Structural Condition Report

City of Haddam

Former Scovil Hoe Facility
11 Candlewood Hill Road
Higganum, CT 01040

December 13, 2017

146 Hartford Road
Manchester, CT 06040

Project No. 20160476.A20

1 Executive Summary

Fuss & O'Neill, Inc. (F&O) prepared this Structural Condition Report (SCR) for the Town of Haddam for the former Scovil Hoe facility located on Candlewood Hill Road near the intersection of Saybrook Road in Higganum, CT. The purpose of this SCR is to assess the structure and building envelope for conditions that present immediate concern of risk, hazard, or safety to the Town of Haddam and the building's future occupants. F&O performed the Structural Condition Assessment (SCA) on November 15, 2017.

The SCA included a visual walk-though survey in which the following building components and building systems were reviewed where possible: foundation walls, floor structures, roof structures, exterior and interior bearing walls and the building envelope. Access to foundations, roofing conditions and roof structures were limited, but observations were made where possible and are reported herein.

The complex consists of two single story, gable roofed manufacturing buildings with mezzanines and roof monitors constructed between the late 1800's and early 1900's. It is our understanding that the buildings were in use until 2014, most recently as a storage and maintenance facility for the State of Connecticut DPW. They have been abandoned since that time, but have generally been secured and protected from the elements and vandalism.

Both building structures are generally in sound condition, although there is some evidence of past and present water infiltration and degradation of timber structures, and significant mortar loss was found at exterior walls. Both buildings have timber roof trusses that span the full width on exterior brick bearing walls, with partial mezzanines generally supported on the exterior brick walls and suspended from the roof trusses with steel rods. The following immediate and short-term recommendations are made based on the SCA in order to prepare the building for marketing and reuse.

- Remove all damaged interior finishes to permit full visual inspection of structures.
- Repair or replace damaged wood members and decking. Based on the SCA, only isolated damage was found at the floors and roof, but more damaged areas are likely to be discovered as finishes are removed and repair work proceeds, especially reroofing.
- Repoint stone masonry foundations walls.
- Repair spalled concrete foundations and wall elements, including the retaining wall at Building A.
- Repair and reset or replace damaged and loose brick units, and repoint all exterior brick walls, including chimneys. Consider removal or shortening of chimneys no longer in use.
- Replace the roofing at the north side of Building A.
- Replace damaged window frames and wood trim.

It is important to note the limitations of this SCA. The buildings have limited electrical service and contain hazardous materials. Consequently, visibility was limited and the team performing the SCA was careful to not disturb any finishes. Although most of the structures were exposed to view, some structural elements were concealed by finish materials and could not be directly observed.

2 Purpose and Scope of Services

2.1 Purpose

The purpose of the SCA was to evaluate the structural aspects of the subject property's condition as it relates to potential future use by the Town of Haddam and any future occupants. This SCR is based upon those apparent conditions observed at the time the SCA was performed and from facility-related documentation obtained and made available for review. This SCR is not a guarantee of the overall condition of the functional suitability of the real estate asset. Limiting conditions for this SCR are described in Section 4.

2.2 Scope

The SCA included the following: site reconnaissance, review of available existing building documentation and visual observations. The SCA was limited to the structural frame and building envelope for the following buildings on the site, which are identified on the aerial photograph in Appendix A:

- Building A
- Building B

This SCR is intended for use as a complete document; therefore interpretations and conclusions drawn from the review of individual sections are the sole responsibility of the user.

Most areas of the property were available for observation during the SCA, however some mezzanine and roof areas were inaccessible. Furthermore, portions of the mezzanine framing and portions of roof trusses were concealed by finishes and could therefore not be directly observed. Secondary evidence of structural conditions, such as rust staining, floor deflections and irregularities, and cracks in finishes, were observed where possible to assess structural behavior and performance.

3 System Descriptions and Observations

3.1 General Description

The subject structures are a pair of similar single story, gable roofed manufacturing buildings with mezzanines and roof monitors constructed between the late 1800's and early 1900's, with a number of more recent modifications and repairs. It is our understanding that the buildings were in use until 2014, most recently as a storage and maintenance facility for the State of Connecticut DPW. They have been abandoned since that time, but have generally been secured and protected from the elements and vandalism. The structures consist of timber roof trusses supported on exterior solid brick exterior walls. Both buildings contain wood framed mezzanines supported on interior walls and wood columns as well as the exterior brick walls. Portions of the mezzanines are hung from the roof trusses with steel rods. The exterior walls are supported on stone foundation walls. All first floor slabs are supported on grade. The roofs of both buildings have asphalt shingles. A pipe trench runs between concrete pits below the

slabs of both buildings. A number of chain hoists are suspended from the roof and mezzanine floors in both buildings. Several chimneys extend up above the roof level at both buildings (three at Building A and one at Building B).

3.2 Visual Survey

The walk-through survey conducted during the field observers' site visit of the property consisted of non-intrusive visual observations and a survey of readily accessible, easily visible components and systems of the property. Select wood members were also probed to identify deterioration. Concealed physical deficiencies are excluded from this SCR. The survey should not be considered technically exhaustive. The survey was conducted to the extent it could be completed without the use of lifts, scaffolding, etc. The assessment of the condition of the exterior wall systems and finishes is based upon observations made from the ground and floor surfaces. Close observation of upper wall systems, roofs and finishes above ground or mezzanine levels was beyond the scope of the SCA.

Readily accessible areas of the property are defined as areas that were promptly made available for observation by the field observers at the time of the walk-through survey and did not require moving materials. The field observers did not enter spaces they deemed unsafe or impassable for any reason.

F&O conducted the visual walk through survey on November 15, 2017. The weather was partly sunny and cold for the duration of the survey. No active water infiltration was observed, although ponding water was found in one garage bay at Building A.

3.3 Structural Frame and Building Envelope Observations

3.3.1 Building A

Building A is an approximately 262' long by 40' wide, timber framed gable structure, subdivided into an office section and a series of garage bays. The slab elevation steps up at the western bay. A series of attic spaces are connected by a central walkway thru small openings in interior brick walls.

The following observations were made at Building A.

3.3.1.1 Exterior

- The building exterior consists of brick walls generally supported on stone foundations, although concrete was noted at some walls (see photo A-1). Some sections of the foundations have minor cracks and concrete spalling (see photo A-1 and A-10), but overall appear to be in adequate condition. No indications of widespread settlement were found.
- Some deterioration was noted at the wood trim and window framing throughout the building, primarily due to water exposure (see photos A-2 and A-6).
- A wooden louver cover located at the back of the building has deteriorated significantly (see photo A-3).

- The chimney located at the eastern side of the building has vertical cracks near the bottom (see photo A-4). Cracks and missing mortar were also noted at the top.
- The top portion of the chimney located on the west side of the building has some brick displacement due to mortar degradation, as well as minor cracks (see photo A-5).
- Some sections of the wood window frames appear loose or displaced, likely due to weather damage (see photo A-6).
- The roofing at the south side of Building A appears to have been replaced fairly recently. The north side of the roof is much older and has more wear and damage (see photos A-7 and A-21).
- A section of the north side of the roof, as well as some of the adjoining exterior brick, are overgrown with vegetation and appear to have failed (see photo A-7).
- A concrete retaining wall extends along the north side of the building and continues beyond the building at an angle to the west. A large vertical crack was found in the wall near the change in direction, along with smaller horizontal cracks and spalls. The wall surface is somewhat irregular, but other than the distress at the corner, the wall is generally intact (see photo A-8).
- The exterior wall at the northwestern corner of the building appears to be directly founded on a rock outcropping. Significant mortar loss was noted at this location (see photo A-9).
- The brick exterior walls are generally intact, but some areas were noted where mortar has deteriorated and brick units are chipped and cracked (see photo A-10). There was evidence of previous repairs throughout.
- The roof structure consists of wooden planks, with asphalt shingles on both sides of the gable roof. The roofing appears to be intact throughout (except one section on the north side shown in photo A-7), although there are some areas of the roof that show significant signs of water infiltration at the inboard surfaces of roof joists and walls (see photos A-17 through A-20).

3.3.1.2 Interior

- The building is divided into two sections. The east side (section 1) of the building consists of mainly office space and has one entry to that section of the building. The west side (section 2) of the building consists of 7 garage bays and two offices and a mechanical space at the rear of the building. There is a walkway at the center of the attic that links the two sections of the building.
- At section 1, the interior side of the louver appears to be in good condition despite the damage noted at the cover at the exterior. The paint on the brick walls in the mechanical space is chipped and mortar degradation was observed (see photo A-11).
- At section 1, there are two rooms in the back of the building. These rooms have a wood floor over a crawlspace. The flooring shows signs of water infiltration (see photo A-12).
- Vertical cracks were found at the inboard face of a brick pier between door openings. The cracks translate to stepped cracks further up on the pier (see photo A-13).
- At section 2, there is a concrete utility pit that connects to a trench that leads to Building B (see photo A-14). The pit is covered with a series of wood planks. The pit, trench and planks appear to be intact.
- The concrete slab at some of the garage bays appears to be sloping towards the center. Ponding at the center of the floor was observed (see photo A-15).
- Some of the timber roof trusses have significant cracks at the bottom chord, particularly close to bearing conditions (see photo A-16).

- Access to the attic is located in section 2 near the entrance of the building. The attic allows closer inspection of the gable roof structure, including the trusses, rafters and wood planks (see photo A-17). Signs of water infiltration (staining, mold, rust at nails) can be seen at the underside of the planks and framing, but active leaks were not found. Many of the planks and some roof joists show signs of water exposure and damage (see photos A-18 through A-20).
- Section 2 had several chain joists suspended from the roof framing and mezzanine (see photo A-21). No distress was noted at or around the hoists.

3.3.1.3 Recommendations

Repair recommendations depend to some degree on the proposed reuse, but it is likely the following repairs will be indicated at Building A:

- Reinforce or replace deteriorated wood framing.
- Replace roof and floor sheathing damaged by water exposure.
- Replace the roofing at the north side of the building.
- Repoint interior and exterior brick walls as required.
- Repair or consider removal or reduction of the height of chimneys.

3.3.2 Building B

Building B is an approximately 200' long by 40' wide, timber framed gable structure, subdivided into a series of garage bays. Stairs lead to mezzanines at the east and west ends of the building, with a series of divided attic spaces in between. The first floor steps down several feet at the east end of the building.

The following observations were made at Building B.

3.3.2.1 Exterior Observations

- In general, exterior walls appear to be in adequate condition, with some exceptions as noted.
- There is a significant step crack at the southeast corner of the building (see photo B-1). The crack transmits fully to the interior (see photo B-2).
- There is mortar degradation and brick displacement along with minor cracks along the top of the chimney (see photo B-3).
- The exterior brick walls on the south side have significant mortar disintegration and resulting brick displacement (see photo B-4).
- Brick spalling was found at several locations at corners of the building (see photo B-5).
- The building exterior consists of brick walls supported by stone and concrete foundations, with some sections of the brick walls bearing directly on a bedrock outcropping (see photo B-6).
- At the front of the building, a portion of the exterior brick wall appears to have been damaged by vehicular impact (see photo B-7).
- At the west side of the building, a stepped crack was noted at the upper corner of an infilled garage door (see photo B-8).

3.3.2.2 Interior Observations

The following observations were noted:

- The building is divided into two sections. The east side (section 1) of the building consists of a one story building with 4" lally columns supporting a mezzanine. This section has a separate entrance from the exterior. The west side (section 2) of the building consists of a one story building with 4 garage bays and mezzanine located at the west end of the building.
- Section 1 of the building has added post shoring that reinforces the west end of the mezzanine above the area where the main floor slab is lower (see photo B-9).
- There is a vertical concrete crack in an interior retaining wall that separates the two different floor levels, directly below an interior column (see photo B-13).
- The wood framing that supports the mezzanine in section 1 of the building has signs of water damage as well as some deterioration at the bearing ends (see photo B-10).
- Several roof rafters and planks are deteriorated near the bearing seats at the exterior wall (see photo B-11).
- The top portion of the south and center stringers at the wood stairs near the east end have significant cracks (see photo B-12). The south stringer has been reinforced where a pipe penetrates the stair.
- Section 2 of the building has a wood column with a significant vertical crack at the underside of the mezzanine framing (see photo B-14).
- Mortar degradation and cracks were found at several locations at the painted brick interior wall (see photo B-15).
- The roof structure at section 1 can be observed from the mezzanine (see photo B-17). Some deteriorated truss members appear to be reinforced by sistered wood beams on each side. Several roof planks have also been replaced. Several truss members and rafters were found with significant cracks and evidence of water infiltration (see photos B-16 and B-17).
- From the mezzanine in section 2 of the building, the roof structure is visible, including the trusses, rafters and planks (see photo B-18). Some of the truss members and rafters have been reinforced with sistered members on each side, and deteriorated wooden planks have been replaced with newer planks and sections of plywood. There is evidence of water infiltration and deterioration on the wood framing (see photo B-18 & B-19), but overall the roof structure appears to be intact.
- Section 2 had a few two ton chain joist suspended from the roof frame and mezzanine (see photo B-20). No distress was noted at or around the hoists.
- Subflooring at the west mezzanine consists of a variety of materials, including plywood, wood planks and repurposed plywood signs.

3.3.2.3 Recommendations

Recommendations at this building include the following:

- Reinforce or replace deteriorated wood framing.
- Replace roof and floor sheathing damaged by water exposure and floor sheathing not suitable for the proposed use.
- Replace or reset displaced brick at exterior walls.

- Repair damaged concrete and stone bases, sills and curbs.
- Repoint interior and exterior brick walls as required.
- Assess capacity of framing and evaluate conditions at east mezzanine relative to proposed use in order to assess impact of removal of existing post shoring.

4 Limiting Conditions

F&O's SCA cannot wholly eliminate the uncertainty regarding the presence of physical deficiencies and the performance of a subject property's building systems. Preparation of a Structural Condition Report (SCR) is intended to reduce – but not eliminate – the uncertainty regarding the potential for component or system failure and to reduce the potential that such component or system may not be initially observed.

This SCR was prepared recognizing the inherent subjective nature of F&O's opinions as to such issues as workmanship, quality of original installation, and estimating the remaining useful life of an given component or system. It should be understood that F&O's suggested remedy may be one of several possible alternatives or methods to rectify the physical deficiency. F&O's opinions are generally formed without detailed knowledge from individuals familiar with the component's or system's performance.

The opinions of F&O consultants expressed in this report were formed utilizing the degree of skill and care ordinarily exercised by any prudent architect or engineer in the same community under similar circumstances. F&O assumes no responsibility or liability for the accuracy of information contained in this report that was obtained from the client or the client's representatives, from other interested parties, or from the public domain. The conclusions presented represent F&O's professional judgment based on information obtained during the course of this assignment. F&O's evaluations, analyses, and opinions are not representations regarding the design integrity, structural soundness, or actual value of the property. Factual information regarding operations, conditions, and test data provided by the client or their representatives is assumed correct and complete. The conclusions presented are based on the information provided, observations made, and conditions that existed specifically on the date of the assessment.

Appendix A

Structural Frame & Building Envelope Photographs

Aerial Photograph of Site

Photo A-1 –Diagonal crack and concrete spalling at foundation wall

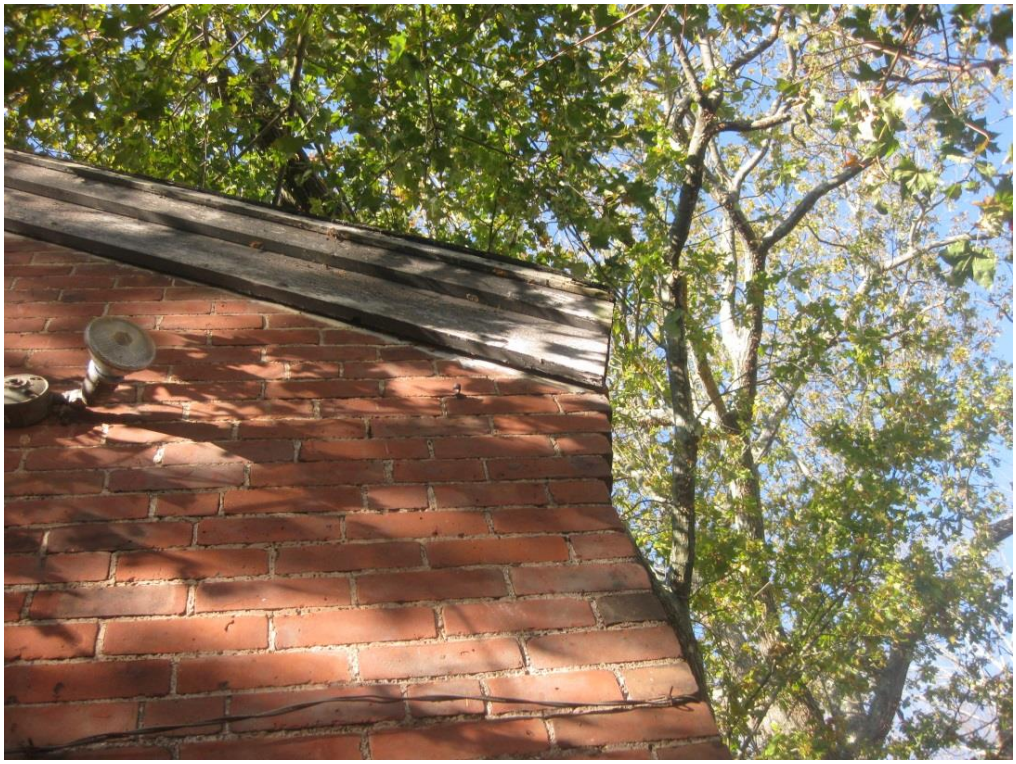

Photo A-2 – Dry and deteriorated wood fascia

Photo A-3 – Deteriorated louver cover

Photo A-4 – Vertical Crack along Chimney

Photo A-5 – Brick degradation at chimney

Photo A-6 – Deteriorated exterior window frame

Photo A-7 – Failed roof shingles and exterior brick at north side of Building A

Photo A-8 – Deterioration at retaining wall parallel to rear wall of Building A

Photo A-9 – NW Corner of Building A directly founded on bedrock

Photo A-10 – Concrete and brick degradation at exterior walls of Building A

Photo A-11 – Chipped paint and deteriorated mortar at interior walls

Photo A-12 – Weathered and water damaged subflooring

Photo A-13 – Stepped and vertical cracks at interior face of exterior wall

Photo A-14 – Utility trench in Building A

Photo A-15 – Ponding water at concrete slab sloped to center

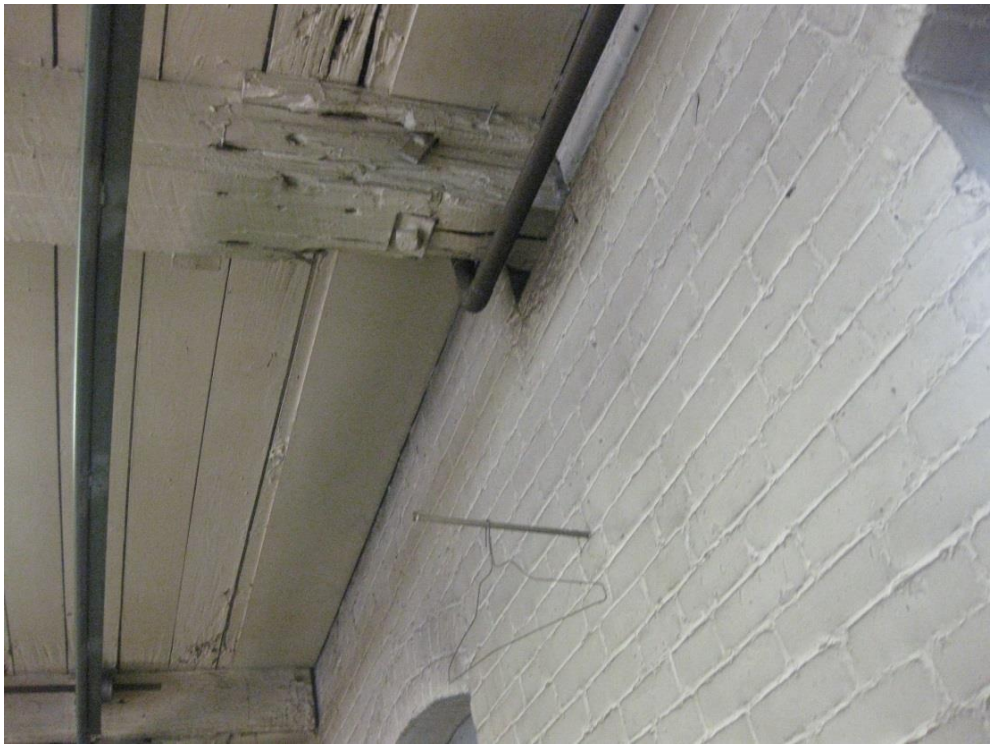

Photo A-16 – Deteriorated wood truss chord at bearing seat

Photo A-17 – Water damage at roof truss and rafters

Photo A-18 – Water damage and horizontal cracks at wood rafters

Photo A-19 – Water damage at roof trusses and rafters

Photo A-20 – Deteriorated wood roof members and planks

A-21– Two ton chain hoists located in the garage bays

A-22– Newer section of roofing at south side of Building A

Photo B-1 – Stepped crack along mortar joint at SE corner of Building B

Photo B-2 – Crack at SE corner of Building B at interior face

Photo B-3 – Vertical crack at the chimney of Building

Photo B-4 – Displaced brick and disintegrated mortar at south exterior wall

Photo B-5 – Disintegrated mortar and spalling at SE corner of Building B

Photo B-6 – Section of exterior wall founded on rock outcropping

Photo B-7 – Brick damage on exterior brick wall due to impact

Photo B-8 – Stepped crack at infilled garage door

Photo B-9 – Retaining wall, framing and shoring at east end of Building B

Photo B-10 –Moisture stains on wood beams at mezzanine

Photo B-11 – Weathered roof planks and cracked rafters

Photo B-12 – Wood stringer failure at mezzanine stair

Photo B-13 – Vertical crack at concrete wall directly below column

Photo B-14 – Significant vertical crack at wood column

Photo B-15 – Disintegrated mortar at inside face of exterior wall

Photo B-16 – Horizontal crack on the wood truss bottom chord (east side)

Photo B-17 – Deteriorated and weathered wood truss at wall bearing (east side)

Photo B-18 – Deteriorated and weathered wooden truss (west side)

Photo B-19 – Wood roof planks and framing

Photo B-20 – Two ton hoists in the garage bays