Charles Sturt University

Revision 1.0

Infrastructure Design Standards

Module S08: Fire and Safety Systems

Division of Finance (Strategic Infrastructure)
Charles Sturt University

Document Control

Document Name	**Infrastructure Design Standards**
Sub-Section Name	**Module S08: Fire and Safety Systems**
Document Status	Current
Revision Number	1.0
Effective Date	11/11/2024
Review Date	10/11/2025
Unit Head	Director, Strategic Infrastructure
Author(s)	The Standards have been developed by Strategic Infrastructure, Facilities Management, external consultants, contractors, and colleagues.
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1. Introduction

1.1. Overview

The Charles Sturt University Infrastructure Design Standards (the Standards) outline the University's expectations for its built forms to achieve consistency in the quality of the design and construction of those built forms.

The Standards have been developed to provide guidance to the design team and to assist Facilities Management to drive a consistent approach to the design, construction, commissioning, handover, and operation of new capital projects to ensure the new asset is fully integrated into campus life and conforms to the University's standards and policies.

The successful integration of any new project into the day-to-day operation of campus life cannot be underestimated and is vital to ensuring the new asset provides a fully functional platform for Facilities Management clients and the University. The Standards will ensure Facilities Management is successful in supporting the University's strategic objectives now and into the future. The pitfall of viewing any new project as a standalone entity must be avoided as any new project is an extension of the existing campus.

The Standards are aligned with Charles Sturt's requisites for aesthetic appeal, life cycle maintenance and environmental sustainability, while ensuring that there is sufficient scope for innovation and technological advancements to be explored within each project.

1.1. The University

The history of Charles Sturt University dates to 1895, with the establishment of the Bathurst Experiment Farm. Formed progressively through the merge of regional institutions in south-western and western NSW, Charles Sturt was formally incorporated on 19 July 1989 under the Charles Sturt University Act 1989. As one of Australia's newer universities, Charles Sturt has been built on a tradition of excellence in teaching and research spanning more than 100 years.

With over 40,000 current students studying both on-campus and online, Charles Sturt University is the largest tertiary education institution in regional Australia. The University operates six main campuses across New South Wales in Albury-Wodonga, Bathurst, Dubbo, Orange, Port Macquarie, and Wagga Wagga, alongside specialist campuses in Canberra, Parramatta, and Goulburn. Charles Sturt University is structured around three Faculties: Arts and Education; Business, Justice and Behavioural Sciences; and Science and Health.

1.2. University Vision and Values

Charles Sturt University is committed to building skills and knowledge in its regions by offering choice and flexibility to students, while collaborating closely with industries and communities in teaching, research, and engagement. As a significant regional export industry, the University brings both strength and learning back to

its regions, positioning itself as a market-oriented institution. Its goals are to remain the dominant provider of higher education in its regions and a sector leader in flexible learning.

Charles Sturt University believes that wisdom has the power to transform communities. With perseverance and dedication, the University contributes to shaping resilient and sustainable regions for the future. Acknowledging the deep culture and insight of First Nations Australians, the University's ethos is encapsulated by the Wiradjuri phrase *yindyamarra winhanganha,* which translates to "the wisdom of respectfully knowing how to live well in a world worth living in." Through its values, Charles Sturt University fosters a welcoming community and learning environment that supports innovation, drives societal advancement, and gives back to the regions it serves.

1.3. Using the Infrastructure Design Standards

The Infrastructure Design Standards are written to advise Charles Sturt University performance requirements and expectations that exist above and beyond existing industry codes and standards.

The Infrastructure Design Standards do not repeat codes and standards.

Performance to Codes and Standards are a non-negotiable regulatory minimum of any design solution, to be determined for each project by the design team.

The Standards are to be used by all parties who are engaged in the planning, design, and construction of Charles Sturt's facilities. This includes external consultants and contractors, Charles Sturt's planners, designers, and project managers as well as faculty and office staff who may be involved in the planning, design, maintenance, or refurbishment of facilities. All projects must comply with all relevant Australian Standards, NCC, EEO as well as Local Government and Crown Land Legislation.

1.4. Modules

The Standards are divided into the following modules for ease of use, but must be considered in its entirety, regardless of specific discipline or responsibilities:

- S01 Overview and Universal Requirements
- S02 Active Transport
- S03 Acoustics
- S04 Building Management System
- S05 Electrical and Lighting
- S06 Energy Management
- S07 Ergonomics
- **S08 Fire and Safety Systems**
- S09 Floor and Window Coverings
- S10 Furniture
- S11 Heritage and Culture
- S12 Hydraulic

- S13 Information Technology
- S14 Irrigation
- S15 Mechanical Services
- S16 Roof Access
- S17 Termite Protection, Vermin Proofing and Pest Management
- S18 Security Systems
- S19 Signage
- S20 Sustainable Building Guidelines
- S21 Waste Management
- S22 Project Digital Asset and Data Requirements
- S23 Commissioning, Handover and Training

1.5. Related Documents

1.5.1. University Documents

The Standards are to be read in conjunction with the following relevant University documents, including but not limited to:

- Facilities and Premises Policy along with supporting procedures and guidelines
- Charles Sturt University Accessibility Action Plan 2020 - 2023
- Relevant operational and maintenance manuals
- Charles Sturt University Asbestos Management Plan
- Charles Sturt University Signage Guidelines
- Charles Sturt University Modern Slavery Statement
- Charles Sturt University Sustainability Statement
- Charles Sturt University Work Health and Safety Policy
- Charles Sturt University Risk Management Policy
- Charles Sturt University Resilience Policy
- Charles Sturt University Health, Safety and Wellbeing Policy

1.5.2. Federal Legislation

The planning, design and construction of each Charles Sturt University facility must fully comply with current relevant Federal legislation, including but not limited to:

- National Construction Code (NCC)
- Disability Discrimination Act 1992 (DDA)
- Environment Protection and Biodiversity Conservation Act 1999 (EPBC)
- Work Health and Safety Act 2011

1.5.3. NSW State Legislation

The planning, design and construction of each Charles Sturt University facility must fully comply with current relevant Federal legislation, including but not limited to:

- Work Health and Safety Act 2011
- Environmental Planning and Assessment Act 1979 (EP&A Act)
- Building and Development Certifiers Act 2018
- Heritage Act 1977
- Protection of the Environment Operations Act 1997 (POEO Act)
- Design and Building Practitioners Act 2020
- State Environmental Planning Policies (SEPPs)
- Local Government Act 1993

1.5.4. Federal Regulations and Standards

- Relevant Australian or Australian/New Zealand Standards (AS/NZS)
- Safe Work Australia Model Codes of Practice
- Work Health and Safety Regulations 2011
- Disability (Access to Premises – Buildings) Standards 2010
- National Environment Protection Measures (NEPMs)

1.5.5. NSW State Regulations and Standards

- SafeWork NSW Codes of Practice
- Disability (Access to Premises – Buildings) Standards 2010
- Building and Development Certifiers Regulation 2020
- NSW Work Health and Safety Regulation 2017
- Protection of the Environment Operations (General) Regulation 2022
- NSW State Environmental Planning Policies (SEPPs)
- Fire and Rescue NSW Fire Safety Guidelines
- NSW Local Council Development Control Plans (DCPs)

1.5.6. Manufacturer Specifications and Data Sheets

All installation must be carried out in accordance with manufacturer specifications and data sheets to ensure product performance over its intended life and so as not to invalidate any warranties.

1.5.7. Project-Specific Documents

Requirements specific to a particular project, campus, or other variable, will be covered by project specific documentation, such as client briefs, specifications, and drawings. These Standards will supplement any such

project specific documentation. The Standards do not take precedence over any contract document, although they will typically be cross-referenced in such documentation.

Extracts from the Standards may be incorporated in specifications; however, it must remain the consultant's and contractor's responsibility to fully investigate the needs of the University and produce designs and documents that are entirely 'fit for purpose' and which meet the 'intent' of the project brief.

1.6. Discrepancies

The Standards outline the University's generic requirements above and beyond the above-mentioned legislation. Where the Standards outline a higher standard than within the relevant legislation, the Standards will take precedence. If any discrepancies are found between any relevant legislation, the Standards and project specific documentation, these discrepancies should be highlighted in writing to the Manager, Capital Works.

1.7. Departures

The intent of the Standards is to achieve consistency in the quality of the design and construction of the University's built forms. However, consultants and contractors are expected to propose 'best practice / state of the art' construction techniques, and introduce technological changes that support pragmatic, innovative design. In recognition of this, any departures from relevant legislation, or the Standards, if allowed, must be confirmed in writing by the Manager, Capital Works. Any departures made without such written confirmation shall be rectified at no cost to the University.

1.8. Professional Services

All projects at Charles Sturt University require the involvement of adequately skilled and experienced professionals to interpret and implement the Standards. Consultants or contractors lacking proper qualifications and licenses are not permitted to conduct any work.

1.9. Structure of Document

This document is structured into 4 sections:

Section 1 Introduction (this Section).

Section 2 General Requirements – outlines the general requirements or design philosophies adopted at Charles Sturt University.

Section 3 Supporting Documentation – Legislation, Standards, Codes of Practice, University Policies, and other applicable technical references.

Section 4 Specifications (if applicable) – materials specifications and/or preferred lists for materials, processes or equipment used by Charles Sturt University.

2. General Requirements

2.1. Overview

Under the Environment Planning and Assessment Regulation 2000 under the Environmental Planning and Assessment Act 1979, Charles Sturt University has ongoing responsibilities in respect to fire safety services installed as part of building services. These responsibilities commence with planning authority approval of the project and are ongoing throughout the life of the building.

The selection of essential fire safety solutions to be installed in a building is based on the building's classification. The Project Officer shall work with onboarded consultants to collect and submit details about the building classification and any specific requirements during the early design phase for approval by the Manager, Capital Works and the Manager Campus and Space Planning. See Understanding the NCC Building Classifications:

https://www.abcb.gov.au/sites/default/files/resources/2022/UTNCC-Building-classifications.PDF

2.2. Design, Compliance and Certification

An accredited practitioner (fire safety) who is engaged to develop a performance solution for proposed development is advised to engage Fire and Rescue New South Wales (FRNSW) as a key stakeholder in the performance-based design brief (PBDB) or fire engineering brief (FEB) process.

As per Section 26 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (EP&A Reg.), the owner of a building (i.e. University) must ensure that the person who develops a performance-based design brief for a performance solution for a fire safety requirement in the building requests the Fire Commissioner's comments on the brief if:

- the building is a class 2, 3, 4, 5, 6, 7, 8 or 9 building, and
- a construction certificate is required for the building work comprising the performance solution.

Certification of fire safety services is necessary at specific project milestones:

- Consultants responsible for the services shall certify upon completion of the design / documentation phase.
- The installing contractor shall certify upon completion of installation at project practical completion. These certifications of individual fire safety services will underpin the issuance of the Final Fire Safety Certificate as mandated by the Environment Planning and Assessment Regulation 2000
- Upon conclusion of the Defects Liability Period (DLP), the head contractor is required to submit an Annual Fire Safety Statement.

A certifier is any person who is authorised under section 6.5 of the Environmental Planning and Assessment Act 1979 (EP&A Act) to issue a compliance certificate, construction certificate, occupation certificate or subdivision certificate. The function of these certificates is detailed under section 6.4 of the EP&A Act. The

certifier can be either Council or an accredited certifier, being the holder of a certificate of accreditation as a certifier regarding the matter which applies.

A certifier may be appointed as the principal certifier for the development if they hold the appropriate accreditation. The principal certifier may only be appointed by the person having the benefit of a development consent or complying development certificate.

The following reports and requirements pertain to regulations and procedures in NSW related to fire safety and building certification:

Initial Fire Safety Report:

- This report is required when a certifier receives an application for a construction certificate (CC) under Part 3, Division 3 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (EP&A Reg.).
- Within seven days of receiving the CC application, the certifier must refer certain plans and specifications to Fire and Rescue NSW (FRNSW).
- FRNSW reviews these plans and specifications to ensure compliance with fire safety requirements before construction begins.

Final Fire Safety Report (FFSR):

- This report is required when the principal certifier receives an application for an occupation certificate (OC) for development that includes building work with a performance solution for a fire safety requirement.
- The principal certifier must request the FFSR from FRNSW as soon as practicable after receiving the OC application.
- FRNSW provides this report to verify that the fire safety systems implemented during construction comply with approved plans and meet regulatory standards.

Fire Safety System Report (FSSR):

- This report is required when the principal certifier receives an application for an occupation certificate (OC) for any class 2 or 3 building.
- It applies specifically to building work that involved implementing a relevant fire safety system in the building.
- The principal certifier must request the FSSR from FRNSW promptly upon receiving the OC application to ensure the fire safety systems are installed and operational as required.

Certifier Disciplinary Condition Report:

- This report is required when a certifier has a disciplinary condition imposed upon their accreditation by NSW Fair Trading or a former accreditation body (such as the Building Professionals Board).
- If the disciplinary condition mandates written comment from FRNSW, the certifier must request a report from FRNSW.
- FRNSW provides this report as part of the process to ensure that certifiers under disciplinary review continue to meet fire safety standards and regulatory requirements.

2.3. Baseline Data for Routine Service

All states and territories have laws mandating building or facility owners to ensure that fire protection systems and necessary equipment remain operational to fulfill their intended purpose as approved. AS 1851 serves as the industry-standard framework to help owners demonstrate compliance with these legislative requirements. It achieves this by validating the reliability and effectiveness of installed fire protection systems and equipment.

The application of AS 1851 involves:

- Conducting regular servicing tasks and documenting and reporting the outcomes.
- Comparing the outcomes of specific routine servicing tasks against performance criteria specified in the approved design.

These performance criteria outlined in the approved design constitute the foundational data needed to assess the outcomes of routine servicing performed in accordance with AS 1851.

2.4. Newly Installed or Replaced Equipment

When installing new or replacing existing equipment, make sure to inform the University so they can update the asset register. This update should include the operation and maintenance manual along with as-built drawings and specific asset details as specified by the Facilities Management Operations Team.

2.5. Fire Detection System

The current fire detection system across Charles Sturt University campuses comprises a variety of brands with differing capabilities. While the university has adopted a strategy of implementing a standardised system across all buildings on all campuses the reality is each campus has adopted a different standard. Consultants will need to liaise with Campus Facilities Managers to ascertain the relevant standard for the targeted campus.

2.5.1. Fire Indicator Panel (FIP)

Criteria for Fire Indicator Panel selection and installation:

- The FIP shall be located under cover and generally adjacent to the main entry of the building but ‘external’ to the door. This is to prevent the Fire Brigade putting an axe through the locked door to get to the FIP.
- The FIP shall be capable of connection via and compatible with university’s fibre optic network.
- The FIP shall be capable of interconnectivity and remote alarm transmission, including Fire Brigade notification, via this network.
- The FIP communications hardware and software shall comply with the current version of the Division of Information Technology (DIT) Infrastructure Standards and the current version of the DIT Standards for the Installation of Communications Infrastructure at Charles Sturt University.
- The fire panel shall be integrated back to the campus Main Fire Panel and any rework required to upgrade the campus Main Fire Panel will form part of the new building contract.

2.5.2. Generic Panel Access

The access code for the FIP required to allow open access to the system for ongoing maintenance and/or expansion purposes shall be provided in the Operations and Maintenance Manuals to ensure the service contracts are not restricted to one service company.

2.5.3. Remote Monitoring

The University has an existing contract with an accredited Remote Monitoring Supplier and all hardware, wiring and connection fees required to provide a fully integrated remote monitoring system shall form part of the new building contract.

2.5.4. EWIS and BOWS

Depending on the building's use and size, the need may arise for either an Occupant Warning System (BOWS), which notifies occupants and potentially enables building-wide public announcements, or an Emergency Warning and Intercommunication System (EWIS), allowing for staged alerts and evacuations by zones, along with public addressing capabilities. BOWS focuses on alerting building occupants and may include public address capabilities, EWIS is a broader system that encompasses emergency alerts, intercommunication, and coordination during emergencies in larger and more complex environments.

As with all university buildings, emergency protocols for EWIS and BOWS systems must be established, and fire drills should be practiced ensuring all occupants know the necessary actions in case of a fire or any other emergency that necessitates evacuation.

2.5.5. Direct Brigade Alarm (DBA)

An assessment of building risk and function will define the appropriate DBA solution. In principle, all core university buildings will have monitored alarms which are linked directly to the fire brigade. This may not take place for less critical buildings or buildings agricultural functions. Residential buildings have an alternative system whereby a thirty-second delay switch is installed to allow for the manual override of minor kitchen incidents (i.e., burnt toast) to be mitigated before an alarm is sent to the local brigade.

2.6. Fire Hydrant and Hose Reel System

All campuses have extensive hydrant main networks. Additions to these networks shall be designed in collaboration with Campus Facilities Managers and appropriate fire service practitioners to ensure alignment to standards and codes. Given their criticality, the installation of fire hydrants and extensions to mains requires strong levels of documentation along with photographic evidence of all joins, terminations, valves, and control mechanisms. Inspection and photography must be undertaken by the Project Officer or their delegate before the hydrant is covered. Project Officers are to ensure the above instructions for part of tender documentation for fire services.

2.6.1. Fire Hydrants

Hydrants are strategically distributed across campus areas based on fire risk assessments and regulatory requirements. Fire Hydrant installations shall be installed is to comply with AS 2419.1 and tested to the requirements of Fire and Rescue NSW. The Australian Standard AS 2419.1 provides guidelines and requirements for the design, installation, and commissioning of fire hydrant systems, including specifications for water pressures to ensure effective firefighting capabilities. It covers aspects such as the location of hydrants, water supply requirements, and the performance criteria for the system during firefighting operations.

2.6.2. Fire Hose Reels

Fire hose reels are critical components of building fire safety systems, providing a quick response means to extinguish small fires or suppress them until firefighters arrive. These systems are governed by specific standards and regulations to ensure their effectiveness and reliability:

National Construction Code (NCC):

- The NCC sets out requirements for fire safety measures in buildings across Australia, including NSW. Section E1.6 of Volume One (BCC) specifically addresses fire hose reels.
- Requirements include the number of hose reels needed based on the building classification and size, their location, installation standards, and the minimum performance criteria they must meet.

Australian Standard AS 2441: Installation of Fire Hose Reels:

- AS 2441 provides detailed guidelines for the installation of fire hose reels in buildings. It covers aspects such as the positioning of hose reels, spacing requirements, mounting heights, and accessibility to ensure they are readily accessible during a fire emergency.
- The standard specifies the design and installation criteria for hose reels to ensure they are capable of delivering water at the required pressure and flow rate.

Maintenance and Compliance:

- Fire hose reels in NSW must undergo regular maintenance and testing to ensure they remain operational and compliant with regulatory standards.
- AS 1851: Maintenance of fire protection systems and equipment provides guidelines for the frequency and procedures of maintenance, inspection, and testing of fire hose reels.

Local Council Regulations:

- Local councils may have specific requirements or additional regulations concerning the installation and maintenance of fire safety equipment, including hose reels.
- The appointed accredited fire and safety practitioner should consult with local authorities to ensure compliance with all relevant regulations and standards.

Certification and Compliance Checks:

- Certifiers and fire safety inspectors conduct compliance checks to verify that fire hose reels in buildings meet the requirements of the BCA, AS 2441, and other applicable standards.

- This includes checking the condition of hoses, nozzles, valves, and ensuring that hose reels are easily accessible and properly maintained.

2.7. Fire Sprinkler System

Fire sprinkler systems are not common within the university-built environment and have historically been installed through code compliance requirements or from a risk assessment of the building. Focusing on the regulatory framework and standards applicable to fire sprinkler systems, key considerations for consultants are:

Requirement and Installation Criteria:

- Code Compliance - Fire sprinkler systems may be required as per BCA compliance requirements for certain building classifications and occupancies. These systems are designed to automatically discharge water over a fire area when triggered by heat, effectively suppressing or controlling the fire until firefighters arrive.
- Risk Assessment - In some cases, the installation of fire sprinkler systems may be determined by a risk assessment of the building. This assessment evaluates factors such as building occupancy, fire hazards present, and potential consequences of a fire incident to determine the necessity of fire sprinklers for enhanced safety measures.
- New Builds and Insurance Underwriters - Fire sprinkler systems are frequently recommended or required by insurance underwriters for new construction projects. This is based on risk assessment factors and insurers' criteria to reduce the potential for significant property damage and financial losses due to fire incidents. This may be relevant to commercial kitchens on university premises where systems such as kitchen hood suppression systems may be required to extinguish fires in cooking appliances and exhaust hoods, protecting both personnel and property.

Australian Standards (AS 2118 Series):

- The AS 2118 series of Australian Standards provides comprehensive guidelines for the design, installation, and maintenance of automatic fire sprinkler systems.
- These standards detail technical specifications, performance criteria, and requirements for system components to ensure reliable operation and effectiveness in suppressing fires across various building types and applications.

Maintenance and Compliance Checks:

- AS 1851: Maintenance of fire protection systems and equipment outlines requirements for routine inspections, testing, and servicing to verify system functionality and compliance with regulatory standards.

2.8. Portable Fire Extinguishers

Portable fire extinguishers are critical frontline tools in fire safety, providing immediate response capabilities to control small fires and prevent their escalation. Strategically placed and designed for versatility across various

fire classes, these extinguishers ensure rapid intervention, enhancing occupant safety by enabling quick and effective firefighting efforts in buildings and facilities. Compliance with standards and regular maintenance ensures their reliability, making them indispensable assets in protecting lives and property during fire emergencies:

Selection and Installation:

- Portable fire extinguishers must be selected and installed according to the requirements specified in Australian Standard AS 2444: Portable Fire Extinguishers and Fire Blankets - Selection and Location.
- The BCA (Volume One, Clause E1.6) also provides requirements for the type, size, and number of fire extinguishers based on the building classification, occupancy type, and fire hazard.
- The above will be managed by the appointed accredited fire and safety practitioner.

Maintenance and Testing:

- Regular maintenance and testing of portable fire extinguishers are crucial to ensure they remain operational and effective. Australian Standard AS 1851: Maintenance of Fire Protection Systems and Equipment provides guidelines for the frequency and procedures of maintenance and testing.
- This includes inspection, testing, and servicing by qualified personnel to ensure compliance with the standards and regulatory requirements.

Location and Accessibility:

- Portable fire extinguishers must be located in positions that are easily accessible and visible. Specific requirements for placement are detailed in AS 2444, considering factors such as the type of fire risk and the layout of the building.
- Extinguishers shall be mounted at appropriate heights and shall not be obstructed or obscured from view.

Signage and Identification:

- Each portable fire extinguisher must be clearly identified with signage indicating the type of fire it is suitable for (e.g., Class A, B, C, D, or F fires).
- Tags installed on the extinguisher should also indicate the inspection and maintenance details, such as the last inspection date and service provider's details.

Training and Awareness:

- Building occupants should be trained in the proper use of fire extinguishers and the appropriate response to a fire emergency.
- Training programs and emergency response plans should include instructions on how to identify fire extinguishers, the types of fires they can combat, and safe operating procedures.

2.9. Passive Fire Suppression

Passive fire protection systems are critical for ensuring occupant safety by containing fire and smoke within compartments and providing sufficient time for safe evacuation. Passive fire protection systems encompass various elements, including:

- Fire-rated walls, floors, doors, and ceilings designed to resist fire for specified durations.
- Sealing of penetrations such as pipes and ducts with fire-resistant materials to maintain compartmentalisation.
- Compartmentalisation strategies that limit fire and smoke spread, protecting evacuation paths and enhancing building safety.

Compliance with Australian Standards is integral to the design, installation, and maintenance of passive fire protection systems. Key standards include:

- **AS 1530 series**: Methods for fire tests on building materials and components, ensuring they meet specified fire resistance criteria.
- **AS 4072 series**: Components for the protection of openings in fire-resistant walls, crucial for maintaining the integrity of fire-rated barriers.
- **AS 1851**: Guidelines for the ongoing maintenance of fire protection systems and equipment, ensuring systems remain operational and effective over time.

2.10. Specialised Fire Detection / Extinguishing Systems

The university several instances of specialist fire detection / extinguishing systems installed. For example, the Dubbo Campus building 901 has a VESDA (Very Early Smoke Detection Apparatus) which is specialised type of aspirated smoke detection system known for its high sensitivity and early detection capabilities.

Several Australian Standards govern the design, installation, and maintenance of specialised fire detection and extinguishing systems:

- **AS 1670 series**: Fire detection, warning, control, and intercom systems - System design, installation and commissioning: This series provides guidelines for the design, installation, and commissioning of fire detection and alarm systems, including requirements for different types of buildings and occupancies.
- **AS 1851**: Maintenance of fire protection systems and equipment: Part 14 of AS 1851 specifically addresses the maintenance of fire suppression systems, ensuring these systems remain operational and effective over time through regular inspection, testing, and servicing.
- **AS 5062**: Fire protection for mobile and transportable structures: This standard applies to specialised structures and vehicles, providing guidelines for fire protection systems tailored to their unique requirements.

The appointed accredited fire and safety practitioner will consider the requirement for specialised fire detection and extinguishing systems. This will be determined based on building function and risk profiling however it is recommended, where possible to work with more conventional solutions.

2.11. Block Plans

It is essential that block plans are regularly updated to reflect any system upgrades or modifications, maintaining their accuracy and effectiveness over time. Properly managed, these plans ensure that emergency responders have access to up-to-date and accurate information, facilitating prompt and efficient action in the event of a fire situation.

2.11.1. Fire Alarm and EWIS Block Plans

Fire alarm and Emergency Warning and Intercommunication System (EWIS) block plans must be installed in accordance with AS1671.1 and should be prominently displayed adjacent to the main emergency control panel, the fire indicator panel, the mimic panel, and/or any repeater panels within the property or building. These plans must clearly and accurately depict the following: the precise location of the fire indicator panel, the boundaries of each fire alarm zone, the delineation of evacuation zones, and the locations of all Workstation Intercom Phones (WIP) throughout the building.

2.11.1. Sprinkler Block Plans

Sprinkler block plans, as specified by AS2118.1, must be installed at each set of installation control assemblies or at each group of valves within the building. These plans should be both water-resistant and fade-resistant to ensure long-term durability and readability. Each block plan must provide a comprehensive layout of the areas protected by the sprinkler system, clearly indicating the locations of the main stop valves. Additionally, the plans should include detailed emergency shutdown instructions for the automatic sprinkler system. This ensures that in the event of an emergency, the necessary actions can be taken quickly and effectively to manage or disable the sprinkler system as required.

2.11.1. Hydrant Block Plans

In compliance with AS2419.1, hydrant block plans are mandatory for all properties or buildings equipped with a hydrant system that includes a booster assembly. These plans must be prominently displayed in several key locations: inside the booster cabinet, within the fire control room, in the pump room, and adjacent to the fire indicator panel if one is installed.

To ensure durability and legibility, hydrant block plans must be water-resistant. They should provide a comprehensive and clear depiction of the following critical components: the exact locations of each fire hydrant, hose reel, stop valve, and any other essential fire equipment. Additionally, the plans should include pertinent information that will aid the Fire Brigade or emergency services in efficiently locating and accessing these systems during an emergency situation.

2.12. Statutory Signage

2.12.1. General Statutory Signage

New South Wales statutory signage requirements encompass a variety of signs mandated by regulations to ensure safety, provide information, and comply with legal standards. Project Officers shall ensure the development of signage schedules in consultation with appropriate consultants to align with statutory requirements aligned to the building class and function. Schedules will also align with braille and tactile standards which are discussed in Section 2.11.2 of this document.

Signage categories include:

Fire Safety Signs:

- Signs indicating the location and type of fire safety equipment such as fire extinguishers, hose reels, fire alarms, and fire blankets. These signs assist in locating firefighting equipment quickly in the event of a fire.

Occupational Health and Safety Signs:

- Signs relating to workplace health and safety, including hazard warning signs (e.g., slippery surface, electrical hazard), mandatory signs (e.g., wearing personal protective equipment), and prohibition signs (e.g., no smoking, no entry).

First Aid Signs:

- Signs indicating the location of first aid facilities, first aid kits, and trained first aid personnel. These signs are essential for providing immediate medical assistance in case of injuries or health emergencies.

Building Information Signs:

- Signs providing essential information about the building, such as floor directories, room numbers, accessible facilities, and building rules and regulations. These signs assist occupants and visitors in navigating and understanding building-specific information.

Accessibility Signs:

- Signs indicating accessible routes, accessible facilities (e.g., toilets, ramps), and designated accessible parking spaces in compliance with disability access regulations.

No Smoking Signs:

- Signs indicating areas where smoking is prohibited, as per smoke-free environment regulations in public places, workplaces, and certain outdoor areas.

Traffic and Parking Signs:

- Signs regulating traffic flow, speed limits, parking restrictions, and designated parking areas in compliance with road traffic regulations.

Environmental Signs:

- Signs relating to environmental protection and conservation efforts, such as recycling stations, waste disposal guidelines, and environmental hazard warnings.

Informational and Directional Signs:

- Signs providing general information, directions, instructions, and safety guidelines relevant to specific locations or activities within buildings or public spaces.

2.12.2. Braille and Tactile Information

Clear and legible Braille and tactile signage complying with BCA Specification D3.6 clauses 3 and 6 is required, which includes these key points:

- Tactile characters must be raised by 1mm – 1.5mm above the sign surface.
- Upper case tactile characters must have a height of not less than 15mm and not more than 55mm.
- Lower case tactile characters must have a height of 50 per cent of the related upper-case characters.
- Grade 1 Braille must be used; and
- Braille must be left-justified and located 8mm below the bottom line of text.
- On signs with multiple lines of text and characters, a semicircular braille locator at the left margin must be horizontally aligned with the first line of braille text.
- Braille must be located 8 mm below the bottom line of text (not including descenders).

2.12.3. Evacuation Diagrams

Evacuation diagrams provide information to the public about what should happen and where they can evacuate in the event of an emergency. In all states of Australia, it is a requirement of AS3745:2010 ('Planning for Emergencies in Facilities' Section 3.5) to have evacuation diagrams in all facilities. Evacuation diagrams must be submitted and approved by the Division of Student Safety and Wellbeing (DSSW) for all new buildings and upgrades.

In consultation with DSSW, the current standard evacuation frames as specified in the Charles Sturt:

University Signage Guidelines (December 2022), Section 5.44 Internal Signage - Evacuation Diagram are to be replaced with Snap Frames. Their advantage is once installed, the frames can be easily opened and the content can be changed without use of a tool, saving time and effort of Facilities Management staff and contractors. Evacuation Diagrams are required to be reviewed and updated every 5 years, which means the contents will change regularly.

Should a person decide to interfere with or deface an emergency diagram, this would represent a breach of Section 28 Duties of Workers under the WHS Act in the case of staff or contractors, and a breach of Section 29 in the case of students or visitors.

Snap Frame model details as supplied by DSSW noting they do order in bulk so may have stock at hand:

- Snapper Display Systems: https://www.snapperdisplay.com.au/
- SNAPFRAME SILVER ANODISED 25MM MITRED.
- Front loading, snap open snap shut, aluminium poster frame weather resistant & corrosion free.
- Anti-glare PVC cover sheet holds poster flat.
- Pre-drilled and individually boxed with screws and wall plugs.
- Dimensions: A3 (297x420 mm); A4 (210x297mm).
- Plastic cover sheet can also be replaced and purchased in bulk from office suppliers.

The university has specific requirements for the deployment of evacuation diagrams:

New Buildings:

Evacuation diagram holders for all new buildings will be as specified in the University Signage Guidelines Version 4: December 2022. As noted above, this excludes the framing standard and will reflect the changes as specified by DSSW.

Residences (behind bedroom doors only):

Hotels or any other Short-Term Accommodation properties (Class 3 buildings) also require back of door evacuation diagrams along with common rooms. Given that guests and visitors tend not to be familiar with the property, this extra signage provides additional resources in case of an emergency. Evacuation diagrams for behind doors shall be A3 where possible. It is preferable only to have evacuation plans in frames and no other information which may require more regular updating frame contents.

Childcare Centres:

Design consultants must adhere to the following conditions in relation to childcare centres located on university property:

- Regulation 97 of the Education and Care Services National Regulations 2011 (NSW), requires all Childcare Centres on University property to have emergency and evacuation floor plans (regulation 97(1)(b)) that are displayed prominently near each exit (regulation 97(4)).
- The NSW Regulatory Authority considers that the AS3745 term 'evacuation diagram' means, for all intents and purposes, the same as the regulation 97 term 'emergency and evacuation floor plan'.
- Regulation 97 requires all Childcare Centres on University property to have emergency and evacuation floor plans and that they 'are displayed in a prominent position near each exit'. AS3745 provides specific detail on content, validity, and positioning.
- The NSW Department of Education Early Childhood Education Directorate has published an evacuation diagram checklist specific to childcare centres: https://education.nsw.gov.au/content/dam/main-education/early-childhood-education/operating-an-early-childhood-education-service/media/documents/emergency-and-incident-management/evacuation-diagram-checklist-template.docx

The process for creating or amending evacuation diagrams is as follows:

New Builds:

- Floor plan CAD files with coded markups (Figure 1) will be provided to the Project Officer who will forward to the CAD Coordinator for review.
- The CAD Coordinator will forward to DSSW who will forward files to a third party for conversion to evacuation diagrams.
- Completed evacuation diagrams will (CAD and PDF) will be retained by DSSW and will be also provided to the Project Officer for printing and deployment.
- The Project Officer will also provide a PDF of the evacuation diagrams to the Senior Assets and Systems Officer for inclusion in the FMCentral mapping system.

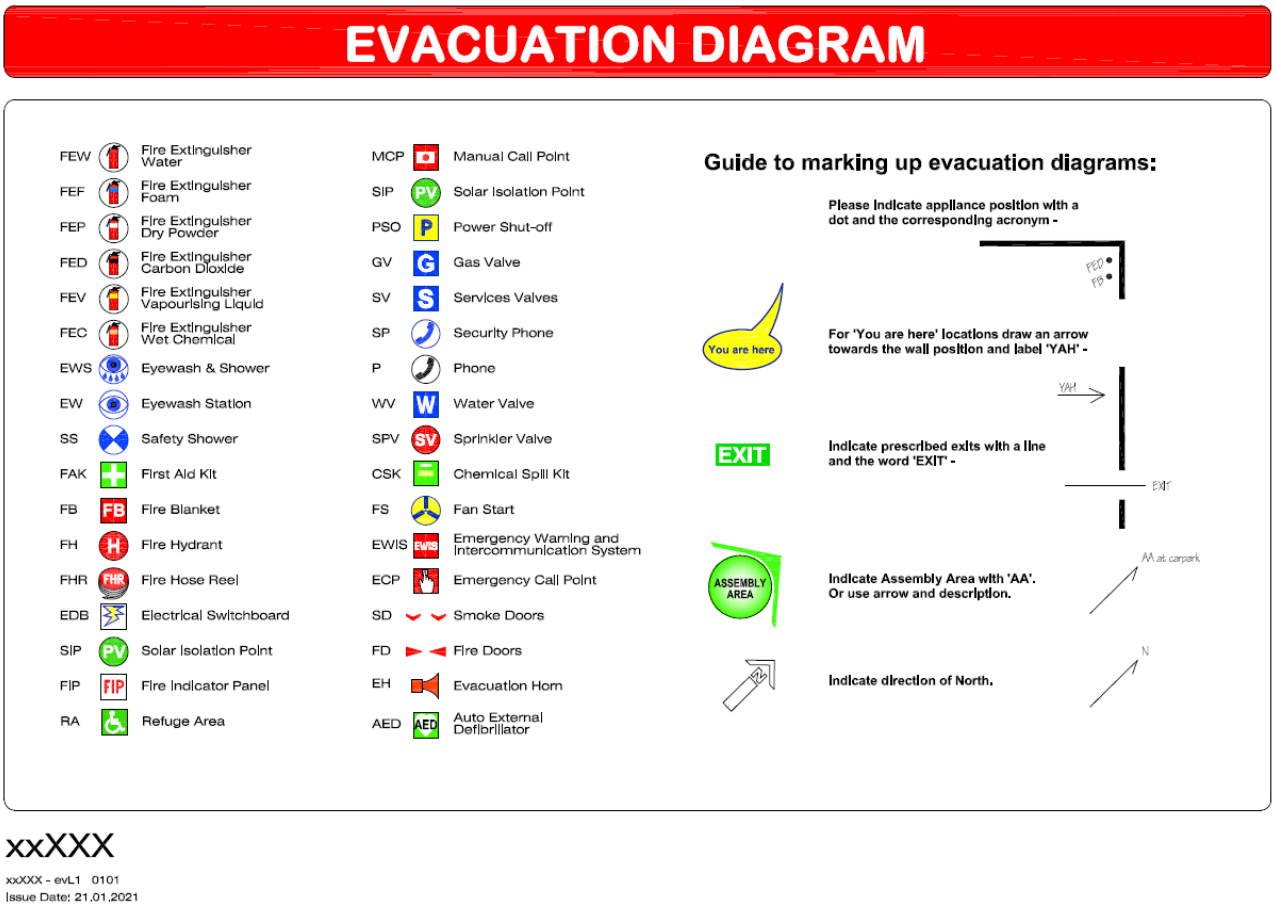

Figure 1: Sample evacuation diagram noting mandatory and optional icons along with mark up instructions. Source: Charles Sturt University Division of Student Safety and Wellbeing.

Amendments:

Amendments to evacuation diagrams occur as the result of minor modifications to the building, rectification of errors or based on statutory five-year review updates.

- DSSW will provide floor plan CAD files or PDFs to the responsible party be it Project Officer or Campus Facilities Manager. Note this may also be available on the Facilities Management S-Drive.

- The responsible party will facilitate a markup of amendments to the floor plan along with updated fire equipment, etc.
- Coded markups (Figure 1) will be provided to the Project Officer who will forward to the CAD Coordinator for review.
- The CAD Coordinator will forward to DSSW who will forward files to a third party for conversion to evacuation diagrams.
- Completed evacuation diagrams will (CAD and PDF) will be retained by DSSW and will be also provided to the responsible party for printing and deployment.
- The responsible party will also provide a PDF of the evacuation diagrams to the Senior Assets and Systems Officer for inclusion in the FMCentral mapping system.

2.13. Emergency Lighting, Security Lighting and Egress Systems

Emergency lighting and egress systems are regulated by specific standards and guidelines to ensure their effectiveness in facilitating safe evacuation during emergencies. These standards outline requirements for the design, installation, testing, and maintenance of emergency lighting and egress systems across various building types:

Building Code of Australia (BCA):

- Section E4 Emergency lighting, exit signs and warning systems - This section of the BCA mandates requirements for emergency lighting and exit signs in buildings. It specifies criteria for the provision of illuminated exit signs, emergency luminaires, and pathway lighting to ensure safe egress during power failures or emergencies.
- Australian Standards (AS 2293 series) - AS 2293.1: Emergency escape lighting and exit signs for buildings - System design, installation and operation: This standard provides comprehensive guidelines for the design, installation, and operation of emergency lighting systems in buildings. It covers aspects such as the placement of exit signs, minimum illumination levels for escape routes, and requirements for backup power sources to ensure continuous operation during emergencies.
- AS 2293.2 - Emergency evacuation lighting for buildings - Inspection and maintenance: AS 2293.2 details requirements for the inspection and maintenance of emergency lighting systems. It specifies procedures for routine testing, periodic inspections, and record-keeping to verify the operational readiness of emergency luminaires and ensure compliance with regulatory standards.

Compliance and Certification:

- Project Officers, Campus Facilities Managers and certifiers are responsible for ensuring that emergency lighting and egress systems comply with BCA requirements, Australian Standards, and applicable NSW regulations. Compliance involves proper installation by qualified professionals, regular testing, and maintenance as per AS 2293 series, and documentation of compliance records to demonstrate operational readiness and adherence to standards.

Security Lighting:

- The BCA includes provisions related to external lighting, including security lighting, under Section J6. This section outlines requirements for the design and installation of lighting systems to ensure safety and security around buildings.
- AS 1158.1: Lighting for roads and public spaces - Part 1: Vehicular traffic areas: While primarily focused on roads and public spaces, this standard provides guidelines for lighting design principles, illuminance levels, and uniformity requirements that may be relevant to security lighting in outdoor areas.
- AS 1158.3.1: Lighting for roads and public spaces - Part 3.1: Pedestrian area (Category P): This part of the standard specifies lighting requirements for pedestrian areas, which can be applicable to pathways, walkways, and public spaces around buildings where security lighting is needed.
- AS 1158.5: Lighting for roads and public spaces - Part 5: Arterial roads (Category V): This part of the standard outlines lighting requirements specifically tailored for arterial roads and highways. It encompasses guidelines for designing and illuminating these high-traffic corridors to ensure optimal visibility, safety, and traffic management, crucial for nighttime and adverse weather conditions.
- CPTED principles emphasise the use of lighting as a deterrent to crime by ensuring that outdoor areas are well-lit to discourage illegal activities and improve visibility for surveillance purposes.
- While not a standard per se, CPTED guidelines influence security lighting practices and create safer environments and shall be employed for all capital projects.
- Specific requirements for security lighting may also be outlined in local council planning regulations and development control plans (DCPs). These regulations ensure that new developments and refurbishments incorporate adequate lighting to enhance security without causing light pollution or glare.
- Considerations for Effective Security Lighting include:
    - Placement: Lighting should be strategically placed to illuminate critical areas such as building entrances, car parks, pathways, and perimeter boundaries.
    - Intensity and Coverage: Adequate illuminance levels and uniform distribution are essential to ensure that security cameras and surveillance systems can effectively capture images and monitor activities.
    - Energy Efficiency: While ensuring sufficient illumination, efforts should also be made to optimise energy use by selecting energy-efficient lighting technologies such as LED fixtures.

University-Specific Requirements:

- Emergency lighting and exit lights need to be the remote monitored addressable 'Legrand' Axiom (wireless) systems.
- The emergency exit signs shall be the Legrand LED blade style light fittings. These exit lights use LED illumination which greatly reduces energy consumption and light globe replacement.
- Prior to hand-over the installing contractor shall engage ‘Legrand’ technical staff to verify, commission and integrate the final system into the remote head-end on the university network.

- The final system installation shall facilitate all statutory inspection and testing through the University approved, most up to date proprietary software.
- The University project officer shall ensure each new building project is evaluated with representatives from the Facilities Management Operations team. The evaluation will take the perspective of ensuring the safe evacuation of occupants during a power failure the result of which may result in no illumination in the normal paths of egress. If the risk is deemed to be sufficient to warrant the inclusion of additional emergency lighting in a building that would otherwise be deemed to comply with the BCA emergency lights (Spitfires) shall be included.

3. Supporting Documentation

These below lists are not all-inclusive and those associated with the project are responsible for identifying and complying with all standards relevant to the scope of works.

3.1. Supporting Legislation

National Construction Code of Australia (NCC) 2022 (Cth)

Fire and Emergency Services Levy Act 2017 (Cth)

Work Health and Safety Act 2011 (NSW)

Work Health and Safety Regulation 2017 (NSW)

Work Health and Safety Act 2011 (ACT)

Environmental Planning and Assessment Act 1979 (NSW)

Environmental Planning and Assessment Regulation 2000 (NSW)

Fire and Rescue NSW Act 1989 (NSW)

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (NSW)

Education and Care Services National Regulations 2011 (NSW)

Building Act 2004 (ACT)

Building (Fire Safety) Regulation 2008 (ACT)

Planning and Development Act 2007 (ACT)

Emergency Services Act 2004 (ACT)

3.2. Supporting Standards

Standard Number	Standard Title
AS/NZS 1158.1.1:2022	Lighting for roads and public spaces, Part 1.1: Vehicular traffic (Category V) lighting — Performance and design requirements
AS/NZS 1158.2:2020	Lighting for roads and public spaces, Part 2: Computer procedures for the calculation of light technical parameters for Category V and Category P lighting
SA/SNZ TS 1158.6:2015	Lighting for roads and public spaces, Part 6: Luminaires - Performance
AS/NZS 1221:1997	Fire hose reels
AS 1428 Series	Design for access and mobility
AS 1668.1:2015	The use of ventilation and air conditioning in buildings, Part 1: Fire and smoke control in buildings
AS 1668.2:2012	The use of ventilation and air conditioning in buildings, Part 2: Mechanical ventilation in buildings
AS 1670.1:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 1: Fire
AS 1670.3:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 3: Fire alarm monitoring
AS 1670.4:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 4: Emergency warning and intercom systems

Standard Number	Standard Title
AS 1670.5:2016	Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 5: Special hazards systems
AS 1670.6:2023	Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 6: Smoke alarm system
AS 1682.1:2015	Fire, smoke and air dampers, Part 1: Specification
AS 1682.2:2015	Fire, smoke and air dampers, Part 2: Installation
AS 1851:2012	Routine service of fire protection systems and equipment
AS 1905.1:2015	Components for the protection of openings in fire-resistant walls, Part 1: Fire-resistant doorsets
AS 1905.2-2005	Components for the protection of openings in fire-resistant walls, Part 2: Fire-resistant roller shutters
AS 1940:2017	The storage and handling of flammable and combustible liquids
AS 2118.1:2017	Automatic fire sprinkler systems, Part 1: General systems
AS 2118.2:2021	Automatic fire sprinkler systems, Part 2: Wall wetting sprinkler systems
AS 2118.3-2010	Automatic fire sprinkler systems, Part 3: Deluge systems
AS 2243.1:2021	Safety in laboratories, Part 1: Planning and operational aspects
AS/NZS 2243.8:2014	Safety in laboratories, Part 8: Fume cupboards
AS/NZS 2293.1:2018	Emergency lighting and exit signs for buildings, Part 1: System design, installation and operation
AS/NZS 2293.2:2019	Emergency lighting and exit signs for buildings, Part 2: Routine service and maintenance
AS/NZS 2293.3:2018	Emergency lighting and exit signs for buildings, Part 3: Emergency luminaires and exit signs
AS 2419.1:2021	Fire hydrant installations, Part 1: System design, installation and commissioning
AS 2441:2005	Installation of fire hose reels
AS 2444:2001	Portable fire extinguishers and fire blankets - Selection and location
AS 2941:2013	Fixed fire protection installations - Pumpset systems
AS/NZS 3000:2018	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3013:2005	Electrical installations - Classification of the fire and mechanical performance of wiring system elements
AS 3745:2010	Planning for emergencies in facilities
AS 3786:2023	Smoke alarms using scattered light, transmitted light or ionization (ISO 12239:2021, MOD)
AS 4072.1-2005	Components for the protection of openings in fire-resistant separating elements, Part 1: Service penetrations and control joints
AS 4214:2018	Gaseous fire-extinguishing systems
AS 4083:2010	Planning for emergencies - Health care facilities
AS/NZS 4804:2001	Occupational health and safety management systems - General guidelines on principles, systems and supporting techniques
AS 5007:2007	Powered doors for pedestrian access and egress
AS 6905:2007	Smoke doors
AS ISO 7240.1:2018	Fire detection and alarm systems, Part 1: General and definitions

Standard Number	Standard Title
AS 7240.2:2018	Fire Detection and Alarm Systems, Part 2: Fire detection control and indicating equipment (ISO 7240-2:2017, MOD)
AS ISO 7240.3:2021	Fire detection and alarm systems, Part 3: Audible alarm devices
AS 7240.4:2018	Fire detection and alarm systems, Part 4: Power supply equipment (ISO 7240-4:2017, MOD)
AS ISO 7240.5:2018	Fire Detection and Alarm Systems, Part 5: Point-type heat detectors
AS 7240.6:2017	Fire detection and alarm systems, Part 6: Carbon monoxide fire detectors using electro-chemical cells
AS 7240.7:2018	Fire detection and alarm systems, Part 7: Point type smoke detectors using scattered light, transmitted light or ionization (ISO 7240-7:2018, MOD)
AS ISO 7240.8:2018	Fire detection and alarm systems, Part 8: Point-type fire detectors using a carbon monoxide sensor in combination with a heat sensor
ISO/TR 7240-9:2022	Fire detection and alarm systems, Part 9: Test fires for fire detectors
AS ISO 7240.10:2018	Fire detection and alarm systems, Part 10: Point-type flame detectors
AS ISO 7240.11:2018	Fire detection and alarm systems, Part 11: Manual Call Points
AS 7240.12:2018	Fire detection and alarm systems, Part 12: Line type smoke detectors using a transmitted optical beam (ISO 7240-12:2014, MOD)
AS 7240.13:2021	Fire detection and alarm systems, Part 13: Compatibility assessment of system components (ISO 7240-13:2018 (ED.2.0) MOD)
ISO 7240-14:2013	Fire detection and alarm systems - Part 14: Design, installation, commissioning and service of fire detection and fire alarm systems in and around buildings
AS 7240.15:2018	Fire detection and alarm systems, Part 15: Point type fire detectors using smoke and heat sensors (ISO 7240-15:2014, MOD)
ISO 7240-16:2007	Fire detection and alarm systems - Part 16: Sound system control and indicating equipment
AS ISO 7240.17:2021	Fire detection and fire alarm systems, Part 17: Transmission path isolators
AS ISO 7240.18:2018	Fire detection and alarm systems, Part 18: Input/output devices
ISO 7240-19:2007	Fire detection and alarm systems - Part 19: Design, installation, commissioning and service of sound systems for emergency purposes
AS 7240.20-2012	Fire detection and alarm systems, Part 20: Aspirating smoke detectors
ISO 7240-21:2005	Fire detection and alarm systems - Part 21: Routing equipment
AS 7240.22:2018	Fire detection and alarm systems, Part 22: Smoke-detection equipment for ducts (ISO 7240-22:2017, MOD)
AS ISO 7240.23:2014	Fire detection and alarm systems, Part 23: Visual alarm devices
AS ISO 7240.24:2018	Fire detection and alarm systems, Part 24: Fire alarm loudspeakers
AS ISO 7240.25:2015	Fire detection and fire alarm systems, Part 25: Components using radio transmission paths
AS 7240.27:2018	Fire detection and fire alarm systems, Part 27: Point type fire detectors using a smoke sensor in combination with a carbon monoxide sensor and, optionally, one or more heat sensors (ISO 7240-27:2018, MOD)
ISO 7240-29:2024	Fire detection and alarm systems, Part 29: Video fire detectors
ISO/TS 7240-30:2022	Fire detection and alarm systems, Part 30: Design, installation, commissioning and service of video fire detector systems
ISO 7240-31:2022	Fire detection and alarm systems, Part 31: Resettable line-type heat detectors
ISO/CIE 8995-3:2018	Lighting of work places - Part 3: Lighting requirements for safety and security of outdoor work places

3.3. Industry Codes of Practice

Australian Building Codes Board Australian Fire Engineering Guidelines 2021

https://www.abcb.gov.au/sites/default/files/resources/2022/Handbook-Australian-Fire-Engineering-Guideline.pdf

Australasian Fire and Emergency Services Authorities Council Fire Safety in the Built Environment

https://www.afac.com.au/docs/default-source/doctrine/afac_doctrine_fire-safety-in-the-built-environment_position_2019-06-14_v1-0.pdf?sfvrsn=0&download=true

Fire and Rescue NSW Fire Safety Guidelines and Technical Information Sheets

https://www.fire.nsw.gov.au/page.php?id=9166

ACT Emergency Services Agency Fire Safety

https://esa.act.gov.au/be-emergency-ready/fire-safety

WorkSafe ACT Signage

https://www.worksafe.act.gov.au/health-and-safety-portal/managing-safety/signage

3.4. University Documentation

Charles Sturt University Resilience Policy

https://policy.csu.edu.au/document/view-current.php?id=332

Charles Sturt University Emergency Management Procedure

https://policy.csu.edu.au/document/view-current.php?id=381

Charles Sturt University Risk Management Policy

https://policy.csu.edu.au/document/view-current.php?id=175

3.5. Other Resources

SafeWork NSW Emergency Plans

https://www.safework.nsw.gov.au/safety-starts-here/safety-overview/emergency-plans

SafeWork NSW Bushfire smoke

https://www.safework.nsw.gov.au/safety-starts-here/physical-safety-at-work-the-basics/bushfire-smoke

4. Specifications

4.1. Evacuation Diagram Requirements AS 3745

An overview of Evacuation Diagram requirements as per Australian Standard 3745:2010 follows:

3.5 EVACUATION DIAGRAMS

3.5.1 General

Evacuation diagrams that provide emergency and evacuation information shall be displayed in all facilities in accordance with Clauses 3.5.2, 3.5.3, 3.5.4 and 3.5.5. NOTES: 1 Optional elements of the evacuation diagram are given in Clause 3.5.6. 2 Examples of evacuation diagrams are shown in Appendix E.

3.5.2 Number and location

Evacuation diagrams shall be displayed in locations where occupants and visitors are able to view the diagrams. The location within the facility and number of evacuation diagrams shall be determined by the EPC.

3.5.3 Position

The evacuation diagram should be positioned within a zone at a height not less than 1200 mm and not more than 1600 mm above the plane of the finished floor.

3.5.4 Orientation

Individual evacuation diagrams shall have the correct orientation with regard to the direction of egress and its location to the 'YOU ARE HERE' point. Where an assembly area diagram is included, the assembly diagram area shall have the same orientation to the rest of the diagram.

3.5.5 Minimum Elements

The following shall be included in each evacuation diagram:

A pictorial representation of the floor or area, which shall be at least 200 mm × 150 mm.

The title 'EVACUATION DIAGRAM'.

The 'YOU ARE HERE' location.

The designated exits in the facility, which shall be green.

The following communications equipment, where installed:

(i) Warden intercommunication points (WIPs), which shall be red.

(ii) Manual call points (MCPs), which shall be red and emergency call points (ECPs), which shall be coloured white, or have a black border.

(iii) Main controls/panels for the occupant warning equipment.

Hose reels, which shall be red.

Hydrants, which shall be red.

Extinguishers, which shall be red with an additional appropriate colour as specified in AS/NZS 1841.1.

Fire blankets, which shall be coloured red.

Fire indicator panel (FIP), if provided.

Refuges, if present.

Validity date.

Location of assembly area(s), either stated in words or pictorially represented.

A legend, which shall reflect the symbols used.

3.5.6 Optional Elements

The following additional information may be considered by the EPC for inclusion on the evacuation diagram:

(a) Direction of opening of doors on designated exits.

(b) North.

(c) First aid stations and kits (denoted by a white cross on a green background).

(d) Hazardous chemical store.

(e) Spill response kits.

(f) Emergency information. NOTE: For example, emergency telephone numbers, emergency response procedures, fire orders etc.

(g) Warden details.

(h) Paths of travel, coloured green

4.3 EMERGENCY COLOUR CODES

A standardised colour code for notification, identification and response activation may be used in the emergency response procedures:

(a) Where colour codes are used for specific emergencies the colours should—

(i) be as shown in Column 2 of Table 4.1; and

(ii) approximate those listed in Table 4.1, either from AS 2700, or the colour settings for printing (see Notes 1, 2 and 3).

(b) For the verbal ‘all clear’ notification, the relevant colour code shall be stated followed by the words ‘ALL CLEAR’.

NOTES: 1 These colour codes are consistent with those used in AS 4083.

Minimum Size

Each Evacuation Diagram must be no smaller than A4 and must have a minimum floor plan size of 150mm x 200mm or 30,000m².

For any diagram that consists of optional elements in addition to the minimum requirements then it must be no smaller than A3 and must have a minimum floor plan size of 200mm x 300mm or 60,000m².

When installing diagrams, you must ensure that there is no less than 1200mm to the bottom & no more than 1600mm to the top from the finished floor level.