

STRUCTURAL DESIGN LETTER

470 Mill Bend Drive
Fuquay-Varina, NC

November 25, 2024

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 as finished space (40 PSF).

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 3-1.75"x16" LVL central beam (spanning left to right) across the garage space approximately 20 feet. Connect the LVL plies with (4) rows of 4" Simpson SDWS screws at 24" on-center from each side.
 - a) Support the LVL 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 ¾" 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) At the stair boxout, 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.

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

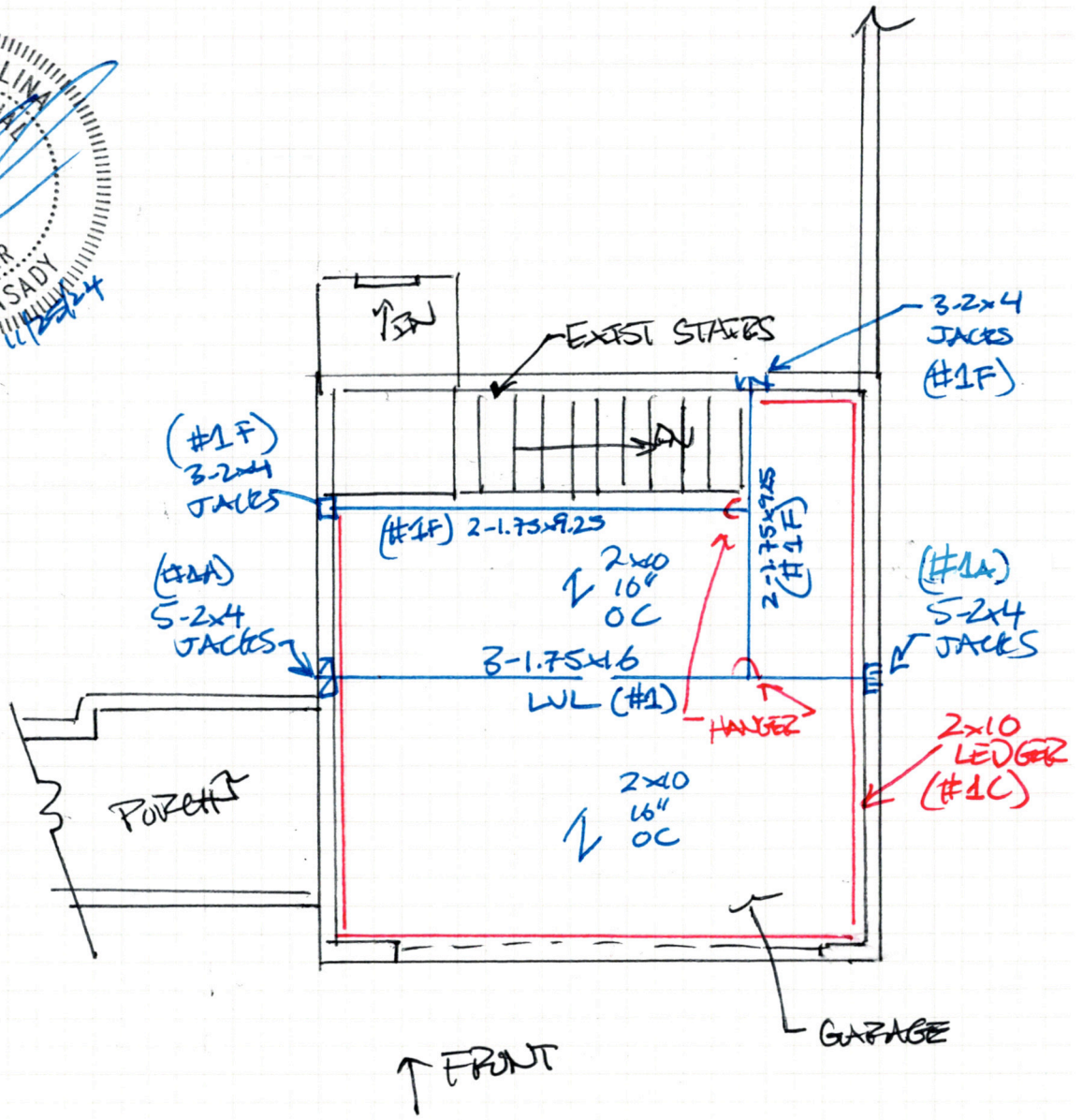
ADDRESS
7283 NC Hwy 42,
Ste 102-148
Raleigh, NC 27603

470 MILL BEND
FUQUAY-JARRINA, NC

PROJECT

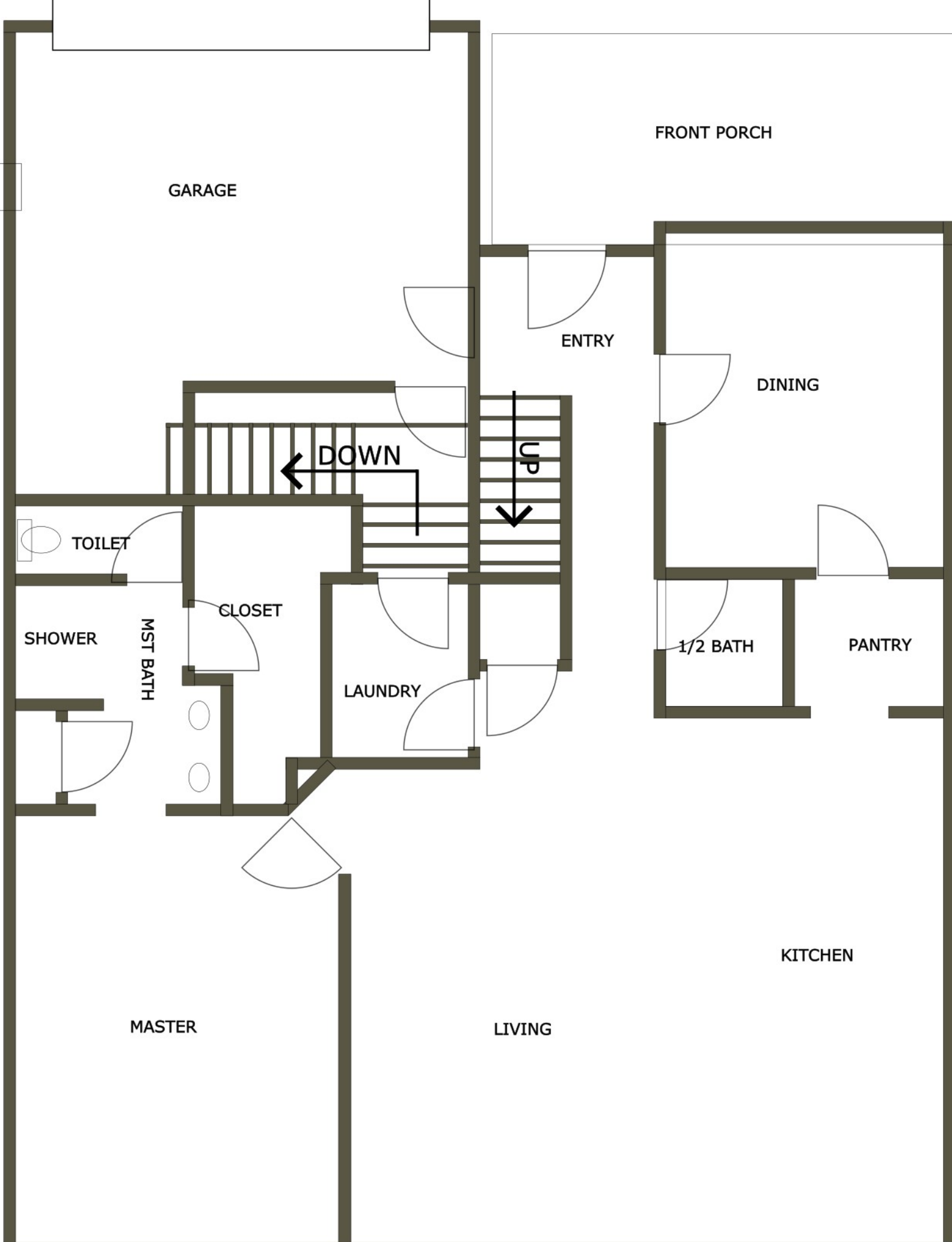
11/25/24

DATE



2ND FLOOR GARAGE AREA

SCALE: NTS



GARAGE

FRONT PORCH

ENTRY

DINING

DOWN

UP

TOILET

SHOWER

MST BATH

CLOSET

LAUNDRY

1/2 BATH

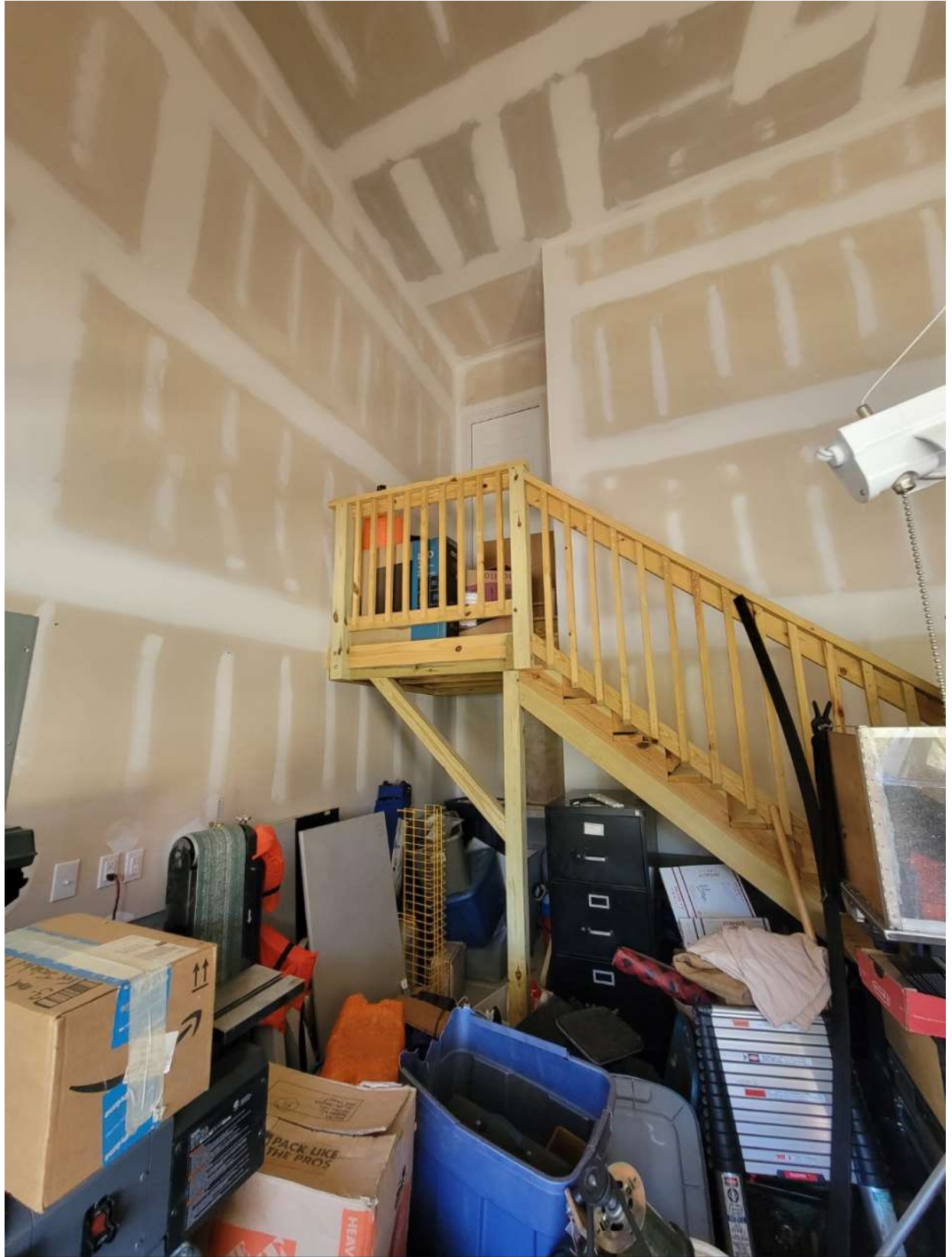
PANTRY

KITCHEN

MASTER

LIVING





- Need a floor plan with room labelled
 - Existing and Proposed floor plans attached
- Staircase shall be fire separated from garage
 - Walled in staircase with 5/8" 'X' drywall
- Egress from stairs shall be into the house, or directly to the exterior without passing through garage
 - Added egress door direct to interior
- If a door is located in firewall between stairs and garage, it shall be a solid residential door without glazing
 - Added door from garage stairs to new space
- Must have a code compliant egress window from space created to exterior
 - Added egress window to new space - far wall
- Ceiling heights shall be code compliant.
 - Ceiling height in new space will be 9'.
 - Ceiling height in garage below will be
 - 7'8" under main beam
 - 8'6" everywhere else