April 19, 2021 Project No. 20-0716.01

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Paul Pepe
24 W. Landing
Sanford, NC 27332

Re: Structural Observation—*24 West Landing, Sanford, NC 27332*

Mr. Pepe,

At your request, we analyzed the back office window opening that is proposed to be modified to accommodate a window and door combination at the Sanford residence noted above. Renovation drawings by Robert Mikesell dated 12/2/2005 were provided during a previous site visit. The structure is a conventionally framed, detached, single family residence with raised 1st floor framing over a pier/girder foundation system with perimeter masonry foundation walls *(see picture 1).*

Our observations and recommendations are listed below. Indicators such as "left," "right," "front," and "back" are referenced as viewing the front of the home.

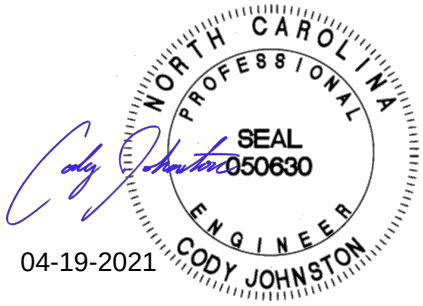
BACK OFFICE WINDOW MODIFICATION

- The windows at the back of the office are to be modified to accommodate an approximately 18'-0" wide opening. A new beam is to be installed over the new opening *(see picture 2).*
    - The beam should be a (2)1¾"x14" LVL (Boise Cascade VersaLam 3100 or better) with continuous span across the entire back wall of the office (use an approximately 24' long beam) that is built-up with (3) rows of 16d sinkers at 12" o.c. spacing.
    - Cut the existing top plates so the top of the beam supports the attic joists. Restore top plate continuity around the corners of the office at both ends of the beam using (2) Simpson CS-16 straps that are nailed to both the beam and the perpendicular wall top plates of the left and right office walls using (10)10d common nails into each (20 nails total per strap).
        - Additionally, install Simpson "H2.5A" clips at 32" o.c. spacing (max) to fasten the rafters to the top of the beam.
    - Support the beam at each end of the 18' wide opening with (4)2x4 #2 Spruce-Pine-Fir (SPF) jacks studs.
        - The studs will be located over the foundation wall, which is sufficient to carry the new distribution of structural loads. No foundation modifications should be necessary unless a vent opening is aligned at the point load. In the case of a vent opening conflict, install a tight-fit 4x4 stub to directly transfer the loads to the CMU at the bottom of the opening.

- A 2x4 king stud should be installed at the end of each beam. (6) ¼" diameter x 5" long Simpson SDS wood screws should be installed through the exterior sheathing to fasten the king stud to the centerlines of the end of the LVL plies (3 screws per LVL ply). The king studs should also be boundary nailed with 10d common nails at 3" o.c. to the wall sheathing of the left and right office walls.
- Frame the wall sections at the left and right of the beam as conventional 24" wide Portal Frames (PF) per the provisions in Figure R602.10.1 of the 2018 edition of the *North Carolina Residential Building Code* (see attached).

The above-listed determinations were made in accordance with common engineering principles and the intent of the 2018 edition of the *North Carolina Residential Building Code.* Sequencing, and means and methods of construction are considered to be beyond the scope of this report. Contractor is to provide adequate temporary shoring prior to cutting or removing any structural load bearing elements. Please feel free to contact us, should you have any questions or concerns regarding this matter.

Sincerely,
Cody Johnston, PE
Stonewall Structural Engineering, PLLC
Lic. #P–0951



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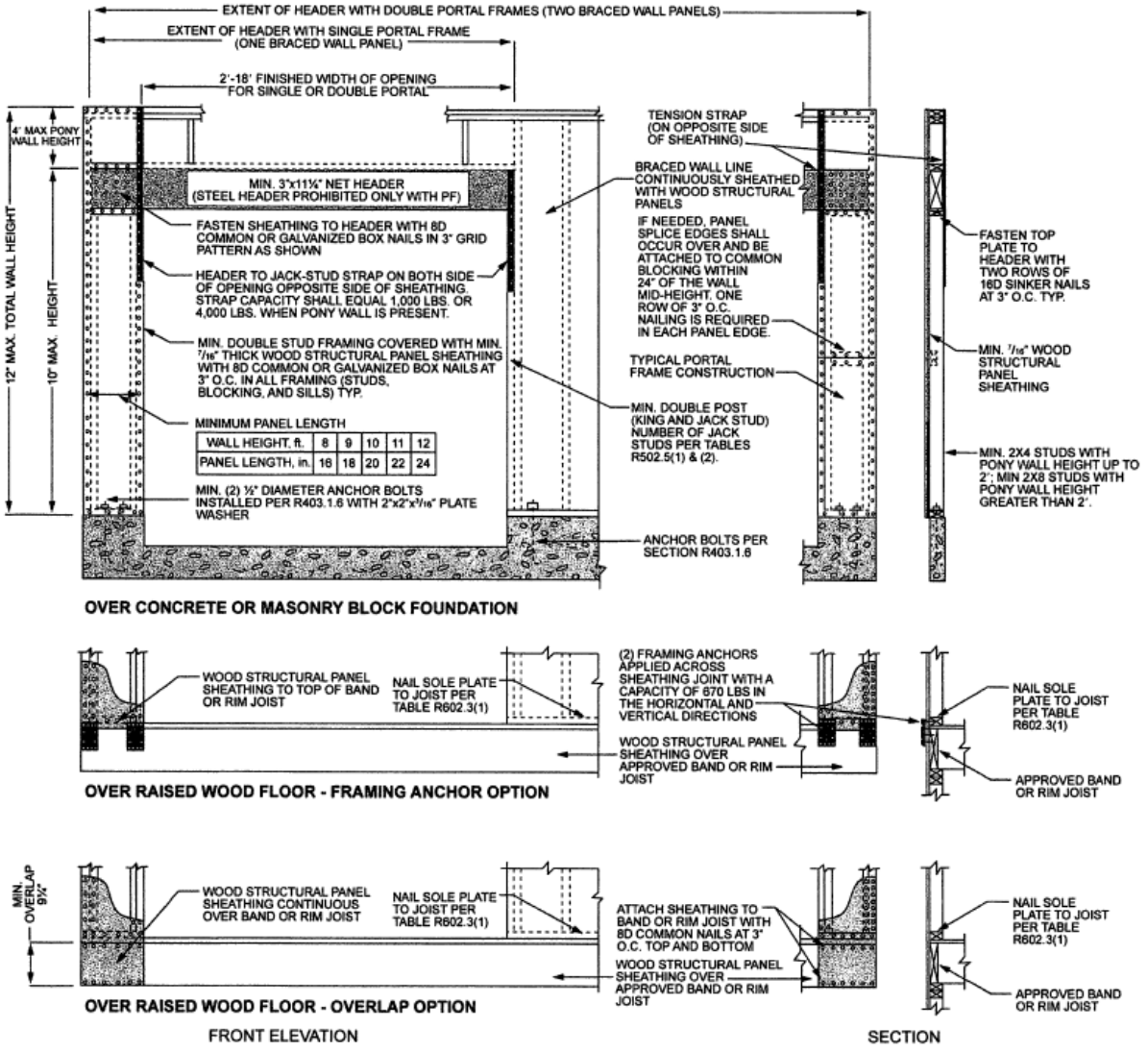
PICTURE ADDENDUM

Picture 1 – 24 West Landing, Sanford, NC

Picture 2 – Back office window to be modified



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N.

FIGURE R602.10.1
METHOD PF—PORTAL FRAME CONSTRUCTION