

STRUCTURAL DESIGN LETTER

470 Mill Bend Drive
Fuquay-Varina, NC

November 25, 2024 (revised March 3, 2025)

Owner
Ben Clayton

SCOPE/BACKGROUND

At your request, the structural design of a new platform to be installed above a garage in the excess ceiling space was performed.

The scope of this design letter is limited to the design of select components of the new platform structure. The owner provided a new layout which the structural recommendations are based on. No site inspection, finish material removal or destructive testing were performed as a part of the project scope. The information provided in this design letter is based on the conditions as depicted in the provided information by the contractor.

For purposes of this report, all directions (left, right, rear, etc.) are taken from the viewpoint of an observer standing and facing the front door of the home.

Should there be any questions or concerns regarding this report, contact us at sean@builtupengineers.com or 919-817-9915. Our mailing address is 7283 NC HWY 42 STE 102-148, Raleigh, NC, 27603. Our website is Builtupengineers.com

DESCRIPTION

The existing garage is approximately 19'x19' and includes a ceiling that is over 20 feet high. Per our understanding, the owner wishes to install a new platform to utilize some of the ceiling height (40 PSF live load).

RECOMMENDATIONS

Note, structural guidance has been provided below for select components. The remaining components shall be constructed per the 2018 NC Building Code, Residential Code.

Foundation and Floor Framing (see attached sketch)

1. Provide W10x22 (A992, grade 50) central beam (spanning left to right) across the garage space approximately 20 feet. Flush connect the framing to the beam per the below detail.
 - a) Support the beam on 5-2x4 jack studs on each end, extending down to the foundation wall sections at each end.
 - b) The new beam shall be located in the middle third of the garage, such that the floor joist span does not exceed 14-feet.
 - c) Provide a 2x10 ledger board around the perimeter of the garage where the new storage space is to be located. Connect the ledger to the wall studs with (3) 4" long Simpson SDWS

screws at each stud or 16" on-center max.

- d) Provide new 2x10 floor joists, at 16" on-center, spanning front to back. Connect the floor joists to the ledger with Simpson LUS joist hangers.
- e) Provide $\frac{3}{4}$ " tongue and groove floor sheathing attached to the floor framing with 10d nails at 6" on-center on the edges and 12" on-center in the field.
- f) Where the landing intersects the stairs, provide 2-1.75x9.25" LVL beams. Connect the beams at their intersection and at the intersection with the 3-1.75"x16" LVL beam by a Simpson HUS410 hanger. Support the beam ends at the garage walls on 3-2x4 jack studs. Connect the plies of the beams together with (4) 16d nails at 16" on-center.

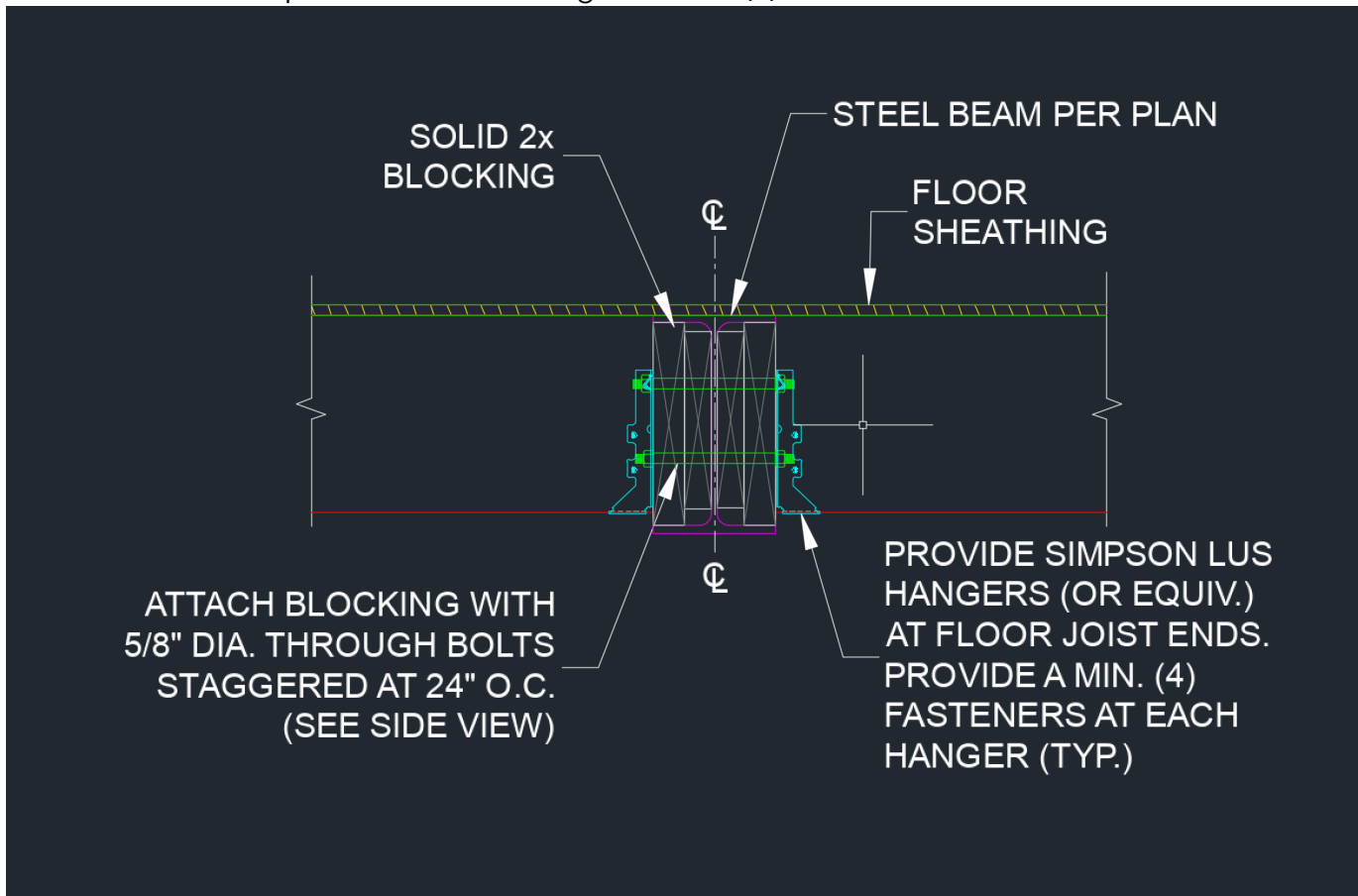


Figure 1 – Flush framing detail

General Notes:

- The contractor should verify all dimensions prior to ordering materials.
- If the contractor has any questions or concerns regarding the method of construction or if conditions vary from what is described below, the engineer should be consulted.
- Likewise, if any changes to sizes or modifications to the structure are desired other than what is explicitly described below, the engineer should be consulted.
- All construction and workmanship shall adhere to the 2018 NC Building Code, Residential Code.
- All new lumber should be SPF or SYP No.2 or equivalent. All lumber exposed to concrete/masonry or weather must be pressure-treated.
- All new metal hangers/ties/clips are to be installed per manufacturer specifications.



- All fasteners/connections are to be installed per table R602.3 of the 2018 NC Building Code, Residential Code.
- With any structural changes, finish material cracks and minor movements are typical and expected. These are associated with settlement generally observed after the construction of an addition or significant remodel.

No areas of the structure were reviewed other than those explicitly described in this report. The review used a standard of care consistent with other local design professionals limited by the scope and budget. This report was at a flat rate and has a liability limitation of 10 times the fees collected. It represents the best judgment of the staff of Built Up Engineers, PLLC given the information available at the time of writing. No review of organic growth, mildew, or any other building science issue was performed except as noted. All opinions are subject to revision based on new or additional information. No responsibility will be taken for conditions that could not be easily seen or are outside the scope of this review. Any use that a third party makes of this report, or any reliance upon, decisions made in response to or in any way influenced by this report are the responsibility of the such third party. Recommendations are provided to address structural-related issues, and may not rectify cosmetic issues.

CONCLUSION

We trust that this report provides the information you require. Please contact us at 919-817-9915 if you have any questions. Thank you for the opportunity to be of assistance to you.

Sincerely,

Sean Casady, PE
Project Engineer
Built Up Engineers PLLC
NC Lic. No. P-2664

Enclosed: supplemental sketch





BUILT UP ENGINEERS

ADDRESS

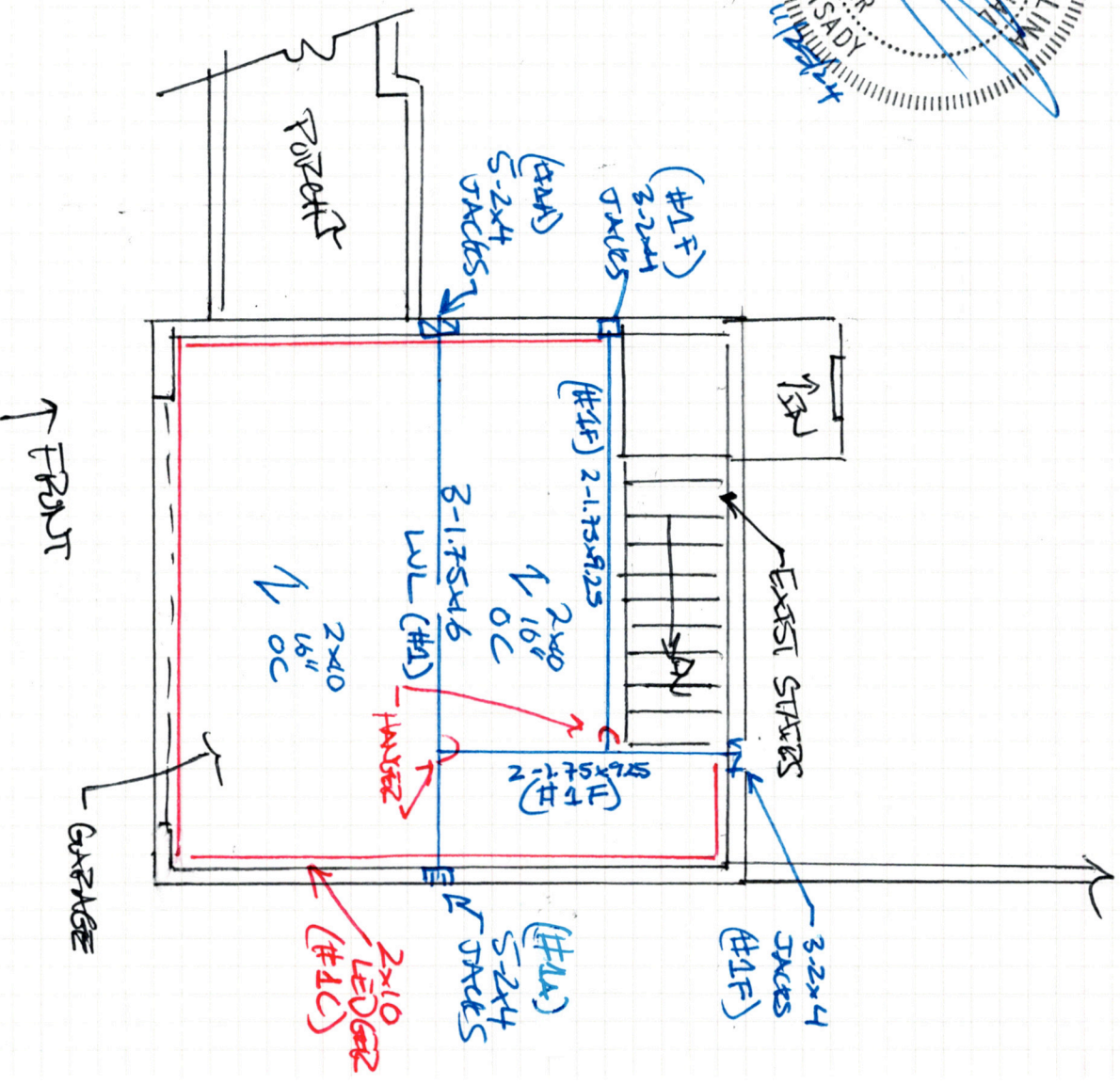
7283 NC Hwy 42,
Ste 102-148
Raleigh, NC 27603

PROJECT

470 RAIL ROAD
FOUR-VARIABLE, NC

DATE

11/23/24



2ND FLOOR GARAGE AREA
SCALE: NTS