



Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Lincoln/Haney Engineering Associates, Inc.

Structural Engineering Consultants

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Date: 02/25/16

October 28, 2014

Abigail Ingraham
180 High Street, Unit 60
Portland, Maine 04101

Re: Review of structural impact from increasing wall openings

Dear Abigail:

As requested, I have reviewed the layout of load-bearing walls at your condominium in order to assess the impact of the widening of openings in walls that is planned for renovations. Attached is a sketch of the planned renovations with the new, widened openings identified as #1, #2, and #3.

The roof framing and supporting walls could be clearly seen from an access hatch in the stairwell leading to the roof. That access hatch opens to a crawl space, with height a little over 2 feet clear. From that hatch, the roof framing and walls that support the roof structure can be seen. The repetitive roof framing elements are timber joists, measuring 2" x 8-1/2" at 16" on center. The joists are supported on bearing walls that extend through the crawl space from walls below the ceiling. One of the interesting aspects of the framing support layout is that all of the load bearing lines that I could observe are not continuous across the building. For instance, the wall that contains openings #1 and #2 extends for the entire length of the condominium. But the portion that supports roof framing only extends for about 19 feet from the exterior wall. Other bearing lines appear to be similarly discontinuous. Another interesting aspect is that the joists are not necessarily spliced over the supports. This condition occurs at the portion of the bearing portion of the wall that contains openings #1 and #2. Ceiling joists at the area in question frame in the same direction as the roof rafters, with the same points of bearing.

Regarding the planned renovations, the load-bearing portion of the wall that contains openings #1 and #2 does not extend to opening #1. It does extend about 3' into the widened 6' opening #2. However, since the joists are continuous over the top of the wall without splices and the spans on either side of the wall are only 3'-6" and 5'-6", it is not necessary to provide temporary support for the roof construction during demolition. This assumes that the demolition and reconstruction can occur when there is not a significant snow load on the roof. I do recommend that the header utilized to span the new 6 foot opening consist of 2-2x8 members of #2 Spruce-Pine-Fir, or better. The wall that contains opening #3 is parallel with framing members and, therefore, is not load-bearing.

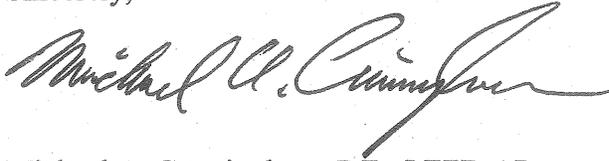
To summarize, I find that openings #1 and #3 do not occur in load-bearing walls. Standard details for framed openings in a non-bearing partition may be utilized. At opening #2, approximately 1/2 of the opening is within a load-bearing portion of the wall. But because the rafters above are continuous over the wall with short spans on both sides of the wall, shoring of the roof construction is not required during construction unless that construction is delayed to

coincide with a period of heavy snow accumulation. Over opening #2, a lintel sh with a minimum size of 2-2x8 of lumber #2 grade and Spruce-Pine-Fir species g NLGA rules, or better.

I trust that this letter serves your current needs for this project. If you need furthe clarification regarding this letter, please call or email.

Date: 02/25/16

Sincerely,



Michael A. Cunningham, P.E., LEED AP

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10/29/14



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