



12 December 2018

Robert Maynard, First Selectman  
Town of East Windsor  
11 Rye Street  
Broad Brook, CT 06016

Reference: Broad Brook Mill - Building 11 - Opinion of Structural Conditions

Dear Bob:

It is a pleasure to provide a written summary of the author's structural conditions assessment of Building 11 of the Broad Brook Mill complex in East Windsor, Connecticut in the following report.

### **General Description**

The Broad Brook Mill complex consists of five remaining structures, including Buildings 5, 11, 17 and 25, after a fire destroyed a majority of the buildings in 1986. The author has been engaged to provide an opinion of structural condition for Building 11, constructed in 1882 for the purpose of wool storage.

The author visited Building 11 of the Broad Brook Mill complex on October 23, 2018 to visually assess its condition. The following report contains a summary of findings. For the purposes of this report the front elevation of Building 11 faces south, while the rear that borders the northern edge of the site and the Broad Brook faces north.

The following description provides historical background for the site, and is an extract from wikipedia.com:

"The Broad Brook Company complex was once the industrial centerpiece of Broad Brook village in northeastern East Windsor. Set astride Broad Brook west of Main Street, the company complex consisted of eighteen buildings of stone and wood, built over a period of over a century.

The Broad Brook site had an industrial history dating to the early 19th century, when a sawmill, gristmill, and tannery were located at or near this site. A textile mill was established by the Phelps brothers in the 1830s, but it eventually failed, and was reorganized in the late 1840s into the Broad Brook Company. This company was an economic success, employing 300 people at the turn of the 20th century, producing a variety of woolen fabrics. By the 1930s, the company was producing cloth fabrics for upholstery in automobiles, and suffered significantly when that industry shifted to vinyl finishes in the 1950s.

In 1954 the plant was shuttered and sold to Hamilton Standard, a division of United Technologies. Hamilton manufactured printed circuit boards on the premises, involving

electroplating chemicals and chlorine solvents. The company sold the property to real estate developers in 1977. In May 1986, a significant portion of the mill complex (which had by then been listed on the National Register of Historic Places) was destroyed by fire. The main mill building was converted into residential condominiums in the early 1990s. Chemical contamination was discovered in the property's soils in 1998, and the complex was shuttered in 2004."



Bird's Eye photograph taken from the [connecticutmills.org](http://connecticutmills.org) website

## Building Description



The following description of Building 11 was extracted directly from the 1985 National Register nomination for site:

"Building 11 is different from others in the complex because it has a high brownstone basement, an original tower and dormers in its gabled roof. On the south elevation there are five bays east of the off-center tower and seven bays west of the tower. In the basement of rock-faced brownstone ashlar windows are 6-over-6. At the first and second floors windows are 2-over-2 under segmental arches and with brownstone lintels, such lintels being rare in the complex. These windows are set in 2-story recesses between piers. The eaves are defined by brick corbeling. The shed-roofed dormers, in every other bay, have 3-over-3 windows. The easternmost dormer is missing. A glazed double door is placed in the second bay from the east in the first floor, a similar door without glazing in

the second bay from the west, and another door at the far south in the basement. Floor-level washers positioned between the windows tell of the existence of iron tie rods that are characteristic of the 19th-century buildings in the complex.

The gable-roofed stair and elevator tower projects 15 feet. Its front elevation has a double door and 2-over-2 window on each of three floors. Above, the gable end is treated as a pediment, embellished with a central pilaster and two tiers of raking corbeling.

On the north elevation of Building 11 the brownstone foundations, close to the brook, are without windows. In the upper stories this elevation is similar to the south elevation except it has no tower and except for its northeast corner, which is chamfered. The roof above the chamfer is angled to conform with the oblique wall. The west elevation has three bays. In its attic gable end the upper sash of the left and right windows are angled to fit the space, a design feature that is similar to the raking corbeling in the tower's gable end.

On the interior, the attic floor is suspended by rods from the roof framing, following the practice used for the fourth and fifth floors of Buildings 3, 3A and 3B. Thus, the second-floor space is a clear span in contrast with the basement and first floor where there are posts.

This building was constructed in 1882 and used for wool storage.”

### **Noted Building Conditions and Repair Recommendations**

The following conditions were noted at the site.

- S-1** Interior Roof and Floor Framing, general condition. The interior roof and floors are framed with heavy timber “slow burn” beam and structural wood decking. Most remain exposed as architectural elements within the units and appear to have been sandblasted during the 1990’s conversion. Iron wall ties connect the beam ends through the wall to an exposed decorative element on the exterior; an important structural element for meeting contemporary seismic codes. The majority of the framing appears to be sound and capable of re-use, with the exception of the items below.



View of Typical Second Floor Framing



- S-2** Roof Breach at West End, South Slope. A roof breach at the west end has allowed water to infiltrate the building causing local deterioration of the roof and floor framing below. The breach has also been a source of moisture fueling the mold growth noted in item S-5 below. *Deteriorated roof and floor framing will need to be examined more closely after finishes are removed to determine extent of damage. Decking and sheathing local to the leak will most certainly need replacement, and at least one roof truss and floor beam will require replacement or significant reinforcement. In the short-term, we recommend that the breached area be covered to minimize additional damage to the area.*



Exterior and Interior Images of West Roof Breach



- S-3** Roof Breach at West Slope of Stair Tower. A second roof breach was identified at the west slope of the stair tower. This breach has also caused local framing deterioration and provided a moisture source for the mold. *Deteriorated roof and floor framing will need to be examined more closely after finishes are removed to determine extent of damage, and damaged section replaced. In the short-term, we recommend that the breached area be covered to minimize additional damage to the area.*



Exterior and Interior Images of Stair Tower Roof Breach  
Interior image shows a water-stained wood beam bearing on brick wall

- S-4** Cornice Breaches, West End. A few breaches in the wood cornice at the west end of the building were identified, possibly caused by rodents. The openings have lead to local deterioration of the top wood plate and rafter ends. *Local replacement of wood plate, reinforcement of rafter ends, and rebuilding of the cornice will be required.*





Interior Images of Opening at Cornice Breach

**S-5** Mold. Mold growth is pervasive and extensive throughout the interior of the building. While not experts in mold remediation, *it is clear that all finishes will need to be removed from the building, and existing framing treated with a boric acid spray or other similar medium for killing the mold.* Sources of moisture for the mold are likely roof breaches, as well as moisture absorbed at ground level through the masonry walls due to rainwater leaders discharging at the perimeter of the building, and moisture retained by vegetative growth on and around the exterior walls as noted below. Carpet and drywall also hold abundant moisture and create an environment conducive to mold growth.







Images of Typical Mold Growth Found throughout the Building

- S-6** General Vegetative Overgrowth on Exterior. Vegetation on the exterior has grown on the building (ivy) and alongside it; these elements provide a source of water and moisture within the masonry walls that has likely fueled the mold on the interior. In addition, ivy has the ability to root into mortar joints and other crevices in walls causing accelerating aging and deterioration of these materials. *We recommend that the vegetation be removed from the walls and perimeter to reduce this source of moisture and facilitate better air flow.*



Images showing Vegetative Growth



- S-7** Rainwater Leaders Discharging at Foundation. A number of rainwater leaders appear to be discharging right at the foundation wall leading to probable water and moisture infiltration into the masonry walls and basement. At least one beam at the first floor level was observed to be actively growing fungus and may have compromised the integrity of the structural wood; *deteriorated beams will require reinforcement and/or replacement. Rainwater leaders should be extended to discharge and drain away from the building. In all likelihood, the roof drainage system in general is compromised due to lack of maintenance and general age, and will need to be replaced.*



Images showing Truncated Rainwater Leader and Fungal Growth on Beam



## Conclusion

In summary, it is the author's opinion that the majority of structural framing supporting Building 11 is in good condition and capable of re-use. In isolated locations below roof breaches, and at eaves, the building envelope has been breached allowing precipitation into the building. Moisture from the precipitation has caused localized deterioration of framing members that would need to be repaired and/or replaced for future re-use. Mold is pervasive throughout, and the building would need to be stripped of all finishes, and the framing treated with boric acid prior to reuse. It is the author's opinion that Building 11 is eminently capable of re-use and renovation following mold remediation and treatment of localized deterioration.

In the short-term, it is advisable to seal the roof breaches, remove the vegetation from building and along its perimeter, and extend rainwater leaders to prevent continued damage.

We reserve the right to supplement or amend these findings and/or opinions should new information become available to us. This report shall be considered representative of the conditions encountered at the site. Further documentation of the conditions encountered may be furnished, as necessary, by request.

It has been a pleasure to perform this assessment. If you have any questions regarding this report, please do not hesitate to contact this office.

Respectfully Yours,

Cirrus Structural Engineering, LLC

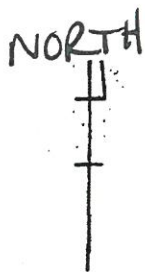
A handwritten signature in black ink, appearing to read 'E. Acly', is written over a light gray rectangular background.

Elizabeth Acly, PE  
Principal

**Appendices:**

Site Plan





KEY



EXTANT, BLDG #11 (FOCUS OF REPORT)



EXTANT, OTHERS



NON-EXTANT

Bound Brook Company  
East Windsor, CT

Scale: 1" = 67'

Photo key

