



April 1, 2021

Mr. David Berry
21 Dinsmore Cross Road
Bowdoinham ME 04008
207-751-2809
Alisonberry374@gmail.com

RE: **Recycling Barn, 243 Post Road, Bowdoinham, Maine**
Structural Barn Evaluation – Dangerous Building

Dear David,

At your request, I have performed a visual inspection of the Recycling Barn at 243 Post Road in Bowdoinham, Maine, on September 25, 2020 and March 29, 2021, and reviewed the information provided by Calderwood Engineering, Richmond, Maine. The Select Board of Bowdoinham, Maine, is considering treating the barn as a dangerous building, and we are providing a second engineering opinion.

The barn was built in three phases, from the front, near the road, to the back, from 1958 to 1962, with three floors and wood framing, a concrete foundation and slab, and a gable roof. The building is around 285' long and 36' wide, with generally 12' bays in both directions. The wall and roof sheathing is corrugated metal panels, and the building was built as a chicken barn. The building is currently in use as storage, and was in use for many years as the town recycling barn, with sorting and storage done in the barn. The recycling function has been moved elsewhere temporarily. There is one occupied apartment on the third floor near the middle of the building.

The barn had one partial roof collapse, in the winter of 2011, in the south side of the roof in the back end of the building. There have been ongoing repairs, strengthening, and modification of the building, including modifications as requested by the State Fire Marshall for egress for the apartment.

The building falls under the Existing Building Code (2015 IEBC), which is a part of the Maine Uniform Building and Energy Code (MUBEC); this uses parts of the 2015 IBC (the building code), the ASCE 7-10 (for structural loading requirements), and the NDS (the wood design specification).



In my opinion, the following work should be done on this building:

1. Part of the south side of the roof has been strengthened. While historically, the storms have come from the north and deposited most of the snow on the south side, where it slid off the roof due to the metal sheathing, we should plan on the design snow load coming from any direction, and strengthen the rest of the roof framing. The simplest method is to provide an angled support for each rafter at the midpoint, down to the ceiling level beam, and the ceiling level beam would be strengthened. The columns are generally adequate. This strengthening should be completed by November 1, 2021, to be ready for next winter.
2. The floor for the third floor apartment needs to be strengthened to handle a 40 pounds per square foot (psf) live load, or 30 psf in the bedrooms. Most of the strength upgrade is in strengthening the beams.
3. The south side wall has some metal siding, but is enclosed with plastic sheeting. The State Fire Marshall has requested another siding, and Mr. Berry's current plan is to use T1-11 plywood with a stain, except at the doors and windows. Mr. Berry has added some diagonal let-in bracing, but also has wood boards run horizontally on the inside of the 2x6 studs for 4' on the two upper floors, and he has added 2x6 boards run horizontally in two locations where the boards are missing.
4. The east end of the building (approximately 60') was built last and on around 6' of fill. It has experienced some settlement since 1962. The lower part of the back end is open and ready to be lifted and the rotted lower parts replaced.
5. The elevated floors where the building will be used for a loading above the calculated floor live load should be strengthened to meet or exceed the expected maximum load, and the limits of this area should be delineated, with a placard noting the load rating, and a painted stripe around the area, or the area could be fully painted, typically yellow or white to make a high contrast. The floor live load rating and the strengthening should include the floor sheathing, joists, beams, and columns; the foundations are unknown, but should be adequate for most loading conditions. Alternately, the elevated floors could be restricted to the calculated floor live load, and the recycling functions could be kept to the first floor.

While this building has some ongoing maintenance and repair needs, common in any 60-year-old commercial building, in my experience with buildings condemned as hazardous or dangerous, this building is neither hazardous nor dangerous, which implies conditions that could affect life safety.

Some modifications are needed if a loaded pallet jack is planned to be used on the upper floors, and the floor for the apartment should also be strengthened. The planned work on the south wall and on the east end of the building should also be done.

Let me know if you would like me to explain this to the Codes Enforcement Officer and the Select Board, either at a Zoom meeting or onsite.

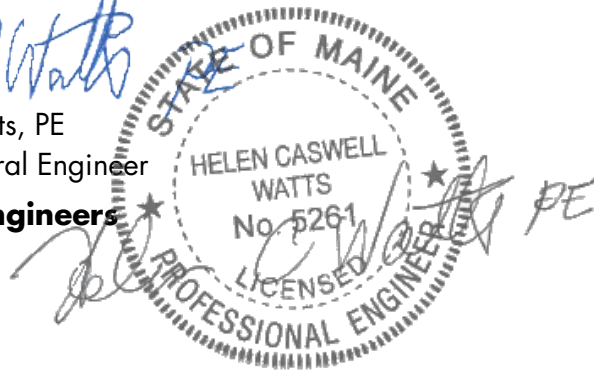
Thank you for giving us the opportunity to be of continued service to you.

Sincerely,



Helen C. Watts, PE
Senior Structural Engineer

Criterion Engineers



Enclosures: Resume

Helen C. Watts, P.E.
Senior Structural Engineer



Helen Watts practices structural engineering with PE licensure in nine states, with over 40 years of experience in construction, facilities engineering, inspection, and structural design for repairs, new construction, and building modifications.

Her experience includes hundreds of residential and commercial building inspections, remediation and remodeling designs, forensic investigations, and design for new construction on commercial, industrial, condominium and residential properties, as well as construction management and inspection.

For over 12 years, she worked as a Principal at Helen Watts Engineering PLLC performing inspections and design for wood, timber, masonry, concrete, and steel structures.

Helen has taught a variety of courses to engineers and the trades, including developing a curriculum and teaching the first course of structural engineering for timber framers at KVCC, and teaching structural engineering for the PE preparation course for mechanical engineers.

EDUCATION AND PROFESSIONAL AFFILIATION

University of New Hampshire, Durham, NH – 1980, BS Civil Engineering
 University of Maine, Orono, ME – 1983, 5th Year Certificate, Pulp and Paper Manufacturing
 Licensed Professional Engineer: Maine, New Hampshire, Massachusetts, Hawaii, Colorado, Ohio, Illinois, New Jersey and Minnesota
 Certifications: NCEES, SECB, MaineDOT LPA
 Memberships: Structural Engineers Association of Maine
 Timber Guild Engineering Council
 ASCE Fellow, Lead for 2 Areas for Maine Infrastructure Grade 2008 -
 Society of Women Engineers
 Pejepscot Terrace, Brunswick, ME – Chair of the Board
 Author: The Graphic Handbook of the Pretty Good House (2013)
 Volume 2, The Pretty Good House (2016)

WHY I DO WHAT I DO

I want to help every building be the best it can be, and every building owner get the most out of their building dollar. Buildings should be healthy, comfortable, robust and sustainable. My work impacts the productivity of the building occupants, the carbon footprint during construction and maintenance, and the bottom line of the owners. I love finding the little problems that can be big possibilities instead of bad surprises.

WHY CRITERIUM ENGINEERS

Criterion Engineers serves a wide variety of clients across the country, and I like the challenge of assisting Criterion Franchises. I also like the care taken in producing high-quality reports.

PROJECT HIGHLIGHTS

- Inspection and report on the Gedney House, Salem, MA, owned by Historic New England and built in 1665 – Structural adequacy, durability, and ideas for the use of the building as a museum of timber and wood construction methods.
- Hathorn Block, Bowdoinham, ME – Structural evaluation and repair planning, new masonry openings, plus structural design to bring 5 stories of 1849 timber framing up to modern building code floor loadings and to provide an elevated concrete deck.
- New private residence and cottage, Biddeford, Maine – Evaluation of existing retaining wall, and design and permitting of new retaining wall under new Maine Sand Dune regulations, structural design of two new buildings, weekly construction inspection through completion of structural framing.
- Horizontal boring machine, Portsmouth Naval Shipyard, Kittery, ME – Design of foundation and installation of the foundation and the horizontal boring machine in the Controlled Industrial Access area of the shipyard
- Portland House, Portland, ME – Inspection, development of repair plans and specifications, project contracting assistance and construction inspection, repairs to 3-level parking garage. Also, repairs to the masonry exterior, and planning of work for the handrail attachment to the balcony decks.
- Danforth Heights, Portland, ME – Investigation, report, repair planning, specifications and drawings, contracting assistance, construction inspection, repairs to masonry façade to stop water intrusion. Also, inspections of 43 units of low-income townhouses with reports for maintenance planning.

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