

# EMERGENCY LIGHTING SYSTEM

**1300 INCITE**

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System Design, Installation, Maintenance and Operation

**FIREscape**

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Incite Fire operate under the manufactures guideline as per below:

**Manufacturing Warning:** The purpose of this General Guide to AS2293 is to provide a simplified overview of the installation requirements under AS2291.1, as at 2005. This document is not intended to be used as a substitute for AS2293.1 and should not be relied upon as an accurate, comprehensive or up-to-date reflection of the applicable Australian Standard(s). It is your responsibility to ensure that installation of the **FireEscape**® product is in compliance with all applicable Australian Standards and any other legal requirements. Hochiki Australia Pty Ltd will not take responsibility for any loss or damage due to your non-compliance with AS2293.1, any other applicable standards or legal requirements.

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# AN EXTRA LOW VOLTAGE EXIT & EMERGENCY LIGHTING SYSTEM

**FIREscape®** is a revolutionary emergency lighting system, made using fully recycled materials and able to save up to 80% in power costs through its patented energy efficient design.

## Key Benefits of **FIREscape®**

### 1 Environmentally friendly in energy costs and CO2e emissions

The **FIREscape®** emergency light system uses fully recyclable materials that do not place an unnecessary burden on the environment. Due to their unique extra low-voltage solution, cabling costs are reduced by 60% during installation when compared to old central battery-based systems.

**FIREscape®** also runs off 35 volts instead of 230 volts like traditional emergency lighting systems, saving significant money in power consumption savings.

### 2 A cost-efficient system to implement and maintain

A **FIREscape®** exit sign luminaire consumes less than 0.5W, including the power loss.

When compared to 230V LED lights, **FIREscape®** products save more than 50% of energy.

The lower energy consumption directly correlates with lower CO2e emissions.

### 3 Exit luminaires and emergency exit signs share the same circuit

Due to **FIREscape®** programmability, exit and route lights can be freely installed anywhere on the line without having to group them into either exit or route lights.

### 4 Reduced cabling costs

Due to their self-contained backup power source, the **FIREscape®** lighting devices can use screened, non-fire rated cabling, instead of heavy and costly fire resistant cabling, reducing the installation costs associated with traditional emergency lighting systems.

### 5 Operational reliability; luminaires feature integral stand-by batteries

A fire-rated cable is not required because all **FIREscape®** luminaires are equipped with integral stand-by batteries allowing the luminaires to function in fail-safe mode even in situations where the control panel becomes damaged or inoperable or the line cable is severed. The luminaire batteries allow continual operation in excess of 3 hrs.

### 6 Automatic luminaire battery and LED health testing features

The EL-2 control panel constantly monitors the condition of the luminaire batteries and LEDs and can be programmed to perform the periodical testing and reporting required by legislation.

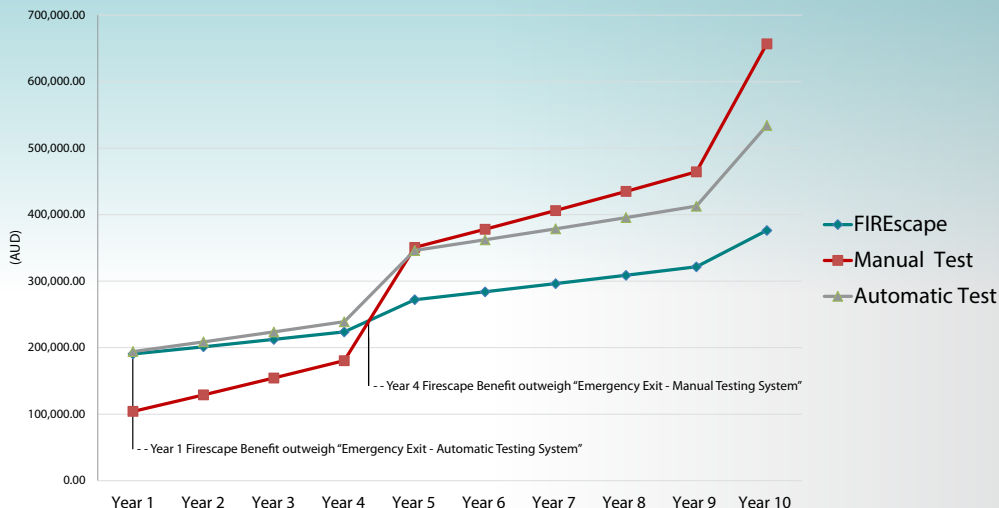
### 7 Easy display control centre

Fault information from the **FIREscape®** emergency lighting system can be displayed using the optional EL-GRAPH graphic software which can show actual building floor-plans with activated areas and individual unit faults. The software can allow the **FIREscape®** emergency lighting system to be monitored from a control room/centre.

### 8 Remote Monitoring

Remote monitoring of the EL-2 emergency lighting system control panel is possible utilising the GSM alarm transfer unit. Fault data is easily transmitted to end user or service company GSM numbers. Each GSM number can be stored in an 'alarm ring' so that each responsible person can be contacted in turn if any others are unavailable.

## ACCUMULATIVE ANNUAL COST



The above "cost of ownership product comparison" line graph is based on 1000 luminaires (80% Emergency Escape & 20% Emergency Exits) over a 10 year period. It incorporates the following variables in relation to an emergency lighting system - Power Consumption / Carbon Foot print - Labour Cost for AS2293.2 Testing requirements - Capital cost for Battery / Luminaire failure - Labour Cost for Battery / luminaire replacement

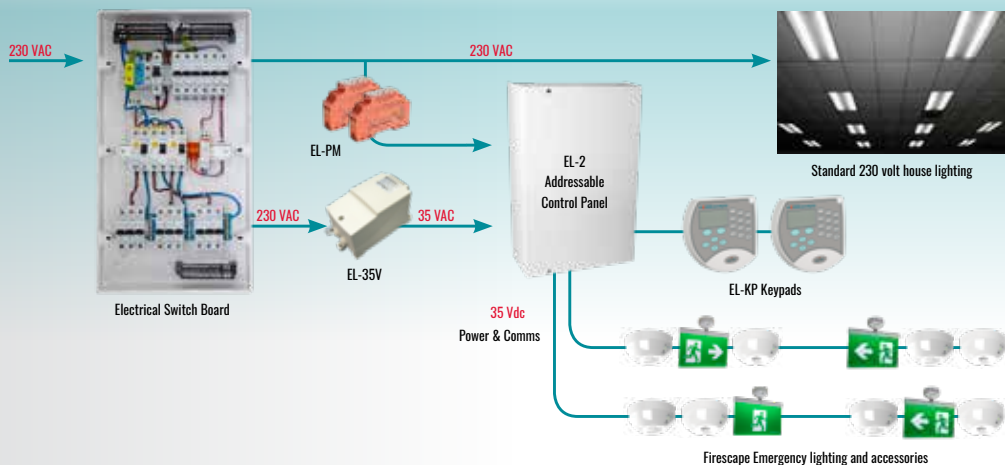
## KEY POINTS

Save energy costs through:

- Each light not needing a transformer.
- Minimum 60% more energy efficient than standard exit & emergency lighting systems.
- Extra Low Voltage System.

**The only EXIT Emergency Lighting System with compliant AS2293 - Parts 1 & 3**

# FIRESCAPE EXIT & EMERGENCY LIGHTING SYSTEM



## EL-PM

The EL-PM monitors normal house lighting supply and changes state under 300ms on detection of house supply failure.

## EL-35V

The EL-35V transformer converts 230 Ac volts to 35 V dc.

## EL-2 ADDRESSABLE CONTROL PANEL

The EL-2 emergency light control panel features two lines, each line can accommodate 127 exit signs, route lights or I/O units. The EL-2 supplies the operational voltage to the light units during normal conditions, whilst also completing the continuous testing and monitoring of the equipment on the system. All monitored event information is saved in the memory of the control panel, and this can be accessed through the connected EL-KP keypad.

## EL-KP KeyPad

EL-KP Keypads show system status of the lighting units including battery charge and LED faults.

## Why Emergency Lighting?

In the event of normal house or artificial lighting failure, the objective of an emergency lighting system is to safeguard occupants from injury by:

- Supplying adequate lighting
- Having adequate identification of exits and paths of travel to exits
- Being made aware of the emergency

The **Building Code of Australia** (BCA) requires every emergency lighting system to comply with **AS 2293**. The AS 2293 series is comprised of 3 parts:

AS 2293 = Emergency Escape Lighting and Exit Signs for Buildings

- Part 1 = System design, installation and operation
- Part 2 = Inspection and maintenance
- Part 3 = Emergency escape luminaires and exit signs



Remember, the correct positioning of exit signage and emergency lighting is essential in saving lives.

# 1. EMERGENCY LIGHTING REQUIREMENTS

In Australia, the BCA requires emergency lighting to be provided and installed in the following locations of class buildings. For class building types explanation see page 6.

BCA Requirements for the installation of Emergency Exit and Escape Lighting																
Clause	Area/Location	1a	1b	2	3	4	5	6	7a	7b	8	9a	9b	9c	10a	10b
E4.2A	In every fire-isolated stairway, fire-isolated passageway or fire-isolated ramp.			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
B	In every storey of a Class 5, 6, 7, 8 or 9 building where the storey has a floor area more than 300m <sup>2</sup> :							✓	✓	✓	✓	✓	✓	✓		
i	in every passageway, corridor, hallway, or the like, that is part of the path of travel to an exit and							✓	✓	✓	✓	✓	✓	✓		
ii	in any room having a floor area more than 100m <sup>2</sup> that does not open to a corridor or space that has emergency lighting or to a road or open space and							✓	✓	✓	✓	✓	✓	✓		
iii	in any room having a having a floor area more than 300m <sup>2</sup> .			✓	✓	✓										
C	In every passageway, corridor, hallway, or the like, having a length of more than 6m from the entrance doorway of any sole-occupancy unit in a Class 2 or 3 building or Class 4 part of a building to the nearest doorway opening directly to:			✓	✓	✓										
i	a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp or			✓	✓	✓										
ii	an external stairway serving instead of a fire-isolated stairway under D1.8 or			✓	✓	✓										
iii	an external balcony leading to a fire-isolated stairwell, fire-isolated passageway or fire-isolated ramp or			✓	✓	✓										
iv	a road or open space.			✓	✓	✓										
D	In every required non-fire-isolated stairway.			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
E	In a sole-occupancy unit in a Class 5, 6 or 9 building if:						✓	✓			✓	✓	✓			
i	the floor area of the unit is more than 300m <sup>2</sup> ; and						✓	✓			✓	✓	✓			
ii	an exit from the unit does not open to a road or open space or to an external stairway, passageway, balcony or ramp, leading directly to a road or open space and						✓	✓			✓	✓	✓			
F	In every room or space to which there is public access in every storey in a Class 6 or 9b building if:							✓				✓				
i	the floor area in that storey is more than 300m <sup>2</sup> or							✓				✓				
ii	any point on the floor of that storey is more than 20m from the nearest doorway leading directly to the stairway, ramp, passageway, road or open space or							✓				✓				
iii	egress from that storey involves a vertical rise within the building of more than 1.5m, or any vertical rise if the storey concerned does not admit sufficient light or											✓				
iv	the storey provides a path of travel from any other storey required by (i), (ii), or (iii) to have emergency lighting.											✓				
G	In a Class 9a health-care building:											✓				
i	in every passageway, corridor, hallway, or the like, serving a treatment area or a ward area and											✓				
ii	in every room having a floor area of more than 120m <sup>2</sup> in a patient care area.											✓				
H	In every Class 9c building within sole-occupancy units and in every required fire control area.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## Building Class Summary

### Classification Summary of Buildings and Structures defined in the Building Code of Australia

Classes of Building		
Class 1	Class 1a	Single dwelling being a detached house, or one or more attached dwellings, each being a building, separated by a <i>fire-resisting</i> wall, including a row house, terrace house, town house or villa unit.
	Class 1b	A boarding house, guest house, hostel or the like with a total area of all floors not exceeding 300m <sup>2</sup> , and where not more than 12 reside, and is not located above or below another dwelling or another Class of building other than a private garage.
Class 2	A building containing 2 or more sole-occupancy units each being a separate dwelling.	
Class 3	A residential building, other than a Class 1 or 2 building, which is a common place of long term or transient living for a number of unrelated persons. <i>Example: boarding-house, hostel, backpackers accommodation or residential part of a hotel, motel, school or detention centre.</i>	
Class 4	A dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.	
Class 5	An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	
Class 6	A shop or other building for the sale of goods by retail or the supply of services direct to the public. <i>Example: cafe, restaurant, kiosk, hairdressers, showroom or service station.</i>	
Class 7	Class 7a	A building which is a carpark.
	Class 7b	A building which is for storage or display of goods or produce for sale by wholesale.
Class 8	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.	
Class 9	A building of a public nature:	
	Class 9a	A health care building, including those parts of the building set aside as a laboratory.
	Class 9b	An assembly building, including a trade workshop, laboratory or the like, in a primary or secondary school, but excluding any other parts of the building that are of another class.
	Class 9c	An aged care building.
Class 10	A non habitual building or structure:	
	Class 10a	A private garage, carport, shed or the like.
	Class 10b	A structure being a fence, mast, antenna, retaining or free standing wall, swimming pool or the like.

Types of construction		
Rise in storeys	Class of building 2, 3, 9	Class of building 5, 6, 7, 8
4 or more	A	A
3	A	B
2	B	C
1	C	C

Note: The classification of buildings and the type of construction can vary from the standard model depicted in the tables. Concessions can be provided that change the type of construction. The concessions can relate to the design of the building, its size and the number of escapes.



There are many varieties of emergency luminaire fittings, the following are the most common types and operations found in typical installations, as referenced in AS 2293.1 definitions.

## Luminaire Types

- **Self-Contained**

Self-contained emergency luminaires are an emergency luminaire contained or mounted within 2 metres of a battery, charger, inverter (where used) and controls necessary for sensing supply failure of the normal supply and for changing over to the emergency supply and vice versa.

- **Single Point**

Single point emergency luminaires are a system of emergency lighting employing only self-contained emergency luminaires.

- **Centrally Supplied**

Centrally supplied luminaires are a system of emergency lighting and exit signs supplied from a common power source.

## Operation Types

- **Maintained**

Maintained emergency escape luminaire and exit sign is when all emergency lighting lamps are energised at all times when normal or emergency lighting is required.

- **Non-Maintained**

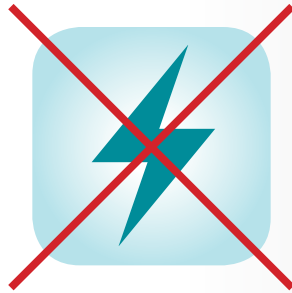
Non Maintained emergency escape luminaire and exit sign is when all emergency lighting lamps are in operation only when the supply to normal lighting fails.

- **Combined**

Combined emergency escape luminaire and exit signs contain two or more lamps, at least one of which is energized from the emergency lighting supply and the other from normal lighting supply. The emergency lamps in a combined emergency exit luminaire are either maintained or non-maintained.

## System Arrangement and Control

Upon the failure of the electrical supply to the normal lighting in the area, irrespective of whether it is illuminated or not, each relevant emergency escape luminaire and exit sign shall be energized from its emergency power supply.



Single point systems require that the failure of any supply to any final sub circuit supplying lighting to a designated area shall cause each self-contained emergency escape luminaire and exit sign in the area served by the sub circuit to be automatically connected to its emergency power source.

NOTE: This requirement does not prevent other emergency luminaires that have not lost supply from switching to their emergency power source.

## Performance and Commissioning

The objective of the BCA is to safe guard occupants from injury by providing adequate lighting, which specifies:

**0.2 lux, minimum**, at floor level in general areas and **1 lux at floor level in every stairway, ramp or fire isolated passageway.**



At the time of commissioning, emergency lighting luminaires shall last for no less than 120 minutes on its emergency power source.

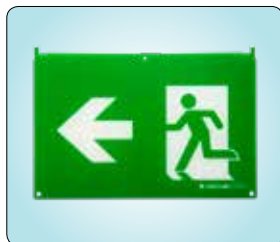


## 2. EMERGENCY EXIT SIGNS

### Exit Sign Design Requirements

The BCA requires that exit signs shall be illuminated at a level sufficient for them to be clearly visible at all times when the building is occupied by any person with legal entry.

The 3 types of exit sign are:



Left



Straight from here



Right

### Luminance Requirements

Luminance of the sign shall be no less than **8cd/m<sup>2</sup>**

Luminance ratio of any 2 white or green area  
not more than **5:1**

Contrast of white to green to be no less than **4:1**



## Locations

**Section 6 of AS 2291.1** specifies required locations for exit sign installation. The following are some locations referenced:

Mounting heights shall not be less than **2 metres** and not more than **2.7 metres** above floor level, or immediately above the doorway if the doorway is higher than 2.7 metres.



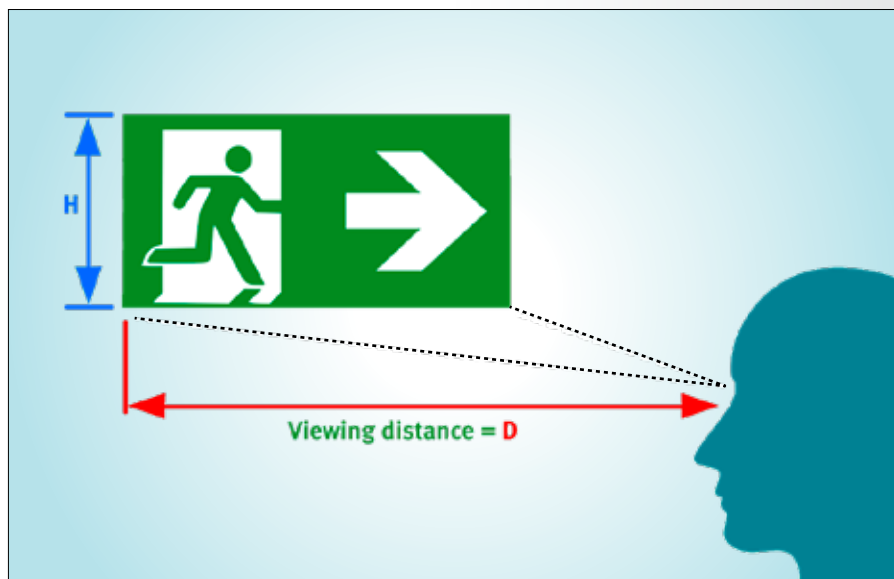
An exit sign must be clearly visible to persons approaching the exit, and must be installed on, above or adjacent to each:

- Door providing direct egress from a storey to;
  - an enclosed stairway, passageway or ramp serving as a required exit
  - an external stairway, passageway or ramp serving as a required exit
  - an external access balcony leading to a required exit
- Door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space
- Horizontal exit
- Door serving as, or forming part of, a required exit in a storey required to be provided with emergency lighting in accordance with **E4.2 of the BCA**

## Viewing Distances

Maximum Exit Sign Viewing Distance Categories	
Exit Sign Height (mm)	Maximum Viewing Distance (m)
>100 <150	16
>150 <200	24
>200 <250	32
>250 <300	40

The **height** of any pictorial element on an exit sign shall be determined by the maximum viewing **distance**.

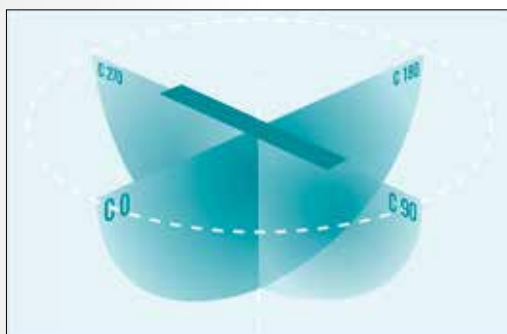


### 3. EMERGENCY ESCAPE LUMINAIRES

A building is to be provided with adequate lighting upon failure of normal house / artificial lighting during an emergency and provide sufficient means of warning occupants, assist in the evacuation process and identify exits and paths of travel to exit. Emergency escape luminaires are assigned classifications to assist in this requirement.

#### Classifications and Spacing

The purpose of classifications is to facilitate the specification of requirements, in terms of luminaire mounting height and spacing, to simplify both design, installation and assessment.



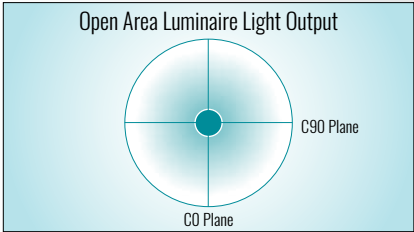
Vertical planes through an emergency escape luminaire

An emergency escape luminaire is assessed via its **transverse (C0)** and **longitudinal (C90)** planes through the luminaire.

Not all downlights share the same C0 classification to their C90. This allows for various types of emergency lighting for specific applications (ie. corridor lights, open areas, etc).

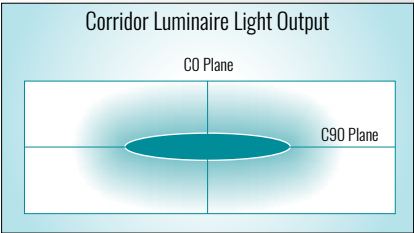
**AS 2293.1 section 5** specifies requirements for the installation, spacing and location of emergency escape luminaires. Refer to pages 15-19 for luminaire classification mounting height and spacing requirements.

### Examples



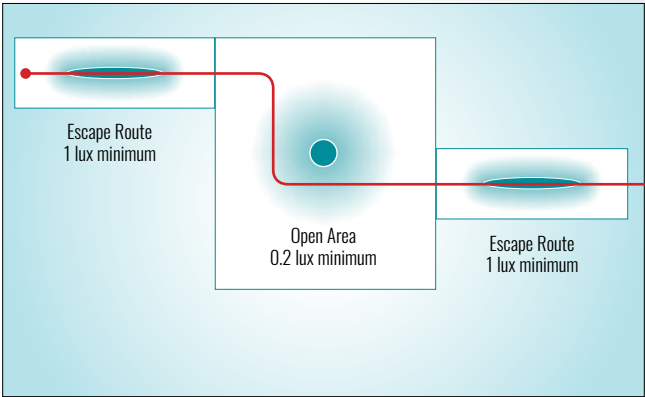
**EL-DL3-AS Open Area Emergency Escape Luminaire**

EL-DL3	Class	2.1m	2.4m	2.7m	3m	3.3m	3.6m	4m	4.5m	5m	6m	7m	8m	9m	10m	15m
C0	E6.3	7	7.6	8	8.4	8.6	8.8	9.2	9.4	9.4	8.8	8.2	7			
C90	E6.3	7	7.6	8	8.4	8.6	8.8	9.2	9.4	9.4	8.8	8.2	7			



**EL-DL2-AS Corridor Emergency Escape Luminaire**

EL-DL2	Class	2.1m	2.4m	2.7m	3m	3.3m	3.6m	4m	4.5m	5m	6m	7m	8m	9m	10m	15m
C0	C2	4.1	4.1	4.1	3.9	3.7	3.3	2.6								
C90	E25	9	10	10.8	11.4	12.2	12.8	13.6	14.4	15.2	16.6	17.4	18.2	18.6	18.6	17.4





## Class A Luminaire Mounting Height and Spacing

Luminaire Classification	Mounting Height in Metres															
	2.1	2.4	2.7	3	3.3	3.6	4	4.5	5	6	7	8	9	10	15	20
A1	2.2	2	1.7	1												
A1.25	2.5	2.4	2.2	1.9	1.3											
A1.6	2.8	2.8	2.7	2.5	2.2	1.8										
A2	3.1	3.1	3.1	3	2.9	2.6	2.1									
A2.5	3.4	3.5	3.5	3.5	3.4	3.3	3	2.2								
A3.2	3.7	3.8	3.9	4	4	3.9	3.7	3.4	2.7							
A4	3.9	4.1	4.3	4.4	4.4	4.4	4.4	4.2	3.8	2.1						
A5	4.2	4.4	4.6	4.8	4.9	4.9	5	4.9	4.7	3.8	1.1					
A6.3	4.5	4.8	5	5.2	5.3	5.4	5.5	5.6	5.5	5	3.8					
A8	4.8	5.1	5.4	5.6	5.8	5.9	6.1	6.2	6.3	6.1	5.4	4.1				
A10	5	5.4	5.7	6	6.2	6.4	6.6	6.8	7	7	6.7	5.9	4.5			
A12.5	5.3	5.7	6	6.4	6.6	6.9	7.2	7.4	7.6	7.8	7.8	7.3	6.5	5.1		
A16	5.6	6	6.4	6.8	7.1	7.4	7.7	8.1	8.4	8.7	8.9	8.8	8.3	7.6		
A20	5.9	6.4	6.8	7.2	7.5	7.8	8.2	8.7	9	9.5	9.8	9.9	9.8	9.4		
A25	6.2	6.7	7.1	7.6	7.9	8.3	8.7	9.2	9.6	10.3	10.8	11	11.1	10.9	5.2	
A32	6.5	7	7.5	8	8.4	8.8	9.3	9.9	10.4	11.2	11.8	12.2	12.5	12.6	9.8	
A40	6.8	7.4	7.9	8.4	8.9	9.3	9.8	10.4	11	11.9	12.7	13.3	13.7	13.9	12.7	
A50	7.1	7.7	8.3	8.8	9.3	9.8	10.3	11	11.6	12.7	13.6	14.3	14.9	15.3	15.2	10.3
A63	7.4	8.1	8.7	9.2	9.8	10.3	10.9	11.6	12.3	13.5	14.5	15.4	16.1	16.6	17.5	14.9
A80	8.4	9	9.1	9.7	10.3	10.8	11.5	12.3	13	14.3	15.5	16.5	17.3	18.9	19.8	18.7
A100	8.1	8.8	9.5	10.1	10.7	11.3	12	12.9	13.7	15.1	16.4	17.5	18.4	19.3	21.9	21.9
A125	8.4	9.2	9.9	10.6	11.2	11.8	12.6	13.5	14.3	15.9	17.3	18.5	196	20.6	23.9	24.8
A160	8.8	9.6	10.3	11.1	11.7	12.4	13.2	14.2	15.1	16.8	18.3	19.7	20.9	22	26	27.9
A200	9.1	10	10.8	11.5	12.2	12.9	13.8	14.8	15.8	176	19.2	20.7	22	23.3	27.9	30.6
A250	9.5	10.4	11.2	12	12.7	13.5	14.4	15.5	16.5	18.4	20.2	21.8	23.2	24.6	29.8	33.2
A320	9.9	10.8	11.7	12.5	13.3	14.1	15.1	16.2	17.3	19.4	21.2	23	24.5	26	32	36
A400	10.3	11.2	12.2	13	13.9	14.7	15.7	16.9	18.1	20.2	22.2	24	25.8	27.3	33.9	38.6
A500	10.7	11.7	12.6	13.5	14.4	15.2	16.3	17.6	18.8	21.1	23.2	25.2	27	28.7	35.8	41.1
A630	11.1	12.1	13.1	14.1	15	15.9	17	18.3	19.6	22	24.3	26.3	28.3	30.1	37.8	43.8
A800	11.5	12.6	13.7	14.6	15.6	16.5	17.7	19.1	20.5	23	25.4	27.6	29.7	31.6	40	46.5

## Class B Luminaire Mounting Height and Spacing

Luminaire Classification	Mounting Height in Metres															
	2.1	2.4	2.7	3	3.3	3.6	4	4.5	5	6	7	8	9	10	15	20
B1	2.4	2.2	1.8	1.1												
B1.25	2.7	2.6	2.4	2	1.4											
B1.6	3.1	3.1	3	2.8	2.4	1.9										
B2	3.4	3.4	3.4	3.3	3.1	2.8	2.2									
B2.5	3.7	3.8	3.8	3.8	3.7	3.6	3.2	2.4								
B3.2	4.1	4.2	4.3	4.4	4.3	4.3	4.1	3.7	2.9							
B4	4.4	4.6	4.7	4.8	4.9	4.9	4.8	4.5	4.1	2.3						
B5	4.7	4.9	5.1	5.3	5.4	5.4	5.4	5.3	5.1	4.1	1.2					
B6.3	5	5.3	5.5	5.7	5.9	6	6.1	6.1	6	5.4	4.1					
B8	5.4	5.7	60	6.2	6.4	6.6	6.7	6.9	6.9	6.6	5.9	4.4				
B10	5.7	6.1	6.4	6.7	6.9	7.1	7.3	7.5	7.7	7.6	7.3	6.4	4.9			
B12.5	6	6.4	6.8	7.1	7.4	7.6	7.9	8.2	8.4	8.6	8.5	8	7.1	5.6		
B16	6.4	6.8	7.2	7.6	7.9	8.2	8.6	9	9.3	9.6	9.7	9.6	9.1	8.2		
B20	6.7	7.2	7.7	2.1	8.4	8.8	9.2	9.6	10	10.5	10.8	10.9	10.7	10.2		
B25	7.1	7.6	8.1	8.5	9	9.3	9.8	10.3	10.7	11.4	11.9	12.1	12.2	12	5.7	
B32	7.5	8.1	8.6	9.1	9.5	10	10.5	11.1	11.6	12.4	13.1	13.5	13.7	13.8	10.6	
B40	7.8	8.5	9	9.6	10.1	10.5	11.1	11.7	12.3	13.3	14.1	14.7	15.1	15.3	13.8	
B50	8.2	8.9	9.5	10.1	10.6	11.1	11.7	12.4	13.1	14.2	15.1	15.9	16.4	16.9	16.6	11.1
B63	8.6	9.3	10	10.6	11.2	11.7	12.4	13.2	13.9	15.2	16.2	17.1	17.8	18.4	19.2	16.2
B80	9.1	9.8	10.5	11.2	11.8	12.4	13.1	14	14.7	16.2	17.4	18.4	19.3	20	21.8	20.4
B100	9.5	10.3	11	11.7	12.4	13	13.8	14.7	15.6	17.1	18.4	19.6	20.6	21.5	24.1	23.9
B125	9.9	10.7	11.5	12.3	13	13.6	14.5	15.5	16.4	18	19.5	20.8	22	23	26.3	27.2
B160	10.4	11.3	12.1	12.9	13.6	14.4	15.3	16.3	17.3	19.1	20.7	22.2	23.5	24.7	28.8	30.7
B200	10.9	11.8	12.7	13.5	14.3	15	16	17.1	18.2	20.1	21.9	23.5	24.9	26.2	31.1	33.7
B250	11.3	12.3	13.2	14.1	14.9	15.7	16.8	18	19.1	21.2	23	24.8	26.3	27.7	33.3	36.7
B320	11.9	12.9	13.9	14.8	15.7	16.5	17.6	18.9	20.1	22.3	24.4	26.2	27.9	29.5	35.8	40
B400	12.4	13.5	14.5	15.5	16.4	17.3	18.4	19.8	21	23.4	25.6	27.6	29.4	31.1	38.1	43
B500	12.9	14	15.1	16.1	17.1	18	19.2	20.7	22	24.5	26.8	29	30.9	32.8	40.4	46
B630	13.5	14.6	15.8	16.9	17.9	18.9	20.1	21.6	23.1	25.7	28.2	30.4	32.5	34.5	42.8	49.1
B800	14.1	15.3	16.5	17.6	18.7	19.7	21.1	22.7	24.2	27	29.6	32	34.3	36.4	45.4	52.4

## Class C Luminaire Mounting Height and Spacing

Luminaire Classification	Mounting Height in Metres															
	2.1	2.4	2.7	3	3.3	3.6	4	4.5	5	6	7	8	9	10	15	20
C1	2.8	2.5	2.1	1.3												
C1.25	3.2	3.1	2.8	2.4	1.7											
C1.6	3.7	3.6	3.5	3.2	2.9	2.3										
C2	4.1	4.1	4.1	3.9	3.7	3.3	2.6									
C2.5	4.5	4.6	4.6	4.5	4.4	4.2	3.7	2.8								
C3.2	5	5.1	5.2	5.2	5.2	5.1	4.8	4.3	3.4							
C4	5.4	5.6	5.7	5.8	5.8	5.8	5.7	5.3	4.3	2.6						
C5	5.9	6.1	6.3	6.4	6.5	6.5	6.5	6.3	6	4.8	1.3					
C6.3	6.3	6.6	6.8	7	7.2	7.3	7.3	7.3	7.1	6.4	4.8					
C8	6.8	7.2	7.4	7.7	7.9	8	8.2	8.3	8.2	7.8	6.9	5.2				
C10	7.3	7.7	8	8.3	8.6	8.8	9	9.1	9.2	9.1	8.6	7.5	5.6			
C12.5	7.8	8.2	8.6	8.9	9.2	9.5	9.8	10	10.2	10.3	10.1	9.4	8.3	6.5		
C16	8.3	8.8	9.3	9.7	10	10.3	10.7	11	11.3	11.6	11.6	11.3	10.7	9.6		
C20	8.9	9.4	9.9	10.3	10.7	11.1	11.5	12	12.3	12.8	13	13	12.7	12		
C25	9.4	10	10.5	11	11.5	11.9	12.4	12.9	13.4	14	14.4	14.6	14.5	14.2	6.6	
C32	10	10.7	11.3	11.8	12.3	12.8	13.4	14	14.5	15.4	16	16.4	16.5	16.5	12.3	
C40	10.6	11.3	12	12.6	13.1	13.6	14.3	15	15.6	16.6	17.4	17.9	18.3	18.5	16.2	
C50	11.3	12	12.7	13.4	14	14.5	15.2	16	16.7	17.9	18.8	19.6	20.1	20.4	19.6	12.9
C63	11.9	12.8	13.5	14.2	14.9	15.5	16.2	17.1	17.9	19.2	20.3	21.2	22	22.5	22.9	18.9
C80	12.7	13.5	14.4	15.1	15.8	16.5	17.3	18.3	19.1	20.7	22	23	23.9	24.7	26.1	24
C100	13.4	14.3	15.2	16	16.8	17.5	18.4	19.4	20.4	22.1	23.5	24.8	25.8	26.7	29.1	28.4
C125	14.1	15.1	16.1	16.9	17.7	18.5	19.5	20.6	21.7	23.5	25.1	26.5	27.7	28.8	32.1	32.5
C160	15	16.1	17.1	18	18.9	19.7	20.8	22	23.1	25.2	27	28.5	29.9	31.2	35.4	36.9
C200	15.8	16.9	18	19	20	20.9	22	23.3	24.5	26.7	28.7	30.4	32	33.4	38.4	40.9
C250	16.7	17.9	19	20.1	21.1	22	23.2	24.7	26	28.4	30.5	32.4	34.1	35.7	41.5	44.9
C320	17.7	19	20.2	21.3	22.4	23.4	24.7	26.2	27.6	30.2	32.6	34.6	36.6	38.2	45	49.3
C400	18.6	20	21.3	22.5	23.6	24.7	26.1	27.7	29.2	32	34.5	36.8	38.9	40.8	48.3	53.4
C500	19.6	21	22.4	23.7	24.9	26.1	27.5	29.3	30.9	33.9	36.5	39	41.2	43.3	51.7	57.6
C630	20.7	22.2	23.7	25	26.3	27.5	29.1	30.9	32.7	35.9	38.7	41.4	43.8	46.1	55.3	62
C800	21.9	23.5	25	26.5	27.8	29.1	30.8	32.8	34.6	38	41.1	44	46.6	49	59.2	66.8

## Class D Luminaire Mounting Height and Spacing

Luminaire Classification	Mounting Height in Metres															
	2.1	2.4	2.7	3	3.3	3.6	4	4.5	5	6	7	8	9	10	15	20
D1	3.4	3.1	2.5	1.6												
D1.25	4	3.8	3.4	2.9	2											
D1.6	4.6	4.5	4.3	3.9	3.4	2.7										
D2	5.2	5.2	5	4.8	4.4	4	3.1									
D2.5	5.8	5.8	5.7	5.6	5.4	5.1	4.5	3.4								
D3.2	6.5	6.6	6.6	6.5	6.4	6.2	5.8	5.1	4.1							
D4	7.2	7.3	7.3	7.3	7.3	7.2	6.9	6.5	5.8	3.1						
D5	7.8	8	8.1	8.2	8.2	8.2	8	7.7	7.3	5.7	1.6					
D6.3	8.6	8.8	9	9.1	9.2	9.2	9.2	9	8.7	7.7	5.7					
D8	9.4	9.7	9.9	10.1	10.2	10.3	10.4	10.3	10.2	9.5	8.3	6.1				
D10	10.2	10.6	10.9	11.1	11.3	11.4	11.5	11.6	11.6	11.2	10.3	8.9	6.7			
D12.5	11.5	11.5	11.8	12.1	12.4	12.5	12.7	12.9	13	12.8	12.3	11.3	9.9	7.6		
D16	12.1	12.6	13	13.3	13.6	13.9	14.1	14.6	14.6	14.6	14.4	13.8	12.9	11.5		
D20	13.4	13.6	14.1	14.5	14.8	15.1	15.5	15.8	16.1	16.4	16.3	16	15.4	14.5		
D25	14.2	14.7	15.3	15.7	16.1	16.5	16.9	17.3	17.7	18.1	18.3	18.2	17.9	17.3	7.7	
D32	15.4	16.1	16.7	17.2	17.6	18	18.5	19.1	19.5	20.2	20.6	20.7	20.6	20.3	14.6	
D40	16.7	17.4	18	18.6	19.1	19.6	20.1	20.8	21.3	22.1	22.7	23	23.1	23.1	19.4	
D50	18	18.7	19.4	20.1	20.7	21.2	21.8	22.5	23.2	24.2	24.9	25.4	25.7	25.9	13.7	15.2
D63	19.4	20.3	21.1	21.8	22.4	23	23.7	24.5	25.2	26.4	27.4	28.1	28.6	28.9	28	22.5
D80	24.2	22	22.8	23.6	24.3	25	25.8	26.7	27.5	28.9	30	30.9	31.6	32.1	32.4	28.9
D100	22.7	23.7	24.6	25.5	26.3	27	27.9	28.9	29.8	31.4	32.7	33.7	34.6	35.3	36.5	34.5
D125	24.5	25.6	26.6	27.5	28.3	29.1	30.1	31.2	32.2	34	35.5	36.7	37.8	38.6	40.8	40
D160	26.6	27.8	28.9	29.9	30.8	31.7	32.8	34	35.1	37.1	38.8	40.2	41.5	42.5	45.7	46.1
D200	28.6	29.9	31.1	32.2	33.2	34.2	35.3	36.7	37.9	40.1	42	43.6	45	46.3	50.4	51.7
D250	30.8	32.2	33.5	34.7	35.8	36.8	38.1	39.6	40.9	43.3	45.4	47.2	48.9	50.3	55.2	57.5
D320	33.4	35	36.4	37.7	38.9	40	41.4	43	44.5	47.2	49.5	51.5	53.4	55	60.9	64.2
D400	36	37.6	39.2	40.6	41.9	43.1	44.6	46.4	48	50.9	53.5	55.7	57.7	59.5	66.4	70.5
D500	38.8	40.5	42.2	43.7	45.1	46.4	48.1	50	51.7	54.9	57.7	60.2	62.4	64.4	72.2	77.2
D630	41.8	43.8	45.4	47.2	48.7	50.1	51.9	54	55.9	59.4	62.4	65.1	67.6	69.8	78.6	84.5
D800	45.3	47.4	49.3	51.1	52.7	54.3	56.2	58.8	60.6	64.3	67.6	70.6	73.3	75.8	85.6	92.5

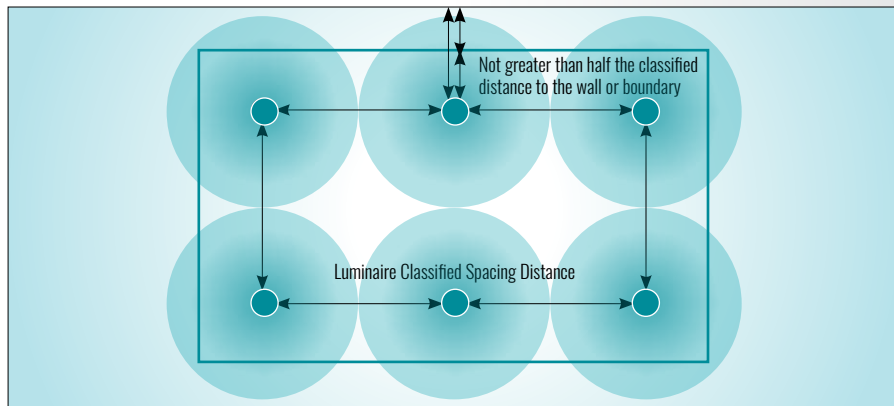
## Class E Luminaire Mounting Height and Spacing

Luminaire Classification	Mounting Height in Metres															
	2.1	2.4	2.7	3	3.3	3.6	4	4.5	5	6	7	8	9	10	15	20
E1	3.8	3.6	3.2	3.6												
E1.25	4.2	4.2	4	3.6	4	3										
E1.6	4.8	4.8	4.8	4.4	4	4.2	3.8									
E2	5.2	5.2	5.4	5.2	5	4.6	4.8	4								
E2.5	5.6	5.8	5.8	6	5.8	5.8	5.8	5.2	4.6							
E3.2	6	6.2	6.4	6.6	6.6	6.6	6.6	5.8	5.8							
E4	6.2	6.6	7	7.2	7.4	7.4	7.4	7.2	6.6	7						
E5	6.6	7.2	7.4	7.8	8	8.2	8.4	8.4	8.2	7	6.8					
E6.3	7	7.6	8	8.4	8.6	8.8	9.2	9.4	9.4	8.8	8.2	7				
E8	7.4	8	8.4	9	9.2	9.6	10	10.2	10.4	10.4	9.4	9.4	8			
E10	7.8	8.4	9	9.4	9.8	10.2	10.8	11.2	11.4	11.8	11.6	10.2	10.4	9.2		
E12.5	8	8.8	9.4	10	10.4	11	11.4	12	12.4	13	13.2	12.8	11.4	11.6		
E16	8.4	9.2	9.8	10.6	11	11.6	12.2	12.8	13.4	14.4	14.8	14.8	14.4	13.2		
E20	8.8	9.6	10.4	11	11.6	12.2	13	13.6	14.4	15.4	15.4	16.2	16.6	16.6		
E25	9	10	10.8	11.4	12.2	12.8	13.6	14.4	15.2	16.6	17.4	18.2	18.6	18.6	17.4	
E32	9.4	10.2	11.2	12	12.8	13.4	14.4	15.4	16.2	17.8	19	19.8	20.4	20.8	17.4	
E40	9.6	10.6	11.6	12.4	13.2	14	15	16	17	18.8	20.2	21.4	22.2	22.8	22	18.4
E50	9.8	11	12	12.8	13.8	14.6	15.6	16.8	17.8	19.8	21.4	22.8	23.8	24.8	26	23.2
E63	10	11.2	12.2	13.2	14.2	15	16.2	17.6	18.8	20.8	22.6	24.2	25.6	26.6	29.4	25.8
E80	10.2	11.4	12.6	13.6	14.6	15.6	16.8	18.2	19.6	21.8	24	25.8	27.2	28.6	32.6	32.2
E100	10.4	11.6	12.8	14	15	16	17.4	18.8	20.2	22.8	25	27	28.8	30.4	35.6	37
E125	10.6	11.8	13.2	14.4	15.4	16.6	17.8	19.4	21	23.8	26.2	28.4	30.4	32.2	38.4	41.2
E160	10.8	12	13.4	14.6	15.8	17	18.4	20.2	21.8	24.8	27.4	29.8	32	34	41.4	54.6
E200	10.8	12.2	13.6	14.8	16.2	17.4	18.8	20.6	22.4	25.6	28.4	31	33.4	35.6	44.2	49.4
E250	11	12.4	13.8	15	16.4	17.6	19.2	21.2	23	26.4	29.4	32.2	34.8	37.2	46.8	53.2
E320	11	12.4	14	15.2	16.6	18	19.6	21.6	23.6	27.2	30.6	33.6	36.4	39	49.6	57.2
E400	11.2	12.6	14	15.4	16.8	18.2	20	22	24	27.8	31.4	34.6	37.6	40.4	52.2	60.6
E500	11.2	12.6	14.2	15.6	17	18.4	20.2	22.4	24.6	28.6	32.2	35.6	38.8	42	54.6	64.2
E630	11.2	12.8	14.2	15.8	17.2	18.6	20.4	22.8	25	29	33	36.6	40	43.4	57	67.3
E800	11.2	12.8	14.4	15.8	17.2	18.8	20.6	23	25.2	29.6	33.8	37.6	41.2	44.6	59.4	71.2

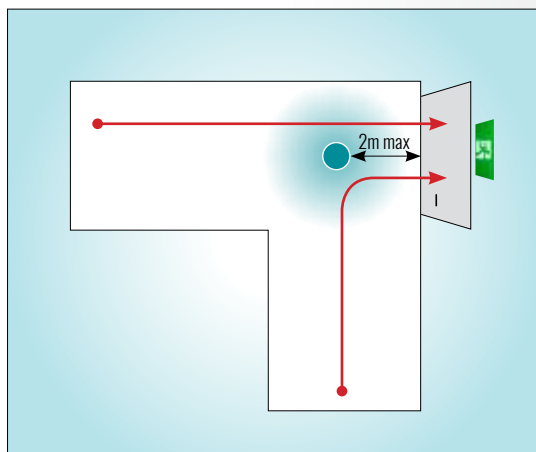
## Specific Locations

Section 5 of AS 2291.1 specifies required locations for emergency lighting installation. The following are some locations referenced:

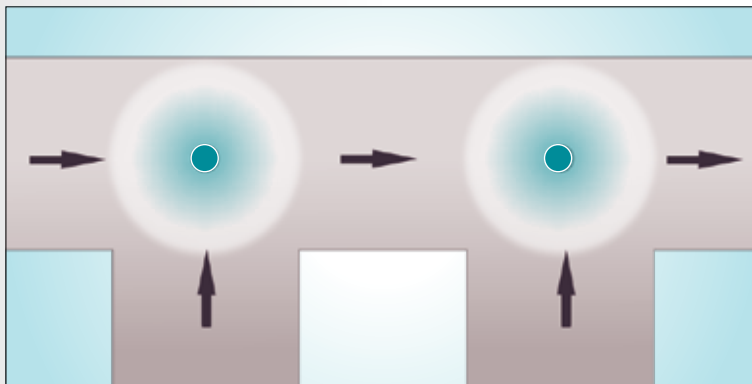
- Not greater than half the classified distance to the wall or boundary



- Within 2 metres of the approach side of each doorway requiring an exit



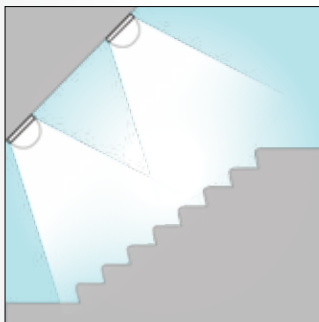
- Within 2 metres of the intersection of centre-lines of intersecting corridors or each change of direction



- Within 2 metres of any change of floor level, on the low side



- In such a manner that each flight of stairs including the associated landings receive direct light



## Points of Emphasis

The following points of emphasis are **not** requirements set out in the BCA or AS 2293 suite of standards, but areas for consideration and good practice when designing an emergency lighting installation.



Near Fire Fighting Equipment and Manual Call Points



Near each First Aid Point, defibrillator



To illuminate safety signs of hazardous areas, such as:

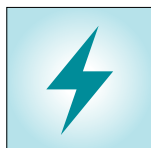
- Kitchens
- Elevators
- Receptions
- Swimming pools/slip hazards



Disabled refuge/disabled facilities (toilets, changing rooms)



Examination/operating theatre/first aid/treatment rooms/nurse station



Electrical switch rooms/plant rooms/lift motor rooms



# 4. INSPECTION AND MAINTENANCE

AS 2293.2 sets out the periodic inspection and maintenance procedures which are necessary to ensure that the emergency evacuation lighting system will be in a state of readiness for operation at all times.

Any time during the life of an installation, the duration of operation on emergency power for every emergency escape luminaire and exit sign shall be not less than 90 minutes except where applicable building regulations specify a shorter in service time.

Maintenance records shall be logged and kept on the premises at all times. Maintenance records may be in the form of:

- Electronic
- Log book with durable cover
- Printed records held within a durable cover

6 monthly and annual testing schedule for single point systems				
No	Item	Action Required	Six Monthly	Annual
1	Emergency Lights	Before conducting the required 6 monthly test, a check should be made to ensure there has not been an interruption to the mains power supply within the last 16 hours.	✓	
2		Check that emergency luminaires of the directional beam type, if used, are aimed in such a manner that the beam will not be directed into the eyes of persons moving through the designated area.	✓	
3		Emergency luminaires using fluorescent lamps that exhibit blackening at their ends recommend replacement.	✓	
4		Clean all light emitting and reflecting surfaces of emergency luminaires and exit signs.		✓
5		Visual check to be made to ensure that the emergency lighting operates in correct relationship to the normal lighting in the designated area.		✓
6	Manual Discharge Test Facility	Visual inspection of relays, contactors, timers, push buttons, connections.	✓	
7		Removal of dust, dirt.	✓	
8		Isolate coil circuits of all sensing relays or contactors from AC supply and observe operation.	✓	
9		Operate the emergency luminaires and exit signs from their battery supply by simulating failure of the monitored supply. The luminaires and exit signs shall remain illuminated for not less than the required in-service duration. Where manual discharge testing facilities are provided, the simulation of supply failure must be effected by the manual test facility.	✓	
10	Automatic Testing Facilities	A visual check needs to be made of the operational status of each of the units either by means of the indicator at each unit or by means of the relevant controller or indicator panel.	✓	

## Discharge Test Facilities

### Manually Operated Testing Facilities

Where manually operated testing facilities are provided for discharge testing, the test facility shall provide for the operation of the relevant group of emergency lighting by simulating supply failure and:

- Be capable of being manually reset and automatically reverting to normal state at the conclusion of the discharge test
- Either be key operated or located in an area with restricted access and clearly identified



### Automatically Operated Testing Facilities

An automatic test facility shall ensure that each emergency escape luminaire and exit sign is subject to a discharge test in accordance with the relevant procedures and test intervals specified in **AS 2292.2** inspection and maintenance.

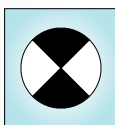


## Labelling

Labelling of devices controlling the operation of emergency lighting which if turned off or removed shall operate emergency lighting and display the following:

**WARNING Interrupting supply will  
discharge emergency lighting batteries**

The following identification symbol has to be located in a position where it will be visible from below where the luminaire is installed.



The classifications identification of the C0 longitudinal and C90 transverse coordinates must be displayed on the luminaire to assist with the correct orientation spacing and height installation.

Example:

C0 = C2

C90 = E25

Refer to section 3 of this manual, Class Luminaire Mounting Height and Spacing.

## Correct Viewing Distance Information



Each exit sign shall have the maximum viewing distance printed on the sign face.

# FIREscape®

**FIREscape®** is a highly cost effective and environmentally friendly emergency lighting system that incorporates the latest in LED and battery technologies.

The system is based around an emergency lighting control panel with battery back-up and features intelligent addressable, self-contained luminaires and signage interconnected via traditional extra low-voltage cabling.



- Extra Low Voltage
- Intelligent
- LED Technology
- Simple Installation
- Low Maintenance Graphics Software

**FIREscape®** is a fully configurable system that incorporates an automatic weekly self-test facility to deliver reassurance that the emergency lighting system is fully operational.



## EL-2 Emergency Lighting Control Panel

- Supports 2 lighting lines with 127 points per line
- Supports Maintained and Non-maintained
- Slim profile – only 100mm deep
- 12V 7Ah Battery Back Up



## EL-KP Keypad

- Provides control over **FIREscape**® system
- Easy-to-read LCD display
- 8 keypads per panel
- Slim profile
- Programmable function buttons
- Password protected menus



## EL-16-AS & EL-24-AS Addressable Exit Signs

- Comply with AS 2293
- Comprise frame and choice of legends
- EL-16-AS visible at 16 metres
- EL-24-AS visible at 24 metres
- LED technology
- Integral back-up battery inside 'cup'
- Hinged to fit any surface/angle
- Fitted to standard Hochiki test switch base (EL-TSB)
- Recess adaptor available

## EL-DL2-AS Corridor Down Light

- Complies with AS 2293 for escape routes
- LED technology
- Integral Lithium Polymer Battery Backup
- Fitted to standard Hochiki test switch base (EL-TSB)



EL-DL2	Class	2.1m	2.4m	2.7m	3m	3.3m	3.6m	4m	4.5m	5m	6m	7m	8m	9m	10m	15m
C0	C2	4.1	4.1	4.1	3.9	3.7	3.3	2.6								
C90	E25	9	10	10.8	11.4	12.2	12.8	13.6	14.4	15.2	16.6	17.4	18.2	18.6	18.6	17.4

## EL-DL3-AS Open Area Down Light

- Complies with AS 2293 for open areas
- LED technology
- Integral Lithium Polymer Battery Backup
- Fitted to standard Hochiki test switch base (EL-TSB)



EL-DL3	Class	2.1m	2.4m	2.7m	3m	3.3m	3.6m	4m	4.5m	5m	6m	7m	8m	9m	10m	15m
C0	E6.3	7	7.6	8	8.4	8.6	8.8	9.2	9.4	9.4	8.8	8.2	7			
C90	E6.3	7	7.6	8	8.4	8.6	8.8	9.2	9.4	9.4	8.8	8.2	7			

## NF89-C-AS High Powered Corridor Down Light

- Complies with AS 2293 for escape routes
- LED technology
- Integral Lithium Battery Backup
- Fitted to standard Hochiki test switch base (EL-TSB)



NF89-C	Class	2.1m	2.4m	2.7m	3m	3.3m	3.6m	4m	4.5m	5m	6m	7m	8m	9m	10m	15m
C0	D6.3	8.6	8.8	9	9.1	9.2	9.2	9.2	9	8.7	7.7	5.7				
C90	D32	15.4	16.1	16.7	17.2	17.6	18	18.5	19.1	19.5	20.2	20.6	20.7	20.6	20.3	14.6

## NF89-O-AS High Powered Down Light

- Complies with AS 2293 for escape routes
- LED technology
- Integral Lithium Battery Backup
- Fitted to standard Hochiki test switch base (EL-TSB)



NF89-O	Class	2.1m	2.4m	2.7m	3m	3.3m	3.6m	4m	4.5m	5m	6m	7m	8m	9m	10m	15m
C0	E40	9.6	10.6	11.6	12.4	13.2	14	15	16	17	18.8	20.2	21.4	22.2	22.8	22
C90	E40	9.6	10.6	11.6	12.4	13.2	14	15	16	17	18.8	20.2	21.4	22.2	22.8	22

## EL-IO

- 4 inputs
- Can be used to link 3rd party products, switches, motion sensors etc
- Connects to the EL-2 control panel line
- Powered directly from EL-2 control panel



## EL-PM Phase Monitor Unit

- Monitors final mains lighting circuit
- Switches power from line to individual **FIREscape**® unit backup batteries when voltage drops



## EL35V EL2 Control Panel Transformer

- Turns 240V AC input into 35V 220VA output
- Powers the EL2 lighting control panel



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