

**METROPOLITAN FIRE AND EMERGENCY  
SERVICES BOARD**



**DESIGN & DELIVERY MANUAL**  
**FOR**  
**NEW & REFURBISHED FIRE STATIONS**

## REVISION HISTORY

Revision	Prepared By	Date Prepared	Issue
B	-StrataPNA Architects -BRT Consulting	09/2010	Incorporating MFB comments and workshop recommendations
A	-Tony Green Architects, -CPS Services, -Peter James Sustainable Built Environments	Revised 07/2008 09/2005	-

## DESIGN AND DELIVERY MANUAL FOR NEW & REFURBISHED FIRE STATIONS

### METROPOLITAN FIRE & EMERGENCY SERVICES BOARD

*Note that all issued documents are to have a 'Revision' reference number or date attached to it.*

*This content page and the 'Revision' column are to be updated on the receipt of every document issued.*

SECTION	CONTENTS	Tag No	REVISION / VERSION
<b>A</b>	<b>General</b>		
	<ul style="list-style-type: none"> <li>General Rules for Working on an MFB site</li> </ul>	1	A
	<ul style="list-style-type: none"> <li>Acknowledgments and Preface</li> </ul>	2	B
	<ul style="list-style-type: none"> <li>Volume 1 - Overview and user guide for Design &amp; Delivery Manual for new &amp; Refurbished Fire Stations</li> </ul>	3	B
	<ul style="list-style-type: none"> <li>Volume 2 - Site Issues &amp; Building Specification Requirements</li> </ul>	4	B
	<ul style="list-style-type: none"> <li>Volume 3 – Strategic Delivery Principles</li> </ul>	5	B
<b>B</b>	<b>Volume 4 – Consultants' Design Briefs</b>		
	<ul style="list-style-type: none"> <li>Volume 4.1 – Architecture Fire station Design Functional Brief</li> </ul>	6	B
	<ul style="list-style-type: none"> <li>Volume 4.2 – Mechanical Services Fire Station Design Functional Brief</li> </ul>	7	C
	<ul style="list-style-type: none"> <li>Volume 4.3 – Hydraulic &amp; Fire Services Fire Station Design Functional Brief</li> </ul>	8	A
	<ul style="list-style-type: none"> <li>Rainwater Quality Management</li> </ul>	9	1.0
	<ul style="list-style-type: none"> <li>Volume 4.4 Electrical, Communication &amp; Special Services Fire Station Design Functional Brief</li> </ul>	10	C
	<ul style="list-style-type: none"> <li>Volume 4.5 – Ecological Sustainable Design Fire Station Design Functional Brief</li> </ul>	11	A
	<ul style="list-style-type: none"> <li>Environmental Overlay for Fire Station Design Guidelines</li> </ul>	12	Doc # 558287
	<ul style="list-style-type: none"> <li>Volume 4.6 – Fire Station Security Standards</li> </ul>	13	A
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<b>C</b>	<b>Project Specific Brief</b>		
	<ul style="list-style-type: none"> <li>Volume 4.8 – Fire Station Accommodation req' &amp; Room Data Sheets</li> </ul>	15	B
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	<ul style="list-style-type: none"> <li>General Access &amp; Mobility Manual</li> </ul>	23	2010
	<ul style="list-style-type: none"> <li>Executive Directive Minimum Crewing</li> </ul>	24	ED 1 / 2006
	<ul style="list-style-type: none"> <li>Lift up Glazed Doors</li> </ul>	25	1
	<ul style="list-style-type: none"> <li>S600 APOGEE Operating Manual Turnout Control</li> </ul>	26	1
	<ul style="list-style-type: none"> <li>Sliding Gate Specification</li> </ul>	27	1
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	• Signage Specification	31	1
	• Fire Station Refurbishment Principles Paper	32	3/02/2009
	• Design Guide Review by StrataPNA June	33	D

### **Protocols for the control of the documents within this manual**

- The Manager, Property Services Department is the controller for the distribution of this document.
- All changes or revisions to individual documents are to have a revision number or date attached to it.
- Prior to the internal distribution of any document, the Property Services Department is to be issued with an advance copy containing the revision number or date. The revision number/date of the document is to be updated on the contents page at each issue.
- The Property Services Department will be the responsible party for the maintenance of the manual.
- The Property Services Department will be the responsible party for the issue to external parties of the documents within this manual.

### **For issue to external consultants and contractors**

It is advised that the current content page be issued with the issue of any of the documents within this manual ie a partial issue of the Design and Delivery Manual. Recipients of the document/s will then be able to see the extent of the reference documents available for review and the currency of the documents.

### **Document issued for tender purposed**

Consultants and contractors who have previously been engaged by the organisation and are familiar with the procedures and protocols may not be issued with the full set of Design and Delivery Manual documents. External consultants and contractors may request updates of documents where the revision numbers do not match that previously issued.

### **Amendments to the fire station design guide**

It is envisaged that changes, clarification of omissions discrepancies, reformatting to this manual will be ongoing for a period of time after the adoption of the manual.

To ensure operational continuity, from time to time changes, in particular, to improve occupational health and safety aspects of the design manual may occur with approval at the fire station design steering committee as it has representation from the UFU, OH&S, Operational representatives from the various Zones and relevant departments. However changes approved can only occur if does not affect the intent of this design manual.



## **ACKNOWLEDGMENTS**

The Metropolitan Fire & Emergency Services Board has produced this New Fire Station Delivery Manual. However, a number of other organisations have contributed significantly to its production:

### **PRIMARY TECHNICAL CONSULTANTS**

- StrataPNA Architects
- BRT Consulting Engineers
- Tony Green, Tony Green Architects
- Peter James, Sustainable Built Environments

### **CONTINUAL IMPROVEMENT POLICY**

In the interests of maintaining quality and accuracy, this Manual will be periodically reviewed and revised, taking into account current best practices and building performance information.

### **FEEDBACK**

Feedback on this document is welcome and should be addressed to:

Greg Pearson | Acting Executive Manager  
Property Services Department  
Metropolitan Fire Brigade  
456 Albert Street | East Melbourne | VIC 3002  
Ph: 03 9665 4363| Fax: 03 9665 4244  
Mobile 0409 868 951| Quick dial 7112  
Email: gpearson@mfb.vic.gov.au

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### **USE BY EXTERNAL AGENCIES**

Other Government Departments are encouraged to utilise these Principles and Guidelines in design and construction activities. It is anticipated they will also be of benefit to building professionals such as architects, engineers, project managers and construction contractors.

## **PREFACE**

The Metropolitan Fire & Emergency Services Board continues to successfully build, operate and maintain Fire Stations. To assist in the delivery of new Fire Stations the MFB have in recent years employed a “New Fire Stations Consultants Briefing” document, the latest edition of which is presented here and has been given the working title “**Design and Delivery Manual for New & Refurbished Fire Stations (2010)**”. Whilst compliance with purpose, accommodation, and functional requirements are a given it has been the integration of energy and sustainability targets that have been the focus of this document.

The main aim sought to be achieved in the compilation of this Design and Delivery Manual for New & Refurbished Fire Stations (2010) has been to provide integrated Energy Performance Improvements and Integrated Sustainability Advice. In previous versions of this document an Energy Brief had been provided in an appendix and sustainability advice had been given its own dedicated section. However, in this current version it has been the intention to integrate these items into each of the consultants’ design briefs.

Inclusion of design features that enhance the energy and sustainability performance of Fire Stations have developed gradually over the last decade. However, it is understood that this Design and Delivery Manual for New & Refurbished Fire Stations (2010) represents the first concerted attempt to consolidate the experience and lessons learnt to date, and to attempt to provide benchmarks and targets for energy and sustainability performance. The main omission of this document is that there is a considerable amount of energy data, design lessons and maintenance/operational cost data and feedback that has not yet been collated and reviewed and that would add valuable input.

# **General House Rules for working on a MFB site.**

## **Shutting Down Plant and Services**

Any significant interruption to basic services, such as water, power or communication, the contractor must complete a Permit – to – work Approval Form and have it signed off by an approved facilities staff member.

## **Rubbish Housekeeping**

Contractors and sub-contractors must clean up the work area as work proceeds. Housekeeping must be regular and ongoing, every day. No rubbish is to be left on site or in MFB rubbish bins.

## **Dust and Liquids**

Strict control of dust and liquids when working on an MFB site is compulsory. Discuss your plans to control these major problems with the nominated MFB representative.

## **Water**

When roof, wall or floor penetration is necessary, suitable waterproof tarpaulins are required depending on weather conditions. Roofing must always be reinstated before completion of the days work.

## **Chemicals**

The MFB requires that all chemicals must be cleared and approved prior to use and Materials Data Sheets provided.

No lead based paint is allowed to be used on any MFB site.

## **Site Security**

Contractors whilst working on MFB premises are subject to the State Crimes Act and other stringent legislation. To conform to this legislation the following applies:

- The use of MFB computers and other allied equipment is forbidden.
- The use of telecommunications monitoring and/or recording equipment on site is forbidden.
- The unauthorised removal of MFB property including paperwork relating to MFB workings and activities is strictly forbidden. Paper in the “shredder” bin falls within category.
- Data and confidential documents relating to MFB projects are to be kept secure at all times.
- Have arrival and departure entered in occurrence book (stations) attendance books at other (admin) sites.
- Do not leave the site unless MFB staff are present (if working in stations) station must not be left unsecured.

## **Fire Safety**

In the event that the fire fighters get called out to an emergency, all contractors must follow the directions of the on-duty Station Officer at a Fire Station and/or fire wardens at an Administration Building. Do not leave the fire station un-locked.

## **Contractor Pass must be worn at all times**

Notify the on-duty Station Officer or nominated MFB representative of entrance and departure. Site must remain secure at all times.

## **Within the MFB buildings**

- NO smoking

- NO cameras
- NO arc welding
- NO explosive powered tools
- USE hot work permits where required
- CLEAN up work area as work proceeds
- REGISTER / COMMUNICATE entry and exit times via the nominated MFB representative

**Within the Fire Station**

- NO solvent based paints
- NO water or dust
- NO contractors can park their cars on site without prior approval

This document should be read in conjunction with Metropolitan Fire and Emergency Service Board Contractors OH&S Induction Booklet. All contractors and their staff are required to complete an induction prior to working on an MFB site.

A Fire Station is considered a Fire Fighters home while they are on duty and contractors are required to treat the building as such, taking into account discretion and courteous behaviour when entering or working in area's such as living areas and private areas such as bedrooms and bathrooms.

**Contact Numbers**

**If you are unsure about some of your works or have a question, please contact the Project Manager or Supervisor who is running the project.**

**Or call the Help Desk 03 9665 4444 (external) or Extension 4444**

**Or call Emergency Control Victoria on 03 9665 4300**

**VOLUME 1:**

**OVERVIEW AND USER GUIDE**

**FOR DESIGN & DELIVERY MANUAL**

**FOR NEW & REFURBISHED**

**FIRE STATIONS**

**REVISION HISTORY**

<b>Revision</b>	<b>Prepared By</b>	<b>Date Prepared</b>	<b>Issue</b>
B	StrataPNA Architects	09/2010	Incorporating MFB Comments and workshop recommendations
A	Tony Green Architects	09/2005 Revised 07/2008	-

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## **1.1. USER GUIDE**

This Design and Delivery Manual is divided into 4 Volumes:

<b>Volume 1</b>	MFB Overview and the User Guide for Design & Delivery Manual for New & Refurbishment Fire Stations
<b>Volume 2</b>	Site Issues & Building Specification Requirements
<b>Volume 3</b>	Strategic Delivery Principles
<b>Volume 4</b>	Consultants Design Briefs which include Architecture, Mechanical, Hydraulic, Electrical Communication, Special Services & E.S.D.

Each Discipline in the Design Team is required to make themselves familiar with Volumes 1, 2, 3 and 4 and the particular brief directed to them in Volume 4.

## **1.2. PURPOSE**

The Design and Delivery Manual for New & Refurbished Fire Stations is a practical guide to assist the entire Project Team in the delivery of new Fire Stations and refurbishments to existing operational Fire stations. It is intended for use with new fire stations regardless of size, cost, complexity and source of funds.

Its purpose is to integrate current best practice and policy initiatives in the areas of design, construction, operation, maintenance and environmental sustainability into the planning, design and construction processes for all new capital works. Moreover, this document focuses on “learning from the past” in that it integrates key recommendations and lessons learnt which arose from a previous report that analysed historic energy performance data of the 47 Metropolitan Fire Stations and from several site energy audit surveys.

Requirements for alterations and additions to existing fire stations are more flexible and subject to change.

Compliance should be specific or as intended in this document.

## **1.3. OBJECTIVES**

The objectives of Design and Delivery Manual for New & Refurbished Fire Stations are:

- (i) To deliver buildings which reflect all current policy initiatives of the MFB.
- (ii) To deliver buildings, which meets all the accommodation requirements of the MFB as identified by the Brief
- (iii) Produce an “intelligent” building solution that will deliver:-
  - (a) Lower building operating and lifecycle costs
  - (b) Improve the environmental sustainability of the building and achieve sustainability targets in the following areas:
    - Management
    - Energy
    - Indoor Environmental Quality
    - Water
    - Materials
    - Land Use and Ecology
    - Emissions
    - Social
  - (c) Improved flexibility of building services performance, tailored to occupant needs and the building owner's requirement to eliminate energy wastage
  - (d) A clear reflection of the MFB's role in the community
  - (e) A clear reflection of the MFB's concern for the environment

- (iv) Provide a building design which is achievable within a clearly established project budget and which proceeds to documentation and construction within that budget.
- (v) To enable a cycle of continual improvement with respect to the delivery of new Fire Stations and to enable the continual revision and improvement of this Delivery Manual in the pursuit of the former mentioned aim.

## **1.4. AN INTRODUCTION TO THE MFB**

### **1.4.1 MFB Profile**

The Board is constituted under the Metropolitan Fire Brigades Act 1958 ("the Act"). The organization's name and role changed along with its Board and management structure following amendments to the Act in 1997. The MFB Board's role of protecting life and property from fire in the Metropolitan Fire District ("MFD") was broadened to deal with a greater range of emergencies and to encompass more aspects of community safety and emergency prevention activities.

The Board has approximately 1500 professional fire fighters manning 47 (as of 1st September 2000) strategically located fire stations around the MFD and other operational departments. They are aided by approximately 240 support staff (technical and administrative employees). Assets in the MFD comprise property valued at close to \$200 billion, vital community infrastructure and, during the working day, around 3 million people within the MFD.

The Board is accountable to the Minister for Police and Emergency Services and is mainly funded by contributions from the State Government (12.5%), Local Government (12.5%) and insurers (75%). Funding from fee for service and other internal means also contribute to the Board's overall budget requirements.

The Office of the Emergency Services Commissioner establishes and monitors standards to be used by all emergency services agencies.

### **1.4.2 MFB Mission and Corporate Policy Statements**

- (i) **CORPORATE ACTION PLAN**  
(Note: To be amended to include latest action plans as an attachment to the Brief)

Recently the MFB formulated a new Corporate Action Plan covering the period 2002 to 2005 that has the following key elements.

Our Mission – "Protecting Our Community."

To protect our community from those risks for which the government has given us the responsibility of addressing, not just by responding to emergencies but firstly by preventing them and helping our community to be prepared for such emergencies.

Our Goal – "Saving lives, preventing injury and protecting the community and the environment."

Our Objectives:

**Initiative** – showing initiative in our community safety activities and services

**Response** – providing an appropriate response to all calls for assistance and advice (each other and the community)

**Professionalism** – being professional in everything we do

The Corporate Action Plan will be implemented without loss of focus or capability in delivering the existing fire-fighters response capabilities and thus represents a significant broadening of the fire-fighters duties and training requirements.



(ii) SERVICES PROVIDED AND ACTIVITIES UNDERTAKEN BY THE BOARD INCLUDE:

The continuous protection from fire and other emergencies in Melbourne's major Metropolitan area and providing assistance in the CFA/MFB mutual aid areas.

Rapid and effective emergency response services including:

- Suppression of all types of fires
- Urban Search and Rescue
- High Angle Rescue
- Road Accident Rescue
- Emergency Medical Response (EMR) First Responder
- On request, to emergencies on water in Port Phillip Bay
- Industrial accidents and hazardous material handling and storage incidents.
- Assisting other combat agencies in emergencies.
- A range of community awareness, education and safety programs on fire and emergency prevention and preparedness.
- Extensive technical input into the development of Australian Standards, Codes of Practice and Regulations affecting community safety and influence on related strategic direction and government policy.
- Conducting building code related inspections of fire detection and suppression systems in buildings; industrial, commercial, public, sporting and entertainment facilities; and high-risk sites to ascertain compliance.
- Development of fire safety and emergency plans for major events.
- Fire investigation and cause analysis, and the provision of data to the community and external authorities.
- Reviewing and inspecting the dangerous goods handling and storage practices of major hazardous materials sites.
- Advice to the community, including councils and industry, on fire detection and suppression systems. Representation on councils for fire prevention planning and community risk management.
- Attendance and participation with local councils in municipal emergency management planning exercises.
- Provision of expertise, technical advice and skills acquisition services to interstate and international organizations.
- Commercial training, Consultancy services and the sale of fire safety services and equipment.
- The Board has developed a Community Safety Program, which expands on the current community safety activities and makes greater use of the Board's human and physical resources.

## **1.5. PROJECT PHILOSOPHY**

### **1.5.1 What Is A Fire Station?**

Essentially a fire station is a complex building system, integrating workplace with accommodation, information technology, security systems, public accessibility and garaging for the Brigade's primary "workhorses" - the fire trucks.

It must provide a pleasant, healthy, living environment whilst withstanding extremely hard wear, 24 hours-a-day / every day of the year.

In addition to being inherently durable, a fire station must be arranged to:

- (i) Ensure safe and easy and immediate access between living quarters and the appliance bay;

- (ii) Segregate the public areas of the building from operational areas;
- (iii) Provide for movement flow of fire fighters from living quarters to the appliance bay, separated by a suitable Personal Protective Equipment (PPE) changing area which enables fire fighters to put on or remove protective clothing prior to entering the living quarters;
- (iv) Provide safe and secure access to plant areas for maintenance works;
- (v) Set a community example for fire engineering;
- (vi) Provide a non-load bearing layout of interior walls. Fire stations will undergo changes to their layout over their lifespan and their design must adapt easily to those changes. The following should be taken into account:
  - a) Changes to communications technology
  - b) Population shifts causing alterations to the level of services required
  - c) Changes in award conditions for fire fighters
  - d) Developments in fire fighting technology
  - e) Changes to appliance types and sizes (fire trucks)
  - f) Changes to environmental demands
  - g) Possible requirements for resale and change of use at the end of its useful life as a fire station.

### **1.5.2 Preferred Public Image**

The MFB continues to enjoy the community's high regard. This is in part due to the MFB's prime function, fire fighting and rescue with the connotations of heroism, bravery and chivalry, which that entails.

It also stems from a number of broader qualities which the MFB is keen to promote. These qualities and their possible implications on building design are as follows:-

- (i) The building should respect its adjacent environment.  
The MFB are a part of the community it operates within, friendly, not aloof from the community.
- (ii) The building should appear open and inviting.  
The MFB invites community participation and enquiries. It offers information and lectures as part of public awareness leading to public safety.
- (iii) Even when the building is securely locked up, the public access and appliance bay must be immediately obvious, welcoming and accessible.  
The MFB is always there and ready to help with a "door is always open" policy.
- (iv) The building should be of durable, good quality materials, without extravagance and be clearly representative of the 21st century. The MFB is a modern and efficient organisation, which uses state-of-the-art technology as a provider of services of excellence.
- (v) The building should exhibit a strong sense of environmentally sustainable design with the best use of passive and active energy conservation systems and practices.  
The MFB is a permanent body with a vested interest in personal health and environmental sustainability.
- (vi) A fire station should be a clear expression of its function. It should be easily identifiable as belonging to a family of buildings without being a stereotype (as some popular fast food stores). It should not be able to be confused with a factory or commercial building.

The MFB is an active and energetic organisation. It does not sit and wait for emergencies to happen. It is constantly drilling, training and maintaining equipment. The MFB is made up of

people. Windows and large glass doors should provide a view to activity inside and the large “shiny red trucks”.

### **1.5.3 Internal Organisation & Image**

The internal planning and environment of a fire station should clearly reflect two distinct characteristics of the MFB.

- (i) The MFB is a hierarchical, although not elitist, organisation.
  - It is clearly ordered with the station officer in control of the fire fighters.
  - It is disciplined but friendly without the regimentation characteristics of the armed forces.
- (ii) The fire station is a home to the officers and fire fighters.

### **1.5.4 Design Life**

The MFB expects that a new fire station will have a service depreciation life of 40 years. Refurbished buildings have an expected depreciation life of 25 to 30 years, depending on the scale of refurbishment.

The service life is expected to include at least one major internal refurbishment to bring a station up to the standards applicable at the time.

Equipment is expected to have a 25-year life. The building should be designed against a life cycle which takes into account the following:-

- Expected design life of the building fabric
- Equipment life spans
- Expected internal refurbishment cycles
- Maintenance costs
- Cost of staffing the facility
- Operational costs

# VOLUME 2:

## SITE ISSUES & BUILDING

## SPECIFICATION REQUIREMENTS

### REVISION HISTORY

Revision	Prepared By	Date Prepared	Issue
B	StrataPNA Architects	09/2010	Incorporating MFB Comments and workshop recommendations
A	Tony Green Architects	09/2005 Revised 07/2008	

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## **USER GUIDE**

### **2.1.1 Title and Survey Information**

The MFB will provide the Architect with complete Title information and a levels and features survey at a scale of 1:100 prepared by a licensed surveyor.

### **2.1.2 Adjoining Development Information**

The MFB will provide or support the Architect with the production of adjoining development information whenever available. Proposed site layouts shall show all relevant adjoining development information and reflect any site planning or layout implications which result from the adjoining developments. Site plans should show any adjoining development information as pertaining to local council for the assessment of town planning submissions.

### **2.1.3 Geotechnical Report**

The MFB will provide the Architect with a Geotechnical report for the site based on the Australian Standard AS1726-1993. The architect and the civil sub-consultant may request additional bores/tests and the like to suit their specific requirements.

Comment by ESD Engineer will also be required on the suitability of the site for geothermal bore holes (for the potential installation of heat sink pipes to work in conjunction with a heat pump for the provision of heating and cooling to the building).

### **2.1.4 Contamination Report**

Where considered necessary to do so or where required by the EPA, the MFB will arrange for a site contamination assessment report to be carried out and a copy of the report made available to the Architect. The report will be carried out in accordance with Australian Standard AS 4482.1-2005 "Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1- Non-volatile and semi-volatile compounds

### **2.1.5 Site Services Availability**

The MFB will provide the Architect with details of all services available to the site as far as identifiable, through a detailed feature & services survey:-

e.g. electricity, gas, water, telephones, sewer, stormwater, etc.

Together with relevant capacities, connection points, pipe sizes, pressures, locations and depths. Where the provided information is not adequate the architect shall organise the required actions to obtain this information. The MFB will also provide any 'as built' drawings where available for existing buildings which are being refurbished.

### **2.1.6 Landscaping**

- To be in keeping with the conceptual items.
- To assist in moderating the local micro-climate and complementing the building aesthetics.
- Use of deciduous trees to promote shade in summer and sunlight in winter.
- To provide dense perimeter "noise buffer" to assist reduction of "road noise".
- To be a low maintenance installation where possible as gardening is mainly carried out on a volunteer basis by fire fighters.
- To incorporate low water use planting and water efficient water irrigation system.
- Hard elements in the landscape design to be durable and low maintenance.
- Inclusion of seating areas provided with sun shading.

### 2.1.7 Traffic Engineering

The MFB will engage traffic engineers to provide, after the production of conceptual site master planning, specific swept path diagrams of the appliances intended to be stationed at the fire station being designed or refurbished. The traffic engineers shall also check the general configuration of the site layout for car parking and any additional on-site operational vehicles intended to be stored at the station. In addition, the traffic engineers shall liaise with Vic Roads or local authorities regarding any changes to road conditions as generated by the movement of emergency vehicles on and off site.

Ready access to and from the site for MFB vehicles in any traffic conditions is fundamental to the successful operation of the proposed fire station. The MFB will engage and provide the services of a traffic engineer to carry out any necessary traffic studies for the site in order to assist the Architect to plan appropriately road access/ egress and for anticipated traffic flow.

## 2.2 **SITE PLANNING ISSUES**

### **2.2.1 Planning Policy**

The MFB shall engage a town planning consultant to prepare and co-ordinate a town planning application submission if required. The town planning consultant shall co-ordinate the production of this submission with other consultants who are directly engaged by the MFB and principle consultant.

Sites selected for use as fire stations vary in zoning. Generally re-zoning is not required.

Fire stations are generally built in an industrial or residential zone and are a Class 3 and 7a under the BCA. If re-zoning of land is required in order to allow a fire station to be constructed, then the preparation of the re-zoning application is handled by a planning consultant selected and engaged by the MFB.

Careful consideration must be given to the following issues:

- 24 hour active occupation
- 24 hour call-out
- lighting levels
- noise levels
- building scale
- construction materials
- landscaping

### **2.2.2 Planning Overlays**

The site shall be carefully assessed for any existing planning overlays (e.g. heritage overlay, design development overlay) within the relevant Municipality's Planning Scheme as the overlay may impact on the fire station planning and design.

### **2.2.3 Traffic and Public Transport Study**

The design supports the reduction of transport-related greenhouse gas emissions of at least 10% in line with the Victorian Greenhouse strategy.

### **2.2.4 MFB Planning and Parking Requirements**

- (i) External areas to be provided are:
  - (a) Drill yard
  - (b) Car parking
  - (c) Barbeque area
  - (d) Landscaping

(ii) Access and circulation

Drive-through facilities are essential (i.e. appliance enters the appliance bay from the rear or drill yard end and when exiting the building drives forward out onto the street).

(iii) Public approach

The public entrance (and approach) must be clearly obvious both day and night. For occasions when appliances are out on call and the station is locked, the emergency 'phone to contact MFB central control must be prominently located.

(iv) Requirements for specific site areas:

**(a) Drill yard**

- Used for training exercises such as ladder practice etc. and combined exercises with appliances from other stations.
- Size: (to be maximized considering site constraints)
  - 2 Bay – 800m<sup>2</sup>
  - 3 Bay – 1200m<sup>2</sup>
  - 4 Bay – 1300m<sup>2</sup>
  - 5 Bay – (1400m<sup>2</sup>) If Identified as Hub Station 1500m<sup>2</sup> \*
  - 6 Bay – 1500 m<sup>2</sup>
- Location: Usually accessed from drive-through route.  
Direct relationship to Appliance Bay
- Refer to Station Drill Yard Layouts & Sizes advice in Section F: Appendices

**(b) Car Parking**

- Used for S.O.'s and fire fighters cars.
- Size: Minimum N<sup>o</sup> of spaces to be provided as follows:
  - 2 Bay - minimum 10 spaces
  - 3 Bay - minimum 14 spaces
  - 4 Bay - minimum 20 spacesWherever possible, provide 1 space for public use and 1 space for disabled use; refer to table 4.1.1 for site specific accommodation requirements.
- Jockey parking is not acceptable
- Location: In a secure area at the back of the fire station.
- Direct access to fire fighters and officers' quarters for staff spaces.
- Consideration shall be made to the collection of rain water runoff from the car park; pollution/oil traps and the possible incorporation of rain water retention tanks.

**(c) Barbeque area**

- Used by fire fighters and S.O.s.
- Location: Close and over looked from fire fighters' mess.
- Provision of sun shading (shade cloth not acceptable) and weather protection if in an exposed position.
- Glazed or sheltered spaces alongside or within the envelope providing access to light and fresh air. Can also be used to provide heating in winter.

**(d) Perimeter fence**

- Refer to Section B - Appendix B: Minimum Fencing Requirements and Associated Drawings of the MFB Fire Station Security Standards
- The default perimeter fence shall be corrugated steel fence 2.0m high unless dictated by other site and planning constraints. Ensure that solid fencing is adequately braced against lateral loads.



### **2.2.5 Fire Calls**

Calls may occur at any time

All calls come and go to a centralized emergency service call centre and from there are directed automatically to individual stations.

Details of the call type, location and appliance to be taken are printed out by computer system in the Dispatch Alcove. An alarm sounds and the fire fighters promptly respond to the call.

The Station Officer attending the call collects the print out. If the call is at a building with an automatic alarm, the Officer also collects the relevant keys from the Dispatch Alcove key safe before joining the fire fighters on the appliance.

The Turnout System is fully automatic so that when crews are out, the station will be completely locked. An external telephone near the public entrance will link directly to the call centre to deal with any further calls.

### **2.2.6 The Public**

Members of the public may enter a fire station for a number of reasons:

- (i) To notify the station of an incident
- (ii) To make informal inquiries
- (iii) To attend a group lecture or visit to the station (e.g. boy scouts, school groups)

The public enters the fire station through an entrance lobby, (which is overlooked and supervised by the Station/SO's office). Depending on the nature of their visit, they may be directed either to the Station/SO's office or the appliance bays. The public is rarely, if ever, allowed into the officer or fire fighters accommodation quarters.

The following areas are considered to be "public spaces" for the purposes of disability access:

- Entry Foyer
- Multi Purpose Room
- Visitor / disabled toilet
- Dispatch Alcove (so people can access the appliance bay)
- Appliance bay

The rest of the station building is considered to be private. A member of the public or a visitor by invitation may be taken through these areas. However, an employee will always escort them.

# VOLUME 3:

## STRATEGIC DELIVERY PRINCIPLES

### REVISION HISTORY

Revision	Prepared By	Date Prepared	Issue
B	StrataPNA Architects	09/2010	Incorporating MFB Comments and workshop recommendations
A	Tony Green Architects	09/2005 Revised 07/2008	

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## **PROJECT ENVIRONMENTAL SUSTAINABILITY TARGETS**

The MFB is committed to implementing sustainable design practices. In order to meet this objective, Architects and sub-consultants are required to consider the four inter-related tenets of environmental sustainability at all stages of a building's life:

- (i) Bio-diversity – protect and restore ecological diversity, health and functionality
- (ii) Resources – optimize their use, especially non-renewable resources
- (iii) Pollution – minimize pollution of soil, air and water
- (iv) Quality of life – improve the health, safety and comfort of building users.

In practice, Architects are required to follow the specific design strategies and actions as set out in the Building Design Profession manual: "Environment Design Guide" published by The Australian Council of Building Design Professions, February 2000 together with current amendments.

Specific attention is drawn to document GEN 1 pages 5 to 10 inclusive, headed "Sustainable Design Strategies for Architects" and the following sub-headings –

- 1. Pre-design
- 2. Site and Planning Issues
- 3. Concept design
- 4. Resources – Material Selection
- 5. Resources - Energy
- 6. Resources – Water and Others
- 7. Construction Management
- 8. Building Operation and Management

Part of the MFB's design evaluation and approval process will include consideration of the Architects' responses to the above sub-headings 1 to 8 inclusive.

## **3.2 PROJECT ADMINISTRATION & MANAGEMENT STRUCTURE**

- (i) The project will be co-ordinated by the Property Services Department of the MFB.
- (ii) The Architect will be responsible to the Property Services Department and take instructions from an authorized member of this Group.
- (iii) The Architect shall be responsible for the coordination and adequate briefing of their sub-consultant team. Briefing will include the following workshops:
  - (a) At the commencement of the Schematic Stage, the Architect shall host a workshop for all consultants and client representatives as nominated by the MFB Major Projects Group Coordinator. The Workshop shall address all the items listed in 3.1 "Project Environmental Sustainability Targets" and agree specific design strategies under each of the above sub-headings noted in 3.1 'Project environmental sustainability targets'.
  - (b) At the commencement of the Design Development Stage the Architect shall host a second workshop to review and amend as necessary the strategies agreed at the commencement of Schematic Design. At the conclusion of the review, the amended strategy shall be signed off by each of the consultants and agreed with coordinator of MFB Major Projects Group.
- (iv) The Architect shall issue any necessary checklists to sub-consultants as and when required in order to monitor progress of the consultant in achieving the agreed strategies from the "Project Environmental Sustainability Workshops" at Schematic Design Stage and Design and Development stages. The Architect shall keep the Major Projects Group coordinator informed.
- (v) The Architect will be required to review the briefing documents (provided by the MFB) with the various consultants and develop a specific brief for the facility. The final form of the brief will be

the sketch design drawings, together with appropriate documentation that fully describes the proposal and shall be approved by the MFB prior to development approval submission.

- (vi) The MFB will engage an independent Cost Planning Consultant to undertake cost planning for the project. It is expected that design and documentation will be completed within the Cost Consultant's initial project costings, without rework, to bring costs down at the time of tender.
- (vii) The MFB will provide the services of a Town Planner to assist in the preparation, documentation and submission of the Town Planning Application, planning scheme amendments where necessary and attending planning appeals.
- (viii) The MFB will provide the services of a Consultant Building Surveyor to review documentation and issue building permit.

### **3.3 QUALITY ASSURANCE REQUIREMENTS**

The following performance standards will be expected to be maintained by the Architect and their consultant team for the duration of the contract and be subject to continuous monitoring by the MFB.

- (i) Achievement of "on schedule" performance of the various parts of the project.
- (ii) Ability to understand the MFB's briefing requirements and provision of all questions necessary to enable the 'on schedule' completion of sketch planning and the submission for a town planning permit and the following completion of contract documents.
- (iii) Documentation completed with the minimum of errors that require corrections and result in variations to the project – Target 5 errors.
- (iv) Design and documentation completed within the Cost Consultants' initial project costings – that is: no rework to bring the costs down at the time of tender.
- (v) Work completed within the overall project budget.
- (vi) Contractor completes project with no major defect problems and a minimal number of minor defects.
- (vii) Mechanical services and air-conditioning systems function well with no complaints.
- (viii) No roof leaks due to design deficiencies.
- (ix) The building meets or exceeds all energy performance targets set for the project.
- (x) The building meets or exceeds all agreed environmental sustainability objectives set for the project.
- (xi) The building meets or exceeds all OH&S requirements, including all MFB, OH&S practices and procedures for construction safety management.
- (xii) Complete documentation at the end of the project and all necessary paperwork submitted to the MFB as required to facilitate future maintenance.
- (xiii) Diligent contract administration, minimal outstanding variations, claims, disputes or other problems for the duration of the contract.
- (xiv) As built drawings, manuals and service manuals delivered within 4 weeks of Practical Completion.

### **3.4 PROJECT BENCHMARKING**

The MFB will nominate recently completed Fire Stations, which may be used for benchmarking purposes. Such purposes may include quality of materials, quality of finish, attention to detail, mechanical and air conditioning performance, standard of structure, landscaping, etc.

#### **3.4.1 ROLES & RESPONSIBILITIES**

- (i) The Architect will be required to review the briefing documents (provided by the MFB) with the various MFB user groups coordinated by MCP. At the direction of MCP, the Architect will develop a specific brief for this facility as previously noted.
- (ii) The Architect shall carry out an analysis of the site to recommend optimum usage, including a review of planning requirements as applicable to the MFB in order to achieve an “energy smart” fire station that meets MFB’s current needs and be adaptable to meet future changes in requirements.
- (iii) The Architect shall carry out a study of services requirements, both on and off site, which shall include electrical and gas services and distribution, sewer and storm water collection, drainage, water supply and distribution, security protection, voice and data services.
- (iv) The Architect shall determine conformity with planning control and prepare documentation for planning approval. Planning Consultants and MFB representatives are responsible for consultation with authorities and applications for approval by planning authorities. Rezoning, seeking amendments to planning schemes or attending appeals is not part of the Architect’s role.
- (v) The Architect shall prepare schematic design, illustrated by sketch drawings and reports.
- (vi) The Architect is responsible for landscape planning, design and subsequent contract administration.
- (vii) The Architect and consultant team are responsible for preparation of preliminary engineering details to ensure the feasibility of all proposed civil, structural and services works and their conformity with the appropriate regulations.
- (vii) The Architect is responsible for preparation of developed designs including, as appropriate, developed sketch drawings, reports, engineering and specialist services recommendations to a stage satisfactory for submission and approval by town planning authorities.
- (viii) The Architect and consultant team are responsible for inclusion of any engineering services, structural, civil, mechanical, electrical, IT, telephone, security, hydraulic and fire services to ensure that accurate cost plans may be prepared.
- (ix) The Architect’s reports shall identify the significant drivers of in-service life-cycle costs and verify design trade-offs between desirable and affordable capital investment decisions and the impact on optimum maintenance and support of the facility. This process shall include consideration of:
  - (a) Reduction of constructions costs
  - (b) Reduction of maintenance costs
  - (c) Reduction of user costs
  - (d) Reduction of future adaptation costs
- (x) The Architect shall allow time within the work program for the application of a thermal modeling program to the design. The modeling work will be carried out by an independent Consultant appointed by the Architect. The selected thermal modeling program shall have a proven track record.

VOLUME 4.1

ARCHITECTURE

FIRE STATION DESIGN

FUNCTIONAL BRIEF

**REVISION HISTORY**

Revision	Prepared By	Date Prepared	Issue
B	StrataPNA Architects	09/2010	Incorporating MFB Comments and workshop recommendations
A	Tony Green Architects	09/2005 Revised 07/2008	

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## **ARCHITECTURE**

The architect shall read Volumes 1, 2, 3 and 4 of this delivery manual and shall present a “return of brief” to the MFB to confirm their understanding and detail any exclusion to their work.

### **4.1.2 DESIGN QUALITY AND STANDARDS**

This brief shall be read in conjunction with all Volumes of this delivery manual.

The design of the works must comply with all applicable Australian and New Zealand Standards, Regulations and Authorities requirements.

The architect shall specify “robust” and reliable equipment and shall be able to provide the Client with references for existing sites where the equipment can be seen to be running.

The architect shall design the works so that convenient commissioning and future maintenance may be conveniently carried out (making parts accessible etc.).

The architect is to design the works in such a way that optimises so far as is practically possible the operational energy efficiency of the installation.

The architect shall include any items that are not specifically shown in this Document which in his/her opinion shall result in a satisfactory installation.

The architect shall utilise the ‘Guide Checklist’s’ in Section E of this manual and sign-off each checklist at stages of brief formulation, land assessment, schematic design, developed design and town planning. Items not ticked are to be brought forward to the following stage.

The architect shall include documents suitable for presentation to the user group at each design stage. Developed Design stage plans are to include scaled furniture plans.

### **4.1.3 GENERAL BUILDING REQUIREMENTS**

#### **(i) Size Categories**

Fire Stations generally are categorized according to either the number of bays or the number of appliances (fire trucks):

- |     |                          |   |  |
|-----|--------------------------|---|--|
| (a) | Two Bay – 1 appliance    | ) | Follow the general design principles and room  |
| (b) | Three Bay – 2 appliances | ) | data sheets set out in this Brief.   |
| (c) | Four Bay – 3 appliances  | ) |  |
| (d) | More than Four Bays      | ) | The number of bedrooms, showers,<br>appliance bays and size of Mess-rooms, etc.<br>may vary in accordance with site specific data. |

#### 4.1.4 **BUILDING FORM**

Design considerations:

(i) Orientation

- Passive solar heating, cross ventilation and natural lighting - maximise Northern solar exposure for solar gains in winter and face main openings to South
- Shape - minimise ratio of Building Envelope to floor area.
- Zoning with buffer spaces e.g. Lobby, corridors
- Consider atria - in deep structures to allow natural light penetration into building and to provide indoor courtyard at ground level. This could also function as a solar chimney to facilitate natural ventilation of appropriate areas. Amenity further improved if appropriate vegetation planted and/or water feature (also has evaporative cooling effect)

(ii) Single vs. Double Storey:

Two storeys should only be considered where the site size cannot possibly accommodate a single storey building. This is because stairways and level changes are considered dangerous and are to be avoided if possible.

If two-storey construction is unavoidable, the following rooms may be located upstairs:  
Refer to Site specific data brief in Section C for suggested Area/Rooms to be located upstairs.

(iii) Ceiling Heights

Generally – 2.7m (as a minimum)

Appliance bays – **5.5m clear of beams** to allow for tilt-up cabin for maintenance of vehicles and **4.5m clear height** at doorways when the appliance bay door(s) is in the fully open position.

#### 4.1.5 **FLEXIBILITY AND EXPANSION**

The MFB is subjected to constant changes and fire stations must allow for these in the following ways:

(i) Appliance Bays

**One more appliance bay than the number of working appliances is always provided for future growth and the storage of spare vehicles in case a vehicle breaks down.** It is for this reason that a one-appliance station has two bays; a two appliance station has three bays and so on.

(ii) Appliance Sizes

All stations must be capable of taking the largest vehicles with the exception of specialist appliances (e.g. turntable appliances or snorkels). For this reason, the Appliance Bay size is fixed

(iii) MAS (Metropolitan Ambulance Service) Accommodation

“To be Added/Included” if required

(iv) Siting and Planning

Where possible, stations should be planned and sited to allow for future expansion (e.g. the addition of fire fighters' bedrooms).

## **MAINTAINABILITY**

Ongoing maintenance, including; cleaning, plant servicing, routine decoration, routine fabric maintenance, landscape maintenance, minor and major repair and replacement work at fire stations represents a significant resource cost to the MFB. Not only must building fabric and plant items that pose increased maintenance cost are to be avoided, but the design must facilitate cost effective maintenance, for example, by the provision of easy access.

## **STRUCTURAL DESIGN**

Design to comply with following:

- The building is to be designed in such a manner that no internal load bearing walls are ever required.
- Columns or small props to provide roof support, which can be moved later on, are acceptable.

## **MATERIALS (BUILDING FABRIC)**

### **(i) General**

Design to comply with following:

- Use materials with low allergenic characteristics.
- Do not use hazardous and/or toxic materials. (Including organic chlorine-based materials e.g. PVC, vinyl).
- Avoid the use of materials and insulation containing ozone depleting potential (ODP) blowing agents.
- Specification of durable and low maintenance materials.
- Use low emission options for particle and composite boards.
- Source local materials wherever possible.
- Documentation should be accurate so that correct quantities of materials are delivered to site.
- External louvers - Fixed louvers to reduce heat gain in summer and allow winter sun into areas that can be passively heated.
- Dimension and detail building and fit-out design to require use of standard material sizes and components. Adopt a building grid/layout to maximise potential to standardise material dimensions/modules, reducing excessive waste
- Use reusable or recyclable materials wherever possible.
- Minimise the use of building materials which have damaging ecological effects during harvesting and/or manufacturing.

Design considerations:

- Select similar products on basis life cycle cost analysis for options (total energy required).

### **(ii) Floors**

Design to comply with following:

- Service lease instead of purchase - Consider leasing materials/products instead of purchasing e.g. carpets companies that offer "green lease" for floor covering. The company supplies carpet, maintains it throughout its life then replaces it when required. The used carpet is then fully recycled into new carpet.
- Do not use native forest timber (local or imported). Instead consider options such as recycled timber, timber from verifiable sustainable forestry management plantations (i.e. not displaced indigenous forest), and native species plantation timber.

### (iii) Walls

Design to comply with following:

- Protection of outer surface from rain wetting (wet masonry walls allow heat to escape many times faster than when dry).

Design Considerations:

- Façade integrated PV cells - PV cells form part of the façade replacing traditional materials (glass, cladding, sunshades) to partly offset cost.
- Appropriate use of skylights.

### (iv) Glazing

Design to comply with following:

- Low E glazing - Coating or laminate to improve solar/thermal properties of glass.
- Thermally broken frames to reduce heat loss and gains.
- Appropriate glazing areas, orientations and treatments.
- Light window frames - Dark frames absorb heat and can become very hot to touch inside the building.
- Operable windows - Allow windows to be opened by occupants. Link to BAS/DDC in air conditioned facilities.
- Internal window coverings - Type of blinds, curtains, etc affects thermal performance. Controlled by occupants. Can reduce glare, solar gain in summer and heat loss in winter.
- External shading solutions - for control of solar access.

Design considerations:

- Double-glazing (if required to meet acoustic or energy requirements) - Reduces heat loss/gain through glazing.
- Façade integrated PV cells - PV cells form part of the façade replacing traditional materials (glass, cladding, sunshades) to partly offset cost.
- Appropriate use of skylights.

### (v) Ceilings

Design to comply with following:

- Appropriate levels of insulation in ceilings, walls, floors and facades - avoid thermal bridging.

### (vi) Roofs

Design to comply with following:

- Roof and façade colour - Light roofs/walls absorb less heat than dark. Use high reflectance and high emissive roofing.

- Placement of air conditioning roof top condensers or evaporative coolers to be placed in locations with permanent shade.

(vii) Fittings & Finishes

Design to comply with following:

- Internal Reflectance - Choice of finishes will influence daylight penetration. Light walls/floors feel brighter. Consider installation of light shelf.
- Restrict use of materials, such as carpets, paints, adhesives and sealants, releasing volatile organic compounds (VOCs) and other toxic chemicals into the working environment e.g. Formaldehyde.
- Mechanical fixing in preference to adhesives.
- Re-use fittings, furniture and materials from vacated and/or demolished premises.
- Avoid ozone-depleting chemicals (CFC's)- source recognised alternatives with low ozone depleting potential (ODP), for example HC gases in air conditioning, and non CFC blowing agents used in insulation products and furniture foams.

(viii) Waste

Design considerations:

- Minimise production of residuals in building materials selected. Try to incorporate systems for re-use, salvage and recycling of residuals.
- Waste Management Plan - Prepare a Waste Management Plan for construction and ongoing operations.
- Waste Minimisation Specifications - Prepare a Waste Management Specifications for construction and ongoing operations.

(ix) Building Fabric and Passive Strategies

(a) Application of Passive Design Strategies to Fire Stations

Passive design features are only of benefit if the use of the space is in phase with the passive design strategy. For example, thermal mass together with passive solar design is only of use if the space is used several hours after the thermal mass has absorbed a useful amount of heat. Further it is only of use if the placement of the thermal mass on the inside of the building is exposed to direct solar gain. A good example of where this is applicable in a fire station would be the Bedroom, where in the use of thermally massive interior partitions allows more thermal mass to be placed where it can be used to store heat. Thermal mass walls in the bedroom will also provide radiant heating and cooling which can widen the range of air temperatures occupants can tolerate.

The areas where implementing passive heating and cooling strategies should be considered are:

- Office
- Multi Purpose Room
- Drying Rooms (PPE, Personal)
- Bedrooms, adjoining En-suites & Breakout Room
- Gymnasium / Weight Room
- Mess & Lounge Rooms

The areas where implementing thermal mass should be considered are:

- Multi Purpose Room
- Bedrooms, adjoining En-suites & Breakout Room
- Gymnasium / Weight Room
- Mess & Lounge Rooms

(b) Level of internal thermal mass

Consideration shall be given to utilise the thermal mass in the structure to reduce peak loads and consequently HVAC plant size and capital cost.

The advantages of implementing thermal mass strategies can be seen throughout a number of existing MFB stations. A number of older stations throughout the MFB use considerably less energy than modern stations due to their substantial thermal mass. By implementing passive solar design strategies in conjunction with thermal mass, the reduction in HVAC operational costs and capital costs of plant and space are well worth considering.

VOLUME 4.2

MECHANICAL SERVICES

FIRE STATION DESIGN

FUNCTIONAL BRIEF

**REVISION HISTORY**

Revision	Prepared By	Date Prepared	Issue
C	BRT Consulting	09/2010	For Issue
B	BRT Consulting	08/2010	Draft For Comment
A	CPS Services	11/2008	General Release

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# **1 INTRODUCTION**

## **1.1. GENERAL**

This Functional Design Brief for Mechanical Services shall be read in conjunction with the Architectural Functional Brief for each new or refurbished MFB Fire Station. The Functional Design Brief outlines the design requirements for the Mechanical services pertaining to fire stations of the Metropolitan Fire & Emergency Services Board (MFB).

All the Mechanical services items required for the completion of the installation in fire stations, whilst not necessarily being mentioned but necessary for the completion of the complete installation, shall be incorporated in the design and shall conform to good trade practices and manufacture.

The layout of the brief includes the Design Requirements and suggested specification clauses that are required to be incorporated into the design and the MFB.

Under all circumstances these clauses shall be met. We note that any diversion from the approved methods must be proposed to the MFB for consideration first.

The operation and characteristics of controls may vary from station to station. All requirements shall be confirmed with MFB.

## **1.2. DOCUMENT REVIEW**

The functions and characteristics described are current at this document's date of issue. This manual will be revised when significant changes are made to station electrical equipment. Any comments and errors should be reported to: The Executive Manager MFB Property Development Metropolitan Fire and Emergency Services Board.

## **1.3. GREENSTAR**

The designer shall be aware that the project will be subject to independent Greenstar certification including design and as built. Any change from the design requirements nominated below shall be approved by the MFB prior to implementation.

## **1.4. DESIGN CRITERIA**

The main criteria in the design of Fire Station are to ensure that once commissioned, the Mechanical installation achieves high energy efficiency, low maintenance cost, reliable operation, and is fit for the purpose of the emergency service needs of the MFB.

The mechanical engineer shall specify "robust" and reliable equipment and shall provide the Client with references for existing sites where the equipment can be seen to be running.

The mechanical engineer shall design the works so that convenient commissioning and future maintenance may be conveniently carried out (making parts accessible etc.).

The mechanical engineer shall design the works in such a way that optimises so far as is practically possible the operational energy efficiency of the installation.

The mechanical engineer shall include any items that are not specifically shown in this Document which in his/her opinion shall result in a satisfactory installation.

Drawings and tender documentations appropriate for Contractor pricing and design shall be provided by the Mechanical Engineer.

The contractors commissioning, operation and maintenance manuals shall be reviewed as required by the mechanical engineer to confirm the installation has been satisfactorily installed and commissioned.

The design of the HVAC system for the building shall be integrated with the design of the building envelope and fabric and the other building services to minimise the size and cost of energy consuming systems and minimise the operational energy consumption of these systems.

## **1.5. MECHANICAL SUBCONTRACTORS**

Consultants shall prepare the list of the proposed, Mechanical sub contractors selected for the project and confirm with the MFB. Only, the contractors accepted by the MFB shall be used for the project.

## **1.6. EXTENT OF WORKS**

The scope of works shall comprise the necessary design, approvals, manufacture, supply, delivery, installation, testing, commissioning, maintenance and defects liability service of materials, provision of operation and maintenance documents, maintenance, labour and equipment and certification of performance of the complete Mechanical services including but not limited to the following:.

- airconditioning systems including ductwork, diffusers, grilles and pipework;
- ventilation systems;
- heating systems
- automatic controls;
- electrical work;
- commissioning, testing and putting into service;
- as-built drawings and maintenance manuals;
- routine maintenance during defects liability period;
- Certificate of Compliance;

## **1.1 STANDARDS AND REGULATIONS**

All works shall be designed and documented in accordance with all the relevant authorities having jurisdiction over the works, including the following:

- Building Code of Australia
- Relevant current Australian Standards including where appropriate:
- AS/NZS 3000 - Wiring Rules
- Environment Protection Authority.
- Local Water Supply Authority.
- Plumbing Industry Commission.
- Local Electricity Supply Authority.
- EnergySafe Victoria
- Relevant Health Department.
- Department of Human Services
- All Local Authorities having jurisdiction over the work.

### **1.6.1.Air Handling**

- AS 1668.1 - The use of mechanical ventilation and airconditioning in buildings
- AS 1668.2 - The use of ventilation and airconditioning in buildings - Part 2: Ventilation design for indoor air contaminant control
- AS 1688.2 Supplement 1 - The use of mechanical ventilation and airconditioning in buildings - Mechanical ventilation for acceptable indoor-air quality
- AS/NZS 3666.1: Air handling and water systems of buildings - Microbial control - Design, installation and commissioning.
- AS/NZS 3666.2: Air handling and water systems of buildings - Microbial control - Operation and maintenance.
- AS 4254 - Ductwork for air handling systems in buildings.

### **1.6.2.Airconditioning**

- AS 1277 - Measurement procedures for ducted silencers.
- AS 1324.1 - Air filters for use in general ventilation and airconditioning - Application, performance and construction.
- AS 1324.2 - Air filters for use in general ventilation and airconditioning - Methods of test.

- AS 3823.1.1 - Performance of household electrical appliances - Room airconditioners. Part 1.1: Non ducted airconditioners and heat pumps - Testing and rating for performance.
- AS 1861.2 - Airconditioning units - Methods of assessing and rating performance - Refrigerated package airconditioners.
- AS 2913 - Evaporative airconditioning equipment.
- AS 1596 - Storage and handling of Liquified Petroleum Gas.
- AS 1677 - Refrigerating Systems - Parts 1 & 2
- AS1432 - Copper tubes for plumbers, gas fitting and drainage application.
- AS 4508 - Thermal resistance of insulation for ductwork used in building Air Conditioning.
- AS 4426 - Thermal insulation of pipework, ductwork and equipment - selection, installation and finish.

## **2. DESIGN CONDITIONS**

All systems will be designed to operate and maintain comfort levels to all occupied spaces. The design conditions provided by AIRAH for Melbourne Composite will be applied for calculating heat loads to each space.

Critical Areas include – SO Office and SSO office.

### **2.1. Outdoor Design Conditions – Critical Areas**

Summer : 40.0°C DB  
21.0°C WB  
Winter : -1.0°C DB

### **2.2. Outdoor Design Conditions – Non Critical Areas**

Summer : 34.3°C DB  
20.5°C WB  
Winter : 3.5°C DB

### **2.3. Indoor Design Conditions**

The internal conditions unless noted otherwise shall be designed as follows:

Summer : 24.0 ± 1°C DB  
Winter : 21.0 ± 1°C DB

## **3. ACOUSTICS**

The design should achieve ambient internal noise levels in accordance with AS/NZS 2107:2000 as follows:

- Building Services Design - building services noise should meet the recommended design sound levels provided in Table 1 of AS/NZS2107:2000.
- Overall Building - the sound levels should fall between 40-45 dB LAeqT in general offices and 35-40dB LAeqT in private offices.

The following parameters should also be considered:

- Background noise levels and facility acoustics should meet or better Australian Standards
- Minimise noise emissions to adjacent properties

## **4. AIR CONDITIONING AND HEATING SYSTEM**

Generally air conditioning shall be provided by a Daikin VRV system.

### **4.1. Large Internal Spaces**

All large internal and mechanically ventilated spaces shall be serviced by a ducted unit with outside and discharge louvers suitably sized to enable economy cycle.

### **4.2. Bedrooms**

All bedrooms shall be serviced with an individual ducted unit. The unit shall be located within the corridor to reduce the noise levels. Each room shall have the ability to control their heating or cooling mode (ie each room shall have its own branch selector)

The branch selection box shall be provided with additional insulation and located well clear of the bedrooms to avoid noise.

### **4.3. Other Areas**

Other areas as nominated within the room data sheets may be serviced by ceiling cassette, wall mounted or ducted unit to suit the application.

### **4.4. AS1677**

The system size shall be selected to avoid grilles required by AS1677.

### **4.5. Control**

Each unit shall be provided with an individual controller located within the space.

All ducted units shall have a remote type sensor located within the space.

The VRV system shall be provided with a high level interface to the Siemens BMS. Refer later section for details.

### **4.6. Zoning and Unit selection**

All units shall be selected to allow isolation of unoccupied rooms. This will require a separate unit for each space. Zoning must take into account the aspect of glazing and use of the space.

When selecting a HVAC system, the following factors must be taken into account:

### **4.7. Condensing Unit Diversity**

An appropriate diversity shall be used apart from the critical areas, the condensing units for these areas need to have 100% capacity.

## **5. VENTILATION**

Outside air intake and exhaust systems shall comply with the minimum rates set out in AS 1668 Part 2 taking into account the energy. Higher rates may be used where they can be shown to have a positive effect on the internal environment and the occupants therein. All exhaust shall be discharged directly to atmosphere.

The ventilation strategy should feature natural ventilation, heat/cool recovery mechanical ventilation, occupancy sensor control, BMS (building management system) control, minimal duct lengths and variable speed fans.

Economy cycle operation should also be considered, allowing ideal ambient conditions to provide full fresh air cooling. The following table details the recommended ventilation criteria for the various room types found at a station. This information is also detailed in room data sheets ('Design Criteria' edition):

## **6. MAINTAINABILITY**

On going maintenance, including; cleaning, plant servicing, routine decoration, routine fabric maintenance, landscape maintenance, minor and major repair and replacement work at Fire Stations represents a significant resource cost to the MFB. Not only must building fabric and plant items that pose increased maintenance cost are to be avoided, but the design must facilitate cost effective maintenance, for example, by the provision of easy access.

## **7. BUILDING MANAGEMENT SYSTEM (BMS)**

The fire station shall be designed with a complete Siemens DDC control system to control all systems including:

- VRF Air Conditioning System
- Heat Exchanger Units
- Electric Panel Heaters
- Exhaust and Supply Fans
- Domestic Hot Water Pumps
- Economy Cycle Dampers
- Incoming Power Supply
- Rainwater Use
- Mains Pressure Water Use

The system will have the ability to control these systems by

- Having timeclock control to minimising out of hours use
- Occupant control to prevent unnecessary use of equipment in intermittently used areas
- Having the ability to vary set points on a seasonal basis
- Vary speed of fans depending on occupancy and humidity
- Having run on timers to minimise out of hours use
- Time scheduling of A/C and ventilation plant operation to prevent the unnecessary use of equipment in intermittently used areas.
- Variation of comfort criteria (dead band widening) and temperature set point for different space usages or when space unoccupied.
- Optimisation strategies for staging on/off and operating central plant with multiple heating/cooling modules

### **7.1. Client friendly BMS**

Ensure user interface and software is easy to use and that data is readily accessible on site and that the BMS may be operated at the MFB maintenance facility at Thornbury (Melbourne). Also ensure BMS is easily reprogrammable and provide necessary training to staff.

### **7.2. Siemens Daikin Interface**

Refer Siemens to Daikin interface for the Metropolitan Fire & Emergency Services Board for further information of the VRV integration.

### **7.3. DDC/BMS Control Loop Specifications**

Provide comprehensive control loop descriptions in the specification for the DDC/BMS systems to optimise energy savings. These may include:

- Supply air temperature reset
- Terminal regulated air systems - night time free cooling
- Cooling set point reset
- Optimum start times

### **7.4. Monitoring**

The system must enable monitoring and logging of all points.

VOLUME 4.3

HYDRAULIC & FIRE SERVICES

FIRE STATION DESIGN

FUNCTIONAL BRIEF

**REVISION HISTORY**

Revision	Prepared By	Date Prepared	Issue
A	BRT Consulting	09/20101	Incorporating MFB Comments

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# **1. INTRODUCTION**

## **1.1 GENERAL**

This Functional Design Brief for Hydraulic Services shall be read in conjunction with the Architectural Functional Brief for each new or refurbished MFB Fire Station. The Functional Design Brief outlines the design requirements for the Hydraulic services pertaining to fire stations of the Metropolitan Fire & Emergency Services Board (MFB).

All the hydraulic services items required for the completion of the installation in fire stations, whilst not necessarily being mentioned but necessary for the completion of the complete installation, shall be incorporated in the design and shall conform to good trade practices and manufacture.

The layout of the brief includes the Design Requirements and suggested specification clauses that are required to be incorporated into the design.

Under all circumstances these clauses shall be met. We note that any diversion from the approved methods must be proposed to the MFB for consideration first.

The operation and characteristics of electrical controls may vary from station to station. All requirements shall be confirmed with MFB.

## **1.2 DOCUMENT REVIEW**

The functions and characteristics described are current at this document's date of issue. This manual will be revised when significant changes are made to station electrical equipment. Any comments and errors should be reported to: The Executive Manager MFB Property Development Metropolitan Fire and Emergency Services Board.

## **1.3 GREENSTAR**

The designer shall be aware that the project will be subject to independent Greenstar certification including design and as built. Any change from the design requirements nominated below shall be approved by the MFB prior to implementation.

## **1.4 DESIGN CRITERIA**

The main criteria in the design of Fire Station are to ensure that once commissioned, the hydraulic installation achieves high energy efficiency, low maintenance cost, reliable operation, low ecological impact and is fit for the purpose of the emergency service needs of the MFB.

Therefore consideration has been given to such factors as:

An energy efficient design is achieved and complied with the BCA Section J

Over all life cost of plant and equipment. Items to be reviewed include capital costs, installation costs and running and maintenance costs.

The selected equipment would be easy to maintain, reliable (have a low history of faults) and have replacement equipment readily available on the local market.

## **1.5 EXTENT OF WORKS**

The scope of works shall comprise the necessary design, approvals, manufacture, supply, delivery, installation, testing, commissioning, maintenance and defects liability service of materials, provision of operation and maintenance documents, maintenance, labour and equipment and certification of performance of the complete Hydraulic services.

This includes but is not limited to the following:.

**drain connection to the relevant Authority's sewer including boundary trap if required;**  
**drains;**  
**treatment pits, tanks and traps;**  
**plumbing wastes and vents and their connection to all fixtures;**  
**cold water tapping to the Authority's mains;**  
**obtaining a CW meter from the Authority and installation to their requirements, including valves, strainers, check valves, test points, backflow prevention devices, etc;**  
**cold water reticulation and connection to all fixtures and fittings;**  
**cold water backflow prevention devices;**  
**hot water services;**  
**Solar Hot Water System;**  
**hot and tepid water reticulation and connection to all fixtures and fittings;**  
**boiling water units;**  
**fire hydrant protection;**  
**fire hose reels;**  
**fire extinguishers;**  
**fire sprinkler system**  
**gas connection to local Gas Supply Authority's mains;**  
**gas fitting line and reticulation and connection to all fixtures and fittings;**  
**rainwater harvesting including storage tanks, pipework, valves, fittings, pumps, controls and electrical services;**

## **1.6 STANDARDS AND REGULATIONS**

All works shall be designed and documented in accordance with all the relevant authorities having jurisdiction over the works, including the following:

**Current relevant Australian Standards and in particular AS 3500.**

**Building Code of Australia**

**AS 5601 - Gas Installations**

- AS 3666            Air Handling and Water Systems of Buildings - Microbial Control
- HB 263            Heated Water Systems

**Plumbing Industry Commission.**

**Relevant Sewerage and Water Supply Authority**

**Plumbing Industry Commission**

**Metropolitan Fire Brigade**

Relevant Fire Codes and in particular where relevant:

- AS 2419            Fire Hydrant Installations
- AS 2441            Installation of Fire Hose Reels
- AS 2444            Portable Fire Extinguishers and Fire Blankets.
- AS 1841            Portable Fire Extinguishers
- AS 1851            Maintenance of Fire Protection Equipment
- AS 2118.4          Automatic fire sprinkler systems - Residential

## **1.7 DESIGN QUALITY AND STANDARDS**

The hydraulic engineer shall specify robust and reliable equipment and shall provide the Client with references for existing sites where the equipment can be seen to be running.

The hydraulic engineer shall design the works so that convenient commissioning and future maintenance may be conveniently carried out (making parts accessible etc.).

The hydraulic engineer shall design the works in such a way that optimises so far as is practically possible the operational energy efficiency of the installation.

The hydraulic engineer shall include any items that are not specifically shown in this Document which in his/her opinion shall result in a satisfactory installation.

Drawings and tender documentations appropriate for Contractor pricing and design shall be provided by the hydraulic engineer.

The contractors commissioning, operation and maintenance manuals shall be reviewed as required by the hydraulic engineer to confirm the installation has been satisfactorily installed and commissioned.

## **1.8 DOMESTIC HOT WATER SYSTEM (DHW)**

The domestic hot water system shall be separate to any heating hot water system

Central DHW Plant shall be gas fired where supply is available to the site, and fitted with electronic ignition

The system shall be solar boosted with preheat as a preferred method.

Where gas is not available heat pump units shall be used. The system must be suitable for pumped systems.

Where possible, localised hot water services should be implemented as they are more energy efficient than centralised hot water systems with circulating distribution systems

Dead legs on piping distribution systems shall be minimised.

## **1.9 RAIN WATER**

Rainwater shall be harvested for irrigation - Collect rainwater from roof/hard areas and divert into storage tanks or retention dams (for irrigation purposes) rather than stormwater drains. This can then be used for irrigation purposes.

Rainwater shall also be harvested for toilet flushing - Collect rainwater from roof and divert into storage tanks. The system shall be provided with automatic change over to mains pressure and incorporate backflow prevention. The system shall be provided with constant pressure pumps. Connect rainwater system to all toilet cisterns for flushing. Constant pressure pumps

## **1.10 COLD WATER**

Water meters shall be provided for the main potable water supply to the building. The connection to the street shall incorporate 100mm connection for fire service from which a suitably sized domestic service shall be provided. The hose reels may be connected to the domestic service providing all valves are marked as required by the regulations.

The design shall incorporate meters as required by the authority.

## **1.11 TEPID WATER**

Tepid water shall be provided from Thermostatic Mixing Valves located at 1800AFL located in hinged access box.

## **1.12 FIRE PROTECTION**

The building shall be provided with Hydrant, Hose Reel and Fire Blanket protection to the BCA and relevant standards.

The design shall include a ground ball hydrant, an L type and a Millcock fed from a 100mm fire main. These hydrants may be used for the building protection. However the system must comply to the BCA and AS2419.

## **1.13 FIRE SPRINKLERS**

The building shall be provided with a complete fire sprinkler system to AS2118.4. The system shall be complete with all requirements including flow switches and monitored valves.

The consultant shall specify that the system shall be independently certified at the end of the project.

#### **1.14 MATERIAL SELECTION**

Material selection shall be in accordance with Greenstar requirements with a reduction PVC and incorporation of sustainable, recycled, and recyclable materials. Regardless of the material the performance shall be of best practice and provide long life with low maintenance.

All domestic hot water pipe work insulation shall be free of Ozone Depleting Potential substances.

#### **1.15 BOILING WATER UNITS**

Boiling water shall be air cooled with low energy design and internal timeclock.

#### **1.16 FIXTURES**

Refer Architectural section for details of fixtures.

Flick mixer taps with cold default - Specify flick mixer taps which default to cold setting. Often people have mixer in central position when cold water is only required. This drains hot water from system.

### **1. Purpose:**

This document describes the requirements for managing rainwater quality for uses including garden watering, toilet flushing, vehicle washing and training drills (general outdoor use).

### **2. Scope:**

This procedure applies to all rainwater collection systems without treatment intended for use in either

- Garden watering
- Toilet flushing
- Vehicle washing
- Training drills

This procedure does not apply to rainwater for drinking

### **3. References:**

- Building Act 1993
- A Framework for Alternative Urban Water Supplies (DSE 2006)
- Rainwater Use in Urban Communities Guidelines for Non-drinking Applications in Multi-residential, Commercial and community Facilities
- AS/NZS 3500:2003 National Plumbing and Drainage Code
- *Australian Drinking Water Guidelines 6* (2004), National Health and Medical Research Council (NHMRC).
- *Guidelines for Environmental Management: Use of Reclaimed Water Publication 464.2*, Environment Protection Authority (2003).
- *A Guide to Developing Risk Management Plans for Cooling Tower Systems*, Victorian Department of Human Services (2001).

### **4. Definitions:**

Rainwater

## 5. Responsibility:

Property Services, Operations,

## 6. Background

Rainwater does not pose significant environmental and health risk and therefore it is not regulated in Victoria (or other states). There are no specific regulatory approval standards (water quality standards) for its use<sup>1,2</sup>. It is classified as a readily accessible water supply that is a low risk alternative to reticulated drinking water supply<sup>1,2</sup>.

Treatment is not required for uses such as toilet flushing, garden watering and general outdoor use.

## 7. Procedure

Two separate rainwater management plans are provided. The first applies to rainwater for use in toilet flushing and garden watering only. The second applies to rainwater used for general outdoor use (vehicle washing and training drills), but may also be applied to rainwater used for all purposes outlined in this procedure.

### a) Rainwater Management Plan for Garden Watering & Toilet Flushing

	Activity/Event	Hazard	Risk	Recommended Controls
1	Animal access/perching on roof	Faecal contamination from birds or animals	Low	Garden & roof maintenance includes gutter clean, trim of overhanging trees and site inspections
2	Animal and insect access to tank	Contamination from birds or animals + mosquito borne disease	Insignificant	Screens fitted to all tank inlets Site inspections to include check on security of tank inlets and hatches
3	Human access to tanks	Microbial contamination from humans	Low	Access to hatches/inlets are secured. Site inspections to include check on security of tank inlets and hatches
5	General nutrient inflow to tank	Microbial growth in tank e.g legionella	Low	Garden & roof maintenance includes gutter clean, trim of overhanging trees and site inspections tank inlet screens, gutter guards installed to minimise entry of leaves and debris –consider first flush diverter Installation via licenced plumber – prevention of deadlegs
4	Cross contamination from leaking sewer etc	Microbial contamination from humans	N/A	Installation via licenced plumber
5	Unsafe application of water -e.g drinking	Ingestion of rainwater	Insignificant	Signage on all tanks identifying rainwater and/or do not drink. Communication to all staff regarding

				approved uses

**b) MFB Rainwater for Truck Washing and Training Drills (General Outdoor Use)**

	Activity/Event	Hazard	Risk	Recommended Controls
1	Animal access/perching on roof	Faecal contamination from birds or animals	Low	As above for Garden Watering and Toilet Flushing <b>+First flush diversion system</b>
2	Animal and insect access to tank	Contamination from birds or animals + mosquito borne disease	Insignificant	As above for Garden Watering and Toilet Flushing
3	Human access to tanks	Microbial contamination from humans	Low	As above for Garden Watering and Toilet Flushing
5	General nutrient inflow to tank	Microbial growth in tank e.g legionella	Low	As above for Garden Watering and Toilet Flushing <b>+First flush diversion system</b>
4	Cross contamination from leaking sewer etc	Microbial contamination from humans	N/A	As above for Garden Watering and Toilet Flushing
5	Accidental ingestion of rainwater	Ingestion of pathogens	Low	As above for Garden Watering and Toilet Flushing <b>+ Verify quality of water meets quality requirements via water quality analysis</b>

**Rainwater Quality Verification (including Test Parameters).**

The testing program below is applicable only to rainwater used for general outdoor use (e.g. vehicle washing and training drills). The rainwater quality verification is not required for rainwater used for garden watering or toilet flushing.

The type, frequency and quantity of samples for any ongoing monitoring will be dependant on the results of the initial analysis and the effectiveness of controls e.g first flush, filters etc.

The test parameters, relevant to general outdoor use have been selected from applicable drinking water, class A and cooling tower water standards.

Relevant Test Parameter	Comment	Recommended limit	Sampling plan
* <i>E. coli</i>	Indicator of presence of faecal contamination and therefore potential pathogens.	<10 org/100mL	Test representative sample of all rainwater tanks prior to commencing use for vehicle washing or training drills.
*pH	Is relevant for determining plant/soil impact from garden watering. Good indicator to pick up on unusual (high/low pH inputs)	6-9	Test representative sample of all rainwater tanks prior to commencing use for vehicle washing or training drills.
*Temperature	General indicator of potential for bacterial growth. Will determine the growth or exclusion of certain types of bacterial including legionella sp (20-50°C).	19oC max	Test representative sample of all rainwater tanks prior to commencing use for vehicle washing or training drills.
Heterotrophic bacteria (HCC)	Indicative of high nutrient content and total bacterial numbers	<100,000 cfu/mL	May be tested as an alternative to <i>E. coli</i>

<i>Legionella sp.</i>	Direct testing may be warranted if conditions of rainwater tanks are high risk (e.g. high temps/nutrient)	Not detected (<10cfu/mL)	Perform test only if temperatures between (20-50°C).
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# VOLUME 4.4

## ELECTRICAL, COMMUNICATION AND SPECIAL SERVICES

### FIRE STATION DESIGN

### FUNCTIONAL BRIEF

#### REVISION HISTORY

Revision	Prepared By	Date Prepared	Issue
C	BRT Consulting	09/2010	Incorporating MFB Comments
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## **8      INTRODUCTION**

### **8.1      GENERAL**

This Functional Design Brief for Electrical Services shall be read in conjunction with the Architectural Functional Brief for each new or refurbished MFB Fire Station. The Functional Design Brief outlines the design requirements for the electrical and communications services pertaining to fire stations of the Metropolitan Fire & Emergency Services Board (MFB).

All the electrical/communications services items required for the completion of the installation in fire stations, whilst not necessarily being mentioned but necessary for the completion of the complete installation, shall be incorporated in the design and shall conform to good trade practices and manufacture.

The layout of the brief includes the Design Requirements and suggested specification clauses that are required to be incorporated into the design.

Under all circumstances these clauses shall be met. We note that any diversion from the approved methods must be proposed to the MFB for consideration first.

The operation and characteristics of electrical controls may vary from station to station. All requirements shall be confirmed with MFB.

### **8.2      DOCUMENT REVIEW**

The functions and characteristics described are current at this document's date of issue. This manual will be revised when significant changes are made to station electrical equipment. Any comments and errors should be reported to: The Executive Manager MFB Property Development Metropolitan Fire and Emergency Services Board.

### **8.3      GREENSTAR**

The designer shall be aware that the project will be subject to independent Greenstar certification including design and as built. Any change from the design requirements nominated below shall be approved by the MFB prior to implementation.

### **8.4      GLOSSARY**

The following terms are used throughout this document.

TS	TURNOUT SYSTEM shows visual messages on a screen and has printing facility for messages received from the Communication Centre.
BMS	Building Management System is an electronic switching device, which controls mechanical equipment such as bells, lights, ventilation fans etc. (BMS-1) and electrical (BMS-2) within the station.
PLC:	Appliance Bay Door PLC equipment controls the opening and closing of the appliance bay doors.
PAX:	(Private Automatic Exchange) refers to the telephone system reserved for fire emergency calls, (otherwise known as the 'Fire Phone' or 'Bat Phone'). Handsets are located in the Turnout Area and the Station Office.
VoIP	Voice over IP telephone system.

## **8.5 DESIGN CRITERIA**

The main criteria in the design of Fire Station are to ensure that once commissioned, the electrical installation achieves high energy efficiency, low maintenance cost , reliable operation , and is fit for the purpose of the emergency service needs of the MFB.

Therefore consideration has been given to such factors as:

- An energy efficient design is achieved and complied with the BCA Section J
- Over all life cost of plant and equipment. Items to be reviewed include capital costs, installation costs and running and maintenance costs.
- The selected equipment would be easy to maintain, reliable (have a low history of faults) and have replacement equipment readily available on the local market.

## **8.6 ELECTRICAL AND COMMUNICATIONS SUBCONTRACTORS**

Consultants shall prepare the list of the proposed, electrical and communications sub contractors selected for the project and confirm with the MFB. Only, the contractors accepted by the MFB shall be used for the project.

## **8.7 EXTENT OF WORKS**

The scope of works shall comprise the necessary design, approvals, manufacture, supply, delivery, installation, testing, commissioning, maintenance and defects liability service of materials, provision of operation and maintenance documents, maintenance, labour and equipment and certification of performance of the complete Electrical services including but not limited to the following:.

- negotiation as necessary with local Electricity Supply Authority;
- connection of Consumer Supply Authority's mains (including Pillar/Pit or Substaion as Required);
- underground consumer mains;
- meter panel;
- standby generator;
- Uninterruptable Power Supplies
- underground conduits and pits;
- switchboards;
- mains and sub mains;
- lighting;
- emergency lighting and exit signs;
- switching;
- dimmer systems;
- general power;
- wiring of equipment;
- ducting systems;
- power supplies;
- telecommunication systems;
- audio-visual system;
- MATV system;
- security system;
- fire detection system;
- Public Address System
- Turn Out system including Lights, Bells, conduits,
- Building Management System
- Connection of Sprinkler system to Fire Detection System

### **8.7.1 WORKS BY MFB**

- Supply of 3kVA UPS system complete with the required cables and batteries for communications
- Supply and installation of communications cabinet complete with network gear and the required number of patch panels, and patch leads,
- Supply and Configure VoIP phone system
- IP Phone interfaces to door intercoms
- Supply of PA amplifier, mixer and microphones

- Supply and installation of Station Turnout Equipment (STO)
- Supply of cabinet for equipment in STO area
- Supply and installation of fibre optic cable from the underground pit located in the street to communications room. Cable pits and underground conduits by the contractor.
- Co-ordination with the City Council and Traffic Authority for the interfacing with traffic lights in the nearest intersection.

#### **8.7.2 WORKS BY SECURITY CONTRACTOR**

Supply and installation of a complete security detection and access control systems and associate wiring

#### **8.7.3 WORKS BY FIRE SPRINKLER CONTRACTOR**

The fire services sprinkler contractor shall supply and install complete system including sprinklers, flow switches.

### **8.1. STANDARDS AND REGULATIONS**

All works shall be designed and documented in accordance with all the relevant authorities having jurisdiction over the works, including the following:

- Building Code of Australia.
- Local Electricity Supply Authority.
- Current relevant Australian Standards, especially;
- AS 3000 – Electrical Installation - Wiring Rules.
- AS 3008 - Electrical Installation - Selection of Cables.
- AS 4836 - Safe Working on low-voltage electrical installations.
- Victorian Service and Installation Rules.
- AS 3013 - Electrical Installations - Classification of the Fire and Mechanical Performance of Wiring Systems.
- AS 2834 - Computer Accommodation.
- AS 3080 + series - Telecommunications Installations.
- AS 4607 - Personal Response Systems.
- AS HB29 - Telecommunications Cabling Handbook
- Austel and in particular their Private Network Design Guide (PNDG).
- AS 1768 - Lightning Protection.
- AS 1670 - Automatic Fire Detection and Alarm Systems - System Design, Installation and Commissioning
- AS 1851 (Series) - Maintenance of Fire Protection Equipment
- AS 1735 - Lift Code.
- AS1680 Series - Interior Lighting Code
- AS/NZS 3084 Telecommunications installations - Telecommunications pathways and spaces for commercial buildings
- AS 2220 - Emergency warning and intercommunication systems in buildings.
- AS/NZS 2293 – Emergency Evacuation Lighting for Buildings.
- Relevant Local, State and Commonwealth Health Departments.
- Metropolitan Fire Brigade.

Where stated the consultant shall use the current version of these standards unless stated otherwise in the BCA.

## **9 ELECTRICAL SUPPLY**

### **9.1 Design Requirement**

Design an electrical supply distribution system of suitable size for the fire station. Liaise with the Supply Authority for method and point of electrical supply to the fire station.

The electrical services shall be designed in consultation with MFB's representative. The maximum demand (MD) shall be prepared in accordance with AS/NZS3000. Additional 20% spare capacity shall be allowed within the cabling and switchboard capacity to allow for future growth. Consumer mains shall be enclosed in underground conduit from the point of attachment to the main switchboard.

The selected Retail Electrical Supply Company is AGL (shall be confirmed with MFB). The Tariff for the supply shall be Tariff 'D'.

## **9.2 Specification Clauses**

Meters shall be Smart Type. The metering panel shall be externally mounted in an approved by Supply Authority weatherproof enclosure.

# **10 EARTHING**

## **10.1 Design Requirement**

The Electrical installation shall be designed to include earthing in accordance with AS/NZS3000 and comply with Supply Authority requirements.

## **10.2 Specification Clauses**

The earthing system shall include a new earth stake, cables, clamps and all required accessories.

The main earth electrodes shall be located near the site main switchboard or as recommended by the Supply Authority. Provide vandal proof and weather proof duct covering main electrode. Provide label "main electrical earthing conductor - do not disconnect"

All earthing conductors shall be insulated. Generally, the earthing conductors shall:

- Be of minimum size as recommended by AS 3000
- Be continuous throughout the entire length
- Be protected against mechanical damage and corrosion
- Be provided to all equipment throughout the station

Metallic pipes, ducts, or brackets, which are accessible from and within 2m of any metallic enclosure containing electrical supplies or GPO's, shall be earthed. Light fittings, sockets outlets and fixed wiring to appliances shall be earthed by means of the earth conductor.

The UPS battery cabinet (enclosure) shall be earthed via 6mm<sup>2</sup> Green Yellow cable

Include an earthing system for telephone telecommunications system and the integrated voice and data cabling system. Telephone equipment shall be bonded to power earth system. The rating and type of earthing cabling shall be in accordance with Australian Telecommunications Authority regulations.

A separate earthing conductor shall be used for each circuit and run back to the earth bar within the switchboard.

# **11 SWITCHBOARDS**

## **11.1 MAIN SWITCHBOARD (MSB)**

### **11.1.1 Design Requirements**

The board shall be located in the accessible location, preferably enclosed in a cupboard in the corridor or in plant room, in close vicinity to the main entry, and Siemens equipment.

The switchboard shall be designed to incorporate automatic change over to generator as nominated elsewhere in this document.

### **11.1.2 Specification Clauses**

The main switchboard shall be a custom built switchboard designed in accordance with the relevant sections of AS 3439..

The board shall be a front connected, dust and vermin proof cubicle, designed to withstand a fault level (to be confirmed with Supply Authority) and constructed as follow: -

- Minimum metal thickness of the cubicle of 2.0 mm.
- Doors, fabricated from minimum 1.6mm, folded bright mild steel with a heavy-duty latch. No plastic locks are allowed. Stiffen and brace doors to achieve rigidity and prevent warping or sagging.
- Lift off hinges for all doors and escutcheon plates.
- Three point locking device and locks keyed to CL-001 keys.
- Connections for normal and generator supplies.
- Centre mounted main switch and manual transfer switches (mechanically and electrical interlocked manual transfer switches).
- Ammeter with maximum demand indication. Voltmeter with 240/415 volts A.C. indication.
- Digital Energy Monitor devices (Siemens DEM series 1000/2000) mounted on the live side of the main switch at MSB and live side of Mechanical Services Board (MSSB). Works shall include twisted pair RS485 cabling between DEM devices and Siemens BMS Mechanical panel and between DEM devices and Siemens BMS Electrical.
- Ducting for final sub circuits and control wiring
- A separate compartment consisting of chassis of the sufficient size for all circuit breakers and RCD circuit breakers protecting the outgoing circuits.
- Neutral and earth bars.
- A separate compartment consisting of the required number of contactors, time switches and 24V AC relays and 100-way termination strip panels for termination of wiring between MSB and controlled fields.
- Voltage-free contacts and wiring required for a number of controls including "Mains Phase Failure contacts and wiring to Siemens BMS to indicate the stand-by generator status.
- Voltage-free contacts and wiring between metering panel and Siemens BMS equipment.
- Voltage-free contacts and wiring between mechanical services isolator and Siemens BMS equipment.
- Colour shall be standard manufacturers colour scheme or as requested by MFB.

## **11.2 DISTRIBUTION SWITCHBOARD DB-UPS**

### **11.2.1 Design Requirements**

Design switchboard to provide UPS power to communications equipment.

### **11.2.2 Specification Clauses**

8-pole 240V single-phase metal load centre complete with lockable door, 40A, double pole main switch and DIN-T miniature circuit breakers, neutral and earth bars and circuit schedules shall be provided adjacent to UPS system in the communications room. The load centre shall be manufactured by NHP – cat no. NLC8FE c/w LD6/8 door and DSLK locking kit. The following services shall be wired from the DB-UPS:

- Communications cabinet
- Siemens BMS
- Telephone system
- Station Turnout System
- Security detection system

All circuit breakers shall be labelled to give clear identification of circuits or equipment controlled. Labels on switchboards shall indicate switchboard name, supply mains size, type number and origin of supply and be fixed with cadmium-plated screws.

## **11.3 DISTRIBUTION SWITCHBOARDS (DSB) – LARGER INSTALLATIONS**



### **11.3.1 Design Requirements**

Design distribution switchboards as necessary to distribute power.

### **11.3.2 Specification Clauses**

The distribution boards shall have Form 1, segregation in accordance to AS 3439 and be manufactured by an approved company. The distribution boards shall be wall-mounted, dust and vermin proof cubicles and be provided with: -

- Minimum metal thickness of the cubicle of 1.6 mm.
- Doors, fabricated from minimum 1.6mm, folded bright mild steel with a heavy-duty latch. No plastic locks are allowed. Stiffen and brace doors to achieve rigidity and prevent warping or sagging.
- Lift off hinges for all doors and escutcheon plates.
- Flush mounted metal locks complete with two (2) CL001 keys
- Connections for essential and non-essential supplies.
- Ducting for final sub circuits and control wiring
- Centre mounted main switch.
- A separate compartment consisting of chassis of the sufficient size for all circuit breakers and RCD circuit breakers protecting the outgoing circuits. All circuit breakers shall be rated for the 6kA fault level minimum at the switchboard.
- A separate compartment consisting of the required number of contactors, time switches and 24V AC relays and 100-way termination strip panels for termination of wiring between DB and controlled fields. Colour shall be standard manufacturers colour scheme or as requested by MFB.
- 
- 

## **11.4 SWITCHBOARD EQUIPMENT - SPECIFICATION CLAUSES**

All switchboards shall be manufactured in accordance with AS 3439 by an approved company and have a minimum of 30% spare capacity in pole spaces.

The form of segregation for the switchboards shall be as follows:

Less than 150 Amps capacity - Form 1  
150 Amps to 500 Amps - Form 2

Switchboards shall be manufactured by NHP, Heinemann or an approved by MFB manufacturer.

All switchboards shall be earthed by means of earthing conductors provided with each sub-main cable. All metal work in vicinity of switchboards shall be effectively earthed. Earth studs shall be securely welded to each anchoring point prior to painting.

### **11.4.1 Miniature Circuit Breakers**

Miniature circuit breakers shall comply with the requirements of AS 3111 and be Email 'Quicklag', NHP Terasaki, Heinemann, Schneider or approved equivalent. 3-pole circuit breakers shall be interchangeable for 3-single pole circuit breakers and vice versa.

### **11.4.2 Residual Current Devices (RCD's)**

Residual current devices combined circuit breakers to protect final GPO's shall be in accordance with AS 3190. The RCD's shall be single phase; cores balanced and have a sensitivity of 30mA. The current carrying capacity of each unit shall be equal to the present load plus 50% allowance for future load increases.

### **11.4.3 Moulded Case Circuit Breakers**

Moulded case circuit breakers (MCCB) shall comply with the requirements of AS 2184 and be rated to withstand the maximum prospective fault current achievable at the device. MCCB's shall have trip units that are interchangeable and electronic with adjustable over-current and short circuit protection curves.

#### **11.4.4 Fuse Combination Switch Units**

Fuse combination units shall comply with the requirements of AS 3947.3, and be designed to accommodate HRC type fuses in removal fuse cartridge. Fuse bases carriers and links shall comply with AS 2005. Fault current limiters shall be provided to restrict the fault current to levels, which the downstream equipment can accept without damage.

#### **11.4.5 Isolators and Switches**

Isolators and switches shall be rated for AC2 and AC3 utilisation category and comply with the requirements of AS 3947.3, AS 3133. Auxiliary and control switches shall comply with AS 3133, be of rotary snap action type and have contacts of minimum 10A continuous rating.

#### **11.4.6 Instrumentation**

Voltmeters, ammeters and maximum demand meters shall be provided on the incoming supply of the main switchboard. They shall be manufactured by Crompton or other approved manufacturer. Voltmeters shall be connected via selector switch to provide phase to phase and phase to neutral voltages. Ammeters shall have a maximum demand indicator and be provided one per phase. Selector switches shall have a minimum current rating of 15A.

#### **11.4.7 Indicator Lights**

Indicator lights shall be provided to indicate incoming power supply and generator power supplies. The indicator lights shall be front loading type and be Schneider, NHP or approved equivalent. All indicator lights shall have a lamp test facility.

#### **11.4.8 Current Transformers**

Current transformers shall comply with the requirements of Australian Standard AS 1675, be easily removed without removing large sections of bus bars and be labelled to indicate rating, ratio, burden and primary winding of the device.

#### **11.4.9 Contactors**

Contactors shall comply with the requirements of AS 1029, have mechanical duty Class 01 and operation AC3 and be manufactured by Siemens, Email, Schneider or Sprecher and Schuh. Contactor coils shall be fitted with suitable surge diverters to attenuate transient over voltages.

#### **11.4.10 Control Relays**

Control relays shall:

- Be DIN rail mounted, have 10 amp minimum contact rating and be suitable for continuous operation at the voltages nominated
- Have contacts made of silver and have at least 2 spare normally open contacts and 1 spare normally closed contacts
- Coils of control relays shall have surge diverters fitted.

Phase failure relays shall:

- Monitor the 3-phase supplies for correct phase sequence
- Monitor the voltage balance with a 5-15% adjustable setting
- Be provided with 70-90% adjustable under-voltage setting.

#### **11.4.11 Mounting of Equipment**

Equipment shall be mounted to allow ample access and space for adding and removing equipment and wiring. Contactors, time switches etc shall be housed separately from circuit breaker assemblies. Circuit breakers rated above 100A shall be arranged for back connection where installed within freestanding cubicle type switchboards and for front connection where installed within wall mounted switchboards.

#### **11.4.12 Labelling**

All switchgear, apparatus and controls shall be labelled to provide identification of circuits or equipment controlled. Labels on switchboards shall indicate switchboard name, supply mains size, type number and origin of supply and be fixed with cadmium plated screws.

#### **11.4.13 Testing**

All equipment shall be tested at the manufacturer work prior to delivery to site in accordance with AS3439. Tests to be carried shall be laid down in the relevant standard specification for the equipment.

#### **11.4.14 Thermographic Survey**

The thermographic survey of all switchboards including main switchboard, distribution boards, mechanical switchboards, UPS switchboard and generator panel shall be included in the contract to ensure loads are balanced evenly over three phases reducing the risk of potential 'hot spots' and identifying loose connections.

The switchboards shall be surveyed one month after premises are fully occupied and again at the end of the defects liability period. Comprehensive report of thermal survey shall be submitted for examination, recommendation of required works and maintenance procedure and approval.

Recommended specialist contractors:

Mainphase Pty Ltd  
Thermal imaging  
121 Dover Street, Richmond Vic 3121  
Phone (03) 9429 9344  
Fax (03) 9429 2815

Preventive Maintenance Condition Monitoring Infra  
Red Inspections  
P.O. Box 2243 Sunbury Vic 3429  
Phone: 1300 132 517  
Fax 1300 132 518  
Website: [www.thermoscan.com.au](http://www.thermoscan.com.au)

Or other contractor approved by the Superintendent.

All results shall be provided to the superintendent for review and included in the As Built Manual.

## **12 DIGITAL MONITORING DEVICES**

### **12.1 Design Requirements**

Digital Monitoring Devices shall be incorporated into the design of switchboards as nominated below.

### **12.2 Specification Clauses**

Digital Energy Monitor (DEM) devices shall be provided to monitor electricity, gas and water consumption by Siemens BMS system. DEM devices (Siemens DEM series 1000/2000) shall be connected as follows:

- On the live side of the main switch at the main switchboard.
- On the live side of the main switch at the mechanical services switchboard.
- On the solenoid adjacent to water mains meter.

Twisted pair RS485 cabling shall be provided between DEM devices and the Siemens BMS (electrical and mechanical) panels.

## **13 CABLES**

### **13.1 Design Requirements**

Cables shall be selected in accordance with AS/NZS3000 and AS/NZS3008.2 and be based on current carrying capacity and voltage drop. A minimum of 20% spare capacity shall be allowed.

All cabling shall have stranded copper conductors and shall be insulated with 0.6/1kV-grade XLPE unless otherwise specified. All multiphase single core cables shall be installed in trefoil formation. Aluminium conductors shall not be permitted.

The minimum size of final sub-circuits (light and power cables) shall be stranded 2.5mm<sup>2</sup>.

#### **13.1.1 De-Rating**

The current carrying capacity of the cables shall be de-rated in accordance with the guidelines of AS/NZS3008.1 if the cables are bunched or installed together in a trench, duct or conduit or on cable trays.

### **13.2 Specification Clauses.**

XLPE/PVC cables shall be rated for 0.6/1kV, V-90, XLPE insulated, PVC sheathed, stranded copper conductor, single or multicore cables in accordance with AS/NZS3198.

#### **13.2.1 Fire Resistant Cables**

Fire resistant cables shall be rated for 0.6/1kV, have fire resistant insulation, sheathed stranded copper conductor, single or multicore cables, type Radox FR or Fire Stop to comply with AS/NZS3013 and construction to AS/NZS3116.

## **14 CABLE SUPPORT**

### **14.1 Design Requirements**

The design shall incorporate be made for the following underground conduits:

- Conduits to enclose electrical mains cables from the Supply Authority POA to MSB.
- Conduits to external floodlights, sign lighting, electrical gates, hose tower (if any) etc.
- Conduits from Telstra pit to MDF in communications room.
- Conduits to external communications services including conduits to enclose fibre optic cables from the street.
- Conduits to enclose security cabling.
- Conduits to enclose other services as required.

#### **14.2 Specification Clauses**

No cables are allowed to run directly on the ceiling.

#### **14.2.1 Cable Ladders and Trays**

Use cable trays or ladders to support the major mains and submains in the building. Where six or more cables are installed over common routes, the cables shall be installed on cable ladders, trays or in wiring ducts. Use vertical cable ladders to support cables below and above switchboards and communications cabinets and control panels.

##### **14.2.1.1 Cable Trays**

Cable trays shall be electro-galvanised perforated metal type, sized with 25% spare space including space for air gaps for derating purposes and be installed parallel to the building lines and fixed to walls or concrete slabs. Hangers shall be mild steel angles or 20mm diameter threaded steel rods. Supports shall be provided so that the cable tray does not sag more than 10mm when fully loaded. Earth continuity shall be retained throughout the cable tray runs.

#### **14.2.1.2 Cable Ladders**

The cable ladders shall be used where cables loading exceed 75 kg/metre. They shall be fabricated from galvanised steel or aluminium sections fitted with the manufacturer's standard accessories and have rungs spaced at maximum 300mm centres. They shall be supported at spans maximum of 3 metre intervals.

#### **14.2.1.3 Catenary Systems**

Catenary wires shall be used to secure cabling within false ceiling spaces. The catenary wires shall comprise of stranded galvanised steel wires (7 strands) and be secured to turnbuckles with U-bolts and tensioned so that they do not sag more than 100mm when fully laden with cabling. The maximum number of TPS cables per catenary shall be in accordance with AS/NZS3000.

#### **14.2.1.4 Conduits**

Conduits shall be PVC or steel manufacture and have a minimum 20mm diameter and be sized to allow 25% increase in the number of cables enclosed. Conduits shall be installed in straight runs, which are parallel or perpendicular to the building lines and be completed with steel draw-in wires before installation of cables.

Steel conduits shall be used in locations, which are liable to be subjected to mechanical damage. Where exposed to the weather or dampness junction boxes shall be provided with covers of heavy gauge material fitted with a neoprene gasket.

### **14.2.2 Cable Ducting Systems**

#### **14.2.2.1 Cable Ducts**

Cable ducts shall have 50% spare capacity and be provided with screwed removable covers of maximum length 1200mm and cable retaining straps along the length. Cables of different voltages shall be physically segregated within the duct. Separate ducts shall be provided for communications services in accordance with Australian Telecommunications Authority regulations.

#### **14.2.2.2 Wiring Duct**

The Moduline skirting wiring duct shall have three compartments and be made of extruded aluminium section. Access holes for cabling and conduits in slabs shall not be less than 32mm diameter. All such access shall be fitted with grommets.

The skirting duct and covers shall be earthed in accordance with the requirements of the AS/NZS3000:2007 SAA Wiring Rules and Australian Communication Authority. Wiring ducts shall be installed in offices, utility rooms and communications rooms.

### **14.2.3 Underground Cabling**

Underground cables shall be installed in heavy-duty high impact PVC conduits at a minimum of 600mm below finished ground level. Cable markers shall be provided over all underground routes, every 30m of run, at each change of direction and at each end of the buried run. Orange PVC marker sheeting with indelible lettering giving warning of electric cables below shall be supplied and located across the width and along the entire length of the excavation at a depth of approximately 300mm from finished ground level.

## 15 LIGHTING

### 15.1 Design Requirements

Light fittings shall be complete with control gear, lamps and be designed in accordance with AS 1680 and AS 3137. They shall be selected to suit the type of the ceiling.

The designer shall note the interface required to the Siemens BMS.

The preferred types of luminaires and fitting supplier for the MFB Fire Station and Administration sites shall be as follows:

#### 15.1.1 Fitting Selection

LOCATION	DETAILS	Fitting Supplier
Offices	Recessed mounted fluorescent luminaires c/w T5 4000K fluorescent lamps, low brightness louvers: 16-cell for 600x600mm luminaires and 32-cell for 1200x1200mm luminaires.	Rytec, Thorn or Approved Equal
Toilets/Bathrooms	Recessed/Surface mounted fluorescent luminaires c/w PL lamps and sealed framed clear diffusers.	Rytec, Thorn or Approved Equal
Bed rooms (Ceiling)	Recessed mounted fluorescent downlight luminaires c/w PL acrylic diffuser.	Rytec, Thorn or Approved Equal
Bed rooms (bedhead)	Wall mounted low glare fluorescent luminaires mounted above beds and desks.	Rytec, Thorn or Approved Equal
Entry Hall Corridors	Recessed mounted fluorescent luminaires c/w T5 4000K fluorescent lamps and prismatic diffusers or downlights c/w compact fluorescent lamps and protective glass diffusers.	Rytec, Thorn or Approved Equal
PPE/Change / Locker Rooms	Recessed mounted fluorescent luminaires c/w T5, 4000K fluorescent lamps and clear UV YORK tube guards fitted, sealed and framed polycarbonate prismatic diffusers.	Rytec, Thorn or Approved Equal
PPE Drying Room	Surface mounted fluorescent luminaires c/w T5 4000K, fluorescent lamps and clear UV YORK tube guards fitted, sealed, framed polycarbonate, prismatic diffusers	Rytec, Thorn or Approved Equal
PPE Drill Equipment store	Surface mounted fluorescent luminaires c/w T5 4000K, fluorescent lamps and clear UV YORK tube guards fitted, sealed, framed polycarbonate, prismatic diffusers.	Rytec, Thorn or Approved Equal
Drying Rooms	Surface mounted standard batten fluorescent luminaires c/w T5 4000K fluorescent lamps and prismatic diffusers (K12).	Rytec, Thorn or Approved Equal
Engine Bay	<ul style="list-style-type: none"> <li>•Surface mounted, weatherproof type luminaires IP67, c/w T5 4000K fluorescent lamps, sealed acrylic diffusers and stainless steel clips, fixed to the suspended Unistrut-trunking system mounted at approx. 5m AFFL (approx. 500mm above the appliance bay door).</li> <li>70W HPS downlight luminaire, c/w high pressure lamp, silver reflector, sealed glass diffuser and white housing.</li> </ul>	Rytec, Thorn or Approved Equal  Concorde 25204G/70
Plant room	Surface mounted standard batten fluorescent luminaires c/w T5, 4000K fluorescent lamps and wire guards	Rytec, Thorn or Approved Equal
Engineering Workshops	Surface/Suspended mounted high bay luminaire c/w H.I.D. lamps and protective wire guards. Alternatively,	Rytec, Thorn or Approved Equal

	Surface mounted standard batten fluorescent luminaires c/w T5, 4000K fluorescent lamps and wire guards (to be confirmed with MFB).	
External lighting	<p>Decorative, wall mounted luminaires c/w fluorescent PL lamps and acrylic diffusers.</p> <p>Floodlights mounted above the Appliance Bay (1) and on the Hose tower (1) complete with High-Pressure Sodium lamps.</p> <p>Decorative Bollard luminaires 70W HPS type.</p>	<p>Rytec, Thorn or Approved Equal</p> <p>Versalux Lighting, KIM Lighting or equivalent</p> <p>THORN ROUNDLINE</p>
Turnout Warning Lights	<p>Wall mounted at 3000mm AGL on each side of the front appliance bay door and at rear of BBQ and resting area (to be confirmed by MFB):</p> <p>70W 24V DC Turnout warning light fitting, A Ferguson 240/24V AC/DC 100VA Transformer/Rectifier for each turnout warning light.</p> <p>Bollard mounted: 70W 24V DC Pedestrian warning light fitting c/w a Ferguson 240/24V AC/DC 100VA transformer/rectifier for each pedestrian warning light. Bollards should be located each side of driveway on the front of appliance bay door.</p>	<ul style="list-style-type: none"> <li>HELLA 1721 RED or equivalent</li> </ul>

All exterior light shall be designed to incorporate a photoelectric light sensor.

## UV Protection

Fluorescent lamps shall be fitted with clear UV YORK tube guards in the following areas:

- PPE Change/Lockers
- PPE Drying Room
- Drill Equipment Store.

The UV filtering tube guards (clear acrylic) have 0% transmittance below 395 nanometre.

The clear UV T5 YORK tube guards are available from:

### **15.1.2 Fire Station Alarm Lighting Controls**

Selected lighting circuits shall be activated on receipt of a fire alarm signal. This signal shall originate from relays in the BMS (refer other sections of this Brief) and shall operate contactors, which will 'hold-in' until the signal from the BMS is switched off.

BMS system shall control the lighting in the following areas/rooms: -

- Appliance Bay • Bathrooms
- Bedrooms • Gym
- Corridor • Lockers
- All Offices • Station Turnout Area.

The power supply to operate the contactor coils shall originate from the Main Switchboard via interposing relays, not from the BMS. Contactors shall be Sprecher and Schuh CA1 series or equal of not less than 20Amp rating with 24V AC coils. Relays shall be Sprecher and Schuh CA3 plug in series or equal.

Interposing relay coil voltage shall be confirmed prior to placing orders.

Refer to Siemens (BMS) – Turnout Controls section of this Design Brief for control details.

## **15.2 Specification Clauses**

### **15.2.1 Light Fitting Types**

#### **15.2.1.1 Fluorescent Fittings**

Fluorescent luminaires shall be provided with energy efficient, tri-phosphor 4000K T5 lamps (complying with the requirements of AS/NZS1201) and electronic ballasts that comply with the requirements of AS/NZS 3168 and AS/NZS2643 for 240V, 50 Hz operations.

#### **15.2.1.2 UV Light Filters**

Supply and install UV light Filters where shown on the drawings. The filters shall be manufactured by YORK PRECISION PLASTICS, Sydney Warehouse Contact: Paul Higgins or Adam Taylor on 02 9584 7000.

#### **15.2.1.3 Downlight Luminaires**

Downlight luminaires shall have separate ballast for each fitting and be selected from ranges that incorporate compact fluorescent or HID lamps.

#### **15.2.1.4 High Intensity Discharge Luminaires**

High intensity discharge (HID) luminaires shall have Edison screw type lamp holders and have power factor correction capacitors to correct the overall power factor to greater than 0.85 lagging. Control gear shall have an operating loss less than 10% of wattage of the luminaire.

### **15.2.2 Light Switches**

All general lighting shall have normal operation via local wall switches. Light switches shall be 15-amp minimum rated, rocker operation and quick make and break. Light switches mechanisms connected to fluorescent luminaires shall be heavy-duty type suitable for the type of load and manufactured by Clipsal - Cat. No. 30 FLM15 or equal.



The switches shall be mounted at approximately 1100mm AFFL or as advised by the DDA consultant. Preferred make shall be the Clipsal 2000 Series.

Weatherproof type switches shall be used where mounted externally, in plant rooms in car parks or where they are exposed to water.

#### **15.2.2.1 External Floodlights and Controls**

Floodlight luminaires shall be provided to illuminate rear yard. One floodlight shall be provided above the rear appliance bay door.

Externally mounted floodlights complete with safety guards (enclosures), or good quality in ground uplights to illuminate flagpole and MFB sign (to be confirmed) shall be provided.

Floodlights on the hose tower (if any) shall be controlled from the lighting control panel in Station Turnout Area. A green indicator lamp above each switch will light when the floodlights are on. Floodlight mounted at the rear of the Appliance bay shall be operated by the photoelectric sensor.

Refer to Siemens BMS turnout controls section for control of the floodlights after 23.00.

#### **15.2.2.2 By-pass Test Switches**

Separate by-pass test switches for each external lighting circuit shall be provided on the main switchboard/distribution board, enabling the testing and maintenance of all externally mounted luminaires during the day. By-pass switches shall be labelled.

#### **15.2.2.3 Light Sensitive Switches**

Light sensitive switches (photoelectric sensors) shall have adjustable luminance from 10-200lux and incorporate a time delay to prevent nuisance operation. They shall be positioned so that their operation is not affected by artificial lighting sources.

The preferred make shall be the Clipsal, HPM or equivalent.

#### **15.2.2.4 Occupant Detection Switches**

Switches shall be "Sensor Switch-JSB Lighting Ph. 98279888" or BEG units with the following functions:

- movement sensor;
- noise sensor;
- fan controller;
- PE Cell
- ceiling mounted.

The unit shall be arranged to automatically turn on the light and fan while a person is detected. Where required the fan shall remain activated for 10 minutes after the toilet area is vacated.

## **16 EMERGENCY & EXIT LIGHTS**

### **16.1 Design Requirements**

The emergency and exit lights shall be designed in accordance with the requirements of BCA and be arranged to illuminate in the event of a power supply failure. The installation shall be in accordance with the requirements of AS/NZS2293.

Exit signs shall be maintained/or sustained and installed in all egress paths and in areas as required by BCA. Emergency lights shall be non-maintained type. The emergency and exit lights shall be self-contained type luminaires, consisting of sealed nickel cadmium batteries and be wired via time test switch located in the electrical distribution cupboard for testing purpose.

Time clock test switches shall be provided on each switchboard to allow 120min for initial duration of testing and 90min for in-service duration of testing in accordance with AS/NZS2293.

## **16.2 Specification Clauses**

Emergency and Fire Exit lights shall be connected to their own circuits and be provided with an automatic test system in accordance with the requirements of AS/NZS 2293.

The test system shall be Legrand 201946, NHP CPELK1 or equivalent and shall be provided complete with test switch, timer, contactors and relays as necessary

The Exit signs shall be recessed type manufactured by STANILITE (or Legrand) Legend Series, maintained complete with the cold cathode lamp (6-years, 50,000 lamp life), nickel cadmium battery pack, dual rate battery charger, single or double sided diffuser and flex and plug. Cat no LRC104ML.

Emergency Lights shall be recessed type manufactured by STANILITE (or Legrand), 'Spitfire' range, non-maintained complete with 10W halogen lamp, NCad battery pack, battery charger and flex and plug. Cat no SF10FP.

Tests shall be conducted at practical completion, after six and twelve months as specified in AS/NZS2293. Results shall be recorded in the Maintenance logbook. The logbook shall consist of the reduced size plans of the emergency and exit lighting layouts and sufficient number of pages for 5 years (minimum) for testing details.

## **17 POWER OUTLETS**

### **17.1 Design Requirements**

General power outlets shall be wall-mounted at 150mm AFL, symmetrically located and aligned with other outlets (e.g. with voice/data outlets). All outlets shall be labelled with traffolyte type labels, fixed to the flush plates and indicate circuit number and phase. Alternatively, flush plates shall be engraved. Mixed circuits of lighting and power sub-circuits are not permitted.

#### **17.1.1 General Purpose Outlets**

General-purpose outlets (GPO) shall have 10Amp make/break switch mechanisms. The maximum number of outlets per circuit shall be twelve single (GPO's) or six doubles (DGPO's) and shall not exceed rating of the circuit protective device. Where power outlets are mounted externally, in plant rooms or car parks, they shall be the weatherproof rating of IP67.

The preferred make shall be the Clipsal 2000 range. Colours of Outlets to be used:

Electric White: - All outlets fed from normal/generator supply

Electric Red: - Outlets fed from UPS system

#### **17.1.2 Three Phase Outlets**

Three-phase outlet shall be a combination switch socket outlet mounted on a common base plate and shall be weatherproof type IP67. The switch and plug socket shall be interchangeable (able to be replaced or rotated to suit the installation position).

#### **17.1.3 Direct Wired Equipment**

Direct-wired equipment shall be wired via a suitably sized weatherproof local isolator, adjacent to equipment. Cables between direct-wired equipment and isolator shall be enclosed in a flexible PVC conduit sufficient in length to allow the equipment to be moved for servicing.

## **18 STANDBY POWER SUPPLY SERVICES**

### **18.1 Design Requirements**

The site shall be provided with a suitably sized generator with capacity to operate the whole facility in the event of a power failure. The system shall be arranged with automatic changeover to generator supply and return to mains upon stable supply.

Emergency turnout and communications equipment shall be backed-up by an UPS system, which shall be located in the communications room.

#### **18.1.1 Standby Generator**

The new standby generator shall be included in the design to the following:-

- One standby diesel alternator (generator) with the specified capacity.
- Fuel system including day tank.
- Cooling system.
- Battery and charger.
- Exhaust silencer systems.
- All control systems.
- Remote Control panels (if applicable).
- Anti vibration mounts.
- Acoustic enclosure.
- Automatic starting upon signal from main switchboard.

#### **18.1.2 Generator and Tank Size**

The generator shall be FG Wilson standard Rental Range 150 kVA (822L Storage) or 100 kVA (631L Storage) or 60 kVA (569L Storage). The needs to include full load output, some overload capacity, fully enclosed, weatherproof, sound attenuated container with fuel tank included within bunded enclosure.

The size of the generator will nominated by the MFB.

##### **18.1.2.1 Ratings**

The generator set and fuel tank shall be suitably sized for the designed load, running continuously over a 60-hour period at full rated load without the need to refuel.

##### **18.1.2.2 Noise**

The diesel generator system shall be located in an acoustic enclosure to ensure that maximum sound levels shall in no way exceed the requirements of the local Council and EPA.

##### **18.1.2.3 Engine**

The Engine shall run at 1500 RPM and direct coupled to the alternator.

##### **18.1.2.4 Generator Controls**

Engine-generator set control shall be provided with a three-position RUN/OFF/AUTO control switch. A red mushroom head push button emergency stop switch shall be provided. Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting.

##### **18.1.2.5 Generator Set Alarm and Status Message Display**

If generator set is required it shall be provided with alarm and status indicating lamps to indicate non-automatic generator status and existing alarm and shutdown conditions. The lamps shall be high-intensity LED types. Alarm and shutdown conditions shall be displayed on a digital display panel.

#### **18.1.3 Generator Termination Panel**

The termination panel shall be fully sealed weatherproof enclosure mounted externally and complete with suitably sized three phase circuit breakers or HRC fuses, suitably sized terminals for the termination of active, neutral and earth.

The termination panel shall be a B&R enclosure or similar manufacture.

## **19      UNINTERRUPTED POWER SUPPLY (UPS) AND BATTERIES**

### **19.1      Design Requirements**

The station shall be designed to include a UPS to provide power supply to the critical services. The MFB will nominate on a project by project basis the reuse of existing systems.

The system shall include the following equipment

- 3000VA, 240V single phase UPS – Eaton Powerware 625 (3kVA) UPS cat no. 91203000ANB
- SNMP/Web adaptor cards
- UPSBD adaptor
- 15A plug to 16A-IEC socket mains input and output leads with cable retention clips fitted to UPS.
- 1.5m (length) cabling and connector assemblies for interconnecting between batteries, UPS and DB-UPS
- Sealed lead acid batteries (Valve regulated vented Cell), (8-off) – Powerson 370 type.
- Battery enclosure 1300mm(W) x 1200mm(H) x 300mm(D)) complete with shelves cat no. Eaton (Invensys) BAT2/3000P370E8.
- Maintenance By-Pass switches Eaton Powerware Cat. No BMS3000SW1
- UPS distribution board.
- 

The UPS system shall be wired from the main switchboard via dedicated power outlet and maintenance by-pass.

The following critical loads shall be fed from UPS via distribution load centre DB-UPS:

- Communications Cabinet – UPS Rail
- Siemens BMS
- Telephone system
- Station Turnout Equipment
- Security Detection system

All power outlets dedicated for the above equipment shall be of different colour (red) to distinguish services powered by UPS.

The complete UPS system, batteries and Maintenance By-pass switches shall be located in the communications room.

### **19.2      Specification Clauses**

Upon completion, the contractor shall arrange for testing and commissioning of the complete installation.

#### **19.2.1      Battery Enclosure**

The battery enclosure shall be pre-wired by the manufacturer with 2-off output sockets and an isolator/circuit breaker mounted in the upper right-hand end of the cabinet. The circuit breaker shall be housed in a wall-mounted enclosure suitable for hardwiring between batteries and UPS.

The enclosure shall be earthed via 6mm<sup>2</sup> Green Yellow cable. The enclosure shall also have DIN rails with 9120 DC socket wired directly to the battery isolator. The enclosure shall be labelled “UPS BATTERY ISOLATOR”.

#### **19.2.2      Maintenance By-Pass Switch**

Maintenance By-Pass switch (Make Before Break type switch) shall be provided to isolate all AC input and output supplies from UPS to allow maintenance personnel to safely work on the equipment, while critical load equipment continues to be powered from the input supply, normally raw mains, without interruption.

The maintenance by-pass switch shall operate as follows:

Normal	In the 'NORMAL' position the UPS is fed from the AC Mains supply and the load equipment is fed from the output of the UPS. In this position the critical load is protected by the UPS.
Restart	The 'RESTART' position connects the load equipment directly to raw AC Mains supply. AC input power is also fed from the UPS to enable it to power up. The output of the UPS is

	disconnected from the load equipment and the critical load is not protected by the UPS.
By-Pass	<p>The 'BYPASS' position connects the load equipment directly to raw AC Mains supply. AC input power is disconnected from the UPS to facilitate maintenance or component replacement.</p> <p>The critical load is not protected by the UPS. In this position the entire UPS can be removed or replaced without disturbing the load equipment</p>

### **19.2.3    Manufacture Test**

The UPS equipment shall be tested continuously, connected to the test load, for at least 24 hours. Record line and load voltage, current frequency and temperature measurements at regular hourly intervals.

Testing of the equipment shall be conducted on the completion of works. Correct functional operation, including mains failure and return, and operation of static and remote bypass switches. Correct operation or indication of controls, alarms, indicators and instruments. Record direct readings on test sheets and indicate time scales on oscillograms and chart records.

### **19.2.4    12.4 Training**

A training course shall be provided to demonstrate the operations of the UPS at the end of the acceptance tests.

### **19.2.5    Log Books**

A logbook shall be provided to record all activities undertaken during the maintenance period.

### **19.2.6    Warranty**

12 x 1-month service after commissioning shall be allowed. Provide 12 months warranty for the complete installation.

**VOLUME 4.5**

**ECOLOGICAL SUSTAINABLE DESIGN**

**FIRE STATION DESIGN**

**FUNCTIONAL BRIEF**

**REVISION HISTORY**

<b>Revision</b>	<b>Prepared By</b>	<b>Date Prepared</b>	<b>Issue</b>
A	Tony Green Architects	09/2005 Revised 07/2008	

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### 19.3 ECOLOGICALSUSTAINABLE DESIGN

Energy targets together with assumed building loads are detailed in this section.

#### (i) Energy Targets

Energy targets are based on the four end use areas of the building. Namely - lighting, equipment power, HVAC and DHW. In addition, it is proposed that each separate end use area be normalised for the factor which governs it, for example:

- Lighting energy use is normalised for the total area of the building
- Equipment energy use is normalised for the total area of the building
- HVAC energy use is normalised for the total air conditioned area of the building
- DHW energy use is normalised for the number of staff per day (including both day and night shift)

The above-recommended normalising factors allow the performance of each energy end use type to be better assessed. For example, lighting energy use is proportional to the electrically lit area and not the number of staff. Thus, if a high staff density is achieved but a very inefficient lighting system installed then assessing the lighting energy on the basis of numbers of staff may indicate that the lighting is efficient.

SBE has based the energy targets on the end use figures established from the desktop audits and site energy surveys. The targets for lighting, equipment and DHW energy use were selected from the results of the desktop audit and site visits, based on normalised energy consumption and system type.

When attempting to predict the likely energy performance of a building design via the use of computer energy modelling it is necessary to standardise.

The following table represents the targets for each of these use areas:

Targets for Energy End Uses			
End Use	Annual Consumption	Energy	
	kWh	MJ	Normalising Index
Lighting	31	112	/m <sup>2</sup> of total area
Equipment Power	38	137	/m <sup>2</sup> of total area
Total HVAC	68	245	/m <sup>2</sup> of air conditioned area
Total DHW	2,060	7,416	/number of staff per day

#### (ii) Internal Gains - Equipment

##### (a) Density

The equipment density in the building was assumed to be 8W/m<sup>2</sup> in the office space, to represent the heat gain from computers. Miscellaneous equipment was assumed to contribute 1W/m<sup>2</sup> to internal heat loads in all spaces.

##### (b) Equipment Hours of Operation

The equipment gain was assumed to be constant throughout the day.



(iii) Internal Gains – Occupancy

(a) Density

The occupant density for the building was assumed to be 15m<sup>2</sup> per person. The heat gains from occupants totalled 150W, with 90W sensible and 50W latent.

(b) Hours of Occupancy

The hours of occupancy are summarised in Table 3.

Time Period	Bedrooms	General
00:00 – 01:00	100%	100%
01:00 – 02:00	100%	100%
02:00 – 03:00	100%	100%
03:00 – 04:00	100%	100%
04:00 – 05:00	100%	100%
05:00 – 06:00	100%	100%
06:00 – 07:00	0%	100%
07:00 – 08:00	0%	100%
08:00 – 09:00	0%	100%
09:00 – 10:00	0%	100%
10:00 – 11:00	0%	100%
11:00 – 12:00	0%	100%
12:00 – 13:00	0%	100%
13:00 – 14:00	0%	100%
14:00 – 15:00	0%	100%
15:00 – 16:00	0%	100%
16:00 – 17:00	0%	100%
17:00 – 18:00	0%	100%
18:00 – 19:00	0%	100%
19:00 – 20:00	0%	100%
20:00 – 21:00	0%	100%
21:00 – 22:00	0%	100%
22:00 – 23:00	100%	100%
23:00 – 24:00	100%	100%

Table 1 - Occupant Load Profiles

(iv) Internal Gains - Lighting

(a) Power Density

The lighting power density was 8W/m<sup>2</sup> in general fire stations areas and 5W/m<sup>2</sup> WCs, stores rooms, and corridors. These figures were taken from Appendix A1 of the Building Energy Brief (page 2).

(b) Lighting Hours of Operation

The lighting hours of operation are summarised in Table 4.

Table 2 - Lighting Load Profiles

Time Period	Bedrooms	General
00:00 – 01:00	0%	100%
01:00 – 02:00	0%	100%
02:00 – 03:00	0%	100%
03:00 – 04:00	0%	100%
04:00 – 05:00	0%	100%
05:00 – 06:00	0%	100%
06:00 – 07:00	100%	50%
07:00 – 08:00	100%	50%
08:00 – 09:00	0%	50%
09:00 – 10:00	0%	50%
10:00 – 11:00	0%	50%
11:00 – 12:00	0%	50%
12:00 – 13:00	0%	50%
13:00 – 14:00	0%	50%
14:00 – 15:00	0%	50%
15:00 – 16:00	0%	50%
16:00 – 17:00	0%	50%
17:00 – 18:00	0%	50%
18:00 – 19:00	100%	100%
19:00 – 20:00	100%	100%
20:00 – 21:00	100%	100%
21:00 – 22:00	100%	100%
22:00 – 23:00	100%	100%

23:00 – 24:00	0%	100%
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## Environmental Overlay for Fire Station Design Guidelines

The following design requirements have been developed for incorporation into the MFB station design guidelines. These requirements are to ensure the principles of MFB's environmental policy and strategy and whole of life facility management are addressed in all new building designs.

These requirements are presented with little detail and so it is acknowledged that some amendments, detailed specs or acceptance criteria may need to be provided in due course.

### **All New MFB buildings and fire stations must have:**

- Design standard equivalent to a Green Building Council, 5 Green Star standard
- Building orientation to be part of site selection criteria
- Early engagement with Property Services to identify feasible innovations (e.g. renewable energy and heating and cooling systems)
- Selection of all equipment/electrical appliances (including lighting) based on consumption efficiencies and of minimum 4 star ratings (WELS, and Energy Star labelling schemes)
- Rainwater use for toilet flushing, garden watering, truck washing and/or training\*
- Solar Hot Water Systems and instantaneous gas boosted hot water systems
- Waste segregation and storage facilities (both in mess areas and outside yard) for recyclables
- Sub-metering of electricity, gas, water
- Bike storage facilities
- Design of facilities to ensure oil/foam runoff does not enter stormwater
- Design of facilities to ensure truck washing runoff does not enter stormwater
- Window coverings (external or equivalent to) for western facing windows
- Double glazing of all external windows
- Individual lighting controls for all lighting
- Sensor/timing lighting for low use rooms/area (e.g. meeting rooms, storage rooms)
- Temperature (& duration) settings on heating and cooling systems to be applicable to the use of the area (e.g. wider temperature range for low use areas -e.g. change rooms)

### **All New MFB buildings and fire stations must consider:**

- \*\*Water re-use and treatment (equivalent to Class A standard) systems for training hub fire stations.

- Application of new renewable energy technologies and innovative heating and cooling systems to reduce energy consumption and improve energy efficiency.

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### **All New MFB buildings and fire stations must consider:**

- \*\*Water re-use and treatment (equivalent to Class A standard) systems for training hub fire stations.
- Application of new renewable energy technologies and innovative heating and cooling systems to reduce energy consumption and improve energy efficiency.

*\*As per MFB rainwater (single use/untreated) quality management procedure #571617.*

*\*\*As per MFB rainwater & stormwater recycling quality management procedure #565489*

*Revised 10/12/2010, Doc # 558287, Authors: M. Erwin, B. Hardy, I. Rooney, S.Blacklow*

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**Project manager:** Sharné Hesse  
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# 1. Introduction

## 1.1 General

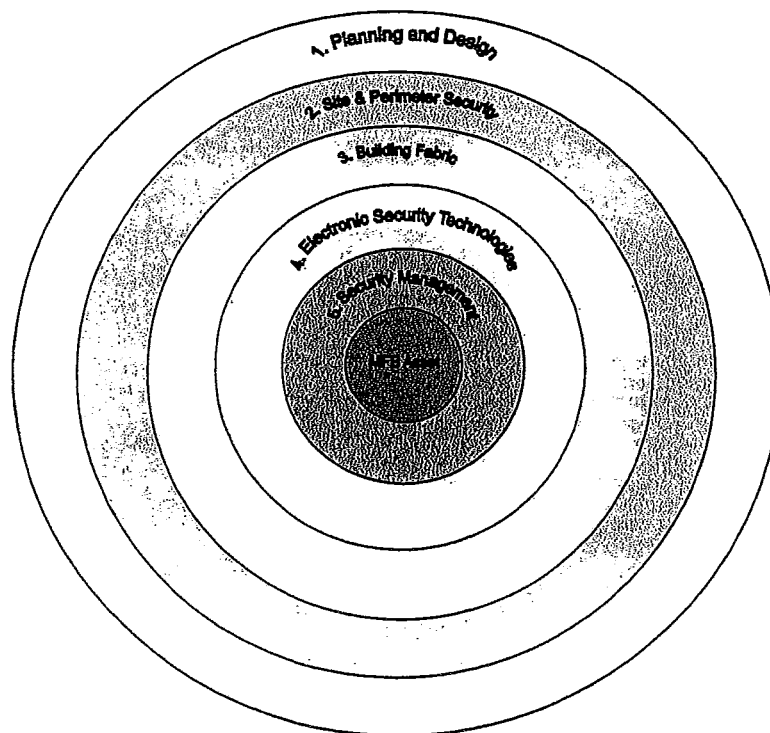
The Metropolitan Fire Brigade (MFB) is committed to minimising risk to its people, assets, information and services delivered to the community, as well as preventing loss or damage to MFB property and equipment.

Security as a principle method of minimising risk is the joint responsibility of all levels of staff and management.

The purpose of this 'Security Standards' document is to provide the MFB, and associated service providers, with sound guidelines for the provision of best security practice in design, planning and management of security, in order to meet the MFB's commitment to providing a safe and secure work environment and quality of service.

## 1.2 Security Philosophy

The MFB Security Philosophy is based on the 'Rings of Security' or Defence in Depth principle. Each ring or layer represents the security measures and treatments employed by the MFB. This document provides the minimum standards required to meet the applied level of security for each layer.



**MFB Security Philosophy Model**

Section 4 of this document details how the security philosophy is currently, and will be applied within each MFB fire station.

### **1.3 Security Profile**

The minimum security standards and guidelines for fire stations, as described in this document, have been developed and endorsed by the MFB.

In order to apply the commensurate level of security to each MFB Fire Station a 'Security Profile' will be allocated based on the assessment of external threats described within this standard.

The assessment for all fire stations, in determining the security profile is based on the site specific attributes of the external threats and commensurate security measures.

For the purpose of these standards, the fire station security profile has been categorised into three levels, LOW, MEDIUM and HIGH. The security category for each fire station will be determined by a micro security assessment in the form of a Security Profile – Proforma (Appendix A) to be undertaken for each station.

#### **1.3.1 Security Profile Proforma**

The security profile proforma is an assessment form based on a list of survey questions to be completed by MFB personnel responsible for, or with site specific knowledge of the fire station. In the case of a new fire station at a new site, the proforma will be completed by the MFB Security Co-ordinator.

### **1.4 Security Standards**

The Security Standards detail the minimum security requirements to be applied to each fire station based on agreed generic risks and identified external threats.

The standards that have been applied as described in this document are based on the 'Rings of Security' principle, to provide a level of security which is commensurate to the Fire Station security profile.

These standards have been developed over time in cooperation with the MFB and are consolidated in this document. The minimum Security Standards and the station Profile are subject to change and will be continuously reviewed by the MFB to ensure they remain current and up to date with the environment.

## **2. Background**

### **2.1 Overview**

The requirements for the development of Fire Station “Security Standards” have been identified by the MFB, as a result of increased security awareness and the ongoing development of security standards and practices within the MFB environment.

The MFB have recognised the increased security threats and risks facing the modern Fire Station facilities. This includes the increased need for a level of physical security, planning and design, construction, electronic security and operational procedures within new and existing fire stations.

This security standards document combines the existing security principals in place at all Fire Stations and newly developed standards to meet the evolving security profile of modern fire stations.

This standards document will provide the MFB with a framework to apply ‘Best Security Practice’ for security design, planning and management, and a ‘Security Profile’ to determine the level of physical security to be provided.

It should be noted that this document is a minimum guideline and that each station should therefore be assessed based on its individual merits, budgetary constraints, planning and spatial consideration.

### **2.2 Information Resources**

The following resources were used in the development and documentation of these standards;

- MFB SMS Rollout Project Specification
- Previous MFB project experience, including:
  - MFB SMS Rollout Project
  - Previous security risk assessments conduct on behalf of the MFB
  - Various MFB Fire Station projects.

The project group involved in the development of these standards includes:

- Darryl Tams – MFB Facility Services ([DTAMS@mfb.vic.gov.au](mailto:DTAMS@mfb.vic.gov.au))
- Sharne Hesse – SKM ([SHesse@skm.com.au](mailto:SHesse@skm.com.au))
- Sara Macsood – SKM ([SMacsood@skm.com.au](mailto:SMacsood@skm.com.au))

### **2.3 Applied Security Principles & Standards**

The following Security Principles and Standards have been applied as part of the Security Standards to be adopted for the MFB:

- The principles of “Security in Depth” (Rings of Security), also known as “Defence in Depth”

- The principles of Crime Prevention Through Environmental Design (CPTED)
- Application of relevant Australian Standards for Security and Engineering Design
- Application of Security and Safety Best Practices
- Consideration of Environmental Health and Safety (EH&S) in the workplace, public and private areas.

## **2.4 Appendices**

The following Appendices are attached to this document:

- Appendix A – Proforma – Fire station Security Profile
- Appendix B – Minimum Fencing Requirements and Associated Drawings
- Appendix C – Existing MFB SMS Layout
- Appendix D – Alarm Panel Construction and Layout

### **3. Security Profile**

#### **3.1 General**

Each fire station will be categorised as either a LOW, MEDIUM or HIGH security station. This profile relates to the external security rating of the fire station only. Generic risks and associated security standards have been agreed for all fire stations. The internal fire station security measures are standardised across all MFB fire station. The external however will vary depending upon the environment or location in which the fire station is located.

As such, an assessment of external threats will be utilised to determine the fire station security profile. Refer to Appendix A for the Fire Station Security Profile Proforma to be completed for each fire station.

For fire stations identified with unique or different security risks, a detailed security risk assessment should be undertaken separately.

#### **3.2 Risk Overview – Generic Risks**

The Standards have been developed in consultation with the MFB's Facility Services Department and have been based on the agreed generic 'Risks' facing fire stations.

The following is a list of generic risks, which are considered to apply in various levels, to all fire stations:

- Assault or harassment of MFB Staff, Contractors or Visitors.
- Theft or vandalism to MFB or MFB staff vehicles.
- Anti-social behaviour or loitering in or around fire stations.
- Unauthorised or forced access to MFB fire stations or MFB staff only areas.
- Theft or damage to MFB or Fire Fighter property.
- Vandalism to buildings, property, plant or infrastructure.
- Unauthorised or forced entry to the building plant or equipment rooms.
- Unauthorised or forced entry to 'Unmanned' Fire Stations.
- Unauthorised access to sensitive or restricted information.
- Unauthorised occupation of the fire station areas including appliance bays, stairwells, offices, mess, etc.
- Arson or Fire

(Note: the above risks are not listed in any particular priority and are provided as an overview of the potential risks facing MFB fire stations).

### **3.3 External Threats**

The security profile for a station will be based upon the assessment of the external threat to that station, including but not limited to:

- Characteristics of local suburb including:
  - Population
  - Socio – economic status
  - Crime rate
- Risk Profile of neighbours:
  - Residential
  - Commercial
  - Industrial
- Proximity of fire station to public facilities including:
  - Roads
  - Bus
  - Train stations
  - Public venues (pubs, parks, etc)
  - Petrol stations

### **3.4 Security Profile Proforma**

The Security Profile proforma consists of 10 questions, each weighted 1, 2, or 3. The score of 1 is representative of Low or a No answer, whereas the score of 2 is representative of Medium or an Unsure answer and the score of 3 is representative of High or a Yes answer.

#### **3.4.1 LOW Security**

Based on the agreed generic risks and assessment of the external threats, Fire Stations with a score of between 1 – 12 have been allocated a LOW Security profile.

#### **3.4.2 MEDIUM Security**

Based on the agreed generic risks and assessment of the external threats, Fire Stations with a score of between 13 – 22 have been allocated a MEDIUM Security profile.

#### **3.4.3 HIGH Security**

Based on the agreed generic risks and assessment of the external threats, Fire Stations with a score of between 22 – 30 have been allocated a HIGH Security profile.



## **4. Security Standards**

### **4.1 Security Planning and Design Guidelines**

#### **4.1.1 General**

The following security principles and standards should be applied in the application, or design of security for a fire station:

- The principles of “Security in Depth”, also known as “Defence in Depth” or “Rings of Security”
- The principles of Crime Prevention Through Environmental Design (CPTED)
- Application of relevant Australian Standards for security and engineering design
- Application of Security and Safety Best Practices

#### **4.1.2 Landscaping and External Areas**

The planning of landscaping should be conducted in accordance with the objective and guidelines provided within this clause, which have been developed following the principle of CPTED.

The objective is to ensure that clear sight lines are achieved and maintained for natural surveillance, the landscaping provided does not provide potential hiding places or shadow points though still maintains the aesthetic features required.

Ensure landscaping and other features do not interfere with sight lines or provide voids or other places where vandalism and illicit behaviour can take place.

The following general guidelines are provided:

- Shrubs planted at ground level should not exceed 500mm in height when fully matured.
- Shrubs planted in a planter box should not exceed 200mm in height from the top of the planter box.
- The canopy of all trees must clear the ground or planter boxes by a minimum of 2m.
- The canopy of all trees must be maintained to ensure branches do not hang over the perimeter fence and provide a scaling aid.
- Shrubs should be dense to reduce possible hiding places.
- The relative positioning of shrubs/trees should compliment the lighting, ensuring that light sources are not obscured and that the required lighting levels are achieved.

Gardens and landscaped areas should be maintained regularly to ensure that any excess foliage or over growth is removed and clear site lines are maintained at all times.

Avoid the use of landscape or architectural features which may reduce surveillance of the building façade, entry or exit points, windows, etc, or provide hiding spaces.

#### **4.1.3 Spatial Requirements**

The following principles have been developed in keeping with the 'Security in Depth' principle and should be used as a reference to design the layout of a fire station.

Where possible, the position of the fire station should be central to the site. However, in the situation where neighbouring sites are considered to be of a high-risk profile, the fire station should be located as far from the corresponding perimeter as practical.

Rooms within the fire station that contain core assets (e.g. watch room/dispatch room, and locker room) should be located centrally within the building to maximise the protection offered through the facilities structure.

The key safe should be located within the dispatch room.

The security panel and IT rack should be located within a dedicated, locked communications room. Where this is not available, the equipment should be located within an area that is considered to be secure and out of sight.

### **4.2 Site & Perimeter Security**

#### **4.2.1 General**

To maintain the security of the fire stations, each site shall consist of a *'fully enclosed perimeter barrier forming the site boundary and providing a clear segregation between public property and the MFB site'*. The following section details the minimum requirement for the site and perimeter security, which consists of:

- Perimeter Fencing
- External Lighting
- Vehicle and Pedestrian Access to Site
- Emergency Exit Facilities

#### **4.2.2 Perimeter Fencing**

A number of approved fence types which have been tried and tested have been detailed in this section and shall be selected depending on the security profile of the fire station. Although this is not a complete list, the use of fence styles not included in this document will not be accepted, unless written approval is obtained from the MFB.

Requests to the MFB for alternative fencing shall be detailed in writing and could be subject to review by the incumbent Security Consultant and the MFB facility services department.

The fence type and fabric should be selected in keeping with the MFB's open philosophy and maintain a level of visual transparency around the site.

The table below outlines the fence styles that are approved by the MFB and the security profile level at which they are recommended.

Type	Security Profile Level		
	Low	Medium	High
Chain Wire Mesh Fence	✓	✓	✓
Lysaght (Colorbond) Steel Fence (Sheet Steel)	✓	✓	✗
TangoRail Fence (Steel tube railings)	✓	✓	✗
Brick or Concrete Fence	✓	✓	✓
Palisade Fence (Galvanised steel pickets)	✗	✓	✓
Wooden Paling Fence	✓	✗	✗
Securifor Fence (Galvanised Iron welded mesh)	✗	✓	✓

The security profile of a fire station will determine the corresponding minimum fencing requirements (i.e. type, construction, height, etc). Refer to Appendix B for minimum requirements for each of the MFB approved fence styles and associated fire station security profile.

#### 4.2.2.1 Chain Wire Mesh Fence

Chain Wire Mesh Fences installed at the MFB fire station shall comply with the following minimum requirements:

- Minimum height of 2.4m, regardless of security profile of the station.
- Fitted with top and bottom horizontal rails.
- Minimum core wire diameter shall apply according to the station security profile.
- Vertical post extension with barbed wire and outriggers shall apply to medium and high security profile stations, as described in Appendix B.
- Comply with AS1725, and all fencing material shall comply with AS2423.

#### 4.2.2.2 Lysaght (Colorbond) Steel Fence

The Lysaght steel fence type may be used in low to medium security profile stations providing a layer of privacy to the fire station.

A steel lattice strip shall be installed at the top of the fence for aesthetic purposes.

This fence type is not suitable for installation within marine, severe industrial or other corrosive environments.

#### **4.2.2.3 TangoRail Fence**

The Gryffin TangoRail fence type, or approved equivalent, may be used within low and medium security profile stations only.

The rails, posts and vertical tubular infill shall be constructed from mild steel, galvanised and powder coated to AS1627.

Details on this fence type are provided within Appendix B.

#### **4.2.2.4 Palisade Fence**

The Gryffin Palisade fence type, or approved equivalent, may be used within medium to high security level stations, and shall comply with the following requirements:

- The minimum height shall be 2.4m.
- All fence parts shall be made from steel.
- All components shall be hot dipped galvanised after fabrication to AS 1627.

Refer to Appendix B for further details regarding the Palisade fence type.

#### **4.2.2.5 Securifor Fence**

The Securifor Fence type may be used within medium to high security level stations, and shall comply with the following requirements:

- Mesh apertures shall be small enough to reduce risk of penetration or scaling.
- Posts shall be hot dipped galvanised subsequent to fabrication.
- Strength of welds shall be at least 75% of steel strength.

#### **4.2.2.6 Wooden Paling Fence**

Wooden paling fences may be used within low security profile stations and shall be minimum 1.8m in height (2.1m preferable subject to council approval), and shall comply with the following minimum requirements:

- Red gum components, or approved equivalent, shall be used.
- Consist of 3 horizontal rails.
- Fence palings shall overlap.
- Palings shall be oriented to ensure rails are not exposed to the external side of the perimeter.

#### **4.2.2.7 Non-uniform fencing construction**

For aesthetics purposes, it is preferable to have a perimeter fence of uniform style and characteristics. However, detailed below are situation where this may not be possible or suitable and thus, requiring fences of different styles and construction to be used.

To maintain the security requirements of the facility, selected sections of the perimeter fence may need to be constructed to a higher security standard than the site is rated. Examples of situations where this may occur include:

- A neighbouring site presenting a direct threat to the fire station.
- A particular section of the immediate environment providing climbing aids increasing the chances that the perimeter fence will be breached (e.g. adjacent or abutting structures or walls, parked vehicles, etc).
- A particular region of the fire station being in close proximity to an area presenting an additional security threat (e.g. public bus and train stations, public access ways, parks or vacant land, etc)

If an upgrade of an exiting fire station perimeter fence is being undertaken, nominated sections of the existing perimeter fence may be reused to minimise cost. However, as a guiding rule, the fence should be upgraded where possible to meet the minimum requirements of these standards. This will be subject to the review and approval of the MFB facility services and/or the incumbent Security Consultant.

Adjacent building structures may, in some instances, be used to form a part of the secure perimeter fence of the site. However this shall only apply where a further assessment of risk is conducted, such that the tenants of the adjacent building are considered low risk and the neighbouring building structure can provide a suitable barrier.

#### **4.2.3 External Lighting**

To deter vandalism, illicit behaviour and provide safe passage for staff, the minimum external lighting level to be provided at each fire station shall be in accordance with the following guidelines.

During the hours of darkness minimum 25 Lux lighting shall be provided at the front of the station and street main entry. Note that a level of lighting may already be provided by street lighting or adjacent facilities.

External areas of the site, e.g. the car yards, shall also be well-lit. Provide a minimum of 5 Lux at all locations for car park lighting. Two-stage lighting should be considered to raise the ambient car yard lighting level to 25Lux using sensors for fire stations of a high security rating or with a history of previous incidents after hours.

Footpaths leading to external car parks and main entries shall be provided with lighting evenly spread every 3m. Pathways should be clearly lit after-hours using low level bollard type or equivalent lighting to clearly guide pedestrian traffic and assist way finding.

The selection of final light fittings should also give consideration to the use of vandal-resistant external fittings. External lighting design should be of an appropriate ambient lighting level to support natural surveillance of the fire station building external perimeter after-hours and avoid any dark spots around the building.

Note that standards for internal fire station lighting levels are not included within this document. These are covered within the MFB Electrical Standards in accordance with the Australian Standards.

#### **4.2.4 Vehicle & Pedestrian Access**

The MFB have a nominated gate contractor (contact the MFB Facility Services department for details). The nominated gate contractor shall conduct the works associated with the site's motorised vehicle gates and pedestrian access gate (if required) to the car yard area.

All works associated with the vehicle and pedestrian gates shall be in accordance with the following guidelines:

All vehicle access to the fire station site (i.e. rear car yard) shall be restricted by the implementation of an automated vehicle access gate. The vehicle gate shall form a part of the security site perimeter. The MFB's preferred gate option is the motorised swing gate, however a sliding gate type may also be used where this is considered more suitable, subject to the approval of the MFB. Where the sliding gate option is considered, a trackless cantilevered sliding gate operation is preferred.

Gates should contain a mechanical (or electromagnetic) locking system, in lieu of simply relying on the gate operator to remain in the closed and locked position.

The height of the vehicle access gate should match the height of gates at existing fire stations, unless prior approval is gained from the MFB due to extenuating circumstances.

A single gate may be used to service both entry and exit vehicle paths.

Output control shall be provided to each motorised vehicle gate from the SMS for access control functionality via card reader and vehicle access receiver/transmitter technology.

Provide in ground vehicle detection loops on the exit side of the gates for free egress configuration, and a safety induction loop directly under the gate.

Provide Photocells (safety beams) at each vehicle gate and program the door controller to minimise a collision between an obstruction and the gates. The photocells shall be used to detect whether a vehicle has passed through the gate, and close if a vehicle has been detected.

Pedestrian entry to the site shall be via the fire station front door. However, if pedestrian gates are required to provide pedestrian access to the car yard area, the gate construction shall match the fire station perimeter fence, and the gate shall be physically locked from both sides. Electronic access control may be used where it is deemed necessary by the MFB.

All gate locking, access control, intercom devices etc, shall be of weather proof construction and suitable for external applications.

#### **4.2.5 Emergency Exit Facilities**

All emergency exit doors located on the building perimeter of the fire station shall be locked or access controlled from the non-secure side and provide free emergency egress from the secure side. Such doors shall be monitored to provide alarm indication upon unauthorised access.

Generally all perimeter and emergency exit doors shall be installed with 'fail secure' electric mortice locks configured with manual free handle egress at all times. This will maintain the security of the perimeter doors, whilst supporting emergency egress requirements.

Where Request to Exit buttons or Emergency Breakglass Units are used in conjunction with fail safe electric locking devices (e.g. Maglock, Mortice Locks or Electric Strike):

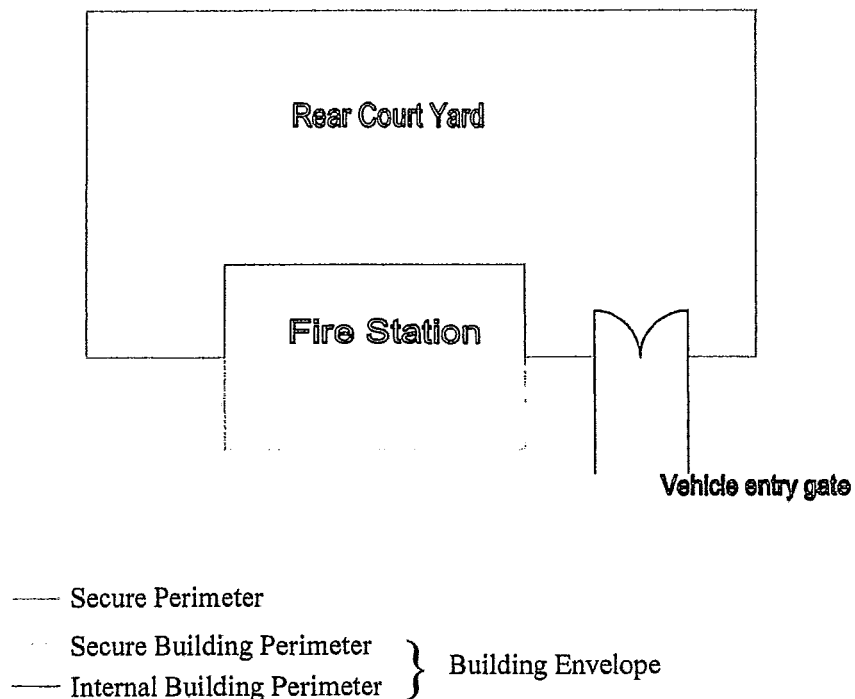
- Ensure these are not accessible from the non secure side of the door (i.e. Provide a protective shroud where such exit devices are installed on the secure side of external pedestrian gates).
- They shall be cabled such that upon activation, the fail safe lock will be directly disconnected from power.

### 4.3 Building Requirements

This section provides the minimum requirements and guidelines relating to the physical fire station building construction, in the context of security, relating to the following:

- Building Fabric and Construction
- Glazing
- Doors and Doorframe Construction
- Door Hardware
- Mechanical Locking
- Master Keying System
- Key Safe Design and Security Requirements.

The external regions forming the envelope of the site can be classified according to their purpose and features, which is outlined in the diagram below:





#### **4.3.1 Building Fabric, Construction & Layout**

Refer to the MFB architectural standards for building fabric, construction and layout requirements.

Openings in the building envelope (i.e. doors and windows) are the most common points of entry for unauthorised persons. Reducing points of entry minimises the risk of unauthorised entry and as such, points of entry should be minimised where this does not contradict the MFB's "open" philosophy requirements.

#### **4.3.2 Glazing**

All glazing shall be in accordance with AS2208 – Safety Glazing Materials in Buildings.

In general, for High security fire stations:

- Glazing within the secure building perimeter of the fire station should be minimised.
- Where glazing is required to form a part of the secure building perimeter, intruder resistant glazing should be used. Alternatively, a protective film may be used to prevent the glass from shattering under impact.
- Floor to ceiling (wall) glazing should also be avoided within the secure building perimeter of the site. At such stations, brick walls shall be used, or alternatively Intruder Resistant glazing may be considered.
- Glazing can be replaced with heavy gauge glass bricks or glass panels secured within a metal frame.

For further details, refer to MFB Architectural Standards.

##### **4.3.2.1 Windows**

Where lighting and not ventilation is required, windows should be fixed to prevent them from being opened.

Windows used for ventilation should be avoided within the secure building perimeter of the site, and in general, be also avoided in High security rated fire stations. However, where windows are required, the opening should be minimised to enable ventilation while preventing unauthorised entry.

The fixing of window frames to walls should be at least as strong, and resistant to intruders, as the glazing.

#### **4.3.3 Doors and Doorframe Construction**

All doors and door frames within the site should be designed to meet their intended purpose and with a level of physical hardening commensurate to the fire station security profile and locking device applied. The doors can be classed into two categories according to their purpose and location; perimeter and internal.

Perimeter doors, including main entry, are located on the external walls of the building and forms part of the building or site perimeter or contained within the site boundary perimeter.

Internal doors are located within the internal building structure and, in general, provide free access at all times.

The list below details the minimum requirements for doors located on the external building perimeter:

- 45mm thick solid core timber.
- Glazing should be rated to AS3555.1998 Level 1 5 min attack.
- Fully glazed doors shall be encased by an aluminium frame.
- Door frame to be metal or have a metal strip securely mounted to the frame from the top to the bottom of the lock side.
- Door frames shall be constructed to provide a level of physical protection equivalent to the door and locking type specified.
- Main entrance door to the fire station should have a protected view panel to allow vetting of people wanting admission and enable viewing of the immediate door surroundings.
- Doors shall provide provisions for the installation of appropriate locking.
- Where ever possible, single leaf doors shall be used in lieu of double doors.

#### **4.3.4 Door Hardware**

All hardware installed on doors shall adhere to the following guidelines:

- Appropriate three stage door closers (Dorma TS93 or approved equivalent type) shall be installed on all access control doors (and to a lesser extent mechanical doors) to ensure the correct closing and locking of doors.
- Double doors fitted with access control shall be secured in place with panic bolts at the top and bottom of the door.
- Hinge pins should be resistant to easy removal.
- For access controlled doors, provide cable access through doorframes.

Note: Also refer to the MFB architectural standards.

#### **4.3.5 Mechanical Locking**

All perimeter doors and nominated internal doors shall be provided with Lockwood 3570 series mortice locks, or approved equivalent, appropriate for the accepted MFB Keying Systems (cylinders). For approved electric locking refer to 5.4.3.1.

#### **4.3.6 Master Keying Systems**

The MFB keying system for all fire stations' front main entry door and key safe is the Bi-Lock Omega Corporate Security Master Keying System.

Currently, all other fire station perimeter doors not leading into the Fire Station are provided with a separate keying system.

All new fire stations shall utilise the Bi-Lock Omega Corporate Security Master Keying System for the front main entry door and key safe. All other perimeter entry doors shall be card access only, without any key cylinder.

For all internal fire station keyed doors, refer to Architectural standards.

#### **4.3.7 Key Safe Design and Security Requirements**

Each fire station consists of a Key Safe (by others), generally located within the turn out area. The key safe consists of an electric strike (by others) which shall be interfaced to the security system (by Security Contractor).

The Security Contractor shall supply and install a Card Reader, Sonalert and Reed Switches at the key safe, to achieve the functionality described in this section.

The key safe shall be programmed within the SMS as an independent Area. In the normal state (i.e. when the key safe door is closed), this area shall be Armed at all times. Badging the card reader associated with the key safe shall disarm the key safe area and unlock the electric strike for authorised access.

The area shall remain disarmed for a nominated time. Once this time has elapsed, if the key safe door remains open, the Sonalert shall activate as a warning to the user for a further nominated short period (10 seconds). Once the warning time period has elapsed, if the key safe door remains open, the area shall Arm and an alarm will be produced.

The key safe shall also be programmed to allow for an extended access period. This functionality shall be facilitated via the disarming of the key safe for an extended time period if the associated card reader is double badged.

## **5. Electronic Security Technologies**

### **5.1 General**

All existing MFB fire station consist of an electronic security system, which include the following components:

- Access Control System.
- Intruder Detection System.
- Intercommunication System.
- Interface to the station Building Management System.
- Interface to the station Smoke Detectors.

All new MFB fire stations shall also be provided with an electronic security system, which shall conform to the guidelines of this document.

### **5.2 Security Management Systems**

The existing MFB state-wide Security Management System (SMS) is a Pacom 'GMS System' with dual redundant servers located at the MFB's Eastern Hill and Thornbury Facilities. All security related events and alarms report to and are logged at both servers, via the MFB Wide Area Network (WAN).

Fire Station alarms are monitored by:

- FSCC (Tally Ho).
- A Remote Monitoring Station – currently ADT.

Each fire station consists of local control equipment which control local security devices.

A dual redundant communication link shall be provided between the local controllers and the MFB SMS server via a Field Controller (commonly referred to as an "RTU"). The RTU is housed within the station ICS equipment rack. ICS will provide a dedicated shelf within the ICS communications rack for the shelf mounting of the RTU on the top level.

Appendix C provides an overview of the existing MFB SMS layout.

#### **5.2.1 Wall Mounted Equipment Panel**

The Security System local control equipment is housed within a custom built wall mounted Equipment Panel and consists of:

- Local door controllers.
- Data gathering panels.

- Power supplies, battery backups, fuses etc.

The security panel shall be wall mounted within the Communications room where the station communications rack is also located. At existing fire stations, where a dedicated communications room does not exist, a suitable location shall be selected to the approval of the MFB.

Appendix D shows the layout of a typical Equipment Panel.

### **5.2.2 Power Supplies and Battery Backups**

Low voltage power supplies shall be installed within the control panel to provide power to all security devices. Exposed plug in step down transformers, including 'plug packs', shall not be accepted.

The power supply shall be monitored by the SMS for mains fail and low battery conditions. Such alarms shall be monitored 24 hours a day.

Each output shall be individually labelled and fused with LED indication of the output condition.

The power supply shall be backed up by the battery with sufficient capacity to maintain full operation of the systems for a minimum of twelve (12) hours, after mains failure, under normal operating conditions. The battery pack shall be housed within the control panel and labelled with the date of installation.

The MFB will supply and install a standard 240V GPO within the control panel for the security system.

### **5.2.3 Cabling and Conduits**

All cabling shall be installed within the fire station wall cavities, ceiling space etc. concealed wherever possible. In general, installation of cabling within surface mounted conduits will not be acceptable unless it is not possible to conceal cabling. In such circumstances, approval to install surface mounted conduits shall be gained from the MFB prior to installation.

Should surface mounted conduits be approved for installation by the MFB, conduits shall be 25mm or 32mm white PVC, as required. Surface mounted conduits shall be painted to match the surrounding surfaces and finish. Conduits shall be installed in straight lines, parallel to other conduits and building structures, at high level and, in general, located where there will be minimal visual impact on the aesthetics of the area. The installation of surface mounted conduits shall be to the approval of the MFB at all times.

Security cabling from the Control Panel to the Car Park vehicle gate shall be reticulated as follows.

Where possible, cabling shall be reticulated via underground PVC conduits installed in full accordance with the SMS Rollout Project Specification.

Where installation of underground conduits is not a practical option (e.g. when providing an interface to an existing gate), cabling may be reticulated by inserting cabling into a saw-cut penetration of not greater than 20mm into the concrete or bitumen. The penetration shall then be backfilled using tar or silicon, as appropriate.

#### 5.2.4 Cable Labels

All cables shall be allocated and identified with a unique cable number using Critchley type labels at both ends. Cable labels shall be orientated uniformly to read left to right when installed horizontally and from bottom to top where installed vertically.

#### 5.2.5 Approved Equipment

The MFB approved Security Management equipment are detailed in the table below:

SMS Equipment	Model	Notes
<b>Security Management System (SMS)</b>	Pacom GMS-CAMPUS	
<b>Local door controller</b>	Pacom 1057 series (single door) or 1067 series (two door)	
<b>Data gathering panel</b>	Pacom 1065 series	Input expansion module – Pacom 1050-004R Output expansion module – Pacom 1050-003
<b>Field Controller (RTU)</b>	Pacom 1057 series	
<b>Remote Arming Station (RAS)</b>	Pacom 1061 series	
<b>Power supply</b>	Tactical Technologies TPS12-5BD	
<b>Battery backup</b>		Minimum 8 hour battery backup

### 5.3 Building Access Control

Access to the fire station shall be controlled via electronic security in the form of:

- Proximity Access Card Readers.
- Vehicle Access Receivers and Transmitters technology (VAR/VAT).

Access control shall be provided to:

- The front pedestrian entry door:  
The front pedestrian entry door to the fire station shall be configured to be secured 24/7 with card reader access at all times.
- Rear and side pedestrian doors:

Side and rear doors providing access between the fire station and the car yard / back yard areas shall be access controlled and configured with the “double badging” functionality whereby double badging the associated card reader will switch the door into access mode for a pre-programmed time period, nominally 2 hours.

Note that when the station is Armed, any doors that are in the “double badged” state shall automatically switch to the locked mode.

- The key safe:

The station key safe consists of an electric strike which is interfaced to the SMS for access control to the key safe on a 24/7 basis. The key safe shall also be configured with the “double badging” functionality, however double badging the key safe card reader shall simply extend the time allowed prior to the generation of a Door Open Too Long alarm by a pre-programmed time period.

The key safe electric strike shall be Fail Secure such that the key safe remains locked when power is cut to the lock.

- Car Park Pedestrian Gates:

Nominated pedestrian entry gates to the fire station car park shall be access controlled (nominated by the MFB). These shall be configured to be secured 24/7 with card reader access at all times.

- Car Park Vehicle Gate:

Vehicle entry gates to the fire station car yard shall be configured to be secured 24/7 with card reader access and VAR/VAT technology access at all times. This shall be via a voltage free contact from the SMS to the gate controller to provide Output Control. Remote operation shall be provided via an intercom and Commander Phone System (by others).

- Appliance Bay Doors:

Appliance bay doors shall be access controlled with VAR/VAT technology. At drive-through stations, nominated rear appliance bay door(s) shall be access controlled, while at non drive-through stations, nominated front appliance bay door(s) shall be access controlled. This shall be via voltage free contact(s) from the SMS to the associated appliance bay door controller(s) to provide Output Control.

Access control shall be in accordance with all BCA regulations for fire and emergency egress at all times.

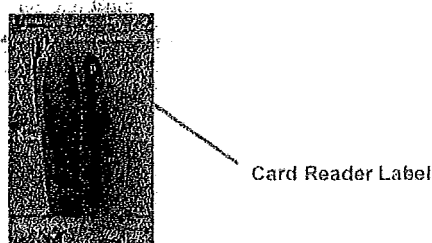
The access control system shall provide the functionality to remotely lock, unlock and provide temporary access through all access controlled doors (except appliance bay doors) from nominated GMS workstations, subject to user logon and privileges.

### 5.3.1 Card Readers

Card Readers installed throughout the MFB Fire Stations shall be the approved Indala Flexpass/Flexkey type.

In general, card readers shall be mounted at a height of 1200mm above FFL directly adjacent to the associated door on the latch side. Should this location not be available, an alternative location shall be selected to the approval of the MFB.

Card readers shall be labelled with their corresponding SMS allocated hardware number using Traffolyte labels as shown in the following typical application:



The card reader LED and tone operation shall be in accordance with the table below:

Card Reader Status	Visual Indication	Audible Indication
Secure	None	None
Access Granted	Solid Green LED Indication	None
Access Denied	LED Momentarily Flashes Red	Momentarily Buzz

Card readers shall be fixed in place using tamper proof fixings.

### 5.3.2 Access Cards and Key Fobs

MFB staff and nominated contractors will be issued with a proximity access card and/or proximity key fob to allow access to authorised areas.

The approved proximity access card is the Indala Flexcard and the approved proximity key fob is the Indala Flexkey.

### 5.3.3 Vehicle Access Receiver / Transmitters

A Vehicle Access Receiver / Transmitter system shall be installed at each fire station for the control of access to the station car yard and into the appliance bay.

The VAR unit shall be mounted at a minimum height of 3m and at a location approved by the MFB. Where it is not possible to mount the unit at this height, an alternative location shall be selected to the approval of the MFB.



The VAT/VAR system shall consist of four (4) channels; channel 1 will operate the vehicle entry gate while the remaining channels will activate nominated access controlled appliance bay door(s).

VAT units are installed in all fire appliances and the buttons are labelled G, D1, D2 and D3, which correspond to operation of the vehicle entry gate and appliance bay doors respectively. 4 button VAT key rings are also provided to all board vehicles to provide remote fire station gate/door operation.

#### **5.3.4 Electric Locks**

Throughout the fire stations, where possible, Electric Mortice Locks shall be used for access controlled doors. Where this is not appropriate, Electro-Magnetic Locks (Maglocks) shall be used as a suitable alternative. Electric strikes shall generally not be used, unless approved by MFB Security Supervisor.

All access controlled doors shall be programmed for free egress at all times where possible.

All Electric Mortice Locks shall be power on to unlock (power fail secure). All other electric lock types shall be power on to lock (power fail safe).

Front fire station doors shall consist of a key cylinder with Key-Override functionality for unlocking of the front door with a mechanical key in the event of a system failure.

#### **5.3.5 Power Transfer Device**

Where Electric Mortice Locks are to be installed, a Power Transfer Device will be required for the transfer of lock cabling from the door to the door frame.

The approved MFB power transfer device is the Assa Abloy 8810 type.

#### **5.3.6 Request to Exit Pushbuttons**

Access controlled doors consisting of Maglocks shall be installed with a Request to Exit (RX) pushbutton for free egress.

The approved button is the Sedean SSE4350 black mushroom-head type mounted on a standard switch plate. The mounting height and location of RX buttons shall be 1200mm adjacent to the associated door on the latch height, or an alternative location selected to the approval of the MFB, should the specified location not be available.

#### **5.3.7 Breakglass Unit**

Breakglass units shall be installed where Maglocks are used if the associated door is within a direct path of a fire exit, as determined by the MFB. Breakglass units shall be the dual pole KAC KW200/SW/B type. The first contact shall pass the positive of the power to the electric lock. The second contact shall be connected to the SMS as an alarm input.

The Breakglass unit shall be installed at a height of 1200mm adjacent to the associated Request to Exit Button.

#### **5.3.8 Sonalerts**

Each fire station access controlled door shall be installed with a sonalert for the audible annunciation of access control alarms.

Sonalerts installed at fire station doors (i.e. front, rear or side doors) shall be ceiling mounted centrally and directly above the corresponding door. Where this is not possible, sonalerts shall be wall mounted centrally and directly above the corresponding door, preferably out of reachable height.

Sonalerts installed at the station key safe shall be ceiling mounted directly above the key safe.

External pedestrian gates to the car yard shall be installed with a suitable weather proof and vandal resistant sonalert, such as the Mallory Sonalert, mounted to the approval of the MFB.

Appliance bay doors and vehicle entry doors to the car yard do not require a sonalert.

#### **5.3.9 Door Closers**

Each access controlled swing door shall be installed with a 3-staged door closer.

The approved MFB door closer is the Dorma TS 83 type.

Access controlled car park pedestrian gates shall consist of a suitable weather proof type door closer.

### 5.3.10 Approved Equipment

All MFB approved Access Control equipment are detailed in the table below:

Access Control Equipment	Model	Notes
<b>Card Readers</b>	Indala - Flexpass	Card readers to be mounted at a height of 1200mm above FFL to the centre of the unit. At vehicle entry gates, card readers shall be mounted on the gate bollard.
<b>Electric Mortice Locks</b>	Lockwood 3570 or 3580 series	Electric mortice locks shall be configured for free-handle egress at all times.
<b>Power Transfer Device</b>	Assa Abloy 8810	Installed on the hinge side of the door.
<b>Electromagnetic Lock</b>	Padde EML series	Require lock monitor 'bond sensing', enabling detection of the correct alignment, engagement and locking of the armature plate.
<b>Vehicle access receivers and transmitters</b>	AirKey AKTX4-W26 transmitter AirKey AKRX22-W26 receiver	Appropriate data encryption to be used to avoid possible duplication of transmission code.
<b>Reed Switches</b>	Sentrol 1078C or 2700 series	Two Sentrol 2700 series reed switches shall be installed on all appliance bay doors and pedestrian entry gates.
<b>Break glass door release unit</b>		Required to be dual pole, plastic, collapsible and key resettable insert type.
<b>Sonalert</b>		Adjustable pitch

### 5.3.11 Access Control Alarms

Access controlled doors shall be monitored for:

- Forced Door Alarms.
- Door Held Open Alarms.

The access control door monitoring alarm input shall be suppressed during a valid entry or exit, but shall provide an immediate alarm indication of when the door is forced open. This shall report as a Forced Door (FD) intrusion alarm and automatically activate the associated sonalert until such time as the door is secured (i.e. closed and locked).

If a door is opened during a valid entry or exit, and held open for longer than the pre-programmed access time (nominally 20 seconds), the associated sonalert shall activate a warning/embarrassment tone until the door is closed and locked.

If the door is not closed and locked after a further pre-programmed period of time (nominally 10 seconds), a Door Held Open (DHO) alarm shall be generated at the SMS and the associated sonalert activated until the door is closed and locked.

FD and DHO alarms shall be annunciated to GMS and ADT at all times, however DHO alarms shall be suppressed from reporting to ADT while the station is Disarmed.

#### **5.4 Equipment Bollards**

Vehicle entry gates shall consist of an equipment bollard for the mounting of security equipment such as a card reader and intercom unit.

To facilitate the cabling required to interface the vehicle entry gate to the SMS, the following shall be provided:

- 1 x 32mm Dedicated Security Conduit - communications conduit, white ridged duty underground type, to the gate controller.
- 1 x 32mm Dedicated Security Conduit - communications conduit, white ridged duty underground type, to the gate bollard. Conduit to turn up directly into the base of the bollard (fully concealed).

At existing fire stations where underground conduits are not available for security cabling reticulation, the concrete/bitumen may be cut and the cabling placed directly within the concrete/bitumen, and secured in place with an appropriate silicon adhesive. Refer to section 5.2.3.

#### **5.5 Intrusion Detection**

Intrusion detection shall be provided throughout the fire station to monitor all perimeter doors, nominated internal doors, as well as nominated rooms.

The intruder detection devices to be provided to each Fire Station shall include the following:

- PIR
- Dual Tech
- Reed Switch
- Heavy Duty Reed Switch
- Status Indicator
- Push to Arm Button
- Internal Siren
- External Siren and Strobe
- Son Alert
- RAS

##### **5.5.1 Volumetric Detection**

The following rooms shall consist of Passive Infrared Detectors (PIR) of the Alarmcom IR200 or IR261 type for volumetric intruder detection coverage:

- Fire fighter locker rooms.
- Rooms/areas where valuable equipment is stored (e.g. lecture rooms with A V equipment).

- Watch room / dispatch area.
- Communications room
- Corridors.

The appliance bay shall consist of Dual Technology (DT) Detectors of the Alarmcom LM100 type installed, as a minimum, at each corner of the appliance bay.

PIRs and DTs shall, in general, be mounted at the uniform height, positioned to provide maximum coverage of the protected areas.

Each PIR and DT device shall consist of a detector tamper switch, independently monitored on a 24 hour basis.

#### **5.5.2 Door Monitoring**

Monitored and Access Controlled doors shall be monitored as detailed.

##### **Monitored Internal Swing Doors**

Monitored Internal Swing Doors shall be monitored using recessed Sentrol 1078C Reed Switches (RS), installed at the head of the door on the latch side.

##### **Access Controlled Internal Swing Doors**

Where Electric Mortice Lock have been installed, the door shall be monitored using the following devices cabled in series as a single input to the SMS:

- recessed Sentrol 1078C Reed Switches, installed at the head of the door on the latch side,
- the electric lock's inbuilt latch monitor,
- the electric lock's inbuilt reed switch.

Where Electro-Magnetic Locks have been installed, the door shall be monitored using the following devices cabled in series as a single input to the SMS:

- recessed Sentrol 1078C Reed Switches, installed at the head of the door on the latch side,
- the electric lock's inbuilt Bond Sensor.

##### **ICS Cabinet**

The ICS cabinet located in the communications room shall be monitored via a standard surface mounted reed switch.

##### **Appliance Bay Doors**

All appliance bay doors shall be monitored by 2-off Sentrol 2700 series heavy duty reed switches (HD RS) cabled in series as a single input.

### **External Pedestrian Gates**

All pedestrian gates shall be monitored using a Sentrol 2700 series surface mounted heavy duty reed switch.

### **Key Safe**

The Sentrol 1078C reed switch shall be installed to the key safe door internally for the monitoring of the key safe.

### **5.5.3 Intruder Detection Areas**

The Security System shall be configured according to the following Areas:

- Fire station (Areas 1 -5).
- Key safe (Area 7 - Refer to the “Key Safe design and Security Requirements” section for details).
- Smoke detectors (Area 8).

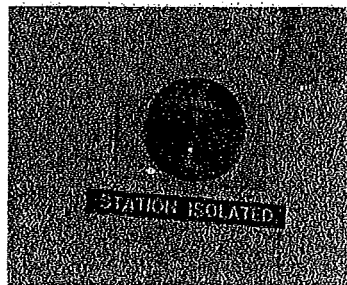
### **5.5.4 Station Isolated Strobes**

Devices referred to as ‘Station Isolated Strobes’ (SIS) shall be installed throughout the following locations within the fire stations to indicate the Armed/Disarmed status of the station:

- Appliance bay.
- Watch room
- Dispatch / Turn-out area.

When the station is Armed, the strobes will flash RED. When the station is Disarmed, the strobes shall be deactivated.

The strobes shall match those installed throughout the MFB fire stations and shall be labelled as shown in the image below.



### **5.5.5 Arming and Disarming**

Arming of the station shall be via the station “Push to Arm” button (PAB), generally located within the turn-out area.

Activation of the “Push to Arm” button shall initiate an exit timer to allow MFB staff to exit the premises before arming the station, trigger the flashing of the Station Isolated Strobes, cancel any “double badged” card readers and notify the BMS system of the change to UNMANNED status.

If access controlled perimeter doors are not fully closed when a “Push to Arm” button is activated, the system will force arm and an alarm will be reported.

Activation of the “Push to Arm” button shall Arm all Areas including the key safe.

The station shall be configured to disarm by badging any external card reader or activation of an authorised Vehicle Access Transmitter unit to open an appliance bay door. Disarming a fire station shall automatically turn off the Station Isolated Strobes and notify the BMS system of the change to MANNED status. Note that badging external card readers will not Disarm the key safe or smoke detector Areas.

The key safe shall be Disarmed by badging the associated card reader with an authorised card. The key safe shall automatically Arm when the door is shut after use.

Smoke detectors shall be Armed and Disarmed via the station RAS.

#### **5.5.6 Push to Arm Button**

The station shall consist of a “Push to Arm” button generally located within the turn-out area.

In some instances, where the station PPE area is not within close proximity to the turn-out area, the installation of an additional “Push to Arm” button will be required within the PPE area.

#### **5.5.7 Remote Arming Stations**

Each fire station shall consist of a Remote Arming Station (RAS) installed within the turn-out area. The station RAS is not used by MFB staff under normal circumstances, and will mainly be used by system technicians for the purpose of servicing and maintenance.

#### **5.5.8 Sirens and Strobes**

Each station shall consist of the following devices installed for the purpose of alarm annunciation:

- Internal Siren – Recessed Internal Piezo Screamer ceiling mounted within the Watch Room.
- External Siren and Strobe – Wall mountable to the external perimeter wall of the station at the front and the rear (rear installation where the station contains a car yard only).

The sirens and strobes shall automatically activate to provide visual and audible indication when there is an alarm.

### 5.5.9 Intrusion Detection requirements

Different areas within the fire station will require different types of intrusion detection devices, depending on the location, purpose and characteristics of the room. The table below highlights the intrusion detection devices required within each of the different types of areas within a fire station:

Area	PIR	Dual Tech	Reed Switch	Heavy Duty Reed Switch	Status Indicator	Push to Arm Button	Internal Siren	Son Alert	RAS
<b>Communications Room</b>	✓		✓						
<b>Appliance Bay</b>		✓		✓	✓				
<b>Locker Areas</b>	✓								
<b>Watch Room/ Dispatch Area</b>	✓				✓	✓	✓		✓
<b>Lounge Rooms</b>	✓								
<b>Corridors</b>	✓								
<b>External Pedestrian Gate</b>				✓					
<b>Key Safe</b>			✓					✓	

### 5.6 Alarm Monitoring Requirements

Alarms generated at fire stations shall be configured for annunciation at the following locations:

- FSCC (Tally Ho).
- Remote Monitoring Station – currently ADT.

### 5.7 Door Intercom Systems

Fire stations will require slave intercom units to be provided for communication at the following general locations:

- Front fire station door, in lieu of a doorbell.
- Vehicle entry gate.

Intercom stations shall be interfaced to the station PABX system. Activation of an intercom unit shall initiate a call to all station telephone handsets.

Refer to the Electrical Functional Brief for further details.

### 5.8 System Interfacing

#### 5.8.1 LLI Interface to BMS

A Low Level Interface (LLI) shall be provided between the SMS and BMS to enable the status of the station (armed/disarmed) to be communicated to the BMS. When the station Arms, the SMS shall provide a signal to the BMS via a voltage-free contact, allowing the BMS to initiate tasks including but not limited to:

- Relay Armed/Disarmed status to appliance bay door PLC.



- Isolate power to stove.
- Divert phones to voicemail.

Refer to the ICS 'Fire Station Security – SMS-PLC Operation' document for a full system description of the interface between the SMS and BMS.

#### **5.8.2 HLI to Siemens Apogee System**

The HLI between the Security Management System and the Building Management System (Siemens Apogee) shall be bi-directional and via a TCP/IP link, allowing for the exchange of all general and system alarms between the two systems. The interface shall meet the following minimum standards:

- Utilise the standard BACnet protocol to facilitate the interfacing between the two systems.
- Provide a duplex connection to allow the simultaneous transmittal and receipt of data.
- Programmable time off-set to compensate for the delays in signal transmission and processing.
- Time and Date stamp synchronised from a single source via the HLI and sent at maximum intervals of 24 hours.

Although to-date the final configuration of alarms to be transferred has not been determined by the MFB, this interface shall be provided to allow the transfer of alarms between the two systems, if required in the future.

Refer to the ICS 'Fire Station Security – SMS-PLC Operation' document for a full system description of the interface between the SMS and BMS.

## **6. Security Management (Operational)**

### **6.1.1 Access Control**

Access to the fire station and yard will be controlled 24/7 via Card Readers and VAT/VAR units.

The VAR/VAT system will consist of four (4) channels to operate the appliance bay doors and vehicle entry gate. Channel one (1) will operate the vehicle entry gate and the remaining channels will activate appliance bay doors.

At drive through stations, channels 2 - 4 will operate the rear appliance bay doors. At non-drive through stations channels 2 - 4 will operate the front appliance bay doors.

### **6.1.2 Intrusion Detection**

Each fire station shall consist of minimum 4 Areas:

- 1 – Fire Station
- 6 – BMS/Appliance bay door PLC
- 7 – Smoke Detectors
- 8 – Key Safe

If the station consists of multiple levels, Areas 2 – 5 will be allocated to levels 1 – 3, respectively.

#### **Disarming a Fire Station**

Disarming an Armed Fire Station can be achieved in two ways:

- 1) Via activation of any external Card Reader by an authorised access control proximity key fob or Photo ID proximity card. This will also provide access through the associated door.
- 2) Via activation of an authorised Vehicle Access Transmitter unit to open an appliance bay door.

Disarming a fire station will automatically turn off the Station Isolated Strobes and notify the BMS system of the change to Disarmed status.

#### **Arming a Station**

Arming of a fire station Security System is via activation of the station "Push to Arm" button, generally located in a nominated fire fighter turnout area. Activation of the "Push to Arm" button will initiate the following processes:

- Initiates the exit delay timer and Arms the fire station.
- Activates the flashing of the Station Isolated Strobes.
- Notifies the BMS system of the change to Armed status.

## **Appendix A Fire station Security Profile**

# MFB FIRE STATION - SECURITY PROFILE



Criteria	Rating	Security Profile
1. Is the Fire Station located in an area considered to be Residential (1), Commercial (2) or Industrial (3)?	Low	nil
2. Is the area considered to be a Low (1), Medium (2) or High (3) Crime rate area?	Low	
3. Does the Fire Station have a history of security incidents?	Low	
4. Is the Fire Station located in close proximity to high frequency and multiple types of Public transport?	Low	
5. Is the Fire Station located in close proximity to Public venues or services (eg, shops, pubs, parks etc)?	Low	
6. Is there a history of vandalism, loitering or theft in the area?	Low	
7. Are the public able to access the rear yard and car park?	Low	
8. Are the vehicle gates manually operated?	Low	
9. Are surrounding and ambient (street) lighting levels inadequate?	Low	
10. Is the Fire Station adjacent to or bordering a park, open field, public access way or vacant block?	Low	
Total		

INSTRUCTIONS	COMMENTS
<p>a. Answer each question by assigning a value corresponding to one of three possible answers.</p> <p>b. For questions requiring a rating or description the value for each response is indicated in the question.</p> <p>c. For questions requiring a Yes, No or Unsure, allocate a value of 3=Y, 2=U and 1=N.</p> <p>d. The total score is calculated to determine the Fire Station Security Profile of LOW, MEDIUM AND HIGH (see legend).</p> <p>e. For any specific or identified threats or special note, provide details in the Comments box.</p>	

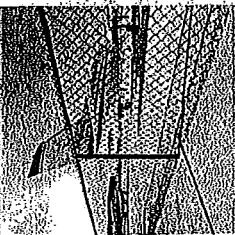



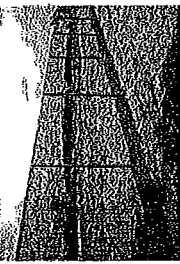

  

<p>Fire Station: _____</p> <p>Completed by: _____</p> <p>Date: _____</p>	<p><b>LEGEND.</b></p> <p>Low (1-2) Medium (3-22) High (23-30)</p>
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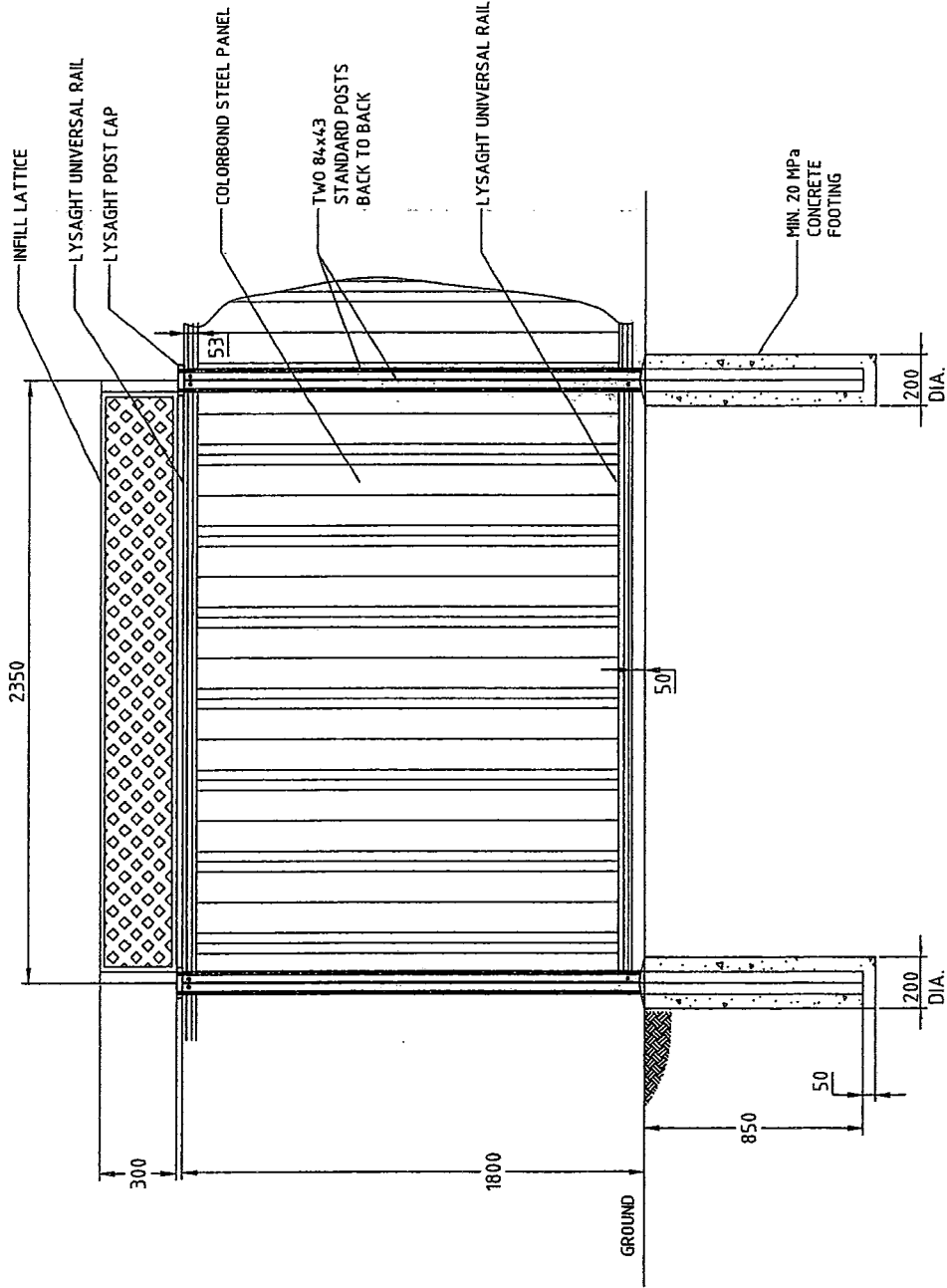
## **Appendix B Minimum Fencing Requirements and Associated Drawings**

- Table of fencing options
- Detailed fence drawings

## Minimum Fencing Requirements

Fence Type	Image (indicative)	General	Minimum Requirements at each Security Profile level		
			Low	Medium	High
Chain Link (Refer to drawing U01 for further details)		<ul style="list-style-type: none"> <li>The chain link fence shall comply with AS 1725.</li> <li>All fencing material (chain link fencing fabric, barbed wire, single stranded fencing wire and double wire) shall comply in all respects with AS 2423.</li> <li>Chain link metal fence fabric can either have a black paint finish or coated in black PVC.</li> <li>All metallic coated wires shall either be galvanized or zinc/aluminium-alloy coated.</li> <li>Plastic coated wires and paint finishing's shall comply with AS 2423.</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> <li>Fitted with galvanised top and bottom horizontal rails</li> <li>Core wire diameter of chain link fabric shall be a minimum of 2.50 mm</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> <li>Fitted with galvanised top and bottom horizontal rails</li> <li>3 strands of barbed wire on vertical extension of posts.</li> <li>Core wire diameter of chain link fabric shall be a minimum of 2.50 mm</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> <li>Fitted with galvanised top and bottom rails</li> <li>Outriggers and 3 strands of barbed wire</li> <li>Concrete plinth</li> <li>Core wire diameter of chain link fabric shall be a minimum of 3.15 mm</li> </ul>
Lysight Steel Fence (Refer to drawing U02 for further details)		<ul style="list-style-type: none"> <li>Fence shall not be used if site within 1 km of marine, severe industrial or other corrosive environments.</li> <li>Steel lattice strip to be attached to top of fence.</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 1.8m</li> <li>Height of 2.1m preferred, subject to council approval.</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.1m</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>
TangoRail (Refer to drawing U03 for further details)		<ul style="list-style-type: none"> <li>Rails, posts and vertical tubular infill shall be constructed from mild steel, Galvanised and Powder Coated to AS 1627.</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.1m</li> <li>100mm spacing between tubes</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> <li>100mm spacing between tubes</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable -</li> </ul>
Palisade (Refer to drawing U04 for further details)		<ul style="list-style-type: none"> <li>All fence parts shall be made from steel</li> <li>All components shall be hot dipped galvanised after fabrication to AS 1627.</li> <li>All bolts and rivets used shall be tamper proof, preventing easy removal.</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> <li>Layer of welded or expanded metal mesh fixed between plates and rails</li> </ul>
Securifor (Refer to drawing U05 for further details)		<ul style="list-style-type: none"> <li>Mesh apertures shall be small enough to reduce risk of penetration or scaling.</li> <li>Posts shall be hot dipped galvanised subsequent to fabrication.</li> <li>Strength of welds shall be at least 75% to steel strength.</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.1m</li> <li>3510 single skin mesh panels</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 2.4m</li> <li>358 single skin mesh panels</li> </ul>
Wooden Paling (Refer to drawing U06 for further details)		<ul style="list-style-type: none"> <li>All structural components of fence shall be red gum or approved equivalent.</li> <li>Fence palings shall overlap.</li> <li>Palings shall be oriented to ensure rails are not exposed to the internal side of the perimeter.</li> </ul>	<ul style="list-style-type: none"> <li>Min Height 1.8m</li> <li>Height of 2.1m preferred, subject to council approval.</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>





# LYSAGHT (COLORBOND) FENCE DETAILS - ELEVATION

1 : 10 @A1

THIS DRAWING IS PROVIDED ONLY AS A REFERENCE ONLY.  
ALL CONSTRUCTION REQUIREMENTS SHALL COMPLY WITH  
MANUFACTURER'S SPECIFICATIONS AND COUNCIL  
REGULATIONS.

PRELIMINARY

SECURITY SERVICES		SECURITY COLORBOND FENCE DETAILS	
DATE	10/02/2022	PROJECT	1002
DRAWN BY	AS SHOWN	CHECKED BY	1002
SCALE	1:10	PROJECT NO.	1002

METROPOLITAN FIRE BRIGADE		SECURITY UPGRADE	
DATE	10/02/2022	PROJECT	1002
DRAWN BY	AS SHOWN	CHECKED BY	1002
SCALE	1:10	PROJECT NO.	1002

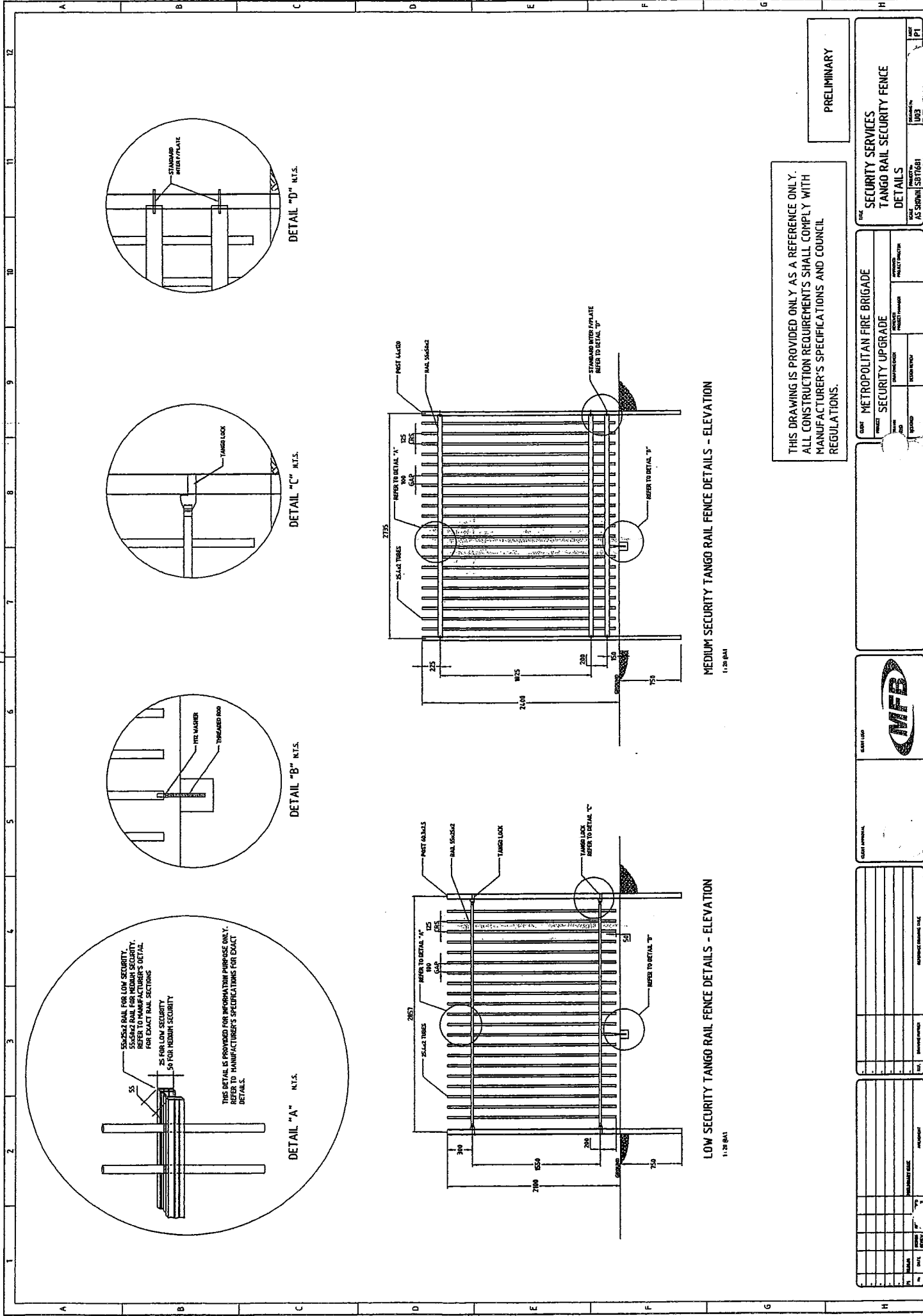
METROPOLITAN FIRE BRIGADE		SECURITY UPGRADE	
DATE	10/02/2022	PROJECT	1002
DRAWN BY	AS SHOWN	CHECKED BY	1002
SCALE	1:10	PROJECT NO.	1002

METROPOLITAN FIRE BRIGADE		SECURITY UPGRADE	
DATE	10/02/2022	PROJECT	1002
DRAWN BY	AS SHOWN	CHECKED BY	1002
SCALE	1:10	PROJECT NO.	1002

METROPOLITAN FIRE BRIGADE		SECURITY UPGRADE	
DATE	10/02/2022	PROJECT	1002
DRAWN BY	AS SHOWN	CHECKED BY	1002
SCALE	1:10	PROJECT NO.	1002

METROPOLITAN FIRE BRIGADE		SECURITY UPGRADE	
DATE	10/02/2022	PROJECT	1002
DRAWN BY	AS SHOWN	CHECKED BY	1002
SCALE	1:10	PROJECT NO.	1002

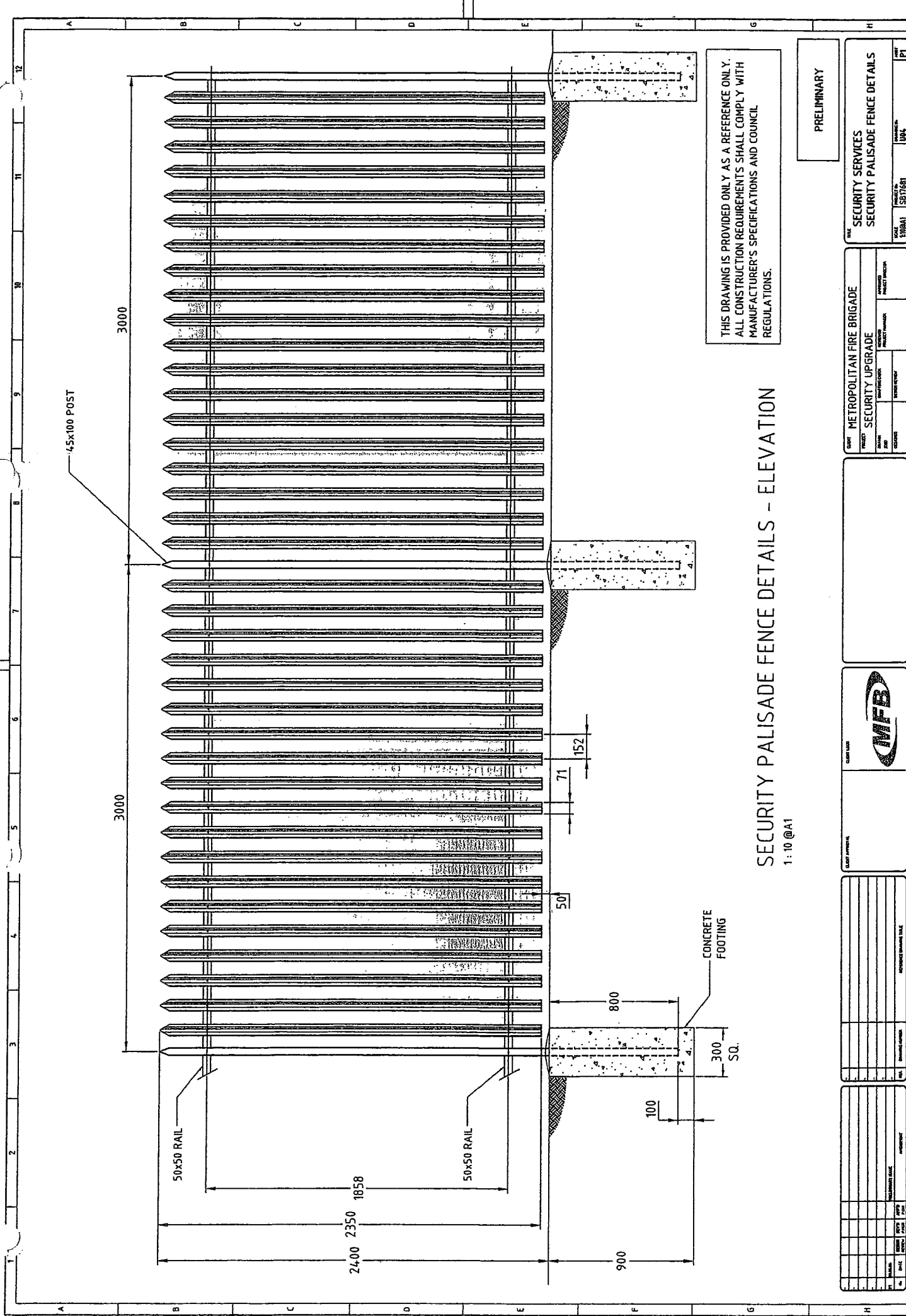




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MANUFACTURER'S SPECIFICATIONS AND COUNCIL  
REGULATIONS.

PRELIMINARY

<b>CLIENT LOGO</b> 		<b>CLIENT INFORMATION</b> METROPOLITAN FIRE BRIGADE SECURITY UPGRADE		<b>FILE</b> SECURITY SERVICES TANGO RAIL SECURITY FENCE DETAILS
<b>PROJECT</b> TANGO RAIL SECURITY FENCE DETAILS	<b>PROJECT NUMBER</b> 1903	<b>SCALE</b> AS SHOWN / SUBTITLED	<b>DATE</b> 1903	<b>PROJECT NO.</b> 1903

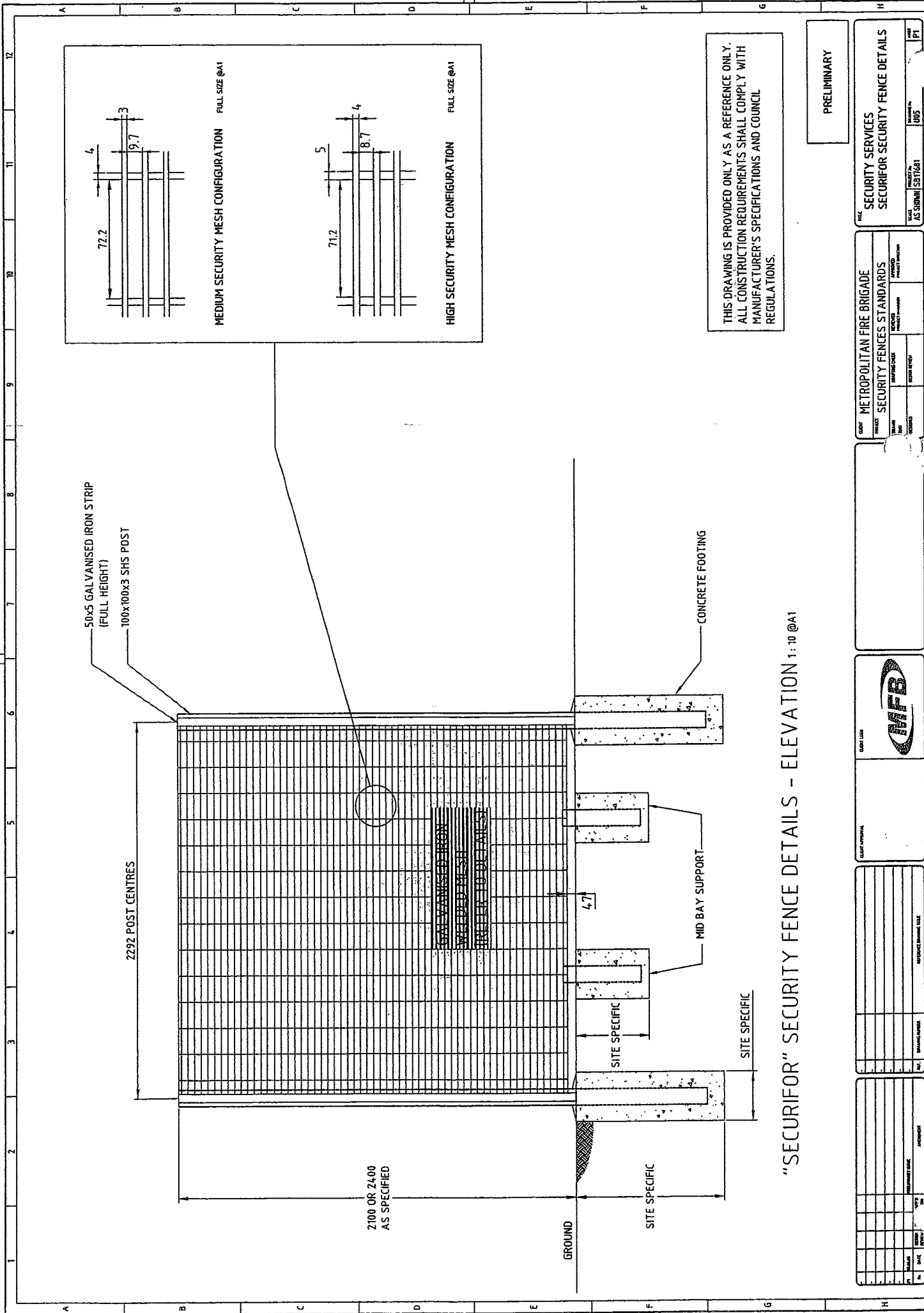


# SECURITY PALISADE FENCE DETAILS - ELEVATION 1:10 @A1

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MANUFACTURER'S SPECIFICATIONS AND COUNCIL  
REGULATIONS.

PRELIMINARY

<b>CLIENT</b> METROPOLITAN FIRE BRIGADE <b>PROJECT</b> SECURITY UPGRADE <b>DESIGN</b> PROJECT MANAGER <b>DATE</b> 10/04/11 <b>SCALE</b> 1:10 @A1 <b>PROJECT NO.</b> SBT5681 <b>DATE</b> 10/04/11 <b>PT</b>		<b>SECURITY SERVICES</b> <b>SECURITY PALISADE FENCE DETAILS</b>															
<b>CLIENT APPROVAL</b> 		<b>REVISIONS</b> <table border="1"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DESCRIPTION	DATE												
NO.	DESCRIPTION	DATE															



50x5 GALVANISED IRON STRIP  
(FULL HEIGHT)  
100x100x3 SHS POST

2292 POST CENTRES

2100 OR 2400  
AS SPECIFIED

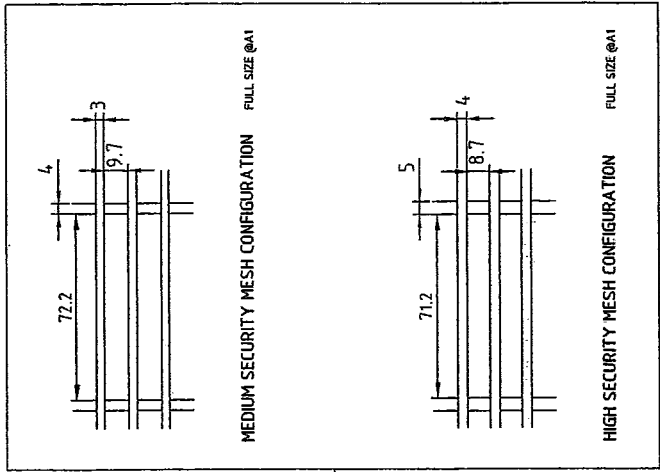
GROUND

SITE SPECIFIC

SITE SPECIFIC

MID BAY SUPPORT

CONCRETE FOOTING



MEDIUM SECURITY MESH CONFIGURATION  
FULL SIZE @A1

HIGH SECURITY MESH CONFIGURATION  
FULL SIZE @A1

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MANUFACTURER'S SPECIFICATIONS AND COUNCIL  
REGULATIONS.

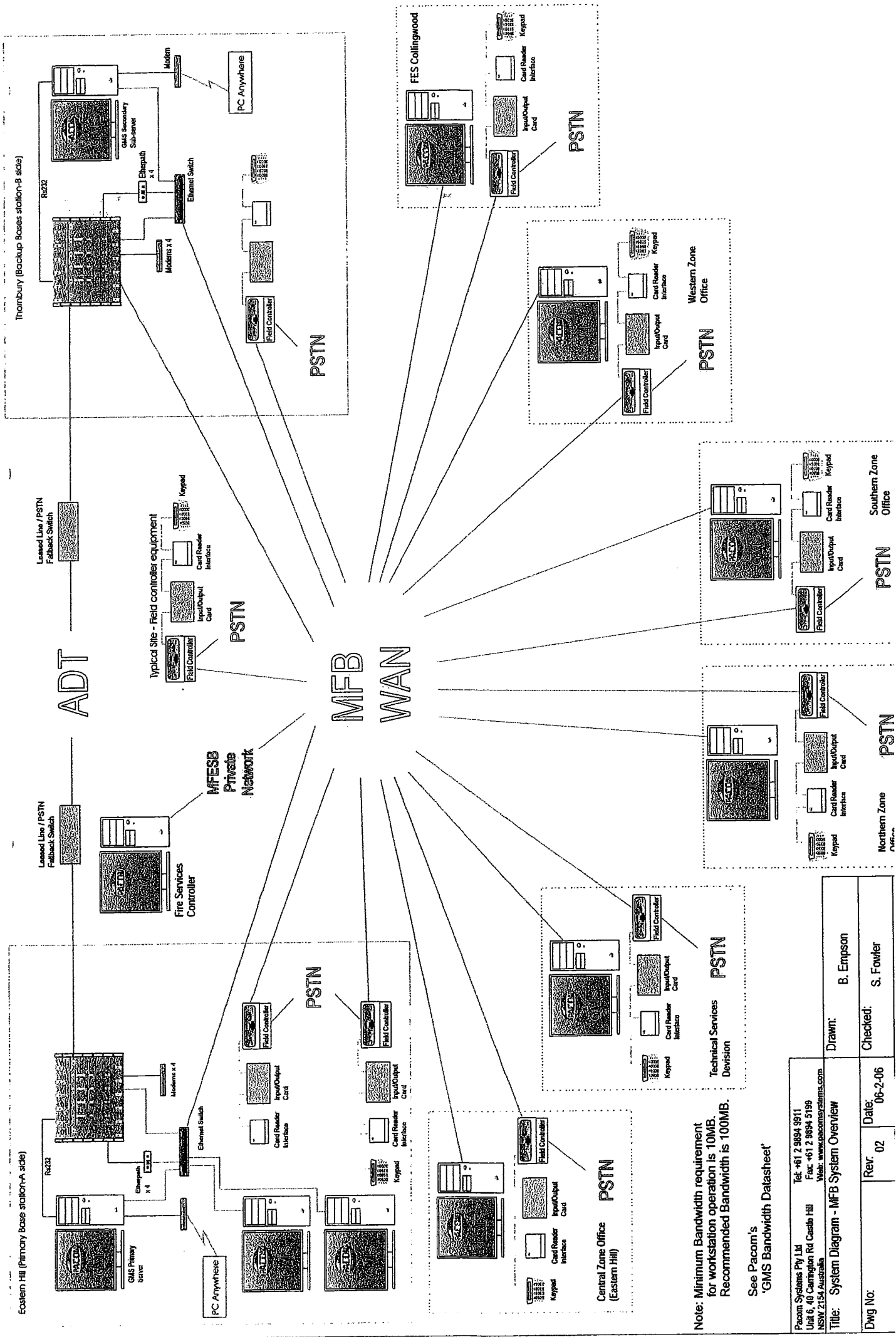
"SECURIFOR" SECURITY FENCE DETAILS - ELEVATION 1:10 @A1

PRELIMINARY

<b>CLIENT APPROVAL</b> _____ DATE: _____		<b>CLIENT LOG</b> 		<b>CLIENT</b> METROPOLITAN FIRE BRIGADE SECURITY FENCES STANDARDS		<b>PROJECT</b> SECURITY SERVICES SECURIFOR SECURITY FENCE DETAILS		<b>DATE</b> 10/05/2024		<b>BY</b> JMS		<b>CHKD BY</b> JMS		<b>DATE</b> 10/05/2024																
<b>REVISIONS</b> <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.	DATE	DESCRIPTION													<b>DESIGNED</b> _____ DATE: _____		<b>DRAWING CHECK</b> _____ DATE: _____		<b>REVIEW</b> _____ DATE: _____		<b>APPROVED</b> _____ DATE: _____		<b>PROJECT NUMBER</b> _____		<b>SCALE</b> 1:10		<b>PROJECT NAME</b> _____	
NO.	DATE	DESCRIPTION																												



## **Appendix C Existing MFB SMS Layout**



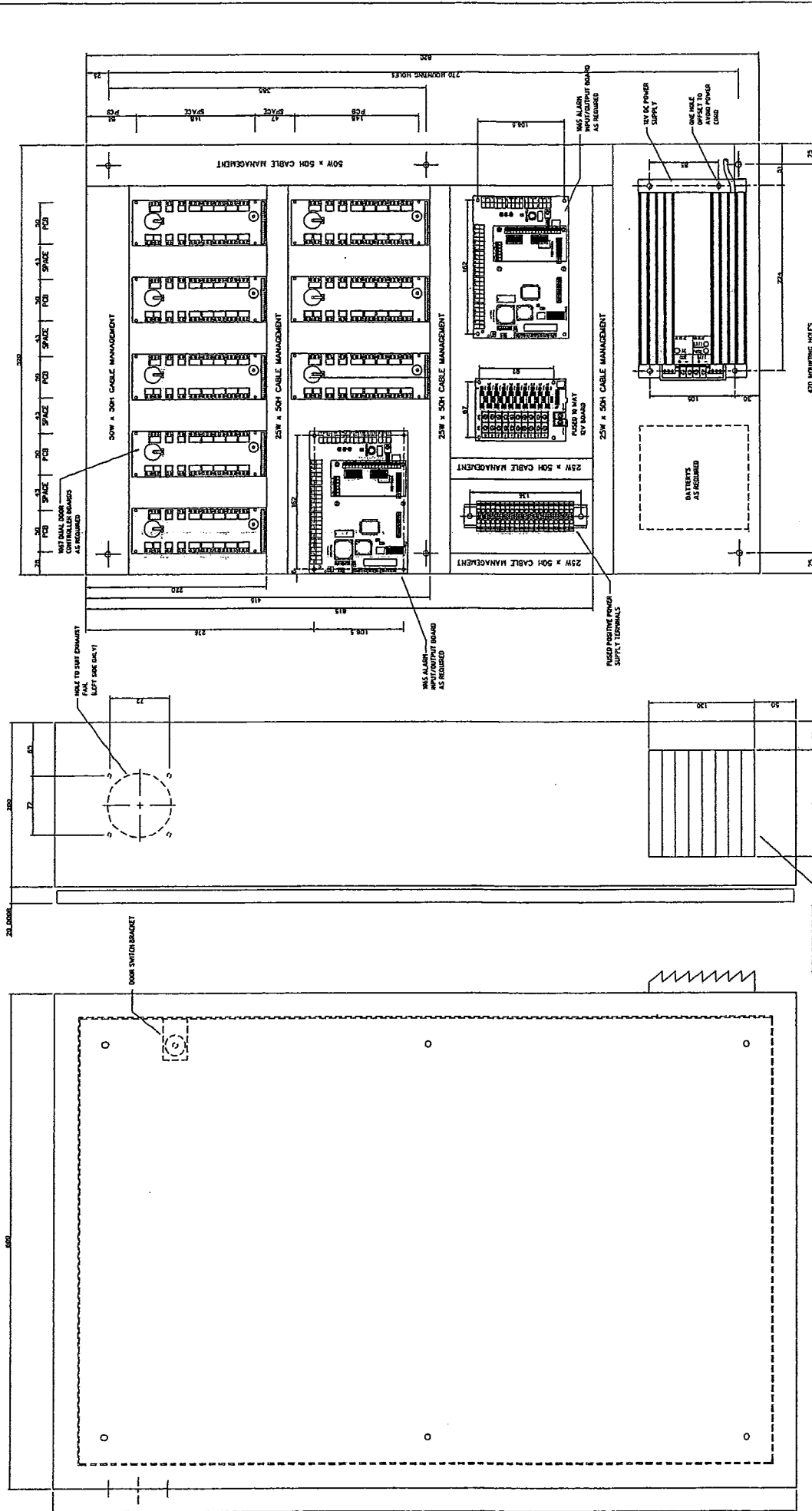
Note: Minimum Bandwidth requirement for workstation operation is 10MB. Recommended Bandwidth is 100MB.

See Pacom's 'GMS Bandwidth Datasheet'

Pacom Systems Pty Ltd Unit 6, 40 Carrington Rd Castle Hill NSW 2154 Australia Tel: +61 2 9894 9911 Fax: +61 2 9894 5199 Web: www.pacomsystems.com		Title: System Diagram - MFB System Overview	
Dwg No:	Rev. 02	Date: 06-2-06	Checked: S. Fowler
		Drawn: B. Empson	

## **Appendix D Alarm Panel Construction and Layout**

- Alarm panel layout
- Alarm panel enclosure detail
- Alarm panel enclosure door detail



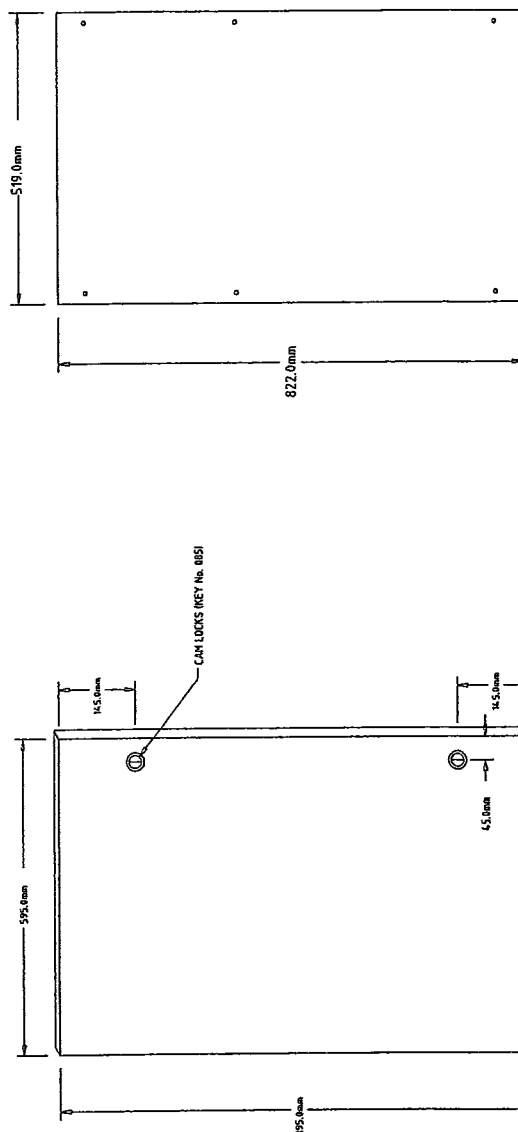
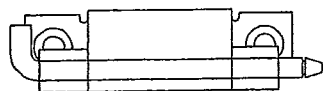
FRONT VIEW

RIGHT SIDE VIEW



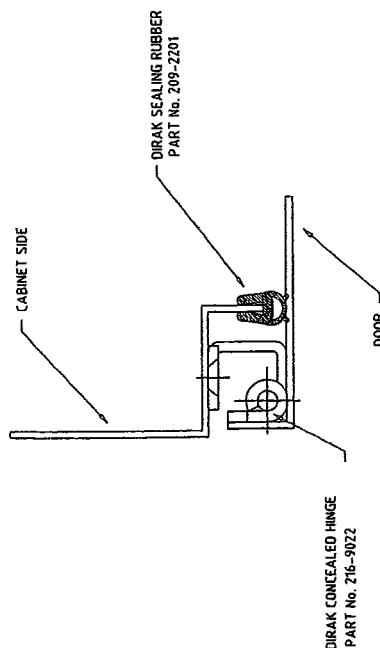


DO NOT SCALE  
DIMENSIONS IN MILLIMETRES



**INTERNAL GEAR TRAY**

- GEAR TRAY MOUNTED ON STAND-OFFS
- GEAR TRAY TO BE REMOVABLE
- HOLES TO BE PUNCHED FOR MOUNTING OF EQUIPMENT
- GEAR TRAY IS FLAT (NO RETURN FOLDS)



## DOOR HINGE AND SEALING DETAILS

[illegible]



PROJECT:	MFB Fire Station Facility Tenders	DESIGN ADVICE No.:	DA001
TO:	StrataPNA Architects	FAX NO.:	By email
ATTENTION:	Mr Patrick Ng	DATE:	19 August 2010
FROM:	Charles Rossiter	REFERENCE:	201008bd/001
CROSS REFERENCE:	Email 5 August 2010	NO. OF PAGES:	6

REPLY REQUIRED BY.....	<input type="checkbox"/>	INSPECTION REPORT.....	<input type="checkbox"/>
CONFIRMATION / RESPONSE TO DA NO.....	<input type="checkbox"/>	CHANGE TO DOCUMENT .....	<input type="checkbox"/>
REFER TO DOCUMENT APPROVAL FROM.....	<input type="checkbox"/>	ATTACHMENTS .....	<input type="checkbox"/>
FOR INFORMATION / ACTION.....	<input checked="" type="checkbox"/>	OTHER.....	<input type="checkbox"/>

**SUBJECT**

MFB Design Guide Recommendations

**DESCRIPTION**

Our recommendations for the acoustic requirements for MFB fire stations are attached.

**DISTRIBUTION:**

<input checked="" type="checkbox"/> Patrick Ng	Strata PNA	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

THE DOCUMENTS ARE APPROVED FOR ACTION AND ISSUE AS NOTED TO RELEVANT CONSULTANTS OR CONSTRUCTION FOR:

REVIEWER: Alistair Bavage

REVIEW DATE: 19 August 2010

## ACOUSTICS

The following guidelines have been prepared by Marshall Day Acoustics Pty Ltd for MFB Fire Station Facility tenders.

### 1.0 INTRODUCTION

This section defines sound insulation, speech privacy, room acoustics and noise control guidelines for the design of MFB Facilities and presents a system for defining acoustic performance for each of the spaces.

### 2.0 ACOUSTIC TERMINOLOGY

The following acoustic terminology is used.

$R_w$	Weighted sound reduction index. A single number rating of the sound insulation performance of a specific building element. $R_w$ is measured in a <b>laboratory</b> . $R_w$ is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete.
$D_{nT,w}$	Weighted standardised level difference. A single number rating of the sound level difference between two rooms. $D_{nT,w}$ is typically used to measure the <b>on-site</b> sound insulation performance of a building element such as a wall, floor or ceiling.
dBA	A-weighted decibel. The A-weighting approximates the response of the human ear.
NR	Noise Rating. A single number rating which is based on the sound level in the octave bands 31.5Hz – 8kHz inclusive, generally used to assess noise from mechanical services in buildings.
$L_{eq}$	The equivalent continuous sound level. This is commonly referred to as the average noise level.
Reverberation time ( $T_{60}$ )	Reverberation time is used for assessing the acoustic qualities of a space. $T_{60}$ is measured in seconds (s) and describes how quickly sound decays within a space.

### 3.0 SPEECH PRIVACY OVERVIEW

Speech privacy between two adjoining spaces is primarily dependent upon three factors:

- Voice level in the source room
- Noise reduction between the rooms
- Ambient noise in the receiving room.

### *Voice Level*

The loudness of the voice in the source room will depend upon the individual concerned and the style of management practised by the organisation. Generally, two categories of voice level are used in speech privacy analysis:

- Raised voice – a level of conversation that would be used when delivering a lecture or an enthusiastic reprimand
- Normal voice – which would be used for a typical one-to-one exchange or telephone conversation.

### *Noise Reduction*

The degree of speech privacy between adjoining spaces is dependent upon the noise reduction achieved. The partition is an important part of the overall noise reduction, and the partition construction must be selected carefully to ensure the appropriate noise reduction is achieved.

The noise reduction between areas is approximately equal to the Weighted standardised level difference, ( $D_{nT,w}$ ) of the partition system.

In standard offices, the ceiling is also of critical importance to the overall noise reduction achieved. The conventional practice of running partitions to ceiling height and providing return air openings in the ceiling provides a weak link in the sound insulation path between rooms. This problem is dealt with by providing a baffle above the partition in the ceiling space, by running the partition slab to slab, or by providing a solid plaster ceiling instead of the building standard mineral fibre tile.

### *Background Noise*

The ambient noise level in a building consists of the continuous background noise generated by the air-conditioning system and intermittent time-varying noise from road traffic. The ambient noise level is measured in terms of the equivalent continuous noise level,  $L_{eq}$ .

The background noise level in the receiving room plays a significant role in masking intrusive speech from adjacent rooms. Noise from air-conditioning systems, and to a lesser extent, road traffic and general activity within the building, have a significant effect on speech privacy due to the masking they provide.

A direct trade-off with noise reduction applies. If, for a given situation, the masking noise is reduced by 5dB, the noise reduction of the adjoining partition needs to be increased by 5dB to maintain the same level of speech privacy.

It is clear that low levels of air-conditioning noise provide a comfortable environment. However, low noise levels provide difficulties in achieving adequate levels of speech privacy, due to a lack of masking. An appropriate compromise between noise levels that are too high for comfort, and too low for speech privacy, needs to be determined.

Recommended maximum ambient noise levels for various areas are provided in Australian Standard AS2107-2000 *Acoustics – Recommended design sound levels and reverberation times for building interiors*. Noise levels in all areas should comply with AS2107:2000.

Typical Noise Rating Values and an indication of the applicable areas are given in Table 1.

**Table 1**  
**Typical Noise Ratings**

Level	Noise Rating	Representative Space
High	65dBA+	Plant Room
Moderate	45-55dBA	Amenities Area
Normal	40-45dBA	Offices, Entry Foyer
Low	40dBA	Bed rooms, Executive offices, lecture rooms, meeting rooms

### Speech Privacy

For design purposes, speech privacy can be divided into the following ratings:

- Raised voice confidential privacy ( $D_{nT,w}$  45)  
Raised voice conversation can just be heard as a muffled sound in the adjoining space, but cannot be understood. Normal voice levels cannot be heard
- Normal voice confidential privacy ( $D_{nT,w}$  40)  
Normal voice conversation can just be heard as a muffled sound in the adjoining space, but cannot be understood. Raised voices can be understood.
- Normal voice privacy ( $D_{nT,w}$  35)  
Normal voice conversation can be heard in the adjoining space, and limited speech can be understood. Raised voices can be understood clearly.
- Poor privacy (less than  $D_{nT,w}$  30)  
Normal voice conversation can be heard and understood in the adjoining space. Raised voices can be understood clearly.

The nominated  $R'_w$  rating is that required by a typical office background noise of NR35.

Table 2 indicates areas which require these privacy ratings.

**Table 2**  
**Typical Privacy Requirements**

Level	$R_w$	$D_{nT,w}$	Representative Space
Raised voice confidential privacy	$R_w$ 50	$D_{nT,w}$ 45	Bedrooms, lecture rooms
Normal voice Confidential privacy	$R_w$ 45	$D_{nT,w}$ 40	Private offices, Toilets, Gymnasium, Conference Room
Normal voice privacy	$R_w$ 40	$D_{nT,w}$ 35	General Office Areas
Poor privacy	$R_w$ 35	Less than $D_{nT,w}$ 30	Store rooms

Partitions should be selected to achieve the laboratory  $R_w$  detailed in Table 2. Site performance between areas must achieve an on-site performance,  $D_{nT,w}$ , detailed in Table 2. This must take into account all sound flanking paths. Due consideration must be given to ducting, ceiling construction, etc to ensure that sound flanking paths that the on-site performance is achieved.

### *Doors*

Doors have a lower  $R_w$  rating than the partitions in which they are installed. This will usually only affect privacy if listeners are close to the doors. As most doors lead to corridors or open spaces, any person listening will be conspicuous. In most areas, we consider that this will not be a problem. Partition constructions for walls containing doors must be based on the laboratory performance specified in Table 2.

Typically the on-site performance of a wall with a door should not derate the acoustic performance by more than 10 units. Special requirements for certain doors are as follows:

*Areas requiring special consideration are lecture rooms, conference, and bedrooms*

All doors to bedrooms opening to public areas or highly trafficked, corridors should be purpose-built acoustic doors with a rating of  $R_w$  40. This acoustic door rating can be reduced and a solid timber core door set fitted with acoustic door seals can be used if the space directly outside the door is acoustically isolated from the main work areas or corridors, via a sound-lock corridor.

For conference rooms and lecture rooms, special door treatment is required. These rooms should have solid timber doors which are fitted with acoustic door seals. If the space directly outside the door is acoustically isolated from the main work areas then door seals will not be required.

For other areas which require acoustic ratings, solid timber doors with felt brush seals should be provided. Grilles through doors are not acceptable.

Doors close to bedrooms should be fitted with door closers to reduce door slam noise.

## 4.0 ROOM ACOUSTICS

Consideration should be given to the installation of sound absorptive wall panels in the conference, lecture rooms and entry foyer and interview rooms to reduce excessive reverberation which can result in high noise levels which cause speech communication difficulties.

Compliance with reverberation times recommended in AS2107:2000 should be achieved.

## 5.0 OTHER NOISE CONTROL ISSUES

Traffic noise should be controlled to ensure that the internal noise level requirements are not exceeded. MFB stations close to major roads may require special window construction. Traffic noise levels should comply with the requirements of AS2107:2000.

Plant rooms should be located as far from bedrooms, lecture or conference rooms as possible.

Lifts should be located as far from bedrooms, conference or lecture rooms as possible. A separately supported partition system will be required around lift shafts if they services share common walls with noise-sensitive areas.

Cold water pipes, hot water pipes, waste pipes, down pipes or plumbing fittings should not be located above or adjacent bedrooms, conference or lecture rooms. In any case noise control treatment if necessary must be applied to limit noise from pipes etc to noise sensitive areas.



Noise emission in metropolitan Melbourne is regulated by the State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1). Air-cooled chillers, boilers and air-handling units and other plant must comply with these requirements.

Outside the metropolitan area noise emission should comply with EPA Publication N3/89 Interim Guidelines for Control of Noise from Industry in Country Victoria.

If bedrooms, conference or lecture rooms have metal deck roofs, then rain noise will be a problem unless adequate precautions are taken. Rain noise control must be considered during the design process.

# **METROPOLITAN FIRE AND EMERGENCY SERVICES BOARD**



## **VOLUME 4.8**

### **FIRE STATION**

# **ACCOMMODATION REQUIREMENTS & ROOM DATA SHEETS**

#### **REVISION HISTORY**

<b>Revision</b>	<b>Prepared By</b>	<b>Date Prepared</b>	<b>Issue</b>
B	StrataPNA Architects BRT Consulting	09/2010	Incorporating MFB comments and workshop/report recommendations
A	Tony Green Architects	09/2005 Revised 07/2008	-

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### 4.8.1 FIRE STATION ACCOMMODATION REQUIREMENTS

#### Accommodation Requirements Table

New Fire Station designs shall follow closely the accommodation requirements detailed below.

Compliance with this requirement will be assessed using the Room Data Sheets which shall be updated and submitted at each stage of the project delivery process. **\*Please note that these areas, whilst desirable, should be checked against Room Data Sheets for clarification**

Room data sheet No:	Fire Station	No: of Appliance Bays				
		2 Bay	3 Bay	4 Bay	5 Bay	6 Bay
	<b>Staff</b>					
	No of Fire Fighters per shift	4	8	12	16	20
	No of officers per shift	1	2	3	4	5
	Staff Facility Factor (no. of lockers)	6.0	5.0	5.3	5.0	5.2
	Area/Rooms	m <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>
1	Appliance Bays	187.20 18 x 10.40W	273.60 18 x 15.20W	360.00 18 x 20.00W	446.40 18 x 24.80W	532.80 18 x 29.60W
2	Entrance Lobby	6	9	12	12	12
3	Switchboard Cupboard / Switch Room	TBC	TBC	TBC	TBC	TBC
4	Station Office (includes future SO office of 10m <sup>2</sup> in 2 and 3 Bay stations)	24	24	24	24	34
5	SSO Office	Not Req'	Not Req'	20	24	24
6	Multi Purpose Room (* will vary if station is identified as 'hub' or specialist station)	Not Req'	20*	30*	40*	50*
7	Visitor Toilet (unisex disabled)	4.37	4.37	4.37	4.37	4.37
8	Male/Female Toilet Blocks module (6m <sup>2</sup> )	12	12	12	12	12
9	Equipment/Communications Room	8	8	10	10	12
10	SO Mess Room /Lounge	Not Req'	Not Req'	42	42	56
11	Fire Fighter's Mess (separate Meals-Kitchen)	25	54	63	84	105
12	Fire Fighter's Lounge (*Room acts as and is to be named Multi Purpose in 2 Bay Stations)	35	35	36	41	50
13	Break-Out Room	12	12	12	12	12
14	SSO Bedroom module (even numbers 10.8m <sup>2</sup> )	Not Req'	Not Req'	(2R) 21.6	(2R) 21.6	(2R) 21.6
15	SO Bedroom module (even numbers 10.8m <sup>2</sup> )	(2R) 21.6	(2R) 21.6	(2R) 21.6	(2R) 21.6	(4R) 43.2
16	Fire Fighter Bedroom module (even nos. 10.8m <sup>2</sup> )	(4R) 43.2	(8R) 86.4	(12R) 129.6	(16R) 179.2	(20R) 216
17	Shwr/basin en-suite bet. Two bedrooms (4.8m <sup>2</sup> )	(3R) 14.4	(5R) 24	(8R) 38.4	(10R) 48	(13R) 62.4
18	WC module associated with bedrooms (2.9m <sup>2</sup> )	(2R) 5.8	(3R) .7	(4R) 11.6	(5R) 14.5	(5R) 14.5
19	Personal Drying Room	3.5	4.5	7	10	14
20	General Stationery Store	3.6	3.6	3.6	3.6	3.6
21	Gymnasium/Weight Room (suggested room size)	42	51	51	(56)	(64)
22	PPE Change & Storage Area	32	46	80	96	132
23	PPE Drying Room	3	4.5	7	10	14
24	Dispatch Alcove	6	6	10	12	12
25	Cleaners Store	3	3	4	4	5
26	Spare PPE Storage	10	14	20	26	32
27	Station Store	10	10	12	14	16
28	BA (Breathing Apparatus)	10	10	12	14	16
29	Hose Bay / Linen Drop Off & Pick Up	10	10	12	14	16
30	Drill Equip/Gear/Bike Store/	12	18	25	25	25
	<b>External Requirements</b>					
	Staff Car Parks (1 bay+driveway=30m <sup>2</sup> )	10 (Parks)	14 (P)	20 (P)	25 (P)	30 (P)
	Visitor Car parks + DA (30m <sup>2</sup> + disable 36m <sup>2</sup> )	1(P) + 1DA	1 + 1DA	2 + 1DA	2 + 1DA	2 + 1DA
	Contractor Car parks (30m <sup>2</sup> )	1 (P)	1 (P)	2 (P)	2 (P)	2 (P)
	Fire Fighter Recreation / BBQ Area (30m <sup>2</sup> )	40	60	80	100	120
	Drill Yard (Desirable) *If identified as 'hub' station	(800)	(1200)	(1300)	(1400)*1500	(1500)
	Plant Room Area	TBC	TBC	TBC	TBC	TBC
	Other Agency's Requirements	TBC	TBC	TBC	TBC	TBC

#### **4.8.2 ROOM DATA SHEETS**

Room data sheets detailing areas and numerous other design details and requirements for the rooms shown below follow. The room data sheets provided in this document are "Design Brief" versions. The Design Team shall record any development or alteration to the sheets and report them to the Project Manager. The room data sheets provided are:

1. Appliance Bay
2. Entry lobby
3. Switchboard cupboard/Switch Room
4. SO Office/Station Office
5. SSO Office
6. Multi Purpose Room
7. Visitors toilet (unisex disability access)
8. Male/Female Toilet Blocks Module
9. Equipment/Communications Room
10. SO Mess Room/Lounge
11. Fire Fighter Mess Room (separated Meals-Kitchen)
12. Fire Fighter's Lounge (Room acts as and is to be named Multi Purpose Room in 1 Appliance Stations)
13. Break-out room
14. SSO Bedroom Module
15. SO Bedroom Module
16. Fire Fighter Bedrooms Module
17. Shower/Basin En-suite between Two Bedrooms
18. WC module associated with Bedrooms
19. Personal drying room
20. General stationary Store
21. Gymnasium/ weight room
22. PPE change & storage area
23. PPE drying room
24. Dispatch Alcove
25. Cleaner's store
26. Spare PPE storage
27. Station store
28. BA (breathing apparatus)
29. Hose Bay/Linen Drop Off & Pick Up
30. Drill Equipment/Gear/Bike Store

### 4.8.2.1 APPLIANCE BAY

Room Data Sheet No: 1  
Reference Plan No: 1

Floor Area	Desirable	Size	Min width(mm)	Min Length (mm)	Floor to ceiling			5.5M clear of any structure	
	2-bay	187.20m <sup>2</sup>	10400	18000					
	3-bay	273.60m <sup>2</sup>	15200	18000					
	4-bay	360.00m <sup>2</sup>	20000	18000					
	5-bay	446.40m <sup>2</sup>	24800	18000					
	6-bay	532.80m <sup>2</sup>	29600	18000					
Functions	<ul style="list-style-type: none"><li>Storage and Charging of Appliance Vehicles/Equipment</li><li>Carrying out Vehicle maintenance (tilt-up cabins)</li><li>Putting on or taking off gear</li><li>Muster Area – not defined as a separate area but usually part of the open area away from vehicles</li></ul>								
Relationship to other areas	<ul style="list-style-type: none"><li>Access to Appliance Bay from all areas of station via the PPE Change area &amp; Dispatch Alcove</li><li>Overlooked by Dispatch Alcove and Station/SO Office</li><li>Access to Utility and Equipment maintenance rooms/areas from Appliance Bay</li></ul>								
Special Room attributes	<ul style="list-style-type: none"><li>Dimensions in length are internal clear space dimensions from face or closed door to face of closed door and clear of any column or projections. In width, dimensions are the internal space clear of any column(s) or ribs between side walls</li><li>Drive through access from Drill Yard to street</li><li>Natural daylight through glass folding doors</li><li>Graded floor to doors 1:100 and localised fall under truck parking areas to floor wastes</li></ul>								
Door(s)	<ul style="list-style-type: none"><li>Refer to 'Lift up Glazed Doors' section of the manual for detailed req' on types and sizes</li><li>Clearance to underside of doors when in fully open position 4.5m</li></ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					N	N	N		
Glazing	Type	Window (Y/N)	N	Additional Information: Refer to 'Lift up Glazed Doors' section of the manual for detailed req' on types and sizes	External solar shading provided (Y/N)	Fixed	N		
		Skylight (Y/N)	N			Moveable (user operated)	N		
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N		
		Automated	N		Internal blackout blinds (Y/N)		N		
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)		N		
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		Y		
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance		Finish		
	Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes			At least 15%		N/A		
	Walls	Face finished masonry preferred – prefinished insulated sandwich panel OK			At least 50%		Semi gloss		
	Ceilings	Insulated metal roofing with no ceiling lining			At least 70%		Semi gloss / Nil finish		
Services	Ventilation	Clean or Transition area (C/T)		T					
		Relative Pressure		Negative (to outside and adjacent spaces)					
		Exhaust		Mechanical Extract system sound isolated and 3000l/s per vehicle					
		Makeup Air		Via door					
		Outside Air		N/A					
		Controls		BMS interlocked with doors to provide vehicle exhaust fumes extraction					
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls				
		160	T5 Suspended		Daylight linked photo electric cell				
	Power	Power – to detailed requirements (all GPO's to be weatherproof)/drop down GPO on rollers from ceiling via Catenary wires (1 per Bay).							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold/Rain Water		N					
		Dom. Hot/Tepid Water		N					
	Fire	Sprinkler	Y	Extinguisher	Y	Blanket	N	Detection	Y
Furniture/ Equipment	<ul style="list-style-type: none"><li>Document box</li><li>Wash trough</li><li>600mm W x 2000mm L x 900mm H bench along wall to PPE area</li><li>Refer to appendix of schedules</li></ul>								

#### 4.8.2.2 ENTRY LOBBY

Room Data Sheet No: 2  
Reference Plan No: 2

Floor Area	Desirable size		Min width		Min Length	Floor to ceiling			
	2-bay	6m²	2000		-	2700			
	3-bay	9m²	3000		-				
	4, 5 & 6 -bay	12m²	3000		-				
Functions	<ul style="list-style-type: none"><li>Public reception area</li><li>Space for charitable collections / drop off eg Christmas toy campaign</li><li>Contain cupboards for FH Reel and electrical switchboard</li></ul>								
Relationship to other areas	<ul style="list-style-type: none"><li>Public access zone. May be accessed out of hours for community use of 'Multi Purpose Room'.</li><li>Overlooked by Turnout Alcove and SO Office</li><li>Must be clearly visible from the street</li></ul>								
Special Room attributes	<ul style="list-style-type: none"><li>Provide external canopy to provide weather protection to doorway and eliminates summer sun penetration</li><li>Air lock foyer</li></ul>								
Door(s)	<ul style="list-style-type: none"><li>Glazed door to Entrance. 1050 wide (lockable - complete with dust seals)</li><li>Glazed doors to station proper (lockable)</li><li>Closers fitted to all doors</li></ul>					Ventilation relief air provided via			
							Door undercut (mm)	Door transfer grille (free area m²)	Acoustic transfer grille
							N	N	N
Glazing	Type	Window (Y/N)	Y	Additional Information:	External solar shading provided (Y/N)	Fixed		Y	
		Skylight (Y/N)	N			Moveable (user operated)		N	
	Internal blinds (Y/N)	User operated	N			Moveable (auto)		N	
		Automated	N						
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)		N		
					Openable windows (Y/N)		N		
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		N		
		"U" value (W/m² K)							
	"U" value (W/m² K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)					Reflectance		Finish	
	Floor	Non slip ceramic floor tiles and skirt				At least 15%		N/A	
	Walls	Painted plasterboard				At least 50%		Semi gloss	
	Ceilings	Mineral fibre tiles or plasterboard with paint finish				At least 70%		Nil/Satin	
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			N/A				
		Exhaust			N/A				
		Makeup Air			N/A				
		Outside Air			N/A				
		Controls			N/A				
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls				
		160	T5 Fittings		Movement Sensor with daylight sensing				
	Power	Single GPO							
	Hydraulic	Chilled Water fountain			N				
		Dom. Cold/Rain Water			N				
		Dom. Hot/Tepid Water			N				
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
	Furniture/ Equipment	<ul style="list-style-type: none"><li>Letter Box required, Position to Aust. Post regulations</li><li>Externally mounted emergency phone located prominently out front to contact MFB central control</li><li>Refer to appendix of schedules</li></ul>							

#### 4.8.2.3 SWITCHBOARD CUPBOARD / SWITCH ROOM

Room Data Sheet No: 3

Floor Area	Desirable		Size		Min width	Min length	Floor to ceiling			
	2 & 3 - bay		Cupboard		Refer to Electrical Services Brief					
	4, 5 & 6 - bay		Room		Refer to Electrical Services Brief					
Functions	<ul style="list-style-type: none"> <li>Constructed to house free standing switchboard</li> <li>Refer to Electrical Services Brief</li> </ul>									
Relationship to other areas	<ul style="list-style-type: none"> <li>Located within Entry Lobby</li> </ul>									
Special Room attributes	<ul style="list-style-type: none"> <li>Cupboard to be dust and vermin proof</li> </ul>									
Door(s)	<ul style="list-style-type: none"> <li>Solid core, lockable, complete with air relief grille</li> </ul>					Ventilation relief air provided via				
							Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
							N	Y	N	
Glazing	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed		N/A		
		Skylight (Y/N)	N			Moveable (user operated)		N/A		
	Internal blinds (Y/N)	User operated	N/A			Moveable (auto)		N/A		
		Automated	N/A							
	Glass specification thickness (mm)	N/A			Internal blackout blinds (Y/N)		N/A			
					Openable windows (Y/N)		N			
	Shading co-efficient	N/A			Mechanical ventilation provided (Y/N)		N			
	"U" value (W/m <sup>2</sup> K)	N/A								
Finishes	Type (to be read in conjunction with appendix of schedules)					Reflectance		Finish		
	Floor	Rubber mat								
	Walls	N/A								
	Ceilings	N/A								
Services	Ventilation	Clean or Transition area (C/T)			C					
		Relative Pressure			N/A					
		Exhaust			N/A					
		Makeup Air			N/A					
		Outside Air			N/A					
		Controls			N/A					
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A			
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A			
	Lighting	Lux	Fitting Type		Controls					
		160	T5 Fittings		Local door micro switch					
	Power	Refer to Electrical Services Brief								
	Hydraulic	Chilled Water fountain			N					
		Dom. Cold/Rain Water			N					
		Dom. Hot/Tepid Water			N					
	Fire	Sprinkler	N	Extinguisher	N	Blanket	N	Detection	Y	
	Furniture/ Equipment	<ul style="list-style-type: none"> <li>Nil</li> </ul>								



#### 4.8.2.4 SO OFFICE / STATION OFFICE

Room Data Sheet No: 4  
Reference Plan No: 4

Floor Area	Desirable		Size		Min width		Min length		Floor to ceiling			
	2-5 Bay		24m²		4000		-					
	6 Bay		34m²		5000		-		2700 min			
Functions	<ul style="list-style-type: none"><li>centre for station administration</li><li>area for meeting with one other person and additional area for fire fighter to work in</li></ul>											
Relationship to other areas	<ul style="list-style-type: none"><li>located between and overlooking Appliance Bay and Entry Lobby and Public Entry</li></ul>											
Special Room attributes	<ul style="list-style-type: none"><li>Total floor area includes provision for future separate SO Office of 10m² in 2 &amp; 3 Bay stations</li></ul>											
Door(s)	<ul style="list-style-type: none"><li>1000 wide, glazed door to Entry Lobby with door closer to comply with DDA req'</li></ul>					Ventilation relief air provided via						
							Door undercut (mm)	Door transfer grille (free area m²)	Acoustic transfer grille			
							Y	N	N			
Glazing	Type	Window (Y/N)	Y	Additional Information: - window to external wall to be shaded externally from summer sun - external window to be fitted with close fitting blind or venetian - fixed window to Entry Lobby - fixed window to Appliance Bay	External solar shading provided (Y/N)	Fixed		Y				
		Skylight (Y/N)	N			Moveable (user operated)						
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)		N				
		Automated	N									
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)		Y					
					Openable windows (Y/N)		Y					
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		Y					
	"U" value (W/m² K)	TBC at design phase										
	Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance		Finish				
		Floor	Recyclable carpet tiles 6mm thickness				At least 15%		N/A			
Walls		Painted plasterboard				At least 50%		Semi gloss				
Ceilings		Mineral fibre tiles or plasterboard with paint finish				At least 70%		Nil/satin				
Services	Ventilation	Clean or Transition area (C/T)			C							
		Relative Pressure			Positive/Neutral							
		Exhaust			No							
		Makeup Air			N/A							
		Outside Air			Yes via operable windows or mechanical ventilation							
		Controls			Via occupancy and BMS Controlled							
	Heating	Provided	Y	Set point °C	21	Setback temp °C	TBC					
	Cooling	Provided	Y	Set point °C	21	Setback temp °C	TBC					
	Lighting	Lux		Fitting Type		Controls						
		320 @ Desk		T5 Fittings		Movement and Sound Sensor						
	Power	<ul style="list-style-type: none"><li>General power – 3 No double GPO's</li><li>Data/LAN points – 2 No (adjacent to desk location)</li><li>Moduline ducts to walls</li><li>Phone points</li></ul>										
	Hydraulic	Chilled Water fountain			N							
		Dom. Cold/Rain Water			N							
		Dom. Hot/Tepid Water			N							
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y			
Furniture/ Equipment	<ul style="list-style-type: none"><li>Ergonomic desk and drawer pedestal per officer and 1 desk without return</li><li>Shelving</li><li>Stationary cupboard</li><li>Pinboard</li><li>Whiteboard</li><li>Filing cabinets</li><li>Hat and coat hooks</li><li>Personal computer equipment</li><li>Refer to appendix of schedules</li></ul>											

#### 4.8.2.5 SSO OFFICE

Room Data Sheet No: 5

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling					
	4 - bay	20m <sup>2</sup>	4000	-						
	5 & 6 - bay	24m <sup>2</sup>	4000	-	2700 min					
Functions	<ul style="list-style-type: none"> <li>Administration</li> <li>Area for meeting with one or two other people</li> </ul>									
Relationship to other areas	<ul style="list-style-type: none"> <li>Immediately adjacent to SO Office, preferably accessible from Entry Lobby or close to Entry Lobby</li> </ul>									
Special Room attributes	<ul style="list-style-type: none"> <li>Window between SSO and SO Office if possible</li> </ul>									
Door(s)	<ul style="list-style-type: none"> <li>1000 wide, solid core door with door closer</li> </ul>			Ventilation relief air provided via						
				Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille				
				Y	N	N				
Glazing	Type	Window (Y/N)	Y	Additional Information: - window to external wall to be shaded externally from summer sun - external window to be fitted with close fitting blind or venetian	External solar shading provided (Y/N)	Fixed	Y			
		Skylight (Y/N)	N			Moveable (user operated)				
						Moveable (auto)	N			
	Internal blinds (Y/N)	User operated	Y		Internal blackout blinds (Y/N)		Y			
		Automated	N		Openable windows (Y/N)		Y			
	Glass specification thickness (mm)	TBC at design phase			Mechanical ventilation provided (Y/N)		Y			
	Shading co-efficient	UV Filter								
	"U" value (W/m <sup>2</sup> K)	TBC at design phase								
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish				
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%	N/A				
	Walls	Painted plasterboard			At least 50%	Semi gloss				
	Ceilings	Mineral fibre tiles or plasterboard with paint finish			At least 70%	satin				
Services	Ventilation	Clean or Transition area (C/T)		C						
		Relative Pressure		Positive/Neutral						
		Exhaust		No						
		Makeup Air		N/A						
		Outside Air		Yes via operable windows or mechanical ventilation						
		Controls		Via occupancy and BMS Controlled						
	Heating	Provided	Y	Set point °C	21	Setback temp °C	TBC			
	Cooling	Provided	Y	Set point °C	21	Setback temp °C	TBC			
	Lighting	Lux	Fitting Type		Controls					
		320 @ Desk	T5 Fittings		Movement and Sound Sensor					
	Power	<ul style="list-style-type: none"> <li>General power – 2 No double GPO's</li> <li>Data/LAN points – 2 No (adjacent to desk location)</li> <li>Moduline ducts to walls</li> <li>Phone points</li> </ul>								
	Hydraulic	Chilled Water fountain		N						
		Dom. Cold/Rain Water		N						
		Dom. Hot/Tepid Water		N						
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N			
					Detection	Y				
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Ergonomic Desk and drawer pedestal per Officer</li> <li>Shelving</li> <li>Pinboard</li> <li>Whiteboard</li> <li>Filing cabinets</li> <li>Hat and coat hooks</li> <li>Personal computer equipment</li> <li>Refer to appendix of schedules</li> </ul>									

#### 4.8.2.6 MULTI PURPOSE ROOM

Room Data Sheet No: 6

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling			
	3 Bay	20m <sup>2</sup>	4000	-	2700 min			
	4 Bay	30m <sup>2</sup>	5000	-				
	5 bay	40m <sup>2</sup>	6000	-				
	6 Bay	50m <sup>2</sup>	7000	-				
Functions	<ul style="list-style-type: none"> <li>Public lectures and meetings</li> <li>Fire fighter drill lectures</li> <li>Recreation (eg table tennis)</li> <li>Private study</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Accessible from Entry Lobby</li> <li>Accessible to the public</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li>Acoustic insulation to walls and ceilings</li> <li>Room size will vary if station is identified as 'Hub' or specialist station</li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Solid core fitted with door closer</li> <li>Min width 1000 with viewing panel</li> </ul>				Ventilation relief air provided via			
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
					N	N	N	
Glazing	Type	Window (Y/N)	Y	Additional Information: - operable sash window to external wall, double glazed and fitted with close fitting blinds or venetians - window to be shaded externally from summer sun	External solar shading provided (Y/N)	Fixed	Y	
		Skylight (Y/N)	N			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)	N	
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)		Y	
	Shading co-efficient	UV Filter			Openable windows (Y/N)		Y	
	"U" value (W/m <sup>2</sup> K)	TBC at design phase			Mechanical ventilation provided (Y/N)		N	
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%	N/A		
	Walls	Painted plasterboard			At least 50%	Semi gloss		
	Ceilings	Mineral fibre tiles or plasterboard with paint finish			At least 70%	Nil		
Services	Ventilation	Clean or Transition area (C/T)			C			
		Relative Pressure			Positive/Neutral			
		Exhaust			No			
		Makeup Air			N/A			
		Outside Air			Yes via operable windows or mechanical ventilation			
		Controls			Via occupancy and BMS Controlled			
	Heating	Provided	Y	Set point °C	21	Setback temp °C	TBC	
	Cooling	Provided	Y	Set point °C	21	Setback temp °C	TBC	
	Lighting	Lux	Fitting Type		Controls			
		240 @ Desk	T5 Fittings		Dimmable lighting across at least 2 circuits (controlled away from presentation wall)			
	Power	<ul style="list-style-type: none"> <li>General power – provide 6 No double GPO's</li> <li>Data/LAN points – 4 No (adjacent to desk location)</li> <li>Moduline duct to walls</li> <li>TV point / Phone point</li> </ul>						
	Hydraulic	Chilled Water fountain		N	Sink with mixer tap and boiling water unit ('Billi' or 'Zip' type)			
		Dom. Cold/Rain Water		Y				
Dom. Hot/Tepid Water		Y						
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Lecture chairs</li> <li>Table</li> <li>Pin board</li> <li>Whiteboard</li> <li>Lockable TV, video cabinet with storage for AV equipment and teaching aids</li> <li>600 wide bench to one wall @ 720 height with sink and tiled splashback</li> <li>Hat and coat hooks</li> <li>Roll paper towel dispenser.</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.7 VISITORS TOILET (UNISEX DISABILITY ACCESS)

Room Data Sheet No: 7

Floor Area	Size		Min width	Min length	Floor to ceiling			
	4.37m <sup>2</sup>		To meet Building Code compliance					
Functions	<ul style="list-style-type: none"> <li>Unisex toilet facility for public, disabled access/use</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Accessible from Entry Lobby</li> <li>Accessible to the public</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li>Sized and equipped to meet building regulations and Disability Discrimination Act and Australian Standards - AS 1428</li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Solid core, privacy latch</li> </ul>				Ventilation relief air provided via			
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
					N	Y	N	
Glazing	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N	
		Skylight (Y/N)	Y			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	N		Moveable (auto)	N		
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)		N	
					Openable windows (Y/N)		N	
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		N	
"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	Non slip ceramic floor tiles and skirt				N/A		
	Walls	Anti mould water resistant plasterboard				N/A		
	Ceilings	Anti mould water resistant plasterboard				Satin		
Services	Ventilation	Clean or Transition area (C/T)			C			
		Relative Pressure			Negative			
		Exhaust			Yes to AS1668			
		Makeup Air			Via door grille			
		Outside Air			No			
		Controls			Via occupancy and BMS Controlled			
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		80	T5 Fittings Heat Lamps		Movement and Sound Sensor Pushbutton timer for heat lamps			
	Power	<ul style="list-style-type: none"> <li>General power – 1 single GPO</li> </ul>						
	Hydraulic	Chilled Water fountain		N	Fitted with shower, water saving shower rose, shower screen and hinged door. WC (low water use) and hand wash basin Floor waste gully			
Dom. Cold/Rain Water		Y						
Dom. Hot/Tepid Water		Y						
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Stainless steel prescribed handrails</li> <li>Roll paper towel dispenser</li> <li>Toilet roll holder</li> <li>Hat and coat hooks</li> <li>Toilet suite approved for disability access</li> <li>Nappy change station.</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.8 MALE / FEMALE TOILET BLOCKS MODULE

Room Data Sheet No: 8

Floor Area	Size	Min width	Min length	Floor to ceiling				
	12m <sup>2</sup>	To meet Building Code compliance						
Functions	<ul style="list-style-type: none"> <li>Toilet facility for Staff and public</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Accessible from Entry Lobby</li> <li>Accessible by general corridor area</li> </ul>							
Special Room attributes								
Door(s)	<ul style="list-style-type: none"> <li>Solid core, privacy latch</li> </ul>				Ventilation relief air provided via			
						Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille
					N	Y	N	
Glazing	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N	
		Skylight (Y/N)	Y			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N	
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)		N	
					Openable windows (Y/N)		N	
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		N	
	"U" value (W/m <sup>2</sup> K)	TBC at design phase						
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	Non slip ceramic floor tiles and skirt				N/A		
	Walls	Anti mould water resistant plasterboard				N/A		
	Ceilings	Anti mould water resistant plasterboard				Satin		
Services	Ventilation	Clean or Transition area (C/T)			C			
		Relative Pressure			Negative			
		Exhaust			Yes to AS1668			
		Makeup Air			Via door grille			
		Outside Air			No			
		Controls			Via occupancy and BMS Controlled			
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		80	T5 Fittings Heat Lamps		Movement and Sound Sensor Pushbutton timer for heat lamps			
	Power	<ul style="list-style-type: none"> <li>General power – 1 single GPO</li> </ul>						
	Hydraulic	Chilled Water fountain		N	Fitted with shower, water saving shower rose, shower screen and hinged door. WC (low water use) and hand wash basin Floor waste gully			
		Dom. Cold/Rain Water		Y				
		Dom. Hot/Tepid Water		Y				
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Roll paper towel dispenser</li> <li>Toilet roll holder</li> <li>Hat and coat hooks</li> <li>Mirror</li> <li>Soap dispenser</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.9 EQUIPMENT / COMMUNICATIONS ROOM

Room Data Sheet No: 9

Floor Area	Desirable		Size	Min width	Min length	Floor to ceiling			
	2 & 3 - bay		8m <sup>2</sup>	2000	-	2700			
	4 & 5 - bay		10m <sup>2</sup>	2500	-				
	6 - bay		12m <sup>2</sup>	3000	-				
Functions	<ul style="list-style-type: none"> <li>Used for storage of UPS</li> <li>Used for storage of communications equipment cabinets</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Adjacent to Dispatch alcove</li> <li>Adjacent to SO Office</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Access via cable trays to Dispatch alcove</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>Solid core door 920 wide with closer, lockable (may be sliding door)</li> <li>Air relief grille from corridor</li> </ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					TBC @ DP	TB C @ DP	N		
Glazing	Type	Window (y/n)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N/A		
		Skylight (y/n)	N			Moveable (user operated)	N/A		
	Internal blinds (Y/N)	User operated	N/A			Moveable (auto)	N/A		
		Automated	N						
	Glass specification thickness (mm)	N/A			Internal blackout blinds (Y/N)	N/A			
					Openable windows (Y/N)	N			
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)	N			
	"U" value (W/m <sup>2</sup> K)	N/A							
	Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
		Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes				N/A		
Walls		Painted plasterboard				Gloss			
Ceilings		N/A				satin			
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			Neutral				
		Exhaust			No				
		Makeup Air			No				
		Outside Air			No				
		Controls			No				
	Heating	Provided	Y	Set point °C	18	Setback temp °C	N/A		
	Cooling	Provided	Y	Set point °C	21	Setback temp °C	N/A	24/7 operation	
	Lighting	Lux	Fitting Type		Controls				
		Min 350 @ desk	T5 Fittings		Movement and Sound Sensor				
	Power	<ul style="list-style-type: none"> <li>General power – 3 No double GPO's</li> <li>Data/LAN points – 2 No</li> </ul>							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold/Rain Water		N					
Dom. Hot/Tepid Water		N							
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection Y		
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Shelf bench</li> <li>Com-net security cabinet</li> <li>Distribution board</li> <li>Communications hub</li> <li>UPS</li> <li>Security cabinet</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.10 SO MESS ROOM / LOUNGE

Room Data Sheet No: 10

Floor Area	Desirable		Size	Min width	Min length	Floor to ceiling			
	4 - bay		42m <sup>2</sup>	5500	-	2700 min			
	5 - bay		42m <sup>2</sup>	5500	-				
	6 - bay		56m <sup>2</sup>	6000	-				
Functions	<ul style="list-style-type: none"> <li>Meals and retreat for officers</li> <li>Some paperwork</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Located near Officer bedrooms</li> <li>Preferably with access onto BBQ courtyard wherever possible</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Not provided within 2-Bay and 3-Bay (1 Officer) stations</li> <li>Attractive outlook, natural daylight and natural ventilation required</li> <li>Acoustic insulation to walls and ceilings</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>Solid core door with door closer</li> <li>Glazed external door, if access to BBQ are provided</li> </ul>					Ventilation relief air provided via			
						Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
						Y	N	N	
Glazing	Type	Window (Y/N)	Y	Additional Information: - window with openable sash to external wall fitted with blind or venetians - window to be shaded externally from summer sun - double glazing preferred	External solar shading provided (Y/N)	Fixed	Y		
		Skylight (Y/N)	Y			Moveable (user operated)	N		
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)	N		
		Automated	N						
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)	Y			
		UV Filter			Openable windows (Y/N)	Y			
	Shading co-efficient				Mechanical ventilation provided (Y/N)	Y			
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish			
	Floor	Flotex carpet, 6mm thickness / Non slip ceramic floor tiles and skirt				At least 15%	N/A		
	Walls	Painted plasterboard				At least 50%	Semi gloss		
	Ceilings	Mineral fibre tiles/plasterboard, paint finish				At least 70%	Satin/Gloss		
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			Negative				
		Exhaust			Yes Kitchen Exhaust				
		Makeup Air			Adjacent Spaces				
		Outside Air			Yes via operable windows or mechanical ventilation				
		Controls			Occupancy and BMS (supply)				
	Heating	Provided	Y	Set point °C	21	Setback temp °C	18		
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26		
	Lighting	Lux	Fitting Type		Controls				
		160 (240 counters)	T5 Fittings		Daylight dimming. A 2 <sup>nd</sup> "relaxation" layer separately switched/dimmed				
	Power	<ul style="list-style-type: none"> <li>Power to kitchen appliances and range hood, plus 4 No double GPO's</li> <li>TV aerial point (where Mess &amp; Lounge are combined)</li> </ul>							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold		Y					
		Dom. Hot/Tepid Water		Y					
Fire	Sprinkler	Y	Extinguisher	Y	Blanket	Y	Detection	Y	
Furniture/Equipment	<ul style="list-style-type: none"> <li>Kitchen cupboards with open bench to lounge (where combined) and eating area, Table and chairs, Whiteboard, Pin board, Equip with stove, griddle, microwave, boiling water unit, ducted range hood, double bowl sink, Refrigerator, under bench recycling bins, lockable food lockers, bag rack, Lounge chairs, TV and lockable TV video cabinet (where combined), Roll paper towel dispenser, Hat and coat hook – 1 per fire fighter</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.11 FIRE FIGHTERS MESS ROOM

Room Data Sheet No: 11  
Reference Plans No: 11

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling					
	2 - bay	25m <sup>2</sup>	5000	-	2700 min					
	3 - bay	54m <sup>2</sup>	6000	-						
	4 – bay	63m <sup>2</sup>	7000	-						
	5 - bay	84m <sup>2</sup>	8000	-						
	6 - bay	105m <sup>2</sup>	8000	-						
Functions	<ul style="list-style-type: none"><li>2 &amp; 3 Bay Mess is shared with Officers'</li><li>Cooking and eating</li></ul>									
Relationship to other areas	<ul style="list-style-type: none"><li>Near bedrooms but acoustic separation must be maintained</li><li>Preferably with access onto BBQ/courtyard area wherever possible</li></ul>									
Special Room attributes	<ul style="list-style-type: none"><li>Attractive outlook, natural daylight and natural ventilation required</li><li>Acoustic insulation to walls and ceilings</li></ul>									
Door(s)	<ul style="list-style-type: none"><li>Solid core internal door, fitted with door closer</li><li>Glazed external door to BBQ area provided</li></ul>				Ventilation relief air provided via					
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille			
					N	N	N			
Glazing	Type	Window (Y/N)	Y	Additional Information: - window with openable sash to external wall fitted with blind or venetians - window to be shaded externally from summer sun - double glazing preferred	External solar shading provided (Y/N)	Fixed	Y			
		Skylight (Y/N)	N			Moveable (user operated)	N			
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)	N			
		Automated	N		Internal blackout blinds (Y/N)		Y			
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)		Y			
		Shading co-efficient	UV Filter		Mechanical ventilation provided (Y/N)		N			
	"U" value (W/m <sup>2</sup> K)		TBC at design phase							
	Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance		Finish		
		Floor	Non slip ceramic floor tiles and skirt			At least 15%		N/A		
Walls		Anti mould water resistant plasterboard			At least 50%		Semi gloss			
Ceilings		Anti mould water resistant plasterboard			At least 70%		Semi gloss			
Services	Ventilation	Clean or Transition area (C/T)			C					
		Relative Pressure			Negative					
		Exhaust			Yes Kitchen Exhaust					
		Makeup Air			Adjacent Spaces					
		Outside Air			Yes via operable windows or mechanical ventilation					
		Controls			Occupancy and BMS (supply)					
	Heating	Provided	Y	Set point °C	21	Setback temp °C	18			
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26			
	Lighting	Lux	Fitting Type		Controls					
		160 (240 counters)	T5 Fittings		Daylight dimming. A 2 <sup>nd</sup> "relaxation" layer separately switched/dimmed					
	Power	<ul style="list-style-type: none"><li>Power to kitchen appliances and range hood, plus 4 No double GPO's</li><li>TV aerial point (where Mess &amp; Lounge are combined)</li></ul>								
	Hydraulic	Chilled Water fountain		N						
		Dom. Cold		Y						
		Dom. Hot/Tepid Water		Y						
	Fire	Sprinkler	Y	Extinguisher	Y	Blanket	Y	Detection	Y	
Furniture/ Equipment	<ul style="list-style-type: none"><li>Lounge chairs, table and chairs, kitchen cupboards with open bench to Lounge and Eating area (where combined), TV, TV/Video cabinet, lockable, Whiteboard, Pin board, Hat and coat hooks – 1 per fire fighter, Equip with stove, griddle, microwave, boiling water unit, ducted range hood, double bowl sink, refrigerator, under-bench recycling bins, lockable food pantries for each shift, bag rack (personnel gear store)</li><li>Refer to appendix of schedules</li></ul>									



#### 4.8.2.12 FIRE FIGHTERS LOUNGE

Room Data Sheet No: 12

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling				
	2 & 3 bay	35m <sup>2</sup>	5000	-	2700 min				
	4 bay	36m <sup>2</sup>	6000	-					
	5 Bay	41m <sup>2</sup>	6000	-					
	6 bay	50m <sup>2</sup>	6500	-					
Functions	<ul style="list-style-type: none"> <li>Tv watching</li> <li>General living room</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Beside Mess (usually opening into Mess)</li> <li>Near bedrooms but acoustic separation must be maintained</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Attractive outlook, natural daylight and natural ventilation required</li> <li>Acoustic insulation to walls and ceiling</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>Solid core internal door, fitted with door closer</li> <li>Glazed external door to BBQ area provided</li> </ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					N	N	N		
Glazing	Type	Window (Y/N)	Y	Additional Information: - window with openable sash to external wall, fitted with close fitting blind or venetians - double glazing preferred - window to be shaded externally from summer sun penetration	External solar shading provided (Y/N)	Fixed	Y		
		Skylight (Y/N)	N			Moveable (user operated)	N		
						Moveable (auto)	N		
	Internal blinds (Y/N)	User operated	Y		Internal blackout blinds (Y/N)		Y		
		Automated	N		Openable windows (Y/N)		Y		
	Glass specification thickness (mm)	TBC at design phase			Mechanical ventilation provided (Y/N)		N		
	Shading co-efficient	UV Filter							
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance		Finish		
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%		N/A		
	Walls	Painted plasterboard			At least 50%		Semi gloss		
	Ceilings	Mineral fibre tiles/plasterboard, paint finish			At least 70%		Nil		
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			Neutral/Positive				
		Exhaust			No				
		Makeup Air			No				
		Outside Air			Yes via operable windows or mechanical ventilation				
		Controls			Provide independently controlled air conditioning for "on demand" operation. Occupancy and BMS				
	Heating	Provided	Y	Set point °C	21	Setback temp °C	18		
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26		
	Lighting	Lux	Fitting Type		Controls				
		160	T5 Fittings		Daylight dimming. A 2 <sup>nd</sup> "relaxation" layer separately switched/dimmed				
	Power	<ul style="list-style-type: none"> <li>Power – 3 No double GPO's</li> </ul>							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold		N					
		Dom. Hot/Tepid Water		N					
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Lounge chairs</li> <li>TV</li> <li>TV/ video cabinet, lockable</li> <li>Whiteboard</li> <li>Pinboard</li> <li>Hat and coat hooks – 1 per fire fighter</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.13 BREAK OUT ROOM

Room Data Sheet No: 13

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling			
	2 – 6 bay inclusive	12M <sup>2</sup>	3000	-	2700 min			
Functions	<ul style="list-style-type: none"> <li>For quiet contemplation time, counselling or study</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Adjacent to fire fighter bedrooms</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li>Acoustic separation must be maintained</li> <li>Provide natural daylight and attractive outlook</li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Solid core fitted with door closer</li> </ul>			Ventilation relief air provided via				
				Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
				N	Y	N		
Glazing	Type	Window (Y/N)	Y	Additional Information: - window with openable sash to external wall, fitted with close fitting blind or venetians - double glazing preferred - window to be shaded externally from summer sun penetration	External solar shading provided (Y/N)	Fixed	Y	
		Skylight (Y/N)	N				Moveable (user operated)	N
	Internal blinds (Y/N)	User operated	Y				Moveable (auto)	N
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase				Internal blackout blinds (Y/N)		Y
	Shading co-efficient	UV Filter				Openable windows (Y/N)		Y
	"U" value (W/m <sup>2</sup> K)	TBC at design phase			Mechanical ventilation provided (Y/N)		N	
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%	N/A		
	Walls	Painted plasterboard			At least 50%	Semi gloss		
	Ceilings	Painted plasterboard			At least 70%	Nil/satin		
Services	Ventilation	Clean or Transition area (C/T)		C				
		Relative Pressure		Neutral/Positive				
		Exhaust		No				
		Makeup Air		No				
		Outside Air		Yes via operable windows or mechanical ventilation				
		Controls		Provide independently controlled air conditioning for "on demand" operation. Occupancy & BMS				
	Heating	Provided	Y	Set point °C	21	Setback temp °C	18	
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26	
	Lighting	Lux	Fitting Type		Controls			
		240	T5 Fittings		Dual mode switching. Consider direct and indirect lighting with separate switch controls for each			
	Power	<ul style="list-style-type: none"> <li>General power – 1 single GPO</li> </ul>						
	Hydraulic	Chilled Water fountain	N					
		Dom. Cold	N					
		Dom. Hot/Tepid Water	N					
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	
					Detection	Y		
Furniture/Equipment	<ul style="list-style-type: none"> <li>2 No 2 seater couches or 4 No lounge chairs</li> <li>1 No coffee table</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.14 SSO BEDROOM MODULE

Room Data Sheet No: 14  
Reference Plan No: 14,15,16

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling								
	4 - 6 bay inclusive	10.8m <sup>2</sup>	2700	-	2700 min								
Functions	<ul style="list-style-type: none"> <li>Sleeping</li> <li>Changing</li> <li>Private study</li> <li>Some paperwork or taking telephone calls</li> </ul>												
Relationship to other areas	<ul style="list-style-type: none"> <li>Near Officer Mess (if provided)</li> <li>Adjoining private en-suite (shower/basin) shared between two rooms</li> </ul>												
Special Room attributes	<ul style="list-style-type: none"> <li>Acoustic separation from other rooms and external noise generators (eg traffic)</li> <li>Openable windows to external wall – double glazed for noise privacy and thermal insulation as required</li> </ul>												
Door(s)	<ul style="list-style-type: none"> <li>Solid core 820 wide, can open in to single bedroom, fitted with acoustic seals</li> <li>Sliding doors not acceptable</li> </ul>				Ventilation relief air provided via <table border="1"> <tr> <td></td><td>Door undercut (mm)</td><td>Door transfer grille (free area m<sup>2</sup>)</td><td>Acoustic transfer grille</td></tr> <tr> <td></td><td>N</td><td>N</td><td>N</td></tr> </table>		Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		N	N	N
	Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille										
	N	N	N										
Glazing	Type	Window (Y/N)	Y	Additional Information: - Openable sash window, double glazed fitted with close fitting heavy duty blind or venetians - window to be shaded externally from summer sun penetration	External solar shading provided (Y/N)	Fixed	Y						
		Skylight (Y/N)	N				Moveable (user operated)	N					
	Internal blinds (Y/N)	User operated	Y				Moveable (auto)	N					
		Automated	N										
	Glass specification thickness (mm)	TBC at design phase				Internal blackout blinds (Y/N)		Y					
	Shading co-efficient	UV Filter				Openable windows (Y/N)		Y					
	"U" value (W/m <sup>2</sup> K)	TBC at design phase			Mechanical ventilation provided (Y/N)		N						
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish							
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%	N/A							
	Walls	Painted plasterboard			At least 50%	Semi gloss							
	Ceilings	Painted plasterboard			At least 70%	Satin							
Services	Ventilation	Clean or Transition area (C/T)			C								
		Relative Pressure			Neutral/Negative								
		Exhaust			Yes to cupboards								
		Makeup Air			No								
		Outside Air			Yes via operable windows or mechanical ventilation								
		Controls			Provide independently controlled air conditioning for "on demand" operation. Occupancy & BMS								
	Heating	Provided	Y	Set point °C	21	Setback temp °C	17	Individual Ducted Units					
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26						
	Lighting	Lux	Fitting Type		Controls								
		240 during study mode	T5 Fittings		Separately switch ceiling vs task/bedside lighting. Possible occupancy sensor								
	Power	<ul style="list-style-type: none"> <li>General power – 2 double GPO's</li> <li>Phone point (TBC)</li> <li>Data/LAN point (adjacent to desk location)</li> </ul>											
	Hydraulic	Chilled Water fountain	N										
		Dom. Cold	N										
		Dom. Hot/Tepid Water	N										
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y				
Furniture/Equipment	<ul style="list-style-type: none"> <li>Single bed</li> <li>Desk</li> <li>Chair</li> <li>2 coat hooks</li> <li>Built in lockers</li> <li>Refer to appendix of schedules</li> </ul>												

#### 4.8.2.15 SO BEDROOM MODULE

Room Data Sheet No: **15**  
Reference Plan No: **14,15,16**

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling				
	2 – 6 bay inclusive	10.8m <sup>2</sup>	2700	-	2700 min				
Functions	<ul style="list-style-type: none"> <li>Sleeping</li> <li>Changing</li> <li>Private study</li> <li>Some paperwork or taking telephone calls</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Near Officer Mess (if provided)</li> <li>Adjoining private en-suite (shower/basin) shared between two rooms</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Acoustic separation from other rooms and external noise generators (eg traffic)</li> <li>Operable windows to external wall – double glazed for noise privacy and thermal insulation as required</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>Solid core 820 wide an open in to single bedroom, fitted with acoustic seals and door closer</li> <li>Sliding doors are not acceptable</li> </ul>			Ventilation relief air provided via					
				Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille			
				N	N	N			
Glazing	Type	Window (Y/N)	Y	Additional Information: - Openable sash window, double glazed fitted with close fitting heavy duty blind or venetians - window to be shaded externally from summer sun penetration	External solar shading provided (Y/N)	Fixed	Y		
		Skylight (Y/N)	N			Moveable (user operated)	N		
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)	N		
		Automated	N			Internal blackout blinds (Y/N)	Y		
	Glass specification thickness (mm)	TBC at design phase				Openable windows (Y/N)	Y		
	Shading co-efficient	UV Filter				Mechanical ventilation provided (Y/N)	N		
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish			
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%	N/A			
	Walls	Painted plasterboard			At least 50%	Semi gloss			
	Ceilings	Painted plasterboard			At least 70%	Satin			
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			Neutral/Negative				
		Exhaust			Yes to cupboards				
		Makeup Air			No				
		Outside Air			Yes via operable windows or mechanical ventilation				
		Controls			Provide independently controlled air conditioning for "on demand" operation. Occupancy & BMS				
	Heating	Provided	Y	Set point °C	21	Setback temp °C	17	Individual Ducted Units	
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26		
	Lighting	Lux 240 during study mode	Fitting Type T5 Fittings		Controls Separately switch ceiling vs task/bedside lighting. Possible occupancy sensor				
	Power	<ul style="list-style-type: none"> <li>General power – 2 double GPO's</li> <li>Phone point (TBC)</li> <li>Data/LAN point (adjacent to desk location)</li> </ul>							
	Hydraulic	Chilled Water fountain	N						
		Dom. Cold	N						
		Dom. Hot/Tepid Water	N						
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Single bed</li> <li>Desk</li> <li>Chair</li> <li>2 coat hooks</li> <li>Built in locker</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.16 FIRE FIGHTER BEDROOM MODULE

Room Data Sheet No: 16  
Reference Plan No: 14,15,16

Floor Area	Desirable			Size	Min width	Min length		Floor to ceiling		
	2 – 6 bay inclusive			10.8m²	2700	-		2700 min		
Functions	<ul style="list-style-type: none"><li>Sleeping – single bedroom for each fire fighter</li><li>Changing</li><li>Private study</li><li>Each fire fighter has separate bedding which is stored in bedding locker (adjacent to bedrooms in corridor) between shifts</li></ul>									
Relationship to other areas	<ul style="list-style-type: none"><li>Adjoining private en-suite (shower/basin) shared between two rooms</li></ul>									
Special Room attributes	<ul style="list-style-type: none"><li>Acoustic separation from other rooms and external noise generators (eg traffic)</li><li>Openable windows to external wall – double glazed for noise privacy and thermal insulation as required (a roof window is permissible alternative, eg Velux type)</li></ul>									
Door(s)	<ul style="list-style-type: none"><li>Solid core 820 wide, can open in to single bedroom, fitted with acoustic seals and door closer</li><li>Sliding doors not acceptable</li></ul>				Ventilation relief air provided via					
						Door undercut (mm)	Door transfer grille (free area m²)	Acoustic transfer grille		
						N	N	N		
Glazing	Type	Window (Y/N)		Y	Additional Information: - Openable sash window, double glazed fitted with close fitting heavy duty blind or venetians - window to be shaded externally from summer sun penetration	External solar shading provided (Y/N)		Fixed		Y
		Skylight (Y/N)		N				Moveable (user operated)		N
	Internal blinds (Y/N)	User operated		Y		Internal blackout blinds (Y/N)		Moveable (auto)		N
		Automated		N				Openable windows (Y/N)		Y
	Glass specification thickness (mm)	TBC at design phase				Mechanical ventilation provided (Y/N)		N		
	Shading co-efficient	UV Filter								
	"U" value (W/m² K)	TBC at design phase								
	Finishes	Type (to be read in conjunction with appendix of schedules)					Reflectance		Finish	
Floor		Recyclable carpet tiles 6mm thickness					At least 15%		N/A	
Walls		Painted plasterboard					At least 50%		Semi gloss	
Ceilings		Painted plasterboard					At least 70%		satin	
Services	Ventilation	Clean or Transition area (C/T)				C				
		Relative Pressure				Neutral/Negative				
		Exhaust				Yes to cupboards				
		Makeup Air				No				
		Outside Air				Yes via operable windows or mechanical ventilation				
		Controls				Provide independently controlled air conditioning for "on demand" operation. Occupancy & BMS				
	Heating	Provided	Y	Set point °C	21	Setback temp °C	17	Individual Ducted Units		
	Cooling	Provided	Y	Set point °C	24	Setback temp °C	26			
	Lighting	Lux	Fitting Type		Controls					
		240 during study mode	T5 Fittings		Separately switch ceiling vs task/bedside lighting. Possible occupancy sensor					
	Power	<ul style="list-style-type: none"><li>General power – 2 double GPO's</li><li>Phone point (TBC)</li><li>Data/LAN point (adjacent to desk location)</li></ul>								
	Hydraulic	Chilled Water fountain			N					
		Dom. Cold			N					
Dom. Hot/Tepid Water			N							
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y		
Furniture/Equipment	<ul style="list-style-type: none"><li>Single bed</li><li>Desk</li><li>Chair</li><li>2 coat hooks</li><li>Built in locker</li><li>Refer to appendix of schedules</li></ul>									

#### 4.8.2.17 SHOWER / BASIN EN-SUITE BETWEEN TWO BEDROOMS

Room Data Sheet No: 17  
Reference Plan No: 17

Floor Area	Desirable			Size	Min width	Min length	Floor to ceiling				
	2 – 6 bay inclusive			4.8m²	1200	4000	2700				
Functions	<ul style="list-style-type: none"><li>Officer &amp; Fire fighters ablutions</li></ul>										
Relationship to other areas	<ul style="list-style-type: none"><li>Situated between two bedrooms, shared facility</li></ul>										
Special Room attributes	<ul style="list-style-type: none"><li>As well as Mechanical extraction Natural light &amp; ventilation preferred</li><li>Provide fixed signage on doors reminding occupant to lock &amp; unlock neighbours door before and after use, Signage 40mm Alum. Plate with black vinyl lettering 20mm high.</li></ul>										
Glazing	Type	Window (Y/N)		Y	Additional Information: Ensure obscure glass and no blinds.	External solar shading provided (Y/N)	Fixed		N		
		Skylight (Y/N)		Y			Moveable (user operated)		N		
	Internal blinds (Y/N)	User operated		N			Moveable (auto)		N		
		Automated		N							
	Glass specification thickness (mm)	TBC at design phase				Internal blackout blinds (Y/N)				N	
						Openable windows (Y/N)				N	
	Shading co-efficient	UV Filter				Mechanical ventilation provided (Y/N)				Y	
	"U" value (W/m² K)	TBC at design phase									
Finishes	Type (to be read in conjunction with appendix of schedules)					Reflectance		Finish			
	Floor	Non slip ceramic floor tiles and skirt					At least 15%				
	Walls	Anti mould water resistant plasterboard					At least 50% (above lockers)		Semi gloss		
	Ceilings	Anti mould water resistant plasterboard					At least 70%				
Services	Ventilation	Clean or Transition area (C/T)				C					
		Relative Pressure				Negative					
		Exhaust				Yes					
		Makeup Air				Undercut					
		Outside Air				No					
		Controls				Occupancy & BMS					
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A				
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A				
	Lighting	Lux	Fitting Type			Controls					
		160	T5 Fittings Heat Lamp			Movement and Sound Sensor Pushbutton timer for heat lamps					
	Power	<ul style="list-style-type: none"><li>General power – 1 double GPO</li></ul>									
	Hydraulic	Chilled Water fountain			N	Fitted with shower, water saving shower rose, shower screen and hinged door, WC (low water use) and hand wash basin. Floor waste gully					
		Dom. Cold			Y						
		Dom. Hot/Tepid Water			Y						
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y		
Furniture/Equipment	<ul style="list-style-type: none"><li>Shelf or vanity cabinet under basin</li><li>Roll paper towel dispenser</li><li>Soap holder</li><li>Coat hooks</li><li>Refer to appendix of schedules</li></ul>										

#### 4.8.2.18 WC MODULE ASSOCIATED WITH BEDROOMS

Room Data Sheet No: 18

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling				
	2 – 6 bay inclusive	2.9m <sup>2</sup>	1200	-	2700				
Functions	<ul style="list-style-type: none"> <li>Toilet</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Located near bedrooms 'only'</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Provide natural daylight and ventilation where possible</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>Solid core with privacy latch</li> </ul>			Ventilation relief air provided via					
				None	Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					N	N	Y		
Glazing	Type	Window (Y/N)	Y	Additional Information: - where possible or by ventilated roof light where external wall not available - either window or skylight can be considered	External solar shading provided (Y/N)	Fixed	Y		
		Skylight (Y/N)	Y			Moveable (user operated)	N		
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N		
		Automated	N						
	Glass specification thickness (mm)	TBC at design phase				Internal blackout blinds (Y/N)	N		
	Shading co-efficient	UV Filter				Openable windows (Y/N)	Y		
	"U" value (W/m <sup>2</sup> K)	TBC at design phase				Mechanical ventilation provided (Y/N)	N		
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish			
	Floor	Non slip ceramic floor tiles and skirt			At least 15%	N/A			
	Walls	Anti mould water resistant plasterboard			At least 50%	N/A			
	Ceilings	Anti mould water resistant plasterboard			At least 70%	Semi gloss			
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			Negative				
		Exhaust			Yes				
		Makeup Air			Acoustic transfer grille				
		Outside Air			No				
		Controls			Occupancy & BMS				
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls				
		80	T5 Fittings		Movement and Sound Sensor				
	Power	<ul style="list-style-type: none"> <li>General power – 1 double GPO</li> </ul>							
	Hydraulic	Chilled Water fountain	N	Fitted with shower, water saving shower rose, shower screen and hinged door, WC (low water use) and hand wash basin. Floor waste gully					
		Dom. Cold/Rainwater	Y						
		Dom. Hot/Tepid Water	Y						
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/Equipment	<ul style="list-style-type: none"> <li>Mirror</li> <li>Roll paper towel dispenser</li> <li>Toilet roll paper towel dispenser (not sheet feed)</li> <li>Soap holder</li> <li>Coat hooks</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.19 PERSONAL DRYING ROOM

Room Data Sheet No: 19

Floor Area	Desirable		Size		Min width	Min length	Floor to ceiling	
	2 - bay		3.5m <sup>2</sup>		1800	-	2700 min	
	3 - bay		4.5m <sup>2</sup>		2000	-		
	4 - bay		7m <sup>2</sup>		2500	-		
	5 - bay		10m <sup>2</sup>		3000	-		
	6 - bay		14m <sup>2</sup>		3500	-		
Functions	<ul style="list-style-type: none"> <li>Drying wet Personal clothing (after drill or gym work – not for PPE clothing)</li> <li>Walk in room with space for one set of clothing for each person on all four shifts</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Locate near lockers and showers</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li></li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Solid core with door closer and air-relief grille near floor level</li> </ul>					Ventilation relief air provided via		
						Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille
						Y	TBC @ design phase	N
Glazing	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N	
		Skylight (Y/N)	Y			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N	
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase				Internal blackout blinds (Y/N)	N	
						Openable windows (Y/N)	N	
	Shading co-efficient	UV Filter				Mechanical ventilation provided (Y/N)	N	
	"U" value (W/m <sup>2</sup> K)	TBC at design phase						
Finishes	Type (to be read in conjunction with appendix of schedules)					Reflectance	Finish	
	Floor	Non slip ceramic floor tiles and skirt					At least 15%	N/A
	Walls	Anti mould water resistant plasterboard					At least 50%	Semi gloss
	Ceilings	Anti mould water resistant plasterboard					At least 70%	Semi gloss
Services	Ventilation	Clean or Transition area (C/T)			C			
		Relative Pressure			Negative			
		Exhaust			Yes to outside			
		Makeup Air			Door Grille			
		Outside Air			No			
		Controls			Variable Speed Fan with Humidity Sensor via BMS provide local pushbutton			
	Heating	Provided	Y	Set point °C	N/A	Setback temp °C	N/A	Provide 2kw radiant panel on 2hour push button timer. Controlled by BMS. Fan to operate when humidity and heating is in operation
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		80	T5 Fittings		Movement Sensor			
	Power	Nil						
	Hydraulic	Chilled Water fountain		N				
		Dom. Cold/Rainwater		N				
Dom. Hot/Tepid Water		N						
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection Y	
Furniture/Equipment	<ul style="list-style-type: none"> <li>Hanging rails</li> <li>Refer to appendix of schedules</li> </ul>							



#### 4.8.2.20 GENERAL STATIONARY STORE

Room Data Sheet No: 20

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling			
	2 – 6 bay inclusive	3.6m <sup>2</sup>	1800	-	2700			
Functions	<ul style="list-style-type: none"> <li>Provide general administration storage facility</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Locate reasonably close to SO Office and PPE Change Area</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li></li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Solid core door, lockable</li> </ul>			Ventilation relief air provided via				
				None	Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
					N	N	N	
	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N/A	
		Skylight (Y/N)	N			Moveable (user operated)	N/A	
	Internal blinds (Y/N)	User operated	N/A			Moveable (auto)	N/A	
		Automated	N/A					
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)	N/A		
	Shading co-efficient	UV Filter			Openable windows (Y/N)	N/A		
	"U" value (W/m <sup>2</sup> K)	TBC at design phase			Mechanical ventilation provided (Y/N)	N		
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	Recyclable carpet tiles 6mm thickness			At least 15%	N/A		
	Walls	Impactshield Painted plasterboard			At least 50%	Semi gloss		
	Ceilings	Painted plasterboard			At least 70%	N		
Services	Ventilation	Clean or Transition area (C/T)			C			
		Relative Pressure			Neutral			
		Exhaust			No			
		Makeup Air			No			
		Outside Air			No			
		Controls			Nil			
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		160	T5 Fittings		Movement Sensor			
	Power	Nil						
	Hydraulic	Chilled Water fountain		N				
		Dom. Cold/Rainwater		N				
		Dom. Hot/Tepid Water		N				
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Shelving to one wall</li> <li>Lockable metal cabinet</li> <li>Refer to appendix of schedules</li> </ul>							

# 4.8.2.21 GYMNASIUM / WEIGHT ROOM

Room Data Sheet No: **21**  
Reference Plan No: **21**

Floor Area	Desirable	Size	Min width	Min length	Floor to ceiling				
	2 - bay	42m <sup>2</sup>	6000	-	2700 min				
	3 & 4 bay	51m <sup>2</sup>	6000	-					
	5 - bay	56m <sup>2</sup>	6000	-					
	6 - bay	64m <sup>2</sup>	7000	-					
Functions	<ul style="list-style-type: none"> <li>Weight training/strength programmes, recreation and fitness maintenance</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Locate near locker/shower change areas</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Requires natural daylight and natural ventilation</li> <li>Position equipment in circuit type arrangement to allow multiple users at same time.</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>Solid core door and door closer from corridor</li> </ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					N	N	N		
Glazing	Type	Window (Y/N)	Y	Additional Information: - window with Openable sash to external wall required - window to be shaded externally from summer sun	External solar shading provided (Y/N)	Fixed	Y		
		Skylight (Y/N)	Y			Moveable (user operated)	N		
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)	N		
		Automated	N		Internal blackout blinds (Y/N)		N		
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)	Y			
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)	N			
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish			
	Floor	Rubber Mat			At least 15 %	N/A			
	Walls	Impactshield Water Resistant Painted plasterboard			At least 50%	Semi gloss			
	Ceilings	Water Resistant Painted plasterboard			At least 70%	-			
Services	Ventilation	Clean or Transition area (C/T)			C				
		Relative Pressure			Neutral				
		Exhaust			No				
		Makeup Air			Economy Cycle				
		Outside Air			Economy Cycle				
		Controls			Occupancy & BMS				
	Heating	Provided	Y	Set point °C	13	Setback temp °C	N/A	Independent controlled for on demand operation	
	Cooling	Provided	Y	Set point °C	20	Setback temp °C	N/A	Independent controlled for on demand operation	
	Lighting	Lux	Fitting Type		Controls				
		300 @ 1000AFL	T5 Fittings		Daylight dimming				
	Power	<ul style="list-style-type: none"> <li>Power – 2 No double GPO's</li> <li>Phone</li> <li>Power for equipment</li> </ul>							
	Hydraulic	Chilled Water fountain	Y						
		Dom. Cold/Rainwater	N						
		Dom. Hot/Tepid Water	N						
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/Equipment	<ul style="list-style-type: none"> <li>Refer to Standard Gym Equipment Schedule</li> <li>Refer to appendix of schedules</li> </ul>								

# 4.8.2.22 PPE CHANGE & STORAGE AREA

Room Data Sheet No: 22

Floor Area	Desirable		Size		Min width		Min length		Floor to ceiling	
	2 - bay		32m <sup>2</sup>		5200		-		2700 min	
	3 - bay		46m <sup>2</sup>		5800		-			
	4 - bay		80m <sup>2</sup>		7600		-			
	5 - bay		96m <sup>2</sup>		7600		-			
	6 - bay		132m <sup>2</sup>		9400		-			
Functions	<ul style="list-style-type: none"> <li>An area immediately adjacent to the Appliance Bay where, at call out, fire fighters put on their PPE gear prior to boarding the appliance and shed their PPE gear on return to station before entering the station living quarters</li> </ul>									
Relationship to other areas	<ul style="list-style-type: none"> <li>Access from all parts of the Fire Station living quarters prior to Appliance Bay</li> <li>The room opens onto the Dispatch Alcove corridor (no doors from room to corridor)</li> </ul>									
Special Room attributes	<ul style="list-style-type: none"> <li>Natural daylight is desirable via UV filtered roof light</li> <li>Room layout should maximise locker capacity and ease of access to Appliance Bay</li> </ul>									
Door(s)	<ul style="list-style-type: none"> <li>2No separate access doors to Appliance Bay</li> </ul>					Ventilation relief air provided via				
						Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
						N	N	N		
Glazing	Type	Window (Y/N)	N	Additional Information: -skylight can be considered with UV Filter	External solar shading provided (Y/N)	Fixed	N			
		Skylight (Y/N)	Y			Moveable (user operated)	N			
	Internal blinds (Y/N)	User operated	N		Internal blackout blinds (Y/N)	N				
		Automated	N			Openable windows (Y/N)	N			
	Glass specification thickness (mm)	TBC at design phase			Mechanical ventilation provided (Y/N)	Y				
	Shading co-efficient	UV Filter if exposed to natural daylight								
	"U" value (W/m <sup>2</sup> K)	TBC at design phase								
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance		Finish			
	Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes			At least 15%		N/A			
	Walls	Anti mould, water & impact resistant plasterboard			At least 50%		Semi gloss			
	Ceilings	Anti mould water resistant plasterboard			At least 70%					
Services	Ventilation	Clean or Transition area (C/T)			T					
		Relative Pressure			Positive					
		Exhaust			Yes via air to air heat exchanger					
		Makeup Air			Nil					
		Outside Air			Yes via air to air heat exchanger					
		Controls			Occupancy & BMS					
	Heating	Provided	Y	Set point °C	16	Setback temp °C	N/A	Provide Infrared radiant heating panels and connect to BMS and local pushbutton. Celmech IRH units to operate only when room temperature is below setpoint and in turn out		
		Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls					
		80	T5 Fittings		Movement sensor and BMS					
	Power	<ul style="list-style-type: none"> <li>Power – 2 No double waterproof GPO's</li> </ul>								
	Hydraulic	Chilled Water fountain		N						
		Dom. Cold/Rainwater		N						
		Dom. Hot/Tepid Water		N						
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y		
Furniture/Equipment	<ul style="list-style-type: none"> <li>PPE racks 600 wide x 600 deep x 1800 high</li> <li>2-Bay – 27 PPE racks req'</li> <li>3-Bay – 46 PPE racks req'</li> <li>4-Bay – 68 PPE racks req'</li> <li>5-Bay – 90 PPE racks req'</li> <li>6-Bay – 112 PPE racks req'</li> <li>Refer to appendix of schedules</li> </ul>									

#### 4.8.2.23 PPE DRYING ROOM

Room Data Sheet No: 23

Floor Area	Desirable		Size		Min width	Min length	Floor to ceiling	
	2 - bay		3m <sup>2</sup>		1500	-	2700 min	
	3 - bay		4.5m <sup>2</sup>		2000	-		
	4 - bay		7m <sup>2</sup>		2500	-		
	5 - bay		10m <sup>2</sup>		2500	-		
	6 - bay		14m <sup>2</sup>		3000	-		
Functions	<ul style="list-style-type: none"> <li>Drying wet PPE gear</li> <li>Walk in room with space for one set of clothing for each person on all four shifts</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Locate adjacent to and opening onto PPE Change/Storage area</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li>Layout to suit maximum hanging space around perimeter of room</li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Solid core door with glazed top panel and door closer</li> </ul>					Ventilation relief air provided via		
						Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille
						N	Y	N
Glazing	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N	
		Skylight (Y/N)	Y			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N	
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)	N		
	Shading co-efficient	UV Filter			Openable windows (Y/N)	N		
	"U" value (W/m <sup>2</sup> K)	TBC at design phase			Mechanical ventilation provided (Y/N)	N		
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes			At least 15%	N/A		
	Walls	Face finished masonry preferred – prefinished insulated sandwich panel OK			At least 50%	Semi gloss		
	Ceilings	Water Resistant Painted plasterboard			At least 70%	Semi gloss		
Services	Ventilation	Clean or Transition area (C/T)			T			
		Relative Pressure			Negative			
		Exhaust			Yes (speed Controlled)			
		Makeup Air			Via Undercut			
		Outside Air			No			
		Controls			Humidity & BMS (exhaust and pushbutton heating)			
	Heating	Provided	Y	Set point °C	35	Setback temp °C	N/A	Provide radiant heating panel to room with 2hour pushbutton timer.
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		80	T5 Fittings		Movement sensor			
	Power	<ul style="list-style-type: none"> <li>Power for Electric Radiant</li> </ul>						
	Hydraulic	Chilled Water fountain		N				
		Dom. Cold/Rainwater		N				
		Dom. Hot/Tepid Water		N				
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/Equipment	<ul style="list-style-type: none"> <li>Hanging rails</li> <li>Hot water panel heater</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.24 DISPATCH ALCOVE

Room Data Sheet No: 24

Floor Area	Desirable size		Min width	Min length	Floor to ceiling			
	2 & 3 - bay	6M <sup>2</sup>	2000	-	2700			
	4 - bay	10M <sup>2</sup>	2500	-				
	5 & 6 bay	12M <sup>2</sup>	3000	-				
Functions	<ul style="list-style-type: none"> <li>Supervision of all call out dispatches from the Dispatch printer</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Overlooking the Appliance Bay and opening off the PPE Change/Locker area</li> <li>Good access to the Station Office</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li>Direct open access to the Appliance Bay</li> <li>Natural daylight desirable (may be achieved indirectly through Appliance Bay)</li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Not required</li> <li>Open onto PPE Change/ Lockers</li> <li>Glazed doors to SO Office (1000 wide)</li> </ul>				Ventilation relief air provided via			
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
					N/A	N/A		
Glazing	Type	Window (Y/N)	TBC at design phase	Additional Information: - roof light or referred light required	External solar shading provided (Y/N)	Fixed	Y	
		Skylight (Y/N)	Y			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N	
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase			Internal blackout blinds (Y/N)	N		
					Openable windows (Y/N)	N		
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)	N		
	"U" value (W/m <sup>2</sup> K)	TBC at design phase						
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	Non slip ceramic floor tiles and skirt			At least 15%	N/A		
	Walls	Impactshield Water Resistant Painted plasterboard			At least 50%	Semi gloss		
	Ceilings	Water Resistant Painted plasterboard			At least 70%	N/A		
Services	Ventilation	Clean or Transition area (C/T)			T			
		Relative Pressure			Neutral			
		Exhaust			No			
		Makeup Air			No			
		Outside Air			No			
		Controls			Nil			
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		320	T5 Fittings		Daylight dimming			
	Power	<ul style="list-style-type: none"> <li>Power – 2 No double waterproof GPO's</li> <li>Access via cable trays to the Equipment/Communications room</li> <li>Data points</li> </ul>						
	Hydraulic	Chilled Water fountain		N				
		Dom. Cold/Rainwater		N				
		Dom. Hot/Tepid Water		N				
	Fire	Sprinkler	Y	Extinguisher	Y	Blanket	N	Detection
Furniture/ Equipment	<ul style="list-style-type: none"> <li>Key safe</li> <li>Counter style bench (half open under, half cupboards under)</li> <li>Touch screen computer</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.25 CLEANER'S STORE

Room Data Sheet No: 25

Floor Area	Desirable size		Min width	Min length	Floor to ceiling				
	2 & 3 - bay	3m <sup>2</sup>	1500	-					
	4 & 5 - bay	4m <sup>2</sup>	1500	-					
	6 - bay	5m <sup>2</sup>	2000	-					
Functions	<ul style="list-style-type: none"> <li>Used for storage of equipment to be used for internal cleaning</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Located off Appliance Bay with easy access to Mess Room(s) and easy access for Council street collection</li> </ul>								
Special Room attributes									
Door(s)	<ul style="list-style-type: none"> <li>820 wide solid core door, with closer, lockable, air relief grille from Appliance Bay</li> </ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					Y	TBC @ design phase	N		
Glazing	Type	Window (Y/N)	N	Additional Information:	External solar shading provided (Y/N)	Fixed	N		
		Skylight (Y/N)	N			Moveable (user operated)	N/A		
	Internal blinds (Y/N)	User operated	N/A			Moveable (auto)	N/A		
		Automated	N/A						
	Glass specification thickness (mm)	N/A			Internal blackout blinds (Y/N)	N/A			
		Shading co-efficient	UV Filter		Openable windows (Y/N)	N/A			
	"U" value (W/m <sup>2</sup> K)		N/A		Mechanical ventilation provided (Y/N)	N			
	Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
		Floor	Non slip ceramic floor tiles and skirt			At least 15%	N/A		
Walls		Impactshield Water Resistant Painted plasterboard			At least 50%	Semi gloss			
Ceilings		Water Resistant Painted plasterboard			At least 70%	N/A			
Services	Ventilation	Clean or Transition area (C/T)			T				
		Relative Pressure			Negative				
		Exhaust			Yes				
		Makeup Air			Undercut				
		Outside Air			No				
		Controls			Occupancy & BMS				
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls				
		80	T5 Fittings Heat Lamp		Movement and Sound Sensor Pushbutton timer for heat lamps				
	Power	<ul style="list-style-type: none"> <li>General power – 1 double GPO</li> </ul>							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold		Y					
Dom. Hot/Tepid Water		Y							
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y	
Furniture/Equipment	<ul style="list-style-type: none"> <li>Slop hopper</li> <li>Shelving</li> <li>Mop/broom racks</li> <li>Storage of cleaning equipment and materials</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.26 SPARE PPE STORAGE

Room Data Sheet No: 26

Floor Area	Desirable Size		Min width	Min length	Floor to ceiling				
	2 - bay	10m <sup>2</sup>	2200	-	2700				
	3 - bay	14m <sup>2</sup>	2200	-					
	4 - bay	20m <sup>2</sup>	2200	-					
	5 - bay	26m <sup>2</sup>	2200	-					
	6 - bay	32m <sup>2</sup>	2200	-					
Functions	<ul style="list-style-type: none"> <li>Clean PPE clothing</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Located adjacent to PPE Change area</li> <li>Separate convenient access from outside, or internal corridor</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Lighting to be artificial light only</li> <li>Room layout should maximise locker capacity</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>2 No access doors – solid core doors with glazed top panels and door closer</li> <li>1 No access door from PPE Change area</li> <li>1 No access door from internal corridor</li> </ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					N/A	N/A	N/A		
Glazing	Type	Window (Y/N)	N	Additional Information: - all roof lights, skylights and glazing to be provided with UV blackout	External solar shading provided (Y/N)	Fixed		Y	
		Skylight (Y/N)	Y			Moveable (user operated)		N	
	Internal blinds (Y/N)	User operated	N			Internal blackout blinds (Y/N)	Moveable (auto)		N
		Automated	N						
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)			N	
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)			N	
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish			
	Floor	Non slip ceramic floor tiles and skirt			At least 15%	N/A			
	Walls	Impactshield Painted plasterboard			At least 50%	Semi gloss			
	Ceilings	Water Resistant Painted plasterboard			At least 70%	Semi gloss			
Services	Ventilation	Clean or Transition area (C/T)			T				
		Relative Pressure			Neutral				
		Exhaust			No				
		Makeup Air			No				
		Outside Air			No				
		Controls			Nil				
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls				
		80	T5 Fittings		Movement Sensor				
	Power	2 No waterproof GPO's							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold/Rainwater		N					
		Dom. Hot/Tepid Water		N					
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y	
Furniture/Equipment	<ul style="list-style-type: none"> <li>400mm wide proprietary hanging rails for clean PPE clothing</li> <li>2-Bay – 6.4 lin metres</li> <li>3-Bay – 10.6 lin metres</li> <li>4-Bay – 15.9 lin metres</li> <li>5-Bay – 21.2 lin metres</li> <li>6-Bay – 26.5 lin metres</li> <li>Refer to appendix of schedules</li> </ul>								

#### 4.8.2.27 STATION STORE

Room Data Sheet No: 27

Floor Area	Desirable size		Min width	Min length	Floor to ceiling				
	2 & 3 - bay	10m <sup>2</sup>	3000	-	2700 min				
	4 - bay	12m <sup>2</sup>	3000	-					
	5 - bay	14m <sup>2</sup>	3000	-					
	6 - bay	16m <sup>2</sup>	3500	-					
Functions	<ul style="list-style-type: none"> <li>Used for general store of station supplies such as toilet rolls, cleaning products, cleaning equipment etc</li> </ul>								
Relationship to other areas	<ul style="list-style-type: none"> <li>Located off Appliance Bay</li> </ul>								
Special Room attributes	<ul style="list-style-type: none"> <li>Nil</li> </ul>								
Door(s)	<ul style="list-style-type: none"> <li>2.4m wide lockable roller-shutter access door (powdercoat finish)</li> </ul>				Ventilation relief air provided via				
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
					Y	TBC @ design phase	N		
Glazing	Type	Window (Y/N)	TBC at design phase	Additional Information: - provide natural daylight via roof light is desirable - window not required	External solar shading provided (Y/N)	Fixed	Y		
		Skylight (Y/N)	Y			Moveable (user operated)	N		
	Internal blinds (Y/N)	User operated	Y			Moveable (auto)	N		
		Automated	N		Internal blackout blinds (Y/N)		N		
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)	TBC @ design phase			
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)	N			
	"U" value (W/m <sup>2</sup> K)	TBC at design phase							
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish			
	Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes			At least 15%	N/A			
	Walls	Face finished masonry preferred – prefinished insulated sandwich panel OK			At least 50%	Semi gloss			
	Ceilings	Water Resistant Painted plasterboard			At least 70%	Semi gloss			
Services	Ventilation	Clean or Transition area (C/T)			T				
		Relative Pressure			Neutral				
		Exhaust			No				
		Makeup Air			No				
		Outside Air			No				
		Controls			Nil				
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A		
	Lighting	Lux	Fitting Type		Controls				
		80	T5 Fittings		Movement Sensor				
	Power	1 double weatherproof GPO							
	Hydraulic	Chilled Water fountain		N					
		Dom. Cold/Rainwater		N					
		Dom. Hot/Tepid Water		N					
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y	
Furniture/Equipment	<ul style="list-style-type: none"> <li>Adjustable steel shelving</li> <li>Refer to appendix of schedules</li> </ul>								



#### 4.8.2.28 BA (BREATHING APPARATUS)

Room Data Sheet No: 28

Floor Area		Size	Min width	Min length	Floor to ceiling					
	2 & 3 - bay	10m <sup>2</sup>	3000	-	2700 min					
	4 - bay	12m <sup>2</sup>	3000	-						
	4 - bay	14m <sup>2</sup>	4000	-						
	5 & 6 bay	16m <sup>2</sup>	4000	-						
Functions	<ul style="list-style-type: none"><li>Used for cleaning, storage and checking of breathing apparatus</li></ul>									
Relationship to other areas	<ul style="list-style-type: none"><li>Located off Appliance Bay</li></ul>									
Special Room attributes	<ul style="list-style-type: none"><li>Natural daylight desirable via roof light</li></ul>									
Door(s)	<ul style="list-style-type: none"><li>Solid core door 870mm wide with closer, lockable</li></ul>				Ventilation relief air provided via					
						Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille		
						Y	TBC @ design phase	N		
Glazing	Type	Window (Y/N)	TBC @ design phase	Additional Information: - provide natural daylight via roof light is desirable -window not required	External solar shading provided (Y/N)	Fixed	N			
		Skylight (Y/N)	Y			Moveable (user operated)	N			
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N			
		Automated	N		Internal blackout blinds (Y/N)		N			
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)		TBC @ design phase			
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		N			
	"U" value (W/m <sup>2</sup> K)	TBC at design phase								
	Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance		Finish		
		Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes			At least 15%		N/A		
		Walls	Face finished masonry preferred – prefinished insulated sandwich panel OK			At least 50%		Semi gloss		
Ceilings		Water Resistant Painted plasterboard			At least 70%		Semi gloss			
Services	Ventilation	Clean or Transition area (C/T)			T					
		Relative Pressure			Negative					
		Exhaust			Yes (variable speed)					
		Makeup Air			Door Grille and Undercut					
		Outside Air			No					
		Controls			Occupancy and BMS					
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A			
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A			
	Lighting	Lux	Fitting Type		Controls					
		160	T5 Fittings		Movement and Sound Sensor					
	Power	1 double weatherproof GPO								
	Hydraulic	Chilled Water fountain		N	Low temp hot water Separate HWS TBC @ design phase					
		Dom. Cold/Rainwater		Y						
		Dom. Hot/Tepid Water		Y						
	Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y	
Furniture/ Equipment	<ul style="list-style-type: none"><li>Bench</li><li>Stainless steel trough (bowl size TBC)</li><li>Whiteboard</li><li>Paper towel dispenser</li><li>EMR cabinet</li><li>Separate HWS</li><li>Refer to appendix of schedules</li></ul>									

#### 4.8.2.29 HOSE BAY / LINEN DROP OFF & PICK UP

Room Data Sheet No: 29

Floor Area	Desirable	Size	Min width x Min length	Floor to ceiling				
	2 & 3 bay	10M <sup>2</sup>	3000	2700 min				
	4 bay	12M <sup>2</sup>	4000					
	5 bay	14M <sup>2</sup>	4000					
	6 bay	16M <sup>2</sup>	4000					
Functions	<ul style="list-style-type: none"> <li>Used for storage of hose racks</li> </ul>							
Relationship to other areas	<ul style="list-style-type: none"> <li>Located off Appliance Bay</li> </ul>							
Special Room attributes	<ul style="list-style-type: none"> <li>Linen drop off and pick up point for outside contractor</li> </ul>							
Door(s)	<ul style="list-style-type: none"> <li>Open bay, nil door, minimum opening width 1500mm</li> </ul>				Ventilation relief air provided via			
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille	
					N/A	N/A	N/A	
	Type	Window (Y/N)	TBC @ design phase	Additional Information: - natural daylight preferred, maybe by roof light	External solar shading provided (Y/N)	Fixed	N	
		Skylight (Y/N)	Y			Moveable (user operated)	N	
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N	
		Automated	N					
	Glass specification thickness (mm)	TBC at design phase				Internal blackout blinds (Y/N)	N	
	Shading co-efficient	UV Filter				Openable windows (Y/N)	TBC @ design phase	
	"U" value (W/m <sup>2</sup> K)	TBC at design phase				Mechanical ventilation provided (Y/N)	N	
Finishes	Type (to be read in conjunction with appendix of schedules)				Reflectance	Finish		
	Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes			At least 15%	N/A		
	Walls	Face finished masonry preferred – prefinished insulated sandwich panel OK			At least 50%	Semi gloss		
	Ceilings	Water Resistant Painted plasterboard			At least 70%	Semi gloss		
Services	Ventilation	Clean or Transition area (C/T)			T			
		Relative Pressure			Neutral			
		Exhaust			No			
		Makeup Air			No			
		Outside Air			No			
		Controls			Nil			
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A	
	Lighting	Lux	Fitting Type		Controls			
		160	T5 Fittings		Movement Sensor			
	Power	1 double weatherproof GPO						
	Hydraulic	Chilled Water fountain		N				
		Dom. Cold/Rainwater		N				
		Dom. Hot/Tepid Water		N				
Fire	Sprinkler	Y	Extinguisher	N	Blanket	N	Detection	Y
Furniture/Equipment	<ul style="list-style-type: none"> <li>Racks for hoses (MFB supply item)</li> <li>Refer to appendix of schedules</li> </ul>							

#### 4.8.2.30 DRILL EQUIPMENT / GEAR / BIKE STORE

Room Data Sheet No: 30

Floor Area	2 - bay	12m <sup>2</sup>	3000	-						
	3 - bay	18m <sup>2</sup>	4000	-						
	4, 5 & 6 - bay	25m <sup>2</sup>	5000	-						
Functions	<ul style="list-style-type: none"> <li>Used for the storage of bicycles &amp; drill gear</li> </ul>									
Relationship to other areas	<ul style="list-style-type: none"> <li>Located off Appliance Bay adjacent to Indoor Drill</li> </ul>									
Special Room attributes										
Door(s)	<ul style="list-style-type: none"> <li>A 2.4m wide lockable roller-shutter access door (powdercoat finish)</li> </ul>				Ventilation relief air provided via					
					Door undercut (mm)	Door transfer grille (free area m <sup>2</sup> )	Acoustic transfer grille			
					N/A	N/A	N/A			
Glazing	Type	Window (Y/N)	TBC at design phase	Additional Information: - natural daylight via roof light is desirable	External solar shading provided (Y/N)	Fixed	Y			
		Skylight (Y/N)	Y			Moveable (user operated)	N			
	Internal blinds (Y/N)	User operated	N			Moveable (auto)	N			
		Automated	N		Internal blackout blinds (Y/N)		N			
	Glass specification thickness (mm)	TBC at design phase			Openable windows (Y/N)		TBC			
	Shading co-efficient	UV Filter			Mechanical ventilation provided (Y/N)		N			
	"U" value (W/m <sup>2</sup> K)	TBC at design phase								
	Type (to be read in conjunction with appendix of schedules)							Reflectance	Finish	
	Floor	(EP) Non-slip epoxy on concrete slab, (light grey colour), anti slip grates to floor wastes				At least 15%		N/A		
	Walls	Face finished masonry preferred – prefinished insulated sandwich panel OK				At least 50%		Semi gloss		
Ceilings	Water Resistant Painted plasterboard				At least 70%		Semi gloss			
Services	Ventilation	Clean or Transition area (C/T)			T					
		Relative Pressure			Neutral					
		Exhaust			No					
		Makeup Air			No					
		Outside Air			No					
		Controls			Nil					
	Heating	Provided	N	Set point °C	N/A	Setback temp °C	N/A			
	Cooling	Provided	N	Set point °C	N/A	Setback temp °C	N/A			
	Lighting	Lux	Fitting Type		Controls					
		80	T5 Fittings		Movement Sensor and Daylight dimming where naturally lit					
	Power	2 No waterproof GPO's								
	Hydraulic	Chilled Water fountain		N						
		Dom. Cold/Rainwater		N						
		Dom. Hot/Tepid Water		N						
	Fire	Sprinkler	Y	Extinguisher	Y	Blanket	N	Detection	Y	
Furniture/Equipment	<ul style="list-style-type: none"> <li>Racks for Bicycles</li> <li>Refer to appendix of schedules</li> </ul>									

# **METROPOLITAN FIRE AND EMERGENCY SERVICES BOARD**



## **VOLUME 4.9**

### **SITE SPECIFIC DATA BRIEFS'**

#### **REVISION HISTORY**

<b>Revision</b>	<b>Prepared By</b>	<b>Date Prepared</b>	<b>Issue</b>
A	StrataPNA Architects	09/2010	Incorporating MFB Comments and workshop recommendations

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#### 4.9.1 SITE SPECIFIC DATA BRIEF 2 BAY FIRE STATION

##### Fire Station Accommodation Requirements

<b>PROJECT:</b>	
<b>ADDRESS:</b>	

Room data sheet No:	Fire Station	No: of Appliances/Vehicles				
	Staff		2 Bay		2 Bay Two level option	
	No of Fire Fighters per shift		4		Ground	First
	No of officers per shift		1			suggested
	Staff Facility Factor (no. of lockers/staff per shift)		6.0			
	Overload/ Contingency Capacity Factor					
	Area/Rooms		m <sup>2</sup>		m <sup>2</sup>	m <sup>2</sup>
1	Appliance Bays		187.20 18 x 10.40W		187.20 18 x 10.40W	
2	Entrance Lobby		6		6	
3	Switchboard Cupboard / Switch Room		TBC		TBC	
4	SO Office (10m2)/Station Office (14m2)		24		24	
5	SSO Office		Not Req <sup>i</sup>		Not Req <sup>i</sup>	
6	Multi Purpose Room		Not Req <sup>i</sup>	Area absorbed in Lounge, Gym, Mess		
7	Visitor Toilet (unisex disability)		4.37		4.37	
8	Male/Female Toilet Blocks module (6m2)		12		12	12
9	Equipment/Communications Room		8		8	8
10	SO Mess Room /Lounge		Not Req <sup>i</sup>		Not Req <sup>i</sup>	
11	Fire Fighter's Mess (separate Meals-Kitchen)		25		25	25
12	Fire Fighter's Lounge (*Room acts as and is to be named Multi Purpose in 1 Appliance Stations)		35		35	35
13	Break-Out Room		12		12	12
14	SSO Bedroom module (even numbers10.8m <sup>2</sup> )		Not Req <sup>i</sup>		Not Req <sup>i</sup>	
15	SO Bedroom module (even numbers10.8m <sup>2</sup> )		(2R)21.6		(2R)21.6	
16	Fire Fighter Bedroom module (even nos.10.8m <sup>2</sup> )		(4R)43.2		(4R)43.2	
17	Shwr/basin en-suite bet. two bedrooms (4.8m <sup>2</sup> )		(3R)14.4		(3R)14.4	
18	WC module associated with bedrooms (2.9m <sup>2</sup> )		(2R)5.8		(2R)5.8	
19	Personal Drying Room		3.5		3.5	
20	General Stationery Store		3.6		3.6	
21	Gymnasium/Weight Room(suggested room size)		42		42	42
22	PPE Change & Storage Area		32		32	
23	PPE Drying Room		3		3	
24	Dispatch Alcove		6		6	
25	Cleaners Store		3		3	3
26	Spare PPE Storage		10		10	
27	Station Store		10		10	
28	BA (Breathing Apparatus)		10		10	
29	Hose Bay / Linen Drop Off & Pick Up		10		10	
30	Drill Equip/Gear/Bike Store/		12		12	
	Lift & Stairs				15	20
	<b>Total Net Internal Area m<sup>2</sup></b>		<b>543.67</b>		<b>558.67</b>	<b>157.0</b>
	Add grossing factor of 30% for Circulation					
	<b>Total Gross Building Footprint Area</b>					
	Add External Areas (below) sqm		<b>436.0</b>		<b>436.0</b>	
	Staff car parks (1space+driveway =30sqm/)		10P		10P	
	Visitor car parks + DA (30+ disabled 36sqm)		1 + 1DA		1 + 1DA	
	Contractor car parks (30sqm)		1		1	
	Fire Fighter Recreation/ BBQ area (sqm)		40		40	
	Add other Site Requirements (below)					
	Drill yard area (desirable) sqm		(800)		(800)	
	Plant Room Area (TBC)					
	Front, rear & side setbacks (Site Specific)					
	Landscape buffers (Site Specific)					
	Other Agency's requirements					
	<b>Notional Total Site Area</b>					

## 4.9.2 SITE SPECIFIC DATA BRIEF 3 BAY FIRE STATION

### Fire Station Accommodation Requirements

<b>PROJECT:</b>	
<b>ADDRESS:</b>	

Room data sheet No:	Fire Station	No: of Appliances/Vehicles				
	Staff		3 Bay		3 Bay Two level option	
	No of Fire Fighters per shift		8		Ground	First
	No of officers per shift		2			Suggested
	Staff Facility Factor (no. of lockers/staff per shift)		5.0			
	Overload/ Contingency Capacity Factor					
	Area/Rooms		m <sup>2</sup>		m <sup>2</sup>	m <sup>2</sup>
1	Appliance Bays		273.60 18 x 15.20W		273.60 18 x 15.20W	
2	Entrance Lobby		9		9	
3	Switchboard Cupboard / Switch Room		TBC		TBC	
4	SO Office (10m2)/Station Office (14m2)		24		24	
5	SSO Office		Not Req'		Not Req'	
6	Multi Purpose Room		20*	Larger if identified as 'hub' station		20*
7	Visitor Toilet (unisex disability)		4.37		4.37	
8	Male/Female Toilet Blocks module (6m2)		12		12	12
9	Equipment/Communications Room		8		8	8
10	SO Mess Room /Lounge		Not Req'		Not Req'	
11	Fire Fighter's Mess (separate Meals-Kitchen)		54		54	54
12	Fire Fighter's Lounge		35		35	35
13	Break-Out Room		12		12	12
14	SSO Bedroom module (even numbers 10.8m <sup>2</sup> )		Not Req'		Not Req'	
15	SO Bedroom module (even numbers 10.8m <sup>2</sup> )		(2R)21.6		(2R)21.6	
16	Fire Fighter Bedroom module (even nos. 10.8m <sup>2</sup> )		(8R)86.4		(8R)86.4	
17	Shwr/basin en-suite bet. two bedrooms (4.8m <sup>2</sup> )		(5R)24		(5R)24	
18	WC module associated with bedrooms (2.9m <sup>2</sup> )		(3R)8.7		(3R)8.7	
19	Personal Drying Room		4.5		4.5	
20	General Stationery Store		3.6		3.6	
21	Gymnasium/Weight Room(suggested room size)		51		51	51
22	PPE Change & Storage Area		46		46	
23	PPE Drying Room		4.5		4.5	
24	Dispatch Alcove		6		6	
25	Cleaners Store		3		3	3
26	Spare PPE Storage		14		14	
27	Station Store		10		10	
28	BA (Breathing Apparatus)		10		10	
29	Hose Bay / Linen Drop Off & Pick Up		10		10	
30	Drill Equip/Gear/Bike Store/		18		18	
	Lift & Stairs				15	20
	Total Net Internal Area m <sup>2</sup>		773.27		788.27	215.0
	Add grossing factor of 30% for Circulation					
	Total Gross Building Footprint Area					
	Add External Areas (below) sqm		576.0		576.0	
	Staff car parks (1space+driveway =30sqm/)		14P		14P	
	Visitor car parks + DA (30+ disabled 36sqm)		1 + 1DA		1 + 1DA	
	Contractor car parks (30sqm)		1		1	
	Fire Fighter Recreation/ BBQ area (sqm)		60		60	
	Add other Site Requirements (below)					
	Drill yard area (desirable) sqm		(1200)		(1200)	
	Plant Room Area (TBC)					
	Front, rear & side setbacks (Site Specific)					
	Landscape buffers (Site Specific)					
	Other Agency's requirements					
	<b>Notional Total Site Area</b>					

### 4.9.3 SITE SPECIFIC DATA BRIEF 4 BAY FIRE STATION

#### Fire Station Accommodation Requirements

<b>PROJECT:</b>	
<b>ADDRESS:</b>	

Room data sheet No:	Fire Station	No: of Appliances/Vehicles				
	Staff		4 Bay		4 Bay Two level option	
	No of Fire Fighters per shift		12		Ground	First
	No of officers per shift		3			Suggested
	Staff Facility Factor (no. of lockers/staff per shift)		5.3			
	Overload/ Contingency Capacity Factor					
	Area/Rooms		m <sup>2</sup>		m <sup>2</sup>	m <sup>2</sup>
1	Appliance Bays		360.00 18 x 20.00W		360.00 18 x 20.00W	
2	Entrance Lobby		12		12	
3	Switchboard Cupboard / Switch Room		TBC		TBC	
4	SO Office (10m2)/Station Office (14m2)		24		24	
5	SSO Office		20		20	
6	Multi Purpose Room		30*	Larger if identified as 'hub' station		30*
7	Visitor Toilet (unisex disability)		4.37		4.37	
8	Male/Female Toilet Blocks module (6m2)		12		12	12
9	Equipment/Communications Room		10		10	10
10	SO Mess Room /Lounge		42		42	42
11	Fire Fighter's Mess (separate Meals-Kitchen)		63		63	63
12	Fire Fighter's Lounge		36		36	36
13	Break-Out Room		12		12	12
14	SSO Bedroom module (even numbers10.8m <sup>2</sup> )		(2R) 21.6		(2R) 21.6	
15	SO Bedroom module (even numbers10.8m <sup>2</sup> )		(2R) 21.6		(2R) 21.6	
16	Fire Fighter Bedroom module (even nos.10.8m <sup>2</sup> )		(12R)129.6		(12R)129.6	
17	Shwr/basin en-suite bet. two bedrooms (4.8m <sup>2</sup> )		(8R)38.4		(8R)38.4	
18	WC module associated with bedrooms (2.9m <sup>2</sup> )		(4R)11.6		(4R)11.6	
19	Personal Drying Room		7		7	
20	General Stationery Store		3.6		3.6	
21	Gymnasium/Weight Room(suggested room size)		51		51	51
22	PPE Change & Storage Area		80		80	
23	PPE Drying Room		7		7	
24	Dispatch Alcove		10		10	
25	Cleaners Store		4		4	4
26	Spare PPE Storage		20		20	
27	Station Store		12		12	
28	BA (Breathing Apparatus)		12		12	
29	Hose Bay / Linen Drop Off & Pick Up		12		12	
30	Drill Equip/Gear/Bike Store/		25		25	
	Lift & Stairs				15	20
	Total Net Internal Area m <sup>2</sup>		1091.77		1106.77	280.0
	Add grossing factor of 30% for Circulation					
	Total Gross Building Footprint Area					
	Add External Areas (below) sqm		836.0		836.0	
	Staff car parks (1space+driveway =30sqm/)		20P		20P	
	Visitor car parks + DA (30+ disabled 36sqm)		2 + 1DA		2 + 1DA	
	Contractor car parks (30sqm)		2		2	
	Fire Fighter Recreation/ BBQ area (sqm)		80		80	
	Add other Site Requirements (below)					
	Drill yard area (desirable) sqm		(1300)		(1300)	
	Plant Room Area (TBC)					
	Front, rear & side setbacks (Site Specific)					
	Landscape buffers (Site Specific)					
	Other Agency's requirements					
	Notional Total Site Area					



#### 4.9.4 SITE SPECIFIC DATA BRIEF 5 BAY FIRE STATION

##### Fire Station Accommodation Requirements

<b>PROJECT:</b>	
<b>ADDRESS:</b>	

Room data sheet No:	Fire Station	No: of Appliances/Vehicles				
	Staff		5 Bay		5 Bay Two level option	
	No of Fire Fighters per shift		16		Ground	First
	No of officers per shift		4			
	Staff Facility Factor (no. of lockers/staff per shift)		5.0			
	Overload/ Contingency Capacity Factor					
	Area/Rooms		m <sup>2</sup>		m <sup>2</sup>	m <sup>2</sup>
1	Appliance Bays		446.40 18 x 24.80W		446.40 18 x 24.80W	
2	Entrance Lobby		12		12	
3	Switchboard Cupboard / Switch Room		TBC		TBC	
4	SO Office (10m2)/Station Office (14m2)		24		24	
5	SSO Office		24		24	
6	Multi Purpose Room		40*	Larger if identified as 'hub' station		40*
7	Visitor Toilet (unisex disability)		4.37		4.37	
8	Male/Female Toilet Blocks module (6m2)		12		12	12
9	Equipment/Communications Room		10		10	10
10	SO Mess Room /Lounge		42		42	42
11	Fire Fighter's Mess (separate Meals-Kitchen)		84		84	84
12	Fire Fighter's Lounge		41		41	41
13	Break-Out Room		12		12	12
14	SSO Bedroom module (even numbers10.8m <sup>2</sup> )		(2R) 21.6		(2R) 21.6	
15	SO Bedroom module (even numbers10.8m <sup>2</sup> )		(2R) 21.6		(2R) 21.6	
16	Fire Fighter Bedroom module (even nos.10.8m <sup>2</sup> )		(16R)179.2		(16R)179.2	
17	Shwr/basin en-suite bet. two bedrooms (4.8m <sup>2</sup> )		(10R)48		(10R)48	
18	WC module associated with bedrooms (2.9m <sup>2</sup> )		(5R)14.5		(5R)14.5	
19	Personal Drying Room		10		10	
20	General Stationery Store		3.6		3.6	
21	Gymnasium/Weight Room(suggested room size)		(56)		(56)	(56)
22	PPE Change & Storage Area		96		96	
23	PPE Drying Room		10		10	
24	Dispatch Alcove		12		12	
25	Cleaners Store		4		4	4
26	Spare PPE Storage		26		26	
27	Station Store		14		14	
28	BA (Breathing Apparatus)		14		14	
29	Hose Bay / Linen Drop Off & Pick Up		14		14	
30	Drill Equip/Gear/Bike Store/		25		25	
	Lift & Stairs				15	20
	Total Net Internal Area m <sup>2</sup>		1321.27		1336.27	321.0
	Add grossing factor of 30% for Circulation					
	Total Gross Building Footprint Area					
	Add External Areas (below) sqm		1006.0		1006.0	
	Staff car parks (1space+driveway =30sqm/)		25P		25P	
	Visitor car parks + DA (30+ disabled 36sqm)		2 + 1DA		2 + 1DA	
	Contractor car parks (30sqm)		2		2	
	Fire Fighter Recreation/ BBQ area (sqm)		100		100	
	Add other Site Requirements (below)					
	Drill yard area (desirable) sqm		(1400)*1500		(1400)*1500	
	Plant Room Area (TBC)					
	Front, rear & side setbacks (Site Specific)					
	Landscape buffers (Site Specific)					
	Other Agency's requirements					
	Notional Total Site Area					

#### 4.9.5 SITE SPECIFIC DATA BRIEF 6 BAY FIRE STATION

##### Fire Station Accommodation Requirements

<b>PROJECT:</b>	
<b>ADDRESS:</b>	

Room data sheet No:	Fire Station	No. of Appliances/Vehicles				
	Staff		6 Bay		6 Bay Two level option	
	No of Fire Fighters per shift		20		Ground	First
	No of officers per shift		5			suggested
	Staff Facility Factor (no. of lockers/staff per shift)		5.2			
	Overload/ Contingency Capacity Factor					
	Area/Rooms		m <sup>2</sup>		m <sup>2</sup>	m <sup>2</sup>
1	Appliance Bays		532.80 18 x 29.60W		532.80 18 x 29.60W	
2	Entrance Lobby		12		12	
3	Switchboard Cupboard / Switch Room		TBC		TBC	
4	SO Office (10m2)/Station Office (14m2)		34		34	
5	SSO Office		24		24	
6	Multi Purpose Room		50*	Could vary if identified as 'hub' station		50*
7	Visitor Toilet (unisex disability)		4.37		4.37	
8	Male/Female Toilet Blocks module (6m2)		12		12	12
9	Equipment/Communications Room		12		12	12
10	SO Mess Room /Lounge		56		56	56
11	Fire Fighter's Mess (separate Meals-Kitchen)		105		105	105
12	Fire Fighter's Lounge		50		50	50
13	Break-Out Room		12		12	12
14	SSO Bedroom module (even numbers 10.8m <sup>2</sup> )		(2R) 21.6		(2R) 21.6	
15	SO Bedroom module (even numbers 10.8m <sup>2</sup> )		(4R) 43.2		(4R) 43.2	
16	Fire Fighter Bedroom module (even nos. 10.8m <sup>2</sup> )		(20R) 216		(20R) 216	
17	Shwr/basin en-suite bet. two bedrooms (4.8m <sup>2</sup> )		(13R) 62.4		(13R) 62.4	
18	WC module associated with bedrooms (2.9m <sup>2</sup> )		(5R) 14.5		(5R) 14.5	
19	Personal Drying Room		14		14	
20	General Stationery Store		3.6		3.6	
21	Gymnasium/Weight Room(suggested room size)		(64)		(64)	(64)
22	PPE Change & Storage Area		132		132	
23	PPE Drying Room		14		14	
24	Dispatch Alcove		12		12	
25	Cleaners Store		5		5	5
26	Spare PPE Storage		32		32	
27	Station Store		16		16	
28	BA (Breathing Apparatus)		16		16	
29	Hose Bay / Linen Drop Off & Pick Up		16		16	
30	Drill Equip/Gear/Bike Store/		25		25	
	Lift & Stairs				15	20
	<b>Total Net Internal Area m<sup>2</sup></b>		1611.47		1626.47	386.0
	Add grossing factor of 30% for Circulation					
	Total Gross Building Footprint Area					
	Add External Areas (below) sqm		1176.0		1176.0	
	Staff car parks (1space+driveway =30sqm/)		30P		30P	
	Visitor car parks + DA (30+ disabled 36sqm)		2 + 1DA		2 + 1DA	
	Contractor car parks (30sqm)		2		2	
	Fire Fighter Recreation/ BBQ area (sqm)		120		120	
	Add other Site Requirements (below)					
	Drill yard area (desirable) sqm		(1500)		(1500)	
	Plant Room Area (TBC)					
	Front, rear & side setbacks (Site Specific)					
	Landscape buffers (Site Specific)					
	Other Agency's requirements					
	<b>Notional Total Site Area</b>					

FIRE STATION TEMPLATE PLAN MODULES

FIRE STATION TYPE: 1 Appliance Station (2 Bays)

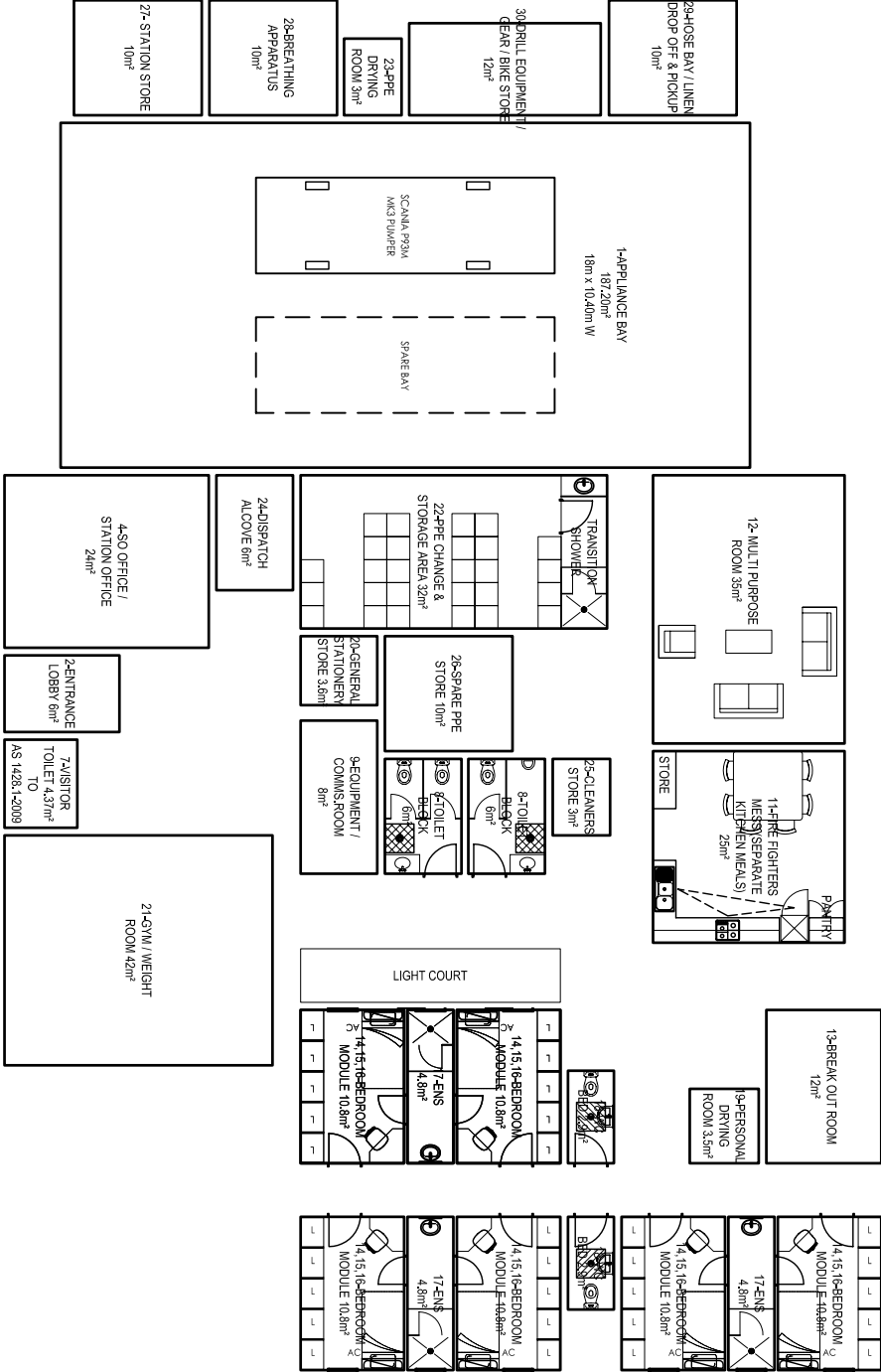
SPACE / AREA

Appliance Bay - 187.20m²

Bedroom module - (2 Bedrooms + 1 En suite) x 3 + (WC's x 2) = 85m²

Fire Station Workplace - 271.47m²

Net Building Area - 543.47m²



Note: Indicative layout modules to be used for area calculation & preliminary site assessment only.

Revision A

STRATAPNA  
ARCHITECTS

88 Howtham Grove, Howtham, 3122 VIC Australia  
Tel: (613) 9815 0588 Fax: (613) 9815 0599  
Email: admin@stratapna.com



**FIRE STATION TYPE: 2 Appliance Station (3 Bays)**

Appliance Bay - 273.60m<sup>2</sup>

Bedroom module - (2 Bedrooms + 1 En suite) x 5 + (WC's x 3) = 140.7m<sup>2</sup>

Fire Station Workplace - 358.97m<sup>2</sup>

Net Building Area - 773.27m<sup>2</sup>



Revision A



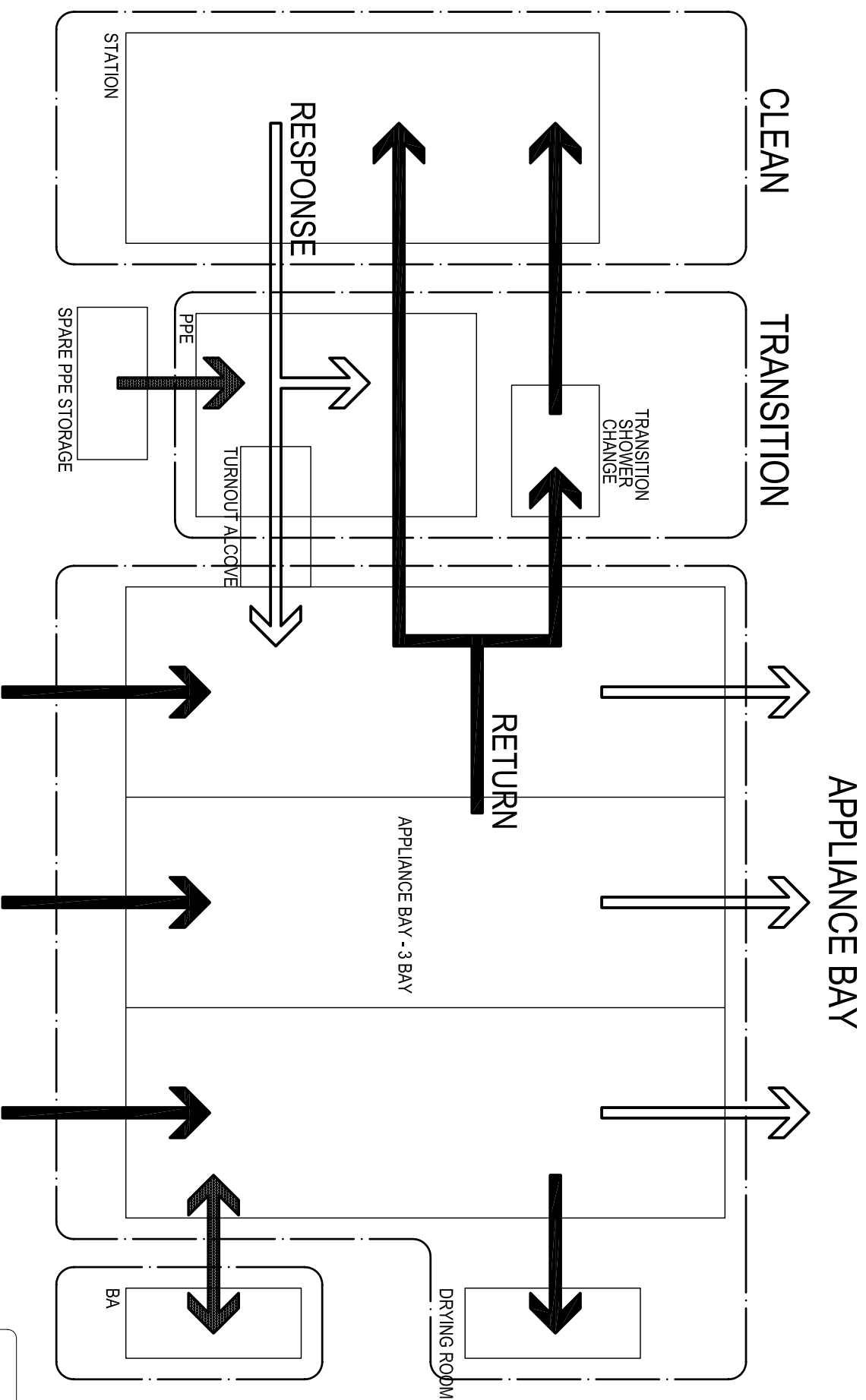
**FIRE STATION TYPE: 3 Appliance Station (4 Bays)**

Appliance Bay - 360.00m<sup>2</sup>

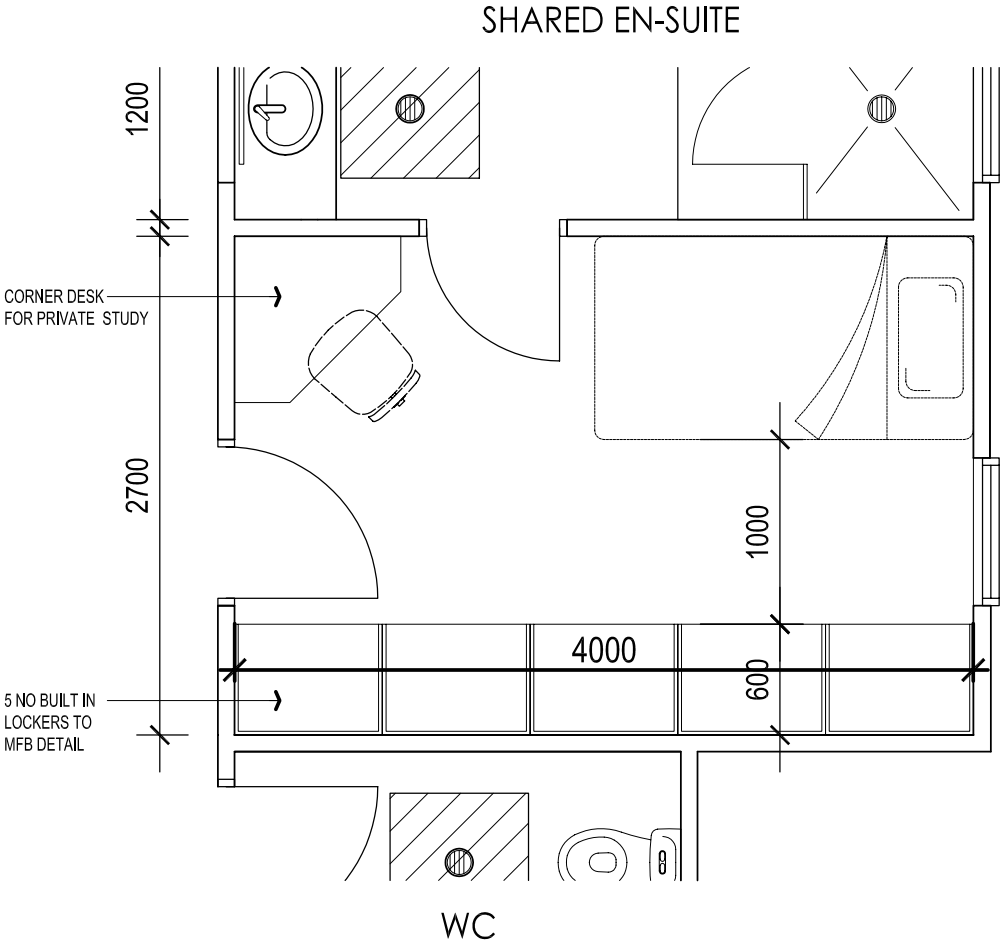
Fire Station Workplace - 508.97m<sup>2</sup>

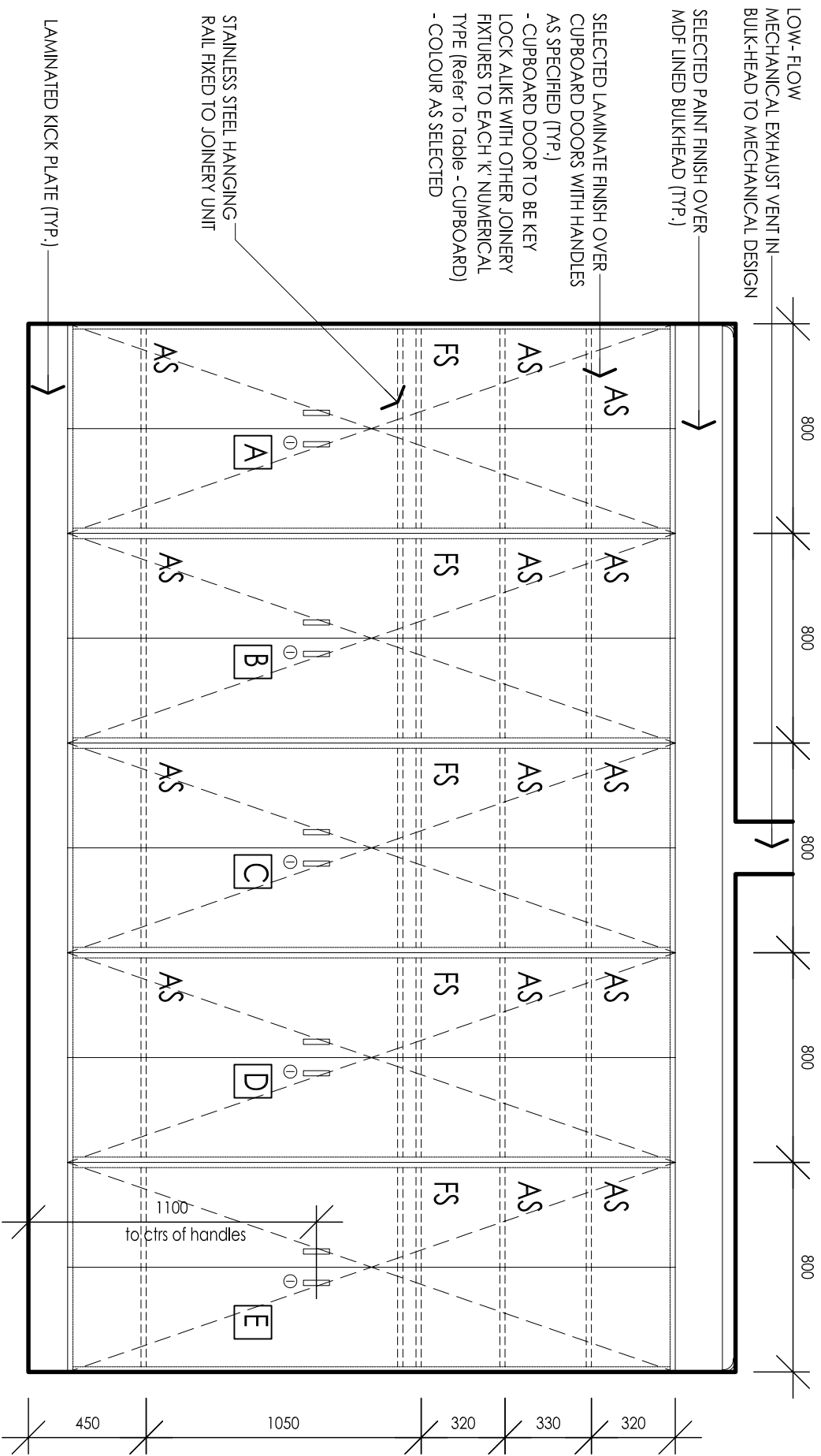
Net Building Area - 1091.77m<sup>2</sup>





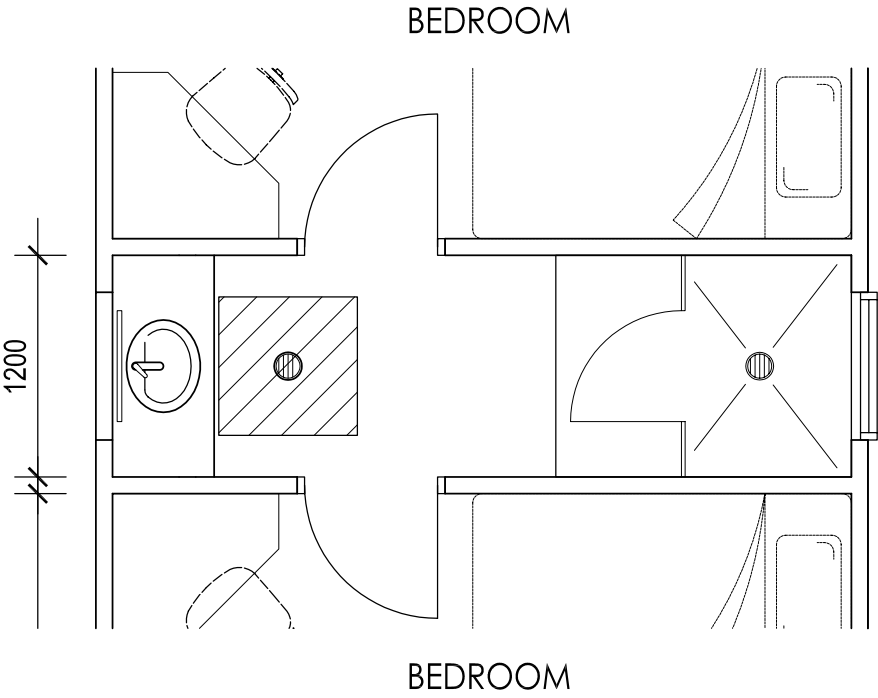






Note: Adapted from CFA model

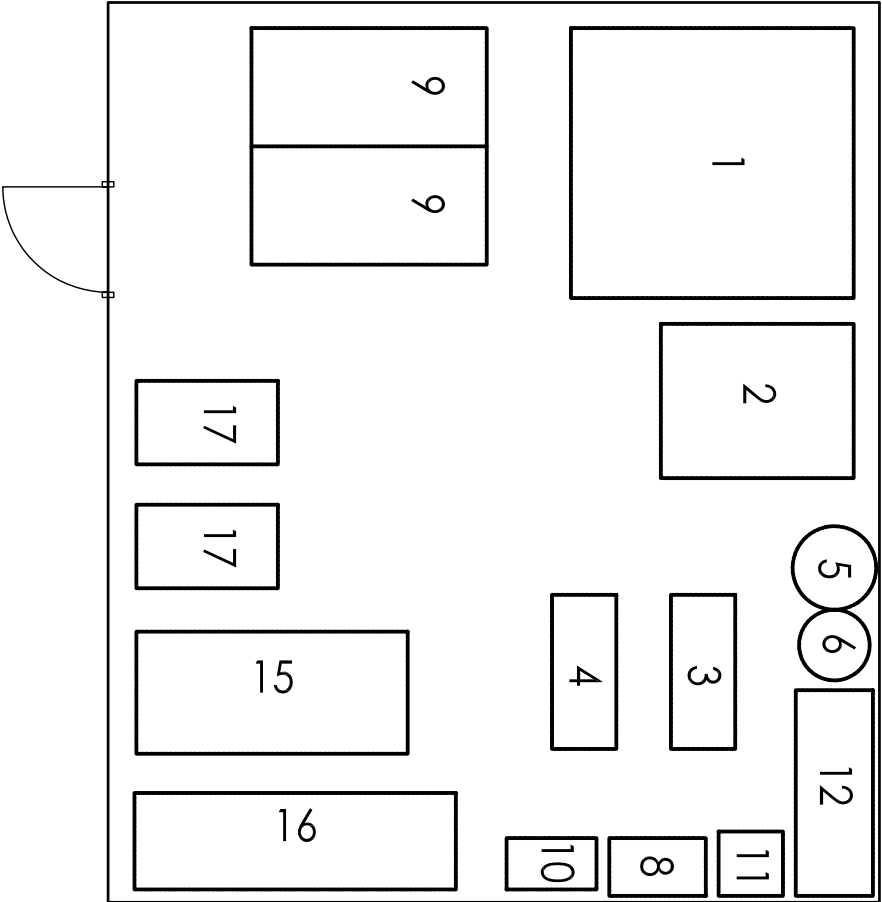
Revision A



FUNCTION SPECIFIC PLANS
Gymnasium Equipment Plan

SPACE / AREA
Gymnasium / Weight Room Area - 42m²

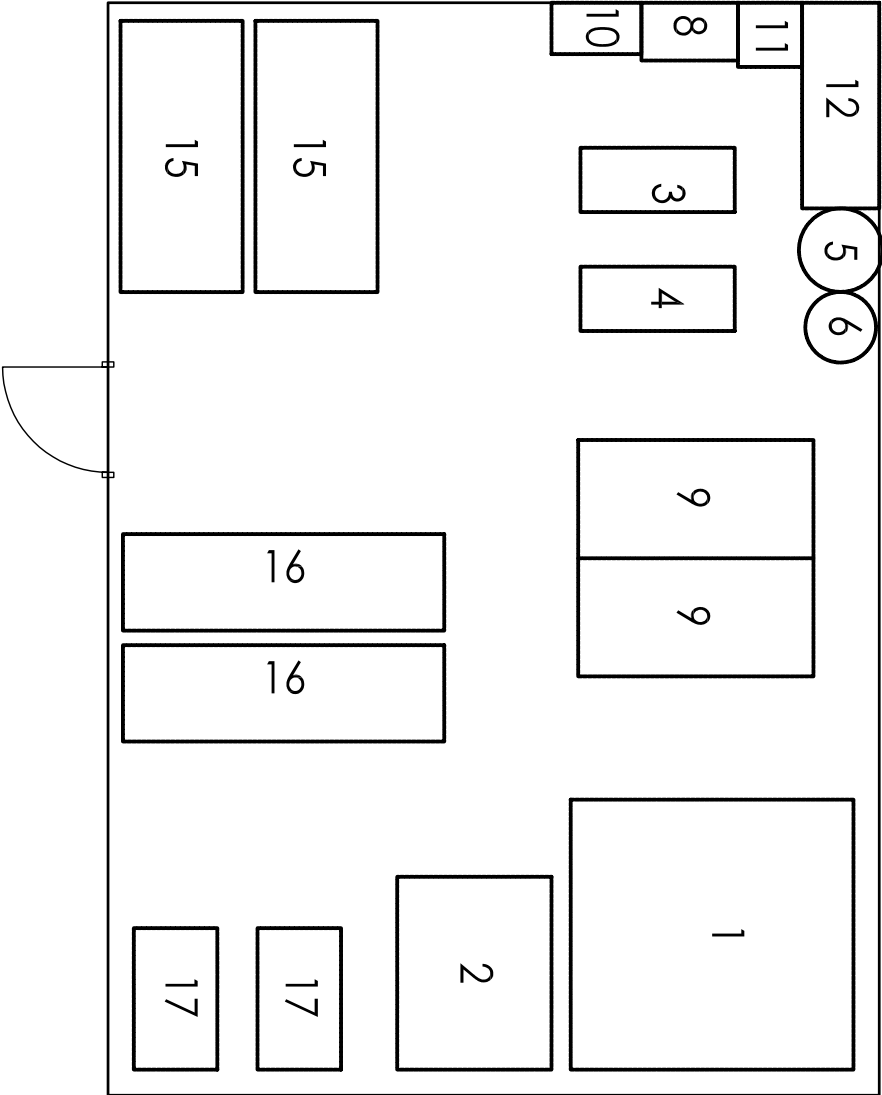
REF	GENERAL EQUIPMENT	DIMENSIONS	QUANTITY
1	Max Rack	2200 X 2100	1
2	2 / 3 way exercise station; lat pull down, seated row, high-low pulleys	1500 X 1200	1
3	Flat bench	1200 X 500	1
4	Adjustable Incline bench (0 to 90 degrees)	1200 X 500	1
5	AOK Swissball grey 65cm diameter	650	1
6	AOK Swissball red 55cm diameter	550	1
7	Storage bowls for Swissballs	N/A	2
8	Dura disc set (incl 2 Dura discs, 1 rectangular board, 1 round board)	450 X 750	1
9	Exercise mat x 2	1830 X 920	2
10	Live Medicine balls - 3kg, 4kg, 5kg	700 X 400	1 set of 3
11	Weight tree for plates	500 X 500	1
12	2 tier dumbbell rack	1600 X 600	1
13	Polar Heart Rate Monitor	N/A	1
14	Exercise Wall Charts	N/A	7
15	Treadmill	2110 x 950	1
16	Concept Rowing Machine	2500 x 750	1
17	Exercise Bike	1100 x 650	2
18	Skipping Rope	N/A	2



FUNCTION SPECIFIC PLANS
Gymnasium Equipment Plan

SPACE / AREA
Gymnasium / Weight Room Area - 51m²

REF	GENERAL EQUIPMENT	DIMENSIONS	QUANTITY
1	Max Rack	2200 X 2100	1
2	2 / 3 way exercise station; lat pull down, seated row, high-low pulleys	1500 X 1200	1
3	Flat bench	1200 X 500	1
4	Adjustable Incline bench (0 to 90 degrees)	1200 X 500	1
5	AOK Swissball grey 65cm diameter	650	1
6	AOK Swissball red 55cm diameter	550	1
7	Storage bowls for Swissballs	N/A	2
8	Dura disc set (Incl 2 Dura discs, 1 rectangular board, 1 round board)	450 X 750	1
9	Exercise mat x 2	1830 X 920	2
10	Live Medicine balls - 3kg, 4kg, 5kg	700 X 400	1 set of 3
11	Weight tree for plates	500 X 500	1
12	2 tier dumbbell rack	1600 X 600	1
13	Polar Heart Rate Monitor	N/A	1
14	Exercise Wall Charts	N/A	7
15	Treadmill	2110 x 950	2
16	Concept Rowing Machine	2500 x 750	2
17	Exercise Bike	1100 x 650	2
18	Skipping Rope	N/A	2



# FRONT

APPROX. POSITION FOR PEDESTRIAN  
BOLLARD 'FB' WITH RED FLASHING  
LIGHT FOR CALL-OUT

Vehicle exit  
direction

Vehicle exit  
direction

Vehicle exit  
direction

DRIVEWAYS TO BE  
NON SLIP FINISH

2 BAY: 10400mm, 3 BAY: 15200mm, 4 BAY: 20000mm, 5 BAY: 24800mm, 6 BAY: 29600mm

PROVIDE 1100mm HIGH SQUARE  
BOLLARDS TO INTERIOR AND  
EXTERIOR OF ALL VEHICLE  
DOOR OPENINGS AND ALLOW  
FOR PE DETECTORS MOUNTED  
AT 600mm HIGH AS INDICATED  
ALLOW FOR HIGH LEVEL PE  
DETECTORS WHERE LADDER  
PLATFORMS TRUCKS ARE  
GARAGED

EPOXY SEALED FLOOR WITH  
NON SLIP FINISH (R12 RATING)  
PROVIDE 100mm FALL ACROSS  
FLOOR TO DRAINAGE GRATES

CATENARY WIRE FOR  
EXTENSION LEAD CABLE  
ENSURE CATENARY WIRE  
IS CLEAR OF DOOR OPENINGS

LOCALISED FALL TO  
FLOOR WASTE(S)  
GRAVITY FEED TO  
PETROL & OIL  
INTERCEPTOR

PETROL & OIL  
INTERCEPTOR

LOCATE INTERCEPTOR  
FOR EASY ACCESS  
& MAINTENANCE

GARAGE DOORS &  
CONTROLS BY MFB  
RECOMMENDED  
CONTRACTOR

PROVIDE HAZARD LINE  
MARKINGS ACROSS  
ALL APPLIANCE BAY  
DOOR OPENINGS (TYP)

Vehicle entry  
direction

Vehicle entry  
direction

# REAR

PROVIDE 30mm  
FALL ACROSS  
APPLIANCE BAY  
DOOR OPENINGS

EXHAUST FAN  
ABOVE

STATION  
OFFICE

DISPATCH  
ALCOVE

PPE

DOCUMENT BOX  
TO MFB DETAIL

600mm X 2000mm  
@ 900 ABOVE FL  
BENCH.

18000mm LENGTH ACROSS ALL BAY TYPES

## NOTES:

Layout indicates a typical 2 Bay Appliance Garage

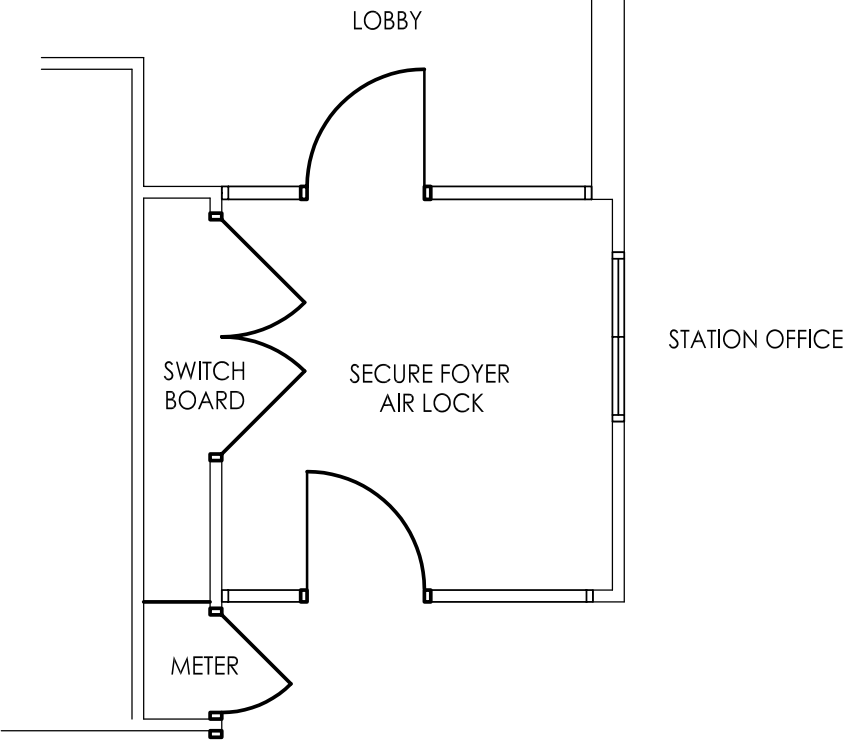
Exact number & positions of exhaust fans may vary.

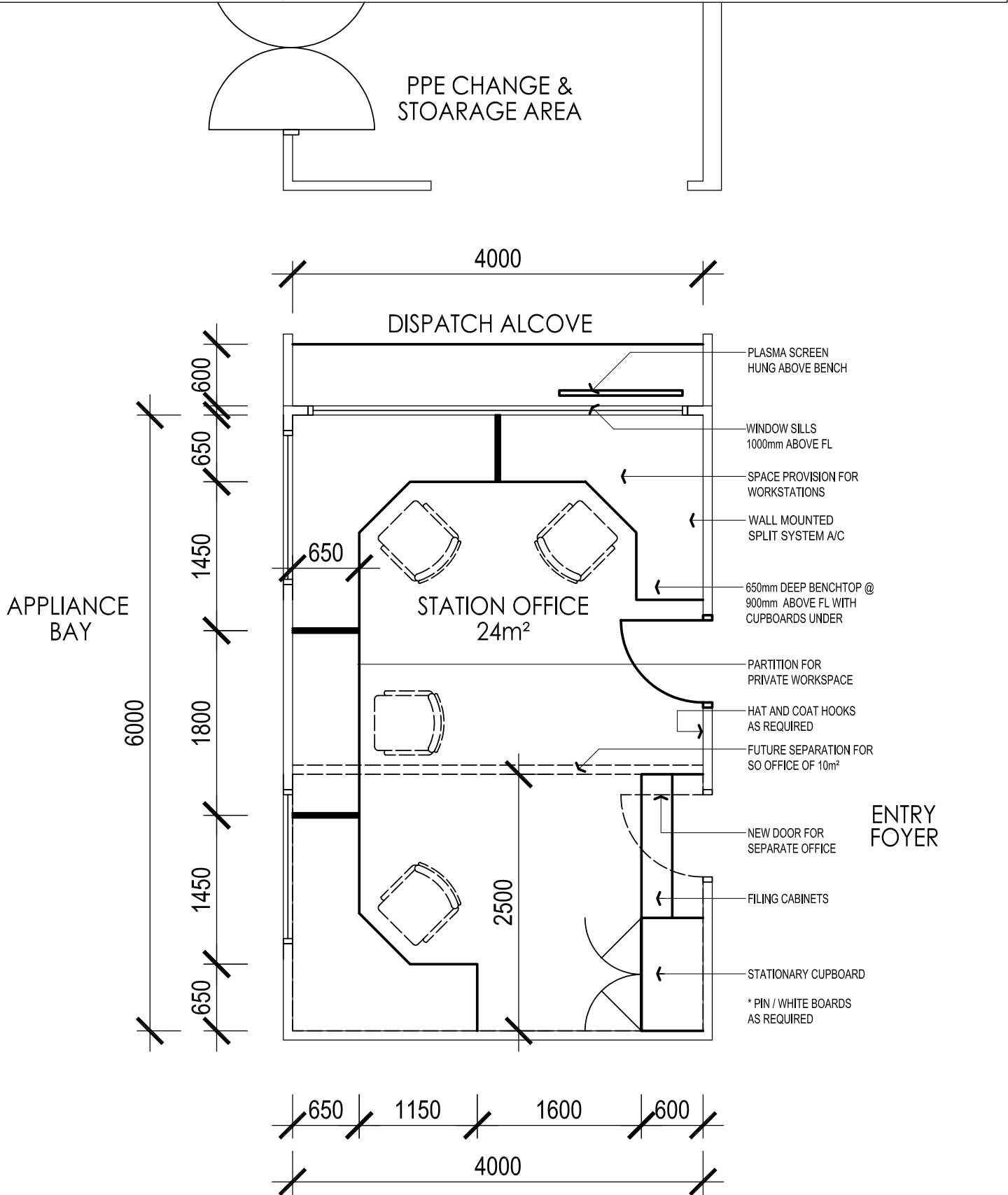
Denotes position of Red / Green Indicator lights to motorised doors

Revision A

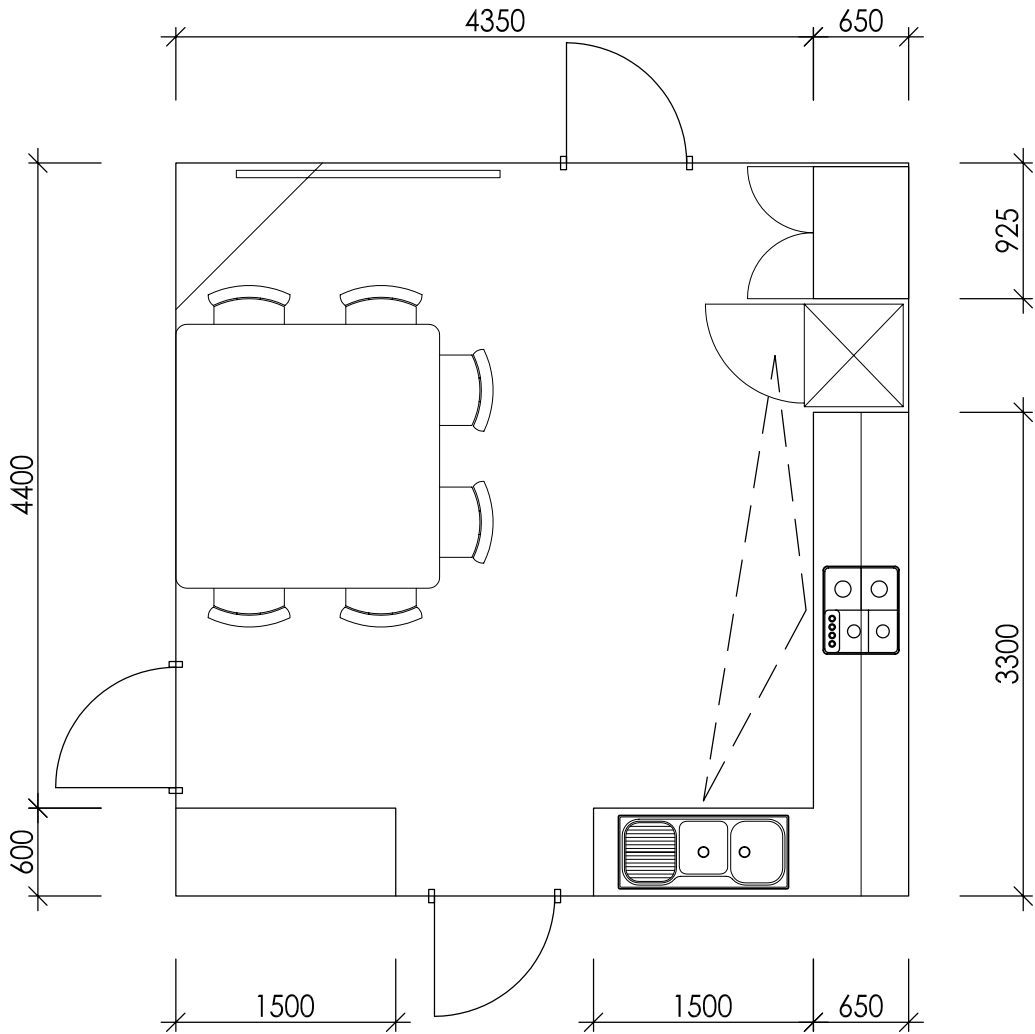
**STRATAPNA**  
ARCHITECTS

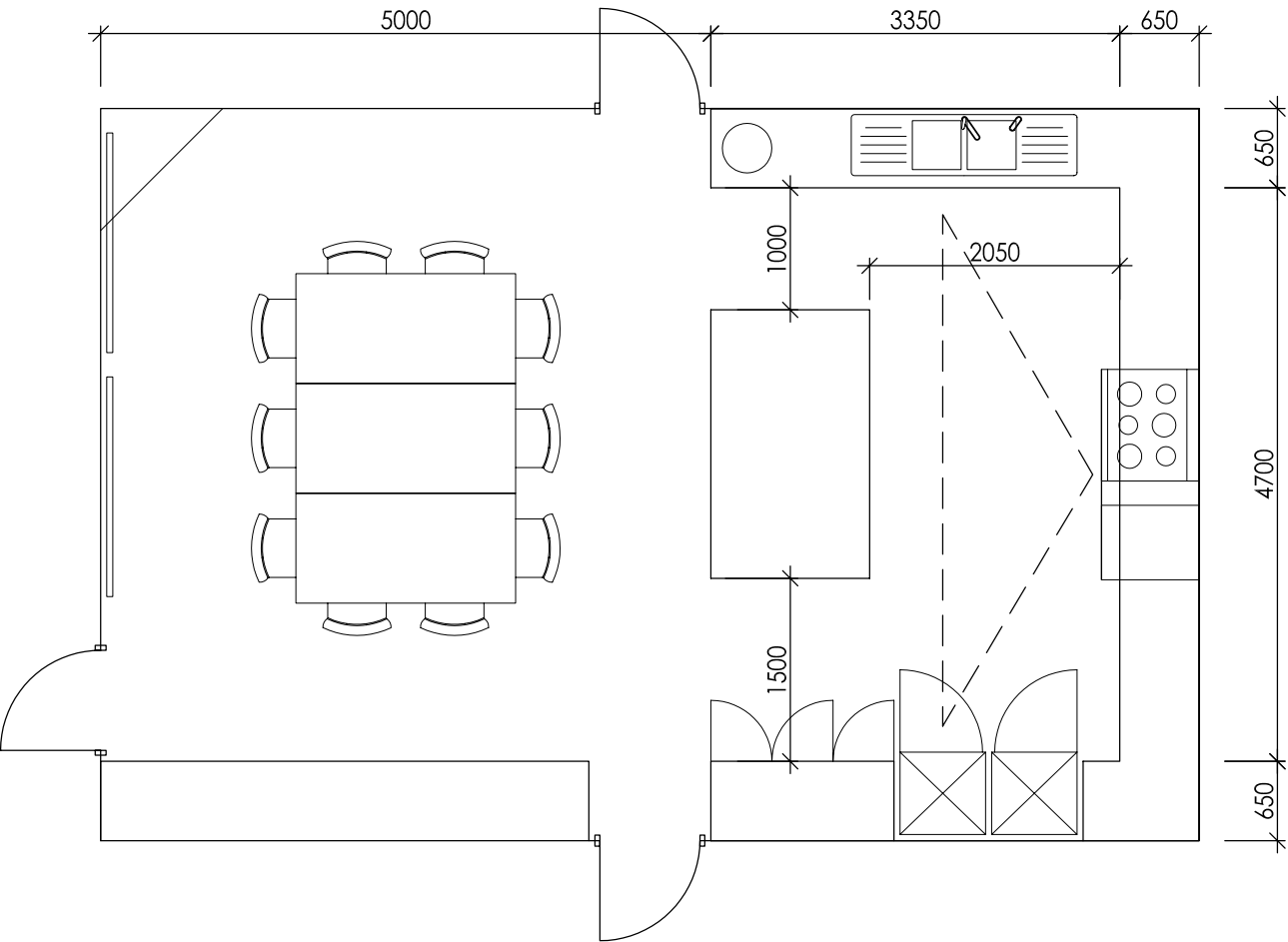
88 Hawthorn Grove, Hawthorn, 3122 VIC Australia  
Tel: (613) 9815 0588 Fax: (613) 9815 0599  
Email: admin@stratapna.com

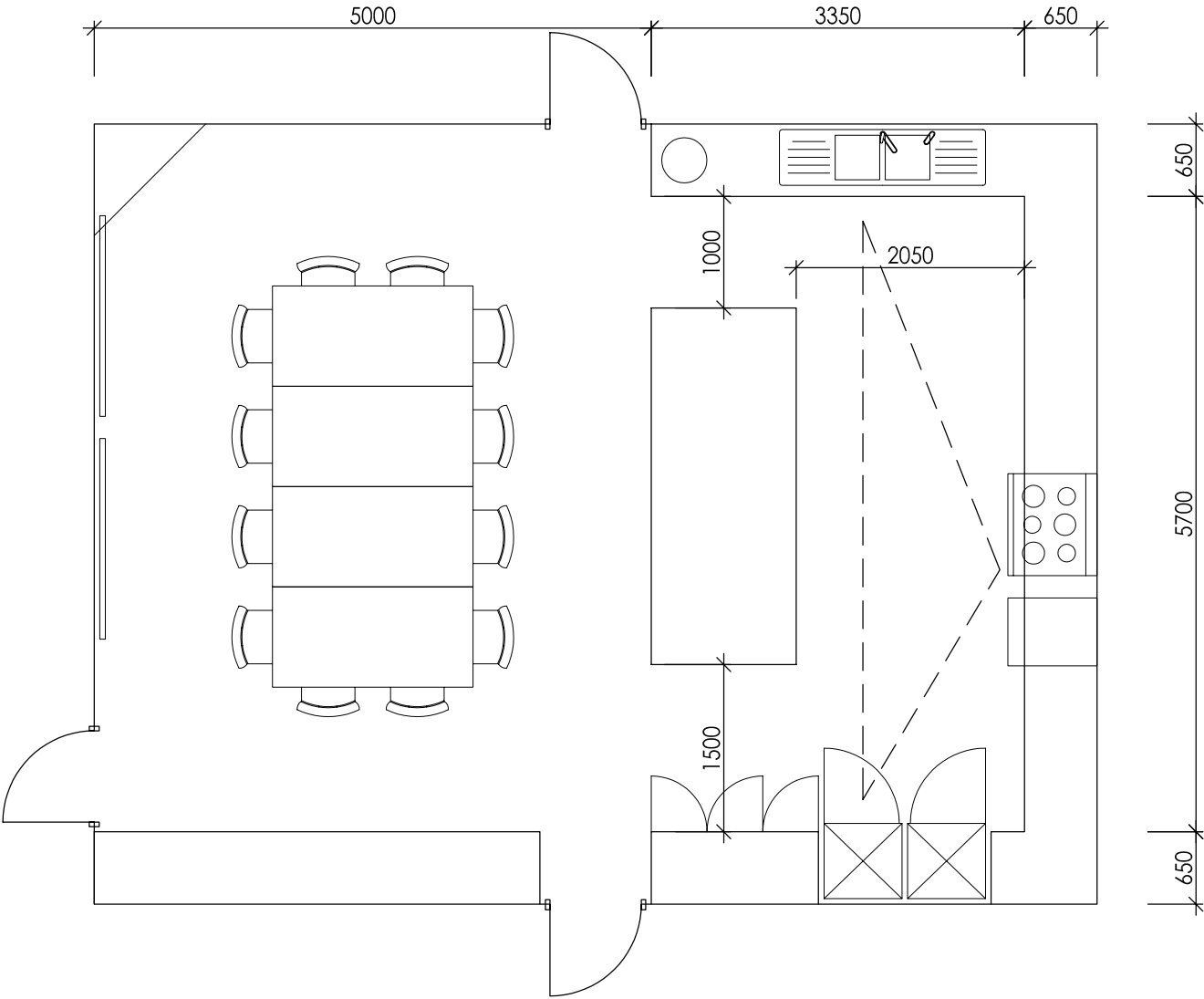


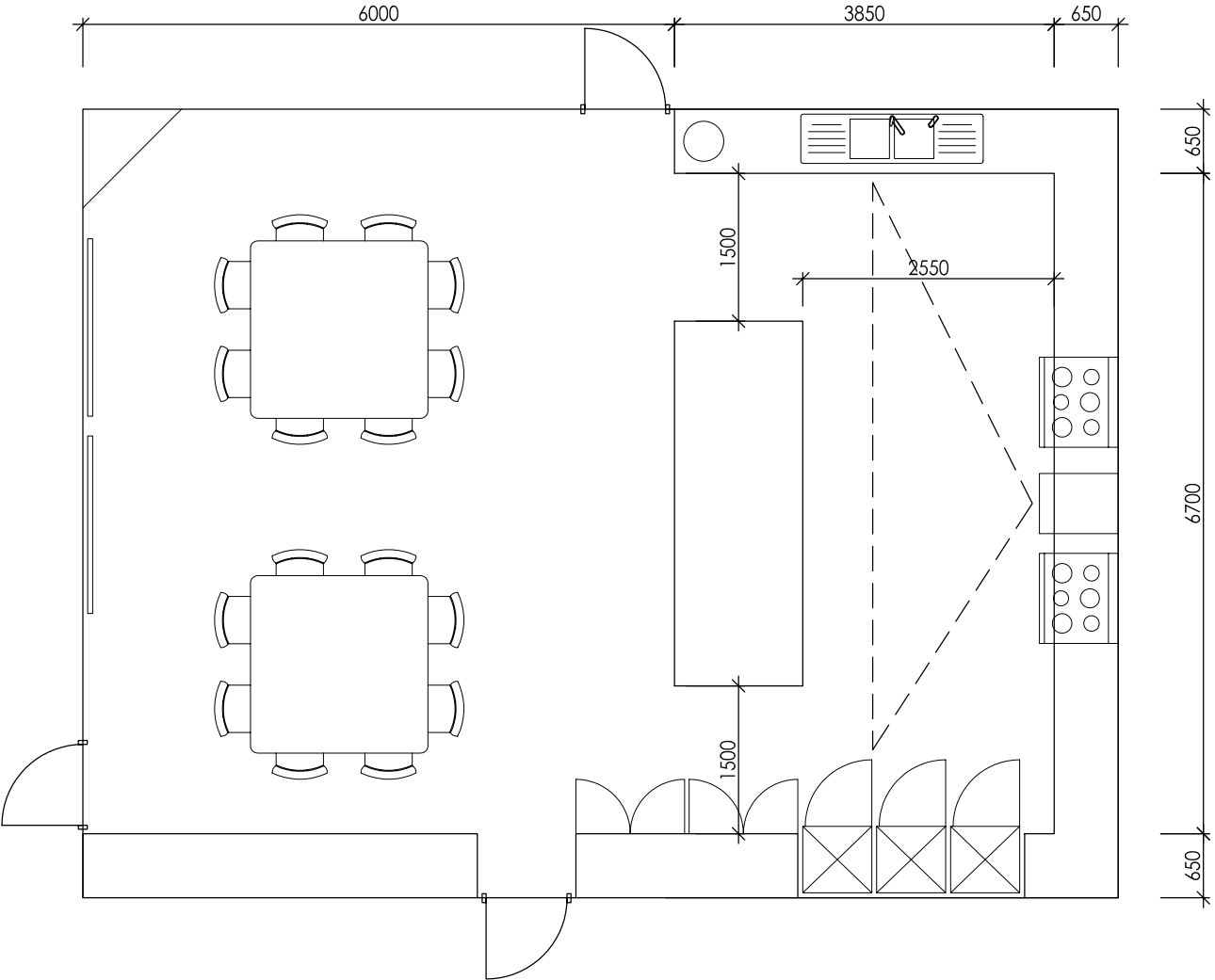


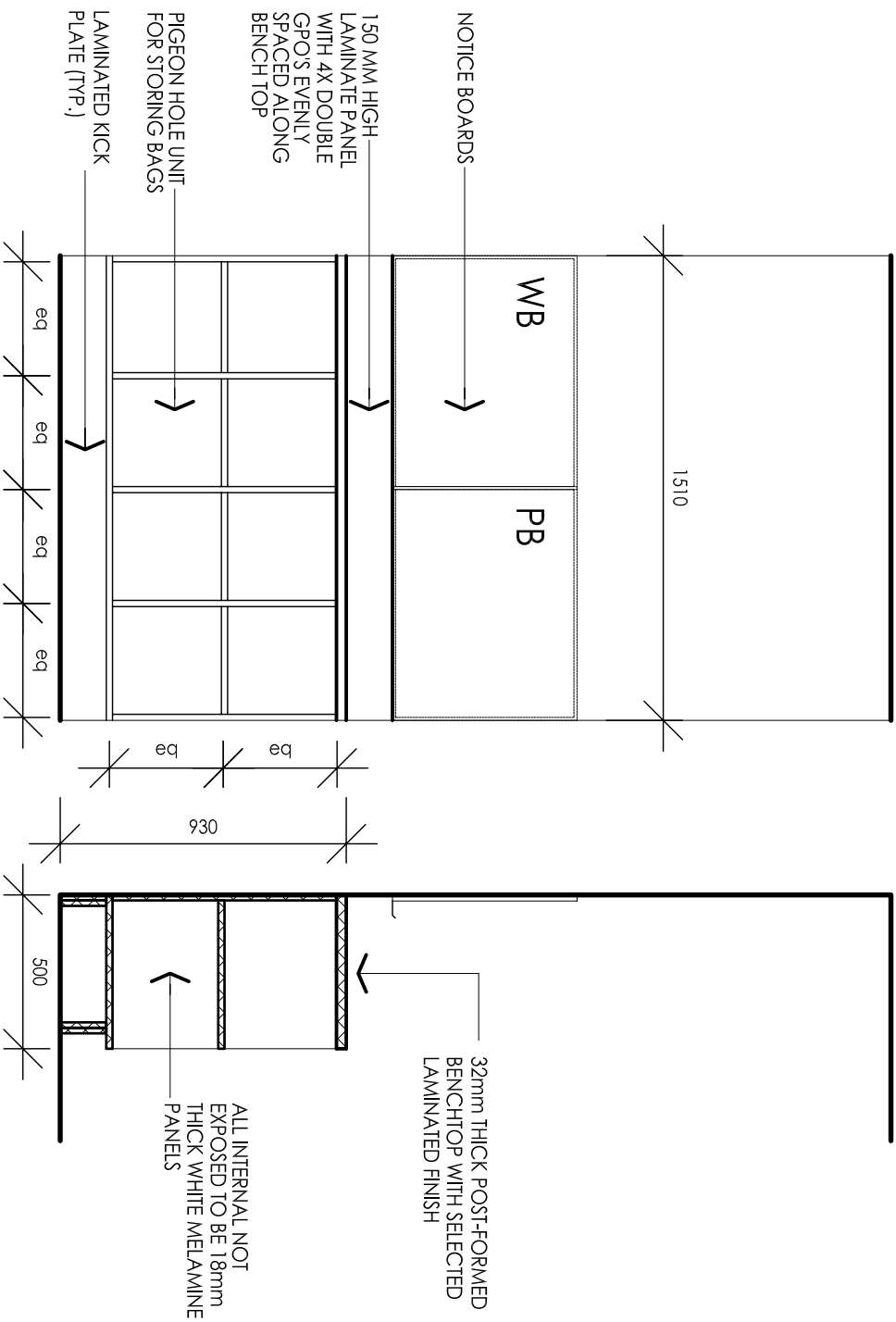












# METROPOLITAN FIRE AND EMERGENCY SERVICES BOARD



## GUIDE CHECKLISTS

### REVISION HISTORY

Revision	Prepared By	Date Prepared	Issue
A	StrataPNA Architects	09/2010	

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	<b>PROJECT NAME:</b>	<b>Name of reviewer:</b>				<b>Date of checklist review:</b>
<b>Item No.</b>	<b>Description</b> <b>BRIEF FORMULATION STAGE</b>	<b>Yes</b>	<b>No</b>	<b>Pending</b>	<b>Item to be carried forward to next Stage</b>	<b>Action</b> Write action required and initials of reviewer in boxes below.
		Place a tick against the appropriate boxes				
	<b>Brief Formulation</b>					
	Has a Site Specific Brief been formulated for this project?					
	Has the Site Specific Brief been clearly defined to include Appliance numbers, personnel and overflow capacity where required?					
	Have you been issued with the Design Manuals and Guidelines?					
	Have all the updates for the design of this facility been identified and issued?					
	Are the goals of Green Star and Environmentally Sustainable Design been clearly defined?					
	Has a project program been formulated for the project?					
	Has the following reference guidelines and standards been issued with this project? <ul style="list-style-type: none"> <li>• Environmental Overlay for Fire Station Design Guidelines</li> <li>• OH&amp;S standards</li> <li>• Gymnasium Design and Space Allocation</li> <li>• Combined Fire Station and MFB Corporate Signage</li> <li>• (add MFB standards and reference material as required)</li> </ul>					



	PROJECT NAME:	Name of reviewer:				Date of checklist review:
Item No.	Description Land Assessment Stage	Yes	No	Pending	Item to be carried forward to next Stage	Action Write action required and initials of reviewer in boxes below.
		Place a tick against the appropriate boxes				
	Have the outstanding items in 'Brief' above been satisfactorily completed? If not, identify items to be carried forward to this stage.					
	Has the building footprint area for the project been determined?					
	Have the external spaces, drill yard, parking and driveways been determined?					
	Has Council's planning dept been contacted to verify zoning, setbacks and other planning requirements?					
	In determining the total site area required, have the following been included: front and site setbacks, landscaped buffers, planning constraints, external spaces, driveways, fall of land, trees and vegetation, authority assets?					
	Is the site large enough to accommodate the proposed facility?					
	Is the site affected by heritage (Planning and Aboriginal) issues?					
	Is there a history of use on the site that could have lead to site contamination?					
	Is the site in a corrosive environment ie within 1km of a coastline?					
	What are the known constraints on the site ie flood zone, planning overlays, unusual wind terrain, within a bush fire zone, road widening etc					
	Are there any environmental constraints in close proximity of the site ie traffic noise, train lines?					
	Are there any underground tanks on site?					

Item No.	Description Land Assessment Stage	Yes	No	Pending	Item to be carried forward to next Stage	Action Write action required and initials of reviewer in boxes below.
	Is a Hazardous Material audit required for this site?					
	Is an Asbestos audit required for this site?					
	Has a site constraints and opportunity analysis been carried out on this site?					
	Have the approach and response driveways been approximately located?					
	Is there clear entry and exit approach sightlines from the site onto the main road?					
	Are any of the driveways to be shared with other users? If yes,					
	Is the site access at least 10m from a road junction? If not, has a traffic engineer been engaged to carry out a traffic flow analysis?					
	Are there significant contours across the site? If yes, will this impact on site layout and land size?					

	<b>PROJECT NAME:</b>	<b>Name of reviewer:</b>				<b>Date of checklist review:</b>
<b>Item No.</b>	<b>Description</b> <b>Land Procurement Stage</b>	<b>Yes</b>	<b>No</b>	<b>Pending</b>	<b>Item to be carried forward to next Stage</b>	<b>Action</b> Write action required and initials of reviewer in boxes below.
		Place a tick against the appropriate boxes				
	Have the outstanding items in 'Land Assessment' above been satisfactorily assessed? If not, identify items to be carried forward to this stage.					
	Has the site been surveyed and the title established?					
	Is the site fully serviced with power, water, gas and sewer? If no, what has not been provided?					
	Are there any easements, covenants or encumbrances on title?					
	Are there any encroachments on the subject site or from the site onto adjoining sites?					
	Has a geotechnical engineering assessment been conducted? if yes, has the report identified unusual sub-ground conditions?					
	Identify and list the relevant stakeholder for this stage. ie Design Steering committee, Facilities & Building, User Group, Fleet, Environment etc.					
	Have the relevant stakeholders been consulted for this stage?					
	Have the appropriate stakeholders signed-off this site?					

FS	PROJECT NAME:	Name of reviewer:				Date of checklist review:
Item No.	Description Schematic Design Stage	Yes	No	Pending	Item to be carried forward to next Stage	Action Write action required and initials of reviewer in boxes below.
		Place a tick against the appropriate boxes				
	Have the outstanding items in 'Land Procurement Stage' above been satisfactorily completed? If not, identify items to be carried forward to this stage.					
	Review - Has the Brief been clearly defined?					
	Review - Have you been issued with the current design standards and guidelines?					
	Review - Has the Site Specific Brief been issued and clearly defined?					
	Has the site layout include templates for fire appliance turning circles into and out of the site?					
	Has the design been able to be oriented to optimize passive sun control?					
	Has an ESD engineer been engaged to provide advice on the design and 'Green Star' compliance?					
	Is there the opportunity for rainwater harvesting without having a charged system?					
	Is the public entry prominently located?					
	Has the design been reviewed for disability access?					
	Has a Disabled Person parking space been located in close proximity to the front entry?					
	Has the designed areas been referenced against the brief areas and any exceptions highlighted?					
	Are plant rooms located on a working floor and not on the roof?					

Item No.	Description Schematic Design Stage	Yes	No	Pending	Item to be carried forward to next Stage	Action Write action required and initials of reviewer in boxes below.
	Is there an outdoor BBQ area in close proximity to the Meals area?					
	Has the outdoor drill area been identified?					
	Is there a secure covered area for bicycle storage?					
	Are the required number of on-site car parks been accommodated?					
	Is there a clear flow for clean-transition-appliance bay response and vice versa?					
	Have the sleeping quarters been located away from potential noise sources?					
	Has a cost plan been prepared for this design stage?					
	Identify and list the relevant stakeholder for this stage. ie Design Steering committee, Facilities & Building, User Group, OH&S, Environment etc.					
	Have the relevant stakeholders been consulted for this stage?					
	Has a presentation of the design and circulation flow been provided to the user groups?					
	Have the appropriate stakeholders signed-off this site?					

FS	PROJECT NAME:	Name of reviewer:				Date of checklist review:
Item No.	Description Developed Design Stage and Town Planning	Yes	No	Pending	Item to be carried forward to next Stage	Action Write action required and initials of reviewer in boxes below.
		Place a tick against the appropriate boxes				
	Have the outstanding items in 'Schematic Design Stage' above been satisfactorily completed? If not, identify items to be carried forward to this stage.					
	Has Council's planning department been consulted for a preliminary assessment of the proposal?					
	Has a Traffic Engineer been engaged to carry out a traffic flow analysis and parking demands?					
	Have Structural and Civil Engineers been engaged to carry out preliminary structural design and stormwater discharge?					
	Have Services Engineers been engaged to investigate adequacy of existing authority services provision?					
	Has the Principal Consultant prepared a program for this stage?					
	Have design meetings with consultants been scheduled for this stage?					
	Has a furniture plan been prepared to test usability of each space and circulation flow?					
	Have 'high-use' areas ie Turn-out, Bedroom, Bathrooms, Kitchen been detailed for presentation at this stage?					
	Has a review of external levels been conducted to ensure surface water flows are adequately collected.					
	Identify potential problematic roof forms leading to internal gutters. Redesign to avoid internal gutters where possible.					
	Has the sizing of gutter and downpipes been calculated for the roof catchment areas?					

Item No.	Description Developed Design Stage and Town Planning	Yes	No	Pending	Item to be carried forward to next Stage	Action Write action required and initials of reviewer in boxes below.
	Is the majority of roof water able to be captured for rainwater harvesting? What size of water tank will be required?					
	Is there a requirement for an interceptor trap for this facility?					
	Has a presentation of the design with furniture plans been provided to the user groups?					
	Has a presentation of the details of the 'high-use' areas been provided to the user groups?					
	Has a cost plan been prepared for this design stage?					
	Identify and list the relevant stakeholder for this stage. le Design Steering committee, Facilities & Building, User Group, OH&S, Environment, Planning, Neighbours etc.					
	Have the relevant stakeholders been consulted for this stage?					
	Have the appropriate stakeholders signed-off this site?					

## **APPENDIX OF SCHEDULES**

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<b>I</b>	<b>Gate Schedule</b>	<b>Page 31</b>
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## APPENDIX A: MATERIALS & FINISHES SCHEDULE

### Notes:

1. Provide finished samples for approval prior to installation – 1 No. 600 x 600 samples unless otherwise noted.
2. Install in strict accordance with manufacturer's specifications.

<b>AP</b>	<b>ACOUSTIC PANEL</b>  <b>Manufacturer</b> WOVEN IMAGE (ph: 02 9913 8668) <b>Product</b> Echo Panel <b>Colour</b> TBA <b>Thickness</b> 9mm <b>Panel Size</b> 2700 x 1200mm <b>Fixing</b> Provide 20mm air gap behind (acoustic rating) using battens spaced at 450mm centres)
<b>BK</b>	<b>EXPOSED BLOCK WORK</b>  <b>Manufacturer</b> NUBRICK <b>Material</b> Face Finish Concrete Block <b>Size</b> Refer Structural Engineer's documents <b>Colour</b> TBA <b>Mortar</b> TBA <b>Joints</b> Rolled horizontal & flush vertical joints
<b>CB</b>	<b>COLORBOND® METAL SHEET CLADDING</b>  <b>Manufacturer</b> LYSAGHT <b>Profile</b> Trimdeck <b>Thickness</b> 0.48 BMT <b>Finish</b> COLORBOND® steel
<b>CFC</b>	<b>COMPRESSED FIBRE CEMENT SHEET</b>  <b>Manufacturer</b> CSR or CEMINTEL™ compressed sheet <b>Size</b> 2400 x 1200mm sheets <b>Type</b> 15mm square edge sheets (external use) <b>Fixing system</b> CEMINTEL Commercial Express Wall™ Façade System <b>Joints</b> expressed <b>Fixings</b> counter sunk screws
<b>CO1</b>	<b>COLOURED CONCRETE PAVING (to courtyard)</b>  <b>Colour</b> TBA by CCS CONCRETE COLOUR SYSTEMS <b>Finished Surface</b> Exposed aggregate, high pressure wash finish <b>Sealant</b> Refer to Painting Schedule
<b>CO2</b>	<b>IN-SITU CONCRETE WITH EXPOSED AGGREGATE FINISH</b>  <b>Colour</b> TBA <b>Finished Surface</b> Exposed aggregate, high pressure wash finish <b>Sealant</b> Refer to Painting Schedule
<b>CO3</b>	<b>COLOURED CONCRETE – HEAVY DUTY PAVING</b>  <b>Colour</b> TBA <b>Finish Surface</b> Broom finish <b>Sealant</b> Refer to Painting Schedule

<b>CP1</b>	<b>CARPET TILES</b>  <b>Manufacturer</b> INTERFACE FLOR – (ph: 03 9214 0704) <b>Type</b> Tufted Multi Level Loop Pile Modular Carpet <b>Product</b> Solid Foundation <b>Colour</b> TBA <b>Underlay</b> To manufacturer's specifications <b>Trims</b> N/A – Carpet to finish flush with adjoining floor materials. Material change to align with wall. <i>Provide 4 No. samples for approval.</i>
<b>CT</b>	<b>SUSPENDED CEILING TILES</b>  <b>Manufacturer</b> ARMSTRONG <b>Product</b> Ultima <b>Edge Profile</b> Square edge with peak porm 24mm exposed tee grid <b>Sheet Sizes</b> 600 x 1200mm
<b>EM</b>	<b>EXPANDED MESH SHEETING</b>  <b>Manufacturer</b> LOCKER GROUP <b>Product</b> Expanded Mesh JE1112 Security Mesh <b>Sheet Widths</b> 1200mm wide <b>Finish</b> Galvanised finish
<b>EP</b>	<b>EPOXY RESIN COATING</b>  <b>Manufacturer</b> PARCHEM (ph: 03 9380 2400) <b>Product</b> Durafloor HP (2 coats) <b>Slip Resistance</b> R12 <b>Colour</b> TBA
<b>FG</b>	<b>FIBREGLASS ROOF SHEETING</b>  <b>Manufacturer</b> AMPELITE FIBREGLASS P/L (Ph: 03 9794 0977) <b>Product</b> Wonderglass GC Industrial grade fibreglass roof sheet <b>Profile</b> Kliplok 700 <b>Colour</b> TBA <b>Fixings</b> stainless steel
<b>LA1</b>	<b>TIMBER VENEER JOINERY – Refer Joinery Schedule</b>  <b>Product</b> LAMINEX <b>Colour</b> TBA <b>Substrate</b> E1 Particleboard <b>Sealant</b> Clear 2-pack low sheen seal
<b>LA2</b>	<b>LAMINATE JOINERY – Refer Joinery Schedule</b>  <b>Product</b> LAMINEX <b>Colour</b> TBA <b>Substrate</b> E1 Particleboard
<b>MAT</b>	<b>ENTRANCE MAT – recessed matting</b>  <b>Manufacturer</b> BIRRUS MATTING SYSTEMS <b>Product</b> Matador <b>Colour</b> TBA <b>Size</b> Refer to plan for extend. Site measure & install to size. <i>Allow to set down matting flush with concrete paving; maximum 3mm floor level</i>

	<i>difference to adjacent surface to AS1428.1:200xDRAFT.</i>	
<b>PPW</b>	<b>CONCRETE PRECAST PANEL</b>	
	<b>Product</b>	CONCRETE PRECAST LANDSCAPE WALL
	<b>Colour</b>	TBA
	<b>Finish</b>	<u>Outer face:</u> Class 1 off-form finish rib, pattern <u>Inner face:</u> Class 1
	<b>Form Liner</b>	RECKLI 1/171 Sinus 18/76
	<b>Panel Size</b>	2600mm wide
	<b>Sealant</b>	<u>Outer face (public access):</u> anti graffiti seal <u>Outer face (no public access):</u> penetrating seal <u>Inner face:</u> penetrating seal
<b>PBI</b>	<b>PLASTERBOARD – ‘IMPACTCHEK’</b>	
	<b>Product</b>	GYPROCK ‘Impactchek’
	<b>Thickness</b>	13mm
	<b>Sheets</b>	1200 x 2700mm, square edge
	<b>Finish</b>	Paint Finish
<b>PBS</b>	<b>PLASTERBOARD – ‘SOUND’</b>	
	<b>Product</b>	GYPROCK ‘Fyrechek’
	<b>Thickness</b>	2 layers – 13mm fire rated plasterboard to both sides of RONDO quiet studs
	<b>Insulation</b>	refer architectural specification
	<b>Finish</b>	Paint Finish
<b>PBA</b>	<b>PLASTERBOARD – ‘AQUACHEK’</b>	
	<b>Product</b>	GYPROCK ‘Aquachek’
	<b>Thickness</b>	13mm
	<b>Sheets</b>	1200 x 2700mm
	<b>Finish</b>	Paint Finish
<b>PB</b>	<b>PLASTERBOARD</b>	
	<b>Product</b>	GYPROCK (ceiling)
	<b>Thickness</b>	10mm
	<b>Finish</b>	Paint Finish
<b>RB</b>	<b>RUBBER FLOORING</b>	
	<b>Manufacturer</b>	REGUPOL (Australia) (ph: 02 9820 1233)
	<b>Product</b>	REGUPOL Everlast Flooring
	<b>Thickness</b>	8mm
	<b>Colour</b>	TBA
<b>SK</b>	<b>SKIRTING</b>	
	<b>Type</b>	flat anodised aluminium 100mm high
	<b>Colour</b>	TBA
<b>SS</b>	<b>STAINLESS STEEL</b>	
	<b>Material</b>	2mm stainless steel – cast, welded and folded as required by application
	<b>Finish</b>	Brushed, No. 4

<b>TB</b>	<b>TIMBER BATTENS</b>  <b>Manufacturer/Supplier</b> RADIAL TIMER SALES (ph: 03 9768 2100) <b>Product</b> Dressed Bevelled Edge Boards <b>Species</b> TBA <b>Profile</b> 55 x 40mm (bevelled/seasoned/DAR) <b>Finish</b> Paint Finish
<b>TL1</b>	<b>CERAMIC TILES</b>  <b>Supplier</b> CERAMIC SOLUTIONS (ph: 03 9545 5322) <b>Product</b> Stroher Stalotec <b>Colour</b> TBA <b>Finish</b> Plain <b>Size</b> 240 x 115mm, 10mm thick <b>Cove</b> STALOTEC 4000 coving tile 240 x 100mm <b>Grout</b> PCI Durafug NT – colour TBA
<b>TL2</b>	<b>CERAMIC TILES – BATHROOMS</b>  <b>Supplier</b> CERAMIC SOLUTIONS (ph: 03 9545 5322) <b>Product</b> Stroher Secuton <b>Colour</b> TBA <b>Finish</b> 8802 starpoint studded tile <b>Size</b> 196 x 196mm, 10mm thick <b>Cove</b> 8640 coved base, 196 x 96 x 8mm <b>Grout</b> PCI Durafug NT – colour TBA
<b>TP</b>	<b>THERMOMASS CONCRETE PANEL</b>  <b>Product</b> CONCRETE PRECAST WALL – THERMOMASS SYSTEM <b>Colour</b> TBA <b>Finish</b> <u>Outer face:</u> Class 1 off-form finish rib, pattern <u>Inner face:</u> Class 1 <b>Form liner</b> RECKLI 1/171 Sinus 18/76 <b>Panel Size</b> 2600mm wide <b>Sealant</b> <u>Outer face:</u> anti graffiti seal <u>Inner face:</u> penetrating seal
<b>TV</b>	<b>TIMBER VENEER WALL LINING</b>  <b>Product</b> LAMINEX 'Natural Timber Veneers' <b>Species</b> TBA <b>Substrate</b> 12mm plywood <b>Sealant</b> Clear finish – refer to Interior Paint Schedule – Appendix B <b>Edging</b> N/A
<b>VB</b>	<b>VILLABOARD SOFFIT LINING</b>  <b>Manufacturer</b> JAMES HARDIE (ph: 131 103) <b>Product</b> 6mm Villaboard <b>Control Joints</b> Flush joints 3.6m centres <b>Finish</b> Paint finish
<b>WAP</b>	<b>AQUAPANEL WALL LINING</b>  <b>Product</b> LAMINEX Aquapanel Wet Area Panelling <b>Thickness</b> 2.7mm

	<b>Finish</b> Gloss <b>Colour</b> TBA <b>Joints</b> Install panelling without mouldings. Allow for expansion gaps. Seal joints with 'LAMISEAL'; colour match to panelling <b>Substrate Generally</b> AQUACHEK moisture resistant plasterboard <b>Substrate to Concrete</b> Fix in accordance with manufacturers specifications; do not direct stick to concrete panels
<b>MANUFACTURERS/SUPPLIERS:</b>  <b>RECKLI form liner available from:</b> RECKLI Building 1/123 Pipe Rd, Cnr Hume Rd North Laverton VIC 3026 Ph: 0418 176 044	

<b>APPENDIX D: SANITARY WARE SCHEDULE</b>					
<b>Location</b>	<b>Item</b>	<b>Manufacturer/Supplier</b>	<b>Type</b>	<b>Colour</b>	<b>No.</b>
<b>Appliance Bay</b>	sink	BRITEX	HBS wall mounted sink without splashback	stainless steel	1
	sink	ENWARE	Level Pillar Tap 15mm with aerated outlet 7 150mm lever 5 star rating (5.6lpm) pre-mixed set temperature	chrome plate	1
	pits		<i>refer to Hydraulics Drawings</i>	Heelguard (DDA compliant) slip resistant grates	6
<b>Lecture Room</b>	sink	CLARK	Benchmark No. 1003 930mm single end bowl LH 1 tap hole	stainless steel	1
	sink mixer	POSH	Solus Sink Mixer (7.5Lt/min) with extended lever	chrome plate	1
<b>Visitors' WC</b>	toilet suite	CAROMA	Care Pan Concealed Trap with - Sovereign 2000 cistern, push button option No. 405067 - Colani single flap seat No. 813000 - extended flush pipe in accordance with AS1428-1	white	1
	wall basin with shroud	CAROMA	Caroma Care Integra 500 No. 648210 with chrome covered uni plug	white & vitreous china	1
	basin mixer	CAROMA	Solus basin mixer aerated outlet & flow restrictor (7.5Lt/min) with 150mm extended lever	chrome plate	1

<b>Mess (kitchen)</b>	sink	CUSTOM MADE	Cast and formed double bowl sinks (no. 400 x 400 x 220 deep) with 500mm long side insets draining to sinks Integrated in SS benchtop.	stainless steel	1
	sink mixer	CAROMA	Solus Sink Mixer (7.5Lt/min)	chrome plate	1
<b>Bathrooms</b>	toilet suite	CAROMA	Trident Sovereign 2000 Connector with 4.5/3 smart flush dual flush cistern. Caroma double flap closed front snap-on detachable toilet seat Ministop stopcock, chrome finish	white	1 per room
	wall basin with shroud	CAROMA	Faun 450 No. 640210 & shroud No. 651350 with chrome covered uni plug	white & vitreous china	1 per room
	basin mixer	POSH	Solus basin mixer Aerated outlet & flow restrictor (7.5Lt/min)	chrome plate	1 per room
	shower rose	POSH	Solus 4 Function High Rise 7.5Lt hi rise arm with wall plate & adjustable shower head	chrome plate	1 per room
	shower mixer	POSH	Solus shower & bath mixer Aerated outlet & flow restrictor (7.5Lt/min)	chrome plate	1 per room
	shower base	POSH	Canterbury MK11 rectangular 900 x 1500, rear outlet horizontal	white	1 per room
<b>Cleaners' Store</b>	cleaners' sink	CAROMA	No.811592 with grate	white	1
	tap ware	ENWARE	Traditional hose tap 15mm set (hot & cold taps)	chrome plate	1
<b>Breathing Apparatus</b>	spray gun	LW GEMMELL & ASSOCIATES	Pr2 Spray Gun Z-8000-PR2		1

	hose	LW GEMMELL & ASSOCIATES	T&S Replace S/S Hose No handle 1200mm Z-8000-H48	stainless steel	1
	wall hook	LW GEMMELL & ASSOCIATES	wall hook for gun Z-8000-WHK1		1
	adapter	LW GEMMELL & ASSOCIATES	NPT to 15mmFi adapter TS99A		1
	trough & bench	BRITEX	grade 304, No. 4 finish stainless steel bench top & trough with splashback & shelf under	stainless steel	1
	tap ware	ENWARE	Traditional Wall Top Assembly 15mm set (hot & cold taps)	chrome plate	1
External	garden taps	TBA	TBA	TBA	TBA
<b>MANUFACTURERS/SUPPLIERS:</b>  LW GEMMELL & ASSOCIATES Ph: 03 9459 4411					



APPENDIX E: FITTINGS, FIXTURES & FURNITURE SCHEDULE				
Location	Item	Manufacturer	Type	No.
Appliance Bay	soap dispenser & refill	ECONOMIST AUSTRALIA	No. SZ5001 Spray Soap dispenser plus No. VU5001 800mm Soap hand lotion refill	1
	paper towel dispenser	METLAM	No. ML4093 S/S Roll Towel dispenser, stainless steel	1
Public Entry	letterbox	THE LETTERBOX MAN	No. d. 3080 MB1 Front retrieval wall mounted box 175h x 250w x 350d, aluminium	1
Station Office	office chairs	TURNCO	<i>refer Turnco quotation provided</i>	3
	pin board	TURNCO	a) 3400 x 430, b) 2400 x 1400, c) 1600 x 1400	3
	white board	TURNCO	1200 x 1400	1
	robe hooks	METLAM	No. ML4158 stainless steel hook	6
Lecture Room	lecture chairs	TURNCO	TBA	8
	table	TURNCO	TBA	1
	pin board	TURNCO	2400 x 1200	1
	white board	TURNCO	2400 x 1200	1
	TV wall bracket	ATDEC or similar approved	Teledec minispace size according to weight	1

	roll paper towel dispenser	METLAM	No. ML4093 S/S Roll Towel dispenser, stainless steel	1
	robe hooks	METLAM	No. ML4158 stainless steel hook	6
<b>Visitors' WC</b>	shelf	JD MACDONALD	610 x 125mm surface mounted stainless steel shelf No. 0692-542 No. 4 satin finish	1
	grab rail 1	JD MACDONALD or approved alternative supplier	No. 73 GRC00 18-gauge 304 stainless steel tubing satin finish install in accordance with AS 1428	1
	grab rail 2	JD MACDONALD or approved alternative supplier	No. 73 GRC53 18-gauge 304 stainless steel tubing satin finish install in accordance with AS 1428	1
	toilet roll holder	REECE	Phoenix – Gen X toilet roll holder with satin chrome plate	1
	mirror above sink	PILKINGTON	Optimirror-Protect Grade A safety glass - clear - 1200 x 600 x 4mm thick - 12mm moisture resistant MDF substrate	1
	mirror full-length	PILKINGTON	Optimirror-Protect Grade A safety glass - clear - 1950 x 600 x 4mm thick - 12mm moisture resistant MDF substrate	1
	soap dispenser & refill	ECONOMIST AUSTRALIA	No. SZ5001 Spray Soap dispenser plus No. VU5001 800mm Soap hand lotion refill	1

	roll paper towel dispenser	METLAM	No. ML4093 S/S Roll Towel dispenser	1
	robe hooks	METLAM	No. ML4158 stainless steel hook	2
<b>Mess (kitchen)</b>	table	TURNCO	TBA	2
	pin board	TURNCO	1800 x 900	1
	white board	TURNCO	1800 x 900	1
	bin drawer	KIMBERLEY	No. KRB14D 44ltr. Pull-out bin drawer with waste bin	2
	TV wall bracket	ATDEC or similar approved	Teledec minispace size according to weight	1
	roll paper towel dispenser	METLAM	No. ML4093 S/S Roll Towel dispenser	1
<b>Lounge</b>	coffee table	TURNCO	TBA	1
	pin board	TURNCO	2400 x 1200	1
	robe hooks	METLAM	No. ML4158 stainless steel hook	8
<b>Break-Out</b>	coffee table	TURNCO	TBA	1
	robe hooks	METLAM	No. ML4158 stainless steel hook	4
<b>Bedrooms</b>	chair	TURNCO	TBA	1 per room
	robe hooks	METLAM	No. ML4158 stainless steel hook	2 per room
<b>Bathrooms</b>	toilet roll holder	REECE	Phoenix – Gen X toilet roll holder with satin chrome plate	1 per room

	soap dispenser & refill	ECONOMIST AUSTRALIA	No. SZ5001 Spray Soap dispenser plus No. VU5001 800mm Soap hand lotion refill	1
	shower screen	HAWTHORN	hinged pivot door with matt anodised frame & safety glass to AS1288 & AS2208	1 per room
	shelf	JD MACDONALD	610 x 125mm surface mounted stainless steel shelf No. 0692-542 No. 4 satin finish	1 per room
	shower seat	JD MACDONALD	No. 8203-M-AU compact rectangular phenolic fold-up shower seat	1 per room
	towel rail	JD MACDONALD	GRABRAIL Clean Seal	1 per room
	roll paper towel dispenser	METLAM	No. ML4093 S/S Roll Towel dispenser	1 per room
	robe hooks	METLAM	No. ML4158 stainless steel	2 per room
	shower soap dispenser & refill		No. H80533 Alpha Mouss Shower dispenser plus No. H80534 Alpha Mous 3 in 1 refill (300ml)	1
<b>Personal Drying Room</b>	hanging rails	TBA	35mm dia. CHS brushed stainless steel	1
<b>PPE Change Room</b>	PPE racks	R.E. WALTERS PTY LTD	600 x 600 Fileguard PPE Cages Powdercoat finish – colour TBA	49
<b>PPE Dry Store</b>	hanging rail		35mm dia. CHS brushed stainless steel	1
<b>Turnout Alcove</b>	drafting chair	TURNCO	TBA	1
	pin board	TURNCO	a) 880 x 1000, b) 2300 x 1000	2

			b)	
	key safe	FILEGUARD	MFESB Key Safe 60 key capacity	1
<b>Cleaners' Store</b>	mop/broom rack	METLAM	No. ML981 stainless steel mop & broom rack with 5 holders (1168mm)	2
	bench	CUSTOM MADE	KDHW timber planks & steel brackets fixed to wall	1
<b>Spare PPE Storage</b>	hanging rails		35mm dia. CHS brushed stainless steel	
<b>Station Store</b>	adjustable shelving	DEXICON	Ultima Longspan 900w x 400d x 2000h Adjustable shelving with steel shelves	3
<b>Breathing Apparatus</b>	white board	TURNCO	2400 X 1200	1
	roll paper towel dispenser	METLAM	No. ML4093 S/S Roll Towel dispenser	1
	EMR cabinet	PRINCIPAL SUPPLIED	Principal to install	1
<b>Hose Bay</b>	shelving	PRINCIPAL SUPPLIED	Contractor to install	1
	bike rack	SECURABIKE or similar approved	CBR4SC – compact security bike rack (for 4 bicycles) Galvanised finish	1
<b>BBQ Area</b>	table	TURNCO	TBA	1
	chairs	TURNCO	TBA	8
<b>MANUFACTURERS/SUPPLIERS:</b>				
<b>TURNCO COMMERCIAL FURNITURE</b> 962 Mount Alexander Rd				

Essendon VIC 3040  
Ph: 03 9375 4944  
Mobile: 0411 880 728  
Contact: Cheryl Moulin

**R.E. WALTERS PTY LTD**

3-11 Market Rd  
Sunshine VIC 3020  
Ph: 03 9310 1671  
Contact: Pat O'Maley

**HAWTHORN SHOWER SCREENS**

Ph: 03 9853 0053

**JD MACDONALD**

65-73 Nantilla Rd  
Clayton North VIC 3168  
Ph: 03 9271 6400

**METLAM AUSTRALIA**

7 Sauer Rd  
New Gisborne VIC 3438  
Ph: 03 5428 4618

**LW GEMMELL & ASSOCIATES**

59 Kylta Rd  
West Heidelberg VIC 3081  
Ph: 03 9459 4411

**THE LETTERBOX MAN**

218 Lutwyche Rd  
Windsor QLD 4030

**SECURABIKE**

2/89 Enterprise Way  
Sunshine West VIC 3020

**ECONOMIST AUSTRALIA P/L**  
Ph: 03 9873 8407

<b>APPENDIX F: APPLIANCE SCHEDULE</b>				
<b>Location</b>	<b>Item</b>	<b>Model/Code</b>	<b>Type</b>	<b>Details</b>
<b>Lecture Room</b>	zip hydro tap	BCD60/85 Instant Boiling & Chilled Filtered Water (under sink) unit No. 37676 with disabled lever.	Electric	Supplier: ZIP HYDRO TAP
	zip hydro tap	"font" grille tray No. 90046		Supplier: ZIP HYDRO TAP
<b>Mess (kitchen)</b>	dishwasher	GOLDSTEIN ESWOOD built-in dishwasher No. UC25NDP	Electric	Commercial Grade Appliance
	free standing oven/cooktop	GOLDSTEIN ESWOOD heavy duty static oven No. PE-6R-28 900 wide x 800 deep x 1120 high	Electric	Commercial Grade Appliance
	griddle	GOLDSTEIN ESWOOD heavy duty griddle No. GPEDDB24	Electric	<i>Note: Provide adequate ventilation between griddle &amp; joinery.</i>
	rangehood	CUSTOM	Electric	<i>Note: Custom stainless steel hood.</i>
	zip hydro tap	BC100/125 Instant Boiling & Chilled Filtered Water (under sink) unit No. 30271	Electric	Supplier: ZIP HYDRO TAP
	refrigerators (x 2)	WESTINGHOUSE No. WTM4200WB fridge & freezer 1 x left hand, 1 x right hand opening	Electric	
	microwave (x 2)	PANASONIC Inverter 1200 watt	Electric	SUPPLIED BY PRINCIPAL
<b>BBQ Area</b>	bbq & stainless	D.A. CHRISTIE brick-in Electric Park	Electric (3.6kW)	Distributor: 1300 135 227



	steel bench	Safe cooking system No. BI-E-02 cooking insert No. SSBT/1 bench top		
<b>Vacuum Plant</b>	complete ducted vacuum system including plant, pump, hoses & fittings	Vacuum Pump: Rietshle SAP 530 side channel design (direct drive). Activated via low voltage control circuit at each inlet valve. Motor: continuously rated 415 volt, 15 Amps. (72 dBA noise level). Hoses: 3 x 8m x320 vacuum hoses Inlets: metal square intels with surround, white. Mount 300mm affl. Pipework: generally concealed in ceiling space. 1 x single exposed run at high level in appliance bay.	Electric	Ducted Vacuum System to be supplied & installed by nominated sub-contractor: INDUSTRIAL VACUUM DESIGN.
<b>MANUFACTURERS/SUPPLIERS:</b>  <b>ZIP HYDRO TAP</b> Ph: 02 9796 3100 Mobile: 0418 227 242 Contact: Vanessa Beever  <b>INDUSTRIAL VACUUM DESIGN</b> 0407 559 896  <b>GOLDSTEIN ESWOOD</b> 03 9604 7333				

## APPENDIX G: DOOR SCHEDULE

### Notes:

1. All glazing in accordance with AS1288 & AS2208
2. Anodised aluminium shall be minimum 25 microns thick.
3. Double glazing to all external glazed doors unless otherwise specified.
4. CLEARSHIELD protective coating to outside face of all external doors and both faces of Appliance Bay doors.
5. Hinges external doors – McCALLUM No. A104NA Aluminium Heavy Duty Fast Fix Hinge
6. Hinges internal doors – LOCKWOOD No. LW10070BBFFSSS 100 x 70 x 2.5mm Fast Fix Hinge
7. All cylinders to be keyed alike.

	Type	Manufacturer/Product	Finish	Operator
D01 D02 D03 D11	Bi-fold lift-up glazed door (appliance bay)	ARCO COMMERCIAL DOOR SYSTEMS P/L or DOOR REPAIR AND MAINTENANCE PTY LTD	Frame: galvanised steel frame Glazing beads: natural anodised aluminium Glazing: 4mm toughened or 6.38mm laminated grey glazing Kick panel: anodised aluminium natural finish Signage: Appliance Bay door signage	Motorised: motorisation control unit & security & electrical interface Indicator lights: refer specification Light beams: refer specification Controls: refer specification
D04	Automatic double glazed single slide door	Automatic track & mechanism: DORMA BWN AUTOMATICS EL301 Ezy Fit series Door frame: CAPRAL 200 Narrowline Window frame: CAPRAL 406 St Lucia	Frame: natural anodised aluminium finish Glazing: clear laminated glazing. Thickness in accordance with AS1288 Signage: Vision Strips to sliding door & fixed panel	Motorised: refer to manufacturer's specification

	Type	Frame	Finish	Glazing	Lock/Latch	Furniture	Seals	Closer	Kick	Stop
D05	CAPRAL ALUMINIUM 275 series external glazed hinged double doors	CAPRAL Aluminium 400 Narrowline  CAPRAL	Door & frame: anodised natural finish	G2  Vision strips	Electric mortice lock: LOCKWOOD No. 3582ELENOLSC 12VDC 23mm	Lever: LOCKWOOD No. 5801/70SC bras round short backset exterior plate cylinder &	Threshold: CAPRAL EO854 Bottom seal: RAVEN nylon brush seal Head & jambs:	2 x C1	N/A	YES

		No. EO854 Aluminium Threshold Plate			elec. Mort. Secure non. Mon. no cyl No. LC8810 277mm cable transfer device lead cover Card reader: to outside	lever No. 5905/70SC brass round short backset interior plain plate & lever	in accordance with CAPRAL specifications			
<b>D06</b> <b>D07</b>	CAPRAL ALUMINIUM 275 series external glazed hinged door EXIT ONLY	CAPRAL Aluminium 400 Narrowline  CAPRAL No. EO854 Aluminium Threshold Plate	Door & frame: anodised natural finish	G2  Vision strips	Electric mortice lock: LOCKWOOD No. 3582ELENOLSC 12VDC 23mm elec. Mort. Secure non. Mon. no cyl No. LC8810 277mm cable transfer device lead cover Card reader: to outside	Lever: LOCKWOOD No. 5801/70SC bras round short backset exterior plate cylinder & lever No. 5905/70SC brass round short backset interior plain plate & lever	Threshold: CAPRAL EO854 Bottom seal: RAVEN nylon brush seal Head & jambs: in accordance with CAPRAL specifications	2 x C1	N/A	YES
<b>D08</b>	CAPRAL ALUMINIUM 275 series external glazed hinged door	CAPRAL Aluminium 400 Narrowline  CAPRAL No. EO854 Aluminium Threshold	Door & frame: anodised natural finish  Fixed panel: paint finish	G2	Electric mortice lock: LOCKWOOD No. 3582ELENOLSC 12VDC 23mm elec. Mort. Secure non. Mon. no cyl	Lever: LOCKWOOD No. 5801/70SC bras round short backset exterior plate cylinder & lever No. 5905/70SC brass round	Threshold: CAPRAL EO854 Bottom seal: RAVEN nylon brush seal Head & jambs: in accordance with CAPRAL specifications	C2	N/A	YES

		Plate			No. LC8810 277mm cable transfer device lead cover Card reader: to outside	short backset interior plain plate & lever				
<b>D09</b>	CAPRAL ALUMINIUM	CAPRAL Aluminium 400 Narrowline	Door & frame: anodised natural	G2	Electric mortice lock: LOCKWOOD	Lever: LOCKWOOD No. 5801/70SC brass round Flush bolt: INGERSOLL RAND No. 1901- 03SC 300 x 19mm & No. 1901-04SC 450 x 19mm	Threshold: CAPRAL EO854	C2	N/A	YES
<b>D14</b> <b>D15</b> <b>D16</b>	Solid core flush panel hinged door with grille	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	Mortice lock: LOCKWOOD no. 3572Z-LSC mortice escape lock with cylinder	Lever: LOCKWOOD No. 2801/70SC brass round end exterior plate cylinder & lever No. 2905/70SC brass round end interior plain plate & lever	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C4	YES	N/A
<b>D17</b>	Solid core flush panel hinged door with grille	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	Mortice lock: LOCKWOOD No. 3574SC mortice passage latch (no locking	Lever: LOCKWOOD No. 2801/70SC brass round end exterior plate	Head & jambs: in accordance with CAPRAL specifications to suit 400	C4	YES	N/A

					function)	cylinder & lever No. 2905/70SC brass round end interior plain plate & lever	Narrowline frame			
<b>D18</b>	Solid core flush panel hinged double door with view panels	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	view panel with UV film	N/A	Push plate: LOCKWOOD No. 21407NNSS #214 series to both doors Pull: LOCKWOOD No. 21524NN/07SS #214 series to both doors	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	2 x C3	YES	N/A
<b>D19 D33</b>	Flush panel hinged solid core door with grille above	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	Mortice lock: LOCKWOOD No. 3574SC mortice passage latch (no locking function)	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C3	YES	YES
<b>D21</b>	Flush panel hinged double solid core door with view panel	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	view panel with UV film	N/A	Push plate: LOCKWOOD No. 21407NNSS #214 series to both doors Pull: LOCKWOOD No. 21524NN/07SS	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	2 x C3	YES	YES

						#214 series to both doors				
<b>D22</b>	Flush panel hinged solid core door undercut	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	Mortice lock: LOCKWOOD No. 3572Z-RSCNCYL mortice escape lock no cylinder Bi-lock cylinder & key: MFB to supply	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C4	YES	YES
<b>D23</b>	Flush panel hinged door with view panel	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	view panel	Mortice lock: LOCKWOOD No. 3574SC mortice passage latch (no locking function)	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C2	YES	YES
<b>D24</b>	Hinged glazed door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	clear laminated glazing to AS1288	Mortice lock: LOCKWOOD No. 3574SC mortice passage latch (no locking function)	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C2	YES	YES
<b>D25</b> <b>D43</b>	Flush panel solid core hinged door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	Ball catch: DALCO 70mm brass double ball catch	Pull: LOCKWOOD No. 07SSS 150 x 16mm pull handle	N/A	N/A	N/A	YES
<b>D26</b>	Solid core flush panel hinged	CAPRAL Aluminium	Frame: anodised	N/A	Mortice lock: LOCKWOOD	Lever: LOCKWOOD	Head & jambs: in accordance	N/A	YES	YES

	door undercut	400 Narrowline	natural finish Door: paint finish		No. 3572EARSC mortice vestibule anti-lock-out privacy lock	No. 3880/3881/37SC Daintree Gidgee on round rose full set Privacy latch: DORMA No. 5309 indicating emergency button, satin chrome finish DORMA No. 5310 disabled turn snib, satin chrome finish	with CAPRAL specifications to suit 400 Narrowline frame			
<b>D27</b>	Glazed hinged cat & kitten solid core door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	clear laminated glazing to AS1288	Mortice lock: LOCKWOOD No. 3584SC mortice passage latch	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C3	YES	YES
<b>D28</b>	44mm flush panel hinged cat & kitten solid core door with view panel	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	view panel	Mortice lock: LOCKWOOD No. 3574SC mortice passage latch (no locking function)	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: RP10 to door frame. RP16Si or RP71 astragal seals to double doors (1 each door) Bottom seal: RAVEN RP8Si Threshold plate: RAVEN RP66	2 x C3	YES	YES

<b>D29</b>	LOTUS room divider No. 100S/45/CD2 100mm thick, Rw 45	LOTUS standard 10mm aluminium Track: centre stacking No.1 track	Track & frame: anodised natural finish Door: echo panel pin boards to both sides No. 442	N/A	N/A	Closer: LOTUS 'D Passdoor'	Head & jambs: fixed sweep top seals, retractable bottom seals	N/A	LOTUS kick rails	N/A
<b>D30</b>	Solid core flush panel hinged cat & kitten door with view panel	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	view panel	Mortice lock: LOCKWOOD No. 3574SC mortice passage latch (no locking function)	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Head & jambs: RP10 to door frame. RP16Si or RP71 astragal seals to double doors (1 each door) Bottom seal: RAVEN RP8Si Threshold plate: RAVEN RP66	2 x C3	YES	YES
<b>D31</b>	Hinged glazed door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	clear laminated glazing to AS1288	N/A	Push plate: LOCKWOOD No. 21407NNSS #214 series to both doors Pull: LOCKWOOD No. 21524NN/07SS #214 series to both doors	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C1	YES	YES
<b>D34</b>	44mm solid core	CAPRAL	Frame:	N/A	Mortice lock:	Lever:	Bottom seal:	C3	YES	YES



<b>to D41 D56</b>	flush panel hinged door – Acoustic rating Rw 32	Aluminium 400 Narrowline	anodised natural finish Door: paint finish		LOCKWOOD No. 3572EARSC mortice vestibule anti-lock-out privacy lock	LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	RAVEN RP38 semi-morticed acoustic seal to door bottom Threshold plate: RAVEN RP66 Head & jambs: RAVEN RP24 to door frame, acoustic seals			
<b>D42</b>	Flush panel hinged door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	N/A	Push plate: LOCKWOOD No. 21407NNSS #214 series to both doors Pull: LOCKWOOD No. 21524NN/07SS #214 series to both doors	Head & jambs: in accordance with CAPRAL specifications to suit 400 Narrowline frame	C3	YES	YES
<b>D45 D46</b>	Flush panel hinged door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	N/A	Push plate: LOCKWOOD No. 21407NNSS #214 series Pull: LOCKWOOD No. 21524NN/07SS #214 series	N/A	C3	YES	YES
<b>D47 to</b>	Hollow core cavity sliding	CS CAVITY SLIDERS	Door: paint finish	N/A	Lock & latch: HANDLES	N/A	N/A	N/A	N/A	N/A

<b>D51</b>	door, undercut	single 'Powderseal'			PLUS No. 31601 Doors 6 circular cavity sliding door lock with external emergency release, satin nickel finish					
<b>D52</b>	Smoke door Flush panel hinged double door (35mm thick min.)	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	Lock & latch: <i>refer fire protection services drawings</i>	Push plate: LOCKWOOD No. 21407NNSS #214 series to both doors Pull: LOCKWOOD No. 21524NN/07SS #214 series to both doors Hold open: Electro magnetic hold open.	Bottom seal: RAVEN No. RP38Si face mounted smoke seal Head & jambs: RAVEN No. RP24Si smoke seal	2 x C3	YES	YES
<b>D53</b> <b>D54</b>	35mm solid core flush panel hinged door	CAPRAL Aluminium 400 Narrowline	Frame: anodised natural finish Door: paint finish	N/A	No. 3572EARSC mortice vestibule anti-lock-out privacy lock	Lever: LOCKWOOD No. 3880/3881/37SC Daintree Gidgee on round rose full set	Bottom seal: RAVEN No. RP99 semi- morticed acoustic seal Head & jambs: RAVEN No. RP10 acoustic seals	C3	YES	YES
<b>D55</b>	CAPRAL	CAPRAL	Frame:	N/A	Track: CENTOR	Pull:	N/A	NO	YES	YES

	ALUMINIUM 275 series external glazed sliding door	Aluminium 400 Narrowline	anodised natural finish Door: paint finish		Airtrack A14 aluminium track (satin finish) recessed flush with the ceiling Guide: CENTOR surface mounted roller guide in overlap	LOCKWOOD No. 21524NN/07SS #214 series to both sides of doors Min. 60mm between door pull & closing jamb				
<b>DOOR LEGEND</b> Where nominated, items shall be as follows:										
	BI-LOCK KEY	MFB to supply cylinder & key, contractor to install								
	GLAZING	G1 DOUBLE GLAZING UNIT (TINT)    VIRIDIAN 'Thermo-tech' - 6mm 'TS30 on clear' heat strengthened glass (external side) - 12mm argon filled cavity - 6mm 'clear float' heat strengthened glass (internal side)								
		G2 DOUBLE GLAZING UNIT (CLEAR)    VIRIDIAN - 6mm 'Sunergy' clear heat strengthened glass (external side) - 12mm air gap - 6mm 'clear float' heat strengthened glass (internal side)								
		G3 SINGLE GLAZING TOUGHENED (CLEAR) VIRIDIAN 'V-LAM' clear - no. 12mm safety glass								
	CLOSER	C1 No. TS83 EN1-5 door closer (transom fixing) with hold open device – silver finish								
		C2 No. TS83 EN1-5 door closer (transom fixing) – silver finish								
		C3 No. TS83 EN1-5 door closer (door leaf fixing) – silver finish								

		C4 No. TS83 EN1-5 door closer (door leaf fixing) with hold open device – silver finish	
	KICK PLATE	Provide LOCKWOOD satin stainless steel countersunk drilled kick plate to all solid core doors to one side only (to opening face). Height 100mm; width to suit door	
	DOOR STOP	METLAM No. ML0672 floor mounted door stop	
	DOOR SIGNAGE	Room Names (General)	Type: Vinyl lettering, 80mm high, Arial font, lower case Size: 60mm Colour: White
		Appliance Bay Door Numbers	Type: Vinyl lettering, Arial font, lower case Size: 500mm high Colour: Black
		D26 Visitors' WC	Manufacturer: PICTOBRAILLE (ph: 07 3848 7371) or approved alternative supplier Type: Unisex & disabled access sign No. PB-UAT Blue with white lettering and Braille, 180 x 180
	UV FILM	Supplier: SOLARX (ph: 1300 765 213)	
	VISION STRIPS	Supplier: SOLARX (ph: 1300 765 213) Type: 3M window film – Illumina No. SH2FG IM dense white spot pattern	

## **APPENDIX H: WINDOW SCHEDULE**

### **Notes:**

1. All glazing in accordance with AS1288 & AS2208
2. All double hung & casement sashes to have a restricted opening of 125mm maximum
3. All double hung & casement sashes shall be fitted with removable insect screens, aluminium framed, with metal mesh
4. All aluminium to be natural anodised. Anodising to be 25,000 Microns thick
5. Double glazing throughout unless otherwise specified
6. CLEARSHIELD protective coating to outside face of all external windows

APPENDIX I: GATE SCHEDULE				
	Type	Manufacturer	Frame & Finishes	Hardware
<b>G01</b>	Cantilevered gate single leaf	ARCO	<p>Frame: hot dipped galvanised steel; vertical supports to suit cladding</p> <p>Cladding: expanded mesh (material EM)</p> <p>Concrete footing: nominal 4000 x 800 x 500mm by builder. Final footing specifications to be confirmed by gate manufacturer.</p> <p>Receiver post: hot dipped galvanised steel</p> <p>Fence FN-2: by builder</p>	<p>Motorisation: 3 phase 0.75kW 100% duty cycle motor with torque limiting manual release gearbox &amp; independent limit switches.</p> <p>Cradle assembly, guides: cast in hot dipped galvanised cradle. Axle &amp; bearings to suit door weight operation.</p> <p>Controls: OMRON PLC with variable speed inverter drive in a lockable metal enclosure with input/output capacity to accommodate; radio receiver, induction loop, card reader, pedestrian mode, key switch.</p> <p>Access from street: by card reader (by security contractor) mounted to security access bollard (by gate manufacturer) and radio receiver.</p> <p>Access from drill yard: by vehicle exit loop (by gate manufacturer) and card reader (by security contractor).</p>
<b>G02</b>	Double gate with fence		<p>Frame: nominal 100 x 50 RHS with bracing, hot dipped galvanised steel</p> <p>Cladding: expanded mesh (material EM)</p> <p>Tongue: nominal 80 x 40 x 8mm steel plate with rounded end &amp; circular eyelet cut-out welded perpendicular to the face of both gates at 1000mm above ground level.</p>	<p>Padlock: AUSTRALIAN LOCK COMPANY bi-lock padlock master keyed with bi-lock cut key</p> <p>Drop bolts: both leafs (outside face)</p> <p>Door pulls: galvanised steel D-pull handle to both leafs welded perpendicular to the face of both gates at 1200mm above ground level.</p>

## APPENDIX J: JOINERY SCHEDULE

Joinery Pulls manufactured by HAFELE D-pull No. 117.40.622 matt brushed stainless steel unless otherwise specified

	Item	Description	Finish/Colour	Hardware/Details
Office	Desk - desktop - drawers - open shelves	Desk top: 32mm MDF MR with LAMINEX premium grade laminate with matching 2mm rigid ABS edging Drawer fronts, exposed panels & kicker: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges Internal carcass & shelves: 18mm white melamine with matching melamine edging Open shelves: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges	Laminate (LA2): LAMINEX white, 200, flint finish	Drawer pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel Hinges: concealed
Office	Office storage - cupboards - drawers - pigeon holes - bench top	Bench top: 32mm MDF MR with LAMINEX premium grade laminate with matching 2mm rigid ABS edging Drawer fronts, exposed panels & kicker: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges Internal carcass & shelves: 18mm white melamine with matching melamine edging Open shelves: 25mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges Pigeon holes: 16mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges	Laminate (LA2): LAMINEX white, 200, flint finish	Door & drawer pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel Hinges: concealed

<b>Lecture room</b>	Kitchenette - bench top - cupboards - drawers	Desk top: 32mm MDF MR with LAMINEX premium grade laminate with matching 2mm rigid ABS edging Drawer fronts, exposed panels & kicker: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges Internal carcass & shelves: 18mm white melamine with matching melamine edging	Laminate (LA2): LAMINEX white, 200, flint finish	Door & drawer pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel Hinges: concealed
<b>Lounge</b>	Cabinets - cupboards - video cabinet	Bench top: 32mm LAMINEX Natural Timber Veneer veneered E1 particleboard with KDHW edge strip to match Door fronts, exposed panels & kicker: 18mm LAMINEX Natural Timber Veneer veneered particleboard with veneer edge strips to all exposed edges to match Internal carcass: 18mm white melamine with matching melamine edging	Laminate (LA1): LAMINEX Natural Timber Veneer Tasmanian Oak, crown cut 5mm KDHW edge strip	Door pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel Hinges: concealed
<b>Kitchen</b>	Full height cupboards - cupboards - open shelves	Drawer fronts, exposed panels & kicker: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges Internal carcass & shelves: 18mm white melamine with matching melamine edging Open shelves: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges	Laminate (LA2): LAMINEX white, 200, flint finish	Door pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel Hinges: concealed
<b>Kitchen</b>	Work Bench - work bench - cupboards - pigeon holes - drawers	Bench top: folded 1.6mm Grade 304 stainless steel to 38mm thick MR particleboard substrate with integrated sinks & drains Splashback: stainless steel to water resistant substrate	Stainless steel: No. 4 brushed finish Laminate (LA2): LAMINEX white, 200, flint finish	Door & drawer pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel Hinges: concealed



	<ul style="list-style-type: none"> <li>- integrated sink</li> <li>- integrated cook top, oven, range hood &amp; grill</li> </ul>	<p>Door, drawer fronts, exposed panels &amp; kicker: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges</p> <p>Internal carcass &amp; shelves: 18mm white melamine with matching melamine edging</p> <p>Open shelves/pigeon holes: 18mm LAMINEX 'Laminwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges</p>		
<b>Firefighter Bedrooms SO Bedrooms</b>	<ul style="list-style-type: none"> <li>- desk top</li> <li>- bedside table</li> </ul>	<p>Bench top: 32mm LAMINEX Natural Timber Veneer veneered E1 particleboard with KDHW edge strips to all exposed edges to match</p> <p>Bedside table: 32mm LAMINEX Natural Timber Veneer veneered E1 particleboard with KDHW edge strips to all exposed edges to match</p>	Laminate (LA1): LAMINEX Natural Timber Veneer Tasmanian Oak, crown cut 5mm KDHW edge strip	N/A
<b>Firefighter Bedrooms SO Bedrooms</b>	<ul style="list-style-type: none"> <li>- single bed to MFB detail</li> </ul>	<p>Exposed panels: 18mm LAMINEX Natural Timber Veneer veneered E1 particleboard with KDHW edge strips to all exposed edges to match</p> <p>Bed slats: 90 x 45 KDHW timber planks</p> <p>Internal framing: KDHW framing</p>	Laminate (LA1): LAMINEX Natural Timber Veneer Tasmanian Oak, crown cut 5mm KDHW edge strip	N/A
<b>Bed Lockers</b>	<ul style="list-style-type: none"> <li>- built in lockers to MFB detail</li> </ul>	<p>Door &amp; exposed panels: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges</p> <p>Internal carcass &amp; shelves: 16mm white melamine with matching melamine edging</p>	<p>Laminate (LA2): LAMINEX white, 200, flint finish</p> <p>Signage: 10mm high engraved locker numbers, Arial font</p>	<p>Door pull: HAFELE metal flush handle No. 151.38.002 stainless steel, matt brushed</p> <p>Magnet push mechanism</p> <p>Air vent: white, round, 75mm diam. To fit within depth of 18mm lamiwood</p> <p>Hinges: concealed</p> <p>Locks: heavy duty joinery lock</p>
<b>Bathrooms</b>	Recessed mirror	Mirror door panel: 18mm LAMINEX 'Lamiwood MR'	Laminate (LA2): LAMINEX	Door pulls: magnet push

	cabinet - mirror to face of doors - fixed shelves	with matching melamine edging. Mirror to face of door. Carcass & shelves: 16mm white melamine with matching melamine edging	white, 200, flint finish	mechanism Mirror: 3mm thick, polish all exposed edges
<b>Turnout Alcove</b>	Work bench - bench	Bench top & step-in bench: 32mm MDF MR with LAMINEX premium grade laminate with matching 2mm rigid ABS edging Exposed backing panels: 16mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges	Laminate (LA2): LAMINEX white, 200, flint finish	N/A
<b>Equipment</b>	Work bench - bench	32mm MDF MR with LAMINEX premium grade laminate with matching 2mm rigid ABS edging	Laminate (LA2): LAMINEX white, 200, flint finish	Bench leg: HAFELE Regula Furniture feet 25/25/700 SHS steel with M10 threaded plug – No. 635.45.370 matt black colour No. 651.01.304 30mm M10 adjusting screw
<b>Hose Bay</b>	Clothing cabinet - cupboard - hanging rails	Door fronts & exposed panels: 18mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges Base/legs: black powder coated steel frame	Laminate (LA2): LAMINEX white, 200, flint finish	Hanging rails: 30mm chrome finish Door & drawer pulls: HAFELE D-pull No. 117.40.622 matt brushed stainless steel
<b>Lecture Room</b>	Computer desk	Bench top: 32mm MDF MR with LAMINEX premium grade laminate with matching 2mm rigid ABS edging. Provide 40 diam.circular cutouts in desk with plugs for computer cables Dividing panels: 9mm white Perspex sheeting – removable Backing & side panels: 16mm LAMINEX 'Lamiwood MR' prefinished board with matching 2mm rigid ABS edging to all exposed edges	Laminate (LA2): LAMINEX white, 200, flint finish	Cable basket: plastic/metal basket mounted to underside of desks, full length of desk for excess computer cables

		Leg: 35 x 35 stainless steel legs with adjustable foot & base plate		
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<b>APPENDIX K: PROVISIONAL QUANTITIES</b>			
	<b>Item</b>	<b>Where Specified</b>	<b>Provisional Quantities</b>
<b>a</b>	Supply & installation of Acrovlyn Corner Guards	TBA	TBA

## **APPENDIX L: FURNITURE SCHEDULE**

### **STATION OFFICE**

Office Chairs – standard MFB “new style”

Style: BOB 201 Mesh Chair with arms

Cost:

\$485.00 ea

Pin Boards – silver anodised frame

Fabric: Prelude – colour TBA

Size: 3400 x 430

2400 x 1200

1600 x 1200

Whiteboard (vitreous)

Size: 1200 x 1400

### **LECTURE ROOM**

Lecture Chairs (stackable)

Style: Meteor High Back – fully upholstered

Black 4 leg frame – sloping arms

Fabric: commercial grade – colour TBA

Lecture Room Folding Table

Top: Standard laminate range – 25mm

Size: 2100 x 900

Frame: Thinking Ergonomic “I am turn”

Pin Board – silver anodised frame

Fabric: Prelude – colour TBA

Size: 2400 x 1200

Whiteboard (vitreous)

Size: 1200 x 2400

### **KITCHEN MESS**

Kitchen Mess Tables

Top: Standard laminate range – 25mm

Colour: TBA – 75mm radius corners

Size: 2400l x 80w0 x 735h

Frame: black heavy duty 4 leg (38 x 38 tube)

Pin Board – silver anodised frame

Size: 1800 x 900

Whiteboard (vitreous)

Size: 1800 x 900

### **GENERAL PURPOSE ROOM**

Low Level Coffee Table

Top: Standard laminate range – 25mm

Colour: TBA

Size: 1200l x 600w x 450h

Frame: Black 4 leg powercoat

Pin Board – silver anodised frame

Size: 2400 x 1200

### **BREAKOUT**

Low Level Coffee Table

Top: Standard laminate range – 25mm

Colour: TBA

Size: 1200l x 600w x 450h

Frame: Black 4 leg powercoat

### **BEDROOMS**

Office Chairs – standard MFB “new style”

Style: BOB 201 Mesh Chair with arms

### **TURNOUT ALCOVE**

Drafting Chair

Style: Henty HT 12

High back – no arms

265mm gas lift – foot ring

Fabric: commercial grade – colour TBA

Pin board – silver anodised fram

Fabric: Prelude – colour TBA

Size: 880 x 1000

2300 x 1000

### **BREATHING APPARATUS**

Whiteboard (vitreous)

Size: 2400 x 1200

### **BBQ AREA**

Hunter Outdoor Table

Size: 2200 x 1000

OR

Size: 2600 x 1200

Outdoor Chairs

Style: Kuranda



# Gymnasium Design and Space Allocation

Version 7 - August 2009

## Background

Increased gymnasium usage during the past 10 years has created a delicate balance between the need for increased gymnasium size without significantly impacting on Station size. The provision of sufficient space to meet the needs of exercising personnel is paramount to assist in the development and maintenance of fitness, strength, flexibility and general wellbeing. This reflects the approach the MFB is taking in relation to ensuring operational employees have the physical capacity to safely perform the role of emergency response and mitigate the risk of injury.

## Key considerations

A long term approach to health and fitness within the MFB is necessary to:

- Provide opportunities for firefighters to physically prepare themselves to safely perform operational duties;
- Ensure the physical well-being of an aging workforce;
- Physically prepare employees to reduce the occurrence of injuries;
- Provide suitable gymnasiums and equipment for the MFB Active Program; and
- Adequately plan and budget for appropriate exercise facilities and equipment.

The recommendations put forward in this document are the results of consultations with a range of personnel from within the organisation and liaison with external contacts in other emergency services. Although there is scope for variation, this document suggests a range of recommended equipment options that satisfy safety standards as determined by space limitations and risk assessments. This ensures uniformity throughout the Brigade and the ability for the organisation to control any risks, budget for and manage facilities effectively.

A coordinated and standardised approach from within the organisation is paramount. Such an approach achieves several outcomes.

1. Health and safety risks are assessed and control measures are implemented to minimize risk.
2. Uniformity is achieved with respect to the type and amount of equipment in gym facilities.
3. Adequate budget is allocated and established to meet long term plans.
4. The organisation has an understanding of appropriate avenues for equipment purchase, maintenance and replacement.

Whilst implementing a standard gymnasium equipment strategy, consideration must be given to a range of issues.

The major considerations include:

**1. Size of current and future gym facilities**

- For any new station or rebuilt station, gymnasiums need to comply with the needs of current and future fitness programs with respect to size and layout;
- All existing gyms that are inadequate in size to house all the recommended equipment require refurbishment as part of a long term strategy to meet the standard. Where this is not possible an alternative arrangement will need to be agreed upon by the Health and Safety Department, Facilities Services and Operations.

**2. Safety**

- Risk assessments exist for the recommended equipment and approved sporting activities.
- Control measures are implemented to address any perceived risk. The objective is to ensure the benefits of activities and equipment outweigh any risk.
- Equipment and activities will be assessed periodically and also in response to injury incidence. Modification or changes may result if required.

**3. Maintenance Budget**

- An ongoing budget is required to ensure all approved equipment is adequately maintained, repaired or replaced as required. A budget is required for the structured periodic replacement of items such as bikes, treadmills and Swiss balls. Facility Services is responsible for all equipment maintenance.

## **Gymnasium design and size**

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Considerable change in gymnasium usage and equipment has occurred since gymnasiums were first included into station design some 15 years ago. These changes have resulted in certain MFB gymnasiums no longer adequately meeting safety requirements and gym usage demands. Future gymnasium design and sizing requires long term planning and commitment, as fire stations are being designed and built with an anticipated 40 year lifespan.

The aging firefighter population brings with it new demands, particularly in injury prevention and management. As firefighters age, they need to take an active role managing their personal health and fitness. This will help prevent physical de-conditioning and improve their capacity to manage operational demands. This, accompanied by the Board's commitment to actively assist and encourage staff in their health maintenance, will only increase gymnasium usage pressures.

Proposed increases to crewing numbers will place additional strain on the gymnasium resources. It is difficult to predict future crewing numbers, however past experience is indicating a growth rather than a reduction in staff (both operational and support) across the organization. Gymnasium size and equipment needs to anticipate these organisational changes.

The minimum sizes recommended have been established after careful consideration of safety and future fitness activities. These recommendations apply to any built, rebuilt or renovated Fire Station or work location where gymnasiums are provided. When stations are refurbished, the recommended sizes need to be accommodated. Given that many existing Fire Stations do not meet these size recommendations, a long term approach should be adopted to progressively make alterations to facilitate the changes.

The delicate balance between increased gymnasium usage and the simultaneous need for increased gymnasium size can be accommodated by implementing the following:

- **Construct a partitioned door in Stations where gymnasium and lecture rooms are adjoining.**
- **Design future Stations to have the gymnasium and lecture rooms adjoining via a partitioned door.**



Having gymnasium/lecture rooms adjoining provides an opportunity for stationed members to safely use extended gym facilities alongside each other. It also allows group activities (circuits, boxercise classes, etc.) to be conducted, which serves to increase motivation and participation. Conversely when the lecture room is required, the partitioned door can be drawn, and the space is once again divided.

The following are equipment recommendations based on the assumption that the Lecture Room is available for use by gym participants.

Equipment to remain in Gymsnasiums	Equipment that can be used in Lecture room
Max Rack Free-Weights Dumbbell Racks Exercise Charts Weight Multi-station Incline Benches Treadmill	Swiss Balls Swiss Ball Storage Bowls Exercise Mats Boxing Station Medicine Balls Dura disc set Skipping Rope Step Up Box Rowing Machine Exercise Bikes

#### Recommended gym sizes for Stations where gym adjoins lecture room

Number Personnel / Location	Minimum size	Preferable Dimensions
3-4 per shift	30 sq.m	5.0 x 6.0 m
5-8 per shift	36 sq.m	6.0 x 6.0 m
9-12 per shift	42 sq.m	7.0 x 6.0 m
>16 per shift	49 sq.m	7.0 x 7.0m

#### Recommended gym sizes for Stations where gym is not adjoining lecture room

Number Personnel / Location	Minimum size	Preferable Dimensions
3-4 per shift	42 sq.m	6.0 x 7.0 m
5-8 per shift	49 sq.m	7.0 x 7.0 m
9-14 per shift	56 sq.m	8.0 x 7.0 m
>16 per shift	64 sq.m	8.0 x 8.0 m

In order to support the health and welfare of all MFB staff members, it is recommended that the following be implemented:

- A member of the Health and Fitness Unit should oversee the positioning of any equipment and be involved in the station design brief (which involve gymnasiums) prior to sign off.
- To increase the flexibility for unanticipated changes to gymnasium layout, ensure all gymnasium equipment is made free-standing, and future equipment purchases do not require bolting to the floor.
- Fire Stations that are relocated and rebuilt should automatically be supplied with the standard equipment determined by the number of personnel at that station.
- Where an existing structure permits, the station gymnasium should be upgraded to meet all the requirements as outlined in this document. Where an existing structure does not permit an alternative arrangement will need to be agreed upon by the Health and Safety Department, Facilities Services and Operations.
- Consideration needs to be given to the total number of people who may use the gymnasium at Stations that are located with Zone Offices. These stations may require additional floor space.



## Standard Gym Equipment

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## 1. Standard Gymnasium Equipment List

Rubber Ended Hexagonal Dumbbells	Fixed Dumbbells	Weight Plates
8 kg pair	3.5 kg pair	6 x 0.5 kg
10 kg pair	5.5 kg pair	6 x 1.25 kg
12.5 kg pair	7.5 kg pair	4 x 2.5 kg
15 kg pair		4 x 5.0 kg
17.5 kg pair		2 x 7.5 kg
20 kg pair		2 x 10 kg

General Equipment	Dimensions	Quantity
Max Rack	2200x2100	1
2/3 way exercise station: lat pull down, seated row, high-low pulleys	1500x1200	1
Flat bench	1200x500	1
Adjustable incline bench (0 to 90 degrees)	1200x500	1
AOK Swissball grey 65 cm	650	1
AOK Swissball red 55 cm	550	1
Storage bowls for Swissballs	n/a	2
Dura disc set (includes 2 dura discs, 1 rectangular board ,1 round board)	450x750	1
Exercise mat 6 ft x 3 ft x 2"	1830x920	2
Live Medicine balls - 3kg, 4kg, 5kg	700x400	1 set of 3
Weight tree for plates	500x500	1
2 tier dumbbell rack	1600x600	1
Polar Heart Rate Monitor	n/a	1
Exercise Wall Charts	n/a	7

Stations with 3-4 personnel			
Central Zone	Northern Zone	Southern Zone	Western Zone
18, 39	4, 6, 9, 11, 12, 13, 15, 16, 19	20, 24, 28, 29, 32, 33	40, 41, 45, 46, 48, 49, 50, 52
Aerobic Equipment	Quantity	Dimensions	
Treadmill	1	2110x950	
Concept Rowing Machine	1	2500x750	
Exercise bike	1	1100x650	
Skipping Rope	1	n/a	

Stations with 5-8 personnel			
Central Zone	Northern Zone	Southern Zone	Western Zone
2, 3	5, 14, 30	22, 23, 26, 27, 31, 34	42, 43, 51
Aerobic Equipment	Quantity	Dimensions	
Treadmill	1	2110x950	
Concept Rowing Machine	1	2500x750	
Exercise bike	2	1100x650	
Skipping Rope	2	n/a	

Stations with 9-14 personnel			
Central Zone	Northern Zone	Southern Zone	Western Zone
10, 35, 38	7	25	44, 47
Aerobic Equipment	Quantity		
Aerobic Equipment	Quantity	Dimensions	
Treadmill	2	2110x950	
Concept Rowing Machine	2	2500x750	
Exercise bike	2	1100x650	
Skipping Rope	2	n/a	

## 2. Eastern Hill Gymnasium Equipment List

On-shift personnel, operational day workers and support staff

<b>General Equipment</b>	<b>Quantity</b>
Max Rack	1
7 way exercise station: lat pull down, seated row, leg press, shoulder press, bench press, chin up, abdominal raise	1
Wall mounted High-low pulleys	1
Wall mounted chin up bar	1
Wall mounted dip bar	1
Flat bench	2
Adjustable incline bench (0 to 90 degrees)	2
AOK Swissball grey 65 cm	1
AOK Swissball red 55 cm	1
Storage bowls for Mediballs	2
Dura disc set (includes 2 dura discs, 1 rectangular board and 1 round board)	1
Exercise mat 6 ft x 3 ft x 2"	3
Exercise Wall Charts	10
<b>Aerobic Equipment</b>	<b>Quantity</b>
Concept 2 Rowing Machine	2
Treadmill	2
Exercise bike	4
Skipping Rope	2
Ceiling mounted Boxing bag and mitts	1
Polar Heart Rate Monitor	1

<b>Rubber Ended Hexagonal Dumbbells</b>	<b>Fixed Dumbbells</b>		<b>Weight Plates</b>	<b>Barbells</b>
	<b>Solid</b>	<b>Fixed Plates</b>	<b>General</b>	<b>Fixed</b>
8 kg pair	2 x 2.5 lb pair	2 x 25.0 lb	4 x 0.5 kg	25 lb
10 kg pair	2 x 5.0 lb	2 x 30.0 lb	4 x 1.25 kg	30 lb
12.5 kg pair	2 x 7.5 lb	2 x 35.0 lb	4 x 2.5 kg	40 lb
15 kg pair	2 x 10.0 lb	2 x 40.0 lb	4 x 5.0 kg	50 lb
17.5 kg pair	2 x 12.5 lb	2 x 45.0 lb	4 x 7.5 kg	60 lb
20 kg pair	2 x 15.0 lb	2 x 50.0 lb	4 x 10 kg	70 lb
	2 x 17.0 lb	2 x 55.0 lb		80 lb
	2 x 20.0 lb	2 x 60.0 lb	<b>Other</b>	
<b>Squat plates</b>			1 upright barbell rack	
2 x 1.25 kg	<b>Individual bars</b>	<b>Adj. dumbbells</b>	1 horizontal barbell rack	
2 x 2.5 kg	1 barbell	4 dumbbells	2 dumbbell wall racks (solid dumbbells)	
2 x 5.0 kg	4 collars	8 collars	2 fixed dumbbell floor racks	
2 x 10.0 kg	1 Squat Barbell		2 weight plate racks / trees	
2 x 15.0 kg	4 collars		2 medicine balls and rack	
4 x 20.0 kg			1 Squat rack	
			1 Free standing barbell bench press	

### 3. Thornbury Gymnasium Equipment List

On-shift personnel, operational day workers and support staff

# Rubber Ended Hexagonal Dumbbells	Fixed Dumbbells	Weight Plates	Ancillary Items
8 kg pair	3.5 kg pair	6 x 0.5 kg	1 x weight tree for plates
10 kg pair	5.5 kg pair	6 x 1.25 kg	#1 x 2 tier dumbbell rack
12.5 kg pair	7.5 kg pair	4 x 2.5 kg	2 adjustable dumbbells
15 kg pair		4 x 5.0 kg	4 collars
17.5 kg pair		2 x 7.5 kg	2 barbells
20 kg pair		2 x 10 kg	

<b>General Equipment</b>	<b>Quantity</b>
Max Rack	1
3 way exercise station: lat pull down, seated row, speed ball	1
Free standing high-low pulleys	1
Flat bench	1
Adjustable incline bench (0 to 90 degrees) free standing bench press	1
AOK Swissball grey 65 cm	1
AOK Swissball red 55 cm	1
Storage bowls for Mediballs	2
Dura disc set (includes 2 dura discs, 1 rectangular board and 1 round board)	1
Exercise mat 6 ft x 3 ft x 2"	1
Exercise Wall Charts (refer to section 2.1)	7
<b>Aerobic Equipment</b>	
Treadmill	1
Concept 2 Rowing Machine	1
Exercise bike (Repcos Studio Cycle or LeMonde Cycle - to be reviewed)	2
Skipping Rope	2
Polar Heart Rate Monitor	1

#### 4. Burnley Street Training College Gymnasium Equipment List

Recruits, on-shift personnel, operational day workers and support staff

##### Resistance Training Area

Resistance Training Equipment	Quantity	Dimensions (m)	Total Area (m <sup>2</sup> )
Max Rack	2	2.0 x 2.0	
2 way exercise station: lat pull down, high-low pulleys.	2	3.8 x 2.8	
Adjustable incline bench	3	2.0 x 2.0	
Flat Bench	2	2.0 x 2.0	
Dumbbell racks	3	2.5 x 1.0	
Weight storage trees	3	1.0 x 1.0	

Free Weights				
Rubber Dumbbells	Fixed Dumbbells	Fixed Barbells	Weight Plates	Individual bars
2 x 1.0kg pair	4 x 10.0 lb	1 x 20 lb	2 x 0.5 kg	2 standard barbells
2 x 2.0kg pair	4 x 15.0 lb	1 x 25 lb	4 x 1.25 kg	1 Olympic barbell
2 x 3.0kg pair	4 x 20.0 lb	2 x 30 lb	6 x 2.5 kg	1 Squat Barbell
2 x 4.0kg pair	4 x 25.0 lb	2 x 45 lb	6 x 5.0 kg	1 Ezy curl bar
2 x 5.0kg pair	4 x 30.0 lb	1 x 40 lb	8 x 7.5 kg	
2 x 6.0kg pair	2 x 35.0 lb	1 x 50lb	4 x 10 kg	
2 x 7.0kg pair	2 x 40.0 lb	1 x 60 lb	2 x 20 kg	
2 x 8.0kg pair	2 x 45.0 lb	1 x 70 lb	2 x 25 kg	
2 x 9.0kg pair	2 x 50.0 lb	1 x 80 lb		
2 x 10.0kg pair				
2 x 12.5kg pair				
2 x 15.0kg pair				
2 x 17.5kg pair				
2 x 20.0kg pair				

## Aerobic Training Area

Aerobic Equipment	Quantity
Concept 2 Rowing Machine	4
Exercise bike (Repco Studio Cycle / LeMonde Cycle)	6
Treadmill	2
Step-up Box	4
Polar Heart Rate Monitor	2

## Free Floor Space

Equipment requiring free floor space	Quantity
Portable Boxing Unit (heavy bag, speed ball & floor to ceiling ball)	1
Boxing Mitts	2
Skipping Rope	10
AOK Swissball grey 65 cm	15
AOK Swissball red 55 cm	10
Storage bowls for Swissball	25
Live Medicine balls - 3kg, 4kg, 5kg	6
Dura disc set (2 dura discs, 1 rectangular board & 1 round board)	2
Flexibility mats	10

## **Station Drill Yard Layouts & Sizes**



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# 1 Sample Station Drill Yard Areas

## 1.1 *Sunshine FS 44*

4 Appliance Station



## 1.2 *Thomastown FS 7*

3 Appliance Station

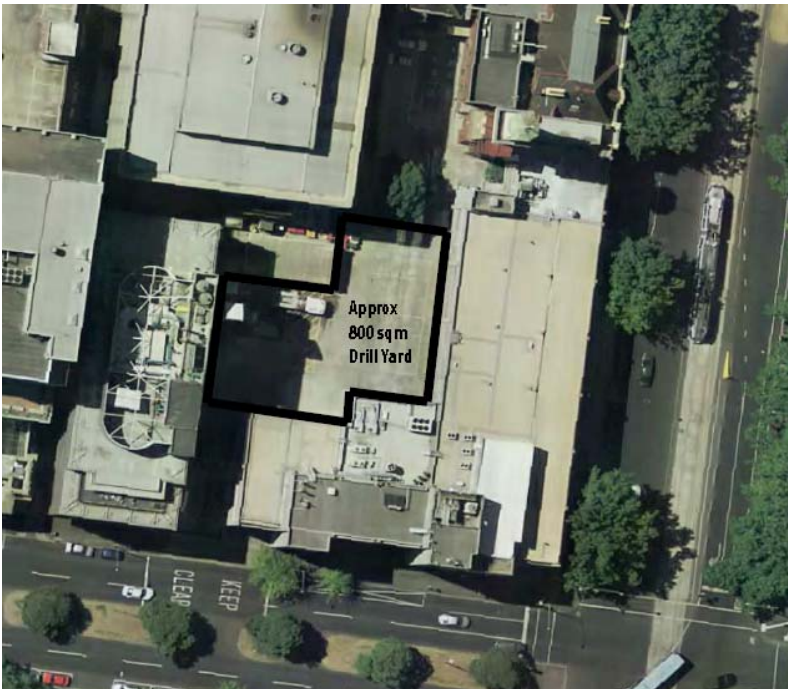


### 1.3 *Burwood FS 23*

1 Appliance Station ( 2 Appliance Design )



### 1.4 *Eastern Hill FS 1*





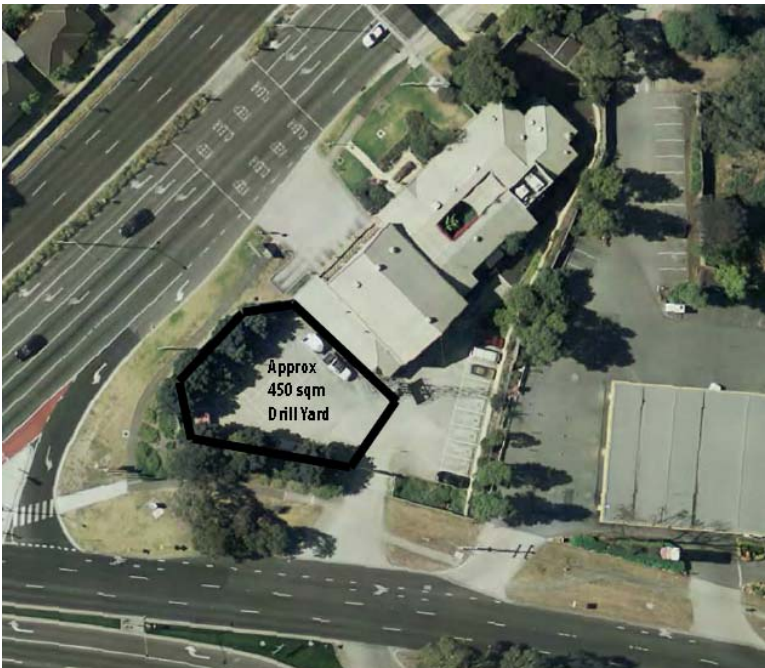
## 1.5 Oakleigh FS 25

4 Appliance Station



## 1.6 Ringwood FS 22

2 Appliance Station



## 2 Typical 800 sqm Drill Yard Layout for 1 Appliance Station.

### 2.1 Site Requirements:

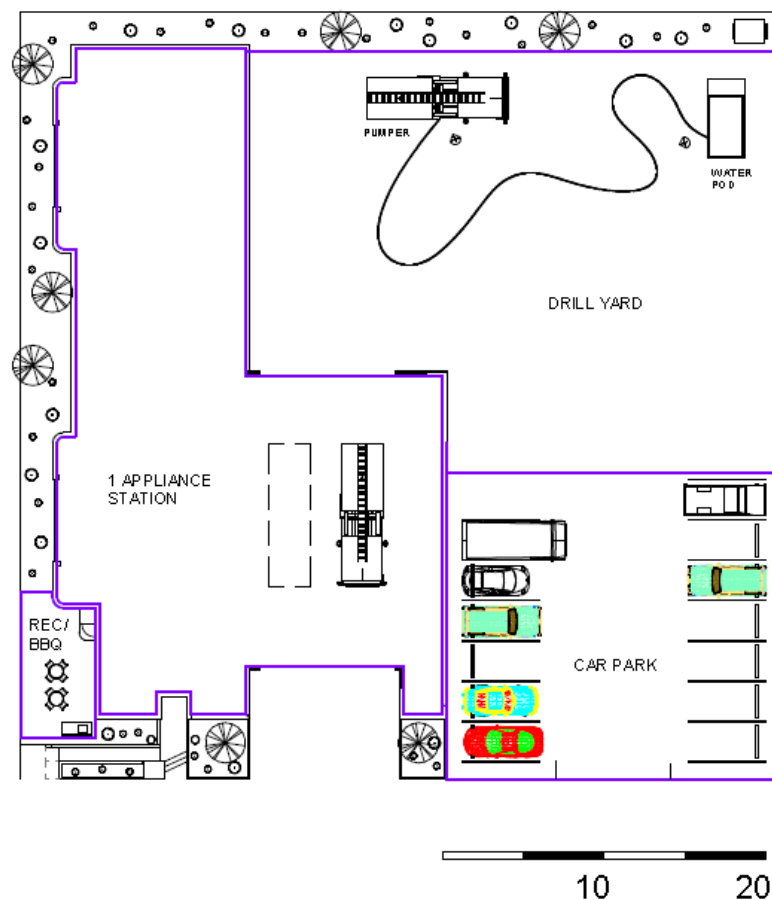
- Net internal station area including grossing factor 30%. 637 sqm
- Car Parking ( 13 Bays ). 396 sqm
- Recreational ( BBQ ) area . 40 sqm
- Drill Yard ( Min 20m Width ). 800 sqm
- Front, Rear & Side Setbacks, Landscape buffers and other agency areas as required.

### 2.2 Site Considerations for Drill Yard Dimensions and Layout:

Area configuration should enable vehicles easy access and egress.

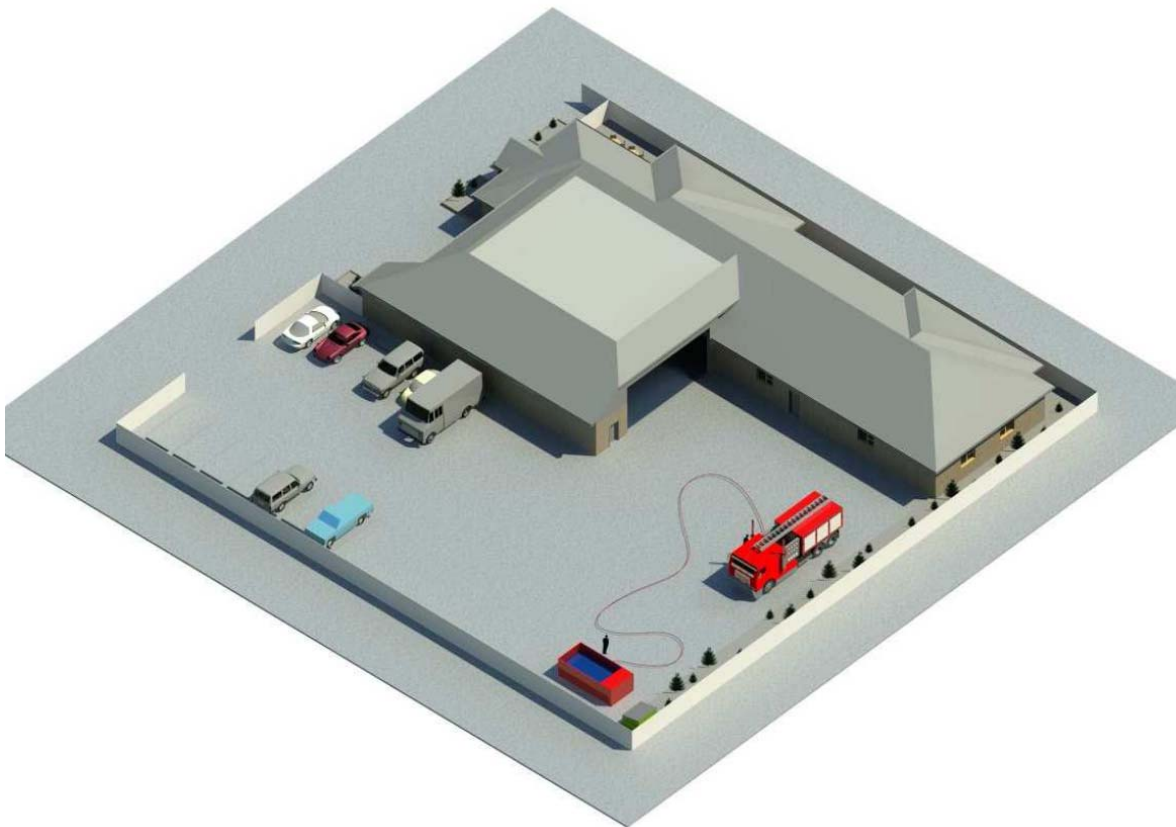
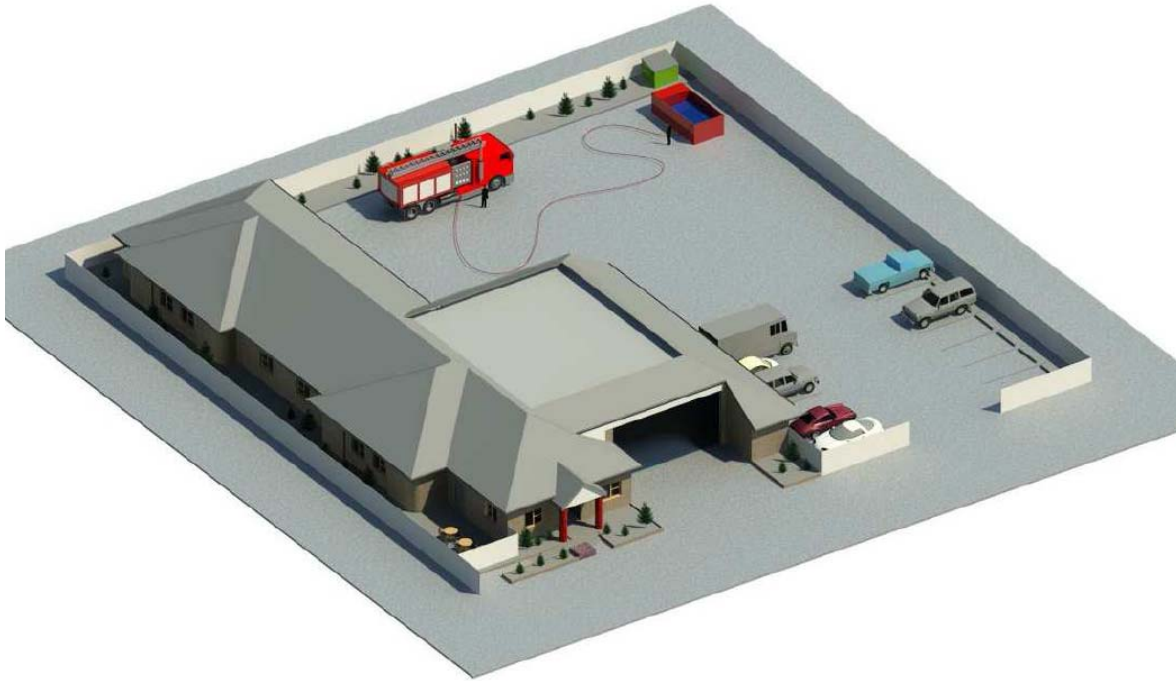
Sufficient clearances between vehicles and structures to enable safe and practical access to ladders and equipment during drill exercises.

### 2.3 Site Layout



**Note:** The above scaled site layout is an example of one possible configuration of an 800 sqm Drill Yard for a 1 Appliance station. The station design in this example is conceptual only.

## 2.4 Site Perspectives.



**Note:** The above scaled site layout is an example of one possible configuration of an 800 sqm Drill Yard for a 1 Appliance station. The station design in this example is conceptual only.

### 3 Typical 1200 sqm Drill Yard Layout for 2 Appliance Station.

#### 3.1 Site Requirements:

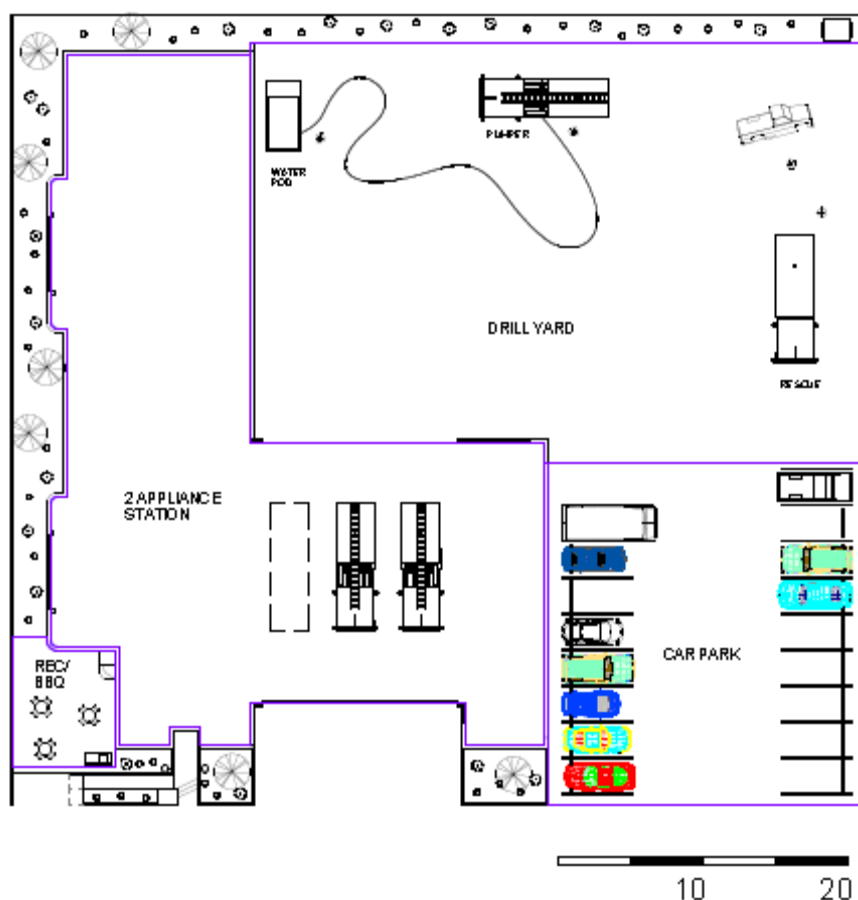
- Net internal station area including grossing factor 30%. 976 sqm
- Car Parking ( 17 Bays ). 516 sqm
- Recreational ( BBQ ) area . 60 sqm
- Drill Yard ( Min 20m Width ). 1200 sqm
- Front, Rear & Side Setbacks, Landscape buffers and other agency areas as required.

#### 3.2 Site Considerations for Drill Yard Dimensions and Layout:

Area configuration should enable vehicles easy access and egress.

Sufficient clearances between vehicles and structures to enable safe and practical access to ladders and equipment during drill exercises.

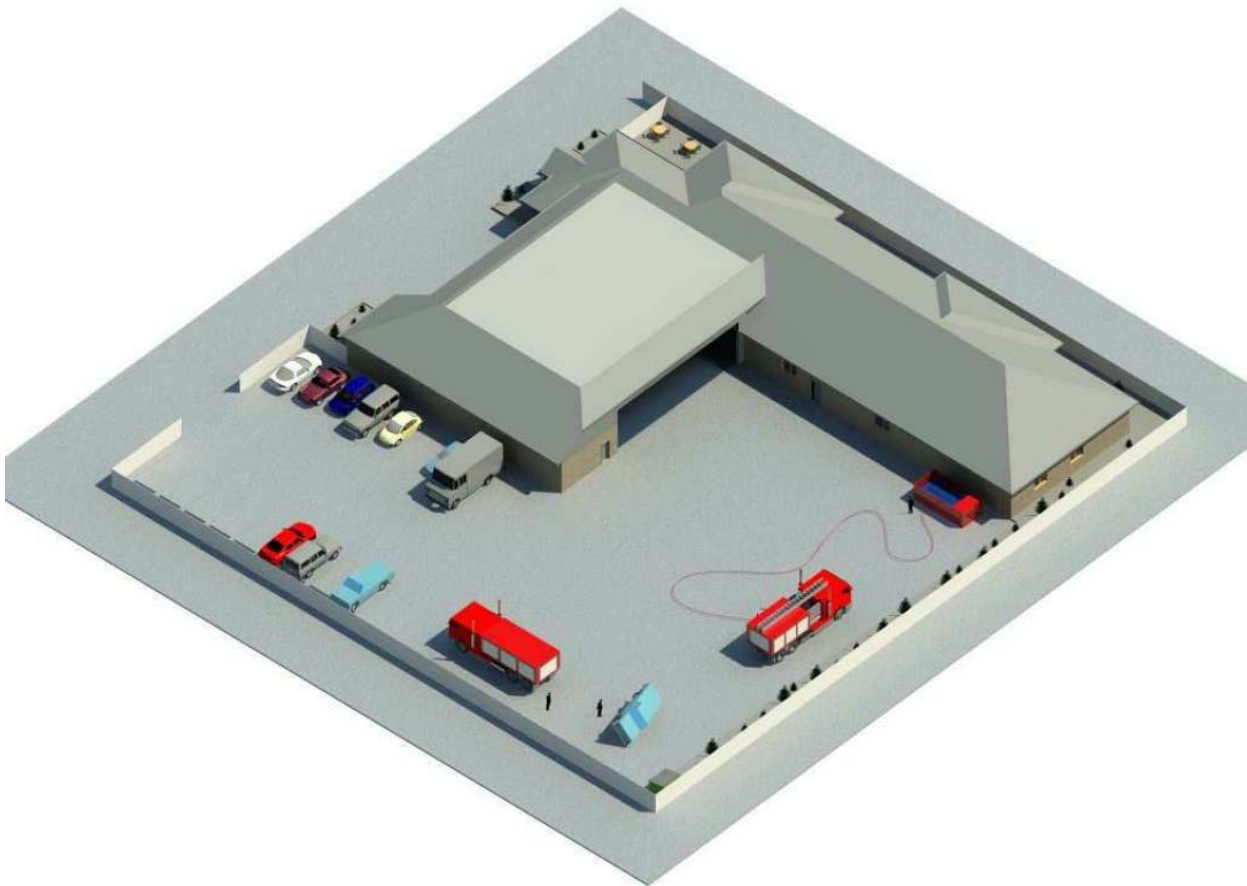
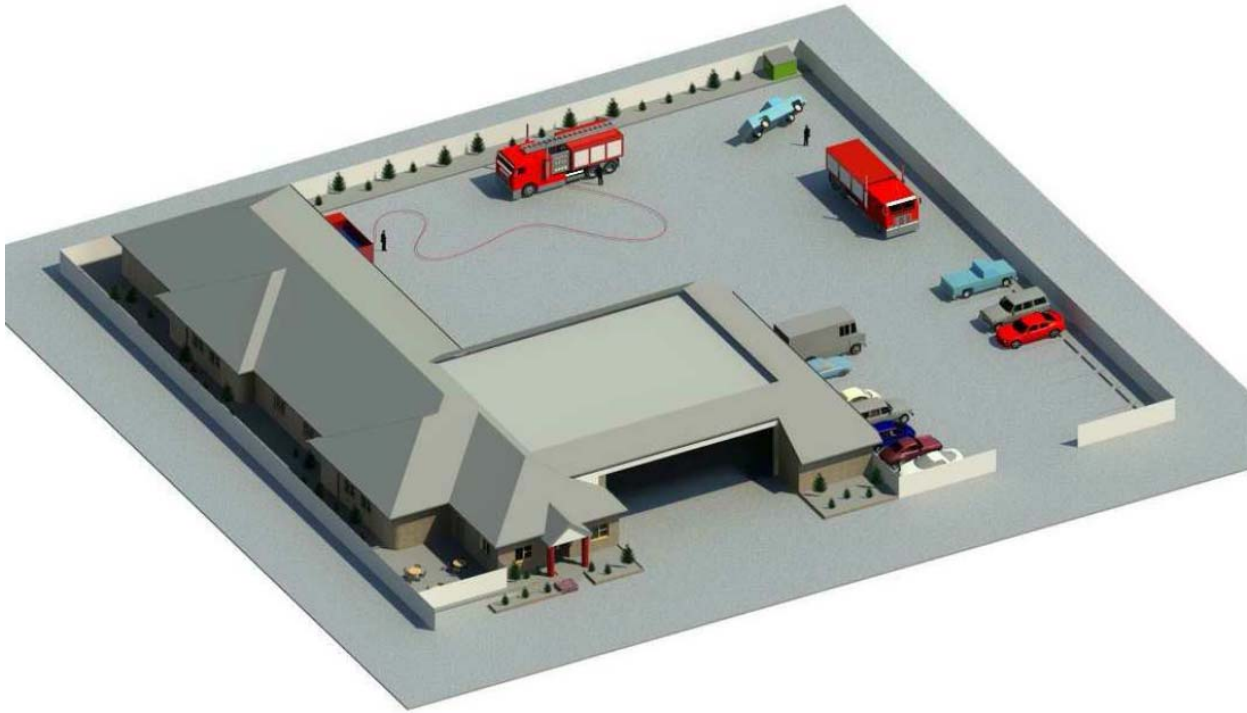
#### 3.3 Site Layout



**Note:** The above scaled site layout is an example of one possible configuration of a 1200 sqm Drill Yard for a 2 Appliance station. The station design in this example is conceptual only.



### 3.4 Site Perspectives.



**Note:** The above scaled site layout is an example of one possible configuration of a 1200 sqm Drill Yard for a 2 Appliance station. The station design in this example is conceptual only.



## 4 Typical 1500 sqm Drill Yard Layout for 3 Appliance Station.

### 4.1 Site Requirements:

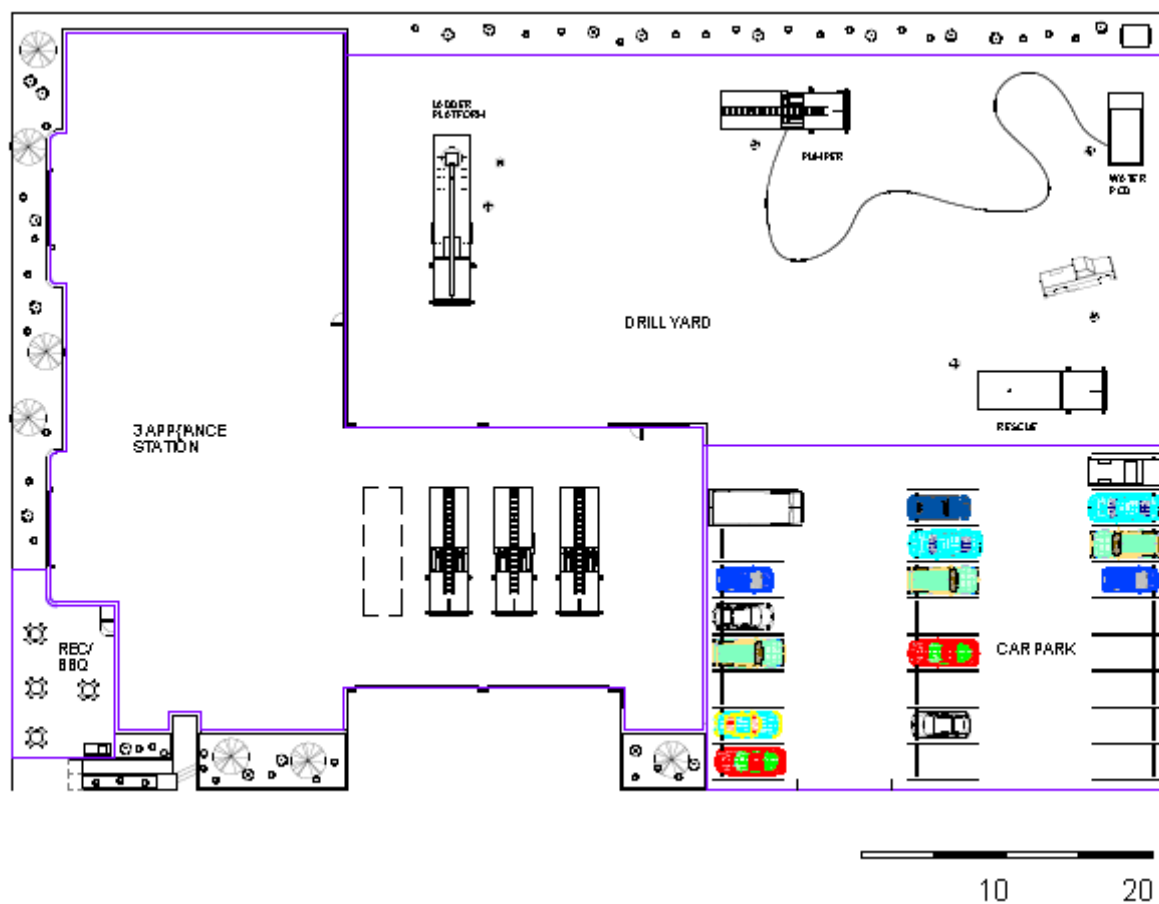
- Net internal station area including grossing factor 30%. 1371 sqm
- Car Parking ( 25 Bays ). 756 sqm
- Recreational ( BBQ ) area . 80 sqm
- Drill Yard ( Min 20m Width ). 1500 sqm
- Front, Rear & Side Setbacks, Landscape buffers and other agency areas as required.

### 4.2 Site Selection Considerations for Drill Yard Dimensions and Layout:

Area configuration should enable vehicles easy access and egress.

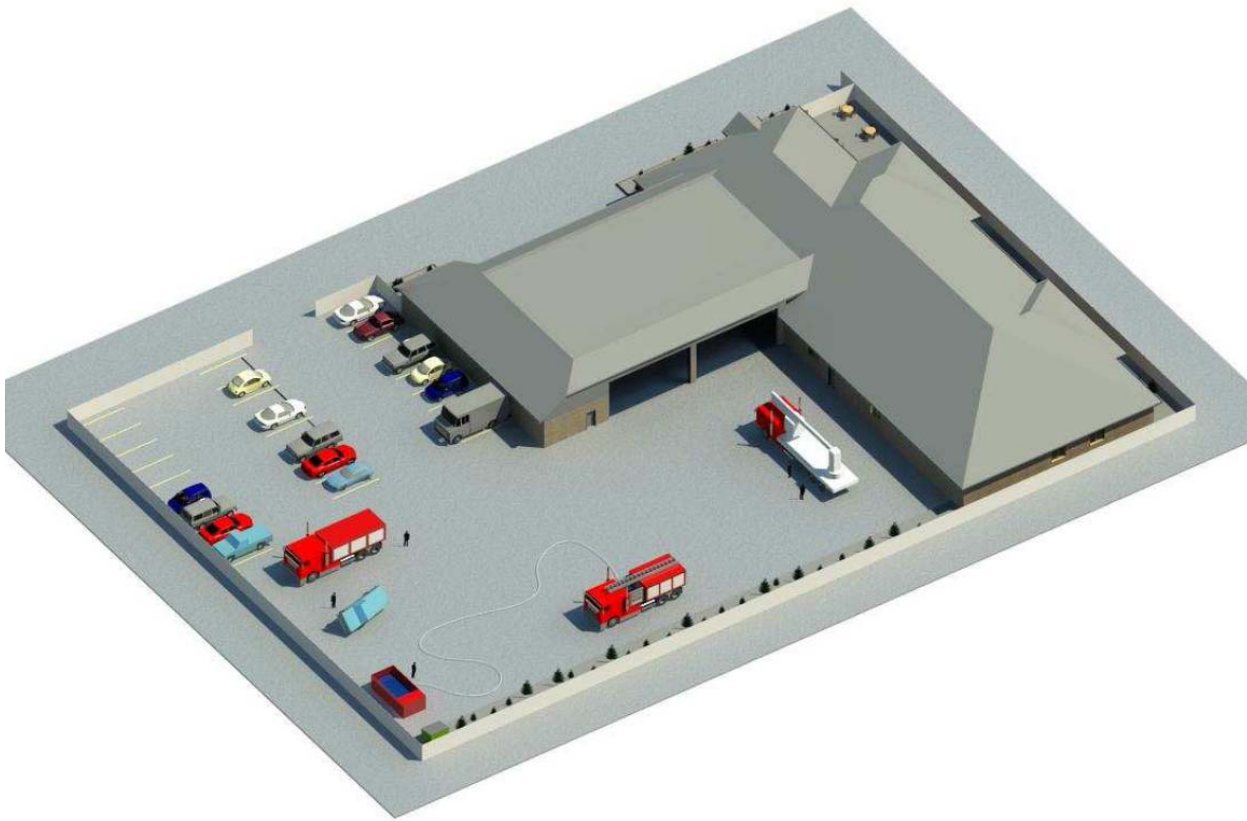
Sufficient clearances between vehicles and structures to enable safe and practical access to ladders and equipment during drill exercises.

### 4.3 Site Layout.



**Note:** The above scaled site layout is an example of one possible configuration of a 1500 sqm Drill Yard for a 3 Appliance station. The station design in this example is conceptual only.

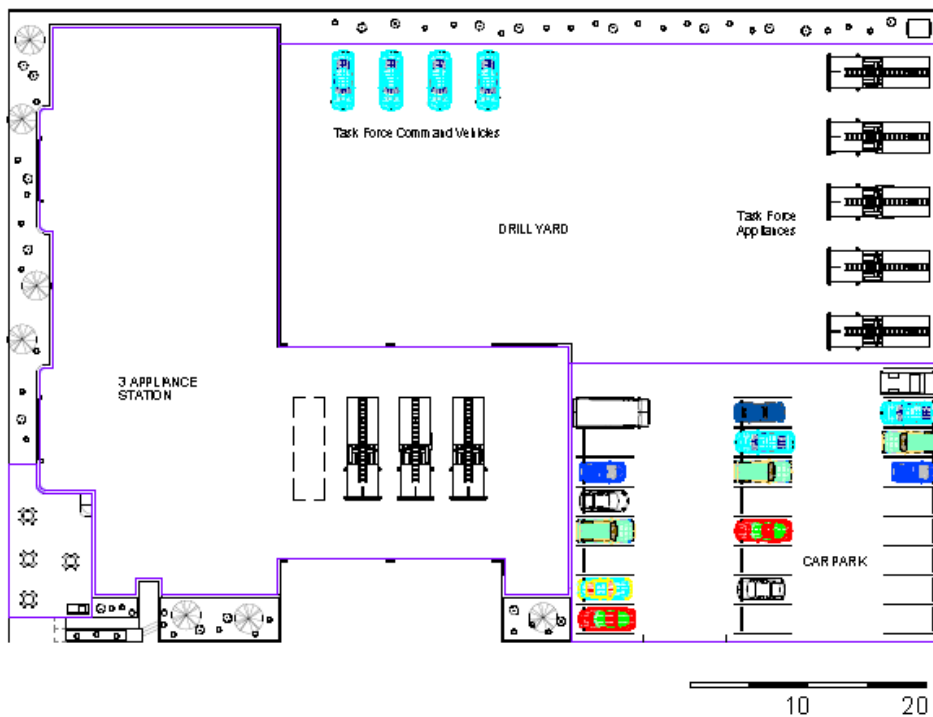
#### 4.4 Site Perspectives.



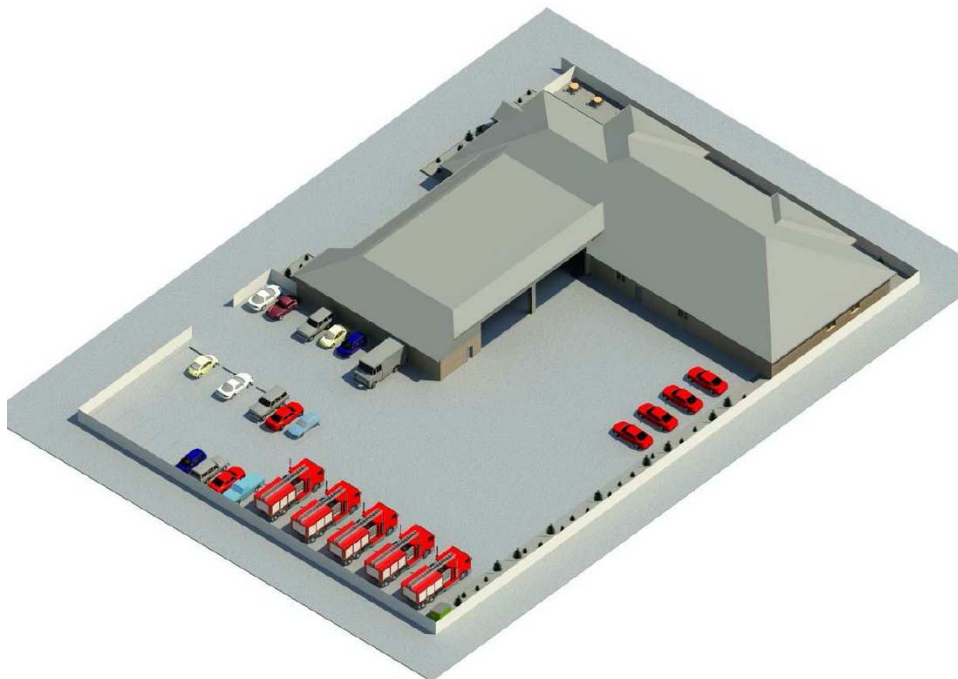
**Note:** The above scaled site layout is an example of one possible configuration of a 1500 sqm Drill Yard for a 3 Appliance Station. The station design in this example is conceptual only.

## 5 Typical 1500 sqm Drill Yard Layout for Task Force staging.

### 5.1 Site Layout.



### 5.2 Site Perspective.



**Note:** The above scaled site layout is an example of one possible configuration of a 1500 sqm Drill Yard for Task Force vehicle staging. The station design in this example is conceptual only.

General Access and Mobility Manual  
Metropolitan Fire Brigade

2010

### **Purpose of the Manual**

The Code aims to ensure that all members of staff and the community have unimpeded access to buildings, services and facilities which the MFB own, lease and operate.

### **Applications of the Manual**

Disability Access relates to the all buildings and facilities, due to the fact that the MFB has Staff and Customers and Service Providers entering buildings who will be people with disabilities.

As per stringent requirements for all Operational Firefighters to be physically fit for duty, Operational Areas may be considered as areas which may not need to be fully compliant to D.D.A. (Disability Discrimination Act 1992) legislative requirements due to the nature of the use for the areas. As such, bedrooms, bathrooms and locker rooms, may not be areas where people with disability, injury or illness would be required to utilise for work purposes. People entering as a visitor or Non –Operational staff member, would be directed and assisted by staff on duty.

If a member of staff was to be located at a site which was not accessible for their needs, Workplace Modifications would be implemented to assist that person to complete the inherent requirements of their job.

The primary function of Fire Stations is to assist in the delivery of an emergency service with a quick and efficient egress through the building.

### **Why access and mobility is important**

To ensure that the MFB comply with the Disability Services Act of 2006, it is imperative that all works to buildings and surrounding environments, meet a minimum Disability Discrimination Act 1992 (DDA) requirement when work is being planned and completed.

Public areas within a fire station relate to

- Car Parking
- Main principle entrance and entry foyer
- Accessible visitor bathroom
- Lecture room (Multipurpose room)
- Appliance bay
- Turnout alcove (to sign in and get through to the Appliance Bay)

The State Government of Victoria has legislative requirements under the Disability Services Act 2006 pertaining to Access to buildings for Statutory bodies.

The MFESB made the commitment to the community and Government in 2008, by endorsing its Disability Action Plan (2008-2011). An objective of this plan, is to *Incorporate physical accessibility in plans for all building upgrades and new stations (6.1, MFESB Disability Action Plan 2008-2011)*

**Disclaimer**

Whilst every effort has been taken to provide thorough information, this document is developed as a guide, and does not replace the use and reference of the Building Codes of Australia and Australia Standards.

## **Summary of key access requirements within the MFB**

Generally, key access requirements must be considered within a building to ensure access for all is provided. Access issues relate to the following:

- Car parking
- Bathrooms and change facilities
- Colour contrasts
- Customer service areas
- Entrances
- Exits
- Floor surfaces
- Internal walkways and corridors
- Kerb ramps
- Kitchens / dining areas / tables
- Landscaping elements
- Lifts
- Meeting and multipurpose areas
- Pathways
- Ramps
- Signage and way finding
- Stairs
- Tactile Ground Surface Indicators
- Toilets (designated accessible toilets)

### **Summary of Australian Standards referred to within the manual**

- a) AS1428.1 Design for Access and Mobility – General Requirements for Access – New Building
- b) AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities
- c) AS1428.4 Design for access Mobility – Tactile Indicators
- d) AS 1680.0 Interior Lighting – Safe Movement
- e) AS 1735.12 Lifts, Escalators and Moving Walks – Facilities for persons with disabilities
- f) AS 1735.14 Lifts for people with limited mobility – restricted use – low rise platforms
- g) AS2220.2 Emergency warning and intercommunication systems in buildings – system design, installation and commissioning
- h) AS 2890.1 Parking facilities: Part 1 – Off Street Car Parking
- i) AS 2890.6 Parking Facilities: Part 6 – Off Street Parking for people with disabilities
- j) AS 2899 Public Information Symbol Signs – Part 1 General Information signs
- k) AS 4586 Slip resistance classification of new pedestrian surface materials
- l) AS 1428 Draft Access to Premise Standards 2009
- m) AS 1680.1 Interior lighting- General principles and recommendations



## **1.0 Accessible Car Parking**

*AS 2890.1 Parking Facilities: Part 1 – Off Street Parking*

*AS 2890.6 Parking Facilities: Part 6 – Off Street Parking for people with disabilities*

Provide accessible off street parking, where possible, which enables a person to disembark from a vehicle safely, with a path which will enable a continuous accessible path of travel to the building entrance.

A minimum bay width of 3200mm and length of 5400mm is generally required to provide appropriate access for both the driver and the passenger to load and unload from the vehicle.

Other key elements include appropriate signage and line marking, kerb ramps, lighting, overhead clearance, and tactile ground surface indicators as per the Standards

## **2.0 Built Form and Entrances**

*AS 1428.1 Design for Access and Mobility*

*AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities*

*AS 1680.0 Interior Lighting – Safe Movement*

*AS 2899 Public Information Symbol Signs – Part 1 General Information signs*

*AS 1680.1 Interior lighting- General principles and recommendations*

*AS 4586 Slip resistance classification of new pedestrian surface materials*

Provide a continual accessible path of travel from the property line and accessible car park to the entry foyer of buildings. Principal public entrances should be wide, level, step free, with matting that is recessed into the flat surface of the ground.

Install ramps that have a gradient of no more than 1:14 as per AS 1428

Provide for colour contrasting to building features, such as bollards, walls and floors and Tactile Ground Surface Indicators (TGSIs).

Provide compliant circulation space of all door width to a minimum of 850mm clear egress with a force less than 110 Newtons to open them, except where air circulation inhibits door closure.

Provide colour contrast and luminance contrast strips on all continuous glass walls and doors.

Provide compliant signage at AS1428 height requirements 1200-1600 mm above floor level.

Install door handles, intercoms, locks and security swipe units at AS1428 requirements of 900-1100mm

### **3.0 Change and Shower Facilities**

*AS 1428.1 Design for Access and Mobility*

*AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities*

Unisex facilities are preferred, which provide enough space to allow two adults to use, change, and shower simultaneously. Provision of an accessible shower seat, adjustable shower rose with vertical shower support grab rails, slip resistant and step free level floor surface, unobstructed circulation space appropriate hand rails, clothes hooks and/ or lockers at an accessible height. If a baby change table is provided, that it be placed where it does not obstruct the circulation space of the facility.

### **4.0 Toilets (Designated Accessible Toilets)**

*AS 1428.1 Design for Access and Mobility*

*AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities*

Unisex facilities are preferred.

Compliance with relevant Australian Standards is crucial in accessible toilets. The most important elements are the circulation area and the location of fittings.

Provide compliant signage at AS1428 height requirements 1200-1600 mm above floor level.

Install door handles, intercoms, locks and security swipe units at AS1428 requirements of 900-1100mm.

### **5.0 Lifts**

*AS 1735.12 Lifts, Escalators and Moving Walks – Facilities for persons with disabilities*

*AS 1735.14 Lifts for people with limited mobility – restricted use – low rise platforms*

*AS1428.1 Design for Access and Mobility*

*AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities*

Passenger lifts should be provided in all new buildings with more than one level (See BCA for exemptions). The lift will incorporate sufficient space to allow a person using a wheelchair or scooter to enter and access the lift control functions. Signage should incorporate tactile elements and clear labelling. Handrails will be provided.

## **6.0 Stairs**

*AS1428.1 Design for Access and Mobility – General Requirements for Access – New Building*

*AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities*

*AS1428.4 Design for access Mobility – Tactile Indicators*

*AS 1680.0 Interior Lighting – Safe Movement*

All stairs and steps shall be fitted with contrast on stair nosing, which incorporate enclosed risers with slip resistant surfaces as well as compliant handrails on both sides of the stairs.

Tactile Ground Surface indicators are to be installed at the top and bottom of stairs and at landings as required.

Appropriate lighting will be installed for night time use.

## **7.0 Meeting Spaces**

*AS1428.1 Design for Access and Mobility – General Requirements for Access – New Building*

*AS 1428.2 Design for Access and Mobility – Enhances and Additional Requirements – Buildings and Facilities*

*AS1428.4 Design for access Mobility – Tactile Indicators*

*AS 1680.0 Interior Lighting – Safe Movement*

*AS 1680.1 Interior lighting- General principles and recommendations*

A continuous accessible path of travel shall be provided to and through any meeting areas. Provide appropriate seating with backs and arm rests, which allows integrated wheelchair space.

Proximity of Accessible Toilets and Emergency Exits is important. Provide access to stage and podium areas, and Audio systems which are at an accessible height. For large meeting rooms/lecture rooms install hearing augmentation systems and appropriate signage for the space covered.

<b>Metropolitan Fire &amp; Emergency Services Board</b> <b>EXECUTIVE DIRECTIVE</b> <b>MINIMUM CREWING</b>		Reference No: <b>ED 1/2006</b>
		Author: A.J. Murphy
		Verified: J.M. Carlisle
Issue Date: 20/2/06	Replaces: Minimum Manning	Page No: 1 of 3

At the commencement of each shift the MFESB employee crewing shall be in accordance with the attached Chart (Ch 060221) with the following variations:

**1. Commanders Location**

Central, Western, Northern, and Southern Zone shall each have a commander on Duty and on shift.

**2. Senior Station Officer Stations:**

- (a) Stations 1, 7, 25, 35 and 44 shall have a Senior Station Officer on duty.
- (b) Other stations designated as Senior Station Officer Stations shall have, as a minimum, a Station Officer on duty acting as the Senior Station officer on duty.
- (c) Stations 1, 7, 25 and 44 shall also have a Station Officer on duty.
- (d) Station 1 shall also have a Station Officer designated as the works officer.

**3. Command Levels - Fire Appliances:**

- (a) Any appliance that is designated on the attached chart (CH 060221) as normally under the command of a Senior Station Officer may be commanded by a Station Officer (substantive) except where paragraph 2(c) above applies.
- (b) Any appliance that is designated on the attached chart (Ch 060221) as normally under the command of a Station Officer may be commanded by a Leading Firefighter (substantive).
- (c) A Leading Firefighter may command an appliance that is designated as a Senior Station Officer appliance on a non urgent move up to a station where such station is normally under the command of a Station Officer.
- (d) Any appliance that is normally under the command of a Leading Firefighter may in the absence of the Leading Firefighter be commanded by:-
  - (i) Senior Firefighter (Qualified to Leading Firefighter) or
  - (ii) Qualified Firefighter (Qualified to Leading Firefighter), or
  - (iii) Senior Firefighter who has successfully completed an assessment in Command and Control.

- 4. A Leading Firefighter may be in charge of a Fire Duty/Watching Duty provided that only one appliance is assigned to said fire (watching) duty.

**5. Flexible Crewing:  
In Shift Emergency:**

An 'In Shift Emergency' occurs when a member of the Brigade who is on duty is required to book off duty on Sick Leave, Carer's Leave, Pressing Necessity Leave etc with such urgency that is not practical to await for a stand by to arrive at the duty station.

Metropolitan Fire & Emergency Services Board <b>EXECUTIVE DIRECTIVE</b> <b>MINIMUM CREWING</b>		Reference No: <b>ED 1/2006</b>
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		Verified: J.M. Carlisle
Issue Date: 20/2/06	Replaces: Minimum Manning	Page No: 2 of 3

During an 'In Shift Emergency' the appliance will remain in commission with a reduced crew until such time as a standby can be effected and an extra MFESB primary appliance shall be responded to all calls attended by the effected appliance.

If all Zones are on Minimum Crewing and an 'In Shift Emergency' occurs all four (4) crewed appliances with the exception of Pumpers at 1, 7, 25, 35 and 44 may be reduced to a crew of three to facilitate a standby to the effected appliance while arrangements are made to recall a firefighter which will be immediately initiated.

**6. Overall Crewing Requirement:**

To ensure MFESB employee capability to meet the crewing and command levels designated in this Executive Directive and other activities there shall be an all inclusive number of employees as follows:

- 40 Commanders
- 92 SSO's
- 308 Station Officers
- 1130 Leading firefighters

**7. Strategic Location Plan:**

Stations/Appliances/Staff removed or relocated as a result of the progressive implementation of the Strategic Location Plan shall result in the reissue of chart (Ch 060221) to reflect these alterations.

**8. Appliance Availability;**

There shall be a minimum of four rescue units and four aerial appliances in commission at any time. In the event that a further unit becomes unserviceable mechanical staff will immediately be recalled to affect repairs and restore the minimum number to four.

**9. (A) Recall Considerations**

Appliances temporarily out of service due to breakdown and unable to be replaced during that shift (eg two Rescue Units broken down) shall result in the appropriate staff numbers being available for standbys and the overall minimum crewing requirements being temporarily reduced for up to one week, by that number, for the purposes of recall.

Metropolitan Fire & Emergency Services Board <b>EXECUTIVE DIRECTIVE</b> <b>MINIMUM CREWING</b>		Reference No: <b>ED 1/2006</b>
		Author: A.J. Murphy
		Verified: J.M. Carlisle
Issue Date: 20/2/06	Replaces: Minimum Manning	Page No: 3 of 3

**(B) Retaining**

In the event that insufficient personnel to crew appliances in accordance with the minimum crewing chart present for duty at the commencement of any shift, sufficient personnel, at appropriate rank/s, to make up the discrepancy will be retained from the off-going shift and subsequently relieved by recall, at appropriate rank/s, from off duty staff.

**10. Excess of Minimum Crewing:**

Rostered staff available over 269 may be used to provide crewing for the following:

- a. additional crewing of other appliances or
- b. commissioning of additional appliances or

As per the requirements of the Director Operations or Senior Duty Officer will give consideration to the risk environment, operational activity, training activity, the climate or other appropriate issues.

**11. Emergency Move Up:**

Nothing in this directive shall restrict the dispatch of crewed appliances to move up to provide fire cover in an emergency.

***This Executive Directive is to be placed in the Brigade Order Book section of the Standard Procedures Manual (Volume 4) immediately following the General Orders.***

**A.J. Murphy**  
**Director - Operations**

**\*Designates notes.**

**NOTE 1** The minimum number of COMMANDERS to be on duty shall be 4.

**NOTE 1.** The minimum number of **COMMANDERS** to be on duty shall be 4.

**NOTE 2.** The minimum number of SENIOR STATION OFFICERS to be on duty shall be 5 (FS1, FS 7, FS 25, FS 35 and FS 40). The minimum number of SENIOR STATION OFFICERS to be on duty shall be 5 (FS1, FS 7, FS 25, FS 35 and FS 40).

NOTE 3. The minimum combined number of STATION OFFICERS and LEADING FIREFIGHTERS to be on duty shall be 75

NOTE 4. Crawling reference to appliance type "T" refers to 1LFF and 1FF for T10a and 1LFF

NOTE 4. Crewing reference to appliance type 1 refers to 10FF and 10FF for 10FF and 10FF.

NOTE 5. Comb ladder FS35 will become Pumper 35B. Comb ladder 1 will become P47B.

NOTE 5. Comb ladder FS35 will become Pumpet 35B. Comb ladder FS35 will become Pumpet 35B. Comb ladder FS35 will become Pumpet 35B.

NOTE 6. Decontamination unit FS47 will become Decontamination unit FS38 listed on chart as a Transporter (NOTE 7. FS47 will be decommissioned. Crews will be assigned as 4th person on Pumps 16 and 41.

NOTE 7. Platform FS38 will be decommissioned. Crews will be assigned a

**NOTE 8. Current Platform 23 will relocate and become Platform 25**

NOTE 8: Current Platform 23 will relocate and become Platform 20. Pumper 50 has been changed to better accommodate 7 persons on fireground and the air crewing of 4 personnel for Pumper 50 has been changed.

# Accommodation for Fire Fighters

## Central Zone

FS	Grass Pkg	Lockers	Beeds SO	Beeds F/F	Colt	Minimum Manning	Optimum Manning	Core Feeding Spaces	Showering Facilities	Total Facilities/Disables	Female Facilities/Unisex	Seating Max Room	Seating Lounge Room
FS 1	220	12ZF762SO/Female	10	21	31	20	31	25	8F5SO/Female	4FF4SO2/Disable	YES (Female)	23FF/ASO	23FF/HISO
FS 2	50	36FF712SO	2	7	8	7	8	6	2FF/ISO	3FF7ISO1 EXTRA (NOT DISABLE)	None	8FFZSO	8FF/ASO
FS 3	37	40FF78SO/184S	2	6	8	6	7	6	4FF7ISO1/Disable	4FF7ISO1/Disable	YES (Un)	8FF/ASO	8FF/ASO
FS 10	80	74	3	12	15	10	12	Under Dev	7	8FFZSO/Disable	All	10FF/ASO	11FF/ASO
FS 18	24	22	1	4	5	3	4	8	2FF/ISO	2FF7ISO1/Disable	No	4	5
FS 35	66	56FF718SO	2	10	12	9	10	12MFB4MAS	5FF/ISO	4FF7ISO1/Disable	YES (Un)	10FF/ASO	10FF/ASO
FS 38	66	56FF712ISO	4	12	14	13	14	15	4FF/ASO	8FFZSO/Disable	YES	10FF/ASO	12FF/ASO
FS 39	33	27	1	2	3	3	3	8	3	0	No	5	11

Note 1  
3 Sn  
Info as requested. Additional Information...  
6 MAS parking bays are allocated as 2 for day shift, 2 for night shift and 2 for afternoon shift  
FF's shower and toilet facilities are shared with MAS (up to a max of 4 during the day)

Note 2  
1 Sn  
1 Bed in Washroom. There is an area adjacent to the 1st floor locker room separated for the female firefighters (7 lockers)  
The locker rooms also accommodate day work staff (uniformed)

## Northern Zone

FS	Grass Pkg	Lockers	Beeds SO	Beeds F/F	Colt	Minimum Manning	Optimum Manning	Core Feeding Spaces	Showering Facilities	Total Facilities/Disables	Female Facilities/Unisex	Seating Max Room	Seating Lounge Room
FS 4	24	24	1	5	6	4	5	6	4	3FF7ISO1/Disable	0	4	5
FS 5	40	36	1	6	7	5	6	7	4	3FF7ISO1/Disable	0	6	6
FS 6	26	24	1	4	5	3	4	5	2	3FF7ISO1/Disable	0	6	6
FS 7	69	64FFZSO	3	10	13	10	12	21	5FFZSO	4FF7ISO1/Disable	Yes	10FF/ASO	12FF/ASO
FS 9	28	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	Unisex	4	5
FS 11	24	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	2	4	5
FS 12	24	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	1	6	6
FS 13	26	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	2	4	4
FS 14	26	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	2	4	4
FS 15	26	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	1	6	6
FS 16	26	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	1	4	4
FS 18	26	24	1	4	5	3	4	5	3	3FF7ISO1/Disable	0	4	4
FS 30	29	35	1	5	6	5	6	7	8	2FF7ISO	0	5	6

## Southern Zone

FS	Grass Pkg	Lockers	Beeds SO	Beeds F/F	Colt	Minimum Manning	Optimum Manning	Core Feeding Spaces	Showering Facilities	Total Facilities/Disables	Female Facilities/Unisex	Seating Max Room	Seating Lounge Room
FS 20	27	24	1	4	5	3	4	5	6	3FF7ISO1/Disable	0	6	6
FS 22	45	46	2	6	8	6	8	14	14	4FF7ISO1/Disable	0	9	9
FS 23	36	33	1	5	6	5	6	7	8	3FF7ISO1/Disable	0	6	6
FS 24	27	22	1	4	5	3	4	5	6	2FF7ISO1/Disable	0	4	4
FS 25	100	88	3	12	15	10	12	22	22	7FFZSO/Disable	2	18	18
FS 26	28	32	2	4	5	3	4	5	6	3FF7ISO1/Disable	0	6	6
FS 28	36	32	2	4	5	3	4	5	6	3FF7ISO1/Disable	0	6	6
FS 29	24	24	1	4	5	3	4	5	6	3FF7ISO1/Disable	0	4	4
FS 31	24	24	1	4	5	3	4	5	6	3FF7ISO1/Disable	0	4	4
FS 32	25	24	1	4	5	3	4	5	6	3FF7ISO1/Disable	0	4	4
FS 33	24	24	1	4	5	3	4	5	6	3FF7ISO1/Disable	1	4	4
FS 34	35	39	1	5	6	5	6	7	8	4FF7ISO1/Disable	0	10	10

## Western Zone

FS	Grass Pkg	Lockers	Beeds SO	Beeds F/F	Colt	Minimum Manning	Optimum Manning	Core Feeding Spaces	Showering Facilities	Total Facilities/Disables	Female Facilities/Unisex	Seating Max Room	Seating Lounge Room
FS 40	29	20	1	3	4	3	4	3	3	2FF/ISO	YES	4	4
FS 41	20	22	1	3	4	3	4	3	2	NO	NO	4	4
FS 42	48	48	2	10	12	7	12	10	10	FF3SO1D	UNISEX	8	10
FS 43	34	33	1	5	6	5	6	6	6	ISO/IFF	UNISEX	6	6
FS 44	132	64	4	10	14	10	14	15	15	5FFZSO	FES	10	11
FS 45	30	22	1	3	4	3	4	4	2	2FF/ISO	UNISEX	4	4
FS 46	24	22	1	3	4	3	4	4	2	2	NO	3	4
FS 48	24	20	1	3	4	3	4	4	2	2	NO	14M	103
FS 49	24	20	1	3	4	3	4	4	2	2	NO	3	4
FS 50	21	25	1	3	4	3	4	4	3	ISO2FF/1D	YES	6	6
FS 51	29	36	1	6	7	5	6	6	3	3FF7ISO1D	UNISEX	3	3
FS 52	24	24	1	4	5	3	4	6	6	2FF/ISO	1 TOILET	8	8



## **LIFT UP GLAZED DOORS**

### **PART I GENERAL**

#### **101 Scope**

Supply and install two Fire Station appliance bay doors. The doors are to be of the two-leaf, counterweight balanced, "Fold-up" type. They are to be motorised, and constructed as outlined in the following specifications.

Front Doors shall be approx. 4000 mm wide X 5000 mm high

Rear Door shall be approx. 8000 mm wide x 5000 mm high.

#### **102 Shop Drawings**

Provide Shop Drawings for major items supplied in accordance with the following directives.

1. Contract Drawings and details provided are indicative as to general and minimum requirements, and do not show conditions.  
Develop details not shown and in conformity with the indicative details shown.
2. Measure and confirm dimensions on site, before preparing Shop Drawings where possible.
3. Submit detailed Shop Drawings for fabrication and installation of major metalwork. Show plans, elevations and detailed sections; indicate materials, finishes, types of joinery, fasteners, anchorages and accessory items. Provide setting diagrams and full-scale templates of blocking, anchorages, sleeves and bolts installed by others.

#### **103 Defects**

The Door Contractor shall guarantee his product against faulty workmanship and materials and accept liability for rectification of any fault free of charge, which occurs within twelve calendar months after the Builder's practical completion, and is attributable to faulty design, workmanship or materials.

##### **103.5 Optional warrantee extension.**

If a maintenance programme is entered into with the manufacture the warrantee shall be extended by up to three years. This shall be entered into prior to practical completion.

#### **104 Performance and Operation**

The Door Contractor shall renew or modify, at his own expense, any item of equipment forming part of his installation to ensure that the whole installation will operate and perform as specified. This obligation shall be in force for the duration of the Defects Liability Period. If a recurring fault is found there must be a rectification procedure given and approved by the MFB at no cost to the MFB. Once approved a completion date must be given in writing.

## LIFT UP GLAZED DOORS

### PART II MATERIALS

#### 201 Bi-Fold Doors

i) **General:**

The Fold-up doors shall be designed to withstand wind loads in accordance with AS1170 Part 2. In the closed position they shall have a maximum horizontal deflection (under design wind load) of 1 in 200 and a maximum vertical deflection of 15 mm (under self-weight load).

Frame members are to be designed to perform within their permissible working stress.

All structural joints shall be fully welded and ground back where necessary.

The force required for manual operation shall not exceed 15 kilograms.

Hinges shall be made from machined steel and fitted with bearing surfaces.

All pins and rotating shafts shall be fitted with bushes and heavy-duty bearings respectively.

The regions required to accommodate the counterweights and their operation shall be enclosed by sheet metal covers. These covers are to be formed from 1.6mm thick galvanized or zincalume coated steel sheet and their length shall equal the height the door. The counter weight covers shall be painted to match the doors frame.

Weather seals, shall be fitted to the bottom and sides of the doors. The bottom weather seal shall be fitted and appropriately sized to take into account undulations in the finished floor level.

Where the floor of the opening is significantly off-square the bottom of the doors shall be made to conform to it.

ii) **Emergency Operation:**

In case of power failure, a quick release system to enable manual operation shall be fitted to the doors. This system will allow the door to be simply and quickly switched to manual control at any position of its operation. Details of this mechanism's operation are to be supplied and approved by the MFB prior to manufacture.

iii) **Cables and Pulleys:**

The door and counterweights will be connected with galvanised steel cables supported by a pulley system.

The cable construction will suit "running" type operation and have a "wire rope core". They will be designed with a safety factor of not less than 10.

Each end of the cables will be fitted with a grooved bronze thimble, suitable for connection to the door axles.

The completed cables must be certified, with a copy of the certificate included in the Installation/Service Manual.

The ratio of pulley root diameter to cable diameter shall be not less than 25:1.

The dimensions of the pulley-cable-groove are to be in accordance with the directions given in the Appendix of the Crane Code (AS1418).

Pulleys will be machined from steel billet and fitted with appropriately sized dual, precision ball bearings.

All cables and pulleys shall be in accordance with AS 1418, Part 1 - 1986 Crane Code and AS 2759 - 1985 Steel Wire Rope Code.

## LIFT UP GLAZED DOORS

- iv) **Glazing:**  
Powder-coated aluminium panels shall be glazed into the bottom of the door to form a kick-panel. In situations where the closed door faces East or West, the top row of glazing shall also be powder-coated aluminium panels.  
The remaining frontal area of the door shall be glazed with 4 mm. toughened or 6.38 laminated grey glass.  
An aluminium security glazing bead shall retain the aluminium and glass panels.  
A maximum of Three (3) square metres per panel of glass.  
The glazing bead shall be powder coated to a nominated colour.  
The glazing bead shall be fitted onto the door frame with an electrical insulating silicon gasket and fixed with Tek screws (zinc plated 10-24 x 16 mm at 300 mm nominal centres). At no point should the aluminium section be in direct contact with the steel frame.  
Closed cell backing rods shall be used on either side of the glass prior to application of an elastomeric glazing sealant.  
The aluminium shall be prepared for powder coating by anodising it to give a "natural anodised" finish with a depth of 10 micron.  
The Door Contractor shall be responsible for the supply and installation of all glass and aluminium panels.
- v) **Decent control device:**  
An approved and tested by the MFB decent control device is to be fitted to all lift up doors greater than 4 Metres in width. The system shall control vertical decent to a maximum speed of 300mm per second. The device shall have a manual reset system and test function. This system shall be tested in the regular maintenance schedule.

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### Approved Supplies

Door systems shall be supplied and installed by one of the following contractors.  
"Arco Pty. Ltd, 03 95873616" or "Door Repair & Maintenance Pty Ltd 03 97206488"

## LIFT UP GLAZED DOORS

### 204 Electrical Equipment

#### A. Fold-up Door Motorisation

Each door shall be motorised by means of a three phase, 0.75Kw, heavy duty 100% duty cycle fan cooled motor and a torque master gearbox assembly. This drive unit will also incorporate a torque limiting clutch and independent limit switch assembly. The torque limiter must be fitted on the output shaft of the gearbox.

An isolating switch shall be fitted for each door in the door PLC control box.

All door/s shall be fitted with a variable speed drive system for a soft start, soft stop which has two program modes. One is for normal operation that will allow the door to operate at a minimum speed of 150mm per second. The second mode is for a quick opening mode to be used in the event of a fire alarm input. This will have an additional input from the BMS for activation. Option slow close shall be programmed into the door PLC for unmanned closing via remote or P.E. beams.

#### Controls:

Local push-button station to operate the raising, lowering and stopping of each door. The push-button station shall incorporate hold-in operation. The location of the push-button stations shall be approved by the Architect prior to installation, and shall be clear of the travel of the doors whilst a person is standing by the push buttons. However this location should be in clear view of the doors with vehicles in each bay.

- Door operation will also be made from control panel in the Turnout Area. This panel will have raise and stop buttons only. It will also have single red and green indicator lights showing the door opening operations of the bi-fold doors.  
The Door contractor supplies the control panel and the Door Contractor shall terminate the wiring from panel to the door PLC Control Unit. Note: the cabling is supplied and ran by the electrical contractor. The door contractor is responsible for communicating with the site electrician for cable type and location.
- Photo-cells of the sender/receiver type across the front door to close the door only when the appliance has departed provided the Fire Station FSE key switch is in the unmanned mode and the correct sequence is followed. The PLC unit controlling this door is to be set up for one appliance departing before the door descends. Each door shall be individually controlled. Note Optional slow close shall be programmed and activated if requested by the MFB.
- Connection and fixing of one proximity switch at the rear of the Station to open the rear door by the security system.
- A large mushroom electric switch located adjacent to the local push button at the front of the appliance bay. It is only to close the rear door when the Fire Station is in the unmanned mode. The purpose of this button is to alleviate staff having to close the rear door on the departure of the outgoing appliance. In this case the front door will close automatically as the last appliance departs. This switch can be replaced by in truck remote controls programmed to close that bays door on exit and close all appliance bay doors if unmanned.
- Each door shall be fitted with two sets of drive indicator lights internally and two sets fitted externally for the rear door. They are positioned with one set of lights each side of the door mounted at a height that can be seen by the driver of the fire appliance. Each set shall consist of one red, amber and green indicating light mounted vertically. The lights shall be 24 volt high intensity

## **LIFT UP GLAZED DOORS**

wide angle LED's. The housing shall be adjustable to allow best view from the drivers location.

The amber indicating lights must be strobing whilst the door is travelling and whilst the door is on countdown for auto close function. The red shall be on whilst stationary between full open and in the fully closed position. The green lights are to indicate operational appliances are clear to exit and on in the fully open position. The amber indicating lights shall perform as strobe lights 5 seconds prior, and during the closing and opening of the appliance bay doors. The amber indicating lights shall perform as strobe during the closing of the appliance bay doors at all times.

Magnetic reed security switches to interface via the door PLC terminals with the MFB BMS shall be fitted to all doors by the Door Contractor. These are to signal the MFB BMS and security units that doors have closed. Mounting location to be approved by the proprietor and be unaffected by wind or door movement and must be operational even whilst the door is in manual operation.

The power supply to the front and rear door motor shall be supplied through an Omron variable speed drive with built in adjustable overload protection and an output to the door PLC as to its statics.

The green indicator lights beside each door shall be supplied through an Omron LY2 Plug-in relay in 24V DC relays or equivalent. The red light is to use a 24V DC solid-state relay. Cables to each set of lights shall be fitted with disconnect plugs above the door to facilitate counterweight cover removal for service.

All underground wiring shall be in a heavy duty PVC conduit and to be double insulated PVC cable (Not trailer flex)

## LIFT UP GLAZED DOORS

### B. PLC Control Unit

The Door Contractor is to supply as a separate item a programmable logic controller (PLC) to control all the doors. The front door using light beams to enable the door to be closed automatically on departure of the vehicles. The rear door shall be operated by manually activated controls only.

Light beams can be mounted on bollards, or on walls, or on specially designed brackets supplied by the Door Contractor. The builder is to mount the external bollards at a location given by the door contractor.

The PLC to be located beside the MFB BMS.

The PLC unit shall interface with the:

- i) Local Door Controls
- ii) Remote Control Panel
- iii) Door Light Beams
- iv) MFB Station Turnout System
- v) MFB Security System
- vi) Motor Limit Switches
- vii) MFB BMS
- viii) Door Reed Switches

A schematic arrangement of the controls is attached.

The Builder's electrical contractor will be responsible for the following work:

- i) All power to Door PLC Cabinet.
- ii) Remote control panel and switches
- iii) Main switchboard
- iv) Cabling from the door PLC to each motor location in shielded cable.
- v) Cabling and conduit to gate control box.
- vi) Cat(5) cabling to all switch panels, photo beams, key switches, intercoms, read switches and BMS data
- vii) Co-ordinate with the Nominated Electrical Sub Contractor for the Bi-Fold door installation for his wiring being installed and to include all wiring and connection of equipment necessary for the complete installation of the Bi-Fold doors not being provided by the Nominated Electrical Contractor.
- viii) All termination of control wiring shall be supplied and installed into position by the Door Contractor as well as the externally mounted key switch control.

Wiring in the PLC Control Unit and at the Control Panel shall be by the Door Contractor. The Door Contractor shall be responsible for the supply and installation of motors, isolating switches, limit switches variable speed drives and control relays.

## **LIFT UP GLAZED DOORS**

The PLC Control Unit shall consist of Omron CJ series Programmable controller. The unit shall have a minimum of 60 I/O and be expandable. A lithium battery shall maintain the programme memory with a 2 year under load memory retention. The actual size of the controller to be fitted shall be determined by the number of doors to be controlled at each station and the complexity of the program.

The PLC Unit is to be fitted with a 16/in 16/ out I/O card, dedicated for the interface with the MFB BMS. The interface cable is to be supplied through a series of knife disconnect switches so as to isolate the two PLC units from each other for maintenance and fault finding.

The PLC outputs shall be used to control current handling power relays and field effective transistors (FET). The raise/lower outputs are to be fed through a N/O relay contacts, which are to be held closed by the stop and safety circuits. This is to allow for the failure of the PLC, where the relays will fail open.

Low voltage power supply is to be supplied using a regulated power supply with a 240V AC input and an output of 24V DC of a minimum of 2 amps.

The power supply unit shall be protected by an over temperature protection circuit.

The PLC power supply, relays and associated terminals and ductwork shall be enclosed in an enclosure with an IP 55 protection rating. The enclosure shall be lockable, fitted with a PLC status light, finished with a two pack; chip and scratch resistant paint to an approved colour.

### **Door PLC Program Requirements**

Each door is controlled by a set of three push buttons (UP, STOP, DOWN) located adjacent to it. They can also be RAISED and STOPPED (but not lowered) by the two push buttons (UP, TOP) on the watchroom control panel. Some of the doors will have an additional proximity Switch located on the outside wall adjacent to the entrance. This proximity switch will be used to RAISE the door from outside the Station.

The Turn Out area control panel has an AUTO RAISE ON/OFF switch for each front door. This switch is used to enable or disable the automatically opening operation of the doors triggered by the DOORS UP pulse from the MFB BMS. This AUTO RAISE ON/OFF switch will have NO effect on the automatic closing operation of the doors and will not override the manual push buttons on the watch alcove control panel or in the engine bay. Each door has a set of (vehicle) driver indicator lamps at each side of the entrance. The GREEN lamp will light to indicate to the driver that the door is fully up and it is safe to drive through the entrance.

The Turn Out area control panel also has GREEN and RED neon for each door which will duplicate the driver indicator lamps in the engine bay.

The door PLC program written by the contractor shall have the intellectual property rights transferred to the MFB. The MFB shall be the sole owner of the PLC program.

## LIFT UP GLAZED DOORS

### Appliance Bay Doors

#### Control from MFB PLC

The MFB BMS will provide the DOOR PLC with two control signals. These will be from normally open, voltage free relay contacts and are used to automatically control the doors in the event of a fire call.

1. DOORS UP a 1-second closure
2. UNMANNED will remain closed while the key switch in FSE is in the unmanned position

#### Outputs to MFB BMS

The DOOR PLC will provide the MFB BMS with two status signals. These must be from normally open, voltage free relay contacts.

1. DOORS LOWERING should remain closed while any of the engine bay front doors are lowering
2. DOORS DOWN should remain closed when all the engine bay doors are fully closed
3. OVERLOAD A closed contact from each door if it has an overload
4. P.E OBSTRUCTED An output for each P.E beam status
5. OPERATIONS A 1 second pulse for a counter for each door.
6. TRAVELL TIME If the travel time expires on the door
7. DOOR STATIS Door closed, part open and open
8. ALLWAYS ON Power status on the door PLC.

### Closing of Front Engine Bay Doors

Each front door can be lowered by the lower push button located adjacent to it, this should not effect any PLC program.

The front doors are each fitted with two photoelectric beams, one across the inside entrance and the other across the outside entrance. These beams should not be obstructed by the DOOR when it is being lowered or raised. The beams are used to detect when an appliance or person is in the path of the door while it is LOWERING. If any one of the beams is obstructed when the door is lowering the door will stop and auto raise. When the beams have been cleared the door will wait 5 seconds before it can continue to lower. If the stop button is pressed at any time the door should remain stopped until either the raise or lower push buttons are pressed.

The UNMANNED input from the MFB BMS should not effect this operation.

The DOOR UP input from the MFB BMS should only cancel this operation and raise the door if the AUTO RAISE ON/OFF switch (on the watch alcove control panel) is on.

The front engine bay door can also be closed automatically - this is explained in detail below.



## LIFT UP GLAZED DOORS

### Automatic Close of Front Engine Bay Door

The front door will close automatically when a number of conditions have been met.

1. The UNMANNED input from the MFB BMS must be present.
- 2, The photoelectric beam on the engineer bay door should have been obstructed in the correct sequence. The correct sequence is as follows:

INNER PHOTO ELECTRIC BEAM	OUTER PHOTO ELECTRIC BEAM
CLEAR	CLEAR
OBSTRUCTED >2 seconds	CLEAR
OBSTRUCTED	OBSTRUCTED >2seconds
CLEAR	OBSTRUCTED
CLEAR	CLEAR

Only when this beam sequence has been detected by **ANY ONE** of the engine bay doors, will that particular door close after a 5-second delay. If any of the beams are obstructed before the 5-second delay has expired the door will still start to lower 5 seconds after the beams have cleared.

When the door begins to close it will follow the conditions as explained in the section CLOSING OF FRONT ENGINE BAY DOORS.

If the STOP button is pressed at any time, the automatic closing sequence will be cancelled and only restarted when the above conditions have again been met.

## LIFT UP GLAZED DOORS

### Opening of Front Engine Bay Door

Each front engine bay door can only be opened in three ways.

1. By the RAISE push button in the engine bay or the RAISE push button in the watchroom control panel.
2. Automatically by the DOORS UP pulse from the MFB PLC. This is explained in the section below.
3. By the proximity switch if fitted this will be located on the outside wall adjacent to the entrance.

The photoelectric beam on each door, if obstructed, should not effect the opening conditions.

### Automatic Opening of Front Engine Bay Door

Each front engine bay door will open automatically only when

1. Its AUTO RAISE ON/OFF switch is in the ON position.
2. The DOORS UP 1 second control pulse from the MFB PLC has been received.

If the doors are already lowering when the above conditions have been met, they should stop, pause for 0.8 secs and return to open.

The photoelectric beams, if obstructed, should not effect the opening of the doors at **ANY** time.

### Rear Engine Bay Door

The rear engine bay doors can be controlled by a set of three push buttons located adjacent to it or RAISED and STOPPED by the two push buttons on the watchroom control panel.

The rear doors have an additional MASTER REAR DOORS DOWN button located near the watchroom. It can only be used to close the rear doors when the UNMANNED input from the MFB PLC is present.

The rear door may have a proximity switch located on the outside wall adjacent to the entrance it will raise the door from outside the Station.

The rear doors are not controlled automatically.

## LIFT UP GLAZED DOORS

### Location of Light Beam Detectors

1. **Bollards**  
Light beams can be mounted on external bollards provided by the Door Manufacture or on walls or on specially designed brackets or stands supplied by the Door Contractor.
2. **Front Door External Bollards**  
**The bollards are to be supplied and installed by the Builder.** The Door Contractor shall provide and install light beam components and wiring for each door and shall liaise with the Builder to fit the equipment appropriately.
3. **Front Doors Internal Brackets or Bollards**  
These bollards where necessary shall be supplied and installed by the Door Contractor. These bollards shall be of a substantial nature made from a rectangular hollow section.  
The Door Contractor shall be responsible for liaising with the Builder for the installation of wiring or chases in the floor slab to provide for the necessary wiring. The brackets or bollards themselves should have a height of approximately 1.5 metres overall for safety reasons.

### 205 Finish

#### Bi-Fold Doors

All door metalwork shall be sand blasted to class 2.5 AS 1627-1974 and coated Alternately the base metal must be of a galvanised or zincalume base and sanded. All welds and grind spots to have an additional zinc primer. Zinc based two pack etch primer to a thickness of 75 microns minimum. Topcoat shall be two pack paint then baked, and shall conform to all relevant Australian Standards

## PART III EXECUTION

### 301 Installation

Carry out installation of all equipment and fittings in strict accordance with Manufacturer's instructions.

### 302 Operating Instructions and Service Manuals

After completion of the works, the Door Contractor shall issued to the Architect, three (3) complete sets of Operating and Maintenance Manuals and As Built Drawings.

The manuals shall include:

1. Index of Conditions
2. Description of doors
3. Full list of motors and equipment, detailing manufacturer, supplier, model number and capacities.
4. Operating instructions.
5. Maintenance instructions for all plant and equipment.
6. Technical information, operating and maintenance manuals, spare part list, etc., on all equipment, as published by the manufacturers.
7. Line diagrams and schematics of all systems, including electrical and control systems. The as Built Drawings shall clearly show all arrangements as finally installed.
8. Copy of Omron maintenance and installation manuals
9. Copy of the door PLC program
10. As installed control wiring diagram showing all terminals numbered on the door PLC

## LIFT UP GLAZED DOORS

### 303 Maintenance Schedule

The appliance bay doors are required to be checked at three (3) monthly intervals and a written report sent to Brian Hardy at 456 Albert Street, East Melbourne.

Items that are to be checked:

1. Check door balance; disconnect door from motorisation and operate manually, and if the door is balanced it will remain stationary in its 45° position.  
Adjust the door to bring into balance if required.
2. Manually run the door up and down listening for any noise. Inspect the free running of the pulley sheaves and listen for any wire rope noise that could signal fraying or rubbing. Visually inspect the wire rope. Lubricate light and RICOH wire rope lubricant if required. Check the wire rope, replace the wire rope if frayed and give a full report as to why this has occurred.
3. With the door fully open inspect the top shaft wire rope swage, check that it has not or will not rub on the stops located on the vertical guides.  
Check wire rope, replace wire rope if frayed.
4. Reconnect the door and raise up, inspect the leaves of the door to check whether they are held together to achieve the full drive through.  
Adjust the upper limits as required.
5. Lower the door to 45° and stop, check both vertical sprockets chains to ensure that the tensions are equal, but not over taut.  
Adjust the chain tensions if required by the adjusting bolts.
6. Lower the door down and check if the carriage over travels and the connecting pins can be easily removed.  
Make the required adjustments and lubricate the connecting pin shaft.
7. The above items are the most important, however, the following items are required to be checked when service is being carried out.  
The top shaft sprockets alignment, adjust as required. Uneven wear on the bottom sprockets and bushers, replace if required.  
Check torque limiter for slippage; if it has been slipping dismantle the outer pad and inspect, if it has worn smooth either rough up or replace the torque limiter clutch plates and make the adjustments as required.  
Check clutch, the door should be able to be stopped by hand while to motor is in operation.  
Inspect the gearbox for oil leakage, replace seals as required.  
Provide written maintenance report after each service.

#### i) Switchgear and Electrical Wiring

The switchgear is required to be checked at 6 monthly intervals.

The following maintenance recommendations are made to ensure the continued satisfactory operation of the switchgear, and the electrical wiring installed as part of the controls for the appliance bay doors.

Items to be checked.

1. Cubicles are clean and free from dust.
2. Contactors faces are clean and free of pitting, terminal connections are tight. If the contactors have become pitted they are to be replaced. (Not to be cleaned with emery tape).

At twelve (12) monthly intervals the switchboard should be thoroughly inspected and tested by a Qualified Electrician with the following work being carried out.

## LIFT UP GLAZED DOORS

1. Inspect all contactors and relays for the correct operation and contact alignment, lightly oil pivot points.
2. Clean and dress copper contact faces, do not dress silver contact faces, wipe off carbon deposits. Replace the entire set of contactor fingers if worn to about half the normal thickness.
3. Check the programmable Logic Controller thermal overloads and circuit breakers for the correct operation and setting.
4. Check and tighten all electrical connections. Check solder on lugs for signs of discolouration due to heating, if heating is apparent but no fault is located replace the lug.

### ii) **Electrical Wiring**

Wiring is to be inspected at twelve (12) monthly intervals by a Qualified Electrician and the following work carried out.

1. Check the tightness of all electrical connections, particularly motor isolating switches.
2. Check that all conduits are fixed in position and the joints are sound.

### iii) **Electrical Motors**

When the electric motors are commissioned and every twelve (12) months thereafter, check each phase with an amp meter for overload. If overloaded, or current readings vary by more than 5% between phases, then check the line voltage at the motor is within permissible tolerances.

Incorrect line voltage should be corrected, if current readings are still uneven refer to electric motor manufacturer.

If there electric motor is overloaded and the voltages are normal, check and correct the cause of the overload. Always operate the electric motors with the thermal overload protection of the proper capacity.

At six (6) monthly intervals check the electric motors to ensure that the air passages are free of all foreign matter that may include, dust and stray oil and grease, etc.

### iv) **Electrical Motor Bearings (Ball or Roller)**

The factory lubricated bearings should not require attention for at least twelve (12) months, unless operating under vigorous conditions. Lean and repack the bearings to about 2/3 capacity, DO NOT over grease, where the bearings are fitted with lubricators, add a little grease every six (6) months. ALWAYS replace the lubricator caps otherwise entry of grit will shorten the life of the bearings.

## **LIFT UP GLAZED DOORS**

### **v) Photo Electric Switches**

Photoelectric beams are to be checked at three (3) monthly intervals, the front face or reflective mirror on both the transmit and receiver units are to be cleaned.

Checking the operation of the indicating LED on the receiver should check the photoelectric switches for alignment. The LED should be fully on, if it is flashing make the required adjustment so that the LED is not flashing on and off.

### **vi) Indicator Lamps**

The indicator lamps at the doors and in the watch alcove need to be checked and replaced as required.

### **vii) Programmable Logic Controller**

The PLC is to check six (6) monthly, checking the tightness of all terminals and the operation of the indicator LED's, in particular the battery indicator. If the battery indicator is indicating that the battery is getting low or two or three after the completion of the Fire Station, the battery should be replaced to avoid the program being lost due to power failure.

**SIEMENS BUILDING TECHNOLOGIES**  
**S600 APOGEE OPERATING MANUAL**  
**TURNOUT CONTROL**

**MFESB STATIONS**

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### 1. Introduction

*The DDC system at MFESB ??????? Fire Station is based on the Siemens Building Technologies System 600 Apogee platform.*

*The system architecture consists of a Modular Building Controller (MBC) and sixteen 540-110 Terminal Equipment Controllers (TEC).*

*MBC controls the DDC station turnout system and the mechanical services within the fire station. These are discussed in a separate manual. MBC is connected via a Apogee Ethernet Microserver (AEM) to the MFB Ethernet network, which allows the DDC to be monitored from the main DDC front-end computer located at the MFB Eastern Hill Fire Station.*

#### 1.1 System Description

*MBC will be located in an area to be agreed upon. It is powered from the 12V standby battery bank, via a 12VDC to 240VAC inverter so that it can continue to function in the event of a mains power failure. The terminals for all field connections are located within the MBC02 enclosure.*

*The appliance bay doors are controlled by a dedicated Programmable Logic Controller (PLC) supplied by the door manufacturer. This PLC is responsible for all aspects of door operation, including the monitoring of all safeties and interlocks.*

*The DDC is limited to providing a single "doors up" signal to the door PLC in a turnout situation. The MBC also monitors the status of the doors via "mirror" outputs on the door PLC via volt-free contacts.*

*The ???? Fire Station has an appliance bay with ? front doors and ? rear doors. Only the front doors operate automatically in a Turnout situation. The rear doors are controlled manually. The number and combination of front doors to be opened in a turnout is manually selected through the door PLC – it is NOT a DDC function.*

*The MBC interfaces with the Station Security Panel (supplied by others) with the Fire Station Turnout System (FSTS). The MBC monitors inputs from the FSTS for initiation of the turnout function.*

## 2. Station Turnout Control system

### 2.1 General Overview.

The Siemens Building Technologies DDC station turnout control system controls the fire call turnout function. It receives a "fire alarm" or "call out" signal, energises the turnout alarm within the station and signals the door PLC to initiate the automatic appliance bay door sequence. Once the door PLC detects that the appliances have left and the appliance bay door(s) are shut, it signals this to the DDC. The DDC then secures the station by locking the side door(s) and arming the security system.

The following functions are listed as outputs to various devices with a description of which inputs are used to enable them.

### 2.2 MBC Fail indication Output.

This output (point **MFB?STATION?.PLCFAIL**) indicates the status of MBC02. It is normally ON (indicating MBC02 is OK) and turns OFF to indicate failure of MBC02. It is energised (ON) on initial start up of MBC02 and remains ON unless the following occurs:

- 1) The MBC02 power supply fails.
- 2) A program running in MBC01 detects a virtual point (**MFB?STATION?.HBEAT**) in the MBC02's database has stopped being pulsed at a 2-second rate for more than 10 seconds. This indicates that program execution has halted and is an error condition.

### 2.3 WR-BELLQ (Dispach Area Bell) Output.

This output (point **MFB?STATION?.DA-BELLQ**) energises the fire alarm bells in the watch alcove and is energised (ON) when:

- 1) The WR-BELL input (point **MFB?STATION?.WR-BELL**) from the FSE panel is ON and both the SMS-ARMED (point **MFB?STATION?.SMS.ARMED**) input from the SMS Panel and SERVICE (point **MFB?STATION?.SERVICE**) input from the FSE are both OFF.
- 2) Either RDDRING input (point **MFB?STATION?.RDDRING1** or **MFB?STATION?.RDDRING2**) is pulsing after a 15-second delay from the first detection of the ring input. The output will only switch on while a pulse is present on the RDDRING input.
- 3) The 15-second delay is controlled by the MBC while the bell pulsing is controlled directly from the ring detector relay.

The 15-second delay output is reset automatically 15 seconds from when the ring detect input has stopped ringing.

The WR-BELLQ output can be reset when:

- 1) The ACK (acknowledge) input from the FSTS (point MFB?STATION?.ACK) is ON.
- 2) The SERVICE input from the FSTS (point MFB?STATION?.SERVICE) is high (ON)
- 3) The SMS ARMED input from the SMS Panel is high (ON).

### 2.4 FA-BELLQ (Fire Alarm Bells) Output.

This output (point MFB?STATION?.FA-BELLQ) energises the turnout fire alarm bells. It is energised (ON) when:

- 1) The FA-BELLS input from the FSE (point MFB?STATION?.BELLS) is high (ON) and the SMS ARMED input from the SMS Panel and SERVICE input from the FSE are OFF

- 2) The WR-BELLQ output has remained high (ON) for 40 seconds

This output is also ON when:

One of the two RDDRING inputs is pulsing after a 30-second delay from the first detection of the ring input. The output will only switch on while a pulse is present on the RDDRING input.

The 30 second delay is controlled by the 30 second delay output from the MBC while the pulsing of the bells is controlled directly from the ring detector inter facing relay.

The 30 second delay output is reset automatically 15 seconds from when the ring detect input has stopped ringing.

The FA-BELLQ output can be reset when:

- 1) The ACK input from the FSE is high (ON) and the FA-BELLS input from the FSE is low (OFF)

- 2) The SERVICE input from the FSE is high (ON).

The FA-BELLQ output shall be de-energised automatically after 10 minutes from when the bells were energised if none of the above occurs within the 10 minute period.

### 2.5 FA-LIGHTQ (Fire Alarm lights) Output.

This output (point MFB?STATION?.FA-LIGHTQ) turns on all of the internal station lights during a turnout if the turnout occurs between the hours of 18:00 and 08:00. It is only energised when:

- 1) The FA-LIGHT input from the FSE (point MFB?STATION?.FA-LIGHT) is pulsed high (ON) and the SMS ARMED input from the SMS Panel and SERVICE inputs from the FSE are OFF.

- 2) The WR-BELLQ has remained high (ON) for 40 seconds this output is automatically reset after 5 minutes. If the SMS ARMED input is ON then the FA-LIGHTQ will automatically reset after 90 seconds. A pulse at any time from the LIGHTOFF input shall also

reset the output.

3) The FA-BELLS input is high (ON) and the SMS ARMED point and SERVICE input are OFF. While this input is high (ON), the output cannot be reset by the LIGHTOFF input from the FSE (point MFB?STATION?.LIGHTOFF).

4) One of the two RDDRING inputs is pulsing for longer than 30 seconds and the SMS ARMED point and SERVICE inputs are OFF. Under this condition, the output can be reset anytime by a pulse from the LIGHTOFF input.

The FA-LIGHTQ output is automatically reset after 90 seconds. In effect, this turns off the station internal lights once the firefighters have left the station. It will also be de-energised (OFF) if the SMS ARMED input from the SMS Panel should go high (ON). A pulse at any time (except when the FA-LIGHTS input from the FSE is ON) from the LIGHTOFF input shall also reset the output.

### 2.6 UN-SWQ (Station Unmanned) Output.

This output (point MFB?STATION?.UN-SWQ) signals the door PLC that the turnout has completed and that the station is now in unmanned mode. It is set high (ON) when one of the following conditions has been met.

1) SMS ARMED input from the SMS Panel goes high (ON).

### 2.7 ISO240V (Isolate 240 volts) Output.

This output (point MFB?STATION?.ISO240V) is normally ON and will only de-energise (OFF) when the SMS ARMED input is high. This shall be done at the end of the turnout sequence and it disconnects 240V power to the kitchen GPO's (excluding the fridge) and rear BBQ via a relay in the electrical switchboard, thus isolating these circuits. It shall be re-energised (ON) when the 240Vac Reset switch (locally positioned near the isolated devices) is depressed.

### 2.8 REDLIGHT Output (Front and rear Red lights).

This output (point MFB?STATION?.REDLIGHT) energises the red turnout warning lights in the appliance bay and at the rear of the fire station (adjacent to the BBQ). It is only set high (ON) when the SMS ARMED input from the SMS Panel is low (OFF) and one or more of the following conditions have been met:

1) FA-BELLS input from the FSE is high (ON)

2) FA-LIGHT input from the FSE is high (ON)

These outputs will be reset automatically after 2 minutes.

### 2.9 DOORS-UP (Appliance bay Doors).

This output (point MFB?STATION?.DOORS-UP) signals to the door PLC to initiate the automatic front appliance bay door open-close sequence during a turnout situation.

The doors are controlled by the door PLC, which provides status

inputs to the MBC. The (simplified) door sequence is as follows:

- 1) The front appliance bay door(s) is raised. Note that the number and combination of front doors raised is NOT controlled by the DDC, but is selected manually via the door PLC.
- 2) The door PLC checks that both the inner and outer door photoelectric beams are clear.
- 3) The door PLC checks that the inner door photoelectric beam is blocked while the outer photoelectric beam is clear, followed by both the inner and outer door photoelectric beam being blocked, indicating that the fire appliance is driving out.
- 4) The door PLC checks that the inner door photoelectric beam is clear after being blocked (with the outer beam still blocked), followed by both photoelectric beams being clear after being blocked. This indicates that the fire truck has completely left the appliance bay, cleared the doors and has driven out.
- 5) The door PLC then closes the front appliance bay door(s). The doors can be manually closed by one of the firefighters, if one of the doors remain up.

Note that each of the appliance bay doors is fitted with its own inner and outer photoelectric beams and that the above sequence takes place at each door that was raised during the turnout.

Manual override switches on the door PLC determine the number and combination of front doors to be opened on a turnout. This is dependent both on the number of appliances in the appliance bay and the number of appliances required for the turnout. It is not controlled or monitored by the DDC.

The DOORS-UP output is only set high (ON) when the SMS ARMED point is low (OFF) and one or more of the following conditions have been met.

- 1) The FA-BELLS input from the FSE turns ON.
- 2) The FA-LIGHT input from the FSE turns (ON). Between 23:00 and 06:15 there is a 15-second delay before this output will be set high.

The DOORS-UP output will be reset automatically after 3 seconds.

### 2.9.1 Door PLC Power ON Status

The point **MFBS?STATION?.PLC-STATUS** is ON whenever the door PLC is active and OFF whenever the door PLC is either failed or has no power.

### 2.10 PED-LHTQ (Pedestrian Lights) Output.

This output (point **MFBS?STATION?.PED-LHTQ**) energises the pedestrian warning lights at the front of the appliance bay, indicating that an appliance is about to drive out. It is energised shortly before the DOORS-UP output is energised.

This output will automatically be energised after a 40-second delay when the SMS ARMED point is OFF and one or more of the

following conditions have been met:

FA-BELLS input from the FSE is high (ON).

FA-LIGHT input from the FSE is high (ON)

The output will automatically reset after 2 minutes.

## 2.11 C-FANQ (Ceiling fans) Output.

This output (points **MFB?STATION?.C-FANQ** and **MFB?STATION?.AB-FANQ**) energises the appliance bay exhaust fans. It is energised when the C-FANS input from the FSE (point **MFB?STATION?.C-FANSP**) is pulsed high (ON). If this input is pulsed a second time the output is reset.

This output will automatically be energised (ON) after a 40-second delay when the SMS ARMED point is OFF and one or more of the following conditions have been met

1) FA-BELLS input from the FSE is high (ON).

2) FA-LIGHT input from the FSE is high (ON)

The output will automatically reset after 10 minutes or at any time by a pulse on the C-FANS input.

## 2.12 EXTSPEAK (External speaker) Output.

This output (point **MFB?STATION?.EXTSPEAK**) energises the external loudspeakers. It is turned off between 23:00 and 06:15.

## 2.13 EX-PH (External Phone speaker) Output.

This output energises the external telephone speakers. It is turned off between 23:00 and 06:15 or when the SMS ARMED input from the SMS Panel is ON.

## 2.14 External Hose Tower Floodlights (Where Fitted)

The floodlights on the hose tower are energised via the output **MFB?STATION?.HT-LHTQ**. This output is turned on and off via time schedule.

## 2.15 External Bollards

The external light bollards, located around the perimeter of the fire station grounds, are energised on a time schedule via the output **MFB?STATION?.EXT-BOLLARDS**.

## 2.16 Daylight savings.

The automatic daylight savings time adjustment is controlled by four virtual Points.

**MFB?STATION?.DST.FMTH** (Forward Month)

**MFB?STATION?.DST.FDAYOFM** (Forward Day of Month)

**MFB?STATION?.DST.BMONTH** (Back Month)

**MFB?STATION?.DST.BDAYOFM** (Back Day of Month)

### 2.17 Sequence of Events

#### *SMS Armed to BAS*

- *After 15 seconds voicemail turns on.*
- *240 Volts A/C to appliance/oven turns off.*
- *Doors are commanded to stay close if a call is made to the station.*
- *External phone speaker on.*

#### *SMS Armed (Call is Activated)*

- *Voicemail is already on.*
- *240 Volts A/C to appliance/oven is already off.*
- *Doors are already commanded to stay close.*
- *External phone speaker is already on.*
- *If time is greater than 6 pm and less than 8 am then on the security door/lights).*

## **Sliding Gate Specification**

### **Scope of Works**

The supply and installation of a completely operational set of auto sliding gate to the car park entry at each to fire stations. The Contractor shall include for the following:-

- Supply and installation of concrete footings, vehicle & pedestrian access gates where shown on the plans, and matching fencing sections as required.
- Electrical wiring and connection of all new power circuits from the fire station main electrical switchboard, including the upgrading of the switchboard legend.
- Wiring cat 5 cabling to accommodate data and telephone circuits for current and future requirements as documented.
- Line marking.
- Maintenance and servicing of the gates during the warranty period.

Control of the gates shall be as follows:

- ENTRY: Access for MFB personnel to all sites will be via an 080 key switch located on a bollard at the right hand side of the driveway. Visitor access shall be via an intercom located on the entry bollard which connects to the station telephone system.
- Commander Australia shall be employed by the Gate Contractor to supply and install the intercom and gate open relay to operate via the station telephone system.
- Access for the fire appliances will be via remote control handsets. Remote control receivers shall be included at each site, and two remote control handsets shall be provided to each fire station.
- EXIT: Auto vehicle exit operated by an in ground magnetic loop.

### **Specification**

As a minimum, the gate installations shall include the following safety devices:-

- PE cells shall be fitted to sight across the gate posts, to prevent the gate closing whilst a person or vehicle is within the gate arc.
- Yellow powder coated bollards shall be located at the extremity of the gate open position fitted with PE cells, to prevent the gate closing whilst a person or vehicle is within the gate line.
- A torque limiting device shall be fitted to restrict the force applied in the event of a collision.
- Touch and go sensors shall be incorporated, to reopen the gates in the event of a collision.



## **GATES/FENCES**

- Where shown in the plans, a matching fence extension shall be included to enable a 3 metre setback from the entry bollard to the face of the gates.
- The gate and fence sections shall be neatly finished and similar in appearance to the elevation drawing attached.
- The gates shall be of heavy duty industrial strength fully welded construction, utilising first quality square and rectangular hollow steel section.
- Upright bars shall be welded to the frame with gaps not exceeding 120mm.
- The gate design shall be configured to ensure adequate penetration of all surfaces exposed to weather when receiving the galvanising treatment.
- Upon completion of manufacture, all fabricated items shall be hot dip galvanised to AS 1650.
- No welding alterations shall be carried out to the gates, support posts, fence sections or other fittings after galvanising. If welding alterations are required to suit site conditions the affected item/s shall be regalvanised prior to installation.
- The contractor shall provide detailed engineering shop drawings prior to manufacture of any fabricated item. All engineering and set out drawings shall be provided on a disc in PDF format.
- Following completion of the installation, the gates shall receive preventative maintenance visits at intervals not exceeding 3 months, until expiry of the 12 month warranty period.

## **BOLLARDS**

An entry bollard shall be installed 3 metres away from the gate line, to the right side the fire station driveway on the entry side. The construction of the bollards shall be welded/galvanised similar to the gates. The bollard shall have an electrical control panel protected from the weather at the top with a clear area 400 high x 160 wide, and 080 key switch shall be fitted at the bottom of the panel. An intercom panel shall be mounted to the entry bollard as detailed in the scope of works.

The bollard control panels at all fire stations shall provide sufficient spare space for the installation of electronic swipe card controls.

Bollards shall also be located at the extremity of the gate open position, and PE cells shall be fitted to these bollards to prevent the gate operating when a person or vehicle is within the gate line. All bollards shall be galvanised and finished in safety yellow.

## **ACTUATORS**

The gate actuators shall be sized to provide reliable operation over the 10 year anticipated life of each gate installation, and electric motors shall be selected for continuous duty.

## **ELECTRICAL WIRING**

The entire electrical installation shall comply strictly to the requirements of AS 3000.

## **INTERCOM & GATE OPENING RELAY**

Cat 5 wiring shall be installed from the entry bollard to the PABX cupboard within the station, to accommodate the installation of an intercom and remote gate open function operating via the fire station telephone system.

Commander Australia shall be employed by the gate contractor to install and commission an intercom system which allows communication between the entry bollard and any telephone handset in the fire station. A remote "gate opening" function shall be included which shall be installed and commissioned by Commander Australia, which allows operation of the gates via the fire station telephone handsets. In addition to the wiring detailed above, two spare ( 2 ) Cat 5 cables shall be installed between the gate control cubicle and the telephone connection box located within the fire station, for future use by the MFB.

## **CONTROLS**

- Motor controls shall be solid state programmable logic controller type ( PLC ) programmed to provide flexibility, with different modes of operation requiring only software changes. Software applicable to the installation shall be the property of the client, and the MFB shall be free to amend or make changes to software settings or content, without consultation with or approval of any other party. The system shall include all available safety features to safeguard MFB personnel and equipment, including PE beams, inductive loops, etc.

The PLC shall include options for the following functions:-

1. Open / close gates.
2. Control safety modes.
3. Be fully programmable.
4. Remotely programmable for rectification of faults.
5. Variable speed control.
6. Communicate with the existing Building Management System.
7. Offer connection for indicator lights
8. Multi Function output for drive speed – fast stop for PE interruption.
9. Programmable option to vary mode for emergency or normal gate speed.
10. Able to store error history.

To cater for a possible future MFB property security upgrade, the gate PLC shall have the capacity to provide the following functions:-

### **INPUTS**

- 20 Input/output functions.
- Normal access control momentary gate open request.
- Gate open/hold open function.
- Gate stop.
- Gate close.

## OUTPUTS

- Gate closed indication.
  - Gate locked indication.
  - Exit loop activation.
  - Exit loop activation status.
  - Safety loop activation status.
  - Safety beam/s status.
- 
- The remote gate opening transmitters shall be programmed to a secure frequency common to all MFESB fire stations.
  - The key switches and an intercom system connected to the station telephone system shall be mounted on a bollard, which is to be located about 3 metres outside the gate line. The intercom system with a remote gate opening shall be supplied, installed and warranted for 12 months after installation by Commander Australia.
  - Vehicle exit shall be automatically controlled via in ground induction loops located inside the gates to detect vehicles as they approach the gates. The induction loop shall extend across the entire width of the gate opening.
  - The gates shall incorporate 240 volt electrically operated actuators, selected for continuous duty.
  - Preference will be given to actuators of a completely sealed design, which require no maintenance, greasing or oil replacement.
  - A clutch or quick disconnect facility shall be provided to allow the gates to be manually opened in case of power failure.
  - The gates shall be securely locked by electromagnetic locks or other approved method when in the closed position. Suppliers shall provide details of the method proposed.
  - A buffer shall be incorporated to reduce gate speed at the extremities of operation, to reduce the effect of slamming when opening or closing.

## GATE SPEED

Opening / closing times through the line shall not exceed 12 seconds.

## LINE MARKING

Upon completion of each gate installation, the following line marking shall be applied:-

- Angled lines to indicate the swing arc which must be kept clear when the gate opens, line marked KEEP CLEAR.
- A STOP HERE sign marked on the ground in front of the exit sensor loop.

## **WARRANTY**

The minimum acceptable warranty/defects liability period will be 12 months from the date of practical completion of the project, however suppliers are encouraged to offer details of additional warranty offered with their equipment.

## **MAINTENANCE DURING WARRANTY**

Following completion of each installation, preventative maintenance shall be carried out to the gate linkages, tracks, cable & chain drives, electric motors and associated control equipment at intervals not exceeding 3 months for the entire warranty period.

# **Siemens to Daikin interface for the Metropolitan Fire & Emergency Services Board.**

## ***Introduction***

The interface between the Siemens Building Management System (BMS) and the Daikin Variable Refrigeration Volume (VRV) system is achieved via a High Level Interface (HLI). This interface allows for the transfer of data between the two systems that is not possible via low level (hard wired) communications. The Siemens HLI communicates to the Daikin Master Station via an RS232 communication port on the Master Station.

The interface is a mandatory requirement if the Daikin VRV units are to be monitored by the BMS or if any secondary hot water heating coils are used on a VRV unit. As any heating coil would be used as the first stage of heating, the BMS must control the heating coil and be able to override the VRV heating control. In order to control the heating coil, in the above manner, the BMS must also be able to view the local temperature and setpoint. Once again this is only possible via the HLI interface.

## ***Requirements***

Two main components are needed for the communication between the two systems, these are: the Daikin Master Station and the Siemens Daikin High Level Interface.

The additional equipment needed is:

- 1/ One RS232 to RS485 adaptor, for the communication cable connecting the Master Station to the HLI. This is known as Trunk Interface and is a Siemens proprietary part.
- 2/ Communications cards for each of the VRV units. This is a Daikin proprietary part.

The Master Station and VRV communication cards are supplied by Daikin and are used to connect all the VRV units in the installation together on a communications bus. The supply and wiring of the Daikin Master Station and the communication cards is the responsibility of the mechanical contractor (ie. Supplied by Daikin, installed by the mechanical contractor's electrician). The Master Station can be installed inside the mechanical services switch board or in an enclosure near the Siemens control panel, known as the air conditioning Modular Building Controller (MBC). The communication cards are installed in each VRV unit.

The Siemens Daikin HLI and the Trunk Interface are supplied by Siemens and are fitted inside the Siemens air conditioning MBC. The supply of the HLI, the Trunk Interface and the installation of the communication cable between the HLI and the Master Station is the responsibility of Siemens.

### ***Point information***

The following points are available from the Master Station to be used by the BMS:

Indoor unit start stop, one point for each indoor unit connected to the master Station.

Indoor unit temperature setpoint, one point for each indoor unit connected to the master Station.

Indoor unit temperature, one point for each indoor unit connected to the master Station.

Indoor unit air conditioning mode, this indicates if the unit is on Fan, Heat or Cool, one point for each indoor unit connected to the master Station.

Indoor unit filter status, one point for each indoor unit connected to the master Station.

Indoor unit fan status, one point for each indoor unit connected to the master Station.

Indoor unit heater operation status, one point for each indoor unit connected to the master Station.

Indoor unit humidifier operation status, one point for each indoor unit connected to the master Station.

Compressor operation status, one point for each indoor unit connected to the master Station. **Note:** this point is shown as an individual point for each indoor unit, however as there is only one compressor for multiple indoor units all the points will be on whenever the compressor is on.

The above points are a mixture of read only points and points that can be commanded by the BMS. The read only points are:

The temperature, filter status, fan status, heater status, humidifier status and compressor status.

The points that can be commanded are:

The unit start stop, temperature setpoint and air conditioning mode.

The read only points are used to provide information to the MFB for remote fault finding and monitoring. The commandable points are used both for monitoring and control of the units.

## **VRV Specifications**

### **General**

Unit shall be air cooled, split type multi-system air conditioner consisting of one outdoor unit and plural indoor units, each having capability to cool or heat independently for the requirements of the rooms. Up to 15 different type and 0.8-10HP capacity indoor units can be connected to one refrigerant circuit and controlled individually.

Compressor shall be equipped with inverter controller, and capable of changing the rotating speed to follow variations in cooling and heating load.

Outdoor unit shall be suitable for mix-match connection of following models.

#### **Ceiling Mounted Cassette Type (Double Flow)**

- Ceiling Mounted Cassette Type (Multi Flow)
- 600×600 Ceiling Mounted Cassette Type (Multi Flow)
- Ceiling Mounted Cassette Corner Type
- Slim Ceiling Mounted Duct Type
- Ceiling Concealed (Duct) Type (Australia exclusive use)
- Ceiling Mounted Built-In Type
- Ceiling Mounted Duct Type
- Ceiling Suspended Type
- Wall Mounted Type
- Floor Standing Type
- Concealed Floor Standing Type
- Ceiling Suspended Cassette Type (Connection Unit Series)
- Wall Mounted Type (Connection Unit Series)
- Floor Standing Type (Connection Unit Series)
- Refrigerant : R-410A

### **Outdoor Unit**

The refrigerant piping shall be extended up to 150m with 50m (\*1) level difference without any oil traps. Air conditioner shall operate continuously at the ambient temperature of -5°C in cooling -15°C in heating (Operative Range: -20°C).

Both indoor unit outdoor unit are assembled, tested, and charged with refrigerant at the factory.

The value is based on the case where the outdoor unit is located above indoor unit. Where the outdoor unit is located under the indoor unit, the level difference is a maximum of 40m.

### **Outdoor Unit**

The outdoor unit shall be a factory assembled unit housed in a sturdy weatherproof casing constructed from rust proof mild steel panels coated with a baked enamel finish.

- The outdoor unit shall have two (three) of scroll compressors and be able to operate even in case that one of compressors is out of order. The Outdoor unit of 5HP shall have one scroll compressor (Heat Pump).
- The connectable range of indoor units shall be from 0.8 to 10HP with all outdoor units.
- The noise level shall not be more than 54 dB(A) (in case of 5HP) at normal operation measured horizontally 1m away and 1.5m above ground.

The outdoor unit shall be modular in design and should be allowed for side by side installation.

### **Compressor**

The compressor shall be of highly efficient hermetic scroll type and equipped with inverter control capable of changing the speed in accordance to the cooling or heating load requirement.

The outdoor unit shall have the multi-step of capacity control to meet load fluctuation and indoor unit individual control.

**Heat Exchanger**

The heat exchanger shall be constructed with copper tubes mechanically bonded to aluminum fins to form a cross fin coil. The aluminum fins shall be covered by anti-corrosion resin film.

**Refrigerant Circuit**

The refrigerant circuit shall include liquid and gas shut off valves and a solenoid valves.

All necessary safety devices shall be provided to ensure the safety operation of the system.

**Safety Devices**

The following safety devices shall be part of the outdoor unit.

High Pressure Switch, Overload Relay, Inverter Overload Protector, Fusible Plugs.

**Oil Recovery System**

Unit shall be equipped with an oil recovery system to ensure stable operation with long refrigerant piping.

**Indoor Units**

Each indoor unit shall be of the Ceiling Mounted Cassette Type (Double Flow), or Ceiling Mounted Cassette Type (Multi Flow), or 600×600 Ceiling Mounted Cassette Type (Multi Flow), or Ceiling Mounted Cassette Corner Type, or Slim Ceiling Mounted Duct Type, or Ceiling Concealed (Duct) Type (Australia exclusive use), or Ceiling Mounted Built-In Type, or Ceiling Mounted Duct Type, or Ceiling Suspended Type, or Wall Mounted Type, or Floor Standing Type, or Concealed Floor Standing Type, or Ceiling Suspended Cassette Type (Connection Unit Series), or Wall Mounted Type (Connection Unit Series), or Floor Standing Type (Connection Unit Series). It shall have electronic control valve which control refrigerant flow rate in respond to load variations of the room. The fan shall be of the dual suction multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation.

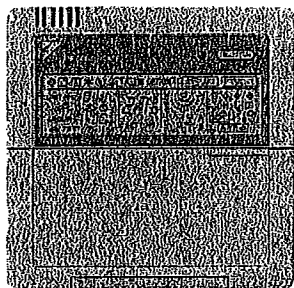
\* The address of the indoor unit shall be set automatically in case of individual and group control.



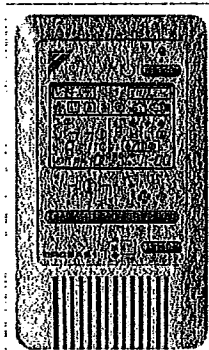
## Wired Remote Controller BRC1A62

### Appearance and Functions

- Large liquid crystal screen displaying complete operating status.
- Digital display with set temperature in 1°C units.
- Individually program by timer the respective times for operation stop within a maximum of 72 hours (timer function not available when connected to a central controller).
- Equipped with a thermostat sensor in the remote controller
- Monitor room temperature and preset temperature by microcomputer, cool/heat operation mode automatically.
- Ability to select cool / heat / fan operation mode with the indoor controller.
- Monitor malfunctions in the system, and "self-diagnosis function" that lets you know immediately when a malfunction occurs.
- Ability to carry out field settings by remote controller.



## Simplified Remote Controller BRC2C51



### Note:

1. Following functions are not including in this controller.

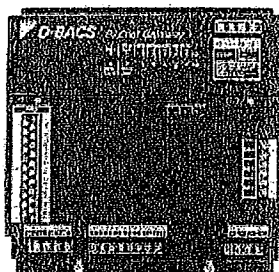
- Auto swing function.
- Timer setting function.
- Display of time to clean air filter.

## Daikin BACnet Gateway

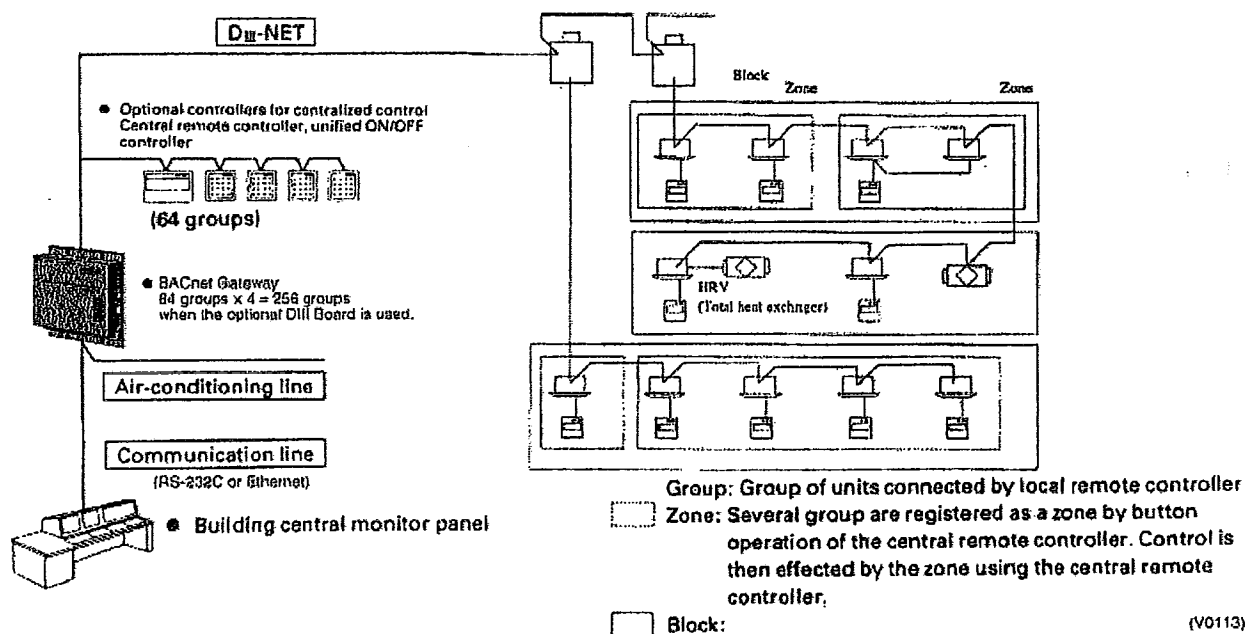
DMS502A51 / DAM411A1 / DAM412A1

### Outline and Features

1. Managing the information on 64 groups of air-conditioners (main units only).
2. Up to 256 groups manageable and controllable at once by adding the optional DIII board
3. Packaging of air-conditioner objects
  - \* Compatible with BACnet (ANSI/ASHRAE-135)
  - \* Compatible with BACnet/IP (ANSI/ASHRAE-135a)
  - \* Compatible with IEIEJ/p-0003-2000 (plan) (IEIEJ is Institute of Electrical Installation Engineers of Japan)
4. Conforming to European, Oceanian, Safety and EMC rules and regulations.
5. JIS-specified basic procedures (RS232C system) readily selective.



### 1.2.2 System Outline



## **Outline of air-conditioner management system control devices**

### **BACnet Gateway**

DMS502A51

Interface unit to allow communications between VRV and BMS. BMS ready to run and monitor the air conditioning systems through BACnet communications

### **Optional DIII Board**

DAM411A1

Expansion kit, installed on the BACnet Gateway (DMS502A51), to provide 3 more DIII-NET communication ports. Not usable independently. Up to 250 groups.

### **Optional Di Board**

DAM412A1

Expansion kit, installed on the BACnet Gateway (DMS502A51), to provide 16 more wattmeter pulse input points. Not usable independently.

## Brass Door Furniture

### Lockwood Brass Lever & Knob Furniture (continued)

#### Cantana 73

##### Dimensions

Length 125 mm

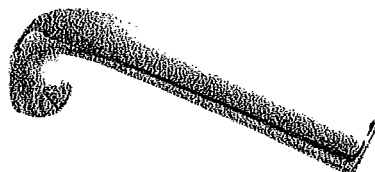
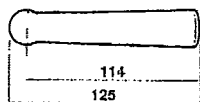
Projection 53 mm

F= Finger clearance 33 mm

##### Description

A stylish modern lever, combining elegant elongated lines with a subtle flared base.

\*Design Registered Australia/New Zealand



#### Ving 74

##### Dimensions

Length 120 mm

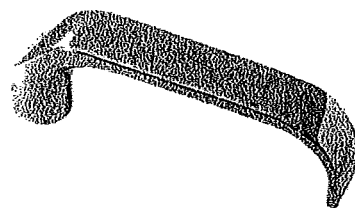
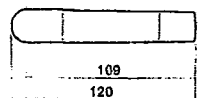
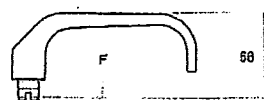
Projection 56 mm

F= Finger clearance 48 mm

##### Description

Chunky, funky and functional, the Ving 74 means business. A strong design statement, ideal for numerous heavy duty applications.

\*Design Registered Australia/New Zealand



#### Cadenza 78

1220/1221/ 78 SC

##### Dimensions

Length 118 mm

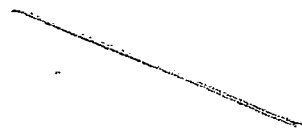
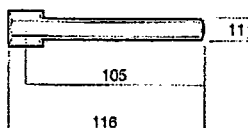
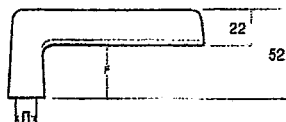
Projection 52 mm

F= Finger clearance 30 mm

##### Description

The sleek design of the Cadenza exudes an aura of elegance.

\*Design Registered Australia/New Zealand



#### Tenor 79

##### Dimensions

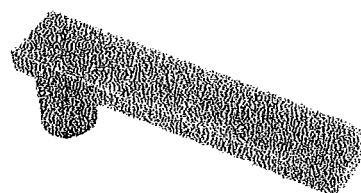
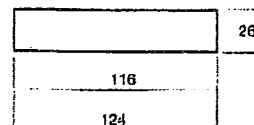
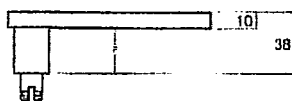
Length 124 mm

Projection 38 mm

F= Finger clearance 28 mm

##### Description

Contemporary, solid and simple, the Tenor epitomises style and strength.



## Brass Door Furniture

### 1220 Series Symphony Cylinder & Turn Escutcheons (continued)

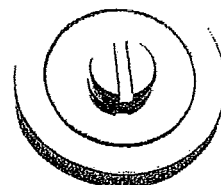
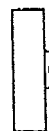
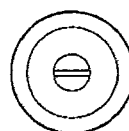
#### 1228 Emergency Turn Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this brass emergency release escutcheon. For use in indicating privacy applications. Features concealed fixing.



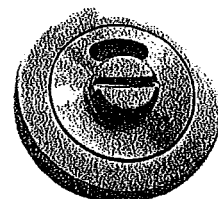
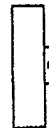
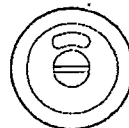
#### 1228P Privacy Indicator Emergency Turn Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this brass emergency release escutcheon. For use in indicating privacy applications. Features concealed fixing.



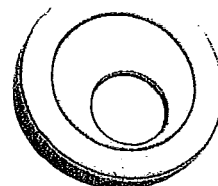
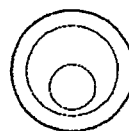
#### 1229 Hotel-Motel Escutcheon

##### Application

Designed for use with Lockwood 3576 Series Hotel-Motel Lock function.

##### Description

This rounded, brass escutcheon is designed for 3576 Series Hotel-Motel Lock function. Features concealed fixing.



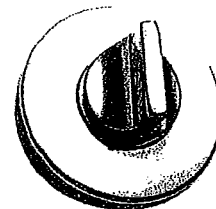
#### 1231 Small Turn Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this aesthetically pleasing turn escutcheon. For ease of use in all snibbing applications.



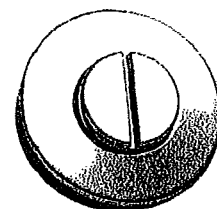
#### 1232 Small Emergency Turn Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this aesthetically pleasing emergency release escutcheon. For use in privacy applications.





## Brass Door Furniture

### 1220 Series Symphony Cylinder & Turn Escutcheons

#### Round Brass Escutcheons

A range of escutcheons for the fitting of oval cylinders including turns and emergency turns is available in the same wide choice of metal finishes and powder coatings to complement all Symphony lever furniture installations.

Dimensions shown for cylinder escutcheon are consistent for entire range.

#### Standard Finishes

Black Chrome Plate	BC
Chrome Plate	CP
Florentine Bronze	FB
Polyester Powdercoat	PC
Polished Brass	PB
Satin Chrome	SC
Satin Brass	SB

#### Ordering Procedure

Select appropriate escutcheons to suit 3570 Series Mortice Lock function for both exterior and interior, then add finish code, eg 1226SC or 1227SC.

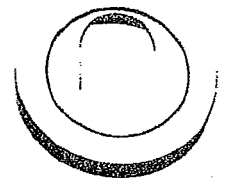
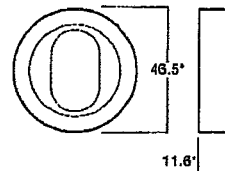
#### 1226 Oval Cylinder Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Practical, secure and pleasing to the eye, this brass escutcheon has an oval cylinder hole. Features concealed fixing.



#### 1226C# Round Cylinder Escutcheon

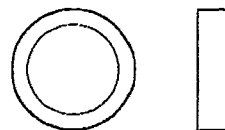
##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

This round cylinder brass escutcheon provides security in an unobtrusive design featuring concealed fixing.

# Specify round cylinder when ordering 3570 Series Mortice Lock.



#### 1227 Turnknob Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this brass turn for use in all snibbing applications. Features concealed fixing.



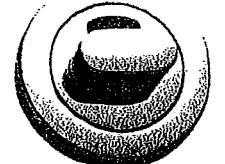
#### 1227P Privacy Indicator Turnknob Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this brass escutcheon. For use in applications where privacy turnknob access is required effectively and easily. Features concealed fixing.



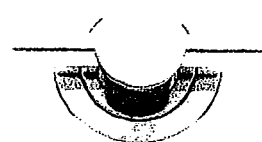
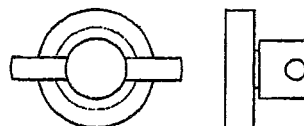
#### 1227DT Disabled Turn Escutcheon

##### Application

Designed for use with Lockwood 3570 Series Mortice Locks.

##### Description

Complement your round door furniture with this brass escutcheon. For use in applications where access is required effectively and easily especially in a disabled environment. Features concealed fixing.



## Fire Station Shower

### **PART I GENERAL**

#### **Scope**

Supply and install shower screens with necessary accessories and related equipment required for the work.

### **PART II MATERIALS**

#### **Materials**

New shower screens shall be supplied by Hawthorn Shower Screens Pty. Ltd.

Shower screens shall be fabricated with frames made from extruded aluminium sections. All aluminium shall have a bright polished finish.

Doors shall be hinged type with magnetic catches.

Fixed side panels (where applicable) shall be fabricated from similar materials to doors.

Screens shall be complete with all hardware including handles and seals.

All shower screens shall be glazed with laminated 'satinlite' obscure glass 6.3mm thick.

Note: Shower Screens are required to have screen doors higher than would normally be provided.

### **PART III EXECUTION**

#### **Installation**

Install in accordance with manufacturer's instructions.

- All internal and external windows in PPC storage areas (this includes the PPE transition/change room and the clean PPE storage room), including door viewing panels, need to be treated with clear UV protective film. This film needs to meet the requirements of Thomson's Specification.

*Thomson's Specification states that transmission through the film at a wavelength of 400nm shall be less than 50% of transmission at 500nm, and transmission at 320nm and 380nm each shall be less than 1% of transmission at 500nm.*

- Each window pane with UV protective film applied needs to have a "UV FILM ADHERED TO GLASS - CLEAN WITH SOAP & WATER ONLY" sticker applied to the corner of the pane of glass.
- All fluorescent light fittings in PPC storage areas need to be GE Cov-R-Guard Starcoat fluorescent lamps or equivalent.
- All skylights into these PPC storage areas need to have a clear polycarbonate cover (fitted at ceiling level) to stop UV from entering the rooms.

Please get back to me if you have any questions on UV protection requirements for the new PPC.



# Signage Specifications

## Door / Room Identification

### Typical door sign placement

The current AS 1428 as well as the Access to Premises Standard 2009 states that any information presented to the public should be accessible for all. The height of text on any information should be located at a height no greater than 1600mm above floor level (AFL).

### Typical door sign design

- Aluminium plate 40mm(H) x length to suit(L)
- Black vinyl lettering 20mm(H)
- Arial lower case with capital e.g. **PPC Dry Room**

### Typical Room Names

S.O.s Office  
Lecture Room  
Gymnasium  
Store 1  
Store 2  
Comms Room  
Mess  
Lounge  
PPC  
PPC Dry Room  
Rescue Store  
Drying Room  
F.F. Bedroom 1  
F.F. Bedroom 2  
Lockers 1  
Lockers 2  
Change Room 1  
Change Room 2  
Breakout  
PPC Storage  
Cleaning Store  
BA Room  
S.O. Bedroom 1  
S.O. Bedroom 2  
S.O. Lockers  
S.O Change Room

### Access WC

Provide compliant signage incorporating the International symbol for Access which incorporates Braille at AS1428 height requirements 1200-1600 mm above floor level.

### **Car Parking / Designated Access Parking Bay**

Appropriate International symbol for designated Accessible Parking Bays should be used as specified in AS 1428.1 Parking Facilities, and AS 2890.1 and AS 2890.6:

- Background Colour: Ultramarine B21
- Symbol: Wheelchair on Square background
- Colour: Vivid White on Ultramarine

### **Station Name Plates Front of Station**

The current AS 1428 as well as the Access to Premises Standard 2009 states that any information presented to the public should be accessible for all. The height of text on any information should be located at a height no greater than 1600mm above floor level (AFL). The MFB would like to include the board crest and logo in the appropriate lay out and size as governed by the MFB board approved style guide.

### **Crest – Front of Station**

Refer to the Corporate Style Guide on the MFB Intranet under the Corporate, Organisational Information Tab

### **Swoosh – Front of Station**

Refer to the Corporate Style Guide on the MFB Intranet under the Corporate, Organisational Information Tab

### **Electronic Signage – Front of Station**

See attached specifications

\*Note only applicable if review of Test Sign located at FS14 Bundoora is successful

### **Emergency Procedure Plans**

The current AS 3745 calls for a clear and concise lay out of the evacuation plan and assembly area set out on A3. The plans are required to be positioned as close as practicable to any external door. Plans are required to be orientated so that the plan is visually constant throughout the building. The plans will be fixed to wall surfaces at a height no greater than 1600mm AFL and dated at the time of production.

The MFB would like to include the board crest and logo in the appropriate lay out and size as governed by the MFB board approved style guide. If the

plans are not update due to construction works at a building the legislation calls for an update in three years.

## **Hygiene Plans**

The Occupational Health and Safety Act 2004 place stringent obligations on employers (and designers of infrastructure) in controlling workplace hazards via appropriate design. The MFESB, in meeting its obligations, has demonstrated commitment to achieve best practice in exposure control at fire stations

Currently the hygiene plans are located at all MFB sites and are on an A3 poster. These posters clearly identify the Clean & Transition Areas within that work location:

- Transition areas - Engine Bay, Yard, PPE Room, BA Room, Storerooms
- Clean areas - All other station areas

The station hygiene plan is developed and signed off by UFU, HSR's and Operations.

It displays the MFB Crest, UFU logo and the H&S department logo. In addition to the A3 poster, every door entering into the 'Clean' area [from a dirty area] currently has an A4 sign reminding staff of the hygiene plan.

# **FIRE STATION REFURBISHMENT**

## **PRINCIPLES PAPER**

### **Foreword**

It is incumbent on the Metropolitan Fire and Emergency Services Board to meet changing community values, expectations and meet changing social needs. The privacy principles have been developed to ensure all personnel have the ability to shower, change and use toilet facilities in a secure and private location away from interruption and exposure to colleagues, or member of the general public visiting the station.

The driving force behind this change is recognition by the MFB of the need to ensure the organisation complies with relevant legislation and the station environment, reflects the expectations of our workforce and that of contemporary society.

To meet this changing environment the MFB is in the process of upgrading facilities at all fire stations. These upgrades involve in most cases, redesigning dormitory sleeping quarters into individual bedrooms, converting existing unisex toilets and shower facilities into individual bathrooms and finally modifying large locker rooms/change rooms into small functional locker alcoves and removing the ability for these rooms to be change rooms.

This document outlines the guiding principles which will be used when determining the new modified layout at fire stations. These guiding principles will need to be used in a "common sense approach" due to the fact existing station layouts vary widely in size and design.

A further matter that needs addressing is that of acceptable station dress particularly whilst moving around the station. This standard defined as "Acceptable Station Etiquette" promotes an ethical standard of behaviour and dress that should be maintained at all times.

The "Acceptable Station Etiquette" is stated as being:-

- Minimum dress standard within the station is shorts and tee shirt.
- Always get changed behind a locked door out of sight of other personnel on station.
- Locker rooms are not change rooms.
- Change in appropriate areas only.
- There is to be no nudity in the station unless it is behind a locked door

## **STATION REFURBISHMENTS**

### **GUIDING PRINCIPLES**

This document outlines the design principles that will be taken into account when individual fire stations are being upgraded. Whilst the design principles stipulate the minimum area for bedrooms and bathrooms, a common sense approach will need to be observed at stations where design is restricted due to available area. In this situation the minimum areas nominated should be regarded as nominal sizes. Final building design in relation to layout is governed by building footprint and age. Bedroom/Bathroom/Locker room sizes or numbers must not be compromised by gym/recreation areas

#### **Bedrooms**

Bedrooms are to become single rooms. The bedrooms shall be a minimum of 7m<sup>2</sup>. This area is adequate for housing a king sized single bed 1000mm x 2300mm long and a desk beside the bed. Bedroom doors will be fitted with a locking device which can only be activated from inside.

The number of beds provided will be determined on an individual station basis and will be dependent on the number of appliances situated at the station. Single appliance stations will, if at all possible, have a minimum of four (4) bedrooms.

#### **Bathrooms**

Bathrooms will have a desirable area of 5m<sup>2</sup>. They should be located as close as practicable or possible to bedrooms. Bathrooms shall have a toilet, hand basin and a shower cubicle.

The nominal number of bathrooms for one (1) appliance stations is 2. The nominal number of bathrooms for two (2) appliance stations will be 4. The nominal number of bathrooms for three (3) or more appliances will be determined individually for each station.

#### **Personal Lockers**

Lockers shall be located as close as practicable to the bathrooms and bedrooms. They shall be clustered in groups of 8-12 in alcoves outside the entry to the bathroom. This configuration will be adopted if existing walls, circulation spaces etc. allow. Otherwise personal lockers will be located together in a room adjacent to the bathrooms.



**STRATA**PNA  
ARCHITECTS

**METROPOLITAN FIRE AND EMERGENCY SERVICES BOARD**

## Design Guide Review

Prepared by:  
StrataPNA  
88 Hawthorn Grove  
Hawthorn  
Victoria 3122

30 June 2010 - Rev D



Member  
StrataPNA



# MFB DESIGN GUIDE REVIEW

## MFB DESIGN GUIDE REVIEW

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	• 3 Appliance Station – one and two levels	
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	• 5 Appliance Station – one and two levels	

**Guide checklist****TAB 2**

- Checklist – Brief
- Checklist – Land Assessment
- Checklist – Land Procurement
- Checklist – Schematic Design
- Checklist – Developed Design

**Fire Station Template Modules****TAB 3**

- Template plan for 2 Bays, 1 Appliance - single level
- Template plan for 2 Bays, 1 Appliance - two levels
- Template plan for 3 Bays, 2 Appliances - single level
- Template plan for 3 Bays, 2 Appliances - two levels
- Template plan for 4 Bays, 3 Appliances - single level

**Function Specific Plans****TAB 4**

- Bedroom/Bathroom/Locker Plan
- Bedroom Locker Elevation
- Kitchen Layout
- Mess Room Personal Gear Store
- Gymnasium Equipment Plan
- Clean/Transition/Vehicle Response Bay - Flow Diagram

**Minutes of Meetings at Selected Fire Stations****TAB 5**

- FS 26 – Croydon fire station
- FS 27 – Nunawading temporary fire station
- FS 30 – Templestowe fire station
- FS 31 – Glen Waverley fire station
- FS 01 – Eastern Hill central fire station
- FS 47 – Footscray fire station
- FS 43 – Deer Park fire station

**Minutes of Meetings with MFB Committees****TAB 6**

- ACFO
- Commanders
- Facilities
- Health & Safety
- Station Design

**Workshops 1****TAB 7**

- Worksheet Responses



## **MFB DESIGN GUIDE REVIEW**

### **Report and Recommendations**

## **1.0 EXECUTIVE SUMMARY**

### **1.0.1 INTRODUCTION**

In January 2010, StrataPNA was invited to a meeting with the Property Manager and the Design Steering Committee to discuss issues that have troubled the MFB in the delivery of Fire Station facilities. Some of the matters discussed included issues of accountability, incomplete consultation, lack of transparency and inadequately resolved functional solutions. At the meeting StrataPNA gave an informal presentation and was invited to submit a fee proposal for specialist services to research, address and provide recommendations to address these issues.

StrataPNA was engaged in March 2010 and completed the review and report at the end of June 2010.

### **1.0.2 SCOPE**

To fully understand the underlying problems with the issues identified, StrataPNA prepared a program of activities to encourage dialogue with the end users including informal group discussions at fire stations, inspections of existing facilities, meetings, discussion forums and workshops. The scope of the design guide review was broken into four major stages; Identification, Preparation, Application and Implementation.

Initially, the focus of the Design Guide Review was primarily about the design and delivery of fire station facilities. However, as matters unfolded and in order to fully appreciate the multitude of drivers and influences affecting the design guide, the scope of the review was expanded to take into account a wider range of influences including site selection, land procurement, strategic and organisational policies, stakeholder engagement and product delivery.

### **1.0.3 BACKGROUND**

The process to uncover the issues and deficiencies in the current facilities design guides and facilities delivery methodology involved a process of discovery that included the review of existing design documents, interviews with proponents, managers, facilitators, staff and users of fire stations, discussions with specialists and specialist groups, inspections of built facilities, research and theoretical 'test' applications of different design templates. To assist with the understanding of the issues facing the design and delivery of fire station facilities, the following activities were undertaken:

- a) Inspections and informal discussions with Fire-fighters  
Representative fire-fighters were interviewed and visual inspections were conducted at the following stations:
- FS 26 – Croydon fire station
  - FS 27 – Nunawading temporary fire station
  - FS 30 – Templestowe fire station
  - FS 31 – Glen Waverley fire station
  - FS 01 – Eastern Hill central fire station
  - FS 47 – Footscray fire station
  - FS 43 – Deer Park fire station

b) Meetings

Meetings and discussions were held with various focus groups including:

- Design steering committee
- Zone Commanders
- Facilities
- Health, safety & environment
- ACFO

c) Review of current guides and standards

The following MFB documents were provided for review:

- MFB Design and delivery manual, dated Sept 2005
- Project management guidelines, updated 7 Jan 2010
- Zone infrastructure implementation model
- Fire station refurbishment – Principles paper
- Contractor OH&S induction
- Gymnasium design and Space allocation
- Fire station design guidelines –intranet suggestions (ongoing)

d) Workshops

Two workshop sessions were conducted and attended by representatives from:

- ACFO
- Zone commanders
- Facilities
- Property Development
- Environment
- Health & Safety
- Fire-fighter's union representative

The first workshop session was conducted to flesh out areas of concerns within the context of the Facilities Design Guide and the delivery processes and to define the issues already identified as deficient via the interview process. The outcome of this workshop and major elements of concerns that were uncovered were converted into design guide solutions, new design templates and recommendations.

Solutions to the issues uncovered from the first two phases of the program were converted into generic design templates, site specific design guides, checklist and recommendations. During the middle 'Preparation' and 'Application' stages of the program, further discussions were conducted with managers from the Building Development office and Facilities department, culminating in meetings with the CFO and CEO.

The second workshop session involved the trial implementation of the recommended changes and amendments via their application on fire station sites. The objective of the exercise was to uncover deficiencies or anomalies with the proposed recommended changes prior to formal adoption.

At this workshop session, major recommendations of the report were tested against two real fire station sites;

- an existing site established in readiness for construction and,
- a 'proposed' site with limited land area located in a built-up area of inner Melbourne.

Checklists and site specific information were established for these sites and implemented via design layout 'test' scenarios. The outcome of the exercises conducted at the workshop supported and augmented the recommendations of the report.

#### **1.0.4 OBJECTIVES**

The objective of the design guide review is to deliver a set of design tools that will facilitate improved practices for the selection of fire station sites and the design and delivery of fire station facilities. The design tools will consist of:

- Recommendations for the adoption of a more efficient macro distribution model for fire station facilities which will facilitate better use of resources and delivery of services,
- Recommendations for the adoption of a process for future proofing of fire stations via the early identification of contingency or overload capacity,
- Guide templates and checklists to facilitate the comprehensive and uniform process of assessment and procurement of suitable sites for fire stations,
- The implementation of a definitive Site Specific Data Brief for each site prior to the commencement of the design process,
- New design templates, changes to the current room data sheets, guides to facilitate more efficient utilisation of space and function for a fire station,
- Recommendations and checklists to facilitate a 'continuity of process' as a project progresses from one stage to another.

This report and its recommendations are limited in its scope by the issues uncovered through the process of this review. There will be other issues or matters which will require additional review as they have not been 'discovered' during the current review process or as a consequence of the adoption of some of the recommendations of this report. The intention of this review is to ensure that the recommendations and guides provided with this report are kept 'live' by the ongoing maintenance of the guides.

### 1.0.5 CONCLUSION

The process of informal discussions with the end users uncovered many of the fire-fighters concerns and dissatisfactions. Not all issues were able to be addressed however, recurring issues that were meritorious were addressed by changes to the design guides and brief. A major change in the design brief was the adoption of the combined bedroom/locker room model. The adoption of this room arrangement not only resolved some functional deficiencies, it also removed a potential major privacy issue for the organization, by providing dedicated locker/change area for the individual. For the smaller two and three bays stations, this model will also be able to deliver a more efficient floor plate and smaller footprint.

Another important tool to address regional and local needs is the formulation of a 'Site Specific Data Sheet' which will be required to be updated by the Zone Steering Committee prior to the commencement of each project. Each 'Site Specific Data Sheet' is essentially an area schedule of all spaces required for a specific facility. The data sheet not only allows the steering committee to identify areas of special needs ie hub station requirements, overload facilities, etc, it will also identify areas allocated to each space, which will assist with the formulation of a project's total area and footprint at the commencement of a project. A default 'Site Specific Data Sheet' has been formulated for 2 to 5 bays stations. As each zones plans and appropriates resources, these data sheets can be fine-tuned to address local requirements and space allocations. Each zone's input in completing the 'Data Sheet' will assist with cost planning and will facilitate a sense of ownership for the zone for each project.

In response to the objectives of the Design Review, this report has been able to make recommendations, changes and additions to the current design guidelines and room data sheets via the following mechanisms:

- Facilitate a more efficient allocation of resources and a better delivery of product via the adoption of the **concept of a 'hub and spoke' stations**.
- Facilitate better checks and balances in the assessment of land and the design and delivery of fire station projects via the application of pre-defined **Checklists** and prompters,
- Facilitate the early understanding and allocation of appropriate internal and external floor areas via **Site Specific Data Briefs**,
- Deliver a better fire station product via the adoption of a variety of **spatial templates** and suggested **changes to the current design brief** and **room data sheets**.
- Deliver a **better distribution of floor areas** from underutilised spaces to high use spaces without necessarily involving a significant increase in overall gross building area.
- Demonstrate that a well considered design for a **two storey fire station** could be a viable solution for locations where large land parcels are at a premium or unavailable for purchase when required.

## 2.0 PROGRAM

The program for the design review commenced on the 22 March 2010. The anticipated date of completion was the end of June 2010. The original program envisaged a 5 stage program over a 12 to 14 week program. In the original time-line, it was anticipated that the completion of the two phases of stage 1 was to have been achieved by 16 April 2010. However, due to the increased scope of work to take into account a wider range of influences on the design of fire stations at the Identification and Preparation stages, the program was reformulated with the merging of the Preparation and Application stages. For the penultimate stage of the program, the Implementation Stage, recommendations of the report were tested against real site layout design exercises at the second workshop session. The final report and recommendations will be delivered prior to the end of June 2010 as originally envisaged.

### Original project program

Project Time-Line	Commence	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14
IDENTIFICATION – Phase 1	22 Mar 10														
IDENTIFICATION – Phase 2	5 April 10														
PREPARATION	19 April 10														
APPLICATION	10 May 10														
IMPLEMENTATION	31 May 10														
REVIEW AND SIGN-OFFS	21 June 10														

### Amended project program

Project Time-Line	Commence	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14
IDENTIFICATION – Phase 1	22 Mar 10														
IDENTIFICATION – Phase 2	5 April 10														
PREPARATION	19 April 10														
APPLICATION	10 May 10														
IMPLEMENTATION	31 May 10														
REVIEW AND SIGN-OFFS	21 June 10														

### Actual project program

Project Time-Line	Commence	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14
IDENTIFICATION – Phase 1	22 Mar 10														
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IMPLEMENTATION	31 May 10														
REVIEW AND SIGN-OFFS	21 June 10														

## 3.0 WORKSHOP OUTCOMES

The issues discovered and uncovered during the Identification stage of this project can roughly be categorised into the following headings. The decisions and recommendations resulting from the stage 1 workshop session are summarised below:

### Strategy

Policies and decisions that influence the design of fire stations at the strategic level which include determinants governing land procurement and strategic locations. Decisions for this category are usually made at the zone or manager level. This review report will look to provide guide recommendations for this category.

### Policy

Corporate level decisions that affect the short to long term goals of the organisation including the need to define what a 'specialist station' is. Decisions for this category are usually made at the director or board level. This review report will look to provide guide recommendations for this category.

### Process

This review will look to recommend a methodology to ensure that there is 'continuity of review' as a project progresses from the early stage of land identification and procurement to project handover. The review report will look to provide recommendations for checklists to be signed-off at each stage.

### Facilities and Building Design

The outcome of the review of the 'Design and Delivery Manual' for new and refurbished fire stations will form the main component of this report. Deficiencies and improvements identified in the DDM will be addressed by the provision of amended static room data sheets, the inclusion of diagrams, drawings, templates and flow charts and written recommendations.

## 4.0 WAY FORWARD

This report has recommended changes to current procedures and guidelines on policy and strategic matters. Design and building matters that have received general acceptance through discussions and workshop sessions have been included as amendments to Room Data Sheets. Amendments have been supplemented by flow charts, template floor plans and checklists.

With the implementation of the recommendations from this report, the MFB will have to have a process in place to maintain the currency of the documents referred to above.

The recommended checklists, templates and schedules attached to this report are static documents. The Room Data Sheets, Site Specific Data Brief and Checklists attached to this report have been designed to be easily amended or have additional items added where required. However, there should be a process in place to identify issues, or where issues are discovered in the field, a process to easily update data files and design templates for future application.

It is recommended that a process be implemented to allow the formulation of the attached checklists, templates and schedules into programmable documents with links to MFB's data bases and reference documents with the view to ensure that the documents and templates are able to be regularly updated and kept 'live'.

## 5.0 WORKSHOP RECOMMENDATIONS

### 5.1.0 STRATEGIC

#### 1.1 Strategic Location and Land Procurement

Two issues were identified on this worksheet:

- What drives the need for a new fire station and the time-lines for delivery?
- What determines the geographical location and catchment area for a fire station?

The delineation of geographical 'catchment' areas or 'response time' areas is a vital component for the formulation of policies regarding the strategic location of new fire stations and where upgrades are required to be prioritised for existing stations. The determinants that govern the delineation of these geographical areas could be a combination of a number of factors including:

- current population densities and projected population growth,
- predominant fire source feature ie grass fire, dwelling type, high rise offices etc,
- existing and future access routes,
- proximity to other emergency services etc.

There is the need to develop a process to identify and assess land within an agreed *strategic location*. Strategies to procure land that meet prioritised determinants including the process for compulsory acquisition of land are currently being developed by the Property Development group.

Prioritised determinants should also include the element of 'time' where time is an imperative due to the age of the station, health & safety etc. Where a number of shortlisted land parcels are available for consideration, a list of prioritised determinants will assist with the decision on whether sites under consideration will meet the essential requirements of the proposed station needs or, on the occasion where secondary sites are selected, the level of compromise that will have to be made.

##### 1.1.1

It is recommended that the responsibility for the development of the process to identify land, strategies to procure land and the process for compulsory acquisition within a target time frame be clearly defined.

It is recommended that *strategic location* determinants and drivers be identified and documented for each project. Each of these determinants should be weighted and prioritised to reflect the importance of the determinants to the particular project.

##### 1.1.2

It is recommended that a checklist be developed for the feasibility assessment of all target sites under consideration. This checklist should contain prompts for the assessors to promote a uniform approach towards land viability assessment. Checklists should include environment prompts ie noise, vibration, fumes, contamination, cultural (indigenous land and vegetation), neighbourhood amenity etc.

##### 1.1.3

Items within the checklist that have not been addressed should be able to be brought forward to the next stage after the land is procured to ensure continuity of process.



## 1.2 Land size determinants

Two issues were identified on this worksheet:

- What are the determinants for an optimum land size based on a proposed station's needs?
- Consider two storey options for inner city areas where large land allotments are at a premium.

The spatial requirement of a station is readily defined by the spaces identified in the Room Data Sheets. For the more common smaller two and three bay stations, there are no reasons why template footprints cannot be established to assist with land size determination. For the larger stations where zone strategies may require additional facilities or specialist functions, the spatial demands for these areas will have to be developed at project inception.

The issue of whether a functioning fire station can be located over two levels was discussed at the workshop. The current Consultants' Design brief, section 4.2.3 (ii) states "two storeys should only be considered where the site size cannot possibly accommodate a single storey building". This section also list two areas able to be located on the upper level of a two level building i.e., "Gymnasium/Weight room and Change/WC/Shower suites and adjacent Locker areas and non PPE drying room". These areas in total make up a small proportion of the total floor area and do not represent good value if located on a separate floor when the cost of the additional building envelope and mechanical vertical connections are taken into account.

For a viable two storey option, there will have to be more areas located on the upper level. Another alternative canvassed at the workshop was the location of additional daytime activity areas on the upper level including; Kitchen, Mess room, Lounge, Meeting rooms, Gymnasium etc. Functions essential for ground level operations including Bedrooms, Locker rooms, Bathrooms, Turn-out alcove and Administrative Offices would remain at the operational floor level. The argument for the above is based on the premise that emergency turn-out procedures at night should not be carried out over two levels for obvious safety reasons. However, it was argued that turn-outs during the day should not be adversely hindered by personnel having to negotiate stairs. If this principle were to be adopted for situations where large land areas are at a premium, there is the potential to significantly reduce footprint areas and at the same time deliver structurally efficient two level buildings on smaller allotments. It should be noted that vertical transportation to comply with DDA requirements will have to be factored in the overall costs for a two level fire station.

### 1.2.1

It is recommended that for localities where existing land size cannot accommodate the requirements of a single storey building, the above principle "that only daytime functional spaces be allocated on the upper floor of a two level building" be adopted.

### 1.2.2

It is recommended that typical guide footprint templates be developed for 2, 3 and 4 bay stations including two storey options.

To guide land viability assessment, associated spatial constraints (ie, boundary setbacks, landscape buffers, car parking, drill yard space, vehicle turning circles, approach and exit driveways, site contours, land batters and retaining walls, sightlines, future expansion etc) typical to each site should be added to the basic station footprint templates to form the notional land area required for a project.

### 1.2.3

It is recommended that a Site Specific Data Sheet be developed by the Zone Steering Committee for each project. Major determinants for a project's Site Specific Data Sheet should include a list of all the main functional areas required for a fire station including, number of appliance bays, number of bedrooms, area allocation for Kitchen, Mess room, Lounge room, Gymnasium, Lecture room, Administration and Offices, PPE turn-out room etc plus a percentage factor for contingency capabilities (overload facility, future growth etc), a percentage factor for circulation and external areas including the number of car parks required to be located on site.

### 1.3 Specialist Stations

Two issues were identified on this worksheet:

- What are the determinants that define a Specialist Station or Hub Station?
- What additional facilities are required in such a station?

The concept of specialist or hub stations located geographically central to 'satellite' or 'spoke' stations was discussed at the workshop. It was envisaged that the hub stations could be functioning fire stations with additional facilities ie overflow lockers, spare bedrooms, spare parking, larger training yard, larger lecture rooms, larger Mess and Lounge rooms. These stations could also be staffed with specialists and equipped with specialised rescue and fire fighting equipment.

A strategically located hub station could also be equipped for contingency capabilities, for example, with 'overflow' capacity to temporarily take on personnel and appliances from other stations that are undergoing renovation or during the period of construction of a new fire station located within the zone or for the deployment of additional staff during periods of high seasonal demands for fire fighting services.

The hub stations could also be built incorporating environmentally sustainable design solutions and equipped with measurable energy usage devices for 'benchmarking' of energy use against other stations. An internally benchmarked system comparing 'like for like' facilities would be beneficial for the organisation in developing an understanding of the efficacy of current energy use programs, for the education of station personnel and for the implementation of future efficient energy use program. Facility specific lessons ie reduced energy use practices, learnt from hub station practices could also be gradually rolled out to other stations where appropriate.

Hub stations will allow the concentration of specialist equipment and skills in central locations, will reduce duplication and could assist in the reduction of spatial demands from associated 'satellite' stations especially for existing stations located within inner city areas where large land allotments are at a premium.

#### 1.3.1

It is recommended that the concept of specialist or 'hub' stations supporting smaller 'spoke' stations be adopted for further development by the appropriate zones and project development committees. The contingency capabilities of each 'hub' station will have to be defined to ensure that adequate functional and spatial support elements are included in the design brief. 'Enhance' facilities could include; spare bedrooms, additional offices, larger meeting rooms, dedicated lecture theatres, larger Mess and Lounge rooms, spare appliance bays, specialised rescue equipment, overflow car parking spaces, larger drill yards, ESD elements, measurable energy and water usage devices etc.

### 1.4 Overload/Contingency Capacity

Two issues were identified on this worksheet:

- What are the current (and future) designed overload determinants for fire stations?
- What facilities need to be considered to accommodate overload demands?

The question of whether a fire station should be designed and built with overload or contingency capacity is one that will need to be discussed in depth and substantiated by current demands and future changes. Demand can be generated from a number of sources including; crewing changes, equipment use changes, changes in government policy, mergers with other emergency services agencies etc. Future demand for increased crewing, flexible work choices etc could lead to increased demands for beds, lockers, mess room area, on-site parking etc. A factor over and above the current crewing number per shift will be required to be formulated to determine spatially, the overload requirements.

Current Design Brief requires a staff facility factor of 5.3. This factor should be reviewed against current and projected demands. With the adoption of the combined bed/locker room model incorporating a part ensuite between two bedrooms, this factor will vary between 5.0 and 6.0 (Refer to proposed Site Specific Brief).

Overload capacity for a station should be formulated at the strategic level and determined prior to the commencement of a project. The overload capacity for a station can be captured in the Site Specific Brief under Staff Facility Factor. This factor will determine the number of bedrooms (bedrooms numbers will always be even as each module contains two bedrooms with a shared part ensuite in-between) and associated lockers which will always be in multiples of 5 (5 lockers per bedrooms).

Attention is drawn to Worksheet 1.3 where the definition of a specialist or 'hub' stations could include some of the requirements of 'overload capacity'.

#### 1.4.1

It is recommended that a Site Specific Data Brief be developed to encompass all the spatial requirements of a proposed station prior to the commencement of the project. This Site Specific Data Brief shall include a Staff Facility Factor which will dictate overload or contingency capacity where required. Refer to Site Specific Brief proforma attached to this report.

#### 1.4.2

It is recommended that the requirement for overload or contingency capacity be built into some stations, preferably identified 'hub' stations. It is suggested that protocols be developed for decisions to incorporate overload or contingency capacity where required to be incorporated in new/refurbished station designs.

## 1.5 Room Data Sheet (RDS)

### 1.5.1 RDS 01.

Single width 'fold-up' doors are the default standard for all appliance bays. Double width 'fold-up' doors should be considered where turning circle and sightlines are limited due to site constraints. Note that with double width doors, there is the associated issue of the shared safety beam across the doorway not being able to identify a second vehicle exiting after the first. For double width doors, it is recommended that a second safety beam be installed across the opening and programmed to activate after the initial activation by the first vehicle across the beam. For bays accommodating ladder appliances, the second beam could be located at a higher level to pick up booms protruding past the front of the appliance.

The distance between a fixed wall and appliance bay should be specified to ensure that doors can be opened without undue interference into paths of travel. Refer to typical Appliance Bay layout template.

### 1.5.2 RDS 06

Current design guide allows the data/LAN/TV video cabinet to be located on the floor of lecture room. For security and safety reasons, a dedicated AV cupboard or joinery fixture should be provided for this equipment.

### 1.5.3 RDS 07

The 'Visitor Toilet' should be acoustically attenuated, refer worksheet 2.8.

### 1.5.4 RDS 10 – Firefighter's Mess.

The Kitchen and Meals areas are two separate functional areas and should not be combined. Refer worksheet 2.6.

### 1.5.5 RDS 15 – Bedrooms.

Level of acoustic separation should be prescribed, refer worksheet 2.8.

Current standards allow the utilisation of 'velux' type roof windows to substitute for external windows to firefighters' bedrooms that do not have an external wall. Standards will need to clarify situations where internally located bedrooms are permissible.

### 1.5.6 RDS 16 – Bed lockers.

Total numbers should include a provision for 'overload' or relief crewing over minimum. Refer to worksheet 2.1.

### 1.5.7 RDS 24 – Gymnasium/Weight room.

Review the 'relationship to other areas' where double doors access into the Appliance Bay is a prescribed requirement. Consider safety and separation between a clean and a 'vehicle parking and response' area.

#### 1.5.8 RDS 25 – PPE Change.

Consider deletion of ambiguously worded “No access doors to Appliance Bay” and replace with a flow diagram.

### 1.6 Room Data Sheet (RDS)

It is recommended that the following current standards be reviewed to incorporate the recommendations:

#### 1.6.1 RDS 27

Review equipment and fittings located in Turn-out dispatch console area. This ‘transition’ area should not be used for any activities other than for the dispatch of turn-out information.

#### 1.6.2 RDS 28 – Circulation corridors.

Review current recommended wall finishes to high-use corridors for cleaning and maintenance purposes. For motion detected lighting, consider breaking up light circuits in corridors to enable lowered lighting levels to prevent ‘all on’ or ‘all off’ situations.

#### 1.6.3 RDS 34 – Plant Room Area.

The plant room is a workplace for plant maintenance service personnel. Avoid locating plant and equipment at the roof level where ‘fall from height’ is a potential risk. OH&S, Section 28 recommends the ‘elimination of hazard’ as the first order of control.

#### 1.6.4 Corporate Signage

Project delivery manual should refer to the new corporate signage specification package for, mandatory signage, door and room signage, station identification signage, external illuminated corporate signage.

## 5.2.0 BUILDING AND DESIGN

### 2.1 Locker/Bathroom/Bedroom relationship

One issue was identified on this worksheet:

- Anecdotal evidence suggests that current policy requiring users to change in bathrooms has not generally been practised.

Current bedroom/locker/bathroom arrangement is separated from each other. Bathroom/change room is located off the common locker area. Anecdotal evidence suggests that users are reluctant to change within the privacy of the bathrooms but prefer to change directly in front of their lockers for a variety of reasons including; wet bathroom floors, distance from clothing lockers. If this practice is continued, there is a potential problem regarding privacy and associated issues with harassment.

The location of the WC within the bathroom potentially doubles the amount of time the bathroom is occupied.

An alternative bedroom/locker arrangement with clothing and bed lockers located within the bedrooms, has been successfully utilised by another emergency services agency over a number of years. Under this model, two bedrooms share a semi-ensuite equipped with a shower and a vanity. WCs are located separately. This bedroom/locker model allows disrobing and changing within the privacy of the bedroom with direct (but shared) access to a shower and vanity.

Under this alternative model, each bedroom will contain five combined lockers for bedding and clothing, a desk and a bed. As this arrangement requires two bedrooms per semi-ensuite, the number of bedrooms will always be even.

This alternative model of rooms/lockers could potentially be less spatially demanding than the current arrangement of separate bedrooms and locker areas. Refer to attached suggested floor plan of this alternative bedroom/locker room model.

#### 2.1.1

It is recommended that the alternative bedroom/locker and shared semi-ensuite arrangement of rooms be adopted for all future new stations.
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## 2.2 Clean/Transition/Appliance Bay flow diagram

One issue was identified on this worksheet:

- Clearly define the use of these areas and what is allowed in each area.

Refer to Flow Diagram attached. The flow sequence for a turn-out should be Clean – Transition/Turn-out alcove – Appliance Bay. On return, the flow is reversed except for the possibility of the insertion of a shower room with direct access from the Appliance Bay to enable firefighters to shower off residues and remnant dirt (ash) from a job.

### 2.2.1

Turn-out alcove in the transition zone should only be used for dispatch of information and not be equipped with a work station for prolonged administration work.

### 2.2.2

RDS should specify double swing doors with vision panels located between the transition area and the Appliance bay. Ensure that the doors are of sufficient width to comfortably allow a fully equipped firefighter safe access through the doors. Swing tension should be adjustable.

### 2.2.3

New Personal Protection Equipment and Clothing are highly susceptible to UV degradation. RDS should include specifications that all glazing to appliance bays and PPE store be coated with UV limiting properties and that artificial lighting to these areas be fitted with UV filters.



## 2.3 Lecture Room

One issue was identified on this worksheet:

- Anecdotal evidence from stations visited suggests that lecture rooms are infrequently used for their intended purpose ie lectures, community use.

Most lecture rooms visited were used as multi-purpose rooms or alternative small group lounge. In some of the newer stations, this room is equipped with an operable wall to enable 'spill-over' use from the adjoining Gymnasium.

There are two inherent issues with the location of the Gymnasium with the Lecture room;

- a) the location of the Gymnasium room adjacent the Lecture room will require the Gymnasium to be located near the front entry. In most situations, this location is not ideal as this will locate the Gymnasium away from the showers and change rooms which are usually located at the rear of a station,
- b) the finishes for a Gymnasium and a Lecture room are not necessarily compatible.

Anecdotal evidence gathered from discussions with the fire fighters from a number of stations appears to suggest that skills maintenance training is conducted in a variety of areas in a station including the Lounge or Mess room and the Lecture room. Evidence also appears to suggest that the majority of time fire fighters spend at a station is in the Mess room. As there are pressing spatial demands for a larger Mess room due to the separation of the Mess and Kitchen areas, Lounge rooms if recliners are to be provided and the Gymnasium, it is suggested that the current space allocation for the Lecture Room be reduced and redistributed to other areas.

### 2.3.1

It is recommended that in future spatial briefs, the Lecture room be renamed 'Multi Purpose Room' and be reduced in size and the 'saved' area be re-allocated to other functional areas.
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## 2.4 Gymnasium dimensions and layout

One issue was identified on this worksheet:

- Size of Gymnasium is inadequate.

Anecdotal evidence suggests that the gymnasium is used by a number of people at the same time; typically, by the members of a shift doing a gym program or circuit training. Staggering usage appears to be impractical as activities ie turn-outs, skills maintenance training, cleaning, cooking etc are usually carried out by all members of a shift working as an integral unit. It is suggested that every gymnasium should be able to comfortably fit personnel from one shift ie 3-4 persons, each person having sufficient space to train on a separate piece of gym equipment in a 'circuit-type' arrangement.

### 2.4.1

It is recommended that future Gym designs include equipment template layouts to demonstrate spatial separation between equipment and the useability of the space for 3-4 persons. The default size Gymnasium should be a minimum of 42sqm and increased where appropriate to accommodate additional equipment for larger stations.

## 2.5 Provision of lockers for personal use

Two issues were identified on this worksheet:

- Current locker space provision is insufficient for storage of personal gear ie Gym bags.
- Storage lockers (for access to personal gear) are too remote from living areas.

Feedback provided by the station users suggest that there is a need for the temporary storage of:

- a) personal clothing bags (usually a gym bag). There is no defined area to store this type of bag used to ferry clothing and personal effects between home and work.
- b) personal effects bags (usually a small back pack) in the location where the majority of time is spent ie, the Mess room. Personal effects in this instance could include; mobile phone, wallets, non perishable food, drinks, reading material etc.

### 2.5.1

In the first instance, the adoption of the combined bedroom/locker model will provide the storage space in the bedroom storage cupboards for empty gym bags as well as bedding.

### 2.5.2

In the second instance, it is recommended that a pigeon hole-type storage cabinet be provided in the Mess area for the storage of a small bag and personal effects. Typically, this cabinet could be incorporated on the Mess room side of a Kitchen prep bench as part of the Kitchen joinery design.

## 2.6 Kitchen Design

One issue was identified on this worksheet:

- The Kitchen is a high-use area with potentially hazardous uses. Under the current Design Guide, the kitchen can be combined with the mess room.

Kitchen design should facilitate hygienic food handling practices, the safe handling of hot food and liquids and sharp instruments etc. Good ergonomic design where the relationship between cooktop, wash-up sink and food store (incl fridge) should be a consideration in the design of the Kitchen layout. Food preparation should not be interspersed between food consumption and other activities.

### 2.6.1

It is recommended that the Kitchen and Mess room be kept contiguous but separate from each other.

### 2.6.2

It is recommended that consultants be asked to prepare detailed kitchen plans and elevations for presentation to users as a requirement for the engagement of the end-user stakeholders. Consider the provision of three bin bays for general rubbish, recyclables and compostable waste.

### 2.6.3

It is recommended that the non slip flooring be prescribed in the RDS for all wet areas.

## 2.7 Kitchen Appliances

Two issues were identified on this worksheet:

- Kitchen appliances –type and quantity have not been prescribed in the Design Guide.
- Consider gas or induction coils for cook tops. Consider the provision of dishwashers.

The quantity of kitchen appliances ie cooktops, sinks, fridges etc should be prescribed in the design guide to identify and accommodate the needs of the larger station especially during shift change. It has been suggested that a three level kitchen appliance provision standard be adopted.

- Level 1 -the default level of kitchen appliance (600wide) as prescribed in the current RDS and including a dishwasher to be provided for all stations with shifts up to 5 people.
- Level 2 – duplicated cook tops, ovens and fridges to be provided for all stations with shifts between 5 to 10 people.
- Level 3 – duplicated 900 wide cook tops, ovens, fridges and wash up area for all stations with shifts in excess of 10 people.

### 2.7.1

Induction cooktops utilises a magnetic field to transfer energy directly to a cooking vessel and is ideal for turn-out situations as no remnant heat remains on the cooktop when the switch is turned off. Induction cooktops are highly efficient appliances but will require cooking vessels to be made of magnetic materials ie stainless steel, cast iron. Consider the use of induction cooktops for fire station applications.

### 2.7.2

RDS should include a prescribed standard for rangehoods including its mounting height to allow sufficient head height clearance for tall personnel.

### 2.7.3

MFB should include a list of approved kitchen appliances that meets the organisation's standards in regard to energy efficiency, level of local content, operational reliability, after sales service reliability etc.

## 2.8 Acoustics

Two issues were identified on this worksheet:

- The Design Guide for acoustics separation of nominated spaces does not contain measurable acoustic standards.
- Review current acoustic separation requirements.

It is recommended that the RDS should include prescribe measurable ie FSTC (Field Sound Transmission Class) levels of acoustic attenuation required for specific rooms.

### 2.8.1

It is recommended that a four-level acoustic attenuation standard (FSTC, Rw or other equivalent acoustic definitions) be adopted for the design guide to define acoustic separation for different functions:

- Raised voice confidential privacy (FSTC 45) ie bedrooms
- Normal voice confidential privacy (FSTC 40) ie private offices, toilets, lounge, lecture rooms
- Normal voice privacy (FSTC 35) ie general office areas, mess room, gymnasium
- Poor privacy (less than FSTC 30) ie store rooms, PPE rooms

## 2.9 Exit and Approach Drives

Two issues were identified on this worksheet:

- Approach driveways that are shared with the public have been problematic during peak periods.
- All exit driveways should be checked for unobstructed views and turning circle clearances.

### 2.9.1

It is recommended that:

- Where approach driveways are shared with the public, consider the current and potential future use and impact of increased traffic demands.
- Include an assessment of view angles and turning circle clearances at the land assessment and selection stage.
- Where the location of approach and exit driveways are in close proximity to road junctions, a thorough traffic flow investigation should be conducted to examine congestion and safe passage from and into the site.

## 2.10 External Areas

Three issues were identified on this worksheet:

- Details of the BBQ area are not prescribed. Areas for clothes drying line, compost, gardening, service yard, secure bicycle store have not been prescribed.
- Areas of roadways for Fire Appliances should be constructed in concrete.
- Fencing type required for stations has not been clearly prescribed.

It is recommended that:

### 2.10.1

A RDS be created for the external BBQ area including the total area to be allocated, type of roof cover, proximity to other functions, services, furniture & fittings to be provided etc.

### 2.10.2

If Kitchens are to be allocated bin space for general rubbish, recyclables and compostable waste, then an outdoor area should be set aside for composting (perhaps a concrete area with a hose and waste outlet adjacent the area for the compost bins).

### 2.10.3

External floor material for Drill yard, driveways and turning areas should not be constructed in asphalt but are to be in concrete.

### 2.10.4

The issue of glare reflected off light coloured concrete surfaces is apparently an issue at some stations. Consider the addition of a colour to the concrete to reduce glare.

### 2.10.5

There are a number of fence types listed in the RDS. The RDS should nominate a default fence type for perimeter boundary fencing unless prescribed otherwise; suggest colorbond 2100m high, of colour to be selected.



## **2.11 Administration Office**

This item was identified as deficient outside the workshop sessions:

- There should be a general administration office incorporating the Watchroom and current SO office that will allow fire-fighters to carry out general office duties including report writing, office administration, professional development, logging of attendance to call-outs etc.

### **2.11.1**

It is recommended that the RDS's 'SO Office' be amended to 'Administration Office' and the dimensions of this room be increased to a size capable of accommodating work stations to enable the general staff of the station to carry out office administration duties. The actual room dimensions are to be commensurate with the size of the station and to be determined by an agreed workstation to staff ratio.

### 5.3.0 POLICY

#### 3.1 Environmentally Sustainable Design

Two issues were identified on this worksheet:

- MFB has adopted Green Star compliance. To what extent is Green Star to be applied to staged renovation of existing operational stations?
- What are the drivers for ESD? Corporate image? Corporate responsibility? Continuing education of staff? Best practice? Financial?

The MFB has adopted Green Star compliance as a best practice policy to reduce the carbon footprint of the organisation. Green Star assessment is proposed to be conducted by external accredited GBCA assessors.

There is no model for fire station assessment so current modelling will have to be based on an office-type use. A fire station specific model is currently being developed by external consultants.

##### 3.1.1

The MFB organisation is unique in that it has multiple facilities performing identical functions located within areas with geographical and meteorologically similar profiles. There is the opportunity to internally benchmark stations against each other for energy use with the view to reduce the organisation's carbon footprint. Energy efficient stations can be identified, studied and utilised as benchmark target stations where efficient energy use equipment and good energy use practices can be identified and replicated at other stations. Internal benchmarking can be carried out to meet standards similar to 'green star' but will not require external assessment. With an internal benchmarking system in place, the organisation would essentially run a MFB specific energy monitoring and assessment system which can be better utilised to achieve energy targets and reduction of the organisation's carbon footprint. The outcomes of the internally rated system would then be used to form the basis of an energy tool for the design of future ecologically sustainable fire stations.

### 3.2 OH&S & DDA

Two issues were identified on this worksheet:

- OH&S Section 28, Consider the formulation of a checklist for OH&S compliance for the documentation of every project.
- Review Design & Delivery Manual, section 2.2.6's definition of 'public spaces' where DDA applies. DDA should also include access for personnel with temporary disability as well as for a disabled member of the non-operational MFB staff.

It is recommended that:

#### 3.2.1

MFB utilise the information derived from reported OH&S injury records to identify areas in the physical environment that have been the causative source of injuries. This information, where suitable, could be translated into a design checklist to ensure that appropriate measures are taken into account in the design of new facilities and the specification of finishes and fittings.

#### 3.2.2

Compliance to DDA regulation is onerous and requires substantial spatial allocation. Consideration should be given to clearly define what areas are to be made DDA compliant. It is suggested that only operational areas that require staff to be able-bodied be excluded from DDA compliance ie bedrooms and associated lockers and bathrooms.

#### 3.2.3

RDS should include nominated mounting height for door handles, switch points card readers etc.

#### 3.2.4

Appliance bay floor wastes (2no. per bay) should be located along the centreline of each bay with localised falls from the edge of the bay into the middle to drain excess water from vehicles away from the walkways.

### 3.3 Engineering Services

Engineering services issues identified on this worksheet:

#### 3.3.1

Consider the division of light fittings into separate circuits so lights do not have to be either on or off.

#### 3.3.2

Consider the allocation of essential power circuitry to all outlets for the future proofing of station designs. Note that circuits backed up by UPS (uninterrupted power supply) battery supply will still need to be separately identified to that of essential (generator) supply.

#### 3.3.3

Tie light fittings sensors to automatically adjust to daylight levels.

#### 3.3.4

Review the need to have a mechanical solution to prevent back-flow of air from Engine bay ie pressurisation system, air curtain, sealed doors etc.

#### 3.3.5

Consider interceptor traps for waste management.

#### 3.3.6

Consider identifying essential services circuits for future UPS adoption.

#### 3.3.7

Consider the rating of all power hungry fixtures ie TVs, CPUs, to ensure that only energy efficient fittings are specified for use.

#### 3.3.8

Consider the inclusion of essential power circuits with UPS and (future) generator backup connections in all new/refurbished stations.

#### 3.3.9

Consider the provision of mechanical air conditioning (set with a wide temperature range) to the 'Turn-out PPE' room to ensure that this room and associated equipment and clothing are not subjected to extremes of temperatures.

#### 3.3.10

The Breakout room's utility as a multi-use space should be supported by the provision of TV, power and data points.

## 5.4.0 PROCESS

### 4.1 Due diligence / continuity of process

One issue was identified on this worksheet:

- What processes are in place to ensure accountability for decisions made during the course of a building project which could span several years and involve multiple decision makers?

Under the changes to the Project Management Structure, the new Infrastructure Steering Committee for each zone includes UFU BCom, OH&S and End Users. This will ensure engagement with the end users during the design and implementation process for building works.

Ongoing feedback and communication can be achieved via an intranet website set up for each zone. Minutes of the Infrastructure Steering Committee meetings are also posted on the intranet for perusal and comment.

#### 4.1.1

Consider a system of prescribed checklist and sign-offs that are handed over from stage to stage, personnel to personnel that will facilitate continuity of process.
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## 4.2 Stakeholders consultation

Two issues were identified on this worksheet:

- Identify stakeholder for each stage of a project.
- What level of consultation is required?

Stakeholder groups change at each stage of the project. Are users, OH&S, Council, the public that shares driveways, adjoining neighbours, DSE, ESD specialists, external consultants, maintenance personnel all stakeholders?

Refer Worksheet 4.1 – The new Infrastructure Steering Committee will be the vehicle by which different interest group stakeholders are engaged at different stages of a project.

### 4.2.1

It is recommended that a detailed list identifying potential interest groups (temporary stakeholders) be formulated and checked against each stage of a project to ensure that appropriate groups are consulted and invited to attend meetings at the appropriate stage.

### 4.2.2

Ensure that there is a prescribed list of design items that are presented to station users and/or other members of the Infrastructure Steering Committee at the different stages of a project's life. Design items should include: circulation and flow diagrams, furniture plans (to provide a sense of scale), detailed kitchen plan. Detailed joinery and cabinet drawings etc.

### 4.3 Project Control Group

Two issues were identified on this worksheet:

- Identify the terms of reference and control. The important responsibilities for time and budget control and oversight have not been identified.
- Current number of representatives unwieldy –consider specific representations at defined checkpoints. Identify person/s with overall sign-off capability for this group.

Project Management framework should include:

#### 4.3.1

Terms of Reference to be formulated to define review checkpoints and the level of participation and consultation at each checkpoint. Include a 'Decision List' that is followed through and signed-off by the committee.

#### 4.3.2

Time and budget controls should be reported at each Project Management meeting.

## 6.0 APPENDICES

<b>6.1</b>	<b>Site Specific Data Brief</b>	<b>TAB 1</b>
	<ul style="list-style-type: none"> <li>• 1 Appliance Station – one and two levels</li> <li>• 2 Appliance Station – one and two levels</li> <li>• 3 Appliance Station – one and two levels</li> <li>• 4 Appliance Station – one and two levels</li> <li>• 5 Appliance Station – one and two levels</li> </ul>	
<b>6.2</b>	<b>Guide checklist</b>	<b>TAB 2</b>
	<ul style="list-style-type: none"> <li>• Checklist – Brief</li> <li>• Checklist – Land Assessment</li> <li>• Checklist – Land Procurement</li> <li>• Checklist – Schematic Design</li> <li>• Checklist – Developed Design</li> </ul>	
<b>6.3</b>	<b>Fire Station Template Modules</b>	<b>TAB 3</b>
	<ul style="list-style-type: none"> <li>• Template plan for 2 Bays, 1 Appliance - single level</li> <li>• Template plan for 2 Bays, 1 Appliance - two levels</li> <li>• Template plan for 3 Bays, 2 Appliances - single level</li> <li>• Template plan for 3 Bays, 2 Appliance - two levels</li> <li>• Template plan for 4 Bays, 3 Appliances - single level</li> </ul>	
<b>6.4</b>	<b>Function Specific Plans</b>	<b>TAB 4</b>
	<ul style="list-style-type: none"> <li>• Bedroom/Bathroom/Locker Plan</li> <li>• Bedroom Locker Elevation</li> <li>• Kitchen Layout</li> <li>• Mess Room Personal Gear Store</li> <li>• Gymnasium Equipment Plan</li> <li>• Clean/Transition/Vehicle Response Bay - Flow Diagram</li> </ul>	
<b>6.5</b>	<b>Minutes of Meetings at Selected Fire Stations</b>	<b>TAB 5</b>
	<ul style="list-style-type: none"> <li>• FS 26 – Croydon fire station</li> <li>• FS 27 – Nunawading temporary fire station</li> <li>• FS 30 – Templestowe fire station</li> <li>• FS 31 – Glen Waverley fire station</li> <li>• FS 01 – Eastern Hill central fire station</li> <li>• FS 47 – Footscray fire station</li> <li>• FS 43 – Deer Park fire station</li> </ul>	
<b>6.6</b>	<b>Minutes of Meetings with MFB Committees</b>	<b>TAB 6</b>
	<ul style="list-style-type: none"> <li>• ACFO</li> <li>• Commanders</li> <li>• Facilities</li> <li>• Health &amp; Safety</li> <li>• Station Design</li> </ul>	
<b>6.7</b>	<b>Workshop 1</b>	<b>TAB 7</b>
	<ul style="list-style-type: none"> <li>• Worksheet Responses</li> </ul>	



**6.1 Site Specific Data Brief****TAB 1**

- 1 Appliance Station – one and two levels
- 2 Appliance Station – one and two levels
- 3 Appliance Station – one and two levels
- 4 Appliance Station – one and two levels
- 5 Appliance Station – one and two levels

<b>6.2</b>	<b>Guide checklist</b> <ul style="list-style-type: none"><li>• Checklist – Brief</li><li>• Checklist – Land Assessment</li><li>• Checklist – Land Procurement</li><li>• Checklist – Schematic Design</li><li>• Checklist – Developed Design</li></ul>	<b>TAB 2</b>
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**6.3 Fire Station Template Modules****TAB 3**

- Template plan for 2 Bays, 1 Appliance - single level
- Template plan for 2 Bays, 1 Appliance - two levels
- Template plan for 3 Bays, 2 Appliances - single level
- Template plan for 3 Bays, 2 Appliance - two levels
- Template plan for 4 Bays, 3 Appliances - single level

**6.4 Function Specific Plans****TAB 4**

- Bedroom/Bathroom/Locker Plan
- Bedroom Locker Elevation
- Kitchen Layout
- Mess Room Personal Gear Store
- Gymnasium Equipment Plan
- Clean/Transition/Vehicle Response Bay - Flow Diagram

**6.5 Minutes of Meetings at Selected Fire Stations****TAB 5**

- FS 26 – Croydon fire station
- FS 27 – Nunawading temporary fire station
- FS 30 – Templestowe fire station
- FS 31 – Glen Waverley fire station
- FS 01 – Eastern Hill central fire station
- FS 47 – Footscray fire station
- FS 43 – Deer Park fire station

**6.6 Minutes of Meetings with MFB Committees**

TAB 6

- ACFO
- Commanders
- Facilities
- Health & Safety
- Station Design

6.7

Workshop 1

- Worksheet Responses

TAB 7