



**CITY OF ANN ARBOR, MICHIGAN**  
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December 7, 2015

Building Board of Appeals  
City of Ann Arbor

Re: New Apartment Building  
121 W. Kingsley St.  
Ann Arbor, MI 48105

Applicant: Tom Fitzsimmons, Huron Kingsley LLC  
Ann Arbor, MI

Dear Board Members:

Outline:

- Variations Requested
- Background: Michigan Building Code Section 510.2 (1) & (3)
- Background: Michigan Building Code Section 403.1
- Background: Story Above Grade
- Project Description
- Condition for Granting an Appeal
- Staff Discussion

**Variations Requested**

Tom Fitzsimmons, Huron Kingsley LLC is requesting variations from three sections of the 2009 Michigan Building Code:

1. Section 510.2 (1) which requires a 3 hour fire-resistance rating for a horizontal assembly separating buildings being constructed using the prescriptive provisions of section 510.2;
2. Section 510.2 (3) which requires a type 1-A construction for a horizontal assembly separating buildings being constructed using the prescriptive provisions of section 510.2; and
3. Section 403.1 which defines the level at which a building must be considered as a “high rise” building for purposes of code application.

**Background: Michigan Building Code Section 510.2 (1) & (3)**

Normally, when designing a building, the “Allowable Building Heights and Areas” table (503) of the 2009 Michigan Building Code is used to determine the maximum height in feet and in stories allowed. As an alternative, Section 510 outlines seven different prescriptive methods for constructing a building outside of the normal requirements of Table 503. Sections 510.2 through 510.8 list those seven methods. Each of these sections provides a method to construct a building in an alternative fashion to table 503, and a selection of the method is usually dependent upon occupancy and construction type desired.

The concept behind section 510.2, one of those seven methods, is that a one story “platform” is constructed with a building below it and another building is placed on top of it. Structures built using this section are considered to be distinct buildings above and below the platform assembly. The height of the building below the platform is limited to one story above grade plane, and the height in stories of the building placed above is allowed to be measured from the top of the platform rather than the grade plane. In effect, a horizontal “fire wall” is created separating the building below the platform from the building above it. The assembly is required to be a 3-hour, non-combustible fire-resistance-rated horizontal assembly. This allowance provides an extensive benefit for height and area in these structures. Buildings constructed under this section are frequently referred to as “pedestal,” “podium” or “platform” buildings.

A common example of a building constructed under the provisions of Section 510.2 is a Type I-A lower level building that contains parking at grade level and below, with up to four stories of Group R-2 apartments in a Type 5-A, wood frame constructed building above the horizontal assembly. The number of stories of the type 5-A portion of the building is determined by starting at the horizontal separation between the construction types, rather than the grade plane.

In order for the design to comply with section 510.2, all seven of the following conditions must be met:

1. The buildings (above and below) must be separated with a horizontal assembly having a fire-resistance rating of not less than 3 hours.
2. The building below the horizontal assembly must not be greater than one story above grade plane.
3. The building below the horizontal assembly must be of Type IA construction.
4. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly must have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Section 716.5.
5. The building or buildings above the horizontal assembly are permitted to have multiple Group A occupancy uses, each with an occupant load of less than 300, or Group B, M, R or S occupancies.
6. The building below the horizontal assembly must be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and is permitted to be any of the following occupancies:
  - 6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;
  - 6.2. Multiple Group A, each with an occupant load of less than 300;
  - 6.3. Group B;
  - 6.4. Group M;
  - 6.5. Group R; and
  - 6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).
7. The maximum building height in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

#### **Background: Michigan Building Code Section 403.1**

Section 403.1 defines the point at which a building must be considered as a “high rise” building. This section states that buildings having occupied floors located more than 55 feet above the lowest level of fire department vehicle access are to be considered as “high rise” buildings. While the height limitation of 75 feet is normally used in other states, the State of Michigan has determined that 55 ft. is the figure to be used within Michigan. This lower limit has been explained as being necessary due to the types of fire-fighting equipment needed to fight the taller building fires (such as tower trucks) and the lack of such equipment in many rural Michigan areas. It has also been noted that many municipalities do not have water supply by pressure mains or even sufficient pressure if they do to assure proper sprinkler operation. The 55 ft. measurement can be to any occupied floor and need not be an official “story”. Thus the measurement may also be a mezzanine.

High rise buildings require special consideration relative to fire protection and occupant safety because of difficulties associated with smoke movement (stack effect), egress time, access by fire department personnel and perceived vulnerability to terrorist attack. This section contains provisions for high-rise buildings to help address these special considerations.

High-rise buildings must comply with all provisions of the code, but section 403 provides additional requirements. Significant cost and construction savings are inherent if a building is not considered a high rise.

- Section 403.2 specifies additional construction requirements, as well as some requirement reductions, applicable to constructing a high-rise building.
- Section 403.3 states the basic requirement for all high-rise buildings that an automatic sprinkler system be provided throughout the building. Specific standards unique to high-rise development are also provided.
- Section 403.4 specifies the various emergency detection and response systems that are required in a high-rise building.
- Section 403.5 provides additional means of egress system requirements for the occupants of a high-rise building.
- Section 403.6 provides elevator-related requirements for these structures.

The provisions are applicable to all buildings when the highest occupied floor is more than 55 feet above the lowest level of fire department vehicle access. The lowest level of fire department vehicle access is not a defined term, but is normally taken to refer to the lowest ground level at which the fire department vehicle could be staged at the exterior of the building for carrying out fire-fighting operations. In most cases, since the nature of the operations needed to handle a fire in any building vary with each fire, the lowest single point around the perimeter of a structure is used.

### **Background: Story Above Grade**

The determination of the allowable number of stories above grade is made by determining where to start counting. In many cases where the surrounding grade is more or less flat the first story is obvious. But where the grade slopes, the determination is made by comparing each exposed or partially exposed level of a structure to the definition of "Story Above Grade Plane":

*Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is:*

1. *More than 6 feet (1829 mm) above grade plane; or*
2. *More than 12 feet (3658 mm) above the finished ground level at any point.*

Where either condition (1) or (2) is present, the level being checked is considered a story above grade and the counting for the number of stories begins there. In this case, the finished surface of the floor next above the garage level is more than 12 ft. above the finished ground level (approximately 16 ft.) for at least half of the western exposure. Thus the garage level is considered a story above grade and, absent the use of sections such as 510.2, would be the first story of the building. That would limit the project to just four stories, based on the type 5A construction, occupancy R-2 and Table 503 limits.

### **Project Description**

The project involves multiple structures on a single site being considered as a single "building". There is an existing two story structure, and two new structures which will be connected by an exterior deck. The existing structure is a business occupancy (B) and the new buildings include 18 residential units (R-2) over two private garages. Below the deck is the entrance drive to the garages. The design professional has requested that, for code application purposes, the 3 separate structures and connecting deck be reviewed as a single building. The Michigan Building Code allows this consideration in sections such as 503.1.2 and 705.3. The "single building" is the subject of this variance request. The proposal is to use the concept found in section 510.2 to provide a horizontal assembly to create two buildings (one above and one below) this "platform".

The lower building would be one story in height and would include parking garages, the area beneath the connecting deck, and the first level of the existing business structure. The lower building as currently built is not, however, type 1-A construction as required by 510.2 (3). Type 1-A is construction is that in which the building elements are of noncombustible materials except as permitted by other code sections. The primary structural frame, floor and roof construction in general must all be noncombustible. As built in this case, wood floor joists form a large portion of the structural system.

The assembly between the upper and lower buildings as currently built is also close to, but not exactly, a 3 hour fire-resistance rated assembly as required by section 510.2 (1). The architect has proposed a construction approximating 2 hr. 50-55 min. of fire-resistance.

The horizontal assembly also may not extend into the existing structure and thus the "platform" may not be consistently provided across the single lower level "building". Further, it is unclear if connecting deck carries the 3 hour rating and is noncombustible construction.

The upper building would include the residential units and the second floor of the existing business structure. The upper building varies from one to four stories in height and is built of type 5-A wood frame construction with fire-resistance ratings required for most elements including walls, floors and roofs.

#### **Condition for Granting an Appeal:**

According to the Michigan Building Code section 113.1 an application for appeal must be based on a claim that:

- (1) The true intent of the code has been incorrectly interpreted,
- (2) That the rules of the code do not apply, or
- (3) That an equal or better form of construction is proposed.

(While the application requests a listing of "practical difficulties" or "unnecessary hardships" as conditions for granting a variance, the Board should only use one or more of the three claims above in their motion).

Staff suggests the Board take up the variance requests in order, as the request from section 403.1 is dependent upon the disposition of the first two requests. In the event the board does not grant the variances from section 510.2, the project will be limited to four stories in total height based upon table 503. Those four stories would include the garage level, considered by definition as a story above grade plane, and three residential stories above it. Given that scenario, the high rise variance would not be needed.

In the event the variances to section 510.2 are granted, the garage level is not included in the height consideration and an upper four story building can be built upon it. A level of mezzanines is also contemplated. There would be 6 levels in the project: a garage level below the 3 hour platform, 4 stories of dwelling units, and a top occupied level of mezzanines. Given this scenario the variance from the high rise section would be needed.

#### **Staff Discussion**

Staff feels that the code has been correctly interpreted and does apply, and suggests that if the board is inclined to allow the project as proposed that they look for potential measures to create an equally good or better form of construction. Staff suggests the board consider any or all of the following in their deliberation:

1. Requiring the sprinkler system to be a full NFPA 13 system and increasing the design hazard level from light to ordinary throughout the building, in order to help compensate for (a) presence of combustile construction and (b) reduced fire rating of the horizontal assembly.
2. Increasing the ventilation rate in the garages to be able to more adequately address any smoke conditions in order to address the potential for smoke rising throughout the building and to offset some concerns resulting from de-classification of the building as a high rise. Presently, the garage ventilation rate is based upon the need for CO and NO ventilation.
3. Requiring pressurized stairwells in all parts of the structure to help facilitate means of egress movement to help offset concerns resulting from de-classification of the building as a high rise.
4. Requiring a back-up generator for all critical life safety functions to help compensate for the de-classification of the building as a high rise.
5. Sprinkler coverage within each cavity of the horizontal assembly in order to help compensate for (a) presence of combustile construction and (b) reduced fire rating.
6. Encasing each individual wooden structural member of the horizontal assembly in order to compensate for the presence of combustile construction.
7. Verification that the horizontal assembly is or should be continuous through all portions of this "single building". Specifically, whether the platform be extended within the floor level between

the first and second floor within the existing business structure and meet the 3 hour rated horizontal assembly requirements.

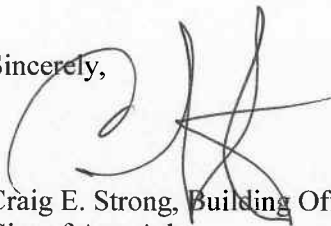
8. Verification that other portions of the first level of the existing business structure be type 1-A construction, or whether they should be upgraded to conform to type 1-A construction required for the level below the horizontal assembly.
9. Verification that the construction of the connecting deck, which forms a portion of the horizontal platform assembly, is also type 1-A construction and carries a 3 hour fire resistance rating.

Staff further requests that the Board, if the determination is made to grant variances from section 510.2 (1) & (3), and in the event they wish to grant the variance request from section 403.1, indicate the following or similar language:

This project has been reviewed by the Ann Arbor Fire Department by visiting the actual project site. Based upon their review they have indicated that the building need not be considered a high rise building. They have indicated that the lowest staging point they will use for fire-fighting operations is not the lowest possible level at which a vehicle could be staged, but is instead at a point less than 55 feet below the highest occupied floor of the building. The Board accepts this determination and thus finds that the high rise section of the Michigan Building Code does not apply.

If you have any questions, please call me at 734 652-6813.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Strong', written over a faint circular stamp or watermark.

Craig E. Strong, Building Official  
City of Ann Arbor