

Essex County Department of Public Works
8053 US Rte. 9
Elizabethtown, NY 12932

June 2, 2008
SRA 06-755.20

ATTN: Frederick Buck, Superintendent

**RE: Structural Review of the Agricultural Center Building - Essex County
CCE Offices**

Dear Mr. Buck:

At your request, we have completed a visual review of the above-referenced structure to identify areas of the existing building which exhibit indications of probable structural distress. The work was performed in general accordance with the Description of Services included in Letter of Authorization No. 20. In general, our work consisted of the completion of an initial site visit on 5/20/08 to review the interior and exterior areas of the building and to mark locations for the limited removal of exterior wall finishes by County staff where possible structural distress was evident. We then completed a second site visit on 5/30/08 to review the exposed exterior wall framing at the previously designated areas.

Please note that our evaluation of this structure was limited to a visual walk-through inspection of the first floor, second floor, partial basement and attic areas of the building. No structural calculations were performed to determine the existing load capacities of the building elements, nor were any existing interior building finishes removed to expose structural framing members which are hidden from view. This report presents our opinion of the probable structural condition of the building based on our limited observations during our site visits only and does not represent a thorough or complete evaluation of the integrity of the structure.

GENERAL BUILDING DESCRIPTION

The building is a two story timber-framed structure with a partial basement at the east end of the footprint and a low crawl space foundation for the remainder of the building. The building was reportedly constructed in the 1920's and is in the process of being listed on the State and National Registers of Historic Places as a contributing resource to the Essex County Fairgrounds. A Master Plan report for the renovation of the building was prepared by Crawford & Stearns Architects and Preservation Planners in December, 2005. The purpose of our review is to determine the general structural condition of the building prior to the County's undertaking extensive architectural renovation work.

The building foundation system consists of concrete foundation walls at the partial basement area and isolated concrete piers supporting the remainder of the structure. The spaces between the concrete piers at the exterior walls are infilled with sheets of 2" thick

rigid insulation to limit air penetration below the structure. This rigid insulation board is resisting lateral earth load from exterior backfill and has displaced inward at some locations. Isolated small foundation vents are cut into the perimeter insulation at various locations.

The exterior building walls consist of 2x4 timber framing which is supported by built-up timber beams spanning between the exterior foundation piers. These piers also support the first floor framing inboard of and separate from the exterior wall framing. Siding consists of 8" novelty siding boards nailed directly to the timber studs; no exterior wall sheathing was noted.

The first floor framing consists of timber floor joists supported by built-up timber beams bearing on isolated concrete piers at the crawl space areas and on the foundation walls at the partial basement. Fiberglass batt insulation is present between the first floor joists at the crawl space and was noted to be hanging down from the joists at some locations; no vapor barrier is present at the earthen floor in this area. The second floor joist framing is supported by interior timber framed walls at the east and west ends of the building and by structural steel beams spanning between the north and south walls at the Meeting Room area in the middle section of the structure. Roof framing consists of field-fabricated timber trusses. Blown-in cellulose insulation was evident at the attic floor and in the exterior wall cavities.

Porches at the building entrances are present near the center of the west wall, center and east end of the south wall, center of the east wall, and center and west end of the north wall of the building. A porch is also present which serves as the Fair Office along the east half of the north wall of the building. The main building roof is generally a hip roof type structure with a dormer at the west end. Column-supported gable roofs are framed into the building walls at the canopies above the porches at the building entrances. A single-sloped shed roof is present over the porch area serving as the Fair Offices. A decorative cupola is present at the ridge of the main roof near the center of the building.

EXISTING CONDITIONS

In general, the building appeared to be of sound construction with the exception of the areas noted below. Minimal staining of the ceiling finishes and of the timber roof framing in the attic was evident at some locations which is indicative of roof leaks. The roofing was reportedly replaced recently and has eliminated any additional water penetration. No rotting of the structural framing in the attic was evident as a result of prior roof leaks. The first and second floor framing appeared to be sound with minimal deflections noted. Minor cracking was evident at some interior wall surfaces; except as noted below, such cracks are not considered to be indicative of structural distress. The foundation walls in the partial basement and the isolated concrete piers at the crawl space appeared to be in good condition with no indication of significant settlement or other displacement.

Areas of observed or potential distress noted during our review of the building are as

follows:

- Rotting of the siding was evident for the lower 1.5 ft. of the exterior wall finishes at the following locations:
 - on both sides of the entrance canopy at the west building wall
 - at the south building wall to the east of the west entrance canopy
 - at the west sidewall of the center entrance canopy on the south wall of the building
 - at the north building wall between the west and center entrance canopies
 - at the east wall on the north side of the entrance canopy.

These areas of rotting are typically located where rainwater from the porch canopy roofs is discharged down the wall of the main building. County Staff removed the lowest 1.5 ft. of exterior wall siding north of the canopy at the west building wall and west of the center canopy at north building wall. At these locations, extensive rotting of and active insect damage to the built-up timber beams supporting the exterior building walls was noted. The floor framing members located inside of the wall framing exhibited moderate rotting at the west wall and no deterioration at the north wall in these areas. A downward displacement of the north wall of the building was evident at the rot locations and crushing of the rotted timber beam below the wall framing was noted at the top of the piers at this location. The downward displacement of this section of the north building wall was also evident at the second floor with exterior window openings being out of square.

- The tops of the posts supporting the ends of the porch canopies on the east and west ends of the building and at the west and east ends of the north and south building walls, respectively, were displaced laterally by approximately 1.5 in. with respect to the bottoms of the columns. This lateral displacement is a result of the thrust of the rafters at these canopy roofs. The bottoms of these canopy columns were also significantly rotted at several locations.
- The bottom 1.5 ft. of the walls supporting the west sidewall of the center entrance porch on the north side of the building are significantly rotted. The siding at these locations was removed and rot was noted in the wall framing members. Note that the columns at these locations are decorative only and consist of 1x trim as an architectural feature.
- Handrails at several of the entrance canopy steps are poorly attached, rotted and/or are missing members.
- Water staining with possible rotting of the siding and wall framing was noted at the junction of the porch roofs with the main building walls. These observations were made from ground level only and should be confirmed by future detailed inspection.
- An existing concrete masonry chimney which is reportedly no longer in use is present at the west side of the north building wall. This chimney is not considered to be

structurally stable.

RECOMMENDATIONS

As noted, it is our opinion that the overall building is structurally sound with the exception of the deterioration noted above. If this structure is to be renovated, we recommend that the following additional investigations and modifications should be performed:

- The siding boards should be removed at the lower 1.5 ft. of all exterior walls to facilitate a detailed inspection of the wall framing in order to locate additional areas where rot and insect damage may be present at the wall support beams and spandrel first floor joists. Note that the deterioration of the bottom of the exterior walls will result in the eventual loss of support for the wall, second floor framing and roof framing. Any framing which is found to be deteriorated should be replaced. An engineered design for the replacement members should be provided.
- A detailed insect inspection should be performed by a qualified exterminator and treatment to eliminate carpenter ants and other species which will attack the timber framing should be applied.
- The entrance canopies where lateral displacement of the tops of the support columns was noted should be reinforced with adequate tension cross-ties between the columns. An engineered design for the reinforcing members should be provided.
- Additional ventilation in the crawl space area should be provided as required to maintain an adequate airflow. A vapor barrier and the replacement of the existing batt insulation between the floor joists should be considered. The 2" rigid insulation spanning between the foundation piers at the crawl space area should be replaced with a more substantial skirt system which can adequately resist lateral earth loads from backfill around the building. An architectural design should be provided to address these concerns in the crawl space area.
- The existing unused masonry chimney at the north building wall and the existing tie rods from the chimney to the building should be removed.
- A detailed inspection of the siding and wall framing at the junction of the porch roofs with the main building walls should be performed to determine if the existing flashing is performing adequately and if any rot is present at these wall and roof locations. Rotted members and ineffective flashing should be replaced as necessary. Flow diverters should also be installed at the porch roofs to prevent rainwater that drains from these surfaces from flowing toward and down the existing building walls.
- A detained review of all building flashings, caulking, roofing and exterior paint systems should be performed by an architect and deficient items should be

addressed to provide a watertight building envelope.

- All porch railings should be inspected in detail and all deficient rail systems which do not comply with the New York State Building Code should be replaced.

The deterioration of the bottom of the exterior wall framing is the most significant issue that was noted during our review of this building. **If this existing deterioration is not addressed in the near future, serious damage to or failure of the wall framing and support for the second floor and roof of the building could result.**

Thank you for the opportunity to provide these engineering services. If you require further assistance on this project, please call at any time.

Sincerely,

A handwritten signature in cursive script that reads "Carl B. Schoder".

Carl B. Schoder, PE
Principal

