

BULLETIN 2016-002-BU

July 7, 2016

## BALCONY AND PATIO DOORS IN HOUSES AND DWELLING UNITS

The purpose of this Bulletin is to clarify requirements regarding the proper design of balcony and patio doors. The Bulletin discusses major design concerns that may compromise the safe use of balcony doors.

Proper design and construction of the door leading to an exterior balcony (or patio) from a single-family dwelling unit or a house often presents significant challenges. A raised sill is required in order to achieve watertight exterior door opening. In addition, insulation or pavers installed above a balcony or a patio may result in elevation differences between exterior and internal surfaces. Accordingly, if not thoroughly planned and designed, an exterior balcony door may create a tripping, falling or slipping hazard.

It has been common practice in the City of Vancouver to construct a single “step-over” at the bottom of the balcony or patio door. To conform to headroom requirements in Part 9 of the VBBL, a minimum clearance of 1980 mm must be provided for all exterior balcony doors. It has been intended that a “step-over” would allow a person to step through the opening without stepping on the sill, thus maintaining the minimum head room clearance requirement of 1980 mm. This may be achieved where the curb height measured to the finished surface of the balcony deck or interior floor does not exceed the maximum rise of 200 mm permitted for a stair riser within a dwelling unit. The curb width must also not exceed 300 mm, including any baseboard heater along the inside of the curb, to ensure that people will instinctively “step over” rather than step on the curb, thereby maintaining the required headroom. Likewise, it is paramount that the stepping surface will be on the same level on both sides of the door. See Figure 1.

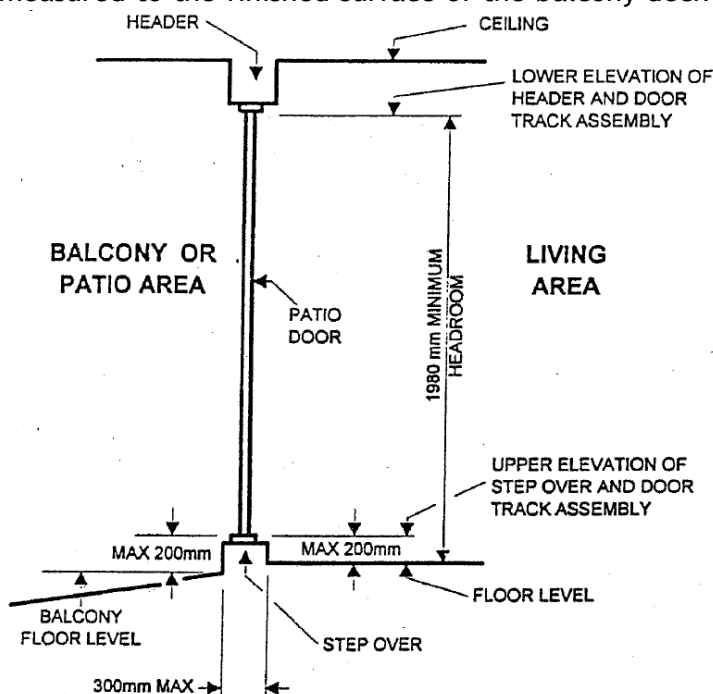


Figure 1. Headroom Requirements for Residential Balcony Doors

In order to achieve level surfaces on the exterior and interior sides of the balcony door, it is important to take into account any finishes which may be installed, particularly on the balcony deck where insulation and/or pavers may be used. Pavers or insulation installed above the finished floor on the balcony side of the door with a 200 mm high “step-over” result in a higher than permitted “step-over” on the interior side. In order to alleviate the problem, designers or builders may add on a single step on the interior side of the “step-over” sill.

Sometimes, a problem occurs in reverse and an additional step is required on the balcony side of the door. These additional steps create safety and accessibility concerns discussed in the continuation of this bulletin.

### An Additional Step on the Interior Side of the Balcony Door

An additional step on the interior side of the 200 mm high and up to 300 mm wide “step-over” threshold presents a significant challenge to negotiate for seniors, occupants with poor vision or balance, people under influence of drugs or alcohol, children, or even for able-bodied occupants carrying something in their hands while stepping in or out of the balcony. Such geometry creates non-uniform steps that are less than an average stride for an occupant and thus, disrupts the typical relationship between the rise and the run. A balcony user needs to step over onto the narrow tread and after which, while balancing on the step, has to pull a leg over the step. Moreover, because the additional step is hidden behind the 200 mm high “step-over”, such design would encourage users to step on the door threshold defeating thereby the intent of the “step-over” design criteria.

In light of the above, it is of great importance to properly design floor elevations during the design stage. In existing conditions with higher sills, a landing conforming to Article 9.8.6.3., Dimensions of Landings, may be considered. Makeshift solutions, such as an additional step, will not be accepted by the City.

### A Raised Platform or a Step on the Exterior Side of the Balcony Door

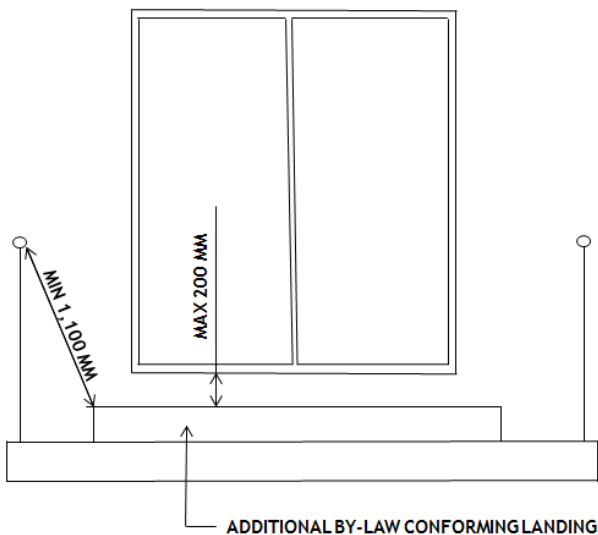


Figure 2. Minimum height to guard railing

A raised platform or a step on the exterior side of the balcony door located adjacent to a guard reduces the guard height by the height of the raised platform. As a result, the guard becomes a hazard for children because the step or platform facilitates climbing. In addition, the guard becomes a falling hazard for an adult occupant.

In order to mitigate such risks without imposing undue burden to builders and owners, the City would permit measuring a minimum guard height diagonally. The minimum diagonal distance between the top of the guard and the top of the raised platform must be not less than 1,100 mm (see **Figure 2**). If this minimum safe distance cannot be maintained, the guard must be raised.

### Accessibility Concerns

The City of Vancouver makes a continuous effort to create indoor and outdoor environments that are accessible to all. A balcony or a patio as described in this Bulletin is a portion of a dwelling unit that needs to be accessible for occupants in wheelchairs. A typical 200 mm high “step-over” threshold does not exceed the height of a standard concrete curb within an accessible pathway outside of the building. Sentence 3.8.3.3.(5) in the City of Vancouver Building By-law permits curb cut ramps to be constructed without handrails even when their slope is more than 1 in 10. Accordingly, if required, a properly

designed “step-over” within a balcony door may be equipped with detachable or permanent wheel-chair ramp. However, a ramp for a door with threshold in excess of 200 mm would be too steep for someone in a wheelchair to negotiate. When additional landings are required due to the threshold height, longer accessibility ramps with handrails must be incorporated into the design and shown on the building permit drawings as a future possible upgrade.

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B. Turishev, M. Eng., P.Eng., MBA  
BUILDING POLICY ENGINEER  
BUILDING POLICY BRANCH

(Original signed by)

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P. Ryan, M.Sc., P.Eng.  
CHIEF BUILDING OFFICIAL  
DIRECTOR, BUILDING CODE & POLICY