Field Report
Sent Via: E-mail

Date: October 19, 2016
Attention: Michael Rosalie – Wesleyan University
Project: 266 Pine St. 1st Floor Repair
Job Number: 16151
Present: Michael Rosalie, Thomas Policki & Steven Formica – Wesleyan University

The following was noted:

At the request of Michael Rosalie from the Wesleyan University Physical Plant Department, Josh Dobbs-McAuliffe visited 266 Pine Street in Middletown CT between 0830 and 0930 on September 22, 2016 to assess the 1st floor framing within the living room.

The following items were observed:

- The typical framing observed from the basement included 1-7/8" x 9-1/2" wood joists spaced at 16"oc spanning 14'-8" between a wood support beam at one end and a brick masonry wall at the other end. The area of the damaged floor framing included 1-7/8" x 9-1/2" wood joists spaced at 16"oc spanning 11'-0" between the wood support beam at one end and a double 1-7/8" x 9-3/4" wood header at the other end. The header spanned 6'-0" between two double 1-7/8" x 10" wood trimmers, one at each end with the trimmers spanning between the wood support beam at one end and the brick masonry wall at the other end. On the opposite side of the header, there were 1-3/4" x 3-1/2" wood joists spaced at 12"oc spanning between the aforementioned trimmers. Additionally, the floor included plank sheathing and hard wood flooring with a tiled hearth above the 1-3/4" x 3-1/2" wood joists. See sheet S1 for details. All dimensions taken in the field were approximate.

- At first observation, temporary shoring was put in place to support the damaged framing and one of the joists was reinforced with a new 2x10.

- The 1-7/8" x 9-1/2" joists spanning parallel between the two trimmers appeared to be connected to the header with (2) 16d nails through one of the header plies into the end grain of the joists. A visible split located near the top of the joists occurred at one of the nails connecting the joists to the header.

Signed: Joshua Dobbs-McAuliffe

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The two plies of the header appeared to be inadequately attached as an observable gap between the two plies showed only a couple of nails connecting the two plies of the header.

The two plies at both trimmers appeared to be inadequately attached as an observable gap between the two plies showed approximately 10 nails connecting the two plies of both trimmers.

Visible cracks were observed in the header, both the trimmers and some of the joists within the damaged area of the floor framing.

A horizontal crack had developed from the corner of a notched end of one joist spanning 14'-8" (see photo 1).

Based on the observations and analysis, we conclude that the living room floor framing failed due to the inadequate connection between the 1-7/8" x 9-1/2" joists and header, the inadequate connection between the two plies of the header and both trimmers and the undersized 1-3/4" x 3-1/2" joists. With the exception of the 1-3/4" x 3-1/2" joists and inadequate connections, the floor framing was determined to meet the code required dead and live loads per the current state building code.

The initial cause of failure appeared to occur at both the trimmers. Since the trimmers were inadequately connected, the applied load from the header was not shared between the two plies of the trimmer and allowed the inner ply to be overstressed and fail. The failure of the trimmer allowed the load attributed to the trimmer to be distributed to the header and joists between the trimmers. The applied load from the joists was not shared between the two plies of the header, also inadequately connected, allowing the inner ply to be overstressed and fail. The failure of the header and both trimmers allowed the end of the joists connected to the header to drop and rotate splitting the top of the joist at the nail connecting the joists to the header. The visible flexural cracking in the 1-3/4" x 3-1/2" joists was evident of the joists being undersized.

The shoring in place can remain allowing the residents to occupy the premises until repairs can be completed.

Refer to attached Sheets S1 & S2 for floor repair details.
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Photo 1 – Temporary Shoring

Photo 2 – Damaged Joist at Header
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Photo 3 – Damaged Trimmer at 1-3/4” x 3-1/2” Joists

Photo 4 – Damaged Header at 1-3/4” x 9-1/2” Joists
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Photo 5 – Flexural Crack at 1-3/4" x 3-1/2" Joist

Photo 6 – Horizontal Crack at Notched End of Joist
1. ALL FRAMING LUMBER SHALL BE DRY (15% MAXIMUM MOISTURE CONTENT) DOUG-FIR NO. 2 OR BETTER.

2. WHERE FRAMING CLIPS ARE USED, NAILING SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.

3. METAL CONNECTOR HARDWARE SHOWN ON DETAILS ARE SIMPSON STRONG-TIE CONNECTORS AND ARE SELECTED FOR LOAD REQUIREMENTS. SUBSTITUTION IS PERMITTED IF LOAD CAPACITIES OF ALTERNATE ARE OF EQUAL OR GREATER CAPACITY THAN COMPARABLE SIMPSON CONNECTOR. FASTENING SHALL BE PER MANUFACTURER'S REQUIREMENTS.

4. CONSTRUCTION ADHESIVE SHOWN IN DETAILS SHALL BE PL-400 CONSTRUCTION ADHESIVE OR EQUIVALENT. ADHESIVE SHALL CONFORM TO APA PERFORMANCE SPECIFICATION AFG-01

5. OSB SHEATHING SHOWN IN DETAILS SHALL BE APA RATED SHEATHING

6. BENT PLATE STEEL TO BE 36 KSI

7. BOLTS TO BE GRADE A307

NOTE:
IN PLACE SHORING TO REMAIN UNTIL NEW FRAMING IS IN PLACE.

1. PARTIAL 1ST FLOOR PLAN
1/2" = 1'-0"

2. TRIMMER REINF. DETAIL
1" = 1'-0"

3. HEADER REINF. DETAIL
1" = 1'-0"

EXISTING BRICK WALL

EXIST. TRIMMER
EXIST. HEADER BEYOND

SIMPSON 1/4" x 5" LONG SDS SCREWS
WITH WASHERS AT 12"oc TOP AND BTM

SIMPSON 1/4" x 5" LONG SDS SCREWS
WITH WASHERS AT 16"oc STAGGERED TOP AND BTM

EX. 1-7/8" x 9-1/2" JOISTS AT 16"oc
REINFORCED WITH NEW 2x10

2'-0" BTWN TRIMMERS

EX. (2) 1-7/8" x 10" TRIMMER
REINFORCED WITH NEW 2x10

EX. 1-3/4" x 3-1/2" AT 12"oc

EXIST. HEADER BEYOND

NEW 2X10

2'-0" TYP
CUT EXISTING JOISTS BACK FOR NEW 15/32" OSB PLATE. ATTACH PLATE WITH CONSTRUCTION ADHESIVE AND (4) #10x2-1/2" SD SCREWS PER BAY TO SIDE OF EXIST. TRIMMER.

NOTE:
EXIST. TRIMMER
NEW 2X10

NEW SIMPSON A34 FRAMING CLIP EACH SIDE WITH 8d NAILS

NEW 2X10
ATTACH NEW 2X10 TO EX. JOISTS WITH 16d COMMON NAILS AT 16"oc TOP AND BTM.

NEW 2X10
ATTACH NEW 2X4 TO EX. JOISTS WITH 10d COMMON NAILS AT 6"oc STAGGERED TOP AND BTM.

NOTE:
EXIST. TRIMMER
NEW 2X4

NEW 2X10
ATTACH NEW 2X10 TO EX. JOISTS WITH 16d COMMON NAILS AT 16"oc TOP AND BTM.

NEW 2X10
ATTACH NEW 2X4 TO EX. JOISTS WITH 10d COMMON NAILS AT 6"oc STAGGERED TOP AND BTM.

EXIST. TRIMMER
NEW 2X10

NEW 2X10
ATTACH NEW 2X10 TO EX. JOISTS WITH 16d COMMON NAILS AT 16"oc TOP AND BTM.

NEW 2X10
ATTACH NEW 2X4 TO EX. JOISTS WITH 10d COMMON NAILS AT 6"oc STAGGERED TOP AND BTM.

EXIST. HEADER
NEW 2X10

NEW 2X10
ATTACH NEW 2X10 TO EX. JOISTS WITH 16d COMMON NAILS AT 16"oc TOP AND BTM.

NEW 2X10
ATTACH NEW 2X4 TO EX. JOISTS WITH 10d COMMON NAILS AT 6"oc STAGGERED TOP AND BTM.

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EXIST. HEADER
NEW 2X10

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