Builder Tip

Issue No: 101
Issued Mar 2020

Structural Sufficiency of Glass for Houses

ONTARIO BUILDING CODE

Structural Sufficiency of Glass

9.6.1.3.(2) Where the building has an essentially uniform distribution of paths for air leakage, including operable openings, but no large openings that would permit wind gusts to rapidly enter the building and the building is not in an exceptionally exposed location such as a hilltop, the maximum area of individual panes of glass for windows is permitted to conform to,

(a) Tables 9.6.1.3.A. to 9.6.1.3.C., where the building has a height from grade to the uppermost roof of 12 m or less and is located in a built-up area, no less than 120 m away from the boundary between this area and open terrain,

OBJECTIVE

An excessive area of glass used in a window could lead to the glass being unable to resist wind and impact loads. Therefore, glass used in windows is required to comply with CAN/DGSB-12.30-M, “Structural Design of Glass for Buildings”, using an adjustment factor on the wind load, W, of not less than 0.75.

However, Part 9 of the Building Code permits glass used for houses to comply with Tables 9.6.1.3.A to F, depending on the height of the building and the location of the building. For this Builder Tip, the following building parameters have been identified;

- The height of the building is a maximum of 12 m from grade to the upper most part of the roof,
- The building is located in an urban or built-up area, and
- The building is located not less than 120 m from open terrain area.

Generally, when using Part 9 of the Building Code to design the glass used in windows, the area of the glass maybe larger when the building is located in an urban setting compared to the same building located in an open area. Additionally, the building must not have large openings that would permit wind gusts to rapidly enter the building. Large openings would include very wide glass door openings and if install may require the glass for the windows to be designed in accordance with Part 4 of the Building Code.

The following diagram is an example of a building located within a City of Markham urban area and the maximum glass area permitted based on the glass thickness used in the window.

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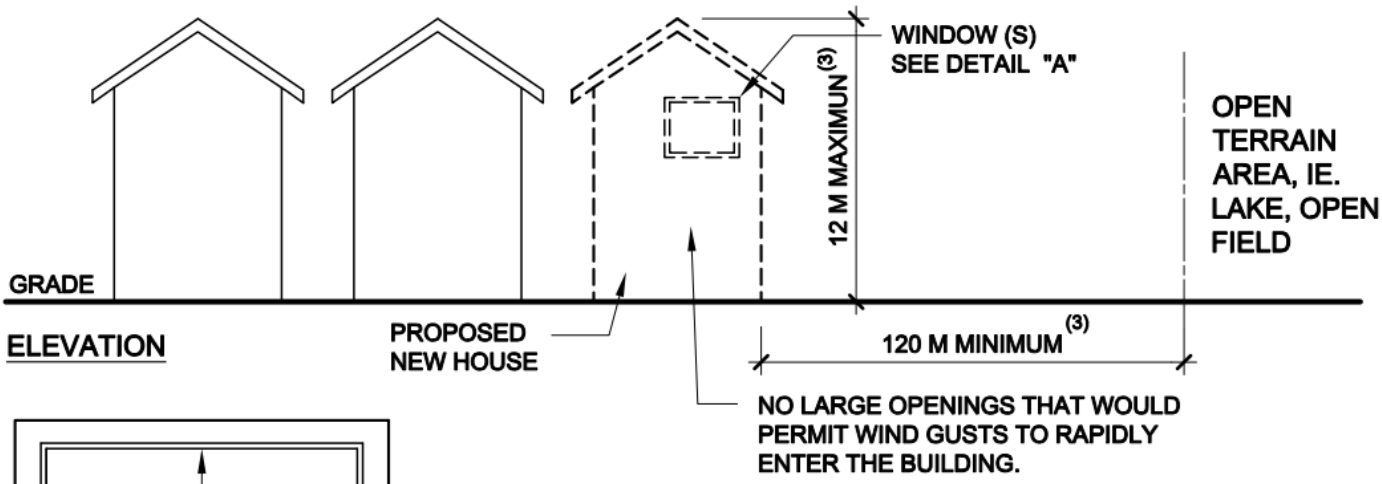

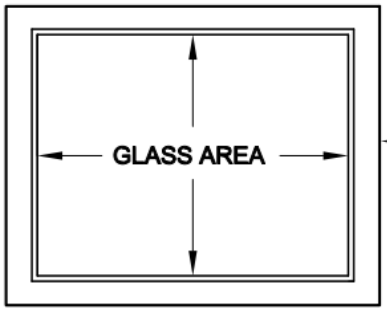

FROM SUPPLEMENTARY STANDARD SB-1 THE MAXIMUM HOURLY WIND PRESSURE WITH ONE CHANCE IN FIFTY (1 IN 50) FOR THE CITY OF MARKHAM IS 0.44 kPa. THEREFOR TABLE 9.6.1.3.A MAY BE USED.

DETAIL A
ELEVATION

TABLE 9.6.1.3. A.

GLASS THICKNESS (mm)	MAXIMUM GLASS AREA m^2 FOR FACTORY SEALED GLASS UNITS (1)
2.5	1.02
3	1.71
4	2.68
5	3.74
6	5.24
8	7.93
10	9.92
12	13.92 (2)

TABLE 9.6.1.3. A.

GLASS THICKNESS (mm)	MAXIMUM GLASS AREA m^2 FOR FACTORY SEALED GLASS UNITS (1)
2.5	0.80
3	1.34
4	2.11
5	2.93
6	4.10
8	6.90
10	9.60
12	12.53

(1) MAXIMUM GLASS AREA VALUES APPLY TO INSULATED GLASS UNITS OF TWO IDENTICAL LITES (ANNEALED, HEAT -STRENGTHENED OR TEMPERED) SPACED AT 12.7 mm.

(2) GLASS MUST BE DESIGNED IN CONFORMANCE WITH ARTICLE 4.3.6.1. OF THE BUILDING CODE WHEN GLASS AREA EXCEEDS 13.92 m^2.

(3) GLASS MUST BE DESIGNED IN CONFORMANCE WITH TABLE 9.6.1.3.D. WHEN GREATER THAN 12m MAXIMUM HEIGHT OR LESS THAN 120M MINIMUM.