

Status Update: Glass Balcony Guards

Date:	September 22, 2011
To:	Planning and Growth Management Committee
From:	Ann Borooah, Chief Building Official and Executive Director, Toronto Building
Wards:	All
Reference Number:	PG11015

SUMMARY

The purpose of this report is to recommend that the Planning and Growth Management Committee direct the Chief Building Official and Executive Director, Toronto Building to report to the November 2011, Planning and Growth Management Committee, on the findings of Toronto Building's review into glass balcony guard safety and provide recommendations for action by the City on the issue.

This report also provides a status update on Toronto Building's response to the failure of glass panels on several high-rise condominium towers in the downtown area. Toronto Building is acting proactively to ensure that the public is protected in and around each of the buildings affected and is investigating the causes of the failures to determine what further actions should be taken to protect the public.

Toronto Building has received Professional Engineer's reports on three of the buildings where glass balcony panels broke: 37 Grosvenor, 38 Grenville and 1 Bedford. This report summarizes the **preliminary** findings to date and should not be considered conclusive for consideration of the issue in its entirety. Toronto Building has retained an independent Professional Engineer to peer review the reports and any remedial plans being proposed by the developers. The consultant is also working with staff to develop recommendations for any action required by the City in considering its own practices and to inform discussions with the province, professional designers and the building industry in addressing the issue of glass paneled balcony safety

RECOMMENDATIONS

The Chief Building Official and Executive Director, Toronto Building recommends:

That the Planning and Growth Management Committee direct the Chief Building Official and Executive Director, Toronto Building report to the November 2011, Planning and Growth Management Committee, on the findings of its review into glass balcony guard safety and provide recommendations for action by the City in considering its own practices and to inform discussions with the province, professional designers and the building industry in addressing the issue of glass paneled balcony guard safety.

Financial Impact

This report will have **no** financial impact beyond what has already been approved in Toronto Building's 2011 budget.

DECISION HISTORY

At its meeting of September 21 and 22, 2011 Council referred Member Motion 11.5 "[City of Toronto calls for Comprehensive Review to determine why glass panels are falling from some high-rise buildings](#)" to the Planning and Growth Management Committee.

ISSUE BACKGROUND

Toronto Building is the division responsible for the enforcement of the Ontario Building Code in the geographical jurisdiction of the City of Toronto. The Ministry of Municipal Affairs and Housing administers and updates the Ontario Building Code which governs the construction of new buildings and the renovation or change of use of existing buildings in Ontario. The Building Code contains requirements that tempered glass, when used, conform with CAN/CGSB 12.1, the Canadian standard for tempered glass.

There have been several instances in Toronto where tempered glass panels within balcony guards on several residential high rise buildings broke. These occurrences took place at the following buildings: 37 Grosvenor Street; 38 Grenville Street; 1 Bedford Avenue; 326 King Street West (Toronto International Film Festival Building (TIFF)), 628 Fleet Street and 620 Dundas Street West (1 Cole Street/252 Sackville Street). The seven buildings have been built by three separate developers.

In each failure, numerous small pieces of glass fell to the ground. In one instance a member of the public sustained minor injuries. Toronto Building responded, under the Building Code Act, issuing unsafe orders requiring remedial action be undertaken to correct the unsafe conditions and protect the public in and around the affected buildings from any possible future glass balcony guard breaks. Toronto Building has issued a total of 16 Orders: Two at 326 King Street West; three at 1 Bedford Road; one at 628 Fleet Street, four at 37 Grosvenor Street, three at 38 Grenville Street, and three at 620 Dundas Street East. At each site, Toronto Building required that appropriate overhead protection be provided to protect the public. Toronto Building required reports on the causes of the breakage of the tempered glass panels within the balcony guards.

The development companies have been working cooperatively with Toronto Building to comply with the Orders and to protect public safety. Toronto Building has issued further Orders to the developers requiring detailed testing and analysis to determine the cause of the failures and Professional Engineer reports describing: The measures necessary to make the building safe; detailed information with respect to the glass installed and verification of compliance with relevant standards; confirmation from a Professional Engineer that the guard assemblies were installed in conformance with the design, and a remedial plan. The developers are complying with the Orders. To date, Toronto Building has received Professional Engineer's reports on three buildings: 37 Grosvenor Street; 38 Grenville Street, and 1 Bedford Avenue. At the present time, Professional Engineer's reports are pending on 326 King Street West, 628 Fleet Street, and 620 Dundas Street East.

COMMENTS

Public safety is paramount. A number of possible causes exist as to why failures of the glass panels have occurred. While Toronto Building has been working with each property owner individually, the division and the City are interested in determining the reasons for the current situation and developing a comprehensive solution. A comprehensive solution may only be developed through a thorough understanding and analysis of the individual buildings along with the collective experience in the industry as a whole.

Toronto Building has hired a Professional Engineer with technical and research expertise in the area of building materials and knowledge of design and construction practices in this area. The consultant is providing technical expertise to the Chief Building Official and her staff to "peer review" submitted reports with respect to Orders issued. Toronto Building is working to identify commonalities and possible causes for the failure of glass panels within balconies.

The Chief Building Official has proactively engaged stakeholders such as the Ministry of Municipal Affairs and Housing, Tarion and the Building Industry and the Land Development Association. These discussions, in advance of the broader review, are integral for the development of recommendations for action by the City. Toronto

Building has been working in cooperation with the area Councillor and/or staff with respect to each of the properties affected to keep them up-to-date on the status and will continue to do so. Toronto Building has kept the public informed of its work on the issue through a statement on its [website](#) . The statement will be updated as new information becomes available.

The analysis conducted with the City's consultant will inform the City's own practices and discussions with the province, professional designers and the building industry in addressing the issue of glass paneled balcony safety.

The initial reports provided by the developers on 37 Grosvenor, 38 Grenville and 1 Bedford have not yet been peer reviewed by Toronto Building's independent Professional Engineer. The following summarizes the **preliminary** findings of the reports to date and should not be considered conclusive for consideration of the issue in its entirety.

37 Grosvenor: (11 panels have failed) According to the Professional Engineer's reports the most probable cause for the balcony glass panel failure is micro-cracking caused by inclusions within the glass itself. The inclusions recovered were below the maximum size limits allowed by the governing standard CAN/CGSB 12.1, referred to in the Ontario Building Code. Conformance with the standard was confirmed based on visual review, thickness measurement and surface compression. The rate of glass breakage, if all failures are attributed to inclusions is higher than anticipated and suggests an isolated concentration of inclusion in the glass batch. The glass used in all the balcony guards was provided by three different North American glass fabricators.

38 Grenville: (Four panels have failed) According to the Professional Engineer's report the rate of glass breakage at this site, if all attributed to inclusions, is within the anticipated or normal breakage rate of tempered glass due to inclusions. Conformance with the CAN/CGSB 12.1 standard was confirmed based on visual review, thickness measurement and surface compression evaluation. The report notes that the traceability of the supply of prime glass to the glass fabricator is not always possible but in this situation the prime glass used came from one of three North American suppliers and one based in China. It is further noted that all glass was certified to comply with all relevant Canadian glass standards.

1 Bedford: (Two panels have failed) According to the Professional Engineer's report the testing and analysis conducted on the two balcony glass panels, the breakage was due to micro-cracking caused by inclusions within the glass itself. In both cases, critical fragments of glass from the break origin were recovered allowing identification of the failure mechanism. The inclusions were below the maximum size limits allowed by the governing CAN/CGSM 12.1 standard. As such, the report stated that the glass was not defective. Secondary risk factors were identified but they did not play a significant role in the failure of the two subject panels. The rate of glass breakage, according to the report, is within the range of normally anticipated breakage due to inclusions.

All the reports received to date note that there are no practical procedures in the manufacture of glass to completely eliminate the risk of inclusion induced breakage.

At the present time, Professional Engineer's reports are pending on **326 King Street West, 628 Fleet Street and 620 Dundas Street East**. Professional Engineers retained by the developers are currently conducting testing of the tempered glass panels, which will take several weeks to complete. Toronto Building staff are meeting regularly with the developers' Professional Engineers. The reports are expected in early-October.

All of the reports will be reviewed by staff and the independent consultant hired by Toronto Building. The development companies involved are cooperating in undertaking the requested analysis and to provide a remedial plan satisfactory to the City.

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