

MEANS OF EGRESS

Common Myths and Mistaken Beliefs to Avoid

The Solution Is NOT A Blue Manual Station!

While you analyze a project, as a designer you raise different requests with your client concerning the layout on a floor area. Together you look for the required areas for each functionalities, connections between them, and the functionality of the layout.

Since the preliminary design, have you considered validating with your client the access control needs and also the layout requirements in the selection of doorways hardware? The solution is NOT a blue manual station! Did you know that this option, offered by the control system suppliers, has never been permitted by the Construction Code?

Thus, when we analyze the preliminary plans of a project, as a Codes and Standards consultant we notice that this step of access control validation has not been done or that the recommendations for a future Safety consultant will be added into subsequent phases. The recommendations from this consultant are not limited to the specific choice of the hardware. Some types of hardware, even though available in the market, do not meet the regulations requirements. Or else they are applicable to very specific situations.

However, disregarding this step in the preliminary phase, may cause compliance problems when the means of egress analysis is performed at the very end of the project's design. Sometimes the proposed layouts simply do not work!

In fact, during a preliminary, to validate if the plans meet the means of egress requirements, the architects rapidly validate the rooms' floor areas so to determine the occupant load in different spaces, as well as the number of required doors [3.3.1.5. *National Building Code 2010 amended Quebec* (NBC 2010 amended QC)].

- Would each room have only one egress doorway, or shall the room include two or more doorways?
- Would the number of doorways in a room or suite rather be derived from the travel distance required at the egress doorway or from the distance to the nearest exit?

When an occupant travels towards a required egress or exit door but encounters a door, the **occupant shall still be able to open that door**. In fact, according to Sentence 3.3.1.13.(2) of the NBC 2010 amended QC, a door in an access to exit shall be **readily openable** in travelling to an exit without requiring keys, special devices or specialized knowledge of the door opening mechanism.

Have you ever stumbled upon a door having an electromagnetic lock? Have you ever searched for a push button to exit a room? Or, were you ever stuck in a lobby because of a lock and did not consider using the blue emergency manual station, as you had no visual instructions on how to use it?

The search of this type of mechanism, that shall have sign including clear instructions, absolutely does not correspond to the Code's intents. The purpose of the hardware choices is to limit the likelihood of occupants not knowing the operation or maneuvering of the doors located in an exit access. If the person does not have the keys or the knowledge of the doorway's functionality, it could delay the evacuation or the travel of other persons towards a point of safety; which may cause injuries to persons by increasing the evacuation time.

Thus, during the layout analysis, if there is a locked door in the path of access to the exit, and this door, due to its hardware, does not allow occupants to freely access the exit; this door **becomes a wall!**

Except for dwelling units or residential suites, the door release hardware shall be **operable by one hand and the door shall be openable with not more than one releasing operation** [3.3.1.13.(3) and (4) on NBC 2010 amended QC]. To press a door release button is therefore a second operation not permitted by the Code.

Historically, this type of installation has been permitted for the following two types of situations:

- Between 2001 and 2004 in the Building By-Law of the *City of Montreal*; some devices of the By-Law permitted this type of hardware.
- When there has been official requests of equivalent measures or alternative solutions accepted by the *Régie du bâtiment du Québec (RBQ)*.

With the acceptance letter from the *RBQ*, this situation is therefore compliant to the regulations for specific designs. Furthermore, as soon as the tenant indicated in the official acceptance letter would move out, the request often became obsolete as it was agreed specifically for this tenant. To remain compliant to the regulation by using an alternative solution, it is therefore required to address *RBQ* once again so to maintain the equipment on the doors.

How to Comply with The Regulation Without Going Through an Alternative Solution (Equivalent Measure)?

First, we shall well plan circulations. It is necessary to identify the public circulations and the circulations that will be controlled.

- It is possible to provide a door for impeded entrances and to provide doorways for evacuation?
- The controlled door that opens in the **direction of the exit** shall be equipped with an electric door opener. Then it will be possible to control the entrances with a card reader, but the persons wishing to leave, will just need to turn the knob.

The only permitted exceptions in the regulation, for a door to not readily open in access to exit, are [3.3.1.13.(2)(a) and (b) of NBC 2010 amended QC]:

- Option 1: doorways equipped with an electromagnetic locking device installation compliant to:
 - Sentence 3.4.6.16.(4): 3/15 s locking devices, or
 - Sentence 3.4.6.16.(5): locking device with the red emergency manual station.
- Option 2: the doors serving a detention area or with a controlled exit area, provided that the releasing devices are compliant to Sentence 3.3.1.13.(6).

We will return to these two options by explaining in detail the conditions to apply. Please note that NBC 2010 amended QC has evolved by permitting option 1 in the egress access and not just in the exits compared in NBC 2005 amended QC.

We noticed that when Option 2 is selected, safety measures are usually considered as first analysis of the project according to the building occupancy, to be a contained use area or an impeded egress zone, it takes staff permanently assigned to the security of the premises. In addition to the door hardware, such as door contacts that detect the door opening, are cameras and other types of elements to validate the coming and going of the occupants.

For other types of projects, the only acceptable solution according to the Construction Code is Option 1 and all other solutions considered by the Safety consultant shall be addressed in Alternative solutions to the *RBQ*.

When you apply Option 1, the 3/15 s locking device, includes some requirements that shall be validated so to permit its use.

In the light of the Construction Code requirements (see Appendix 1), would the designer wish to create more brightness by choosing entirely glazed doors to adequately validate the hardware if this door shall be controlled for safety reasons?

We have to admit that glass doors often require revolving type hinges that rarely allow to install electrical hardware compliant to the regulation. The panic bars, after a delay of 3 seconds shall unlock 15 seconds later, requiring an electromagnetic relay as well as electrical wires that are integrated within a frame (often aluminum or steel). One of the frequent issues seen during the plans review is that a glass door does not permit the installation of hidden hardware that meet the requirements. Also, the beautiful design presented to the client shall be revised. This process fails to maintain the client's trust and requires work hours that are hardly chargeable.

These new products are offered when a person pushes on the regular hardware of the door; for example, the electromagnetic lock which recognizes the applied force. Ensure that this new hardware shall conform to the test requirements prescribed in CAN/ULC-S533 and not only of the American standards.

The presence of electromagnetic lock only connected to the fire alarm in compliance with **Sentence 3.4.6.16.(5)** is not automatically authorized for all occupancies. The Code permits to use this type of electromagnetic lock only for these two types of occupancies:

- located in floor areas laid out for sleeping rooms in a residential care centre (Group B, Division 3), or

- located in floor areas laid out for patients' sleeping rooms in a long-term care centre CHSLD (Group B, Division 2).

Nonetheless even in this type of occupancy, it is not permitted for their floor areas. It is required to ensure that the mechanism is installed on the storeys of rooms and to provide in case of activation, a manual interrupter easily accessible and placed in a location under constant surveillance **inside** the confined spaces. Therefore, there shall be a space designed with a security guard and staff station.

This type of unlocking mechanism with manual fire alarm activation (red) is preferred to the 3/15 s locking mechanism, as the latter is not appropriate in a sleeping room in a CHSLD or a care occupancy when persons among other things have cognitive issues. It is permitted to install this type of electromagnetic locks provided the construction requirements of Appendix 2 are met.

If you considered installing this type of locking mechanism with a manual fire alarm activation (red) in an assembly, business, and commercial occupancy, **there are no provisions** in the regulation that permits the type of installation. It is the same for caring occupancies in dwelling units in private senior citizens' residence.

How About the Egress Doorways?

Last but not least, you need to think about the door control. In some cases, it is required to provide floor levels that serve as re-entry for the stair shafts. Indeed, it is often thought that the doors of the exit stairs only allow the evacuation to descend to the outside of the building and that it is possible to lock them all. But during a fire, if the smoke reaches a stair shaft, the occupants will prefer to return to another floor area. Currently in the regulations, it is not possible to avoid the presence of re-entry levels using electrical hardware or otherwise you have to go to an alternative solution.

Therefore, it is required to point out access to the floor area in case of an emergency. It is required for *buildings of more than 6 storeys in building height* [3.4.6.18.]. See the construction requirements in Appendix 3.

Conclusion

So, when the access control installer proposes different solutions, it is important to validate that these options meet the Construction Code wording.

Therefore, it is required that each time you wish to install another type of electromagnetic lock on a door, to present the alternative solution to the Authorities who will adequately analyze this

situation. According to the occupancy, the nature of the impact on safety, some mechanisms are proposed, such as emergency door release push buttons (green), to replace the blue manual station or the manual fire alarm activation (red) in exit shafts to avoid the re-entry. As each case has their own particularities, we shall not copy the “recipe” of another project without addressing it to the Authority having jurisdiction.

Do you have time in your schedule to do this type of approach? What is your margin for manoeuvre to carry out this project if the RBQ does not accept your request? Think about this carefully in the beginning of your project!

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