

NOTE: This Bulletin applies to bedroom windows in buildings that fall under Part 9 of the National Building Code of Canada-Alberta Edition (NBC-AE).

The City of Lethbridge is providing this bulletin to assist in determining if the size of a proposed window meets the minimum bedroom egress (emergency escape) requirements.

REQUIREMENTS of the NBC-AE

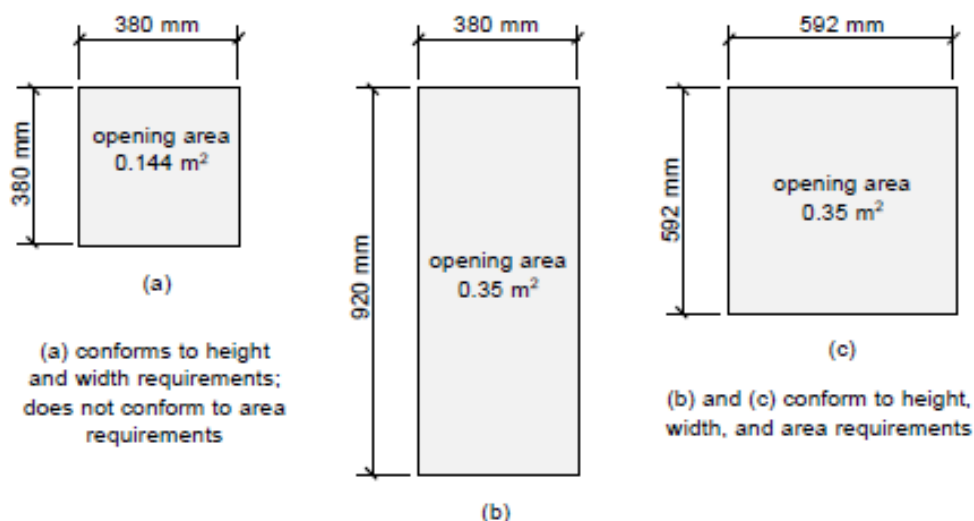
The emergency escape requirements for bedroom windows the City of Lethbridge is addressing in this bulletin are in two separate articles.

Article 9.9.10.1 Bedroom Windows

Except where the suite is sprinklered, each bedroom or combination bedroom shall have at least one outside window or exterior door openable from the inside without the use of keys, tools or special knowledge and without the removal of sashes or hardware. (See Article 9.5.2.1. and Note 9.9.10.1.(1).)

The window referred to in Sentence (1) shall provide an unobstructed opening of not less than 0.35m^2 (542.5 in^2) in area with no dimension less than 380mm (15in), and maintain the required opening during an emergency without the need for additional support.

(See Appendix A)



This requirement is specifically intended to provide occupants with the means to escape in an emergency situation when the use of the normal building exits is prevented. Although bedroom windows are not considered to be ordinary escape routes, using them in an emergency has saved many occupants.

The unobstructed opening must be measured between the window components (sash, jamb, sill, opening mechanism, etc.) with the window in the fully open position. (Figure 2)

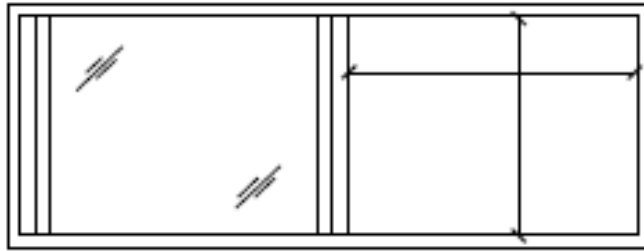


Figure 2

It is not simply the dimensions of the rough opening or the glass area. A test for the required minimum opening is the ability to pass a prism of the required cross-sectional area and minimum dimensions through the opening. (Figure 3)

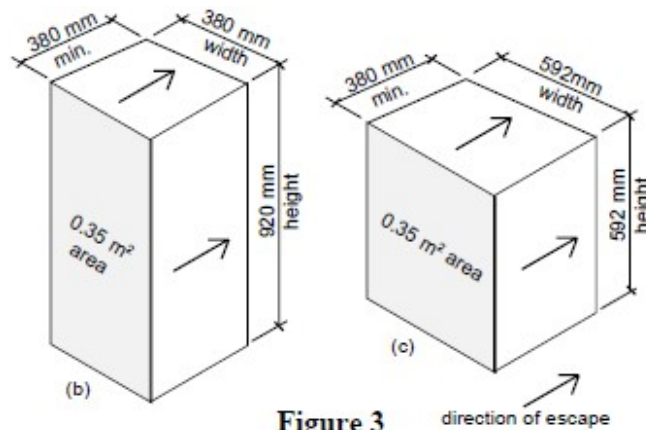


Figure 3

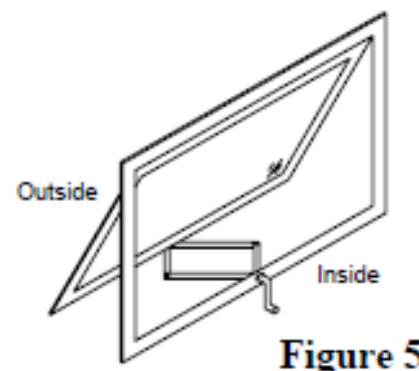
There is no set maximum sill height for the bedroom windows. Therefore, it is possible to install a window or skylight that satisfies the requirements, but defeat the intent when the sill height is so high that it cannot be reached for escape purposes. It is recommended that the sills of windows intended for use as emergency escape be no higher than 1.5m (5'-0") above the floor. When it is unavoidable to have a sill higher than 1.5m, access to the window should be improved by some means, such as built-in furniture installed below the window.



WINDOW TYPES

AWNING

The use of awning windows in bedrooms has caused concern when applying Article 9.9.10.1. Awning windows (figure 5) swing open on their horizontal axis at the top of the frame or at an intermediate mullion. The opening hardware for an awning window typically extends between the middle of the sill and the middle of the window sash. It obstructs an occupant's escape. Only very large awning windows will provide an opening at the side of the hardware that will meet the NBC-AE requirements.



Although the opening hardware is usually designed to be detached from awning windows, detaching the hardware is not considered part of the normal opening operation. A person needs special knowledge to use the release mechanism, because it is hidden from plain view, requires the user to be familiar with how it functions, and requires dexterity to operate. Quick-release hardware, intended to improve an occupant's ability to release the hardware, does not appear to be commonly used. Even if quick-release hardware could eliminate the need for special knowledge, when the opening hardware is detached (or light enough to be broken away) so that the opening is large enough to be a means of escape the window is no longer held in an open position. The window itself then becomes an obstruction.

In general, awning windows do not meet the intent for a means of escape and do not provide compliance with Article 9.9.10.1. For exceptional circumstances, specific approvals by the authority having jurisdiction or local building official should be obtained.

CASEMENT

Casement windows (figure 6) open on their vertical axis and usually have opening hardware installed at the bottom of the window. Since this hardware obstructs an occupant's escape, the opening should be measured to the hardware. In addition to the opening hardware, casement windows usually have latches opposite the hinge. These latches should be within reach of children who are expected to escape on their own.

Casement windows come with two types of hinge hardware. The normal hardware allows the window to pivot around a vertical axis that is not at the jamb. Alternatively, egress hinge hardware hinges the window at an axis along the jamb to allow for a maximum unobstructed opening. Casement windows will satisfy the requirements of Article 9.9.10.1. when the opening is large enough to pass the prism test with the opening hardware in its most restrictive position and the window fully open.

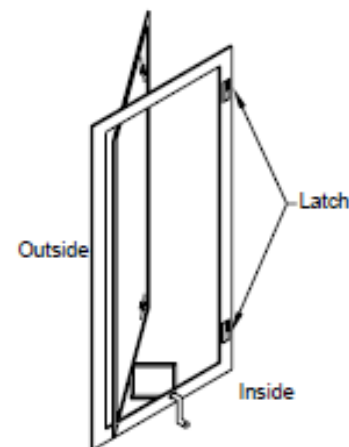


Figure 6

SLIDER

Horizontal and vertical slider windows (figure 7) are commonly used in residential construction. They are capable of meeting the requirements of Article 9.9.10.1 when the opening is large enough to pass the prism test. Some slider windows have the ability to flip open into the room to allow for easy cleaning. This operation requires several steps and is not considered normal opening of the window. The unobstructed opening should be measured when the window is in the fully open position.

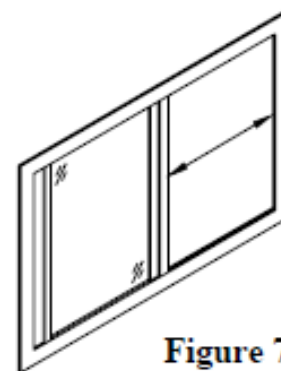


Figure 7

FULL VENT INSWING AWNING

Full vent inswing awning windows (figure 8) swing open on their vertical axis at the top of the frame or at an intermediate mullion. This type of window latch does not use an opening operator and is able to swing open without restriction or be held partially open with intermediate catches. It swings in toward the user and does not restrict the clearance when opening into a window well. This type of window is typically marketed as a "basement" window because it swings inward and the size of the opening is not restricted by the opening mechanism. If there is a catch available to hold the window in an open position, this type of window can satisfy the requirements of Article 9.9.10.1.

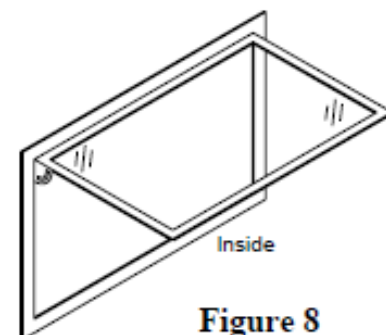


Figure 8

HOPPER

Hopper windows (figure 9) swing open on their horizontal axis at the bottom of the frame or at an intermediate mullion. They have a latch to hold them closed and do not typically come with an opening operator. This allows them to swing open freely or be held partially open with intermediate catches. With typical hopper windows, a bedroom occupant would have to crawl over the glass area to escape. Hopper windows that swing to an open, fully vertical position without intermediate catches could meet the requirements of Article 9.9.10.1. but hopper windows are not commonly used for bedrooms.

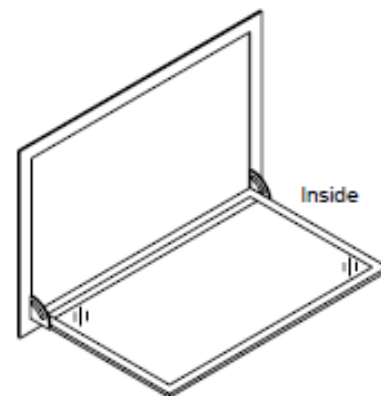


Figure 9

OTHER CONSIDERATIONS

Ice build-up that prevents or restricts opening window is a concern with any type of window. With improved heating and venting systems in houses and improved window construction, ice build-up appears to be less of a concern than it may have been in the past.

Latches incorporated on the inside of a window frame are not considered to require special knowledge to release. These latches are typically engaged, for security or to ensure the window is shut tightly, and released as part of the normal opening process.

Insect screens, security bars, grills or similar devices shall be easily removable or releasable from the inside without the use of a key, tool, or special knowledge.

Children who are expected to escape through a bedroom window on their own should be taught how to open the window and remove or release any screens or bars that may be installed. Home fire drills should include practicing in using the window as a means of escape. For those people that are too young or physically infirm to escape on their own through a window, special precautions such as additional smoke alarms in the bedroom to assist with early detection or relocating their bedroom to the first story to assist with their rescue, might be considered.

Windows Opening Into a Window Well

When a window required in Article 9.9.10.1. opens into a window well, a clearance of not less than 760mm (30") shall be provided in front of the open window. Where the sash of a window opens towards the window well, the operation of the sash shall not reduce the clearance in a manner that would restrict escape in an emergency situation.

