

STP23-0348 – WET AND DRY FIRE SCHEMATIC DESIGN REPORT

1. DESIGN PRINCIPLES AND CODES

1.1 Scope

The wet and dry fire services for the Mackay Base Hospital Stage 2 P Block expansion include but are not limited to the following:

- Provision of new point type smoke detection system
- Provision of new Emergency Warning and Intercommunication System (EWIS)
- Provision of new Sprinkler Protection system
- Provision of new Water storage tank and diesel fire sprinkler pump for the Helipad Sprinkler deluge system
- New FDCIE and EWCIE complete with cabinet. Panels to be interconnected to remainder of the site.

1.2 Standards and Codes

The fire services for relevant areas will be designed to comply fully with the statutory requirements including the following:

Standard	Title
NCC 2019 Amendment 1	National Construction Code
-	Building Act and Regulations
-	Workplace Health & Safety Act, Regulations and Codes of Practice
	Queensland Health – Capital Works Guidelines, Building & Refurbishment: Infection Control Guidelines
	Australasian Health Facility Guidelines
	QFES Prevention of Unwanted Alarms Guidelines
QDC MP 4.1	Queensland Development Code Mandatory Part 4.1: Sustainable buildings
AS 1170.4	Structural Design Actions Part 4: Earthquake Actions in Australia
AS 1670.1	Fire Detection, warning, control and intercom systems - System design, installation and commissioning
AS 1670.4	Emergency warning and intercom systems
AS 1851	Routine service of fire protection systems and equipment
AS 2118.1	Automatic fire sprinkler systems Part 1 General Systems

2. Design Parameters

2.1 Fire Sprinkler Services

Fire sprinkler services design will be based on the provisions nominated in AS2118.1-2017 or as deviated in the Omnii FEB. These parameters are described below:

Reference	Description
Hazard Classification	
Health Care	Light Hazard
Plant Areas	Ordinary Hazard 1
Max Floor Area per Sprinkler Head	
Light Hazard	21m ²
Ordinary Hazard 1	12m ²

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Reference	Description
Residential	37.2m ²
Maximum Spacing between Sprinklers	
Light Hazard	4.8m
Ordinary Hazard	4.2m
Residential	6.1m
Maximum Spacing off Walls	
Light Hazard	2.3m
Ordinary Hazard	2.1m
Residential	3.05m
Minimum sprinkler head pressure	
Light Hazard	70kPa
Ordinary Hazard	50kPa
Valve Sets Required	1/9000m ² (2 valve sets)
Special Hazard Valve Sets	1 Deluge sprinkler system

1.1 FIRE SPRINKLER PROTECTION

The new block P will be provided with sprinkler protection throughout to AS2118.1-2017 except where varied by the Omnii FEB. Ordinary Hazard category 1 sprinkler protection is to be provided throughout plant areas and Light Hazard sprinkler protection in the remainder of block A. Patient care areas are to be provided with residential heads.

Areas where sprinkler protection is to be omitted per the Omnii FEB:

- Top of lift shafts.
- UPS rooms.
- Generator rooms.
- Electrical switch rooms.
- Communication rooms.

A new sprinkler main will connect to the existing Fire services ring-main. Two sprinkler control valves will be provided, one to protect L00 and L01, and one to protect L02, L03 & L04.

Remote test facilities shall be provided and drained to the Hydrant Test Drain pipework located in the fire stairs.

Separate to this sprinkler protection, the Helipad is to be provided with an independent sprinkler deluge system. The Fire services contractor shall provide the infrastructure to facilitate this system. The sprinkler contractor shall provide a 10kL sprinkler water storage tank, diesel pump and reticulation pipework terminating above level 5 slab. The deluge valve set and the remaining reticulation pipework from L05 slab and sprinkler design and install for the helipad shall be provided by the Helipad contractor.

Extent of any wall wetting heads for P-Block is still being determined by the Fire Safety Engineer.

Anti-ligature heads may be required for mental health designated rooms, however the requirements can only be determined once the risk category of these rooms is provided.

Isolation rooms are proposed to have sealed concealed type pendants due the pressure differentials and frequent disinfecting expected. Since these types of heads can't be plunge tested to technically be rated as fast response (even though they're marketed as such) this may need inclusion in the Fire Engineering Report so these can still be utilised.

1.2 DETECTION SYSTEMS

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The existing systems on site are of Pertronic manufacture. The systems are to be networked and to keep the HLI functionality, the same manufacture is to be retained. The new FDCIE is proposed to be a Pertronic F220A. The main FDCIE for the site network is in the Fire Control room in block A.

Point type detectors are generally being utilized throughout the building. Type of detectors and location are both considered when determining the best device for the use of the space to reduce the risk of spurious alarms.

Anti-ligature requirements may require aspirated smoke detection to mental health designated rooms however this will not be known until the risk category of the rooms is known. Polycarbonate covers are an alternative however they're not aesthetically appealing and broken pieces can still be used as implements. Ceiling heights are currently not high enough to avoid these considerations.

As part of this works, the FireMap graphics system is to be updated to incorporate the new P block.

Fire Fan Controls will need to be expanded to include Block P mechanical life safety systems and spare space is available for this.

It should be noted that the existing FDCIE panels across the site are discontinued product and should be upgraded to current product. This upgrade was originally a separate project so is currently outside of this scope of works. STP are liaising with Pertronic to determine the full extent of upgrades required to both the FDCIE and EWCIE infrastructure for possible inclusion within the project scope.

1.3 OCCUPANT WARNING AND INTERCOMMUNICATION

The existing facility utilises a still supported EWCIE connected to the numerous evacuation zones across the site. The new P block will be provided with a new EWCIE to control evacuation of P block. It is intended to house the EWCIE in the same chassis as the FDCIE. This EWCIE is to be connected into the existing EWCIE site network. An evacuation zone strategy for cascading alarms to suit the existing arrangement will be determined once the compartment plans are available. The main EWCIE appears to only have 2 spare rows on the existing fascia in the Fire Control Room in Block A so an additional panel is being considered.

Visual warning devices are to be provided in Birthing and Special Care Nursery Rooms in lieu of audible warning signals per the Omnii FEB. Exclusion of these devices from the ensembles of mental health rooms may also need consideration for inclusion in the FEB.