



BRIEF STATEMENT OF OPINIONS

1001 Spring Street, Suite 227 • Silver Spring, MD 20910
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 Team@RESolutionsDC.com
 www.RESolutionsDC.com

Site Visit Date: August 28, 2016

Our Project No.: 216CI55

Project Name and Address: 4014 34th Street, Mount Rainier, MD

Issue(s) to be Reviewed: Roof Structure at Detached Garage Conversion

Present on Site: John and Ellen (Owners); Charlie Angelilli (RESolutions);

Opinions:

Observations

During our site visit we made visual observations of the following items (please note that directions are given as if one were looking at the front of the house from 34th Street):

- Existing roof framing is a ridge plate and collar tie system with different size framing members at spacing's between 26 and 32 inches on center;
- Existing exterior structural walls are 2x4 construction with plywood sheathing that bear on CMU foundation walls on the left, rear and right sides (no foundation wall or foundations are assumed to be present on front wall as this was the opening for the garage door). CMU stands for Concrete Masonry Unit and is sometime referred to as cinder block colloquially.

Explanations and Recommendations

In our discussions during the consultation you mentioned that you would like to increase the height of the ceiling in the garage in order to improve the acoustics for the planned music studio. As noted above, the current roof configuration is a ridge plate and collar tie system which means that the roof structure is only stable if there are collar ties that connect the bottom of the 'rafter' members (currently these are 2x6 members). Per best construction practices the collar tie members should be located in the bottom third of the height of the roof framing (in this case the bottom 16 inches or so) to prevent splaying of the roof under heavy loading. The addition of soundproofing will contribute to the trusting forces that cause the framing to want to splay.

In our opinion there are a few options that you can consider to create the extra volume in the ceiling. See the list of options, with some of the pros and cons for each, below.

- 1) Install new collar ties at the 1/3 point of the height of the roof framing. These ties could be traditional wood framing that are nailed to the existing sloped roof members or potentially metal cables (or rods). Soundproofing the penetration of the new collar ties through the soundproofing insulation that is installed against the rafter members will be an issue because the ties will need to be connected to the sloped rafter members. We recommend speaking with your acoustics consultant to discuss if this is possible (we have made a few phone calls to date and have not been able to reach him). The advantage is that this is probably the least expensive of the options.

Good, Rossi & Associates, P.C.
 A Professional Corporation, T/A Residential Engineering Solutions

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Special Notes for Brief Evaluations of Structures: It should be understood that a visual observation of the readily accessible portions of an existing structure is an evaluation limited in time and scope, and does not constitute a warranty or guarantee of the structure or of its adequacy. To conduct a brief structural evaluation for the quoted fee, we are required to make certain assumptions regarding existing conditions, which cannot be adequately verified without destroying otherwise adequate or serviceable portions of the structure. By accepting this report, the Client hereby understands and accepts the limitations that are inherent in a brief professional evaluation. This brief statement of opinions is intended to serve as a reminder of issues discussed in depth while on site. It shall not be used in lieu of a formal, written report, which typically includes detailed descriptions of our observations, opinions and recommendations for future action. Additional follow-up investigation is recommended for any on-going issues, such as cracking. Further, in-depth investigation is available upon request for a fee. Repair Design Documents, professionally prepared by a licensed structural engineer, is strongly recommended for most issues, and required for others. Please inquire for a fee quotation.

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- 2) Install a ridge beam that will span from the front wall to the rear wall. By doing this you will eliminate the need for collar ties all together. New posts will need to be installed below the ridge beam to provide proper support and a new foundation will need to be installed below the post support in the front wall to prevent settling of the ridge beam (currently no foundations a present there). A full-length beam will be difficult to install because it will need to be long as the garage is (typically this requires cutting a hole in the front or rear wall to fit the beam). As an alternative, the new ridge beam can be shorter than that garage, but a new post and concrete footing will need to be installed in the interior space of the garage. If you don't mind losing a bit of space on the interior, this may be your best option. Engineering design of the beam and the connections to the existing members will be required. This option is probably more expensive than the first, but will allow you to have more volume in the ceiling without penetrating the soundproofing against the roof.
- 3) The third, and maybe most expensive option is to have the roof replaced in whole. This would allow you to install a prefabricated roof truss system or a ridge beam and rafter system. The advantages are that you can construct the roof in a stronger manner and you can ensure that the connections to the exterior walls meet the building code requirements (currently the rafter to wall connections are sub-par). Surprisingly, this option may be in the same ballpark for cost as Option Two because the demolition and installation of trusses should be fairly quick, whereas the installation of a ridge beam in the space may require more labor and time.

We recommend consulting your acoustics consultant to discuss the different options from a soundproofing standpoint and recommend consulting with a General Contractor to discuss ballpark pricing for each option.

Thank you for using RESolutions as your structural engineering consultant and let us know if you have any questions. Please note that all follow-up structural designs should be done by a Maryland registered Professional Engineer. We have included some sample photographs from our site visit below for your reference.



Charles J. Angelilli, P.E.

Good, Rossi & Associates, P.C.
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Exterior View of Garage



Typical Existing Roof Framing



Typical Soundproofing of Interior Wall

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End

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