

# THE VILLAGE OF LOMBARD

## Inspection ordinances for “bowstring trusses” and elevated parking structures

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Community Development Department

**The Building Division**

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This document is to highlight two potentially dangerous and costly building systems, and recommend two ordinances that help prevent some of the tragedies that have occurred in other communities.

Two building systems that have been in the news but have no State or Federal requirement to correct the problem are bowstring roof collapses and parking garage collapses. They each have different reasons why they are happening, but a simple inspection of these existing systems can highlight most problems prior to them causing a catastrophic event.

Tragedies that have occurred over the past several years have highlighted the need to address the aging wood "bowstring roof trusses" and elevated parking garages. While wood bowstring roof trusses have long been a concern of firefighters due to their tendency to collapse in a sudden catastrophic failure, they now are collapsing from heavy snow loading and from excess wear on the bottom wood cords of the trusses. These unique trusses can have extreme tension applied to the bottom cord during heavy snow loading or due to extreme loads caused by adjoining truss failure. In addition, the wood ends of these trusses can deteriorate due to roof leakage at parapet walls. Lastly, snow drift loads were not always taken into account when these roof systems were originally designed. While drift loads are required to be calculated into the roof design now, it was not a requirement in the past. As we have witnessed through the years, the end result of any one of these failures can be deadly for fireman and the building occupants.

We are proposing an ordinance requiring all the buildings with wood bowstring roof systems be inspected by a structural engineer by the end of 2011. In addition, the roofs would be inspected every 10 years thereafter. Some of the building owners have already had their bowstring roofs inspected, but most do not know about the risk that is over them. The ordinance would also require a plaque stating the existence of bowstring trusses be installed next to the "Knox Box". This would be a warning to all fire companies reporting to a structure fire that this system exists. With a bow string roof in good condition, these trusses fail all at once in a fire.

We are also proposing a similar ordinance for elevated parking garages. Several parking garage collapses have occurred from failed connections that may have been noticed during an inspection of the structure. While these type inspections are common, many building owners are not doing them or understand the risks. In addition to the risk to life, there is the financial risk. Some buildings have transferred ownership through condominium conversions and later discovered that repairs are needed in the hundreds of thousands of dollars to continue to use the parking structures. We are proposing that all elevated parking garages not built within the past ten years be inspected by 12/31/2012. They would also have to inspect these type structures every ten years thereafter. This could help avoid what has happened in Milwaukee, Atlanta, and Charlotte NC in the past few years.

Copies of the two proposed ordinances are below:

150.092 (G) Section PM 304.4.1

All property owners that have elevated parking structures constructed prior to 2002 shall have the parking structure and its supporting structural components inspected under the direction of an Illinois Licensed Structural Engineer by 12/31/2012, and shall be inspected every 10 years thereafter. The Engineer's report will need to be submitted to the Lombard Building Division by 12/31/12. In the event a building owner has an elevated parking structure that has been constructed after 2002, that parking garage will be required to be inspected at the point it reaches ten years of age, and every ten years thereafter. The cost of the inspection shall be at the expense of the building owner.

150.092 (H) Section PM 304.4.2

All property owners that have buildings constructed using wood "bow-string-roof-trusses" shall have the trusses inspected under the direction of an Illinois Licensed Structural Engineer by 12/31/2011, and shall be inspected every 10 years thereafter. The engineers report will need to be submitted to the Lombard Building Division by 12/31/2011. The cost of the inspection shall be at the expense of the building owner.