

Lee Farm Corporate Park
83 Wooster Heights Road
Suite 200
Danbury, CT 06810
Tel: (203) 490-4140
www.tdeg.com



July 19, 2016

James Levato
KSQ Design
235 Main Street, Suite 410
White Plains, NY 10601
Email: jlevato@ksq.design

Re: New Canaan Teen Center – Structural Survey
77 Main Street
New Canaan, CT 06840
TDEG Project No. 16153.00

Dear Jim:

As you requested at our meeting on site last Thursday with Lea Cromwell and Bill Oestmann I am sending you my initial observations and opinions. My recommendation to close the building to the Public was previously received by you and forwarded to the Town.

Summary of Conditions Observed:

1. Bill pointed out that the roof/ soffit deck is separated from the top of the eave brackets. This could be either the brackets have pulled away from building and the roof deck, this did not appear to be the case. Or more likely, the deck is deflecting up and away from the tops of the brackets due to roof framing deflection downward within the perimeter of the building. This second scenario could not be readily verified.
2. Immediately adjacent to the interior posts Bill pointed out the floor slab is depressed $\frac{1}{4}$ " +/- below the typical slab height. The condition is most likely caused by differential settlement between the column footing and the slab outside a typical slab/ column isolation joint. To some degree this is to be expected and not a significant concern if the differential settlements are small. Bill noted that portions of the building were built on fill due to the deep excavation after the demolition of the previous building on the site that had contaminated soil beneath it that needed to be removed. Bill recalled that the new fill was compacted in lifts but is unsure whether it was truly controlled fill where the density of the soil is measured after each lift.
3. The structure is predominantly framed with heavy oak timber floor joists, beams, posts, roof purlins and roof trusses. A majority of the timber members are noticeably checked, cupped, warped and twisted suggesting the timbers had a high moisture content at the time of fabrication/ installation and have seasoned or dried out over the 15 years of service, **see Photo Nos. 1 and 2**. Seasoning causes shrinking of the overall dimensions of the timber perpendicular to the wood grain, differential shrinkage within the timber causes the checks, cups, etc... as the moisture content of the wood is reduced. This is to be expected with high moisture

Bruce D. Richardson, P.E.
Kenneth D. Jones, P.E.
Trevor B. Hill, P.E.



- content timber and is not necessarily a structural concern with framing relying strictly on bearing directly on their supports. However, this is not the case for this building where connections between members are not just bearing type connections.
4. Posts were measured to be at most $\frac{1}{4}$ " in 4 feet out-of-plumb from vertical with the tilt towards Town Hall.
 5. Connections between beams and posts have been significantly affected by the movement of the timbers as they have seasoned.
 - a. Gaps between end of beams and posts of up to $\frac{1}{2}$ " are prevalent, leaving a beam that originally had 1" of bearing now has $\frac{1}{2}$ " of bearing, **see Photo No. 3**. Gaps of this amount are greater than can be attributed to seasoning alone and suggest some amount of external tension is separating the beams from the posts. The tension connection between post and beam appears to be separate block of wood, acting as a tenon, that is mortised into the top of the beam and through the post. The block of wood then appears to have been pegged/ doweled to the post and beam. The separation suggests that the dowel has pulled through the tenon. **See Photo No. 4**.
 - b. Steel plates have been bolted to both sides of the girder/ post connection at several locations under the main level along the east side (facing Town Hall). The steel plates have been distorted by tightening of the bolts bending the plates over uneven surfaces. Nuts were loose in a few instances. **See Photo No. 5**
 - c. Beams have twisted or warped at their ends causing uneven bearing and offset bearing on supporting surfaces. **See Photo Nos. 5 & 6**
 - d. At the northernmost roof truss, the top connection at the exterior wall has been thru- bolted unlike the other 4 trusses. The purpose of these bolts was not determined. **See Photo No. 7**
 6. The nailing for the flooring/ decking has pulled out of the joists at locations. No readily apparent reason. **See Photo No. 8**
 7. Foundation wall on west side retains approximately 4 feet of fill above the floor slab. If not installed as a cantilever retaining wall having a reinforced wall and footing, and the footing wider than is normally used there may be some lateral soil pressure exerted on the framed structure
 8. Overall framing plan has little lateral bracing in the east-west direction other than the stthat rigidify the connection, **see Photo No. 9**, and the connection of both top and bottom chords of the scissors truss to the exterior post, **See Photo No. 7**.
 9. Beams are lifted off their post bearing seats, the opposite effect would normally be expected, due to gravity forces, the beam would seat itself. **See Photo No. 10**

What were thought to be the original building drawings were reviewed during our meeting. Much of what is indicated on the drawings is not what was built, the more significant items are:

- a. The roof trusses indicated in the architectural building section were shown as heavy timber rafters with a steel rod tie – the installed roof trusses are heavy timber scissors trusses.
- b. The main level framing is not as indicated on the structural drawings. Interior posts were installed farther apart than shown on the plans creating spans of equal length between posts of approximately 10 feet. Girders were considerably smaller than indicated on the plan. The joists were not spaced according to the plans.

Structural Engineering Survey
New Canaan Teen Center
77 Main Street
New Canaan, CT

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Bill will attempt to find more recent documents that mirror what actually was built. Please forward these on to me as soon as you receive them.

Please review and contact me with any questions or comments you or the Town may have.

Sincerely,
The Di Salvo Engineering Group



Kenneth D. Jones, PE/ Principal
kenj@tdeg.com
(203) 490-4140 ext. 228

Attachments: (3)



Photos



No. 1



No. 2



No. 3



No. 4



No. 5



No. 6



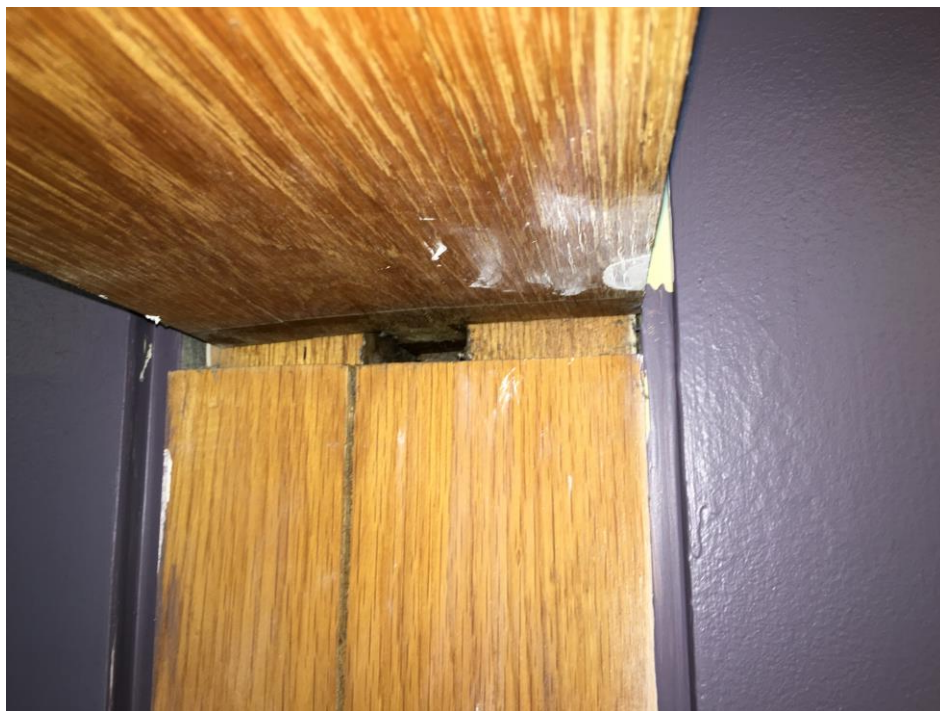
No. 7



No. 8



No. 9



No. 10