

Performance standards for specified systems

Purpose:

The following provides guidance on performance standards for specified systems and how these may be referenced on a building consent application and compliance schedule. It is suggested to first read MBIE's Compliance schedule handbook¹ to understand the wider framework and certain terms or references for compliance schedules and specified systems before reading this guidance.

Overview:

A Building Consent Authority is required to state performance standards for the specified systems that are required by the building code when issuing a building consent. Currently, this is displayed on AC1129 'List of approved specified systems included in the building consent' as an attachment to the building consent (Form 5). This describes what level of performance the specified systems will need to achieve before a code compliance certificate can be issued and for the life of the building where this is also recorded on the buildings compliance schedule.

MBIE's Compliance schedule handbook describes a performance standard as:

The term 'Performance standard' for a specified system is not defined by the Building Act. However, it can be interpreted as the level of performance a specified system was intended to meet, and to continue to meet, at the time it was designed and installed in a building.

The Building Act requires that a specified system must be inspected and maintained in order to ensure that it performs, and continues to perform, to that standard.

If a specified system is designed and installed to an Acceptable Solution, Verification Method, Standard or specific documentation, this will set the performance standard for that specified system. An example is the level required by NZS 4541 for sprinkler systems

Specifying a performance standard is the role of the system designer. Often inspection and maintenance standards are confused with performance standards where many of the standards referenced in the Compliance Schedule Handbook are misused as performance standards. It does not need to be an actual standard i.e. NZSXXX, rather it should be thought of as the *level of performance* a specified system must achieve.

The level of performance for a system could be a detailed reference to an acceptable solution, verification method, specific design or manufactures technical literature. Inspection maintenance and reporting procedures are what ensures a specified system will be able to achieve this level of performance for the life of a building.

There are a small number of specified systems where cited standards holistically cover system performance, design, installation, certification and inspection & maintenance. These are cited as acceptable solutions and can be used to describe both the performance standard and inspection maintenance & reporting procedures, such as:

- SS 1/1 Automatic sprinkler systems: NZS 4541:2013 Automatic Fire Sprinkler Systems.
- SS 2/1 Automatic or manual emergency warning systems for fire: NZS 4512:2010 Fire detection and alarm systems in buildings.
- SS 6 Riser mains: NZS 4510:2008 Fire hydrant systems for buildings.

A suitable level of design information is still required on these systems to determine the level of performance required for the system to a particular building.

¹ <https://www.building.govt.nz/building-code-compliance/building-code-and-handbooks/compliance-schedule-handbook>

There are also specified systems, such as SS 3/2 Access controlled doors, that have no cited standard for performance, where specific design is required to detail this. For this system, paragraphs from acceptable solutions could be referenced for the performance of the system.

This means that most specified systems will require performance standards to be further detailed by the system designer and should be part of the systems design documentation demonstrating building code compliance.

There is no requirement under the Building Act for the applicant to declare a performance standard on a building consent application form (Form 2), however, we believe that it is prudent to do so to achieve a more efficient consenting experience since this may not be immediately identified in the consent documentation.

The examples below are where you will not likely find performance standards:

- A PS1 or PS2 generically confirming compliance with a building code clause as it does not confirm the level of performance a specified system must achieve.
- Fire designs that generically reference acceptable solutions or other standards (aside from fire alarms, sprinkler systems and riser mains) as they may not be detailed enough to confirm the level of performance a specified system must achieve. It is also noted that most (if not all) fire designs do not cover the design of the specified systems they require for building code compliance as it is generally not the fire engineer's role to undertake this detailed design work.
- General or tender specifications only noting the design and construction requirements of the systems.

Should there be a lack of detail on the building consent application it will require Building Surveyors to request further information (RFI) from the applicant. This RFI will require system designers to provide information of what performance is required to achieve building code compliance for each specified system and more detailed inspection and maintenance procedures for the proposed system. While this could be done in several ways, a good way of capturing this information could be a design features report by the system designer. It is also suggested that specific inspection and maintenance procedures are covered by this report to confirm any additional inspection or maintenance requirements that are not covered by standards or elements that are contained in the compliance schedule handbook.

If specified systems are being designed to Acceptable Solutions or Verification Methods, the level of performance a system needs to achieve are typically contained in relevant sections or paragraphs of those documents. It is important the system designer provides this information so that they can be added to the AC1129 which will accompany the Form 5 Building Consent.

Care must be taken when referencing a performance standard where year, version of the document must be included along with relevant sections or paragraphs relating to the systems performance. As noted in the example below, referencing one part of a paragraph over another will change the level of performance required for a system. This way of referencing is also to ensure that the installed system is not required to be upgraded should the document be updated later.

In the event there is no document to reference (such as a standard or acceptable solution) for the level of performance a specified system must achieve, this will need to be detailed by the system designer to describe how the system is required to operate to ensure building code compliance.

Example using SS 4 Emergency Lighting Systems:

The following example is to illustrate what a performance standard may look like for an emergency lighting system when designed to F6/AS1 (Amendment 4, 1 January 2017).

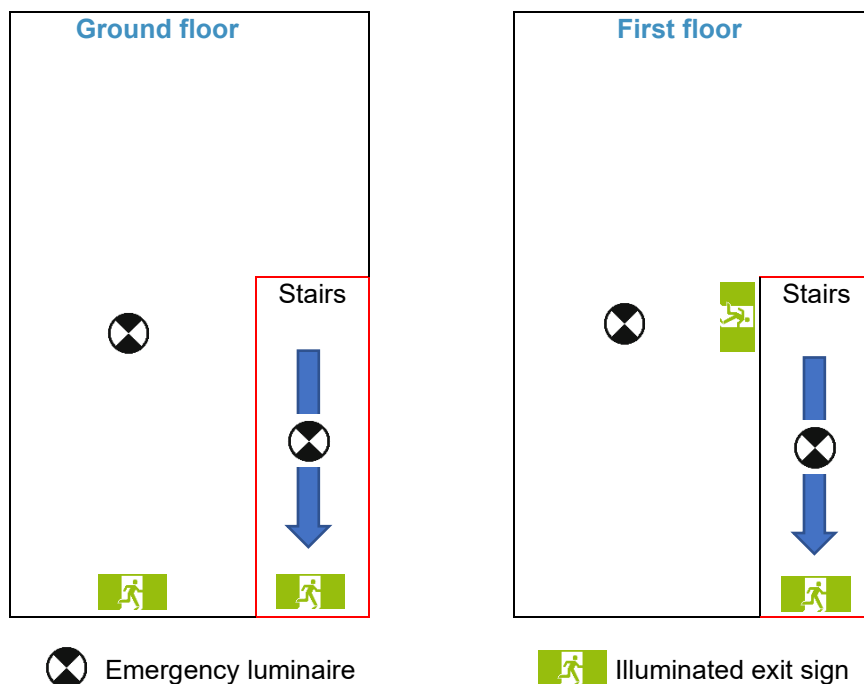
If an emergency lighting design has been completed in accordance with F6/AS1, there is a requirement for:

- a) full technical justification of the design,
- b) the method of checking the illuminance of the completed design, and
- c) the method of checking ongoing compliance for the life of the building

To demonstrate building code compliance, the design information should also cover the level of performance the system needs to achieve for the life of the building which would include reference to relevant paragraphs of the acceptable solution relating to system performance.

The method of checking ongoing compliance for the life of the building should be incorporated into the proposed inspection procedures to be included in the compliance schedule for the building.

For this example, we have a two-level commercial building as depicted below. *Note: the diagram is a representation only and not intended to be a design compliant with F6/AS1*



The design standards for the system would be:

AS 2293.1-2005 Emergency escape lighting and exit signs for buildings. Part 1: System design, installation and operation; and

AS 2293.3-2005 Emergency escape lighting and exit signs for buildings. Part 3: Emergency escape luminaires and exit signs.

When designing to F6/AS1, these standards wouldn't solely be referred as the performance standard since F6/AS1 amends the standards in relation to system performance for elements such as illumination, duration (in part 1) and start-up and output (in part 3).

In this case the performance standard may be: AS 2293.1-2005 & AS 2293.3-2005 as amended by F6/AS1 (Amendment 4, 1 January 2017) paragraphs 1.3.1(a, b, c), 1.5.1 (b-c) & 1.6.1(c).

The above referencing would cover elements such as illuminance such as 1 Lux to stairs, startup & light output requirements and a duration of 30 minutes for this building, which is how the installed system needs to perform on failure of the main lighting. If you refer to these paragraphs in F6/AS1 you will see that a different building would require distinct referencing i.e. a tall building would need to perform to 1.6.1(b), for a duration of 90 minutes.

The standard for the designer to reference for inspection maintenance and reporting procedures would be: AS/NZS 2293.2:1995 Emergency evacuation lighting for buildings – Part 2: Inspection and maintenance. This standard cannot be used as a performance standard as it does not relate to performance of a system.

Below is an example of how the AC1129 form attached to a Building Consent (Form 5) may be completed to display this information.

SS 4 Emergency lighting systems			
Performance Standard:	AS 2293.1-2005 & AS 2293.3-2005 as amended by F6/AS1 (Amendment 4, 1 January 2017) paragraphs 1.3.1(a, b, c), 1.5.1 (b-c) & 1.6.1(c).	System notification:	New
Inspection, maintenance & reporting procedures	AS/NZS 2293.2:1995		
Interfaced with SS 2/1:	No		

It is important the AC1129 document carries appropriate performance standards as these must also appear on the building's compliance schedule and should only be changed by amending the building consent if not correct. As council are not the designers it cannot apply a different performance standard to an issued building consent without the applicant amending their building consent.

If there is a previously issued building consent that does not contain appropriate performance standards displayed on the attached AC1129, an administrative amendment to the consent is required through the request for further information process at CCC stage to amend this before the CCC can be processed and compliance schedule issued correctly.

Performance standards for specified systems

Use of this part

The following provides *guidance* on performance standards for each specified system, where:

- It is only intended to highlight where information in acceptable solutions or standards exist for use as a performance standard. The system designer is required to provide specific and detailed information on the level of performance a system needs to achieve.
- If paragraphs from acceptable solutions are noted, they are referenced below generically and should not be applied in this manner. Also it is important to check any standard or acceptable solution to ensure the paragraphs and sections are appropriate for the design (*Do not copy and paste examples below to any building consent or CCC application*).
- If the design was to a previous version of an acceptable solution or document noted below, check that specific version to ensure the paragraphs relate to the same as these can change over time.
- The examples below are typically the most common, where other standards or specific design may be provided for any system.
- Refer to the Compliance Schedule Handbook for guidance on inspection and maintenance procedures.

SS 1/1: Automatic sprinkler systems

NZS 4541:2013 Automatic Fire Sprinkler Systems

NZS 4541:2021 Automatic Fire Sprinkler Systems

SS 1/2: Automatic fire suppression systems (gas and foam flood systems)

Specific design required detailing level of performance (system designer to specify performance standard)

SS 2/1: Automatic or manual emergency warning systems for fire

NZS 4512:2010 Fire detection and alarm systems in buildings

NZS 4512: 2021 Fire detection and alarm systems in buildings

SS 2/2 Automatic or manual emergency warning systems for other dangers

Specific design required detailing level of performance (system designer to specify performance standard)

SS 3/1 Automatic doors

For automatic sliding doors: Section 5 of NZS 4239:1993 Automatic sliding door assemblies

For automatic and powered opening doors: Sections 2-3 of AS 5007:2007 Powered doors for pedestrian access and egress

SS 3/2 Access controlled doors

C/AS2, Amendment 3: 2 November 2023 Paragraphs 3.15.2 a, b, c (i)(ii)
(System designer to nominate paragraphs shown in red as applicable to the design)

SS 3/3 Interfaced fire or smoke doors or windows

For door hold open devices: C/AS2, Amendment 3: 2 November 2023 (Paragraphs 3.15.9 a, b, c, d, e & 3.15.10 a, b, c)
(System designer to nominate paragraphs shown in red as applicable to the design)

SS 4 Emergency lighting systems

AS 2293.1-2005 & AS 2293.3-2005 as amended by F6/AS1, Amendment 4: 1 January 2017 Paragraphs 1.3.1 a, b, c 1.3.2, a, b, c 1.5.1 a, b, c & 1.6.1 a, b, c
(System designer to nominate paragraphs shown in red as applicable to the design)

SS 5 Escape route pressurisation systems

AS/NZS 1668.1:2015 The use of ventilation and air-conditioning in buildings Part 1: Fire and smoke control in multi- compartment buildings

SS 6 Riser mains

NZS 4510:2008 Fire hydrant systems for buildings

SS 7 Automatic back-flow preventers

AS/NZS 2845.1:2022 Water supply - Backflow prevention devices, Part 1: Materials, design, & performance requirements

AS/NZS 2845.1:2010 Water supply - Backflow prevention devices - Part 1: Materials, design and performance requirements

SS 8/1 Passenger carrying lifts

NZS 4332:1997 non-domestic passenger and goods lifts

EN 81-20: 2014 Safety rules for the construction and installation of lifts. Lifts for the transport of persons and goods. Passenger and goods passenger lifts

NZS 4334:2012 Platform lifts and low-speed lifts

SS 8/2 Platform, low-speed and service lifts

NZS 4332:1997 non-domestic passenger and goods lifts

EN 81-28: 2003 Safety rules for the construction and installation of lifts. Lifts for the transport of persons and goods. Remote alarm on passenger and goods passenger lifts

NZS 4334:2012 Platform lifts and low-speed lifts

SS 8/3 Escalators and moving walks

EN 115-1:2008 Safety of Escalators and Moving Walks – Construction and Installation

SS 9 Mechanical ventilation or air conditioning systems

For air supply performance: NZS 4303:1990 Ventilation for acceptable indoor air quality

For air supply, car parks, extract systems: AS 1668.2:2002 The use of ventilation and air-conditioning in buildings – Part 2: Mechanical ventilation in buildings

AS/NZS 1668.1:2015 The use of ventilation and air-conditioning in buildings Part 1: Fire and smoke control in multi- compartment buildings

Section 3 for fire dampers

Section 6 for kitchen hoods

Section 7 for shutdown systems

For spray booths: AS/NZS 4114.1:2003 Spray painting booths, designated spray-painting areas and paint mixing rooms – Part 1: Design, construction and testing

SS 10 Building maintenance units

For suspended access equipment: BS 6037-1:2017 Planning, design, installation and use of permanently installed access equipment. Code of practice. Suspended access equipment

For travelling ladders and gantries: BS 6037-2:2004 Code of practice for the planning, design, installation and use of permanently installed access equipment. Travelling ladders and gantries

SS 11 Laboratory fume cupboards

AS/NZS 2243.8:2014 Safety in laboratories Part 8: Fume cupboards

SS 12/1 Audio loops

AS 60118.4-2007 Hearing aids – Magnetic field strength in audio-frequency induction loops for hearing aid purposes

SS 13/1 Mechanical smoke control

AS/NZS 1668.1:2015 The use of ventilation and air-conditioning in buildings Part 1: Fire and smoke control in multi-compartment buildings

SS 13/2 Natural smoke control

Specific design required detailing level of performance (system designer to specify performance standard)

SS 13/3 Smoke curtains

BS EN 12101-1: 2005 Smoke and heat control systems. Specification for smoke barriers

Section 9 of AS/NZS 1668.1:2015 The use of ventilation and air-conditioning in buildings Part 1: Fire and smoke control in multi-compartment buildings

SS 14/1 Emergency power systems

NZS 6104:1981 Specification for emergency electricity supply in buildings

SS 14/2 Signs relating to specified systems 1–13

SS 1/1:

Sign showing maximum storage heights (F8/AS1 Amendment 4, 1 January 2017: Paragraph 5.4)

Sign showing Sprinkler Stop Valve Inside (NZS4541:2013)

Sign showing Fire Sprinkler Inlet (NZS4541:2013)

Sign for Aerosol Warning (NZS4541:2013)

- SS 1/2:
Warning signs for gas suppression systems (AS 4214:2012)
- SS 2/1:
Sign showing how to operate a fire alarm call point (F8/AS1 Amendment 4, 1 January 2017: Paragraph 5.1)
- SS 3/1:
Sign showing location of accessible automatic door (F8/AS1 Amendment 4, 1 January 2017: Paragraphs 6.1-6.2)
Indicator sign showing direction of door leaf travel (NZS 4239:1993)
Sign showing location of exit buttons *if not part of SS 3/2* (NZBC F8.3.1 (10 April 2012))
Indicator arrow showing direction of door travel (AS 5007-2007)
Warning sign for breakout door systems (AS 5007-2007)
Indicator sign for swing door that opens away from the user (AS 5007-2007)
Warning sign for swing door that opens towards the user (AS 5007-2007)
Sign showing location of an emergency door release *if not part of SS 3/2* (NZBC F8.3.1 (10 April 2012))
SS 3/2: Sign showing location of a request to exit device *if not part of SS 3/2* (NZBC F8.3.1 (10 April 2012))
- SS 3/3:
Sign showing and automatic closing fire or smoke door (F8/AS1 Amendment 4, 1 January 2017: Paragraph 5.2.1)
- SS 4:
Warning notice for discharge of emergency lighting (AS 2293.1:2005)
- SS 6:
Signs showing location of hydrant riser (F8/AS1 Amendment 4, 1 January 2017: Paragraph 5.5)
Sign for no fire hydrants to stairwell (NZS4510:2008)
- SS 8/1:
Sign showing location of an accessible lift (F8/AS1 Amendment 4, 1 January 2017: Paragraphs 6.1-6.2)
Sign showing not to use the lift in event of fire (F8/AS1 Amendment 4, 1 January 2017: Paragraph 5.3)
Sign showing lift load ratings in people and Kg (F8/AS1 Amendment 4, 1 January 2017: Paragraph 7.3a)
Sign for a machine room (F8/AS1 Amendment 4, 1 January 2017: Paragraph 7.4.1)
- SS 8/2:
Sign showing not to use the lift in event of fire (F8/AS1 Amendment 4, 1 January 2017: Paragraph 5.3)
SS 8/2: Sign showing lift load ratings in Kg (F8/AS1 Amendment 4, 1 January 2017: Paragraph 7.3b)
- SS 8/3:
Sign showing hazards to escalators and moving walks (F8/AS1 Amendment 4, 1 January 2017: Paragraph 7.5)
- SS9:
Sign for toxic and/or flammable vapours may be present to spray booth doors (AS/NZS 4114:2020)
- SS 12/1:
Sign showing symbol for deaf (assisted listening devices) (F8/AS1 Amendment 4, 1 January 2017: Paragraph 6.3)
- SS 12/2:
Sign showing symbol for deaf (assisted listening devices) (F8/AS1 Amendment 4, 1 January 2017: Paragraph 6.3)
- SS 13/3:
Sign showing Smoke / Fire curtain drops on fire alarm (NZBC F8.3.1 (10 April 2012))

Sign showing: Do not store items in this area (in curtain drop zone) (NZBC F8.3.1 (10 April 2012

SS 15(a) Systems for communicating spoken information intended to facilitate evacuation

NZS 4512:2010 Fire detection and alarm systems in buildings

AS 2220.2—1989 Emergency warning and intercommunication systems in buildings Part 2: System design, installation and commissioning

SS 15(b) Final exits

C/AS2, Amendment 3, 2 November 2023, Section 3.15

SS 15(c) Fire separations

For walls, floors and ceilings: Structural adequacy/ Integrity/ Insulation, for example: 60/60/60 *Fire Resistance Rating* as defined C/AS2 Amendment 3, 2 November 2023

For fire doors: Integrity/ Insulation, for example -/60/60 *Fire Resistance Rating* to NZS 4520:2010 Fire resistant door sets

SS 15(d) Signs for communicating information to facilitate evacuation

F8/AS1 Amendment 4, 1 January 2017, Section 4

SS 15(e) Smoke separations

Smoke control doors: C/AS2, Amendment 3, 2 November 2023, Appendix C, Section C6.1

Smoke Separations as defined by C/AS2, Amendment 3, 2 November 2023

SS 16 Cable Cars

NZS 5270:2005 Cable cars for private residences – design, construction, installation and maintenance
