



MIKE CAUSEY, INSURANCE COMMISSIONER & STATE FIRE MARSHAL
BRIAN TAYLOR, CHIEF STATE FIRE MARSHAL

March 17, 2020

Vic Fasolino
Sound Shore Construction
1913 Front Street
Beaufort, NC 28516

**RE: 2018 NC Building Code, Section 420.2 and 708.3, Exception #2
Use of 30-min. Horizontal Assemblies Between Group R3 Dwelling Units and Mixed Occupancy**

Mr. Fasolino:

This letter is in response to your request for formal interpretation dated January 3, 2020 that was received by NC DOI by email to Cliff Isaac. In my words you are requesting:

In a nonseparated mixed use occupancy building where the second floor is two Group R-3 dwellings and the first floor is Group B can NFPA 13D sprinklers be used on the second floor and NFPA 13 sprinklers be used on the first floor if the dwellings are separated from the Group B occupancy with 30-minute horizontal assemblies that are allowed by 2018 NC Building Code, Sections 420.2 and 708.3, Exception #2?

Remarks:

All code section references are from the 2018 NC Building Code unless noted otherwise in this letter.

Code Analysis:

Sections 420.2 and 708.3, Exception #2 are addressing fire-resistance-rated separation of dwelling units from other dwelling units and other occupancies. They are not addressing automatic fire sprinkler requirements. Sprinkler requirements are addressed in Section 903. Sections 903.2.8.1 specifically addresses Group R-3 and requires sprinklers throughout the building containing the dwelling units. Section 903.3.1.3 addresses the use of NFPA 13D requirements for Group R-3. NFPA 13D, Section 1.1.1 indicates that NFPA 13D sprinklers are only used in the dwelling units; they are not used in other occupancies. NFPA 13 sprinklers are, therefore, required in the nonresidential occupancies. As NFPA 13 and NFPA 13D systems provide a different degree of fire protection it is not acceptable to mix them within the same fire area. Per the definition of "Fire Area" in Chapter 2 fire areas cannot be established by use of fire partitions which precludes the use 30-minute dwelling separation. The two different occupancies must be separated as required by Table 508.4. Table 508.4 does not consider NFPA 13D sprinklers to be a source of reduction in the minimum fire-resistance-rated separation. Table 508.4 then requires a 2-hour separation between Group B and Group R to establish separate fire areas.

Conclusions:

If NFPA 13D sprinklers are used in the Group R-3 dwelling units and NFPA 13 sprinklers in the nonresidential occupancies (Group B in the case), the Group R-3 dwelling units on the second floor must be separated from the Group B occupancy on the first floor with a 2-hour fire-resistance-rated horizontal assembly (floor ceiling assembly).

As a matter of reference, a copy of your letter of request for formal interpretation and attachments (Attachment A below) are included with this letter.

Please call if you have comments or questions.

Sincerely,

A handwritten signature in blue ink that reads "Carl Martin".

Carl Martin, RA
Chief Code Consultant

cc: File
Robbie Davis, Chairman – BCC
Daniel Priest, RA, Chairman Building Code Standing Committee – BCC
Wayne Hamilton, Chairman Fire Code Standing Committee – BCC
Cliff Isaac – NC DOI

ATTACHEMNT A

**SOUND SHORE
CONSTRUCTION, INC.**

Vic Fasolino
1913 Front Street
Beaufort, NC 28516
252-269-3415

Mr. Cliff Isaac
NC Department of Insurance
Office of State Fire Marshal
Engineering & Codes
1202 Mail Service Center
Raleigh NC 27699-1202

Jan 3, 2020

Dear Mr. Isaac,

The Town of Beaufort has recently instituted a new "Cedar Street Mixed Use Zone" within the Town limits to foster a more progressive type of development. I own two lots within that zone and am proposing the construction of the first mixed-use building on one of those lots. After several discussions with our engineer, two different fire sprinkler companies and our Construction Official, it has become apparent to me that I would like to have a Formal Interpretation by the DOI to insure that our building is code compliant but not overly designed to the point that it is cost-prohibitive to construct.

Here are the building parameters, followed by the code justifications:

This building consists of 4 units. (see next page).

The first floor has two Use Group B units of 1128 sq ft each.

The second floor contains two Use Group R-3 residential units of 1152 sq ft each.

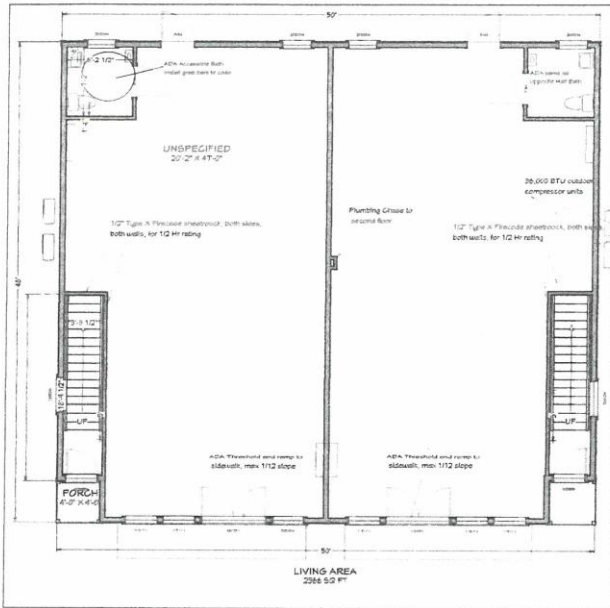
The building is a **Nonseparated Mixed Use** building of **Type 5B** construction.

The ceiling between the two floors is a horizontal assembly with a ½- hour fire-resistance-rating.

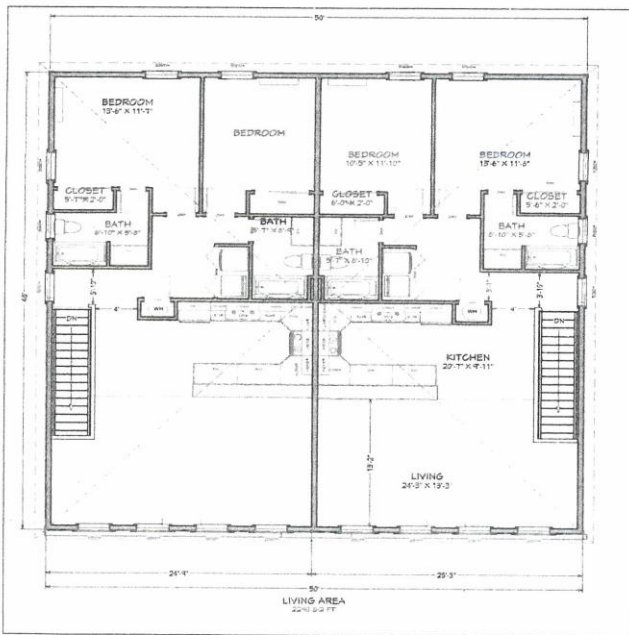
The wall separating the two residential units is a fire partition with a ½- hour fire-resistance rating.

The first floor B units are to be protected with a NFPA 13 fire sprinkler system

The second floor R-3 units are to be protected with NFPA 13D or Section P2904 fire sprinkler system



FIRST FLOOR



SECOND FLOOR

Regarding the automatic fire sprinkler systems, the following 2018 NC Building Code Sections apply:

Section 508.3.1 Nonseparated Occupancies. Buildings or portions of buildings that comply with this section shall be considered as nonseparated occupancies.

This is our design selection.

Sec 508.3.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 that apply to the nonseparated occupancies shall apply to the nonseparated occupancy area....

Table 506.2 allows Group B units up to 9000 sq ft without a sprinkler and it allows R-3 units of unlimited area and we would be compliant without a sprinkler system, except for:

Section 903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Use Group R fire area except as provided for in Section 903.2.8.5.

The exception, Sec 903.2.8.5, does not apply, therefore we are required to sprinkler in accordance with 903.3 and the sprinkled R-3 units are now the "most restrictive provision of Chapter 9" and impose the sprinkler requirement onto the Group B units.

Sec 903.3 Installation Requirements. Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.8

The residential units are R-3 so Sec 903.3.1.3 is applicable:

Sec 903.3.1.3 NFPA 13D sprinkler systems. Automatic sprinkler systems installed in one- and two-family dwellings; *Group R-3*, *Group R-4 Condition 1* and townhouses shall be permitted to be installed throughout in accordance with NFPA 13D or Section 2904 of the International Residential Code.

And also note the code is redundant here:

Section 903.2.8.1 Group R-3. An automatic sprinkler system installed in accordance with section 903.3.1.3 shall be permitted in Group R-3 Occupancies.

We are proposing NFPA 13D or Section 2904 sprinkler for the R-3 units.

The Group B units must also be sprinkled due to the "most restrictive" clause and therefore:

Section 903.3.1.1 NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1 and 903.3.1.1.2

No exceptions are applicable to the B Use Group and we are proposing an NFPA 13 system for the B Use Group units.

Regarding the fire separation assemblies, the following apply:

Section 508.3 Nonseparated Occupancies. Buildings or portions of buildings that comply with this section shall be considered as nonseparated occupancies.

Section 508.3.3 Separation. No separation is required between nonseparated occupancies. Exceptions:

- 1. Group H-2, H-3.....**
- 2. Group I-1, R-1, R-2, R-3 dwelling units and sleeping units shall be separated from other dwelling units or sleeping units and from other occupancies contiguous to them in accordance with the requirements of Section 420.**

Exception 2 does apply to the R-3 units and Section 420 describes that separation walls shall be built as fire partitions and also that the horizontal separations shall be built as horizontal assemblies. We are then referred to Sections 708 and 711. Section 708 describes how the Fire Partition is to be constructed and Section 711 describes how the Floor Assembly is to be constructed. More specifically:

Section 708.3 Fire-resistance rating. Fire partitions shall have a fire-resistance rating of not less than 1 hour. Exceptions:

- 1.**
- 2. Dwelling unit and sleeping unit separations of Type IIB, IIIB, VB construction shall have a fire-resistance ratings of not less than ½ hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.**

We are sprinkling in accordance with Sec 903.3.1.1 and we have a ½- hour rating.

Section 711.2.4 Fire-resistance rating. The fire-resistance rating of horizontal assemblies shall comply with Sections 711.2.4.1 through 711.2.4.6 but shall be not less than that required by the building type of construction.

Recalling that Section 508.3.3 does not require a separation except for the dwelling units, Section 711.2.4.3 applies:

Section 711.2.4.3 Dwelling Units and Sleeping Units. Horizontal assemblies serving as dwelling or sleeping unit separations in accordance with 420.3 shall not be less than 1-hour fire-resistance-rated construction. Exception: Horizontal assemblies separating dwelling units and sleeping units shall be not less than ½-hour fire resistance

rated construction in a building of Type IIB, IIIB, VB construction, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

We have a 1/2 -hour rated assembly separating the dwelling units from each other and from the Group B use.

Our belief is that our building as designed is code compliant. Accordingly, we are requesting a Formal Interpretation of the DOI, as it will possibly apply not just to this building, but to future projects also. Please inform us if we are compliant and if not, what Section of the code has been overlooked?

A prompt response would greatly aid in our moving forward in this project. Thank you for your time.

Respectfully,



Vic Fasolino

Sound Shore Construction

252-269-3415

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