

---

**Date**      **July 21, 2009**

**To**         Sid Kaplan

**From**       Giancarlo G. Botazzi, P.E.

**Subject**    Star Market Wellesley MA Chapter 34 Analysis

---

The 7<sup>th</sup> edition of the Massachusetts State Building Code became fully enacted in March 2009. Chapter 34 of the code is the section that pertains to existing buildings. In addition to egress concerns, change of use and other architectural concerns, this section deals with the structural work for alterations, repairs and additions to existing buildings. While there are many structural alteration activities that trigger the requirements of chapter 34, a new requirement was added for the 7<sup>th</sup> edition. This is the trigger for non-structural remodeling and rehabilitation.

Substantial renovation of a pre 1975 constructed building will trigger the analysis of the building for gravity and lateral loads per Chapter 34 of the Mass Code. This section of the code has been triggered for the subject building because more than 20,000 sf of area will have new ceilings and partitions. (Section 3408.4.3, Level 2 work). The code specifies that the following tasks be performed:

- Site visit and investigation of building
- Review of any drawings
- Identify any lateral load paths in the building (from roof to foundation).
- Determine lateral load capacity of existing building and determine what is needed to provide the required lateral load resistance. Analyze the building for 3 different load cases and other requirements within the chapter. The requirements do not mandate upgrade to new construction levels but it does specify that a "minimum" level of lateral load resistance must exist.
- Evaluate the following details:
  - Connectivity of the structural elements.
  - Existence of anchors connecting floor and roof decks to masonry walls, and if they exist, their ability to provide lateral support to the walls and transfer in plane shear from the decks to the plane of the walls.
  - Existence of unreinforced masonry parapets, how they are supported at the roof diaphragm, their height measured from the roof diaphragm, and their thickness.
  - For masonry walls, the ratio of the distance between lateral supports to the thickness of wall.

As for cost of possible repairs, it is difficult to assign a cost value before an analysis is done and repair options are developed. Note that if existing walls are removed as part of the renovation, this could raise the level of work to Level 3 or 4. This would increase the amount of reinforcing that the structure would require.



---

## MEMORANDUM

**TO:** Sid Kaplan

**DATE:** 10/04/10

**FROM:** Dov Kirsztajn P.E.

**SUBJECT:** WFM Wellesley, MA  
Chapter 34

**PROJECT #** FRWR5500

---

Chapter 34 of the 7<sup>th</sup> edition of the Massachusetts Building Code was revised on April 16 2010. This revision modifies the way that the Level of Work is assigned to any project. The revised definition of the Level 1 Work permits more extensive renovation with out trigger of structural upgrade of the existing building.

Our evaluations of the extent of the proposed renovation of the existing Star Market Building lead me to conclusion that this renovation involves Level 1 Work only. The Level 1 Work designation das not require the structural upgrade of the building to conform to the requirement of the current building code.

Paragraph 3408.6 –Structural Investigation of Existing Building requires the Structural Engineer of Record to investigate in field the impact of the proposed renovation on existing structural members.

Following the demolition work (removal of ceilings and wall covers) we will inspect the building structure to identify any structural deficiencies.

Following the field investigation we will devise all required corrective measures for the damaged structural components or specify a replacement component.

Attached:  
Copy of revised Ch. 34

Jacobs  
343 Congress Street  
Boston, Massachusetts 02210  
Telephone (617) 242-9222 :: Fax (617) 242-9824



The following text includes the Commercial Construction Consulting, Inc. proposed amendment to 780 CMR 3408 Requirements for Existing Buildings which is unique to Massachusetts. Proposed changes to 780 CMR 3408 are shown in ~~strikeout~~ (deleted text or numeric) or red font (for added text or numeric). Comments within code text are shown within parenthesis.

**This text includes the original 7<sup>th</sup> Edition text with the errata of November 2008 incorporated and indicated as ***bold underlined italic***.**

#### Supporting Statement for 3408.4.2

This change is intended to clarify minor rehabilitation and remodeling work as Level 1 work. Doing this would have the architect determine if the existing structural elements would be affected by the proposed work. The addition of a floor opening, such as a new elevator, escalator, or stair, has been reworded to read "when the new openings in any framed floor or roof area 5% or less of the area of the framed floor or roof." This is compatible with the Level 2 requirement found in 3408.4.3 5. D. that discusses structural openings greater than 5% of the framed roof or floor.

...

#### **780 CMR 3408.0 STRUCTURAL REQUIREMENTS FOR EXISTING BUILDINGS**

**3408.4.2 Level 1 Work.** (The language below currently defines Level 2 Work and we propose moving this language to be included in the definition of Level 1 Work)

Work involving any of the following.

1. Removal or repair of ceilings, partitions, or interior facing of exterior walls; new ceilings, partitions, or interior facing of exterior walls; reconstruction or repair of floors; new mechanical or electrical distribution systems within an area; or new elevators, escalators, or stairs within an area or serving an area, when the new openings in any framed floor or roof are 5% or less of the area of the framed floor or roof.
2. Work that is not specified for Levels 2, 3, 4, or 5.

...



### Supporting Statement for 3408.4.3

This sub-section of Section 3408 has created many problems within the construction and renovation industry. Currently, tenant spaces greater than 20,000 square feet or that are 50% of a pre-1975 building's area proposing any rehabilitation and remodeling work must be structurally evaluated. This includes even the most basic cosmetic renovation work and disregards the fact that no structural work is proposed. We opine that the current Massachusetts specific language poses an undue burden with little benefit to the public, and that is impractical to enforce and implement. Under the current provisions, it is difficult if not possible to implement potential required upgrades in fully occupied buildings without significant disruption of existing tenant spaces. This is already having a negative impact on renovation work

Removing the text will eliminate the need for unnecessary structural evaluations and upgrades to buildings that are undergoing non-structural renovations. Currently, the work described in this section **3408.4.3 1. and 2.** only involves change of use of a space and does not describe structural work whatsoever. Changes of use resulting in greater live loads are addressed in Section 3408.8.1.1; a change of use results in no other load changes in a building.

The changes within this section will not affect other portions of Chapter 3408.

...

**3408.4.3 Level 2 Work.** ~~Work or change of use involving any of the following.~~

~~1. Change of use of an area which is more than 35% of the existing floor area of the building.~~

~~2. For Pre-1975 buildings, when rehabilitation or remodeling is accumulated over a floor area of 20,000 sf or 50% of the total floor area of the building, whichever is less, starting from July 1, 2008. The terms rehabilitation and remodeling for the purposes of this clause shall mean any of the following work: removal or repair of ceilings, partitions, or interior facing of exterior walls; new ceilings, partitions, or interior facing of exterior walls; reconstruction or repair of floors; new mechanical or electrical distribution systems within an area; or new elevators, escalators, or stairs within an area or serving an area.~~

~~3. 1. Increase in total framed floor and roof area due to structurally attached additions up to a lifetime limit of 10% of the total framed floor~~



and roof area of the building that existed on February 28, 1997, or on the date of the certificate of occupancy if the building was built thereafter.

4. 2. Increase in effective seismic weight, with or without structurally attached additions, up to a lifetime limit of 10% of the effective seismic weight of the building that existed on February 28, 1997, or on the date of the certificate of occupancy if the building was built thereafter.

5. 3. Structural work involving any of the following.

A. More than 25% of the total existing framed floor and roof area or 20,000 sf of existing framed floor and roof area, whichever is less. Where the work involves existing beams or girders, the tributary Area of the beams and girders shall be included in the Count for framed floor and roof area.

B. More than 25% of the total area of shear walls above the foundation.

C. More than 25% of the total length of columns and diagonal braces.

D. Openings in any framed floor or roof that have an area more than 5% of the area of the framed floor or roof.

E. Changes to any structural wall that reduce its in-plane shear resistance by more than 15%.

F. Changes to any floor or roof diaphragm that reduce its in-plane shear resistance by more than 15%.

G. Removal or reconfiguration of lateral load resisting frames, or foundations supporting them.

6. 4. **Exemption for Pile Foundations.**

Structural repairs of pile foundations are exempt from Level 2 Work.

...