council`s Area Planning Manager at email address:

hbapplications@cityofsydney.nsw.gov.au

The operational measures must include but not be limited to the following:

(a) A maintenance inspection log must be kept on site at all times documenting the maintenance works, procedures and any actions taken to deal with breakdowns carried out on the gas-fired plant.

(b) A log must be kept on site to document any complaints received in relation to emissions, noise and of any other nature. The log should also outline the actions undertaken to resolve the complaints.

(37) WASTE LIQUIDS

All storage areas where spillages may reasonably occur shall be bunded. The capacity of the bunded area shall be calculated as being equal to 110% of the largest vessel or container in the area or 10% of the total volume of vessels/containers accommodated in the area, whichever is greater. All bunded areas shall be graded to a blind sump to facilitate testing of collected wastewater and provide a low point for pump out. Bunded areas shall be suitably treated to prevent the ingress of water.

SCHEDULE 1B

Prior to Construction Certification/Commencement of Work/Health and Building

(38) ACCESSIBIITY REQUIREMENTS

The proposal is to comply with the requirements outlined at section recommendations in Section 4.2 of the Access Assessment Report (BCA Logic, 17 May 2016) as well as the general requirements of the City of Sydney Access DCP 2004

(39) CONSTRUCTION TRAFFIC MANAGEMENT PLAN

(a) The Construction Traffic Management Plan accompanying this Development Application has not been approved by this consent.

(b) A Construction Traffic Management Plan must be submitted to and approved by Council prior to a Construction Certificate being issued.

(40) ARCHAEOLOGICAL DISCOVERY DURING EXCAVATION

(a) Should any historical relics be unexpectedly discovered on the site during excavation, all excavation or disturbance to the area is to stop immediately and the Heritage Council of NSW should be informed in accordance with section 146 of the Heritage Act 1977.

(b) Should any Aboriginal relics be unexpectedly discovered then all excavation or disturbance of the area is to stop immediately and the Department of Environment and Climate Change is to be informed in accordance with Section 91 of the National Parks and Wildlife Act, 1974.

(41) TREES APPROVED FOR REMOVAL

(a) All trees marked for removal in Appendix 6 of the Arboricultural Impact Assessment Report prepared by Earthscape Horticultural Services dated May 2016 are approved for removal.

(b) All trees included in the Addendum to Arborist Report prepared by Earthscape Horticultural Services dated 28 September 2016.

(c) Tree removal must not occur until the Construction Certificate has been issued.

(d) All tree removal works must be carried out by a qualified Arborist, with a minimum Level 3 AQF in arboriculture and in accordance with WorkCover's Code of Practice – Amenity Tree Industry.

(e) In the event that wildlife is found during the course of tree removal works, work must stop until a trained wildlife handler attends the site or the animal relocates itself.

(42) TREES THAT MUST BE RETAINED

All trees marked for retention in Appendix 6 of the Arboricultural Impact Assessment Report prepared by Earthscape Horticultural Services dated May 2016 must be retained and protected throughout the proposed development.

(43) COMPLIANCE WITH ARBORIST'S REPORT

(a) All recommendations detailed in Arboricultural Impact Assessment Report prepared by Earthscape Horticultural Services dated May 2016 must be implemented prior to the issuing of the Construction Certificate and shall be maintained for the duration of all construction and development activities. All works shall comply with the following sections of the report

(i) Appendix 4 – Impact Assessment Schedule for Structural Root Zones (SRZ) Tree Protection Zone (TPZ) distance required for trees listed for retention and recommendations for required tree protection measures to be installed prior to the commencement of demolition, construction and development works.

(ii) Section 10 – Recommended Tree Protection Measures

(iii) Appendix 5 – Tree Location Plan showing Retention Values

(iv) Appendix 6 – Tree Protection Plan

(44) SITE SUPERVISION AND REPORTING

(a) An Arborist with minimum qualifications in Arboriculture of Level 5 (under the Australian Qualification Framework) must oversee various stages of work within the Tree Protection Zones of all trees to be retained and in accordance with Australian Standard AS4970 Protection of Trees on Development Sites.

(b) The appointed Arborist must be approved by the City's Tree Management Officer prior to engagement and prior to the issuing of the Construction Certificate.

(c) The Arborist must certify compliance with each key milestone detailed below to the Council's Area Planning Manager:

(i) The installation of tree protection measures prior to the issuing of a Construction Certificate;

(ii) During demolition of any ground surface materials (concrete, asphalt, garden area) within the Tree Protection Zone (TPZ) of any tree to be retained;

(iii) During demolition of the retaining wall along Joynton Avenue frontage;

(iv) During any excavation and trenching within the TPZ of any tree listed for retention;

(v) During any Landscape works within 6 metres of the trunk of any tree listed for retention.

(d) An Arboricultural Compliance Statement report shall be submitted each month to Councils Area Planning Manager which provides details on the health and structure of tree to be retained and protected and must include:

(i) Certification of compliance with each key milestone;

(ii) Details of any other works undertaken on any tree to be retained or within TPZ/s;

(iii) Documentary evidence of compliance with tree protection and measures (including photographs and site notes);

(45) ADVANCE TREE PLANTING

All new tree planting associated with the project must be undertaken in accordance with the following conditions, and to Council's satisfaction, prior to the issuing of the Occupation Certificate.

(a) All new trees must be grown to NATSPEC Guidelines for Specifying Trees to ensure quality trees and more successful establishment.

(b) At the time of planting, the container size is to be a minimum of 100 litres and a minimum height of 2.5 metres.

(c) All new trees must be planted by a qualified Horticulturalist or Arborist of Level 3 under the Australian Qualifications Framework (AQF).

(d) All new trees must be planted in such a manner as to promote good health during the establishment period, and must be maintained, as far as practicable to ensure tree growth into maturity.

(e) Written confirmation is to be obtained from Council's Area Planning Manager that all tree planting/s have been completed to Council's satisfaction (excluding tree maintenance) prior to the issue of an Occupation Certificate.

(f) Any newly planted tree that fails to establish within 2 years of the initial planting date must be replaced with a tree of comparable qualities.

(46) ALIGNMENT LEVELS – MAJOR DEVELOPMENT

(a) Proposed building floor levels, basement levels, basement car park entry levels and ground levels shown on the approved Development Application plans are indicative only and have not been approved by this consent.

(b) Prior to a Construction Certificate being issued for any excavation, civil construction, drainage or building work (whichever is earlier), excluding approved preparatory or demolition work, alignment levels for the building and site frontages must be submitted to and approved by Council. The submission must be prepared by a Registered Surveyor, must be in accordance with the City of Sydney's *Public Domain Manual* and must be submitted with a completed Alignment Levels checklist (available in the *Public Domain Manual*) and Footpath Levels and Gradients Approval Application form (available on the City's website).

(c) These alignment levels, as approved by Council, are to be incorporated into the plans submitted with the application for a Construction Certificate for any civil, drainage and public domain work as applicable under this consent. If the proposed detailed design of the public domain requires changes to any previously approved Alignment Levels, then an amended Alignment Levels submission must be submitted to and approved by Council to reflect these changes prior to a Construction Certificate being issued for public domain work.

(47) PAVING MATERIALS

The surface of any material used or proposed to be used for the paving of colonnades, thoroughfares, plazas, arcades and the like which are used by the public must comply with AS/NZS 4586:2004 (including amendments) "Slip resistance classification of new pedestrian surface materials".

(48) PUBLIC ART

Final details of the approved public art work must be submitted to and approved by Council's Area Planning Manager prior to issue of a Construction Certificate. The public artwork must be in accordance with the Sydney DCP 2012 and the Public Art Policy. Installation of the art work must be completed to Council's satisfaction prior to the issue of an Occupation Certificate.

(49) PUBLIC DOMAIN PLAN - MODIFICATIONS

The Public Domain Plan accompanying this Development Application has not been approved by this consent.

An amended, detailed Public Domain Plan must be prepared by an architect, urban designer, landscape architect or engineer to document all works required to ensure that the public domain complies with the City of Sydney's *Public Domain Manual*, *Sydney Streets Design Code, Epsom Park Precinct Public Domain Concept Design, Green Square Town Centre Public Domain Strategy* and *Sydney Streets Technical Specification*, including road pavement, traffic measures, footway pavement, kerb and gutter, drainage, vehicle crossovers, pedestrian ramps, lighting, street trees and landscaping, signage and other public domain elements. The plan must be submitted with a completed Public Domain Plan checklist (available in the City of Sydney's *Public Domain Manual*) and must show the following information as a minimum:

i. Detailed design of Rose Valley Way including;

a. Footway, kerb and gutter, driveway crossover

b. Street signage

c. Lighting

d. Alignment Levels

e. Soft landscaping including trees

f. Temporary works

g. Vehicle turning movement diagrams

ii. The new driveway crossovers, and removal of the redundant driveway crossovers in Joynton Avenue and the reinstatement of the kerb and gutter and footway to City Standards.

iii. The Public Domain Plan must be lodged with Council's Public Domain Section and be approved by Council prior to a Construction Certificate being issued for public domain work or above ground building work, whichever is later.

iv. The Public Domain Plan must be prepared in accordance with the City of Sydney's *Public Domain Manual* and *Sydney Streets Technical Specification*. If an Alignment Levels condition applies to the development, the Public Domain Plan submission must incorporate the approved Alignment Levels. If the proposed detailed design of the public domain requires changes to any previously approved Alignment Levels, then an amended Alignment Levels submission must be submitted to and approved by Council to reflect these changes prior to a Construction Certificate being issued for public domain work.

v. The works to the public domain are to be completed in accordance with the approved Public Domain Plan and Alignment Levels plans and the Public Domain Manual before any Occupation Certificate is issued in respect of the development or before the use commences, whichever is earlier.

(50) PUBLIC DOMAIN WORKS - HOLD POINTS AND HANDOVER

(a) Prior to a Construction Certificate being issued for public domain work, including civil, drainage and subsurface works, a set of hold points for approved public domain, civil and drainage work is to be determined with and approved by the City's Public Domain section in accordance with the City of Sydney's *Public Domain Manual* and *Sydney Streets Technical Specification*.

(b) Prior to a Certificate of Completion being issued for public domain works and before the issue of any Occupation Certificate for the development or before the use commences, whichever is earlier, electronic works-as-executed (as-built) plans and documentation, certified by a suitably qualified, independent professional must be submitted to and accepted by Council for all public domain works. Completion and handover of the constructed public domain works must be undertaken in accordance with the City of Sydney's *Public Domain Manual* and *Sydney Streets Technical Specification*, including requirements for as-built documentation, certification, warranties and the defects liability period.

(51) STORMWATER AND DRAINAGE - MAJOR DEVELOPMENT

(a) Prior to a Construction Certificate being issued for any excavation, civil construction, drainage or building work (whichever is earlier), excluding approved preparatory or demolition work, details of the proposed stormwater disposal and drainage from the development including a system of on-site stormwater detention in accordance with Council's standard requirements and details of the provision and maintenance of overland flow paths must be submitted to and approved by Council. All

approved details for the disposal of stormwater and drainage are to be implemented in the development.

(b) The requirements of Sydney Water with regard to the on site detention of stormwater must be ascertained and complied with. Evidence of the approval of Sydney Water to the on-site detention must be submitted prior to a Construction Certificate being issued excluding any approved preparatory, demolition or excavation works.

(c) Prior to a Construction Certificate being issued for any excavation, civil construction, drainage or building work (whichever is earlier), but excluding approved preparatory or demolition work, a stormwater quality assessment must be undertaken and must be approved by Council.

The stormwater quality assessment must:

(i) be prepared by a suitably qualified drainage engineer with experience in Water Sensitive Urban Design;

(ii) use modelling from an industry-standard water quality model; and

(iii) demonstrate what water sensitive urban design and other drainage measures will be used to ensure that the development will achieve the following post-development pollutant loads:

a. reduce the baseline annual pollutant load for litter and vegetation larger than 5mm by 90%;

b. reduce the baseline annual pollutant load for total suspended solids by 85%;

c. reduce the baseline annual pollutant load for total phosphorous by 65%;

d. reduce the baseline annual pollutant load for total nitrogen by 45%.

Prior to the issue of any Occupation Certificate, maintenance schedules of the proposed water sensitive urban design and drainage measures must be submitted to and approved by the Certifying Authority and a copy provided to Council.

(52) DEFECTS LIABILITY PERIOD – PUBLIC DOMAIN WORKS

All works to the City's public domain, including rectification of identified defects, are subject to a 12 month defects liability period from the date of final completion. The date of final completion will be nominated by Council on the Certificate of Completion for public domain works.

(53) DRAINAGE AND SERVICE PIT LIDS

Drainage and service pit lids throughout the public domain shall be heelguard and bicycle safe, finish flush with the adjacent pavement to avoid trip hazards and be clear of obstructions for easy opening and cleaning. Pit lids shall be in accordance with the *City of Sydney's Sydney Streets Design Code* and *Sydney Streets Technical Specification*. Details of drainage and service pit lids shall be

submitted and approved by Council prior to a Construction Certificate being issued for the relevant stage of work.

(54) PUBLIC DOMAIN LIGHTING

(a) Prior to a Construction Certificate for public domain works or above ground building works being issued, whichever is later, a detailed Public Domain Lighting Plan for pedestrian and street lighting in the public domain must be prepared by a suitably qualified, practicing lighting engineer or lighting designer and must be submitted to and approved by Council. The Lighting Plan must be prepared in accordance with the City of Sydney's Interim Draft Sydney Lights Design Code, Sydney Streets Design Code, *Sydney Streets Technical Specification* and *Public Domain Manual* and must include the following:

(i) Vertical and horizontal illuminance plots for the public domain lighting design to demonstrate compliance with all relevant Australian Standards and to meet the lighting categories and requirements specified by the City;

(ii) The location, type and category of existing and proposed lights, including details of luminaire specifications, required to ensure compliance with City policies and Australian Standards;

(iii) Footing locations and structural details;

(iv) Location and details of underground electrical reticulation, connections and conduits;

(v) Certification by a suitably qualified, practicing lighting engineer or lighting designer to certify that the design complies with City policies and all relevant Australian Standards including AS 1158, AS 3000 and AS4282;

(vi) Structural certification for footing designs by a suitably qualified, practicing engineer to certify that the design complies with City of Sydney policies and Australian Standards.

(b) The public domain lighting works are to be completed in accordance with the approved plans and the City of Sydney's *Public Domain Manual* before any Occupation Certificate is issued in respect of the development or before the use commences, whichever is earlier.

(55) ROAD NETWORK AND GEOMETRIC ROAD DESIGN

(a) Preparation of the detailed design and construction documentation for the proposed public road system shall include all necessary liaison with and requirements of all relevant public utility authorities, Roads and Maritime Services, Council, the Local Pedestrian Cycling and Traffic Calming Committee and its nominated consultants in order to achieve design approvals and construction compliance. Written evidence of approval from relevant authorities must be submitted to Council with the road design submission.

(b) The design and construction of all road works shall be undertaken in accordance with City of Sydney's *Sydney Streets Technical Specification* and the *Public Domain Manual*. Detailed plans, construction details and specifications for the works shall be prepared and submitted to Council for approval prior to issue of a Construction Certificate, excluding for approved preparatory or demolition work, or before issue of an approval under Section 138 of the *Roads Act 1993* for the road and drainage, infrastructure work. The detailed plans and supporting documentation shall include as a minimum the following information;

(i) General subdivision plan with contour details, clearly indicating the extent of work;

(ii) Road cross sections showing road and footway widths, existing levels, design levels, cross fall grade pavement configuration, batter slopes, engineered retaining walls, kerb returns, kerb and gutter, vehicle crossovers, pedestrian ramps the location of public utility services and 900mm minimum road restoration to match smoothly into the existing road levels;

(iii) Plan drawing and longitudinal section showing gutter invert, kerb and boundary alignments with design grades of the existing and proposed future public road network including public utility services;

(iv) Road design and drainage plans showing the following:

a. road pavement structure and design;

b. kerb, gutter and building alignment;

c. traffic management structures / measures;

d. traffic, pedestrian and parking signage;

e. details of intersections with existing roads including line-marking, pavement marking, sign-posting, swept paths for the largest expected vehicle;

f. on-road bicycle route infrastructure and facilities;

g. Drainage plans and schedule of drainage elements, showing the following:

i. The proposed location of all subsoil drains and sub-pavement drains, including the nominal width and depth of trenches, pipe diameters and materials, longitudinal design grades, and the locations of outlets and cleanouts;

ii. The location of public utility services;

iii. Details and specifications for the construction of all components of the system in accordance with the *City of Sydney's Sydney Streets Technical Specification*;

iv. All assumptions and/or calculations made in the determination of the need or otherwise for subsurface drainage, including requirements of broader stormwater catchment analysis to undertaken beyond the site boundary;

v. Drainage details and longitudinal sections with hydraulic grade lines for the design storm and other standard features such as flow rates, pipe class, pipe grade and velocity;

vi. Adjustments/upgrades to utility services as required;

vii. Standard engineering and structural details plan;

viii. Erosion and sedimentation control plans;

iv. A design certification report for the road works prepared by an appropriately qualified civil engineer certifying that the design complies with the City of Sydney's policies, standards and specifications and those of all other relevant authorities as applicable. All design documentation shall be completed in accordance with the relevant standards and specifications as adopted by Council from time to time. All engineering plans and calculations shall be checked, signed and certified by a suitably qualified practicing professional engineer.

(c) The road and drainage works are to be completed in accordance with the approved plans and the City of Sydney's *Public Domain Manual* before any Occupation Certificate is issued in respect of the development or before the use commences, whichever is earlier.

(56) TACTILE GROUND SURFACE INDICATORS AND HANDRAILS

All tactile ground surface indicators, handrails and other elements required to provide access into the building / property must be located entirely within the private property boundary.

(57) PUBLIC DOMAIN & ESSENTIAL INFRASTRUCTURE CO-ORDINATION

The design of the Aquatic Centre and Park and its connection to the surrounding streets and public domain infrastructure must be in accordance with the City's 'Sydney Streets Design Code', 'Sydney Streets Technical Specification', 'Epsom Park Precinct Public Domain Concept Design', 'Green Square Essential Infrastructure' approval (D/2012/1175 as amended) and subsequent documentation undertaken by the City and as issued in approved Construction Certificates.

The Aquatic Centre and Park design must address the following issues, which are to be submitted and approved by the Council prior to the first Construction Certificate;

- Demonstrate how the development integrates into the existing and future surrounding street network and adjoining properties including road and footway alignment levels and drainage systems.

- Detail any temporary or sacrificial work to facilitate staging or until the adjoining developments are constructed such as temporary vehicle connections, retaining walls and batters, public footways, stormwater lines, and lighting.

- Temporary lighting to facilitate Staging or until adjoining developments are constructed and permanent lighting installed are to form part of the submission.

- Detail works required outside the boundary of the site which are required to connect into the surrounding public domain infrastructure. Evidence of owners consent to undertake work, as required, on land owned by others is to be submitted.

(58) PUBLIC DOMAIN ACCESS

Safe accessible access for pedestrians, cyclist, vehicles and service vehicles must be provided which connects the public domain road reserve to the Aquatic Centre and Park. The access must be in accordance with Australian Standards, and the principles of the Sydney Streets Design Code, including the provision of adequate lighting, footway and lane widths and grades, and the like.

Works may be required within the site and to the surrounding properties to provide adequate access. Details of the access, including any temporary works are to be submitted and approved by the Council prior to Construction Certificate.

The access must be constructed in accordance with the approved plans prior an Occupation Certificate being issued or the use commencing whichever is the earlier.

(59) COMPLIANCE WITH ACID SULFATE SOILS MANAGEMENT PLAN

All recommendations contained in the Acid Sulphate Soils Management Plan prepared by AECOM, reference 60477507 dated 27 October 2016 must be implemented, including the following:

(a) 4.0 – Management Strategies

(b) 5.0 – Monitoring of Treatment

(c) 6.0 – Disposal

(d) 7.0 – Alternative Treatment Options

(e) 8.0 – Water Quality Management

(60) EMISSIONS

(a) The use of the premises must not give rise to the emission of gases, vapours, dusts or other impurities which are a nuisance, injurious or prejudicial to health.

(b) Gaseous emissions from the development must comply with the requirements of the *Protection of the Environment Operations Act 1997* and *Protection of the Environment Operations (Clean Air) Regulation 2010*.

(c) Uses that produce airborne particulate matter must incorporate an effective dust collection system.

(61) ASBESTOS REMOVAL WORKS

(a) All works removing asbestos containing materials must be carried out by a suitably licensed asbestos removalist duly licensed with Safework NSW, holding either a Friable (Class A) or a Non- Friable (Class B) Asbestos Removal Licence which ever applies.

A copy of the relevant licence shall be made available to any authorised Council officer on request within 24 hours

(b) Five days prior to the commencement of licensed asbestos removal, Safework NSW must be formally notified of the works. All adjoining properties and those opposite the development must be notified in writing of the dates and times when asbestos removal is to be conducted. The notification must identify the licensed asbestos removal contractor and include a contact person for the site together with telephone number and email address.

(c) All work must be carried out in accordance with the Work Health and Safety Regulation 2011 and the NSW Government and Work Cover document entitled How to manage and control asbestos in the work place: Code of Practice (Safework NSW) December 2011 and the City of Sydney Managing Asbestos Policy dated 21 October 2013 and associated guidelines.

(d) The asbestos removalist must use signs and barricades to clearly indicate the area where the asbestos removal work is being performed. Signs must be placed in positions so that people are aware of where the asbestos removal work area is and should remain in place until removal is completed and clearance to reoccupy has been granted. Responsibilities for the security and safety of the asbestos removal site and removal must be specified in the asbestos removal control plan (where required). This includes inaccessible areas that are likely to contain asbestos.

(e) Warning signs must be placed so they inform all people nearby that asbestos removal work is taking place in the area. Signs must be placed at all of the main entry points to the asbestos removal work area where asbestos is present. These signs must be weatherproof, constructed of light-weight material and adequately secured so they remain in prominent locations. The signs must be in accordance with AS 1319 -1994 Safety Signs for the Occupational Environment for size, illumination, location and maintenance.

(f) Asbestos waste must only be transported and disposed of at an EPA licensed waste facility.

(g) No asbestos products are to be reused on the site (i.e. packing pieces, spacers, formwork or fill etc).

(h) No asbestos laden skips or bins are to be left in any public place without the written approval of Council.

(i) A site notice board must be located at the main entrance to the site in a prominent position and must have minimum dimensions of 841mm x 594mm (A1) with any text on the notice to be a minimum of 30 point type size.

The site notice board must include the following:

(i) contact person for the site;

(ii) telephone and facsimile numbers and email address; and

(iv) site activities and time frames.

(62) CLASSIFICATION OF WASTE

Prior to the exportation of waste (including fill or soil) from the site, the waste materials must be classified in accordance with the provisions of the Protection of the *Environment Operations Act 1997* and the *NSW DECC Waste Classification Guidelines, Part1: Classifying Waste (July 2009)*. The classification of the material is essential to determine where the waste may be legally taken. The *Protection of the Environment Operations Act 1997* provides for the commission of an offence for both the waste owner and the transporters if the waste is taken to a place that cannot lawfully be used as a waste facility for the particular class of waste. For the transport and disposal of industrial, hazardous or Group A liquid waste advice should be sought from the EPA.

(63) DEWATERING

The Council does not permit or grant permission on application to discharge groundwater at any time and for any purpose into the City's stormwater system.

If any dewatering of the site is to be undertaken, a bore licence may be required from the NSW Office of Water under the provisions of Part V of the Water Act 1912. The NSW Office of Water licences dewatering to allow excavation for construction for a temporary period, usually 12 months.

NOTE: The Department's instructions to Council are that they will not endorse the extraction of groundwater in perpetuity i.e. permanent dewatering around a development site, because it considers such development to be unsustainable. For this reason any proposed basement or other area that requires dewatering on an on-going basis may need to be fully tanked

(64) ENVIRONMENTAL MANAGEMENT PLAN

Prior to the commencement of any demolition and remedial works an Environmental Management Plan (EMP) must be prepared for the site and submitted to the City's Area Planning Manager for written approval prior to the commencement of work. The EMP must consider all potential environmental impacts from the approved works including but not limited to sedimentation

control, contamination containment, stockpiles, noise and vibration, odours and dust emissions.

All works must be undertaken onsite in accordance with the approved Environmental Management Plan.

(65) IMPORTED FILL MATERIALS

All fill imported onto the site shall be validated to ensure the imported fill is suitable for the proposed land use from a contamination perspective. Fill imported on to the site shall also be compatible with the existing soil characteristic for site drainage purposes.

The City may require details of appropriate validation of imported fill material to be submitted with any application for future development of the site. Hence all fill imported onto the site should be validated by either one or both of the following methods during remediation works:

(a) Imported fill should be accompanied by documentation from the supplier which certifies that the material is not contaminated based upon analyses of the material for the known past history of the site where the material is obtained; and/or

(b) Sampling and analysis of the fill material shall be conducted in accordance with NSW EPA (1995) Sampling Design Guidelines.

(66) LAND REMEDIATION

The site is to be remediated and validated in accordance with the Remedial Action Plan prepared by AECOM dated 28 February 2017, reference number 60477507 Council reference 2017/113607 and the Letter of Interim Advice prepared by NSW Environment Protection Authority accredited Site Auditor Melissa Porter dated 3 March 2017 and reference AS121697. All remediation work carried out shall be conducted in accordance with the guidelines in force from time to time under the Contaminated Land Management Act 1997.

Any new information which comes to light during remediation, demolition or construction works which has the potential to alter previous conclusions about site contamination must be immediately notified to the Council's Area Planning Manager, the Site Auditor and the Principal Certifying Authority.

Any variations to the approved Remediation Action Plan shall be approved in writing by the Site Auditor and Council's Area Planning Manager prior to the commencement of such work.

(67) NOTIFICATION – NEW CONTAMINATION EVIDENCE

Any new information which comes to light during remediation, demolition or construction works which has the potential to alter previous conclusions about site contamination shall be notified to the City’s Area Planning Manager and the Principal Certifying Authority immediately.

(68) SITE AUDIT STATEMENT

Prior to the issue of a construction certificate associated with the built form of the development (excluding building work directly related to remediation), a Section A Site Audit Statement must be obtained from a NSW Environment Protection Authority accredited Site Auditor and submitted to the Council's Area Planning Manager at email address:-

hbapplications@cityofsydney.nsw.gov.au

The Site Audit Statement must confirm that the site has been remediated in accordance with the approved Remedial Action Plan and clearly state that site is suitable for the proposed use.

(a) In circumstances where the Site Audit Statement is subject to conditions that require ongoing review by the Auditor or Council, these must be reviewed and must be approved by the Council's Health and Building department in writing through the Area Planning Manager before the Site Audit Statement is issued.

(b) In circumstances where the Site Audit Statement conditions (if applicable) are not consistent with the consent, the development must not proceed until the inconsistency has been resolved to the satisfaction of Council (such as via a S96 modification of the consent pursuant to the provisions of the *Environmental Planning & Assessment Act 1979*).

(c) **No Occupation Certificate is to be issued** by the Principal Certifying Authority unless a Site Audit Statement has been submitted to and approved by Council in accordance with this condition.

(69) SITE AUDIT STATEMENT – ENVIRONMENTAL MANAGEMENT PLAN

Where the ongoing land use suitability and release of the Final (Section A) Site Audit Statement is dependent upon the implementation of an Environmental Management Plan (EMP) in relation to any residual contamination remaining onsite, the EMP must be approved by the Site Auditor and the City's Area Planning Manager prior to the issue of the final Site Audit Statement.

The owner of the land is required to comply with the ongoing obligations of any EMP which form part of the final Site Audit Statement for the site.

A covenant shall be registered on the title of the land binding the owners and future owners to be responsible for ongoing maintenance and any future rehabilitation works required in terms of the encapsulated/remaining contaminated materials, including the discharge or prevention of discharge from any contaminants or for any works subsequently required by the NSW Environment Protection Authority

A copy of the revised certificate of land title recording the covenant must be submitted to the City's Area Planning Manager and the Principal Certifying Authority prior to the issue of an Occupation Certificate.

(70) STOCKPILES

(a) No stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior approval has been obtained from the City's Construction Regulation Unit.

(b) All stockpiles of soil or other materials shall be placed away from drainage lines, gutters or stormwater pits or inlets.

(c) All stockpiles of soil or other materials likely to generate dust or odours shall be covered.

(d) All stockpiles of contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours

(71) CONSTRUCTION AND FITOUT OF FOOD PREMISES

The construction, fitout and finishes of the food premises must comply with Standard 3.2.3 of the Australian and New Zealand Food Standards Code under the *Food Act 2003* and AS 4674 – 2004 Design, Construction and Fitout of Food Premises.

Note: Copies of AS 4674-2004 may be obtained from the Standards Australia Customer Service on telephone 1300 65 46 46 or by visiting the website www.standards.com.au.

Copies of the Food Standards Code (Australia) may be obtained by contacting the Food Standards Australia and New Zealand Authority on telephone (02) 6271 2222, email info@foodstandards.gov.au or by visiting the website www.foodstandards.gov.au.

(72) COOLROOMS

Cool room(s), refrigerated chambers and strong-rooms must be constructed in accordance with G 1.2 of the *Building Code of Australia,* and:

(a) The floor of the coolroom must be graded to the door and a floor trapped waste outlet must be located outside the coolroom as near as possible to the door opening.

(b) All proposed shelving in the coolroom must be free-standing, constructed of galvanised steel angle section or other approved material with the lowest shelf at least 150mm clear of the floor.

(c) The floor of the coolroom must be constructed of impermeable concrete or coated, topped or otherwise finished with an impervious material to a smooth even surface and coved at the intersections with the walls to a minimum radius of 25mm.

(d) Must be fitted with a door that can be opened at all times from inside without a key.

(e) An approved audible alarm device must be located outside the coolroom(s) but controllable only from within the coolroom(s) and must be able to achieve a sound pressure level outside the chamber or

coolroom(s) of 90 d B (A) when measured 3 metres from a sounding device.

(73) FOOD PREMISES – ADDITIONAL MECHANICAL VENTILATION REQUIREMENTS

(a) The cooking appliances require an approved air handling system designed in accordance with *AS1668.1 -The Use of Mechanical Ventilation and Air conditioning in Buildings – Fire and Smoke Control in Multi-compartment Buildings* and *AS1668.2 - The Use of Ventilation and Air-conditioning in Buildings – Mechanical Ventilation in Buildings*, and must incorporate the following:

(i) The discharge exhaust air must be directed in a vertical, or near vertical direction above the roof, and

(ii) The cooking appliances must not burn any charcoal, wood or other solid fuel.

(b) Details of the proposed system must be submitted to and approved by Council's Health and Building Unit in writing prior to the issue of a Construction Certificate.

(74) FOOD PREMISES – DETAILED PLANS

(a) Detailed and scaled plans of all kitchen, bar, food preparation, waste and storage areas, food handler toilets and all areas associated with the food business must be prepared in accordance with the *Australia New Zealand Food Standards Code – 3.2.3 – Food Premises and Equipment* under the *Food Act 2003* and *AS 4674 - Design, Construction and Fit-out of Food Premises*.

(b) Prior to the Issue of a Construction Certificate the plans required by (a) of this condition must be submitted to and approved in writing by the Certifying Authority.

(75) GREASE AND LIQUID WASTE TRAPS

(a) A grease trap if required by Sydney Water must be installed in accordance with Sydney Water requirements and:

(i) Must be installed by a suitably qualified and licensed plumber in accordance with the *Plumbing Code of Australia*;

(ii) The grease trap must be not be located in any kitchen, food preparation or food storage area;

(iii) Be suitably constructed and installed in a location which allows it to be easily and effectively cleaned and emptied; and

(iv) Be suitably constructed and located as not to encourage the harbourage of pests and be effectively pest proofed.

(b) In-sink and in-floor waste bucket traps must be installed in all sinks and floor wastes in all commercial kitchens and food preparation areas and

must be carried out by a suitably qualified and licensed plumber in accordance with the *Plumbing Code of Australia*.

(76) HOT WATER SERVICE

The capacity of the hot water service must ensure that a constant supply of hot water is provided to the premises at all times for all sinks and basins including hand wash basin/s. The temperature of the hot water provided to the sinks must be in accordance with *AS4674 – Design, Construction and Fit-out of Food Premises* and the *Australia New Zealand Food Standards Code 3.2.2 - Food Safety Practices* and general requirements.

(77) NOTIFICATION OF CONDUCT OF FOOD BUSINESS

(a) The use shall not commence until the food business has notified Council with their food business details in accordance with the *Food Act 2003* and *The Australia New Zealand Food Standards Code – 3.2.2 – Food Safety Practices and General Requirements, Clause 4*.

(b) An Occupation Certificate will not be issued until such notification has been received by Council in accordance with Clause (a) of this condition.

Note: Registration forms are available on Council's website www.cityofsydney.nsw.gov.au.

(78) PERSONAL LOCKERS

Clothing lockers or change rooms for male and female staff must be provided in the premises or a dedicated, separate and isolated space for personal items must be provided in a separate location to the food handling and storage areas, in accordance with *AS4674 - Design, Construction and Fit out of Food Premises*.

(79) SANITARY FACILITIES – FOOD PREMISES

The sanitary facilities must be separated from all food handling areas via an airlock, self-closing door or mechanical ventilation in accordance with the provisions of the *Building Code of Australia*, Part F 3.1, 4.8 and 4.9.

(80) TOILETS FOR FOOD HANDLERS

(a) Adequate toilet facilities must be available for food handlers working for the food business. Toilets and associated facilities must be provided in accordance with *AS4674 – Design, Construction and Fit-out of Food Premises* and the *Australia New Zealand Food Standards Code, 3.2.3 - Food Premises and Equipment.*

(b) Details of the location of toilets which are provided exclusively for the use of food handlers and staff working at the business must be submitted for the approval of the Certifying Authority prior to the issue of a Construction Certificate.

(c) The toilet(s) must be provided with a hand wash basin, with hot and cold running water mixed through a common spout, hand wash soap, hygienic hand drying facilities and hands-free taps.

(81) WASTE STORAGE AREA

(a) To ensure the adequate storage and collection of waste from the food premises, all garbage and recyclable materials emanating from the premises must be stored in a designated waste storage area. The waste storage area must be designed and constructed in accordance with *AS 4674 – Design, Construction and Fit-out of Food Premises, Australia New Zealand Food Standards Code 3.2.3 – Food Premises and Equipment* and comply with the *Council Policy for Waste Minimisation in New Developments*, and must be:

(i) Provided with a hose tap connected to the water supply.

(ii) Paved with impervious floor materials.

(iii) Coved at the intersection of the floor and walls.

(iv) Graded and drained to a waste disposal system in accordance with the requirements of the relevant regulatory authority (Sydney Water).

(v) Adequately ventilated (mechanically or naturally) so that odour emissions do not cause offensive odour or air pollution as defined by the *Protection of the Environment Operations Act 1997* or a nuisance.

(vi) Fitted with appropriate interventions to meet fire safety standards in accordance with the *Building Code of Australia*.

(vii) Provided with the appropriate number and size of bins adequate for the storage of waste generated by the business, including recycling.

(viii) Appropriately managed so that it does not attract pests or create litter.

(b) Detailed plans and specifications for the construction of the waste storage area must be submitted to and approved by the Certifying Authority prior to the issue of the Construction Certificate and must be constructed in accordance with such plans and specifications prior to the issuance of an Occupation Certificate.

(82) MICROBIAL CONTROL IN WATER SYSTEMS

(a) Prior to the issue of a Construction Certificate detailed plans of any water cooling system (including cooling towers) as defined under the *Public Health Act 2010* must be prepared by a suitably qualified person and certified in accordance with *AS3666: 1: 2011 Air handling and water systems of buildings – Microbial Control – Design, installation and commissioning* and must be submitted to and approved in writing by the Council's Area Planning Manager at email **hbapplications@cityofsydney.nsw.gov.au**

(b) Water cooling system operation and maintenance manuals and maintenance service records must be readily available at the premises for inspection by an authorised officer upon request. Such records must be

kept on the premises in accordance with Clause 2.6 to *AS/NZS 3666:2:2011 Air handling and water systems of buildings – Microbial control, operation and maintenance.*

(c) The installation, operation and maintenance of warm water systems and water cooling systems (as defined under the *Public Health Act 2010*) must comply with the following:

(i) *Public Health Act 2010*, *Public Health Regulation 2012* and Parts 1 and 2 (or part 3 if a Performance-based water cooling system) of *AS3666:2011 Air handling and water systems of buildings – Microbial Control* and the *NSW Health Code of Practice for the Control of Legionnaires Disease*.

(ii) Prior to the issue of an Occupation Certificate or if non-applicable, prior to commencement of the use, the owner or occupier of the premises at which any warm water system and/or water cooling system is installed must cause notice of such installation(s) by providing to Council's Health and Building Unit, written notification by way of the prescribed form under Clause 12 to the *Public Health Regulation 2012.* Any changes to these particulars must be notified to the Council's Health and Building Unit in writing within 7 days of the change(s). Copies of the notification forms are available on the City of Sydney Council's website.

SCHEDULE 1C

During Construction/Prior to Occupation/Completion

(83) HOURS OF WORK AND NOISE – OUTSIDE CBD

The hours of construction and work on the development must be as follows:

(a) All work, including building/demolition and excavation work, and activities in the vicinity of the site generating noise associated with preparation for the commencement of work (eg. loading and unloading of goods, transferring of tools etc) in connection with the proposed development must only be carried out between the hours of 7.30am and 5.30pm on Mondays to Fridays, inclusive, and 7.30am and 3.30pm on Saturdays, with safety inspections being permitted at 7.00am on work days, and no work must be carried out on Sundays or public holidays.

(b) All work, including demolition, excavation and building work must comply with the City of Sydney Code of Practice for Construction Hours/Noise 1992 and Australian Standard 2436 - 2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites.

Note: Works may be undertaken outside of hours, where it is required to avoid the loss of life, damage to property, to prevent environmental harm and/or to avoid structural damage to the building. Written approval must be given by the Construction Regulation Unit, prior to works proceeding

The *City of Sydney Code of Practice for Construction Hours/Noise 1992* allows extended working hours subject to the approval of an application in accordance with the Code and under Section 96 of the *Environmental Planning and Assessment Act 1979*.

(84) NOTIFICATION OF EXCAVATION WORKS OR USE OF HIGH NOISE EMISSION APPLIANCES/PLANT

The immediately adjoining neighbours must be given a minimum of 48 hours notice that excavation, shoring or underpinning works or use of high noise emission appliances / plant are about to commence.

(85) USE OF HIGH NOISE EMISSION APPLIANCES / PLANT

(a) The operation of high noise emission appliances, plant and/or machinery such as pile – drivers, rock breakers and hydraulic hammers and those which are not listed in Groups B, C, D, E or F of Schedule 1 of the *City of Sydney Code of Practice for Construction Hours/Noise 199*2 and Australian Standard 2436-2010 *Guide to Noise Control on Construction, Maintenance and Demolition Sites* is restricted to the hours of

(i) Monday to Friday – 8:30am to 12:30pm and 2:00pm to 4:30pm

(ii) Saturday – 9:00am to 1:00pm

(iii) Sunday and Public Holidays – No works permitted

(b) All reasonable and feasible steps must be undertaken to ensure that the work, including demolition, excavation and building complies with the *City of Sydney Code of Practice for Construction Hours/Noise 1992* and Australian Standard 2436- 2010 *Guide to Noise Control on Construction, Maintenance and Demolition Sites*.

(86) COVERING OF LOADS

All vehicles involved in the excavation and/or demolition process and departing the property with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.

(87) HAZARDOUS AND INDUSTRIAL WASTE

Hazardous and/or industrial waste arising from the demolition/operational activities must be removed and/or transported in accordance with the requirements of the NSW Work Cover Authority pursuant to the provisions of the following:

(a) *Protection of the Environment Operations Act 1997*

(b) *Protection of the Environment Operations (Waste) Regulation 2005*

(c) *Waste Avoidance and Resource Recovery Act 2001*

(d) *Work Health and Safety Act 2011*

(e) *Work Health and Safety Regulation 2011.*

(88) VEHICLE CLEANSING

Prior to the commencement of work, suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site. It is an offence to allow, permit or cause materials to pollute or be placed in a position from which they may pollute waters.

(89) ACCESS DRIVEWAYS TO BE CONSTRUCTED

Approved driveways are to be constructed for all vehicular access to the construction site in accordance with the requirements of Council's "Driveway Specifications" to the satisfaction of Council.

(90) LOADING AND UNLOADING DURING CONSTRUCTION

The following requirements apply:

(a) All loading and unloading associated with construction activity must be accommodated on site.

(b) If, during excavation, it is not feasible for loading and unloading to take place on site, a Works Zone on the street may be considered by Council.

(c) A Works Zone may be required if loading and unloading is not possible on site. If a Works Zone is warranted an application must be made to Council at least 8 weeks prior to commencement of work on the site. An approval for a Works Zone may be given for a specific period and certain hours of

the days to meet the particular need for the site for such facilities at various stages of construction. The approval will be reviewed periodically for any adjustment necessitated by the progress of the construction activities.

(d) In addition to any approved Works Zone, provision must be made for loading and unloading to be accommodated on site once the development has reached ground level.

(e) The structural design of the building must allow the basement and/or the ground floor to be used as a loading and unloading area for the construction of the remainder of the development.

(f) Where hoisting activity over the public place is proposed to be undertaken including hoisting from a Works Zone, a separate approval under Section 68 of the Local Government Act 1993 must be obtained.

(91) NO OBSTRUCTION OF PUBLIC WAY

The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances. Non-compliance with this requirement will result in the issue of a notice by Council to stop all work on site.

(92) USE OF MOBILE CRANES

The following requirements apply:

(a) Mobile cranes operating from the road must not be used as a method of demolishing or constructing a building.

(b) For special operations including the delivery of materials, hoisting of plant and equipment and erection and dismantling of on site tower cranes which warrant the on-street use of mobile cranes, permits must be obtained from Council for the use of a mobile crane. The permits must be obtained 48 hours beforehand for partial road closures which, in the opinion of Council will create minimal traffic disruptions and 4 weeks beforehand in the case of full road closures and partial road closures which, in the opinion of Council, will create significant traffic disruptions.

(c) Special operations and the use of mobile cranes must comply with the approved hours of construction. Mobile cranes must not be delivered to the site prior to 7.30am without the prior approval of Council.

(93) STREET NUMBERING – MAJOR DEVELOPMENT

Prior to an Occupation Certificate being issued, street numbers and the building name must be clearly displayed at either end of the ground level frontage in accordance with the *Policy on Numbering of Premises within the City of Sydney*. If new street numbers or a change to street numbers is required, a separate application must be made to Council.

SPECIAL CONDITIONS

(94) PARKING PLAN

(a) An indicative area wide parking plan must be submitted to the Traffic Operations team for review and approval. This plan must show all the proposed parking restrictions proposed to be put in place adjacent to the development site. This plan must be approved prior to any of the street specific parking plans being submitted.

(b) Street specific parking plans must be submitted to the Traffic Operations team for approval. These plans must include the location and information present on each stem and sign. The plans must include chainages to each sign and stem from the kerb line of the nearest intersection. The street specific parking plans must be in line with the area wide parking plan, with any changes identified with the submission. The street specific parking plans must be submitted for each of the streets prior to the construction commencing for the street.

All parking signs must be approved and installed prior to the road being open for public use and prior to the occupation certificate being granted. The plans will require a referral to the LPCTCC for endorsement.

[Note: The process of reporting an item to the Local Pedestrian, Cycling and Traffic Calming Committee takes approximately 8 weeks from the relevant officer being satisfied with the proposal.]

(95) GREEN TRAVEL PLAN

The Green Travel Plan submitted as part of this application has not been approved, but is supported in principle. A Green Travel Plan based on the draft Green Travel Plan submitted by GTA dated 8 June 2016, must be submitted to and approved by Council prior to the Occupation Certificate for the site being granted.

In preparing the final Green Travel Plan, the applicant should review information on Council's website about preparing Travel Plans. The final Green Travel Plan would include steps which address customer and staff transport patterns by providing mode share targets which promote sustainable travel behaviour, means of minimising travel demand by private car and maximise the share of travel by other modes including public transport, cycling, walking, carpooling or car share.

[*Note: A Travel Plan is a 'live' document that needs to be closely monitored and reviewed throughout the first few years of implementation. The Travel Plan Coordinator responsibilities include:*

- *Coordinating implementation efforts,*
- *Conducting surveys or other data collection processes to measure progress;*
- *Communicating the travel plan to stakeholders;*
- *Coordinating events to promote awareness of the plan and associated invites;*
- *Coordinating marking and promotional programs.*

The steps outlined above should not be considered as a linear process, but rather an on-going cycle. Travel planning requires regular review and adjustment – a review may reveal the need to reconsider objectives or targets, or to add new actions to create greater incentives for the uptake of sustainable transport choices.

It is recommended the applicant review information on Council's website about preparing Travel Plans. The applicant may also contact a member of the Transport and Access Unit, to discuss the Green Travel Plan prior to its submission].

(96) BICYCLE FACILITIES WAY FINDING PLAN

A way finding parking plan must be submitted showing all the signage to the bicycle facilities. This might include illuminated signage where appropriate. These plans must be submitted to and approved by Council prior to the Occupation Certificate being issued.

(97) PARKING PLAN

Street specific parking plans must be submitted to the Traffic Operations team for approval. These plans must include the location and information present on each stem and sign. The plans must include chainages to each sign and stem from the kerb line of the nearest intersection. The street specific parking plans must be in line with Council's Neighbourhood Parking Policy. The street specific parking plans must be submitted for the streets adjacent to the site.

All parking signs must be approved and installed prior to the road being open for public use and prior to the Occupation Certificate being granted. The plans will require a referral to the LPCTCC for endorsement.

[Note: The process of reporting an item to the Local Pedestrian, Cycling and Traffic Calming Committee takes approximately 8 weeks from the relevant officer being satisfied with the proposal].

(98) PUBLIC DOMAIN ACCESS

Safe accessible access for pedestrians, cyclist, vehicles and service vehicles must be provided which connects the public domain road reserve to the Aquatic Centre and Park. The access must be in accordance with Australian Standards, and the principles of the Sydney Streets Design Code, including the provision of adequate lighting, footway and lane widths and grades, and the like. The plan must address issues such as vehicle access, passing vehicles, terminating roadways, swept path movements, waste collection and pedestrian arrangements to be in place.

Works may be required within the site and to the surrounding properties to provide adequate access. Details of the access, including any temporary works are to be submitted and approved by the Council prior to Construction Certificate.

The access must be constructed in accordance with the approved plans prior an Occupation Certificate being issued or the use commencing whichever is the earlier.

SCHEDULE 2

The prescribed conditions in accordance with Clause 98 of the Environmental Planning and Assessment Regulation 2000 apply to the development.

Clause 98 Compliance with *Building Code of Australia* and insurance requirements under the *Home Building Act 1989*

Clause 98A Erection of signs

Clause 98B Notification of *Home Building Act 1989* requirement

Clause 98C Conditions relating to entertainment venues

Clause 98D Conditions relating to maximum capacity signage

Clause 98E Conditions relating to shoring and adequacy of adjoining property

Refer to the NSW State legislation for full text of the clauses under Division 8A of the Environmental Planning and Assessment Regulation 2000. This can be accessed at http://www.legislation.nsw.gov.au

SCHEDULE 3

Terms of Approval

Other Integrated Development Approvals

The Terms of Approval for Integrated Development as advised by Water NSW are as follows:

General

1. An authorisation shall be obtained for the take of groundwater as part of the activity. Groundwater shall not be pumped or extracted for any purpose other than temporary construction dewatering at the site identified in the development application. The authorisation shall be subject to a currency period of 12 months from the date of issue and will be limited to the volume of groundwater take identified.

2. The design and construction of the building must prevent any take of groundwater after the authorisation has lapsed by making any below-ground levels that may be impacted by any water table fully watertight for the anticipated life of the building. Waterproofing of below-ground levels must be sufficiently extensive to incorporate adequate provision for unforeseen high water table elevations to prevent potential future inundation.

3. Sufficient permanent drainage shall be provided beneath and around the outside of the watertight structure to ensure that natural groundwater flow is not impeded and:

    (a) any groundwater mounding at the edge of the structure shall be at a level not greater than 10 % above the level to which the water table might naturally rise in the location immediately prior to the construction of the structure; and

    (b) any elevated water table is more than 1.0 m below the natural ground surface existent at the location immediately prior to the construction of the structure; and

    (c) where the habitable part of the structure (not being footings or foundations) is founded in bedrock or impermeable natural soil then the requirement to maintain groundwater flows beneath the structure is not applicable.

4. Construction methods and material used in and for construction shall be designed to account for the likely range of salinity and pollutants which may be dissolved in groundwater, and shall not themselves cause pollution of the groundwater.

5. Documentation (referred to as a 'report') comprising measurements, maps, bore logs, calculations, results, discussion and justification for various matters related to the dewatering process must be provided. Information will be required at several stages: prior to construction commencing (initial report - which will accompany the application for the authorisation), at any time when an authorisation renewal is required or a significant change in activities occurs (intermediate report); and at the completion of dewatering and related operations (completion report). Reports need to be submitted in a format consistent with electronic retrieval without editing restrictions; raw data should be presented in Excel spreadsheets without editing restrictions.

Prior to excavation

6. The following shall be included in the initial report:

    (a) measurements of groundwater levels beneath the site from a minimum of three relevant monitoring bores, together with details of the bores used in the assessment including bore logs and three-dimensional identification information.

(b) a map of the site and its immediate environs depicting the water table (baseline conditions) shown relative to the topography and approved construction footprint from the surface level and below. An assessment of the potential variation in the water table during the life of the proposed building together with a discussion of the methodology and information on which this assessment is based.

(c) details of the present and potential groundwater flow paths and hydraulic gradients in and around the site; the latter in response to the final volumetric emplacement of the construction.

(d) a schedule for the ongoing water level monitoring and description of the methodology to be used, from the date of consent until at least two months after the cessation of pumping. [Note that groundwater level measurements should be undertaken on a continuous basis using automatic loggers in monitoring bores.]

7. The Applicant shall assess the likely impacts of the dewatering activities on other groundwater users or structures or public infrastructure; this assessment will include an appropriate bore, spring or groundwater seep census and considerations relevant to potential subsidence or excessive settlement induced in nearby buildings and property, and be documented together with all calculations and information to support the basis of these in the initial report.

8. Groundwater quality testing of samples taken from outside the footprint of the proposed construction, with the intent of ensuring that as far as possible the natural and contaminant hydrochemistry of the potential dewatered groundwater is understood, shall be conducted on a suitable number of samples and tested by a NATA-certified laboratory. Details of the sampling locations and the protocol used, together with the test results accompanied by laboratory test certificates shall be included in the initial report. An assessment of results must be done by suitably qualified persons with the intent of identifying the presence of any contaminants and comparison of the data against accepted water quality objectives or criteria for the intended dewatering purpose. In the event of adverse quality findings, the Applicant must develop a plan to mitigate the impacts of the hydrochemistry on the dewatered groundwater and present the details of all assessments and plans in the initial report.

9. Groundwater quality testing generally in accordance with Clause 8, shall be undertaken on any anniversary or other renewal or alteration of any dewatering authorisation.

10. A reasonable estimate of the total volume of groundwater to be extracted shall be calculated and included in the initial report; together with details and calculation methods for the parameters and supporting information to confirm their development or measurement (e.g. permeability determined by slug-testing, pump-testing or other means).

11. A copy of a valid consent for the development shall be provided in the initial report.

12. The method of disposal of pumped water shall be nominated (i.e. reinjection, drainage to the stormwater system or discharge to sewer) and a copy of the written permission from the relevant controlling authority shall be provided in the initial report. The disposal of any contaminated pumped groundwater (sometimes called “tailwater”) must comply with the provisions of the Protection of the Environment Operations Act 1997 and any requirements of the relevant controlling authority.

13. Contaminated groundwater (i.e. above appropriate NEPM 2013 thresholds) shall not be reinjected into any aquifer. The reinjection system design and treatment methods to remove contaminants shall be nominated and included in the initial report and any subsequent intermediate report as necessary. The quality of any pumped water that is

to be reinjected must be demonstrated to be compatible with, or improve, the intrinsic or ambient groundwater in the vicinity of the reinjection site.

During excavation

14. Engineering measures designed to transfer groundwater around and beneath the basement shall be incorporated into the basement construction to prevent the completed infrastructure from restricting pre-existing groundwater flows.

15. Piping, piling or other structures used in the management of pumped groundwater shall not create a flooding hazard or induce mounding of groundwater. Control of pumped groundwater is to be maintained at all times during dewatering to prevent unregulated off-site discharge.

16. Measurement and monitoring arrangements to the satisfaction of the approval body are to be implemented. Weekly records of the volumes of all groundwater pumped and the quality of any water discharged are to be kept and a completion report provided after dewatering has ceased. Records of groundwater levels are to be kept and a summary showing daily or weekly levels in all monitoring bores provided in the completion report.

17. Pumped groundwater shall not be allowed to discharge off-site (e.g. adjoining roads, stormwater system, sewerage system, etc.) without the controlling authority's approval and/or owner's consent/s. The pH of discharge water shall be managed to be between 6.5 and 8.5. The requirements of any other approval for the discharge of pumped groundwater shall be complied with.

18. Dewatering shall be undertaken in accordance with groundwater-related management plans applicable to the excavation site. The requirements of any management plan (such as acid sulfate soils management plan or remediation action plan) shall not be compromised by the dewatering activity.

19. The location and construction of groundwater extraction works that are decommissioned are to be recorded in the completion report. The method of decommissioning is to be identified in the documentation.

20. Access to groundwater management works used in the activity is to be provided to permit inspection when required by the approval body under appropriate safety procedures.

Following excavation

21. Following cessation of the dewatering operations, the applicant shall submit the completion report which shall include:

    (a) detail of the volume of water taken, the precise periods and location of water taken, the details of water level monitoring in all of the relevant bores; and

    (b) a water table map depicting the aquifer's settled groundwater condition and a comparison to the baseline conditions; and

    (c) a detailed interpreted hydrogeological report identifying all actual resource and third party impacts, including an assessment of altered groundwater flows and an assessment of any subsidence or excessive settlement induced in nearby buildings and property and infrastructure.

22 The completion report is to be assessed by the approval body prior to any certifying agency's approval for occupation or use of the completed construction.

Ausgrid conditions

- The substation ventilation openings, including substation duct openings and louvered panels, must be separated from building air intake and exhaust openings, natural

ventilation openings and boundaries of adjacent allotments, by separation distances which meet the requirements of all relevant authorities, building regulations, BCA and Australian Standards including AS 1668.2: The use of ventilation and air-conditioning in buildings - Mechanical ventilation in buildings.

- In addition to above, Ausgrid requires the substation ventilation openings, including duct openings and louvered panels, to be separated from building ventilation system air intake and exhaust openings, including those on buildings on adjacent allotments, by not less than 6 metres.

- Exterior parts of buildings within 3 metres in any direction from substation ventilation openings, including duct openings and louvered panels, must have a fire rating level (FRL) of not less than 180/180/180 where the substation contains oil-filled equipment. For further details on fire segregation requirements refer to Ausgrid's Network Standard 113

- Any work undertaken near Overhead Power lines needs to be done in accordance with
  - WorkCover Document ISSC 23 "Working Near Overhead Power Lines"
  - Ausgrid Network Standards
  - Ausgrid Electrical Safety Rules

- The location of underground cables by using *Dial Before You Dig* and comply with the requirements of Ausgrid's Network Standard 156*: Working Near or Around Underground Cables* before any excavation works are undertaken.

- Existing Ausgrid easements, leases and/or right of ways must be maintained at all times to ensure 24 hour access. No temporary or permanent alterations to this property tenure EF 520, V3, 19/07/13 can occur without written approval from Ausgrid. For further details refer to Ausgrid's Network Standard 143.

- The developer is required to make a formal submission to Ausgrid by means of a duly completed Preliminary Enquiry and/ or Connection Application form, to allow Ausgrid to assess any impacts on its infrastructure and determine the electrical supply requirements for the development (eg. whether a substation is required on site).

The developer is to ensure that the proposed works do not contravene Ausgrid's technical standards and statutory requirements, in regards to the safe and reliable operation of Ausgrid's network.

IMPORTANT ADDITIONAL INFORMATION

Advisory note: The State Government has commenced planning for the construction of the CBD South East Light Rail (CSELR). You may need to consider the potential impacts of this project in programming your development. The CSELR route includes Alfred St, George St, Rawson Place, Eddy Ave, Chalmers St, and Devonshire St. For construction and programming information contact the Transport for NSW Infoline on 1800 684 490 or www.transport.nsw.gov.au/projects.

The Environmental Planning and Assessment Act 1979 requires you to:

1. Obtain a ***Construction Certificate*** prior to the commencement of any works. An application may be lodged with Council, or you may apply to a private accredited certifier for a Construction Certificate. An accredited certifier **must obtain Council's approval** to certain conditions of this development consent, where indicated before issuing the Construction Certificate.

2. ***Note: it is compulsory to lodge digital copies of applications, including plans and documentation if lodging an application with Council. Please refer to the link below for any further information about digital requirements and electronic files.***

   http://www.cityofsydney.nsw.gov.au/development/application-guide/application-process/digital-requirements.

3. Nominate a ***Principal Certifying Authority*** (PCA) which may be either Council or an accredited certifier and notify Council of that appointment. You **cannot lawfully** commence works without complying with this requirement.

4. Give Council at least two days notice of your intention to commence the erection of a building **before** commencing construction works. You cannot lawfully commence works without complying with this requirement.

5. Obtain an ***Occupation Certificate*** before commencing occupation or commencing to use the building or on the completion of other works including the erection of a sign. You cannot lawfully commence occupation or the use of a building without complying with this requirement.

You may also need to:

6. Lodge an ***Application for Approval*** under Section 138 of the *Roads Act 1993* for the **erection of a hoarding**.

7. Lodge an ***Application for Subdivision*** to obtain a ***Subdivision Certificate*** if a land (including stratum) subdivision is proposed and an Application for Subdivision to obtain ***Strata Title Subdivision*** under the relevant Strata Titles Act, if strata title of the development is proposed.

8. Comply with the Food Act 2003, the Australia New Zealand Food Standards Code, Australian Standard 4674 – 2004, and register the business with Council if the premises is used for the manufacture, preparation, packing, storing, conveying or delivering of food or beverage for sale.

9. Contact Sydney Water, Rockdale (Urban Development Section) regarding the water and sewerage services to this development.

10. Carry out critical stage inspections in accordance with Section 109E of the EP&A Act 1979 and clauses 162A, 162B and 163 of the EP&A Regulation 2000.

Applications and submissions referred to in this consent may be lodged at:

CBD Level 2, Town Hall House, 456 Kent St, Sydney.
KINGS CROSS 50-52 Darlinghurst Rd, Kings Cross.
GLEBE Customer Service Centre, 186 Glebe Point Rd, Glebe.
If you have any enquiries on any aspect of this consent, contact Russell Hand ph. 9246 7321, email rhand@cityofsydney.nsw.gov.au.

Statement of Environmental Effects

City of Sydney
Town Hall House
456 Kent Street
Sydney NSW 2000

Green Square Town Centre Essential Infrastructure

August 2012

Sydney2030/Green/Global/Connected

city of villages

CITY OF SYDNEY 2030

Table of Contents

Table of Contents

APPENDICES

Certification

This report has been prepared and reviewed by the City of Sydney as prescribed below.

Action	Name	Title	Signature	Date
Prepared by	David White	Planner Green Square		03.08.2012
Reviewed by	John Dwyer	Senior Program Manager Green Square		03.08.2012
Approved for issue by	Garry Harding	Director City Operations		03.08.2012

Abbreviations

The following abbreviations are used in this Statement of Environmental Effects:

AADT	Annual Average Daily Traffic
AEP	Annual Exceedance Probability
ANZECC	Australia and New Zealand Environment Conservation
ARI	Average Recurrence Interval
ARR	Australian and Runoff
AS	Australian Standard
AWCS	Automated Waste Collection System
BoM	Bureau of Meteorology
BTEX	Benzene, Toluene, Ethyl benzene and Xylenes
CBR	California Bearing Ratio
Cd	Cadmium
CEMP	Construction Environmental Management Plan
Cr	Chromium
Cu	Copper
CTMP	Construction Traffic Management Plan
DA	Development Application
DEC	NSW Department of Environment& Conservation
DCP	Development Control Plan
ESD	Ecologically Sustainable Development
EMP	Environmental Management Plan
ENM	Excavated Natural Materials
EP&A Act	NSW Environmental Planning & Assessment Act 1979
EPI	Environmental Planning Instrument
FPL	Flood Planning Level
FDA	Full Depth Asphalt
HLA	HLA Envirosciences
Km /	Kilometres / hour
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metres
MWT	Masson Wilson Twinney
Ni	Nickel
OCP	Organochlorine pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	polychlorinated biphenyl

Abbreviations

PMF	Probable Maximum Flood
PQL	Practical Quantification Limit
PSO	Planning Scheme Ordinance
RAP	Remedial Action Plan
REF	Review of Environmental Factors
REP	Regional Environmental Plan
RMS	Roads & Maritime Services
SEPP	State Environmental Planning Policy
SEE	Statement of Environmental Effects
SIL	Soil Investigation Levels
SIS	Species Impact Statement
SVOC	Semi Volatile Organic Compound
the Blue Book	Managing Urban Stormwater Soils and Construction (Landcom)
Council	The City of Sydney Council (Elected Council)
the City / City of Sydney	The City of Sydney (Staff)
the hospital	Royal South Sydney Hospital
the Regulations	NSW Environmental Planning & Assessment Regulations 2000
TMAP	Transport Management & Accessibility Plan
TN	Total Nitrogen
TP	Total Phosphorous
TPH	Total Petroleum Hydrocarbon
TSS	Total Suspended Solids
the Town Centre	Green Square Town Centre
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Materials
VOC	Volatile Organic Compound

Executive Summary

Background

In 2008, the City of Sydney Council (Council) approved a Development Application (D/2008/1195) for Essential Infrastructure at Green Square Town Centre (the Town Centre). Since this time, the City reviewed its planning controls in response to changes to development plans as proposed by the main landowners, which also resulted in changes to the road layout.

The consent period for the previous Development Application (DA) has lapsed and a new DA must now be lodged with Council for approval under Part 4 of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act).

The new DA proposes a slightly amended road layout and also includes 'Green Infrastructure' works which includes the underground pipes and wires that will provide electricity, non-drinking recycled water, waste collection and thermal energy to future residential and commercial development in the Town Centre. Other changes include:

- Staging of the project to occur over a 15 year timeframe;
- the removal of Sites 1 – 4 adjacent to the Green Square Rail Station from the DA area;
- a changing of road names; and
- removal of a previously required community building from the central plaza area.

The proposed Essential Infrastructure works will help achieve the Strategic Directions of Sustainable Sydney 2030 which include 'Division 2 – A leading environmental performer and Direction 9 – Sustainable development, renewal and design'.

The proposed Essential Infrastructure works will help achieve the Metropolitan Strategy, which nominates Green Square as a 'Planned Major Centre' within the City of Sydney Local Government Area, which will have a residential population of 40,000 and a workforce of up to 20,000[1] for the wider urban renewal area.

The DA is for the Essential Infrastructure works, as well as the Green Infrastructure works and the utilities that will be provided above and below ground within the Town Centre. The DA does not involve the construction of any new residential and commercial buildings which will be subject of separate DAs to be lodged with Council.

The Green Square Essential Infrastructure project is proposed to be delivered in a co-ordinated manner over a 15 year period to match proposed development with future infrastructure provision. This SEE has been drafted to achieve Council's objective of undertaking a staged approach to development in the Town Centre.

The proposed Essential Infrastructure works will support future development and will help achieve a high level of public amenity and basic requirements for access, circulation and services.

Proposed Works

The works that form part of this Statement of Environmental Effects (SEE) include:

- Rearrangement and construction of new streets, including footpaths, ramps, access stairs and the like together with associated infrastructure such as drainage, services, vehicular crossings, bus stop set-outs, street tree pits and

[1] In the Green Square Urban Renewal Area covering an area of 278 hectares

street trees etc. Detailed road marking and signage plans, including pedestrian crossings, cycle lanes, bus stops, traffic lights;

- Green Infrastructure works including the above and below ground utility connections that will connect with the proposed Green Infrastructure Centre (GIC)[2] which is proposed to be located at the former Royal South Sydney Hospital site (No.3 Joynton Avenue, Zetland);
- Concept landscape and streetscape design works including pavement design and construction, street furniture (seats, light poles and bins etc.) tree planting etc;
- Existing services, such as electrical, water, stormwater, sewer and telecommunications demolition and relocation, both above and below ground;
- Removal of specified trees and minor structures;
- Construction of new underground and above services;
- Stormwater diversion construction sequencing details;
- Services coordination details;
- Staging details to match the planned construction delivery for the Town Centre; and
- Erosion and sediment control measures during the proposed works.

Assessment

The proposed works are permissible with Council consent under City of Sydney Planning Scheme Ordinance (PSO) 1971, which zones most of the land 'Industrial'. Roads works and infrastructure are not a prohibited use (Column V). The proposed works are also consistent with the following environmental planning instruments which have been assessed in this SEE, which include South Sydney Local Environmental Plan (LEP) No.114 (Southern Industrial and Rosebery/Zetland Planning Districts) and South Sydney LEP 1998 Amendment No.17 Green Square Town Centre.

The SEE also provides an assessment of the Planning Proposals (Draft LEPs) which apply to the Town Centre and the Green Square Town Centre Development Control Plan 2012[3], which was approved by Council in 2012.

The DA is classed as 'Integrated Development' under Clause 91 of the EP&A Act and approval is required from the NSW Roads and Maritime Services (RMS) for a proposed road connection to Botany Road (State road).

Statement of Environmental Effects

The SEE includes the assessment of key engineering, environmental and planning issues such as transport, contamination, geotechnical, archaeological, flooding and hydrology, archaeological and water sensitive urban design. The SEE also includes a public domain strategy and concept design plans for streetscape and landscape works. Mitigation measures are included in the separate reports which will reduce any potential adverse impacts from the works during the construction and operation stage.

Importantly the assessment undertaken in the SEE builds upon the previous DA

[2] The GIC includes the Trigeneration facility, a Water Re-use facility and an Automated Waste Collection System.

[3] The Planning Proposals (Draft LEP) is awaiting gazettal from the Minister for Planning & Infrastructure

studies undertaken but incorporates the assessment of new State and local environmental and planning policy and legislation. Further the assessment and design in the new DA incorporates best practice design in the provision and layout of infrastructure.

Consultation

The City has maintained consultation with the community and key land owners on the redevelopment of the Green Square Town Centre as well as key NSW Government agencies such as Sydney Water, NSW Office of Environment & Heritage, Ausgrid and the NSW Roads & Maritime Services. Relevant issues raised by the community, land owners and NSW Government agencies have been incorporated into the SEE.

Consultation has also been maintained with key landowners to ensure that the works meet their future requirements for development to occur. Land owners in the Town Centre have been notified under Clause 49(2) (a) of the NSW Environmental Planning & Assessment Regulation 2000.

Conclusion

The proposed Green Square Town Centre Essential Infrastructure works are critical to the development of Green Square as a 'Planned Major Centre' and to provide a high level of amenity for a future population. The proposed Green Infrastructure works will help achieve the sustainable renewal of the Town Centre in accordance with Sustainable Sydney 2030.

This SEE has assessed key engineering, environmental and planning issues as well as key environmental planning instruments, relevant environmental and planning legislation and City of Sydney policies. The assessment concludes that the proposed Essential Infrastructure works are unlikely to have a significant or adverse environmental effect.

Consultation undertaken as part of the preparation of this DA has been incorporated into the assessment of this SEE and further consultation will continue as part of the future planning and development of the Town Centre.

The proposed Essential Infrastructure works will provide the foundation from which the Town Centre will be developed, which will occur in a staged manner over the next 15 years. Importantly the proposed Essential Infrastructure works will provide an opportunity for more sustainable outcomes in the Town Centre through less waste, water and energy use.

We request that Council supports the proposed development as described in this SEE and grants approval under Section 80 of the EP& A Act.

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1 Introduction

1.1 Background

In 2008, the City of Sydney Council (Council) approved a Development Application (D/2008/1195) for Essential Infrastructure at Green Square Town Centre (the Town Centre). Since this time, the City reviewed its planning controls in response to changes to development plans as proposed by the main landowners, which also resulted in changes to the road layout.

The consent period for the previous Development Application (DA) has lapsed and a new DA must now be lodged with Council for approval under Part 4 of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act).

The new DA now proposes a slightly amended road layout which includes the 'Green Infrastructure' works which includes the underground pipes and wires that will provide electricity, non-drinking recycled water, waste collection and thermal energy to future residential and commercial development in the Town Centre. Other changes include:

- staging of the development in Town Centre over a 15 year period;
- the removal of Sites 1 – 4 adjacent to the Green Square Rail Station from the DA area;
- a changing of road names;
- changes to proposed developments within the Town Centre;
- removal of a previously required community building from the central plaza area; and
- changes to the road layout.

The proposed Essential Infrastructure works will help achieve the Strategic Directions of Sustainable Sydney 2030 which include 'Direction 2 – A leading environmental performer and Direction 9 – Sustainable development, renewal and design'.

The proposed Essential Infrastructure works will help achieve the Metropolitan Strategy, which nominates Green Square as a 'Planned Major Centre' within the City of Sydney Local Government Area, which will have a residential population of 40,000 and a workforce of up to 20,000[4].

The DA is for the Essential Infrastructure works, as well as the Green Infrastructure works and utilities that will be provided above and below ground within the Town Centre. The DA does not involve the construction of any new residential and/or commercial buildings which will be subject of separate DAs to be lodged with Council.

The SEE acknowledges that development in the Town Centre will be staged over a fifteen year period.

The proposed infrastructure works will support future development and to achieve a high level of public amenity and basic requirements for access, circulation and services.

[4] In the Green Square Urban Renewal Area covering an area of 278 hectares

1 Introduction

1.1.1 The Proposed development

The proposed development, which is assessed in this SEE, covers the above and below ground infrastructure works for the Green Square Town Centre. These infrastructure works will allow future development and to achieve a high level of public amenity. The key infrastructure works cover new roads, new and upgrades utilities (gas, telecommunications, drinking water, stormwater, sewerage, electrical). Further details of these proposed works have been provided in Chapter 3 of this SEE.

1.2 Need for the Development Application

The proposed works are permissible with Council consent under the City of Sydney Planning Scheme Ordinance (PSO) 1971, which zones most of the General Industrial 4(a). Those sites within the Town Centre that have frontage to Botany Road are also affected by a Road Reservation – 2(b) County Road Widening.

In the 4(a) zone, all of the proposed works are permissible with consent, pursuant to the PSO 1971. Pursuant to Clause 12 and 13 of the instrument, buildings may be erected on land affected by a County Road Widening Reservation, subject to consent.

This application is classed as 'Integrated Development' in accordance with Clause 91 of the EP&A Act and approval is required from Roads and Maritime Services (RMS) for a proposed road connection (Geddes Avenue) with Botany Road which is a 'State road'. The DA is also likely to be referred to Sydney Water and RailCorp (Airport Rail Link).

1.3 Contents of this Statement of Environmental Effects

The City of Sydney has prepared this SEE to assess the proposed Essential Infrastructure works, which includes a number of technical reports including hydrology, traffic, contamination and landscape etc. The current SEE confirms the assessment undertaken in the previous SEE[5] and includes further design development undertaken since the previous DA, as well as design best practice principles to ensure a quality outcome for infrastructure provision in the Town Centre.

The SEE technical reports (Refer to the Appendices) also respond to each of the relevant conditions that form part of the previous Development Consent (D/2007/1195). In some cases, a is presented that some of the previous conditions are no longer relevant due to the updated assessment completed as part of this SEE.

This SEE contains the following information:

- Chapter 2 provides an overview of the existing Town Centre and surrounding area;
- Chapter 3 details the key elements of the proposed development;
- Chapter 4 provides an assessment of Section 79C of the EP&A Act; and
- Chapter 5 provides a conclusion and recommendation for the proposed development.

[5] [5] Statement of Environmental Effects, Essential Infrastructure Green Infrastructure Hub prepared by SJB Planning Pty Ltd, dated 17 July 2008

1 Introduction

1.4 Scope of this Statement of Environmental Effects

Design Plans

This SEE has assessed the proposed concept design plans for the Green Square Town Centre Essential Infrastructure works prepared by Aurecon (Refer to Appendix A) which includes the following design plans and provided

- Engineering and services drawing package by Aurecon (Refer to Appendix A); and
- Landscape and streetscape drawing package by Oculus (Refer to Appendix B).

Technical Studies

This SEE has been prepared based on the following engineering, environmental and planning studies:

- Engineering Infrastructure report by Aurecon (Refer to Appendix C);
- Green Square Town Centre Flood Mitigation Options prepared by Cardno (Refer to Appendix D);
- Green Square Town Centre Floodplain Risk Management Plan prepared by Cardno (Refer to Appendix E);
- Transport Report for the Green Square Town Centre Essential Infrastructure by Colston, Budd, Hunt & Twinney (Refer to Appendix F);
- Baseline Archaeological Report Green Square Town Centre prepared by AMAC Archaeological (Refer to Appendix G);
- Additional Geotechnical Study - Green Square Town Centre (Revision 1) prepared by AECOM (Refer to Appendix H);
- Interim Contamination Audit Report - Green Square Essential Infrastructure and Public Domain by Environ (Refer to Appendix I);
- Public Domain Water Sensitive Urban Design Report by AECOM (Refer to Appendix I); and
- Green Square Town Centre Public Domain Strategy by McGregor Coxall (Refer to Appendix K).

Photos of the Town Centre area are also provided in Appendix L.

1.5 Consultation

The following consultation tasks have been undertaken to advise the community of the City of Sydney's plans for the Green Square Town Centre:

- Green Square Town Centre, Public Domain Design Workshop – October 2007;
- Green Square Community Forum – July and November 2008;
- Green Square Community Update – February and August 2009;
- Green Square Town Centre update (November – December 2010) on Landcom, Mirvac, Leighton Planning Proposal;
- Green Square Community Update Meeting – May 2011;
- Green Square Town Centre Update – June 2011; and

1 Introduction

- March 2012 Community meetings (Village Conversations).

These events have provided the community with a constant flow of information regarding development and planning in the Town Centre and surrounding area.

2 Site Location and Context

2.1 The Existing Site

The proposed Essential Infrastructure works cover land within the Green Square Town Centre and partly within the surrounding area (Refer to Figure 1). For the purposes of this assessment, the DA does not apply to Green Square Development Sites Nos 1-4 at Green Square Rail Station.

The area is dominated by existing and vacant industrial land uses on varying block sizes. Existing uses include Sydney City Nissan motor showroom (John Newell site) and the Waverley Council Depot. Vacant uses include the Landcom land (former Waverley and Woollahra Incinerator site and the former City of Sydney Depot site); the former hospital site and NSW Police site (Refer to Figure 2.1). Photos of the site are provided as Appendix L.

There is no open space within the Town Centre area with only small pocket parks located to the east, near Victoria Park. At the western end of the Town Centre is the Green Square Station (underground rail station).

2.2 Adjoining Sites and Surrounding Development

The adjoining area is characterised by industrial uses, motor showrooms, business part estates, as well as newer and older style residential dwellings (apartments, townhouses, terraces and detached dwellings).

Residential redevelopment is occurring along Joynton Avenue as former warehouse sites are being redeveloped into high rise apartment towers (Victoria Park). Portman Street and Hansard Street contain older style residential dwellings (terraces / worker cottages).

2.3 Existing Infrastructure

The existing infrastructure in the Town Centre is summarised below and is taken from the Engineering Infrastructure report (Refer to Appendix C) and the Transport Report (Refer to Appendix F).

2.3.1 Roads

The existing road network within the Green Square is provided below and is based on the Transport report for the Green Square Town Centre Essential Infrastructure (Refer to Appendix F).

Existing Road Network

Major roads in the area, as shown on Figure 2 (Refer to Appendix F), include South Dowling Street, O'Riordan Street, Botany Road, Bourke Road/Bourke Street, Wyndham Street, O'Dea Avenue, Joynton Avenue and Epsom Road. Other roads include Elizabeth Street, Portman Street, Hansard Street and a number of laneways through or adjacent to the site.

South Dowling Street is a major north-south link in Sydney's arterial road network, connecting Southern Cross Drive from the airport with the City. South of O'Dea Avenue it provides a freeway standard, six lane divided carriageway with grade separated intersections and interchange facilities at major junctions. Access between South Dowling Street and the Green Square Town Centre is provided via Epsom Road/Link Road (via a left in/left out arrangement), Lachlan Street/Bourke Street (via a signalised intersection with South Dowling Street/Dacey Avenue) and O'Dea Avenue (via a signalised intersection with South Dowling Street/Todman Avenue). North of O'Dea Avenue, South Dowling Street provides two surface traffic lanes in each direction either side of the Eastern

Distributor, clear of intersections.

O'Riordan Street and Botany Road provide north-south arterial road links through the area. O'Riordan Street links Green Square in the north with Mascot and Sydney Airport in the south. Botany Road is a national freight corridor and forms part of a route linking the City with Botany. Both roads generally provide four lane undivided carriageways with two traffic lanes in each direction. Clearways operate in peak periods in the direction of peak traffic flow (both directions on O'Riordan Street). Outside clearway hours, parking is permitted clear of intersections in some sections.

Botany Road and Wyndham Street, north of Henderson Road/Raglan Street is a one-way pair with Botany Road providing a southbound carriageway and Wyndham Street northbound. South of Henderson Street these streets are two-way undivided roads.

Bourke Street runs east from Botany Road and provides access to commercial and industrial properties. It generally provides a four lane undivided carriageway with two traffic lanes in each direction and peak period clearways in both directions.

The intersection of Bourke Street with Botany Road, O'Riordan Street and Bourke Road is controlled by traffic signals. Right turns from Botany Road (southbound), Bourke Street (westbound) and O'Riordan Street (northbound) are not permitted.

Bourke Road and Wyndham Street provide undivided carriageways with one traffic lane and one parking lane in each direction, clear of intersections. Both roads provide access to commercial and industrial properties. The intersection of Bourke Road with Wyndham Street is controlled by traffic signals. Right turns from Bourke Road south into the link to O'Riordan Street, and right turns from the link east into Bourke Road, is not permitted.

O'Dea Avenue connects South Dowling Street with Bourke Street. Both intersections are signalised. It provides one to two traffic lanes in each direction, clear of intersections. There are bus stops on both sides of the road.

Joynton Avenue connects O'Dea Avenue in the north with Epsom Road in the south. Both intersections are signalised. At the Joynton Avenue/Epsom Road intersection, Rothschild Avenue forms a fourth (southern) approach. Joynton Avenue generally provides one traffic lane and one parking lane in each direction, clear of intersections.

Epsom Road is south of the site and, with Link Road, provides an east-west connection between South Dowling Street and Botany Road. It provides one traffic lane and one parking lane in each direction, clear of intersections. Bus stops are provided on both sides of the road. The intersection of Epsom Road with Botany Road is controlled by traffic signals.

Elizabeth Street runs north-west from Joynton Avenue and provides access to commercial, industrial and residential properties. It is an important bus route as it provides a direct link to/from the City. Elizabeth Street has an un-signalised t-intersection with Joynton Avenue. Traffic calming facilities are provided and a three tonne load limit applies in the southern section.

Portman Street connects Bourke Street in the north with Hansard Street in the south. It provides access to residential development in the northern part and commercial and industrial development in the southern part. Its intersections with Bourke Street and Hansard Street are priority controlled, with Bourke Street and Hansard Street having priority.

Hansard Street connects Joynton Avenue with Botany Road. Turns at the Botany Road intersection are restricted to left only onto Botany Road. Hansard Street provides one traffic lane and one parking lane in each direction, clear of intersections.

There are a number of laneways in the Town Centre, including Christies Lane, Portman Lane, Navins Lane, Tosh Lane and Chester Lane. These laneways basically provide access to properties fronting adjacent streets.

Regional Traffic Context

The main arterial traffic routes servicing the Town Centre include Botany Road, Bourke Street, Bourke Road, O'Riordan Street, Elizabeth Street and Wyndham Street. These are important traffic routes in the RMS regional road network.

A review of RMS's latest published traffic data found that in 2005, these roads carried the following two-way (sum of both directions) daily traffic volumes:-

- *Botany Road, south of Bourke Street, some 22,590 vehicles;*
- *Bourke Road, north of O'Riordan Street, some 17,440 vehicles;*
- *Bourke Street, north of Lachlan Street, some 16,550 vehicles;*
- *Elizabeth Street at Bourke Street, some 27,880 vehicles;*
- *O'Dea Avenue, east of Joynton Avenue, some 15,950 vehicles;*
- *O'Riordan Street, north of Johnson Street, some 21,970 vehicles; and*
- *Wyndham Street, north of Bourke Road, some 11,820 vehicles.*

These figures show that the highest traffic flows in the area occur on Elizabeth Street, O'Riordan Street and Botany Road with some 20,000 to 30,000 vehicles per day two-way. Bourke Road, Bourke Street, O'Dea Avenue and Wyndham Street carried some 10,000 to 20,000 vehicles per day.

2.3.2 Public Transport and Bike Lanes

A summary of the following transport infrastructure within Town Centre has been taken from the Transport report for the Green Square Town Centre (Refer to Appendix F).

Public Transport

Green Square is well served by public transport including heavy rail and public buses. Green Square Station provides heavy rail access via the Airport Rail Line between Central (15 minute and Campbelltown (45 minutes).

Botany Road is a major bus route in the area providing bus access between the City and Mascot / Botany. Bus access is also provided between the Station and the University of NSW Campus at Kensington

and to the Eastern Suburbs (Route 370).

Two proposed Metrobus Routes will link Green Square to Bondi Junction and Burwood and also to Miranda (Strategic Bus Corridor 21). In the longer term Botany Road will also further be developed as a transit corridor. There is also a proposal to provide an Eastern Transit Corridor linking the Town Centre and Central Station.

Bike Lanes

The Bourke Road, Mandible and Bowden Streets separated bike lane is the main bike lane in the Town Centre area. Further connections are proposed linking Green Square to Redfern via Joynton Avenue and Phillip Street.

2.3.3 Other Utilities and Infrastructure

A summary of the following other utilities and infrastructure within Town Centre has been taken from the Essential Infrastructure Engineering Infrastructure report (Refer to Appendix C).

Stormwater Drainage

The site is traversed by an existing stormwater overland flow path which is largely uncontrolled. Severe flooding occurs within the site and on adjacent public roads (Joynton Avenue). The infrastructure provided will accommodate the runoff expected during storms up to the 100 year ARI and convey this through the site in a safe manner. It is proposed to relocate the existing culvert through the site and to provide additional culverts and pipes to collect and carry major storm events.

Existing storage within the roads adjacent to the site which is currently experienced during severe storms will remain, with further detention storage provided within the development. A new culvert system will be provided in later stages of the project to route all collected stormwater directly to the Alexandra canal at Maddox Street.

Sewer

At present the site is crossed by several sewers ranging in size from 100mm to 300mm, serving the Town Centre and upstream development. These sewers drain south-west to the main carrier line in O'Riordan Street and have sufficient capacity to accommodate the flows generated by the proposed development.

Electricity

Ausgrid currently own and maintain a high voltage electrical reticulation network to the site. Additional high voltage supply mains will be required to adequately serve the electrical layout included in the DA submission.

High voltage connection to the Stage 1A lands will occur in accordance with Ausgrid Master Plan for the Green Square Town Centre.

Provisional high voltage, low voltage and communication service connections for future stages will be subject to their own Authority applications for connection. Capacity for these future stages is not included in the LML infrastructure. Conduits for future cabling will be provisioned within future development sites.

Gas

There are existing gas mains in the area, some of which are no longer in

use. The existing infrastructure has sufficient capacity to cater for the proposed development, with new pipelines provided for reticulation within the development.

The City of Sydney proposes to develop a Green Infrastructure Centre (GIC) on the former Royal South Sydney Hospital to provide more sustainable outcomes for the Town Centre. The GIC includes a Trigeneration facility which will help reduce energy demand in the Town Centre.

Water

Water mains exist in the existing road reserves. Sydney Water has indicated that these have sufficient capacity to provide a conventional water supply for the proposed Green Square Development. Future grey water reticulation will serve to reduce this demand as drinking water will not be required for non-contact uses such as toilet flushing and irrigation.

Telecommunications

Several communications cables currently exist within the road reserves within the site and in surrounding roads. These services will remain in place with minor depth relocations being required at new road crossings.

2.4 Regional Catchments and Waterways

The following information is taken from the Green Square Town Centre Public Domain Water Sensitive Urban Design report prepared by AECOM (Refer to Appendix J).

The Green Square Town Centre is located within the Alexandra Canal catchment. Alexandra Canal drains an area of 1,674 ha into the Cooks River adjacent to Sydney Airport. The Alexandra Canal catchment includes the Munni Street, Sheas Creek, Botany Road-Doody Street, Gardeners Road and Mascot West sub catchments, as shown in Figure 2 (Refer to Appendix J). The Town Centre is located within the Sheas Creek sub catchment, on a major drainage channel known as the Victoria Branch of Sheas Creek. The Victoria Branch of Sheas Creek drains a catchment of approximately 250 ha, equivalent to approximately 15% of the Alexandra Canal catchment.

2.5 Past use and History

The following information is taken from the Baseline Archaeological Assessment, Green Square Town Centre, Zetland prepared by AMAC Archaeological (Refer to Appendix G).

The site was located between Waterloo Swamp to the east, and Shea's Creek Swamp to the west. It is situated on a grant of 1400 acres made to William Hutchinson in 1825. Hutchinson appears to have taken possession of the land about five years earlier, and constructed a flour mill, named Waterloo Mill by Governor Macquarie. The Mill was probably located to the north of the site. A dam, named Waterloo Dam, was created on the site by c1830, presumably for the use of the Waterloo Mill.

Between 1848 and 1877, a wool-washing works was established on the site, on the southern edge of the dam. This continued operation until about 1900. The Waterloo Fire Brick Company was then established at this location; the brickworks continued to operate until

the early 1950s.

The drainage of the area was improved in the late nineteenth and early twentieth centuries, probably owing to the construction of Shea's Creek Canal in the early 1890s. Filling of the area of the Dam may have also started at this time. This allowed the construction of another brickworks on the site in about 1911; The Industrial Brick Company. This brickworks site also continued to operate until at least c1950.

In c1912, the Royal South Sydney Hospital was established on the eastern part of the site. The Hospital, later the hospital, continued to operate on the site until 1993. Further buildings were gradually added to the property over this time.

In c1920, the Waterloo Municipal garbage destructor was established in the northern part of the site. At least part of this property has remained in the possession of the City of Sydney, and is presently a City of Sydney depot, although it is leased to the neighbouring car showroom. To the south of this, a garbage incinerator was constructed in c1970, for the use of Waverley and Woollahra Councils. The incinerator continued operation until 1996.

The part of the site between Botany Road and O'Riordan Street appears to have remained undeveloped until about 1915. A row of factories was then built along Botany Road in this area. The O'Riordan Street frontage was less heavily developed.

2.6 Existing Site Condition

The current condition of land in the Town Centre is discussed in Table 1, which is taken from the Interim Contamination Audit Report – Green Square Essential Infrastructure and Public Domain (Refer to Appendix I).

TABLE 1 SITE LOCATION AND CONDITION

Site	Location	Condition
Ebsworth (northern extent)	*Located at the western boundary of the former City of Sydney Depot, extends through the middle of the Incinerator (and the middle of the actual incinerator building) and then along the south-eastern boundary of the Police land.*	*City of Sydney Depot: Amenities building, unsealed BBQ/garden area and a brick workshop building. Three oil vehicle pits were present within the workshop building. The Depot was higher than the adjacent John Newell Mazda to the south indicating potential use of fill in this section in additional to land filling. The south-east section included concrete paving and landscaping.* *The incinerator building has been demolished and all concrete removed. Landfill materials have been excavated as required to facilitate demolition. The materials were stockpiled, tested and re-instated.* *Police land: Bomb rescue squad building, sealed car parking area and landscaped areas.* *The City of Sydney land: Access way/car parking area.*
Green Square (Plaza) and Neilson	*Southern boundary of the Incinerator and northern boundary of the Police land.*	*Landscaped section of the Incinerator.* *Landscaped and asphalt access driveway on the Police land. A small section of the „Special Technical Investigation Branch"*

Square (future pooled carpark Under)		*building.* *Half of Civic Plaza and all Neighbourhood Plaza extend over the former landfill.*
Sluice Street (Tweed Place)	*Northern boundary of the Incinerator site and southern boundary of the City of Sydney Depot*	*Incinerator: Landscaped and car parking* *City of Sydney Depot: Workshop building.*
Felmonger Place	*Centre of the Incinerator*	*Incinerator: Landscaped Area with the western section extending an area from which landfill materials have been excavated as required to facilitate demolition. The materials were stockpiled, tested and re-instated.*
The Drying Green (Park)	*City of Sydney land.*	*Large warehouses* *The north-west corner is located over the former landfill.*
Barker Street	*Extends south from the middle of the former incinerator building through the middle of the Police land.*	*The incinerator building has been demolished and all concrete removed. Landfill materials have been excavated as required to facilitate demolition. The materials were stockpiled, tested and re-instated.* *At the Police land the road extends through areas that are currently landscaped, sealed or support buildings used for technical and engineering investigations.* *Landscaped and asphalt access driveway on the Police land. A small section of the „Special Technical Investigation Branch" building, the Engineering Investigation building.*
Hinchcliffe Street	*Western boundary of Senayear Land and eastern boundary of Hatbands*	*Warehouse and mechanical repairs buildings.*
Woolpack Street	*Through southern portion of Police*	*The road extends through sealed areas currently used for car parking. The eastern extent extends over the former landfill.*
Zetland Avenue	*Southern boundary of the Police land.* *Southern boundary of former Daimler Chrysler.* *Northern boundary of the hospital.*	*The road extends through sealed areas currently used for landscaping and car parking.* *Paved car parking area of the Hospital. Buildings remain in place.*
Portman Street	*Currently Portman Street*	*Roadway and sidewalks*
Geddes Avenue	*City of Sydney land.*	*Landscaping, car parking and a section of a warehouse.*
Paul Street (southern extent)	*City of Sydney land*	*Car parking and a section of a building.*
Sonny Leonard	*Southern boundary of Hatbands*	*Warehouse*

Street		
Matron Ruby Park	*Hospital Park*	*Hospital Centre*
Felmonger Place	*Centre of the Incinerator*	*Incinerator: Landscaped Area with the western section extending an area from which landfill materials have been excavated as required to facilitate demolition. The materials were stockpiled, tested and re-instated.*

Further assessment of contamination issues is provided in Chapter 4 of this SEE and within Appendix I.

2.6.1 Existing Flooding

The following information is taken from the Green Square Town Centre Floodplain Risk Management Plan prepared by Cardno (Refer to Appendix D).

Overview

The flood conditions reported in this Plan are those under the ultimate development scenario (showing indicative building allotments) for the Town Centre with the incorporation of engineering works (described in Chapter 3).

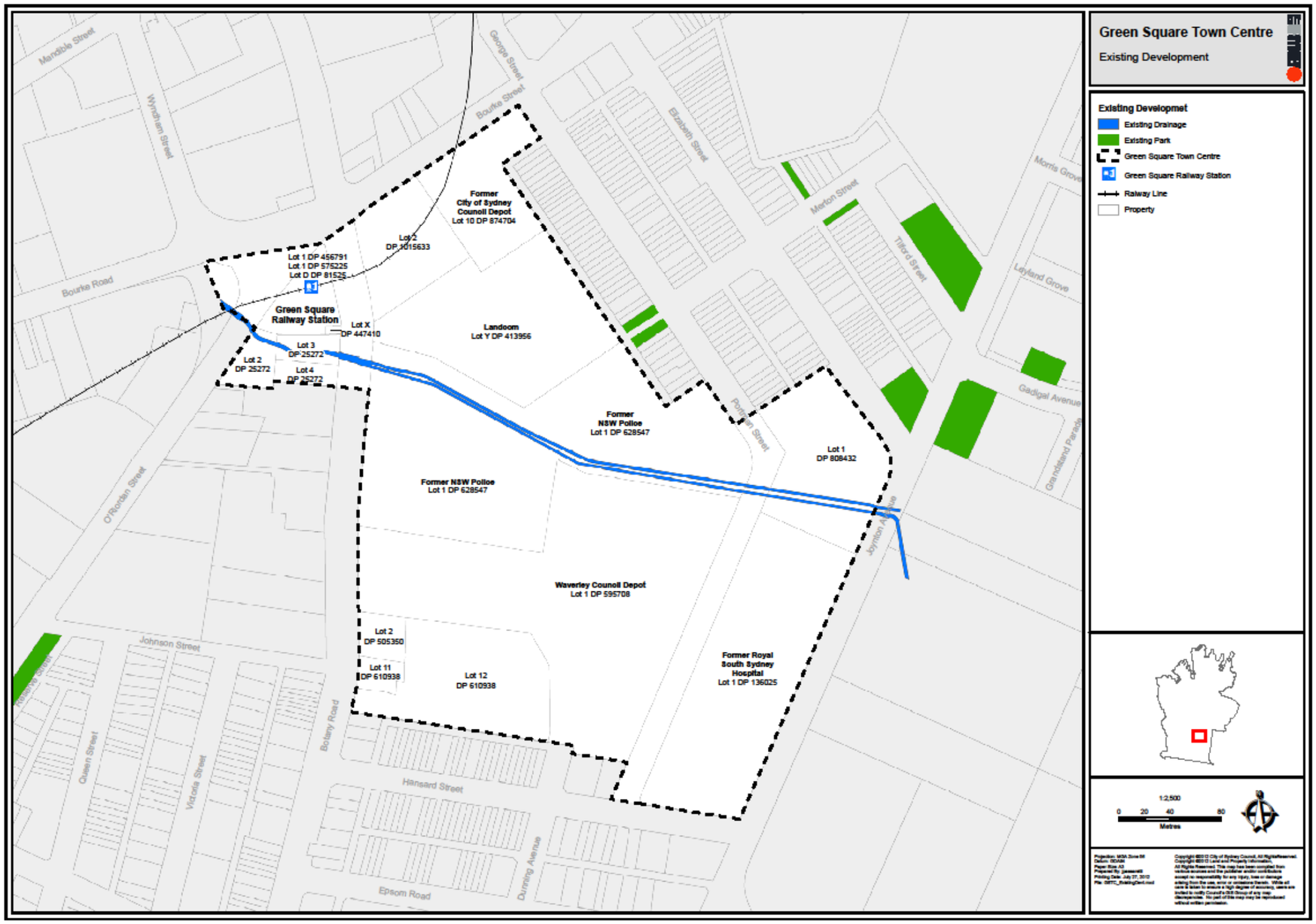
Flooding in the Town Centre is caused by a combination of the geographic features of the catchment and floodplain creating a complex system of flow regimes and flooding mechanisms.

The majority of the catchment that drains to Joynton Avenue, and subsequently to the Town Centre, lies to the north-east of the Town Centre. The catchment is highly urbanised and has an extensive network of street drainage. There are a number of trapped depressions (e.g. low points in roads) that act as temporary storages during flood events and these features play a significant role in governing the flood behaviour of the area (Connell Wagner and Cardno, 2009).

Historical Flooding

Few records are available indicating historical flooding at the site itself. Anecdotal evidence is available for the October 1987 and November 2007 flood events for local road flooding in trapped depression areas. This information suggests depths of the order of 0.5 – 0.6 m in these areas which is consistent with the modelling of flooding reported in this plan.

Figure 1 - Existing location plan of the Green Square Town Centre



3 Proposed Development

This chapter provides the key proposed Essential Infrastructure works that form part of this SEE.

3.1 Proposed Works

The proposed works that form part of this SEE include:

- Rearrangement and construction of new streets, including footpaths, ramps, access stairs and the like together with associated infrastructure such as drainage, services, vehicular crossings, bus stop set-outs, street tree pits and street trees etc. Detailed road marking and signage plans, including pedestrian crossings, cycle lanes, bus stops, traffic lights;
- Green Infrastructure works including the above and below ground utility connections that will connect with the proposed Green Infrastructure Centre (GIC)[6] which is proposed to be located at the former Royal South Sydney Hospital site (No.3 Joynton Avenue, Zetland);
- Landscape and streetscape works within the existing public domain (roads & footpaths);
- Existing services, such as electrical, water, stormwater, sewer and telecommunications demolition and relocation, both above and below ground;
- Removal of specified trees and minor structures;
- Details of pavement types to be constructed;
- Construction of new services in all streets and thoroughfares, or as required;
- The Drying Green construction details (although park itself is under the concurrent Public Domain DA);
- Stormwater diversion construction sequencing details;
- Services coordination details; and
- Erosion and sediment control measures during the proposed works.

3.2 Staging of the Project

It is noted that the Green Square Essential Infrastructure project for the Town Centre is proposed to be delivered in accordance with a number of stages over a 15 year period.

In this regard, Council as the applicant for the proposed development will seek to respond to development consent conditions in a staged manner that allows the coordinated redevelopment of all lands in the Green Square Town Centre.

This SEE has been drafted to achieve Council's objective of undertaking a staged approach to development in the Town Centre.

An indicative Staging Plan (CIV 100) is provided in Appendix A which will be implemented in a co-ordinated manner to meet the preferred staging requirements of landowners.

[6] The GIC includes the Trigeneration facility, a Water Re-use facility and an Automated Waste Collection Facility.

3 Proposed Development

3.3 Proposed Infrastructure

The following documents are relevant to the Civil Works included in the DA for the Engineering Infrastructure Report for the Council of the City of Sydney (Refer to Appendix C).

Scope of Civil Works

The Civil Works included in this application generally comprises the following work:

- *Minor earthworks to form the profiles of the proposed roads and detention basin;*
- *Road profiles and cross sections of public roads serving the development lots;*
- *Road markings and bicycle lanes;*
- *Services (water, sewer, electricity, gas, telecommunications and sustainable services) serving the development lots;*
- *Stormwater pipelines collecting treated runoff and carrying overflows to discharge points;*
- *Relocation of Sydney Water trunk drainage culvert;*
- *Temporary staging works required for sequential occupation of roads and services;*
- *Landscaping, paving and street furniture;*
- *Street lighting; and*
- *Green Infrastructure.*

Exclusions:

The following works are excluded from this application:

- *Public Domain contained within the two plazas and The Drying Green.*
- *Development of buildings;*
- *Development sites 1 – 4 adjacent to the railway station. Services for these sites will be submitted under a separate application;*
- *Any works to the O'Riordan/Bourke Road intersection, which will be submitted under a separate application;*
- *Upgrading of kerbs and footpaths on Portman Street; and*
- *No work to kerbs and footpaths for Bourke Street, Portman Lane, Navins Lane and Botany Road adjacent to Development Site 8A and 8B.*

Design Specifications

The civil works have generally been designed in accordance with the following specifications. Some additional items have been added and these are presented in the project Specification submitted for the project.

- *Standard Specification: Aus-Spec;*

- *City of Sydney Technical Specification;*
- *RMS Specification 106: Sprayed Bituminous Surfacing; and*
- *RMS Specification 116: Asphalt.*

Quality Assurance

In accordance with the Project Specification, a Quality System will be established and operated throughout the construction period. The Contractor will be required to provide a Quality Plan including Method Statements and Checklists to ensure that the construction process is monitored thoroughly.

Procedures will be included for the processing and approval of variations to ensure that these are dealt with before they are required on site, avoiding potential delays.

Regular inspections and Hold Points will be required throughout the construction stage to provide sign off of critical items.

Roads

Footpaths and roads will be constructed with a granular base suitable for residential areas, with honed concrete paving to City's standard specifications in areas of higher pedestrian traffic. An asphalt wearing course will be provided in areas where lower volumes of pedestrians are expected.

Road widths and lane details will generally be provided in accordance with the recommendations of the City of Sydney Planning Proposal Sydney LEP 2010 (Green Square Town Centre) (still to be gazetted), which accommodates the City's cycle strategy and the Public Domain concept design, updated as required by City of Sydney and the Green Square Consortium.

Road Hierarchy & Lane Widths

The following standard cross sectional information for the proposed roads has been provided by the City and will be included in the City of Sydney Planning Proposal Sydney LEP 2010 (Green Square Town Centre).

Zetland Avenue

A revised cross section has been developed by the City to accommodate the future implementation of light rail within the road reserve. This has led to the reconfiguration of the lanes and lane widths of 7.4m for future light rail, 3.2m traffic lanes, 2.2m parking and a 3.0m cycle lane.

- ***Ebsworth Street***

  3.0 m traffic lanes, 2.3 m parking and 4.2 m footpaths each side. Bus routes to have 3.3 m traffic lanes with 4.4 m footpaths.

- ***Paul Street***

  2.9 m traffic lanes, 2.6 m parking and 3.0 m footpaths each side.

- ***Woolpack Street***

  2.9 m traffic lanes, 2.1 m parking and 3.0 m footpaths each side.

- ***Barker Street (south)***

  2.9 m traffic lanes, 2.1 m parking and 3.0 m footpaths each side.

- ***Tweed Place***

  3.0 m traffic lanes, 3.0 m footpath on one side and 11.0 m on opposite side.

- ***Sonny Leonard Street***

  2.9 m traffic lanes, 2.1 m parking and 2.5 m footpaths each side.

- ***Hinchcliffe Street***

  2.9 m traffic lane, 2.6 m parking and 3.25 m footpaths each side.

Turning Circles

A review of all the intersections has been carried out using the AUSTROADS turning circles and completing an analysis using AutoTrack software. Radii suitable for a standard 14.5 m bus have been provided for intersections along the bus route, with an 8.8 m delivery vehicle used for minor intersections.

It is recognised that some areas within the Town Centre are proposed as pedestrian orientated precincts and kerb radii have been reduced in these areas to increase footpath accessibility. Service vehicles are still able to turn but will be required to encroach into the oncoming lane. Within these areas it will be necessary for service vehicles to encroach into oncoming lanes in order to navigate the intersection. A 40 km/h speed limit is proposed for all the roads within the Town Centre.

Bus Routes

The Zetland Area Traffic Study, 2006 proposed a bus route through the Town Centre, entering from Botany Road into Geddes Avenue and exiting through Zetland Avenue, using Ebsworth Street.

An alternative route is suggested in the report, following Geddes Avenue through to Portman Street directly, without diverting onto Ebsworth Street. The route from Botany Road, Geddes Avenue, Ebsworth street and Zetland Avenue will be provided in the short term, until the area within the Plaza which is required for the long term route is available.

A bus route using the central Plaza, with access directly from Botany Road is proposed for the longer term, when the plaza becomes incorporated into the design of the Town Centre. This route provides better accessibility for buses.

In the final development, it is anticipated that the bus route through the plaza will be replaced with a light rail system. The cross section of Zetland Avenue has been designed to allow the light rail to be installed without significant disruption to kerbs and traffic.

Cycle Paths

The City of Sydney Cycle Strategy outlines the cycle paths which are required within the Town Centre. These requirements have been implemented with the standard lane markings and intersection crossings specified by the City in the Strategy by the inclusion of a

cycle path with a 0.4 m separator on one side of the following roads:

- *Geddes Avenue;*
- *Zetland Avenue; and*
- *Portman Street.*

Earthworks

Minor earthworks will be undertaken within the road reserves only and to create the required detention basins. Some erosion and sedimentation control measures will be required on the development sites to ensure surface drainage and prevent localised ponding.

Erosion and Sediment Control

Erosion and sedimentation control measures will be provided during and after construction, to prevent pollution of downstream areas in the event of high rainfall events. The measures proposed would be in accordance with Managing Urban Stormwater Soils and Construction produced by Landcom ('the Blue Book').

Semi-permanent fixtures will include silt and wind fences, silt ponds, stormwater inlet filters, entry cleaning facilities and site barricading will be provided where appropriate for the duration of the contract. Additional, temporary measures will be provided as required when specific sections of the site are exposed and are vulnerable to erosion.

Stormwater Drainage

The stormwater system has been designed to include current best practice in Water Sensitive Urban Design (WSUD). This allows the optimum re-use of stormwater within the development and an appropriate level of stormwater treatment prior to use on the site and discharge from the site.

The system incorporates grass collection swales to filter stormwater runoff and permits the draw-off of runoff for treatment and collection in an irrigation tank for re-use in irrigation. WSUD tree pits for the street tree plantings will feature in both the in-road and in-pavement street trees and will filter and detain a portion of the site stormwater runoff. Details of this system will be included in the Public Domain DA application.

Proposed drainage concept

In accordance with Australian Rainfall and Runoff 1997 (ARR) and City of Sydney's requirements, a major/minor design philosophy has been adopted. The minor system comprises underground pipes located in road reserves, which will be designed for the 20 year Average Recurrence Interval (ARI) storm event, with a provision for safe overland flows during the 1 in 100-year ARI event. The 1 in 100 year storm event flows will be safely discharged through the Drying Green in dedicated overland flow path routes (Refer to Figure 3.2).

Bio-filtration swales form part of the minor drainage infrastructure where the road reserve widths are able to accommodate these. They are designed to treat the 1 in 3-month runoff.

Subsoil collector pipes will route the treated flow into the stormwater

pipe system for discharge to the watercourse. Rain events of greater intensity than the 1 in 3-month storm will be more diluted and treatment will not be required for these flows. The swales are designed to collect all runoff up to the 1 in 20-year storm and route this into the piped minor system.

Overland Flood control

The 'Option 1a' proposal requires the provision of detention storage within the area to be developed as Sheas Park, with a 1500 mm diameter overflow park connecting the detention basin to the existing culverts in Botany Road.

Existing Sydney water culverts

Two existing culverts cross the site from Joynton Avenue to Botany Road and extend downstream to the Alexandra Canal. These culverts will be retained where they lie within the plazas and road reserves, but will be relocated with a culvert if similar capacity where they are located under development sites. Existing easements will be deleted after demolition of these sections of the culverts.

On-site detention

Existing low areas in the upstream catchment serve as detention ponds during storm events. These detention volumes are included in the design of the stormwater system.

Details of these are presented in the 'Draft Flood Mitigations Options' report submitted with the DA, with the volumes of detention achieved by each of the main areas.

On site detention will be required to reduce peak runoff from the proposed Town Centre development, which will be included as part of the proposed building works.

Gross Pollutant Traps

Gross Pollution Traps will be provided and located at the discharge points to Sheas Park and the existing City of Sydney drainage system. These will capture sediment and gross pollutants which have been collected into the piped system. The stormwater pollution control devices have been sized to treat the 3-month ARI flows in accordance with the City of Sydney's requirements and are located adjacent to proposed roads to enable maintenance by the City of Sydney.

Sewer

The existing sewers may be repaired and retained as agreed with Sydney Water where they do not interfere with the development sites. Additional mains will be provided within the road reserves as required to service all properties.

Heritage Elements

The hospital site, located at the eastern edge of Town Centre is a listed item of environmental heritage. In addition, the site has potential archaeological deposits although there are no known Aboriginal archaeological deposits.

Nevertheless, excavation and exception permits will need to be applied for the various development sites once project approval has

been granted by the City of Sydney as noted in the AMAC Archaeological Report.

3.4 Public Domain

The public domain strategy for the Green Square Town Centre is taken from the Green Square Town Centre Public Domain Strategy (Refer to Appendix K).

Achieving a high quality public realm for Sydney's emerging Green Square Town Centre is fundamental to the success of this significant urban renewal project.

Current nearby residents long for local opportunities to socialise, relax, work, shop and celebrate. As the Town Centre develops, new residents who join the existing community must be welcomed and encouraged by the quality of facilities and spaces they are adopting as their own. And the strategic location of the Town Centre creates an imperative to attract business investment in the 'creative class' – the new wealth generating businesses that will not only provide high quality jobs but will also contribute to the economic competitiveness of Metropolitan Sydney.

Underpinning all of this is a commitment to progressive environmental principles – to the creation of a clean and green new community that is a flagship for sustainable development. New public spaces should be not only designed to be accessible, sociable, convivial places to meet, they are explicitly intended to be spaces where the entire Green Square community can celebrate its environmental credentials. The key principles are:

- *A sustainable and liveable space, which offers the versatile, sustainable urban landscape desired by the Green Square community;*
- *A place for pedestrians, which allows an easy connection between the station and Civic Plaza at grade across Botany Road;*
- *A centrally located transport corridor on the northern edge of the plaza providing direct access by bus or light rail [future stage];*
- *A connected place, which includes an integrated public transport hub connecting all modes of transport to the city network;*
- *A place of many places, each with its own functionality and character. Key spaces are:*
- *a. Transport Place (Green Square Station) - where pedestrians converge and connect with public transport;*
- *b. Civic Plaza - the heart of the Town Centre, where the Community gathers for larger civic events, meets regularly in the community centre, and enjoy day to day shopping and dining*
- *c. Neilson's Square - a more intimate meeting place for smaller gatherings,*

- *a cafe and a place for children to play*
- *d. Drying Green Park - a generous sloping lawn suitable for active and passive play, outdoor concerts and festivals*
- *Unified by Sheas Stream, a proposed playful water course running through Civic Plaza and connecting all four major spaces in the Town Centre.*
- *An active place, where all buildings and street frontages at ground level provide an active fine grain interface with the street.*
- *A place where colonnades along the southern edge of the plaza offer outdoor amenity for pedestrians.*
- *An integrated place where the urban structure and scale of the east-west spine coalesces with the human scale of landscape and architectural elements.*
- *A place with a community focus, where the jewel in the public domain is a special community building defining and protecting the main plaza edge while also providing a visual connection between Transport Place and Green Square.*
- *An active place, where all buildings and street frontages at ground level provide an active fine grain interface with the street.*
- *A place where colonnades along the southern edge of the plaza offer outdoor amenity for pedestrians.*
- *An integrated place where the urban structure and scale of the east-west spine coalesces with the human scale of landscape and architectural elements.*
- *A place with a community focus, where the jewel in the public domain is a special community building defining and protecting the main plaza edge while also providing a visual connection between Transport Place and Green Square.*

The Town Centre Components

The primary elements of the urban structure of the Town Centre are:

A new Town Centre building on the existing station infrastructure at Green Square.

A significant civic space at the Green Square train station.

- *A plaza will provide a focus to a higher density of mixed uses and support the pedestrian activity associated with the train station. It will connect over Botany Road at grade to achieve this connectivity;*
- *The plaza will be the primary public domain component within the urban structure, acting as a community focus that will accommodate passive and formal social activities, including community or performance events and markets;*
- *The plaza will have active edges, with retail at ground floor level and a colonnade running along its southern edge;*

- *A public library will be located in the plaza as the primary community building in the Town Centre and integrated with the design of the plaza;*
- *Three towers will define the southern edge of the civic plaza and visibly link the Town Centre across Botany Road to another tower above the station. Taller buildings on the north side will be set back from the plaza to maximise sunlight to the public domain in winter. A comfortable scale of the public domain will be maintained by 8-9 storey frontages along the plaza edge.*

A defined 'core' of the Town Centre

- *The built form in the Town Centre will rise towards the railway station and, together with the Plaza, make a 'core' that is legible from the wider urban context;*
- *The core will be defined by a taller and more varied built form contained within existing and new streets. It incorporates the Plaza, the railway station to the west, new development to the alignment of existing Dunning Avenue to the east, and Portman lane to the north. To the south a new street, Geddes Avenue, will form the edge of the core;*
- *Retail uses will activate the public domain at ground floor level throughout the core.*

A fine grain network of north south streets and laneways create permeability throughout the core

- *Fine grain street blocks extend and mesh with existing streets to the north and south, creating connectivity within the public domain. This creates a series of direct and interesting routes available to pedestrians in and around the town centre, allowing them to 'filter' towards the core;*
- *Building heights through the core will vary, creating interest and different character to each street, but consistently creating activated streets with retail uses at ground floor. Generally, awnings and street trees will frame the public domain from a pedestrian perspective;*
- *The fine grain streets and lanes to the north of the Plaza will hinge on a 'High Street' or shopping street, Ebsworth Street. This will be a busy pedestrian environment;*

A strong east-west connection through the core of the Town Centre

- *Zetland Avenue will be a grand street connecting the Green Square Train Station with the wider renewal area to the east, particularly Epsom Park Precinct. The scale of the street will reinforce it's identity as the primary street in the town centre public domain. The wide street will be defined by zero setback buildings and views at street level will be framed by formal avenue tree planting. It will support dedicated pedestrian, cycle, vehicular and bus or light rail access to and from the town centre;*

- *A mix of uses along Zetland Avenue with commercial at ground floor and residential above will activate the street throughout the day and create overlooking.*

A Park within the town centre

- *The taller built form within the core will break on its eastern edge and open into a formal park. The Drying Green will be a flexible green space for informal recreational and social activities within the town centre. It will be edged by streets on all sides and highly accessible from all parts of the town centre;*
- *The Drying Green will provide relief from the density of the core, and allow space for stormwater to collect and infiltrate;*
- *It will also facilitate informal pedestrian connections through to Epsom Park Precinct via the hospital Site.*

Residential precincts around the core that connect with the surrounding urban context

- *The scale of buildings steps down from the core to maximise sunlight access into the streets and transition to a residential character. Buildings will have a more consistent and lower height through the residential areas;*
- *The new streets in the residential precinct will connect with existing streets and adopt a similar scale and character to those residential areas;*
- *A landscape setback will create private gardens to the street and provide private and communal entries along the edge of the public domain. Buildings will be designed to overlook the street and the ground floor will be slightly elevated to create a separation and transition from the public domain.*

A smaller park to be created with heritage buildings on the former hospital sit

- *A heritage precinct is identified on the former hospital site, to the east of the Drying Green. The buildings will be reused to house community facilities. A smaller, more intimate, green space will be integrated in a campus-like environment. The site will allow pedestrians and cyclists to filter through to the Town Centre from Epsom Park residential areas.*

Civic Plaza

Designed to become the heart of the Green Square Town Centre, the plaza has to offer a range of public domain program. Its edges are programmed with fine grain retail to achieve highest activation. The southern edge with it's exposure to direct sun throughout the year is suggested to provide dining and outdoor seating.

The centre space is proposed to retain as an open, uncluttered space to allow for larger events such as outdoor cinemas, community gatherings etc.

The following should be considered when designing the plaza:

- *avoid permanently fixed street furniture which would reduce the multi functionality of the space;*
- *provide amenities for markets and cultural events [power, water supply in retractable units];*
- *provide a variety of outdoor uses such as seating for groups and single patrons and informal gathering spaces;*
- *integrate the interpretation of the Shea's Stream culvert as a WSUD element along the southern edge of the plaza; and*
- *provide formal and informal play elements integrated in the overall plaza design; — Integrate the public library building as a visual and acoustic termination of the plaza.*

Neilson Square

This smaller square should be visually connected with the Civic plaza by utilising the same pavements and public domain elements however it is to be defined as a space of its own identity. Here, more intimate functions may be held in a softer environment. This part of the central plazas is dedicated to smaller community markets, al fresco dining and family play in combination with cafe and restaurant functions.

The square needs to be designed to become the threshold between the 'outer' public domain with it's streets and parks and the 'inner' core

.***East West Transport Corridor***

Both, Civic Plaza and Neilson's Square, contain the transport corridor along their northern edges. This corridor is to provide east west traffic access for public transport only. It is staged in two stages and provides a road corridor for busses until a light rail system is installed connecting to the city centre.

Whilst the transport corridor is to be designed as an integral part of the plazas, clear demarcation of the traffic lanes is to be provided by the use of kerbs, variety in the selection of the pavement material and physical barriers such as bollards.

Shea's Stream

The Shea's Stream is the linear continuous element that connects all town centre areas such as the boulevard, the Drying Green park and the plazas. The Shea's Stream is an interpretation of the original creek that ran through this area in pre-European times prior to being confined into an in-ground culvert system.

The Shea's Stream is proposed to combine the following elements:

- *WSUD treatment elements such as bio retention or wetland cells;*
- *possible day lighting of base flows of the culvert and hence re-installing the original creek;*
- *tall open tree canopy for shading and provision of microclimates;*
- *informal play/ water play;*

- *informal seating and gathering spots; and*
- *natural, softer and contrasting element to the hard surfaced plazas.*

Drying Green Park

The park forms the 'Green Heart' of the Town Centre. Surrounded by higher developments it will become the green open centre space and provides amenities to the community that are more softscape related. The following components should be integrated in the park:

- *community facilities such as meeting spaces and bbq, possibly a community garden;*
- *provide formal and informal play;*
- *provide large open lawns for picnics and play;*
- *integrate the required WSUD elements such as bio retention, stormwater detention and wetland cells; and*
- *allow for pedestrian cross connections.*

Street Corridors

A fine grained network of streets maximises access to and within the Town Centre. All streets should be designed in a way to prioritise pedestrian and bicycle movement and to enhance the use of public transport. The new streets will connect well into the existing adjacent neighbourhoods and, where possible, continue the hierarchy and characteristics of the existing street typologies.

Street intersections should be designed to increase pedestrian and cyclist safety. Street crossings should be considered as extensions of the footpaths and accordingly highlighted. WSUD should be integrated in the street design where possible. Elements such as WSUD tree pits, rain gardens, permeable pavement etc can be used to define the atmosphere of these streets and highlight their role within the Town Centre. A hierarchy of streets has been established in reference to their context within the Town Centre and also their regional importance.

The Boulevard - Zetland Avenue

This 36m wide corridor is one of the major collector streets that provide access between the north south running arteries Botany Road and, via the slightly smaller Joynton Avenue, the Southern Cross Drive. The gateway into the inner Town Centre, this corridor shall be established with high quality pavement and lighting.

The Boulevard provides the following:

- *2 transit lanes for public transport [interim for buses, light rail as second stage in a grass corridor];*
- *2 vehicular travel lanes;*
- *1 parking lane;*
- *separated bi-directional bike lane;*
- *bio swale/ Shea's Stream as part of the overall stormwater*

management; and

- *Avenue type street tree planting to the north and introduction of the Urban Stream plant communities along the south edge as part of the bio swale/ Shea's Stream Interpretation.*

The High Street - Ebsworth Street

This 20 m wide street corridor is established as the main shopping street accessing a variety of fine grain and larger retail facilities. This street is the heart of the retail precinct and should prioritise pedestrian movement over vehicles.

The High Street provides the following:

- *2 vehicular travel lanes;*
- *2 parking lanes for short term and special parking such as car sharing and electric vehicles etc.;*
- *shared bicycle traffic;*
- *Bicycle parking for short term and mid term;*
- *street furniture such as seating and waste collection points; and*
- *WSUD tree pits.*

The Retail District

The shopping district can be defined by the grid of the following smaller scale local streets; Hinchcliffe Street and Tweed Place, Barker Street, Fellmonger Place and Wool Pack road to the south of the plazas, all enclosed by the streets Geddes Avenue, Ebsworth Street and Paul Street.

The precinct streets provide vehicular access to fine grain retail facilities on ground level and commercial and residential uses in the upper levels. The streets should prioritise pedestrian movement in order to accommodate a high level of activation and fluctuation.

These streets of various widths provide:

- *1 or 2 travel lanes;*
- *parking lanes for short term parking;*
- *shared bicycle traffic;*
- *WSUD tree pits established as covered elements with integrated community amenities such as seating, recyclables collectors; and*
- *Bicycle parking for short and longer term stays.*

The Residential District

South of Geddes Avenue, a residential precinct forms a transition into the existing neighbourhoods. These streets, Hinchcliffe Street southern section, Paul Street and Sonny Leonard Street, provide:

- *2 way travel lanes;*
- *2 parking lanes;*

- *WSUD tree pits established as rain gardens with understorey planting;*
- *some community amenities such as waste/ recyclables collectors and seating zones; and*
- *Portman Street and Geddes Avenue will provide a separated bi-directional bicycle lane.*

Shared Zones/ Naked Streets

Within the retail core, Tweed place, Barker Street, Fellmonger Place and Hinchcliffe Street, all can be identified as special zones. Here, a laneway character should be established with shared movement between pedestrians, bikes and vehicles. The lanes are recommended as extensions of the public plazas to provide a more intimate character. These lanes are to be established as 'naked' streets' with little demarcation of traffic lanes. Special street lighting should further enhance the character of these laneways as pedestrian priority.

Figure 3.1 – Proposed Green Square Town Centre Essential Infrastructure Works

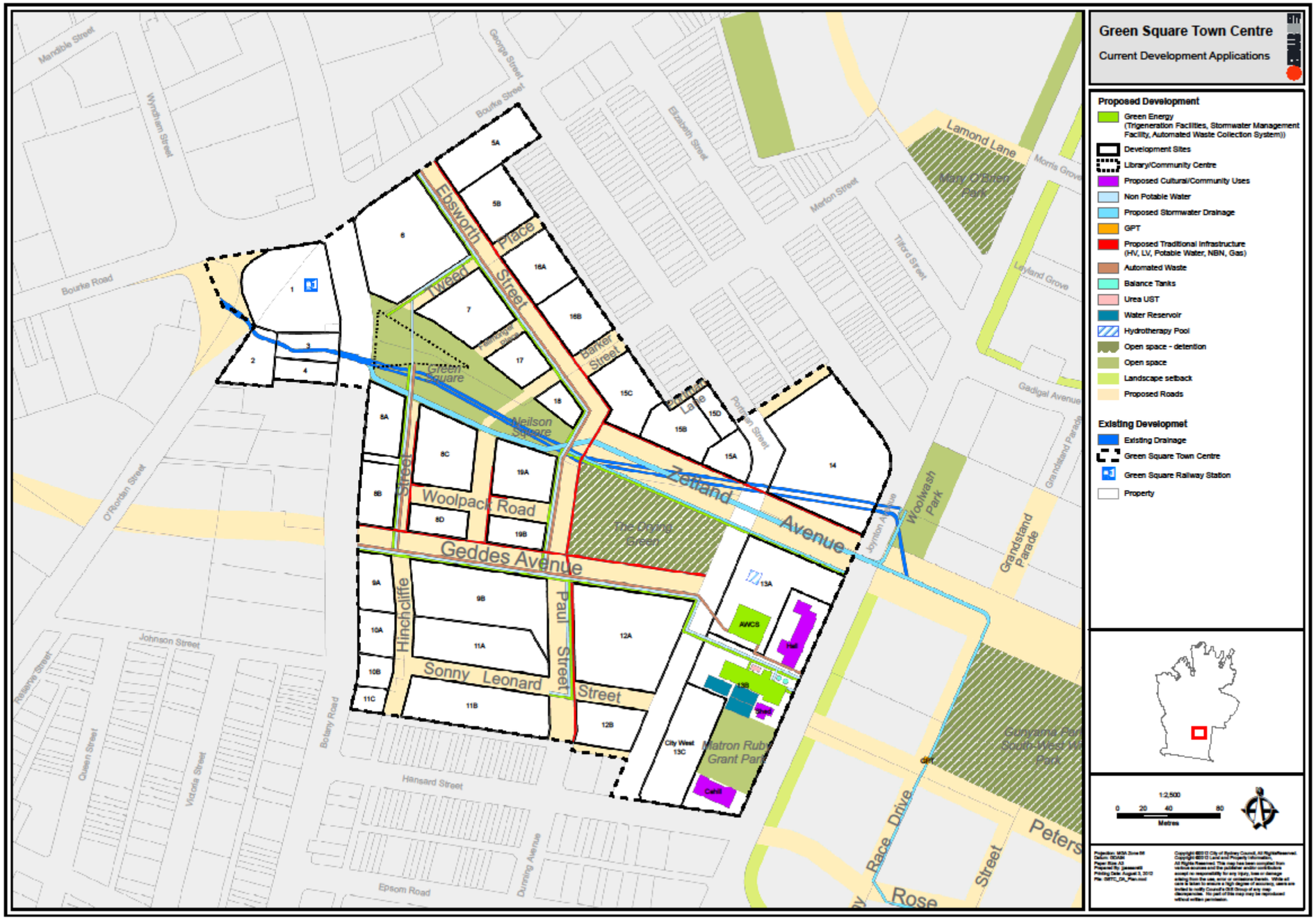


Figure 3.2 – Proposed Green Square Town Centre Drainage Option (Cardno)

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4 Assessment of Section 79C of the NSW Environmental Planning & Assessment Act 1979

In determining a DA, a consent authority (City of Sydney Council) is to take into consideration the following matters which are relevant to the development the subject of this DA. This chapter provides an assessment of those matters for consideration contained in Section 79C of the EP&A Act, which is presented below in relation to the proposed development.

4.1 Provisions of relevant environmental planning instruments

4.1.1 State Environmental Planning Policies

Relevant State Environmental Planning Policies (SEPP) that apply to the Town Centre include SEPP (Infrastructure) 2007 and SEPP No.55 Remediation of Land. These are assessed below in relation to the proposed development.

State Environmental Planning Policy (Infrastructure) 2007

SEPP (Infrastructure) 2007 or 'the Infrastructure SEPP' is the principal EPI that applies to the assessment and approval of infrastructure in NSW. The SEPP aims to provide a consistent approval regime for the assessment of infrastructure and to promote better coordination and integration with adjacent development to efficient development and redevelopment of surplus government owned land. The Infrastructure SEPP also stipulates consultation requirements with key government agencies during the assessment process or prior to development commencing.

The Infrastructure SEPP includes development controls and exempt development provisions relating to the construction of a range of infrastructure and related service works. Included are stormwater management systems, water supply systems, sewerage systems, roads and telecommunications and other communication facilities.

Consultation has occurred with public authorities during the preparation of this SEE which includes Energy Australia, Sydney Water and RMS.

As previously mentioned, approval from the RMS is required for the proposed road connection from proposed Geddes Street to Botany Road, which is a classified road. In particular, RMS has confirmed that no signalised intersection is required at the intersection of proposed Ebsworth Street and Bourke Street. This application complies with Clause 101 Development with frontage to classified road.

In accordance with Clauses 13 and 14, the City is proposing to provide for the integrated delivery of the Essential Infrastructure works that does not impact on existing infrastructure and local heritage items. The Essential Infrastructure works are also being proposed to reduce the impacts of flooding in the Town Centre area in response to Clause 15. There is no consultation required with public authorities listed in Clause 16.

State Environmental Planning Policy No.55 – Remediation of Land

State Environmental Planning Policy No.55 – Remediation of Land (SEPP 55) applies to NSW and establishes a planning approach to the remediation of contaminated land. In particular, SEPP 55 aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. SEPP 55 identifies consent requirements for a remediation work and also specifies standards and notification requirements for proposed remediation work.

Clause 7 Contamination and remediation to be considered in determining a DA requires that Council must not consent to the carrying out of any development on land unless it has considered whether the land is contaminated, and if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out. Furthermore Council must consider that if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

Other provisions require Council (a consent authority) must consider a report, to be prepared in accordance with the contaminated land planning guidelines, of a preliminary investigation that would involve a change of use of land in an investigation area or a known area of potential contamination and land proposed for a range of sensitive uses such as residential, child care hospital etc.

In response to SEPP 55, a Contamination Assessment has been prepared by Environ Australia (Refer to Appendix I) which concluded that.

> *The Auditor considers that the Town Centre area can be made suitable for commercial/industrial and recreation open space uses if the site is remediated in accordance with the Remediation Action Plans (RAP) referenced in this document and in consideration of the comments outlined by the Auditor in this letter.*
>
> *A condition of consent to the previous development application (D/2008/1195) was that the site is to be remediated and validated in accordance with the RAPs reviewed by the Auditor. While the plans previously reviewed were considered by the Auditor to be practical and could make the site suitable for the proposed uses, the plans are conceptual and are required to be updated with further detail prior to implementation. This is particularly as further investigations are required in some areas of the site. Revisions to the RAPs have been proposed by Douglas Partners (2009), and further amendments may be desirable based on further investigations and specific staged development plans.*

Correspondence from Council regarding remediation of contamination at the Green Square Town Centre is provided in Appendix I.

4.1.2 Local Environmental Planning Instruments

The relevant environmental planning instrument (EPI) that applies to the Town Centre include:

- City of Sydney PSO 1971; and
- South Sydney LEP No.114 Southern Industrial and Rosebery/Zetland Planning Districts.

Both plans are assessed below.

City of Sydney Planning Scheme Ordinance 1971

The City of Sydney PSO 1971 is the principal deemed EPI that applies to the study area. The major part of the site covered by the Essential Infrastructure DA is zoned Industrial General 4(a). This zoning still exists due to the deferral of the area from the South Sydney LEP 1998.

4 Assessment of Section 79C of the NSW Environmental Planning & Assessment Act 1979

The proposed works are classified as 'utility installation' which means a building or work intended for use by a public utility undertaken but does not include a building designed wholly or principally as administrative ob business premises or as a showroom.

- The provision of utility installations is permissible with consent; and

The proposed works are also categorized as "Roads and ancillary structures" which are also permissible with consent under the City of Sydney PSO 1971.

The SEE has been prepared in accordance with Clause 31 and has addressed those maters raised including Clause 32 and 33. The proposed road connection to Botany Road must also be approved by the RMS.

Relevant clauses of the City of Sydney PSO have been assessed in Table 2.

TABLE 2: ASSESSMENT OF CITY OF SYDNEY PLANNING SCHEME ORDINANCE 1971

Relevant City of Sydney PSO 1971	Comment on Proposed Essential Infrastructure works
Clause 10 Buildings etc., not to be erected on reserved land without consent / Clause 23. Erection of use of buildings or works / Clause 24. Restrictions on buildings and works	The City of Sydney is obtaining consent for the proposed Essential Infrastructure works
Clause 31 – Submission of plans	Plans have been prepared in support of this DA which are provided as Appendix A and B.
Clause 32 – Consideration of applications generally	The works are being undertaken on public land and consent will be obtained from the Council and relevant NSW Government agencies (RMS). Relevant plans will be sent to the RMS for concurrence under Clause 91 of the EP&A Act.
Clause 33 – Consideration of certain applications (Aesthetic appearance	(a) and (b) – This area to which the application relates is an established urban area which already contains above and below ground infrastructure in the form of roads, stormwater and electrical utilities. (c) – A Traffic and parking assessment (Refer to Appendix F) confirms that the proposed layout and access arrangement is adequate to support future access for residents, workers and visitors. (d) – The proposed design has been developed in accordance with key public authorities including the RMS and Sydney Water. These agencies have provided in-principle support for the proposed Essential Infrastructure works. (e) – The proposed connection to Botany Road does not undermine plans by the RMS to develop this road as a future transit corridor The proposed Essential Infrastructure works conform with the City's future plans for the area

Clause 33 (Continued)	(f) – Substantial landscape treatment of the above ground works will be included as part of the project and once completed the Essential Infrastructure will not generate significant adverse environmental impacts on the amenity of existing and future residents. (g) & (h) – The proposed Essential Infrastructure works are a critical part to the redevelopment of the former industrial lands into a vibrant town centre. The works will contribute to the future amenity for residents, workers and visitors through the provision of electricity, drinking water and energy supply. (i) – the proposed works are consistent with the provisions of the City of Sydney PSO 1971. The SEE has involved an appropriate level of environmental and planning assessment of the proposed works and has addressed relevant issues contained in the PSO.
Clause 36. Consents to be void in certain circumstances	Concurrence (approval) will be obtained from the RMS for the proposed connection from Geddes Avenue to Botany Road which is a State road under the Roads Act 1993. The proposed landscape plans (Refer to Appendix B) will ensure design integration between the proposed Town Centre roads and the future
Clause 37. Determination of application	This SEE has assessed previous development consent conditions (D/2008/1195) and the applicant accepts that Council is likely to impose conditions for the proposed Essential Infrastructure works. The applicant considers that a through environmental and planning assessment has been completed as part of the SEE to warrant a favourable determination for the proposed Essential Infrastructure works.
Clause 39 – Places of scientific or historic interest	Based on the AMAC Archaeological report (Refer to Appendix G) , the following comment is provided in response to Clause 39 *The site is significant at a State level because of the creation and use of Waterloo Dam, associated with the operation of Waterloo flour mill, which was constructed in c1820. The later wool washing works established on the site is significant at a local level, as an early and characteristic industry for the area. The later brickworks are also characteristic for the area. The late 19th century residential buildings are also considered locally significant. It is likely that the significance of the site is represented by archaeological evidence preserved in some areas.* AMAC Archaeological has recommended a range of measures to ensure the identification and protection of un-identified relics during the construction stage. This includes undertaking

	documentary research and seeking Excavation Permits from the Heritage Branch of the Office of Environment & Heritage.
Clause 41 – Preservation of trees	The preparation of the Landscape and Streetscape report (Oculus – Refer to Appendix B) provides the opportunity for substantial tree planting in the Town Centre. Existing trees within the Town Centre that will be protected include: • Poplar trees (Portman Street – at rear of 97-115 Botany Road) • Eucalypt trees (Frontage of 377 – 497 Botany Road) • Eucalypt trees (northern side of Waverley Depot) Note: These trees must be protected in accordance with the D/2008/1195.
Clause 48. Alignment of main roads / Clause 49. Junctions and intersections	Refer to response provided to Clause 36.
Clause 53. Restriction of ribbon development	The proposed development will not result in ribbon development but rather allows for the strategic placement of active street frontages through the establishment of a road hierarchy. For instance, Ebsworth Street will emerge as the primary retail street in the Town Centre. The Traffic report concluded that the proposed access arrangement of the proposed roads is unlikely to significantly impact on traffic using existing state roads. The traffic impact from future development will be assessed on an individual basis once DAs have been lodged with Council.

South Sydney Local Environmental Plan 1998

The South Sydney LEP 1998 was gazetted on 22 December 2006, however it does not currently operate in respect of land within the Town Centre as this land is a "deferred matter" under section 68(5) (now section 59) of the EP&A Act.

The South Sydney LEP 1998 does not fully apply to the Green Square Town Centre as most of the provisions are "deferred" until activated when a Planning Agreement is agreed between the City and a landowner. However Division 1 Heritage conservation, Division 2 Development at Green Square and Division 2A Green Square Town Centre apply to development in the Town Centre.

Relevant provisions are assessed below in Table 3.

TABLE 3 – ASSESSMENT OF SOUTH SYDNEY LEP 1998

Relevant Clause	Comment on Proposed Essential Infrastructure works
22. Heritage Aims	Based on the AMAC Archaeological report (Refer to Appendix G), the following comment is provided in response to Clause 39 *The site is significant at a State level because of the*

creation and use of Waterloo Dam, associated with the operation of Waterloo flour mill, which was constructed in c1820. The later wool washing works established on the site is significant at a local level, as an early and characteristic industry for the area. The later brickworks are also characteristic for the area. The late 19th century residential buildings are also considered locally significant. It is likely that the significance of the site is represented by archaeological evidence preserved in some areas.

AMAC Archaeological has recommended a range of measures to ensure the identification and protection of un-identified relics during the construction stage. This includes undertaking documentary research and seeking Excavation Permits from the Heritage Branch of the Office of Environment & Heritage.

The proposed Essential Infrastructure works are unlikely to impact on the heritage listed Royal South Sydney Hospital which will emerge as a key mixed use site on the fringe of the Town Centre. This site is covered by a Conservation Management Plan (City Plan Heritage, 2011) which provides for the heritage assessment framework and future development of the site in accordance with the Green Square Town Centre DCP 2012.

23. Heritage Items

The proposed Essential Infrastructure works will not impact on Item 554A which covers No.3 Joynton Avenue, Zetland, which covers the former hospital site, including:

- Administration Building, Queen Anne style building, 1913, with later alterations and additions, and
- Pathology Building, single story building to Joynton Avenue, 1913, and
- Outpatients Building, single storey Inter-War Georgian Revival style building, c 1935, and
- Nurses Home (eastern wing), three storey Inter-War Georgian Revival style building, c 1938, and
- Brick and sandstone boundary fence to Joynton Avenue, 1913, and
- Landscaped area fronting Joynton Avenue between the Nurses Home and the Pathology Building, including the significant trees and open landscaped areas around the buildings

The former hospital site is covered by a Conservation Management Plan (City Plan Heritage 2011). Green infrastructure connections within the Town Centre will connect with the proposed Green Infrastructure Centre at the property boundary. The proposed Green Infrastructure Centre has been assessed separately in accordance with the Conservation Management Plan.

23A. Heritage Conservation Areas

The proposed Essential Infrastructure works will not impact on the following heritage conservation areas within and adjacent to the Town Centre:

- CA28 – Hansard Street Conservation Area, Zetland which covers Tosh Lane, Dunning Ave, Hansard Street, the eastern boundary of No 59 Hansard St, Chester Lane and Emanuel Lane
- CA53 – Zetland Estate Conservation Area at Waterloo and Zetland which covers Short St, the

	northern boundary of No 2 Hawksley Street, the northeastern boundary of No 985 Bourke St, Bourke St, the north western boundary of No 904 Bourke St, McPherson Lane, the eastern boundary of No 13 Merton St, Tilford Street, Joynton Ave, Elizabeth St, the northern boundary of No 811 Elizabeth St, Portman St, the southern boundary of No 75 Portman St, Portman Lane, the western boundary of Nos 936–938 Bourke St and Elizabeth St.
24. Development in the vicinity of heritage items, heritage conservation areas, heritage streetscape areas, archaeological sites or potential archaeological sites	Green Square is not within an identified heritage conservation area but lies next to the Zetland Heritage Conservation Area and some listed heritage items (SSLEP 1998) which include 'Ada Terrace' at Nos 13-19 Portman Street. The proposed Essential Infrastructure works will not impact on these listed heritage items as the works are mostly underground and located to the south of these properties.
27. Development of a site or place of potential or known archaeological significance	Refer to comment provided in response to Clause 22.
Division 2 – 27A Vision for Green Square	The proposed Essential Infrastructure works are in accordance with the Vision for Green Square. The works will provide the foundation for future development to occur which will enhance connectivity and allow for long term growth to occur in the Town Centre. The proposed works will help achieve a vibrant Town Centre with a mix of land uses.
27B. Planning principles for Green Square	The proposed Essential Infrastructure will help achieve the planning principles contained in Schedule 4 of SSLEP 1998. The proposed works will support the emergence of the Town Centre as a centre destination with a substantial residential population. The proposed works will provide the opportunity for quality public domain areas that will enhance social mix and interaction and provide for an integrated land use pattern. Public domain areas are easily accessible in the Town Centre which is supported by a hierarchy of streets and lanes to enhance legibility and connectivity. The proposed works will support the provision of shopping streets (Ebsworth Street) to support the Town Centre's emergence as a centre economic activity for an existing and future population. The works will support the provision of employment, residential, cultural & community and open space uses. The proposed road layout also supports provision of large and small retail facilities. The proposed works will provide the foundation for future public transport to link the centre to surrounding regions through the provision of a transport corridor (buses / light rail) and roads to support pedestrian and cycle use. The proposed works incorporate 'best practice' design to ensure amenity for residents, workers and visitors to reduce potential effects from wind, sun and noise. The road design supports ecologically sustainable development measures including WSUD and

	stormwater management, street tree planting to support natural habitat and the use of recycled materials during the construction stage. The layout provides for adequate wind circulation to ensure greater air quality.
27C. Determination of development applications	The proposed Essential Infrastructure works are not subject to a master plan but they have been designed in accordance with the Green Square Town Centre DCP 2012 which is the most recent principal plan that will shape the development of the Town Centre.
27KE Architectural design standards	The design of the public domain has been determined through the implementation of a Public Domain Strategy. The street layout provides for the development of public plazas and squares that will encourage social interaction and community development. The road layout allows for ease of movement throughout the Town Centre from residential areas to key nodes such as the railway station, the town plaza and community centres. The public domain will be enhanced by a Pavement, Planting and Lighting Strategy to add the fine grain to public domain (Refer to Appendix K). The proposed works allow for the inclusion of ESD and WSUD to enhance the environmental performance of the public domain.
27KH Floodwater management	Based on the Flood Mitigations Options Report for the Town Centre (Refer to Appendix D), Cardno concluded the following: *Subsequent to the 2009 Report, the extent of the Town Centre and its road layout have been amended. The proposed drainage works for GSTC, Option 1a in the 2009 Report, has been revised for the new development. The Town Centre and proposed drainage network has been modelled for a range of storm events with flood behaviour generally consistent with the previous report of 2009.* *The proposed drainage network for Town Centre includes additional inlets and pipelines from Joynton Avenue to Botany Road and incorporates the Drying Green storage area. This system is recommended for adoption in the Town Centre development based on review of the LEP and DCP conditions for the site.* *The Mid-term (10 Years) Drainage Response for Green Square and Alexandra Catchment was developed in consultation with the City of Sydney and Sydney Water. This system of augmented culverts and open channels along the trunk drainage corridor results in a significant reduction of peak flood levels and flood risk.* *A Draft Floodplain Risk Management Plan was prepared in 2009 which detailed flood behaviour and identified guidelines for the management of flood risk at specific sites and generally within the Town Centre. This Plan has been updated in-line with the changed Town Centre layout identified in this Report. Further details are provided in Cardno (2012b).*
South Sydney LEP 1998 – Amendment No.17 Green Square Town Centre - Zoning	Under South Sydney LEP 1998 – Amendment No.17 Green Square Town Centre, there are two key land use zones that apply to the Town Centre. These include Zone No.11 (a) Green Square Town Centre Zone and Zone No 11 (b) Green Square Town Centre Public

	Domain Zone. The proposed works are permissible with consent in each respective zone.
South Sydney LEP 1998 – Amendment No.19 Green Square Town Centre	SSEL 1998 Amendment No.19 applies to the Town Centre and aims to permit with development consent the development of a communal car park or retail facilities on land within the Town Centre zoned 11(b) Public Domain. The proposed Essential Infrastructure works will not impact on the potential to provide a communal car park that is proposed on land within the Town Centre

South Sydney LEP No.114 Southern Industrial and Rosebery/Zetland Planning Districts

The South Sydney LEP No.114 (LEP No.114) was gazetted in 1994 and covers the Southern Industrial and Rosebery/Zetland Planning Districts including a small part of the Town Centre, which includes the former Royal South Sydney Hospital site, which is zoned 5(a) Special Uses.

LEP No.114 aims to provide a clear set of planning controls for future development, minimise land use conflict and provided appropriate zoning to enhance the existing environment and amenity of the area. Other objectives cover residential, employment social, built environment, zoning, open space, services and transport.

The proposed Essential Infrastructure works affect a small area of the formal hospital site through with proposed utility connections from the Town Centre to the GIC. The utility connections will allow future Town Centre uses to allow the sustainable renewal of the Town Centre in accordance with Sustainable Sydney 2030.

4.2 Any proposed environmental planning instrument

The following proposed environmental planning instruments have been assessed in this SEE:

- Draft City of Sydney LEP 2011;
- City of Sydney Planning Proposal Sydney Local Environmental Plan 2010 (Green Square Town Centre);
- Draft Planning Proposal Green Square Town Centre (Site 301 Botany Road, 501 Botany Road, 511-515 Botany Road, 97-115 Portman Street, 811 Elizabeth Street, Zetland; 312 -318 (Green Square Consortium lands); and
- City of Sydney Planning Proposal Sydney Local Environmental Plan 2010 (Green Square Town Centre) for 301 Botany Road, Zetland (John Newell Site).

4.2.1 City of Sydney Planning Proposal Sydney Local Environmental Plan 2010 (Green Square Town Centre)

In March 2012, the City approved the Planning Proposal Sydney LEP 2010 (Green Square Town Centre). This Planning Proposal applies to all sites within the Town Centre except the Green Square Consortium lands, which are subject to a separate Planning Proposal.

The Planning Proposal (Draft LEP) is currently with the NSW Department of Planning & Infrastructure awaiting approval (gazettal) from the Minister for Planning & Infrastructure. This Planning Proposal has been prepared in

accordance with the Standard Instrument (Local Environmental Plans) Order 2006 and will replace the City of Sydney PSO 1971, South Sydney LEP 1998, and South Sydney LEP No.114, in so far as they apply to the Town Centre.

The proposed Essential Infrastructure works are consistent with the key objectives of the Planning Proposal which will support the redevelopment of the Town Centre for housing and employment purposes supported by a quality public domain and accessible road layout to support public transport use and increased access to, within and across the Town Centre for pedestrians and cyclists.

The proposed works will allow for the development of active frontages at key streets (Ebsworth Street) and future buildings that will integrate with the public domain areas.

The proposed works provide a Town Centre solution to the flooding risk along with sustainable development measures to encourage best practice design The proposed Essential Infrastructure works will support a range of land uses as proposed on the Planning Proposal to provide for mixed uses east of Botany Road and Commercial Core uses west of Botany Road. The proposed road layout as contained in this SEE supports these uses which are detailed in the Green Square Town Centre DCP 2012. This SEE is also consistent with the key provisions of the Planning Proposal, which are assessed below in Table 4.

TABLE 4 KEY ELEMENTS OF THE PLANNING PROPOSAL (GREEN SQUARE TOWN CENTRE)

Relevant Clause	Comment on Proposed Essential Infrastructure works
5.9 – Preservation of Trees	The preparation of the Landscape and Streetscape plans (Refer to Appendix B) and Public Domain Strategy (Refer to Appendix K) provides the opportunity for substantial tree planting in the Town Centre. Existing trees within the Town Centre that will be protected include: • Poplar trees (Portman Street – at rear of 97 - 115 Botany Road) • Eucalypt trees (Frontage of 377 – 497 Botany Road) • Eucalypt trees (northern side of Waverley Depot
6.21 – Design Excellence	The proposed Essential Infrastructure works achieves design excellence with a road layout as which will create increased permeability and connectivity throughout the Town Centre. The proposed Essential Infrastructure works allow for the Drying Green which is a proposed new town park as proposed in the Planning Proposal. The implementation of the Public Domain Strategy will provide for an attractive and unique public domain area.
7.16 – Acid Sulfate Soils	The proposed Essential Infrastructure works apply to land within the Town Centre which is west of Botany Road. This land is not affected by Acid Sulfate Soils, which applies to a small part of land within Alexandria, west of O'Riordan Street., which is

	located outside of the DA study area.
7.17 – Flood Planning	The proposed Essential Infrastructure will support improved stormwater and flood risk management which has been a major impediment to development in the Town Centre. The proposed infrastructure layout utilises a combination of culverts and cross-site overland flow paths. The proposed stormwater works will achieve a built form layout that is not affected by the 1 in 100 year storm event and compliance with the Flood Risk Management Study and Plan prepared in accordance with the Manual. The proposed works will minimise flood risks through Town Centre measures to better manage flooding. Longer term initiatives are also proposed with Sydney Water to resolve broader Alexandra Canal Catchment. Future DAs for building works will be required to demonstrate the risk of flooding is minimised and that they comply with the following 1. is compatible with the flood hazard of the land; 2. will not significantly and adversely affect flood behaviour to the detriment of other properties or the environment; and 3. manages risks from flooding
7.26 – Active Street Frontages	The proposed Essential Infrastructure works will provide for the development of Active Street Frontages in accordance with the Green Square Town Centre DCP 2012.
7.27 – Public Utility Infrastructure	The proposed Essential Infrastructure works provide the infrastructure necessary for the long term and sustainable renewal and development of the Town Centre.
Schedule 5 Environmental Heritage	The proposed Essential Infrastructure works will not impact on items of environmental heritage as located in the Town Centre.

4.2.2 City of Sydney Planning Proposal Sydney Local Environmental Plan 2010 (Green Square Town Centre) – Green Square Consortium Lands

This Planning Proposal (Draft LEP) applies to the sites at 956 – 960 Bourke Street, 355 Botany Road and 377 – 497 Botany Road Zetland. The planning provisions within this Planning Proposal are very similar to the provisions contained in the Draft Planning Proposal for the Town Centre. In this regard, the assessment of the Essential Infrastructure works has already been addressed above in Table 4.

4.3 Any development control plan

Green Square Town Centre Development Control Plan 2012

The Green Square Town Centre DCP 2012 is the main DCP that applies to future development in the Town Centre. Once the above Planning Proposals are gazetted, this DCP will replace all existing DCPs that apply to the Town Centre. The DCP was approved by Council in early 2012 and this SEE provides an assessment of the relevant clauses of the in Table 5.

4 Assessment of Section 79C of the NSW Environmental Planning & Assessment Act 1979

TABLE 5 ASSESSMENT OF GREEN SQUARE TOWN CENTRE DCP 2012

Green Square Town Centre DCP 2012	Response to Essential Infrastructure works
GSTC 1.4 Objectives)	The proposed Essential Infrastructure works will provide a street network to support active transport and enhanced legibility to connect with the Town Centre and existing Green Square rail station. The proposed works include green infrastructure to achieve the sustainable renewal of the Town Centre. The proposed works will also alleviate the flooding risk in the Town Centre. The proposed provide for the future development foundation to achieve a unique Town Centre area with bespoke public domain measures (Refer to the Public Domain Strategy in Appendix K).
GSTC 2 Desired Future Character / GSTC 2.1 Locality Statement and GSTC 2.2 Principles	The proposed Essential Infrastructure works will achieve the Desired Future Character for the Green Square Town Centre through the provision of a street layout with good access and safety for pedestrians and cyclists etc. The landscape and streetscape elements will provide the opportunity for an attractive public domain design. The Essential Infrastructure works support the long term vision to develop Green Square as a major centre. The proposed works will alleviate the flooding risk but longer term initiatives will reduce flooding and water quality issues in the broader Alexandra Canal catchment. The inclusion of green infrastructure will help reduce the ecological footprint of future residential and commercial development. The proposed works will also achieve the planning principle for active street frontages to enhance the pedestrian experience of the Town Centre. The implementation of the Public Domain Strategy will provide an enhanced public domain area with high amenity for future residents, workers and visitors.
GSTC 3 Local Infrastructure (GSTC 3.1.1 – 3.1.8) **GSTC 3.2 Development in the Public Domain**	The proposed Essential Infrastructure works will achieve a public domain with attractive public spaces (the Drying Green / Transport Plaza) which will enhance social interaction and provide for the celebration of culture and the holding of community events. Landscape and design treatments will enhance the urban experience and provide a Town Centre with a high amenity for residents, workers and visitors. A separate DA will be lodged to Council for the Drying Green and also for the proposed Transport Plaza (Green Square).
GSTC 3.3 Street Network (3.3.1 – 3.3.6)	The Essential Infrastructure is consistent with the objectives in GSTC 3.3. The street network has been designed to achieve optimum pedestrian

	and cyclist safety and access. This includes designated bike lanes and wide pedestrian paths. The street hierarchy with Ebsworth Street as the nominated "high street" and Zetland Avenue adopting a more transit oriented function with bus/light rail will provide a good legibility for pedestrians in the Town Centre. The proposed Essential Infrastructure works will provide an opportunity for integrated stormwater management and inclusion of WSUD. The proposed road layout will allow controlled vehicle access through the Town Centre at a controlled speed limit of 40 km / hr. The proposed east – west road (Geddes Avenue which extends west towards O'Riordan Street) will enhance traffic movements in the broader region. In accordance with GSTC 3.3.1 the proposed Essential Infrastructure works nominate Zetland Avenue as a transit corridor to link the Town Centre to Epsom Park future development area. Zetland Avenue will also provide an opportunity for stormwater management in the Town Centre. The proposed road layout contains a north - south Town Centre (Barker Road) in accordance with 3.3.3. The proposed road layout also includes an opportunity for "Slow zones (GSTC 3.3.4) and "Through site links" (GSTC 3.3.5) as well as arcades (GSTC 3.3.6) in accordance with the DCP.
GSTC 3.4 Flooding and Stormwater Management	The SEE incorporates a Flood Mitigations Options Report (Refer to Appendix D) which identifies flooding and drainage measures to minimise the flooding risk in the Town Centre. The main elements of the flood mitigation works include: A designated overland flow path, stormwater detention and flood a flood free community and retail zone in accordance with Figure 3.7: Flood Management Principles and other measures are also proposed by the City to minimise the broader catchment related flooding issues and these include raising Joynton Avenue and working with Sydney Water to undertake more significant infrastructure works to improve flooding and water quality in the Alexandra Canal catchment. It is noted that developments that form part of Stages 1 and 2 (Landcom / Hatbands) are not impacted upon overland flows or flood impacts and as such do rely on proposed upgrades to existing drainage infrastructure (Refer to Figure 3.2).
GSTC 3.5 Staging and Implementation	The proposed delivery of the Essential Infrastructure works will match the redevelopment of the Town Cent re which is planned to occur in a staged manner over a 15 year period. The City and its contractors will

	implement a staged delivery of conditions compliance to match the release of development sites in the Town Centre. This will be managed through the implementation of a Construction Environmental Management Plan, which will contain provisions listed in GSTC 3.5.
GSTC 4 Land Uses	The proposed Essential Infrastructure works will support the proposed redevelopment of the Town Centre in accordance GSTC 4 Land Uses. This includes a street layout which favours the preferred land uses in the Town Centre but which also includes appropriately sized streets and intersections.
GSTC 4.3 Active frontages	The proposed Essential Infrastructure works will support the proposed "Active Frontage" of the Town Centre in accordance GSTC 4 Land Uses. This includes a provision for street furniture, road and pavement design treatments as well as a nominated street hierarchy and street tree planting.
GSTC 5 Heritage (GSTC 5.1, 5.2 & 5.3)	The Town Centre only contains a small number of items of local environmental heritage which are located on the former hospital site at Joynton Avenue, Zetland (Item 554A of the SSLEP 1998). A Heritage Impact Statement has been prepared for key projects on the former hospital site which supports the proposed Green Infrastructure Centre. A Baseline Archaeological Report has been prepared in support of the SEE (Refer to Appendix G), which recommends a range of mitigation measures to protect the cultural heritage significance of the Town Centre during the construction stage.
GSTC 8 Environmental Management (8.1, 8.3, 8.4, 8.5, & 8.7)	The preparation of the SEE involves the inclusion of ESD measures to achieve a sustainable outcome for the Town Centre. This includes the following measures: • Water sensitive urban design including swales and rain gardens and filtration and bio - retention devices • Protection of existing trees • Significant street tree planting to reduce the "heat island" Effect • Green infrastructure which will support the operation of the Trigeneration facility the Water Re–use facility and the Automated Waste Collection System on the former hospital site • The use of proposed parks for water retention (The Drying Green) Note: Due to the nature of the existing environment (Refer to Section 2) which contains land use that have been significantly modified by past industrial uses, an Ecological Assessment report has not been prepared in support of this SEE.

GSTC 9 Social Sustainability and Impact	The proposed Essential Infrastructure works will support an opportunity for social interaction through the creation of a legible street network with over 10 intersections. Creation of desire lines to the railway station and town centre as well as public plazas and parks for community gathering.
GSTC 10 Transport and Parking (10.3, 10.4)	The traffic and transport measures identified in the DCP are shown on the transport structure plan, as shown on Figure 6 (Refer to Appendix F). *Transport for NSW (RMS) indicated that the majority of the proposed/modified traffic control devices shown on the transport structure plan (Figure 6) (Refer to Appendix F) are supported in principle. However, the proposed traffic control signals at the intersection of Bourke Street and Ebsworth Street are not supported. Any new local street connection to classified roads that are not to be controlled by traffic signals, including Ebsworth Street at Bourke Street, should be restricted to left in and left out. These restrictions should be enforced by physical barriers, such as control medians or splitter islands. As the pedestrian and bicycle movements to and from Green Square Station may substantially increase with the development of the Town Centre, the City will need to work with RMS to provide adequate pedestrian crossings (including possible pedestrian signals on Botany Road) at major intersections near the Town Centre.* *In accordance with Council's requirements and in association with the proposed bus signals at the intersection of Botany Road and Green Square, at- grade pedestrian crossing facilities should be incorporated into the traffic signals to improve pedestrian and bicycle access to and from Green Square Station. The existing underpass does not satisfy pedestrian desire lines and is not considered appropriate. Ease of pedestrian movement is considered essential. The design of pedestrian crossing should be resolved with the RMS at the planning stage, prior to construction.* *Any changes to existing traffic signals, the detailed design of proposed traffic signals, speed limits or reduction of travel lanes on regional roads are subject to approval by RMS. Proposed shared zones and slow zones should be in accordance with RMS standards.* *The proposed road layout has been provided in accordance with Figure 10.1: Transport Structure Plan (Refer to Appendix F) with a street hierarchy which includes Ebsworth Street and Geddes Avenue as the primary streets in the Town Centre connected by second tier streets (Hinchcliffe Street, Barker Street) and laneways. The road layout will support bus movements in the Town Centre which will link the Town Centre with other centres including the City, Bondi and*

Botany.

The road layout has been designed to support safe and accessible pedestrian movements in the Town Centre including markings, pedestrian crossings and sign posting. The proposed Eastern Transport Corridor provides the primary transit function for the Town Centre initially for bus movements but in the longer term for light rail connecting to Epsom Park and the Sydney CBD. The proposed road layout provides for ease of pedestrian and cycle access with a controlled speed limit (40 km/h) to enhance safety and designated bike lanes to assist with safety and movement through the Town Centre. The proposed Essential Infrastructure works includes provisions for bike parking and bike facilities in the centre.

Other Development Control Plans and Codes

Other DCPs and Codes that have shaped the preparation of the Essential Infrastructure works include:

- City of Sydney Contaminated Land DCP 2004;
- South Sydney DCP 1997: Urban Design - Green Square South Sydney DCP;
- City of Sydney Heritage Development Control Plan 2006: 1997 Urban Design;
- South Sydney DCP No.11 – Transport Guidelines for Development;
- City of Sydney's Public Domain Manual;
- City of Sydney Design Codes;
- The City of Sydney Access DCP 2004; and
- Waste Code for New Developments.

4.4 Any Planning Agreements

The City of Sydney and John Newell Pty Limited (landowner) have entered into a Planning Agreement (dated 20 October 2011) to facilitate the rezoning of land under the EP&A Act for high density residential and open space uses on land at No, 301-303 Botany Road, Waterloo (Lot 2 in DP 1015633), which is currently occupied by the Sydney City Nissan dealership.

In summary, the relevant works include utility upgrades, road infrastructure works, street lighting and signage works and underground connections from the John Newell site to the broader Town Centre. This proposed works covered by this Planning Agreement form part of the Essential Infrastructure works proposed in this SEE.

4.5 The NSW Environmental Planning & Assessment Regulations 2000

There are no specific matters contained in the NSW Environmental Planning & Assessment Regulations 2000 that related to the proposed Essential Infrastructure works as covered in this SEE.

4 Assessment of Section 79C of the NSW Environmental Planning & Assessment Act 1979

4.6 Any coastal zone management plan

The Green Square Town Centre is not located within land covered by a Coastal Zone Management Plan. The proposed works will enhance water quality in the broader Alexandra Canal catchment (which flows to the coast via Cooks River / Botany Bay) through infrastructure enhancements and WSUD measures.

4.7 The likely impacts of the development

The likely impacts of the development are assessed below. Minor amendments have been made to extracts from the various report sections to ensure consistency throughout the SEE.

4.4.1 Drainage

The assessment of drainage issues has based on the 'Green Square Town Centre Floodplain Risk Management Plan prepared by Cardno Pty Ltd (Refer to Appendix D).

Flood Drainage Option

The assessment of flood behaviour within and surrounding the town centre was undertaken using the hydraulic model SOBEK. The setup and parameters for this model are discussed in detail in Cardno (2009).

Modelling of the proposed Town Centre design shows that it affects flow behaviour resulting in adverse impacts to peak flood levels upstream and downstream of the site. Additional drainage systems are proposed to manage flow behaviour within the Town Centre.

The proposed drainage layout for the Town Centre is based on Option 1a of the 2009 Report as this was selected as a feasible solution to facilitate the Town Centre development. It is designed in consideration of a potential future augmentation of the main trunk drainage to Alexandra Canal described in the Mid-term (10 Years) Drainage. Response concept in Appendix D.

Proposed Drainage Layout

The proposed drainage system is based on Option 1a presented in the previous assessment (Cardno, 2009) and included in Appendix D, but is reconfigured for the new Town Centre layout. Changes to Option 1a reported in 2009 include realignment of the pipeline from the Drying Green storage area to Botany Road along the trunk corridor to facilitate a future alignment of the Mid-term (10 Years) Drainage Response concept along New Cross Street. Additional inlets have been repositioned closer to Joynton Avenue in the revised Town Centre road layout to improve capture rates.

Appendix D shows the elements of the drainage layout:

- *Additional inlets in Joynton Avenue to convey runoff to the Drying Green storage basin;*
- *Drying Green storage basin (shown in Figure 6.1B) (Refer to Appendix D);*
- *Outlet pipe from storage basin to the existing trunk drainage culvert;*

- *Outlet from storage basin to additional pipe conveying flow to Botany Road; and*
- *Pits to surcharge flows to Botany Road where flow from storage basin exceeds restricted capacity of pipe connecting to existing trunk drainage culvert.*

The model evaluates mainstream overland flow through the Town Centre and does not explicitly model the individual drainage pits downstream of Joynton Avenue.

Climate Change

Climate change is expected to adversely affect rainfall intensities and global sea levels which may consequently impact flood behaviour.

The Alexandra Canal Catchment Flood Study (2011, Draft) modelled the effect of elevated water levels in Alexandra Canal due to increased sea levels. The study showed that for the modelled events, sea level rise in a 100 year ARI event did not alter peak flood levels upstream of Mandible Street.

Thus for the Study Area, increased rainfall intensity is likely to be a more significant factor influencing flood behaviour for the Town Centre. It was agreed with City of Sydney for the 2009 Report to model the Town Centre systems with an increase of 10% to the hydrology (inflow hydrographs for the hydraulic model) to represent a potential 10% increase in rainfall intensity due to climate change. This increase has been adopted for this updated assessment.

Model Results

Peak Water Levels

The peak water level differences of the proposed development (with the revised drainage) compared to the existing case is shown in Appendix D.

Increased peak flood levels on Joynton Avenue, evident particularly during the more frequent events, result from the changed road grading of Zetland Avenue (between Joynton Avenue and Portman Street). The configuration of the inlet structures and transition of the road grading would be refined at detailed design stage. It is understood increases resulting at Joynton Avenue would be managed as part of the Epsom Park and Joynton Avenue road modifications being assessed by Worley Parsons (in preparation). Additional drainage inlets and refinement of the road grading is recommended at detailed design to manage peak water level increases shown on Portman Street.

An increase of around 0.01m is shown to occur post-development on Botany Road. Downstream of Bourke Road, the peak water level increase is up to 0.04m in the 100 year ARI event, except for a small area at Burrows Road. Similarly, in the 10 year ARI an isolated location on Bowden Street shows an increase of 0.10m. These potentially result from the setup of the model and resulting numerical calculations which may not be reflective of actual increases at these locations.

Peak Depth

Figure 6.7 (Refer to Appendix D) shows the peak modelled depths for the 20 year ARI event. The results show that mainstream flooding is not conveyed overland in the 20 year ARI event across Neilson Square, Green Square or Geddes Avenue.

Provisional Hazard

Roadways within the catchment experience high hazard flow conditions under existing conditions as shown in the 2009 Report. Figure 6.8 (Refer to Appendix D) shows the extent of high provisional hazard for the 100 year ARI event for the revised development layout. Similarly to the 2009 Report, high provisional hazard is shown in the Town Centre on part of Geddes Avenue and Zetland Avenue.

Mid-term Drainage Response

The additional culvert and open channel capacity of the Mid-term (10 Years) Drainage Response for Green Square and Alexandra Catchment results in significant reductions in flood inundation and risk. Flood modelling results for the 20 year ARI and 100 year ARI events are detailed in Appendix D.

The proposed drainage system is based on Option 1a presented in the previous assessment (Cardno, 2009), but is reconfigured for the new Town Centre layout. Changes to Option 1a reported in 2009 include realignment of the pipeline from the Drying Green storage area to Botany Road along the trunk corridor to facilitate a future alignment of the Mid-term (10 Years) Drainage Response concept along New Cross Street. Additional inlets have been repositioned closer to Joynton Avenue in the revised Town Centre road layout to improve capture rates.

Figure 3.2 (See Chapter 3 of the SEE) shows the elements of the drainage layout:

- *Additional inlets in Joynton Avenue to convey runoff to the Drying Green storage basin;*
- *Drying Green storage basin (shown in Figure 6.1B);*
- *Outlet pipe from storage basin to the existing trunk drainage culvert;*
- *Outlet from storage basin to additional pipe conveying flow to Botany Road; and*
- *Pits to surcharge flows to Botany Road where flow from storage basin exceeds restricted capacity of pipe connecting to existing trunk drainage culvert.*

The model evaluates mainstream overland flow through the Town Centre and does not explicitly model the individual drainage pits downstream of Joynton Avenue.

Assessment

Proposed Drainage System

A brief description of the LEP objectives (clause 27KH) and the performance of the proposed development system in the Town

Centre to these objectives are provided below. Individual property sites and buildings within the Town Centre may incorporate additional flood mitigation measures.

- *Adverse effect on flood behaviour – Similar to the 2009 assessment, minor increases in peak flood levels result in the catchment post-development. Refinement of the road grading and inlet structures at detailed design phase is recommended to mitigate increases to flood levels;*
- *Significant increase in flood hazard or flood damage to any property – The flood hazard does not increase significantly as a result of the proposed development for the 100 year ARI and is limited to the areas already affected under existing conditions. An important outcome is that no new significant areas of provisional high hazard are created. Flood damage is primarily related to depth of flooding. With insignificant increases in flood levels, the change in flood damage is also likely to be insignificant;*
- *Decreases in the capacity of floodway – The floodways through the Town Centre are modified due to the proposed development. However, the proposed layout provides sufficient flood mitigation to counteract the restriction of floodways through the Town Centre. Elsewhere, the capacity of existing floodways is not significantly affected;*
- *No increase in risk to life and safety of public and emergency services personnel – The true flood hazard for the Town Centre indicates that the flood risk is expected to increase with the proposed Town Centre development due to the change in the number of people in the area. However, due to the nature of flooding, the risk is generally of short duration and the risk may be managed by providing appropriate refuge and assembly places in the proposed buildings in the area. The Green Square Town Centre – Floodplain Risk Management Plan (Cardno, 2012b) describes the management of the flood risk; and*
- *Incorporate freeboard levels and flood proofing measures – The proposed layout is not affected by this requirement. The elements of the Green Square Town Centre DCP 2012 relevant to the Town Centre provide sufficient details on the requirements of freeboard and flood proofing.*

Mid-term Drainage Response

A brief description of the LEP objectives (clause 27KH) and the performance of the Mid-term Drainage Response system to these objectives is provided below:

- *Adverse effect on flood behaviour – The System results in significant reductions to peak flood levels in the catchment from Link Road to Alexandra Canal;*
- *Significant increase in flood hazard or flood damage to any property – The system results in significant reductions in peak flood levels thus reducing flood hazard and potential flood damage;*

- *Decreases in the capacity of floodway – The floodways through the Town Centre are modified due to the proposed development. The system results in a significant increase to floodway conveyance with the augmentation of culverts and channels;*
- *No increase in risk to life and safety of public and emergency services personnel – The true flood hazard for the Town Centre indicates that the flood risk is expected to increase with the proposed Town Centre development due to the change in the number of people in the area. The potential flood risk is reduced compared to the existing situation due to the improved conveyance along the trunk drainage corridor to Alexandra Canal. However, due to the nature of flooding, the risk is generally of short duration and the risk may be managed by providing appropriate refuge and assembly places in the proposed buildings in the area. The Green Square Town Centre – Floodplain Risk Management Plan (Cardno, 2012b) describes the management of the flood risk; and*
- *Incorporate freeboard levels and flood proofing measures – The proposed layout is not affected by this requirement. The elements of the Green Square Town Centre DCP 2012 relevant to the Green Square Town Centre provide sufficient details on the requirements of freeboard and flood proofing.*

Conclusion

Subsequent to the 2009 Report, the extent of the Town Centre and its road layout have been amended. The proposed drainage works for Town Centre, Option 1a in the 2009 Report, has been revised for the new development. The Town Centre and proposed drainage network has been modelled for a range of storm events with flood behaviour generally consistent with the previous report of 2009.

The proposed drainage network for Town Centre includes additional inlets and pipelines from Joynton Avenue to Botany Road and incorporates the Drying Green storage area. This system is recommended for adoption in the Town Centre development based on review of the LEP and DCP conditions for the site.

The Mid-term (10 Years) Drainage Response for Green Square and Alexandra Catchment was developed in consultation with the City of Sydney and Sydney Water. This system of augmented culverts and open channels along the trunk drainage corridor results in a significant reduction of peak flood levels and flood risk.

A Draft Floodplain Risk Management Plan was prepared in 2009 which detailed flood behaviour and identified guidelines for the management of flood risk at specific sites and generally within the Town Centre. This Plan has been updated in-line with the changed Town Centre layout identified in this Report. Further details are provided in Cardno (2012b).

4.4.2 Flood Risk Management

The assessment of hydrology and flooding issues has based on the Green Square Town Centre Floodplain Risk Management Plan prepared by Cardno Pty Ltd (Refer to Appendix E).

This Floodplain Risk Management Plan (FRMP) for the Town Centre has been prepared by Cardno for the City of Sydney and Landcom to provide a Plan for the management of flood risks. The Plan has been prepared in accordance with the NSW Government Floodplain Development Manual (2005).

Flooding in the Town Centre, although rare, can be expected to affect the area in some circumstances and can therefore pose a hazard to future retailers, employees, visitors and residents around Green Square that needs to be managed. This has prompted the City of Sydney and Landcom (as the City's Development and Project Manager for the development) to prepare a comprehensive Floodplain Risk Management Plan for the Town Centre, which is located within the Green Square / West Kensington Floodplain, and the wider Alexandra Canal.

***Floodplain**.*

The aim of this Plan is to provide certainty that the development sites, public streets, plazas and parks can be safely developed in accordance with specific flood-related requirements with respect to management of flood risks. The objectives of the Plan are to:

- *Review the City of Sydney's existing environmental planning policies and instruments including the City's long-term planning strategies for the study area;*
- *Identify flood mitigation measures (or structural measures) for implementation;*
- *Identify property and public domain design measures (e.g. minimum floor levels) for implementation;*
- *Identify emergency management measures (e.g. evacuation strategies) for implementation; and*
- *Be consistent with the objectives of relevant policies, in particular, the NSW Flood Prone Lands; and*
- *Policy and satisfy the objectives and requirements of the EP&A Act.*

This Plan has been prepared for two purposes, for the long-term management of flood risk in the area and to accompany the Public Domain and Essential Infrastructure DAs.

Flood Mitigation Measures (Structural Measures)

Flood modification measures (also known as structural options) assist in modifying the flood behaviour to manage the impacts of a development. The impact of the Town Centre development was assessed in the Flood Mitigation Options Report (Connell Wagner and Cardno, 2009) and a number of flood modification measures were identified.

The preferred option described in Cardno (2009), known as Option 1a, incorporates infrastructure required to manage flows within the Town Centre to maintain existing conditions. The core elements of Option 1a have been amended for the revised Town Centre development layout as described in Cardno (2012). The general features of the revised drainage concept are shown in Figure 2.2 which includes:

- *Inlets in Zetland Avenue (east of Portman Street) to collect runoff from Joynton Avenue and discharging into The Drying Green storage area;*
- *A 0.9m diameter outlet pipe from the storage area to the 1.5m diameter pipe conveying flows to Botany Road (reducing the overland flow along Geddes Avenue);*
- *A 0.375m diameter pipe from the flood storage area to the existing trunk culvert; and*
- *Surcharge pits in Botany Road for flows from the storage area to mitigate impacts downstream of Botany Road.*

The overall works for the area also incorporates the provision of flood detention within the Drying Green storage area and on-site detention as per Sydney Water's requirements within individual building sites as well as the total package of structural works outlined for the concept drainage.

The recommended measures were successful in managing the impact of Town Centre on downstream properties. However, the flood risk on the Town Centre itself was not completely removed, leaving a residual risk on the site for rare events in some locations and for extreme events across most of the ground level areas of the Town Centre (as described in Section 2). This is common in the design of flood mitigation measures as it is not considered economically feasible to remove all flood risks up to the PMF with structural options given their infrequent nature.

Management of the residual flood risk on the site requires consideration of non-structural measures of Property Modification and Emergency Response Modification. These measures are discussed in the following sections.

Property Modification Measures

Property modification measures available for the Town Centre include those provisions contained in the Green Square Town Centre DCP 2012 as well as those mentioned in Appendix E:

Flood Risk Management Plan

Overview

This section of the report documents the action items for implementation based on the flood behaviour described in Section 2, the flood risks described in Section 3 and those options to manage flood risks described in Section 4.

Social, economic and environmental impacts have been taken into account in the development of this flood risk management plan.

- *Environmental - It is expected that the environmental impacts are likely to be minimal due to the nature of the proposed and existing development, the conditions being highly modified and urbanised;*
- *Economic - The economic impacts (e.g. in the form of flood damages to property) are intended to be minimised by using appropriate flood planning for the proposed development (including setting of suitable floor levels, flood proofing measures etc);*
- *Social - Among the social impacts, the primary impacts to be managed within the plan are the minimisation of nuisance and inconvenience on a day to day scale and the minimisation of the risk to life during rare and extreme conditions (and not increase more prosaic risks in the process of reducing flood risk). This risk to life would increase with the proposed Town Centre development merely by increasing the number of people in the area. Hence measures need to be undertaken to manage this risk. The proposed measures therefore mainly address risk to life arising from the likely flooding of the Town Centre in rare and extreme events; and*
- *Summary sheets outlining specific actions for each of the 31 Sites located within the Town Centre, as well as the open space plazas Green Square and Neilson Square, and The Drying Green are provided in Appendix E.*

It is noted that the DAs for subsequent public spaces, streets and private developments will need to prepare their own Flood Risk Management Plan, using the summary sheets provided in Appendix E as a starting point. Further detailed assessment is recommended to identify flood behaviour and management options at particular sites as these sheets contain summarised information.

Property Modification Actions

The South Sydney LEP 1998 and Green Square Town Centre DCP 2012 were reviewed for their requirements associated with the range of planning measures. The following proposed measures are generally in addition to those required under the relevant LEP and DCP clauses. However, some of the proposed measures recommend modification to the development controls presented in the DCP.

Building and Development Controls

The following building and development controls are to be applied for all developments as required in the Town Centre:

- *Habitable floor levels to be set at the 100 year ARI +0.5 m;*
- *For those access points leading to below ground facilities (e.g. the entrance to a public underground carpark below the plazas or the Green Square Station) located within flood prone areas and where it has been determined that there is a risk to life, the PMF is to be adopted as the appropriate FPL;.*

- *All buildings to provide a temporary refuge for persons escaping from the floodwaters. The rapid rate of rise of floodwaters only allows a short period (ranging from approx. 10 – 45 mins) to walk to safety after the onset of rainfall. Any pedestrian should be able to walk to the nearest building to seek temporary refuge once it becomes apparent that a major rainfall event is underway. It is expected that all buildings within the Town Centre will be able to provide temporary refuge for members of the public as required. The temporary refuge could be an open space or foyer at the entrance of the building or a mezzanine level, open to the public, which needs to be at or above the PMF. Emergency lighting for the refuge is to be provided. Persons seeking refuge are expected to only need to take shelter for a short time (up to six hours). Therefore, for those buildings that are to provide refuge, consideration could be given to providing access to basic amenities such as a public telephone, seating, drinking water, toilet amenities etc;*
- *A Flood Emergency Response Plan is to be prepared for each development for submission with each development application. The plan should detail the measures that would need to be taken in case of a flood emergency. The plan should be similar to the fire plan for the development and would require a similar approach for implementation; and*
- *Design of public space areas should be such that in case of flood emergency, the pedestrian movement is directed towards PMF refuge areas at or in adjacent buildings.*

Flood Compatible Materials

Flood compatible materials are to be used for all parts of the building exposed to flood waters (i.e. up to the PMF).

Main Access

To minimise the risk to the public, it is highly recommended that (where possible) the main access to each building is located away from the high hazard areas as shown in Figure 2.14 (Refer to Appendix E). Where this is not possible, a secondary access point should be provided. This would reduce the pedestrian movement in the area and reduce the risk.

Flood Signage

Street signage is to be placed at appropriate locations within the Town Centre, warning of possible flooding hazard. Individual developments are to incorporate appropriate signage on their premises.

Lower Ground Public Domain

A large below-ground public domain area under the plaza area may form part of the Town Centre. There is a flood risk associated with the ingress of waters via stairs or other similar entry points for flood events rarer than the 100 year ARI. In an extreme event, such as the PMF, the risk to life associated with the ingress of waters to underground areas would be extremely high and the potential

consequences of the flooding of the below ground domain would be catastrophic.

In order to manage this risk to life, the access points to any below ground public domain, retail or public parking areas are to be set at the PMF. In adopting this level, below ground areas are unlikely to be inundated during any flood event. In addition, a secondary exit to a flood free area away from the point where flood flows would enter must also be provided.

Access to Green Square Station

Access from the Green Square plaza to the Green Square Station for pedestrians is via Botany Road. In a 100 year ARI event, the Botany Road trapped depression, which is close to the pedestrian crossing area, is subject to provisional high flood hazard. However, there is also a proposed pedestrian underpass through which pedestrians can access the Railway Station from the other side of Botany Road within Development Site 6.

The access to the Railway Station would, therefore, need to be carefully planned to manage the increased risk to the public. As in Section 5.2.5 (Refer to Appendix E), all access points to below ground public areas located within flood prone locations, including that to the Railway Station, are to be placed at the PMF to prevent inundation during a flood event. Pedestrian evacuation routes to flood free areas or flood refuges are to be clearly marked and the design developed such that pedestrians are naturally directed to flood refuges.

Vehicular Entry

The Green Square Town Centre DCP 2012, indicates locations where vehicle entry to basement car parks is not permitted. Additional locations, including major flow paths such as the flowpath along Zetland Avenue and Geddes Avenue, also should preclude any access to basement car parks unless some form of non-mechanical barrier can be installed (e.g. a hump) to prevent ingress of floodwaters up to the FPL calculated for that specific basement parking area. A similar approach is required for the building entry points, i.e. they should be kept away from the major flow paths, where possible.

With respect to vehicular entry points for basement car parks, an appropriate FPL should be adopted with the minimum level being the 100 year ARI plus 0.5 m. Where the 100 year ARI plus 0.5 m is adopted, the proponent will need to calculate the water depth in the carpark (based on the rate of inflow and area) if the crest is overtopped for greater events. Alternatively, the carpark entry could be set at the PMF.

In addition, a well signposted secondary pedestrian exit to a flood free area away from the carpark vehicle entry should be provided.

Transport Network

The Green Square Town Centre DCP 2012, provides details of the transport network for the Town Centre including the location of proposed traffic signals, bus stops and access routes.

Where flooding affects the bus stops intended to be located along Botany Road between Transport Place / Green Square plaza, it is recommended that the SES coordinate the temporary de-activation of these bus stops and re-routing of buses around affected areas in association with the State Transit Authority.

Pedestrians intending to use the bus services within these areas are to evacuate to flood refuges. Similarly, depending on the magnitude of the flood event and the lead time with respect to the provision of flood warnings, the SES may wish to limit pedestrian access to those bus stops and other transport-oriented locations inundated by flood waters, particularly those subject to water depths of 0.3 m or more and especially the Botany Road and Joynton Avenue trapped depression areas.

Street parking is to be avoided along the major flow paths during a flood event to avoid localised increases in flood levels, associated impact on adjacent buildings and damage to vehicles. Where they are provided with advanced warning, the City's rangers are tasked with notifying the SES of any potential problems associated with parked cars in the lead up to a flood event. The SES may then determine whether action needs to be taken.

Where any pedestrian underpasses are to be constructed to access the transport network (e.g. underground passages to connect with the Railway Station), the entrance to these underpasses is to be set at the PMF (see Section 5.2.5).

Emergency Response Modification Actions

As outlined in Section 3.1(Refer to Appendix F), it is important to note that there will be a range of people present in the Town Centre development at any one time, including residents of multi-storey buildings, workers in commercial buildings and retail centres, people commuting by public or private transport and pedestrians, as well as those members of the public utilising the open spaces such as the Green Square and Neilson Square plazas and The Drying Green. Therefore, the emergency response actions consider a range of scenarios.

Community Awareness

Community awareness is the single most important factor in distributing the management of flood risk.

Education campaigns should be undertaken on a regular basis. These campaigns should be carried out for the entire Town Centre and also by individual developments through residential strata and commercial building managers, rail station managers and staff working in community buildings. The Flood Emergency Response Plan for individual developments discussed in Section 4.2.3 should (Refer to Appendix F) includes provision for such an activity.

Various measures that could be undertaken for community education include:

- *Advise residents from time to time of the potential for overland flooding;*

- *Articles in local newspapers;*
- *Flood information leaflets;*
- *Erecting signs showing historic flood levels;*
- *Signposting of evacuation routes;*
- *Development and distribution of FloodSafe Guides by the SES; and*
- *Distribution of Business FloodSafe Kits and holding annual Business FloodSafe breakfasts for commercial premises which have floor levels which can be exceeded in the PMF (i.e. greater than the 100 year ARI + 0.5m).*

FloodSafe guides are generally prepared by the SES in consultation with the City. They provide the basic information about the local flood risk and advise the residents and business owners how to manage the risk by undertaking various actions. The SES has prepared a general Community FloodSafe Guide as well as a Guide for businesses. The Guides help improve the community readiness to combat floods for the risks expected during rare and extreme events.

Flood Warning

There are a number of staged activities that take place as part of the flood warning process. These activities are discussed in detail below.

Flood Warnings Issued by Bureau of Meteorology

The Town Centre is affected by flash flooding (i.e. floods where the warning time is less than 6 hours). As such it is difficult to provide any flood warning in advance of floods. Where possible, the Bureau of Meteorology (BoM) will issue a severe weather / flood warning to the Regional SES headquarters in Bankstown. Where that alert is relevant to the Town Centre area, the SES Regional Command will pass the BoM's warning on to the Local Command based in Erskineville. In some cases, 2-3 days advanced notice may be available (e.g. where an East Coast Low develops off Sydney). However, at other times it may only be possible to issue a flood warning hours in advance, if at all.

Activation of Local SES Command

Once the SES Local Command has been issued with a flood warning by the BoM, they then place their staff on alert and forward via SMS the BoM's flood warning to the relevant individuals and organisations, including the CoS Security and Emergency Management Centre located at Town Hall. It is recommended that all Building Managers responsible for developments within the Town Centre also be included on the distribution list for flood warnings.

It is noted that the SES is the designated lead combat agency in an emergency such as a flood event. However, local authorities may wish to act on the advice provided by the SES to minimise the level of risk in the lead up to the flood event.

Depending on the amount of lead time provided, the City may undertake any relevant priority works, such as cleaning out stormwater pits to reduce the risk of blockage. In addition, the City's rangers are placed on standby and report any issue directly to the SES (e.g. cars parked in overland flow paths, etc.). Building managers will be responsible for implementing any flood risk management measures in accordance with their

Flood Emergency Response Plan.

Management of the Public Domain

A number of open, public areas are located within the proposed Town Centre development, including Green Square and Neilson Square plazas and The Drying Green. With respect to these areas of public domain, with the provision of temporary refuges which can be accessed in a few minutes, even a small warning time will provide the public with sufficient time to seek refuge. The provision of rapid flood warnings at Town Centre may be delivered through an automated process that triggers a warning (e.g. with the installation of water level sensors placed at the Joynton Ave or Botany Road trapped depression areas).

The warning itself can be delivered through the use of suitably located electronic information boards at key locations.

Specifically with reference to roads, it is recommended that permanent flood depth markers be installed on either side of the road in the verge at the Joynton Avenue and Botany Road trapped depressions to provide an indication to motorists of water levels at these locations when the road is flooded. The SES may wish to coordinate closure of affected roads, especially at the location of the Botany Road and Joynton Avenue trapped depressions.

Another option is to have a public address system, which can relay a recorded message. The system could be similar to what the City of Sydney has already installed to manage emergencies in the busy streets of the City. An example of this system can be found near the main entrance of the City's building at Town Hall Square, where the public address speakers are installed on a traffic light pole.

Event Management

It is understood that the public domain areas within the Town Centre are also intended for use for special events to be attended by members of the community. In the unlikely instance that a flood event coincides with a community event, the number of people gathered in the open space areas will pose an additional challenge to emergency management. Considering the example of an annual Carols by Candlelight function, it is estimated that the Plaza's may hold a capacity of around 1,000 people. Whilst it is noted that the plazas are not located within the floodplain for a 100 year ARI event, these areas may be inundated by localised flood waters during larger events.

The event manager for each event will be required to prepare an Event Management Plan, to incorporate an Emergency Response Plan. These Plans should make reference to this Floodplain Risk Management Plan.

Should a flood warning be issued for the time of the event, all event staff should be briefed on the Emergency Response Plan. People will need to be directed to refuges located in adjacent buildings (as shown on the summary sheets provided in Appendix E).

In some circumstances, the event may need to be called off if the likelihood of a flood event occurring on the day is determined to be significant. This would commonly be preceded by rainfall (intense or otherwise) that would generally preclude an outdoor event (except in the case of sudden thunderstorms).

Building Management

The flood warning signal should also be available in the individual buildings to stop the occupants from leaving the building. The Flood Emergency Response Plan for the development should include recommendations for regular 'flood' drills for the occupants of the building similar to the fire drills, which are currently undertaken as a standard practice.

Emergency Management Centre

The emergency response to any flooding of the Town Centre will be coordinated by the lead combat agency, the SES, from their Local Command Centre located at Erskineville.

However, the City of Sydney Security and Emergency Management Centre located at Town Hall is on the notification list for SES flood warning alerts and that direct liaison between the SES and the Security and Emergency Management Centre may be conducted via a dedicated radio frequency. The Manager – Security and Emergency Management may then pass on the flood warnings to any affected City of Sydney or community

Building / Event Managers at Green Square Town Centre

The Security and Emergency Management Centre will continue to receive regular updates from the SES throughout a flood event.

Conclusion

This Plan builds upon the Flood Mitigation Options Report (Connell Wagner and Cardno, 2009) and Addendum (2012) by providing further details on property mitigation measures and emergency response measures that may be implemented to manage the residual flooding risk for the Town Centre. The Plan provides certainty that the Town Centre development sites, public streets, plazas and parks may be safely managed with respect to the long-term management of flood risks in the area.

This Plan will also accompany DAs being prepared for the Green Square Town Centre Public Domain and Essential Infrastructure. However, upon preparation of detailed designs for any development site, open space or street, site specific and detailed Flood Risk Management Plans will need to accompany that DA.

4.4.3 Traffic and Parking

The assessment of traffic and transport issues has based on the 'Transport Report for Green Square Town Centre Essential Infrastructure' prepared by Colston Budd Hunt & Kafes (Refer to Appendix F).

Green Square Town Centre DCP

Public Transport

As discussed in the Green Square Urban Renewal Area Transport Management and Accessibility Plan and the Green Square Town Centre Masterplan Transport Report, the site has good access to existing bus and rail services and will benefit from significant planned improvements in the future. These reports have been prepared to promote accessibility to and within the Green Square redevelopment area. The Transport Management & Accessibility Map (TMAP) examines mode split targets and sustainable means of transport such as public transport, walking and cycling. It recommends a two-pronged strategy to encourage a mode switch to public transport, by the provision of increased services and improved infrastructure, and a restrictive parking policy to minimise the use of private vehicles.

The DCP parking controls for Green Square have been adopted and will form the planning framework for the allocation of maximum car parking rates, whilst the railway station at Green Square and major bus routes through the area provide the spine of the public transport network.

For detail in regards to public transport improvements, reference should be made to the Green Square Urban Renewal Area TMAP.

Pedestrians and Cyclists

The pedestrian network serving the town centre comprises two main components. The first of these is the traditional network of footpaths on the street network. The second component is a separate off-street network of through site links which will be developed through the proposed staging of the town centre.

A series of pedestrian paths will be developed through the town centre linking the commercial, retail and residential precincts to car parking, public transport facilities and access to the surrounding pedestrian network

Primary and secondary pedestrian movements will be developed, with primary pedestrian routes provided through the Civic Place and public domain areas linking to the station and public transport facilities. Secondary pedestrian routes will be developed adjacent to the road network and via dedicated through site links.

Protection will be provided to pedestrians and cyclists from vehicles and driveways by providing regular safe crossing points, signalised intersections and access through the public domain. This encourages walking and cycling for both destinations and recreational movements, including Green Square Station. The pedestrian and cycle network will be integrated with the road network and open space areas to encourage the use of the network when accessing public transport routes, commercial, retail and residential precincts and open space areas.

The cycle network through the town centre will be developed to connect to existing cycle routes through the surrounding area. It will link to Green Square station, allowing cyclists to switch mode from

cycle to either bus or train, in order to complete their journeys.

In time the area will benefit from a comprehensive cycle network allowing cyclists to travel through and within the town centre, and into the surrounding areas. A combination of on and off road cycle routes along Botany Road, Portman Street, Joynton Avenue, Bourke Street, Zetland Avenue, civic plaza (Green Square), Geddes Avenue and Hansard Street, will link the Town Centre with surrounding areas and provide safe travel in all directions. In addition to these routes and in accordance with the City's requirements a bi-directional separated cycle way shall be provided on the western side of Paul Street between Hansard Street and Geddes Avenue and between Zetland Avenue and Bourke Street. A well developed cycle network is likely to be successful in increasing users and therefore making a contribution to sustainable transport for the area.

Approved Road Layout

The road layout for the Green Square Town Centre will retain Botany Road and O'Riordan Street as major north-south traffic routes through the area. RMS have advised that the intersection of Botany Road/Bourke Street/O'Riordan Street is intended to be upgraded to improve the station forecourt, improve traffic movements and allow for pedestrian crossings on all legs of the intersection. The design however is contingent on the longer term development of the station site. Interim, shorter term treatments need to be considered to improve the current pedestrian environment.

A new east-west link will extend from Bowden Street across Bourke Road and O'Riordan Street to join Botany Road to provide direct access to the Town Centre, via Geddes Avenue, from the west. The intersection of the new road link with Botany Road and Geddes Avenue will be signalised.

Additional relief routes will also be developed across Green Square using Joynton Avenue (to the east) and Lachlan Street, McEvoy Street and Euston Road (to the north).

The internal road layout within the Town Centre, as set out in the DCP and shown in Figure 6, includes seven new roads and a number of service access ways.

These new roads include:-

- *two new collector streets (Zetland Avenue and Geddes Avenue) to be provided, linking Joynton Avenue and Botany Road, including signalised intersections at Joynton Avenue/Zetland Avenue, Zetland Avenue/Paul Street and Botany Road/Geddes Avenue;*
- *extension of Dunning Avenue (Paul Street) from Hansard Street in the south to Bourke Street in the north. The intersection of Paul Street with Bourke Street will be left-in/left-out; and*
- *a number of new local roads, including Barker Street, Woolpack Street, Sonny Leonard Street and Hinchcliffe*

Street providing access to at-grade, above ground and basement parking within the Town Centre development sites.

The road layout has been designed to preserve sensitive residential areas within and around the Town Centre and where possible utilise existing road alignments and connections.

In association with the approved road layout, a new loop road will be provided within the Town Centre, improving connectivity and linking the northern and southern parts of the Town Centre. The loop road will encourage pedestrian movements across the public domain, activate pedestrian access through Civic Plaza (Green Square) and promote a finer grain road network with improved vehicular and pedestrian connectivity. Traffic signals including pedestrian crossing facilities will be provided at the intersections of Botany Road/Geddes Avenue, Joynton Avenue/Zetland Avenue and Zetland Avenue/Paul Street.

Intersections within the Town Centre, particularly intersections along Zetland Avenue, Geddes Avenue and Paul Street, will be designed to incorporate two approach lanes into the intersections. They will cater for the swept path of service vehicles and bus services through the intersections. On-street parking will be kept clear of the intersections in order to provide for the two approach lanes.

The internal road layout will be staged, as various land parcels within the Town Centre become available. It is anticipated that construction will commence at the northern end of the Town Centre. Access will be available to/from the northern section of Paul Street onto Bourke Street. The intersection of Paul Street with Bourke Street will be un-signalised with access restricted to left-in and left-out of Paul Street.

Proposed Changes to the Road Network

Changes to the approved Town Centre road layout include:

- *extension of Barker Street between Woolpack Street and Geddes Avenue (between Development Sites 8D and 19B); and*
- *re-alignment of Paul Street adjacent to Development Sites 18, 19A and 19B.*

The extension of Barker Street between Woolpack Street and Geddes Avenue will be a local street, providing improved access and circulation for Development Sites 8C, 8D, 19A and 19B. The proposed local street (16 metre reservation width) will provide an undivided road with two traffic lanes and one kerbside parking lane. Its intersection with Geddes Avenue will be a priority sign controlled intersection, with priority traffic movement along Geddes Avenue.

The extension of Barker Street will improve accessibility to proposed on-site parking within Development Sites 9 and 19. The new road will not noticeably affect traffic distribution through the Town Centre. In addition, the new road is not expected to result in any change in development potential for Development Sites 8D and 19B. It should be noted that the Green Square Urban Renewal Area

TMAP incorporated the extension of Barker Street through to Geddes Avenue in its traffic assessment.

Barker Street will be designed to slow traffic and priority given to pedestrians/cyclists and public transport. The re-alignment of Paul Street adjacent to Development Sites 18, 19A and 19B will also improve traffic circulation through the Town Centre and in particular through the intersection of Zetland Avenue and Paul Street. Paul Street will provide an undivided road with one traffic lane and one parking lane in each direction, clear of intersections. It will provide continuous pedestrian footpaths on both sides of the road. Its intersection with Zetland Avenue will be signalised. The traffic signals will incorporate pedestrian facilities across all approaches. There will be transit lanes through the intersection, between Zetland Avenue and civic plaza.

The re-alignment of Paul Street will not result in changes to traffic distribution through the Town Centre, nor will the re-alignment result in changes in development potential for Development Sites 18, 19A and 19B. As a result there will be no change to the traffic generation of these developments.

The proposed changes to the Town Centre road layout are considered appropriate to provide safe and convenient arrangements for vehicles, pedestrians and public transport services.

Access Arrangements and Internal Circulation

As set out in the Green Square Town Centre DCP 2012, car parking for the Town Centre will be provided in a mix of at-grade, above ground and basement/subbasement parking areas. For efficient operation and to spread traffic on the road network, parking areas will be provided through the site with separate points of entry and exit.

Separate car parking areas will be provided for residential and commercial/retail development. However, in order to take advantage of complementary use of the parking areas, commercial, retail and residential visitor parking will be generally combined within centralised off-street car parks within the Town Centre.

Access points will be located on local streets within the Town Centre, with no access available directly to/from collector streets. Access points will be located in appropriate locations relative to intersections. Appropriate sight lines and queuing space will be provided at the car park entries. The access driveways and car parking areas will be designed at the time development applications are prepared for the individual buildings. They will be required to be provided in accordance with the Australian Standard for Off-Street Car Parking Facilities (AS2890.1-2004).

Appropriate provision for service vehicles, including garbage collection, maintenance vehicles and deliveries, will be made on the internal roads and intersections within the Town Centre and within the individual buildings. The design of the on-site service areas will require service vehicles to enter and exit the sites in a forward direction. Service bays, manoeuvring areas, circulation aisles and

height clearances will be provided for the swept path of these vehicles in accordance with the Australian Standard for Off-Street Commercial Vehicle Facilities (AS2890.2-2002). Service vehicle areas will be finalised at the time development applications are prepared for the individual buildings.

Traffic Generation and Effects

The peak traffic generation of the Town Centre, including the Town Centre core sites, will occur during the morning and afternoon peak periods when retail, commercial and residential traffic combines with the on-road commuter peak. Other components such as community facilities would not generate a significant amount of traffic during these periods.

The MWT transport report (May 2006) estimated an afternoon peak hour traffic generation of some 2,050 vehicles per hour two-way. Based on the same traffic generation rates adopted in the transport report, the afternoon peak hour traffic generation would include a generation of some 830 vehicles per hour two-way for the identified Town Centre core sites.

The morning peak hour traffic generation of the approved Master Plan area was estimated in the MWT transport report (May 2006) to be some 1,540 vehicles per hour two-way. This morning peak hour traffic generation includes some 610 vehicles per hour two-way for the identified Town Centre core sites.

The MWT original transport report (October 2002) estimated the weekday peak hour traffic generation for the overall town centre at 1,560 vehicles per hour two-way for both the morning and afternoon peak hours. The road system traffic modelling allowed for some 1,700 vehicle trips per peak hour which included buses, taxis, service vehicles, etc. The increase over the original estimate for the afternoon peak hour did not change the MWT conclusions and recommendations of the original transport study, as design vehicle traffic volumes for roads in the Town Centre adopted were some 30% higher than the forecast traffic volumes. Thus in effect the design of the internal roads and intersections allow for the higher traffic generation in the afternoon peak periods.

It was further noted by MWT that most of the retail development would have a localised market catchment, so that much of its traffic generation in peak periods would be intercepted from passing traffic traveling to or from work/home in the Green Square area. This traffic would be on the arterial road system anyway.

The afternoon traffic generations for the core and non-core areas (Refer to Table 3.2 in Appendix F) shows that the total afternoon traffic generation for the core and non-core areas will be similar, some 2050 vehicles per hour two-way.

As a result, the MWT traffic assessment and road infrastructure recommendations are unchanged. At the levels of traffic anticipated, roads and intersections would be sized based on function rather than to meet capacity requirements. As previously discussed, intersections within the Town Centre, particularly intersections along Zetland Avenue, Geddes Avenue and Paul

Street, will be designed to incorporate two approach lanes into the intersections. They will cater for the swept path of service vehicles and bus services through the intersections. The intersections will also be designed to cater for the proposed cycle paths. On-street parking will be kept clear of the intersections in order to provide for the two approach lanes.

Summary and Conclusion

This update report has been prepared to provide a transport plan to support the development application for essential road infrastructure works for the Town Centre. The report has been prepared taking into consideration the Green Square Town Centre DCP 2012 and previous transport studies including the Green Square Urban Renewal Area TMAP (currently being updated).

The main points relating to the transport aspects of the proposed infrastructure within the Green Square Town Centre are as follows:-

i) the site has good access to rail and bus services and the road network;

ii) the road infrastructure works for the Green Square Town Centre have been prepared taking into consideration the Green Square Town Centre DCP 2012;

iii) appropriate provision will be made for pedestrians and cyclists in accordance with the Green Square Town Centre Development Control Plan 2012;

iv) the road layout within the Town Centre has been provided in accordance with the transport structure plan;

v) the proposed changes the Town Centre road layout, as described in this report, are considered appropriate to provide safe and convenient arrangements for vehicles, pedestrians and public transport services;

vi) the roads and intersections within the Town Centre will be subject to detailed design and approval by the City and/or RMS for Botany Road;

vii) access, car parking arrangements and internal circulation will be provided in accordance with AS2890.1-2004;

viii) the traffic effects of the Town Centre have previously been assessed in the transport report prepared in association with the approved master plan and the Green Square Urban Renewal Area TMAP;

ix) the traffic report for the approved master plan recommended a series of road works to cater for the traffic generation of the Town Centre. These road works have been adopted and incorporated into the Green Square Town Centre DCP 2012;

x) the traffic generation of the additional floor space and building heights on some town centre core sites would be similar to the traffic generation of the approved master plan;

xi) the traffic report for the approved master plan found that at the level of traffic anticipated, roads and intersections should be sized and designed based on function rather than to meet capacity requirements;

xii) the proposed changes to the road layout will not result in any change to development potential within the Town Centre and will not noticeable affect traffic distribution; and

xiii) the surrounding road network incorporating the recommended road works for the Town Centre will be able to cater for this traffic.

4.4.4 Geotechnical

The assessment of geotechnical issues has based on the Additional Geotechnical Study - Green Square Town Centre prepared by AECOM (Refer to Appendix H).

Review of Geotechnical Issues

A response to the previous Development Consent conditions (D/2008/1195) for the Green Square Town Centre Essential Infrastructure works is provided below:

General Geotechnical Issues

The Town Centre has a history of prior land uses with implications for potentially adverse geotechnical and variable foundation conditions. These include episodes of placement of extensive fill, assumed to be non-engineered.

The extent of the old brick quarries, which have been backfilled with uncontrolled fill apparently using various industrial refuse, including bricks, sandstone rubble, slag, metals, rubber, plastic and wood, etc, extended to some 20 m in depth. The pits covered the majority of the northern and the north-eastern section of the site. Further detailed geotechnical study would be required to confirm the limits of the former quarries at the scheme design stage.

Based on the available geotechnical investigation records, it is understood that the southern section of the site is likely to be underlain by mainly fill, varying from 0.5 m depth to in excess of 20 m, overlying natural superficial sandy deposits (possibly Botany Sand) and weathered Hawkesbury Sandstone between 8 m to 15 m depths approximately. The sandstone is locally overlain by shale and siltstone mudrocks which would likely have been the material originally worked in the brick pits.

Pavement Recommendations

In view of the variable sub-surface conditions at the site, two flexible concept pavement types are considered appropriate for this development site, however further geotechnical investigations and detailed pavement design is required to support the future design stage.

Concept Pavement Design Options:

- *Option 1 - Full Depth Asphalt (FDA) pavement; and*
- *Option 2 - Flexible pavement with unbound granular materials.*

Concept pavement design assumptions (subject to confirmation by the City and RMS in the future design stage):

- *A design traffic of 1 x 106 ESAs for a 20-year design life;*

- *A design sub-grade California Bearing Ratio (CBR) of 5% and this is considered satisfactory subject to adequate compaction of the existing fill materials;*
- *Existing fill materials with 4-day soaked CBR results will not greater than or equal to 5%, otherwise insitu lime modification will be required; and*
- *Placement and compaction of fill material as well as sub-grade preparation must be carried out in accordance with specification AUS-SPEC C213.*

Recommended concept pavement profiles:

For Option 1 - FDA pavement:

Layer	Thickness (mm)	Description	Materials
01	***50***	***Wearing Course***	***AC10 – 320***
02	***100***	***Base***	***AC20 – 320***
03		***Prime Coat***	***AMC00 Prime***
04	***150***	***Sub-base***	***DGS20***
05	***100***	***Sub-base***	***DGS20***
06		***Sub-grade***	***Insitu, CBR>5%***

For Option 2 - Flexible pavement with unbound granular materials and asphalt wearing course:

Layer	Thickness (mm)	Description	Materials
01	***50***	***Wearing Course***	***AC10 – 320***
02		***Prime Coat***	***AMC00 Prime***
03	***150***	***Base***	***DGB20***
04	***150***	***Sub-base***	***DGS20***

Note: This flexible pavement with unbound granular pavement materials will require more regular maintenance than for the Option 1 - FDA pavement, especially after a continuous period of wet weather.

Conclusions

A geotechnical desktop study has been undertaken in the context of the proposed Green Square Town Centre Essential Infrastructure DA to review items of relevance to the lapsed 2008 infrastructure DA (D/2008/1195), which has also been slightly modified. The review has also considered relevant recommendations to the Essential Infrastructure concept design based on available information on ground conditions documented in previous reports.

Item No 68, Geotechnical and Structural Stability and Integrity, is not relevant to the Essential Infrastructure DA since the proposed works are greater than 25 m from the Airport and East Hills railway tunnel centreline and are anticipated to involve excavations of less than 2.5 m depth. Future stages of the development involving building construction will require reconsideration of this item.

Item No 88, Filling of Land, relates to stipulations on design landforms to limit erosion and slope angles. These requirements should be reviewed in the context of the scheme design proposals but are unlikely to be relevant to the verges and landscaping proposed in the Essential Infrastructure DA.

Item No 122, Rock Cutting into Blocks, limits the production of masonry blocks on site whilst undertaking excavations. This clause is considered not applicable to the nature of the proposed Essential Infrastructure DA works and will also likely be irrelevant due to anticipated ground conditions. Rock suitable for masonry block production not anticipated in the excavations for the Essential Infrastructure DA works.

The review of the letter report 'Geotechnical Conditions for Pavement Construction – Green Square Town Centre Development', dated 19 June 2008, prepared by ENSR Australia Pty Ltd (now AECOM) has concluded the recommendations and conclusions remain still valid for the revised proposed Essential Infrastructure arrangements. The previous recommendations and conclusions are extracted below for easy reference:

- *A geotechnical assessment of the new Development Sites 5, 5a, 5b, 9, 10 & 11 (refer to the attached site layout plan) would need to be carried out prior to construction;*
- *The existing preliminary investigation records carried out for the rest of the Town Centre were not intended for detailed design, it was recommended that further site specific investigation and analysis, including the above new sites, would need to be carried out prior to final design and construction; and*
- *The existing fill materials at the Hospital site appeared similar in nature (in terms of physical characteristics) and were generally shallower than those encountered near the northern part of the Town Centre, it was likely that the near surface soils would also be suitable for construction of pavements at the Hospital site. The proposed Essential infrastructure DA is related to the construction of new roads and footpath, the provision of underground services / utilities, the general layout of open spaces, paving and other ground cover, planting, water features, which shall not have any adverse impact to the existing site conditions, though further investigation of geotechnical and environmental issues will be required to support future design and construction phases of the Town Centre project.*

4.4.5 Water Sensitive Urban Design

The assessment of WSUD issues has based on the 'Green Square Town Centre Water Sensitive Urban Design' report prepared by AECOM (Refer to Appendix J).

This report describes the WSUD Strategy for the Green Square Town Centre. It is an update of the previous WSUD strategy (EDAW 2008) that was prepared for Green Square Town Centre in support of the Public Domain Concept Development Application

and Essential Infrastructure Project Applications. The targets for Green Square and the principles for how these targets can be met remain the same.

However, the urban design for Green Square has been altered, and the landscape strategy needs to be revised to accommodate the new urban design. Therefore, this report is limited to presenting principles for stormwater treatment appropriate for different landscape types, and gives direction to these designs.

Planning context

The LEPs and DCPs for the Town Centre identify WSUD as an important component of the Town Centre public domain. Objectives for water management in the Green Square Town Centre Public Domain go beyond typical WSUD objectives for new developments. This WSUD Strategy developed for the Town Centre Public Domain can also serve as an environmental design template for new urban villages, providing ecosystem services beyond their own footprint. Stretch targets applied to the Town Centre public domain form the basis for innovation, leadership and an exemplar of future environmental design of urban villages in Sydney, and other urban environments in Australia.

Targets

The basic targets for WSUD in Green Square include:

- *Water Conservation: 40% reduction on base case water demands through water efficiency and reuse;*
- *Priority must be given to the use of non-drinking water sources for public domain irrigation;*
- *Where reticulated recycled water is available from the local water utility, it must be used for appropriately matched non-drinking demands; and*
- *Stormwater Pollution Control: 85% reduction in the mean annual load of Total Suspended Solids (TSS), 65% reduction in the mean annual load of Total Phosphorus (TP), 45% reduction in the mean annual load of Total Nitrogen (TN).*

The stretch targets appropriate for WSUD in Green Square include:

- *Water Conservation: Utilising an alternative source of water to meet all non-drinking demands in the public and private domains, achieve substantially more than 40% reduction on base case water demands;*
- *Stormwater Pollution from external catchments: Treatment of stormwater from the external catchment, to make a substantial improvement to water quality in Sheas Creek and Alexandra Canal; and*
- *Integration of stormwater treatment into the landscape so as to create functional landscapes that provide ecosystem services such as water filtration, water provision, amenity and microclimate amelioration.*

Strategy

Water conservation targets are to be met through water efficient fixtures and fittings and dual reticulation in all buildings to provide for future connection to an alternative water source.

To provide an alternative water source, base flows from Shea's creek culvert will be harvested and treated to supply most of the non-drinking demands of the Town Centre residences and commercial premises. This alternative supply will also deliver water supplies to two ornamental water features. It is proposed that treatment be provided in the GIC for this purpose.

Stormwater Pollution Control targets can be met by treating all stormwater runoff in the public domain with bio-retention systems or wetlands. These need to be sized at 2 % or 7 % of the contributing catchment size to provide adequate treatment to meet the targets. Treatment systems can be provided in Green Square, Neilson Square, Transport Place, the Drying Green and Matron Ruby Grant Parks. Where an urban stream is required in Green Square and Neilson Square, this should be designed in such a way so as to create the form of an urban stream that provides the function of treating runoff from these plazas. Runoff from the streets can be treated by incorporating bio-retention systems into the street tree planter boxes that are proposed for the streetscapes.

Stormwater Pollution from external catchments can be treated by diverting water and pumping storm flows from Shea's creek culvert into bio-retention systems within the public domain.

Integration with the landscape

The stormwater treatment systems recommended for the Town Centre should be integrated with the landscape designs.

All the treatment systems proposed have the potential to provide a high level of amenity and thermal comfort through shade and evaporative cooling. The amenity of the public domain will assist in activating these spaces and will thus help provide an economic stimulus that contributes to the future success of the town centre.

4.4.6 Contamination

The contamination assessment is based on the Interim Contamination Audit Report – Green Square Essential Infrastructure and Public Domain prepared by Environ (Refer to Appendix I).

5 Contaminants of Potential Concern

Based on a review of the site history and current site conditions (Refer to Section 3) the Auditor has outlined the potential sources of these contaminants in Table 7.

TABLE 7 – POTENTIAL SOURCES OF CONTAMINANTS

Area	*Activity*	*Contaminants of Concern*
Landfilled areas	*Landfilling to refill quarry and filling in general (sand mining).*	*Unknown, could include heavy metals, petroleum Hydrocarbons, Volatile Organic Compounds (VOCs)*

	Landfilling with putrescible materials	*including Benzene, Toluene, Ethyl benzene and xylene (BTEX), Semi-volatile Organic Compounds (SVOCs) including Polycyclic Aromatic Hydrocarbons (PAHs), phenols and asbestos* *Landfill gas, especially methane*
Unsealed areas - unsealed during or prior to operation of the Process Plant	*Atmospheric deposition and runoff from sealed surfaces, surface spills of fuels and lubricants, spraying of herbicides or pesticides*	*Metals, petroleum hydrocarbons, Organochlorine Pesticides (OCPs), possibly dioxins/furans, phenols*
Workshops, vehicle storage building and USTs	*Spills at fuel and chemical store*	*Hydrocarbons, OCPS, some heavy metals (e.g. arsenic, mercury)*
Boiler Room	*Lagging on pipes*	*Friable Asbestos*
Groundwater	*Leaching*	*All contaminants in soil and degradation products from landfill, e.g. ammonia.*

The analyte lists used in the investigations generally covered the range of contaminants of concern, although the VOCs and SVOCs analysed were restricted to only the most common contaminants.

Stratigraphy and Hydrogeology

Stratigraphy

Most of the site contained a quarry which was backfilled with material generally logged as gravely sand, and described in different locations as containing ash, wood, brick, clinker, rubber, tin, slag, tiles, and rubble. The depth of the backfilled quarry is 11-14.5 m over the central and eastern part of the Incinerator, and approximately 7-8 m over most of the western part of the site.

The only potentially putrescible material noted on logs was 'wood', noted in about half the bore logs, most of which were on the northern side of the Incinerator. No descriptions or volume estimates were provided, but 'wood' is not noted as a major component in any location.

At its deepest part, the fill overlies sandstone. Outside the quarry and where the quarry was shallower than 14.5 m, the natural soil profile is sand to a few metres depth, overlying residual clay developed on shale. The shale probably overlies sandstone and laminite at about 15 m depth. Sandstone extends to at least 37 m depth.

Hydrogeology

Groundwater occurs in fill and sands at a depth between about 2.4 and 8.5 m below ground surface. The groundwater flow direction is to the north-west, appearing to be channelled towards a low point in the residual clay. There does not appear to be noticeable mounding of groundwater within the backfilled quarry. The Consultant notes that groundwater flow in the vicinity of the Incinerator appears to converge

on site and may be due to the influence of the modified bedrock profile in the former quarry or the presence of a previously in-filled watercourse. The flow direction data is not conclusive.

Groundwater in the Botany Sands aquifer has been widely used historically, and it is reported that there are approximately 50 registered bores within 2 km. The Auditor notes that the site is located within Zone 2 of the Botany Groundwater Management Zone where groundwater use is banned for domestic uses. The nearest groundwater receptor is likely to be Alexandra Canal to the south west of the site.

In the Auditor's opinion, the subsurface conditions are generally well characterised.

Environmental Quality Criteria

The Auditor has assessed the soil and groundwater investigation data in reference to criteria from the following sources:

- *Soil Investigation Levels for Urban Redevelopment Sites in NSW (SIL Column 4 – commercial/industrial) in DEC (2006) 'Guidelines for the NSW Site Auditor Scheme' were used to asses the risk of dermal contact and direct ingestion of soils for on-site workers including trench workers;*
- *Soil Investigation Levels for Urban Redevelopment Sites in NSW (Soil Investigation Level Column 3 – „recreational open space in Department of Environment & Conservation (2006) 'Guidelines for the NSW Site Auditor Scheme' were used to asses the risk of dermal contact in a recreational open space setting. It is understood that bulk earthworks will be undertaken with plazas to be located over basement car parking. While it is anticipated that landscaping materials would be imported to the site, if site materials are used as a planting medium then consideration of the provisional phytotoxicity based investigation levels in DEC (2006) will be required. It is noted that some of the metals exceed these PPILs in site soils; and*
- *EPA (1994) 'Guidelines for Assessing Service Station Sites' for assessing Total Petroleum Hydrocarbon (TPH) and Benzene, Toulene, Ethyl benzene and Xylenes (BTEX) results in soil.*

The Auditor has assessed the groundwater investigation data in reference to Australia and New Zealand Environment Conservation (2000) 'Australian and New Zealand Guidelines for Fresh and Marine Water Quality' for marine waters.

There are no national or DEC endorsed guidelines for asbestos in soil relating to human health. DEC (2006) state that Auditors must exercise their professional judgement when assessing whether a site is suitable for a specific use. The DEC states that the position of the Health Department is that there should be no asbestos in surface soil.

As the NSW EPA do not provide guidelines for the assessment of dioxins and furans in soils, guidelines used by HLA Envirosciences (HLA) as a screening criteria include:

- *New Zealand - Soil Acceptance Criteria published by New Zealand Health and Environmental Guidelines for Selected Timber Treatment Chemicals (Ministry for the Environment and Ministry, 1997); and*
- *Germany – National Dioxins Program (2001-2004) study undertaken by the Australian Department of Environment and Heritage in Australia (ADEH) found no Australian guidelines level for dioxin in soil. Reference was made to German remediation requirements for residential (1000 pg/g) and industrial (10000 pg/g) areas.*

Action levels in NSW EPA (1996) 'Environmental Guidelines: Solid Waste Landfills' (methane concentrations) for methane at the surface (12500ppm (i.e. 25% of Lower Explosive Level)) and in the subsurface (500ppm (i.e. 1% of Lower Explosive Level) have been considered. It is recognised that any building construction above a landfill also requires consideration of risks from vapour inhalation.

Imported materials would be been assessed in relation to attributes expected of virgin excavated natural material (VENM) and excavated natural material (ENM) as defined under the POEO Regulation (2005).

Evaluation of Soil and Gas Results

Landfill

Landfill materials investigated prior to SAR (GN46) at the incinerator were characterised by metals above the PPILs, elevated Polycyclic Aromatic Hydrocarbons (PAH) concentrations, particularly benzo(a)pyrene (95%

UCL above the SILs for recreational open space) and a few minor detections of phenols and low volatility Total Petroleum Hydrocarbon (TPH).

Later investigations at the Bourke Street Depot reported TPH C10-C36 at particularly elevated concentrations in the vicinity of USTs (off-site), landfill materials (off-site) and associated with a thin layer of gravel fill under the bitumen surface on-site that reported very strong tar/naphthalene odour (maximum 6230 mg/kg at 0.1-0.3m). More elevated concentrations of benzo(a)pyrene were (maximum of 16 mg/kg and PAHs at 282 mg/kg) in shallow fill with elevated TPH reporting a tar/naphthalene odour. Odours and staining were noted during drilling at the City of Sydney Depot.

There were no detections of C6-C9 TPH or BTEX in soil samples, but there were elevated PID readings recorded in the field. Investigations at the City of Sydney Depot only reported TPH C6-C9 (260 mg/kg) in the vicinity of USTs. All other results were non-detected which is consistent with the earlier investigations.

Organochlorine Pesticides were not detected and arsenic and mercury were only detected at low concentrations within the surface. Methane measured over the Incinerator site was reported at low concentrations. The Auditor (GN 46) concluded that the overall results indicated that gas concentrations are low and off-site migration of landfill gas is minimal.

Non-Landfill

A number of other potential impacts were targeted for sampling and analysis from activities undertaken since landfilling and in areas outside of the quarry area.

Fill Material

Sand mining was undertaken in other areas of the site including the Hospital and Chrysler (future location of Zetland Avenue). Shallow filling has also occurred to facilitate development (southern half of Police land).

Sampling of the fill materials directly under the footprints of the proposed developments and in the vicinity indicates that fill may be impacted by contaminants including PAHs, TPH and lead.

At the northern end of the Hospital uncontrolled fill includes layers of ash and crushed sandstone with ash. PAHs were not reported at elevated concentrations (maximum PAHs of 6 mg/kg); however, Douglas note that PAH impacts may still be encountered. An elevated concentration of total PAHs of 162 mg/kg was reported in near surface topsoil materials (0.1- 0.2 m) however no ash was detected. Lead at 3800 mg/kg was detected at 3.5 m in an ash layer well above the SIL of 600 mg/kg for recreational open spaces. This sample also reported elevated concentrations of zinc and copper above the PPILs. Douglas indicate that the lead and PAH results are „hotspots". All other lead results in sub-surface fill the northern section of the site were less than 130 mg/kg.

Fill in the Police land consists of silt, ash and blue metal to deeper fill containing ash, furnace slag, crushed tile and concrete fragments and the presence of asbestos as analysed in the laboratory (not visible in the field). TPH was also encountered in two samples to the west of the site in black oily materials and at the surface.

Immediately under the Barker Street Footprint the fill consists of a shallow layer of sand fill that did not report elevated concentrations. The results obtained were consistent with those obtained at the Incinerator.

The results indicate that visual validation of the fill materials should be undertaken during development works and that any materials that contain ash or oily materials should be specifically targeted. Given that the density of sampling is limited by the presence of buildings and that sampling has not been undertaken over City of Sydney land, Hatbands or Senayear (Hinchcliffe Street, Geddes Avenue, Paul Street (southern extent) and Sonny Leonard Street), The Drying Green and part of Zetland Avenue) validation should be undertaken of any fill materials encountered prior to use in the services trenches and within 1.5 m of the surface. This is discussed further in Section 11.

Unsealed Areas

All sites are located within approximately 250 m of the Incinerator. Samples have been collected from the former Incinerator, Bourke Street City of Sydney Depot and Police land for dioxin analysis. Only two of 66 samples from the Incinerator marginally exceeded the

reference values (dioxins), the depths of which are not clear. All other detections within the surface and sub-surface soils are below the criteria.

Dioxins and furans were detected throughout the soil profile at various concentrations in surface and near surface soils at the incinerator site. Considering the low mobility of dioxins in the environment, the Auditor (GN 46) concluded that fill materials, rather than atmospheric deposition, are the most likely source of the dioxin and furan contaminants. Considering the results, it is in the Auditors opinion that there is unlikely to be significant dioxin contamination within the fill materials.

Underground Storage Tanks

Underground Storage Tanks (UST) were located immediately to the north-east of Paul Street (northern section) (Bourke Street Depot) which will be inspected and remediated in accordance with a RAP (HLA 2007)

One borehole (south of the Zetland Avenue at the Hospital) was excavated in a suspected UST area however was terminated at 0.5 m. Douglas recommend further investigations including geophysical survey to determine whether USTs are located in the vicinity.

USTs are known to have been located at State Rail Authority, Chrysler and Senayear and this should be considered during the excavation of services in this area.

Un-assessed Areas

A number of buildings, concrete and asphalt surfaces remained during the investigations which limited access for drilling and visual observations of materials below the slabs and paving.

No intrusive investigations were undertaken in the workshop building at the Bourke Street Depot and buildings on Police land. Demolition of the incinerator has been undertaken and the materials encountered were consistent with those located in the vicinity.

Visual validation following removal of the slabs and buildings would be required to confirm that the materials are similar to those encountered in surrounding investigations.

No sampling was undertaken in the adjacent boiler room in the vicinity of Zetland Avenue (at the Hospital site) and any demolition works undertaken would need to ensure that licensed contractors are engaged to remove asbestos containing materials including lagging such that it does not impact on the site.

The Auditor considers that soils have been characterised sufficiently such that a plan of remediation can be prepared.

Groundwater

Overall groundwater results were obtained by sampling at the Incinerator, Police land and the Bourke Street Depot sites that are located over the landfill. The results obtained were similar to each other in magnitude and confirmed the earlier investigations at the Incinerator site that concluded that shallow groundwater at the Incinerator site had been well characterised for the potential

contaminants although not fully characterised for potential beneficial uses such as irrigation. The results are summarised as follows:

- *Ammonia, commonly associated with putrescible waste in landfills, was detected in wells down gradient of the landfill. However, the concentrations are relatively low for landfill leachate commensurate with the low amount of putrescible waste noted on borelogs. The consultants indicate that concentrations of ammonia detected may have been derived from a nitrate source up-gradient of the landfill with some potential for ammonia to be generated from the landfill waste; and*
- *A number of contaminants, such as iron, manganese, zinc, nickel and cyanide were detected at elevated levels up-gradient of the landfill. A number of contaminants, such as zinc and lead that were detected at marginally elevated levels within the soil were only detected at relatively low concentrations within the groundwater. Bourke Street City of Sydney Depot groundwater contained higher concentrations of metals in comparison to the other sites.*

Metals that were reported above the ANZECC (2000) trigger values for aquatic organisms in marine environments were arsenic, lead, mercury and zinc. All other metals analysed for (Cadmium, Chromium, Copper and Nickel) were detected below the trigger values.

Outside of the landfill, groundwater wells were installed at the Hospital with one located to the immediate south of the site and down-gradient of ash fill and the grate in the Douglas 1998 suspected UST area. Petroleum hydrocarbons, PAHs, VOCs, OCPs, total PCBs and total phenols were not reported above the Practical Quantification Limit. Metals were all reported below the ANZECC (2000) trigger values for aquatic organisms in fresh and marine environments with the exception of zinc that was reported at 9.9 µg/L below the freshwater TV of 15 and marginally above the marine TV of 8 µg/L. The results are consistent in the three groundwater wells.

The potential sources of groundwater impacts will be further assessed during remedial works for the larger Green Square development. Volatile contaminants were not detected in groundwater and other contaminants were not reported at elevated concentrations and groundwater is located below the depth to which trenches and services would be excavated.

The results obtained were similar in magnitude and confirmed the earlier investigations at the Incinerator that concluded that shallow groundwater at the Incinerator had been well characterised for the potential contaminants although not fully characterised for potential beneficial uses such as irrigation.

HLA consider that ammonia in groundwater does not pose a significant risk to future users of the sites or the environment. Douglas agrees that proactive remediation is not warranted. Management of groundwater during the proposed development works is discussed in Section 10. The Auditor considers that groundwater has been

sufficiently characterised to allow development works to proceed.

Evaluation of Proposed Works

Following investigation works it was identified by HLA and Douglas that remedial works would be required to ensure that the properties they investigated can be made suitable for the proposed uses. RAPs were prepared for the Hospital, Bourke Street Depot and Police land however not for the Incinerator or other properties within the Essential Infrastructure Boundary. More detailed reviews of those RAPs are included in the Interim Advice Letter dated 5 August 2009.

The works proposed to ensure that the proposed uses (streets, services, landscaping/park and plazas) are suitable are discussed in Table 8.

TABLE 8 – WORKS REQUIRED

Infrastructure	*Remediation Works Proposed*	*Auditor's Comments*
Streets	*At least 1 m of non-impacted material is required to be located beneath future basement and road areas "* *Excavation and re-instatement requirements beneath the road will be subject to agreement with relevant authorities "* *Bulk earthworks proposed for some of the road areas (HLA). Douglas note that segregation and adequate validation would enable re-use of materials. While Douglas note that comprehensive segregation would be difficult, selective segregation of targeted soil pockets could be effective.*	*Proposed depth of works considered adequate to ensure that materials accessible for road maintenance are appropriate.* *The Auditor notes that the suitability of bulk earthworks as an option will depend on the validation works undertaken.*
Services	*VENM would be placed in corridors where underground services are required"* *Douglas recommends that services be over excavated by 0.5 m and a marker layer placed over the trench.* *Validation of the thickness of the capping/trench materials and appropriate management measures commensurate with the reduced cap thickness will be required to ensure that this strategy is adequate.*	*Proposed works considered appropriate to ensure that materials used in service trenches are adequately validated.*
Landscaping	*Not discussed*	*It is understood that the Drying Green will be built over different levels. Works should*

In the Auditor's opinion, the proposed remediation and development

works should be able to ensure that accessible materials are suitable for the proposed land uses and that other specific off-site potential sources of contamination are removed such that they do not impact on the suitability of this site.

Further Investigation

- *Beneath buildings and pavements after they are demolished. Observations must be recorded with follow up investigations where indicated by field conditions;*
- *To assess the extent of contamination on the former Police Site; and*
- *To assess contamination at currently un-assessed areas.*

Development of Remediation Processes

- *Detailed design of capping required to provide a separation layer between landfill material and site users;*
- *Detailed design of capping/separation for below ground features such as services including beneath buildings;*
- *Preliminary development of long term management plan detailing management measures related to each capping;*
- *Revision of the RAP to address any contamination found in the further investigations. As the site will be developed in stages, an overarching RAP that addresses the principles to be applied could be prepared; and*
- *A Site Audit Report and Section B Site Audit Statement could be prepared to verify the suitability of the overarching RAP.*

Implementation of Remediation

- *Preparation of remedial action works plans or detailed RAPs for individual stages of development, in consideration of the specific development plan;*
- *An Audit Interim Advice or further Section B Site Audit Statement could be prepared to verify that the relevant stage/site can be made suitable for the proposed use by implementation of the remediation plan;*
- *Implementation of capping or alternative measures in accordance with the remediation plan;*
- *Removal of underground fuel storage tanks and any related contamination;*
- *Completion of remediation in accordance with remediation plan and any approved revisions, for example because of unexpected finds during development;*
- *Adequate validation of remedial works including the thickness and location of the cap, nature and extent of asbestos outside of capped areas and the base of the UST excavations; and*
- *Demonstration that imported material particularly topsoil is suitable for use.*

Management Plan

- *Preparation of long term management plan, documenting the as-constructed conditions, management required and responsibilities;*
- *Acceptance of the management plan by relevant stakeholders; and*
- *Preparation of a Site Audit Report and Section A Site Audit Statement to certify the suitability of the relevant site for the proposed use. Separate Site Audit Statements would be required consistent with the staging of the development.*

Conclusions

The Auditor considers that the Green Square Town Centre Area can be made suitable for commercial/industrial and recreation open space uses if the site is remediated in accordance with the RAPs referenced in this document and in consideration of the comments outlined by the Auditor in this letter.

A condition of consent to the previous DA (D/2008/1195) was that the site is to be remediated and validated in accordance with the RAPs reviewed by the Auditor. While the plans previously reviewed were considered by the Auditor to be practical and could make the site suitable for the proposed uses, the plans are conceptual and are required to be updated with further detail prior to implementation. This is particularly as further investigations are required in some areas of the site. Revisions to the RAPs have been proposed by Douglas Partners (2009), and further amendments may be desirable based on further investigations and specific staged development plans.

As there are a number of existing RAPs and proposed modifications, as further investigations are required, and as the site will be developed in Stages, it is recommended that:

- *An overarching RAP is prepared for the Essential Infrastructure DA Area;*
- *A Site Audit Report and Section B Site Audit Statement is prepared verifying the suitability of the overarching RAP;*
- *Remedial Action Works Plans are prepared for individual stages of development, in consideration of the specific development plan;*
- *An Audit Interim Advice or further Section B Site Audit Statement is prepared to verify that the relevant stage/site can be made suitable for the proposed use by implementation of the Remedial Action Works Plan; and*
- *At the completion of remediation of each stage, a Site Audit Report and Section A Site Audit Statement is completed clearly indicating that the site is suitable for the proposed use.*

4.4.7 Contamination

The archaeological assessment is based on the Baseline Archaeological Assessment Green Square Town Centre Zetland prepared by AMAC Archaeological (Refer to Appendix I).

Physical Evidence and Archaeological Potential

The site is presently occupied by factories, showrooms, warehouses, the hospital buildings, Green Square train station, some offices, and paved car-parking. The incinerator has recently been demolished. There are some grassed areas, and rows of trees along some of the boundaries. In general, the site slopes down to the north-west. There has been some excavation or terracing to create level areas. In particular, along Portman Lane the ground drops considerably. The difference in level decreases gradually to the north along the Lane.

Some large-scale excavation is known to have taken place. The construction of the brickworks would have involved excavation for the construction of underground flues. The construction of the incinerator involved the excavation of a large pit for rubbish. As mentioned above, the area between the former Dam and Portman Lane has also been dug away to make it level with the remainder of the site. Excavation has also taken place for the construction of the Green Square train-line and station. However, the historical evidence concerning the site indicates that, in general, it has been built up rather than excavated. The presence of the Dam on the site indicates that it was originally lower-lying than the surrounding land. It is probable that the Dam was gradually filled from about the end of the nineteenth century. This allowed the centre of the site to be occupied.

It is therefore likely that archaeological evidence of earlier activity on the site has survived. This may include remains of the mechanisms used to control the Dam, such as the sluice gate shown in the c1830 plan, and the wooden shoot lock shown in the 1894 plan. Remains of Hinchcliff's wool washing works may also survive. However, these are likely to have been at least partly disturbed by the construction of the Waterloo Fire Brick Company brickworks. Remains of the two brickworks are also likely to survive.

Archaeological remains of many of the later uses of the site may also exist. For instance, footings of the houses on the corner of Bourke and Portman Streets may exist under the present bitumen paving. Footings of the earlier factories may also remain in the area between Botany Road and O'Riordan Street.

Significance

The site is significant at a State level because of the creation and use of Waterloo Dam, associated with the operation of Waterloo flour mill, which was constructed in c1820. The later wool washing works established on the site is significant at a local level, as an early and characteristic industry for the area. The later brickworks are also characteristic for the area. The late 19th century residential buildings are also considered locally significant. It is likely that the significance of the site is represented by archaeological evidence preserved in some areas.

Recommendations

The following management recommendations are based on the relics thought to be present on the site, and on the assessed heritage significance of these relics. These potential archaeological relics are given protection by local government regulations, in this case South

Sydney LEP 1998 (as amended) and City of Sydney Heritage DCP 2006, and the provisions of the NSW Heritage Act 1977. The requirements concerning archaeology of the South Sydney LEP 1998 and the City of Sydney Heritage DCP 2006 reflect those of the Heritage Act. The following section therefore refers only to the Heritage Act. The Council may apply additional conditions of consent, relating to archaeology, to development approvals.

The different properties comprising the study site in general have the potential to contain relics of various degrees of significance. This is reflected in the recommended management. For example, an Exception may be required for one set of relics on a development site, while a Permit may be required for another set on the same development site. In practice, a single application would be made to the Heritage Branch, addressing the impact of a proposed development on all the relics on a particular development site.1 The extent of impact of the proposed development on relics will also influence whether an Exception Notification or Permit 1 A summary of the process of managing relics according to the legislation can be found in Appendix I. Archaeological Management & Consulting Group Pty Limited July 2012 is more appropriate. In order to clarify the existence of relics on the various properties prior to development, it is also possible to conduct Archaeological Test Excavation under an Exception Notification.

Archaeological research, excavation, recording and reporting is time-consuming, and can cause lengthy delays to development, if the requirements are not addressed at an early stage. If relics are found to be of State significance, it may be necessary to preserve them where they lie. There may also be requirements to incorporate relics or interpretation displays into new developments. It is therefore recommended that any archaeological requirements are considered early in the re-development process. This will allow delays and reconfigurations to be minimised, and will ensure the best possible outcome for the management of the relics.

Unexpected relics remain protected by the Heritage Act. Should any such relics be discovered in the course of work, work in the area of the relics should stop and the Heritage Branch of the Office of Environment and Heritage should be notified.

4.8 The suitability of the site for the development

The study area for the Town Centre is a built-up area containing formed land industrial land uses. The area has a dilapidated appearance with many vacant and also older style industrial buildings.

The proposed Essential Infrastructure works provide for an opportunity to provide the foundation for the redevelopment of this industrial area into a vibrant mixed used centre that will contain residential, commercial, open space, transport and public domain uses.

The proposed Essential Infrastructure works are consistent with State and local planning strategy which aim to provide planned Major Centre with a significant residential and employment population. The proposed works are also consistent with existing and proposed EPI's and City of Sydney policies including the Green Square Town Centre DCP 2012.

The proposed works will provide a high level of amenity for future residents, workers and visitors through provision of a high quality public domain, a legible street network with street tree planting and street furniture to add visual interest. Importantly that proposed Essential Infrastructure works will also support the sustainable renewal of the Town Centre through the inclusion of green infrastructure works that will connect to Council's Green Infrastructure Centre.

The proposed Essential Infrastructure do not require significant upgrade to existing utilities which will allow the works to be developed in an efficient manner without the need for additional approvals from NSW Government.

The key engineering, environmental and planning studies also confirms that the proposed Essential Infrastructure works can be accommodated within the existing land use without significant adverse environmental impact. The implementation of mitigation measures will manage potential environmental impacts both during the construction and operational stage.

The delivery of the project is likely to occur over a 15 year period, which will occur in stages and will limit the full potential environmental impact of the works.

As part of the long term development of the Town Centre, City of Sydney will continue to work with Sydney Water to improve broader water catchment issues in the area and also with Transport for NSW and Roads & Maritime Services to enhance public transport and road access in the area.

The inclusion of mitigation measures will ensure any potential risk to the environment during the construction and operational stage will be kept to a minimum.

4.9 Any submissions made in accordance with this Act or the regulations

There have been no submissions made in accordance with this Act or the regulations.

4.10 The public interest

The public interest is represented in the following areas which represent the strategic planning context of the proposed Essential Infrastructure works.

Metropolitan Plan for Sydney 2036

Green Square is a nominated 'Planned Major Centre' within the Metropolitan Plan for Sydney 2036 (December 2010) which will accommodate a future population of 40,000 and a workforce of up to 20,000. Green Square forms part of the 'Global Economic Corridor' that links the Airport to Macquarie Park, via the City. Green Square is also a nominated strategic bus corridor (Burwood – Bondi & Miranda to the City) to improve connectivity between existing and future centres in the Sydney region.

The proposed infrastructure works that form part of this DA are important to realise the metropolitan strategic objectives for Green Square as a nominated 'Planned Major Centre'.

4 Assessment of Section 79C of the NSW Environmental Planning & Assessment Act 1979

Sustainable Sydney 2030

Sustainable Sydney 2030 is the principal strategic policy document that provides a framework for planning and development in the LGA. The broad vision is to provide a city that is 'Green, Global and Connected' that responds to global warming, recognizes the city's role in the state, national and international economy and which provides for improved accessibility within the city.

Some of the key challenges which are recognized in the Sustainable Sydney 2030 that are relevant to this DA include:

- Climate change; and
- Replacing aging infrastructure.

Sustainable Sydney 2030 is underpinned by a Ten Targets, Five Big Moves, Ten Strategic Directors and Ten Project Ideas. Green Square is nominated as a future 'Activity Hub that ….will make a significant contribution to affordable housing and proposed a shopping, business and cultural focus for communities south of Redfern'. Important to this objective is the need to connect Green Square with the broader LGA through road and infrastructure improvements to support redevelopment over the next 20 years to support the City's sustainability.

The proposed infrastructure works contained in this SEE will help achieves the City's vision as outlined in the Sustainable Sydney 2030 strategic policy document.

Green Square Town Centre Development Control Plan 2012

The Green Square Town Centre DCP 2012 provides for the development planning direction for the town centre. The DCP objectives aim to ensure that the Town Centre becomes a mode of sustainable urban renewal with a high public domain. There is also a need to provide a street network which provides attractive tree-lined streets with an emphasis on pedestrian and bicycle priority, access to public transport and 'water-sensitive urban design' elements.

The DCP also aims to ensure that new development alleviates the impact of stormwater and flooding risk through the design, treatment of public areas including parks and open space and also through the design of buildings. New development must also respond in an appropriate manner to their context in order to minimise their impact on the amenity of neighbouring dwellings and urban character of the surrounding area.

Other public interest related matters

The public interest is represented with the proposed Essential Infrastructure works in the following key areas:

- The need to provide a Town Centre with an attractive public domain design that provides a unique disposition as compared to other centres in the City of Sydney LGA;
- The need to provide an efficient upgrade to existing infrastructure to support Green Square's growth as a Planned Major Centre;
- The need to manage the staged construction delivery of the project will in a coordinated manner and with minimal environmental impact;

- The need to provide increased accessibility in the Town Centre through improved pedestrian and cycle facilities; and
- The need to provide 'Green Infrastructure' to achieve more sustainable outcomes for the Town Centre and the broader area through the establishment of the Green Infrastructure Hub.

5 Conclusion

The proposed Essential Infrastructure works are an important part of the sustainable renewal of the Green Square Town Centre as a planned major centre in accordance with the City of Cities Sydney Metropolitan Strategy 2036 and Sustainable Sydney 2030.

The infrastructure works provide the framework for future residential and commercial development to occur that will be serviced by an accessible and legible road layout, a well connected stormwater and drainage network to allow water re-use; a sustainable energy supply powered by a trigeneration facility and a evacuated waste system to ensure a more environmentally friendly source of waste management.

Future residents, visitors and workers will be provided with a high quality public domain with street tree planting, public art and street furniture and a cohesive street pavement. This will enhance amenity and make the Town Centre an attractive to place to live, work and visit.

The SEE has assessed key engineering, environmental and planning issues based on a number of integrated technical studies and supporting concept design plans. A range of mitigation measures have been recommended which will provide for the staged construction and delivery of the project.

The SEE is consistent with existing and proposed NSW and local environmental planning legislation and planning policy including the relevant Green Square Town Centre Planning Proposals and the Green Square Town Centre Development Control Plan 2012.

Consultation will continue with key NSW Government agencies on relevant matters with further approvals to be obtained for particular construction works. Consultation will also be maintained with the community with regular updates provided about key project milestones and issues.

The Essential Infrastructure works are an important stage in the development of the Green Square Town Centre which will emerge as a vibrant and place to live, work and visit that has a high amenity The works will contribute to the successful sustainable renewal of the town Centre and will achieve substantial environmental benefits through the provision of green infrastructure.

5.1 Recommendation

conditions under Section 80 of the NSW Environmental Planning & Assessment Act 1979.

APPENDIX A Concept Design Plans (Aurecon)

List of Civil Drawings (Aurecon, June 2012)

DOC No.	TITLE
CIV-001	Cover Sheet
CIV-002	Drawing List
CIV-003	Legend
CIV-005	General Notes Sheet 1
CIV-006	General Notes Sheet 2
CIV-010	Site Plan
CIV-020	Services Relocations and Existing Structures Plan - Sheet 1 of 21
CIV-022	Services Relocations and Existing Structures Plan - Sheet 3 of 21
CIV-023	Services Relocations and Existing Structures Plan - Sheet 4 of 21
CIV-024	Services Relocations and Existing Structures Plan - Sheet 5 of 21
CIV-025	Services Relocations and Existing Structures Plan - Sheet 6 of 21
CIV-026	Services Relocations and Existing Structures Plan - Sheet 7 of 21
CIV-027	Services Relocations and Existing Structures Plan - Sheet 8 of 21
CIV-028	Services Relocations and Existing Structures Plan - Sheet 9 of 21
CIV-029	Services Relocations and Existing Structures Plan - Sheet 10 of 21
CIV-031	Services Relocations and Existing Structures Plan - Sheet 12 of 21
CIV-032	Services Relocations and Existing Structures Plan - Sheet 13 of 21
CIV-033	Services Relocations and Existing Structures Plan - Sheet 14 of 21
CIV-035	Services Relocations and Existing Structures Plan - Sheet 16 of 21
CIV-036	Services Relocations and Existing Structures Plan - Sheet 17 of 21
CIV-037	Services Relocations and Existing Structures Plan - Sheet 18 of 21
CIV-038	Services Relocations and Existing Structures Plan - Sheet 19 of 21
CIV-039	Services Relocations and Existing Structures Plan - Sheet 20 of 21
CIV-040	Services Relocations and Existing Structures Plan - Sheet 21 of 21
CIV-050	Erosion and Sediment Control Plan - Sheet 1 of 4
CIV-051	Erosion and Sediment Control Plan - Sheet 2 of 4
CIV-052	Erosion and Sediment Control Plan - Sheet 3 of 4
CIV-053	Erosion and Sediment Control Plan - Sheet 4 of 4
CIV-055	Erosion and Sediment Control Details
CIV-100	Staging Plan
CIV-110	Staging Plan - Stage 1
CIV-120	Staging Plan - Stage 2
CIV-130	Staging Plan - Stage 3
CIV-140	Staging Plan - Stage 4
CIV-150	Staging Plan - Stage 5
CIV-160	Staging Plan - Stage 6
CIV-200	General Arrangement Plan - Sheet 1
CIV-202	General Arrangement Plan - Sheet 3
CIV-203	General Arrangement Plan - Sheet 4

APPENDIX A Concept Design Plans (Aurecon)

List of Civil Drawings (Aurecon, June 2012)

DOC No.	TITLE
CIV-204	General Arrangement Plan - Sheet 5
CIV-205	General Arrangement Plan - Sheet 6
CIV-206	General Arrangement Plan - Sheet 7
CIV-207	General Arrangement Plan - Sheet 8
CIV-208	General Arrangement Plan - Sheet 9
CIV-209	General Arrangement Plan - Sheet 10
CIV-211	General Arrangement Plan - Sheet 12
CIV-212	General Arrangement Plan - Sheet 13
CIV-213	General Arrangement Plan - Sheet 14
CIV-215	General Arrangement Plan - Sheet 16
CIV-216	General Arrangement Plan - Sheet 17
CIV-217	General Arrangement Plan - Sheet 18
CIV-218	General Arrangement Plan - Sheet 19
CIV-219	General Arrangement Plan - Sheet 20
CIV-220	General Arrangement Plan - Sheet 21
CIV-230	Joynton Avenue Detention Basin
CIV-235	Green Square Plaza Plan and Sections
CIV-240	Typical Pavement Details Sheet 1 of 4
CIV-241	Typical Pavement Details Sheet 2 of 4
CIV-242	Typical Pavement Details Sheet 3 of 4
CIV-243	Access Way Vehicle Crossing Details
CIV-250	Stormwater Miscellaneous Details - Sheet 1 of 3
CIV-251	Stormwater Miscellaneous Details - Sheet 2 of 3
CIV-252	Stormwater Miscellaneous Details - Sheet 3 of 3
CIV-260	Ebsworth Street Longitudinal Section, Typical Cross Sections and Setout
CIV-261	Paul Street Longitudinal Section, Typical Cross Sections and Setout
CIV-262	Zetland Avenue Longitudinal Section, Typical Cross Sections and Setout
CIV-263	Geddes Avenue Longitudinal Section, Typical Cross Sections and Setout
CIV-264	Baker Street South Longitudinal Section, Typical Cross Sections and Setout
CIV-265	Hinchcliffe Street North Longitudinal Section, Typical Cross Sections and Setout
CIV-266	Woolpack Street Longitudinal Section, Typical Cross Sections and Setout
CIV-267	Tweed Place North Longitudinal Section, Typical Cross Sections and Setout
CIV-268	Baker Street North Longitudinal Section, Typical Cross Sections and Setout
CIV-269	Tweed Place South Longitudinal Section, Typical Cross Sections and Setout
CIV-270	Hinchcliffe Street South Longitudinal Section, Typical Cross Sections and Setout
CIV-271	Sonny Leonard Street Longitudinal Section, Typical Cross Sections and Setout
CIV-271	Sonny Leonard Street Long Section Typical Cross sections and Setout
CIV-272	Botany Road kerb and gutter control line longitudinal section and setout
CIV-273	Joynton Avenue Long Section

APPENDIX A Concept Design Plans (Aurecon)

List of Civil Drawings (Aurecon, June 2012)

DOC No.	TITLE
CIV-275	Ebsworth Street Cross Sections Sheet 1 of 5
CIV-276	Ebsworth Street Cross Sections Sheet 2 of 5
CIV-277	Ebsworth Street Cross Sections Sheet 3 of 5
CIV-278	Ebsworth Street Cross Sections Sheet 4 of 5
CIV-279	Ebsworth Street Cross Sections Sheet 5 of 5
CIV-280	Paul Street Cross Sections Sheet 1 of 2
CIV-281	Paul Street Cross Sections Sheet 2 of 2
CIV-282	Zetland Ave. Cross Sections Sheet 1 of 5
CIV-283	Zetland Ave. Cross Sections Sheet 2 of 5
CIV-284	Zetland Ave. Cross Sections Sheet 3 of 5
CIV-285	Zetland Ave. Cross Sections Sheet 4 of 5
CIV-286	Zetland Ave. Cross Sections Sheet 5 of 5
CIV-287	Geddes Ave. Cross Sections Sheet 1 of 3
CIV-288	Geddes Ave. Cross Sections Sheet 2 of 3
CIV-289	Geddes Ave. Cross Sections Sheet 3 of 3
CIV-290	Barker Street South Cross Sections Sheet 1 of 3
CIV-291	Barker Street South Cross Sections Sheet 2 of 3
CIV-292	Barker Street South Cross Sections Sheet 3 of 3
CIV-293	Hinchcliffe Street North Cross Sections Sheet 1 of 4
CIV-294	Hinchcliffe Street North Cross Sections Sheet 2 of 4
CIV-295	Hinchcliffe Street North Cross Sections Sheet 3 of 4
CIV-296	Hinchcliffe Street North Cross Sections Sheet 4 of 4
CIV-297	*Woolpack Street* Cross Sections Sheet 1 of 2
CIV-298	*Woolpack Street* Cross Sections Sheet 2 of 2
CIV-299	Sluice Street North Cross Sections
CIV-300	Barker Street North Cross Sections
CIV-301	Tweed Place South Cross Sections
CIV-302	Hinchcliffe Street South Cross Sections Sheet 1 of 2
CIV-303	Hinchcliffe Street South Cross Sections Sheet 2 of 2
CIV-304	Sonny Leonard Street South Cross Sections Sheet 1 of 2
CIV-305	Sonny Leonard Street South Cross Sections Sheet 2 of 2
CIV-306	Portman Street Cross Sections Sheet 1 of 4
CIV-307	Portman Street Cross Sections Sheet 2 of 4
CIV-308	Portman Street Cross Sections Sheet 3 of 4
CIV-309	Portman Street Cross Sections Sheet 4 of 4
CIV-310	Joynton Ave. Cross Sections Sheet 1 of 4
CIV-311	Joynton Ave. Cross Sections Sheet 2 of 4
CIV-312	Joynton Ave. Cross Sections Sheet 3 of 4
CIV-313	Joynton Ave. Cross Sections Sheet 4 of 4

APPENDIX A Concept Design Plans (Aurecon)

List of Civil Drawings (Aurecon, June 2012)

DOC No.	TITLE
CIV-330	Kerb returns KR1, KR2, KR3 & KR4 Plans Sections and Setout Sheet 1 of 12
CIV-331	Kerb returns KR5, KR6, KR7 & KR8 Plans Sections and Setout Sheet 2 of 12
CIV-332	Kerb returns KR9, KR10, KR11 & KR12 Plans Sections and Setout Sheet 3 of 12
CIV-333	Kerb returns KR13, KR14, KR15 & KR16 Plans Sections and Setout Sheet 4 of 12
CIV-334	Kerb returns KR17, KR18, KR19 & KR10 Plans Sections and Setout Sheet 5 of 12
CIV-335	Kerb returns KR21, KR22, KR23 & KR24 Plans Sections and Setout Sheet 6 of 12
CIV-336	Kerb returns KR25, KR26, KR27 & KR28 Plans Sections and Setout Sheet 7 of 12
CIV-337	Kerb returns KR29, KR30, KR31 & KR32 Plans Sections and Setout Sheet 8 of 12
CIV-338	Kerb returns KR33, KR34, KR35 & KR36 Plans Sections and Setout Sheet 9 of 12
CIV-339	Kerb returns KR37, KR38, KR39 & KR40 Plans Sections and Setout Sheet 10 of 12
CIV-340	Kerb returns KR41, KR42, KR43 & KR44 Plans Sections and Setout Sheet 11 of 12
CIV-341	Kerb returns KR45 & KR46 Plans Sections and Setout Sheet 12 of 12
CIV-390	Road Marking and Signage Sheet 1 of 4
CIV-391	Road Marking and Signage Sheet 2 of 4
CIV-392	Road Marking and Signage Sheet 3 of 4
CIV-393	Road Marking and Signage Sheet 4 of 4
CIV-400	Pavement Plan Sheet 1 of 4
CIV-401	Pavement Plan Sheet 2 of 4
CIV-402	Pavement Plan Sheet 3 of 4
CIV-403	Pavement Plan Sheet 4 of 4
CIV-420	Stormwater Profiles Sheet 1 of 9
CIV-421	Stormwater Profiles Sheet 2 of 9
CIV-422	Stormwater Profiles Sheet 3 of 9
CIV-423	Stormwater Profiles Sheet 4 of 9
CIV-424	Stormwater Profiles Sheet 5 of 9
CIV-425	Stormwater Profiles Sheet 6 of 9
CIV-426	Stormwater Profiles Sheet 7 of 9
CIV-427	Stormwater Profiles Sheet 8 of 9
CIV-428	Stormwater Profiles Sheet 9 of 9
CIV-450	The Drying Green Bio-retention Swale Miscellaneous Details
CIV-455	The Drying Green Stormwater Overflow Details
CIV-460	Stormwater Diversion Chambers Sheet 1 of 2
CIV-461	Stormwater Diversion Chambers Sheet 2 of 2
CIV-500	Services Coordination Plan Sheet 1
CIV-501	Services Coordination Plan Sheet 2
CIV-502	Services Coordination Plan Sheet 3
CIV-503	Services Coordination Plan Sheet 4
CIV-504	Services Coordination Plan Sheet 5
CIV-505	Services Coordination Plan Sheet 6

APPENDIX A Concept Design Plans (Aurecon)

List of Civil Drawings (Aurecon, June 2012)

DOC No.	TITLE
CIV-506	Services Coordination Plan Sheet 7
CIV-507	Services Coordination Plan Sheet 8
CIV-508	Services Coordination Plan Sheet 9
CIV-509	Services Coordination Plan Sheet 10
CIV-511	Services Coordination Plan Sheet 12
CIV-512	Services Coordination Plan Sheet 13
CIV-513	Services Coordination Plan Sheet 14
CIV-515	Services Coordination Plan Sheet 16
CIV-516	Services Coordination Plan Sheet 17
CIV-517	Services Coordination Plan Sheet 18
CIV-518	Services Coordination Plan Sheet 19
CIV-519	Services Coordination Plan Sheet 20
CIV-530	Services Trench Details Ebsworth Street Typical Section
CIV-531	Services Trench Details Geddes Ave. Typical Section
CIV-532	Services Trench Details Zetland Ave. Typical Section
CIV-533	Services Trench Details Hinchcliffe Street Typical Section

APPENDIX B Landscape & Streetscape Plans (Oculus)

List of Landscape Civil Drawings (Aurecon, June 2012)

L-000	Cover Sheet	L-300	Street Section A
L-100	Tree Key and Schedule	L-301	Street Section B and C
L-101	Illustrative Landscape Plan	L-302	Street Section D and E
L-200	Landscape Plan 01	L-303	Street Section F and G
L-201	Landscape Plan 02	L-304	Street Section H and I
L-202	Landscape Plan 03	L-305	Street Section N and O
L-203	Landscape Plan 04	L-306	Shared Zone Sections
L-204	Landscape Plan 05	L-307	Shared Zone Sections
L-205	Landscape Plan 06	L-308	Shared Zone Sections
L-206	Landscape Plan 07	L-400	Landscape Details Village Centre 01
L-207	Landscape Plan 08	L-401	Landscape Details Village Centre 02
L-208	Landscape Plan 09	L-402	Landscape Details Village Centre 03
L-209	Landscape Plan 10	L-403	Landscape Details Local Area 01
L-210	Landscape Plan 11	L-404	Landscape Details Local Area 02
L-211	Landscape Plan 12	L-405	Landscape Details Local Area 03
L-212	Landscape Plan 13	L-406	Landscape Details Median 01
L-214	Landscape Plan 15		
L-215	Landscape Plan 16		
L-216	Landscape Plan 17		
L-217	Landscape Plan 18		

APPENDIX C Engineering Infrastructure Report (Aurecon)

APPENDIX D Flood Mitigation Options – Green Square Town Centre (Cardno)

APPENDIX E Flood Risk Management Plan – Green Square Town Centre (Cardno)

APPENDIX F Transport Report Green Square Town Centre Essential Infrastructure (Colston Budd Hunt & Kafes)

APPENDIX G Baseline Archaeological Report Green Square Town Centre, Zetland (AMAC Archaeological)

APPENDIX H Additional Geotechnical Study - Green Square Town Centre (Revision 1) (Environ Australia)

APPENDIX I Interim Contamination Audit Report – Green Square Essential Infrastructure and Public Domain (Environ)

APPENDIX J Green Square Town Centre Public Domain Design Water Sensitive Urban Design Strategy (AECOM)

APPENDIX K Green Square Town Centre Public Domain Strategy (McGregor Coxall)

APPENDIX L Site Photos of Green Square Town Centre

City of Sydney
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456 Kent Street
Sydney NSW 2000
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Fax +61 2 9265 9222
council@cityofsydney.nsw.gov.au
GPO Box 1591 Sydney NSW 2001
cityofsydney.nsw.gov.au

NOTICE OF DETERMINATION - APPROVAL issued under Section 80(1)(a) of the Environmental Planning and Assessment Act 1979

Development Application No.	D/2012/1175/F
Applicant	B Graham
Land to be developed	312-318 BOTANY ROAD , ALEXANDRIA NSW 2015, 318B BOTANY ROAD , ALEXANDRIA NSW 2015, 320-322 BOTANY ROAD , ALEXANDRIA NSW 2015, 324 BOTANY ROAD , ALEXANDRIA NSW 2015, 6-12 O'RIORDAN STREET , ALEXANDRIA NSW 2015, 301-303 BOTANY ROAD, ZETLAND, 501 BOTANY ROAD , ZETLAND NSW 2017, 511-515 BOTANY ROAD , ZETLAND NSW 2017, 509 BOTANY ROAD , ZETLAND NSW 2017, 3 JOYNTON AVENUE , ZETLAND NSW 2017, 811 ELIZABETH STREET , ZETLAND NSW 2017, 97-103 PORTMAN STREET , ZETLAND NSW 2017, 105-115 PORTMAN STREET , ZETLAND NSW 2017, 355 BOTANY ROAD, ZETLAND NSW 2017, 956 – 960 BOURKE STREET, ZETLAND NSW 2017, 377 – 495 BOTANY ROAD, ZETLAND NSW 2017 Lot 1 DP456791,Lot 1 DP575225,Lot D DP81525 (Green Square Stn U/G), Lot X DP 447410, Lot 3 DP 1015619, Lot 4 DP 25272, Lot 4 DP 1015619, Lot 2 DP 1015633, Lot 2 DP 505350, Lot 12 DP 610938, Lot 11 DP 610938, Lot 2 DP 1174641, Lot 1 DP 808432, Lot 2 DP 1181144, Lot 3 DP 1181144, Lot 2 DP 1199427 (future Public Plaza and open space), Lot 5 DP 1199427 (future development lot), Lot 1 DP 1199427 (future development lot)
Approved development	Provision of essential infrastructure for the Green Square Town Centre, including demolition of minor structures and tree removal, construction of new roads and associated infrastructure, concept landscaping and streetscape design, provision of above and below ground services (including stormwater, sewer, water, electrical and telecommunications) and staged construction.
Cost of development	$106,998,000

Determination	The application was determined by Central Sydney Planning Committee and was granted consent **subject to the attached conditions**. This Section 96 modification application was determined under delegation of Council and was granted consent **subject to the attached conditions**.
Consent is to operate from	**8 March 2013**
Consent will lapse on	**8 March 2018**
Date of Section 96(1A) Modification	***06 November 2015***

Reasons for conditions

Unrestricted consent may affect the environmental amenity of the area and would not be in the public interest.

Right of Appeal

If you are dissatisfied with this decision, Section 96(6) of the Environmental Planning and Assessment Act 1979 gives you the right to appeal to the Land and Environmental Court within 6 months after the date of this Notice of Determination.

Alternatively, you may request a review under Section 96AB of the Act within 28 days of the date of this notice (NB section 96AB is not applicable to integrated or designated development).

GRAHAM JAHN AM
Director - City Planning, Development & Transport

CONDITIONS OF CONSENT

SCHEDULE 1A

Approved Development / Design Modifications/Covenants and Contributions/Use and Operation

Note: Some conditions in Schedule 1A are to be satisfied prior to issue of a Construction Certificate and some are to be satisfied prior to issue of Occupation Certificate, where indicated.

(1) APPROVED DEVELOPMENT

(a) Development must be in accordance with Development Application No. D/2012/1175 dated 6 August 2012 (amended 31 October 2012) and Statement of Environment Effects - Green Square Town Centre Essential Infrastructure prepared by City of Sydney, dated August 2012 and the following drawings:

Drawing Number	Rev.	Title	Prepared by	Date
L100-L305 (incl.)	D	Various	Occulus	22/06/2012
~~CIV-010 – CV-055 (incl.)~~		~~Services Demolition and Relocation Plans~~	~~Aurecon~~	~~21.08.12~~
CIV-010	4	Site Plan	Aurecon	21/8/12
CIV-020	3	Services Demolition and Relocation Plan Sheet 1 of 21	Aurecon	14/6/12
CIV-022	3	Services Demolition and Relocation Plan Sheet 3 of 21	Aurecon	14/6/12
CIV-023	3	Services Demolition and Relocation Plan Sheet 4 of 21	Aurecon	14/6/12
CIV-024	3	Services Demolition and Relocation Plan Sheet 5 of 21	Aurecon	14/6/12
CIV-025	3	Services Demolition and Relocation Plan Sheet 6 of 21	Aurecon	14/6/12
CIV-026	3	Services Demolition and Relocation Plan Sheet 7 of 21	Aurecon	14/6/12
CIV-027	3	Services Demolition and Relocation Plan Sheet 8 of 21	Aurecon	14/6/12

Drawing Number	Rev.	Title	Prepared by	Date
CIV-028	3	Services Demolition and Relocation Plan Sheet 9 of 21	Aurecon	14/6/12
CIV-029	3	Services Demolition and Relocation Plan Sheet 10 of 21	Aurecon	14/6/12
CIV-031	3	Services Demolition and Relocation Plan Sheet 12 of 21	Aurecon	14/6/12
CIV-032	3	Services Demolition and Relocation Plan Sheet 13 of 21	Aurecon	14/6/12
CIV-033	3	Services Demolition and Relocation Plan Sheet 14 of 21	Aurecon	14/6/12
CIV-035	3	Services Demolition and Relocation Plan Sheet 16 of 21	Aurecon	14/6/12
CIV-036	3	Services Demolition and Relocation Plan Sheet 17 of 21	Aurecon	14/6/12
CIV-037	3	Services Demolition and Relocation Plan Sheet 18 of 21	Aurecon	14/6/12
CIV-038	3	Services Demolition and Relocation Plan Sheet 19 of 21	Aurecon	14/6/12
CIV-039	3	Services Demolition and Relocation Plan Sheet 20 of 21	Aurecon	14/6/12
CIV-040	3	Services Demolition and Relocation Plan Sheet 21 of 21	Aurecon	14/6/12
CIV-050	1	Erosion and Sediment Control Plan Sheet 1 of 4	Aurecon	14/6/12
CIV-051	4	Erosion and Sediment Control Plan Sheet 2 of 4	Aurecon	21/8/12
CIV-052	1	Erosion and Sediment Control Plan Sheet 3 of 4	Aurecon	14/6/12

Drawing Number	Rev.	Title	Prepared by	Date
CIV-053	1	Erosion and Sediment Control Plan Sheet 4 of 4	Aurecon	14/6/12
CIV-055	2	Erosion and Sediment Control Details	Aurecon	14/6/12
CIV-100	6	Staging Plan	Aurecon	21/8/12
CIV-110	3	Staging Plan – Stage 1	Aurecon	14/6/12
CIV-120	3	Staging Plan- Stage 2	Aurecon	14/6/12
CIV-130 - CIV-160 (incl)	4	Staging Plans- Stages 3-6	Aurecon	21/8/12
CIV-200	3	General Arrangements – Sheet 1 of 21	Aurecon	14/6/12
CIV-202	3	General Arrangements – Sheet 3 of 21	Aurecon	14/6/12
CIV-203 – CIV-204	4	General Arrangements – Sheets 4-5 of 21	Aurecon	21/8/12
CIV-205 – CIV-206	3	General Arrangements – Sheets 6-7 of 21	Aurecon	14/6/12
CIV-207 – CIV-209 (incl)	4	General Arrangements – Sheets 8-10 of 21	Aurecon	21/8/12
CIV-211 – CIV-217 (incl)	4	General Arrangements – Sheets 11-18 of 21	Aurecon	21/8/12
CIV-218 – CIV-220 (incl)	3	General Arrangements – Sheets 19-21 of 21	Aurecon	14/6/12
~~CIV-100 – CIV-160~~	~~04~~	~~Staging Plans~~	~~Aurecon~~	~~14.06.12~~
~~CIV-200 - CIV-220~~	~~03~~	~~General Arrangements~~	~~Aurecon~~	~~14.06.12~~
CIV-260-271 (incl.)	03	Typical Cross Sections and Set Out	Aurecon	14.06.12
CIV-272-341	03	Longitudinal Sections and Cross Sections	Aurecon	14.06.12

and as amended by the conditions of this consent:

(b) In the event of any inconsistency between the approved plans and supplementary documentation, the plans will prevail.

(Amendment "A" – 24 September 2013)

(2) PLANS / DOCUMENTS NOT APPROVED

The plans and documents set out below are NOT APPROVED as part of the subject development consent and shall be resubmitted for Council approval prior to the commencement of any works on site:

Drawing Number	Rev.	Title	Prepared by	Date
L300	D	Street Section A	Occulus	22/06/2012
L306-308	D	Shared Zone Sections	Occulus	22/06/2012
L400	D	Landscape Details Village Centre 01	Occulus	22/06/2012
L401	D	Landscape Details Village Centre 02	Occulus	22/06/2012
L402	D	Landscape Details Village Centre 03	Occulus	22/06/2012
L404	D	Landscape Details Local Area 02	Occulus	22/06/2012
L405	D	Landscape Details Local Area 03	Occulus	22/06/2012
CIV-230	03	Joynton Avenue – Detention Basin	Aurecon	14.06.12
CIV-235	03	Green Square Plaza Plan and Sections	Aurecon	14.06.12
CIV-240	04	Typical pavement details	Aurecon	21.08.12
CIV-243	03	Access Way Vehicle Crossing Details	Aurecon	14.06.12
CIV-250-252 (incl.)	03	Stormwater Miscellaneous Details	Aurecon	14.06.12
CIV-400-403 (incl.)	04	Pavement Layout	Aurecon	14.06.12
CIV-450 and 455	03	The Drying Green Plan and Sections	Aurecon	14.06.12
CIV 460-461 (incl.)	03	Culvert Diversion Chambers	Aurecon	14.06.12
Green Square Town Centre – Public Domain Strategy, Draft			McGregor Coxall	January 2013

(3) ESSENTIAL INFRASTRUCTURE AND SERVICES

In principle support is given for the provision of Essential Infrastructure on the stamp approved plans including the provision of new, augmentation of existing and the removal of redundant services, road and public domain infrastructure.

Essential Infrastructure and Services must be designed and constructed in accordance with the City's current technical specification and standard details for civil works, and the relevant Authorities requirements.

Staged Public Domain Plans and Civil Documentation are to be submitted and approved by Council for each Stage prior to approval for works being granted for the relevant Stage. The submission must clearly indicate any temporary or sacrificial work (such as temporary vehicle turning areas, public footways, stormwater lines, services, remediation areas and stormwater overland flow paths) required due to Staging.

All Essential Infrastructure and Services for each Stage are to be completed to the Council's satisfaction prior to the use commencing.

(3A) REMEDIATION ACTION PLAN

An overarching Remedial Action Plan (RAP) covering the full extent of the proposed Essential Infrastructure works, with the exception of 956-996 Bourke Street (Lot 10 DP 874704), 355 Botany Road (Lot Y DP 413956), and 377-497 Botany Road (Lot 1 DP 628547) subject to the "Green Square Essential Infrastructure and Public Domain – Draft Remedial Action Plan (19 December 2012)", also known as the consortium lands, shall be submitted to and approved by the Council and the NSW EPA accredited Site Auditor prior to Construction Certificate.

A statement must also be submitted by the Site Auditor certifying that this overarching RAP is practical and that the entire site will be suitable after remediation for the proposed development.

(3B) RMS REQUIREMENTS

(a) Comments provided within the previous Transport for NSW (TfNSW) letter to Council dated 5 January 2012 (see attached) with regard to the Green Square Town Centre – Public Exhibition of Planning Proposal and Draft Development Control Plan continue to be applicable to this development application.

(b) In accordance with the Green Square Town Centre DCP – Access and Circulation, direct vehicular access to the subject site is not permitted via Botany Road and Bourke Street.

(c) The proposed intersection of Bourke Street / Ebsworth Street shall be physically restricted to left-in / left-out movements through the installation of a raised concrete median island similar to that indicated on Drawing No: CIV-390, Rev: 03, Dated: 14/06/12. The raised central concrete median shall have a minimum width of 900mm.

(d) To ensure traffic efficiency is not compromised along Botany Road, the RMS will not agree to any at-grade pedestrian crossing facilities at the proposed bus signals at the intersection of Botany Road / East-West Boulevard (Civic Plaza).

(e) To address pedestrian desire lines across Botany Road between the proposed Town Centre and the Rail Station, the applicant will be required to install pedestrian fencing along Botany Road which would direct pedestrians to the at-grade crossings at the signalised intersection of Botany Road / Bourke Street / O'Riordan Street (TCS# 346). Note: The scope and length of pedestrian fencing is to be resolved prior to the issue of any construction certificates.

(f) Prior to the issue of the relevant construction certificates excluding demolition, remediation, excavation and shoring works, the applicant will be required to submit concept design plans to the RMS for in-principle approval for the following signalised intersections:

(i) Bourke Street / Portman Street,

(ii) Zetland Avenue / Joynton Avenue,

(iii) Zetland Avenue / Paul Street,

(iv) Botany Road / Geddes Avenue,

(v) Botany Road / Bourke Street / O'Riordan Street / Wyndham Street,

(vi) Botany Road / East-West Boulevard (Civic Plaza).

a. Note: The applicant must also submit detailed 2031 (AM / PM Peak) traffic modelling for the abovementioned intersections which details Average Delays, Level of Service, queue lengths, lane configurations, turn bay lengths, etc.

b. The abovementioned intersections along Botany Road will need to accommodate the provision of right turn storage lanes along Botany Road, which will require land dedication from the subject site as public road at full cost to the developer.

(g) Redundant driveways are to be removed with kerb and gutter reinstated to Council's requirements.

(h) Appropriate provision must be made for parking, cyclists, service vehicles, including garbage vehicles, maintenance vehicles, deliveries and buses on the internal roads and intersections. Council must also ensure that a review of all the intersections is satisfactorily carried out using Austroads turning circles for the largest vehicle likely to use the intersection.

(i) Full time 'No Stopping' restrictions shall be installed along the entire Botany Road and Bourke Street property frontage of the Green Square Town Centre (except where Bus Zones are required). The applicant is to contact the RMS's Traffic Engineering Services on Phone: (02) 8849 2907

for a Work Instruction, prior to implementing the full time "No Stopping" regulatory signage.

(j) A Construction Traffic Management Plan detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control shall be submitted to Council, for approval, prior to the issue of any construction certificate.

(k) Subject to approval from Council's Local Pedestrian, Cycling and Traffic Calming Committee, full time "No Stopping" restrictions are to be installed in accordance with the Road Marking and Signage Plans (Sheets 1-4).

(l) The developer shall be responsible for all public utility adjustment/relocation works, necessitated by the above work and as required by the various public utility authorities and/or their agents.

(m) The Applicant is to comply with the requirements of the Technical Direction (GTD 2012/001) – Excavation Adjacent to RMS Infrastructure. The developer is to meet the full cost of this assessment by the RMS. Details of this Technical Direction can be emailed to the applicant upon request.

(n) Council should ensure that the post-development storm water discharge from the subject site into the RMS drainage system does not exceed the pre-development discharge.

(i) Should the post-development stormwater discharge exceed the pre-development discharge, detailed design plans and hydraulic calculations of any changes to the stormwater drainage system are to be submitted to the RMS for approval, prior to the commencement of any works.

(ii) Details should be forwarded to:

Sydney Asset Management
Roads and Maritime Services
PO Box 973 Parramatta CBD 2124.

(iii) A plan checking fee will be payable and a performance bond may be required before the RMS's approval is issued. With regard to the Civil Works requirement please contact the RMS's Project Engineer, External Works Ph: 8849 2114 or Fax: 8849 2766.

(o) Proposed Traffic Signal works at the intersections of Bourke Street / Portman Street, Zetland Avenue / Joynton Avenue, Zetland Avenue / Paul Street, Botany Road / Geddes Avenue, Botany Road / Bourke Street / O'Riordan Street / Wyndham Street, Botany Road / East West Boulevard (Civic Plaza) and associated civil works along Bourke Street and Botany Road shall be designed in accordance with Austroads with RMS supplements, RMS' Traffic Signal Design Manual other Australian Codes of Practice. Design plans shall be prepared by a suitably qualified practitioner and submitted to RMS for consideration and approval prior to commencement of any Traffic Signals and associated civil works. RMS fees for administration, plan checking, signal works inspection and project management will need to be paid by the developer prior to

the commencement of any Traffic Signals and associated civil works. A ten (10) year operation charge (payable to Roads and Maritime Services) will apply to each new signalised intersection.

(i) RMS fees for administration, plan checking, signal works inspection and project management will need to be paid by the developer prior to the commencement of any road works. A ten (10) year operation charge (payable to Roads and Maritime Services) will apply to each new signalised intersection.

(p) The Applicant will be required to enter into a Works Authorisation Deed (WAD) for the abovementioned traffic signal and civil works. The Works Authorisation Deed (WAD) will need to be executed prior to RMS' assessment of the detailed design plans.

(q) All works / regulatory signage associated with the proposed development are to be at no cost to the RMS.

(3C) RAILCORP REQUIREMENTS

(a) Final construction methodology with construction details pertaining to the installation of services and undertaking of works with the area shown in green or yellow in the plan provided in Attachment D submitted to Railcorp for review and comment on the impacts of the rail corridor. Works are not to commence until written confirmation has been received from Railcorp confirming that this condition has been satisfied.

(b) Prior to commencement of works, Risk Assessment/Management Plan and detailed Safe Work Method Statements (SWMS) for the proposed works are to be submitted to Railcorp for review and comment on the impacts on rail corridor. Works are not to commence until written confirmation has been received from Railcorp confirming that this condition has been satisfied.

(c) Details of the machinery to be used during the works are to be submitted to Railcorp for review and endorsement. Works are not to commence until written confirmation has been received confirming that this condition has been satisfied.

(d) On completion of works the Applicant is to submit the as-built drawings to Railcorp. The as-built drawings are to be endorsed by a Registered Surveyor confirming that there has been no encroachment into Railcorp property or easement, and that there has not been works deeper than 2m in depth within the are shown in green or yellow in the plan provided in Attachment D.

(4) SUBMISSION OF FINAL DESIGN DRAWINGS

Final design drawings shall be submitted for all infrastructure works.

(5) PUBLIC DOMAIN PLAN

The Public Domain Plan accompanying this Development Application has not been approved by this consent.

Three copies of a detailed Public Domain Plan for each Stage of the development must be prepared by an architect, urban designer or landscape architect and must be approved by Council prior to a Construction Certificate being issued or works commencing on the relevant Stage excluding approved preparatory, demolition, remediation or shoring work.

The Public Domain Plan for each Stage must be prepared in accordance with the City of Sydney's Public Domain Manual, Sydney Streets Design Code and other relevant Public Domain Policies. Public Domain Plans are to be prepared and submitted concurrently with the Civil Design Documentation required for the Alignment Levels, Road Works, Subsoil Drainage, Rain Gardens, Stormwater Management and Utility Services.

The works to the public domain must be completed in accordance with the approved plans, the Public Domain Manual and the City's satisfaction before the use commences for each Stage.

(6) RAIN GARDENS AND LANDSCAPED VERGE

The location of the rain gardens and landscaped verges as shown on the stamped approved plans is supported in principle. Opportunities for additional rain gardens and landscaped verges are to be investigated and incorporated into the design where appropriate. Final locations and design of the raingardens and landscaped verge is to consider the following;

- Crossings and driveway entrances
- Sight lines
- Street lights and other services
- Maximum rainfall harvesting and overall stormwater management
- Street tree locations
- Good design practise

The design and construction of the rain gardens and landscaped verge is be undertaken in accordance with the City's current technical specification and standard details for civil works and submitted concurrently with the Public Domain Plans and Essential Infrastructure Plans for each Stage for approval. The submission shall include as a minimum the following information:

(a) Detailed construction plans, drawn to scale, by suitably qualified landscape architect and engineers (as appropriate).

  (i) Details of proposed levels and site grading including temporary surface treatments (if applicable);

  (ii) Details of bio filtration and soil material;

  (iii) Location, numbers and type of plant species;

  (iv) Details of drainage systems including subsoil drainage.

(b) Prior to the issue of a Construction Certificate, a maintenance plan addressing the Council's operational capabilities is to be submitted to and approved by the Principal Certifying Authority. The maintenance plan is to be complied with during the specified maintenance and defects liability periods.

(c) All works in the approved plan is to be completed prior to any Occupation Certificate being issued or the use commencing for the relevant Stage.

(7) TWEED PLACE BARKER STREET AND HINCHCLIFF STREET (NORTH) DESIGN

The design of Tweed Place, Barker Street (north of the Plaza), and Hinchcliff Street (north) has not been approved by this consent. The design of these streets is to be revised to incorporate the traffic conditions, and address the following;

(a) Crime Prevention Through Environmental Design principles

(b) In accordance with the City's Access DCP 2004 and Access Policy 2004.

(c) Environmental Sustainable Design principles (investigate opportunities for additional soft landscaping).

(d) Ausgrid and City's lighting requirements and standards

(e) Minimise streetscape clutter

(f) Prioritise pedestrian movement

(g) Adequate footway widths and direct line of pedestrian movement

The revised plans are to be submitted to Council and approved as part of the public domain plan submission for the relevant stage.

The proposed design of Tweed Place (south) is to extend not further than 45m in length measured from the centreline of Ebsworth Street to provide appropriate access to Development Site 6.

(8) ~~FUTURE OPEN SPACE – DRYING GREEN~~

~~Works to the future open space – Drying Green, have not been approved by this consent.~~

~~The design of all works to the Drying Green must be submitted to Council and approved prior to any works commencing on this land. Works which require approval include but are not limited to remediation, earthworks, service installation, stormwater detention, construction of GPT's.~~

~~The design of works to the Drying Green must demonstrate that the final landscape design of the Drying Green has been adequately considered and designed for.~~

(Amendment "A" – 24 September 2013)

(9) ~~DRYING GREEN STORAGE BASIN~~

~~Prior to any works on the Drying Green, detailed design of the proposed stormwater works within this area shall be submitted and approved by Council. As a minimum the design shall include the following:~~

(a) ~~Detailed design of the proposed detention basin to meet the storage allowed in the flood modelling including:~~

(i) ~~Flood assessment report to ensure that there will be no over flows from the basin up to and including the 1 in 20 year flood event. The assessment report must also calculate any adverse flood impacts to any existing developments upstream or downstream. No adverse flood impacts are allowed outside the development site.~~

(ii) ~~Designs to show all overflows up to and including the 1 in 100 flows from the proposed basin are contained within the proposed road carriage ways. The depths and velocity of flows are to comply with the safety requirements for overland flows within road carriageways.~~

(iii) ~~Contour plans including long section of the basin wall and cross sections at 20m intervals.~~

(iv) ~~Inlet and outlet details.~~

(b) ~~Detailed design of the proposed stormwater pipelines within and through the detention basin, including HGL analysis.~~

(c) ~~Detailed design of any temporary drainage works that are required for the construction of the proposed basin and also for any staged construction.~~

(Amendment "A" – 24 September 2013)

(10) PORTMAN STREET EXTENT OF WORKS

Essential Infrastructure and Public Domain works are to include the streetscape of Portman Street between Portman Lane and Hansard Street.

(11) SHARED ZONE

(a) The proposed shared zones on Tweed Place and Barker Street are not approved as part of this consent.

(b) Additional information must be submitted prior to the commencement of stage 2 to show the three shared zones can meet the requirements of the RMS warrants.

(c) The design and typical cross sections of the proposed Shared Zones for the Tweed Place and Barker Street are not approved as part of this consent.

The detailed design must be submitted as part of the stage 2 detailed design documentation.

The design of the shared zone will require a referral to the Local Pedestrian, Cycling and Traffic Calming Committee (LPCTCC) for endorsement and then a referral to the RMS for final approval.

Additional reports, information or design changes may be required by Council officers, the LPCTCC or the RMS during the approvals process. The cost for these changes must be undertaken by the applicant at their own cost.

The plan must be approved as part of the in conjunction with the Public Domain Plan prior to the issuing of the Construction Certificate.

[Note: The process of gaining a shared zone approval can take a number of months. It is recommended the applicant begin the process as soon as practical to avoid holding up the issuing of the Construction Certificate.]

[Note: RMS shared zone policy and guidelines can be found on their website]

(d) If these streets are not approved to be shared zones an alternative design must be undertaken and submitted to Council as part of the stage 2 detailed design documentation.

(12) ENTRY TREATMENT – TWEED PLACE AND BARKER STREET

The entry treatments for Tweed Place and Barker Street are not approved. The design of these intersections is to be reviewed and resubmitted to Council for approval prior to the commencement of construction. The revised design is to reduce the width of the entry as much as possible and to ensure pedestrian and driver legibility of the spaces.

(13) ASSOCIATED ESSENTIAL INFRASTRUCTURE COSTS

All costs associated with the construction of any new or temporary Essential Infrastructure works road works including kerb and gutter, road pavement, drainage system, footway, services, vehicle turning movements, remediation, landscaping and similar shall be borne by the developer.

(14) 40KM/H DESIGN SPEED

All streets within the Green Square Town Centre area must be designed to 40km/h speed restrictions.

(15) TRAFFIC CALMING

An indicative area wide traffic calming plan must be submitted to Council for review and approval prior to the detailed design of the first stage of road infrastructure being submitted. This plan must show all the proposed traffic calming devices to be installed on the internal road network within the Green Square Town Centre area. Council will liaise with the RMS with regards to the 40km/h speed zone approval.

All works must be endorsed by the LPCTCC and included in the Essential Infrastructure plans prior to their submission.

[Note: The process of reporting an item to the Local Pedestrian, Cycling and Traffic Calming Committee takes approximately 8 weeks from the relevant officer being satisfied with the proposal.]

(16) BUS ROUTES

The typical cross sections submitted as part of the development application provide for a bus route throughout the site.

Prior to the detailed design of any road within the site the applicant must liaise with the City to confirm whether this bus route is still the preferred option for the

applicant and the City. Any changes to the bus route will result in changes to the typical cross sections.

All bus routes must have a minimum travel lane width of 3.3m.

(17) BUS STOPS

The application does not include any proposed locations for bus stops. The bus zones will need to be included in the parking plans and included in the detailed design of the streets.

To enable an area wide assessment of the bus stop locations to be considered the proposed locations must be submitted to the City prior to the detailed design of any stage which contains a street with a bus route.

The design requirements for the bus stops must be done in consultation with the City.

(18) DESIGN VEHICLES

All streets and intersections must be designed to accommodate a Council waste collection vehicle, as described in Councils Waste Minimisation Policy, with the following exceptions:

(a) The applicant can provide evidence to Council's satisfaction that neither a waste collection vehicle nor a medium rigid vehicle will be required to use the intersection. In this instance a swept path of the largest service vehicle using the street must be submitted or a B99 car if no service vehicles will be using the street ; or

(b) The intersection is located on a bus route. In this instance the intersection must be designed to accommodate a 12.8m bus.

(19) TURNING PATHS

A swept path analysis, for each of the intersections, must be submitted to Council with the detailed design package for each stage. The swept paths must be done to suit the largest design vehicle performing that turn.

This information must be submitted and approved as part of the detailed design documentation.

[Note: The kerb radii shown in the submitted developments applications plans are large and should be refined, where possible, as part of this process.]

(20) TYPICAL STREET SECTIONS

The typical street sections submitted as part of this plan are agreed in principle. Any changes to the typical sections as a result of changes to the cycle network, bus routing or other, will require these sections be amended to the approval of Council prior to the detailed design documentation being submitted.

Section A on plan L-300-D and Section F on plan L-303-D are not approved as part of this application.

(21) CYCLE WAY DESIGN

The minimum section for a bi-direction cycleway must be 2.4m for the cycleway with a 0.4m buffer zone.

The detailed design of the cycle ways must be submitted with detailed design documentation for each stage of the development. All intersection treatments are to be included as part of the detailed design documentation for the relevant stage.

The relevant signage must be included as part of the traffic signage plan required for each stage of the development.

[Note: The location of the Geddes Avenue cycle way must be done in consultation with the City to ensure it is designed to work with the future cycle way currently being designed on the Geddes Avenue extension.]

(22) PARKING SIGNS

All parking restriction signs included as part of this application are not approved.

(23) PARKING PLAN

An indicative area wide parking plan must be submitted to the Traffic Operations team for review and approval. This plan must show all the proposed parking restrictions proposed to be put in place across the entire Green Square Town Centre site as a whole. This plan must be approved prior to any of the street specific parking plans being submitted.

Street specific parking plans must be submitted to the Traffic Operations team for approval. These plans must include the location and information present on each stem and sign. The plans must include chainages to each sign and stem from the kerb line of the nearest intersection. The street specific parking plans must be in line with the area wide parking plan, with any changes identified with the submission. The street specific parking plans must be submitted for each of the streets prior to the construction commencing for the street.

All parking signs must be approved and installed prior to the road being open for public use and prior to the occupation certificate being granted. The plans will require a referral to the LPCTCC for endorsement.

[Note: The process of reporting an item to the Local Pedestrian, Cycling and Traffic Calming Committee takes approximately 8 weeks from the relevant officer being satisfied with the proposal.]

(24) FLOOD ASSESSMENT REPORT

(a) A site-specific flood assessment report shall be prepared and submitted by the applicant for each Stage, which ensures that no long term additional adverse impacts are created upstream or downstream of the site;

(b) The flood assessment is to include a site specific Flood Risk Management Plan in accordance with the recommendations outlined in the Green Square Town Centre Floodplain Risk Management Plan prepared by Cardno dated July 2012.

The flood assessment is to be undertaken by a suitably qualified and experienced hydraulic engineer and must show pre-development and post-development scenarios.

(25) TRAFFIC PRIORITIES AND SIGNAGE

All traffic signage and line marking included as part of the development application is not approved as part of this consent.

A separate application must be made to the City's Traffic Operations Unit for the approval of all traffic signage and line marking within and on the boundary to the Green Square Town Centre site.

The signage and line marking plans must be submitted for each of the stages prior to the construction commencing for that stage.

The signs and line marking for each stage must be approved and installed prior to the road being open for public use and prior to the occupation certificate being granted. The plans will require a referral to the LPCTCC for endorsement.

[Note: The process of reporting an item to the Local Pedestrian, Cycling and Traffic Calming Committee takes approximately 8 weeks from the relevant officer being satisfied with the proposal.]

(26) PEDESTIAN CROSSING FACILITES

All pedestrian crossing facilities shown within the site are not approved as part of this consent.

A separate application to Council must be made to plan the pedestrian crossing facilities throughout the site.

Prior to any detailed design documentation being submitted for any of the stages the applicant must undertake a review of pedestrian crossing facilities for the whole site. An area wide plan must be submitted to Council for approval. This plan must provide an indicative location and crossing type along with evidence the RMS warrants for each crossing can be satisfied.

As part of the detailed design documentation for each stage the final location and design of each crossing must be submitted for approval.

All pedestrian crossing facilities along with evidence the RMS warrants can be satisfied must be submitted to the LPCTCC for endorsement.

[Note: The process of reporting an item to the Local Pedestrian, Cycling and Traffic Calming Committee takes approximately 8 weeks from the relevant officer being satisfied with the proposal.]

(27) MEDIAN STRIP

The intersection of Ebsworth Street onto Bourke Street must restricted to left in left out only. Right turn movements to and from Ebsworth Street must be prohibited by a concrete median.

The design and location of this median is not approved as part of this consent.

The design and location of the median will require a separate submission to be made to the Traffic Operations Unit and a referral to the Local Pedestrian and Traffic Calming Committee (LPCTCC) and approval from Council officers prior to the construction certificate being issued.

The median must be constructed as per the conditions of the LPCTCC.

The median must be constructed prior to Ebsworth Street between Bourke Street and Zetland Avenue being open for public use.

(28) SIGNALISED INTERSECTIONS PLANNING

The applicant must undertake a traffic study of the Green Square Town Centre and surrounding area to review which intersections are required to be signalised and when each of the signalised intersections will need to be activated.

The intersections being reviewed must include but not be limited to:

(a) Paul Street and Zetland Avenue;

(b) Zetland Avenue and Joynton Avenue;

(c) Geddes Avenue and Botany Road; and

(d) Portman Street and Bourke Street.

The review must be submitted to Council for review and approval. The report will require discussion with the RMS and additional work may need to be undertaken at this planning stage.

The review must be approved by Council and gain RMS in-principle approval prior to the detailed design documentation of any of the stages within the development site being submitted.

(29) SIGNALISED INTERSECTIONS DESIGN AND DELIVERY

The proposed signalised intersections will each need to be designed and submitted with the detailed design documentation for their respective stage.

The signal design must be submitted to the City and will require approval from the RMS and a referral to the LPCTCC for endorsement.

The traffic signal infrastructure must be installed as part of the stage they appear in even if the planning does not require them to be activated until a later stage of development.

The design of the signals must be approved by the City as part of the detailed design documentation of that stage.

(30) STAGED DELIVERY OF SURROUNDING SITES

This consent does not provide approval for the consent to the staging of the development lots adjacent to the road network.

Each development lot must provide a review of their proposed traffic generation, and any approved applications generation, to ensure the intersection capacity can perform suitably.

The development lots may be required to wait until the next stage of the road network is provided.

(31) TEMPORARY TURNING AREAS

Any road which is constructed and dedicated as a dead end street, as a result of the staged delivery of the site, must provide a temporary vehicle turning area.

Details of the vehicle turning must be submitted with the detailed design of the affected road.

All temporary turning areas must be designed to accommodate a Council waste collection vehicle as a minimum.

The vehicle turning area must remain until the relevant subsequent stages are complete and the turning area is no longer required.

(32) JOYNTON AVENUE INFRASTRUCTURE WORKS

Any infrastructure works associated with the intersection of Joynton Avenue and Zetland Avenue adjacent to the localised low point (depression) shall not proceed until a drainage solution has been developed to the satisfaction of Council. Documentary evidence of the drainage design is to be submitted to Council before any construction works can commence for the relevant Stage.

(33) HISTORIC SANDSTONE AND BRICK WALL ON JOYNTON AVENUE

The proposed works to raise the level of Joynton Avenue are to include raising the level of the historic sandstone and brick wall on Joynton Avenue to the final road level to the satisfaction of Council.

(34) ADDITIONAL LANDSCAPING DETAILS TO BE PROVIDED

Prior to the commencement of works final design documentation must be submitted to the satisfaction of the City's Tree Management Team including:

(a) Details of the proposed tree / plant species. This shall include both botanical and common names, quantities of species, pot sizes, height at maturity, and the like.

(b) The selection of species shall have regard to the adopted Council Street Tree Masterplan policy at the time, the suitability of the respective species having regard to site constraints, and the overarching vision for the Green Square Town Centre as reflected in South Sydney LEP 1998 and DCP 1997 (as may be amended).

(c) Details of the planting and maintenance methodologies, including pit details, soil preparation methods, soil depths, stock sizes and the like. It should be noted that the use of advance stock is preferred that are a minimum pot size of 100 litres.

(d) That designs provide details of deep soil plantings on development sites and are in accordance with the standards specified in the DCP.

(35) NEW STREET TREE PLANTINGS

(a) All street trees are to be supplied and installed in accordance with the requirements of the City of Sydney Street Tree Master Plan 2011 (or the most relevant adopted version), Part D Technical Guidelines.

(b) The design must include the following Street tree species detailed in the table below; noting that several streets have had the species amended from that detailed within the plan (Geddes Avenue, Paul Street, Zetland Avenue).

Street location	**Recommended tree species**	**Common name**
Ebsworth Street	Liriodendron tulipiferia	Tulip Tree
Tweed Place (~~east~~ *North* of Ebsworth)	~~Acer buergerianum~~ *Elaeocarpus eumundii*	~~Trident Maple~~ *Smooth Leaved Quandong*
Tweed Place (~~west~~ *South* of Ebsworth)	~~Zelkova serrata 'Green Vase'~~ *Elaeocarpus eumundii*	~~Japanese Zelkova~~ *Smooth Leaved Quandong*
Fellmonger Place	~~Celtis australis~~ *Ulmus parvifolia 'Todd'*	~~Southern Hackberry~~ *Chinese Elm*
Barker Street (~~east~~ *North* of Ebsworth)	~~Acer buergerianum~~ *Waterhousia floribunda 'Green Avenue'*	~~Trident Maple~~ *Weeping Lilly Pilly*
~~Barker Street (west of Ebsworth)~~	~~Brachychiton acerifolius~~	~~Illawarra Flame Tree~~
Barker Street (Ebsworth Street to Plaza)	***Elaeocarpus eumundii***	***Smooth Leaved Quandong***
*Barker Street (**Plaza to Woolpack**)*	*Ulmus parvifolia 'Todd'*	*Chinese Elm*
Barker Street (South of Woolpack)	*Elaeocarpus eumundii*	*Smooth Leaved Quandong*
~~Hinchcliff Street~~	~~Celtis australis~~	~~Southern Hackberry~~
Hinchcliff Street (Mid-Plaza to Woolpack)	*Ulmus parvifolia 'Todd'*	*Chinese Elm*
Hinchcliff Street (Woolpack to Geddes)	*Elaeocarpus eumundii*	*Smooth Leaved Quandong*
Hinchcliff Street (South of Geddes)	*Keolreuteria bipinnata* ~~***'Urbanite'***~~	*Pride of China*
Woolpack Street	~~Zelkova serrata 'Green Vase'~~ *Elaeocarpus eumundii*	~~Japanese Zelkova~~ *Smooth Leaved Quandong*

Street location	**Recommended tree species**	**Common name**
Geddes Avenue (***Botany to Paul Street)***	Ulmus parvifolia 'Todd'	Chinese Elm
Geddes Avenue (Paul Street to Portman Street)	***Angophora costata***	***Smooth-barked apple***
Sonny Leonard Street	~~Corymbia maculata~~ *Keolreuteria bipinnata* ~~***'Urbanite'***~~	~~Spotted Gum~~ *Pride of China*
Paul Street (footways)	~~Liriodendron tulipiferia~~ *Keolreuteria bipinnata* ~~***'Urbanite'***~~	~~Tulip Tree~~ *Pride of China*
Paul Street (median)	~~Eucalyptus microcorys~~ *Keolreuteria bipinnata* ~~***'Urbanite'***~~	~~Tallow Wood~~ *Pride of China*
Zetland Ave (~~southern median, between Bus lane and traffic lane~~ *Southern Footway*)	~~Waterhousia floribunda 'Green Avenue'~~ *Zelkova serrata 'Green Vase'*	Weeping Lillypilly *Japanese Zelkova*
Zetland Ave (~~northern median, between traffic lane and cycle lane~~ *Central Median*)	~~Brachychiton acerifolius~~ *Agathis robusta*	~~Illawarra Flame Tree~~ *QLD Kauri Pine*
Zetland Ave (northern footway)	~~Populus simonii~~ *Zelkova serrata 'Green Vase'*]	~~Simons Poplar~~ *Japanese Zelkova*
Tosh Lane	*Elaeocarpus reticulatus*	*Blueberry Ash*
Portman Street	*Eucalyptus microcorys*	*Tallowood*
Joynton Avenue (Green Square Town Centre Western footway Hansard to Elizabeth Street)	***Quercus ilex***	***Evergreen Oak***
Joynton Avenue (Green Square Town Centre Eastern verge Hansard to Elizabeth Streets)	***Ficus rubiginosa***	***Port Jackson Fig***

(Amendment "C" – 19 February 2014)

(Amendment "E" – 12 January 2015)

(Amendment "F" – 06 November 2015)

(36) STREET TREE PLANTING PIT DESIGN

(a) The volume of uncompacted soil provided within the Stratacell modules in each street location be revised in accordance with the recommended soil volumes presented on drawing L-100, and increased where necessary to at least meet the recommended soil volumes.

(b) The location of the Stratacell modules be modified to create linked street tree planting pits aligned parallel to the street kerb, rather than individual pits that encourage root growth towards the boundaries of private property.

(c) All imported soils (including subgrade) be specified by an accredited and experienced consultant specialising in science of urban soils, with proper regard given to the design of the tree planting pits and long term health and viability of the specified street tree species.

(d) The detailed design gives full consideration to sub-soil drainage to ensure that all street tree planting pits are free draining and suitable for tree establishment.

(e) Opportunities for the harvesting of surface storm water be investigated and used for the passive watering of street trees and other planted areas where appropriate.

(f) The specified tree grate be substituted with the new City of Sydney standard street tree grate (yet to be determined). The applicant / developer shall contact the City's Street Tree Contract Coordinator to obtain the relevant details of this standard.

(37) REMOVAL OF TREES ON THE SITE

The following requirements apply:

(a) All trees, including the three Poplar trees adjacent to Portman Street, shall be retained and protected in situ for as long as possible during excavation, earthwork, and construction, and where possible, retained until further development on the site is approved and commenced.

(b) Details of tree protection measures to be implemented during construction and development on site shall be provided to Council's Tree Management Team for approval prior to commencement of work for the respective stages. This shall include a Arboricultural Impact Assessment by a qualified Arborist with a minimum Australian Qualification Framework (AQF) of Level 5 must be provided to Council that includes;

(i) A detailed list of trees recommended for removal and/or retention.

(ii) Tree locations and numbers provided on a site plan

(iii) An assessment and discussion of the likely impacts the proposed development will have on the trees. This should include above and below ground constraints on trees that should be retained.

(iv) Recommendations of any design modifications, construction techniques and/or other protection methods required to minimise adverse impact on trees that should be retained during the demolition & construction works, and into the long term.

(v) Any soil level changes and construction methods, and

(vi) Details of the tree protection measures in accordance with AS4970-2009 Protection of trees on development site,

(c) The local community shall be regularly informed of the removal of trees, including any staged removal. This may be in the form of regular neighbourhood newsletters and/or community information sessions and/or the like.

(38) TREE PROTECTION ZONES

(a) Before the commencement of works, the Tree Protection Zone/s (TPZ) must be established around all tree/s to be retained not less than the distance indicated in the TPZ schedule below.

TPZ Schedule

Tree No	Species Name	Location	Radius (m) from Trunk
Group 1	Poplar trees	Portman Street (at rear of 97-115 Botany Rd). (excluding trees numbered 51, 52 and 53 in the Arboricultural Impact Assessment prepared by urban Forestry Australia, dated September 2013)	8 metres
Group 2	Eucalypt trees	Frontage of 377-497 Botany Road	8 metres
~~Group 3~~	~~Eucalypt trees~~	~~northern side of Waverly Depot~~	~~8 metres~~

Each TPZ must be:

(b) Enclosed as outlined above with a 1.8m high fully supported chainmesh protective fencing. The fencing shall be secure and fastened to prevent movement. The fencing shall have a lockable opening for access. Woody roots shall not be destroyed during the establishment or maintenance of the fencing.

(c) Kept free of weed and grass and mulch maintained to a depth of 75mm for the duration of works

(d) Have two signs identifying the name and contact details of the site Arborist attached facing outwards in a visible position. All signs must remain in place throughout all work on site

(e) The following works shall be excluded from within all TPZs, unless prior approval is obtained from the City's Tree Management team;

(i) Soil cut or fill including excavation and trenching

(ii) Soil cultivation, disturbance or compaction

(iii) Removal or pruning of trees, except where consent has been given

(iv) Stockpiling. storage or mixing of materials

(v) The parking, storing, washing and repairing of tools, equipment and machinery

(vi) The disposal of liquids and refuelling

(vii) The disposal of building materials

(viii) The siting of offices or sheds

(ix) Any action leading to the impact on tree health or structure

(f) All work undertaken within or above the TPZ must be:

(i) Carried out in accordance with a work methodology statement prepared by a qualified Arborist with a minimum Australian Qualification Framework (AQF) of Level 5 and approved by Council's Tree Management Officer before its implementation (including, without limitation, handling and pedestrian/ machinery access).

(g) Any root/s over 50mm in diameter must be pruned by the site Arborist. The Site Arborist must also detail all root pruning undertaken in report form to Council within 1 month of the excavation being undertaken.

(Amendment B – 2 December 2013)

(39) REMOVAL OF TREES ON 'DEVELOPMENT SITES' TO BE SUBJECT OF SEPARATE DEVELOPMENT APPLICATIONS

(a) Besides tree removal related to the provision of the essential infrastructure approved as part of this development, the removal of any other trees on the 'Development Sites' identified in South Sydney LEP Green Square Town Centre shall be considered as part of the future Development Applications for the respective sites. Where possible, the future building and landscape designs shall retain healthy trees.

(b) *This consent includes approval for the removal of trees within 105-115 Portman Street that are required to be removed for the future construction of roads and associated works (i.e trees that are within land to be dedicated to the City for the future roads).*

(c) Setbacks, including allowances for the full height of buildings, shall be considered with all future development applications to allow existing healthy trees to be retained.

(d) All trees shall remain on private development sites in the short term and their retention will be assessed and considered in relation to each development Application. Overall, any tree that is permitted for removal shall be kept on site for as long as possible, prior to the physical commencement of building works.

(Amendment E – 12 January 2015)

(40) STREE TREE REMOVAL AND RETENTION

(a) No street trees are approved for removal as part of this development application / consent.

(b) Any street tree which requires removal for the purposes of essential infrastructure works or for any other reasons shall not be removed without written consent from Council's Tree Management Unit.

(c) The applicant / developer shall provide sufficient evidence detailing why a street tree requires removal. this information shall include but is not limited to;

(i) An Arboricultural Impact Assessment by a qualified Arborist with a minimum Australian Qualification Framework (AQF) of Level 5 must be provided to Council that includes;

(ii) A detailed list of trees recommended for removal and/or retention.

(iii) Tree numbers provided on a site plan.

(iv) An assessment and discussion of the likely impacts the proposed development will have on the trees. This should include above and below ground constraints on trees that should be retained.

(v) Recommendations of any design modifications, construction techniques and/or other protection methods required to minimise adverse impact on trees that should be retained during the demolition and construction works, and into the long term.

(vi) Details of the tree protection measures in accordance with AS4970-2009 Protection of trees on development site,

(41) ADDITIONAL LANDSCAPING DETAILS TO BE PROVIDED

(a) All development sites, where appropriate, shall include a provision within the designs / landscape plans, for at least one tree to be planted that will reach a minimum mature height of 8 metres.

(b) Any landscaping to be undertaken should utilise species native to the locality with reference to the Draft City of Sydney DCP 2010 (Section 2.7) and the Draft Urban Ecology Strategy (in preparation). Non-native plants that have the potential to become invasive weeds should not be used in landscaping. A diversity of trees, shrubs and groundcover should be incorporated in the landscaping plans to provide foraging and nesting opportunities for native fauna.

(42) VEHICLE FOOTWAY CROSSING

A separate application is to be made to, and approved by, Council for the construction of any proposed vehicle footway crossing or for the removal of any existing crossing and replacement of the footpath formation where any such crossings are no longer required.

All disused or redundant vehicle crossings and laybacks must be removed and footway and kerb reinstated in accordance with Council's standards, to suit the adjacent finished footway and edge treatment materials, levels and details, or as otherwise directed by Council officers. All construction and replacement works are to be completed in accordance with the approved plans prior to the issue of an Occupation Certificate.

Note: In all cases the construction materials should reinforce the priority of pedestrian movement over that of the crossing vehicle.

(43) COST OF SIGNPOSTING

All costs associated with signposting for any kerbside parking restrictions and traffic management measures associated with the development shall be borne by the developer.

(44) TRAFFIC WORKS

Any proposals for alterations to the public road, involving traffic and parking arrangements, must be designed in accordance with RMS Technical Directives and must be referred to and agreed to by the Local Pedestrian, Cycling and Traffic Calming Committee prior to any work commencing on site.

(45) VEHICLE ACCESS

The site must be configured to allow a vehicle to be driven onto and off the site in a forward direction.

SCHEDULE 1B

Prior to Construction Certificate / Commencement of Work / Health and Building

(46) STORMWATER AND DRAINAGE MANAGEMENT

(a) The existing stormwater management and drainage connections servicing the upper catchment areas are to be maintained at all times (during and after approved works). Where temporary or interim stormwater works are required, permission is to be sought from the relevant authority (Council or Sydney Water) prior to works commencing. If a drainage line is to be removed or altered, replacing drainage line must have similar or better capacity.

(b) Prior to a Construction Certificate being issued for each Stage, details of the proposed stormwater disposal and drainage from the development including where required a system of on-site stormwater detention in accordance with Council's standard requirements and details of the provision and maintenance of overland flow paths must be submitted to and approved by Council. All approved details for the disposal of stormwater and drainage are to be implemented in the development.

(c) The requirements of Sydney Water with regard to the on-site detention of stormwater must be ascertained and complied with. Evidence of the approval of Sydney Water to the on-site detention must be submitted prior to a Construction Certificate being issued for each Stage.

(d) Any proposed connection to the Council's underground drainage system will require the owner to enter into a Deed of Agreement with the Council and obtain registration on Title of a Positive Covenant prior to Construction Certificate being issued and prior to the commencement of any work within the public way.

(47) SUBSURFACE DRAINAGE

Subsurface drainage systems shall be provided for all road formations, cuttings, the base and sub base of pavement layers, retaining walls and the street closure parks. The design and construction of the subsurface drainage system shall be undertaken in accordance with City's current technical specification and standard details for civil works. Detailed plans and construction specifications for the subsurface drainage systems shall be prepared and certified as complying with Council's specifications prior to the issue of the first Construction Certificate excluding approved remediation, preparatory, demolition and excavation work for each Stage.

A design certification report for the subsurface drainage system shall be prepared by an appropriately qualified civil engineer and shall be submitted to the Principal Certifying Authority for approval prior to the issue of the first Construction Certificate excluding approved remediation, preparatory, demolition and excavation work for each Stage.

The plans shall include as a minimum the following information:

(a) The proposed location of all subsoil drains and sub-pavement drains, including the nominal width and depth of trenches, pipe diameters and

materials, longitudinal design grades, and the locations of outlets and cleanouts;

(b) The location of public utility services shall also be included on the plans and cross sectional drawings;

(c) Specifications for the construction of all components of the system in accordance with Council's Development Specification for Civil Works; and

(d) All assumptions and/or calculations made in the determination of the need or otherwise for subsurface drainage in special circumstances shall be submitted to Council for approval with the documentation.

(48) DRAINAGE AND SERVICE PIT LIDS

Drainage and service pit lids throughout the public domain shall be heelguard and bicycle safe, finish flush with the adjacent pavement to avoid trip hazards and be clear of obstructions for easy opening and cleaning. Pit lids shall be in accordance with any Council standards and details provided to Council prior to issue of a Construction Certificate excluding approved remediation, preparatory, demolition and excavation work for each stage where relevant.

(49) DESIGN AND CONSTRUCTION OF ROADS AND DRAINAGE WORKS

(a) The final design and construction of all road and drainage works, including temporary road works, shall be undertaken in accordance with City's current technical specification and standard details for civil works. Detailed plans and construction specifications for the works shall be prepared and certified as complying with Council's specifications prior to the issue of the first Construction Certificate for each Stage of works. A design certification report for the road works shall be prepared by an appropriately qualified civil engineer and shall be submitted for approval of Council prior to the issue of the first Construction Certificate excluding approved remediation, preparatory, demolition and excavation work for that Stage.

(b) The submission to Council is to provide plans and specifications sufficient to describe in detail the design, scope and extent of all proposed road, drainage and infrastructure works for the construction of the road and drainage works prepared and certified by a Professional Engineer, and is to include:

(i) Details of existing and final site contours, levels and volumes of proposed earthworks providing confirmation that the site contours and levels will not adversely impact upon the flow of floodwater on the site.

(ii) Geometric design and pavement design of the road network including formation widths, batter slopes, longitudinal sections, cross-sections, materials, specifications and thicknesses of pavement and surfacing.

(iii) Kerb and gutter design and specifications and any necessary works and matching into existing formations including a minimum 500mm existing road pavement restoration.

(iv) Geometric and hydraulic design of all stormwater drainage structures and systems including drainage swales and temporary downstream drainage, if required, and specifications and materials and details of connections into Council's public stormwater system.

(v) Details of the provision of stormwater stub connections for each Stage is to be included into the design.

(vi) Details of design and specifications for footpaths, retaining walls, pedestrian and associated verge works,

(vii) Details of structures and conduits for the provision and installation of any public utility services and any adjustment to existing services required,

(viii) Specifications showing assumptions, calculations and testing.

(c) The certification for each Stage is to include confirmation from a Professional Engineer that the design complies with Council's Development Specifications for Civil Works Design and Construction or Council's specification current at the time.

(d) The documentation is to be fully coordinated with the approved Public Domain and Landscape plans for the development.

(50) DRAINAGE SYSTEM DESIGN

Drainage systems that convey flood waters from upstream catchments through the site must be designed such that:

(a) The drainage systems convey flood waters up to and including the 1 in 100 year ARI and flows safely to downstream trunk drainage system. The design must comply with the safety standard recommended in the Australian Rainfall and Runoff, a guide to Flood Estimation by the Institution of Engineers and NSW Flood Development manual, 2005

(b) Minimum of 1 in 20 year ARI flows must be contained within below ground pipes and the remaining flows above the pipe capacity and up to and including the 1 in 100 year ARI flows as overland flows. If roads are to be used to convey overland flows the safety requirements outlined in (a) above must be met.

(c) Any special drainage structures or collection drainage pits within road reserves or in public spaces to capture or divert overland flows must meet safety requirements in (a) above.

(51) ESSENTIAL INFRASTRUCTURE AND PUBLIC DOMAIN WORKS - HOLD POINTS AND HANDOVER

(a) Prior to a Construction Certificate for each Stage being issued, excluding approved remediation, preparatory, demolition and excavation work, a set of hold points for approved public domain and civil construction work is to

be determined and approved by Council in accordance with the City's Public Domain Manual.

(b) Completion of the constructed Essential Infrastructure and Public Domain works is to be undertaken in accordance with the City's Public Domain Manual, including requirements for as-built documentation, certification and defects liability period.

(52) ALIGNMENT LEVELS

Plans approved in principle

(a) Prior to a Construction Certificate being issued for each Stage, road and footpath alignment levels must be submitted to Council for approval. The submission must be prepared by a Registered Surveyor and must be in accordance with the City of Sydney's Public Domain Manual.

(b) These alignment levels, as approved by Council, are then to be incorporated into the plans submitted with the application for a Construction Certificate, excluding a Construction Certificate for approved preparatory, demolition or shoring work.

(c) If a Public Domain Plan condition applies to the development the Alignment Levels application must be made concurrently or before the submission of a Public Domain Plan.

(53) DESIGN CAPACITY FOR DRAINAGE SYSTEM

(a) Prior to the release of the Construction Certificate excluding approved remediation, preparatory, demolition and excavation work the applicant must submit for Councils' approval the design capacity for the proposed trunk drainage system to accommodate events up to and including the one in twenty year ARI event, including:

(b) Detailed engineering drawings both for all new drainage infrastructure an retained sections of existing drainage infrastructure;

(c) Hydrologic and hydraulic calculations, including (but not limited to allowances for the effects of climate change, HGL levels, pit losses, inlet losses, bend losses, junctions losses and appropriate pit blockage factors.

(54) SYDNEY WATER TRUNK DRAINAGE SYSTEM

(a) Prior to a Construction Certificate being issued for Stages affected by Sydney Water's trunk drainage system, the approval of Sydney Water for the proposed work and relocation of its system shall be provided to Council.

(b) Prior to a Construction Certificate being issued for Stages affected by Sydney Water's trunk drainage system, the approval of Sydney Water for any proposed connection into its system shall be provided to Council.

(55) EASEMENTS FOR STORMWATER

(a) An Easement for stormwater purposes to the benefit of Sydney Water must be registered on title for all relocated sections of its trunk drainage system.

(b) Creation of Drainage Easement rights in favour of the City for any parts of the proposed local drainage system within private property.

(56) SUBMISSION OF SUBDIVISION APPLICATION

A separate subdivision application shall be submitted to and approved by the City for the creation of the proposed roads and public reserves, including all easements reasonably necessary to recognise and support any infrastructure.

(57) FOOTWAY WIDTH

Minimum footway widths as detailed in the City LEP and DCP are to be provided including at road intersections. Where kerb and gutter alignments need to be adjusted to accommodate vehicle turning movements, appropriate adjustments to future property boundaries will need to occur. All adjustments are to be submitted to Council for approval.

(58) FOOTPATH DAMAGE BANK GUARANTEE

(a) A Footpath Damage Bank Guarantee for each Stage of the development, calculated on the basis of lineal metres of site frontage of each stage, must be lodged with Council in accordance with the City of Sydney's adopted Schedule of Fees and Charges. The Footpath Damage Bank Guarantee must be submitted as an unconditional bank guarantee in favour of Council as security for repairing any damage to the public domain in the vicinity of the site.

(b) In lieu of the bank guarantee required by a), Council may accept an unconditional performance bond that is in accordance with Council's policy on performance bonds.

(c) The guarantee must be lodged with Council prior to works commencing on site.

(d) The guarantee for each Stage will be retained in full until the works for the relevant Stage are complete and all rectification works carried out to the satisfaction of Council.

(59) PHOTOGRAPHIC RECORD / DILAPIDATION REPORT - PUBLIC DOMAIN

Prior to an approval for works being granted, including demolition, for each Stage a photographic recording of the public domain site frontages is to be prepared and submitted to Council's satisfaction.

The recording must include clear images of the footpath, nature strip, kerb and gutter, driveway crossovers and laybacks, kerb ramps, road carriageway, street trees and plantings, parking restriction and traffic signs, and all other existing infrastructure along the street.

The form of the recording is to be as follows:-

(a) A PDF format report containing all images at a scale that clearly demonstrates the existing site conditions;

(b) Each image is to be labelled to identify the elements depicted, the direction that the image is viewed towards, and include the name of the relevant street frontage;

(c) Each image is to be numbered and cross referenced to a site location plan;

(d) A summary report, prepared by a suitable qualified professional, must be submitted in conjunction with the images detailing the project description, identifying any apparent existing defects, detailing the date and authorship of the photographic record, the method of documentation and limitations of the photographic record;

(e) Include written confirmation, issued with the authority of both the applicant and the photographer that the City of Sydney is granted a perpetual non-exclusive license to make use of the copyright in all images supplied, including the right to make copies available to third parties as though they were Council images. The signatures of both the applicant and the photographer must be included.

(60) PRESERVATION OF SURVEY MARKS

All works in City streets must ensure the preservation of existing permanent survey marks (a brass bolt, or a lead plug holding a brass tack, covered by a cast iron box). At least forty-eight hours prior to the commencement of any works in the public way within 1 metre of a permanent survey mark contact must be made with the City's Project Manager Survey / Design Services to arrange for the recovery of the mark.

Prior to the issue of a Construction Certificate, a survey plan, clearly showing the location of all permanent survey marks fronting the site and within 5 metres on each side of the frontages must be submitted to Council.

At least forty-eight hours prior to the commencement of any works in the public way within 1 metre of a permanent survey mark contact must be made with the City's Senior Surveyor to arrange for the recovery of the mark.

A fee must be paid to the Council for the replacement of any permanent survey mark removed or damaged in accordance with the City's Schedule of Fees and Charges (Reinstatement of Survey Box).

(61) ESSENTIAL INFRASTRUCTURE / PUBLIC DOMAIN SECURITY

Security for Essential Infrastructure Works is not required to be lodged where the City of Sydney (or its contractors) is responsible for the delivery of the works.

*Except as outlined above, s*ecurity for Essential Infrastructure Works is to be lodged prior to the issue of a Construction Certificate or works commencing (whichever is earlier) for each Stage.

A detailed cost estimate (certified by a Quantity Surveyor) of each Stage of Essential Infrastructure and Public Domain Works is to be prepared and submitted to Council for approval. The approved value ~~of~~ will determine the Essential Infrastructure Security amount.

The Essential Infrastructure Security must be submitted as an unconditional bank guarantee or insurance bond in favour of Council in accordance with Council policy, as security for completion of the relevant Stage of Essential Infrastructure Works.

The Security will be retained in full until all Essential Infrastructure Works for that Stage is complete and the required certifications, warranties and works–as executed documentation are submitted and approved by Council in writing. On satisfying the above requirements, 90% of the total securities will be released. The remaining 10% will be retained for the duration of the specified Defects Liability Period.

(Amendment "D" – 13 May 2014)

(62) STREET AND PEDESTRIAN LIGHTING

The applicant shall provide a system of underground street and pedestrian lighting along all roads, footpaths, and street closures in accordance with Ausgrid and Council standards. Detailed plans, specifications, light level calculations are to be submitted to and approved by Council for each stage prior to the issue of a construction certificate for that stage.

The extent of smart pole lighting, Ausgrid standard lighting and wall mounted non-standard lighting types are to be reviewed and agreed with by Council.

The lighting plans shall show layout, location, connections, conduits, types, luminaries, fixtures and footings.

If lighting is to be fixed to adjoining buildings the above details plus details of the fixture and timing for delivery are to be included in the submission.

Temporary lighting to facilitate Staging or until adjoining developments are constructed and permanent lighting installed are to form part of the submission.

(63) DILAPIDATION SURVEYS

If required by RailCorp, prior to the commencement of works and prior to the issue of the occupation certificate, a joint inspection of the rail infrastructure and property in the vicinity of the project is to be carried out by representatives from RailCorp and the Applicant. These dilapidation surveys will establish the extent

of any existing damage and enable any deterioration during construction to be observed. The submission of a detailed dilapidation report will be required unless otherwise notified by RailCorp.

(64) ELECTROLYSIS RISK

Prior to the issue of a Construction Certificate the Applicant is to engage an Electrolysis Expert to prepare a report on the Electrolysis Risk to the development from stray currents. The Applicant must incorporate in the development all the measures recommended in the report to control that risk. A copy of the report is to be provided to the Principal Certifying Authority with the application for a Construction Certificate.

(65) RISK ASSESSMENT / MANAGEMENT PLAN AND DETAILED SAFE WORK METHOD STATEMENTS

If required by RailCorp, prior to the issue of a Construction Certificate a Risk Assessment / Management Plan and detailed Safe Work Method Statements (SWMS) for the proposed works are to be submitted to RailCorp for review and comment on the impacts on the rail corridor. The Principal Certifying Authority is not to issue the Construction Certificate until written confirmation has been received from RailCorp that this condition has been satisfied.

(66) TUNNEL/TRACK MONITORING PLAN

If required by RailCorp, a tunnel/track monitoring plan (including instrumentation and the monitoring regime during excavation and construction phases) is to be submitted to RailCorp for review and endorsement prior to the issuing of a Construction Certificate. The Principal Certifying Authority is not to issue the Construction Certificate until written confirmation has been received from RailCorp advising of the need to undertake the track monitoring plan, and is required, that it has been endorsed.

(67) PUBLIC LIABILITY INSURANCE COVER

Prior to the issue of a Construction Certificate the Applicant must hold current public liability insurance cover for a sum to be determined by RailCorp. This insurance shall not contain any exclusions in relation to works on or near the rail corridor. The Applicant is to contact RailCorp's Rail Corridor Management Group to obtain the level of insurance required for this particular proposal. Prior to issuing the Constriction Certificate the Principle Certifying Authority must witness written proof of this insurance in conjunction with RailCorp's written advice to the Applicant on the level of insurance required.

(68) UTILITY SERVICES

(a) Prior to the commencement of any subdivision work on the site or public domain work, documentary evidence is to be submitted to the accredited certifier/Principal Certifying Authority and Council that the requirements of all public utility authorities (e.g. Energy Australia, Sydney Water, and Telecommunications Carriers) with services within and adjacent to the site have been satisfied with regard to the design of any deviation, diversion, construction or removal of service infrastructure within the site.

(b) Documentary evidence is to be submitted to the accredited certifier/Principal Certifying Authority and Council that the requirements of all public utility authorities providing services to the site have been

satisfied with regard to the completion of construction and installation of those services.

(69) REMEDIATION ACTION PLANS – STAGED WORKS

Final Remediation Action Plans for each Stage of the proposed works, are to be submitted for approval by the Council and the NSW EPA accredited Site Auditor Graeme Nyland in accordance with the approved Overarching Remediation Action Plan for the Essential Infrastructure works (referred to in Condition 1 above), prior to the commencement of work.

(70) LAND REMEDIATION

The site must be remediated and validated in accordance with the final Remediation Action Plan approved by the Site Auditor and the Council as required in accordance with this consent.

Any variations to the proposed remediation Action Plan shall be approved in writing by the Accredited Site Auditor and Council prior to the commencement of such work.

(71) SITE AUDIT STATEMENT

Prior to any above ground works commencing a Site Audit Statement prepared by a NSW EPA accredited auditor is to be submitted to Council certifying that the site is suitable for the intended use. Conditions on the Site Audit Statement shall form part of the consent.

Note: Where the Site Audit Statement is subject to conditions that require ongoing review by the Auditor or Council these should be discussed with Council before the Site Audit Statement is issued.

(72) CLEAN FILL

Documentation is to be submitted to Council for approval demonstrating that clean fill will be established with an adequate clearance around all infrastructure, services, roads and public domain works.

(73) ASBESTOS REMOVAL WORKS

All works removing asbestos containing materials must be carried out by a suitably licensed asbestos removalist duly licensed with Workcover NSW, holding either a Friable (Class A) or a Non- Friable (Class B) Asbestos Removal Licence which ever applies.

Five days prior to the commencement of licensed asbestos removal, Workcover must be formally notified of the works. All adjoining properties and those opposite the development must be notified in writing of the dates and times when asbestos removal is to be conducted. The notification is to identify the licensed asbestos removal contractor and include a contact person for the site together with telephone number and email address.

All works must be carried out in accordance with the Work Health and Safety Regulation 2011 and the NSW Government and Workcover document entitled

How to Safely Remove Asbestos, Code of Practice and the City of Sydney Asbestos Policy.

Standard commercially manufactured signs containing the words "DANGER ASBESTOS REMOVAL IN PROGRESS" measuring not less than 400mm x 300mm are to be erected in prominent visible positions on the site.

Asbestos to be disposed of must only be transported to waste facilities licensed to accept asbestos. The names and location of these facilities are listed in Part 6 of the City of Sydney's Asbestos Policy.

No asbestos products are to be reused on the site (i.e. packing pieces, spacers, formwork or fill etc.).

No asbestos laden skips or bins are to be left in any public place without the approval of Council.

A site notice board must be located at the main entrance to the site in a prominent position and must have minimum dimensions of 841mm x 594mm (A1) with any text on the notice to be a minimum of 30 point type size.

The site notice board must include the following:

(a) contact person for the site;

(b) telephone and facsimile numbers and email address; and

(c) site activities and time frames.

(74) EROSION AND SEDIMENT CONTROL - MORE THAN 2,500SQM

The Soil and Water Management Plan accompanying this Development Application has not been approved by this consent.

[Planner: Only use this first paragraph if a Soil and Water Management Plan was submitted with the DA, otherwise delete]

Prior to the commencement of any works on site, including, but not limited to demolition, excavation or construction work, a Soil and Water Management Plan (SWMP) must be submitted to and be approved by the Principal Certifying Authority.

(a) The SWMP must identify and respond to all items for Erosion and Sediment Control Plans listed in the condition above, as well as:

  (i) existing site contours;

  (ii) location and diagrammatic representation of all necessary erosion and sediment control systems or structures used to mitigate or prevent pollution to stormwater;

(b) Location and engineering details with supporting design calculations for all necessary sediment basins, constructed wetlands, gross pollutant traps, trash racks or bio filtration swales (as relevant).

(75) ROAD OPENING PERMIT

A separate Road Opening Permit under Section 138 of the Roads Act 1993 must be obtained from Council prior to the commencement of any:

(a) Excavation in or disturbance of a public way, or

(b) Excavation on land that, if shoring were not provided, may disturb the surface of a public road (including footpath).

(76) STORMWATER AND DRAINAGE - MAJOR DEVELOPMENT

On-site detention, treatment and re-use is encouraged.

(a) Prior to a Construction Certificate being issued, details of the proposed stormwater disposal and drainage from the development including a system of on-site stormwater detention in accordance with Council's standard requirements and details of the provision and maintenance of overland flow paths must be submitted to and approved by Council. All approved details for the disposal of stormwater and drainage are to be implemented in the development.

(b) Any proposed connection to the Council's underground drainage system will require the owner to enter into a Deed of Agreement with the Council and obtain registration on Title of a Positive Covenant prior to Construction Certificate being issued and prior to the commencement of any work within the public way.

(c) The requirements of Sydney Water with regard to the on-site detention of stormwater must be ascertained and complied with. Evidence of the approval of Sydney Water to the on-site detention must be submitted prior to a Construction Certificate being issued.

(d) An "Application for Approval of Stormwater Drainage Connections" must be submitted to the Council with the appropriate fee at the time of lodgement of the proposal for connection of stormwater to the Council's drainage system.

(e) A Positive Covenant must be registered on the title for all drainage systems involving On-site Detention (OSD) to ensure maintenance of the approved OSD system regardless of the method of connection.

(77) APPLICATION FOR HOARDINGS AND SCAFFOLDING ON A PUBLIC PLACE

(a) A separate application under Section 138 of the Roads Act 1993 is to be made to Council to erect a hoarding and/or scaffolding in a public place and such application is to include:-

(i) Architectural, construction and structural details of the design in accordance with the Policy for the Design and Construction of Hoarding (September 1997) and the Guidelines for Temporary Protective Structures (April 2001).

(ii) Structural certification prepared and signed by an appropriately qualified practising structural engineer.

Evidence of the issue of a Structural Works Inspection Certificate and structural certification will be required prior to the commencement of demolition or construction works on site.

Assessment of the impacts of construction and final design upon the City of Sydney's street furniture such as bus shelters, phone booths, bollards and litter bins and JCDecaux street furniture including kiosks, bus shelters, phones, poster bollards, bench seats and littler bins. The applicant is responsible for the cost of removal, storage and reinstallation of any of the above as a result of the erection of the hoarding. In addition, the applicant is responsible for meeting any revenue loss experienced by Council as a result of the removal of street furniture. Costing details will be provided by Council. The applicant must also seek permission from the telecommunications carrier (e.g. Telstra) for the removal of any public telephone.

(b) Should the hoarding obstruct the operation of Council's CCTV Cameras, the applicant must relocate or replace the CCTV camera within the hoarding or to an alternative position as determined by Council's Contracts and Asset Management Unit for the duration of the construction of the development. The cost of relocating or replacing the CCTV camera is to be borne by the applicant. Further information and a map of the CCTV cameras is available by contacting Council's CCTV Unit on 9265 9232.

(c) The hoarding must comply with the Councils policies for hoardings and temporary structures on the public way. Graffiti must be removed from the hoarding within one working day.

(78) BARRICADE PERMIT

Where construction/building works require the use of a public place including a road or footpath, approval under Section 138 of the Roads Act 1993 for a Barricade Permit is to be obtained from Council prior to the commencement of work. Details of the barricade construction, area of enclosure and period of work are required to be submitted to the satisfaction of Council.

(79) UTILITY SERVICES

To ensure that utility authorities are advised of the development:

(a) Prior to the issue of a Construction Certificate a survey is to be carried out of all utility services within and adjacent to the site including relevant information from utility authorities and excavation if necessary, to determine the position and level of services.

(b) Prior to the commencement of work the applicant is to obtain written approval from the utility authorities (e.g. Energy Australia, Sydney Water, and Telecommunications Carriers) in connection with the relocation and/or adjustment of the services affected by the construction of the underground structure. Any costs in the relocation, adjustment or support of services are to be the responsibility of the developer.

(80) CONTAMINATED WASTE

The generation, storage, transport, treatment or disposal of industrial, hazardous or Group A liquid waste must be in accordance with the requirements of the Protection of the Environment Operations Act 1997 and the NSW Department of Environment and Climate Change and Water (DECCW) waste tracking requirements. The generation, storage, transport, treatment or disposal of industrial, hazardous or Group A liquid waste must be in accordance with the requirements of the Protection of the Environment Operations Act 1997 and the NSW Department of Environment Climate Change and Water (DECCW) waste tracking requirements. For further information contact DECCW on 131 555.

(81) CONSTRUCTION TRAFFIC MANAGEMENT PLAN

A Construction Traffic Management Plan must be submitted to and approved by Council prior to a Construction Certificate being issued.

SCHEDULE 1C

During Construction/Prior to Occupation/Completion

(82) TEMPORARY DRAINAGE DIVERSIONS

At all times during the construction/reconstruction of the trunk drainage system, adequate temporary diversions are to be installed and maintained to the satisfaction of Council to ensure that the design 20 year capacity of the drainage system is retained at all times.

(83) HAZARDOUS AND INDUSTRIAL WASTE

Hazardous and/or industrial waste arising from the development activities must be removed and/or transported in accordance with the requirements of the NSW Environmental Protection Authority, NSW Work Cover Authority pursuant to the provisions of the following:

(a) Protection of the Environment Operations Act 1997.

(b) Protection of the Environment Operations (Waste) Regulation 2005.

(c) Waste Avoidance and Recovery Act 2001.

(d) Work Health and Safety Act 2011

(e) Work Health and Safety Regulation 2011

(84) WASTE CLASSIFICATION

Prior to the exportation of waste (including fill or soil) from the site the material should be classified in accordance with the provisions of the Protection of the 'Environment Operations Act1997 and the NSW EPA Environmental Guidelines Assessment, Classification and Management of Non- Liquid Wastes'. The classification of the material is essential to determine where the waste may be legally taken. The Protection of the Environment Operations Act 1997 provides for the commission of an offence for both the waste owner and the transporter if the waste is taken to a place that cannot lawfully be used as a waste facility for the particular class of waste. For the transport and disposal of industrial, hazardous or Group A liquid waste advice should be sought from the EPA.

(85) DUST MANAGEMENT

All reasonable and feasible steps must be taken to ensure that dust from activities conducted on site is kept to a minimum. This includes the covering and wetting-down of disturbed soils.

(86) WATER POLLUTION

No waste water, chemicals or other substances harmful to the environment shall be permitted to discharge to Council's stormwater system. Only clean, unpolluted water is permitted to discharge into the stormwater system.

(87) USE OF INTRUSIVE APPLIANCES - TIME RESTRICTION.

(a) The operation of high noise intrusive plant and machinery such as pile – drivers, rock breakers and hydraulic hammers and those which are not listed in Groups B, C, D, E or F of Schedule 1 of the City of Sydney Code of Practice for Construction Hours/Noise 1992 and Australian Standard 2436-2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites is restricted to the hours of:

(i) 9:00am – 12:30pm and 1:30pm to 4:30pm Mondays to Fridays and

(ii) 9am – 1pm on Saturdays and No operation is permitted on Sundays or public holidays.

(b) All reasonable and feasible steps must be undertaken to ensure that all works complies with the City of Sydney Code of Practice for Construction Hours/Noise 1992 and Australian Standard 2436- 2010 'Guide to Noise Control on Construction, Maintenance and Demolition Sites'

(c) All reasonable and feasible steps must be taken to ensure that noise levels from activities conducted on site are kept to a minimum including the adoption of less noise intrusive plant and equipment or technologies.

(88) HOURS OF WORK AND NOISE – OUTSIDE CBD

The hours of construction and work on the development must be as follows:

(a) All work, including building/demolition and excavation work, and activities in the vicinity of the site generating noise associated with preparation for the commencement of work (e.g. loading and unloading of goods, transferring of tools etc.) in connection with the proposed development must only be carried out between the hours of 7.30am and 5.30pm on Mondays to Fridays, inclusive, and 7.30am and 3.30pm on Saturdays, with safety inspections being permitted at 7.00am on work days, and no work must be carried out on Sundays or public holidays.

(b) All work, including demolition, excavation and building work must comply with the City of Sydney Building Sites Noise Code and Australian Standard 2436 - 1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites".

(89) NOISE USE

(a) General criteria

The emission of noise associated with the use of the premises including the operation of any mechanical plant and equipment shall comply with the following criteria:

(i) The LAeq, 15minute noise level emitted from the use must not exceed the background noise level LA90, 15minute by more than 5dB when assessed at the boundary of any affected residence.

(ii) The background noise level shall be measured in the absence of noise emitted from the use in accordance with Australian Standard

AS 1055.1-1997-Description and measurement of environmental noise.

(iii) The LAeq,15minute noise level shall be adjusted to account for any applicable modifying factors in accordance with Part 4 of the EPA NSW Industrial Noise Policy.

(iv) In this clause, the term "noise level emitted from the use" means the contributing noise level from the use in isolation to any other ambient noise and account must therefore be taken of the LAeq, 15minute when the use is not in operation.

(v) In circumstances where this development application refers to a modification or addition to an existing use, the background noise level referred to in this clause pertains to the LA90, 15minute noise level measured in the absence of all noise from the site.

(90) ACID SULFATE SOILS

(a) If any new information comes to light during, demolition, excavation or construction works which has the potential to alter previous conclusions about Acid Sulfate Soils then this must be immediately notified to the Council and the Principal Certifying Authority.

(b) All works arising from the identification of Acid Sulfate Soils are to be carried out in accordance with the NSW Acid Sulfate Soils Management Advisory Committee, Acid Sulfate Soils Assessment Guidelines 1998 for works that are classified as being in an Acid Sulfate Soils Zone Class 3.

(91) COVERING OF LOADS

All vehicles involved in the excavation and/or demolition process and departing the property with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.

(92) EROSION AND SEDIMENT CONTROL

The Soil and Water Management Plan (SWMP) or Erosion and Sediment Control Plan (ESCP) which has been approved by the Principal Certifying Authority must be implemented in full during the construction period.

During the construction period;

(a) erosion and sediment controls must be regularly inspected, repaired and maintained in working order sufficient for a 10 year Average Recurrence Interval (ARI) rainfall event;

(b) erosion and sediment control signage available from Council must be completed and attached to the most prominent structure visible at all times when entering the site for the duration of construction; and

(c) building operations and stockpiles must not be located on the public footway or any other locations which could lead to the discharge of materials into the stormwater system.

(93) HAZARDOUS AND INDUSTRIAL WASTE

Hazardous and/or industrial waste arising from the demolition/operational activities must be removed and/or transported in accordance with the requirements of the Department of Environment and Conservation (DEC) and the NSW Work Cover Authority pursuant to the provisions of the following:

(a) Protection of the *Environment Operations Act 1997*.

(b) Protection of the *Environment Operations (Waste) Regulation 1996*.

(c) *Waste Avoidance and Recovery Act 2001*.

(d) New South Wales Occupational Health & Safety Act 2000.

(e) *New South Wales Construction Safety Act 1912* (Regulation 84A-J Construction Work Involving Asbestos or Asbestos Cement 1983).

(f) The *Occupational Health & Safety Regulation 2001*.

(g) The *Occupational Health & Safety (Asbestos Removal Work) Regulation 1996*.

(94) PROTECTION OF STREET TREES DURING CONSTRUCTION

All street trees adjacent to the site not approved for removal must be protected at all times during demolition and construction, in accordance with Council's Tree Preservation Order.

Details of the methods of protection must be submitted to and be approved by Council prior to the issue of the Construction Certificate and such approval should be forwarded to the Principal Certifying Authority. All approved protection measures must be maintained for the duration of construction and any tree on the footpath which is damaged or removed during construction must be replaced.

(95) VEHICLE CLEANSING

Prior to the commencement of work, suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site. It is an offence to allow, permit or cause materials to pollute or be placed in a position from which they may pollute waters.

(96) ACCESS DRIVEWAYS TO BE CONSTRUCTED

Approved driveways are to be constructed for all vehicular access to the construction site in accordance with the requirements of Council's "Driveway Specifications" to the satisfaction of Council.

(97) LOADING AND UNLOADING DURING CONSTRUCTION

The following requirements apply:

(a) All loading and unloading associated with construction activity must be accommodated on site.

(b) If, during excavation, it is not feasible for loading and unloading to take place on site, a Works Zone on the street may be considered by Council.

(c) A Works Zone may be required if loading and unloading is not possible on site. If a Works Zone is warranted an application must be made to Council at least 8 weeks prior to commencement of work on the site. An approval for a Works Zone may be given for a specific period and certain hours of the days to meet the particular need for the site for such facilities at various stages of construction. The approval will be reviewed periodically for any adjustment necessitated by the progress of the construction activities.

(d) In addition to any approved construction zone, provision must be made for loading and unloading to be accommodated on site once the development has reached ground level.

(e) The structural design of the building must allow the basement and/or the ground floor to be used as a loading and unloading area for the construction of the remainder of the development.

(98) NO OBSTRUCTION OF PUBLIC WAY

The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances. Non-compliance with this requirement will result in the issue of a notice by Council to stop all work on site.

10th August 2015

Flow systems pty ltd

Quick Check reference no: 9124762
Property No: 4227677

Water connection application
Property address: 5, JOYNTON AVE, ZETLAND, 2017

Dear Applicant

Sydney Water gives you conditional authorisation to connect to our water system based on the information submitted.If you follow the conditions in this letter, you are authorised to connect to this service and use it, under section 48A of the Sydney Water Act.

Conditions and instructions

1 You are also authorized to make a 150mm x 100mm Tee and Valve connection into Sydney Water's 150mm watermain in Joynton Ave Zetland.

2 The flow rate from the connection must be restricted to 10 L/Per Second in accordance with the Notice of Requirements.

3 You will need to contact our Civil Delivery group on **Ph.9694 6535** to obtain a quote for the cost of installing the connection, together with the specific connection conditions that need to be met. If you want to proceed with this connection, you will need to pay the quote at any Quick Check agent. Once the quote has been paid, you will need to contact Civil Delivery to arrange a suitable time for the work to be carried out.

4 You must install a 50mm Heavy meter within two working days of making a connection to Sydney Water's watermain.

5 You must engage a listed driller to make your watermain connection. Visit sydneywater.com.au and go to Building and Developing page for a list of drillers, that includes Sydney Water. Drillers and licensed plumbers will need to apply for the connection at a Quick Check agent.

Drillers must carry out the connection in accordance with "Instructions and Technical Requirements for Drillers" and send a Construction Commencement Notice to Sydney Water two days before working on our systems. Sydney Water may audit connections made by listed drillers.

6 Application for the connection to be carried out by Sydney Water can be made at any Quick Check outlet.

7 You can request a Sydney Water meter by applying at any Quick Check agent or by contacting us on 13 20 92 to arrange fitting or supply of the meter. You must not use water from this service while there is no meter fitted.

Meter installations must comply with Sydney Water's guidelines for issuing and fitting meters. Visit sydneywater.com.au and go to the Plumbing page.

8 All fire hose reels must be connected to the metered service. Other fire services (sprinklers, drenchers and hydrants) may be unmetered. No other water using appliance or fixture may be connected to an unmetered fire service.

9 All connections must be made in accordance with Sydney Water's Policy *Connecting to Sydney Water Systems* and the *Customer Connections Guide.*

10 All watermain connections, including those used for construction activities and fire services must have appropriate backflow prevention containment devices appropriate for the hazard rating of the property.

Backflow prevention containment must comply with AS/NZS 3500.

Backflow containment on fire services must be provided by a double check detector assembly. It must be fitted as close to the property boundary as possible, and no further than 10 metres inside the property boundary. It must be fitted upstream of any booster on or off-take from the fire service. There shall be no off-takes in between the double check detector assembly and the booster assembly.

The owner of the property is responsible for ensuring that backflow and metering installations are correct.

11 All plumbing work must comply with:
- the Plumbing Code of Australia
- AS/NZS 3500

12 This approval is valid for one year from the date of this letter.

If your connection does not comply with these conditions it will be an unauthorised connection. We may ask you to rectify unauthorised connection, restrict your water supply or disconnect you.

Customers with approved connections are covered by the conditions of our Customer Contract. If you have special conditions of connection, they will be covered in an additional Customer Agreement.

Plumbing inspections
Private plumbing is regulated by NSW Fair Trading.

Further information
For more information you can email me at connections@sydneywater.com.au or call 8849 6516**.**

Yours sincerely

James Milton
Business Customer Representative
Customer Connections.

CERTIFICATE OF APPROVAL

No. 005-98285-S

This is to certify that the Occupational Health & Safety Management System at

Flow Systems Pty Ltd

of

Level 40, 259 George Street,Sydney, NSW 2000

Has been examined by assessors of QMS Certification Services and found to be conforming to the requirements of:

AS/NZS 4801:2001
OH&S Management Systems

In respect of the following activities:

Design, construction, operation, maintenance and retail supply of drinking water, waste water and recycled water services

This certificate is valid from: 10/08/2018 to 10/08/2021
Original certification date: 03/09/2015

Gerry Bonner, CPEng, BEng, FIE Aust, Chairman – QMSCS Pty Ltd
Approval: QMSCS Pty Ltd Trading as QMS Certification Services
To verify the validity of this certificate please visit www.jas-anz.org/register

Occupational Health & Safety Management System

QMS Certification Services
QMSCS Pty Ltd
Trading as QMS Certification Services
Suite 404, Level 2 - 161 King St,
Newcastle NSW 2300 Australia

Accreditation Number 03910907AL

CERTIFICATE OF APPROVAL

No. 005-98285-S

Occupational Health & Safety Management System

Schedule of Certified Locations

Flow Systems Pty Ltd

Level 40, 259 George Street,Sydney, NSW 2000
Discovery Point Local Water Centre, Suite 19, 5 Brodie Spark Drive, Wolli Creek, NSW 2205
Pitt Town Local Water Centre, 83 Bootles Lane, Pitt Town, NSW 2756
Central Park, 80 Broadway, Chippendale, NSW 2008
Green Square Local Water Centre, 3 Joynton Avenue, Zetland, NSW 2017
Cooranbong Local Water Centre, 617 Freemans Drive, Cooranbong, NSW 2265
Huntlee Local Water Centre, 1794 Wine Country Drive, North Rothbury, NSW 2335
Melbourne Office, Unit 18, 828 High Street, Kew East, VIC 3102
Box Hill, Lot 10 Red Gables Rd., Box Hill, NSW 2675
Shepherd's Bay, Street Address to be provided, Meadowbank NSW 2114

QMS Certification Services
QMSCS Pty Ltd
Trading as QMS Certification Services
Suite 404, Level 2 - 161 King St,
Newcastle NSW 2300 Australia

JAS-ANZ

APPROVED COMPANY
AS/NZS 4801
OH&S
Management Systems
QMS Certification Services

Accreditation Number 03910907AL

CERTIFICATE OF APPROVAL

No. 005-98285-E

This is to certify that the Environmental Management System at

Flow Systems Pty Ltd

of

Suite 2, Level 40, 259 George Street,Sydney, NSW 2000

Has been examined by assessors of QMS Certification Services and found to be conforming to the requirements of:

ISO 14001:2015
Environmental Management Systems

In respect of the following activities:

Design, construction, operation, maintenance and retail supply of drinking water, waste water and recycled water services

This certificate is valid from: 10/08/2018 to 10/08/2021
Original certification date: 03/09/2015

Gerry Bonner, CPEng, BEng, FIE Aust, Chairman – QMSCS Pty Ltd
Approval: QMSCS Pty Ltd Trading as QMS Certification Services
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Environmental Management System

QMS Certification Services
QMSCS Pty Ltd
Trading as QMS Certification Services
Suite 404, Level 2 - 161 King St,
Newcastle NSW 2300 Australia

Accreditation Number E2550101AM

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Huntlee Local Water Centre, 1794 Wine Country Drive, North Rothbury, NSW 2335
Box Hill, Lot 10 Red Gables Rd., Box Hill, NSW 2675
Shepherd's Bay, 10 Nancarrow Ave, Ryde, NSW 2112

Environmental Management System

QMS Certification Services
QMSCS Pty Ltd
Trading as QMS Certification Services
Suite 404, Level 2 - 161 King St,
Newcastle NSW 2300 Australia

Accreditation Number E2550101AM

CERTIFICATE OF APPROVAL

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Flow Systems Pty Ltd

of

Suite 2, Level 40, 259 George Street,Sydney, NSW 2000

Has been examined by assessors of QMS Certification Services and found to be conforming to the requirements of:

OHSAS 18001:2007
OH&S Management Systems

In respect of the following activities:

Design, construction, operation, maintenance and retail supply of drinking water, waste water and recycled water services

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Original certification date: 03/09/2015

Gerry Bonner, CPEng, BEng, FIE Aust, Chairman – QMSCS Pty Ltd
Approval: QMSCS Pty Ltd Trading as QMS Certification Services
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APPROVED COMPANY
OHSAS 18001
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Management Systems
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AVCB ASSOCIATION OF ACCREDITED CERTIFICATION BODIES

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