CITY OF VANCOUVER

BULLETIN 2020-009-BU **April 27, 2020**

USE OF ELECTROMAGNETIC LOCKS WITHIN MEANS OF EGRESS

This Bulletin replaces Bulletins 2000-009-BU, Elevator Lobby Access to Exits, and 2000-013-BU, Locks on Egress and Exit Doors. Requirements for the use of electromagnetic locks were revamped in the 2019 Vancouver Building By-law (VBBL). New requirements allowed wider use of electromagnetic locks including their installation within means of egress in addition to only exit doors as was permitted in the previous Edition of the VBBL. The purpose of this Bulletin is to provide clarifications regarding the use of electromagnetic locks in conformance with the 2019 VBBL. The Bulletin also summarizes and discusses our review of various issues and inconsistencies that the City's plan checkers and inspectors regularly encounter while reviewing design and installation of locks within means of egress.

Sentence 3.3.1.13.(7) of the 2019 VBBL permits installation of electromagnetic locks on doors within a means of egress. Accordingly, any door within a floor area may be equipped with an electromagnetic lock and this condition could conform to the 2019 VBBL on an acceptable solution basis. This may potentially entail the provision of two or more electromagnetic locks within the same path of egress to exit.

The building security design often includes provision of electromagnetic locks on exit doors and the installation of additional electromagnetic locks within the scope of tenant improvement projects that would interfere with proper functioning of the egress system. While the VBBL permits the installation of several electromagnetic locks within the same path for egress, the total delay initiated by the egress system cannot exceed 15 seconds as permitted in Clause 3.4.6.16.(4)(h). In order to ensure that the egress system equipped with electromagnetic locks conforms to the VBBL requirements, the following information is to be provided by the building owner as part of a building permit application:

- A letter outlining a sequence of operation for new electromagnetic locks along the path of travel to the required exits/egress. The letter is to include a sketch showing location of all new and existing locks within the path of travel, and

City Hall 453 West 12th Avenue Vancouver BC V5Y 1V4 | website: vancouver.ca/CBO
Office of the Chief Building Official | tel: 604.873.7611 | fax: 604.873.7100 | email: cbo@vancouver.ca

- A letter of commitment to decommission the proposed locks once no longer required or amend the sequence of operation should additional electromagnetic locks be provided within this floor area in the future.

Types of Locks and Releasing Devices Permitted by the 2019 VBBL

Except for devices on doors serving a contained use area or an impeded egress zone designed to be remotely released in conformance with Article 3.3.1.13., the 2019 VBBL references electromagnetic locks as the only devices permitted for installation within a means of egress. This type of lock has an electromagnet and an armature plate which are held together by magnetic force produced by an electric current. The electromagnet is usually attached to the door frame and the armature plate is mounted on the door leaf. There are no moving parts and the electromagnet is the only mechanism that holds the door in the closed position. The latch on the door is not electronically controlled.

Other types of electric locking mechanisms such as strike plates, mortise locks, deadbolts, pins or other similar electronically-controlled devices are not permitted by the VBBL.

Electromagnetic Locks on Glazed Doors

It is frequently desired to secure frameless glazed doors located within a means of egress.

As per Clause 3.4.6.16.(4)(e) of the 2019 VBBL, the locking device must be released by a force of not more than 90 N applied to the door opening hardware. The hardware would be a latching panic bar installed on the door leaf. Given that a provision of wired panic bar is not possible on a frameless glazed door, it is routinely attempted to substitute an activation by the panic bar with an activation by the push button located on the side of the door. A push button does not conform to Clause 3.4.6.16.(4)(e) of the VBBL and cannot be permitted on an acceptable solution basis. If glazing is required for aesthetic and security purposes within secured doors, framed doors similar to those shown in Figure 1 will be the only the By-law conforming choice.

Figure 1

Likewise, a By-law conforming solution would require a legible sign to be installed on the leaf of a glazed door. Such a sign would not be desirable on frameless glazed doors because it would reduce their aesthetic appeal and the owners would be tempted either to omit or to remove them.

Architects and consultants should foresee these challenges and exercise caution in specifying decorative glazed doors that need to be secured in accordance with Sentence 3.4.6.16.(4) of the VBBL.

Unique to Vancouver Requirements for Electromagnetic Locks on Exit Door

Sentence 3.4.6.16.(6) of the 2019 VBBL provides a prescriptive Unique to Vancouver solution for use of electromagnetic locks on exit doors that need to be secured for unauthorized entrance. This solution incorporates two mandatory features - a push button on the side of a door and a motion sensor or a pressure sensitive pad that immediately releases the locking device. Typically, this solution is used for exit doors leading from lobbies in residential and office buildings but it may be used on any exit door. The VBBL permits this solution only for exit doors and it cannot be implemented for egress doors within floor areas.

Secured Elevator Lobbies in Office Buildings

The Bulletin pertains also to tenant floor areas in office buildings that are not being served by public corridors. In order to ensure the level of security required to minimize the risk of an intrusion and an assault, it is often desired to lock an elevator lobby from the tenant space. In the absence of public corridors, this results in an elevator lobby not having a direct access to exits. The VBBL requires an access from any portion of the floor area be provided to at least two exits at all times. This includes elevator lobbies in Group D occupancies that are less than 300 sq. m. in area. Locking elevator lobbies would be permitted on the same basis as discussed above for the use of electromagnetic locks within floor areas and the same letters are to be provided by the building owner.

Contained Use Areas in Care and Treatment Occupancies

New provision for ensuring safety of occupants with impairment in cognitive functioning who placed in care and treatment occupancies were adopted into the 2019 VBBL from the British Columbia Building Code. Sentence 3.4.6.16.(5) permits the use of manual door release stations provided in lieu of a hardware activating a 15-second delay. Manual door release devices installed within 0.5 m of doors in care and treatment occupancies are deemed to be acceptable, where push buttons are utilized for this purpose. These manual push buttons must release electromagnetic locks immediately without a delay. For everyday circulation, card readers will be provided along with emergency request to exit buttons.

Appendix A of the VBBL recommends emergency access buttons to be protected with plastic covers. The plastic covers must not be locked but they must be wired so, as to activate a localized audible alarm to alert staff about an attempt to open them by patients.

Red colored manual pull stations connected to the fire alarm system in conformance with Article 3.2.4.16. are required to be provided near exit doors in addition to the manual door release stations referenced in Clause 3.4.6.16.(5)(b)(iv).

Locks on Crossover Floors in High Buildings

A requirement to equip with electromagnetic locks doors from exit stairs to floor areas on emergency crossover stories in high buildings has been introduced in the 2018 BCBC in Clause 3.4.6.16.(4)(k). This permission has been amended for adaptation into the 2019 VBBL. The 2019 VBBL permits locks on emergency crossover floors only where an exit stair leads directly into the corridor used by public.

The amendment was provided to allow these locks only where the doors can be inspected during routine fire inspections to ensure that doors are not blocked and will be available during fire emergencies. Accordingly, the intent is to prohibit locks only where an exit door leads to a tenanted space or a room that is not being accessed within the scope of fire inspections. For the purpose of conformance with requirements in Clause 3.4.6.16.(4)(k), an exit door in assembly, care, treatment, or industrial occupancy that leads into a corridor used by public would be permitted to be equipped with an electromagnetic locks. This includes storage garages.

In addition to a signage within the stairwell, Vancouver Fire and Rescue Services require a signage to be provided on the floor area side of the exit door on a cross-over floor in order to inform first responders who may be approaching the exit door from the floor area side of the presence of maglocks.

Secured Access from Underground Parkades into Residential Buildings

Multiple requests have been received to permit locking of doors leading from secured residential parking garages into exit stairways. There is a history of offenders gaining an access into secured parkades through entrance gates and then attempting to proceed further into above-ground floor areas through protected exit stairways. In an effort to improve the level of security and reduce the risk of intrusion or assault, building owners are willing to lock doors that lead from underground parkades into stairways.

Based on our discussion with Security Consultants, Building Owners and Vancouver Police, a provision of localized intrusion alarm in combination with electromagnetic locks meeting the requirements in Sentence 3.4.6.16.(4) is efficient in successfully deterring criminal invaders. For everyday circulation through exit stairways and elevator lobbies, parkade users are utilizing access cards to release electromagnetic locks. The access system is equipped with a localized alarm that sounds when a 15-second delay is initiated without employing an access card. A legible sign “IN CASE OF AN EMERGENCY, THE LOCK WILL RELEASE WITHIN 15 SECONDS. AN ALARM WILL SOUND FOR UNATHORIZED ENTRY.” is to be placed on the door. The sign will deter intruders and an alarm would alert occupants of an attempt of unwanted entry.

Other than a localized alarm, the door sequence of operation would meet the requirements in Sentence 3.4.6.16.(4) and hence, the level of fire and life safety would not be reduced.

Fire Safety Plan

Vancouver Fire and Rescue Services require the sequence of operation and testing measures for electromagnetic locks to be included the Fire Safety Plan.

(Original signed by)
B. Turishev, M. Eng., P.Eng., CP, MBA
Building Policy Engineer
Building Policy Branch

(Original signed by)
P. Ryan, M.Sc., P.Eng.
Chief Building Official
Director, Building Code and Policy