INSYNC SERVICES
PTY LTD

Hydraulic & Fire Services Infrastructure Requirements

Opal Development

Site 68 – Sydney Olympic Park

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File: 20140028 Hydraulic & Fire Services Infrastructure Requirements.docx

BSI
Quality ISO 9001
Certified System
FS 581006

Review and Approval Record

Rev	Date	Description of Release	Prepared By	Reviewed By	Approved By
A	02/09/14	Preliminary Issue	BL	RW	BL
B	18/09/14	DA Issue	IN	RW	BL

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1 Executive Summary

1.1 Summary

The proposed Opal Development at Site 68 Sydney Olympic Park will be constructed on an existing parcel of land having all existing buildings fully demolished.

The site will be subject to strata sub-division only, and therefore the entire lot can be serviced from a single point of Authority mains connection.

In undertaking our assessment of the existing Authority infrastructure, we have considered the feasibility of providing hydraulic and fire services connections to the proposed development in accordance with the following calculated infrastructure loads and connection sizes;

SEWER DRAINAGE

Variable	Residential	Retail	Child Care	Totals
Equivalent Population	923	2	33	**958**
Site Sewer Connection	225mm	100mm	100mm	**225mm**

POTABLE COLD WATER

Variable	Residential	Retail	Child Care	Totals
Probable Simultaneous Flow	19.82L/s	0.30L/s	0.45L/s	**20.57L/s**
Main Connection	150mm	20mm	25mm	**150mm**
Meter	100mm	20mm	25mm	**150mm**

NON-POTABLE COLD WATER

Variable	Residential	Retail	Child Care	Totals
Probable Simultaneous Flow	15.44L/s	0.00L/s	0.42L/s	**15.86L/s**
Main Connection	100mm	0mm	25mm	**100mm**
Meter	100mm	0mm	20mm	**100mm**

NATURAL GAS

Building	Residential	Retail	Child Care	Totals
Appliances	7,483MJ/h	750MJ/h	0MJ/h	**8,233MJ/h**
Hot Water	5,272MJ/h	0MJ/h	400MJ/h	**5,672MJ/h**
Totals	12,755MJ/h	750MJ/h	400MJ/h	**13,905MJ/h**
Connection				**Jemena**
Index Length (m)	140	140	140	**140**
Pressure Loss (kPa)	1.5	1.5	1.5	**1.5**
Primary Site Service	125mm	40mm	32mm	**125**

COMNBINED FIRE HYDRANT / FIRE SPRINKLER SERVICE

Variable	Combined
Maximum Fire compartment	>10,000m^2
Building Height	>50m
Sprinkler Hazard	OHII
Fire Hydrant Water Storage	2 x 25,000L
Fire Sprinkler Water Storage	2 x 75,000L

Total Water Storage	2 x 100,000L
Hydrant Flow Rate	30L/s
Sprinkler Flow Rate	20L/s
Total Flow Rate	50L/s
Main Connection	150mm
Fire Mains	50L/s
Diesel Pump	50L/s
Electric Pump	50L/s

We have reviewed the existing infrastructure with regard to its capacity and location to service each stage of the proposed development in accordance with the connection requirements detailed above, our comments are as follows;

Service	Infrastructure Location	Infrastructure Capacity	Comments	Cost Estimate
Stormwater Drainage	☑	☑	1 x standard connections assuming a suitable site stormwater connection will be provided by the Civil Engineer.	$0,000
Sanitary Drainage	☑	☑	1 x standard connections assuming a suitable site sewer connection will be provided by the Water servicing Coordinator.	$0,000
Potable Cold Water	⊘	☑	Approximately 20m of 150mm water main road crossing, including a standard connection to the site.	$51,248
Non-Potable Cold Water	⊘	☑	Approximately 200m of 150mm water main amplification from Australia Avenue, including a standard connection to the site.	$234,980
Natural Gas	☑	☑	Jemena amplification of the existing 32mm medium pressure gas main within Albany Street, including a standard connection to the site.	$0
Fire Hydrant/ Fire Sprinkler	⊘	☑	Approximately 20m of 150mm water main road crossing, including a standard connection to the site.	$51,248
Total Cost Estimate (ex GST)				**$337,476**

Infrastructure Services have been assessed as follows;

☑ Infrastructure connection is readily available.

⊘ Infrastructure connection requires minor adjustment of existing services.

☒ Infrastructure connection requires significant amplification or diversion of existing services.

2 Introduction

2.1 Background

Ecove Group Pty Ltd has engaged Insync Services Pty Ltd to provide building services consultancy for the development. Specifically, Insync Services Pty Ltd have been engaged to provide engineering consultancy with regard to the following building services disciplines;

- Hydraulic Services
- Wet Fire Services

2.2 Aims

The aim of this Hydraulic and Fire Services Infrastructure Report is to provide a high level review of existing hydraulic and fire services infrastructure surrounding the proposed development site.

Specifically, the report is intended to identify capability, options, constraints and risks associated with the ability of existing hydraulic and fire services infrastructure to service the needs of the proposed development.

2.3 Briefing Documents

The hydraulic services engineering elements considered within this report have taken into account the following preliminary documentation and investigations;

- Authority main diagrams.
- Existing Authority correspondence.
- Architectural documentation prepared by Bates Smart Pty Ltd.

2.4 Scope of Services

The hydraulic and fire services engineering elements considered within this report are as follows;

- Stormwater Drainage Services
- Sewer Drainage Services
- Potable Cold Water Services
- Non-Potable Cold Water Service
- Natural Gas Services
- Combined Fire Hydrant / Fire sprinkler Services

3 Schedule Of Accommodation

3.1 Area Schedule

Preliminary load estimates within this report have been based upon the Schedule of Area detailed below;

Building Level	Floor Level	Building Area (m^2)
Basement Level 3	0.500	6516
Basement Level 2	3.500	6516
Basement Level 1	6.500	6516
Ground Level	10.700	750
Level 01	15.800	1083
Level 02	19.000	1083
Level 03	22.200	1083
Level 04	25.400	1080
Level 05	28.600	1080
Level 06	31.800	1080
Level 07	35.000	1080
Level 08	38.200	1080
Level 09	41.400	1080
Level 10	44.600	1083
Level 11	47.800	1083
Level 12	51.000	1083
Level 13	54.200	1083
Level 14	57.400	1083
Level 15	60.600	1083
Level 16	63.800	1072
Level 17	67.000	1072
Level 18	70.200	1072
Level 19	73.400	1072
Level 20	76.600	1072
Level 21	79.800	1072
Level 22	83.000	1072
Level 23	86.200	1072
Level 24	89.400	1072
Level 25	92.600	1076
Level 26	95.800	1076
Level 27	99.000	1076
Level 28	102.200	1076
Level 29	105.400	1076
Level 30	108.600	1076
Level 31	111.800	1076
Level 32	115.000	1076
Level 33	118.200	1076
Plant Level	121.400	598
Roof Level	125.600	
Totals		56455

3.2 Accommodation Schedule

Preliminary load estimates within this report have been based upon the Schedule of Accommodation detailed below;

Building Level	Studio	One Bed	Two Bed	Three Bed	Four Bed	Totals
Basement Level 3	0	0	0	0	0	**0**
Basement Level 2	0	0	0	0	0	**0**
Basement Level 1	0	0	0	0	0	**0**
Ground Level	0	0	0	0	0	**0**
Level 01	0	6	6	0	0	**12**
Level 02	0	6	6	0	0	**12**
Level 03	0	6	6	0	0	**12**
Level 04	0	6	6	0	0	**12**
Level 05	0	6	6	0	0	**12**
Level 06	0	6	6	0	0	**12**
Level 07	0	6	6	0	0	**12**
Level 08	0	6	6	0	0	**12**
Level 09	0	6	6	0	0	**12**
Level 10	0	6	6	0	0	**12**
Level 11	0	6	6	0	0	**12**
Level 12	0	6	6	0	0	**12**
Level 13	0	6	6	0	0	**12**
Level 14	0	6	6	0	0	**12**
Level 15	0	6	6	0	0	**12**
Level 16	0	7	4	1	0	**12**
Level 17	0	7	4	1	0	**12**
Level 18	0	7	4	1	0	**12**
Level 19	0	7	4	1	0	**12**
Level 20	0	7	4	1	0	**12**
Level 21	0	7	4	1	0	**12**
Level 22	0	7	4	1	0	**12**
Level 23	0	7	4	1	0	**12**
Level 24	0	7	4	1	0	**12**
Level 25	0	2	4	2	1	**9**
Level 26	0	2	4	2	1	**9**
Level 27	0	2	4	2	1	**9**
Level 28	0	2	4	2	1	**9**
Level 29	0	2	4	2	1	**9**
Level 30	0	2	4	2	1	**9**
Level 31	0	2	4	2	1	**9**
Level 32	0	2	4	2	1	**9**
Level 33	0	2	4	2	1	**9**
Plant Level	0	0	0	0	0	
Totals	**0**	**171**	**162**	**27**	**9**	**369**

4 Summary Of Requirements

4.1 Sanitary Drainage Requirements

The proposed development will provide facilities in accordance with the Schedule of Accommodation as detailed in Clause 3.2.

Sanitary drainage connection sizes should be based upon the total equivalent population, which we have calculated as follows for each respective site;

Variable	Residential	Retail	Child Care	Totals
Equivalent Population	923	2	33	**958**
Site Sewer Connection	225mm	100mm	100mm	**225mm**

The proposed connection size referred to above reflects consolidated loads and is provided for reference only. The layout of buildings and available spatial clearances are likely to require loads to be connected into the authority sewer drainage system on a more diversified basis. The number, location and size of sewer drainage connections for this development will be further developed as the design progresses.

4.2 Potable Cold Water Requirements

The proposed development will provide facilities in accordance with the Schedule of Accommodation as detailed in Clause 3.2.

We have based our potable cold water service load estimates upon the following allowances;

- 0.49L/s Per Serviced Residential (diversity to be applied)
- 0.3L/s Per Retail Tenancy (no diversity)
- Fixture Loading per Child Care (diversity to be applied)

For a residential building connection sizes should be based upon the total building probable simultaneous flow rate which we have estimated as detailed below;

Variable	Residential	Retail	Child Care	Totals
Probable Simultaneous Flow	19.82L/s	0.30L/s	0.45L/s	**20.57L/s**
Main Connection	150mm	20mm	25mm	**150mm**
Meter	100mm	20mm	25mm	**150mm**

Due to the proposed height of the building being in excess of 8 stories, a connection may need to be sourced from an Authority water main of at least 200mm diameter.

4.3 Non-Potable Cold Water Requirements

The proposed development will provide facilities in accordance with the Schedule of Accommodation as detailed in Clause 3.2.

We have based our non-potable cold water service load estimates upon the following allowances;

- 0.245L/s Per Serviced Residential (diversity to be applied)
- Fixture Loading per Child Care (diversity to be applied)

For a residential building connection sizes should be based upon the total building probable simultaneous flow rate which we have estimated as detailed below;

Variable	Residential	Retail	Child Care	Totals

Probable Simultaneous Flow	15.44L/s	0.00L/s	0.42L/s	**15.86L/s**
Main Connection	100mm	0mm	25mm	**100mm**
Meter	100mm	0mm	25mm	**100mm**

Due to the proposed height of the building being in excess of 8 stories, a connection may need to be sourced from an Authority water main of at least 200mm diameter.

4.4 Natural Gas Requirements

The proposed development will provide facilities in accordance with the Schedule of Accommodation as detailed in Clause 3.2.

We have based our natural gas service load estimates upon the following allowances;

Building	Residential	Retail	Child Care	Totals
Appliances	7,483MJ/h	NA	NA	**7,483MJ/h**
Kitchen	NA	NA	NA	
Laundry	NA	NA	NA	
Café	NA	750MJ/h	NA	**750MJ/h**
Restaurant	NA	NA	NA	
Swimming Pool	NA	NA	NA	
Hot Water	5,272MJ/h	NA	400MJ/h	**5,672MJ/h**
Mechanical Services	NA	NA	NA	
Totals	**12,755MJ/h**	**750MJ/h**	**400MJ/h**	**13,905MJ/h**
Connection				**Jemena**
Index Length (m)	140	140	140	**140**
Pressure Loss (kPa)	1.5	1.5	1.5	**1.5**
Primary Site Service	125mm	40mm	32mm	**125**

NOTE: Incoming 210kPa medium pressure gas mains and main connections will be determined by Jemena.

4.5 Combined Fire Hydrant / Fire Sprinkler Service Requirements

The proposed development will provide facilities in accordance with the Schedule of Accommodation as detailed in Clause 3.2.

Fire services are sized based upon the fire compartment area and hazard classification within the building, as well as the building effective height. We have calculated the combined fire hydrant / fir sprinkler service requirements as follows;

Variable	Combined
Maximum Fire compartment	>10,000m^2
Building Height	>50m
Sprinkler Hazard	OHII
Fire Hydrant Water Storage	2 x 25,000L
Fire Sprinkler Water Storage	2 x 75,000L
Total Water Storage	2 x 100,000L
Hydrant Flow Rate	30L/s
Sprinkler Flow Rate	20L/s
Total Flow Rate	50L/s
Main Connection	150mm
Fire Mains	50L/s
Diesel Pump	50L/s
Electric Pump	50L/s

5 Authority Infrastructure

5.1 Stormwater Drainage

5.1.1 Existing Services

Refer to documentation provided by the Civil Engineer.

5.1.2 Connection Options

Refer to documentation provided by the Civil Engineer.

5.1.3 Recommendation

Refer to documentation provided by the Civil Engineer.

5.2 Sanitary Drainage

5.2.1 Existing Services

Sydney Water are the Authority who provide sanitary drainage infrastructure in the locality of the development site. Currently there are three existing Sydney Water sewer mains located within close proximity to the development site, described as follows;

- **Internal Site** – an existing 900 GRP sewer main runs centrally within the proposed development site. The sewer falls towards the south, and is accessible for the full length of the site.

A copy of the Sydney Water mains diagram has been included for reference within the Appendix of this report.

5.2.2 Anticipated Works

A formal Section 73 application will need to be made to Sydney Water after receipt of the Development Approval, in order to confirm their requirements for the provision of sanitary drainage connections to the proposed development. A summary of the anticipated Sydney Water sewer main works required to facilitate the proposed developments is as follows;

- **Sewer Main Diversion** – the existing 900mm GRP Sydney Water sewer main will be required to be diverted to facilitate construction of the proposed development. Currently a design is being prepared for the diversion by an accredited Water Servicing Coordinator.

- **Site Connection** – the existing 900mm GRP sewer main within the site boundary has adequate capacity to service the proposed development via a new 225mm sewer connection.

All Sydney Water sewer main works are required to be designed by a Sydney Water accredited Water Servicing Coordinator. We recommend that contact be made with a suitable Water Servicing Coordinator at the earliest possible convenience to further develop and assess the various sewer main diversion options.

5.3 Potable Cold Water Service

5.3.1 Existing Services

Sydney Water are the Authority who provide potable cold water infrastructure in the locality of the development site. Currently there is a single existing Sydney Water water main located within close proximity to the development site, described as follows;

- **Bennelong Parkway** – an existing 150mm DICL potable cold water main located along the western boundary of Bennelong Parkway. The main is accessible for the full length of the sites eastern boundary.

A copy of the Sydney Water mains diagram has been included for reference within the Appendix of this report.

5.3.2 Anticipated Works

A formal Section 73 application will need to be made to Sydney Water after receipt of the Development Approval, in order to confirm their requirements for the provision of potable cold water connections to the proposed development. A summary of the anticipated Sydney Water water main works required to facilitate the proposed developments is as follows;

- **Bennelong Parkway** – two new water main connections will be required across the kerb of Bennelong Parkway into the existing 150mm DICL water main. One being a 150mm potable cold water service and the other being a 150mm combined fire hydrant /fire sprinkler service connection.

All Sydney Water sewer main works are required to be designed by a Sydney Water accredited Water Servicing Coordinator. We recommend that contact be made with a suitable Water Servicing Coordinator at the earliest possible convenience to further develop and assess the various water main connection options.

5.4 Non-Potable Cold Water Service

5.4.1 Existing Services

Sydney Water are the Authority who provide non-potable cold water infrastructure in the locality of the development site. Currently there is a single existing Sydney Water non-potable water main located within close proximity to the development site, described as follows;

- **Australia Avenue** – an existing 375mm DICL non-potable cold water main is located along the western boundary of Australia Avenue. The main is not directly accessible from the proposed development site.

A copy of the Sydney Water mains diagram has been included for reference within the Appendix of this report.

5.4.2 Anticipated Works

A formal Section 73 application will need to be made to Sydney Water after receipt of the Development Approval, in order to confirm their requirements for the provision of non-potable cold water connections to the proposed development. A summary of the anticipated Sydney Water water main works required to facilitate the proposed developments is as follows;

- **Australia Avenue** – a new 150mm diameter extension of non-potable cold water service main will be required from Australia Avenue. An accredited Water Servicing Coordinator will be required to develop a design for the proposed works. The existing 375mm non-potable cold water main located within Australia Avenue is assumed to have adequate capacity to service the proposed development via a new 100mm diameter non-potable cold water service connection.

All Sydney Water sewer main works are required to be designed by a Sydney Water accredited Water Servicing Coordinator. We recommend that contact be made with a suitable Water Servicing Coordinator at the earliest possible convenience to further develop and assess the various water main connection options.

5.5 Natural Gas Service

5.5.1 Existing Services

Jemena are the Authority who provide natural gas infrastructure in the locality of the development site. Currently there is a single existing Jemena natural gas main located within close proximity to the development site, described as follows;

- **Bennelong Parkway** – an existing 100mm nylon natural gas main located along the eastern boundary of Bennelong Parkway. The main is accessible for the full length of the sites eastern boundary.

A copy of the Jemena mains diagram has been included for reference within the Appendix of this report.

5.5.2 Anticipated Works

We await confirmation advice from Jemena with regard to their preferred connection options. A summary of the anticipated Jemena gas main works required to facilitate the proposed developments is as follows

- **Bennelong Parkway** – a new connection across Bennelong Parkway will be required to provide a suitable capacity connection for the proposed development.

All Jemena gas main works are required to be designed by Jemena. We recommend that contact be made with Jemena at the earliest possible convenience to further develop and assess the various gas main connection options.

6 Appendix

6.1 Sydney Water Mains Diagram

6.2 Jemena Natural Gas Mains Diagram

6.3 Infrastructure Budget