CEC # 210126AB-sd

CARTER ENGINEERING & CONSULTING, PLLC

STRUCTURAL + CIVIL

Mr. B. Amack
193 Tripp Road
Lillington, North Carolina 27546

Date: 2 April 2021

Project: Residential Modifications: Kitchen widening into garage - roof framing
Project No.: 210126AB
Location: 193 Tripp Road, Lillington, North Carolina 27546

Proposed Modification Narrative:

The proposed residential remodel to expand the kitchen area includes replacing the original exterior load bearing wall "B" with a beam recessed in the ceiling, constructing a load bearing wall "C" in the garage, and removing wall "A" between the kitchen and the dining room, as illustrated on drawings sheet 1 Existing and sheet 2 Proposed, dated 3/15/21. Removal of load bearing walls "A" and "B" requires replacement with an engineered beam installed in the attic to carry the load members. Construction of wall "C" requires a minimum of one pier to support the elevated floor and wall assembly and basic good construction practice.

Provisions of Compliance:

- Structural Beam "A" [11-ft maximum clear span]: minimum 2-ply 2"x12" SPF/SYP grade no. 2 or better, or a 2-ply 1-3/4"x9-1/4" 2.0E laminated veneer lumber (LVL) beam; each ply bonded with contractor grade adhesive and stitched with 5 rows of 12d framing nails (or 3" power driven structural fasteners) spaced 12-inches on center the length of the beam. Beam ends shall have a minimum bearing length of 3-inch on solid support [double 2x4 stud column] to transfer load to the foundation.
- Structural Beam "B" [15-ft intermediate clear span]: on the right side of the gable wall apply two 1-3/4"x 14" LVL 2.0E planks with a tapered front end cut having a 5-inch heel height and 9/12 cut slope using 5 rows of 12d framing nails (or 3" power driven structural fasteners) in each member crossed for the length of the beam. The front end of the beam shall have a minimum bearing length of 4.5-inch on solid support to the foundation. The rear end of the beam shall fasten to Beam "A" with either a face-mount joist hanger or bracket, such as BA1.56/14 or THA29 by Simpson Strong-Tie, or similar acceptable mechanical connection using manufacturer specified fasteners and fastening pattern.
- These beams are designed to carry tributary load from main attic non-storage loads (12-psf dead load, 10-psf live load), garage attic storage loads (12-psf dead load, 30-psf live load), and no roof loads, and not to exceed the maximum live load deflection limit (L/360).
- Ceiling Joist Support Attachment: These beams may be: 1) dropped below the ceiling with the ceiling joists top mounted on the beam; 2) recessed into the ceiling with the ceiling joists face mounted to the beam [such as LUS26 by Simpson Strong-Tie]; or 3) set above the ceiling with ceiling joists hung from the beam with coil strap [1.5-inch wide CMSTC16 by Simpson Strong-Tie], see illustrations below.

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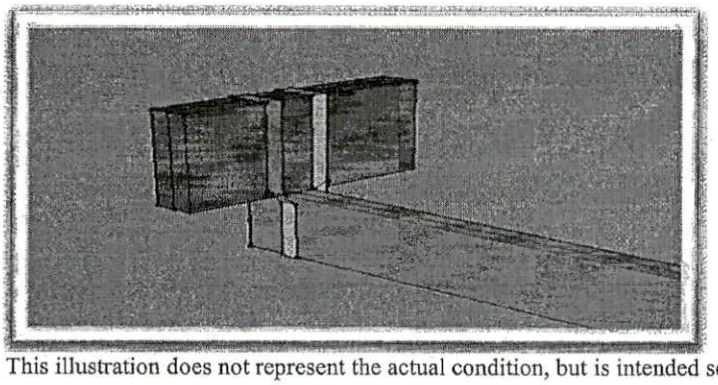


This illustration does not represent the actual condition, but is intended solely to clarify a method.

- Load bearing wall "C" [16.0-ft new section]: Standard exterior 2x4 wall framing assembly with sheetrock on the garage side for fire barrier separation and an appropriate fire rated door, on a double 2"x10" band joist with ends bearing on the existing continuous foundation walls and the center bearing on a pier with a 4-inch thick mortar base. The pier construction may be either: structural grade 6x6 timber post with post base and cap [ABA66Z base and AC6RZ by Simpson Strong-Tie or similar] on a 12x12 mortar base; or, stacked and mortared 8x16 concrete blocks on a 12x20 mortar base. The mortar shall be a minimum non-shrink structural 4000-psi grout. The existing perimeter foundation walls are sufficient to receive load from this band joist. The existing garage concrete floor slab is sufficient to bear the pier load.

- Any conditions discovered to be non-compliant or present structural concern shall be immediately brought to the attention of the engineer of record.

As a registered North Carolina professional engineer in good standing and faith, I certify that having meet the noted provisions, the prescribed beams and the completed structural framing in its entirety is considered adequate to support the non-habitable storage attic design to meet the intent and be in conformity with the 2018 North Carolina Building Code.

This letter is for the express use by the client. It is the responsibility of any third party to perform proper assessment prior to any modification to the construction from the original plan and/or intent; the Consultant accepts no responsibility for damages suffered by any third party as a result of such decisions or actions. This letter has been based, generally, on common practice, standard tables, and a non-intrusive visual review and is not an exhaustive study and should not be interpreted as such.

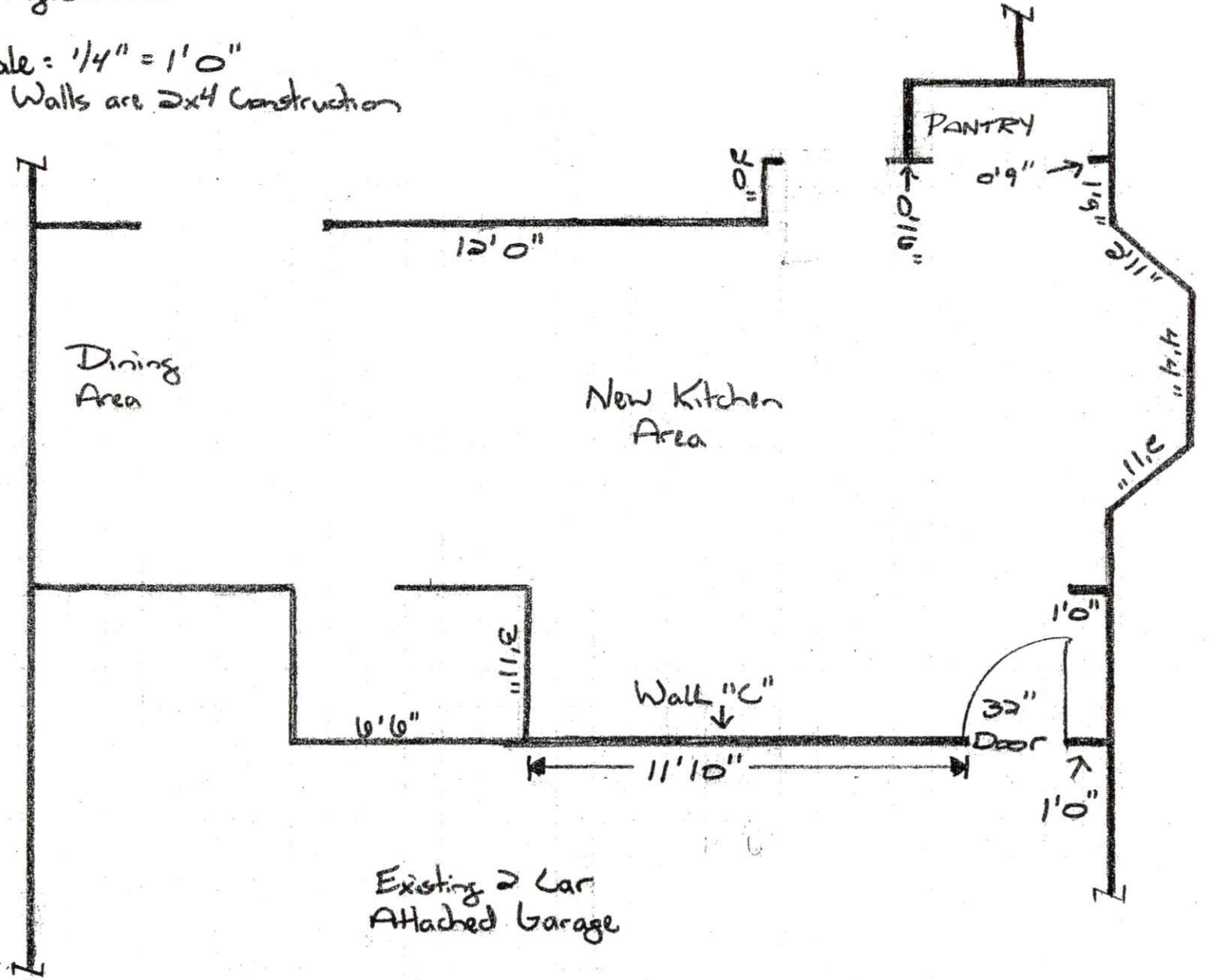
Sincerely,

NORTH CAROLINA PROFESSIONAL SEAL 036181 ENGINEER SEAN C. CARTER 2 April 2021

Sean C. Carter, PE
North Carolina No. 036181

193 Tripp Rd
Lillington NC

Scale: 1/4" = 1'0"
All Walls are 2x4 Construction



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