# **Emergency & Exit Lighting – Specification Section**

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**Exit and Emergency Lighting**

1. **Scope**

Provide a computer monitored exit and emergency lighting system comprising:-

* self-contained emergency lights
* self-contained emergency exit lights
* wiring and controls
* PC or cloud based software for monitoring, testing and fault diagnosis.
1. **Standards**
* AS/NZS 2293 Emergency Escape Lighting and Exit Signs for Buildings and as amended by the NZBC Clause F6 Appendix B in New Zealand.
* Exit and emergency lighting complying with all relevant clauses in the Luminaires section of this specification.
1. **Regulatory Authority Requirements**

Comply with requirements applicable to the relevant jurisdiction:

* Applicable Local Government Authority.
* National Construction Code of Australia (Building Code of Australia).
* New Zealand Building Code.
1. **General Requirements**

Provide a single point exit and emergency luminaire installation as follows:

* 1. **Battery**
* LP Lithium Iron Phosphate cells with a minimum design life of seven years at an external ambient temperature of 40°C.
* Battery protection: over voltage in charge, low voltage protection and over current in discharge.
* Mount battery in location as far as practicable from heat producing components.
* Emergency Period: 2 hours initial duration, 90 minutes in-service duration.
* Labelling: date of manufacture, ampere hour (Ahr) rating and replacement part number.
	1. **Controls**

Provide a test push button and LED monitor for each luminaire.

* 1. **NATA Classification**

Test results of luminaires and components from a registered NATA laboratory shall be available on request. Classify luminaires in accordance with AS2293 and supply copies of test results on request to Principal.

* Be tested in accordance with AS2293.3 with respect to Thermal/Duration, and Photometry resulting in a classification.
* Be tested to comply with EMC Standard AS/NZS CISPR 15:2011.
* The AS2293 classification shall be clearly marked on the luminaire label.
	1. **Circuit Breaker Labelling**

Label all lighting circuit breakers controlling circuits to which emergency lights or exit signs are connected in accordance with AS 2293.1, Clause 2.5.

* 1. **Luminaire Labelling**
* All exit and emergency luminaires and system routers to be numerically identified with permanent approved device reference labels with numbers corresponding with the log book identification and as installed drawings.
* The device reference shall be a logical alpha numeric reference such as the Building, Level and fitting number on that level, e.g. BLGA-L4-67 and permanently and indelibly fixed to a visible part of the emergency luminaire.
* The device reference numbers will be entered into the electronic logbook and used as the primary reference for the device.

1. **Emergency Luminaires**
	1. **General**

Emergency luminaires shall:

* incorporate long life, low energy LED lamp source
* contain a mains failure relay
* be adequately ventilated
* located clear of any heat source
* connected to external components via quick connect tab and receptacle connectors
* positioned to permit easy access for maintenance removal and replacement
* minimum design life of seven years
* have reverse battery polarity protection
* comply with the relevant clauses in the luminaire section of this specification
	1. **Single Point Type**

Self-contained, non-maintained, single point fittings complete with batteries, charger and electronic controls.

* 1. **Integral Type**

Where shown, normal lighting luminaries shall incorporate an emergency lighting self-contained power pack.

* 1. **Wiring and Sensing of Supply Failure**

Exit and emergency luminaires shall be connected to an unswitched active as outlined in AS/NZS2293 Appendix C and installed to comply with the AS/NZS 2293 Section 2 requirements for Operation, Arrangement and Control.

The failure of the normal supply to one or more final lighting subcircuits in an area shall cause the exit and emergency lighting in that area to be automatically connected to its emergency power source as per AS/NZS 2293.1 Section 2.3.

1. **Illuminated Exit Signs**
	1. **Maintained**

Self-contained, maintained, single point, illuminated exit signs with LED lamp sources. Incorporate the same general features as specified for Emergency Luminaires.

* 1. **Types**

Exit signs shall be both aesthetically and functionally suitable for the intended location and application. In general:

* Restaurants, meeting rooms, office areas and the like recessed or surface blade style exits with narrow edge illuminated diffuser.
* Back of house, undercover concourse areas, car park slide connect surface mounted exits. The exit luminaire shall slide fit into the bracket and engage the power socket by a suitable fitted plug. A locking tab shall automatically secure the luminaire into position.
* Other exit types suitable for exterior use, impact resistant or large format as required or specified in the luminaire schedule.
	1. **Brackets**

Provide mounting brackets, rods or wire suspension for ceiling mounting, surface wall mounting and cantilevered wall mounting as required.

1. **Emergency Lighting Monitoring System**

The Emergency Lighting System shall be the Zoneworks XT HIVE computerised automatic testing system by Clevertronics Pty Ltd. The system shall provide group luminaire testing and individual real time monitoring facilities in addition to compliance management software and electronic logbook in accordance with the requirements of the AS/NZS 2293 suite of standards.

* 1. **System Server and Emergency Lighting Controllers**

The System:

* Shall comprise a network of exit and emergency luminaires capable of being monitored and tested through a single RF Gateway (Hive Controller) per 1000 fittings.
* The network shall utilise Dynamic Self-Managed Meshing to enable the exit and emergency luminaires to autonomously build their own dynamic communications network and self-determine the optimal communications pathway to the gateway.
* Multiple gateways may be added as required and there shall be no limit to the number of exit and emergency luminaires able to be managed by the system.
* The system shall use a sub-gigahertz communications frequency with average luminaire status and request times of 1 second or less per fitting to allow real time analytics and response.
* If multiple Gateways / Hive Controllers are required, they shall be networked together via a LAN/WAN or the WEB. If a converged site (client) network is not available, then the Installing Contractor will provide and install the network facilities to connect the Hive Controllers. This will typically consist of an Ethernet Network Switch and CAT6 connections to emergency lighting controllers and the Server Hosting the management software application.
* Test and status information shall be reported to a WEB based management software application, connected to the same network, that will display all the system devices on screen and record and hold all information such as status, test results and maintenance logbook history.
* The management software application will be hosted on a dedicated PC or Server, Microsoft Windows based, machine. This machine will be hosted either on site, directly connected to the same network, or offsite using WAN or WEB facilities to connect into the emergency lighting network.
* The system shall provide the capability for the management software application and database to be hosted in the “cloud” utilizing the LAN, WAN or WEB to connect with the emergency lighting system network.
* The system shall provide the capability to facilitate multiple sites/locations on a single emergency lighting management software interface.
	1. **System design detail and installation**

Prior to installation contact Clevertronics for system documentation and to arrange a Zoneworks pre-installation meeting.

* 1. **Luminaires**

All emergency luminaires within the system must capable of the following:

* Monitoring the battery voltage
* Monitoring the state of the emergency lamp in test
* Monitoring the state of the normal lamp (mains lamp)
* Storing the result of its last discharge test in non-volatile memory that is retained even after loss of both AC power and DC battery supply
* Support dynamic allocation of the network address - no pre-programming of network ID

* 1. **System Software**

The Management Software Application shall:

* Display graphical representations of the system server, controllers and emergency luminaires
* Display real time status information
* Provide the facility to create “groups” of emergency luminaires for testing and the ability to move devices between these different groups using “drag & drop”
* Provide reporting facilities capable of sorting by date, group and or device
* Provide the facility to replace of defective luminaires
* Provide the facility to program of multiple test groups to test at different times and dates
* Provide the facility to install emergency luminaires and dynamically allocate the network address
* Produce Emergency Lighting Test Reports that can be sorted by, fitting, group, test type (discharge or diagnostic) or date range plus the facility to generate a report with the last test result for each fitting
* Display a summary of the system status and produce a simple report containing only defective emergency luminaires including location details
* Provide an Emergency Lighting Electronic Logbook, that can be printed, detailing relevant location information (unit description, floor, DWG, grid ref, distribution board and circuit number), test results and maintenance history
	1. **Commissioning**
* The Installing Contractor will engage the system manufacturer for commissioning the automatic emergency lighting system.
* Each emergency luminaire must be labelled with a user reference that can be entered into the electronic logbook and used as the primary reference for the device (device reference). The device reference shall be an alpha numeric reference such as the Building, Level and fitting number on that level, e.g. BLGA-L4-67 and permanently and indelibly fixed to a visible part of the emergency luminaire.
* Location information is to be entered into the electronic logbook by the installing contractor at the time of installation and will be retained by the system’s management application on the server. This logbook information will be compiled during the construction of the project by the installing contractor in the form of Emergency Lighting Registers and Emergency Lighting Controller Registers. These registers will be provided to the emergency lighting system manufacturer for the purpose of commissioning the system and uploading into the management application’s logbook facility.
* A complete set of “as installed” drawings must be provided by the installing contractor detailing the following:
* The location of the emergency luminaires
* The User ID (device reference) assigned to each emergency luminaire
	1. **Testing and Handover**
* Test the emergency lighting system to the satisfaction of the regulatory Authority.
* Demonstrate the operation of the emergency lighting system by performing the 12 monthly test as specified in AS/NZS 2293.2 prior to the date of practical completion.
* All units which fail to operate for the required period will be rejected and shall be repaired or replaced and shall be similarly tested after repair.
* Results of the test at practical completion shall be recorded in the electronic log book.
* Rectify all defects, including replacement of failed lamps during the defects liability period.
* The electronic log book shall be accessible on site.