Association of Building Compliance

CODE OF PRACTICE

Code of Practice for

Electro Mechanical Controlled Locking Devices on Egress Doors

Prepared by the Association of Building Compliance

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2. PREAMBLE

The Association of Building Compliance has drafted this Code of Practice to set parameters around how electromechanical locking devices shall be installed, maintained and certified.

The need arises due to a lack of a current definitive standard for such tasks.

The Code of Practice offers good practice methods for the compliant installation of these systems, to service contractors as to the requirements for maintenance and to IQPs for the certification of the systems for building warrant of fitness (BWoF) purposes.

3. DEFINITIONS

ACCESS CONTROLLED DOOR	Access controlled door means a door within a building which has a locking device that restricts movement through the door to authorised personnel only.
BUILDING	Building has the meaning given to it by sections 8 and 9 of the Building Act 2004.
BUILDING ACT 2004	Building Act 2004 (the Building Act) means the principal legislation dealing with building controls in New Zealand.
BUILDING CODE	Building Code means the regulations made under section 400 of the Building Act 2004.
BUILDING CONSENT	Building consent means consent to carry out building work granted by a building consent authority under section 49 of the Building Act 2004.
BUILDING CONSENT AUTHORITY (BCA)	Building consent authority has the meaning ascribed to it by section 7 of the Building Act 2004.
DELAYED ACTION UNLOCKING DEVICE	Delayed action unlocking device means a security mechanism that allows a door to be unlocked without the use of a key, but does not release the door under non-emergency conditions until after a time delay. The time delay allows the person intending to use the door to be checked for security reasons.
DOORSET	A complete assembly comprising a door leaf or leaves including any glazed or solid panels adjacent to or over the leaves within the door frame including hardware or other inbuilt features; and a door frame, if any, with its fixings to the wall and, for a sliding or tilting door, all guides and their respective fixings to the lintel, wall or sill.
ELECTRO-MECHANICAL LOCKING DEVICE	A locking device which requires power to operate, and requires the user to interface with the powered lock to open a door.

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3. DEFINITIONS *cont.*

EMERGENCY DOOR RELEASE (EDR)	A switch located adjacent to a doorset to allow any person to override an electromechanical locking device in the event of an emergency, regardless of the operation of the system or the authorisation of the user.
ESCAPE ROUTE	A continuous unobstructed route from any occupied space in a building to a final exit to enable occupants to reach a safe place, and shall comprise one or more of the following: open paths and safe paths.
FAIL SAFE DEVICE	A locking device which is powered to activate into the locked position, and will automatically unlock in the event of power failure to the device.
FAIL SECURE DEVICE	A locking device which is powered to remain in the unlocked position, and will fail to the locked position in the event of power failure to the device.
FINAL EXIT	The point at which an escape route terminates by giving direct access to a safe place.
FIRE DOOR	A doorset, single or multi-leaf, having a specific fire resistance rating, and in certain situations a smoke control capability, and forming part of a fire separation. The door, in the event of fire, if not already closed, will close automatically and be self-latching.
FIRE SAFETY SUMMARY	A report issued for building consent approval detailing the fire safety requirements of a building to comply with the Building Code. This may be compiled by a fire engineer or other suitably qualified person.
FREE HANDLE DEVICE	A fail safe locking device which allows any person to override the locking device installed by the normal use of a door handle in the direction of escape.
INDEPENDENT QUALIFIED PERSON (IQP)	A person— (a) who is accepted by a territorial authority as being qualified to— (i) carry out or supervise all or some of the inspection, maintenance, and reporting procedures required for a specified system stated in a compliance schedule; and (ii) certify that those procedures have been fully complied with; and (b) whose acceptance under paragraph (a) has not been withdrawn by the territorial authority
NORMALLY CLOSED CONTACT	An electrical contact or switch which, when in its normal position, will connect to continue an electrical circuit, and will break the circuit when operated.
NORMALLY OPEN CONTACT	An electrical contact or switch which, when in its normal position, will break the contact in an electrical circuit, and will connect the circuit when operated.
PANIC FASTENING	A locking device complying with C/AS 3.15.3 which has a horizontal bar extending across the width of the door and opens the door when a horizontal force is applied to it. These can be also known as Panic Egress Devices.
OPEN REQUEST FOR EXIT DEVICE (REX)	An electronic switch, input device or other such item which inputs to the access control system to open a locked door without any security device such as a fob, card or PIN code.

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3. DEFINITIONS *cont.*

SECURE REQUEST FOR ACCESS DEVICE (READER)	An electronic input device which will request permission from the access control system to release the door adjacent when an authorised person activates it with a security device such as a fob, card or PIN code. A person without the required permission would not be granted access.
SAFE PLACE	A place, outside of and in the vicinity of a single building unit, from which people may safely disperse after escaping the effects of a fire. It may be a place such as a street, open space, public space or an adjacent building unit.
SPECIFIED SYSTEM	A system as defined in section 7 of the Building Act 2004 and as listed in Schedule 1 of the Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005.
STATEMENT OF COORDINATION	A declaration made by the designer of a system that they have completed their design in full regard to the overall Fire Safety Summary for the building.

4. PURPOSE AND SCOPE

To clarify and elaborate on the existing Building Code, Acceptable Solutions and Compliance Schedule Handbook to clearly define the requirements for the installation, maintenance and certification of electromechanical locking devices and in doing so provide a benchmark for designers, fire engineers, territorial authorities (TA), building consent authorities (BCAs), IQPs and building owners.

The ultimate aim is to ensure that the lawful occupants of buildings are not likely to become trapped and can escape in the event of a fire or other such emergency.

THE CODE OF PRACTICE DOES NOT:

- Seek to define standards for buildings falling outside the Acceptable Solutions for Building Code Clause C - Fire Safety, such as detention facilities or other buildings which may require a specific design for fire safety.
- Form any requirements on the ingress of a building.
- Set to create new standards.

THE CODE OF PRACTICE DOES:

- Aim to be used as a reference document to summarise all requirements for electro-mechanical locking devices for buildings which are covered by the Acceptable Solutions.
- Consider that fire is not the only emergency where escape may be required.
- Define the requirements for egress via escape routes.
- Define the existing standards and clarify them for interpretation.

5. DESIGN

5.1 GENERAL

The installation of access controlled doors is a type of building work relating to a specified system and, as there is no exemption for this type of work, requires a building consent from a BCA before work can begin.

Systems shall be installed in accordance with the manufacturer's instructions and in a trades-like manner. Appropriate consideration shall be given with regard to such issues as cable selection or power supply to prevent loss of voltage or interference to communications which may prevent the system from failing to lock and present the potential for a door to be secured by other means which may impede egress of the occupants.

Access control doors are captured by specified system 3: 'Electromagnetic or automatic doors or windows (for example, ones that close on fire alarm activation)' under the Building (Specified Systems, Change the Use and Earthquake Prone Buildings) Regulations 2005, and as such are required to be included on a building's compliance schedule.

Building consent applications that include access controlled doors shall include a design specification which shows that the system includes a fail-safe means of unlocking doors in the direction of escape throughout the escape route. A system which complies with this Code of Practice shall be deemed to comply with the requirements laid out in the Acceptable Solutions for Fire Safety (C) and Accessibility (D).

Electromechanical devices must only be installed in accordance with the consented building fire safety summary for the building. It is essential for the designer of an access control system to ensure they are familiar with the requirements for egress from all parts of the building. This may include egress through a tenancy or back into a floor level from a stairwell. The designer shall include a statement of coordination, referring to the building fire safety summary within their design. This should include the author, date, reference number and version of the document.

Any building consent applications shall show the approval of the fire door manufacturer to the equipment to be installed on a fire door.

5.2 SECURE AND SEMI SECURE PREMISES AND ACCOMMODATION

Special circumstances may require the prevention of occupants of a building from exiting without supervision such as childcare centres and aged or health care facilities. In these cases a building management plan shall be developed with both the BCA and the Fire Service through an evacuation scheme. These may incorporate otherwise unacceptable release features such as electronic keypads with a fire alarm interface release, but not key-operated locks. The fire safety summary shall specify any necessary provision to ensure that all escape route doors are unlocked or unlockable when any person is lawfully in the building whilst ensuring that only certain occupants may be restricted, and such specifications related to electromechanical locking devices shall be clearly identified in the compliance schedule.

Examples may include a childcare centre having the locking device above a height where a child can reach, or a dementia facility which requires staff and visitors to enter a simple code such as the current calendar year.

This Code of Practice makes no provision for buildings where any person is lawfully detained.

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5.3 AUTOMATIC OPENING DOORS

Access control equipment such as REX, EDR and locking devices fitted to an automatic opening door set is not covered by this Code of Practice. Such equipment shall instead be designed and installed under the requirements for automatic doors, and inspected and maintained under specified system 3/1.

5.4 FAIL SAFETY

All electromechanical locking devices which are to comply with the Acceptable Solutions must include fail-safe locking devices and/or must not impede the normal operation of a manual door handle through the door in the direction of egress. An access controlled door system which comprises entirely of free-handled devices in the direction of egress is not considered a Specified System. Systems which include fail-secure devices and require a powered function to unlock the door must only be considered for approval with the use of a Verification Method (C/VM2) Design, and include specific details and maintenance requirements listed in the compliance schedule.

6. INSTALLATION PRACTICE

6.1 REQUEST TO EXIT DEVICES (REX)

Where a doorset has an open request for access device fitted, the REX must be located in a position which will allow it to be operated by any person at the door with the operating device not lower than 900mm from the floor, and not higher than 1350mm. The device must be clearly accessible, and not obscured from the vision of a person at the doorset. Consideration shall be given to locating the device to allow operation by a person with disabilities.

If the REX device is located more than 1500mm horizontally from the door, signage complying with F8.3.1 shall be installed on the door advising user where the device is.

The REX device must release the locking mechanism for a period long enough for a user to open the door taking into consideration persons with disabilities.

Closed contact devices which require the user to hold the REX with one hand while using another part of the body to open the door do not comply with this Code or Practice.

The device shall be simple to operate and have signage which 1) identifies the device as the means of opening the door and 2) provides instructions as to the operation of the device. The device should include the colour safety green as outlined in NZS 5807.

6.2 EMERGENCY DOOR RELEASE (EDR)

Every door which is locked in the direction of egress in any part of an escape route shall have a means of manually overriding the lock by the use of an Emergency Door Release (EDR). The EDR shall be a mechanical, normally closed switch, which is manually operated to physically break the contact of the power supply to the locking device. The locking device shall fail safe and latch to the unlocked position until reset. The EDR shall have no electronic components in the operation of the unlocking of the door, but may be monitored or perform other functions. The EDR may interrupt power to a relay which in turn interrupts power to the locking device. However, this wiring shall be detailed with a wiring diagram including the location of the equipment and should be included in the building consent application and attached to the building's compliance schedule.

The EDR device shall be clearly labelled to comply with NZBC Clause F8.3.1 and shall include the word "Emergency" and shall incorporate the colour safety green either as a prominent colour on the device, or for the wording. The device shall have clear instructions as to the operation of the switch.

The operating device of the EDR shall be positioned no lower than 900mm from the floor, and no higher than 1350mm. It shall be located within 1500mm of the door, or it shall have clear signage complying with F8.3.1 at the door identifying the location of the device.

The operation of the EDR device may additionally be used to input into a security device, or sound an alarm, but these operations shall not preclude the switch and its direct control of the power to the locking device.

6.3 FIRE ALARM INTERFACE

If required by the Fire Safety Summary for the building, the power to the electro-mechanical locks may be connected to the building fire alarm to release the locking devices when the fire alarm activates. However, the fire alarm interface shall not remove the requirement for the location of an EDR adjacent to each doorset which is fitted with an electro-mechanical locking device that is not free-handled in operation. Any fire alarm interface shall be detailed on the compliance schedule.

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6.4 DEVICE PROTECTION

To prevent malicious activation, or to protect against weather, the EDR may be encased in an enclosure. Any enclosure must:

- have a clear face to allow visibility of the EDR and its operating instructions
- be labelled to comply with NZBC F8.3.1
- identify that it is a cover only
- have instructions how to remove the cover from the EDR
- never be locked
- be replaced if it becomes opaque.

The EDR cover may need additional signage on the side to ensure it is visible and clearly identifiable.

6.5 PANIC FASTENINGS

Where panic fastenings are fitted to a door, the electromechanical locking device shall not prevent the panic fastening opening the doorset. To avoid doubt, a user shall not be required to operate an EDR to release a door fitted with panic fastenings.

6.6 FIRE SEPARATIONS AND FIRE DOORS

Where the building is protected with fire separations, any penetrations in the fire separations shall be sealed using an appropriate method to maintain the integrity of the fire rating outlined in the fire safety summary.

Where an electromechanical lock is fitted to a fire rated door, any equipment fitted to the door and the method of fitting shall be approved by the fire door manufacturer. Any notches, holes or openings in the fire door or frame (including transfer hinges and the running of cables through the door leaf) shall not compromise the integrity of the doorset (to the satisfaction of the manufacturer). The locking device shall not prevent the door from closing automatically or sealing in the latch position when closed, and shall not prevent the fire door from being latched in the closed position even when the locking device has been latched open by the use of the EDR, power failure or fire alarm interface.

6.7 DOOR CLEARANCE AND SWING

The installation of any equipment such as magnetic clamps within a door frame shall not reduce the clearance within the door of minimum 1955mm high, or not reduce the clear width beneath that which is specified in the fire safety summary. The locking device shall not prevent the door from opening to a minimum of 90 degrees.

A locking device shall not prevent the door from swinging in the direction of egress, as outlined in the fire safety summary, including the ability of a door to swing in both directions if this is a requirement. Where a double door is required for egress width, the locking devices shall release both door leaves at once on the operation of both the EDR and the fire alarm interface, if fitted.

6.8 GATES

Any gates with an electromechanical device fitted which are required to be accessed for building occupants to reach a safe place shall be considered doorsets and shall comply fully with this Code of Practice.

Motorised gates shall have a means of manually over-riding the clutch mechanism and allow the gate to be moved freely aside. The operation of the clutch over ride shall be prominently displayed on the inside and shall be able to be operated without the use of a key, code or other security device.

All gates shall comply with the requirements for frictional forces required to release the latch, set the door in motion and to open the door to the minimum required width, and this shall not be impeded by a locking device.

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6.9 DELAYED ACTION UNLOCKING DEVICES

Where specifically approved by building consent, a delayed action REX and or EDR may be fitted to release the electro-mechanical lock to prevent unlawful exit. The delay may be up to 15 seconds from activation. Additional switching separate from the timer circuit must also be interfaced with the fire alarm to ensure immediate unlocking in the event of a Fire Alarm activation. This is only permitted in conjunction with specific definition under the building fire safety summary.

Where a delayed action unlocking device is fitted to a door with panic fastenings, the Fire Safety Summary must define how compliance will be achieved. This definition shall be detailed in the building's compliance schedule.

Signage warning of the delayed operation should be in compliance with NZBC F8.3.1

6.10 AS-BUILT DRAWINGS

As-built drawings clearly identifying each locking devices, the location of REX, EDR, and Readers shall be provided to the BCA when the system is installed, and this plan shall be included as part of the Compliance Schedule and made available to the owner or IQP as required.

7. PREVENTATIVE MAINTENANCE

7.1 GENERAL

It is recommended that all access control systems are maintained and checked for correct operation and programming functions by an appropriately qualified contractor who will also attend promptly, and as required in an emergency, to any failures of the system.

7.2 INSPECTIONS

The following inspection and maintenance procedures shall be included in the building's compliance schedule and completed for the provision of a Certificate of Compliance (Form 12A) for a building warrant of fitness. However, the BCA or TA may increase the frequency of IQP inspections depending on the risk within the occupancy or use of the building. Minimum inspections shall include:

7.2.1 Monthly (by owner or owner's representative)

a) All EDR Devices shall be checked that they are:

i. visibly clear

ii. physically unobstructed

iii. In the correct location in proximity to the respective doorset.

b) All signage related to the location, identification of the EDR and its operation shall be checked.

c) Signage related to delayed action unlocking devices shall be checked. All Delayed Action unlocking devices shall be checked that they release at the expiry of the delay time.

7.2.2 Annually (by IQP)

The monthly inspections shall be carried out in addition to the following:

a) each EDR in the direction of egress shall be operated and tested that the doorset latches in the open position. The EDR shall then be reset and ensure that the doorset locks correctly.

b) Each REX Device in the direction of egress shall be checked for its correct location, operation, proximity to the respective doorset and is appropriately identified.

c) Where an Access controlled door is interfaced with a building fire alarm system, then that interface shall be fully tested in accordance with the requirements of the Compliance Schedule.

d) Delayed action unlocking devices shall be checked to ensure the fire alarm interface overrides the time delay.

e) The accuracy of the compliance schedule, plans and specifications shall be checked, and if necessary, an application for amendment (form 11) submitted to the owner to be provided to the territorial authority.

7.3 COMPLIANCE

Only systems which have been maintained in accordance with section 7.2 are deemed to comply with this standard for the purpose of certification for a Building Warrant of Fitness.

8. CERTIFICATION & APPROVAL

The installation of any electromechanical locking device must be approved by the BCA. Application for building consent must include the design showing plans for each door, each REX and EDR clearly marked, the direction of egress clearly shown, and wiring diagrams which show the fail-safe nature of the EDR interface with the locking devices. All designs must include a Statement of coordination with the fire safety summary and include a Producer Statement Design (PS1)

The installation shall be carried out by competent personnel who have a proven industry training record in Access Control systems. The installer shall complete a Producer Statement Construction (PS3) on completion, and provide a set of as-built plans for Code Compliance.

9. REFERENCES

- New Zealand Building Code documents:
  - C/ASn Clause 3.15.1, 3.15.2
  - D/AS1 Clause 7.0.5
  - F8.3.1
- NZS3000 Electrical Wiring regulations
- NZS4512 Fire Alarm Systems
- Building Act 2004
- Fire Safety and Evacuation of Buildings Regulations 2005
- Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005

10. APPENDIX A

10.1 SAMPLE STATEMENT OF COORDINATION

STATEMENT OF COORDINATION

(in accordance with IPENZ Practice Note 22)

The Design Coordination Statement is to be provided to the Building Consent Authority and is intended to accompany the documents submitted in the building consent application.

The Acceptable Solution Fire Report prepared by [author of fire report] titled [title of report, including reference number and version] dated [date of final version of report] has been reviewed for egress requirements.

I believe on reasonable grounds that the 'relevant elements' of the fire safety summary and associated plans have been incorporated into the design of the electromechanical locking devices as described in this document, and that this design ensures that the locking devices will comply with the building code requirements.

Signed:

[name of signatory and date]

10. APPENDIX A *cont.*

10.2 EXAMPLES OF SIGNAGE

10.1.1 Emergency Door Release (EDR) Device

- Lettering to be either green or white on a green background, and shall incorporate the word "Emergency" prominently.
- Lettering height 5mm minimum
- Clear instructions to the operation of the device

10.1.2 Signage on Door where EDR is not within 1.5m

- Sign must incorporate Safety Green as a prominent colour.
- Must display clear location of EDR device including distance.
- Minimum sign dimensions 100mm x 100mm

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