

# TMK CONSULTING ENGINEERS

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SPECIFICATION 1710168FI\_A

SEPTEMBER 2018



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## SPECIFICATION FOR FIRE SERVICES

**PROPOSED RESIDENTIAL DEVELOPMENT  
419 REGENCY ROAD, PROSPECT**

**FOR: NIATRON 10 PTY LTD**

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## **FIRE SERVICES**

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## PRELIMINARIES

### 1 SCOPE - PRELIMINARIES

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The Works include, but are not necessarily limited to, the matters or things referred to in the Specifications, Drawings, Amendments and any correspondence.

Allow to make good all existing roads, paths, kerbs and crossovers etc where disturbed by the installation of new services and are external to the area of redevelopment.

### 2 DIRECTIONS TO CONTRACTOR - PRELIMINARIES

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Directions, instructions and the like given in this Specification, whether or not they include the expression 'the Contractor shall' or equivalent, shall be deemed to be given to and accepted by the Contractor, unless otherwise stated in the Contract.

### 3 INTERPRETATIONS - PRELIMINARIES

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The following items may or may not be specified in the Specification, but if specified, the following items shall apply.

In the Contract, except where the context otherwise requires:

'approved', 'directed', 'required', 'rejected', and similar expressions, shall mean approved, directed, required, rejected, and the like, by the Construction Manager.

'give notice', 'submit', 'furnish', and similar expressions, shall mean give notice, submit, furnish, and the like, to the Construction Manager.

'Constructional Plant' means appliances and things used in the execution of the work under the Contract, but not forming part of the Works or the Temporary Works;

'Drawings' means the drawings referred to in the Contract and any modification of such drawings notified to the Contractor by the Construction Manager and includes such other drawings as may from time to time be supplied to the Contractor by the Construction Manager, or the use of which has been permitted by the Construction Manager, for the purposes of the Contract;

'the Architect' means the designer of the building Works,

'the Engineer' means the specifier of the relevant Engineering Works,

'the Construction Manager' means the person acting on the Principal's behalf,

'the Principal' has the same meaning as 'the Proprietor';

'Schedule of Rates' means any schedule included in the Contract which, in respect of any section or item of work to be carried out, shows the rate or respective rates of payment for the execution of that work and which may also include lump sums, provisional sums, contingency sums, other sums, quantities and prices;

'Temporary Works' means works used for the execution of the work under the Contract but not forming part of the Works;

'the Works' means the whole of the work to be executed in accordance with the Contract, including variations provided for by the Contract, which by the Contract are to be handed over to the Principal;



'work under the Contract' means the work which the Contractor is or may be required to execute under the Contract, and includes variations, remedial works, Constructional Plant and Temporary Works.

#### **4 CLASSIFIED DOCUMENTS - PRELIMINARIES**

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This Specification, the relevant Drawings and other documents shall not be disclosed to persons other than those requiring to see them in the course of their duties except with the prior consent of the Principal and then only subject to such conditions as the Principal may impose.

Handle prints or copies of classified Drawings and other documents in accordance with instructions given by the Principal.

#### **5 DISCREPANCIES IN DOCUMENTS - PRELIMINARIES**

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The several documents which constitute or evidence the Contract shall be taken as mutually explanatory and anything contained in one but not in another shall be equally binding as if contained in all.

The Contractor shall, without adjustment to the contract sum, supply and execute minor items not expressly mentioned in the Contract but necessary for the satisfactory completion and performance of the work under the Contract.

#### **6 DRAWINGS AND SPECIFICATION - PRELIMINARIES**

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The Drawings, if any, and the Specification represent generally the forms, dimensions and description of the Works.

Where any discrepancy exists between figured and scaled dimensions, the figured dimensions shall prevail.

Drawings made to larger scales and those showing particular parts of the Works shall take precedence over Drawings made to smaller scales and those for more general purposes.

#### **7 INTERPRETATION OF DRAWINGS - PRELIMINARIES**

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The layout of plant and equipment as shown on the Drawings is diagrammatic only. Obtain measurements and other information necessary to carry out the work specified.

If the Works include alterations and/or additions to existing work, verify the dimensions of the existing work before proceeding, and notify discrepancies as required by the Contract.

#### **8 PROGRAM OF WORK - PRELIMINARIES**

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The Contractor shall, before commencing work on site, supply a construction program showing the dates by which or the times within which the various stages or parts of the work under the Contract are to be executed, and shall adhere to that program unless a deviation therefrom is approved or directed.

If the Construction Manager approves or directs a deviation from the program the Contractor shall within the reasonable time stated in any such direction, supply a further construction program.



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## **9 PROTECTION OF PERSONS AND PROPERTY - PRELIMINARIES**

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The Contractor shall avoid interference with or damage to property on or adjacent to the site, and shall provide temporary protection to existing fixtures, fittings and surfaces as well as new work, during the course of this contract and shall repair and reinstate all damage caused thereto by him either directly or indirectly.

Take all necessary precautions to protect and prevent nuisance to the owners, tenants or occupiers of the site and properties adjacent to the site, and to the public generally for the duration of the contract.

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## **10 EXISTING SERVICES - PRELIMINARIES**

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Contact the existing personnel before work commences and check with them the location of all services.

In the event of damage to any water, gas, steam, compressed air, electric, drainage, sewerage, telephone, fire alarm, control cable, or other services in the area, they shall render any assistance required in connection with any such incident, but otherwise work in that vicinity shall be stopped immediately and not recommenced until instructions are received from the Construction Manager.

- If the service is to be continued: Repair, divert, or relocate as required.
- If the service is to be abandoned: Cut and seal or disconnect, and make safe.

In either case to satisfy the authorities concerned.

The cost of dealing as above with 'live' services not visible or the location of which could not be ascertained by the Contractor from the appropriate authority or from the Contract will be valued as a variation to the work under the Contract provided that the Contractor has taken all reasonable precautions to determine the location of existing services and safeguard them before trenching, releveling, roadmaking, demolition, or similar operations are commenced.

Notify the Construction Manager immediately upon the discovery of services or obstructions not shown on the Drawings.

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## **11 STORAGE ON SITE - PRELIMINARIES**

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Store materials and equipment on site so as to prevent damage to the site, the stored material and minimise hazards to persons. Keep storage areas neat and tidy.

Do not use roads, driveways, paths, hardstandings and the like forming part of the Works for storage unless prior written approval has been given.

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## **12 NOISE CONTROL - PRELIMINARIES**

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Take all practicable precautions to minimise noise resulting from work under the Contract. Fit all construction equipment with noise suppressers and use so that noise is minimised.

Do not use loud hailers.

Petrol and diesel driven tools are not permitted without prior approval of the Construction Manager.



### **13 TEMPORARY WORKS - PRELIMINARIES**

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Alter, adapt and maintain temporary works as necessary, and remove them progressively as the work proceeds, unless otherwise specified or instructed.

Obtain the written consent of the Construction Manager for the inclusion in the Works of any temporary works which it is proposed to leave in position at the completion of the Contract.

### **14 PRACTICAL COMPLETION - PRELIMINARIES**

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Without prejudice to meanings which may be stated or implied elsewhere in the Contract, 'Practical Completion' shall mean that stage in the execution of the work under the Contract when such documents and other information required under the Contract which, in the opinion of the Construction Manager, are essential for the use, operation and maintenance of the Works have been supplied, and the Works are substantially complete except for minor items.

Minor omissions and minor defects may include those:

- which do not prevent the Works from being reasonably capable of being used for their intended purpose, and
- which the Construction Manager determines that the Contractor has reasonable grounds for not correcting promptly, and
- rectification of which will not prejudice the convenient use of the Works, and
- those tests which are required by the Contract to be carried out and passed before the Works are handed over to the Principal have been carried out and passed.

Without limiting the generality of the foregoing, the following particular requirements shall have been met:

- the testing of fire systems has been satisfactorily completed
- the Contractor's hoist, crane, scaffolding and other major items of Constructional Plant have been removed from the Works
- keys have been labeled appropriately and handed over
- the requirements of statutory authorities have been satisfied and approval certificates handed over to the principal
- the contractor has handed over the "as constructed" drawings to the Construction Manager
- Equipment and fixture warranties, operating manuals and any other relevant information in relation to the works has been handed over to the Construction Manager

### **15 MATERIALS, LABOUR AND PLANT - PRELIMINARIES**

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The Contractor shall, unless the Contract otherwise provides, supply at his own cost and expense everything necessary for the proper completion of the work under the Contract and the proper performance of his obligations under the Contract.





## 17 SAMPLES - PRELIMINARIES

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Items in respect of which samples are specified shall be in accordance with an approved sample, or within a range defined by approved samples, as determined by the Construction Manager, otherwise such items shall be liable to rejection. Keep approved samples in good condition on the site until Practical Completion.

Submit the following samples

- Sprinklers
- Fire detectors
- Manual call points
- Strobe lights
- Electronic sounders
- Alarm bells



## 1. GENERAL

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### 1.1 SCOPE - FIRE SERVICES

The Contract Conditions, Preliminaries and the Drawing form a part of the contract.

The work includes, but is not limited to, the design, supply, installation, testing and commissioning of the following:

The Fire Services Drawings are:

1710168-F1

1710168-F2

1710168-F3

### SITE INFRASTRUCTURE

- (a) Provide a Grade 3 water supply for boosted internal hydrant system
- New 100mm town main supply from Airlie Ave to be used for hydrant system. Make application and pay all fees to SAWater for a full bore connection.
  - Hydrant protection via an internal hydrant in fire rated stairwell at each floor level.
  - Backflow prevention valve at boundary to be testable single-check valve assembly to OTR requirements..
  - Exposed fire hydrant main in building to be protected with hangers fire rated to -/60/60 FRL.
  - Internal Hydrant Flow requirements: one (1) hydrant head at 10l/s @ 350kPa)
- (b) Comply with AS2419 requirements

### BUILDING WORKS

- (b) Provide an internal hydrant system, with single headed internal hydrant at each floor level, within the fire rated stairwell.
- Comply with AS2419 requirements
  - New 100mm hydrant riser, within the central stairwells, with internal hydrant head at each floor level.
  - All isolation valves on system to be monitored valves to AS 2118 requirements.
  - Clearance in stairwell to BCA criteria;
- (c) Provide a new addressable fire detection system throughout complying with AS1670.1 requirements
- In common areas/spaces, spacing to AS1670.1 requirements.



- In Sole Occupancy Units, to AS3786 spacing (residential requirements of BCA). addressable heads wired back to FIP, with 180 second delay, before latching onto common occupant warning system.
  - Addressable AS1670.1 FIP privately monitored .
- (d) Provide a Building Occupant Warning system throughout the building. On activation of any common area smoke detector, the building occupant warning system to activate throughout the building to BCA Part E requirements, including localised sounders within the apartments.  
On activation of a localised smoke detector within an apartment, the sounder bases only within the relevant apartment, and sounders within the bedrooms to activate. If the activation continues, after 180 seconds, the system latches onto the main building occupant warning system, in which case all AS1670.1 sounders to operate throughout the building, including the localised sounders/sounder bases within all apartments, to achieve the 75dBa criteria at the bedhead.
- (e) Portable fire extinguishers throughout to AS2444 requirements.
- (f) Fire hose reel to ground floor to AS2114 requirements;

#### GENERAL

- (a) This is to be read in conjunction with all drawings.
- (b) The plans are indicative & will change.
- (c) Seal all penetrations, fire proof at fire barriers.
- (d) Preparation of co-ordinated shop and as constructed drawings (Drawings in ACAD format)
- (e) Operating and Maintenance manuals (3 hard copies, 3-ring binder , plus soft copy)
- (f) Testing and commissioning of all installed systems
- (g) Twelve months maintenance, warranty and defects liability for the entire installation  
The provision of all hoisting and scaffolding required for the installation of the above systems
- (h) Internal hydrant at each level in the fire stairwell.
- (i) Manual call points, electronic sounders, strobe lights, external alarm bells
- (j) Interfacing as required.
- (k) Fire rated cables for signal cables between fire indicator panels as required.
- (l) Water supply
- (m) Allow to make good all existing roads, paths, kerbs and crossovers etc where disturbed by the installation of new services and are external to the area of redevelopment.
- (n) Allow to supply & install an additional 5 addressable smoke detectors and 20m length of associated cables. Location of smoke detectors to be advised on site.
- (o) Allow to supply and install an additional 5 sprinkler heads & to locations to be confirmed allowing for 3m of 25DN connecting pipework to each sprinkler head.
- (p) Program FIP to give 3 minutes delay for local apartment alarm before FIP notifies security and activates building occupant warning system. All apartment smoke detectors are to be self resetting in the 3 minute time limit. In the event of a fire alarm initiated by smoke/thermal detectors located in common areas the FIP is to notify security and activate building occupant warning system immediately without



- any time delay. In the event of a fire alarm initiated by any fire detectors located within an apartment or common areas all sounders and alarm bells are to activate.
- (q) Obtain Statutory Approval
  - (r) Removal and installations as required of all noggings
  - (s) Vibration isolation penetrations sealing, flashings/ over flashings etc to complete the entire installation
  - (t) Seal all penetrations, fire proof at fire barriers.
  - (u) Preparation of coordinated shop drawings and block diagrams
  - (v) Where items are of dissimilar metals, they shall be separated by suitable material
  - (w) Operating and Maintenance manuals, including 'as-installed' drawings in ACAD format
  - (x) Testing and commissioning of all installed systems
  - (y) Twelve months maintenance, warranty and defects liability for the entire installation
  - (z) The provision of all hoisting and scaffolding required for the installation of the above systems
  - (aa) All materials/products used are to be compliant with all relevant Australian Standards. Compliance certificate to be supplied with any imported materials or equipment used, to certify compliance with Australian Standards.

All technical questions regarding this contract shall be directed to TMK Consulting Engineers through Construction Manager. All work shall be carried out under the terms of this Specification and shall conform with all relevant Statutory Authorities, relevant Australian Standards, Building Code of Australia and Government requirements.

The extent of work stated above is not a complete list of each component, action or work to be undertaken in this Contract. It is up to the tenderer to obtain information as required through a site inspection, interpretation/understanding of the Specification and drawings to allow for all work required to complete the project to the satisfaction of the Construction Manager.

The Contractor shall review all tender documents and ensure that the tender includes all work, insurance's, etc required to complete the Contract.

## **1.2 CO-ORDINATION - FIRE SERVICES**

Co-ordinate with the Construction Manager to ensure that all work is carried out.

## **1.3 MAKING GOOD - FIRE SERVICES**

Make good, and paint to match the surrounding surfaces, areas on walls, floors and ceiling after installation of accessories and equipment. Make good to floors, ceiling and walls after work has been installed.

## **1.4 PENETRATIONS - FIRE SERVICES**

Do not penetrate fire walls and structural members without approval.

## **1.5 EQUIPMENT - FIRE SERVICES**

Supply and install new proprietary materials, equipment and appliances as specified and scheduled. Install in accordance with the manufacturer's recommendations.



## **1.6 INSPECTION OF SITE - FIRE SERVICES**

Arrange to inspect the site prior to pricing submission. Select equipment to meet the specified limiting conditions in this specification.

## **1.7 AT TIME OF COMMISSIONING - FIRE SERVICES**

Supply three bound sets of system Operating and Maintenance Instructions and wiring diagrams.

Be responsible for the initial start-up and operation of the complete systems and each item of equipment until the time that the whole installation is operating under commercial load to the satisfaction of the Construction Manager.

## **1.8 TERMINATION POINTS - FIRE SERVICES**

The work covered by this specification shall be fully complete and independent within the limits of the following termination points at which it shall connect to existing system of work carried out by others.

### **(a) Electrical**

Connect from local distribution board.

### **(b) Water Supply**

Hydrant system: new 100mm fire connection off Gloucester Street.

### **(c) Controls**

All controls are included in this contract.

## **1.9 WORK BY OTHER CONTRACTORS**

### **Electrical**

1. Provision of single phase power to F.I.P



## **2 MAINTENANCE AND COMMISSIONING**

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### **2.1 GENERAL - FIRE SERVICES**

Be responsible for the initial start up and operation of both the complete system and of each item of equipment covered by this Specification and until the time that the whole installation is operating under commercial load to the satisfaction of the Construction Manager. Make all adjustments and alterations during the commissioning period which are required to establish safe, reliable and automatic operation and to achieve the specified conditions of service, operation and performance.

Demonstrate to the Construction Manager that the system is satisfactorily commissioned before the Certificate of Practical Completion can be issued. Notice of intent to issue this Certificate of Practical Completion will be given in writing with effect from 4.00pm on the date of satisfactory conclusion of that demonstration.

### **2.2 SAFE WORKING PROCEDURES - FIRE SERVICES**

Establish safe, working procedures applicable to the site and provide danger notices, danger tags, and the like, for use during the Maintenance Period.

### **2.3 OPERATIONAL MAINTENANCE - FIRE SERVICES**

The Maintenance Period shall be co-extensive with the Defects Liability Period.

During the Maintenance Period promptly rectify faulty parts and equipment.



### 3 SYSTEM PERFORMANCE

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#### 3.1 PERFORMANCE AND GUARANTEE - FIRE SERVICES

Guarantee that all the entire connected systems shall start up, shut down, simultaneously operate automatically, steadily, safely, reliably and with optimum efficiency at full load and to provide all other intermediate ratings, as required throughout the whole year to achieve the following conditions given the scheduled design data:

**(a) Limiting Conditions**

Extreme ambient conditions under which all plant shall be required to operate.

Summer: 46° C DB/24° C WB full solar load.  
Winter: 0° C DB.

Nominal hydrant water pressure

(Refer to SA Water Flow Test in Appendix A)



## **4 NOISE AND VIBRATION**

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### **4.1 GENERAL - FIRE SERVICES**

Install all new plant with new vibration mountings and lead impregnated flexible connections to piping.

Noise levels within the building areas shall comply with Australian Standard AS 2107 - 'Buildings Ambient Sound Levels for Areas of Occupancy'.

Take additional precaution as necessary to ensure the operation of the equipment installed does not result in noise levels or vibration transmission beyond the limits specified.

### **4.2 MOUNTING OF EQUIPMENT - FIRE SERVICES**

All rotating machinery shall be mounted either on springs, rubber in shear mount or rubber pads. Ensure that rotating and vibrating equipment is mounted such that vibrations are isolated from the building structure and the ducting, piping and cabling, etc.

Any rubber used shall be neoprene which shall be protected from oil drips and FIRE damage.

### **4.3 STRUCTURAL BORNE NOISE AND VIBRATION - FIRE SERVICES**

For all new plant and equipment ensure that the vibrations from all moving machinery are effectively isolated from the building structure.

All vibration isolators shall be of the steel spring or flexible rubber mount type.

In addition to providing isolation of all vibrating machinery from the building structure, isolate such machines to the extent of 95% from all piping and electrical connections.





## SECTION 5 - SPRINKLER INSTALLATION

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Not Applicable.

## 6 WALL WETTING SPRINKLERS

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Not Applicable.

Supply and install as indicated on the drawings. Branch off main hydrant system

## 7 FIRE INDICATOR PANEL AND ALARMS

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### 7.1 GENERAL

Provide a fully addressable Fire Indicator Panel (FIP) which includes the following connected services only as required by the relevant State Building Regulations and Authorities for the complete operation of the Fire Protection System:

- a. Supervised/monitor's valves.
- b. Breakglass alarms.
- c. Fire trip signal during building fire mode from pressure switches on sprinkler control valves.
- d. Fire alarm bells.
- f. e.
- f. FIP to have alpha numeric display on FIP screen for automatic display of information and location of the detectors/manual call point initiating the alarm.
- g. 20 spare addressable zones for auxillary devices and fire detectors.

### 7.2 FIRE INDICATOR BOARD PANEL - GENERAL

The fire indicator board/panel (FIP) shall be an addressable system and comply with AS1670 - Automatic Fire Detection and Alarm Systems, and all relevant Building Regulations.

#### **Direct Brigade Alarm**

Not Applicable. Private monitoring only.

### 7.3 WIRING

All wiring associated with the breakglass alarms, shall comply with AS1670 - Automatic Fire Detection and Alarm systems, and all relevant Building Regulations.

#### **Direct Brigade Alarm**

Not Applicable. Private monitoring only.

### 7.4 AUTOMATIC FIRE ALARM SYSTEMS

Supply, install connect, commission and test the complete automatic and addressable fire alarm system as required by the relevant authorities.

Fire Service requirements



- AS1668
- AS 1603.4
- AS 2036
- AS 3000

The addressable fire detection system shall comprise the following major items together with all necessary wiring, relays and other equipment necessary to form a complete installation and connection to new fire indicator panel.

- Addressable manual call points
- Addressable fire detectors
- Master Alarm facility.
- Alarm zone facility (AZF).
- Ancillary control facility.
- Power Supply and battery testing facilities
- FSA alarm verification
- Alarm panel
- Sealed lead acid battery and charging equipment.
- Fire alarm bells
- Pressure switches
- Log book compartment
- Log book, fire alarm block plans and instructions
- Emergency mechanical plant shut down signals (fail safe)
- Fire doors release signals (fail safe)
- FIP to have alpha numeric display on FIP screen for automatic display of information and location of the detectors/manual call point initiating the alarm.

The Fire Indicator Panel shall be a sheet metal cabinet, powder coat paint finish.

Colour of Fire Indicator Panel shall be subject to Architects approval. The FIP shall be suitable for surface mounting.

Locks fitted on doors shall be:

- Lockwood 270 / 7 or similar keyed alike to code 003.
- Or Lockwood 137 keyed alike to code 003.

Batteries shall be sealed lead acid type meeting the requirements of AS1603 – Part 4 and AS1981, Stationary batteries of lead acid pasted plate type.

Batteries shall be installed and charged in accordance with the manufacturers recommendation and of sufficient capacity for 24 hour standby in event of mains power failure.

Install FIP with space for 30% spare alarm zone facilities.

## **POWER SUPPLY**

Supply and install 240 V single phase, neutral and earth power supply from the main switchboard to the FIP.

## **7.5 MANUAL CALL POINTS - FIRE SERVICES**

Supply and install addressable manual call points where shown on the drawings. Confirm location on site. These shall comply with AS 2036 - Manually Operated Fire Alarm Call Points.



Manual call points shall each consist of the break glass self actuating fail safe button type housed within a painted steel casing with a hinged lockable access cover. Opening of the hinged cover shall transmit an alarm signal thereby preventing tampering of panel complete with matching chrome plated hammer and chain.

Install hammers seven days prior to practical completion.

Remote mounted manual call points shall be mounted approximately 1200mm above the floor level. Confirm exact location on site before proceeding with installation.

Manual call points shall be interconnected with the fire sprinkler alarm system and shall indicate location of the call.

Each manual call point shall have the words:

- "FIRE ALARM - BREAK GLASS" incorporated on an engraved label directly above the break glass alarm.

Submit a sample of the break glass alarm and label prior to ordering.

#### **7.6 FIRE ALARM BELLS - FIRE SERVICES**

Supply and install fire alarm bells.

The fire alarm bells shall be painted red (confirm colour) and labelled by proprietary fade resisting self adhesive label or sign written white letters.

"FIRE ALARM"

Provide bell isolation switch for testing purposes.

Supply and install a strobe light above alarm valve.

Wiring to main alarm bell will be 2 core 1.5mm<sup>2</sup> PVC served MICS cable.

Supply and install a main alarm bell 200mm, 24 VDC, weatherproof construction, where shown on drawings.

#### **7.7 FIRE SERVICE AUTHORITY**

Not Applicable. Private monitoring only.

#### **7.8 SPRINKLER CONTROLS - FIRE SERVICES**

Not Applicable

#### **7.9 FIRE SHUT DOWN SIGNAL - FIRE SERVICES**

Supply and install shut down signals as required for other contractors to use.

#### **7.10 OPERATION IN FIRE MODE – FIRE SERVICES**

In the event of any fire alarm, the following shall occur:

- All fire doors shall be released and closed automatically (fail safe).
- All exit/entry doors shall be released (fail safe). Coordinate this work with electrical contractor.
- An alarm to be transmitted for private monitoring.



- Automatic display on FIP screen on information and location of the detectors/manual call point initiating the alarm.



## 8 FIRE DETECTION SYSTEM

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### 8.1 GENERAL

Supply and install an addressable fire detection system comprising of the following components.

- a. Addressable fire detectors complying with the relevant products standard.
- b. Control and indicating equipment.
- c. Alarm bells and manual call points.
- d. All associated wiring from detectors to the control equipment.
- e. Power supply to all equipment.
- f. Control Signals (fail safe).
- g. FIP to have alpha numeric display on FIP screen for automatic display of information and location of the detectors/manual call point initiating the alarm.

### 8.2 FIRE INDICATOR PANEL

Supply and install a microprocessor based addressable fire indicator panel. This panel shall be constructed in accordance with AS1603, Part 4 Control and indicating Equipment.

It shall include the following components:

- Alarm zone facility (AZF)
- Master alarm facility
- Ancillary control facility
- Power supply and battery testing facilities
- Sealed lead acid batteries
- Log book compartment
- FIP to have alpha numeric display on FIP screen for automatic display of information and location of the detectors/manual call point initiating the alarm.

### 8.3 SMOKE DETECTORS

All addressable smoke detectors shall be tested and approved by the Scientific Services Laboratories.

Detectors shall incorporate the following features:

- Common mounting base for interchangeability of detectors.
- Plug-in-type arrangement to a permanently secured base with locking facility, fault indication on FIP on removal of any detector from its circuit.
- Be unaffected by vibration.
- Equipped with LED alarm indication (remote indication for concealed detectors installed to provide easy visibility from floor level).
- Photo-optical detectors shall be dust proof and resistant to high velocity air.
- Return air and supply air detectors shall be sampling type.

Addressable smoke detectors shall be of the following types:

- Photo-optical (operates when products of combustion interfere with the light beam thereby varying current flow).

Sensitivity shall be adjustable from 2 to 10% obscuration.

- Ionization chamber (responds to both visible & invisible smoke particles)



Ionization chamber addressable smoke detectors shall be used only where required.

#### **8.4 THERMAL DETECTORS**

All addressable thermal detectors shall comply with the requirements of AS1603-1074, Thermal Detectors for Automatic Fire Alarm Installations and also be approved by the Scientific Services Laboratories.

The spacing and location of these detectors shall comply with Section 3 of AS1670. Co-ordinate final layout of detectors to suit architectural plans / sections and services.

Addressable thermal detectors shall incorporate the following features:

- Factory serial number for identification.
- Protection from insects which may hinder the operation of detectors.
- Common mounting base for interchangeability of detectors.
- Plug-in-type arrangement to a permanently secured base with locking facility, fault indication on FIP on removal of any detector from its circuit.
- Be unaffected by vibration.
- Equipped with LED alarm indication (remote indication for concealed detectors installed to provide easy visibility from floor level).

Generally Type A thermal detectors shall be used except for roof spaces where Type C detectors shall be used. Refer to drawings where other type of detectors may be indicated.

Detectors shall be continuously monitored for open circuit. Total number of detectors connected to any alarm zone facility shall not exceed the requirements of Section 2.6 of AS1670.

Submit sample of each type of detector to Construction Manager for approval before ordering remaining detectors.

Obtain approval of drawings indicating the layout of detectors and alarm zone facilities from the Construction Manager.

#### **9 EWIS SYSTEM**

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Not Applicable



## **10 FIRE HYDRANT INSTALLATION**

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### **10.1 GENERAL - FIRE SERVICES**

Supply, install, connect, obtain approval, commission and test the complete hydrant/hose reel service installation as required.

Carry out all work in accordance with the requirements of Water Authority, Electrical Authority, Building Code of Australia Regulations, local Fire Service and relevant Australian Standards, Pay all associated fees.

On completion of the whole installation, arrange with the Local Fire Service to conduct a water flow and pressure test and obtain their written approval of the whole installation.

Hydraulic calculations for the water supply to the combined hydrant/hose reel system together with associated sketches shall be submitted to the Engineer for approval before installation.

### **10.2 HYDRANT/SPRINKLER SUCTION & BOOSTER ASSEMBLY**

Supply and install an above ground fire main suction booster connection where shown on the drawings. The installation shall comply with the requirements of Local Fire Authority's requirements and shall incorporate the following:

- Internal main - 100 mm diameter
- Two (2) female 64 mm Local Fire Authority thread inlets incorporating non-return valves and two (2) male 64 mm Local Fire Authority thread outlets.
- Valve inlets are:
  - a. To face in horizontal plant
  - b. To be 750 mm to 1200 mm above ground level
  - c. To be positioned within 100 mm of the front of the cabinet
  - d. To have minimum of 300 mm clearance around sides for coupling keys and hose connections
- Pressure gauges - maximum rating 2500 kPa
- 25 mm bibcock and pipework to drain
- Non-return valve (testable double check valve to OTR requirements)
- Main stop valve - leather strapped and locked open.
- Include signage and painting for the fire booster cabinet by the Fire Contractor to the colour nominated by the Superintendent.

The booster station/alarm valve shall be closed within a cabinet. Co-ordinate installation with Local Fire Service and other trades before installation.

Schematic, permanent photo-etched diagram shall be supplied and fixed for the new booster cabinet doors.

Supply and install 100mm concrete plinth for mounting of booster/alarm valve cabinet.  
Existing Booster remains;



### 10.3 FIRE HYDRANTS INTERNAL - FIRE SERVICES

Supply and install single headed hydrants internally, as required for compliance with AS2419.1.

Valve outlets shall face in the horizontal plane at a height of between 1000 mm and 1200 mm above ground level.

Confirm location of all hydrant upstands before installation.

### 10.4 FIRE STORAGE TANK

Not Applicable

### 10.5 FIRE PUMPSET

Not Applicable

## 11 FIRE HOSE REELS

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### 11.1 GENERAL

Supply and install fire hose reels where shown on the drawings to Local Fire Service requirements.

All hose reels shall comply with AS1221 and shall be installed and maintained in accordance with AS2441 and AS1851 Part 2.

Each hose reel shall be:

- 36 m long, 19 mm nominal bore
- Surface or recess mounted as indicated on the drawings, bracketed to wall. (Spindle shall be between 1500 mm to 2400 mm above the floor, the nozzle assembly and stop valve shall be between 1000 mm to 1500 mm above the floor.)
- Fixed reel maximum diameter 600 mm.
- Fitted with 6 mm diameter nozzle.

Equip with 25 mm stop gate valve on 25 mm inlet pipe. The gate valve shall be equipped with a device to secure the hose nozzle when the valve is shut so that normal operation procedure will be to open the valve which primes the reel and released the nozzle for withdrawal by the operator. Equip with swivel type hose guide with pivot arm and nylon runners.

Attach instruction plate to the centre of the reel. Confirm with Principal prior to installation.

Fit and locate hose guide for easy withdrawal of hose and to prevent fouling, particularly on the door frame. Demonstrate and prove run out of all hoses at time of commissioning.

Allow to install double check valve as per Water Authority requirements for the hose reel system.





## 12 PORTABLE FIRE EXTINGUISHERS

### 12.1 GENERAL - FIRE SERVICES

Carry out all work in accordance with the requirements of Water Authority, Building Code of Australia Regulations, Fire Service and relevant Australian Standards. Pay all associated fees.

On completion of the whole installation, arrange with the Fire Service to obtain their written approval of the whole installation.

### 12.2 PORTABLE FIRE EXTINGUISHERS - FIRE SERVICES

Supply and install portable as nominated on the drawing.

TYPE	MINIMUM RATING (AS 1850)	MAXIMUM CAPACITY kg or l
Stored pressure water	2A	9l
Carbon dioxide	5B:(E)	3.5kg

Each fire extinguisher shall be constructed, installed and maintained in accordance with the appropriate Australian Standards. Securely mount associated warning/identification display signs adjacent each extinguisher.

Confirm exact locations for each extinguisher prior to installation.

Check weights of extinguishers at time of commissioning; charge or replace extinguishers as required during the contact maintenance period.

Ensure that at the end of the maintenance period all extinguishers are fully charged.

Supply and install signage for all extinguishers.



## **13 AUTOMATIC CONTROLS**

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### **13.1 GENERAL - FIRE SERVICES**

Supply and install all controls and make adjustments as necessary for the satisfactory operation of the systems.

Install all auxiliary elements so that each item of plant in the whole system is fully equipped for stable, safe, reliable and unattended automatic control at all practical conditions of operation.

Co-ordinate accurately the work of the automatic control Sub-Contractor and the Electrician so that the installation, connection, commissioning and service of the plant is fully integrated, reliable and safe. Automatic controls shall be electric and/or electronic and shall provide not less than the functions described below for each item of plant. All automatic controls shall fail safe.

### **13.2 CONTROL TERMINATION POINTS - FIRE SERVICES**

The Fire Services Contractor shall supply and install all controls as required.

### **13.3 ELECTRICAL - FIRE SERVICES**

Carry out all electrical work and make all alterations to ensure all proper and correct operation of the Air Conditioning and Ventilation systems.

All electrical work shall be carried out in accordance with the following:

- Water Authority, Electrical Supply Authority
- The Ventilation Code - AS 1668
- Fire Service
- The local Council Authority
- Building Code of Australia

Electrical work shall be carried out only by competent qualified tradesmen holding a current license recognised by the Statutory Authority.

All equipment and/or appliances provided in this contract shall be designed and installed so that no interference shall be caused to any radio, television or radar equipment in the same locality.

In the event of the inherent characteristics of the electrical installation being such that interference does occur, provide efficient devices capable of eliminating the interference.

Rigid PVC conduit must not be used where it will be exposed to damage, weather, dampness or where temperature is likely to exceed 60 degrees C. In these circumstances galvanised screwed conduit must be used.

All wiring associated with fire mode shall be in MIMS complying with AS 1668 and Statutory Authorities.



#### **13.4 OPERATION IN THE EVENT OF FIRE MODE**

In the event of any fire alarm, the following shall occur:

- All fire doors shall be released and closed automatically (fail safe).
- All exit/entry doors shall be released (fail safe). Coordinate this work with electrical contractor.
- An alarm to be transmitted for private monitoring.
- Automatic display on FIP screen on information and location of the detectors/manual call point initiating the alarm.

#### **13.5 OPERATION IN THE EVENT OF POWER FAILURE**

In the event of a power failure, all plant shall shut down with the exception of those items connected to essential power.

All plant and equipment shall restart automatically in a sequence as required by their own automatic control systems on restoration of normal power.



## 14 PIPEWORK

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All fire service pipework shall comply with the requirements of the relevant Building Regulations and AS 2419 - Fire hydrant Installations, AS 3500 - National Plumbing and Drainage Code and the relevant Water Authority.

Pipework materials when located below ground shall be copper or galvanised steel. underground copper pipework to be "Kemlag" or equally approved, installed to manufacturer's recommendations or wrapped with "Denso" 600 with 55 % overlap.

Underground galvanised steel pipework to be wrapped with "Denso" 600 with 55% overlap, to manufacturers recommendations. All new pipework shall be made as inconspicuous as circumstances permit.

Pipe runs should be preferably made of lengths prefabricated externally to the building and should be joined in location by screwed sockets, flanges and unions or rolled grooved joints. (This is to preclude the use of flame producing torches or welding equipment within the structure.)

When flame welding equipment is used, all possible fire safety precautions shall be taken in accordance with AS1674 - Cutting and Welding Safety Code.

Installed piping must be tested by methods that will ensure that no damage is caused to the services, ceilings, walls, fixtures or stock.

All exposed fire service pipework shall be painted with one coat of primer and two coats of red oil and petrol resistant enamel and identified as fire service pipework to the requirements of the Water Authorities and Fire Authorities.

Concealed pipework in roof spaces and ceiling spaces need only be identified and painted to the requirements of the relevant Authorities.

Below ground pipework shall be identified with location markers to the satisfaction of the relevant Fire Authorities and Water Authorities requirements.

Hydrant / FHR Pipework      Galvanised Steel compliant with AS2118



## 15 TESTING, COMMISSIONING AND MAINTENANCE

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### 15.1 GENERAL - FIRE SERVICES

On completion of the work commission the entire installation and put it into operation.

Provide proper facilities and instruments to carry out such tests as may be necessary to satisfy the Principal.

Capacity tests on plant shall be carried out at a time determined by the Construction Manager.

Tests will be carried out during the maintenance period when the plant has been in unserviced operation for not less than one week.

### 15.2 COMMISSIONING - FIRE SERVICES

Carry out all adjustments necessary for the safe, reliable and satisfactory operation of the plant prior to the Practical Completion.

The Fire Contractor is required to commission the SAMFS for final inspection on completion, as required for Occupancy of the Building.

The Fire Contractor is required to be present with the SAMFS at the final inspection.

Pay all associated SAMFS Fees.

### 15.3 MAINTENANCE AND OPERATING INSTRUCTIONS - FIRE SERVICES

Prepare a Maintenance and Operation Instruction Manual. Provide 3 copies.

The Manual shall comprise an A4 size plastic back hard cover 3-ring binder containing the following documents.

- (a) Index
- (b) General Description of Plant
- (c) Plant Operation
  - Starting and Stopping Procedure
- (d) Automatic instructions
  - Description of all control functions, with instructions for re-setting and adjusting controls.
- (e) Maintenance Instructions
  - Routine
  - Preventative
- (f) List of Equipment Suppliers
- (g) Schedule of Technical Data
- (h) Equipment Suppliers Literature
- (i) Electrical Wiring Diagrams
- (j) Installation Shop Drawings

All installation Drawings shall be neatly folded and inserted in a strong plastic envelope(s) which can be fixed into binder.

### 15.4 SERVICE AND MAINTENANCE - FIRE SERVICES

Carry out regular inspections at periods scheduled below and fully service all plant for the term of the Guarantee and Maintenance Period.

To AS & engineers approval

(C) SERVICE:



Undertake to provide a comprehensive breakdown of service whereby a qualified mechanic attends the plant as soon as practicable after a breakdown is reported, and carries out immediate remedial work.

Where the Contractor fails to attend the plant within eight (8) normal working hours of notification of breakdown and where remedial work is interrupted during normal working hours for purposes other than obtaining spare parts from the nearest source, the Principal reserves the right to order such action as may reasonably expedite completion of remedial work at the Contractor's expense.

**(D) SERVICE REPORTS:**

During each visit complete a report, and send it to the Engineer, in the form of a check list which indicates the readings of all gauges, the condition of all items, any remedial work carried out, and the wet and dry bulb temperatures of the outside air, and the return air.

Final payment of retention monies will be only certified pursuant to receipt of Service Reports which indicate that the Maintenance and Service requirements have been regularly and satisfactorily completed.

**15.5 TRAINING OF STAFF - FIRE SERVICES**

The Contractor shall instruct persons nominated by the Principal in the correct practice of operations, routine adjustment and maintenance. Instructions shall continue as needed until the Principal can operate correctly all systems.



## **15 SHOP DRAWINGS & CO-ORDINATION OF SERVICES**

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### **15.1 SHOP DRAWINGS - FIRE SERVICES**

The Fire Contractor shall produce coordinated shop drawings showing all required builder's work.

Submit three copies of all drawings to the Engineers for perusal following which revise and resubmit three copies to the Construction Manager.

### **15.2 CO-ORDINATION OF SERVICES - FIRE SERVICES**

The Fire Contractor shall obtain information from all other trades as required for the purpose of co-ordination.

The tender shall make allowance for changes that may occur. The Fire Contractor will need to amend shop drawings as required.

### **15.3 DRAWINGS AND INSTRUCTIONS**

Block plans and operating and emergency instructions are to be provided in accordance with AS 2118 and AS1670 which include the following:

### **15.4 O & M MANUAL/AS INSTALLED DRAWINGS**

Provide 3 bound copies of O & M Manuals.

Provide all design drawings and shop drawings covering the following:

- a. Fire Hydrant System
- b. Fire Detection/BOWS System
- c. Fire Extinguishers
- e. Breakglass alarms.

### **15.5 INSTRUCTION OF STAFF**

The Contractor must provide instruction and staff training on site, as to how to operate the system and ensure that the instructions are clearly understood by the appropriate personnel.



## 16 SCHEDULE OF COSTS & RATES

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Submit the cost information as set out in the schedule of Cost Summary.

Name of Tenderer .....

Address .....

Contact details .....

## SUMMARY OF COSTS

Provide a cost summary of the mechanical services costs.

• Preliminaries	\$
• Fire Hydrant System	\$
• Fire Detection System	\$
• Portable Fire Extinguishers	\$
• Sundry	\$
• Maintenance and Operating Instructions manuals and drawings	\$
• 12-Month Routine Maintenance	\$
• Warranty & Defects Liability	\$
• Testing, commissioning and evaluation	\$
<b>Grand Total</b>	<b>\$</b>





## SCHEDULE OF RATES

Provide a cost breakdown of the supply and installation of the following:

- |                                 |    |
|---------------------------------|----|
| • Smoke Detector (5m cabling)   | \$ |
| • Thermal Detector (5m cabling) | \$ |
| • Combined strobe/sounder       | \$ |
| • Fire Extinguisher –Dry Powder | \$ |
| • Fire Extinguisher -CO2        | \$ |

## SCHEDULE OF PROPOSED SUB-SUB-CONTRACTORS

The tenderer shall list all sub Sub-Contractors to be used to undertake the specified works for the Fire Services Sub-Contractor. Where sub Sub-Contractors are not identified below then the tenderer shall provide a further comprehensive list of names and individuals proposed to undertake any of the works.

Company.....

Address.....

Contact detail .....



## TENDER FORM – EQUIPMENT SCHEDULE

### Fire Detection System

<b>Unit</b>	<b>Fire Panel</b>
Type	
Make	
Model	

<b>Unit</b>	<b>Smoke Detectors – Common Areas</b>	<b>Smoke Detectors – Apartments</b>
Type		
Make		
Model		

<b>Unit</b>	<b>Somoke Detector – Sounder Bases</b>
Type	
Make	
Model	

<b>Unit</b>	<b>Sounders</b>
Type	
Make	
Model	

<b>Unit</b>	<b>Strobe Lights</b>
Type	
Make	
Model	

### Wet System

<b>Unit</b>	<b>Fire Sprinkler Heads</b>
	<b>Drenchers</b>
Type	
Make	
Model	

<b>Unit</b>	<b>Fire Extinguishers</b>
Type	
Make	
Model	

<b>Unit</b>	<b>Fire Hydrant Pump</b>
Type	
Make	
Model	
Duty	



## **APPENDIX A - DESIGN BASIS**

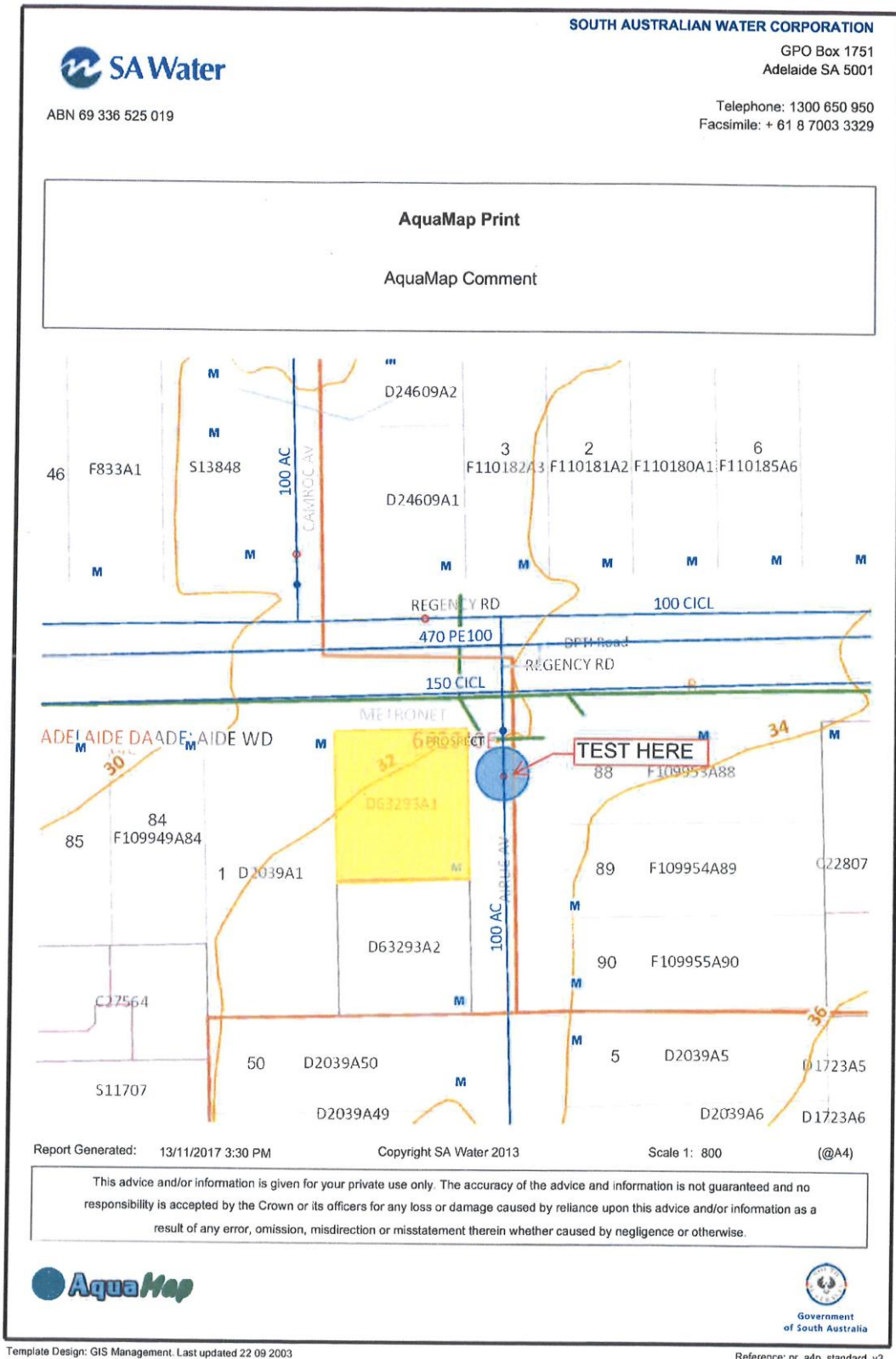
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### **A.01 GENERAL - FIRE SERVICES**

#### **LIMITING CONDITIONS**

SA Water Flow Test Results

Refer to enclosed results





# **SOUTH AUSTRALIAN WATER CORPORATION : FLOW AND PRESSURE SURVEY**

201801071 METERING STRATEGY UNIT, TORRENSVILLE

LOCATION	AIRLIE AVE
SUBURB	PROSPECT
MAIN-SIZE & TYPE	100mm AC
ZONE SUPPLY EL	
TEST DATE	7/01/2018
TEMP	26c
TIME OF DAY	9:30 AM
FIRE PLUG ID	3405017

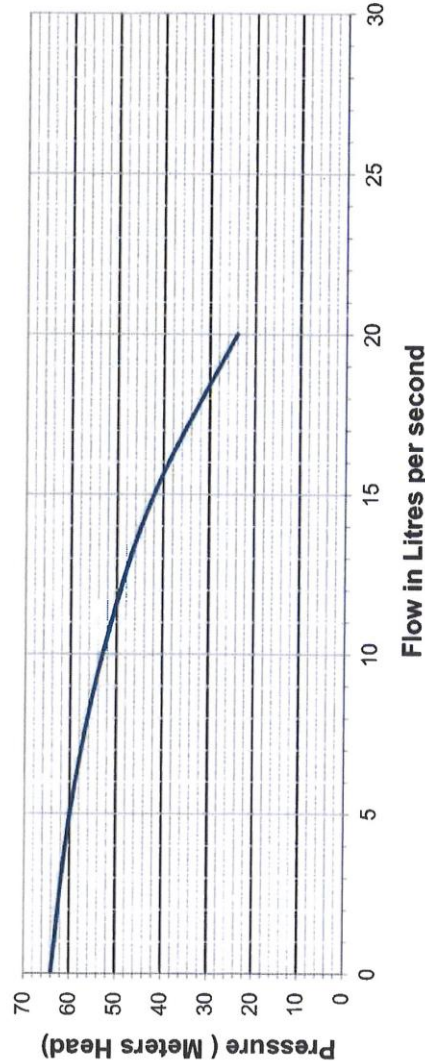
This advice and/or information is given for your private use only. The accuracy of the advice and/or information is not guaranteed and no responsibility is accepted by the Crown, the South Australian Water Corporation of their officers, agents of servants for any loss or damage caused by reliance upon this advice and/or information, as a result of any error, omission, misrepresenting therein whether caused by negligence or otherwise.



## **FLOW AND PRESSURE SURVEY**

THE TEST WAS TAKEN USING A SINGLE 65mm McCROMETER METER, WITH THE PRESSURE AND FLOW TAKEN AT THE SAME POINT, USING A SINGLE FIRE PLUG OR PILLAR HYDRANT AS INDICATED.

STATIC PRESSURE 64.0 MH  
RESULTS TAKEN FROM A McCROMETER METER



### **PLEASE NOTE:**

WHEN INCORPORATING THESE TEST RESULTS IN THE DESIGN CALCULATIONS OF THE PRIVATE SERVICE PIPEWORK, ALLOWANCE SHOULD BE MADE FOR HYDRAULIC LOSSES BETWEEN THE POINTS AT WHICH THE TEST WAS CONDUCTED AND THE PROPERTY SERVICE LOCATION.

THE CORPORATION ENDEAVOURS TO MAINTAIN A SATISFACTORY PRESSURE IN THE MAINS AT ALL TIMES, UNDER SOME CIRCUMSTANCES THIS MAY NOT BE POSSIBLE, THEREFORE NO GUARANTEE CAN BE GIVEN.

SOUTH AUSTRALIAN WATER CORPORATION

CONTACT NAME : P.HUTCHINSON 7424 3253  
TEST BY: P.DIMASCIO, ALLWATER