



Fire Services

Concept Design Report

Social and Affordable Housing - Stage 2

15 Northumberland St, Liverpool

Client:

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1 Executive Summary

1.1 Summary

This fire services concept design report outlines the scope of works, design criteria, components and materials which will be adopted by Insync Services for completion of the fire services design and documentation for the proposed Social and Affordable Housing – Stage 2 development site at 15 Northumberland Street, Liverpool.

The report will form the basis for communication of design principles to the Client for review, comment and sign-off, such that the fire services design and documentation can be completed for the project.

1.2 Code Compliance

The fire services covered by this report will be designed to comply with the following requirements;

Fire Services	Design Codes	Proposed Compliance
Fire Sprinkler Service	NCC, AS2118.1, Fire and Rescue NSW	Deemed To Satisfy
Fire Hydrant Service	NCC, AS2419.1, Fire and Rescue NSW	Deemed To Satisfy
Combined Fire Sprinkler and Fire Hydrant systems	NCC, AS2118.6, Fire and Rescue NSW	Deemed To Satisfy
Portable Fire Extinguishers	NCC, AS2444.1	Deemed To Satisfy

*NCC – National Construction Code which includes:

- Volume 1 – Building Code of Australia – Class 2 to Class 9 Buildings
- Volume 2 – Building Code of Australia – Class 1 and 10 Buildings
- Volume 3 – Plumbing Code of Australia

1.3 Authority Infrastructure

Preliminary investigations indicate that fire services for the proposed Social and Affordable Housing – Stage 2 development site at 15 Northumberland Street, Liverpool should be able to be adequately serviced from the existing Sydney Water infrastructure within Northumberland St. Final confirmation will be sort via a Section 73 application to Sydney Water after the Development Approval has been issued by Council.

Service	Assessment	Cost Estimate
Fire Hydrant/Fire Sprinkler Service	☒	\$ By Others
Total Infrastructure Cost Estimate		\$ TBC

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.

1.4 System Design

The proposed Social and Affordable Housing – Stage 2 development site at 15 Northumberland Street, Liverpool will be provided with a combined fire hydrant / fire sprinkler system throughout the entire development. This type of system has been selected as the most cost efficient system design for a multistorey building.

The system will be designed as far as possible to achieve Deemed To Satisfy code compliance, and thereby minimise the number of Alternate Solutions that may be required.

Fire hydrant and fire sprinkler coverage shall be provided as required throughout all areas of the development, in accordance with the following performance characteristics;

Building Area	Fire Compartment	Fire Hydrant Performance	Fire Sprinkler Performance
Carpark	All Classes Sprinkled <10,000m ²	2 Hydrants Operating 20L/s	Ordinary Hazard II 5mm/m ² over 144m ²
Residential	All Classes Sprinkled >5,000m ² <10,000m ²	2 Hydrants Operating 20L/s	Light Hazard 4.1mm/m ² over 120m ²
Retail	All Classes Sprinkled >5,000m ² <10,000m ²	2 Hydrants Operating 20L/s	Ordinary Hazard III 5mm/m ² over 216m ²
Plant Rooms	All Classes Sprinkled >5,000m ² <10,000m ²	2 Hydrants Operating 20L/s	Ordinary Hazard I 5mm/m ² over 72m ²

A grade 1 water supply shall be provided consisting of a full capacity towns main connection capable of supplying the total combined flow rate for the specified duration, and one on-site water storage tank having at least 2/3 of the required total combined flow rate for the specified duration is the preferred option. Pressure will be maintained within the system by a duplicate pumps, which can be driven by a diesel engine and an electric engine, and both having 100% capacity of the required system duty.

A booster arrangement shall be provided in accordance with Fire & Safety NSW requirements.

Pipework shall be configured in a ring main arrangement to ensure reliability of supply during system maintenance.

Fire hydrants shall be located within fire stairs and as otherwise required to achieve full coverage throughout the building.

Fire sprinkler control valve assemblies shall be located within fire stairs at each level of the building.

2 Introduction

2.1 Background

Anglicare has engaged Insync Services to provide building services consultancy for the proposed Social and Affordable Housing – Stage 2 development site at 15 Northumberland Street, Liverpool. Specifically, Insync Services have been engaged to provide engineering consultancy concept design reports to cover the following building services disciplines;

- Electrical Services
- Fire Services
- Hydraulic Services
- Lift Services
- Mechanical Services

2.2 Aims

The aim of this Concept Design Report is to provide a detailed description of the fire services design proposals associated with development. Specifically, the report is intended to provide a summary of the following;

- Identification of services to be provided.
- Description of the codes to which they will be installed.
- Description of the basis for design.
- Description of the required performance.
- Description of the materials to be used.

This document shall form the basis for communication of design principles and specific building services design requirements to the Client and wider design team, such that the building services design principles can be fundamentally incorporated into the architectural planning proposal to be submitted for the development.

2.3 Briefing Documents

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

- National Construction Code.
- Relevant Australian Standards.
- Authority design and guidelines.
- Authority Main Diagrams
- Preliminary architectural drawings prepared by Group GSA Pty Ltd.

2.4 Development Description

The proposed development scheme is yet to be finalised however for the purposes of this review we have made the following assumptions;

1. Two levels of basement which comprise carpark, fire sprinkler pump room, store room and services room
2. Building management, lounges areas, office, Kiosk, dining, sleep, function room and services room on ground floor
3. SAH and STRATA rental apartments distributed between levels 1 to 11.
4. The development is more than 25m in effective height as Classified by the National Construction Code.

2.5 Associated Services

The associated services engineering elements to be considered in conjunction within this report are as follows;

- Fire Detection and Alarm Services as detailed by the Electrical Engineer.
- Emergency Communication and Warning Services as detailed by the Electrical Engineer.
- Building Management Systems (BMS) as detailed by the Mechanical Engineer.
- Fire Rated Construction as detailed by the Architect and Structural Engineer.
- Acoustic Performance as detailed by the Acoustic Engineer.
- BASIX and Section J report as detailed by the ESD Engineer
- Fire Engineering Report as detailed by the Fire Engineer.
- BCA Report as detailed by the BCA consultant.

3 Design Principles

3.1 Background

The fire system design would be undertaken with key design principles, summarised in terms of building services outcomes regarding this development including the following areas:

- Cost & Efficiency
- Quality & Longevity
- Uniformity
- Serviceability
- Practicality & Ingenuity

All design shall be prepared with due regard to building services such that the clients overall objectives for the development can be realised. In particular the spatial requirements for building services shall be determined and incorporated into the architectural proposals from first principles so that further development of the architectural proposals can be undertaken as the design progresses without the need to backtrack and compromise architectural integrity of the submission as a result of building services requirements that have not previously been adequately considered.

3.2 Cost & Efficiency

The client has ambitious cost benchmarks which will be required to be achieved for the procurement of this development. These benchmarks are not be able to be achieved without the fundamental integration and coordination of building services concurrent with development of the architectural design. Specific areas for consideration include the following;

- Equipment location for maximum efficiency.
- Adequate floor to floor heights.
- Vertical alignment of services risers.
- Standardised design forms that bring cost savings through repetition.
- Development of typical components that can be pre-fabricated off site.
- Continuity of wet area locations at typical floor changes to reduce bulkheads below.
- Modular design of plant where applicable to match proposed construction staging.
- Selection of standard manufacture equipment that is readily available.
- Selection of low maintenance plant & equipment.
- Duplication of equipment where required to provide operational redundancy in critical aspects of the buildings operation.

3.3 Quality & Longevity

The client requires a building that is fit for purpose in terms of the requirements for its ongoing operation. **Selection of plant and equipment shall provide trouble free operation over the duration of its life cycle, aside from the regular maintenance program.** Equipment shall be selected with due consideration to having demonstrated proven reliability on similar installations, in similar operating conditions. Equipment supply shall be via companies that can demonstrate a long term trading history in the Australian market, and have local agents capable of providing the necessary technical support and parts availability as will be required throughout the equipment's life cycle.

3.4 Uniformity

Uniformity of type and manufacture of each specific type of equipment and accessory shall be preserved throughout the whole installation. Where possible the number of types of equipment provided by an individual supplier shall be maximised.

3.5 Servicability

The client requires a building that is fit for purpose in terms of the requirements for its ongoing

operation. Spatial allocation for plant and equipment shall provide due consideration for all ongoing maintenance requirements of the equipment, including total replacement of the equipment at completion of its life cycle. Adequate clearance shall be provided around all equipment for maintenance access, with due consideration given to aspects of Safety In Design principles as may be applicable. Access shall be arranged so as to provide minimal disruption to the normal operation of the building and minimise any inconvenience to the building occupants. **Any need to alter or damage building fabric to effect equipment maintenance shall be avoided under all circumstances.**

3.6 Practicality & Ingenuity

As every project presents its own unique challenges, services designs would be undertaken with a practical approach born from our many years of experience.

At the same time, we apply market leading design approaches and products where necessary to ensure technical, environmental, spatial, and coordination challenges are met.

This approach ensures that the appropriate level of technology is delivered; meeting authorities requirements, market expectations, and the financial objectives of the development.

4 Authority Infrastructure Requirements

4.1 Design Assessment

The proposed development will provide facilities in accordance with the Development Description as detailed in Section 2.

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

Variable	Requirement
Largest Fire Compartment	<10,000m ²
Building Height	>25m
Town's Main	200mm
On-Site Water Storage Tank	150,000L
Maximum Design Flow Rate	40L/s
Town's Main Connection	150mm
Fire Brigade Booster Valve	150mm (4-point)
Fire Mains	40L/s
Primary Electric Pump	40L/s
Fire Sprinkler Control Assembly	Every Floor Level
Sprinkler Locations	All areas of the building

Due to the proposed height of the building exceeding 25 in height, a connection may need to be sourced from an Authority water main of at least 200mm diameter. The proposed connection size referred to above reflects consolidated loads and is provided for reference only. 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.

4.2 Existing Services

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

- **Northumberland Street** – an existing 200mm potable cold water main located along the eastern side of Northumberland Street. The main is accessible for the full length of the sites western boundary.

4.3 Anticipated Works

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

- **Site Connection** – a new 150mm combined fire hydrant / fire sprinkler service connection will be required into the existing 200mm water main within Northumberland Street.

All Sydney Water Corporation water 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 Combined Fire Hydrant/Fire Sprinkler System

5.1 Combined Fire Hydrant / Fire Sprinkler Service Generally

Specifically, this section of the Concept Design report shall cover the following services;

- Combined Fire Hydrant /Fire Sprinkler Service

5.2 Standards

Works under this section of the Concept Design report shall be designed in accordance with the following standards;

- National Construction Code (2016)
- AS 2118.1 (1999) – Automatic Fire Sprinkler Systems Part 1 General Requirements
- AS 2118.1 (2017) – Automatic Fire Sprinkler Systems Part 1 General Requirements
- AS 2118.6 (2012) – Automatic Fire Sprinkler Systems Part 6 Combined Sprinkler and Hydrant Systems In Multistorey Buildings
- AS 2419.1 (2005) – Fire Hydrant Installations Part 1 System Design, Installation and Commissioning
- Plumbing Code Of Australia (2016)
- Fire & Rescue NSW

5.3 Building Height

Combined fire hydrant / fire sprinkler services for this development will be designed in accordance with the requirements for buildings exceeding 25m in effective height, as defined by the Building Code of Australia.

5.4 Fire Hydrant System Design

Fire hydrants shall be located such that every point of the building can be reached by a 10 metre hose stream from a 30 metre fire hose laid out in the actual path of travel to the point of coverage. In addition, every room within the development must be reachable by a fire hose, with at least 1 metre of fire hose able to be extended into the room.

Fire hydrants shall be typically located within each floor landing of all fire stairs, and as otherwise necessary to achieve full coverage throughout the building.

Fire hydrants shall not pass through fire doors or smoke doors, where required fire hydrants shall be provided on each side of fire and smoke doors as necessary to achieve full coverage.

A system of ring-main supply risers and on floor reticulation shall be used to achieve the most reliable fire hydrant service installation.

5.5 Fire Sprinkler System Design

The proposed development will have a Combined Fire Sprinkler/ Hydrant service provided throughout the building to achieve coverage in accordance with the National Construction Code requirements.

The combined fire sprinkler/ hydrant system is an integrated system of fire sprinklers and fire hydrants using combined piping reticulation and water supplies designed to simultaneously supply sufficient water to meet the flow and pressure requirements of both sprinkler and hydrant systems.

Fire sprinklers shall be located such that every point of the building can be reached by a fire sprinkler spray pattern, with the exception of;

- Fire separated rooms containing only dry type electrical equipment
- Where deemed not applicable to the fire safety system as determined by a fire engineering assessment.

Fire sprinkler alarm valve sets shall be provided within the fire stairs located at each level. Branches extend from each alarm valve to flow switches installed on each floor level, with pipework then reticulated throughout the floor to the individual fire sprinkler heads.

Monitored isolation valves and flow switches as well as provision for drainage of test water will be provided at all floor levels. The sprinkler alarm switch and monitored valves will be connected to the Fire & Rescue NSW via the Fire Alarm Panel. The sprinkler jacking pump will be electric and automatic.

All sprinklers will be 'fast response' type.

Fire sprinkler services shall be provided throughout all areas of the development in accordance with the following hazard classifications;

- RETAIL AREAS – Ordinary Hazard III based upon 60L/m per head from the 12 most hydraulically disadvantaged heads. (assumed coverage 12m² per head) designed to provide a density of discharge of 5mm/min. over an assumed area of operation of 216m².
- RESIDENTIAL AREAS – Light Hazard based upon 48L/m per head from the 6 most hydraulically disadvantaged heads. (assumed coverage 21m² per head) designed to provide a density of discharge of 4.1mm/min. over an assumed area of operation of 120m².
- PLANT AREAS – Ordinary Hazard I based upon 60L/m per head from the 6 most hydraulically disadvantaged heads. (assumed coverage 12m² per head) designed to provide a density of discharge of 5mm/min. over an assumed area of operation of 72m².
- CARPARK AREAS – Ordinary Hazard II based upon 60L/m per head from the 12 most hydraulically disadvantaged heads. (assumed coverage 12m² per head) designed to provide a density of discharge of 5mm/min. over an assumed area of operation of 144m².

5.6 Fire Hydrant Building Classification

Fire hydrant building classifications are determined based upon the building classification and the size of fire compartment being serviced, combined with respect to any fire sprinkler protection of that fire compartment. Fire compartments have been determined in accordance with Building Code of Australia as follows;

Carpark Areas	All classes sprinkled <10,000m ²
Retail / Commercial Areas	All classes sprinkled >5,000m ² <10,000m ²
Residential Areas	All classes sprinkled >5,000m ² <10,000m ²
Plant Areas	All classes sprinkled >5,000m ² <10,000m ²

5.7 Fire Hydrant Flow Rates

Fire hydrant flow rates are determined based upon the number of fire hydrant landing valves that are required to discharge simultaneously for the fire compartment that they are serving. Fire hydrant flow rates have been determined in accordance with AS 2419.1 as follows;

Carpark Areas	2 fire hydrants
Retail /Commercial Areas	2 fire hydrants
Residential Areas	2 fire hydrants
Plant Areas	2 fire hydrants

Based upon a largest fire compartment being under 10,000m², the fire hydrant service shall be

sized to operate two (2) fire hydrant landing valves simultaneously.

Fire hydrant mains shall have capacity to supply a flow of 10L/s to each fire hydrant landing valve under fire brigade boosted operations, combining to a total system flow rate of 20L/s.

Fire hydrant service pipework shall be sized such that the maximum velocity within any pipework is as follows;

Location	Maximum Velocity
All Locations	4.0m/s

Fire hydrant pipework shall be sized so that the pressure loss due to friction in the reticulation system between the booster valve assembly and the most hydraulically dis-advantaged fire hydrant is limited to a maximum pressure loss of 150kPa.

5.8 Fire Sprinkler Hazard Classification

Building hazard classifications have been determined in accordance with the requirements of AS2118.1 as follows;

Plant Areas	Ordinary Hazard I (OHI)
Carpark Areas	Ordinary Hazard II (OHII)
Retail	Ordinary Hazard III (OHIII)
Residential Areas	Residential Coverage / Light Hazard

5.9 Fire Sprinkler Flow Rates

Fire sprinkler system sizing for the building fire sprinkler service shall be determined based upon the relevant standard of coverage to be provided;

Residential	4.1mm/m ² /minute over 120m ² (492L/m)
Ordinary Hazard I (OH1)	5mm/m ² /minute over 72m ² (360L/m)
Ordinary Hazard II (OH2)	5mm/m ² /minute over 144m ² (720L/m)
Ordinary Hazard III (OH3)	5mm/m ² /minute over 216m ² (1080L/m)

Fire sprinkler service pipework shall be sized such that the maximum velocity within any pipework is as follows;

Location	Maximum Velocity
All Locations	6.0m/s

5.10 Water Supply

Combined fire hydrant / fire sprinkler service water supplies for buildings exceeding 25m in effective height must comprise of two acceptable water supplies (Grade 1 or dual supply). Dual supply can be provided by any of the following alternatives;

1. Dual on-site water storage tanks, each having at least 2/3 of the required total combined flow rate for the specified duration.
2. Two town main connections each having the required total combined flow rate for the specified period, and also arranged such that in the event of a failure of one town main within the overall system, the other supply remains operative.
3. One town main supply having the required total combined flow rate for the specified period,

and one on-site water storage tank having at least 2/3 of the required total combined flow rate for the specified duration.

For this development we anticipate that the existing 200mm Sydney Water main located within Northumberland Street will have sufficient permissible flow to service the total combined flow rate of the combined fire hydrant / fire sprinkler service. As such the combined fire hydrant / fire sprinkler water supply shall be provided by a single on-site water storage tank located at low level within the building in addition to a single town's main connection. In accordance with code requirements, the water storage tank must provide the required total combined flow rate for the specified duration, which for this development has been calculated as follows;

1. The full fire sprinkler flow of the highest hazard classification contained within the building, for the minimum duration required by that hazard classification. This capacity will be reduced by 1/3 as permitted for tank installations.
2. A minimum of 25,000L for the fire hydrant service provided that a town main connection is available, capable of supplying the required fire total fire hydrant service flow rate for the specified period.

In accordance with the methodology described above, total combined fire hydrant / fire sprinkler service on-site storage for this development has been calculated at 1 x 150,000L tanks split into two (2) equal portions of 75,000L each for maintenance.

5.11 Pressure Zones

Combined fire hydrant / fire sprinkler services shall be designed to incorporate pressure zones no more than 50m in height for each pressure zone within the development. Pressure zones ensure that maximum system pressures are not exceeded as follows;

- 1000kPa to fire sprinkler installations.
- 1200kPa to fire hydrant installations.

The lowest pressure zone shall be designed such that fire brigade boosting is not required to be provided to a vertical height more than 35 metres above ground level at the booster connection.

For this development there will be two (2) pressure zones will be required throughout the building as follows;

- Zone 1 - Low Rise – Basement 1 level to 5
- Zone 2 - High-Rise – Levels 6 to Roof level

A concept diagram indicating proposed pressure zones has been provided in the Appendix of this report

5.12 Metering

An Authority meter shall be provided on the incoming fire hydrant / fire sprinkler service water supply to the development. Metering shall be achieved by a detector check valve assembly installed within the site boundary, adjacent to the fire brigade booster valve assembly.

5.13 Fire Brigade Booster Valve

A combined fire hydrant / fire sprinkler service fire brigade booster valve assembly shall be provided within the site boundary, in a location agreed with the Fire & Rescue NSW. The booster valve shall incorporate the following requirements;

- A 150mm 4 way suction connection from town main supply.
- A 150mm 4-way booster connection

The booster valve assembly shall be located affixed to the building façade, within sight of the

main entry. A 90/90/90 radiant heat shield wall shall be provided behind the booster assembly, extending a minimum of 2m either side of the farthest hose connection points, and 3m above the highest hose connection points.

5.14 Booster Pumps

Booster pumps shall be provided to ensure adequate pressure within the combined fire hydrant / fire sprinkler service. Pumps shall be installed on the fire hydrant /fire sprinkler service water supply, in parallel to the fire brigade booster valve assembly so that Fire & Rescue NSW appliance boosting is not effected by operation of the on-site pumps.

Buildings more than 25m in effective height require a more reliable pump installation in accordance with Building Code of Australia requirements. This increased reliability is achieved by the installation of pumps in duplicate, both being driven by diesel engines or a diesel & electric engines. Pumps shall be sized as a duty/standby arrangement whereby each pump has the capacity to provide 100% of the full required duty, therefore providing 100% redundancy to the system in the event of a single pump failure. Pumps shall be automatically controlled via a dedicated pump control panel, complete with an interface connection to the Fire Indicator Panel and Building Monitoring System.

5.15 Backflow Prevention

Site containment backflow protection shall be provided to the combined fire hydrant /fire sprinkler service water supply for this development in accordance with the requirements of AS 3500.1 – Water Services. The required backflow prevention device shall be a double detector check valve assembly.

5.16 Materials

Combined fire hydrant / fire sprinkler service for this development shall be constructed from materials as follows;

Pipework	Location	Diameter	Material
Fire Hydrant / Fire Sprinkler Service	In-Ground	All	PN16 Blue Brute or equivalent CPVC pipe and fittings with rubber ring joints.
Fire Hydrant / Fire Sprinkler Service	Suspended Mains	All	Galvanised Steel Pipe with mechanical coupling joints.
Fire Hydrant / Fire Sprinkler Service	Downstream of fire sprinkler control assemblies	All	Medium Wall Black Mild Steel Pipe with mechanical coupling joints and screwed fittings.
Fire Hydrant / Fire Sprinkler Service	Test Drains	All	Galvanised Steel Pipe with mechanical coupling joints.

Pumps	Make	Model	Duty
Booster Pumps	TBC by Contractor	TBC by Contractor	TBC by Contractor

6 Spatial Requirements

6.1 Combined Fire Hydrant / Fire Sprinkler Service:

Item	Description	Area	Configuration	Comments
1	Fire Brigade Booster Valve Cupboard	4.50m ²	4.5m x 1.0m 1.8m high	Proposed location is Ground level within site of the main building entry and street facing. The cupboard must have direct access to external space, Affixed to building façade or not less than 10m from the external wall of any building served.
2	Booster Valve Radiant Heat Shield	35.7m ²	8.5m x 4.2m high	If Affixed to building façade behind fire brigade booster valve. Wall to be 90/90/90 fire rated, extending 2m either side of the hose connections and 3m above the highest hose connection.
3	Pump Room	30.00m ²	6m x 5m 2.4m high	Mechanically ventilated plant room located at Basement level 1 with direct access to fire stair via air lock.
4	Water Storage Tank	51m ²	8.5m x 6m 3m high	150,000 litre water storage tank located at Basement level 1 adjacent to fire services pump room. Must be split into two equal portions of 75,000L each for maintenance and will require access from level above.
5	Fire Hydrant Landing Valves	0.21m ²	0.6m x 0.35m 1.2m high	Fire hydrant located within each fire stair at each level of the building, and as otherwise required to achieve full coverage from 30m hose length.
6	Combined Fire Hydrant/Sprinkler control assembly riser	0.385m ²	1.1m x 0.35m 1.8m high	Combined fire Hydrant/ sprinkler control assembly riser located within all fire stairs at each level of the building. Sprinkler control valves wall mounted between 1150mm and 1800mm above floor level, above fire hydrant landing valve.

6.2 Portable Fire Extinguishers:

Item	Description	Area	Configuration	Comments
1	Portable Fire Extinguishers	Included	Included	Typically located within fire hose reel cupboards as required throughout all areas of the development.
2	Portable Fire Extinguishers	0.09m ²	0.3m x 0.3m	Located within dedicated cupboards on all residential levels of the building such that a fire extinguisher is provided within 10m from each apartment entry door.

Note: All riser sizes shown above are provided as minimum requirement to satisfy future works. These are preliminary sizes to fit expected services. Final riser sizes to be confirmed once service layouts are completed. All dimensions are provided for internal configuration.

7 Appendix

7.1 Sydney Water Mains Diagram

7.2 Concept Spatials

7.3 Concept Schematics

Statement of Available Pressure and Flow

Administrator Administrator
89 York Street
Sydney, 2000

Attention: Administrator Administrator

Date: 13/09/2018

Pressure & Flow Application Number: 471286
Your Pressure Inquiry Dated: 2018-07-30
Property Address: 15 Northumberland Street, Liverpool 2170

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Northumberland Street	Side of Street: West
Distance & Direction from Nearest Cross Street	120 metres North from Campbell Street
Approximate Ground Level (AHD):	12 metres
Nominal Size of Water Main (DN):	200 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	53 metre head
Minimum Pressure	38 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	38
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	41
	10	41
	20	40
	25	39
	30	39
	40	38
	50	36
	60	35
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	38
	10	37
	20	36
	25	36
	30	35
	40	34
	50	32
	60	31
Maximum Permissible Flow	84	26

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – www.sydneywater.com.au/tapin/index.htm. Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.



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FIRE SERVICES SPATIAL MARK-UP

DATE: 04/12/2018

BY: INNES WALL

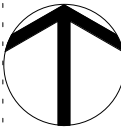
9 - 15 NORTHUMBERLAND STREET,LIVERPOOL, NSW

DEVELOPMENT APPLICATION



DRAWING LIST - GROUPGSA - DA								
WTWT	Sheet Name	Sheet Issue Date	Drawn By	Checked By	Approved By	Current Revision	Discipline	Package
0000 COVER / TITLE / LOCATION								
DA0000	DRAWING SCHEDULE / SITE LOCATION PLAN	07/06/18	MF	MB	LR	D	ARCH	DA
DA0001	PERSPECTIVE	09/11/18	Author	Checker	Approver	D		DA
1000 DEMOLITION PLANS								
DA1001	DEMOLITION PLAN	08/20/18	MF	MB	LR	D	ARCH	DA
1100 SITE PLANS								
DA1100	SITE PLAN	07/06/18	MF	MB	LR	E	ARCH	DA
DA1101	SITE ANALYSIS PLAN	07/06/18	MF	MB	LR	C	ARCH	DA
2000 GENERAL ARRANGEMENT PLANS								
DA2000	BASEMENT 2 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2001	BASEMENT 1 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2002	GROUND FLOOR GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2003	LEVEL 1 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2004	LEVEL 2-3 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2005	LEVEL 4 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2006	LEVEL 5 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2007	LEVEL 6-7 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2008	LEVEL 8 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2009	LEVEL 9-11 GA PLAN	14/08/2018	MF	MB	LR	E	ARCH	DA
DA2010	ROOF PLAN	06/07/18	MF	MB	LR	E	ARCH	DA
2450 1:50 UNIT LAYOUT PLANS								
DA2450	ADAPTABLE UNITS 3 & 3A	07/06/18	MF	MB	LR	D	ARCH	DA
DA2451	ADAPTABLE UNITS 6 & 12	09/06/18	MF	MB	LR	D	ARCH	DA
3000 ELEVATIONS								
DA3000	STREETSCAPE ELEVATION	07/06/18	MF	MB	LR	E	ARCH	DA
DA3001	ELEVATION SHEET 1	07/06/18	MF	MB	LR	F	ARCH	DA
DA3002	ELEVATION SHEET 2	07/06/18	MF	MB	LR	F	ARCH	DA
3100 SECTIONS								
DA3100	SECTION SHEET 1	07/06/18	MF	MB	LR	E	ARCH	DA
DA3101	SECTION SHEET 2	07/26/18	MF	MB	LR	E	ARCH	DA
4000 SHADOWS								
DA4000	SHADOW DIAGRAMS JUNE 21 - 9AM TO 12PM	07/06/18	MF	MB	LR	D	ARCH	DA
DA4001	SHADOW DIAGRAMS JUNE 21 - 1PM TO 3PM	08/03/18	MF	MB	LR	D	ARCH	DA
4100 DIAGRAMS								
DA4100	GFA LEP	08/17/18	MF	MB	LR	D	ARCH	DA
DA4101	SEPP 65 - BALCONY & COMMON OPEN SPACE	08/03/18	MF	MB	LR	D	ARCH	DA
DA4102	SUN'S EYE VIEW	08/02/18	MF	MB	LR	D	ARCH	DA
DA4103	SUN'S EYE VIEW - 2	08/03/18	MF	MB	LR	D	ARCH	DA
DA4104	SOLAR ACCESS	07/06/18	MF	MB	LR	D	ARCH	DA
DA4105	CROSS VENTILATION	07/06/18	MF	MB	LR	D	ARCH	DA
DA4106	CALCULATION DIAGRAMS SHEET 1	09/11/18	MF	MB	LR	B	ARCH	DA
DA4107	CALCULATION DIAGRAMS SHEET 2	11/06/18	MF	MB	LR	B	ARCH	DA
DA4108	NOTIFICATION PLAN	10/25/18	MF	MB	LR	B	ARCH	DA
7000 VIEWS								
DA7001	AXO VIEWS	09/07/18	MF	MB	LR	D	ARCH	DA
DA7002	PERSPECTIVES VIEWS SHEET 1	11/27/18	Author	Checker	Approver	A		DA
DA7003	PERSPECTIVE VIEWS SHEET 2	11/27/18	Author	Checker	Approver	A		DA
Grand total: 37								

Amendments		
Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
B	ISSUE FOR INFORMATION	03/09/2018
C	ISSUE FOR INFORMATION	08/11/2018
D	ISSUE FOR INFORMATION	28/11/2018



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BCA/DDA Consultant

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PO Box 167, Broadway
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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

DRAWING SCHEDULE /
SITE LOCATION PLAN

Scale

Drawing Created (date) 07/06/18

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA0000 D

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by Intrax Consulting Engineers

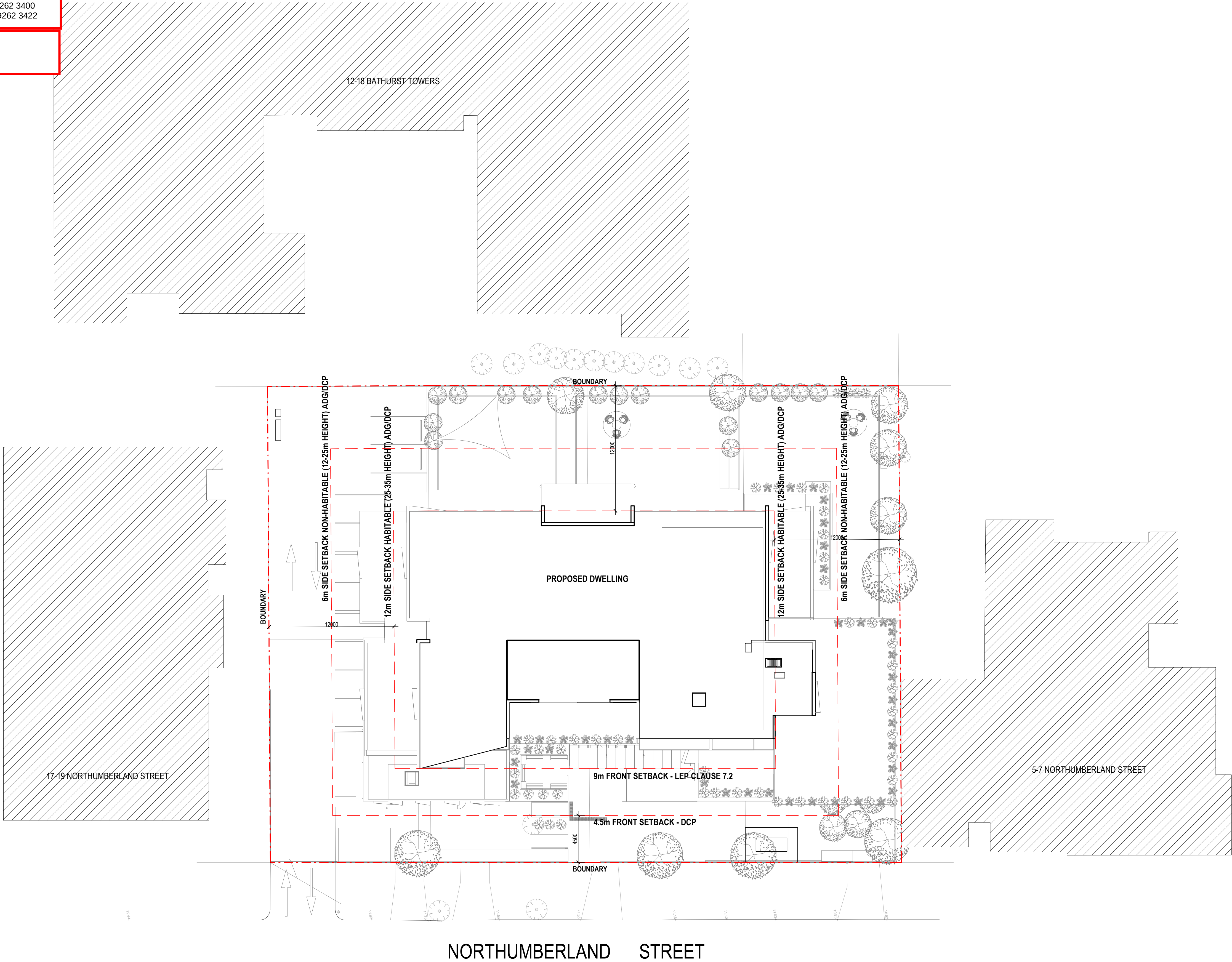
Suite 6.02,
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Fax: (02) 9262 3422

FIRE SERVICES SPATIAL MARK-UP

DATE: 04/12/2018

BY: INNES WALL



1

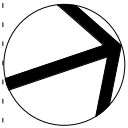
SITE PLAN DA

1 : 200

NOTE:
FOR ROOF PLAN, REFER TO DA2010

Amendments

Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
B	ISSUE FOR INFORMATION	03/09/2018
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Project Title

ANGLICARE - LIVERPOOL

Drawing Title

SITE PLAN

Scale

1 : 200

Drawing Created (date)

07/06/18

Drawing Created (by)

MF

Plotted and checked by

LMC

Verified

MB

Approved

LR

Project No

180350

Drawing No

DA1100

Issue

E

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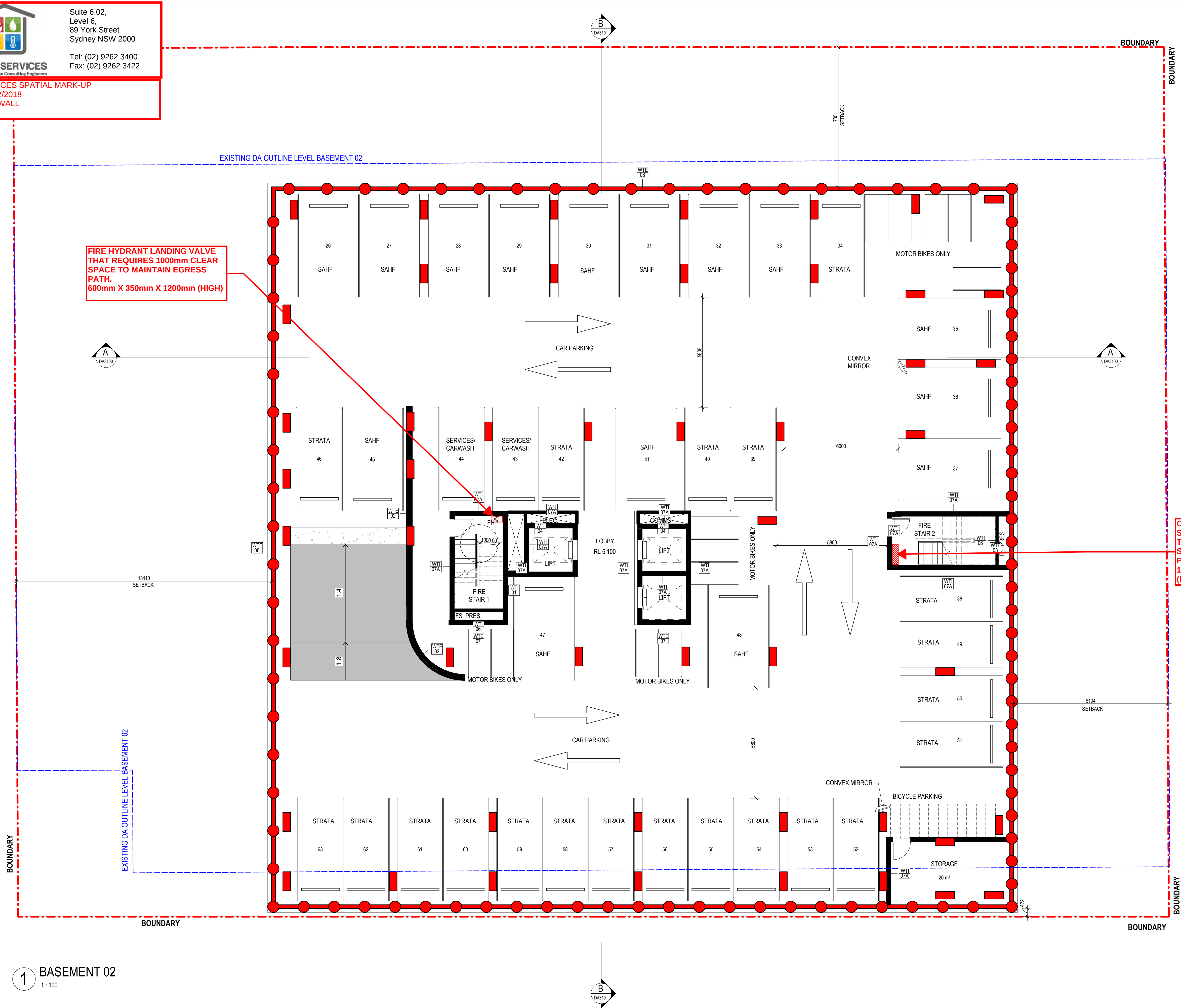
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FIRE SERVICES SPATIAL MARK-UP

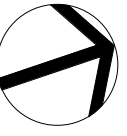
DATE: 04/12/2018

BY: INNES WALL



Amendments

Issue	Description	Date
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E	ISSUE FOR INFORMATION	28/11/2018



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ANGLICARE - LIVERPOOL

Drawing Title

BASEMENT 2 GA PLAN

Scale

1 : 100

Drawing Created (date)

14/08/2018

Drawing Created (by)

MF

Plotted and checked by

LMC

Verified

MB

Approved

LR

Project No

180350

Drawing No

DA2000

Issue

E

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FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

B
DA3101

BOUNDARY

BOUNDARY

EXISTING DA OUTLINE LEVEL BASEMENT 01

FIRE HYDRANT LANDING VALVE
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
600mm X 350mm X 1200mm (HIGH)

A
DA3100

COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
1100mm X 350mm X 2100mm
(HIGH)

COMBINED FIRE HYDRANT /
FIRE SPRINKLER PUMP
ROOM.
6000mm X 5000mm

MOVE COMBINED FIRE
HYDRANT / FIRE SPRINKLER
WATER STORAGE TANK.
150,000L (EFFECTIVE
CAPACITY). SPLIT INTO TWO
EQUAL PORTIONS OF 75,000L
EACH.

ALLOW FOR 4 x 900mm x 900mm
ACCESS COVERS, TWO FOR EACH
TANK FROM ABOVE

EXISTING DA OUTLINE LEVEL BASEMENT 01

BOUNDARY

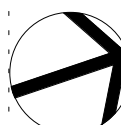
BOUNDARY

BOUNDARY

1 BASEMENT 01

1: 100

Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
B	ISSUE FOR INFORMATION	03/09/2018
C	ISSUE FOR INFORMATION	19/10/2018
D	ISSUE FOR INFORMATION	08/11/2018
E	ISSUE FOR INFORMATION	28/11/2018



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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

BASEMENT 1 GA PLAN

Scale 1: 100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2001 E

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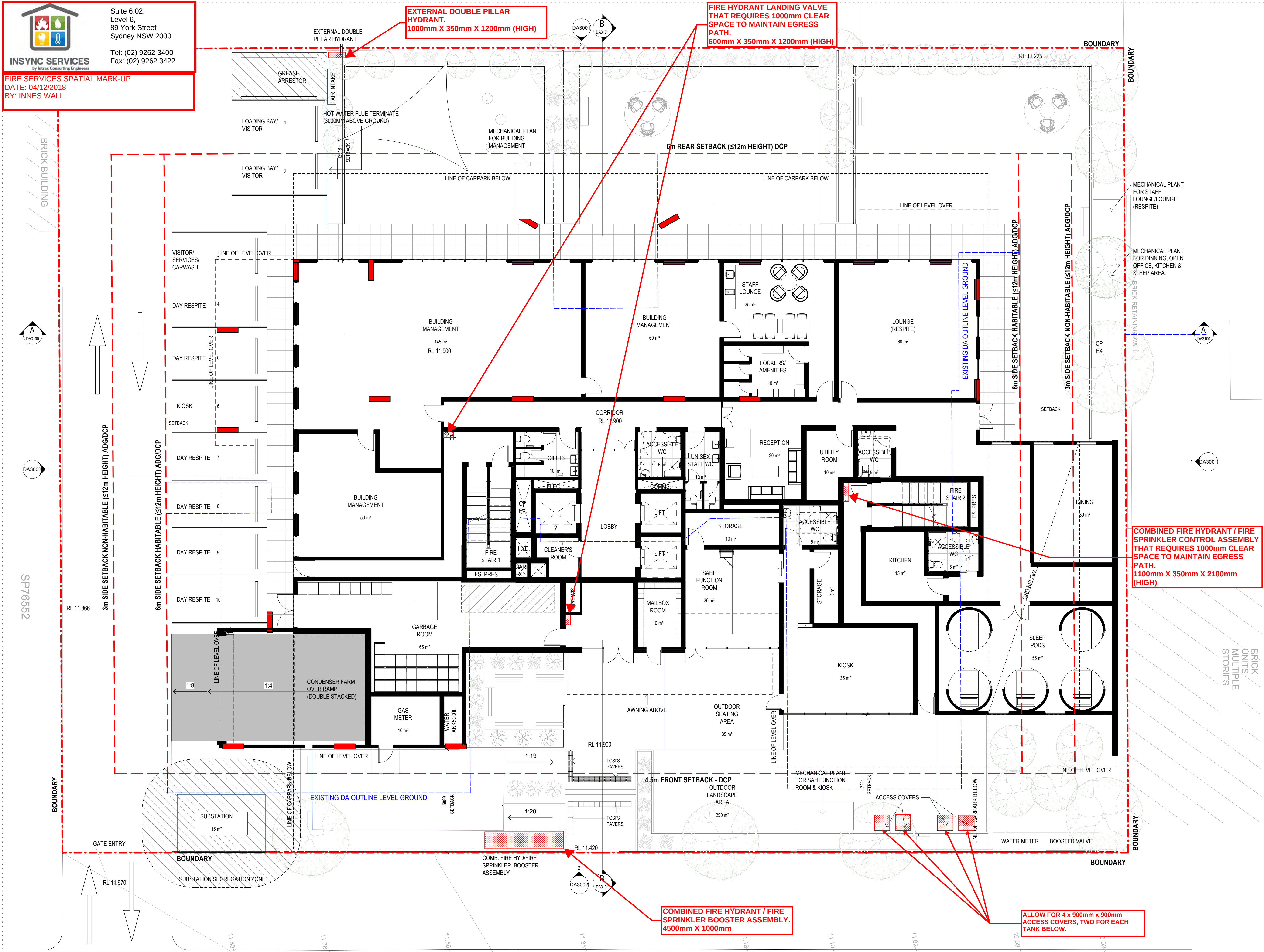


INSYNC SERVICES
by Intra Consulting Engineers

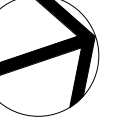
FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

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Amendments		
Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
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nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

GROUND FLOOR GA PLAN

Scale 1:100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

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Project No 180350 Drawing No DA2002 Issue E

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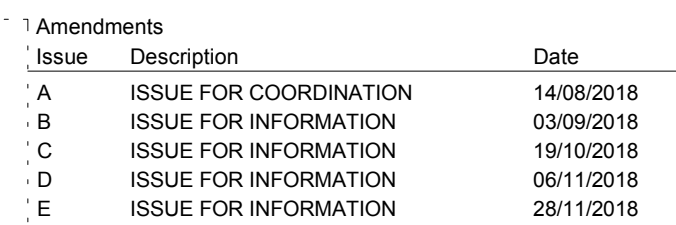
1 GROUND LEVEL PLAN
1:100

NORTHUMBERLAND STREET



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**PORTABLE FIRE EXTINGUISHERS
LOCATED SUCH THAT A FIRE
EXTINGUISHER IS PROVIDED
WITHIN 10m FROM EACH
APARTMENT ENTRY DOOR. CAN
BE WALL MOUNTED OR PLACE
WITHIN CUPBOARDS.
300mm X 300mm X 1200mm (HIGH)**



DA SUBMISSION

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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 1 GA PLAN

Scale 1 : 100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by _____ LMC

Verified	MB
----------	----

Approved LR

Project No	Drawing No	Issue
------------	------------	-------

190350 DA3003 F

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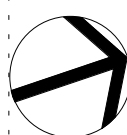
FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

PORTABLE FIRE EXTINGUISHERS
LOCATED SUCH THAT A FIRE
EXTINGUISHER IS PROVIDED
WITHIN 10m FROM EACH
APARTMENT ENTRY DOOR. CAN
BE WALL MOUNTED OR PLACE
WITHIN CUPBOARDS.
300mm X 300mm X 1200mm (HIGH)

FIRE HYDRANT LANDING VALVE
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
600mm X 350mm X 1200mm (HIGH)

COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
1100mm X 350mm X 2100mm
(HIGH)

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nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 2-3 GA PLAN

Scale 1 : 100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2004 E

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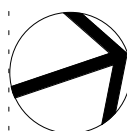
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DATE: 04/12/2018
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300mm X 300mm X 1200mm (HIGH)

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600mm X 350mm X 1200mm (HIGH)

COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
1100mm X 350mm X 2100mm
(HIGH)

Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
B	ISSUE FOR INFORMATION	03/09/2018
C	ISSUE FOR INFORMATION	19/10/2018
D	ISSUE FOR INFORMATION	08/11/2018
E	ISSUE FOR INFORMATION	28/11/2018



North Point

DA SUBMISSION

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Structural Engineer

NORTHROP
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Sydney NSW 2000

Fire Engineer

OLSSON FIRE

Traffic Engineer

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Cammeray NSW 2062

Waste Consultant

ELEPHANTS FOOT
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Brisbane QLD 4000

BCA/DDA Consultant

BLACKETT MAGUIRE + GOLDSMITH
PO Box 167, Broadway
NSW 2007

Client

Enter Project Client Name here

GROUP GSA

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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 4 GA PLAN

Scale 1 : 100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2005 E

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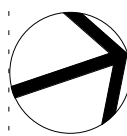
FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

PORTABLE FIRE EXTINGUISHERS
LOCATED SUCH THAT A FIRE
EXTINGUISHER IS PROVIDED
WITHIN 10m FROM EACH
APARTMENT ENTRY DOOR. CAN
BE WALL MOUNTED OR PLACE
WITHIN CUPBOARDS.
300mm X 300mm X 1200mm (HIGH)

FIRE HYDRANT LANDING VALVE
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
600mm X 350mm X 1200mm (HIGH)

COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
1100mm X 350mm X 2100mm
(HIGH)

Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
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D	ISSUE FOR INFORMATION	08/11/2018
E	ISSUE FOR INFORMATION	28/11/2018



North Point

DA SUBMISSION

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NORTHROP
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BCA/DDA Consultant

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NSW 2007

Client

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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 5 GA PLAN

Scale 1:100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2006 E

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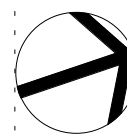
FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

PORTABLE FIRE EXTINGUISHERS
LOCATED SUCH THAT A FIRE
EXTINGUISHER IS PROVIDED
WITHIN 10m FROM EACH
APARTMENT ENTRY DOOR. CAN
BE WALL MOUNTED OR PLACE
WITHIN CUPBOARDS.
300mm X 300mm X 1200mm (HIGH)

FIRE HYDRANT LANDING VALVE
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
600mm X 350mm X 1200mm (HIGH)

COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
1100mm X 350mm X 2100mm
(HIGH)

Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
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E	ISSUE FOR INFORMATION	28/11/2018



North Point

DA SUBMISSION

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Fire Engineer

OLSSON FIRE

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BCA/DDA Consultant

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NSW 2007

Client

Enter Project Client Name here



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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 6-7 GA PLAN

Scale 1:100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2007 E

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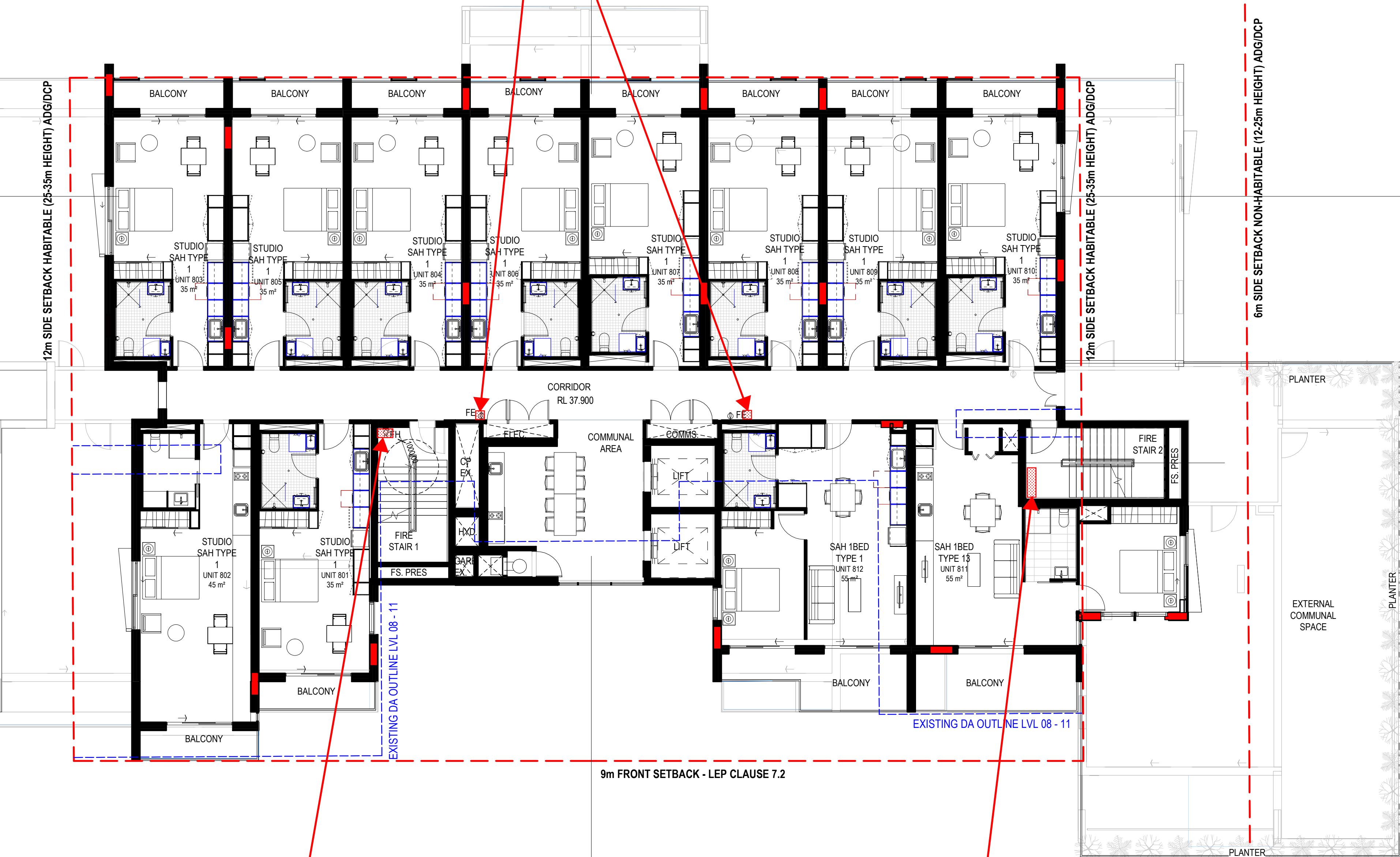


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Fax: (02) 9262 3422

FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

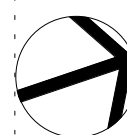
PORTABLE FIRE EXTINGUISHERS
LOCATED SUCH THAT A FIRE
EXTINGUISHER IS PROVIDED
WITHIN 10m FROM EACH
APARTMENT ENTRY DOOR. CAN
BE WALL MOUNTED OR PLACE
WITHIN CUPBOARDS.
300mm X 300mm X 1200mm (HIGH)



FIRE HYDRANT LANDING VALVE
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
600mm X 350mm X 1200mm (HIGH)

COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
PATH.
1100mm X 350mm X 2100mm
(HIGH)

Amendments		
Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
B	ISSUE FOR INFORMATION	03/09/2018
C	ISSUE FOR INFORMATION	19/10/2018
D	ISSUE FOR INFORMATION	08/11/2018
E	ISSUE FOR INFORMATION	28/11/2018



North Point

DA SUBMISSION

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Fire Engineer

OLSSON FIRE

Traffic Engineer

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Waste Consultant

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BCA/DDA Consultant

BLACKETT MAGUIRE + GOLDSMITH
PO Box 167, Broadway
NSW 2007

Client

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GROUP GSA

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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 8 GA PLAN

Scale 1 : 100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by LMC

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2008 E

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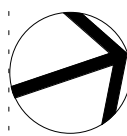
FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL

PORTABLE FIRE EXTINGUISHERS
LOCATED SUCH THAT A FIRE
EXTINGUISHER IS PROVIDED
WITHIN 10m FROM EACH
APARTMENT ENTRY DOOR. CAN
BE WALL MOUNTED OR PLACE
WITHIN CUPBOARDS.
300mm X 300mm X 1200mm (HIGH)

FIRE HYDRANT LANDING VALVE
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COMBINED FIRE HYDRANT / FIRE
SPRINKLER CONTROL ASSEMBLY
THAT REQUIRES 1000mm CLEAR
SPACE TO MAINTAIN EGRESS
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1100mm X 350mm X 2100mm
(HIGH)

Amendments		
Issue	Description	Date
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North Point

DA SUBMISSION

Services Engineers

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Fire Engineer

OLSSON FIRE

Traffic Engineer

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BCA/DDA Consultant

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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title

LEVEL 9-11 GA PLAN

Scale 1:100

Drawing Created (date) 14/08/2018

Drawing Created (by) MF

Plotted and checked by Designer

Verified MB

Approved LR

Project No Drawing No Issue

180350 DA2009 E

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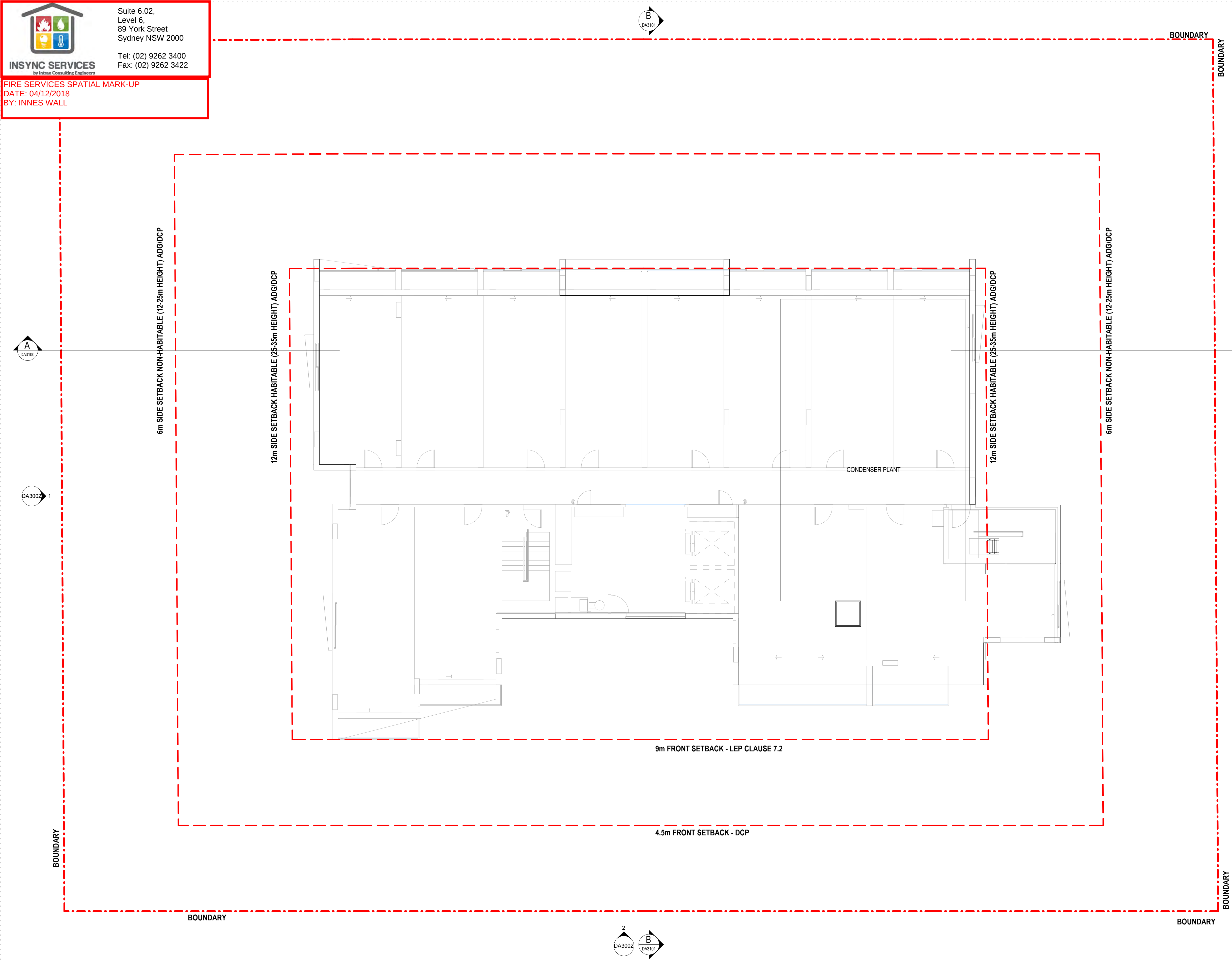


INSYNC SERVICES
by Intra Consulting Engineers

Suite 6.02,
Level 6,
89 York Street
Sydney NSW 2000

Tel: (02) 9262 3400
Fax: (02) 9262 3422

FIRE SERVICES SPATIAL MARK-UP
DATE: 04/12/2018
BY: INNES WALL



1 ROOF PLAN
1 : 100

Amendments		
Issue	Description	Date
A	ISSUE FOR COORDINATION	14/08/2018
B	ISSUE FOR INFORMATION	03/09/2018
C	ISSUE FOR INFORMATION	19/10/2018
D	ISSUE FOR INFORMATION	08/11/2018
E	ISSUE FOR INFORMATION	28/11/2018



North Point

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Services Engineers	
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Structural Engineer	
NORTHROP Level 11, 345 George Street Sydney NSW 2000	
Fire Engineer	
OLSSON FIRE	
Traffic Engineer	
PTC Suite 102, 506 Miller Street Camberay NSW 2062	
Waste Consultant	
ELEPHANTS FOOT Suite 29, Level 8, 820 Adelaide Street Brisbane QLD 4000	
BCA/DDA Consultant	
BLACKETT MAGUIRE + GOLDSMITH PO Box 187, Broadway NSW 2007	
Client	
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architecture interior design urban design landscape
nom architect M. Sheldon 3990
Project Title

ANGLICARE - LIVERPOOL

Drawing Title		
ROOF PLAN		
Scale	1 : 100	
Drawing Created (date)	06/07/18	
Drawing Created (by)	MF	
Plotted and checked by	LMC	
Verified	MB	
Approved	LR	
Project No	Drawing No	Issue
180350	DA2010	E

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RF
RL:

L11
RL:

L10
RL:

L9
RL:

L8
RL:

L7
RL:

L6
RL:

L5
RL:

L4
RL:

L3
RL:

L2
RL:

L1
RL:

GROUND
RL:

B1
RL:

B2
RL:

COMBINED FIRE HYDRANT/ FIRE
SPRINKLER TANKS
2 x 75,000L (EFFECTIVE CAPACITY)
150,000L (TOTAL EFFECTIVE CAPACITY)

150mm 4 X FIRE BRIGADE
BOOSTER POINTS
(HIGH RISE)

150mm 4 X FIRE BRIGADE
BOOSTER POINTS
(LOW RISE)

4 X SUCTION POINT

DOUBLE CHECK DETECTOR VALVE
WITH METERED BYPASS. SIZE AND
TYPE BY FIRE SPRINKLER
CONTRACTOR

NEW 150mm COMBINED FIRE HYDRANT / FIRE
SPRINKLER SERVICE CONNECTION TO
EXISTING SYDNEY WATER 200mm WATER
MAIN WITHIN NORTHERLAND ST.

Services Consultant:



Suite 6.02, Level 6
89 York Street
SYDNEY NSW 2000
Ph (02) 9262 3400
Fax (02) 9262 3422
A.C.N.: 150 234 870
A.B.N.: 24 917 388 129



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Project:

**SOCIAL AND AFFORDABLE HOUSING FUND
STAGE 2
LIVERPOOL**

Drawing Title:

**COMBINED FIRE SPRINKLER &
FIRE HYDRANT
SCHEMATIC DIAGRAM**

Dwg No:

F-LIV-01

Scale:

(A3) N.T.S.
Date: 25/06/18

Job No:

20180062