



Routine service of fire protection systems and equipment



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- Australian Institute of Refrigeration, Air-conditioning and Heating
 - Australasian Fire Authorities Council
 - Communications, Electrical and Plumbing Union
 - Department of Defence
 - Department of Human Services
 - Fire Protection Association of Australia
 - Engineers Australia
 - National Association of Testing Authorities, Australia
 - National Electrical & Communications Association
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 - FP-002—Fire Detection and Alarms
 - FP-003—Fire Extinguishers
 - FP-004—Automatic Fire Sprinkler Systems
 - FP-007—Fire Hose Reels
 - FP-008—Fire Pumpsets
 - FP-009—Fire Hydrants
 - FP-011—Special Fire Hazards
 - FP-017—Emergency Management Procedures
 - FP-019—Passive Fire Systems
 - ME-062—Ventilation and Airconditioning
-

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Australian Standard[®]

Routine service of fire protection systems and equipment

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PREFACE

This Standard was prepared by the Standards Australia Committee FP-001, Maintenance of Fire Protection Systems and Equipment, to supersede AS 1851—2005, *Maintenance of fire protection systems and equipment*.

This Standard incorporates Amendment No. 1 (November 2016). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This edition of AS 1851 incorporates a considerable amount of new material and technical changes for the routine service (maintenance) of fire protection systems and equipment in the light of user experience and feedback from regulatory bodies.

The scope of this Standard is applicable to the routine service procedures for fire protection systems and fire equipment. Routine service procedures for pre-engineered fire systems and other building safety measures such as emergency lighting and exit signs, emergency lifts or standby generator sets can be found in the relevant system Standard.

This edition retains a uniform structure for routine service (maintenance) requirements. Section 1 sets out general requirements applying to all systems and equipment. The other Sections contain the additional requirements specific to particular fire protection systems or equipment.

The following summarizes the major changes made to AS 1851—2005:

- (a) Title changed to overcome reported ambiguity but still reflect the concept of inspection, test and preventive maintenance. The term ‘maintenance’ has been replaced by ‘routine service’.
- (b) Restructured documentation requirements into service records and reporting to assist regulatory use.
- (c) Defined the relationship between initial installation, routine service and annual regulatory compliance (see Figure 1.7).
- (d) Critically appraised and refined the routine service technical requirements in light of field experience and studies including, battery load testing, detector sensitivity testing and system interface testing (examples include change in frequencies and specific application instructions).
- (e) Facilitating the implementation of the Standard by the responsible entity and service provider (e.g. the consolidation of sections and consistency across sections, for the fire alarm, special hazards and mechanical services).
- (f) A thorough overhaul of the general requirements of Section 1 to remove administrative requirements and avoid regulatory conflict.
- (g) Tables in Sections 2 to 14 changed from type based to frequency based, and yearly service separated from supportive routine service schedules.
- (h) Clarified requirements for interface testing.
- (i) Clarified role of commissioning and baseline data as part of the approved design.
- (j) Deletion of specific competency qualifications.
- (k) Distinguished between critical defects, non-critical defects and non-conformances.
- (l) Extensively revised records (logbooks, tags, labels and summary records) and reporting requirements.
- (m) Removed ambiguity relating to current design Standards versus the design Standards applicable at the time of original systems installation, i.e. the approved design.

- (n) Sections 6 to 10 of the 2005 edition covering fire detection, alarms, sound systems and intercom systems have been combined in a new Section 6 with the previous Section 8 (Fire alarm monitoring) being removed from this revised document.
- (o) The routine service requirements for the fire detection and control equipment of special hazard systems and smoke hazard management systems have been relocated from their respective sections into Section 6.
- (p) A new Section 5 has been included, covering water storage tanks for fire protection systems to address the new design Standard AS 2304, *Water storage tanks for fire protection systems*.
- (q) Sections 11 (Gaseous fire extinguishing systems), 12 (Fixed aerosol systems) and 13 (Water mist systems) of the 2005 edition have been combined in a new Section 7 (Special hazards).
- (r) Several new appendices have been included to expand on Section 1 content— baseline data (Appendix C) and systems interface testing (Appendix D), with two normative appendices, battery capacity testing (Appendix F) and fire detector testing (Appendix G). Extensive detail on mechanical services included in the normative section of the 2005 edition has been relocated in two appendices, both informative.

A1

The objectives of Amendment 1 are to address editorial errors and baseline data.

Since its implementation, it became clear that baseline data in AS 1851—2012 had not been interpreted correctly by the fire protection industry. As such, FP-001 has revised this to clarify the intent of the committee.

The definition of baseline data and Clause 1.8 have been updated to reflect that the baseline data required by AS 1851—2012 is only what is required to verify the result of a service activity and only required where such baseline data was required by the approved design.

Appendix C and references to specific baseline data in the service schedules were removed accordingly so that the focus is, as intended, only on what baseline data was required by the approved design.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of the Standard, whereas an ‘informative’ appendix is only for information and guidance.

Notes in this Standard are advisory only.

This Standard incorporates a Commentary on some clauses. The Commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a panel. The Commentary is for information only and does not need to be followed for compliance with the Standard.

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FOREWORD

The criteria adopted for revising this Standard include reliability, integrity, functionality and performance of fire protection systems and equipment. Consideration has also been given to the interfaces between fire protection systems and other building safety systems.

The Standard contains inspection, test, preventive maintenance and survey requirements to demonstrate that the fire systems and equipment installed in a building are achieving a standard of performance to which they were designed (the approved design). The Standard may be applied to fire systems and equipment regardless of building age. The Standard may be applied to demonstrate the minimum performance standard required by the National Construction Code (NCC) BCA, Volume 1, for new buildings or it may also be applied to existing buildings constructed to an approved design prior to the current BCA edition of the NCC. The Standard may also be used to develop specific routine service requirements for fire systems or equipment that are part of an alternative solution designed to satisfy the performance requirements of the NCC. Application of the Standard may also support health and safety acts and regulations.

The scope of this Standard is identified as Stage 2 of the process and procedures diagram in Figure 1.7. It includes the inspection, test, preventive maintenance and survey, coupled with records to be kept and reports to be made, culminating in the issue of a yearly condition report.

The revised inspection, test, preventive maintenance and survey regimes in this Standard address the functional aspects of installed fire protection systems and equipment on a periodic basis, with the objective that systems and equipment operate effectively at all times. The regimes aim to ensure that fire protection systems and equipment are in working order throughout the year or period of interest; not only at the time of annual inspection and test. A significant objective of this Standard is to provide reliability of fire protection systems and equipment, linking design, installation, commissioning and maintenance.

This Standard includes a requirement to annually test all aspects of system interconnection; for example, detection and alarm systems with atrium smoke exhaust plant, alarm systems with stairwell pressurization, automatic fire sprinkler systems with mechanical services fire mode operation and warning facilities. This will require adequate documentation of interconnections between the various systems as required in the design, installation and commissioning Standards.

Training of personnel to the appropriate levels for inspection, testing, preventive maintenance and survey of fire protection systems has not been directly addressed in this Standard; however, it is recognized that effective maintenance programs depend on suitably competent personnel.

This Standard provides a set of requirements to increase the probability that fire protection systems and equipment will function as intended by the respective design, installation and commissioning Standards, thus achieving reliability.

Continuous correct functioning is a basic criterion, and the yearly survey requirement also assures that system performance capability (efficacy) is not degraded by building or occupancy changes, which could otherwise adversely affect the capability of the system to perform as originally intended.

Routine service (maintenance) is concerned with the principle that a system will continue to perform to the approved design when routine service is conducted on a pre-determined and regular basis. Surveys are scripted activities in the routine service schedules as a check for any component degradation or building changes that may impact on system performance. The survey requirements of this Standard do not require auditing to AS 4655, *Fire safety audits*.

STANDARDS AUSTRALIA

Australian Standard**Routine service of fire protection systems and equipment**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire protection systems and equipment.

1.2 OBJECTIVE

The objective of this Standard is to maintain the reliability of fire protection systems and equipment such that they continue to meet the requirements of the approved design and are likely to do so until the next scheduled activity.

1.3 APPLICATION

This Standard provides a systematic basis for minimum routine service applicable to fire protection systems and equipment. It also may be used to develop specific routine service requirements for systems or equipment that are part of an alternative solution. It requires evidence, in the form of records and reports of completion of the periodic inspection (including survey), testing and preventive maintenance activities required by this Standard.

NOTE: The documentary evidence resulting from compliance with this Standard is intended to support the responsible entity to satisfy regulatory obligations.

1.4 REFERENCED DOCUMENTS

The documents referred to in this Standard are listed in Appendix A.

1.5 DEFINITIONS**1.5.1 Adverse operating environments**

Any environment or condition that may adversely affect the reliability of fire protection systems and equipment (see Clause 1.13.)

1.5.2 Approved design

The design of fire protection systems and equipment approved by the authority having jurisdiction at the time of installation or subsequent modification.

1.5.3 Authority having jurisdiction

A minister of the Crown, a government department, or other authority having power to issue regulations, orders or other instructions having the force of law or, in cases where none of these apply, the responsible entity.

1.5.4 Baseline data

Data either provided by or derived from the approved design and commissioning thereof, which, when and where provided, would serve as a basis for verification of results of routine servicing.

1.5.5 Competent person

A person who has acquired through training, qualification, experience, or a combination of these, the knowledge and skill enabling them to correctly perform the required task.

1.5.6 Defect classification and non-conformance

1.5.6.1 Critical defect

A defect that renders a system inoperative.

NOTE: Examples of critical defects include an impaired water supply which is unable to provide water to a sprinkler system or an inoperative fire indicator panel which is unable to warn the building occupants of fire. A critical defect is reasonably likely to have a significant adverse impact upon the safety of occupants of part, or all, of the building (see Figure 1.5.6 and Clauses 1.8 and 1.9).

1.5.6.2 Non-conformance

Missing information or incorrect feature that does not affect the system operation but is required to facilitate ongoing routine service.

NOTE: Examples of non-conformance include missing or incorrect sprinkler block plan as required, missing spare sprinklers, missing sprinkler guards, missing equipment location signs or illegible labels and non-availability of required information required to validate a service activity (see Figure 1.5.6 and Clauses 1.8 and 1.9).

1.5.6.3 Non-critical defect

A system impairment or faulty component not likely to critically affect the operation of the system.

NOTE: Examples of non-critical defects include, local alarm bell not operating, water motor alarm failure (see Figure 1.5.6).

1.5.7 High-rise

A multistorey building with storeys exceeding an effective height of 25 m.

1.5.8 Inspection

Visual examination of the components of fire protection systems or equipment to establish correct settings, physical condition or fitness for purpose.

1.5.9 Mechanical services

Air-handling plant and systems dedicated to or arranged for dual duty to control the spread of fire and smoke in buildings.

1.5.10 Preventive maintenance

A series of actions including lubrication, cleaning, adjustment and replacement of components at a predetermined frequency, to minimize the incidence of breakdown.

1.5.11 Rectification

The repair or replacement of components found to be defective.

1.5.12 Responsible entity

The entity responsible for the routine service of the fire protection systems and equipment.

NOTE: Typically the building owner, the building occupier or the building owner's agent.

1.5.13 Routine service

Inspection (including survey), testing and preventive maintenance at specific intervals (see Figure 1.7).

1.5.14 Service penetrations

Penetrations of fire-resistant building elements by electronic, electrical, plumbing, mechanical ventilation, airconditioning or other services.

1.5.15 Shall

Indicates a mandatory requirement.

1.5.16 Should

Indicates a recommendation (advisory, not mandatory).

1.5.17 Simulate

Rendering the equipment in a state or condition without necessarily carrying out the action that causes that state.

1.5.18 Survey

Visual inspection, typically conducted from floor level, to identify if the fire protection system or equipment has been inappropriately altered, damaged or compromised by changes in the occupancy, environment or building.

CI.5.18 Where an upgrade or modification has resulted in a change of the performance capability, the system should be appraised against the new approved design.

1.5.19 Systems interface

A connection between two or more systems forming part of the approved design.

1.5.20 Testing

Confirmation of correct function or performance of a component or system.

1.5.21 Yearly condition report

A report prepared annually for the responsible entity, which summarizes the routine service activities, records operational status, notes defects and non-conformances and confirms that the installed fire protection systems and equipment generally accord with the approved design (see Clause 1.17.2).

1.5.22 Where fitted

A phrase in the service schedule tables to recognize that the absence of elements or components of a system that were not required as part of the approved design need not be retrofitted and the related routine service activity is not to be considered a defect or non-conformance if not performed (see also Clause 1.9).

CI.5.22 This Standard has been written with the objective of providing relevant routine service activities applicable to fire protection systems and equipment, of any age, that may have been designed and/or installed to an earlier version of their relevant installation Standard. It is not the intent of this Standard to require system or equipment to be upgraded to meet current installation Standards.

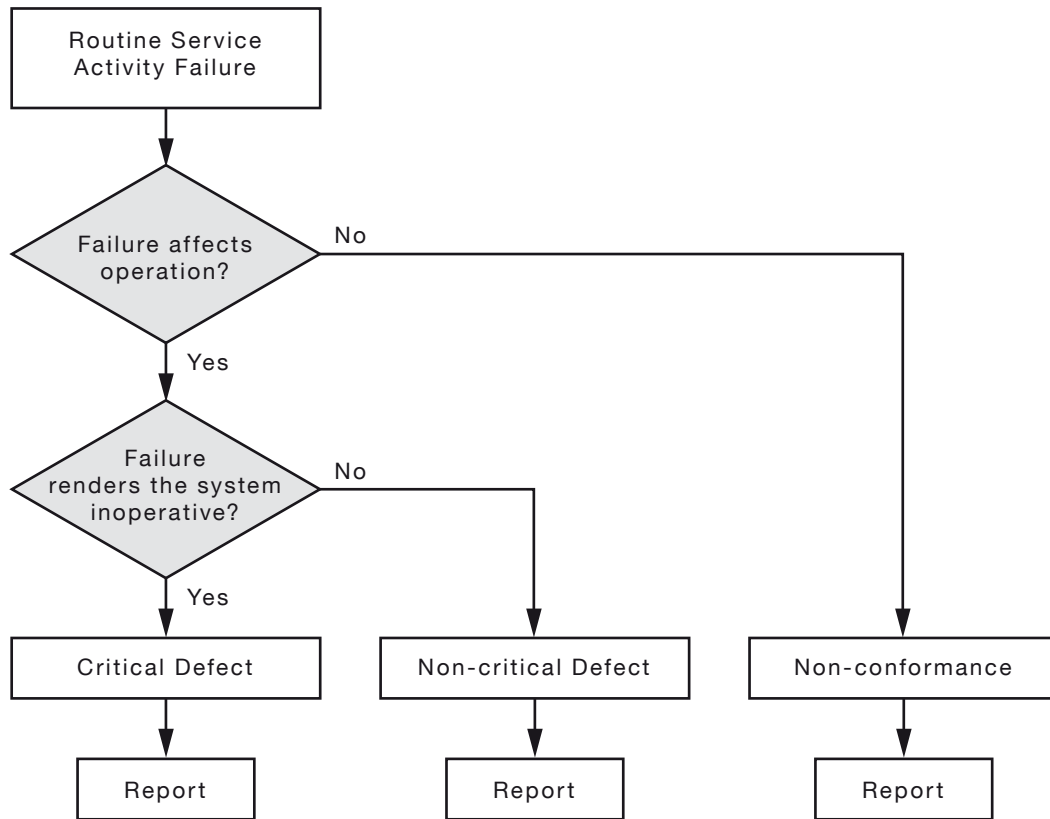


FIGURE 1.5.6 ROUTINE SERVICE ACTIVITY FAILURE

1.6 ABBREVIATIONS

The following abbreviations are used in this Standard:

ASE	Alarm signalling equipment
CIE (c.i.e.)	Control and indicating equipment
DBEP	Designated building entry point
DSEP	Designated site entry point
ECO	Emergency control organization
EPC	Emergency planning committee
EWS	Emergency warning systems
f.b.p	Fire brigade panel
FFCP	Fire fan control panel
FIP	Fire indicator panel (also known as c.i.e.)
FRL	Fire resistance level
HVAC	Heating, ventilation and airconditioning
ISO	International Organization for Standardization
LCS	Local control station
MJC	Multiple jet control
OHS	Occupational health and safety
RTI	Response time index (sprinklers)

SSVI	Sprinkler stop valve inside
VAV	Variable air volume
VFI	Variable frequency inverter
VWD	Visual warning device
WIP	Warden intercom point

1.7 ROUTINE SERVICE PROCESS AND PROCEDURES

1.7.1 General

The routine service process and procedures in this Standard are governed by the overarching requirements of this section, the introductory clauses in Sections 2 to 14 and the tables that follow.

1.7.2 Process

The process of routine service covered by this Standard commences with a service activity and concludes with completion of the Yearly Condition Report by the service provider (see Figure 1.7).

NOTES:

- 1 This process is dependent upon the satisfactory commissioning of fire systems and equipment together with required baseline data to ensure that the service provider has the necessary information to execute the service routine.
- 2 See Appendix B for an explanation of the elements contained in Figure 1.7.

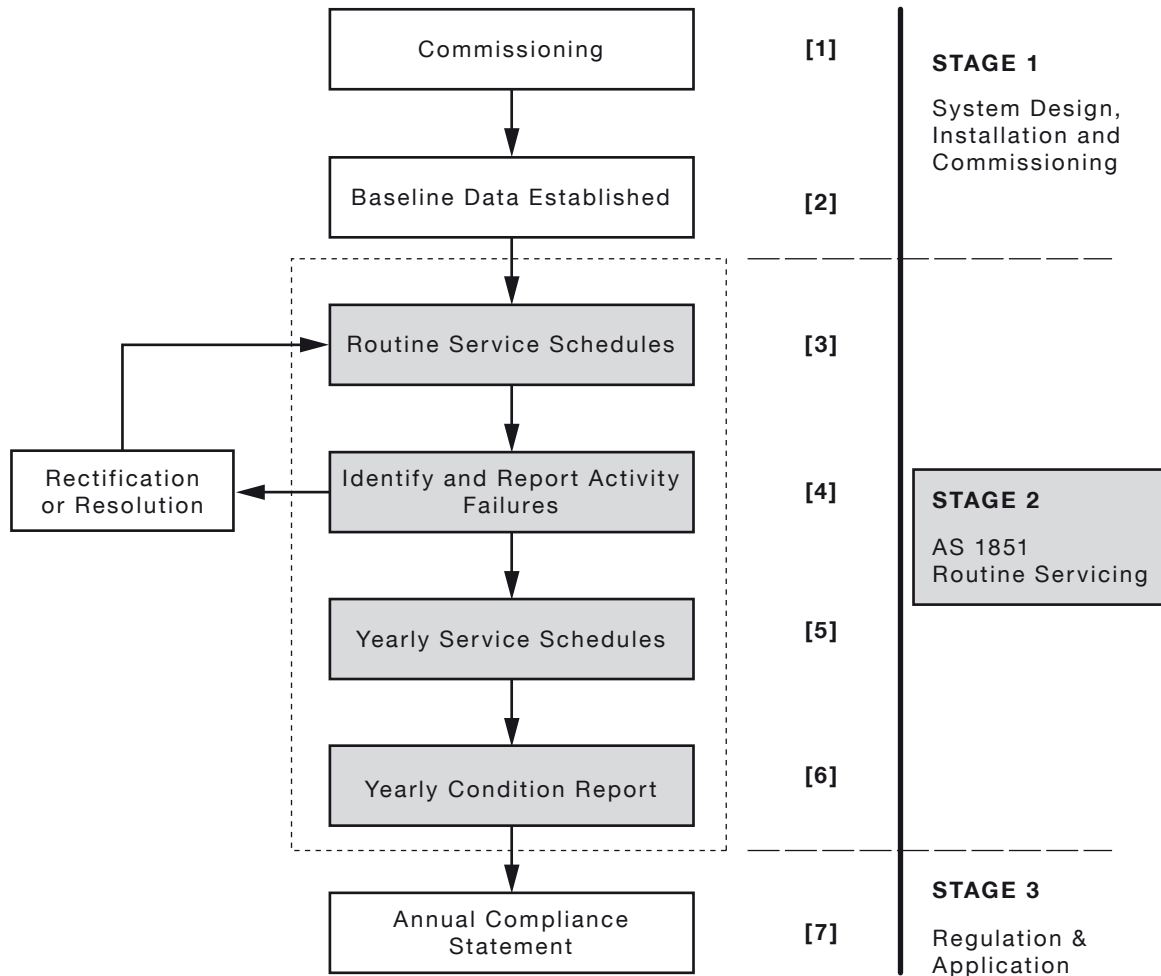
1.7.3 Procedures

Routine service procedures shall be carried out in accordance with this Section, together with Sections 2 to 14 and the criteria to which fire protection systems or equipment were designed, installed and commissioned, or subsequently modified, upgraded and recommissioned.

NOTES:

- 1 Routine service procedures are not intended to be used as substitutes for commissioning.
- 2 In addition to the requirements of this Standard, any additional manufacturer's maintenance requirements should also be considered.

CI.7.3 *Construction of building services does not always finish at the time of handover of the project, resulting in fire protection systems that have not been fully commissioned. The fire safety services need to be completed and commissioned in order for the results of inspection and test work to be meaningful.*



NOTE: See Appendix B for explanations of Items 1 to 7.

FIGURE 1.7 PROCESS AND PROCEDURES DIAGRAM—ROUTINE SERVICING OF FIRE SAFETY SYSTEMS AND EQUIPMENT

1.8 BASELINE DATA

Baseline data may be required to verify the result of a routine service activity required by an applicable service schedule.

Baseline data required by this Standard is limited to that—

- (a) necessary to verify a routine service activity result; and
- (b) prescribed by the regulations, codes or Standards that applied to the approved design.

Irrespective of the availability of baseline data, the routine service activity shall be carried out and the result recorded and reported. Where required baseline data is available, the routine service result shall be verified against it. Where required baseline data is unavailable, its unavailability shall be recorded and reported as a non-conformance.

NOTE: The supply and generation of baseline data is beyond the scope of this Standard.

1.9 SYSTEM RETROFIT

Absent elements or components of a system or systems that were not required as part of an approved design to a Standard that is now superseded are not required to be retrofitted and the related routine service activity shall not be considered a defect or non-conformance if not able to be performed.

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Example 1:

A system installed to AS CA16 (superseded) does not require the retrospective fitting of flow test equipment.

Example 2:

An emergency warning system installed to AS 2220.2 (superseded) does not require a speech intelligibility test.

1.10 COMPETENT PERSONS

Routine service of fire protection systems and equipment shall be conducted by competent persons.

NOTE: Competence may be further defined by the authority having jurisdiction. Governments may have in place occupational licensing schemes or other means of determining competence. Where this is not the case, competencies may be demonstrated in accordance with Australian Qualification Framework (AQF).

CI.10 Sections 2 to 14 nominate the routine service required by this Standard. Equipment and systems have been grouped within these sections simply to comply with normal industry trade demarcations. It is, however, the intention of this Standard that all required tasks be performed by the most appropriately qualified, experienced and competent persons, rather than the trade/discipline normally associated with that particular section of the Standard.

1.11 FREQUENCY AND TOLERANCES OF ROUTINE SERVICE INTERVALS

1.11.1 General

The frequencies adopted in this Standard are set out in Table 1.11(A) and tolerances that apply to the frequency intervals are set out in Table 1.11(B). Tolerances shall be applied to the scheduled date of the initial activity. An activity that is not conducted within the tolerance period for that activity shall be reported as an out of tolerance activity within one week of the end of the tolerance period.

NOTE: A more rigorous routine service program may be recommended by insurers or authorities having jurisdiction to conduct additional visual inspections and specific tests that may be carried out by either the responsible entity or the service provider.

CI.11.1 If the initial monthly activity is scheduled for the 20th of the month then subsequent monthly activities are required to be carried out within five working days either side of the 20th of the month.

1.11.2 Change of scheduled date

The scheduled date may be brought forward by agreement between the responsible entity and the service provider subject to the ongoing frequencies and tolerances applying and the required number of activities being completed within the prescribed period.

CI.11.2 If the initial scheduled date is the 27th of the month and the agreed new scheduled date is the 10th of the month (outside tolerance limits) then, by agreement, the date may be brought forward by performing the test on the 27th of the month and again on the 10th of the next month. This may necessitate an additional test. The new scheduled date would now be the 10th of the month, the date that will consequently be used for tolerance purposes.

1.11.3 Transitional arrangements

Arrangements for transitioning from previous editions of this Standard (AS 1851) shall be treated on a site-by-site basis.

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CI.11.3 *Where this Standard contains a new activity, the scheduled date for that activity may start from commencement of routine service in accordance with this Standard except that, in order to observe the intended frequency interval between activities, new monthly, three-monthly and six-monthly activities should start approximately one month, three months or six months, respectively, after the previous yearly activity.*

Where this Standard provides a schedule for an activity that is identical or similar to an activity required by a previous Standard, the frequency interval for that activity may start from the date the frequency interval for the corresponding activity commenced. By way of example, where a five-yearly activity was conducted two years prior to introducing this Standard the five-yearly activity should be conducted in three years time.

TABLE 1.11(A)
ROUTINE SERVICE FREQUENCIES FOR EACH SECTION

AS 1851 Section		Monthly	Three-monthly	Six-monthly	Yearly	Five-yearly	Ten-yearly	Twenty-five-yearly	Thirty-yearly
2	Automatic fire sprinkler systems	✓		✓	✓	✓	✓	✓	✓
3	Fire pumpsets	✓		✓	✓	✓			
4	Fire hydrant systems	✓*			✓	✓			
	Hydrant valves			✓	✓				
5	Water storage tanks for fire protection systems	✓		✓	✓		✓		
6	Fire detection and alarm systems	✓		✓	✓	✓			
7	Special hazard systems	✓		✓	✓		✓		
8	Delivery lay flat fire hose				✓				
9	Fire hose reels			✓	✓				
10	Portable and wheeled fire extinguishers			✓	✓	✓			
11	Fire blankets			✓					
12	Passive fire and smoke systems		✓**	✓	✓				
13	Fire and smoke control features of mechanical services	✓	✓	✓	✓	✓			
14	Emergency planning in facilities			✓	✓				

*Where pumpsets are fitted.

**Where horizontal sliding doors are fitted.

NOTE: The responsible entity may elect to conduct monthly activities on a weekly frequency.

TABLE 1.11(B)
FREQUENCY TOLERANCES

Frequency	Tolerance (±)
Monthly	5 working days
Three-monthly	10 working days
Six-monthly	1 month
Yearly	2 months
Five-yearly	3 months
Ten-yearly	6 months
Twenty-five-yearly	6 months
Thirty-yearly	6 months

NOTE: The tolerance schedule is not intended to require additional routine service activities to be carried out (e.g. six monthly routines carried out at five or seven monthly intervals).

1.12 SYSTEMS INTERFACE TEST

Where fire protection systems are interfaced to other systems, ‘end-to-end’ tests shall be conducted to confirm that each interface operates in accordance with the approved design. Tests shall take into account all fire protection systems that interface with other systems to ensure that all systems function in accordance with the approved design.

NOTES:

- 1 For an example of a system interface diagram, see Table 1.12.
- 2 Automatic sprinkler and fire alarm systems, for example, when activated, may be arranged to automatically cause operation of fire and smoke hazard management systems, release fire doors, operate roof vents, shut down non-fire essential plant, operate elevator override controls.
- 3 **‘Text deleted’.**
- 4 Worked examples of systems interface are given in Appendix D.
- 5 To limit disruption, the responsible entity should coordinate testing of the interfaced fire protection systems. This may require the attendance during testing of technicians specializing in fire alarms, sprinklers, mechanical services, electrical power and control, building management, etc. Advance notice should be given to the occupants advising of scheduled test date, procedures and purpose. Fire protection system interface documentation and its accuracy is the responsibility of the responsible entity.
- 6 Systems interface excludes interconnections within an integrated system such as a fire indicator panel dedicated to a gaseous fire suppression system or a fire pumpset interconnected with an automatic fire sprinkler system.
- 7 The interface test is not a commissioning test of each system; it is to establish that each interface operates correctly.
- 8 Where an interfaced system would be operated more than once during interface testing, it may be isolated provided at least one complete end to end test of the systems has been carried out and there is an indication that a signal has been received at the interfaced system for all other tests.

		Effect												
		Stair pressurization	Door release	Roof vents	Sound systems for emergency purposes	Plant shutdown	Fuel isolation	Elevator override	Alarm monitoring	Smoke exhaust fans	Smoke curtains	Smoke spill mode	HVAC shutdown	Damper closure
Cause	Sprinkler systems	•	•	•	•	•			•	•		•	•	
	Fire detection and alarm systems	•	•	•	•	•	•	•	•	•	•	•	•	•
	Smoke/heat alarm systems	•	•					•	•	•	•	•	•	•
	Gaseous systems		•		•	•	•		•				•	•
	Aerosol systems		•		•	•	•		•				•	•
	Water mist systems	•	•	•	•	•		•						
	Hydrants								•				•	
	Hose reels								•				•	

FIGURE 1.12 EXAMPLE OF A SYSTEMS INTERFACE DIAGRAM

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1.13 ADVERSE OPERATING ENVIRONMENTS

In adverse operating conditions, such as aggressive environments, high equipment usage or where high defect rates are experienced, a more rigorous routine service program than the minimum requirements set out in Sections 2 to 14 shall be developed. The program shall be determined by the responsible entity in consultation with the service provider.

CI.13 A more rigorous routine service program may involve supplementary inspections or greater frequency of routine service. For example, the responsible entity may elect to conduct weekly inspections and require the service provider to conduct six-monthly service activities on a monthly basis.

Adverse environments may include, but are not limited to, the following:

- (a) Exterior situations exposed to the weather or salt spray.*
- (b) Corrosive atmospheres.*
- (c) Abnormally dusty or moisture-laden (humid) atmospheres.*
- (d) Environments having extremes of temperature.*
- (e) Environments having increased risk of physical damage to equipment.*
- (f) Environments that subject the systems or equipment to continuous or intense vibrations.*

Examples of high usage include frequently used fire and smoke doors in such occupancies as health care buildings, shopping centres and airport terminals resulting in excessive wear on latch mechanisms and door leaf closing sequencing.

High defect rates may result from tampering, excessive vibration, frequent tenancy changes, vandalism or inappropriate occupant activity.

1.14 PRECAUTIONS

Prior to commencing any routine service, the following precautions shall be carried out:

- (a) Take all reasonable precautions to not adversely affect the normal operation of any system, except for those systems to be serviced, or to adversely affect occupants of the building, or to cause any situation that will result in an unwanted alarm.
- (b) Inform the responsible entity or nominated person that routine service is to be carried out, which may adversely affect the occupants or operations of the building.
- (c) Inform the responsible entity or nominated person of the extent and expected duration of the impairment during the routine service so that alternative safety arrangements can be implemented.
- (d) Notify the monitoring service provider where testing or service may cause signals to be transmitted.
NOTE: The notification may be by configuring the alarm signalling equipment to test mode and confirmation that the system has been restored to 'normal' by the alarm signalling equipment returning to 'normal'.
- (e) On completion of any routine service, return all controls to their prior state. When any function is left impaired, disabled or is not restored to 'normal', record in the system logbook and notify the owner or agent.
- (f) If on-site welding is to be carried out, it shall be in accordance with the requirements of AS 1674 and the hot work procedures applicable to the building.

NOTE: On-site welding should be avoided wherever possible and particularly when sprinkler systems are inoperative.

NOTES:

- 1 During periods when the system is inoperative it is recommended that all fire extinguishing appliances be held in special readiness for immediate use, and that a watchperson be on duty throughout non-working hours. Where a water supply from a particular source is curtailed for any protracted period, e.g. as in time of drought, special attention should be given to the routine service of any other water supplies.
- 2 In the case of multiple installations, each individual installation should be returned to service before work commences on subsequent installations.

1.15 DEFECT RECTIFICATION

On completion of defect rectification, the system or component shall be tested for correct function.

NOTE: It may be necessary for the responsible entity to implement interim prevention/protection measures pending the rectification of any defects.

1.16 ROUTINE SERVICE RECORDS

1.16.1 General

Records necessary to comply with this Standard comprise logbooks or, in the case of tags and labels, hardcopy summary records in accordance with Table 1.16.1.

TABLE 1.16.1
ROUTINE SERVICE RECORDS

Section No.	Systems or equipment	Service records			
		Logbooks	Tags	Labels	Summary records
2	Automatic fire sprinkler systems	✓	—	—	—
3	Fire pumpsets	✓	—	—	—
4	Fire hydrant systems	✓	—	—	—
4	Fire hydrant valves	—	✓	✓	✓
5	Water storage tanks for fire protection systems	✓	—	—	—
6	Fire detection and alarm systems	✓	—	—	—
7	Special hazard systems	✓	—	—	—
8	Delivery lay flat fire hose	—	✓	✓	✓
9	Fire hose reels	—	✓	✓	✓
10	Portable and wheeled fire extinguishers	—	✓	✓	✓
11	Fire blankets	—	✓	✓	✓
12	Passive fire and smoke systems	✓	—	✓	✓
13	Smoke and heat control features of mechanical services	✓	—	—	—
14	Emergency planning in facilities	✓	—	—	—

1.16.2 Logbooks, tags, labels and summary records

Service records, including the pass/fail criteria, shall be captured at the time of routine service. These records may be captured in the form of—

- (a) hardcopy logbook;
- (b) electronic log; or
- (c) tags and labels with hardcopy summary records (see Table 1.16.2).

For all methods of recording, a hardcopy of the service record [paper-based logbooks or printed and signed paper-based copy of the electronic log (see Clause 1.16.3)] shall be left on site at the completion of the test. Where tags or labels are permitted, a printed and signed paper-based copy of the summary record (see Clause 1.16.5) may be provided to the responsible entity within one week from the date of service.

NOTE: Clause 1.16.6 requires the responsible entity to retain hard copy service records on site.

Where tags or labels are used, the recording of the completed activity shall be as specified in Clause 1.16.4.1. A service tag or label shall be provided to record the last level of service performed in accordance with Sections 4, 8, 9, 10, 11 and 12. The tag or label shall be permanently marked with a number to correspond with the frequencies as set out in Table 1.16.2.

The record of each non-conformance or defect when using the tag or label system shall be captured in the summary record.

TABLE 1.16.2
SERVICE TAGS OR LABELS—FREQUENCY OF APPLICATION

Section	Equipment	Frequency					
		Three-monthly	Six-monthly	Yearly	Three-yearly	Five-yearly	After use
4	Fire hydrant valves	—	✓	✓	—	✓	—
8	Delivery lay flat fire hose	—	—	✓	—	—	✓
9	Hose reels	—	✓	✓	—	—	—
10	Portable and wheeled fire extinguishers	—	✓	✓	✓ (Note 1)	✓	✓
11	Fire blankets	—	✓	—	—	—	(Note 2)
12	Passive fire and smoke systems	✓	✓	✓	—	—	—

NOTES:

- 1 For adverse operating environments, refer to Clause 10.2.3.
- 2 Discard blanket after any use.

1.16.3 Logbooks

Service records in the form of logbooks (hardcopy or electronic) shall contain the following information:

- (a) Name and address of building or site.
- (b) Date and frequency of service performed.
- (c) System or equipment identification and location.
- (d) Each activity performed, including recorded results if required, and 'pass' or 'fail' as appropriate.
- (e) Details of each non-conformance or defect including its classification, location and any rectification completed.
- (f) Name of responsible entity (owner/occupier).
- (g) Name and signature of the service person and date.
- (h) Name of the service provider or company.

1.16.4 Tags and labels

1.16.4.1 General

Service records in the form of tags or labels shall contain the following information:

- (a) A title 'AS 1851 Service record'.
- (b) Recording of the following—
 - (i) The service performed on fire hydrant valves, lay flat hose, hose reels, fire extinguishers, fire blankets, which shall be etched, embossed, stamped or indelibly marked on the tag or label in the space corresponding to the year and month in which the service was performed, with a figure representing the activity, as follows:
 - = three-monthly (identifiable by a dot on a label or a hole in a tag.)
 - 1 = six-monthly
 - 2 = yearly
 - 3 = three-yearly, where applicable [see Item 2.3(b) of Table 10.4.2]
 - 4 = five-yearly
 - 5 = recharged after use, where applicable [see Item 2.3(b) of Table 10.4.2]
 - (ii) The service performed on passive fire and smoke systems, which shall be indelibly marked on the label in the space corresponding to the year and month in which the service was performed, with a figure representing the activity as detailed in Section 12.
- (c) Date (month/year).

A service tag or label, as shown in Figure 1.16.4.1, shall be attached to the item serviced. The figures shall be not less than 3 mm high, and the markings shall be such that the figures are legible.

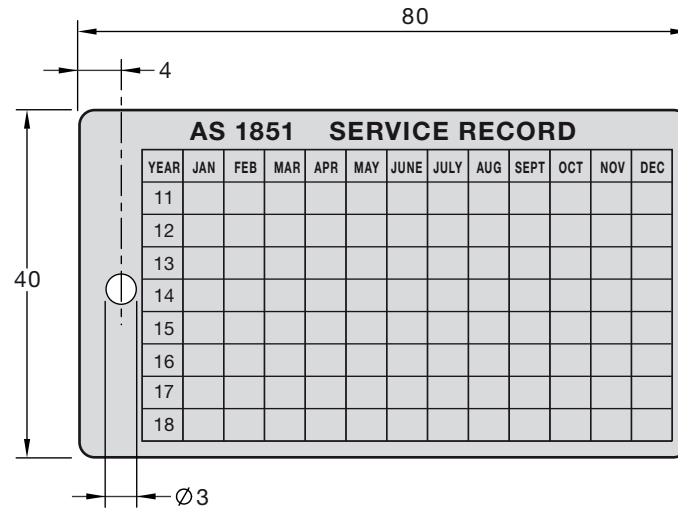
Where a service tag is used, it shall be attached so that the force necessary to detach the tag is not less than 200 N.

1.16.4.2 Requirements

Service tags and labels shall—

- (a) be made from a durable material (adhesive backed in the case of labels);
- (b) have lettering, figures, and lines on the tag printed in black;
- (c) have a continuous background colour of approximately Golden Yellow (Y15 of AS 2700);
- (d) have the dimensions and show only the information detailed in Figure 1.16.4.1 and the recorded information specified in this Clause; and
- (e) have the previous full year service record transferred from the expired tag or label to the new tag when a new tag or label is provided.

The label shall be applied adjacent to the completed label so that the previous service history is not obscured when a new label is provided.



DIMENSIONS IN MILLIMETRES

FIGURE 1.16.4.1 SERVICE TAG OR LABEL (TYPICAL)

1.16.5 Summary record

Where tags or labels are used, a supporting hardcopy summary record shall be completed and shall include a register of the equipment on the premises, a statement of the service performed and details of missing or defective items as follows:

- (a) Name and address of building or site.
- (b) Date of service.
- (c) Details of equipment on site as listed in the Equipment Register.
- (d) Scheduled date of service (see Clause 1.11).
- (e) Quantity and type of equipment serviced and frequency of service performed.
- (f) Quantity and location of equipment not serviced.
- (g) Details of each non-conformance or defect including its classification, location and any rectification completed.
- (h) Name of responsible entity.
- (i) Name and signature of the service person and date.
- (j) Name of the service provider or company
- (k) For fire extinguishers, the date of manufacture or the date of the last pressure test.
- (l) For fire hose reels, details of the flow test results for the most hydraulically disadvantaged hose reel.
- (m) Any other applicable comments (e.g. additional activities as a result of adverse operating environments).

1.16.6 Records retention

The responsible entity shall retain the service records [logbook(s) and summary record(s)] on site, which shall be available at all times. Service records shall be retained for a minimum period of seven years.

1.17 REPORTS

1.17.1 Defects, non-conformances and out of tolerance activities

The responsible entity shall be notified of critical defects before leaving site, or where this cannot be achieved, as soon as possible. Critical defects shall be confirmed in writing within 24 h of the defect identification and reconfirmed each time the defect is identified.

The responsible entity shall be notified of non-critical defects, non-conformances and out of tolerance activities within one week.

NOTES:

- 1 The full report should be submitted as soon as practicable, thereafter.
- 2 A recommendation should be sent to the responsible entity that critical defects be rectified with the minimum of delay, non-critical defects and non-conformances be rectified as soon as practicable prior to the next yearly condition report.

1.17.2 Yearly condition reports

Evidence of compliance with this Standard shall take the form of one or more condition reports. Condition report(s) shall provide a summary of the service records for the year's activities and shall be issued yearly to the responsible entity.

The condition report shall contain details of outstanding defects and non-conformances. If the outstanding defects result in the fire system or equipment being no longer operational, such non-operational status shall be noted on the report. The yearly condition report shall contain the following:

- (a) Name and address of building or site.
- (b) Period covered by this report.
- (c) System or equipment identification and location.
- (d) Applicable approved design Standard.
- (e) Defects outstanding.
- (f) Non-conformances outstanding.
- (g) Summary of the relevant records of service.
- (h) Statement of condition.
- (i) Name and address of responsible entity.
- (j) Name and signature of service provider representative and date.
- (k) Name of the service provider or company.

NOTES:

- 1 It is recognized that different parties may undertake portions of the routine service.
- 2 An example of a condition report is given in Appendix E.

The condition report shall contain acknowledgment of missed service activities or outstanding defects and non-conformances. If the outstanding defects report results in the fire system or equipment being no longer operational, such non-operational status shall be noted on the report.

CI.17.2 *It is intended that the yearly condition report be used as supporting evidence for State or Territory regulatory compliance of fire protection systems and equipment.*

SECTION 2 AUTOMATIC FIRE SPRINKLER SYSTEMS

2.1 GENERAL

This Section sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of automatic fire sprinkler systems.

NOTE: Home sprinkler systems are covered in AS 2118.5.

The following systems are covered in this Section:

- (a) Wet pipe systems.
- (b) Dry pipe systems.
- (c) Deluge and water spray systems.
- (d) Pre-action systems.

Routine service of combined sprinklers and hydrant systems shall be carried out in accordance with the requirements of this Section for automatic fire sprinkler systems and Section 4 for fire hydrant systems.

NOTES:

- 1 For drencher systems (wall wetting) refer to Clause 2.4.1.
- 2 For pumpsets refer to Section 3.
- 3 For water storage tanks refer to Section 5.

This Section shall be read in conjunction with Section 1.

2.2 ROUTINE SERVICE PROCESS AND PROCEDURES

2.2.1 Routine service

Sprinkler systems shall be subjected to routine service in accordance with this Section.

2.2.2 Survey

Sprinkler systems shall be surveyed in accordance with the survey requirements specified in Clauses 2.4.1 to 2.4.4.

C2.2.2 A survey is typically conducted visually from floor level to identify changes to the sprinkler system or the building and its environment, which could impair the performance of the sprinkler system.

2.2.3 Baseline data

Baseline data shall be in accordance with Clause 1.8.

2.2.4 Service records

Service records of activities and results detailed in Clause 2.4.1 shall be kept in accordance with Clause 1.16.

2.2.5 Reports

Critical defects, non-critical defects, non-conformances and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

2.3 FREQUENCY

The frequency of routine servicing of sprinkler systems, as set out in Clause 2.1, shall be in accordance with Clause 2.4 and the following:

- (a) Monthly.
- (b) Six-monthly.
- (c) Yearly.
- (d) Five-yearly.
- (e) Ten-yearly.
- (f) Twenty-five yearly.
- (g) Thirty yearly.

2.4 ROUTINE SERVICE SCHEDULES

2.4.1 Sprinkler system service schedule requirements

2.4.1.1 *Wet pipe systems*

Routine service of wet pipe systems, drencher systems (wall wetting) and combined sprinklers and hydrants shall be carried out in accordance with Clause 2.4.2 (only for the components that are installed). Routine service of sprinkler systems pumpsets and water storage tanks shall be carried out in accordance with Sections 3 and 5 respectively.

2.4.1.2 *Dry pipe systems*

Routine service of dry pipe systems shall be carried out in accordance with Clause 2.4.3. Pumpsets shall be serviced in accordance with Section 3 and tanks with Section 5. All the water supply components upstream of the dry pipe valve shall be serviced in accordance with Clause 2.4.1.1.

2.4.1.3 *Deluge and water spray systems*

Routine service of deluge and water spray systems shall be carried out in accordance with Clause 2.4.4. All the water supply components upstream of the dry pipe valve shall be serviced in accordance with Clause 2.4.1.1. Routine service of deluge and water spray system pumpsets shall be in accordance with Section 3 and deluge and water spray system tanks with Section 5.

2.4.1.4 *Pre-action systems*

Routine service of pre-action systems shall be carried out in accordance with Clause 2.4.5. All the water supply components upstream of the dry pipe valve shall be serviced in accordance with Clause 2.4.1.1. Pre-action system pumpsets shall be serviced in accordance with Section 3 and pre-action tanks with Section 5.

2.4.2 Wet pipe system service schedules

2.4.2.1 *Monthly service schedule*

Routine service of wet pipe systems on a monthly basis shall be carried out in accordance with Table 2.4.2.1.

TABLE 2.4.2.1
MONTHLY ROUTINE SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
WET PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Control valve assembly	CHECK that control valve assembly area is unobstructed and free of any condition that may adversely affect the operation or access.			
1.2	Sprinkler spares, sprinklers and sprinkler spanner	CHECK that there are spare sprinklers of appropriate quantity and type including a matching sprinkler spanner for each type of sprinkler fitted, available.			
1.3	Signage	CHECK for damage, legibility and appropriate location of required signage.			
1.4	Fire brigade booster connection	CHECK that the booster connection or enclosure is unobstructed and for any condition that may adversely affect the operation or access. CHECK that the booster connection coupling type is as per the local fire brigade requirements.			
1.5	Main stop valves and alarm cocks	INSPECT each main stop valve and alarm cock for each control assembly is secured in the open position and the main stop valve is correctly labelled. NOTES: 'Text deleted'			
1.6	Pump starting devices isolating valve	CHECK that each isolating valve to each automatic pump start device is locked in the open position.			
1.7	Pressure switches	CHECK each pressure switch and ensure that the cover is in place, correctly labelled, securely mounted and free from any condition likely to adversely affect its function.			
1.8	Alarm signalling equipment (ASE) (stand-alone)	CHECK the alarm signalling equipment to ensure that it is securely mounted, free from any condition likely to adversely affect its function and is not indicating alarm, fault, loss of connection, or isolated.			
1.9	Sprinkler system interface to other systems	CHECK the sprinkler system alarm interface with other systems is not isolated, inhibited or disabled.			

(continued)

TABLE 2.4.2.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.10	Water supply stop valves	(a) OPERATE (two full turns) all water supply stop valves (including backflow prevention stop valves but excluding underground key-operated valves) and verify they are fully open, secure in the open position (relaxed ¼ turn if appropriate) and are correctly labelled. NOTES: 1 Where more than 12 water supply stop valves are distributed throughout a high-rise building, forming part of a combined sprinkler/hydrant system, the actions under actions (a) and (b) may be conducted on a rotating basis. 2 The period between testing of all water supply stop valves should not exceed 3 months.			
		(b) VERIFY that the valve position indicators are securely mounted and indicate correctly.			
		(c) ‘Text deleted’			
1.11	System pressure gauge readings before alarm function test	(a) RECORD reading from each pressure gauge.	.....kPa		
		(b) VERIFY pressure gauge readings are within the ranges required.			
1.12	Control assembly, alarm gong, alarm-initiating device, fire brigade alarm test and DSEP/DBEP strobes (Alarm function test)	(a) OPERATE each alarm valve by opening each 15 mm test valve or 10 mm for residential sprinkler systems serving buildings up to 4 storeys in height. Where more than 12 control assemblies are distributed throughout a high-rise building forming part of a combined sprinkler/hydrant system, and initiate the fire brigade alarm, testing may be conducted on a rotating basis. The period between testing of all control assemblies shall not exceed 3 months.			
		(b) RECORD time(s) to operation of alarm gong(s) and verify that time does not exceed 180 s for general systems or 90 s for residential sprinkler systems.	.....s		
		(c) RESET the alarm test valve on completion of each test.			
		(d) Where multiple control valve assemblies are separately identified at an FIP, only one transmission from the FIP to the monitoring station is required.			
1.13	Alarm signal	VERIFY the correct operation of each alarm signal. Where the system is monitored ensure the alarm has activated the alarm signalling equipment.			
1.14	DSEP/DBEP strobe indicator	INSPECT for the correct operation of each DSEP/DBEP strobe indicator, where fitted.			

(continued)

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TABLE 2.4.2.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
A1 | 1.15	System pressure gauge readings after alarm valve test	(a) RECORD reading from each pressure gauge.	Inst .....kPa Below SV...kPa WS1 .....kPa WS2.....kPa		
		(b) VERIFY pressure gauge readings are within the ranges required.			
1.16	Pump starting devices function test— Compression ignition drivers (diesel) and electric motor drivers	(a) TEST each automatic pump starting device and pump operation by reducing the applied water pressure to the starting device and run pump, in accordance with Section 3. Where more than one starting device is installed, including the manual starting device, the test may be carried out on a rotating basis. The period between the exercising of each starting device is not to exceed 3 months. Where this would require the pump to start more than 5 times in succession, the period may be extended to 6 months.			
		(b) RECORD the pump cut-in pressures and verify that they are within the ranges required.			
1.17	Manual pump start device, function test	TEST each manual pump starting device and pump operation in accordance with Section 3.			
1.18	Water supply tanks— Atmospheric or pressure	Perform routine service in accordance with Section 5.			
1.19	Foam water sprinkler systems—foam concentrate	CHECK that the concentrate level is correct and level indicator reads correctly.			

2.4.2.2 Six-monthly service schedule

Routine service of wet pipe systems on a six-monthly basis shall be carried out in accordance with Table 2.4.2.2.

TABLE 2.4.2.2
SIX-MONTHLY ROUTINE SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
WET PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service	COMPLETE all monthly service activities, as listed in Table 2.4.2.1.			
2.2	Floor/zone indication test (where fitted)	(a) OPERATE each flow switch test arrangement (automatic or manual).			
		(b) VERIFY correct flow switch indication at the CIE.			
2.3	Underground key-operated and subsidiary valves	(a) Except where owned by the water supply authority, OPERATE (two full turns) all underground key-operated valves and verify they are fully open, secure in the open position (relaxed ¼ turn if appropriate) and are correctly labelled. NOTE: Where underground key-operated valves are owned by the water supply authority, the owner should arrange for the water supply authority to test the valve(s) to confirm the valve(s) is operational and in the correct position.			
		(b) OPERATE all subsidiary stop valves (floor isolation valves, tail-end valves). Ensure that they are fully open and, where applicable, secured in the open position and are correctly labelled. NOTE: 'Text deleted'.	Number checked		
2.4	Valve-monitoring device test	Test each valve monitor by operating the valve and VERIFY the correct indication at the CIE.	Number checked		
2.5	Pressure gauge readings before main drain test	RECORD reading from each pressure gauge. VERIFY pressure gauge readings are within the ranges required.	Inst .....kPa Below SV ..kPa WS1 .....kPa WS2 .....kPa		

(continued)

TABLE 2.4.2.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.6	Main drain valve water supply test—Town main supply only	(a) OPEN the sprinkler control assembly main drain valve without pump(s) running. In the case of grouped valve sets, open one only.			
		(b) VERIFY that residual water supply pressure, with drain valve open, is within 10% of the original value recorded.	Stabilize flow water supply pressure .....kPa		
		(c) CLOSE main drain valve and record time for pressure recovery.	Time for pressure recovery .....s		
		(d) VERIFY that the time for pressure recovery aligns with previously recorded value. NOTE: Where the building exceeds four storeys in height, care should be taken to ensure that the static head of the installation does not excessively elevate the residual pressure reading.			
2.7	Water supply (river, lake, etc.) strainers/screens	CHECK suction inlet strainer(s) or screen(s) for any condition likely to affect its function. Where blocked, CLEAN the suction inlet strainers or screens.			

2.4.2.3 *Yearly service schedule*

Routine service of wet pipe systems on a yearly basis shall be carried out in accordance with Table 2.4.2.3.

TABLE 2.4.2.3
YEARLY ROUTINE SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
WET PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, as listed in Tables 2.4.2.1 and 2.4.2.2.			
3.2	Pressure-reducing valve test	(a) OPERATE all pressure-reducing valves and verify correct operation under flow conditions.			
		(b) VERIFY that pressure readings on the low pressure side of the valves are within the range stated at the pressure-reducing valve station.	High pressure gauge .....kPa Low pressure gauge .....kPa		

(continued)

TABLE 2.4.2.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
A1 A1	3.3 Pressure-relief valve test	<p>OPERATE pressure-relief valve and note operating pressure is within the range stated on the nameplate provided at the reducing valve station.</p> <p>NOTES:</p> <p>1 This test of the pressure-relief valve may be carried out using a portable test apparatus.</p> <p>2 Inappropriate settings for pressure-relief valves can result in very large quantities of water flowing to waste. Ensure settings are maintained to have pressures as identified and not higher than allowed by system component rated working pressures.</p>	Operating pressure kPa		
	3.4 Water supply tanks— Atmospheric or pressure	Perform routine service in accordance with Section 5.			
	3.5 Water supply proving test	(a) CONDUCT a water supply test, subject to limitations imposed by the water agency controlling the supply source. The test may be a combination of physical testing and calculation as necessary.	Static supply pressure kPa		
		(i) Discharge water through the flow-measuring device at the flow corresponding to the hydraulically most favourable duty flow. Record the flowing pressure.	Flow L/min @ pressure kPa		
		(ii) Reduce the water flow through the flow measuring device to that corresponding to the most unfavourable duty point. Record the flowing pressure.	Flow L/min @ pressure kPa		
		(iii) Shut off water flow to flow-measuring device. Record static pressure.	Static supply pressure kPa		
		(b) VERIFY that the system flow and pressure requirements are satisfied.			
		(c) COMPLETE a water supply test report in accordance with AS 2118.1. NOTE: This test should be conducted by substituting the installation and below stop valve pressure gauges with calibrated gauges of known accuracy. Where pumpsets are fitted, the water supply flow test should be performed combined with the pumpset load test requirements in Section 3.			
A1	3.6 Alarm valve— Remote test valve	(a) OPERATE the alarm valve by opening each remote test valve.			
		(b) RECORD time(s) to operation of alarm gong(s) and verify that time does not exceed 360 s for AS 2118.1 and 180 s for AS 2118.4 systems.	..... s		
		(c) CLOSE remote test valve(s) and verify that alarm valve has reseated.			

(continued)

TABLE 2.4.2.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.7	Anti-freeze solution test (where applicable)	(a) DRAW a sample of anti-freeze solution.			
		(b) VERIFY correct specific gravity and top up to correct solution level.			
3.8	Sprinkler system interface control test (fire trips)	(a) CONDUCT a functional system test via the pressure switch or flow switch with each interfaced system.			
		(b) VERIFY that the interface functions as required.			
3.9	Water motor alarm gong	CLEAN the strainer and lubricate the external gong mechanism.			
3.10	Water motor direct brigade alarm	CLEAN the strainer.			
3.11	Alarm signalling equipment (ASE) (Standalone)	Where an ASE is standalone and is connected to a power supply unit and batteries: (a) CHECK the batteries for any condition likely to adversely affects its function <i>and</i> (b) Where the battery has not been replaced in the previous two years, VERIFY the battery condition by carrying out a battery discharge test in accordance with Appendix F.	Date last replaced <i>or</i> Test load current A Final test voltage V		
3.12	Tank quick fill (reduced capacity or break tank)	CONDUCT a water supply test through a flow-measuring device or other appropriate methods that the flow corresponds to the required quick fill-rate.	Flow L/min @ pressure kPa		
3.13	Spray booths and ducts	INSPECT accumulated spray residue on sprinklers and reapply protective medium (petroleum jelly/paper bags). NOTE: The required frequency of inspection depends upon the amount of spraying being done and could be accomplished at the same time as the cleaning of booth.			
3.14	Kitchen hoods and ducts	INSPECT all sprinklers inside kitchen hoods and ducts and CLEAN if necessary to remove accumulated grease and any other foreign matter and verify that the sprinkler head is appropriate for this application.			
3.15	Foam water sprinkler systems—Foam concentrate	DRAW a sample and verify condition in accordance with NFPA 11 (pH, specific gravity, sediment, expansion ratio, 25% drain time).			
3.16	Foam concentrate strainer (where fitted)	CHECK and clean foam concentrate strainer (fitted upstream of proportioning device).			

(continued)

TABLE 2.4.2.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.17	Survey—Pipes and hangers	CHECK that exposed water distribution system, including pipework, pipe supports and valves, appear free from corrosion and damage, not subject to external loads and pipework is properly supported.			
3.18	Survey—Sprinkler condition	CHECK sprinklers for any condition, including physical damage, contamination, and paint on operating elements or cover plates, likely to adversely affect their function. NOTE: Sprinkler frames may be painted as part of the manufacturing process; however, the heat response elements should not be painted as this will delay or prevent operation and paint accumulated at the seat of the sprinkler may affect operation. Minor spatter on the fusible elements may be acceptable but operation should be checked if doubt exists.			
3.19	Survey—Escutcheons, cover plates or guards	CHECK for poorly fitting or missing escutcheons or cover plates, damaged guards, and attachment of foreign material.			
3.20	Survey—Sprinkler obstructions	CHECK for obstructions likely to impede sprinkler discharge and for adequate clear space below sprinklers.			
3.21	Survey—Unprotected areas	(a) CHECK for presence of unprotected areas such as mezzanines, platforms and building extensions.			
		(b) CHECK for sprinkler spacing and location relative to wall, bulkhead and partition alterations and the introduction of fixtures and fittings shielding sprinkler discharge.			
		(c) CHECK for the need to install sprinkler guards.			
3.22	Survey—Sprinkler compatibility	CHECK that sprinklers within a compartment are of similar operating characteristics (e.g. area coverage, RTI and temperature rating).			
3.23	Survey—Sprinkler ambient conditions	CHECK for localized changes in ambient temperatures, which may require different sprinkler temperature ratings (e.g. exposure to freezing or high temperature conditions).			
3.24	Survey—External sprinklers	CHECK for new building structures, yard storage or the like, exposing unprotected openings, non-fire resistant walls that may require the provision for external sprinklers.			
3.25	Survey—Occupancy	CHECK that sprinkler design remains applicable for the occupancy hazard classification and the category of storage involved.			

(continued)

TABLE 2.4.2.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.26	Survey—Storage heights, encapsulation	(a) CHECK that sprinkler design remains applicable for storage heights. If height limits are exceeded, check for in-rack (intermediate) sprinklers.			
		(b) CHECK for shrink wrapping (encapsulation) where not employed previously.			
3.27	Survey—Site documentation (where required)	(a) CHECK that block plans and emergency instructions contain the required details.			
		(b) CHECK that up-to-date sprinkler plans are available on site.			

2.4.2.4 Five-yearly, ten-yearly, twenty-five yearly and thirty-yearly service schedule

Routine service of wet pipe systems on a five-yearly, ten-yearly, twenty-five year and thirty year basis shall be carried out in accordance with Table 2.4.2.4.

TABLE 2.4.2.4
FIVE-YEARLY, TEN-YEARLY, TWENTY-FIVE-YEARLY AND THIRTY-YEARLY
ROUTINE SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
WET PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
FIVE-YEARLY					
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six-monthly and yearly service activities, as listed in Tables 2.4.2.1, 2.4.2.2 and 2.4.2.3.			
4.2	Alarm valve (wet)	FIT new alarm valve seating or port seating (perishable items), check and clean annular groove and outlet ports, polish and lubricate seating spindle/shaft, and check operation of compensator valve if fitted. Fit a new alarm valve faceplate gasket.			
4.3	Main drain and test valve	(a) For screw-down style valves, EXAMINE seating and fit new washers.			
		(b) For packed gland variants, FIT new gland packing.			
		(c) For ball valves, CHECK for leakage and replace if leaking.			
4.4	Alarm cock plug type	REMOVE alarm cock barrels, clean, lap in, grease and reinstall. For packed gland variants, fit new gland packing.			
4.5	Jacking pump (where fitted)	INSPECT hand pump seatings and FIT new pump washers and path cock washers. FIT new gland packing. For electric jacking pumps, maintain as per manufacturer's instructions.			

(continued)

TABLE 2.4.2.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.6	Retard chambers (where fitted)	CLEAN orifice, check seals and overhaul, where indicated, by a functional test.			
4.7	Stop valves	(a) FIT new gland packing and lubricate spindle.			
		(b) For ball and butterfly valves, CHECK for leakage and replace if necessary.			
4.8	Water supply non-return valves	RENEW water supply non-return valve seatings and gaskets.			
4.9	Water motor alarm gong	CLEAN strainer on inlet line, clear water jet, flush drain, renew gasket, check operation of main spindle and striker, remove excess grease and then lubricate.			
4.10	Water motor direct brigade alarm (where fitted)	CLEAN out well of direct brigade alarm, clear water jet, renew gasket, flush drain pipe, remove gear train, check operation of main spindle, remove excess grease and then lubricate.			
4.11	Gauges	CHECK all pressure gauges against a master gauge of known accuracy. Verify that the reading of the gauge under test is within ± 30 kPa of the reading of the master gauge at the nominal pressure.			
4.12	Special valves (other than alarm valves)	OVERHAUL all pressure-reducing valves, pressure-relief valves, tail-end system valves, and any other special valves that are installed in accordance with suppliers' specifications.			
4.13	Anti-freeze systems	DRAIN tail-end anti-freeze systems, including individual sprinkler heads on droppers and refill with new solution.			
4.14	Water supply tanks—Atmospheric	Perform routine service in accordance with Section 5.			
4.15	Air compressor (where fitted)	SERVICE the air compressor assembly in accordance with the manufacturer's instructions. [Periodic hydrostatic testing of air receivers is not required (see AS/NZS 3788)].			
4.16	Foam quality	GENERATE foam through test foam maker or by other means. Check proportioning ratio (refractometer or conductivity test) and drainage rate. Top up foam concentrate tank.			
4.17	Water supply tanks—Pressure	Perform routine service in accordance with Section 5.			

(continued)

TABLE 2.4.2.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
TEN-YEARLY, TWENTY-FIVE YEAR AND THIRTY-YEAR					
A1	4.18 Sprinklers	Subject the sample sprinklers to the following tests conducted by a registered testing authority:			
		(a) Release temperature.			
		(b) Functional test.			
		(c) Leak resistance test—Maximum system design pressure test. REMOVE and TEST a representative sample of sprinklers at the following intervals: (i) Dry pendent sprinklers (representative sample), every 10 years. (ii) All other sprinklers (not less than 14 samples), at 25 years, then every 10 years. NOTE: For all the above sprinklers, using ISO 6182-6, ISO 6182-7 and ISO 6182-12 component Standards, sample sprinklers should be selected from the range of site environmental conditions to which the system(s) is subjected (i.e. office, factory, boiler house environments, etc.). Should one or more sprinklers fail any of the above tests, further sampling and testing should be conducted until the results can be considered truly representative. The extent of sprinkler replacement, if any, will be dependent on the results of testing.			
	4.19 Multiple jet controller (MJC)	At 30 years and every 10 years thereafter:			
		(a) Single MJC installed for alarm purposes only or to control a group of distributors, CHECK in situ for evidence of paint loading, corrosion, etc. Replace if necessary. (b) Multiple MJC installed for alarm purposes only or to control groups of distributors, REPLACE a representative sample. Subject the sample to the following tests conducted by a registered testing laboratory: (i) Leak resistance test. (ii) Maximum system design pressure test (nominally 1200 kPa or 2000 kPa). (iii) Functional test. Use ISO 6182-1. NOTE: Should the sample MJC fail any of the above tests, further sampling and testing should be conducted until the results can be considered truly representative.			

2.4.3 Dry pipe system service schedules

2.4.3.1 Monthly service schedule

Routine service of dry pipe systems on a monthly basis shall be carried out in accordance with Table 2.4.3.1.

TABLE 2.4.3.1
MONTHLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DRY PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Monthly service	COMPLETE all monthly wet pipe service activities listed in Table 2.4.2.1 that are applicable to a dry pipe system.			
1.2	System air pressure	CHECK system air pressure is reading within the range required.	.....kPa		
1.3	System air desiccator or dryer	CHECK desiccant condition and replace if necessary.			
1.4	Air compressor oil level	CHECK oil level and visually assess condition of oil.			
1.5	Air compressor	VERIFY that air compressor operates at specified cut-in and cut-out pressures.	Cut-in .....kPa Cut-out .....kPa		
1.6	Low air pressure alarms(s)	VERIFY:			
		(a) Low air pressure alarm operates at predetermined levels.	.....kPa.....kPa		
		(b) Low air pressure alarm(s) visual indicator and sounders are operational.			
1.7	Local alarm and fire brigade test simulation (in lieu of Item 1.12, Table 2.4.1.1)	SIMULATE operation of dry pipe alarm valve and OPERATE local and fire brigade alarms through the bypass valve(s). Where the system is monitored, ensure the alarm has activated the alarm signalling equipment. (Refer to manufacturer's operating manual.) NOTE: Where multiple control valve assemblies are separately identified at an FIP, only one transmission from the FIP to the monitoring station is required.			
1.8	Air receiver condensate	DRAIN condensate from condensate trap.			

2.4.3.2 Six-monthly service schedule

Routine service of dry pipe systems on a six-monthly basis shall be carried out in accordance with Table 2.4.3.2.

TABLE 2.4.3.2
SIX-MONTHLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DRY PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly and six-monthly service	COMPLETE all monthly service activities listed in Table 2.4.3.1 and all six-monthly wet pipe service activities listed in Table 2.4.2.2 that are applicable to a dry pipe system.			
2.2	Alarm valve and auxiliaries, local alarm and fire brigade alarm test (in lieu of Item 1.12 in Table 2.4.2.1)	(a) Where fitted, CLOSE isolation valve located above alarm valve (to prevent entry of water into system piping).			
		(b) OPERATE each alarm valve by releasing air from system.			
		(c) CHECK for correct operation of alarms and accelerator or exhauster.			
		(d) RECORD time(s) to operation of alarms gong(s) and verify that these do not exceed 180 s. s			
		(e) VERIFY correct operation of the fire brigade alarms from each control assembly or group of control assemblies. Where the system is monitored, ensure the alarm has activated the alarm signalling equipment. NOTE: Where multiple control valve assemblies are separately identified at an FIP, only one transmission from the FIP to the monitoring station is required.			
	(f) Where an isolation valve has not been fitted above the alarm valve, the main stop valve should be mostly closed, enabling a partial test of the alarm valve. NOTE: Consider full testing at the first opportunity (at which time the isolation test valve should be installed).				
2.3	Installation pressure	RESTORE system air pressure and verify the alarm has resealed.			
2.4	FIP/ASE	RESTORE FIP/ASE to operational status.			
2.5	Pressure gauge readings	(a) RECORD reading from each pressure gauge. (b) VERIFY pressure gauge readings are within the ranges required.	Inst.....kPa Below SV.....kPa WS1.....kPa WS2.....kPa		
2.6	Control assemblies resetting	RESET and SECURE all valve and alarms cocks in the open position or the closed position, as labelled.			

2.4.3.3 Yearly service schedule

Routine service of dry pipe systems on a five-yearly basis shall be carried out in accordance with Table 2.4.3.3.

TABLE 2.4.3.3
YEARLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DRY PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities listed in Tables 2.4.3.1 and 2.4.3.2 and all yearly wet pipe service activities listed in Table 2.4.2.3 that are applicable to a dry pipe system.			
3.2	System air desiccators or dryer	REPLACE the desiccators.			
3.3	Survey—Pipes and hangers	CHECK that the water distribution pipe work is correctly pitched to drain.			

2.4.3.4 Five-yearly service schedule

Routine service of dry pipe systems on a five-yearly basis shall be carried out in accordance with Table 2.4.3.4.

TABLE 2.4.3.4
FIVE-YEARLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DRY PIPE SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six-monthly and yearly service activities, listed in Tables 2.4.3.1, 2.4.3.2 and 2.4.3.3.			
4.2	Wet pipe systems five yearly service	COMPLETE all five-yearly wet pipe service activities listed in Table 2.4.2.4 that are applicable to a dry pipe system.			
4.3	Valve overhaul	FIT new dry pipe valve seats and seals. FIT new faceplate gasket (perishable items).			
4.4	Accelerator/exhauster	FIT new seals as appropriate. CHECK and CLEAN operating mechanism. FIT a new faceplate.			

2.4.4 Deluge and water spray system service schedules

2.4.4.1 Monthly service schedule

Routine service of deluge and water spray systems on a monthly and six-monthly basis shall be carried out in accordance with Table 2.4.4.1.

**TABLE 2.4.4.1
MONTHLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DELUGE AND WATER SPRAY SYSTEMS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Monthly service activities	COMPLETE all monthly wet pipe service activities listed in Table 2.4.2.1 that are applicable to a deluge and water spray system.			
1.2	Pressure gauge readings	CHECK that all pressure gauge readings are within the ranges required and RECORD reading from each pressure gauge.	Pilot line.....kPa Diaphragm line.....kPa Below main stop valve.....kPa		
1.3	Air compressor oil level (where fitted)	(a) CHECK oil level is correct and visually assess condition of oil.			
		(b) CHECK regulator is locked and set in the correct position.			
1.4	Electrical detection (where fitted)	INSPECT and TEST in accordance with Section 6.			
1.5	Detector sprinkler line (where fitted)	CHECK detector sprinkler line valves are in the correct operating position.			
1.6	Air compressor (where fitted)	VERIFY that air compressor operates at specified cut-in and cut-out pressures.	Cut in.....kPa Cut out.....kPa		
1.7	Solenoid valve(s)	TEST solenoid valves for correct operations.			
1.8	Low air pressure alarm(s)	VERIFY:			
		(a) Low air pressure alarm operates at predetermined levels.	.....kPa		
		(b) Low pressure alarm(s) visual indicator and sounders are optional.			
1.9	Local alarm and fire brigade test simulation in lieu of Item 1.12 in Table 2.4.2.1	(a) GENERATE a test of the alarm signalling equipment and local alarm in accordance with the manufacturer’s operating manual. NOTE: Where fitted, bypass valve may be used for this test.			
		(b) OBSERVE correct operation of the fire brigade alarm from each deluge and water spray valve or group of deluge and water spray valves. Where the system is monitored, ensure the alarm has activated the alarm signalling equipment. NOTE: Where multiple deluge and water spray valve assemblies are separately identified at the FIP, only one transmission from the FIP to the monitoring station is required.			

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2.4.4.2 Six-monthly service schedule

Routine service of deluge systems on a six-monthly basis shall be carried out in accordance with Table 2.4.4.2.

TABLE 2.4.4.2
SIX-MONTHLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DELUGE AND WATER SPRAY SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service activities	COMPLETE all monthly service activities listed in Table 2.4.4.1 and all six-monthly wet pipe service activities listed in Table 2.4.2.2 that are applicable to a deluge and water spray system.			
2.2	Deluge valve and auxiliaries, local alarm and fire brigade alarm test (in lieu of Item 1.12 and Table 2.4.2.1)	(a) Where fitted, CLOSE isolation valve located above deluge valve (prevents entry of water into system piping).			
		(b) OPERATE each deluge valve by releasing the system via each installed means.			
		(c) CHECK for correct operation of alarm.			
		(d) RECORD times to operation of alarm(s) and verify that these do not exceed 30 s. ....s			
		(e) VERIFY correct operation of the fire brigade alarms from each deluge valve or group of deluge assemblies. Where the system is monitored, ensure the alarm has activated the alarm signalling equipment. NOTE: Where multiple deluge valve assemblies are separately identified at an FIP, only one transmission from the FIP to the monitoring station is required.			
		(f) Where an isolation valve has not been fitted above the alarm valve, the main stop valve should be closed, enabling a partial test of the alarm valve. NOTE: Consider full testing at the first opportunity (at which time the isolation test valve should be installed).			
2.3	Deluge valve resetting	CLOSE main stop valve. CLOSE drain and RESET manual operating valve.			
2.4	Detector sprinkler line pressure (where fitted)	RESET deluge valve and RESTORE detector sprinkler line pressure. OPEN and SECURE main stop valve. OPEN and secure test-isolating valve (where fitted) in an open position.			
2.5	Electrical control unit (and FIP/ASE) (where fitted)	RESTORE units to operational status.			

(continued)

TABLE 2.4.4.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.6	Pressure gauge readings	(a) RECORD readings from each pressure gauge.	Supervisory pressure kPa		
		(b) VERIFY pressure gauge readings are within the ranges required.	Diaphragm line kPa Below stop valve kPa		
2.7	Valve and cocks	SECURE all valves and alarm cocks in the open position or the closed position as labelled.			

2.4.4.3 Yearly service schedule

Routine service of deluge and water spray systems on a yearly basis shall be carried out in accordance with Table 2.4.4.3.

**TABLE 2.4.4.3
YEARLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DELUGE AND WATER SPRAY SYSTEMS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, listed in Tables 2.4.4.1 and 2.4.4.2.			
3.2	Yearly services	COMPLETE all yearly wet pipe service activities listed in Table 2.4.2.3 that are applicable to a deluge and water spray system.			
3.3	Full discharge operation test	Where practicable, CONDUCT full discharge test to check all open sprinklers and nozzles are unobstructed and provide appropriate coverage.			
3.4	Foam concentrate or premix solution (where applicable)	DRAW a sample and verify condition in accordance with NFPA 11 (pH, specific gravity, sediment, expansion ratio, 25% drain time).			
3.5	Foam concentrate strainer (where fitted)	CHECK and clean foam concentrate strainer (fitted upstream of proportioning device).			
3.6	Pilot line strainers	REMOVE and CLEAN strainer.			
3.7	Electrical detection (where fitted)	INSPECT and test in accordance with yearly requirements in Section 6.			
3.8	Installation	To the extent practicable, CHECK that pipe hangers are secure and open sprinklers and spray nozzles are unobstructed. Where applicable, check for missing nozzle dust plugs/caps.			
3.9	System configuration	CHECK that system layout remains appropriate for protected hazard. Check for possible misalignment of spray nozzles.			

2.4.4.4 Five-yearly service schedule

Routine service of deluge and water spray systems on a five-yearly basis shall be carried out in accordance with Table 2.4.4.4.

**TABLE 2.4.4.4
FIVE-YEARLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
DELUGE AND WATER SPRAY SYSTEMS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six-monthly and yearly service activities, listed in Tables 2.4.4.1, 2.4.4.2 and 2.4.4.3.			
4.2	Five-yearly service	COMPLETE all five-yearly wet pipe service activities listed in Table 2.4.2.4 that are applicable to a deluge and water spray system.			
4.3	Deluge valves	FIT new deluge valve seats and seals. Check and clean operating mechanism. Fit new faceplate gasket.			
4.4	Diaphragm valve	FIT a new diaphragm, unless otherwise specified by the manufacturer.			
4.5	Foam quality	GENERATE foam through delivery device (nozzle, monitor) or test foam maker and check:			
		(a) Proportioning ratio (using conductivity meter or refractometer).			
		(b) 25% drainage time.			
		(c) Expansion ratio.			

2.4.5 Pre-action system

2.4.5.1 Monthly service schedule

Routine service of pre-action systems on a monthly basis shall be carried out in accordance with Table 2.4.5.1.

**TABLE 2.4.5.1
MONTHLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
PRE-ACTION SYSTEMS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Monthly service activities	COMPLETE all monthly wet pipe service activities listed in Table 2.4.2.1 that are applicable to a pre-action system.			
1.2	Pressure gauge readings	CHECK that all pressure gauge readings are within the ranges required and RECORD readings from each pressure gauge.	Supervisory pressure.....kPa		
			Diaphragm line.....kPa		
			Below stop.....kPa		
1.3	Air compressor oil level (where fitted)	(a) CHECK oil level is correct and visually assess condition of oil.			
		(b) CHECK regulator is locked and set in the correct position.			
1.4	Electrical detection	INSPECT and TEST in accordance with Section 6.			
1.5	Air compressor (where fitted)	VERIFY that air compressor operates at specified cut-in and cut-out pressures.	Cut-in .....kPa Cut-out .....kPa		
1.6	Nitrogen supply (where fitted)	(a) CHECK cylinder contents per pressure gauge.	Cylinder pressure.....kPa		
		(b) CHECK regulator is locked and set in correct position.			
1.7	Solenoid valve(s)	TEST solenoid valves for correct operations.			
1.8	Low air pressure alarms(s)	(a) Low air pressure alarm operates at predetermined levels.	.....kPa		
		(b) Low air pressure alarm(s) visual indicator and sounders are optional.			
1.9	Local alarm and fire brigade test simulation in lieu of Item 1.12 in Table 2.4.2.1	(a) GENERATE a test of the alarm signalling equipment and local alarm in accordance with the manufacturer's operating manual. NOTE: Where fitted, bypass valve may be used for this test.			
		(b) VERIFY correct operation of the fire brigade alarm from each pre-action valve or group of pre-action valves. Where the system is monitored, ensure the alarm has activated the alarm signalling equipment. NOTE: Where multiple pre-action valve assemblies are separately identified at the FIP, only one transmission from the FIP to the monitoring station is required.			

2.4.5.2 Six-monthly service schedule

Routine service of pre-action systems on a six-monthly basis shall be carried out in accordance with Table 2.4.5.2.

TABLE 2.4.5.2
SIX-MONTHLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
PRE ACTION SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service activities	COMPLETE all monthly service activities listed in Table 2.4.5.1 and all six-monthly wet pipe service activities listed in Table 2.4.2.2 that are applicable to a pre-action system.			
2.2	Pre-action valve and auxiliaries, local alarm and fire brigade alarm test (in lieu of Item 1.12 in Table 2.4.2.1)	(a) Where fitted, CLOSE isolation valve located above pre-action valve (prevents entry of water into system piping).			
		(b) OPERATE each pre-action valve by releasing the system via electrical detection subsystem.			
		(c) CHECK for correct operation of alarm.			
		(d) RECORD time(s) to operation of alarms and verify that these do not exceed 180 s. s			
		(e) OBSERVE correct operation of the fire brigade alarms from each pre-action valve or group of pre-action assemblies. Where the system is monitored, ensure the alarm has activated the alarm signalling equipment. NOTE: Where multiple pre-action valve assemblies are separately identified at an FIP, only one transmission from the FIP to the monitoring station is required.			
	(f) Where an isolation valve has not been fitted above the alarm valve, the main stop valve should be closed, enabling a partial test of the alarm valve. NOTE: Consider full testing at the first opportunity (at which time the isolation test valve should be installed).				
2.3	Installation supervisory air pressure	RESET pre-action valve and restore supervisory air pressure.			
2.4	Electrical control unit (and FIP/ASE)	RESTORE units to operational status.			
2.5	Pressure gauge readings	(a) RECORD readings from each pressure gauge.	Supervisory pressure kPa		
		(b) VERIFY pressure gauge readings are within the ranges required.	Diaphragm line kPa Below stop valve..... kPa		
2.6	Valve and cocks	SECURE all valves and alarm cocks in the open position or the closed position as labelled.			

2.4.5.3 Yearly service schedule

Routine service of pre-action systems on a yearly basis shall be carried out in accordance with Table 2.4.5.3.

TABLE 2.4.5.3
YEARLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
PRE-ACTION SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, listed in Tables 2.4.5.1 and 2.4.5.2.			
3.2	Yearly service activities	COMPLETE all yearly wet pipe service activities listed in Table 2.4.2.3 that are applicable to a pre-action system.			
3.3	Air receiver condensate	DRAIN condensate from:			
		(a) Condensate trap.			
		(b) Air compressor receiver.			
3.4	Survey—Installation	CHECK that sprinkler piping and detection installations are properly secured throughout the protection area.			
3.5	Survey—Design	CHECK that pre-action sprinkler protection covers full extend of special hazard area.			

2.4.5.4 Five yearly service schedule

Routine service of pre-action systems on a five-yearly basis shall be carried out in accordance with Table 2.4.4.4.

TABLE 2.4.5.4
FIVE-YEARLY SERVICE SCHEDULE
AUTOMATIC FIRE SPRINKLER SYSTEMS
PRE-ACTION SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records	
			Task completed	Task completed
			Yes/No	Yes/No
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six-monthly and yearly service activities, listed in Tables 2.4.5.1, 2.4.5.2 and 2.4.5.3.		
4.2	Five yearly service	COMPLETE all five-yearly wet pipe service activities listed in Table 2.4.2.4 that are applicable to a pre-action system.		
4.3	Valve overhaul	FIT new pre-action valve seats and seals. CHECK and CLEAN operating mechanism. FIT new cover plate gasket.		

SECTION 3 FIRE PUMPSETS

3.1 GENERAL

This Section sets out the requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire pumpsets.

Routine service of pumpsets detailed in this Section shall be carried out in addition to the requirements of Section 2 for sprinkler systems and Section 4 for hydrant systems.

This Section shall be read in conjunction with the relevant clauses of Section 1.

3.2 ROUTINE SERVICE PROCESS AND PROCEDURES

3.2.1 Routine service

All pumpsets including sprinkler, hydrant, hose reel, automatic pressure maintenance and jacking pumpsets shall be subjected to routine service in accordance with this Section.

3.2.2 System inoperative precautions

In addition to the requirements of Clause 1.14, where multiple pumps supply fire protection systems, only one pump shall be rendered inoperative at any time.

3.2.3 Isolation of start devices

Prior to commencing any preventive maintenance function, all automatic start devices, both local and remote, shall be checked to ensure they are isolated and tagged or locked out.

3.2.4 Baseline data

Baseline data shall be in accordance with Clause 1.8.

3.2.5 Service records

Records of activities and results detailed in Clause 3.4 shall be kept in accordance with Clause 1.16.

3.2.6 Reports

Critical defects, non-critical defects, non-conformances and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

3.3 FREQUENCY

The frequency of routine servicing of pumpsets shall be in accordance with the following and Clause 3.4:

- (a) Monthly.
- (b) Six-monthly.
- (c) Yearly.
- (d) Five-yearly.

3.4 ROUTINE SERVICE SCHEDULES

3.4.1 Fire pumpsets—Monthly service schedule

Routine service of fire pumpsets on a monthly basis shall be carried out in accordance with Table 3.4.1.

Routine service of hose reels and automatic pressure maintenance pumps shall be carried out in accordance with Table 3.4.5.1.

TABLE 3.4.1
MONTHLY SERVICE SCHEDULE
FIRE PUMPSETS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Pump areas	(a) CHECK that pump areas are unobstructed, not used for storage and lighting is adequate.			
		(b) Where pump pressure-relief valves are fitted, CHECK that discharge will not cause flooding or water damage.			
1.2	Signage and ID plates per AS 2941 (where applicable)	(a) CHECK that each pumpset has a clearly visible warning sign stating 'Danger this Pump Starts Automatically'.			
		(b) CHECK that there are readily seen and clearly legible ID plates on each controller, driver (diesel and electric), pumpset (on base plate) and pump (on the pump).			
		(c) CHECK each pump controller is labelled 'Fire Pump Controller', has clear operating instructions posted, has all operating components clearly identified, and has all indicating lights clearly labelled.			
1.3	Pump water supply valves	CHECK that all valves are in the open position or the closed position, as labelled, and secured, where applicable. NOTES: 'Text deleted'			
1.4	Pressure gauges	CHECK that all pressure gauges are reading within the ranges required and record pressure.	..... kPa kPa		
1.5	Water supply tank (if installed)	Perform routine service in accordance with Section 5.			
1.6	General inspection	CHECK for any obvious signs of physical damage or deterioration.			
1.7	Compression ignition (diesel) driven pumpset(s)	Monitor and engine start batteries.			
		(a) CHECK monitor and engine start batteries and enclosures for corrosion, physical damage and secure mounting.			
		(b) REMOVE any corrosion from battery terminals as required.			
		(c) TEST the float charge voltage of both the monitor and engine start batteries and record result.	..... V V		
		(d) CHECK electrolyte levels and top up with distilled water as necessary.			
		(e) CHECK warning signage and rating (battery capacity) signage (where required).			
		(f) CHECK battery capacity or cold cranking amperage is appropriate.			
1.8	Engine warming devices	Where fitted, check engine warming device is working appropriately.			
1.9	Fuel tank(s)	CHECK that the fuel tank is full.			

(continued)

TABLE 3.4.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.10	Pump controller	(a) CHECK enclosure for corrosion and ingress of water, dust or insects.			
		(b) CHECK operation of all visual indicators, switches and sounders.			
1.11	Pump controller status	(a) CHECK the main isolating switch is in the 'ON' position and secured in position where facilities are provided and, where fitted, the green power supply indicators are illuminated and that no red warning lamps are on.			
		(b) CHECK all lights are functional by pressing the indicator test button, where fitted.			
1.12	Pre-test checks	Prior to commencing any test function:			
		(a) CHECK all safety guards are in place and secure.			
		(b) CHECK the water supply availability—town main pressure adequate or suction tank is full.			
1.13	Pump starting devices— Compression ignition engine	(c) Where compression ignition engine driven pumpsets are installed, CHECK that water, oil, belt drives and exhaust condensate drains and cooling water valves are in the correct position. Check fuel water-trap/filter for water contamination. Rectify where required.			
		(a) START each pumpset by reducing the applied water pressure to the starting device and for compression ignition engines run engine continuously for not less than 10 min on the first automatic start and check that the driver achieves full speed within 15 s of starting.			
		(b) RESTART the pumpset using the manual starting device.			
1.14	Run test checks	(c) RECORD the starting pressures, test run time and the hour meter reading at completion of the test.	..... kPa min h		
		During and after the running period CHECK:			
		(a) Pump operates at the correct discharge pressure. Record suction and discharge pressure. NOTE: The discharge pressures may vary with varied suction static pressure. An excessive negative suction pressure may indicate a suction partial blockage or partially closed valve.	..... kPa kPa		
		(b) Pump gland and drain (where applicable) operates efficiently.			
1.14	Run test checks	(c) Out-of-balance condition or abnormal noises are not evident.			
		(d) All local and remote 'pump running' alarms operate.			

(continued)

TABLE 3.4.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
		(e) Running speed is correct, and record the result.			
		(f) Water, oil and fuel leaks are not evident and fittings on ancillary equipment are secure.			
		(g) Battery charger or alternator/generator is operating at required value within tolerances.	..... V		
		(h) Engine stop mechanism returns to start position automatically.			
		(i) Belt drives are in good condition.			
		(j) Battery charger power failure alarm operates correctly.			
		(k) Engine instrumentation is operating. Record the results.	Oil pressure kPa Engine temp °C		
		(l) Flow is evident from the circulation relief valve when the pump is operating at shut-off head and ceases at the appropriate pressure.			
		(m) Exhaust system is leak free.			
		(n) Cooling water (heat exchanger cooled engines only) is discharging.			
1.15	Electric motor driven pumpset— Precautions	Prior to commencing any test function: (a) CHECK all safety guards are in place and secure. (b) CHECK enclosure for corrosion and ingress of water, dust or insects.			
1.16	Pump controller status	CHECK that the main isolating switch is in the ON position and secured in position where facilities are provided and, where fitted, the green power supply lamps are illuminated and that no red warning lamps are on. Ensure all lights are functional by pressing the lamp test button, where fitted.			
1.17	Pump starting devices	(a) START each pumpset by reducing the applied water pressure to the starting device and run motor continuously for at least 3 minutes. (b) RESTART each pumpset using the manual starting device and run motor continuously for at least 3 minutes. (c) RECORD the starting pressures and the run time at the completion of the test.	..... kPa min		

(continued)

TABLE 3.4.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.18	Run test checks	During and after the running period CHECK:			
		(a) Pump operates at the correct discharge pressures allowing for varying suction conditions. Record suction and discharge pressure.	Suction kPa Discharge kPa		
		(b) Pump glands and drain or mechanical seal(s) operate efficiently.			
		(c) Out-of-balance condition or abnormal noises are not evident.			
		(d) Both local and remote 'pump running' alarms and lights operate.			
1.19	Controller batteries	(a) CHECK battery complies with details on identification plate fitted to the enclosure.			
		(b) CHECK battery for corrosion, physical damage and security.			
		(c) CHECK battery enclosure for corrosion, and the ingress of water, dust and insects.			
		(d) CHECK float voltage of the battery and record.	..... V		
1.20	Restoration to operational condition all pumpsets	After completion of testing procedures, RETURN all equipment to the operational condition.			

3.4.2 Six-monthly service schedule

Routine service of fire pumpsets on a six-monthly basis shall be carried out in accordance with Table 3.4.2.

Routine service of fire hose reel and automatic pressure maintenance pumps shall be carried out in accordance with Clause 3.4.5.2.

TABLE 3.4.2
SIX-MONTHLY SERVICE SCHEDULE
FIRE PUMPSETS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service	Complete all monthly service activities, as listed in Table 3.4.1.			
2.2	Alternative power-supplies—Electric motor-driven pumpset	In addition to the requirement of Item 1.17 of Table 3.4.1, where alternative power supplies are provided, RUN the pump(s) continuously for not less than 3 minutes off the alternative supply.			
2.3	Hydro-pneumatic accumulator (where fitted)	CHECK accumulator air pressure.	..... kPa		

3.4.3 Yearly service schedule

Routine service of fire pumpsets on a yearly basis shall be carried out in accordance with Table 3.4.3.

Fire hose reel pumpsets are excluded from yearly activities.

**TABLE 3.4.3
YEARLY SERVICE SCHEDULE
FIRE PUMPSETS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	Complete all monthly and six-monthly service activities as listed in Tables 3.4.1 and 3.4.2.			
3.2	Annual full flow test— Compression ignition (diesel) driven pumpset— Sprinklers and hydrants load test. This test may be combined with tests required by Table 2.4.2.3, Item 3.5 if applicable	(a) With the pump room door(s) closed, and the pump testing technician present:			
		(i) RUN the pumpset at shut-off (zero flow) for 10 min to allow all equipment to attain normal operating temperature.			
		(ii) RUN the pumpset at 130% of duty flow (sprinklers, hydrants or combined as applicable) for 10 min and record the result.	Flow.... L/min @ pressure kPa		
		(iii) Reduce the flow to the duty flow (sprinklers, hydrants or combined) for sufficient time to record the water supply proving test results.	Flow.... L/min @ pressure kPa		
		(iv) Further reduce the flow until shut-off (zero flow) is achieved and continue to run the pumpset until total run time has reached 30 min.			
		(v) During this period RECORD the following for actions (ii), (iii) and (iv) above:			
		(A) Suction pressures.	..... kPa		
		(B) Discharge pressure.	..... kPa		
		(C) Engine running temperature.	..... °C		
		(D) Engine oil pressure.	..... kPa		
(E) Air temperature at the engine intake manifold. NOTE: If the pump room temperature rises more than 10°C above ambient temperature, this could indicate inadequate ventilation and possible reduction in engine power.	..... °C				
(F) Engine RPM, using both installed tachometer and calibrated tachometer. Record variations. RPM RPM RPM variation				

(continued)

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TABLE 3.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
A1		(vi) While carrying out the above procedures, CHECK temperature of bearings and stuffing box leakage and note and report any abnormality.			
		(b) SIMULATE an engine fail to start and ensure that engine-start cycling requirements and alarm activations are satisfied.			
		(c) TEST correct operation of pump priming tanks and associated equipment, where fitted.			
A1	3.3 Annual full flow test— Electric motor-driven pumpset— Sprinklers and hydrants load test	(a) With the pump room door(s) closed and the pump testing technician present:			
		(i) RUN the pumpset at shut-off (zero flow) for 3 min.			
		(ii) RUN the pumpset at 130% of duty flow (sprinklers, hydrants or combined as applicable) for 4 min and record the result.	..... L/min kPa		
		(iii) Reduce the flow to the duty flow (sprinklers, hydrants or combined) for sufficient time to record the water supply proving test results.	..... L/min kPa		
		(iv) Further reduce the flow until shut-off (zero flow) is achieved and continue to run the pumpset until total run time has reached 10 min.			
		During this period RECORD the following for Items (ii), (iii) and (iv) above:			
		(A) Suction pressure.	..... kPa		
		(B) Discharge pressure.	..... kPa		
		(C) Air temperature at the electric motor.	..... °C		
		(D) Motor RPM.	..... RPM		
		(E) Amps (all three phases). NOTE Ensure current does not exceed full load current of the electric motor.	...A...A...A		
		While carrying out the above procedure, CHECK temperature of bearings and stuffing box leakage and note and report any abnormality.			
(b) TEST correct operation of pump priming tanks and associated equipment, were fitted.					
A1	3.4 All batteries	(a) CHECK each battery for any condition likely to indicate an adverse effect on its function.			
		(b) Where batteries are replaced they shall comply with batteries manufactured in accordance with AS 4029 (series).			

(continued)

TABLE 3.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.5	Engine start batteries	REPLACE all engine-starting batteries after a maximum of 2 years service, irrespective of condition. Record date of replacement on the new battery and the date the batteries were replaced in the service record.	.....Date.....Date		
3.6	Control batteries	When the battery has not been replaced in the previous two years, verify the battery condition by carrying out a battery discharge test in accordance with Appendix F.	Date last replace.....or; Load current A Final voltage V		
3.7	Battery charger	Test and record battery charger voltage output.	..... V		
3.8	Compression-ignition (diesel) driven pumpset	(a) REPLACE engine oil with new oil that meets the engine manufacturer's specification. More frequent oil changes shall be carried out if recommended by the engine manufacturer.			
		(b) REPLACE engine oil filter and fuel filters and, if required, air filters.			
		(c) CHECK the condition of the fuel. NOTE: Visually check a sample of the fuel for foreign particles, contamination, fungal growth, appropriate smell and colour, etc. If suspect, report, replace or send the sample to an independent testing agent.			
		(d) INSPECT engine cooling hoses and replace where necessary.			
		(e) FLUSH engine cooling system and refill using manufacturer's approved corrosion inhibitor (water-cooled engines only).			
		(f) PRESSURE TEST engine cooling system in accordance with the manufacturer's recommendations (radiator and heat exchanger cooled engines only).			
		(g) CHECK correct operation of the engine cooling system pressure-reducing valves, where fitted.			
		(h) REMOVE and CLEAN or REPLACE heat exchanger strainer(s).			
		(i) CARRY out any other routine service procedures in accordance with the engine manufacturer's requirements.			
		(j) INSPECT pump/driver coupling for wear and alignment. Replace worn or damaged components.			
		(k) GREASE jump bearings to the manufacturer's specifications where greased nipples are provided.			
(l) Where the pump bearings are of the oil-lubricated type, REPLACE the bearing oil with new oil that meets the pump manufacturer's specification (does not apply to turbine type vertical shaft centrifugal pumps).					

(continued)

TABLE 3.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
		(m) REPLACE the oil in right-angle gearboxes with new oil that meets the manufacturer's specification.			
3.9	Electric motor-driven pumpset	With all electrical equipment isolated from all power supplies:			
		(a) INSPECT the condition of all exposed heavy current-carrying contacts. Report any item showing any signs of wear or corrosion.			
		(b) INSPECT pump/driver coupling for wear and alignment. Report worn or damaged components.			
		(c) Where grease nipples are provided, GREASE pump and motor bearings to the manufacturer's specifications.			
		(d) Where the pump bearings are of the oil-lubricated type, REPLACE the bearing oil with new oil that meets the pump manufacturer's specification (does not apply to turbine type vertical shaft centrifugal pumps).			
3.10	Non-return valves	ENSURE all non-return valves are operating freely and are seating correctly.			
3.11	Pipework corrosion	SURVEY the system and equipment to identify external corrosion, and detail extent and location accordingly.			
3.12	System pressure-relief valve	CHECK that the system pressure relief valve opens and closes at the pressure required. NOTE: Inappropriate settings for pressure-relief valves can result in very large quantities of water flowing to waste. Ensure settings are maintained to have pressures as identified and not higher than allowed by system component rated working pressures.	Operating pressure kPa		
3.13	Restoration to operational condition	After completion of testing procedures, RETURN all equipment to the operational condition.			
3.14	Overspeed shutdown device	Operate engine overspeed test switch. Ensure the engine shuts down and engine, overspeed light illuminates on the controller.			
3.15	Variable speed control	Operate the pump at 50% of duty flow and 100% of duty flow, and ensure duty head is not exceeded by more than 10%.			
3.16	Remote pump start/stop function	Operate the pump start/stop functions from the remote location, and ensure the appropriate indications are received at the FIP/remote stop/start panel.			

3.4.4 Five-yearly service schedule

Routine service of fire pumpsets on a five-yearly basis shall be carried out in accordance with Table 3.4.4.

TABLE 3.4.4
FIVE-YEARLY SERVICE SCHEDULE
FIRE PUMPSETS

Item No.	Item	Action required and pass/fail requirement	Records	
			Task completed Yes/No	Comments
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six-monthly and yearly activities, as listed in Tables 3.4.1, 3.4.2 and 3.4.3.		
4.2	Pump	REPACK pump glands.		
4.3	Relief, engine cooling and pressure regulating valves	OVERHAUL the following valves in accordance with supplier's specifications:		
		(a) Circulation-relief valves.		
		(b) Pressure-relief valves.		
		(c) Engine cooling valve.		
4.4	Stop valves	(d) Pressure regulating valve.		
		(a) FIT new gland packing and lubricate spindles.		
		(b) For ball and butterfly valves, CHECK for leakage and replace if necessary.		
4.5	Compression ignition engine	Replace engine air filters. NOTE: The air filter should be marked with install date.		
4.6	Restoration to operational condition	After completion of testing procedures, RETURN all equipment to the operational condition.		

3.4.5 Hose reel and pressure maintenance/jacking pumpsets

3.4.5.1 Monthly service schedule

Routine service of hose reel and pressure maintenance/jacking pumpsets on a monthly basis shall be carried out in accordance with Table 3.4.5.1.

Preventive maintenance of hose reel and automatic pressure maintenance/jacking pumpsets shall be carried out on an as-needed basis determined by the inspection and test requirements set out in Table 3.4.5.1.

- A1 | For hose reel pumpsets, perform the actions set out in Table 3.4.5.1 and Table 3.4.5.2 concurrently at six-monthly intervals.

TABLE 3.4.5.1
MONTHLY SERVICE SCHEDULE
HOSE REEL AND PRESSURE MAINTENANCE/JACKING PUMPSETS

Item No.	Item	Action required and pass/fail requirement	Records	
			Task completed Yes/No	Comments
5.1	Pump areas	(a) CHECK that pump areas are unobstructed, not used for storage and lighting is adequate.		
		(b) Where pump pressure-relief valves are fitted, CHECK that the discharge will not cause flooding or water damage.		
		(c) CHECK for any obvious signs of physical damage or deterioration and that all safety guards are in place and secure.		
5.2	Valves	ENSURE that all valves are in the open position or the closed position, as labelled, and secured where applicable.		
5.3	Water supply tank (where fitted)	CHECK that the water supply tank is full.		
5.4	Pump controller status	CHECK that the main isolating switch is in the on position and secured (where facilities are provided), the green power supply lamps are illuminated and that no red warning lamps are on. Ensure all lights are functional by pressing the lamp test button, where fitted.		
5.5	Pump	(a) VERIFY operation (manual and automatic).		
		(b) RECORD cut-in and cut-out pressures.	..... kPa kPa	

3.4.5.2 Six-monthly service schedule

Routine service of hose reel and pressure maintenance/jacking on a six-monthly basis shall be carried out in accordance with Table 3.4.5.2.

TABLE 3.4.5.2
SIX-MONTHLY SERVICE SCHEDULE
HOSE REEL AND PRESSURE MAINTENANCE/JACKING PUMPSETS

Item No.	Item	Action required and pass/fail requirement	Records	
			Task completed Yes/No	Comments
6.1	Monthly service	COMPLETE all monthly service activities, as listed in Table 3.4.5.1.		
6.2	Hydro-pneumatic accumulator	VERIFY that the air pressure is correct.		

SECTION 4 FIRE HYDRANT SYSTEMS

4.1 GENERAL

This Section sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire hydrant installations together with fire mains, fire brigade booster assemblies and other associated equipment. Service requirements for fire pumpsets, water storage tanks and delivery lay flat fire hose are set out in Sections 3, 5 and 8, respectively.

Routine service of combined hydrant and sprinkler systems shall be carried out in accordance with the requirements of this section for hydrant systems, Section 2 for automatic fire sprinkler systems, Section 3 for fire pumps and Section 5 for fire service tanks.

This Section shall be read in conjunction with Section 1.

4.2 ROUTINE SERVICE PROCESS AND PROCEDURES

4.2.1 Routine service

All hydrant systems shall be subjected to routine service in accordance with this Section.

4.2.2 Survey

Hydrant systems shall be surveyed in accordance with the survey requirements specified in Clauses 4.3 and 4.4.

C4.2.2 A survey is typically conducted visually from floor level to identify changes to the hydrant system or the building and its environment which could impair the performance of the hydrant system.

4.2.3 Baseline data

Baseline data shall be in accordance with Clause 1.8.

4.2.4 Service records, tags or labels

Service records of activities and results detailed in Clause 4.4 shall be kept in accordance with Clause 1.16.

4.2.5 Reports

Critical defect, non-critical defects, non-conformances and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

4.3 FREQUENCY

The frequency of routine servicing of hydrants shall be in accordance with Clause 4.4 and the following:

- (a) Monthly (pump-related inspection and test items only).
- (b) Six-monthly.
- (c) Yearly.
- (d) Five-yearly.

4.4 ROUTINE SERVICE SCHEDULES

4.4.1 Fire hydrant systems—Monthly service schedule

Routine service of hydrant systems on a monthly basis shall be carried out in accordance with Table 4.4.1.

TABLE 4.4.1
MONTHLY SERVICE SCHEDULE
FIRE HYDRANT SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Results	Pass/Fail	Comments
1.1	Monthly service	Where pumpsets are fitted complete all pumpset monthly service activities, as listed in Table 3.4.1.			
1.2	Pump-starting devices	(a) CHECK that all isolating valves to pump-starting pressure devices are secured in the open position.			
		(b) CHECK that pressure switches are securely mounted and are protected against the ingress of water, dust and insects.			
1.3	Pump-starting devices function test— Compression ignition engine (diesel)	(a) START each pumpset by reducing the applied water pressure to the pump-starting device and run engine, in accordance with Section 3.			
		(b) RESTART the pumpset using the manual starting device and again run the compression ignition engine in accordance with Section 3. Where more than one starting device is installed, including the manual starting device, the test may be carried out on a rotating basis. The period between the exercising of each starting device is not to exceed 3 months. Where this would require the pump to start more than 5 times in succession, the period may be extended to 6 months (see also Table 3.4.3, Items 3.6 and 3.7).			
		(c) RECORD the pump cut-in pressures and verify that they are within the ranges required.	.....kPa.....kPa		
1.4	Pump-starting devices function test— Electric motor drivers	(a) START each pumpset by reducing the applied water pressure to the starting device and run motor in accordance with Section 3.			
		(b) RESTART the pumpset using the manual starting device and again run the motor in accordance with Section 3.			
		(c) Where more than one starting device is installed, including the manual starting device, the test may be carried out on a rotating basis. The period between the exercising of each starting device is not to exceed 3 months. Where this would require the pump to start more than 5 times in succession, the period may be extended to 6 months.	.....kPa kPa		

4.4.2 Six-monthly service schedule

Routine service of fire hydrant systems on a six-monthly basis shall be carried out in accordance with Table 4.4.2.

TABLE 4.4.2
SIX-MONTHLY SERVICE SCHEDULE
FIRE HYDRANT SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Results	Pass/Fail	Comments
2.1	Monthly service	COMPLETE all monthly service activities, as listed in Table 4.4.1.			
2.2	Water supply stop valves and isolating valves	OPERATE (two full turns) all water supply stop valves (including backflow prevention stop valves and underground key-operated valves except where owned by the water supply authority) and verify they are fully open, secure in the open position (relaxed ¼ turn if appropriate) and are correctly labelled. NOTES: 'Text deleted'			
2.3	Hydrant valves (above ground)	CHECK all hydrant valves:			
		(a) Are accessible.			
		(b) Hand-wheels are securely fitted.			
2.4	Hydrant valves (below ground)	(c) Blanking caps, where fitted, are in good condition.			
		CHECK all hydrant valves:			
		(a) Are accessible.			
2.5	Booster assembly (where fitted)	(b) Blanking caps, where fitted, are in good condition.			
		(c) Check cover plate for ease of opening.			
		(d) Not leaking.			
2.6	Remote pump starting	CHECK all booster assemblies:			
		(a) Are accessible.			
		(b) Hand-wheels are securely fitted.			
2.7	Hydrant and booster connections—Compatibility	(c) Pressure gauges and blanking caps, where fitted, are in good condition.			
		(d) For condition of washers on booster assembly connection inlets.			
		(e) For legible labelling indicating maximum system working pressure.			
2.8	Hydrant hose (where fitted)	(f) For legibility of hydrant system block plan where fitted.			
		DEPRESSURIZE the hydrant system(s) at the most hydraulically disadvantaged hydrant and CHECK that the pump starts.			
		CHECK that all hydrant and booster connection points are compatible with local brigade requirements.			
2.8	Hydrant hose (where fitted)	CHECK all branch pipes, nozzles and hose couplings are in good condition, compatible with the hydrant valves and properly stowed.			

(continued)

TABLE 4.4.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Results	Pass/Fail	Comments
2.9	Foam concentrate and loose equipment (where provided)	CHECK:			
		(a) Equipment provided in the cabinet is in accordance with the cabinet contents list.			
		(b) Equipment items are compatible and in good condition.			
		(c) Foam concentrate containers are in good condition, seals are intact and the labels are legible. NOTE: Storage of foam concentrate in aggressive environments may require testing or replacement of the concentrate.			
		(d) Signage for legibility.			
2.10	Cabinets	CHECK that all hydrant and booster cabinets or enclosures are accessible, clear of extraneous materials, clearly and correctly marked and in good condition.			
2.11	Pressure-reducing/pressure-limiting valves	CHECK pressure readings on the low side of pressure-reducing and pressure-limiting valves for deviations from designed operating pressure. NOTE: Gauges or facilities for gauges should be installed immediately upstream and downstream of the valve(s).			
2.12	Block plan (where required)	CHECK for legibility and appropriate location.			

4.4.3 Yearly service schedule

Routine service of the fire hydrant systems on a yearly basis shall be carried out in accordance with Table 4.4.3.

TABLE 4.4.3
YEARLY SERVICE SCHEDULE
FIRE HYDRANT SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comment
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, as listed in Tables 4.4.1 and 4.4.2.			
3.2	Hydrant valves (above and below ground)	OPEN partially all hydrant valves in the system and prove the presence of water at each point. NOTE: To prevent water damage, it is recommended that a suitable adapter to limit water flow be used for this test on internal hydrants. Each hydrant in the system should be opened separately.			
3.3	Hydrant water supply valves	(a) OPERATE (two full turns) all water supply valves—above ground, underground key-operated valves (except where owned by the water supply authority) and subsidiary stop valves (e.g., floor isolation valves). Ensure they are fully open and, where applicable, secured in the open position (relaxed ¼ turn where applicable) and are correctly labelled. NOTE: Where underground key-operated valves are owned by the water supply authority, the owner should arrange for the water supply authority to test the valve(s) to confirm the valve(s) is operational and in the correct position.			
		(b) VERIFY that the valve position indicators are securely mounted and indicate correctly.			
		(c) TEST each valve monitor (where fitted) by closing and re-opening the valve. Verify correct indication at the CIE.			
3.4	Non-return valves	VERIFY that all non-return valves are operating freely and are seating correctly.			
3.5	Hydrant hose (where fitted)	VERIFY all branch pipe, nozzles and hose couplings waterways are unobstructed and in good condition.			

(continued)

TABLE 4.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comment
3.6	Pressure-reducing station test	(a) OPERATE all pressure-reducing valves and verify correct operation under flow conditions.			
		(b) VERIFY that pressure readings on the low pressure side of the valves are within the range stated at the pressure-reducing valve station.	.....kPa		
		(c) OPERATE pressure-relief valve and record operating pressure. If necessary, adjust the setting to relieve at 50 kPa above the operating pressure of the pressure-reducing valve. Replace the tamper seal if necessary. NOTE: The pressure-relief valve test may be carried out using a portable test apparatus.			
3.7	Water supply proving test	CONDUCT a water supply proving test for each water supply verifying that the system flow and pressure requirements meet the design criteria, using either—			
		(a) a fixed flow meter test facility; or	Static supply pressure.....kPa Flowing pressure.....kPa		
		(b) a portable test apparatus at the most hydraulically disadvantaged hydrant valve(s).	Flow L/s.....kPa No. hydrants flowing		
		NOTES: 1 Where the water supply is the sole source of water for both sprinkler and hydrant systems, both sprinkler and hydrant demands should be available simultaneously. 2 In high-rise buildings where there are multiple pressure zones, a water supply proving test should be carried out on the most remote hydrant in each zone.			
3.8	Hydrant system interface control test (fire trips)	(a) CONDUCT a functional system test via the pressure switch or flow switch with other interfaced fire systems.			
		(b) VERIFY that the interface functions as required. NOTE: It is recommended that the responsible entity coordinate testing the interfaced fire protection systems.			
3.9	Water supply tanks— Atmospheric	Perform routine service in accordance with Section 5.			

(continued)

TABLE 4.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comment
3.10	Water supply (river, lake, etc.) Strainers/screens	(a) CHECK suction inlet strainer(s) or screen(s).			
		(b) Following water supply proving test (Table 4.4.2 Item 2.6), CLEAN suction inlet strainer(s). Lower raised screen and raise and clean 'in-use' screen.			
3.11	Survey—Installation	(a) Pipework—CHECK that exposed water distribution system, including pipework, pipe supports and valve, appears free from corrosion and damage, not subject to external loads and pipework is properly supported.			
		(b) Hydrant obstructions—CHECK for obstructions likely to impede hydrant valve access.			
3.12	Survey—Design	(a) Occupancy—CHECK that hydrant design remains applicable for current building arrangement or use.			
		(b) Site documentation—CHECK that block plans, emergency instructions and pressure schedules contain the details required in accordance with AS 2419.1.			

4.4.4 Five-yearly service schedule

Routine service of fire hydrant systems on a five-yearly basis shall be carried out in accordance with Table 4.4.4.

TABLE 4.4.4
FIVE-YEARLY SERVICE SCHEDULE
FIRE HYDRANT SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comment
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six monthly and yearly service activities, as listed in Tables 4.4.1, 4.4.2 and 4.4.3.			
4.2	Booster connection flow test (where fitted)	CONDUCT a flow test through booster connection in accordance with AS 2419.1 or to approved design Standard. NOTE: Conduct the flow test after a satisfactory (pass) hydrostatic test.			
4.3	Hydrostatic test	Where a booster is fitted CONDUCT a hydrostatic pressure test on the entire system at 1.5 times the system working pressure of the required design Standard.			
4.4	Booster assembly	(a) CHANGE all washers on booster assembly connection inlets.			
		(b) LUBRICATE internal non-return spring check valves on a 10-yearly basis.			
4.5	Drain and test valve washers	For screw-down style valves, EXAMINE seating and fit new washers. For packed gland variants, FIT new gland packing.			
4.6	Stop valves	FIT new gland packing and lubricate spindle.			
4.7	Hydrant valves	FIT new seatings to all hydrant valves and lubricate spindles. (Perishable items only.) NOTE: This activity should be completed prior to conducting the hydrostatic pressure test.			
4.8	Water supply non-return valves	RENEW water supply non-return valve seatings and gaskets.			
4.9	Gauges	CHECK all pressure gauges against calibrated gauge.			
4.10	Water supply tanks—Atmospheric	Perform routine service in accordance with Section 5.			

SECTION 5 WATER STORAGE TANKS FOR FIRE PROTECTION SYSTEMS

5.1 GENERAL

This Section sets out the requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of water storage tanks for fire protection systems.

This Section shall be read in conjunction with Section 1.

C5.1 *Elements of water storage tanks requiring particular attention include the following:*

- (a) *Corrosion of internal and external components such as—*
 - (i) *suction inlets;*
 - (ii) *vortex inhibitors;*
 - (iii) *tie rods in rectangular tanks;*
 - (iv) *fittings; and*
 - (v) *roof supports.*
- (b) *Condition of liner, if installed.*

5.2 ROUTINE SERVICE PROCESS AND PROCEDURES

5.2.1 Routine service

All water storage tanks shall be subjected to routine service in accordance with this Section.

5.2.2 Out of service precautions

When tanks are planned to be out of service for a period exceeding 24 h, the following arrangements shall be made prior to work being carried out:

- (a) Advise the owner.
- (b) Advise the Fire Brigade of the outage and seek agreement in relation to temporary water supply arrangements.
- (c) If possible, provide for a water tanker to be on stand-by.
- (d) If possible, provide for temporary water storage in accordance with AS 2304.

NOTE: When tanks need to be drained, provision should be made to minimize the wastage of water, see Appendix A of AS 2304.

5.2.3 Baseline data

Baseline data shall be in accordance with Clause 1.8.

NOTE: 'Text deleted'

5.2.4 Service records

Records of activities and results detailed in Clause 5.4.1 shall be kept in accordance with Clause 1.16.

5.2.5 Reports

Critical defects, non-critical defects, non-conformances and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

5.3 FREQUENCY

5.3.1 General

The frequency of routine servicing of water storage tanks shall be in accordance with Clause 5.4 and the following:

- (a) Monthly.
- (b) Six-monthly.
- (c) Yearly.
- (d) Ten-yearly (and other frequencies where applicable).

5.3.2 Life of tank liner

An indication of the life remaining in a tank liner shall be estimated at the end of the first 10-year drain and clean period or at the end of the manufacturer’s warranty period (whichever comes first). The estimated remaining life of the liner shall determine the subsequent tank drain and inspection frequency.

5.4 ROUTINE SERVICE SCHEDULES

5.4.1 Water storage tanks—Monthly service schedule

Routine service of water storage tanks for fire protection systems on a monthly basis shall be carried out in accordance with Table 5.4.1

**TABLE 5.4.1
MONTHLY SERVICE SCHEDULE
WATER STORAGE TANKS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Water level	CHECK that the tank is full.			
1.2	Water level indicator	CHECK for correct operation and reading of water level indicator.			
1.3	Water supply pressure tank (where fitted)	VERIFY:			
		(a) Gauge glass indicates the correct water level.			
		(b) Tank pressure gauge reads within the range nominated.	Tank pressure gauge.....kPa		
		(c) Air pressure switch operates at specified compressor cut-in and cut-out pressures.	Compressor operating pressure		
			Cut in.....kPa Cut-out....kPa		
(d) Low tank pressure alarm operates at specified pressure.	Low tank pressure alarm.....kPa				
(e) Air compressor or gas cylinder supply is operational.					

5.4.2 Six-monthly service schedule

Routine service of water storage tanks for fire protection systems on a six-monthly basis shall be carried out in accordance with Table 5.4.2.

TABLE 5.4.2
SIX-MONTHLY SERVICE SCHEDULE
WATER STORAGE TANKS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service	COMPLETE all monthly service activities, as listed in Table 5.4.1.			
2.2	Float valve	VERIFY the operation of the float valve by exercising the valve.			
2.3	Level indicator	VERIFY all water level indicators (mechanical and electronic) are operating properly by exercising the indicator or mechanism.			

5.4.3 Yearly service schedule

Routine service of water storage tanks for fire protection systems on a yearly basis shall be carried out in accordance with Table 5.4.3.

TABLE 5.4.3
YEARLY SERVICE SCHEDULE
WATER STORAGE TANKS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
ALL TANKS					
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, as listed in Tables 5.4.1 and 5.4.2.			
3.2	Leakage	CHECK for water leakage from all joints, flanges and fittings.			
3.3	Loose components	CHECK for loose bolts, anchors and fittings throughout the tank.			
3.4	Damage	CHECK for any physical damage caused by impact, including scratches and dents.			
3.5	Foundation	CHECK for earth subsidence and foundation cracks.			
3.6	Corrosion	CHECK for corrosion of all external components and surfaces, and internal components as far as is safe to do so from the top inspection/access hatch.			
3.7	Access hatch	CHECK to ensure the access hatch is secure and in satisfactory condition.			
3.8	Ladder	CHECK the ladder system is secure and free from corrosion.			
3.9	Roof	CHECK the roof structure for:			
		(a) Stability and security roof sheets are secured.			
		(b) Adequacy of sealing of penetrations.			

(continued)

TABLE 5.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.10	Vermin	CHECK the condition of vermin proofing and adequacy of the positioning.			
3.11	Foreign objects	CHECK for internal foreign objects visually through the top inspection/access hatch.			
3.12	Algae	CHECK for internal accumulation of algae.			
3.13	Vents	CHECK the condition and satisfactory operation of vents and rotary spinners.			
3.14	Accessibility	CHECK for adequate means to access the tank.			
3.15	Signs	CHECK for satisfactory condition of all signs.			
3.16	Gaskets and seals	CHECK the condition of all gaskets and sealants.			
3.17	Vortex inhibitor	CHECK the condition of the vortex inhibitor visually from the access hatch if practicable.			
3.18	Level indicator	LUBRICATE water level indicator, pulleys and cables.			
3.19	Fire authority hard suction fittings	CHECK fittings are compatible with the local fire authority's hard suction fittings.			
3.20	Drain, clean and refill Only required after the first year of service and then every 10 years	DRAIN and CLEAN the tank completely including:			
		(a) Removing all sludge and debris.			
		(b) Cleaning all internal surfaces, excluding the roof, with low pressure water spray.			
		(c) Refilling the tank as soon as practicable.			
		NOTES: 1 A diver or other underwater inspection and cleaning technique may be used in lieu of draining the tank in consultation with the tank manufacturer to satisfy warranty requirements. 2 For water conservation measures when tanks need to be drained, see AS 2304.			
TANKS WITH LINERS—(A) ABOVE THE WATERLINE					
3.21	Eyelets and other liner fixing systems	CHECK eyelets, attachment connectors and other mechanical fixings for wear, detachment or corrosion.			
3.22	Discolouration	CHECK to determine the extent of any discolouration to the tank liner and, if significant, contact the liner manufacturer.			
3.23	Shrinkage	CHECK for signs of shrinkage and increased liner tension.			
3.24	Liner brittleness	CHECK for signs of liner brittleness.			
3.25	Cuts and tears	CHECK for signs of cuts and tear.			
3.26	Surface deterioration	CHECK for signs of surface deterioration or chalking.			

(continued)

TABLE 5.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
TANKS WITH LINERS—(B) BELOW THE WATERLINE					
3.27	Flexibility	CHECK for signs of loss of flexibility.			
3.28	Discolouration	CHECK to determine the extent of any discolouration to the tank liner.			
3.29	Elongation	CHECK for signs of elongation of the liner.			
3.30	Bulging	CHECK for signs of the liner bulging out from under the base girder (external).			
3.31	Leaks, cuts and tears	CHECK for signs of leaks, cuts and tears of the liner.			
3.32	Drain, clean and refill Only required after the first year of service and then every 10 years	DRAIN and CLEAN the tank leaving a minimum of 50 mm of water to prevent liner movement, and—			
		(a) remove all sludge and debris without using sharp tools or shovels to prevent tearing and puncturing of the liner;			
		(b) clean all internal surfaces, excluding the roof, with low pressure water spray using appropriate footwear to avoid damage to the tank liner; and			
		(c) refill the tank as soon as practicable.			
		NOTES: 1 For water conservation measures when tanks need to be drained, see AS 2304. 2 Ensure the liner is in the correct position prior to refilling; this includes the positioning of the neoprene mat (where fitted) under the vortex inhibitor bottom support and strainer. 3 A diver or other underwater inspection and cleaning technique may be used in lieu of draining the tank in consultation with the tank manufacturer to satisfy warranty requirements.			
3.33	Sludge depth	Complete a sludge depth measurement to determine the next period for draining and cleaning the tank.			
3.34	Tank base	Undertake a study of the tank base and liner for weak spots due to undermining, noting that founding material needs to be felt solid at all areas. Minor hollow areas are to be underpinned and major hollowing requires a geotechnical investigation and reassessment of the sealing system.			

(continued)

TABLE 5.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
RECTANGULAR PANEL TANKS					
A1 | 3.35	Stay support systems	Complete a visual inspection of the internal stay support system comprising stay bars, bolts and brackets for the following:			
		(a) Corrosion at connection points.			
		(b) Tightness of bolts.			
		(c) Elongation of bolt holes.			
		(d) Distortion of panels and connection points.			
PRESSURE TANKS					
A1 | 3.36	Pressure tanks	(a) INSPECT externally for structural integrity, freedom from corrosion, and acceptable condition in accordance with AS/NZS 3788.			
		(b) VERIFY low water level alarm switch operates at predetermined level	Alarm level.....m		

5.4.4 Ten-yearly service schedule

Routine service of pressure tanks on a ten-yearly basis and a six-yearly pressure vessel inspection (internal) shall be carried out in accordance with Table 5.4.4.

**TABLE 5.4.4
TEN-YEARLY AND OTHER SERVICE SCHEDULE
WATER STORAGE TANKS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
ALL TANKS					
4.1	Monthly, six-monthly, yearly service	VERIFY completion of all monthly, six-monthly and yearly activities as listed in Tables 5.4.1, 5.4.2 and 5.4.3.			
A1 | 4.2	Drain, clean and refill	DRAIN and CLEAN the tank completely including—			
		(a) REMOVE all sludge and debris.			
		(b) CLEAN all internal surfaces, excluding the roof, with low pressure water spray.			
		(c) REFILL the tank as soon as practicable.			
		NOTES: 1 A diver or other underwater inspection and cleaning technique may be used in lieu of draining the tank. 2 For water conservation measures when tanks need to be drained see AS 2304.			

(continued)

TABLE 5.4.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
TANKS WITH LINERS					
4.3	Drain clean and refill	DRAIN and CLEAN the tank leaving a minimum of 50 mm of water to prevent liner movement, and:			
		(a) REMOVE all sludge and debris without using sharp tools or shovels to prevent tearing and puncturing of the liner.			
		(b) CLEAN all internal surfaces, excluding the roof, with low pressure spray using appropriate footwear to avoid damage to the tank liner.			
		(c) REFILL the tank as soon as practicable.			
		NOTES: 1 For water conservation measures when tanks need to be drained, see AS 2304. 2 Ensure the liner is in the correct position prior to refilling; this includes the positioning of the neoprene mat (where fitted) under the vortex inhibitor bottom support and strainer. 3 A diver or other underwater inspection technique may be used in lieu of draining the tank in consultation with the tank manufacturer (to satisfy warranty requirements).			
PRESSURE TANKS					
4.4	Water supply tanks—Pressure	Conduct a six-yearly inspection by a qualified pressure vessel inspector.			

SECTION 6 FIRE DETECTION AND ALARM SYSTEMS

6.1 GENERAL

This Section sets out the requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire detection and alarm systems.

Where smoke alarms and heat alarms are connected to a fire detection system, the procedures for the smoke and heat alarms shall be in accordance with Clause 6.4.2.

The requirements for routine service of emergency warning systems and emergency intercom systems shall be in accordance with Clauses 6.4.3 and 6.4.4, respectively.

This Section shall be read in conjunction with Section 1.

6.2 ROUTINE SERVICE PROCESS AND PROCEDURES

6.2.1 Routine service

All fire detection and alarm systems shall be inspected and tested on a monthly basis. Further testing, preventive maintenance and survey shall be carried out at the periodic intervals specified in Clauses 6.3 and 6.4.

6.2.2 Precautions

Prior to commencing any testing or preventive maintenance, the following precautions shall be taken:

- (a) Take all reasonable precautions as to not adversely affect the normal operation of any system except for those systems to be maintained or to adversely affect occupants of the building, or to cause any situation that will cause an unwanted alarm.
- (b) Inform the responsible entity or nominated person that routine service is to be carried out, which may adversely affect the occupants or operations of the building.
- (c) Inform the responsible entity or nominated person to the extent of the impairment during the routine service so that alternative safety arrangements can be implemented.
- (d) Notify the monitoring service provider where testing or service may cause signals to be transmitted.

NOTE: The notification may be by configuring the alarm signalling equipment to test mode and confirmation that the system has been restored to 'normal' by the alarm signalling equipment returning to 'normal'.

On completion of any testing or service, return all controls to their prior state. When any function is left impaired, disabled or is not restored to 'normal', it shall be recorded in the system logbook and the owner or agent shall be notified.

6.2.3 Survey

Detection systems shall be surveyed in accordance with the survey requirements specified in Clauses 6.4.1 to 6.4.5.

C6.2.3 *A survey is typically conducted visually from floor level and is intended to identify changes to the detection system or the building and its occupancy which could impair the performance of the detection system.*

6.2.4 Baseline data

Baseline data shall be in accordance with Clause 1.8.

6.2.5 Service records

Records of activities and results detailed in Clause 6.4 shall be kept in accordance with Clause 1.16.

6.2.6 Reports

Critical defect and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.2.

6.3 FREQUENCY

The frequency of routine servicing of detection systems shall be in accordance with the following and Clause 6.4.

- (a) Monthly.
- (b) Six-monthly.
- (c) Yearly.
- (d) Five-yearly.

6.4 ROUTINE SERVICE SCHEDULES

6.4.1 Fire detection and alarm system, special hazard systems and smoke hazard management

6.4.1.1 *General*

Routine service of fire detection and alarm systems, special hazards systems and smoke hazard management, shall be carried out in accordance with Tables 6.4.1.2 to 6.4.1.5.

6.4.1.2 Monthly service

Routine service of fire detection and alarm systems, special hazard systems and smoke hazard management on a monthly basis shall be carried out in accordance with Table 6.4.1.2.

TABLE 6.4.1.2
MONTHLY ROUTINE SERVICE SCHEDULE
FIRE DETECTION AND ALARM SYSTEM, SPECIAL HAZARD SYSTEMS AND
SMOKE HAZARD MANAGEMENT SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	External alarm	INSPECT the external alarm (bell or strobe light) to ensure it clearly indicates the designated building entry point. Inspect to ensure the external alarm label is legible with the word 'FIRE' in characters not less than 25 mm in height.			
1.2	Control and indicating equipment (CIE)	INSPECT the following as applicable: Fire indicator panel (FIP), sub-indicator panel (SIP), repeater panel, fire brigade panel (FBP), mimic panel, fire fan control panel (FFCP) and— (a) ensure that they are clearly visible, readily accessible and free from dust and contaminants; and (b) where a panel is obscured by a door, check that the door is correctly labelled. Where manual call points use replaceable frangible elements, ENSURE that at least one replacement element and tool are available for replacing the element where required.			
1.3	Battery enclosure	Where vented batteries are used, INSPECT the battery enclosure for evidence of corrosion.			
1.4	Fire alarm	SIMULATE an alarm condition and confirm that all required common or general visual and audible indications operate and the external alarm is activated. Where the system is monitored ensure the alarm has activated the alarm signalling equipment. Where CIE is a sub-indicator panel, confirm that the alarm condition is indicated at the FIP.			
1.5	Occupant warning system	SIMULATE an alarm and confirm the alarm initiates the occupant warning system including any visual warning devices (VWD).			
1.6	Isolate/Disable	INITIATE an isolate/disable condition at the fire indicator panel and confirm that all required common or general visual and audible indications operate. Where the system is monitored, ensure the isolate is received by the monitoring service provider alarm signalling equipment. Where the panel is an SIP, confirm that the isolate/disable condition is indicated at the FIP as either a fault or isolate/disable.			

(continued)

TABLE 6.4.1.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.7	Filament visual indicators	TEST the operation of each filament type visual indicators.			
1.8	Zone block plan	INSPECT zone block plans to ensure that they are securely mounted and legible and supplementary zone drawings, where required, are available and legible.			
1.9	'Text deleted'				

6.4.1.3 Six-monthly service

Routine service for fire detection and alarm systems, special hazard systems on a six-monthly basis shall be carried out in accordance with Table 6.4.1.3.

TABLE 6.4.1.3

SIX-MONTHLY ROUTINE SERVICE SCHEDULE FIRE DETECTION, ALARMS AND CONTROLS FOR SPECIAL HAZARD SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service	Complete all monthly service activities, as listed in Table 6.4.1.2.			
2.2	Local control station (LCS)	(a) Ensure that they are clearly visible readily accessible and free from dust and contaminants.			
		(b) Check that the door is correctly labelled.			
2.3	Visual warning devices	INSPECT all visual warning devices, including:			
		• DO NOT ENTER			
		• EVACUATE			
		• FIRE ALARM			
		• SYSTEM INOPERATIVE			
		for any condition or damage that is likely to adversely affect their function.			
2.4	Local control station (LCS) discharge inhibit switch	TEST the operation of each inhibit or auto/manual switch and confirm that:			
		(a) It prevents the automatic discharge of suppression system.			
		(b) Stops and resets the normal system discharge sequence.			
		(c) Causes the illumination of a visual indicator at the LCS and the system FIP.			
		(d) Causes an audible indication.			
		(e) Does not override the operation of the manual discharge switch.			

(continued)

TABLE 6.4.1.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.5	Local control station (LCS) manual initiate switch	TEST the operation of the manual initiate switch and confirm normal system discharge sequence, including fire and evacuation alarms, time delays equipment shutdowns, and that it overrides the LCS discharge inhibit switch.			
2.6	System inoperative visual warning device (VWD)	CONFIRM the system inoperative VWD operates for:			
		(a) Operation of a service switch (discharge initiating circuit electrical isolation).			
		(b) Fault in the discharge actuator circuit.			
		(c) Operation of a lock-off valve (where fitted).			
		(d) Operation of a manual inhibit switch (where fitted).			
2.7	System operation and logic	TEST the system logic (e.g. dual detector operation or dependency on more than one alarm) and confirm the operation of—			
		• VWDs			
		• audible alarms			
		• directional valve signal/output			
		• equipment fire mode signal/output			
		• HVAC fire mode signal/output			
		• system discharge actuator			
		• door and damper release and			
• ancillary controls					
		‘Text deleted’			
2.8	Actuator circuit faults	TEST each supervised actuator circuit to ensure a fault is registered at the FIP.			
2.9	Actuator	TEST the function of each actuator and ensure that each actuator operates correctly. Ensure that each actuator has been mechanically isolated or temporarily removed from the suppressant supply to prevent unintended discharge. For non-resettable actuators (e.g. pyrotechnic types) substitute the actuator with a load of equivalent value and CONFIRM the operating current is as required.			

NOTE: Take precautions to prevent the discharge of the system during these tests.

6.4.1.4 Yearly service

Routine service and survey for fire detection and alarm systems, special hazard systems and smoke hazard management on a yearly basis shall be carried out in accordance with Table 6.4.1.4.

TABLE 6.4.1.4
YEARLY ROUTINE SERVICE SCHEDULE
FIRE DETECTION AND ALARM SYSTEM, SPECIAL HAZARD SYSTEMS AND
SMOKE HAZARD SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, as listed in Table 6.4.1.2 and 6.4.1.3.			
3.2	Manual call points	CHECK all manual call points are free of conditions likely to adversely affect their function.			
3.3	Manual call points	TEST the operation of each manual call point.			
3.4	Other warning devices	Where other warning devices are used as the alarm-indicating devices, INSPECT all devices to ensure that they are in place.			
3.5	Panel switches and keypads	TEST the operation of each control.			
3.6	Visual indicators	TEST the operation of each visual indicator and alphanumeric displays.			
3.7	Battery	MEASURE system quiescent and maximum alarm currents in accordance with Appendix F. Calculate the required battery capacity and CHECK the nominal capacity of the installed batteries is not less than the calculated capacity. 'Text deleted'	Maximum alarm..... I _a Quiescent I _q Required capacity Ah Installed capacity Ah		
3.8	Fire Detectors	TEST detectors as specified in Appendix G and confirm correct alarm zone indication. Where the detectors are used as part of special hazards systems 100% of the detectors shall be functionally tested yearly.			
3.9	Audibility	TEST the occupant warning system and check the signals are distinctly audible in all areas of the building. NOTE: In order to reduce the disturbance to occupants an acceptable means of conducting this test is to provide an audio signal other than the warning signal at a reduced sound pressure level. Where the FIP is connected to a sound systems and intercom systems for emergency purposes (AS 1670.4) or EWIS (AS 2220.2) test in accordance with Table 6.4.3.2.			

(continued)

TABLE 6.4.1.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.10	Occupant warning system sound pressure level	MEASURE and record the sound pressure level from at least one reference point for each amplifier used and ensure at each reference point the measured value is consistent with the required sound pressure level at each reference point.	Location of reference points..... Required SPL dBA Measured test SPL dBA		
3.11	Alarm acknowledgement facility	TEST not less than 20% of installed alarm acknowledgement facilities in such a manner that over a 5-year period, all facilities are tested. CHECK the alarm acknowledgement facility functions as required.			
3.12	Alarm investigation facility	TEST the alarm investigation facility if enabled and check it functions as required.			
3.13	Batteries condition	When the battery has not been replaced in the previous two years, verify the battery condition by carrying out a battery discharge test in accordance with Appendix F.	Date last replaced or; Test load current.....A Final test voltage.....V		
3.14	Smoke alarms and heat alarms	Refer to Clause 6.4.2.			
3.15	Service life	Inspect detectors, equipment or other items having a defined service life and report where the service life is exceeded or will be exceeded before the next scheduled service.			
3.16	'Text deleted'				
3.17	Protected areas survey	SURVEY all areas of the building from floor level and check— (a) that the fire detection and alarm system has not been altered, damaged or compromised; (b) detection device and remote indicators are appropriate for the current use; (c) for any condition that may cause a nuisance alarm or the unintentional operation of a suppression system; (d) all exposed cabling, conduits, junction boxes and the like for any condition that may impact on the performance of the system and are labelled correctly; and (e) all CIE to ensure all components are appropriately mounted and secure.			
3.18	Interfaced system initiation	Simulate alarm(s) to verify that each interface transmission path initiates the corresponding interfaced system(s) as required.			

(continued)

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TABLE 6.4.1.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
SMOKE HAZARD MANAGEMENT SYSTEMS—ADDITIONAL ACTIVITIES					
CAUTION: TAKE PRECAUTIONS TO PREVENT UNACCEPTABLE VENTILATION SYSTEM CHANGES					
3.19	FFCP latching and reset	CHECK that after initiation by a signal from the FIP, the FFCP remains operating in the fire mode until reset by the reset switch on the FFCP.			
3.20	Manual override controls	CHECK that manual override ON-AUTO-OFF control operates. NOTE: Manual override should function in normal mode and fire mode.			
3.21	Airflow fault indicator	CHECK the operation of the airflow fault indicator			
3.22	Open-circuit fault indicator	CHECK the operation of the air-handling equipment interconnecting cable open-circuit fault indicator.			
3.23	Closed-circuit fault indicator	CHECK the operation of the air-handling equipment interconnecting cable closed-circuit fault indicator.			
3.24	Electrical	CHECK the operation of the electricity phase-fail fault indicator.			
3.25	Fan-running indicator	CHECK the operation of the fan-running indicator.			
3.26	Fan-stopped indicator	CHECK the operation of the fan-stopped indicator.			
3.27	Fan fault indicator	CHECK the operation of the fan-fault indicator.			
SPECIAL HAZARD SYSTEMS—ADDITIONAL ACTIVITIES					
CAUTION: TAKE PRECAUTIONS TO PREVENT THE DISCHARGE OF THE SYSTEM DURING THESE TESTS					
3.28	Status monitoring	TEST the each suppression system status monitored function (e.g. container level, pressure switches, pump controllers, isolation valves) and CHECK each monitored function indicates at the suppression system control panel.			
3.29	Suppression system directional valves	SIMULATE the system operation and confirm that each electrical directional valve operates as required.			
3.30	Discharge time delay	TEST and RECORD the system discharge sequence and confirm the time delay period is as required.			
3.31	Agent release indication	TEST the agent release detection device (e.g. pressure switch) and confirm the operation of the agent release is indicated at the FIP.			

6.4.1.5 Five yearly service

Routine service of fire detection and alarm systems, special hazard systems and smoke hazard management on a five-yearly basis shall be carried out in accordance with Table 6.4.1.5.

TABLE 6.4.1.5
FIVE-YEARLY ROUTINE SERVICE SCHEDULE
FIRE DETECTION AND ALARM SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Monthly, six-monthly and yearly service	Complete all monthly, six-monthly and yearly service activities, as listed in Tables 6.4.1.2, 6.4.1.3 and 6.4.1.4.			
4.2	Supervised circuits	TEST each input and output supervised circuit for any condition that prevents the transmission of the required signal and ensure a fault is registered at the FIP.			
4.3	Fault	SIMULATE a circuit fault condition at the FIP and confirm that all required common or general visual and audible indications operate. Where such faults are monitored, ensure the fault has activated the alarm signalling equipment. Where the panel is an SIP confirm that the fault condition is indicated at the FIP.			
4.4	Addressable short circuit isolators	Apply short circuits as required to verify that the short circuit isolation functions as required.			
4.5	Power supply supervision	Where the system is monitored, REDUCE the CIE operating voltage to trigger a power supply supervision fault and CONFIRM that it is received by the monitoring service provider. Where the panel is an SIP or a distributed power supply, confirm that the power supply supervision fault condition is indicated at least as a fault at the FIP.			
4.6	Collective detection circuits	For each collective fire detection circuit, REMOVE the last detector or device on the circuit and confirm that a fault signal is registered at the CIE.			
4.7	Interface and control test	CONDUCT a functional test with each system's interface and VERIFY that each interfaced system responds to the signal as required (see Appendix D).			
4.8	Occupant warning system speaker circuits	MEASURE and record the impedance of each loud speaker circuit and check that it has not changed by more than 15% from the last test nor exceeded the rated output as required for the amplifier.	Required..... Ω Impedance per circuit..... Ω		
4.9	Monitoring connection	Where the system is monitored, TEST that the loss of each of the monitoring links is indicated at the monitored site.			
4.10	Alarm verification facility	TEST one detector of each type per circuit with alarm verification facility enabled to check that it functions as required.			

6.4.2 Smoke alarms and heat alarms

6.4.2.1 General

For a Class 1a dwelling and the sole occupancy units within a Class 2 building, the inspection, test, routine service and survey required by this section may be carried out by the occupant in accordance with the manufacturer's recommended procedure and need not be recorded.

NOTE: Occupants should be aware that this requirement may be altered by the relevant state or territory regulations.

6.4.2.2 Six-monthly service

Inspection, test, routine service and survey for smoke alarms and heat alarms on a six-monthly basis shall be carried out in accordance with Table 6.4.2.2.

TABLE 6.4.2.2
SIX-MONTHLY SERVICE SCHEDULE
SMOKE ALARMS AND HEAT ALARMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Smoke alarms and heat alarms	INSPECT all alarms for any condition that is likely to adversely affect their operation, such as excessive deposition of dust or coating of paint.			
1.2	Battery missing indication	INSPECT all alarms to ensure that any required 'battery missing indicator' has not operated.			
1.3	Mains power on indicator	INSPECT that the mains power on indicator is illuminated.			
1.4	Alarm test	ACTIVATE the alarm test function and check correct activation of the audible indication.			
1.5	Other warning devices	Where other sensory warning devices are used as alarm-indicating devices, INSPECT all devices to ensure that they are in place.			

NOTE: Items 1.1 to 1.5 may be carried out by the occupant or owner and not be recorded.

6.4.2.3 Yearly service

Inspection, test, routine service and survey for smoke alarms and heat alarms on a yearly basis shall be carried out in accordance with Table 6.4.2.3.

TABLE 6.4.2.3
YEARLY SERVICE SCHEDULE
SMOKE ALARMS AND HEAT ALARMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Six-monthly service	COMPLETE all six-monthly service activities, as listed in Table 6.4.2.2.			
2.2	Interconnecting alarms	Where alarms are interconnected, TEST that the activation of each alarm operates the audible alarm indication in other alarms.			
2.3	Smoke alarms	TEST 100% of smoke alarms in accordance with the manufacturer's instructions.			

(continued)

TABLE 6.4.2.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.4	Heat alarms	TEST 100% of heat alarms in accordance with the manufacturer’s instructions.			
2.5	Other warning devices	Where other sensory warning devices are used as alarm-indicating devices, TEST all devices to ensure that they are functioning correctly.			
2.6	Smoke alarms and heat alarms	CLEAN each alarm in accordance with the manufacturer’s instructions.			
2.7	Batteries	CHECK the manufacturer’s requirements for battery replacement and replace the battery if required.			
2.8	Service life	REPLACE smoke alarms and heat alarms where the service life date is exceeded.			
2.9	Survey—Spacing and location	INSPECT each alarm to ensure spacing and location requirements are as required.			

6.4.3 Emergency warning systems

6.4.3.1 Monthly service

Inspection, test, routine service and survey for emergency warning systems on a monthly basis shall be carried out in accordance with Table 6.4.3.1.

TABLE 6.4.3.1
MONTHLY SERVICE SCHEDULE
EMERGENCY WARNING SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	‘Text deleted’				
1.2	Zone Block plan	INSPECT zone block plans to ensure that they are securely mounted and legible and supplementary zone drawings, if provided, are available and legible.			
1.3	Control and indicating equipment	INSPECT the warning system panel, and— (a) ensure that it is clearly visible, readily accessible and free from dust and contaminants; (b) where a panel is obscured by a door, CHECK that the door is correctly labelled; and (c) where manual call points use replaceable frangible elements, ENSURE that at least one replacement element and a tool is available for replacing the element where required.			

(continued)

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TABLE 6.4.3.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.4	Battery enclosure	Where vented batteries are used, INSPECT the battery enclosure for evidence of corrosion.			
1.5	Emergency warning system test	SIMULATE an alarm condition and confirm that the required warning signal(s) operate. NOTE: It is recommended that the warden intercom system is used by the floor wardens to confirm the operation of the warning signals.			

6.4.3.2 *Yearly service*

Inspection, test, routine service and survey for emergency warning systems on a yearly basis shall be carried out in accordance with Table 6.4.3.2.

TABLE 6.4.3.2
YEARLY SERVICE SCHEDULE
EMERGENCY WARNING SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly service	COMPLETE all monthly service activities, as listed in Table 6.4.3.1.			
2.2	Emergency call points	INSPECT all emergency call points for any condition that is likely to adversely affect their operation.			
2.3	Emergency call points	TEST the operation of each emergency call point.			
2.4	Visual warning devices (VWDs)	Where visual warning devices (VWDs) are used as the alarm-indicating devices, INSPECT all devices for any condition or damage that is likely to adversely affect their operation and ensure that they are clearly and correctly labelled where labelling is required.			
2.5	Visual warning devices (VWDs)	TEST the operation of each visual warning device.			
2.6	Other warning devices	Where other warning devices are used as alarm-indicating devices, INSPECT all devices to ensure that they are in place and ensure that they are clearly and correctly labelled where labelling is required.			
2.7	Other warning devices	TEST for correct operation.			
2.8	As-installed drawings	INSPECT the as-installed drawings to ensure the plan is legible and current.			
2.9	Warning system initiation	SIMULATE an alarm condition via the fire system with the warning system in automatic mode.			
2.10	Fault	SIMULATE a speaker circuit fault, emergency call point circuit fault and visual warning device circuit fault for each circuit and confirm the fault condition is indicated at the emergency warning panel (EWP), FIP and any corresponding SIP.			

(continued)

TABLE 6.4.3.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.11	Aural indicators	TEST or confirm the operation of the aural indicators as required.			
2.12	Panel switches and keypads	TEST the operation of each control.			
2.13	Fault	SIMULATE a fault between the fire system and the warning system and confirm the fault condition is indicated at the EWP and the FIP.			
2.14	Visual indicators	TEST the operation of each visual indicator and alphanumeric displays.			
2.15	Nominal battery capacity	MEASURE system quiescent and alarm currents. Calculate the required battery capacity and CHECK the installed battery's nominal capacity is no less than the required capacity. See Appendix F for calculating the required battery capacity.	Quiescent current I_Q.....A Alarm current I_A.....A Battery capacity.....Ah		
2.16	Ancillary controls	TEST the operation of ancillary control functions and ensure that each controlled device can be correctly initiated.			
2.17	Audibility test	TEST the Emergency warning system and check the signals are distinctly audible in all areas of the building. NOTE: In order to reduce the disturbance to occupants an acceptable means of conducting this test is to provide an audio signal other than the warning signal at a reduced sound pressure level.			
2.18	Override test	CONFIRM that the alarm signal overrides non-emergency audible signals.			
2.19	Interface and control test	CONDUCT a functional system test with other interfaced fire systems (see Appendix D) and CHECK the interface functions as required.			
2.20	Batteries	When the battery has not been replaced in the previous two years, verify the battery condition by carrying out a battery discharge test in accordance with Appendix F.	Date last replaced or; Test load current.....A Final test voltage.....V		
2.21	Survey—Change of structure	INSPECT all areas of the building to ensure that no structural changes are likely to affect evacuation zones.			
2.22	Survey—Change of occupancy or use	INSPECT all areas of the building to ensure that changes to the occupancy are not likely to affect the required performance of the system.			

6.4.3.3 Five yearly service

Inspection, test, routine service and survey for emergency warning systems on a five yearly basis shall be carried out in accordance with Table 6.4.3.3.

TABLE 6.4.3.3
FIVE YEARLY SERVICE SCHEDULE
EMERGENCY WARNING SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and yearly Service	Complete all monthly and yearly service activities, as listed in Tables 6.4.3.1 and 6.4.3.2.			
3.2	Speech intelligibility	UNDERTAKE tests to ensure intelligibility in all areas of the building where required.	Location..... Reference....CIS Recorded.....CIS		
3.3	Sound pressure level	MEASURE and record the sound pressure level from at least one reference point for each amplifier used and ensure at each recorded point the measured value is consistent with the reference sound pressure level.	Location of reference point Reference SPL.....dBA Measured test SPL.....dBA		
3.4	Emergency warning system speaker circuits	MEASURE and record the impedance of each loud speaker circuit and check that it has not changed by more than 15% from the last test nor exceeded the rated output as required for the amplifier.	Required Ω Impedance per circuit Ω		

6.4.4 Emergency intercom systems

6.4.4.1 Yearly service

Inspection, test, routine service and survey for emergency intercom systems on a yearly basis shall be carried out in accordance with Table 6.4.4.1.

TABLE 6.4.4.1
YEARLY SERVICE SCHEDULE
EMERGENCY INTERCOM SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	'Text deleted'				
1.2	Emergency intercom equipment	INSPECT the intercom panel to ensure that it is clearly visible, readily accessible and free from dust and contaminants. Where the panel is obscured by a door, check that the door is correctly labelled.			
1.3	Visual indicators	TEST the operation of visual indicators and alphanumeric displays.			
1.4	Aural indicators	TEST the operation of the aural indicators.			
1.5	Panel switches and keypads	TEST the operation of each required control (e.g. secondary emergency control panels).			
1.6	Fault	SIMULATE a WIP circuit fault condition and confirm the fault condition is indicated at the intercom panel.			

(continued)

TABLE 6.4.4.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.7	Reset	TEST the operation of the reset function.			
1.8	Warden indicator and controls	CHECK the operation of each warden indicator and controls.			
1.9	Warden intercom points (WIPs)	INSPECT all WIPs to ensure they are clearly visible and readily accessible. Where the WIP is obscured by a door, check that the door is correctly labelled.			
1.10	WIP	INSPECT all WIPs to ensure there is no mechanical damage.			
1.11	Stand-alone intercom system (battery enclosure)	Where vented batteries are used, INSPECT the battery enclosure for evidence of corrosion.			
1.12	Outgoing WIPs function test	INITIATE a call from each WIP and confirm that each WIP is indicating correctly and that clear communication is possible with the intercom panel operator.			
1.13	Incoming WIPs function test	INITIATE a call to each WIP and phone and confirm that each WIP is indicating correctly and that clear communication is possible with the intercom panel operator.			
1.14	WIPs all call address	Select the all-call address function and CHECK that the visual indicator for all WIP phones activate. CHECK that the address is heard at all WIP phones. NOTE: This test may be carried out in conjunction with a practice evacuation or ECO training.			
1.15	Stand-alone intercom system Battery capacity	MEASURE system quiescent and alarm currents. Calculate the required battery capacity and CHECK the installed battery's nominal capacity is no less than the required capacity. See Appendix F for calculating the required battery capacity.	Quiescent current I_Q.....A Alarm current I_A.....A Battery capacity.....Ah Nominal capacity.....Ah		
1.16	System interface	CONDUCT a functional test with any interfaced systems (see Appendix D).			
1.17	Stand-alone intercom system (battery condition)	When the battery has not been replaced in the previous two years, verify the battery condition by carrying out a battery discharge test in accordance with Appendix F.	Date last replaced or; Battery capacity .....Ah		
1.18	Survey—Change of structure	INSPECT building to ensure that no structural changes have occurred to change zones.			
1.19	Survey—Change of occupancy or use	INSPECT the building to ensure that no changes to occupancy have affected the required audibility of the warden call signal at the WIP.			
1.20	WIP locations	INSPECT all evacuation zones to ensure at least one WIP is installed where required.			

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SECTION 7 SPECIAL HAZARD SYSTEMS

7.1 GENERAL

This Section sets out the requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of gaseous, aerosol and open nozzle water mist special hazard fire suppression systems.

NOTE: Routine service requirements for some pre-engineered special hazard systems are covered in other standards; AS 3772 for pre-engineered systems protecting cooking equipment and AS 5062 for pre-engineered foam spray and dry chemical powder systems fitted to mobile and transportable equipment. Pre-engineered special hazards systems should be serviced in accordance with either of these specific Standards or the relevant parts of this Section where other specific standards do not exist.

Special hazard fire suppression systems that incorporate electrical detection and control systems shall be serviced in accordance with this Section and the requirements of Section 6.

This Section shall be read in conjunction with Section 1.

7.2 ROUTINE SERVICE PROCESS AND PROCEDURES

7.2.1 Routine service

All special hazard systems shall be subjected to routine service at the intervals specified in Clause 7.4.

7.2.2 Precautions

Prior to commencing any routine service, the following precautions shall be carried out:

- (a) Inform the responsible entity that service is to be carried out.
- (b) Where the system may be temporarily impaired, advise the responsible entity of the nature and expected duration of the impairment.
- (c) Advise the monitoring service provider where service activities may cause a signal to be transmitted.
NOTE: Advice may be by configuring the alarm signalling equipment into a test mode.
- (d) Disable the system to ensure that service activities cannot cause discharge of extinguishing agent.
- (e) Set the detection and alarm system in the appropriate test mode and ensure that ancillary facilities, systems and air-handling plant (including smoke exhaust and stairwell pressurization systems, evacuation warning systems, and the like), where they are not to be tested, are isolated to avoid inadvertent operation.

On completion of any testing or service, return all controls to their prior state. When any function is left impaired, disabled or is not restored to normal, it shall be recorded in the system logbook and the owner or agent shall be notified (see Clause 1.17).

NOTE: When any section of an installation is to be isolated, the responsible entity should be notified.

7.2.3 System isolation

All stored pressure container discharge valves shall be mechanically isolated prior to undertaking the tests referred to in Tables 7.4.1 to 7.4.2. This mechanical isolation may involve removing the actuator from the discharge valve or fitting a locking pin. Electrical isolation only does not satisfy this requirement.

Fixed aerosol fire extinguisher system actuation means shall be isolated by means of the maintenance isolate switch as defined in AS/NZS 4487 prior to undertaking the tests set out in Table 7.4.2. Where there is no maintenance isolate switch, aerosol fire extinguisher units shall be removed from the protected areas prior to testing.

7.2.4 Baseline data

A1 | Baseline data shall be in accordance with Clause 1.8.

7.2.5 Service records

Records of activities and results detailed in Clause 7.4 shall be kept in accordance with Clause 1.16.

7.2.6 Reports

Critical defects and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

7.3 FREQUENCY

The frequency of routine servicing of special hazard systems shall be in accordance with Clause 7.4 and the following:

- (a) Monthly.
- (b) Six-monthly.
- (c) Yearly.
- (d) Ten-yearly.

7.4 ROUTINE SERVICE SCHEDULES

7.4.1 General

Routine service of special hazard systems, including gaseous, aerosol and open nozzle water mist special hazard fire suppression systems shall be carried out in accordance with Tables 7.4.2 to 7.4.5.

7.4.2 Monthly service

Routine service of special hazards systems on a monthly basis shall be carried out in accordance with Table 7.4.2.

**TABLE 7.4.2
MONTHLY ROUTINE SERVICE SCHEDULE
SPECIAL HAZARD SYSTEMS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Electrical detection and control systems	Perform routine service in accordance with Section 6.			
1.2	Warning signs (printed signs and labels)	CHECK that all warning signs are readily visible and legible.			
1.3	Storage container enclosure	CHECK the storage container enclosure is accessible, adequately illuminated, ventilated and secured against unauthorized entry.			

(continued)

TABLE 7.4.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.4	Storage containers	(a) CHECK that all containers are secure, accessible, free from damage and mounted to allow free passage of air around the base. (b) CHECK each container pressure indicator and verify that any loss in pressure is not greater than 10% of the nominal charge pressure. Where there is no container pressure indicator, check that the system discharge indicator has not operated.			
1.5	Mechanical release devices	(a) CHECK that all release anti-tamper seals/pull pins are in place and secure. (b) CHECK that all release mechanisms, including gas container valves, actuators and drop weights, are undamaged, accessible and unimpeded.			
1.6	Lock-off valve (where fitted) (see Note 1)	CHECK that the lock-off valve is correctly labelled and accessible.			
1.7	Protected area	INSPECT the protected area to check that the risk has not changed (e.g. volume, fuel type, change of use).			
AEROSOL SYSTEMS—ADDITIONAL ACTIVITIES					
1.8	Aerosol generators	CHECK that all aerosol generators have not been discharged and are secure.			
1.9	Aerosol generator moisture seal	CHECK that all aerosol generator moisture seals are secure.			
WATER MIST SYSTEMS—ADDITIONAL ACTIVITIES					
1.10	Pressure regulator	CHECK for damage and correct setting.			
1.11	Pumps and water supplies	CHECK in accordance with the requirements of Section 3.			
1.12	Pumps and associated equipment	TEST operational function of pumps and associated equipment in accordance with the requirements of Section 3.			
1.13	Air compressor	Where air receivers form part of a water mist system, TEST compressor cut-in/cut-out pressures.			

NOTE: It is recommended that lock-off valves be retrofitted to gaseous fire extinguishing systems which may result in unsafe concentrations of extinguishing agent developing in occupiable areas (e.g. CO₂ systems). The installation of a lock-off valve introduces the possibility of trapping agent in the pipework. As a result, additional safety devices, including means of indicating trapped pressure, means of manually venting trapped pressure and a means of automatic pressure relief, should be installed in conjunction with the lock-off valve (see AS ISO 14520.1).

7.4.3 Six-monthly service

Routine service of special hazards systems on a six-monthly basis shall be carried out in accordance with Table 7.4.3.

**TABLE 7.4.3
SIX-MONTHLY ROUTINE SERVICE SCHEDULE
SPECIAL HAZARD SYSTEMS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Monthly Service	COMPLETE all monthly service activities as listed in Table 7.4.2.			
2.2	Electrical detection and control systems	Perform routine service in accordance with Section 6.			
2.3	Detection devices (mechanical)	CHECK all mechanical and pneumatic detection devices for any condition that is likely to adversely affect their function.			
2.4	Detection systems (mechanical), e.g. fusible links	TEST operation of automatic mechanical detection systems and confirm the alarm activates the warning system and is capable of initiating suppression system discharge.			
2.5	Pneumatic controls	CHECK the integrity of all pneumatic piping and fittings.			
2.6	Pneumatic controls	TEST to ensure correct operation of all pneumatic controls.			
2.7	Manual release systems	TEST operation of all manual release systems.			
2.8	Pipework	CHECK that all pipework, flexible connectors and manifolds are free from damage and adequately secured.			
2.9	Discharge nozzles	CHECK that all discharge nozzles (including aerosol generators) are clear and unobstructed, correctly aimed and secured.			
2.10	Lock-off valve (where fitted) (see Note 1)	TEST operation of the system lock-off valve and confirm system inoperative visual warning device operates.			
2.11	Pressure-relief devices and vent valves	CHECK that the discharge from all pressure-relief devices and vent valves does not create a hazard to personnel.			
2.12	Check valves and directional valves	CHECK that all directional valves and check valves are correctly oriented.			
2.13	Storage container contents (including expellant containers) (see Note 2)	CONFIRM by weighing, or using liquid level determination, that each storage container is correctly charged, that is, any mass loss is not greater than 5% of the nominal charge mass in the case of halocarbons, and not greater than 10% of the nominal charge mass in the case of carbon dioxide, water and nitrogen.	..... kg kg kg mm mm mm		

(continued)

TABLE 7.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
WATER MIST SYSTEMS—ADDITIONAL ACTIVITIES					
2.14	Cycling system	TEST cycling system through a complete discharge cycle.			
2.15	Pumps	Perform routine service in accordance with Section 3.			
2.16	Water valves (release/isolating and control)	Perform routine service in accordance with Section 2.			

NOTES:

- 1 It is recommended that lock-off valves be retrofitted to gaseous fire extinguishing systems, which may result in unsafe concentrations of extinguishing agent developing in occupiable areas (for example CO₂ systems). The installation of a lock-off valve introduces the possibility of trapping agent in the pipework. As a result, additional safety devices, including means of indicating trapped pressure, means of manually venting trapped pressure and a means of automatic pressure relief, should be installed in conjunction with the lock-off valve (see AS ISO 14520.1).
- 2 Cylinder contents for non-liquefied agents may be directly determined from the container pressure gauge without the need for weighing the cylinder.

7.4.4 Yearly service

Routine service of special hazards systems on a yearly basis shall be carried out in accordance with Table 7.4.4.

TABLE 7.4.4
YEARLY ROUTINE SERVICE SCHEDULE
SPECIAL HAZARD SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Monthly and six-monthly service	COMPLETE all monthly and six-monthly service activities, as listed in Tables 7.4.2 and 7.4.3.			
3.2	Electrical detection and control systems	Perform routine service in accordance with Section 6.			
3.3	Gas storage containers	Record last pressure test or inspection date of gas storage containers. Report to owner if ten-yearly pressure test or inspection will be due in the next year. See Table 7.4.5 Items 4.3 and 4.4.			
3.4	Mechanical actuator	CHECK operation and lubricate as necessary.			
3.4	Mechanical release system	CHECK operation and lubricate as necessary.			
3.5	Detection system (mechanical)	CHECK operation and lubricate as necessary.			
3.6	Detection device (mechanical)	REPLACE any detection device or sensing element that will exceed its listed service life prior to the next scheduled routine service.			

(continued)

TABLE 7.4.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.7	Detection device location	CHECK that all mechanical and pneumatic detection devices are spaced and located as required.			
3.8	Pyrotechnic actuator	REPLACE any actuator that will exceed its listed service life prior to the next scheduled routine service.			
3.9	Nozzles	CLEAN nozzles that have been subjected to the deposit of contaminants.			
3.10	Dampers	CLEAN dampers that have been subjected to the deposit of contaminants.			
3.11	Unintentional discharge	CHECK for any condition that could cause inadvertent discharge of the extinguishing agent.			
3.12	Type of hazard	VERIFY fuel class and type.			
3.13	Enclosure volume (total flooding systems)	VERIFY volumes (gross and net).			
3.14	Design concentration or application density	VERIFY design concentration or application density.			
3.15	Dimensions of protected objects (local application systems)	VERIFY dimensions.			
3.16	Enclosure integrity (total flooding systems)	COMPLETE an enclosure integrity test for total flooding systems in accordance with AS ISO 14520.1 for gaseous systems, and CONFIRM that the results satisfy the requirements. NOTE: Where an integrity test cannot be conducted due to factors such as physical dimensional constraints, or large unclosable openings, confirm enclosure integrity by visual inspection.	Equivalent leakage area .....m ² Retention time .....min (gaseous systems only)		
3.17	Pressure-relief vent (where fitted)	TEST and record the pressure at which pressure-relief vent operates. Pa			
3.18	Adjacent areas	INSPECT all areas adjacent to the protected area to ensure that migration of extinguishing agent does not create a hazard to personnel.			
3.19	Ventilation dampers	Test operation of automatically operated ventilation dampers.			
3.20		NOTE: For special hazard system interfaces with HVAC systems, see Clause 1.12 and Section 13.			
3.21	Post-discharge ventilation	TEST the operation of the post-discharge ventilation system.			

(continued)

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TABLE 7.4.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.22	Directional valves	SIMULATE a system operation and confirm that directional valves operate as required.			
3.23	System interface test (see Clause 1.12)	(a) CONDUCT a functional system test with other interfaced fire systems (e.g. HVAC, EWS).			
		(b) VERIFY that the interface functions as required. NOTE: It is recommended that the responsible entity coordinate testing the interfaced fire protection systems.			
AEROSOL SYSTEMS—ADDITIONAL ACTIVITIES					
3.24	Aerosol generators	REPLACE any generator that will exceed its listed service life prior to the next scheduled routine service.			
WATER MIST SYSTEMS—ADDITIONAL ACTIVITIES					
3.25	Water supply	CONDUCT a full flow test to verify pressure and flow of water supply in accordance with the requirements of Section 3.			
3.26	Water additives (where used)	DRAW OFF and check representative sample and confirm correct concentration of additive.			
3.27	Line strainers and filter	CHECK and clean line strainers after any system operation and yearly intervals. If condition of line strainer so indicates, also check and clean individual nozzle strainers.			
3.28	Water container	DRAIN and inspect internal condition of container. Refill including any additive if required.			

7.4.5 Ten-yearly service

Routine service of special hazards systems on a ten-yearly basis shall be carried out in accordance with Table 7.4.5.

TABLE 7.4.5
TEN-YEARLY ROUTINE SERVICE SCHEDULE
SPECIAL HAZARD SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Monthly, six-monthly and yearly service	COMPLETE all monthly, six-monthly and yearly service activities, as listed in Tables 7.4.2, 7.4.3 and 7.4.4.			
4.2	Pipework and nozzles	TEST for free and unobstructed flow from each nozzle, using a continuous flow of nitrogen or suitable alternative.			
4.3	Gas storage container (transport type e.g. cylinders)	Hydrostatically pressure TEST cylinders that have exceeded 10 years since the last test in accordance with the procedure in AS 2030.1 (see Note 1).			
4.4	Storage container (engineered pressure vessels e.g. low pressure CO ₂)	Internally inspect vessels in accordance with the procedure in AS/NZS 3788 (see Note 2).			

NOTES:

- 1 The hydrostatic test is to be completed at 10-yearly intervals. The initial hydrotest is due 10 years after the date of the first fill or, where this is not available, the date of cylinder manufacture.
- 2 The internal inspection is to be completed at 10-yearly intervals. The initial inspection is due 10 years after the date of cylinder manufacture.

SECTION 8 DELIVERY LAY FLAT FIRE HOSE

8.1 GENERAL

This Section sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of delivery lay flat fire hose manufactured in accordance with AS 2792.

Hose not manufactured to comply with AS 2792 shall be maintained in accordance with this Section, except that the maximum periodic test pressure shall be assumed to be as for Class L hose (see Item 1.4 of Table 8.4).

This Section shall be read in conjunction with Section 1.

NOTE: Delivery lay flat fire hose is generally referred to in this Standard as 'the hose' or 'a hose'.

8.2 ROUTINE SERVICE PROCESS AND PROCEDURES

8.2.1 Routine service

Hose shall be serviced at the intervals specified in Clause 8.3.

8.2.2 Baseline data

Baseline data shall be in accordance with Clause 1.8.

NOTE: 'Text deleted'

8.2.3 Defects and repairs

Hose defects shall be repaired in accordance with the hose manufacturer's instructions. Hoses that cannot be repaired, or have failed the hydrostatic pressure test (see Item 1.4 of Table 8.4), shall be condemned (see Clause 8.2.4).

Inadequately fitted couplings shall be cut from the end of the hose and refitted. Defects more than 50 mm in any direction may be cut from the hose and the couplings refitted, provided that the resultant hose is a minimum of 20 m long. Changes to hose lengths shall be recorded in the routine service records, and the corrected length shall be marked on the hose. Where a hose is used to meet the installation requirements of AS 2419.1 the minimum hose length shall be maintained to meet the requirements of AS 2419.1.

All repaired hose shall be subjected to the requirements of Clause 8.4 prior to being returned to service or storage.

8.2.4 Condemned hose

Condemned hose shall be prominently labelled as such, removed from service, and the responsible entity notified. A record of the inspection and the outcome shall be made in the service records and the service tag removed from the hose.

8.2.5 After-use procedures

After use, hose shall be subjected to the requirements of Clause 8.4 before being returned to service, or storage, as appropriate.

8.2.6 Identification

Each hose shall be fitted with a service tag complying with the requirements of Clause 1.16.4.

8.2.7 Service records

Service records of activities and results detailed in Clause 8.4 shall be kept in accordance with Clause 1.16.

8.2.8 Reports

Critical defect and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

8.3 FREQUENCY

Lay flat hose shall be serviced—

- (a) yearly;
- (b) after usage; and
- (c) when defects are suspected.

8.4 ROUTINE SERVICE SCHEDULES

Routine service of delivery lay flat hose shall be completed in accordance with Table 8.4.

TABLE 8.4
YEARLY ROUTINE SERVICE AND RECORDS SCHEDULE
DELIVERY LAY FLAT HOSE

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Hose jacket	CHECK hose when laid out, preferably straight and on a flat clean surface, for obvious defects such as cuts, abrasion, burns or contamination. NOTE: The hose should be free of dirt, abrasives and contaminants prior to inspection.			
1.2	Couplings	INSPECT hose couplings for damage or distortion to threads, lugs or gaskets.			
1.3	Storage	CHECK that the hose is stored as follows: (a) Its folds do not recur in the same position. (b) For normal industry use, on bollards or flaked. (c) Where personnel have the appropriate training, rolled on a bight, with both ends accessible, as an alternative to Action (b) above. (d) With the service tag visible and readily accessible.			
1.4	Periodic pressure test	PRESSURE TEST the hose to a hydrostatic pressure test as follows: (a) LAY the hose out straight on a flat clean surface. (b) MARK the hose/coupling joints so that any movement between the two will be obvious. (c) FASTEN the hose ends to limit movement in the event of rupture. (d) CHARGE the hose with water to a nominal pressure of 500 kPa, taking care to vent all air. (e) INCREASE the pressure gradually, over a period of not less than 20 s and not more than 2 min, until the required maximum working pressure is reached: For Class L hose—1000 kPa For Class M hose—1400 kPa For Class H hose—2100 kPa (f) SUSTAIN this working pressure for not less than 3 min while examining the hose for defects, leakage, and movement of the couplings.			
1.5	Cleaning	CLEAN dirty hose to avoid dirt, abrasives and contaminants that can seriously damage hoses. NOTE: Care should be taken not to damage the hose during cleaning. The manufacturer should be consulted in case of doubt.			

(continued)

TABLE 8.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.6	Drying	<p>DRY the wet hose prior to storage unless it is an extruded type.</p> <p>NOTE: Where the hose is dried by heating:</p> <p>(a) The hose temperature should not exceed 40°C.</p> <p>(b) The heating should be accompanied by a natural or forced air draught through the hose.</p> <p>(c) The hose should not be exposed to the drying temperature for more than 12 h.</p>			

SECTION 9 FIRE HOSE REELS

9.1 GENERAL

This Section sets out the requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire hose reels manufactured to comply with AS/NZS 1221 and installed in accordance with AS 2441 or the relevant statutory requirements.

This Section shall be read in conjunction with Section 1.

NOTE: A fire hose reel is generally referred to in this Standard as ‘a hose reel’ or ‘the hose reel’.

9.2 ROUTINE SERVICE PROCESS AND PROCEDURES

9.2.1 Routine service

A1 | Hose reels shall be serviced at the intervals specified in Clause 9.3.

9.2.2 Baseline data

A1 | Baseline data shall be in accordance with Clause 1.8.

9.2.3 Service provider labels

Any label applied to the hose reel by a service provider after servicing shall not exceed 90 mm × 50 mm in size and shall not be applied over any manufacturers’ labels or instructions, or on the service tag or label.

9.2.4 Isolation valves and backflow prevention devices

Where, for routine service purposes, a system isolation valve that can isolate flow in the hose reel water supply main is installed, it shall be restored to its open position and padlocked open, or have its operating handle removed, at the completion of or after any service. Backflow prevention devices fitted to any hose reel water supply shall be locked open.

9.2.5 Pumps

Where a pumpset is installed to supply the required water pressure to the fire hose reel system, it shall comply with AS 2941, and shall be checked for start-up and serviced in accordance with Section 3 of this Standard.

9.2.6 ‘After-use’ procedure

After the use of any hose reel, or on completion of any service routines on a hose reel, the following actions shall be taken to restore its ‘ready for use’ status:

- (a) Rewind the hose onto the reel in even layers while it is still pressurized (i.e. stop valve open, nozzle closed).
- (b) Re-engage the nozzle in the nozzle interlock, then close the stop valve (Notes 1 and 2).
- (c) De-pressurize the hose by opening the nozzle while it is directed downwards (catching spillage in a suitable container), then closing the nozzle.

NOTES:

- 1 Hose reels manufactured prior to 1989 may not be fitted with a nozzle interlock.
- 2 Automatic hose reels do not have a manual stop valve or nozzle interlock.

9.2.7 Systems interface

Where fire hose reels interface with other systems, all interface functions shall be tested in conjunction with the other systems to ensure that the interconnections to other systems function as intended.

NOTE: A typical interface diagram is shown in Figure 1.12.

9.2.8 Location records

9.2.8.1 Location

The type, size, location and identification of each fire hose reel in or on a property shall be recorded, either on a site plan or by other suitable means, clearly describing the fire hose reels and their location.

A1 | NOTE: ‘Text deleted’

9.2.8.2 Identification

All fire hose reels shall bear a permanently fixed, unique identification mark, suitable for cross-referencing within the service records. The mark shall consist of at least one of the following:

- (a) Written numbers or letters, or a combination of both.
- (b) A barcode.
- (c) A magnetic or electronic strip or similar (e.g. a smart chip).

9.2.9 Service records

Service records of activities and results detailed in Clause 9.4 shall be kept in accordance with Clause 1.16.

9.2.10 Reports

Critical defect and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

9.3 FREQUENCY

Fire hose reels shall be serviced—

- (a) six monthly; and
- (b) yearly.

9.4 ROUTINE SERVICE SCHEDULES

9.4.1 Fire hose reels—Six-monthly service

Six-monthly routine service of fire hose reels shall be completed in accordance with Table 9.4.1.

**TABLE 9.4.1
SIX-MONTHLY SERVICE SCHEDULE
FIRE HOSE REELS**

Item No	Item	Action required and pass/fail requirement
1.1	Accessibility	CHECK that the hose reel is readily accessible with no obstacles restricting its access. Where a hose reel is installed in a recess or cabinet, CHECK that the clearances around the hose reel comply with the requirements of AS 2441.
1.2	Signage	Where a location sign is required by AS 2441, CHECK that it is correctly located and visible.
1.3	Operating instructions	CHECK that the operating instructions are legible.

(continued)

TABLE 9.4.1 (continued)

Item No	Item	Action required and pass/fail requirement
1.4	Damage	CHECK for any damage or corrosion of components that could adversely affect the operation of the hose reel.
1.5	Cabinet	CHECK that any hose reel cabinet is accessible, clear of extraneous materials, clearly and correctly marked and in good repair.
1.6	Nozzle interlock	CHECK that the nozzle is retained in the nozzle interlock.
1.7*	Swing arm	Where fitted, TEST the swing arm to ensure it operates correctly and allows the hose to be run off in its intended direction.
1.8*	Unwind	With the nozzle closed and stop valve open, TEST that the hose reel can be unwound freely in its intended direction by unwinding at least 5 m of hose.
1.9*	Leakage	With the nozzle closed, pressurize the reel by opening the stop valve. DETERMINE if there are any leaks from the reels waterway, including glands, nozzle, stop valve, hose or any fittings. NOTE: In order to check that there is no leakage of water from any part of the reel waterway, it is recommended that the hose be completely unwound off the reel, so that all parts of the waterway can be examined.
1.10*	Flow	TEST water to ensure it is able to flow through the reel by opening and closing the nozzle.
1.11	Service tag or label	CHECK that the service tag or label is firmly attached to the hose reel.

*After completing these actions, the nozzle shall be re-installed in the nozzle interlock and the hose depressurized (see Clause 9.2.6).

9.4.2 Yearly service

Yearly routine service of fire hose reels shall be completed in accordance with Table 9.4.2.

TABLE 9.4.2
YEARLY SERVICE SCHEDULE
FIRE HOSE REELS

Item No.	Item	Action required and pass/fail requirement
2.1	Six monthly service	COMPLETE all six-monthly service activities, as listed in Table 9.4.1.
2.2	Anchor points	CHECK that the hose reel is securely mounted and that the anchor points are tight.
2.3	Hose guide	CHECK that any hose guide fixed to the hose reel supply pipe is not able to move upwards and cause the hose to jamb.
2.4	Hose fittings	CHECK that all hose fittings and connections are tight.
2.5	Bearings	CHECK that the hose reel bearings are not damaged or excessively worn.
2.6	Flow rate	With the stop valve and nozzle fully opened, MEASURE the water flow rate from the most disadvantaged hose reel. Minimum acceptable flow rates: (a) 0.33 L/s for reels with 19 mm hose. (b) 0.41 L/s for reels with 25 mm hose.
2.7	Hose	CHECK hose for kinking, excessive damage or wear, or collapse.
2.8	Ancillary equipment	CHECK that any foam branch pipe or other equipment is in good repair and maintained in accordance with the manufacturer's instructions.
2.9	Fire hazard	CHECK that the hose reel is appropriate protection for the fire hazard/risk.
2.10	Obstructions	CHECK that no alterations have been made to the building, which impede access to the hose reel or restrict the running out of the hose, and that the hose can reach the fire hazard/risk in accordance with AS 2441.

SECTION 10 PORTABLE AND WHEELED FIRE EXTINGUISHERS

10.1 GENERAL

This Section sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of portable and wheeled fire extinguishers, that, at the time of manufacture, complied with the contemporary edition of the relevant Standard listed in Table 10.1 or AS 4265, and were installed in accordance with AS 2444 or the relevant statutory requirement.

This Section shall be read in conjunction with Section 1.

NOTES:

- 1 For extinguishers used regularly for demonstration and training, service should be more frequent than specified due to the increased potential for wear and damage.
- 2 A portable or wheeled fire extinguisher is generally referred to in this Standard as 'an extinguisher' or 'the extinguisher'.

TABLE 10.1
AUSTRALIAN STANDARDS FOR PORTABLE
FIRE EXTINGUISHERS

Extinguisher type	Expellant method	
	Gas container	Stored pressure
Water	AS/NZS 1841.2 (AS 1841.2) (AS 1841) (AS A31.2)	AS/NZS 1841.2 (AS 1841.2) (AS 1842) (AS A31.3)
Wet chemical	—	AS/NZS 1841.3 (AS 1841.3) (AS 1842)
Foam	AS/NZS 1841.4 (AS 1841.4) (AS 1844) (AS A32.2)	AS/NZS 1841.4 (AS 1841.4) (AS 1845) (AS A32.3)
Powder	AS/NZS 1841.5 (AS 1841.5) (AS 1846) (AS A137)	AS/NZS 1841.5 (AS 1841.5) (AS 1846) (AS A137)
Carbon dioxide	—	AS/NZS 1841.6 (AS 1841.6) (AS 1847) (AS A138)
Vaporizing liquid	—	AS/NZS 1841.7 (AS 1841.7) (AS 1848) (AS A163) (see Note 2)

NOTES:

- 1 Australian Standard numbers shown in parenthesis refer to superseded Standards.
- 2 Halon 1211 and Halon 1301.

10.2 ROUTINE SERVICE PROCESS AND PROCEDURES

10.2.1 Routine service

Fire extinguishers shall be serviced at the intervals specified in Clauses 10.4.

10.2.2 Baseline data

Baseline data shall be in accordance with Clause 1.8.

NOTE: 'Text deleted'

10.2.3 Adverse operating environments

Unless protected from the effects of an adverse operating environment (see Clause 1.13), extinguishers located in such environments shall be subjected to a more comprehensive service program by conducting the five-yearly inspection, test and routine service schedules, as set out in Clause 10.4, every three years.

10.2.4 Cylinder lining

Where a cylinder lining is found to exhibit any of the following the cylinder shall be condemned:

- (a) The lining shows evidence of cracking.
- (b) The lining separates from the wall of the cylinder.
- (c) The lining displays any signs of bubbles or irregularities.

10.2.5 Water quality

In areas (see Note) where the water supply, whilst of drinking quality (potable), may be unsatisfactory for prolonged contact under pressure with water-type fire extinguisher cylinders, either specially treated cylinders shall be used, or a corrosion inhibitor shall be added to each charge in the extinguisher. Extinguishers used in these areas shall be supplied with the appropriate treatment in accordance with the extinguisher manufacturer's recommendations.

Where the water quality is in doubt, an inhibitor should be added. Failure to do so may result in rapid deterioration of the extinguisher, leading to leakage or failure to operate.

Routine service shall be undertaken more regularly where—

- (a) water quality has proved to be a problem, or is likely to be a problem;
- (b) salts are deposited in extinguishers; or
- (c) hard water is used.

NOTE: The presence of salts in water that is used to fill extinguishers can clog the pressure indicator filter, bind the actuation mechanism, inhibit the removal of the operating head or lead to the corrosion of extinguisher components. Typical areas affected by water of this type include Adelaide and Perth.

10.2.6 Corrosion

Where an extinguisher is pitted or otherwise damaged by corrosion and it cannot be determined if the damage is within the limits as detailed in AS 2337.1, then the cylinder shall be condemned.

10.2.7 Exceptions

Portable fire extinguishers designed for 'one-off' use, such as aerosol and non-rechargeable types, shall undergo all inspection and test requirements contained in Clause 10.4 except for those requiring the depressurizing of the cylinder, removal of the operating head, inspection of the contents, and inspection of the interior of the extinguisher.

10.2.8 Pressure test marking

Portable carbon dioxide type extinguishers and all wheeled extinguishers that have passed the hydrostatic pressure test (see Items 3.7 and 3.8 of Table 10.4.3) shall be marked in accordance with the requirements of AS 2030.1.

All other portable extinguishers that have passed the hydrostatic test shall have the month and year of the pressure test clearly identified on the extinguisher by one of the following means:

- (a) Permanent marking (by stamping, embossing or engraving) on the skirt or neck ring of the cylinder, provided that it is not applied to part of the pressure retaining portion of the cylinder.

- (b) Recording on a durable label affixed to the cylinder. The label shall be self-destructive when removal from the cylinder is attempted.
- (c) A plastic indicator ring retained under the valve such that it can only be installed/removed from the extinguisher by fully removing the valve from the extinguisher.

10.2.9 Service provider labels

Any label applied to the extinguisher by a service provider after servicing shall not exceed 90 mm × 50 mm in size and shall not be applied on the coloured identification band, over any manufacturer's labels or instructions, or on the service tag or label.

10.2.10 Defects

Defects, including faulty or defective components advised by public notices or manufacturers' service bulletins, shall be replaced, exchanged or repaired.

Defects that can be repaired on site shall be repaired immediately, or reported to the responsible entity (see Clause 1.17.1).

Defective extinguishers that cannot be rectified on site shall be removed from site for repair, or reported to the responsible entity (see Clause 1.17.1).

A replacement unit of the same type and size or a similar rating shall be left in place of the unit removed from site.

Extinguishers with defects that cannot be repaired shall be condemned, and labelled accordingly. The label shall have black letters, not less than 10 mm high, on a yellow background as follows:

CONDEMNED—DO NOT USE

Evidence of the service level shall not be applied to the service tag or label. The inspection and the outcome shall be entered in the service records.

Such unsuitable equipment shall be returned to the owner with a 'defective component' report and an 'action required' report.

Actions taken shall be entered in the service record.

NOTES:

- 1 The owner's permission should be obtained to destroy any extinguisher or component that is unsuitable for re-use.
- 2 The need for prompt action to recharge and return extinguishers to service, or to replace them, should be emphasized to the responsible entity.

10.2.11 Recharging agent

Recommendations and instructions for the recharging of fire extinguishers shall be included on the extinguisher label as supplied by the manufacturer. These instructions shall include the quantity and type of extinguishing agent to be used.

Where an internal inspection of the extinguisher and its components is required, but a discharge test is not specified, the extinguishing agent [with the exception of vaporizing liquid type extinguishers (see Clause 10.2.13)] may be either recovered for re-use in the extinguisher being maintained (provided that the extinguishing agent is not due for mandatory replacement), or discarded.

10.2.12 Powder mixing precautions

Mixing or cross-contamination of different types of powder (e.g. BE and ABE types) represents a hazard and danger and shall be avoided.

NOTE: When mixed, different types of powders may result in a chemical reaction producing water and carbon dioxide capable of generating sufficient pressure to rupture an extinguisher. This reaction may take weeks to become apparent.

10.2.13 Vaporizing liquid extinguishers

'Halon' type vaporizing liquid extinguishers shall not be discharged to the atmosphere and only those extinguishers that have been granted 'essential use' status may be pressure-tested and returned to service (see Note 1).

Prior to any pressure test or service work on any vaporizing liquid type extinguisher that requires the contents to be removed, the contents shall be transferred from the extinguisher to a holding container by a method of recovery approved by the authority having jurisdiction.

NOTES:

- 1 Authorities having jurisdiction have banned the possession and use of 'halon' type vaporizing liquid fire extinguishers, unless 'essential use' status has been sought and granted for nominated extinguishers of this type.
- 2 Other fire extinguishing agents that are known ozone depleting substances and/or synthetic greenhouse gases are also subject to regulation by the authorities having jurisdiction.

10.2.14 Extinguisher recharging

To ensure that adequate fire protection is available, extinguishers that have been—

- (a) found by inspection to be under-pressurized (see Item 1.8 of Table 10.4.1);
- (b) found by test to be under-charged (see Item 1.9 of Table 10.4.1); or
- (c) fully or partially discharged,

shall be recharged, as soon as practicable, in accordance with the manufacturer's instructions.

10.2.15 Location records

10.2.15.1 Location

Where there are more than 10 portable fire extinguishers located in or on a property, or where required by the authority having jurisdiction, the type, size and/or rating (see Note) and location of the extinguishers shall be recorded, either on a site plan or by other means, clearly describing the extinguishers and their location.

NOTE: Ratings for portable fire extinguishers in accordance with AS/NZS 1850 were not required before March 1980.

10.2.15.2 Identification

Extinguishers shall bear a permanently fixed, unique, identification mark, suitable for cross-referencing with the service records. The mark shall consist of at least one of the following:

- (a) Written numbers or letters, or a combination of both.
- (b) A barcode.
- (c) A magnetic or electronic strip, or similar means (e.g. a smart chip).

10.2.16 Service records

Service records of activities and results detailed in Clause 10.4 shall be kept in accordance with Clause 1.16.

10.2.17 Reports

Critical defect and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

10.3 FREQUENCY

Fire extinguishers shall be serviced—

- (a) six-monthly;
- (b) yearly; and
- (c) five-yearly.

Upon installation and after any usage, a six-monthly service shall be carried out. The starting date for five-yearly service shall be either the date of manufacture of the extinguisher or the date of last pressure test, whichever is the later. If the date of manufacture or last pressure test cannot be reliably established, a five-yearly service procedure shall be carried out on the extinguisher.

NOTE: Where an extinguisher has been discharged after the fourth year of the five-year period, a pressure test should be carried out to allow the extinguisher to begin a new five-year cycle.

10.4 ROUTINE SERVICE SCHEDULES

10.4.1 Fire extinguishers—Six-monthly service

Six-monthly routine service of portable and wheeled fire extinguishers shall be completed in accordance with Table 10.4.1.

NOTE: The following fire extinguishers are referred to as ‘All extinguisher types’ in Tables 10.4.1, 10.4.2 and 10.4.3:

- (a) Water (gas container) type.
- (b) Water (stored pressure) type.
- (c) Wet chemical type.
- (d) Foam (gas container) type.
- (e) Foam (stored pressure) type.
- (f) Powder (gas container) type.
- (g) Powder (stored pressure) type.
- (h) Carbon dioxide type.
- (i) Vaporizing liquid type.

TABLE 10.4.1
SIX-MONTHLY SERVICE SCHEDULE
FIRE EXTINGUISHERS

Item No.	Item	Action required and pass/fail requirement
1.1	Accessibility	CHECK the extinguisher is conspicuous, readily accessible and in its assigned location. <i>All extinguishers types</i>
1.2	Anti-tamper device	CHECK that the anti-tamper device is intact. <i>All extinguishers types</i>
1.3	Exterior and operating instructions	CHECK that the extinguisher is clean and the operating instructions are legible. <i>All extinguishers types</i>
1.4	Service tag or label	CHECK that the service tag or label is firmly attached to the extinguisher. <i>All extinguishers types</i>
1.5	External damage	CHECK that the extinguisher, including any attachments, is not damaged (see AS 2337.1). <i>All extinguishers types</i>
1.6	External corrosion	CHECK that the exterior of the extinguisher is not pitted or otherwise damaged by corrosion (see Clause 10.2.5 and AS 2337.1). <i>All extinguishers types</i>
1.7	Outlet hose assembly	CHECK that the hose is securely fitted, the nozzle is securely attached, the assembly is free from obstruction, and the hose shows no cracking or other signs of damage or deterioration. <i>All extinguishers types</i>
1.8	Pressure indicator	Where fitted, CHECK that the pressure indicator is legible, and registering within the operable range. <i>All extinguishers types</i>
1.9	Contents	WEIGH the extinguisher to determine that it is fully charged. <i>All extinguisher types</i>
1.10	Signage	CHECK that the location sign is visible. <i>All extinguishers types</i>
1.11	Support bracket	CHECK that the appropriate support bracket is securely attached to wall or other suitable feature. <i>All extinguishers types</i>
1.12	Discharge nozzle	CHECK that the appropriate discharge nozzle is fitted and is not blocked or damaged. <i>All extinguishers types</i>

(continued)

TABLE 10.4.1 (continued)

Item No.	Item	Action required and pass/fail requirement
1.13	Discharge nozzle and control valve	CHECK that the discharge nozzle is not blocked and that the control valve is functional. <i>All wheeled extinguishers</i>
1.14	Carriage assembly	CHECK that the carriage assembly is functional and free from corrosion. <i>All wheeled extinguishers</i>
1.15	Powder— Portable extinguishers	INVERT the extinguisher and ensure that the powder remains free flowing. <i>Powder (stored pressure), powder (gas container)</i>
1.16	Compressed gas container	DETERMINE that the compressed gas container is the correct size and type, in good condition, fully charged, and subjected to service as per AS 2030.5. <i>All gas container extinguishers</i>
1.17	Actuating device	DETERMINE, where possible and without discharging any contents, that the actuating device is free of corrosion, moves freely and is undamaged. <i>Water (stored pressure), wet chemical, foam (stored pressure), powder (stored pressure), carbon dioxide, vaporizing liquid</i>
1.18	Internal components	DETERMINE that the internal discharge tube and strainer (where fitted) provide clear passage and are securely attached. <i>Water (gas container), foam (gas container)</i>
1.19	Tyres	DETERMINE that pneumatic tyres, where fitted, are pressurized to the recommended pressure. <i>All wheeled extinguishers</i>
1.20	Wheels	LUBRICATE wheel bearings (where applicable). <i>All wheeled extinguishers</i>
1.21	Mobility	CHECK that the extinguisher moves readily on its wheels by rolling it for a distance of at least 5 m. <i>All wheeled extinguishers</i>

10.4.2 Yearly service

Yearly routine service of portable and wheeled fire extinguishers shall be completed in accordance with Table 10.4.2.

**TABLE 10.4.2
YEARLY SERVICE SCHEDULE
FIRE EXTINGUISHERS**

Item No.	Item	Action required and pass/fail requirement
2.1	Six-monthly service	COMPLETE all six-monthly service activities, as listed in Table 10.4.1.
2.2	Operating head or cap	CHECK that the threads on operating head or cap are not damaged, vent(s) is (are) not blocked, and any strainer or expansion device is unobstructed. For heads with no screw thread, determine that security locking device is undamaged and operational. <i>Water (gas container), foam (gas container), water with additive (stored pressure), foam (stored pressure), powder (gas container)</i>
2.3	Discharge	CHECK that the extinguisher functions in accordance with the operating instructions and that the discharge is satisfactory. Recharge in accordance with Item 2.8. (a) <i>Water with additive (stored pressure), foam (stored pressure)</i> (b) <i>Water with corrosion inhibitors or freezing point depressants (stored pressure)*</i> * To be discharged on a three-yearly frequency.
2.4	Actuating device	CHECK that the actuating device is free of corrosion, moves freely, and is undamaged; any cutting edge is sharp; and all sealing gaskets are in good condition. <i>Water (gas container), foam (gas container), foam (stored pressure) powder (gas container)</i>
2.5	Internal components	(a) CHECK that the internal discharge tube, strainer and anti-overfill tube (where fitted) provide clear passage and are securely attached, and that the anti-overfill device is undamaged. <i>Water with additive (stored pressure), foam (stored pressure)</i> (b) CHECK that the internal discharge tube, or the gas inlet tube or ports, provide clear passage and are correctly installed, and that the powder is free flowing. <i>Powder (gas container)</i>

(continued)

TABLE 10.4.2 (continued)

Item No.	Item	Action required and pass/fail requirement
2.6	Internal condition— Portable extinguishers	CHECK that the interior of cylinder is clean, is not pitted by corrosion (see AS 2337.1), and any internal lining is in good condition. <i>Water (gas container), water with additive (stored pressure), foam (gas container), foam (stored pressure), powder (gas container)</i>
2.7	Internal condition— Wheeled extinguishers	CHECK that the interior of cylinder is clean. <i>Water (gas container), foam (gas container), foam (stored pressure)</i>
2.8	Extinguishing agent replacement	RECHARGE the extinguisher with fresh extinguishing agent in accordance with the manufacturer's instructions. <i>Water with additive (stored pressure), foam (gas container), foam (stored pressure)</i> Upon the completion of recharging stored pressure type extinguishers, perform a leak test as per Item 2.10.
2.9	Seals	CHECK that the operating head or cap seal is in good condition. <i>Water (gas container), water with additive (stored pressure), foam (gas container), foam (stored pressure), powder (gas container)</i>
2.10	Leak detection	CHECK if there are any leaks at the joints and seals that were renewed or disturbed during recharging. <i>Water with additive (stored pressure), foam (stored pressure)</i>
2.11	Fire hazard	CHECK that the fire hazard/risk to be protected has not changed. <i>All extinguisher types</i>
2.12	Suitability	CHECK that the extinguisher is the correct type, class, size and/or rating for the hazard to be protected. <i>All extinguisher types</i>
2.13	Obstructions	(a) CHECK that no alterations have been made to the building that may impede access to the extinguisher or increase the travel distances to more than those required. <i>All portable extinguishers</i> (b) CHECK that no alterations have been made to the building that may impede access to, or restrict the movement of, the extinguisher. <i>All wheeled extinguishers</i>

10.4.3 Five-yearly service

Five-yearly routine service of portable and wheeled fire extinguishers shall be completed in accordance with Table 10.4.3.

**TABLE 10.4.3
FIVE-YEARLY SERVICE SCHEDULE
FIRE EXTINGUISHERS**

Item No.	Item	Action required and pass/fail requirement
3.1	Six-monthly and yearly service	COMPLETE all six-monthly and yearly service activities, as listed in Table 10.4.1 and 10.4.2.
3.2	Discharge	CHECK that the extinguisher functions in accordance with the operating instructions and that the discharge is satisfactory. Recharge in accordance with Item 3.9. <i>Water (gas container), water (stored pressure), wet chemical, foam (gas container), powder (gas container), powder (stored pressure), carbon dioxide, vaporizing liquid</i>
3.3	Actuating device	CHECK that the actuating device is free of corrosion, moves freely, and is undamaged; any cutting edge is sharp; and all sealing gaskets are in good condition. <i>Water (stored pressure), wet chemical, powder (stored pressure), carbon dioxide, vaporizing liquid</i>
3.4	Internal components	(a) CHECK that the internal discharge tube, strainer and anti-overfill tube (where fitted) provide clear passage and are securely attached, and that the anti overfill device is undamaged. <i>Water (stored pressure), wet chemical</i> (b) CHECK that the internal discharge tube provides clear passage, is securely attached, and there is no evidence of moisture or foreign matter in the cylinder. <i>Powder (stored pressure), carbon dioxide, vaporizing liquid</i>
3.5	Internal condition— Portable extinguishers	CHECK that the interior of the cylinder is clean, is not pitted by corrosion (see AS 2337.1), and any internal lining is in good condition. Where the lining cannot be removed to inspect the interior of the cylinder, the cylinder shall be accepted or rejected as per AS 2337.1. <i>Water (stored pressure), wet chemical, powder (stored pressure), vaporizing liquid.</i> For carbon dioxide extinguishers, this examination shall be in accordance with AS 2030.5, and shall be performed at a gas cylinder test station certified by a registered certifying body (see AS 2337.1).

(continued)

TABLE 10.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement
3.6	Internal condition— Wheeled extinguishers	CHECK the interior of the cylinder in accordance with the internal examination requirements of AS 2030.5 at a Gas Cylinder Test Station certified by a Registered Certifying Body (see AS 2337.1). <i>All wheeled extinguishers</i>
3.7	Seals	CHECK that the operating head or cap seal is in good condition. <i>Water (stored pressure), wet chemical, powder (stored pressure), carbon dioxide, vaporizing liquid</i>
3.8	Pressure test: Portable extinguishers	(a) SUBJECT the extinguisher body to a hydrostatic pressure test of 1.5 times the working pressure, the marked periodic test pressure, or 2 MPa, whichever is the greatest. <i>Water (gas container), water (stored pressure), wet chemical, foam (gas container), foam (stored pressure), powder (gas container), powder (stored pressure), vaporizing liquid</i>
		(b) SUBJECT the extinguisher body to a hydrostatic pressure test, in accordance with the requirements of AS 2030.5, at a Gas Cylinder Test Station certified by a Registered Certifying body (see AS 2337.1). <i>Carbon dioxide</i>
3.9	Pressure test: Wheeled extinguishers	SUBJECT the extinguisher body to a hydrostatic pressure test, in accordance with the requirements of AS 2030.5, at a Gas Cylinder Test Station certified by a Registered Certifying Body (see AS 2337.1). <i>All wheeled extinguishers</i>
3.10	Extinguishing agent replacement	At the frequency specified by the extinguishing manufacturer, RECHARGE the extinguisher with fresh extinguishing agent, as specified on the extinguisher label, in accordance with the manufacturer's instructions. <i>Wet chemical, foam (gas container with sealed foam liquid container), powder (gas container), powder (stored pressure), carbon dioxide, vaporizing liquid</i>
		Upon the completion of recharging stored pressure type extinguishers, perform a leak test as per Item 3.12.

(continued)

TABLE 10.4.3 (continued)

Item No.	Item	Action required and pass/fail requirement
3.11	Seals and gaskets	RENEW all seals and gaskets fitted to the actuating device, operating head, or cap. <i>All extinguisher types</i>
3.12	Leak detection	CHECK if there are any leaks at the joints and seals that were renewed or disturbed during recharging. <i>Water (stored pressure), wet chemical, foam (stored pressure), powder (stored pressure), carbon dioxide, vaporizing liquid</i>
3.13	Hose Assembly	(a) SUBJECT the hose assembly to a hydrostatic pressure test of 10 MPa. <i>All CO₂ type wheeled extinguishers</i> (b) SUBJECT the hose assembly to a hydrostatic pressure test of 1.5 times the extinguisher working pressure, or 2 MPa, whichever is the greater. <i>All wheeled extinguishers (other than CO₂)</i>

SECTION 11 FIRE BLANKETS

11.1 GENERAL

This Section sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire blankets manufactured to comply with AS/NZS 3504 and installed in accordance with AS 2444.

This Section shall be read in conjunction with Section 1.

11.2 ROUTINE SERVICE PROCESS AND PROCEDURES

11.2.1 Routine service

Routine service of all fire blankets shall be carried out at the periodic intervals specified in Clause 11.3.

11.2.2 Baseline data

Baseline data shall be in accordance with Clause 1.8.

11.2.3 Installation and signage

Fire blankets are located and installed, with the appropriate location signs, in accordance with AS 2444.

11.2.4 'After use' procedures

Fire blankets shall be discarded after they have been used on a fire.

11.2.5 Service provider labels

Any service label applied to the fire blanket container by a service provider after servicing shall not exceed 90 mm × 50 mm in size and shall not be applied over any manufacturer's labels or instructions, or on the service tag or label. Labels shall not be applied to the fire blanket.

11.2.6 Identification

Fire blankets shall bear a permanently fixed, unique site identification mark, suitable for cross-referencing with the service records. The mark shall consist of at least one of the following:

- (a) Written numbers, letters or a combination of both.
- (b) A barcode.
- (c) A magnetic or electronic strip or similar (e.g. a smart chip).

11.2.7 Service records

Service records of activities and results detailed in Clause 11.4 shall be kept in accordance with Clause 1.16.

11.2.8 Reports

Yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

11.3 FREQUENCY

The frequency of routine servicing of fire blankets shall be in accordance with Clause 11.4 and the following:

- (a) At intervals not exceeding 6 months.
- (b) When defects are suspected.

11.4 ROUTINE SERVICE SCHEDULES

Routine service and survey of fire blankets on a six-monthly basis shall be carried in accordance with Table 11.4.

TABLE 11.4
SIX-MONTHLY SERVICE SCHEDULE
FIRE BLANKETS

Item No.	Item	Action required and pass/fail requirement
1.1	Accessibility	CHECK that the fire blanket is: <ul style="list-style-type: none"> (a) Conspicuous. (b) In its assigned location. (c) Readily accessible. (d) Installed in accordance with AS 2444.
1.2	Signage	CHECK that the location sign is visible and correct.
1.3	Blanket container	CHECK that the fire blanket container: <ul style="list-style-type: none"> (a) Is securely and correctly supported. (b) Is clean and free from damage. (c) Has clear and legible instructions thereon. (d) Has a service record tag/label attached.
1.4	Fire blanket	REMOVE the fire blanket from the container and check: <ul style="list-style-type: none"> (a) For any damage or contamination to the fire blanket (refer also Clause 11.2.4). (b) For unsecured or damaged hand-holding devices. (c) That the fire blanket is correctly folded. Where the fire blanket conforms to the above, REPACK the blanket into the container as recommended by the manufacturer. NOTE: It is important that fire blankets are always folded in the manner prescribed by the manufacturer in order that they can be removed from the container quickly (see AS/NZS 3504).

SECTION 12 PASSIVE FIRE AND SMOKE SYSTEMS

12.1 GENERAL

This Section sets out requirements for the routine servicing (inspection, testing and preventive maintenance) of passive fire and smoke systems comprising vertical and horizontal fire and smoke compartment barriers together with any openings, fire doors and fire shutters, or any service penetrations and control joints.

The basis of inspection, test and routine servicing of compartment integrity is to identify the respective vertical and horizontal barriers and their respective fire-resistance level (FRL) or smoke requirements and to ensure all openings or service penetrations and control joints in these barriers do not compromise the performance of the fire and smoke compartmentation.

Required passive fire and smoke systems include, but are not limited to the following:

- (a) Fire and smoke elements—vertical and horizontal—including walls, floors, ceilings, access panels and hatches (see Clause 12.4.1).
- (b) Structural fire-resistant elements—beams, columns, girders, trusses, etc. (see Clause 12.4.2).
- (c) Fire-resistant doorsets—hinged and pivoted and horizontal sliding (see Clause 12.4.3).
- (d) Smoke doors—hinged and pivoted (see Clause 12.4.4).
- (e) Fire shutters (see Clause 12.4.5).
- (f) Fire-rated glazing (see Clause 12.4.6).
- (g) Ducts and dampers (see Clause 12.4.7).

NOTE: The basis of inspection, test and routine servicing of structural elements that have passive fire protection applied is to identify any degradation to the intended performance.

For the purpose of this Section, accessibility refers to any passive fire and smoke elements that can be readily inspected without the de-construction (demolition) of any building elements. Elements that are inaccessible may be excluded from the service routine.

NOTES:

- 1 This exclusion does not apply to roof space or void inspections where an access hatch exists or areas are otherwise accessible (e.g. suspended ceilings or raised floors with removable floor tiles).
- 2 The responsible entity should consider performing an inspection of a representative sample of all non-accessible areas and elements and keep a register of all systems that have been inspected.

This Section shall be read in conjunction with Section 1.

12.2 ROUTINE SERVICE PROCESS AND PROCEDURES

12.2.1 Routine service

Passive fire and smoke systems shall be subjected to routine service in accordance with this Section.

All passive fire and smoke systems shall be inspected and tested on a yearly basis except for—

- (a) fire doors and smoke doors (on a six-monthly basis); and
- (b) sliding fire doors (on a three-monthly basis).

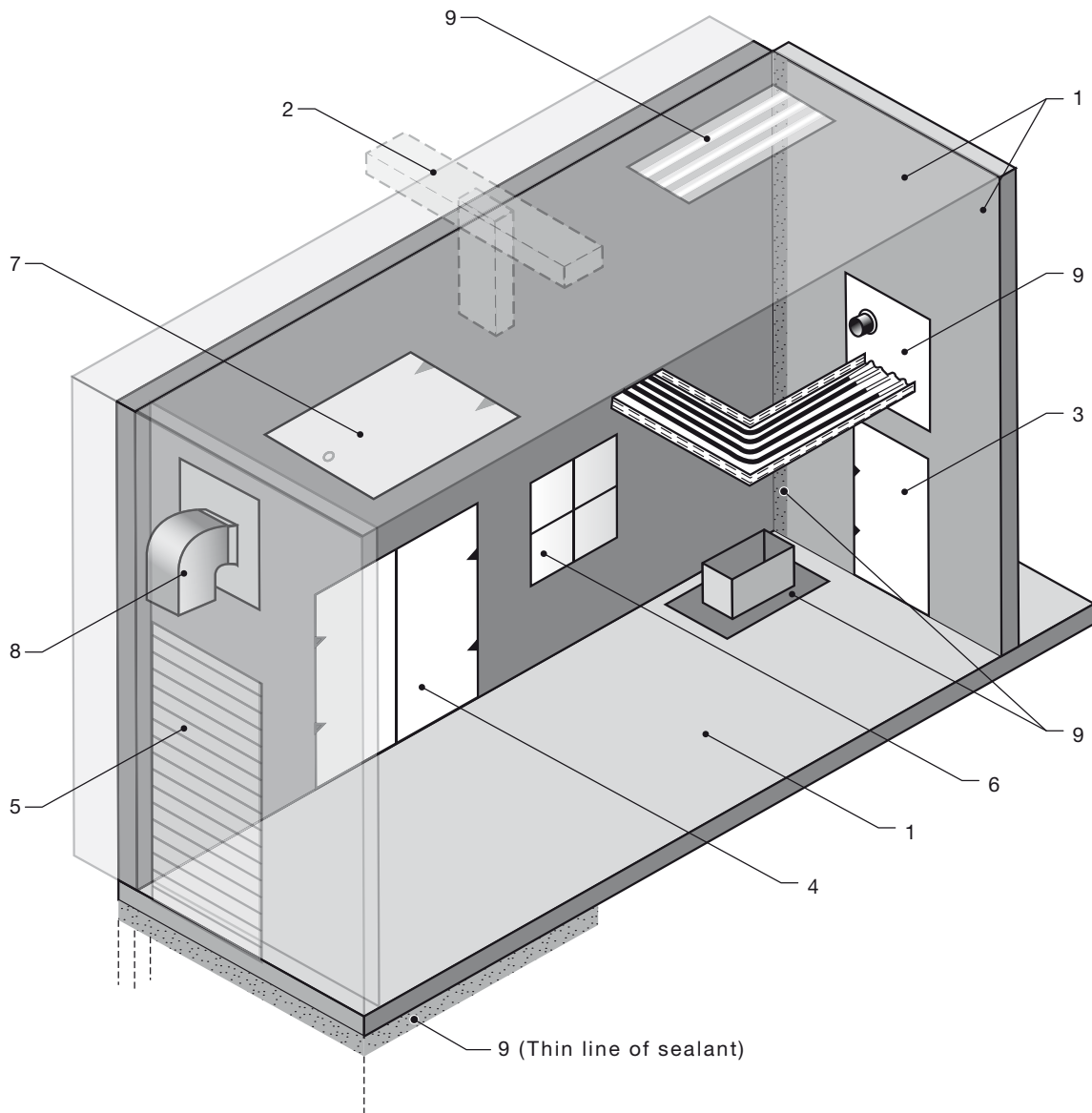
Hinged and pivoted fire-resistant door sets serving as entry doors to private residential apartments may be extended to a yearly service schedule.

12.2.2 Application

The requirements for fire rated^o ducts are included in this Section; however, fire dampers as part of a duct assembly, fire rated or otherwise, are covered in Section 13.

NOTE: The responsible entity should consider arranging random inspections of non-accessible areas.

Passive fire and smoke systems are illustrated in Figure 12.1.



LEGEND:

- 1 Fire and smoke elements
- 2 Structural fire-resistant elements—beams, columns, trusses
- 3 Fire-resistant doorsets
- 4 Smoke doors
- 5 Fire-resistant shutters
- 6 Fire-resistant glazing
- 7 Access panels and hatches
- 8 Ducts and dampers (see Clause 12.4.4 for dampers)
- 9 Fire stopping of service penetration and control joints (metal/plastic pipes, electrical cables/conduits/cable tray, construction/control joints and deflection heads)

FIGURE 12.1 EXAMPLE OF A FIRE AND SMOKE COMPARTMENT SHOWING PASSIVE FIRE AND SMOKE PROTECTION SYSTEMS

12.2.3 Adverse operating environments

Passive fire and smoke systems located in high-use and adverse operating environments shall be subjected to a more rigorous routine service program than that set out in this Section (see Clause 1.13).

NOTES:

- 1 The frequency of routine service may need to be increased to satisfy the needs of the particular building.
- 2 For the purposes of this Section, high-use may be regarded as constant use. For example, a fire door, where building occupants travel between floors or fire compartments using fire stairs or egress paths and aggressive or adverse operating environments.

12.2.4 Inspection, test, routine servicing and survey

12.2.4.1 General

Inspection, test, routine servicing and survey (as defined in Clause 1.5) of any fire and smoke system that is accessible (see Clause 12.1) shall be conducted using existing compartmentation, structural or appropriately marked general drawings and any associated schedules, which show the location of all the items and the requirements for fire and smoke.

C12.2.4.1 An inspection cannot be properly conducted without adequate documentation. The routine inspection is not a code compliance audit of the building systems.

An inspection shall be conducted to identify if any barriers or penetrations have been added, removed or modified and to determine whether there are any areas that may require repair.

12.2.4.2 Structural fire inspection

An inspection shall be conducted, using the structural drawings or appropriately marked general drawings and any associated schedules, to identify or locate all structural elements to determine whether there are any areas that may require repair to an existing fire protective covering.

NOTE: Typically, many structural elements may be inaccessible (see Clause 12.1).

12.2.5 Baseline data

Baseline data shall be in accordance with Clause 1.8.

12.2.6 Marking, labelling and schedule

'Text deleted'

Where labels are used, they shall include—

- (a) a title 'AS 1851 Service Record';
- (b) the service performed* (e.g. three-monthly, six-monthly or yearly);
- (c) date (month/year); and
- (d) equipment ID (link to summary record);

Service labels shall—

- (i) provide for year and month and unique identification;
- (ii) be manufactured from a durable adhesive material;
- (iii) have lettering, figures, and lines on the label printed in black; and
- (iv) have a continuous background colour of approximately Golden Yellow (Y15 of AS 2700).

The service label shall not carry any information other than that shown in Figure 12.2.6 and the recorded information specified in this Clause.

* Denoted by 3, 6 or 12, respectively, in the space provided.

The level or frequency of service performed shall be indelibly marked on the label in the space corresponding to the year and month in which the routine was performed.

The markings shall be such that the figures are legible.

When a new service label is provided, the label shall be applied adjacent to the completed label so that the previous service history is not obscured.

A1

NOTE: If the responsible entity and service provider agree, multiple services may be identified on a single label.

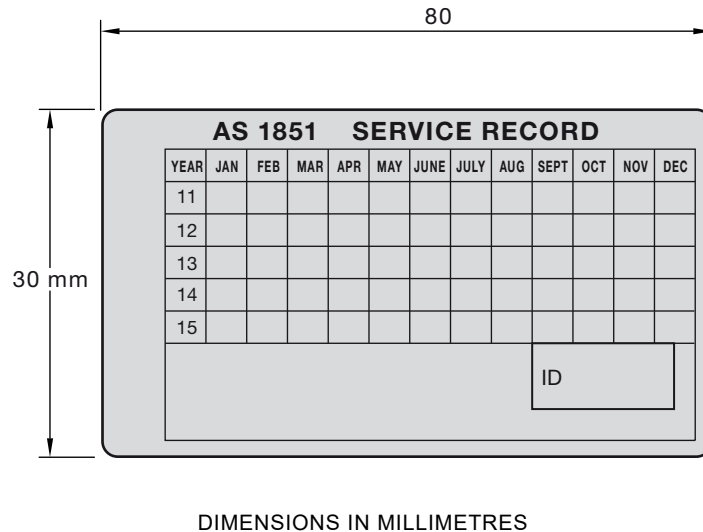


FIGURE 12.2.6 SERVICE RECORD LABEL (TYPICAL)

12.2.7 Service records

Service records of activities and results detailed in Clause 12.4 shall be kept in accordance with Clause 1.16.

12.2.8 Reports

Critical defect and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

12.3 FREQUENCY

The frequency of routine servicing of passive fire and smoke systems shall be in accordance with the following and Clause 12.4.

- (a) Three-monthly (sliding fire doors only).
- (b) Six-monthly (fire doors and smoke doors).
- (c) Yearly.

12.4 ROUTINE SERVICE SCHEDULES

12.4.1 Fire and smoke barriers—Vertical and horizontal

12.4.1.1 Walls, service penetrations and control joints

Yearly service of fire and smoke walls, including service penetrations and control joints shall be completed in accordance with Table 12.4.1.1.

TABLE 12.4.1.1
YEARLY SERVICE SCHEDULE FIRE AND SMOKE BARRIERS WALLS,
SERVICE PENETRATIONS AND CONTROL JOINTS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Wall types, locations	INSPECT against drawings (see Clause 12.2.5) that no fire and/or smoke walls have been added, removed or modified.			
1.2	Service penetration and control joint inspection	(a) INSPECT against drawings and associated penetration schedules that no penetrations have been added, removed or modified.			
		(b) CHECK that reference drawings and penetration schedules correctly represent the installed penetrations.			
		(c) IDENTIFY any penetration and control joints work that is unprotected, damaged or incorrectly installed.			
1.3	Walls, where accessible	(a) INSPECT that walls continue up to the next horizontal fire-resistant barrier or to the underside of the roof above.			
		(b) INSPECT for any damage that will cause loss of fire resistance.			

12.4.1.2 Floors, service penetrations and control joints

Yearly service of fire and smoke floors, including service penetrations and control joints shall be completed in accordance with Table 12.4.1.2.

**TABLE 12.4.1.2
YEARLY SERVICE SCHEDULE
FIRE AND SMOKE BARRIERS FLOORS, SERVICE PENETRATIONS
AND CONTROL JOINTS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Fire rated floors	INSPECT against drawings (see Clause 12.2.5) that no fire-rated floors, including resistance to incipient spread of fire, have been added, removed or modified.			
2.2	Service penetration and control joint inspection	(a) INSPECT against drawings and associated penetration schedules that no penetrations have been added, removed or modified.			
		(b) CHECK that reference drawings and penetration schedules correctly represent the installed penetrations.			
		(c) IDENTIFY any penetration and control joints work that is unprotected, damaged or incorrectly installed.			
2.3	Floors—General	INSPECT for any damage that will cause loss of fire resistance.			

12.4.1.3 Ceilings, service penetrations and control joints

Yearly service of fire and smoke ceilings, including service penetrations and control joints, shall be completed in accordance with Table 12.4.1.3.

**TABLE 12.4.1.3
YEARLY SERVICE SCHEDULE
FIRE AND SMOKE BARRIERS CEILINGS, SERVICE PENETRATIONS
AND CONTROL JOINTS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Ceiling types, locations	INSPECT against drawings (see Clause 12.2.5) that no fire-rated ceilings, including resistance to incipient spread of fire, have been added, removed or modified.			
3.2	Service penetration and control joint inspection	(a) INSPECT against drawings and associated penetration schedules that no penetrations have been added, removed or modified. NOTE: All light fittings and access panels/ceiling hatches should be inspected.			
		(b) CHECK that reference drawings and penetration schedules represent as-installed penetrations.			
		(c) IDENTIFY any penetration and control joints work that is unprotected, damaged or incorrectly installed.			

12.4.1.4 Fire and smoke rated access panels and hatches

Yearly service of fire and smoke access panels and hatches shall be completed in accordance with Table 12.4.1.4.

TABLE 12.4.1.4
YEARLY SERVICE SCHEDULE
FIRE AND SMOKE BARRIERS FIRE AND
SMOKE RATED ACCESS PANELS AND HATCHES

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Access panel	INSPECT against drawings (see Clause 12.2.5) that access panels or hatches, including resistance to incipient spread of fire, have been added, removed or modified.			
4.2	Access panel or leaf	(a) INSPECT panel to ensure it is free of any visible delamination, and other damage.			
		(b) INSPECT that the any perimeter seal is in good condition and not damaged.			
4.3	Frame	(a) INSPECT access panel frame is adequately anchored to surrounding structure.			
		(b) VERIFY that doorframe is free from excessive distortion at any point along frame sections.			
4.4	Screw-fixed panels (where applicable)	INSPECT to ensure screw fixings are all present and engaged in the frame securely.			
4.5	Hinged and/or latched panels (where applicable)	(a) INSPECT to ensure hinges are in good working order and any latches are operational.			
		(b) INSPECT no visible through-gap is created around lock/latch, and that the correct number of hinges and locks are present.			
4.6	Additions	INSPECT that any added laminates and/or hardware do not interfere with the function of the access panel.			

12.4.2 Fire-protected structural members

Yearly service of fire-protected structural members shall be completed in accordance with Table 12.4.2.

TABLE 12.4.2
YEARLY SERVICE SCHEDULE
FIRE-PROTECTED STRUCTURAL MEMBERS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Structural members	INSPECT against drawings (see Clause 12.2.5) that no structural steel members have been added, removed or modified.			
2.2	Inspection	(a) CHECK condition of fire protection system or coating.			
		(b) CHECK for mechanical damage.			
2.3	Fire-protection system or coating	(a) INSPECT visually for areas of deterioration against vermiculite, cement, mineral fibre and plaster (or combinations of) spray's loss of adhesion.			
		(b) CHECK for intumescent coating visual damage to the surface (e.g. bubbling, peeling, flaking and scratches).			
		(c) CHECK fire-protective boards and cladding for missing boards or loss of adhesion.			

12.4.3 Fire-resistant doorsets

12.4.3.1 Hinged and pivoted fire-resistant doorsets

Hinged and pivoted fire-resistant doorsets shall be inspected and subjected to a routine service test (where applicable) and survey on a six-monthly basis in accordance with Table 12.4.3.1.

NOTES:

- 1 Hinged and pivoted fire-resistant doorsets serving as entry doors to private residential apartments may be extended to a yearly service schedule.
- 2 This Clause sets out requirements based on normal conditions and, where considered appropriate, includes notes for the schedules. Variations to the schedules should be in line with the manufacturer's literature, instructions or data sheets.
- 3 A fire-resistant doorset is a system that includes the fire door leaf or leaves, all essential hardware, the frame, inbuilt features such as glazing, air transfer grilles, etc., and the connection of the frame to the compartment wall.

TABLE 12.4.3.1
SIX-MONTHLY SERVICE SCHEDULE
HINGED AND PIVOTED FIRE-RESISTANT DOORSETS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Location	INSPECT to determine if the fire-resistant doorset has been modified since the previous routine service.			
1.2	Marking—Tags and signage	(a) INSPECT door leaves and door frames are tagged in accordance with AS 1905.1.			
		(b) INSPECT to ensure relevant statutory signage has been applied and that the location of the signage is in accordance with regulatory requirements.			
1.3	Clearances in the closed position	(a) CHECK that gaps between the edge of the door leaf and the door frame are in accordance with AS 1905.1 or the relevant test report.			
		(b) CHECK that the gap between the bottom edge of the door leaf and the finished floor level is in accordance with AS 1905.1 or the relevant test report.			
1.4	Hardware general—Locksets and latches, closers and pivots, hinges and sequence selectors	(a) INSPECT all hardware required for suspension, closing and latching is fitted and is a make and model that has been fire-tested for the specific fire-resistant door.			
		(b) INSPECT all hardware is located correctly, securely attached and operational with the correct fittings in accordance with the requirements of AS 1905.1 or the relevant test report.			
		(c) INSPECT the door leaf and door frame are free from non-approved fittings, fixings or attachments and free from damage caused by relocation of hardware items.			
1.5	Frictional forces and self-closing and self-latching function	(a) VERIFY the opening and closing forces are such that the doors can be easily opened and closed in normal conditions and in fire mode, taking into account any pressurization systems within the building.			
		(b) INSPECT the doorset is self-closing and self-latching, if appropriate.			
		(c) Where passage sets or knobs are incorporated, INSPECT that the minimum clearance of 35 mm to the door stop is present.			
1.6	Door closers and pivots	(a) CHECK closers are free from oil leakages.			
		(b) INSPECT the door closer (body and arm) is free from obstruction by walls, fixtures and is operating freely throughout its swing.			
1.7	Door seals	INSPECT any installed door seals are approved for use on the proprietary door type, functioning as intended and are not damaged.			

(continued)

TABLE 12.4.3.1 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.8	Door leaves	(a) CHECK doors for any visible delamination, buckling, warping, bowing, twisting or significant damage.			
		(b) CHECK door edges are in good condition and free from any splitting or damage on all sides.			
1.9	Door frames	(a) CHECK door stop dimensions are approved for the proprietary door type and FRL.			
		(b) CHECK steel door frames are back-filled as required for the proprietary door type and FRL. NOTE: See AS 1905.1.			
		(c) CHECK door frame is free from excessive distortion at any point along frame sections.			
		(d) CHECK to ensure doorframe incorporates a door striker plate.			
		(e) CHECK condition of frame.			
1.10	Vision panels (where fitted)	(a) CHECK proprietary door type is approved for use of a vision panel.			
		(b) CHECK to ensure glass is approved for the proprietary door type, in a sound condition and free from cracks.			
		(c) CHECK to ensure perimeter trim and framing are secure and in sound condition, and all fixing screws are in place and consistent with the fire test approvals for the propriety door type.			
1.11	Fire-rated air transfer grilles or fire dampers (where fitted)	CHECK proprietary door type is approved for use with the fire-resistant air transfer grille or fire damper and is installed as per manufacturer's instructions. NOTE: Where a damper is incorporated in a fire door it is considered to be a fire-rated air transfer grille.			
1.12	Travel limiting device	Where required, VERIFY travel limiting device is installed in accordance with AS 1905.1.			
1.13	Other features	(a) INSPECT the threshold for the door leaf is free from the addition of any combustible covering since installation or previous inspection.			
		(b) INSPECT kickplates are securely fixed (where fitted).			
1.14	Meeting stiles for pairs of doors (where fitted)	INSPECT to ensure that meeting stile astragals are correct for the proprietary door type, installed as per manufacturer's instructions, are in good working order and incorporate seals where required.			
1.15	Doors held in the open position	TEST that doors held in the open position, which require activation of detection system to close, to ensure the door closes satisfactorily upon power failure or detector activation.			

12.4.3.2 Horizontal sliding doors

Horizontal sliding doors shall be inspected and subjected to a routine service test (where applicable) and survey on a three-monthly and six-monthly basis in accordance with Table 12.4.3.2.

**TABLE 12.4.3.2
THREE-MONTHLY AND SIX-MONTHLY SERVICE SCHEDULE
HORIZONTAL SLIDING DOORS FIRE-RESISTANT DOORSETS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
THREE-MONTHLY					
2.1	Frictional forces, operation and self-closing ability	SIMULATE a full operational test (mechanically and electronically) as appropriate to ensure correct automatic closing of the door is achieved. CHECK operation to ensure the door fully closes from the fully open position and from one intermediary position.			
SIX-MONTHLY					
2.2	Location	INSPECT against drawings and all schedules (see Clause 12.2.5) to ensure that no fire doors has been added, removed or modified.			
2.3	Marking—Tags and signage	(a) INSPECT door leaves and door frames (where applicable) are tagged in accordance with AS 1905.1.			
		(b) INSPECT to ensure relevant statutory signage has been applied and that the location of the signage is in accordance with regulatory requirements.			
2.4	Clearances and overlaps in the closed position	INSPECT clearances and overlaps of door panel(s) are in accordance with AS 1905.1.			
2.5	Frictional forces, operation and self-closing ability	CHECK forces to open and close door leaves do not exceed maximum 110 N for a door in the path of travel to an exit and 180 N from the closed position and 135 N through its full travel in other places.			
2.6	Restraint brackets and interlocking steel sections (flame guards)	INSPECT restraint brackets and/or interlocking steel sections are as per manufacturer's specifications, fixed adequately and functional.			
2.7	Hardware	(a) INSPECT hardware required for suspension and operation is fitted and is as per manufacturer's specifications.			
		(b) INSPECT hardware is securely attached with the correct fittings in accordance with the requirements of AS 1905.1.			
2.8	Automatic operations	(a) CHECK fusible links, where fitted, are intact and unpainted.			
		(b) CHECK pulley cables are free from fraying, kinks, excessive stretching and corrosion.			
		(c) CHECK pulleys are free to rotate.			

(continued)

TABLE 12.4.3.2 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
	Automatic operations (<i>cont</i>)	(d) REPLACE all fusible links every 25 years from the date of manufacture. NOTE: In lieu of replacing all fusible links, a representative sample may be tested as per Section 2.			
		(e) PERFORM a full operational test (mechanically and electrically) as appropriate to ensure correct automatic closing of the door is achieved.			
		(f) CHECK operation to ensure the door fully closes from one intermediary position.			
		(g) TEST operation of illuminated sliding doors, warning signs, sounders and release delays, as appropriate.			
2.9	Door guides, stops and restraints	INSPECT floor and/or track and/or wall-mounted guides and stops and all travel-limiting devices at door open and close locations are adequate and soundly mounted.			
2.10	Other fittings and accessories	(a) CHECK arrows indicating opening direction are fixed to each side of the door leaves.			
		(b) CHECK flush pulls, handles or grips are securely fixed.			
2.11	Door leaf	(a) INSPECT door leaf or leaves are free from any delamination, any other damage and all perimeter edge capping is complete and sound.			
		(b) CHECK door leaf or leaves is/are free from any non-approved fittings, fixings and attachments.			
2.12	Door frame (where applicable)	CHECK door frame is adequately anchored to the opening.			
2.13	Other features	(a) CHECK service access panels for cavity sliders are suitable and accessible.			
		(b) CHECK the sill under the door leaf is free from the addition of any combustible covering since installation or previous inspection.			
2.14	Multiple-leaf doors	In addition to the above, INSPECT overlaps or jointing of individual door leaf panels at meeting stiles are in proper alignment and comply with manufacturer's specifications.			
2.15	Wicket doors or personnel access doors	INSPECT wicket or personnel access doors operate satisfactorily in accordance with the hinged door leaf requirements, and in accordance with the manufacturer's test approval. NOTE: These doors are usually found integrated within the sliding door leaf or leaves and are typically side-hung doors.			
2.16	Power-assisted sliding doors	Power-assisted sliding doors are to be serviced in accordance with the manufacturer's maintenance procedures.			

12.4.4 Smoke doors—Hinged and pivoted

Hinged and pivoted smoke doors shall be inspected and subjected to a routine service test (where applicable) and survey on a six-monthly basis in accordance with Table 12.4.4.

TABLE 12.4.4
SIX-MONTHLY SERVICE SCHEDULE
HINGED AND PIVOTED SMOKE DOORS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Location	INSPECT against drawings and all schedules (see Clause 12.2.5) that no smoke doors have been added, removed or modified.			
4.2	Door type and signage	(a) CHECK that the smoke door complies to appropriate door design specification, is at least 35 mm thick solid core door or in accordance with the requirement of the 'building approval'.			
		(b) CHECK that doors are self closing.			
		(c) INSPECT to ensure relevant statutory signage has been applied and that the location of the signage is in accordance with regulatory requirements.			
4.3	Clearance in the closed position	(a) CHECK perimeter—gaps between the door leaf and the door frame are as per door assembly and seal manufacturers' recommendations.			
		(b) CHECK bottom—gaps between the door bottom and threshold are as per door assembly and seal manufacturers' recommendations.			
4.4	Smoke seals	(a) CHECK smoke seals are suitable for use on the door/assembly type.			
		(b) CHECK that any seal is in good condition and not damaged.			
		(c) CHECK perimeter and bottom—perimeter and door bottom seals are correctly fitted in accordance with manufacturer's recommendations and that the sealing elements are in continuous contact with the door/frame/floor.			
4.5	Meeting stiles for pairs of doors	(a) CHECK to ensure meeting stile astragals or door meeting edges incorporate smoke seals.			
		(b) CHECK seals are securely fixed.			
		(c) CHECK smoke seals do not impede the correct operation of the door.			
4.6	Doors held in the open position	TEST smoke doors held in the open position, which require activation of detection system to close, to ensure that they close satisfactorily upon power failure or detector activation.			
4.7	Hardware—General	(a) CHECK all essential hardware required for suspension, closing and latching (as appropriate) is fitted.			
		(b) CHECK all hardware is attached and is securely fixed.			

(continued)

TABLE 12.4.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.8	Frictional forces and self-closing and self-latching function	VERIFY the opening and closing forces are such that the doors can be easily opened and closed in normal conditions and in fire mode, taking into account any pressurization systems within the building.			
4.9	Door closers and pivots	(a) CHECK the door closer (body and arm) is free from obstructions by walls or fixtures and is operating freely throughout its swing.			
		(b) CHECK any closer free from oil leakages.			
		(c) CHECK screw fixing and mounting arrangements for door closer are secured to the door leaf and door frame.			
4.10	Hinges	(a) CHECK hinges are free from any undue wear and tear and are correctly aligned and operating smoothly and freely.			
		(b) CHECK hinges are securely fixed to the door leaf and frame.			
4.11	Door leaves	(a) INSPECT that door is free from any visible delamination, buckling, warping, bowing, twisting or significant damage.			
		(b) INSPECT that door edges are in good condition and free from any splitting or damage on all sides.			
4.12	Door frames	(a) CHECK door frames are adequately anchored to the walling and restrained against rotational movement about their longitudinal axes.			
		(b) CHECK door frame is free from excessive distortion at any point along frame sections.			
4.13	Glazing panels	(a) CHECK glass to ensure it is in sound condition, and free from cracks.			
		(b) CHECK perimeter trim and framing to ensure they are secure and in sound condition and that all fixings are in place.			
		(c) CHECK to ensure clear glass panels are appropriately identified.			
4.14	Kickplates	CHECK to ensure kickplates are securely fixed.			
4.15	Sequence selectors	CHECK for doors that require correct sequencing to self close and ensure the sequencing device operates correctly.			
4.16	Meeting stiles for pairs of doors	CHECK to ensure any essential meeting stile astragals are installed and in good working order and incorporate smoke seals where required.			

12.4.5 Fire shutters

Fire shutters shall be inspected and subjected to a routine service test (where applicable) and survey on a yearly basis in accordance with Table 12.4.5.

TABLE 12.4.5
YEARLY SERVICE SCHEDULE
FIRE SHUTTERS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
5.1	Location	INSPECT against drawings and all schedules (see Clause 12.2.5) that no fire shutters have been added, removed or modified.			
5.2	Marking—Tags and signage	CHECK fire shutters and frames are tagged in accordance with AS 1905.2.			
5.3	Bracket fixings and barrel assembly	(a) CHECK brackets are securely fixed to the walls.			
		(b) CHECK barrel assembly is mounted so that the rolled-up curtain on the barrel sits higher than the top level of the guide tracks.			
5.4	Guide track fixings	(a) CHECK guide tracks are securely fixed to the walls.			
		(b) CHECK guide tracks are mounted such that the curtain overlaps equally the jamb on each side of the opening.			
		(c) CHECK the gap between the end of the slats, including end clips and the guide track, is no more than 10 mm.			
		(d) CHECK that the shutter moves freely in the guide tracks without jamming under normal operation.			
5.5	Threshold	INSPECT that the threshold is of concrete or similar approved material deemed non-combustible.			
5.6	Fusible link	(a) INSPECT that the fire shutter is fitted with a fusible link (if applicable) of not greater than 80°C (57°C in the case of a drenched fire shutter) and the fusible link is in good and operational condition.			
		(b) REPLACE all fusible links every 25 years from the date of manufacture. NOTE: In lieu of replacing all fusible links, a representative sample may be tested as per Section 2.			
5.7	Operation test	(a) TEST that under simulated automatic operation the fire shutter curtain descends to the threshold at an average speed of between 0.15 m/s and 0.3 m/s.			
		(b) TEST that under simulated automatic operation the curtain does not rebound creating a gap greater than 25 mm between the bottom rail and the threshold.			
		(c) CHECK shutter slats, bottom rail and brake release mechanism, illuminated warning signs, sounders and release delays (where fitted) are free from damage and the slats are not binding on each other when opening and closing.			

12.4.6 Fire-rated glazing

Fire-rated glazing shall be inspected and subjected to a routine service, test (where applicable) and survey on a yearly basis in accordance with Table 12.4.6.

TABLE 12.4.6
YEARLY SERVICE SCHEDULE
FIRE-RATED GLAZING

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
6.1	Location	INSPECT against drawings (see Clause 12.2.5) that no fire-rated glazing has been added, removed or modified.			
6.2	Glass	(a) INSPECT for any crazing or cracking around perimeter of glass.			
		(b) INSPECT for impact crazing or cracking over entire surface area of glass.			
6.3	Frame	(a) VERIFY that frame is free from distortion at any point along the frame section.			
		(b) INSPECT frame is securely anchored and free from any visible defects or corrosion.			
		(c) INSPECT perimeter to ensure no through-gaps are visible and the frame has been fire stopped where it meets bounding construction.			
6.4	Seals	INSPECT glazing seals are present and have not deteriorated.			

12.4.7 Fire-protected air ducts

Fire-protected air ducts and dampers shall be inspected and subjected to a routine service, test (where applicable) and survey on a yearly basis in accordance with Table 12.4.7.

Fire dampers are part of the smoke management system (see Section 13).

TABLE 12.4.7
YEARLY SERVICE SCHEDULE
FIRE-PROTECTED AIR DUCTS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
7.1	Location	INSPECT against drawings and all schedules (see Clause 12.2.5) that no air duct has been added, removed or modified.			
7.2	Fire-protected duct	(a) INSPECT fire-resistant ducts from drawings, plans and schedule for condition of fire protection system or coating, including supports.			
		(b) CHECK for mechanical damage.			
7.3	Fire protection system or coating	(a) INSPECT visually for areas of deterioration, vermiculite, cement, mineral fibre and plaster (or combinations thereof) spray's loss of adhesion.			
		(b) CHECK fire protective boards and cladding for missing material or loss of adhesion.			
7.4	Damper	For damper operation refer to Section 13 of this Standard.			
7.5	Ducting	(a) Report to the owner or owner's representative or occupier where any deficiency is identified.			
		(b) Amend schedule as required to maintain accuracy.			

SECTION 13 FIRE AND SMOKE CONTROL
FEATURES OF MECHANICAL SERVICES
(SMOKE HAZARD MANAGEMENT SYSTEMS)

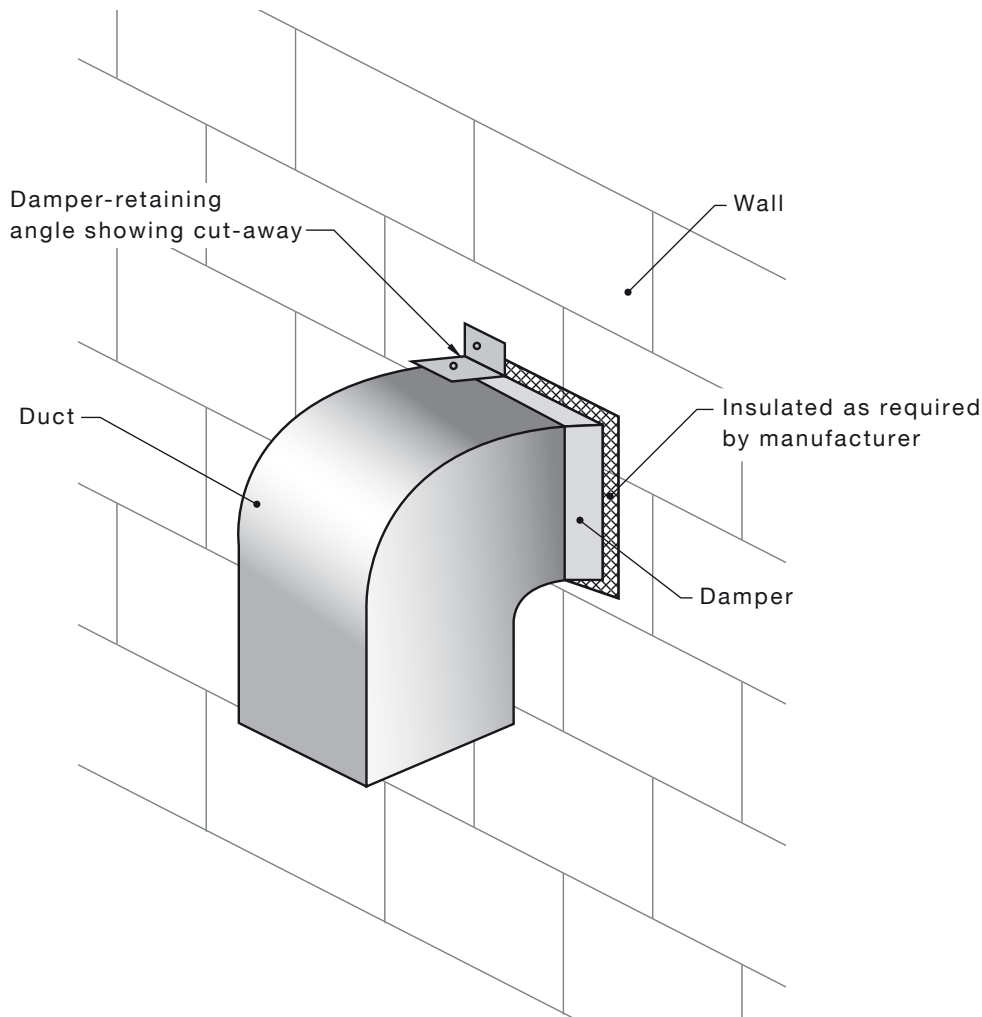
13.1 GENERAL

This Section sets out the requirements for routine service of fire and smoke control features of mechanical services in buildings covered by AS/NZS 1668.1, AS 1668.2, AS 1682.1, AS 1682.2 and AS 2665. This Section does not apply to air conditioning, mechanical ventilation or natural ventilation systems that are not required to operate in fire and smoke control mode. For systems required to shut down in fire mode, it shall be proven they shut down in accordance with Clause 13.2.

This Section shall be read in conjunction with Section 1.

Fire-rated ducts and dampers are illustrated in Figure 13.1.

NOTE: Refer to Appendix H for information relating to documentation, records, reports and skills associated with routine servicing, and to Appendix I for dual duty systems, forms for recording routine service, and explanation of functionality versus performance and use of smoke control system functionality test chart.



NOTE: See Clause 12.4.7 for fire rated ducts.

FIGURE 13.1 ENLARGED VIEW OF A TYPICAL DUCT AND DAMPER

13.2 PROCEDURES AND PRECAUTIONS

13.2.1 Application

This Section applies to the fire and smoke control features of mechanical services systems, including shutdown function. Where operation of mechanical services systems in fire mode is not specified in the approved design, the relevant requirements of this Section do not apply.

NOTE: For the application of AS 1851 (this Standard) to HVAC systems, see Table 13.2.1.

TABLE 13.2.1
APPLICATION OF AS 1851 TO HVAC SYSTEMS

HVAC System	Required fire mode operation	Application of Section 13
Exit pressurization	Run	Yes
Smoke control	Run	Yes
Smoke exhaust	Run	Yes
Air-handling	Run	Yes
	Shutdown	Clause 13.4.2.8 only
	Optional	N/A

NOTE: Smoke exhaust systems, smoke control systems and exit pressurization systems are required to be tested at least annually to demonstrate they are capable of performing to the Standard to which they were installed. In the case of the following systems, this requires measurement of parameters required by AS/NZS 1668.1 or the relevant building codes including:

- Pressurization systems—Doorway velocities, door opening forces, restoration times, etc.
- Smoke control systems—Differential pressures, etc.
- Smoke exhaust systems—Airflow rates.

13.2.2 Design and installation survey

The fire and smoke control features of all mechanical services systems shall have a design and installation survey conducted in accordance with Tables 13.4.3.1 to 13.4.3.3.

Fans that continue operating or stop in fire mode shall be included in the survey.

NOTE: The goal of this survey is to ensure that the system can perform as originally intended and that performance capability is not compromised by occupancy, building alterations or mechanical services alterations. Where an alteration has resulted in a change of the performance requirements, the system should be appraised against the modified performance requirements.

C13.2.2 *A survey is typically conducted visually from floor level, from an accessible platform, or from an accessible roof by simple observation through vent and fan discharges, and is intended to identify changes to the mechanical services system, or the building and its environment, that could affect the performance of the smoke control features of the mechanical services system.*

13.2.3 Dual duty systems

Systems or components that have dual duty operation as well as systems that have dedicated fire mode duty shall be inspected, tested and maintained to the requirements set out in Tables 13.4.1.1 and 13.4.1.2. Dual duty systems are those that operate in day-to-day mechanical services function as well as in fire modes.

NOTE: For guidance on mechanical services, see Appendix I.

13.2.4 Service records

Service records of activities and results detailed in Clause 13.4 shall be kept in accordance with Clause 1.16.

13.2.5 Reports

Critical defect and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

13.3 FREQUENCY

The frequency of inspection, testing, maintenance and survey shall be in accordance with the following:

- (a) Monthly (applies to kitchen exhausts and outdoor air intakes only).
- (b) Three-monthly.
- (c) Six-monthly.
- (d) Yearly. (Also includes 5-yearly and 25-yearly items.)

13.4 ROUTINE SERVICE SCHEDULES

13.4.1 Inspection and service

13.4.1.1 General

The fire and smoke control features of all mechanical services shall be subjected to inspection and routine service in accordance with Clauses 13.4.1 to 13.4.3, and records shall be kept as required. Records shall demonstrate evidence that the procedures in this Standard have been followed (see Clause 1.15) Routine service, where required, includes removal, repair, replacement, lubrication or adjustment, as appropriate.

NOTES:

- 1 In the case of mechanical services used for smoke control, the inspection, testing, preventive maintenance and survey work should be carried out such that inspection, preventive maintenance and surveys are applied to components or equipment, and testing is applied to whole systems.
- 2 Apart from gross failures such as broken belt drives or collapsed bearings, most of the preventive maintenance work on mechanical services depends on the skill and experience of qualified technicians recognizing, after inspection, test or survey, that repair, adjustment, etc., of components or replacement of consumables is necessary. Hence, preventive maintenance work is not specified at prescribed intervals, rather, it depends on an inspection to ascertain the condition of the plant, followed by adjustment, correction or even repair where, in the judgment of the experienced technician, such actions are necessary, and this is the intention of Tables 13.4.1.2 to 13.4.1.18. Where action is taken during inspection to successfully rectify or repair a component, then 'pass' is to be recorded in the 'Pass/fail' column and details of the action taken are to be entered in the 'Comments' column.
- 3 Routine service should be completed at the specified intervals and to the Standard required by the equipment manufacturer and scheduled in the project's operation and service manuals.

C13.4.1.1 In mechanical services, much of the work is carried out when required; hence, inspections need to be carried out prior to considering the scheduled maintenance activity. For example, belt tensioning is carried out when inspection shows it is needed, rather than regular tightening without assessment, which could do more damage than leaving the belts loose.

13.4.1.2 Fans and motors—Three-monthly

Supply, exhaust and return, pressurization, smoke exhaust or smoke spill fans used in day-to-day operation, or dedicated fire mode duty only, shall be inspected and subjected to routine service on a three-monthly basis in accordance with Table 13.4.1.2.

TABLE 13.4.1.2
THREE-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF
MECHANICAL SERVICES—FANS AND MOTORS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Obstructions	CHECK there are no physical obstructions likely to impede performance.			
1.2	Noise, overheating and vibration	CHECK motor and all bearings for noise, overheating and excessive vibration.			
1.3	Flexible connections	CHECK flexible connections, where fitted, for leaks, tearing or fraying.			
1.4	Fan belts (wear)	CHECK fan belts for wear.			
1.5	Guards and other safety features	CHECK for satisfactory condition.			
1.6	Bearings	CHECK lubrication of bearings.			
1.7	Fan belts (tension)	CHECK for correct tension.			

NOTE: Diagnostic procedures or remote monitoring are an acceptable alternative to sensory inspection such as sight, touch, hearing or smell. This alternative is particularly applicable where sensory inspection is dangerous or not practicable.

13.4.1.3 Fans and motors—Yearly

Supply, exhaust and return, pressurization, smoke exhaust or smoke spill fans used in day-to-day operation, or dedicated fire mode duty only, shall be inspected and subjected to routine service on a yearly basis in accordance with Table 13.4.1.3.

TABLE 13.4.1.3
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF
MECHANICAL SERVICES—FANS AND MOTORS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Three-monthly service	COMPLETE all three-monthly service activities (see Table 13.4.1.2.)			
2.2	Pulley wheels and couplings	CHECK pulley wheels for alignment and couplings for alignment and tightness.			
2.3	Casing guards and impeller	CHECK casing, guards and impeller for corrosion.			
2.4	Electrical	CHECK electrical connections, isolators and terminal box.			

NOTE: Diagnostic procedures or remote monitoring are an acceptable alternative to sensory inspection such as sight, touch, hearing or smell. This alternative is particularly applicable where sensory inspection is dangerous or not practicable.

13.4.1.4 Fire dampers and smoke dampers—Yearly

Fire dampers and smoke dampers, including intumescent fire dampers, shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.4.

Where a significant number of dampers fail any inspection, are unable to operate or are corroded, or are otherwise incapable of performing satisfactorily, all dampers shall be inspected within the next twelve-month period. A failure rate in excess of 10% of the 20% tested is regarded as significant.

TABLE 13.4.1.4
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
FIRE DAMPERS AND SMOKE DAMPERS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
MECHANICAL AND INTUMESCENT FIRE DAMPERS					
3.1	Obstruction— Mechanical dampers	CHECK and ensure that the fire damper is in place, open and free from obstruction (see Notes 1 and 2).			
3.2	Operation— Mechanical dampers	For mechanical fire dampers, remove or release the fusible link to ensure closure (and latching) (see Notes 1 and 2).			
3.3	Obstruction— Intumescent dampers	CHECK and ensure that the fire damper is in place, free from obstruction and is capable of operation (see Notes 1, 2, 3 and 4).			
3.4	Corrosion— Mechanical and intumescent dampers	CHECK fire dampers, including casing, retaining flanges and fusible links, for corrosion. The extent of corrosion shall not impede damper operation or prevent it remaining in place until the next inspection (5 years) (see Notes 1, 2, 3 and 5).			
3.5	Tampering and modifications— Mechanical and intumescent dampers	CHECK for signs of tampering or modifications. The responsible entity shall confirm that modifications comply with the manufacturer's requirements or a registered testing authority's confirmation of operation (see Notes 1 and 2).			
3.6	Fire-resisting construction— Mechanical and intumescent dampers	CHECK the integrity of the surrounding structure within the immediate proximity of the fire damper (see Notes 1 and 2).			
3.7	Fusible ink	REPLACE all fusible links throughout the building every 25 years from the date of manufacture. Commencing after 25 years, replace 20% per year over the 5 year routine service cycle.			
SMOKE DAMPERS					
3.8	Operation	CHECK the damper is free from obstruction and capable of operating from fully open to fully closed.			
3.9	Tip seals	CHECK tip seals for signs of damage that would adversely affect smoke leakage performance.			
3.10	Obstruction	CHECK and ensure that the smoke damper is in place free from obstruction and capable of operation (see Notes 1 and 2).			

(continued)

TABLE 13.4.1.4 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.11	Corrosion	CHECK smoke dampers and casings for corrosion, accumulation of dust, which may prevent future operation or affect the overall integrity. The extent of corrosion shall not impede damper operation or prevent it remaining in place until the next inspection (5 years) (see Notes 1, 2 and 5).			
3.12	Fail-safe operation	ENSURE damper moves to its fail-safe position on removal of power source.			
3.13	Tampering and modifications	CHECK for signs of tampering or modifications. The responsible entity shall confirm that modifications comply with the manufacturer's requirements or a registered testing authority's confirmation of operation.			

NOTES:

- Inspect 20% of the fire dampers annually so that all dampers have been inspected by the end of the fifth year. Tagging, labelling or a logbook is necessary for verification.
- Where significant numbers of dampers fail or are unable to close, inspect all dampers within the next twelve-month period. A failure rate in excess of 10% of the 20% tested is regarded as significant.
- For intumescent fire dampers, checks for obstruction and corrosion (internal and external) may be carried out by remote visual inspection, using optical viewing equipment or high-resolution cameras. These techniques may be applied to minimize access requirements for checking.
- For intumescent dampers, where testing shows obstructions will not adversely affect their performance in fire conditions, routine service in accordance with Item 3.3 should be waived by the approval authority. Such testing should consider—
 - rubbish that could burn before closure and be transmitted downstream to breach the damper's integrity;
 - accumulation of rubbish between slats, to prevent complete closure; or
 - compromising of a 'collar style' fire damper by a lump of timber or cable.
- Corrosion may adversely affect the operation of the damper or its capability to remain in the fire-resistant structure.

13.4.1.5 Air control dampers—Recycle air, relief air, smoke spill and outdoor air—Six-monthly

Air control dampers for recycle air, relief air, smoke spill and outdoor air shall be inspected and subjected to a routine service on a six-monthly basis in accordance with Table 13.4.1.5.

NOTE: These dampers are typically used in central plant smoke control systems. They have a single fire mode function, which corresponds to their failure position. For definitions of recycle air, relief air and outdoor air damper, as well as tables specifying their operation, see AS/NZS 1668.1.

TABLE 13.4.1.5

**SIX-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
AIR CONTROL DAMPERS—RECYCLE AIR, RELIEF AIR, SMOKE SPILL
AND OUTDOOR AIR**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Operation	CHECK that the damper is capable of operating from fully open to fully closed, and is clear of obstructions. Where the damper is not required to fully open or close, check that it is capable of operating between maximum and minimum positions. NOTE: Increase frequency to three-monthly if dampers are dedicated to fire mode duty only and are exposed to the corrosive effects of exterior air.			

13.4.1.6 Air control dampers—Recycle air, relief air, smoke spill and outdoor air—Yearly

Air control dampers for recycle air, relief air, smoke spill and outdoor air shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.6.

NOTE: Air control dampers are typically used in central plant smoke control systems. They have a single fire mode function, which corresponds to their failure position. For definitions of recycle air, relief air and outdoor air damper, as well as tables specifying their operation, see AS/NZS 1668.1.

TABLE 13.4.1.6
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
AIR CONTROL DAMPERS—RECYCLE AIR, RELIEF AIR, SMOKE SPILL
AND OUTDOOR AIR

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
5.1	Six-monthly service	COMPLETE all six-monthly service activities as listed in Table 13.4.1.5.			
5.2	Fire mode position	ENSURE damper(s) moves to its fire mode position upon removal of power source.			
5.3	Leakage	CHECK that there is no excessive leakage past dampers when in the closed position (only where dampers are required to close fully).			
5.4	Bearings	CHECK linkage and damper bearings.			
5.5	Corrosion	CHECK dampers for corrosion. NOTE: Corrosion may adversely affect the operation of the damper.			
5.6	Air leaks	If motors are pneumatic, CHECK for air leaks in the air lines and connections.			

13.4.1.7 Air control dampers—Supply, return and exhaust air—Six-monthly

Air control dampers for supply, return and exhaust air shall be inspected and subjected to a routine service on a six monthly basis in accordance with Table 13.4.1.7.

NOTE: Air control dampers are typically used on each floor of a Zone Pressurization System. They have dual fire mode functions as well as a failure position. For definitions of supply, return and exhaust air damper, as well as tables specifying their operation, see AS/NZS 1668.1.

TABLE 13.4.1.7

**SIX-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
AIR CONTROL DAMPERS—SUPPLY, RETURN AND EXHAUST AIR**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
6.1	Operation	CHECK that the damper is capable of operating from fully open to fully closed, and is clear of obstructions. Where the damper is not required to fully open or close, check that it is capable of operating between maximum and minimum positions. NOTE: Increase frequency to three-monthly if dampers are dedicated to fire mode duty only and are exposed to the corrosive effects of exterior air.			

13.4.1.8 Air control dampers—Supply, return and exhaust air—Yearly

Air control dampers for supply, return and exhaust air shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.8.

NOTE: Air control dampers are typically used on each floor of a Zone Pressurization System. They have dual fire mode functions as well as a failure position. For definitions of supply, return and exhaust air damper, as well as tables specifying their operation see AS/NZS 1668.1.

TABLE 13.4.1.8

**YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
AIR CONTROL DAMPERS—SUPPLY, RETURN AND EXHAUST AIR**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
7.1	Six-monthly service	COMPLETE all six-monthly service activities as listed in Table 13.4.1.7.			
7.2	Power failure position	ENSURE damper(s) moves to its required failure mode position upon removal of power source.			
7.3	Leakage	CHECK that there is no excessive leakage past dampers when in the closed position (only where dampers are required to close fully).			
7.4	Bearings	CHECK linkage and damper bearings.			
7.5	Corrosion	CHECK dampers for corrosion. NOTE: Corrosion may adversely affect the operation of the damper.			
7.6	Air leaks	If motors are pneumatic, CHECK for air leaks in the air lines and connections.			

13.4.1.9 Automatic smoke and heat vents—Six monthly

Automatic smoke and heat vents shall be inspected and subjected to a routine service on a six-monthly basis in accordance with Table 13.4.1.9.

TABLE 13.4.1.9
SIX-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
AUTOMATIC SMOKE AND HEAT VENTS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
8.1	Control panel	CHECK air supply and control panel for signs of damage.			
8.2	Power supply	CHECK power supply to control panel.			
8.3	Air filter	CHECK air filter and drain fluid.			
8.4	Air pressure	CHECK system air pressure.			
8.5	Battery	CHECK battery backup supply where power is required to operate vents.			
8.6	Battery function	CHECK operation under mains failure condition.			
8.7	Obstruction	CHECK and ensure that the vents and all components such as pulleys, hinges, latches, cables, etc. are free from obstruction and capable of operation.			

13.4.1.10 Automatic smoke and heat vents—Yearly

Automatic smoke and heat vents shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.10.

TABLE 13.4.1.10
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
AUTOMATIC SMOKE AND HEAT VENTS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
9.1	Six-monthly service	COMPLETE all six-monthly service activities as listed in Table 13.4.1.9.			
9.2	Control panel	CHECK air supply and control panel for signs of damage.			
9.3	Power supply	CHECK power supply to control panel.			
9.4	Air filter	CHECK air filter and drain fluid.			
9.5	Air pressure	CHECK system air pressure.			
9.6	Battery	CHECK battery backup supply where power is required to operate vents.			
9.7	Battery function	CHECK operation under mains failure condition			
9.8	Obstruction	CHECK and ensure that the vents and all components such as pulleys, hinges, latches, cables, etc. are free from obstruction and capable of operation.			

(continued)

TABLE 13.4.1.10 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
9.9	Vents	CHECK vents for damage, wear or corrosion.			
9.10	Drain holes and channels	CHECK drain holes and internal drain channels are clear.			
9.11	Dust covers	CHECK ram dust covers are in place.			
9.12	Operation	CHECK manual/automatic operation and operating time of system.			
9.13	Fusible links	REPLACE any fusible release links if coated with paint.			
9.14	Fusible links	REPLACE all fusible links throughout the building every 25 years from the date of manufacture.			

13.4.1.11 Fire and smoke curtains—Six-monthly

Fire curtains and smoke curtains shall be inspected and subjected to a routine service on a six-monthly basis in accordance with Table 13.4.1.11.

Fire curtains and smoke curtains shall be serviced routinely in accordance with the manufacturers' instructions but in no case less than specified in Table 13.4.1.11.

TABLE 13.4.1.11
SIX MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
FIRE CURTAINS AND SMOKE CURTAINS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
10.1	Operation	CHECK there are no physical obstructions likely to impede operation. RECORD any changes or additions to the surrounding area.			
10.2	Manual operation	CHECK manual deployment of curtain via switch at control panel.			
10.3	Curtain fabric	CHECK for damage to curtain fabric.			
10.4	Guide tracks (where fitted)	CHECK for damage and confirm the integrity of side tracks, to ensure correct operation.			
10.5	Electrical tests—Power supply unit (PSU)	(a) CHECK mains power input.			
		(b) CONFIRM correct display and LED notification.			
		(c) CHECK the battery charger outputs.			
		(d) CHECK the control voltage being supplied from the PSU to the MCU.			
		(e) CHECK the permanent d.c. power supplied from the PSU to the MCU (where applicable).			

NOTE: Curtains that deploy below 2.5 m from floor level should be checked at least monthly, to ensure that the area underneath the curtain is clear of obstructions.

13.4.1.12 Fire curtains and smoke curtains—Yearly

Fire curtains and smoke curtains shall be routinely serviced in accordance with the manufacturers' recommendations but in no case less than specified in Table 13.4.1.12.

**TABLE 13.4.1.12
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
FIRE CURTAINS AND SMOKE CURTAINS**

Item No.	Item	Action required and pass/fail requirement	Records		
11.1	Six-monthly service	COMPLETE all six-monthly service activities, as listed in Table 13.4.1.11.			
11.2	Top limit	(a) CHECK bottom bar and capping (where applied) positioning in relation to the ceiling. Adjust where necessary.			
		(b) CONFIRM that the curtain performs the soft ascent function (where fitted).			
11.3	Bottom limit	CHECK that the bottom limit position is closing to the correct position.			
11.4	Operating speed	CHECK the ascent and descent speeds. RECORD results and adjust if necessary.	Ascent.....S Descent.....S		
11.5	Automatic operation	CHECK automatic deployment of curtain via alarm signal activation.			
11.6	Fail-safe operation	CHECK gravity fail-safe or other fail-safe deployment of curtain by disconnecting all power sources to all controls.			
11.7	Battery function	REPLACE batteries that are more than two years old.	Date last replaced		
11.8	Electrical tests—Motor control card (MCC)	(a) CHECK mains power input (where applicable).			
		(b) CONFIRM correct display and LED notification.			
		(c) CHECK the transformer outputs (where applicable).			
		(d) CHECK the control voltage being supplied from the PSU to the MCC.			
		(e) CHECK the permanent d.c. power supplied from the PSU to the MCC (where applicable).			
		(f) CHECK the motor brake voltage.			
		(g) CHECK the motor drive voltage.			
		(h) CHECK the motor stall-out function (where fitted).			
11.9	Light warning (where fitted)	CHECK that the light warning unit flashes with the correct intensity when required.			
11.10	Audible warning (where fitted)	CHECK that the local audible warning system is distinctly audible in the vicinity of the curtain.			

(continued)

TABLE 13.4.1.12 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
11.11	Obstruction warning (where fitted)	CHECK that the obstruction warning system activates the appropriate warning system when the curtain is obstructed for more than the required duration.			
11.12	Split/dual drop delay (where fitted)	(a) CHECK the half drop height.			
		(b) CHECK the hold time at the half height position.			
		(c) CHECK that the curtain closes when activated by the second alarm source (dual drop only).			
11.13	Emergency retract (where fitted)	CHECK that the curtain retracts temporarily when the retract button is pressed.			
11.14	Fusible link (where fitted)	REPLACE all fusible links throughout the building every 25 years from the date of manufacture.			

13.4.1.13 *Motorized relief openings, windows and shutters—Six monthly*

Motorized relief openings, windows and shutters shall be inspected and subjected to a routine service on a six-monthly basis in accordance with Table 13.4.1.13.

TABLE 13.4.1.13

**SIX-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
MOTORIZED RELIEF OPENINGS, WINDOWS AND SHUTTERS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
12.1	Visual inspection	CHECK the control centre (and in the case of pneumatic actuators, the air supply) for signs of damage.			
12.2	Power supply	CHECK the power supply indicator is functioning.			
12.3	Air filter—Pneumatic systems	DRAIN any fluid that has accumulated in the air filter. NOTE: Solvents should not be used.			
12.4	System pressure—Pneumatic systems	CHECK system pressure against manufacturer's requirements, and RECORD. NOTE: The frequency of filter inspection and service could vary depending on usage and the quantity of supplied air. Fluid should be drained from the filter bowl before fluid reaches the filter element.			
12.5	Battery	CHECK battery backup supply where power is required to operate system.			
12.6	Battery function	CHECK operation under mains failure condition.			

(continued)

TABLE 13.4.1.13 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
12.7	Vents	(a) REMOVE any foreign matter from the blades.			
		(b) REMOVE any debris from the internal rain channel.			
		(c) CHECK that the drain holes are clear.			
		(d) CHECK the vents for signs of damage, wear and tear or corrosion.			
		(e) ENSURE cylinder ram dust covers are in place.			
12.8	Open/close switch	CHECK the manual function by operating the open/close manual switch.			
		NOTE: Closing times in excess of 20 s should be investigated.			
12.9	Air filter— Pneumatic systems	CLEAN or REPLACE the filter element. If any damage or fault is discovered, correct immediately.			

13.4.1.14 *Motorized relief openings, windows and shutters—Yearly*

Motorized relief openings, windows and shutters shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.14.

TABLE 13.4.1.14

**YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
MOTORIZED RELIEF OPENINGS, WINDOWS AND SHUTTERS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
13.1	Six-monthly service	COMPLETE all six-monthly service activities as listed in Table 13.4.1.12.			
13.2	Vents and air lines— Pneumatic systems	CHECK all vents and connecting air lines to ascertain unauthorized alterations, damage or corrosion.			
13.3	Fusible release links	If equipped, CHECK the fusible release links for type and temperature rating and replace release links that have been coated with paint or similar coatings.			
13.4	Control centres and supply lines	CHECK all control centres and supply lines for damage or deterioration.			
13.5	Operation	ENSURE all relief openings, windows and shutters operate open and close in accordance with the system requirements. (Refer Appendix I.)			
13.6	Plans	ENSURE installation plans include current information.			
13.7	Fusible release link (where fitted)	REPLACE all fusible links throughout the building every 25 years from the date of manufacture.			

13.4.1.15 Electric heaters—Duct or unit mounted—Yearly

Duct or unit-mounted electric heaters shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.15.

TABLE 13.4.1.15
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
ELECTRIC HEATERS—DUCT OR UNIT MOUNTED

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
14.1	Overheating	CHECK the outside surface of the heater casing for discolouration or any indication of overheating.			
14.2	Loose connections	CHECK for loose external connections and fittings.			
14.3	Loose insulation	CHECK for loose internal thermal insulation.			
14.4	Obstructions	CHECK the elements for obstructions and accumulation of foreign matter.			
		NOTE: A duct access panel may be installed to permit convenient inspection.			
14.5	Fan interlock	CHECK that the heater switches off upon switching off the fan.			
14.6	Airflow failure switch	CHECK operation of airflow-sensing device by simulating loss of airflow.			
14.7	Over-temperature cut-out	CHECK operation of over-temperature cut-out by simulating overheating of the heater bank.			

NOTE: Inspect 50% of the heaters annually so that all heaters have been inspected at the end of the second year. Tagging, labelling or a logbook may be necessary for verification purposes. Where a significant number of heaters require rectification, all heaters should be inspected within six months.

13.4.1.16 Kitchen exhaust systems—Monthly

Kitchen exhaust systems shall be inspected and subjected to a routine service on a monthly basis in accordance with Table 13.4.1.16.

TABLE 13.4.1.16
MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
KITCHEN EXHAUST SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
15.1	Filters	CHECK grease-arresting filters for excessive grease accumulation.			
15.2	Hood and plenum	CHECK hood and its exhaust plenum for excessive grease accumulation.			
15.3	Gutters	CHECK grease gutters for excessive grease accumulation.			
15.4	Filter (condition)	CHECK that grease-arresting filters are secured in the correct position and undamaged.			
15.5	Filter (clean)	CLEAN grease-arresting filters as required (monthly, see Note).			

NOTE: Owing to wide variations in usage, frequency of cleaning is subject to the assessment of the inspector or the requirements of the regulatory authority. In some cases, cleaning may need to be more frequent than monthly.

13.4.1.17 Kitchen exhaust systems—Yearly

Kitchen exhaust systems shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.17.

TABLE 13.4.1.17
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
KITCHEN EXHAUST SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
16.1	Monthly service	COMPLETE all monthly service activities as listed in Table 13.4.1.16.			
16.2	Hood and plenum	CLEAN hood and its exhaust plenum.			
16.3	Filter (replace)	CHECK for excessive leaks or damage to grease-arresting filters, and REPLACE as necessary.			
		NOTE: Non-metallic grease filters and other special types have to be replaced at specific time intervals whether damaged or not. In these cases, follow manufacturer's instructions.			
16.4	Duct	CHECK duct for accumulated grease and CLEAN.			

13.4.1.18 Outdoor intakes—Monthly

Outdoor intakes shall be inspected and subjected to a routine service on a monthly basis in accordance with Table 13.4.1.18.

TABLE 13.4.1.18
MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
OUTDOOR INTAKES

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
17.1	Fire hazards	REMOVE any combustible material from the vicinity of the intakes.			

NOTE: Removal of combustible material from air intakes on a monthly basis may be carried out by non-technical personnel who are aware of the fire hazards associated with this type of risk.

13.4.1.19 Outdoor intakes—Yearly

Outdoor intakes shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.19.

TABLE 13.4.1.19
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
OUTDOOR INTAKES

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
18.1	Monthly service	COMPLETE all monthly service activities as listed in Table 13.4.1.18.			
18.2	Corrosion	CHECK intake louvres for corrosion and damage.			
18.3	Insect screens	CHECK and clean insect screens, replace if damaged.			
18.4	Oil bath filters	CHECK to ensure that the oil bath or adhesive coating is as specified by the manufacturer.			
		NOTE: Oil bath filters are now obsolete in new commercial air-conditioning systems, and adhesive coated filters are uncommon; however, if such devices are still in service, the oil bath fluid or adhesive coating should be checked on an annual basis to ensure that the material is as specified by the original filter manufacturer and has a flashpoint not less than 160°C.			

13.4.1.20 Variable frequency inverters (VFIs)—Three-monthly

Variable frequency inverters (VFIs) shall be inspected and subjected to a routine service on a three-monthly basis in accordance with Table 13.4.1.20.

TABLE 13.4.1.20
THREE-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
VARIABLE FREQUENCY INVERTERS (VFIs)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
19.1	Dust and dirt	CHECK for dust and accumulated dirt on vents and circuit boards and clean where necessary. Where there is evidence of moisture, inspect on a monthly basis or replace enclosure with one having an appropriate IP rating.			
19.2	Electrical	CHECK electrical connections and tighten where necessary.			
19.3	Cooling fans	CHECK the operation of all cooling fans.			

NOTES:

- 1 VFIs may be used to power mechanical services systems that are used for dual duty or dedicated smoke control purposes. VFIs are electronic devices and are susceptible to breakdown due to dust, moisture 'tracking', corrosion, overheating and physical damage and require service to ensure reliable operation in fire mode.
- 2 Inspection and preventive maintenance on switchboards should be carried out by a relevant trade-qualified technician.

13.4.1.21 Variable frequency inverters (VFIs)—Six-monthly

Variable frequency inverters (VFIs) shall be inspected and subjected to a routine service on a six-monthly basis in accordance with Table 13.4.1.21.

TABLE 13.4.1.21
SIX-MONTHLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
VARIABLE FREQUENCY INVERTERS (VFIs)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
20.1	Three-monthly service	COMPLETE all three-monthly service activities as listed in Table 13.4.1.20.			
20.2	Damage and overheating	CHECK for evidence of damage or overheating and clean or repair where necessary.			

NOTES:

- 1 VFIs may be used to power mechanical services systems that are used for dual duty or dedicated smoke control purposes. VFIs are electronic devices and are susceptible to breakdown due to dust, moisture 'tracking', corrosion, overheating and physical damage and require service to ensure reliable operation in fire mode.
- 2 Inspection and preventive maintenance on switchboards should be carried out by a relevant trade qualified technician.

13.4.1.22 Variable frequency inverters (VFIs)—Yearly

Variable frequency inverters shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.22.

**TABLE 13.4.1.22
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
VARIABLE FREQUENCY INVERTERS (VFIs)**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
21.1	Six-monthly service	COMPLETE all six-monthly service activities, (see Table 13.4.1.21).			
21.2	Calibration	CHECK calibration and set point of all adjustable components, including customer settings and correct if necessary.			
21.3	Fire mode override	CHECK operation of fire-mode override functions and correct if necessary.			

NOTES:

- 1 VFIs may be used to power mechanical services systems that are used for dual duty or dedicated smoke control purposes. VFIs are electronic devices and are susceptible to breakdown due to dust, moisture 'tracking', corrosion, overheating and physical damage and require service to ensure reliable operation in fire mode.
- 2 Inspection and preventive maintenance on switchboards should be carried out by a relevant trade-qualified technician.

13.4.1.23 Pneumatic compressor/receiver station—Three-monthly

Pneumatic compressor/receiver stations shall be inspected and subjected to a routine service on a three-monthly basis in accordance with Table 13.4.1.23.

**TABLE 13.4.1.23
THREE-MONTHLY, ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
PNEUMATIC COMPRESSOR/RECEIVER STATION**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
22.1	Pressures	CHECK cut-in and cut-out pressures and record.			
22.2	Overheating, noise and vibration	CHECK unit for overheating, undue noise and excessive vibration.			
22.3	Crankcase oil	CHECK crankcase oil level and top up as necessary.			
22.4	Pressure-relief valves	CHECK if pressure-relief valves are operating by manually bleeding.			
22.5	Condensate drain	CHECK and clean auto condensate drain or actuate manual drain.			
22.6	Filter and breather	CHECK air intake filter and crankcase breather. Clean or replace as necessary.			
22.7	Belts	CHECK belts for wear (if belt drive); adjust tension or replace as required.			

13.4.1.24 Pneumatic compressor/receiver station—Yearly

Pneumatic compressor/receiver stations shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.24.

TABLE 13.4.1.24
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
PNEUMATIC COMPRESSOR/RECEIVER STATION

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
23.1	Three-monthly service	COMPLETE all three-monthly service activities (see Table 13.4.1.23.)			
23.1	Sump and oil	DRAIN and clean sump and replace sump oil.			
23.2	Pulley alignment	CHECK pulley alignment (if belt drive). Ensure pulleys are secure on shaft.			
23.3	Compressor bolts	CHECK compressor holding-down bolts are secure.			
23.4	Pressure vessel	CHECK and open pressure vessel; clean and operate receiver drain valves.			
23.5	Corrosion	CHECK unit for any sign of corrosion or deterioration. Treat corrosion with rust inhibitor.			
23.6	Pressure-relief valve	CHECK pressure-relief valve operation and setting, where appropriate.			
23.7	Operation	Test run the unit and CHECK for satisfactory operation. Observe the frequency of compressor operation for possible unloader malfunction.			
23.8	Electrical	CHECK electrical connections, isolators and terminal box.			

13.4.1.25 Motor control centres—Yearly

Motor control centres shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.25.

TABLE 13.4.1.25
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
MOTOR CONTROL CENTRES

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
24.1	Busbar connections	CHECK for loose busbar connections and cable terminations.			
24.2	Wiring and switches	CHECK general condition of conduits, connectors, switches and wiring for any condition likely to adversely affect their function.			
24.3	Contacts and relays	CHECK, clean or replace, as necessary, any faulty contacts or relays.			
24.4	Overload ratings	CHECK overload ratings against motor nameplate ratings.			
24.5	Fuses	CHECK circuit protectors (fuses and circuit breakers) for correct rating.			
24.6	Electrical connections	CHECK connections at motors, switchboards and equipment subject to vibration. Retighten cable terminations as necessary.			
24.7	Interpole barriers	INSPECT interpole barriers and shrouds where fitted.			
24.8	Cable insulation	CHECK and rectify any damaged or faulty exposed cable insulation.			
24.9	Switchboard	INSPECT each switchboard internally to ensure it is clean and free from rubbish.			
24.10	Panel seals	CHECK panel seals, and rectify if faulty.			
24.11	Wiring diagrams	CHECK and report where wiring diagram(s) are considered to be incorrect.			
24.12	Earthing	CHECK continuity to earth.			
24.13	Neutral current	CHECK and record neutral current.			

NOTE: Inspection and preventive maintenance on switchboards should be carried out by a relevant trade-qualified technician.

13.4.1.26 Power supplies—Main switchboards (low voltage)—Yearly

Power supplies, main switchboards (low voltage) shall be inspected and subjected to a routine service on a yearly basis in accordance with Table 13.4.1.26.

TABLE 13.4.1.26
YEARLY ROUTINE SERVICE SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
POWER SUPPLIES—MAIN SWITCHBOARDS (LOW VOLTAGE)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
25.1	Busbar connections	CHECK for loose busbar connections and cable terminations and retighten any loose connections.			
25.2	Wiring and switches	EXAMINE the general condition of conduits, connectors, switches and wiring.			
25.3	Contacts and relays	CHECK, clean or replace, as necessary, contacts or faulty relays.			
25.4	Interpole barriers	INSPECT interpole barriers and shrouds.			
25.5	Fuses	CHECK all fuses for correct rating.			
25.6	Cable insulation	CHECK and rectify, where necessary, condition of exposed cable insulation.			
25.7	Switchboard	VACUUM clean switchboard interior and remove any rubbish.			
25.8	Panel seals	CHECK panel seals, and rectify if faulty.			
25.9	Wiring diagrams	CHECK wiring diagram and report where considered to be incorrect.			
25.10	Breakers	TEST operation of main breakers (manually) with power switched off.			
25.11	Current draw	CHECK current draw on main risers and compare to rating.			
25.12	Earthing	CHECK continuity to earth.			
25.13	Neutral current	CHECK and record neutral current.			

NOTES:

- 1 In the case of high voltage switchboards, inspections may be carried out in accordance with the foregoing and the manufacturer's requirements.
- 2 Mechanical services systems used for smoke control purposes typically require significant power supplies that cannot be made available by conventional battery backup. Hence, they are dependent on reliable power supply from a grid system or a generator. In either case, this power may be supplied through the main switchboard and controlled by the motor control centre. These switchboards form part of the smoke control system, and need to be maintained to ensure reliable operation in fire mode.
- 3 Inspection and preventive maintenance on switchboards should be carried out by a relevant trade-qualified technician.
- 4 'Low voltage' as defined in AS/NZS 3000.

13.4.1.27 Fire fan control panel (FFCP) and fire indicator panel (FIP)

The fire fan control panel (FFCP) and fire indicator panel (FIP) shall be subjected to routine service in accordance with Section 6 of this Standard.

13.4.2 Test and records

13.4.2.1 General

The fire and smoke control features of all mechanical services shall be subjected to testing in accordance with Clauses 13.4.2.2 to 13.4.2.9 and records shall be kept as required. Records shall demonstrate evidence that the procedures in this Standard have been followed (see Clause 1.16).

NOTE: Some buildings may have stand-by power generation provisions that are required to operate fire and smoke control equipment and controls in the event of a normal power failure. 'Partial simulation' tests and 'Full simulation' tests should be carried out under stand-by power to verify fire mode performance. Where a system has more than one fire or smoke zone, verification of fire mode operation of the stand-by power need only be carried out for one zone, the most critical in terms of power consumption.

13.4.2.2 Fire isolated exit pressurization systems—Three-monthly

Fire-isolated exit pressurization systems shall be tested on a three-monthly basis in accordance with Table 13.4.2.2.

TABLE 13.4.2.2
THREE-MONTHLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
FIRE ISOLATED EXIT PRESSURIZATION SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Result	Pass/Fail	Comments
1.1	Simulation (from FIP)	SIMULATE by activation from FIP, the fire/smoke situation required to effect operation of the pressurization system. Check fans, dampers and indicator lamps operate in fire mode as documented. Check for excessive noise, ease of opening doors and correct movement of air from each pressurized area through a selected open door (see Appendices H and I).			
		(a) Fan operation.			
		(b) Damper operation.			
		(c) Indicator lamps.			
		(d) Noise.			
		(e) Ease of door opening.			
		(f) Air movement.			
		See Notes 1 to 5.			
1.2	Non-fire mode	SWITCH all systems back to 'normal' and check that all equipment and indicator lamps are in the correct non-fire mode (see Appendices H and I).			

NOTES:

- These routines are to ensure satisfactory ignition and operation of the exit pressurization system on operation of fire alarm. The service of equipment such as fans, motors, fire dampers and similar equipment are covered under the routines for the individual items.
- The purpose of a simulated testing routine is to check the functioning of the pressurization system and not the detectors themselves. The recommended practice in this case is to simulate activation of the system by initiating the fire alarm via the switch in the FIP.
- This test is initiated in the fire panel to verify the integrity of the interface between fire and mechanical systems.
- For the purpose of simulation in accordance with this Item (1.1), the use of elementary sensing methods is sufficient to verify functionality of fans or dampers as well as the pressurization system; for example, fan function may be verified by hearing it start or observing change in status of an indicator lamp, and pressurization systems may be assessed by the use of tell-tale ribbons in doorways, and operator's judgement of noise or door-opening force.
- In order to assess the performance of the system, it is recommended that the same door and the same measuring technique be used every time.

13.4.2.3 Fire-isolated exit pressurization systems—Yearly

Fire-isolated exit pressurization systems shall be tested on a yearly basis in accordance with Table 13.4.2.3.

TABLE 13.4.2.3
YEARLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
FIRE-ISOLATED EXIT PRESSURIZATION SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Three-monthly tests	COMPLETE all three-monthly test activities, as listed in Table 13.4.2.2.			
2.2	Simulation (from Detector)	SIMULATE a fire/smoke situation from any device such as a sprinkler, heat of smoke detector, to effect operation of the pressurization and all other systems required to operate in fire mode.			
		CHECK that the following parameters meet the performance requirements (see Appendices H and I, and Notes 1 and 2).			
		(a) Airflow velocity across all required doorways.			
		(b) The force required to open each door.			
		(c) The noise level at typical doorways and those identified as subject to the highest noise level.			
		(d) Time taken for door opening force and airflow velocity to be restored, after opening and re-closing two successive doors adjacent to the test door(s) (to be that identified as having the longest restoration time).			
		(e) When smoke is introduced to the supply smoke sensor of any air-pressurization system, the associated pressurization fan is shut down.			
		Verify re-start when smoke clears and verify that the FFCP manual override 'ON' operates while the fan has shut down due to supply smoke detection.			
		(f) Operation of the manual switch provided for fire brigade personnel starts and stops fans supplying air to the pressurized fire-isolated escape routes.			
2.3		(g) Check indicator lamps change status when fan starts or stops.			
		(h) With all air-pressurization and other systems operating simultaneously, check that any specific air relief is fully operational and enables the required airflow from pressurized areas to be sustained.			
2.4	Revert system to normal	Switch system to 'normal' and check that all equipment and indicator lamps are in the correct non-fire mode. (Refer Appendices H and I.)			

NOTES TO TABLE 13.4.2.3:

- 1 Any fans starting and stopping checks should be carried out in such a manner to avoid overheating motors due to excessively frequent starts.
- 2 The number of doors required to be tested in Item 2.2 may be reduced, provided the responsible entity has confirmed, in writing, that there have been no changes to the building structure's internal layout, partitioning and air-handling systems in the period since the last test. In such cases, a representative number of doors is to be tested. Test doors should be selected at the extremes of the system performance criteria, i.e. high noise level, high opening force and low air velocity. When testing is carried out on a representative number of doors less than the full number, the same doors should be selected and tested each time
- 3 These routines are to ensure satisfactory initiation and operation of the exit pressurization system on operation of fire alarm. The service of equipment such as fans, motors, fire dampers and similar equipment are covered under the routines for the individual items.

13.4.2.4 System changeover under fire condition—Three-monthly

System changeover under fire condition shall be tested on a three-monthly basis in accordance with Table 13.4.2.4.

TABLE 13.4.2.4
THREE-MONTHLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SYSTEM CHANGEOVER UNDER FIRE CONDITION

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Simulation (from FIP)	<p>SIMULATE by activation from FIP, the fire/smoke situation (for each system or zone where relevant), required to effect changeover from normal mode to fire mode or shutdown as appropriate. Check fans, dampers and indicator lamps operate in fire mode as documented (see Appendices H and I).</p> <p>NOTES:</p> <ol style="list-style-type: none"> 1 The purpose of a simulated testing routine is to check the functioning of the air-handling changeover system and not the detectors themselves. The recommended practice in this case is to simulate activation of the system by initiating the fire alarm via the switch in the FIP. 2 This changeover test is initiated in the fire panel to verify the integrity of the interface between fire and mechanical systems. 3 Verification of fan or damper operation may use elementary testing procedures; e.g. hearing fan start, observation of indicator lamp change of status, feeling of air movement across doorway, grille, duct, etc. 			
3.2	Revert to normal	SWITCH system back to 'normal' and check that all equipment and indicator lamps are in the correct non-fire mode (see Appendices H and I).			

13.4.2.5 System changeover under fire condition—Yearly

System changeover under fire condition shall be tested on a yearly basis in accordance with Table 13.4.2.5.

TABLE 13.4.2.5
YEARLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SYSTEM CHANGEOVER UNDER FIRE CONDITION

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
4.1	Three-monthly tests	COMPLETE all three-monthly test activities as listed in Table 13.4.2.4.			
4.2	Simulation (from Detector)	CONDUCT a simulation of a fire/smoke situation (for each system or zone where relevant) to effect changeover from normal mode to fire mode or shutdown as appropriate. CHECK fans, dampers and indicator lamps operate in fire mode (see Appendices H and I). Tests required in Items 4.4, 4.5 and 4.6 are carried out during this simulation test (see Notes 1 and 2).			
4.3	Fans start and stop at Fire fan control panel (FFCP)	OPERATE the manual switches at the FFCP. Check that fans start and stop and dampers, if applicable, open and close as documented (see Appendices H and I).			
4.4	System shutdown	Where supply air systems are fitted with a smoke detector(s), check system shuts down when the detector is automatically activated as documented (see Appendices H and I). Verify re-start when smoke clears and verify that the FFCP manual override 'ON' operates while the fan has shut down due to supply smoke detection.			
4.5	Zone smoke control	CHECK zone smoke control system performance criteria as documented (see Appendices H and I).	Record all differential pressures on a separate sheet		
4.6	Fire curtains and smoke curtains	CHECK to ensure that the integrity and leakage performance are not compromised by operation of the mechanical systems in fire mode.			

NOTES:

- The purpose of an automatic testing routine is to check the functioning of the air-handling changeover system by the activation of a field device (detector or sprinkler). The recommended practice in this case is bringing a heat, flame or smoke source to a detector or operating a sprinkler valve to activate flow/pressure switches.
- This changeover test is initiated in the field device to verify the end-to-end integrity of the interface between field device and mechanical systems (see Clause 1.12).
- Arrangements should be made for the responsible entity to be notified whenever an automatic activation test is to be conducted to advise that the alarm will sound and to advise that the system may be inoperative for a certain time.
- For the purpose of this test, each compartment should be sequentially placed in fire mode.
- Where there have been no changes to the building structure, internal layout and air-handling system in the period since the last test, testing may be limited to simulating fire mode in selected compartments whose performance is at the extremes of the acceptance criteria.
- When testing is carried out on selected compartments, it is recommended that the same compartments be selected for each test.
- These routines are to ensure satisfactory changeover and operation of the air-handling installation on operation of fire alarm. The service of the equipment such as fans, motors, fire dampers and similar are covered under the routines for the individual items.

13.4.2.6 *Smoke exhaust systems—Three-monthly*

Smoke exhaust systems shall be tested on a three-monthly basis in accordance with Table 13.4.2.6.

TABLE 13.4.2.6
THREE-MONTHLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SMOKE EXHAUST SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
5.1	Simulation (from the FIP)	SIMULATE a fire/smoke situation by activation from the FIP, to effect operation of the smoke exhaust system and all other systems required to operate in fire mode. Check fans, dampers, automatic doors and indicator lamps operate in fire mode as documented (see Appendices H and I). Check for excessive noise and correct movement of air.			
5.2	Revert to normal	SWITCH all systems back to 'normal' and check that all equipment and indicator lamps are in the correct non-fire mode (see Appendices H and I).			

NOTES:

- 1 The purpose of this simulation testing routine is to check the functioning of the smoke exhaust system and not the detectors themselves. The recommended practice in this case is to initiate the fire alarm via the switch in the FIP.
- 2 This test is initiated in the fire panel to verify the integrity of the interface between fire and mechanical systems.
- 3 Verification of operation may use elementary testing procedures, e.g. hearing fan start, observation of indicator lamp change of status, etc. and the use of elementary sensing methods is sufficient to verify noise and air movement, e.g. operator's judgement of sound, telltale ribbon in doorway, etc.

13.4.2.7 *Smoke exhaust systems—Yearly*

Smoke exhaust systems shall be tested on a yearly basis in accordance with Table 13.4.2.7.

TABLE 13.4.2.7
YEARLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SMOKE EXHAUST SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
6.1	Three-monthly tests	COMPLETE all three-monthly test activities as listed in Table 13.4.2.6.			
6.2	Partial simulation	CONDUCT a simulation of a fire/smoke situation from any device such as a sprinkler, heat or smoke detector, to effect operation of the smoke exhaust system and all other systems required to operate in fire mode. Check fans, dampers, automatic doors and indicator lamps operate in fire mode as documented (see Appendices H and I).			

(continued)

TABLE 13.4.2.7 (continued)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
		CHECK: (a) Exhaust airflow rate from the space. (b) Indicator lamps change status when fan starts or stops. (c) That operation of the manual switch provided for fire brigade personnel starts and stops smoke exhaust fans. (d) The maximum noise level in the space. NOTE: In some installations maximum noise criteria may not be specified.			
6.3	Revert to normal	SWITCH all systems back to 'normal' and check that all equipment and indicator lamps are in the correct non-fire mode (see Appendices H and I).			

13.4.2.8 *System shutdown—Yearly*

Systems shutdown shall be tested on a yearly basis in accordance with Table 13.4.2.8.

TABLE 13.4.2.8

**YEARLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SYSTEM SHUTDOWN**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
7.1	Simulation (from detector)	SIMULATE a fire/smoke situation from any device such as a sprinkler, heat or smoke detector, to effect shutdown of all mechanical ventilation systems not required to operate in fire mode. CHECK all systems required to shut down are not operating (see Appendices H and I).			

13.4.2.9 *Smoke dampers—Yearly*

Smoke dampers shall be tested on a yearly basis in accordance with Table 13.4.2.9.

TABLE 13.4.2.9

**YEARLY TEST AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SMOKE DAMPERS**

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
8.1	Normal operation	ENSURE all dampers operate open and close in accordance with the system requirements (see Appendices H and I). CHECK all systems required to shut down are not operating (see Appendices H and I).			

13.4.3 Survey and records

13.4.3.1 General

The fire and smoke control features of all mechanical services systems shall be subjected to survey in accordance with Clauses 13.4.3.2 to 13.4.3.4 and records shall be kept as required. Records shall demonstrate evidence that the procedures in this Standard have been followed (see Clause 1.16).

13.4.3.2 Active fire and smoke control systems—Yearly

Active fire and smoke control systems shall have a design and installation survey carried out on a yearly and five-yearly basis in accordance with Table 13.4.3.2.

TABLE 13.4.3.2
YEARLY SURVEY AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
ACTIVE FIRE AND SMOKE CONTROL SYSTEMS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	System	CHECK for physical impediments that may impair safe operation of smoke control systems comprising exit pressurization systems, smoke exhaust systems, changeover systems and system shutdown.			
1.2	Alterations	CHECK to ensure mechanical services additions and removals, building work, or unintentional obstructions have not affected the functionality or performance of the original design.			

13.4.3.3 Motorized relief openings (windows and shutters)—Yearly

Motorized relief openings (windows and shutters) shall have a design and installation survey carried out on a yearly basis in accordance with Table 13.4.3.3.

TABLE 13.4.3.3
YEARLY SURVEY AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
MOTORIZED RELIEF OPENINGS (WINDOWS AND SHUTTERS)

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Draught curtains— Frames forming roof compartments	CHECK draught curtain areas to ensure there have not been any major alterations or additions that could inhibit their function. CHECK inlet openings to ensure there have not been any major structural alterations that could inhibit their function.			
2.2	Inlet openings	CHECK inlet openings to ensure there have not been any major structural alterations that could inhibit their function.			

13.4.3.4 *Smoke reservoirs—Yearly*

Smoke reservoirs shall have a design and installation survey carried out on a yearly basis in accordance with Table 13.4.3.4.

TABLE 13.4.3.4
YEARLY SURVEY AND RECORDS SCHEDULE
FIRE AND SMOKE CONTROL FEATURES OF MECHANICAL SERVICES
SMOKE RESERVOIRS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
3.1	Changes	CHECK to ensure that changes to the smoke reservoirs have not been made, such as the addition of light fittings or openings created, which would otherwise compromise the integrity of the system.			

SECTION 14 EMERGENCY PLANNING IN FACILITIES

14.1 GENERAL

This Section sets out requirements for the inspection and test of the emergency plan and associated elements developed in accordance with AS 3745, for the controlled evacuation of facilities such as buildings, structures and workplaces.

NOTE: Other emergency evacuation services and procedures are covered in Appendix J.

This Section shall be read in conjunction with Section 1.

14.2 ROUTINE SERVICE PROCESS AND PROCEDURES

14.2.1 Routine service

The emergency plan and associated elements shall be inspected and tested at the specified periodic intervals and maintained to the requirements specified in this Section.

14.2.2 Service records

Service records of activities and results detailed in Clause 14.4 shall be kept in accordance with Clause 1.16.

14.2.3 Reports

Critical defects and yearly condition reports shall be prepared and distributed in accordance with Clause 1.17.

14.2.4 Baseline data

Baseline data shall be in accordance with Clause 1.8.

NOTE: 'Text deleted'

14.2.5 Prior arrangements

Prior to testing the emergency evacuation systems, the emergency control organization shall be advised.

14.3 FREQUENCY

For the purpose of this Section, the following frequencies shall apply:

- (a) Six-monthly.
- (b) Yearly.

14.4 VERIFICATION OF SYSTEM ELEMENTS

14.4.1 General

Checking and test of the emergency plan and associated elements fall into one of the following two categories:

- (a) *Critical emergency evacuation system elements* Critical emergency evacuation system elements (see AS 3745) shall be verified in accordance with Clauses 14.4.2 and 14.4.3.
- (b) *Other emergency evacuation system elements and procedures*

NOTE: Guidance on other emergency evacuation system elements and procedures are set out in Appendix J.

14.4.2 Verification and records—Six-monthly

Critical emergency evacuation system elements shall be inspected and tested on a six-monthly basis in accordance with Table 14.4.2.

TABLE 14.4.2
SIX-MONTHLY INSPECTION, TEST AND RECORDS SCHEDULE
CRITICAL EMERGENCY EVACUATION SYSTEM ELEMENTS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	Emergency control organization (ECO)	INSPECT the ECO list and check for compliance with the emergency plan.			
1.2	Emergency evacuation equipment	INSPECT the emergency evacuation equipment and check for compliance with the emergency plan.			
1.3	Training	INSPECT training records and check for compliance with the emergency plan.			
1.4	Emergency control organization (ECO)	TEST the ECO for relevance to the facility by initiating an alarm and checking the response for compliance with the emergency procedures.			
1.5	Evacuation diagrams	INSPECT the emergency response diagrams for relevancy and check for compliance with the emergency plan.			
1.6	Assembly areas	INSPECT the nominated assembly area(s) and test for relevance to the facility and compliance with the emergency plan.			
1.7	Emergency response procedures	INSPECT the emergency procedures testing for relevancy to the facility or to a nominated incident covered by the emergency procedures by conducting an evacuation exercise.			

14.4.3 Verification and records—Yearly

Critical emergency evacuation system elements shall be inspected and tested on a yearly basis in accordance with Table 14.4.3.

TABLE 14.4.3
YEARLY INSPECTION, TEST AND RECORDS SCHEDULE
CRITICAL EMERGENCY EVACUATION SYSTEM ELEMENTS

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
2.1	Emergency plan	INSPECT the emergency plan and check for relevancy to the facility.			
2.2	Evacuation exercise	INSPECT evacuation exercise records and check for compliance with the emergency plan.			

APPENDIX A

REFERENCED DOCUMENTS

(Normative)

The following documents are referred to in this Standard.

AS

- 1668 The use of ventilation and airconditioning in buildings
- 1668.2 Part 2: Ventilation design for indoor air contaminant control
- 1668.3 Part 3: Smoke control systems for large single compartments or smoke reservoirs
- 1670 Fire detection, warning, control and intercom systems—System design, installation and commissioning
- 1670.1 Part 1: Fire
- 1670.4 Part 4: Sound systems and intercom systems for emergency purposes
- 1674 Safety in welding and allied processes
- 1674 Part 1: Fire precautions
- 1682 Fire Dampers
- 1682.1 Part 1: Specification
- 1682.2 Part 2: Installation
- 1905 Components for the protection of openings in fire-resistant walls
- 1905.1 Part 1: Fire-resistant doorsets
- 1905.2 Part 2: Fire-resistant roller shutters
- 2030 Gas cylinders
- 2030.1 Part 1: General requirements
- 2030.5 Part 5: Filling, inspection and testing of refillable cylinders
- 2118 Automatic fire sprinkler systems
- 2118.1 Part 1: General systems
- 2118.4 Part 4: Sprinkler protection for accommodation buildings not exceeding four storeys in height
- 2118.5 Part 5: Home fire sprinkler systems
- 2220 Emergency warning and intercommunications systems in buildings
- 2220.2 Part 2: System design, installation and commissioning (superseded Standard)
- 2304 Water storage tanks for fire protection systems
- 2337 Gas cylinder test stations
- 2337.1 Part 1: General requirements, inspections and tests—Gas cylinders
- 2419 Fire hydrant installations
- 2419.1 Part 1: System design, installation and commissioning
- 2441 Installation of fire hose reels
- 2444 Portable fire extinguishers and fire blankets—Selection and location
- 2665 Smoke/heat venting systems—Design, installation and commissioning
- 2700 Colour standards for general purposes
- 2792 Fire hose—Delivery layflat
- 2941 Fixed fire protection installations—Pumpset systems
- 3745 Planning for emergencies in facilities
- 3772 Pre-engineered fire protection systems for cooking equipment

- AS
- 4029 Stationary batteries (series)
 - 4265 Wheeled fire extinguishers
 - 5062 Fire protection for mobile and transportable equipment
- AS ISO
- 14520 Gaseous fire-extinguishing systems—Physical properties and system design
 - 14520.1 Part 1: General requirements (ISO 14520-1:2006, MOD)
- AS/NZS
- 1221 Fire hose reels
 - 1668 The use of ventilation and airconditioning in buildings
 - 1668.1 Part 1: Fire and smoke control in multi-compartment buildings
 - 1841 Portable fire extinguishers
 - 1841.2 Part 2: Specific requirements for water type extinguishers
 - 1841.3 Part 3: Specific requirements for wet chemical type extinguishers
 - 1841.4 Part 4: Specific requirements for foam type extinguishers
 - 1841.5 Part 5: Specific requirements for powder type extinguishers
 - 1841.6 Part 6: Specific requirements for carbon dioxide type extinguishers
 - 1841.7 Part 7: Specific requirements for vaporizing liquid type extinguishers
 - 1850 Portable fire extinguishers—Classification, rating and performance testing
 - 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)
 - 3504 Fire blankets
 - 3788 Pressure equipment—In-service inspection
 - 4487 Pyrogen fire extinguishing aerosol systems
- ISO
- 6182 Fire protection—Automatic sprinkler systems
 - 6182-1 Part 1: Requirements and test methods for sprinklers
 - 6182-6 Part 6: Requirements and test methods for check valves
 - 6182-7 Part 7: Requirements and test methods for early suppression fast response (ESFR) sprinklers
 - 6182-12 Part 12: Requirements and test methods for grooved-end components for steel pipe systems
- NFPA
- 11 Low-, Medium-, And High-expansion Foam
- AQF Australian Qualification Framework

APPENDIX B ROUTINE SERVICE PROCESS

(Informative)

This Appendix provides an explanation of the process of routine service covered by this Standard (see also Clause 1.7.2).

Table B1 provides an explanation of the three main elements contained in Figure 1.7, as follows:

- (a) System design, installation and commissioning.
- (b) Routine service (this edition of AS 1851).
- (c) Regulation and application of this Standard.

**TABLE B1
ROUTINE SERVICE PROCESS**

Reference from Figure 1.7	Stage	Element	Explanation
[1]	1 System design, installation and commissioning	Commissioning	This Standard is predicated on a satisfactory completion of system design and installation, which is confirmed during commissioning. Only then can the routine service (maintenance) process commence.
[2]		Baseline data established	Use of baseline data is an essential component in ensuring the system continues to perform in accordance with the approved design (see Clause 1.8).
[3]	2 AS 1851 Routine servicing	Routine service schedules	This Standard addresses the routine service of fire protection systems and equipment in accordance with Clauses 1.1 and 1.2 of this Standard. Common requirements pertaining to all systems and equipment are covered in Section 1; Sections 2 through to 14 covers the individual systems and equipment such as sprinklers, alarms, hydrants and portable fire extinguishers. The schedules (tables) in Sections 2 to 14 are structured on a frequency basis and cover inspection, test, survey and routine service (maintenance). The intent of this Standard is to also maintain reliability of system or equipment operation from one service period to the next.
[4]		Identify and report activity failures	Where a routine service activity failure is identified, the service provider is to record it and indicate whether the failure represents a critical defect, a non-critical defect or a non-conformance, and recommend rectification (see Clause 1.18).
[5]		Yearly service schedules	The objective of this Standard is to confirm that all systems and equipment function correctly and are able to perform in accordance with the approved design. NOTE: Also includes lower frequency routines such as five-yearly, etc.
[6]		Yearly condition report	An important provision in the Standard is the need to keep records of the service work carried out as evidence that the systems and equipment are fit to fulfil the intended purpose. When the service work has been completed for each system and equipment, the consolidated reports for each system and equipment form evidence that the service routine has been satisfactorily completed or that failures have been noted or rectified.

(continued)

TABLE B1 (continued)

Reference from Figure 1.7	Stage	Element	Explanation
[7]	3 Regulation and application	Annual compliance statement	It is a regulatory obligation in most States and Territories for owners to provide an annual compliance statement that the safety measures in their premises satisfy the performance requirements of the approved design. The yearly condition report for fire protection systems and equipment provide evidence to support that obligation. It is not intended that the yearly condition report will take the place of regulatory yearly statements/reports.

APPENDIX C

A1

‘Texted deleted’

APPENDIX D

SYSTEMS INTERFACE TESTING

(Informative)

D1 GENERAL

This Appendix sets out the recommended procedures for the concurrent ‘end-to-end’ test of the system interfaces to confirm that they operate in accordance with the approved design.

This Appendix should be read in conjunction with Clauses 1.1 to 1.17. The baseline data includes the system interface diagram and the relevant cause and effect statements which should be verified as set out in a test schedule.

NOTES:

- 1 The interface test is not intended to be a commissioning test of each system, but to establish that each interfaced function operates correctly.
- 2 A concurrent test of all interfaced systems, as would occur in a fire, is required to ensure that there are no unwanted interactions between systems or unsustainable electrical loads on systems or system components.

D2 PRECAUTIONS

Prior to commencing any interface testing, the following precautions should be carried out:

- (a) Ensure that the responsible entity for the coordination of the concurrent attendance of each person or persons has arranged for the attendance of all persons required to properly conduct the test.
- (b) The precautions detailed in each relevant section of this Standard.

On completion of any procedure, ensure that each control is returned to the condition or state prior to the test. When any function is left impaired, is disabled or is not restored to ‘normal’, it should be recorded in the system logbook and the owner or agent should be notified.

D3 DESIGN AND IMPLEMENTATION SURVEY

Check that all systems required to be interfaced in accordance with the approved design are included in the cause and effect statements.

D4 TEST PLAN

As most interface configurations are unique to the particular building or facility, a test plan detailing each step of the interface test procedure should be available to ensure that tests are carried out consistently and results are adequately documented. The test plan should be based on the procedures that were used during the commissioning of the systems interfaces.

Where a test plan does not exist, it should be prepared and documented by a competent person or persons having an understanding of the interface requirements of the approved design.

The test plan should detail the concurrent attendance of persons specializing in each interfaced system required to achieve the end-to-end test and should include the following:

- (a) A list of all interfaced system.
- (b) Systematic test procedure detailing the method for conducting each interface test.
- (c) List of persons and their responsibilities required to test or verify the function of each interface.
- (d) Owner’s responsibilities.

- (e) Additional precautions and procedures (e.g. town gas shut-off valves).
- (f) Form of test report.

D5 TEST REPORT

An interface test report is a record of each test conducted and should include the following:

- (a) A record of the test result for each interface test (pass or fail) and values as applicable.
- (b) A record of the name signature of the person responsible to verify the result of each interface test.
- (c) Date and time of the test.
- (d) Acceptance signature of the responsible entity's representative.
- (e) Details of any defects identified.

D6 RESULTS

Pass or fail test results for each interfaced system should be recorded in the respective system records with detailed of results in interface test report.

Recorded test results in accordance with Tables D1 to D7 (see Clauses 1.12 and 1.16) may be electronically based; however, a hard copy record of the system interface tests should be kept on site and be available at all times (see Clause 7.2.5). The records include names and signatures of all persons that assessed the compliance of the interfaces to the requirements of the approved design including the dates when the tests were performed.

Any defects identified in the interface tests should be recorded on the respective system's yearly condition report.

The inspection, survey and test schedules defined in Paragraph D7 are examples of test requirements and reports.

D7 INTERFACE INSPECTION, SURVEY AND TEST SCHEDULES

D7.1 Inspection and records

Interfaces of systems should be inspected in accordance with Table D1.

TABLE D1
EXAMPLE OF INTERFACE INSPECTION AND SURVEY SCHEDULE

Item No.	Item	Action required and pass/fail requirement	Records		
			Result	Pass/Fail	Comments
1.1	System's interface diagram	INSPECT the system's interface matrix to ensure it is available and legible.			
1.2	Site survey	SURVEY the site and ensure that all systems required to be interfaced are included in the system's interface matrix.			
1.3	Test plan	INSPECT the test plan and check that it adequately assesses the function of any interfaces that have changed or been added since the interface test was last carried out.			

D7.2 Sprinkler/deluge system interface test and records

Sprinkler system interfaces should be tested in accordance with the test plan.

A typical example of a test schedule forming part of a test plan is given in Table D2.

TABLE D2
EXAMPLE OF TEST SCHEDULE—SPRINKLER/DELUGE SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
2.1	Sprinkler test valve	Perform the six-monthly valve or flow switch test as applicable and check the operation of the following interfaced system as applicable.				
2.2	Fire indicator panel	CHECK that sprinkler operation is indicated correctly.				
2.3	Fire door release	CHECK that fire and smoke doors have closed correctly (e.g. correct sequencing for double leaf doors).				
2.4	Security door release	CHECK that security doors have unlocked correctly.				
2.5	Roof vents	CHECK that interfaced roof vents open correctly.	See Section 13			
2.6	Warning system	CHECK that warning systems operate correctly.				
2.7	Plant shutdown	CHECK that plant shuts down correctly.				
2.8	Fuel shut-off	CHECK that the shut-off valves function.				
2.9	Elevator override	CHECK that the elevator override operates correctly.				
2.10	Other systems	CHECK that other systems operate correctly.				
2.11	Fire-isolated exit pressurization system	CHECK that the fire-isolated exit pressurization operates correctly.				
2.12	Smoke control	CHECK that the smoke control system operates correctly.				
2.13	Smoke exhaust	CHECK that the smoke exhaust operates correctly.				
2.14	Air-handling	CHECK that the air handling system operates correctly.				
2.15	Systems faults	Simulate faults on each interfaced system and check that the fault is indicated. NOTE: This is normally indicated at the fire indicator panel (CIE.)				
2.16	Special hazards	CHECK that the special hazards system operates correctly.				

D7.3 Fire detection system interface test and records

Fire detection system interfaces should be tested in accordance with the test plan.

A typical example of a test schedule forming part of a test plan is given in Table D3.

TABLE D3
EXAMPLE OF TEST SCHEDULE—FIRE DETECTION SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
3.1	Detection device activation and manual control functions	Initiate appropriate detection devices and controls according to test plan and check the correct operation of the interfaced functions. NOTE: This test is intended to check that the fire detection system and interfaced system perform in accordance with the approved cause and effect statements.				
3.2	Pre-action sprinkler or deluge system	Check that the pre-action sprinkler or deluge system valve operates correctly.				
3.3	Fire door release	Check that fire and smoke doors have closed correctly.				
3.4	Security door release	Check that security doors have unlocked correctly.				
3.5	Roof vents	Check that interfaced roof vents open correctly.				
3.6	Warning system	Check that warning systems operate correctly.				
3.7	Plant shutdown	Check that plant shuts down correctly.				
3.8	Fuel shut-off	Check that the shut-off valves operate correctly.				
3.9	Elevator override	Check that the elevator override operates correctly.				
3.10	Other systems	Check that other systems operate correctly.				
3.11	Exit pressurization	Check that the exit pressurization operates correctly.				
3.12	Smoke control	Check that the smoke control system operates correctly.				
3.13	Smoke exhaust	Check that the smoke exhaust operates correctly.				
3.14	Air-handling	Check that the air handling system operates correctly.				
3.15	Alarm systems for hearing impaired	Check that additional alarm systems for the hearing impaired operate correctly.				
3.16	Paging systems	Check that the paging systems operate correctly.				
3.17	Nurse call systems	Check that nurse call systems operate correctly.				
3.18	Systems faults	Simulate faults on each interfaced system and check that the fault is indicated at the CIE.				
3.19	Special hazards	Check that the special hazards system operates correctly.				

D7.4 Smoke alarm and heat alarm system interface test and records

Smoke alarm and heat alarm system interfaces should be tested in accordance with the test plan.

A typical example of a test schedule forming part of a test plan is given in Table D4.

TABLE D4
EXAMPLE OF TEST SCHEDULE—SMOKE ALARM AND HEAT ALARM SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
4.1	Smoke and heat alarm activation	Initiate appropriate alarms to test plan and check the correct operation of the interfaced functions. NOTE: This test is intended to check that the fire detection system and interfaced system perform in accordance with the approved cause and effect statements.				
4.2	Exit lighting	Check that the exit lighting operates correctly.				
4.3	Alarm systems for hearing impaired	Check that additional alarm systems for the hearing impaired operate correctly.				
4.4	Other systems	Check that other systems operate correctly.				

D7.5 Emergency warning system, interface test and records

Emergency warning system interfaces should be tested in accordance with the test plan.

A typical example of a test schedule forming part of a test plan is given in Table D5.

TABLE D5
EXAMPLE OF TEST SCHEDULE—EMERGENCY WARNING SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
5.1	Emergency warning system activation	Ensure that all functions are in the normal state without being isolated or disabled and then manually activate the emergency signals according to test plan and check the correct operation of the interfaced functions.				
5.2	Shutdown	Check that other systems shut down during an emergency shut-down.				
5.3	Alarm systems for hearing impaired	Check that additional alarm systems operate correctly.				
5.4	Paging systems	Check that the paging systems operate correctly.				
5.5	Nurse call systems	Check that nurse call systems operate correctly.				
5.6	Other system	Check that other systems operate in accordance with the test plan.				

D7.6 Special Hazard system interface test and records

Special hazard system interfaces should be tested in accordance with the test plan.

A typical example of a test schedule forming part of a test plan is given in Table D6.

TABLE D6
EXAMPLE OF TEST SCHEDULE—SPECIAL HAZARD SYSTEM

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
6.1	System operation	Simulate the operation of the special hazard system and controls according to test plan and check the correct operation of the interfaced functions in accordance with the cause and effect statement.				
6.2	Fuel shut-off	Check that the shut-off valves operate correctly.				
6.3	Dampers	Check that the dampers operate correctly.				
6.4	Air-handling	Check that the air-handling system operates correctly.				
6.5	Warning systems	Check that warning systems operate correctly.				
6.6	Plant shutdown	Check that plant shuts down correctly.				
6.7	Fire door release	Check that fire and smoke doors have closed correctly.				
6.8	Security door release	Check that security doors have unlocked correctly.				
6.9	Other systems	Check that other systems operate correctly.				

D7.7 Fire fan control panel interface test and records

Fire fan control panel interfaces should be tested in accordance with the test plan.

A typical example of a test schedule forming part of a test plan is given in Table D7.

TABLE D7
EXAMPLE OF TEST SCHEDULE—FIRE FAN CONTROL PANELS

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
7.1	Fire fan control panel (FFCP)	Ensure that all functions are in the normal state without being isolated or disabled and then initiate appropriate detection devices and controls according to test plan and check the correct operation of the interfaced functions in addition to those controlled by the fire detection and alarm system.				
7.2	Fire door release	Check that fire and smoke doors have closed correctly.				
7.3	Security door release	Check that security doors have unlocked correctly.				
7.4	Roof vents	Check that interfaced roof vents open correctly.				
7.5	Warning system	Check that warning systems operate correctly.				

(continued)

TABLE D7 (continued)

Item No.	Item	Action required and pass/fail requirement	Records			
			Section	Result	Pass/Fail	Comments
7.6	Plant shutdown	Check that plant shuts down correctly.				
7.7	Fuel shut-off	Check that the shut-off valves operate correctly.				
7.8	Elevator override	Check that the elevator override operates correctly.				
7.9	Other systems	Check that other systems operate correctly.				
7.10	Exit pressurization	Check that the exit pressurization operates correctly.				
7.11	Smoke control	Check that the smoke control system operates correctly.				
7.12	Smoke exhaust	Check that the smoke exhaust operates correctly.				
7.13	Air-handling	Check that the air-handling system operates correctly.				
7.14	Systems faults	Simulate faults on each interfaced system and check that the fault is indicated at the CIE.				
7.15	Special hazards	Check that the special hazards system operates correctly.				

D7.8 Example test plans

Examples of test plans are shown in Tables D8(A) to D8(C) and contain the following:

- (a) List of interfaced systems.
- (b) Identification of persons required for all systems to be tested.
- (c) Setting time and date, and clearance with the responsible entity.
- (d) Sign off of test plan by all parties.

TABLE D8(A)
SITE DETAILS TO BE INTERFACE TESTED—EXAMPLE

Site name	Site address	Owner	Owner's representative
Date of test		Contact details	Contact details

TABLE D8(B)
INTERFACED SYSTEMS LIST—EXAMPLE

Interfaced systems	Type of interface	Persons responsible	Contact details	Test plan signed off

TABLE D8(C)
DETAILED INTERFACE TESTS—EXAMPLE

From	To	Test to be performed	Expected results	Pass/Fail

APPENDIX E
 YEARLY CONDITION REPORT
 (Informative)

Report number:	
Period covered:	
Responsible entity's address:	
Premises:	
System type:	
Design Standard applicable:	
Statement:	I confirm that the system referred to above has been regularly inspected, tested, maintained and surveyed, where applicable, to Section XX of AS 1851 as per attached system activity reports for the period XX/XX/XXXX. With the exception of items detailed below in 'system defects', the system has been found to be functioning correctly and is generally in accordance with the approved design.
System defects:	
Non-conformances:	
Summary of the relevant records of service:	
Service provider's representative:	
Name:
Signature: Date:
Service provider:
Name:
Address:

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APPENDIX F
BATTERY CAPACITY TESTING
(Normative)

F1 DETERMINING REQUIRED BATTERY CAPACITY

Prior to testing, the battery shall be checked to ensure it is fully charged with the correct charging voltage.

NOTE: See Note 2 of Paragraph F2.

The measurements of the quiescent (I_Q) and alarm current (I_A) shall be measured in the standby supply (battery) lead with the primary supply (mains) turned off.

The capacity of the battery shall be such that, in the event of failure of the primary power source, the batteries shall be capable of maintaining the system in normal working [quiescent load current (I_Q)] condition for the required standby time (T_Q), after which sufficient capacity shall remain to operate two worst case alarm zones [alarm load current (I_A)] for the required time.

When calculating battery capacity, allowance shall be made for the expected loss of capacity over the useful life of the battery. A new battery shall be at least 125% of the calculated capacity requirements, based on a loss of 20% of its capacity over the useful life of the battery.

The battery capacity requirement shall be determined as follows:

- (a) Determine the quiescent load current (I_Q).
- (b) Determine the alarm current (I_A).
- (c) Determine the capacity de-rating factor (F_C) of the battery when discharged at the alarm load rate, taking into account the minimum operating voltage of all connected CIE using the battery manufacturer's data. Where more than one CIE is connected to the battery, use the highest minimum of any of the CIE. A value of 2 for F_C is deemed to satisfy these requirements.
- (d) The 20 h discharge battery capacity C_{20} at 15°C to 30°C shall be determined as follows:

$$C_{20} = L[(I_Q \times T_Q) + F_C (I_A \times T_A)]$$

where

C_{20} = battery capacity in Ah at 20 h discharge rate

I_Q = total quiescent current

T_Q = quiescent standby power source time

F_C = capacity de-rating factor

I_A = total current in alarm state

T_A = alarm load standby power source time

L = compensation factor for expected battery deterioration.

L shall be 1.25 for new batteries and 1.1 for used batteries required to perform for at least 12 months

Where the load may vary, the worst case average over required period shall be used.

Where the average battery temperature is outside 15°C to 30°C, the battery manufacturer's data shall be used to determine any further compensation factor to be applied.

NOTE: This procedure has been derived from AS 1670.1 and AS 1670.4 and satisfies the battery calculations requirements of previously published Australian Standards for fire alarm and warning systems.

F2 BATTERY TEST

F2.1 General

This test is intended to define a procedure to assist in determining the ability of a battery to satisfy the approved design.

NOTES:

- 1 This test is a potentially hazardous process. Appropriate personal protection should be used and a risk assessment carried out. Any batteries showing any signs of physical damage or defect should not be tested and should be replaced immediately.
- 2 Consideration in determining a battery's ability to perform in accordance with the intended design should include other factors affecting battery performance such as battery age, environmental conditions, etc.

This procedure is for a 24 V battery set and is using a minimum test voltage of 21 V (related to the $C_{20}/20$ final voltage). For other nominal battery voltages a corresponding minimum test voltage shall be used.

F2.2 Procedure

The procedure shall be as follows:

- (a) Prior to testing, ensure the battery is fully charged with the correct charging voltage.
- (b) Set the battery testers to a discharge current of $0.8 \times C_{20}/1$ A (e.g. A 100 Ah battery is tested at 80 A), subtracting the system quiescent current if the test is to be carried out without disconnecting the battery from the system.
- (c) Record the total load current used.
- (d) Where the battery is to be tested without being disconnected from the system, isolate the primary (mains) supply just before the commencement of the battery condition test.
- (e) Apply the test load for 25 min or until battery terminal voltage falls to the minimum test voltage of 21 V (for a 24 V battery set).
NOTE: The battery load tester carries a large current and must be connected as close as practicable to the battery terminals.
- (f) If the battery terminal voltage does not fall below 21 V during the 25 min period record the final test voltage and note as a pass.
- (g) Restore the system to allow the battery to begin to be re-charged.

NOTES:

- 1 The battery should be allowed to be charged for a minimum of one week before any test that depletes the battery's state of charge is carried out.
- 2 If an individual battery in the set fails the battery condition test, it is recommended that all batteries in the set be replaced at the same time.

CF2.2 *The purpose of this test is to determine that the battery capacity has not deteriorated by more than 20% of its nominal capacity. If batteries are tested individually and only one fails, it is highly likely that the others in the set will also fail in the near future.*

APPENDIX G FIRE DETECTOR TESTING

(Normative)

G1 TEST MEDIA

The test medium employed for testing smoke, heat and carbon monoxide fire detectors shall be as follows:

- (a) Heat detectors—a source of heated air is the preferred medium. The temperature of the air shall be controlled to produce a predictable rate of increase. The upper temperature shall be limited to a value appropriate to the detector being tested.

NOTE: The use of radiant heat is not recommended. Care should be taken in the use of radiant heat as the effect on the detector can vary significantly with the collection area the detector presents to the tester.

- (b) Smoke detectors—a source of particulate material that does not contaminate the sensing chamber or entry screen and which contains particles in the size range appropriate to the detector.
- (c) Carbon monoxide (CO) detectors—a source of gas that does not adversely affect the sensing element, or entry screen, of the detector and which contains gas appropriate to the detector.
- (d) Aspirating smoke detection systems that do not excessively contaminate, impact the test result or be of a nature that adheres to the internal surfaces of the aspirating smoke detector pipe system.

NOTE: The emitted medium for sensitivity testing of smoke detectors (b) and carbon monoxide detectors (c) should be controlled so as to produce a predictable concentration.

G2 POINT TYPE HEAT DETECTOR FUNCTIONAL TEST

Test a representative sample per annum of all detector models and types or grades and environmental locations consisting of 20% of the detectors per circuit including the last detector on a circuit (for collective circuits, the one nearest to the end of line device) so that all detectors are tested over a five year period.

For non-resettable fixed temperature detectors, simulate an alarm on the circuit at the end of line.

G3 LINEAR HEAT DETECTOR FUNCTIONAL TEST

For resettable linear type heat detectors, test the operation using a suitable heat source at a random location and different location from previous tests.

For non-resettable fixed temperature detectors simulate an alarm on the circuit at the end of line.

G4 POINT TYPE SMOKE DETECTOR FUNCTIONAL TEST

Test in situ the operation of at least 50% of all smoke detectors per annum on each circuit using a test medium as specified in Paragraph G1 so that all smoke detectors are tested over a two year period, except where this requirement is satisfied under the sensitivity test of Paragraph G5.

G5 POINT TYPE SMOKE DETECTOR SENSITIVITY

Unless the sensitivity is tested or verified using the procedure of Paragraph G6 or of Paragraph G7 every 10 years from the date of installation, all smoke detectors shall be replaced with cleaned and recalibrated or new detectors followed by the functional test of Paragraph G4.

G6 POINT SMOKE DETECTOR IN SITU SENSITIVITY TEST

Test the sensitivity of all detectors in situ, using test equipment listed and calibrated in accordance with a national or international Standard, using the procedure provided in the manufacturer's manual after 10 years from the date of installation and then every five years thereafter.

Report all detectors that fail the test.

G7 SMOKE DETECTORS CAPABLE OF REPORTING 'OUT OF SENSITIVITY RANGE'

Where the sensitivity or 'out of sensitivity range' can be indicated or read at either the CIE or at the detectors, carry out the relevant procedure in accordance with the manufacturer's instructions yearly.

Report all detectors that indicate they are at the end of the manufacturer's sensitivity range.

G8 BEAM TYPE SMOKE DETECTORS FUNCTIONAL TEST

Test yearly the operation of each linear beam type smoke detector using neutral density light filters of the appropriate obscuration percentages for alarm and beam blockage for fault.

NOTE: Where information is not available on the appropriate total obscuration then, for direct beams types, a 60% obscuration filter should be used and for reflected beam types a 30% obscuration filter. For faults, greater than 95% obscuration (opaque) should be used.

G9 ASPIRATING SMOKE DETECTOR (ASD) FUNCTIONAL TEST

Test the operation of the ASD by introducing smoke or other suitable aerosol through the last sampling point on each pipe run or branch of the system. Record the transport time for each pipe run or branch. Verify the transport time taken is within 10% or ± 5 s, whichever is the greater, of the transport time recorded but not more than 120 s.

Report all pipe runs or branches that fail the test.

Where ASD systems are installed and utilize capillary tube connections to room sampling points, test in situ the operation of at least 20% of the sampling points of the system so that all sampling points are tested over a five-year period.

G10 ASPIRATING SMOKE DETECTOR SENSITIVITY TEST

After 10 years from the date of installation and then every five years thereafter, test and verify the sensitivity of each aspirating smoke detector.

NOTE: This may require that the detector or part of the detector be returned to the manufacturer.

Report each aspirating smoke detector that fails this test.

Alternatively, replace with a new or recalibrated aspirating smoke detector or components as necessary.

G11 FLAME DETECTORS FUNCTION TEST

Test the operation of all flame detectors annually, and inspect the area of coverage to confirm there has been no change from the approved design. Where manual optical integrity is not used, functional testing shall be carried out using an approved light source suitable for the environment.

G12 FLAME DETECTOR SENSITIVITY TEST

Verify or measure and record the sensitivity of each flame detector at five-yearly intervals from the date of installation. Verify that this falls within the manufacturer's range and approved design. Alternatively, replace with new or recalibrated flame detector. Where the date of installation is unknown, test the sensitivity or replace detector at the next annual test.

G13 CO FIRE DETECTOR FUNCTION TEST

Test the operation of at least 50% of CO detectors annually, using a test medium as defined in Paragraph G1 so that all detectors are tested over a two-year period.

G14 CO FIRE DETECTOR SENSITIVITY TEST

Verify or measure and record the sensitivity of each detector at intervals in accordance with the manufacturer's specifications but no later than 10 years from the date of detector manufacture. Verify that the sensitivity falls within $\pm 25\%$ of the listed range of the approved design. Alternatively, replace with new or recalibrated CO fire detector. Where the date of manufacture is unknown, test the sensitivity and replace detector at the next annual test.

G15 MULTI-SENSORS AND COMBINED DETECTORS

G15.1 General

Multi-sensor smoke/CO detectors are primarily smoke detectors or CO fire detectors with their sensitivity enhanced by the presence of a rate or rise in temperature. This provides a faster flaming fire response, but still detects cold smoke or CO from fire. Test them as smoke or CO fire detectors in accordance with this Appendix.

Combined detectors have more than one sensor that can initiate an alarm without a signal from another sensor. If the detectors are installed on the basis of one sensor type only (e.g. smoke, CO, flame or heat), and the other sensors are supplementary, test them according to the type installed.

Where a fire detector is installed in combination with another detector as a deemed to satisfy (e.g. a combined CO and heat detector), test each sensor in accordance with its type.

If detectors are installed as an engineered solution requiring more than one sensor, then test each sensor according to the type.

NOTE: Engineered solutions may have an engineered maintenance schedule as an alternative to this Standard.

G15.2 Multi-sensors that do not respond to any one single sensor signal

If the detectors are installed as smoke or CO detectors, functionally test them with a test medium that includes components specifically designed for this type of detector.

If detectors are installed with a multi-sensor setting that cannot be verified electronically at the CIE or at the detectors, functionally test the interaction of all sensors according to the manufacturer's specified procedure.

G16 CONSEQUENCES OF FAILURE

G16.1 Consequences of failed detector functional tests

Should one or more detectors fail any of the tests per circuit, further sampling and testing of not less than 10 of the remaining detectors per circuit shall be conducted until the results can be claimed to be truly representative. Should there be a further failure on the extended testing, the balance of the detectors on the circuit shall be tested. All detectors that fail the test shall be replaced.

G16.2 Consequences for detectors or equipment outside their service life

Detectors, equipment or other items that have defined service life before the service life is exceeded shall be replaced.

APPENDIX H
MECHANICAL SERVICES—DOCUMENTATION AND SKILLS
(Informative)

H1 DOCUMENTATION

H1.1 General

Documentation covering routine service records required to implement the service program and sequentially record the service carried out (see Clause 1.16) should include the following:

- (a) A schedule of essential functionality and performance requirements.
- (b) Operating and routine service manuals.
- (c) Routine service schedule.
- (d) Routine service records.
- (e) Plant register.
- (f) Plant history sheet.
- (g) Diagram(s) of the installation.

NOTES:

- 1 The above documentation should be retained by the responsible entity.
- 2 In the absence of adequate documentation, the responsible entity should supply performance and testing data, such as building approvals, occupancy certificates, drawings, etc., to support the service requirements of this Standard.
- 3 Where the installation is incomplete or not in accordance with the approval documentation, the responsible entity should be notified.
- 4 Attention is drawn to the requirements of AS/NZS 1668.1 relating to the purpose, location and updating of operating instructions and diagrams of the installation.

H1.2 Schedule of essential functionality and performance requirements

Documentation should include a schedule indicating the correct fire mode operation of all components, such as fans and dampers, and the required performance parameters of the system. Where relevant, this operation should be linked to the applicable fire alarm zone.

The schedule should be amended on each occasion that the building or mechanical services system is altered in a manner that affects the fire mode functionality or performance of the mechanical services system.

The schedule of essential functionality and performance requirements should incorporate the following:

- (a) Unambiguous description of mechanical services system operation in fire mode.
- (b) Provision to record the status and/or performance (correct or faulty) of the following:
 - (i) Operation of every fan or air handling unit (AHU) in normal duty.
 - (ii) Operation of every fan or AHU during general fire alarm condition.
 - (iii) Operation of every fan or AHU during a zone-specific fire alarm condition.
NOTE: Fans that continue operating or stop in fire mode also need to be included.
 - (iv) Operation of every motorized damper required to operate during a general or zone-specific fire alarm condition.
 - (v) Every required make-up airflow path (natural or via door or damper).

- (vi) Manual override control from the fire fan control panel (FFCP)—ON and OFF.
- (vii) Fan or damper indicator lamps on the FFCP.
- (viii) Operation of any related mechanical system, incorporated in the mechanical services system design criteria, that operates in fire mode.
- (c) Provision to describe specific mechanical services system function linked to specific fire alarm zone reference, and to record correct operation of fire/mechanical services system function.
- (d) Provision to record that the appropriate fire systems and mechanical services system personnel have both been involved in the checking/test process, so that the fire/mechanical services system interface can be seen to have been demonstrated (see Clause 1.12).
- (e) Provision to demonstrate that the essential mechanical services systems are capable of performing to the Standard to which they were originally installed.

CH1.2(a) *As it is critical that this document be available at all time to building management, the document should ideally be associated with the annual testing documentation, rather than being archived in design files, hence making it difficult to find.*

H1.3 Operating and routine service manuals

Operating and routine service manuals should include at least the following:

- (a) The performance criteria for all fire and smoke control features of the mechanical services systems (applicable Standards, regulatory requirements, alternative fire engineered solutions and design criteria).
- (b) Results of initial commissioning tests for all fire and smoke control features of the mechanical services systems.
- (c) Physical details of the plant, equipment and systems.
- (d) Supplier's recommendations on routine service and management.
- (e) Recommended cleaning methods and dismantling instructions.
- (f) Start-up, operating and shutdown procedures.
- (g) Particulars of the routine service program.

H1.4 Routine service schedule

The routine service schedule should include all required items of plant and equipment and operational features subject to the service routines set out in this Standard. It should include the frequencies at which the relevant levels of routines are to be carried out.

H1.5 Plant register

The plant register should list all items of plant and equipment that require inspection as a prerequisite to routine service, and should describe their locations within the building. If not already incorporated in the operating and service manuals, the plant register should include design data and unit capacities in sufficient detail to order a replacement of equivalent performance.

NOTES:

- 1 Each item of plant and equipment in the plant register should be allocated a unique identity reference within the building, which should also be indicated on the diagram(s).
- 2 Generally, an auxiliary item incorporated within the parent equipment need not be allocated a separate identity reference.
- 3 For ease of identification, the marking of items of plant and equipment with allocated identity references is recommended.

H1.6 Plant history record

The plant history record should include details of the performance (test results) of each item at commissioning or any subsequent recommissioning.

NOTE: At subsequent inspections and tests, the results should be recorded and compared with the results achieved at commissioning or any subsequent recommissioning. Any defects observed and any repairs and modifications effected should be recorded in the plant history record.

H1.7 Diagram(s) of the installation

Up-to-date floor plans, showing smoke alarm zones necessary for the development of the schedule of essential functionality and performance.

NOTE: These drawings are made available for the purpose of assessing if specific detectors, used to activate smoke control systems, actually operate in the correct zone.

H2 SKILLS ASSOCIATED WITH ROUTINE SERVICING

H2.1 General

Personnel responsible for inspection, test, preventive maintenance and survey of fire and smoke control features of mechanical services systems should have appropriate qualifications and experience.

H2.2 Skill set (A)

Skill set A comprises the skills applicable to tables referenced in Clause 13.4.1 and include the following:

- (a) Relevant mechanical services trades qualifications from a recognized technical institution.
- (b) Demonstrated knowledge of fire and smoke control systems covered by this Standard, AS/NZS 1668.1, AS 1668.3, AS 1682.1, AS 1682.2, AS 2665 and the relevant parts of the NCC.
- (c) Minimum of three years' experience in maintenance, commissioning, inspection or testing of fire and smoke control systems.

H2.3 Skill set (B)

Skill set B comprises the skills applicable to tables referenced in Clauses 13.4.2 and 13.4.3 and include the following:

- (a) Demonstrated knowledge of fire and smoke control systems contained in this Standard, AS/NZS 1668.1, AS 1668.3, AS 1682.1, AS 1682.2, AS 2665 and the relevant parts of the NCC.
- (b) A relevant engineering degree from a recognized university, together with a minimum of five years' experience in design, installation, commissioning or inspection and testing of fire and smoke control systems.

or

A relevant certificate or associate diploma in mechanical services engineering from a recognized technical institution together with a minimum of five years' experience in design, installation, commissioning or inspection and testing of fire and smoke control systems.

or

Minimum of five years' experience in commissioning or inspection and testing of fire and smoke control systems, with a relevant trade qualification.

APPENDIX I

MECHANICAL SERVICES—GUIDANCE

(Informative)

11 BASELINE DATA

A1 | Refer to Clause 1.8 for guidance and examples on baseline data.

12 DUAL DUTY SYSTEMS

Failure of fire safety equipment can usually be attributed to one of three potential causes:

- (a) Wear and tear.
- (b) Random event (environmental, material or usage).
- (c) Human error.

Prevention of failure due to wear and tear is usually addressed by regular inspections and appropriate service or repair, whereas failure due to random events is usually addressed by inspection or testing, to demonstrate an acceptable level of performance at suitable intervals. Prevention of failure due to human error is usually addressed by training and education of responsible staff, monitoring of equipment status or regular inspection and testing.

When mechanical services equipment has been designed to provide fire and smoke control, the relative likelihood of the first two of these failure modes will depend on the pattern of usage.

Equipment used only for fire service duty will not be subject to the same level of wear and tear as equipment used for day-to-day mechanical services duty, for comfort, health or process control. Hence, for reliable operation, equipment subjected to day-to-day usage will require more frequent inspections and service or repair than equipment used only for fire service duty; however, equipment used for day-to-day mechanical services duty, is effectively monitored (tested) by the occupants of the building every day, and any breakdown is likely to cause occupant discomfort and generate corrective action to regain the required performance providing there is a current service contract in place.

Equipment used only for fire service duty will not be subject to regular monitoring by occupants, and so will require frequent inspections or tests to establish confidence that it will be available to operate when needed, but will not require the same level of service or repair as equipment used for day-to-day duty.

13 EXPLANATION OF FUNCTIONALITY VERSUS PERFORMANCE

Testing of the fire and smoke control features of mechanical services systems requires verification of both functionality as well as performance of the components and the systems. For the purpose of this Paragraph, functionality is demonstrated by a fan starting or stopping, a damper opening or closing, or an indicator lamp turning on/off. Performance is demonstrated by measurement of airflow velocity or volume flow rate, pressure difference between compartments, door opening force, etc. Clause 13.4.2 provides for elementary testing procedures that may be used for functionality tests, but in the case of complete end-to-end performance tests, accurate measurements of the performance parameters should be taken.

Examples of the different results obtained from functionality tests and performance tests are as follows:

Functionality: Fan #1A starts and damper #2A opens on fire alarm in Zone A
 AHU 23 stops on general fire alarm

Performance: Fan #1A delivers 20 000 L/s in fire mode operation
 Pressure in Zone A is 20 Pa below Zone B on fire alarm in Zone A

14 FORMS FOR RECORDING ROUTINE SERVICE

Figures I4.1, I4.2, I4.3 and I4.4 provide examples of typical record documents required by this Section, the format of which may be used for recording purposes. Alternative layouts incorporating all the recommendations of Appendix H1 may be used.

For guidance to the use of the smoke control functionality chart see Figure I4.1.

15 USE OF SMOKE CONTROL SYSTEM FUNCTIONALITY TEST CHART

The following applies to the use of smoke control functionality charts, see Figure I4.1.

- (a) Test indicator lamps to demonstrate on/off fault. Fault may be tested by observing delay after manual override 'start' or by isolating power before activating manual override.
- (b) Where fans or dampers are individually activated by more than one fire alarm, allow a separate row in the chart for each activating alarm. For example, supply air detector, specifically zoned sprinkler alarm or return air detector that is not in the same zone as the occupied space detectors.

NOTE: See column 4, 'Design comments' and column 21, 'Comments on tests'.

- (c) In columns 8 and 11, the inspector should indicate which smoke detector zone, sprinkler zone, supply air detector or specific smoke detector activated this operation.
- (d) Test smoke exhaust fans and exit pressurization systems at frequencies required by the regulatory authority to demonstrate that they are capable of performing to the Standard to which they were installed. This requires measurement of airflow rates, doorway velocities, door opening forces, restoration times, etc. Carry out the performance tests prior to the functionality tests, but within the maximum time period allowed under the relevant legislation. Document test results and methods used for testing separately, with a note in column 21 indicating where performance test results are available, if not attached. To indicate when performance tests are required, highlight the relevant cell in column 20.
- (e) In column 4, charts should include the following:
 - (i) All air-conditioning and ventilation fans in the premises, even if they simply shut down or continue running without manual or automatic control on fire alarm.
 - (ii) All smoke control make-up airflow paths. For example, motorized dampers, barometric (non-return) dampers, fixed intake grilles and doors that open automatically on fire alarm.
 - (iii) All motorized dampers that operate automatically during fire alarm, or have manual control from the fire fan control panel.

NOTE: VAV dampers or ventilation dampers that have no fire mode operation need not be included.

- (f) Smoke exhaust fans, pressurization fans, dampers (and some supply air fans) only operate if fire or smoke is detected in a specific zone and not when fire is detected in other zones. These functionality test charts allow verification of zone-specific activation from the 'fire-affected zone' and one 'outside zone'. There will be many more 'outside zones' than fire-affected zones, so visual verification of non-operation for every device and every outside-zone could generate multitudes of tests, unless an effective procedure is established. Carry out at least one visual confirmation of fire 'non-fire' operation for each device. Confirmation of operation under other fire detection permutations may be verified by observation of indicator lamps (after their operation has been proved). The 'non-operation' verification procedure is to be attached to these charts and indicate, in column 21, that those devices that were verified 'non-operational' when an associated fan or damper were confirmed to be operating.

- (g) In a large project, the functionality charts may require many pages to cover all air handlers, dampers, smoke exhaust fans and sundry ventilation systems. Unless handled carefully, the sheer volume of documentation may cause difficulties during testing.
- (h) Column 1 is to be used to show the reference used by the mechanical services service provider or as shown on the mechanical services drawings.
- (i) Column 2 is to be used to show the name used by the responsible entity to describe the relevant zone or area within the building.
- (j) Column 3 is to be used to show the reference used by the fire system service provider to describe the relevant zone or zones.

NOTE: Smoke control matrices prepared by fire contractors show clearly and unambiguously, the intended operation of mechanical services systems under various different fire alarm conditions. However, limitations do occur and it is important for the documentation to make adequate provision for the following:

- (a) Recording action when the alarm occurs in 'another' smoke zone.
- (b) Recording action on 'general fire alarm' or sprinkler alarm.
- (c) Recording if a fan/damper combination has manual override at FFCP.
- (d) Recording if FFCP has indicator lamps for fan/damper combinations.
- (e) Sufficient space to certify right/wrong operation on the sheet.
- (f) Easy of reading, especially in low light test conditions.
- (g) Written verification of fire alarm zone actuated.

Assessment of essential fire safety measures—Fire damper routine service record

Job No.: _____
Project: _____
Address: _____

Sheet No.: _____

Year of inspection	Year 1	Year 2	Year 3	Year 4	Year 5
Fire damper inspected by / Date/...../...../...../...../...../...../...../...../...../.....
Structure inspected by / Date/...../...../...../...../...../...../...../...../...../.....
Approved by / Date/...../...../...../...../...../...../...../...../...../.....

Fire damper No.	Fire damper location	Damper fully open blades free to close and latch	Fusible link fitted and FD free of obstructions	Damper still in structure, mounting sound and no corrosion	Integrity of surrounding fire-resistant structure satisfactory	Where subject to recent tenancy work, or damaged or never been inspected previously			Year of inspection					Comments	
						Damper orientation and airflow direction correct	Packing OK, flanges retain FD and breakaway joint fitted	Opening in structure correctly formed	1	2	3	4	5		

NOTES:

- 1 This assessment is based on the assumption that the original fire dampers and installation methods were compatible with the FRL of the surrounding fire-resistant structure and complied with the Standards applicable to the original installation as well as the manufacturer’s special instructions, where applicable.
- 2 Wall or floor to be inspected by personnel who are competent to assess passive fire resistant structures, as per Section 12.

FIGURE 14.4 TYPICAL FIRE DAMPER ROUTINE SERVICE RECORD

APPENDIX J
OTHER EMERGENCY RESPONSE IN FACILITIES
(Informative)

J1 OTHER EMERGENCY RESPONSES

J1.1 General

Other emergency evacuation system elements of an advisory nature are in addition to the required emergency evacuation system elements contained in Section 14.

NOTE: Verification of other emergency evacuation system elements relevant to emergency response will increase the likelihood of a successful evacuation. Verification items set out in this Appendix are of an advisory nature and should be carried out as detailed in the Emergency Plan. They may be carried out by the Emergency Planning Committee, Emergency Control Organization (ECO), a consultant, supervisor or management.

J1.2 Schedules summary

Schedules covering routine service for emergency response in facilities are summarized in Table J1. (see also Paragraphs J2.1 to J2.9).

TABLE J1
SUMMARY OF SCHEDULES FOR
EMERGENCY EVACUATION EQUIPMENT AND FACILITIES

Paragraph	Frequency
J2.1	Monthly verification of emergency evacuation procedure elements evacuation routes and paths and records
J2.2	Monthly verification of emergency evacuation system elements emergency response and firefighting equipment and records
J2.3	Monthly verification of emergency evacuation system elements alarms, communication, detection and suppression systems and records
J2.4	Monthly verification of emergency evacuation system elements ECO and emergency procedures and records
J2.5	Monthly verification of emergency evacuation system elements housekeeping and records
J2.6	Six-monthly verification of emergency evacuation system elements emergency evacuation procedures documentation and records
J2.7	Yearly verification of emergency evacuation system elements emergency evacuation procedure training and records
J2.8.1	Monthly verification of emergency procedure elements emergency evacuation procedures monitoring and records
J2.8.2	Six-monthly verification of emergency procedure elements emergency evacuation procedures monitoring and records
J2.8.3	Yearly verification of emergency procedure elements emergency evacuation procedures monitoring and records
J2.9	Yearly verification of emergency evacuation procedures and records

J2 VERIFICATION OF EMERGENCY EVACUATION EQUIPMENT AND FACILITIES

J2.1 Evacuation routes and paths and records—Monthly

A typical example of the inspection, checking and test of evacuation routes and paths on a monthly basis are set out in Table J2.

TABLE J2
EXAMPLE
MONTHLY VERIFICATION OF EMERGENCY EVACUATION PROCEDURE
ELEMENTS EVACUATION ROUTES AND PATHS AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
1.1	Smoke doors	CHECK that smoke doors close correctly.		
1.2	Exit signs/ Emergency lighting	CHECK illumination by activating test button.		
1.3	Exit doors	CHECK that exit doors are free from obstructions and can function as required.		
1.4	Exit routes	CHECK that exit routes are clearly identified and free from obstructions.		
1.5	Fire doors	CHECK that fire doors close correctly.		

J2.2 Emergency response and firefighting equipment and records—Monthly

A typical example of the inspection, checking and test of emergency response and fire fighting equipment on a monthly basis are set out in Table J3.

TABLE J3
EXAMPLE
MONTHLY VERIFICATION OF EMERGENCY EVACUATION SYSTEM ELEMENTS
EMERGENCY RESPONSE AND FIRE FIGHTING
EQUIPMENT AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
2.1	Fire hydrants	CHECK that fire hydrants are identified and free from obstructions.		
2.2	Fire hose reels	CHECK that fire hose reels are identified, free from obstructions and the nozzle interlock is engaged.		
2.3	Fire extinguishers	CHECK that fire extinguishers are fully accessible, mounted, sign-posted and charged and/or sealed.		
2.4	Fire blankets	CHECK that fire blankets are fully accessible, mounted and identified.		
2.5	Disability impairment equipment	Where provided, CHECK that equipment is accessible and functional.		
2.6	ECO identification equipment	CHECK that equipment is available, accessible, correctly colour coded and functional.		

J2.3 Alarms, communication, detection and suppression systems and records—Monthly

A typical example of the inspection, checking and test of alarms, communication, detection and suppression systems monthly, on a basis is set out in Table J4.

TABLE J4
EXAMPLE
MONTHLY VERIFICATION OF EMERGENCY EVACUATION SYSTEM ELEMENTS
ALARMS, COMMUNICATION, DETECTION AND
SUPPRESSION SYSTEMS AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
3.1	MCP (BGA) alarms (red)	CHECK that equipment is accessible.		
3.2	MCP (BGA) alarms (white)	CHECK that equipment is accessible.		
3.3	MCP (BGA) (red & white)	CHECK that equipment is accessible.		
3.4	EWS	CHECK that WIPs are operational, accessible and alarms are audible.		
3.5	EWS	CHECK that alarms are audible.		
3.6	Emergency annunciation services	CHECK that messages are audible.		
3.7	Loudhailers	CHECK accessibility and operation of equipment.		
3.8	Radios (portable)	CHECK that signals are received and audible.		
3.9	Phones (portable and fixed)	CHECK that equipment is accessible, that signals are received and messages are audible.		

J2.4 ECO and emergency procedures and records—Monthly

A typical example of the inspection, checking and test of the ECO and emergency procedures on a monthly basis is set out in Table J5.

TABLE J5
EXAMPLE
MONTHLY VERIFICATION OF EMERGENCY EVACUATION SYSTEM ELEMENTS
ECO AND EMERGENCY PROCEDURES AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
4.1	Identification	CHECK ECO member identification is readily available.		
4.2	Diagrams	CHECK that evacuation diagrams as per AS 3745 are in place.		
4.3	Availability of wardens	CHECK that ECO members are recorded.		

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J2.5 Housekeeping and records—Monthly

A typical example of the inspection, checking and test of housekeeping elements on a monthly basis are set out in Table J6.

TABLE J6
EXAMPLE
MONTHLY VERIFICATION OF EMERGENCY EVACUATION SYSTEM
ELEMENTS HOUSEKEEPING AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
5.1	Rubbish disposal	CHECK that rubbish has not accumulated in area of responsibility.		
5.2	Fire hazards	CHECK that no fire hazards are identifiable in area of responsibility.		
5.3	Hazardous materials	CHECK that all hazardous materials are in a safe condition and registered in the area of responsibility.		

J2.6 Emergency evacuation procedures documentation and records—Six-monthly

A typical example of the inspection, checking and test of documentation and records on a six-monthly basis is set out in Table J7.

TABLE J7
EXAMPLE
SIX-MONTHLY VERIFICATION OF EMERGENCY EVACUATION SYSTEM
ELEMENTS EMERGENCY EVACUATION PROCEDURES
DOCUMENTATION AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
6.1	Distribution and availability of procedures	CHECK ECO members and supply a copy of the documented procedures for EPC directives.		
6.2	Training records	CHECK that all trainees have been recorded and follow up on non-attendees.		

J2.7 Training and records—Yearly

A typical example of the inspection, checking and test of training elements on a yearly basis is set out in Table J8.

**TABLE J8
EXAMPLE
YEARLY VERIFICATION OF EMERGENCY EVACUATION SYSTEM ELEMENTS
EMERGENCY EVACUATION PROCEDURES TRAINING AND RECORDS**

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
7.1	Evacuation exercises	CHECK that evacuation exercises have been conducted and observers' actions recorded for future action with the ECO.		
7.2	Scheduled training	CHECK that the scheduled training has been conducted and reported to the EPC.		
7.3	Management of ECO skills	CHECK that EPC directives for education training and exercises have been completed.		

J2.8 Emergency evacuation procedures monitoring and records

J2.8.1 Monthly

A typical example of the inspection, checking and test of monitoring elements on a monthly, basis is set out in Table J9.

**TABLE J9
EXAMPLE
MONTHLY VERIFICATION OF EMERGENCY EVACUATION PROCEDURE
ELEMENTS EMERGENCY EVACUATION PROCEDURES MONITORING
AND RECORDS**

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
8.1.1	Essential services routine service records	CHECK contractors have signed-off the required entries.		
8.1.2	Monitor testing of essential services	CHECK testing (selectivity) procedures.		
8.1.3	Monitor fault reporting of essential services	CHECK that faults have been reported.		
8.1.4	Rectification of essentials services	CHECK that rectification work has been completed.		
8.1.5	Temporary fire safety impediment	CHECK that any impediments have been rectified.		

J2.8.2 Six-monthly

A typical example of the inspection, checking and test of monitoring elements on a six-monthly basis is set out in Table J10.

TABLE J10
EXAMPLE
SIX-MONTHLY VERIFICATION OF EMERGENCY EVACUATION PROCEDURE
ELEMENTS
EMERGENCY EVACUATION PROCEDURES MONITORING AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
8.2.1	Control centre	CHECK that all documentation is in place and operational capability of the control centre.		
8.2.2	Control of hot works	CHECK compliance with remote system as specified by the EPC.		
8.2.3	Security interfaces	CHECK that interconnections between security provisions and fire safety features are operational.		
8.2.4	Passive systems	CHECK that any works carried out on passive fire protection systems (e.g. fire doors, fire stopping, collars) are rectified according to the facility procedures.		

J2.8.3 Yearly

A typical example of the inspection, checking and test of monitoring elements on a yearly basis is set out in Table J11.

TABLE J11
EXAMPLE
YEARLY VERIFICATION OF EMERGENCY EVACUATION PROCEDURE ELEMENTS
EMERGENCY EVACUATION PROCEDURES MONITORING
AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
8.3.1	Exit door release mechanisms	CHECK that the routine service program has been conducted.		
8.3.2	All routine service logbooks and records	CHECK all logbooks have the required number of entries.		
8.3.3	Management of equipment installation signage	CHECK compliance and, as necessary, replacement.		
8.3.4	Tactical fire plans	CHECK and test tactical fire plans.		
8.3.5	Emergency lighting	CHECK that tests have been completed.		
8.3.6	Fire services access	CHECK provisions and test with the fire services.		
8.3.7	Lifts	CHECK that all emergency procedures for lifts are functional.		

J2.9 Verification of emergency evacuation procedures and records—Yearly

A typical example of the verification of emergency evacuation procedures on a yearly basis is set out in Table J12.

TABLE J12
EXAMPLE
YEARLY VERIFICATION OF EMERGENCY EVACUATION PROCEDURES
AND RECORDS

Item No.	Item	Action required and pass/fail requirement	Records	
			Result	Comments
9.1	Reporting of ECO to management	CHECK ECO activities comply with AS 3745 and are adequate and appropriate for the emergency response risk.		
9.2	Appointment of ECO/EPC management structure (including partial occupancy)	CHECK that all tenancies are represented appropriately by both ECO and EPC.		
9.3	Emergency response budgetary planning	CHECK that all occupancies and tenancies have allocated emergency budgeting allowance.		
9.4	Emergency response compliance	CHECK that all planning, allocation of tasks, training and evacuation exercises, as required by AS 3745, are completed.		
9.5	Fire safety compliance	CHECK that all relevant Standards and statutory requirements are complied with.		
9.6	Monitoring hazards and conducting site emergency assessment	CHECK that hazards and risk analysis recommendations have been implemented.		

AMENDMENT CONTROL SHEET**AS 1851—2012**

Amendment No. 1 (2016)

REVISED TEXT

SUMMARY: This Amendment applies to the Preface, Clauses 1.5.4, 1.5.6.2, 1.5.18, 1.7.2, 1.8, 1.9, 1.11.1, 1.11.2, 1.11.3, 1.12, 1.16.5, 2.2.3, 3.2.4, 3.2.5, 3.3, 3.4.2, 3.4.5.1, 4.1, 4.2.3, 4.2.4, 5.2.3, 5.3.1, 6.2.4, 7.2.4, 8.2.1, 8.2.2, 9.2.1, 9.2.2, 9.2.8.1, 10.2.2, 10.2.15.1, 11.2.1, 11.2.2, 12.2.5, 12.2.6, 13.1 and 14.2.4, Tables 1.11(A), 1.16.2, 2.4.2.1, 2.4.2.2, 2.4.2.3, 2.4.2.4, 2.4.3.1, 2.4.3.2, 2.4.3.3, 2.4.3.4, 2.4.4.1, 2.4.4.2, 2.4.4.3, 2.4.4.4, 2.4.5.1, 2.4.5.2, 2.4.5.3, 2.4.5.4, 3.4.1, 3.4.2, 3.4.3, 3.4.5.2, 4.4.1, 4.4.2, 4.4.3, 4.4.4, 5.4.1, 5.4.3, 5.4.4, 6.4.1.2, 6.4.1.3, 6.4.1.4, 6.4.1.5, 6.4.2.3, 6.4.3.1, 6.4.3.2, 6.4.3.3, 6.4.4.1, 7.4.2, 7.4.3, 7.4.4, 7.4.5, 10.1, 10.4.1, 10.4.2, 10.4.3, 12.4.1.4, 13.2.1, 13.4.1.12, 13.4.2.6 and 13.4.2.7, and Appendices C, G and I.

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NOTES

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