



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 – Floor loading

Dear David,

At your request, I have performed a visual inspection of the Recycling Barn at 243 Post Road in Bowdoinham, Maine, on May 5, 2021. The Town of Bowdoinham, Maine, is considering reopening the barn for recycling, and we are providing an opinion on the present floor loading and the ongoing repairs at the back of the barn.

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 exterior walls are generally 2x6s at 24" on center, except for the third floors which have 2x4 framing.

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 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).

The first floor of the barn has no loading restrictions, since it has a concrete slab-on-grade.

The slab at the back of the barn is approximately 4" deep where it has been cut out, and the soils below the slab there appear to be a clean sandy gravel. The slab will be rebuilt when the framing repairs have been made. Because of the sloping grade beyond the back (east) end of the building, the 12' bay nearest the end should be limited to 100 pounds per square foot (psf) live load maximum (14,400# per bay)



The second and third floor framing was calculated to be able to accommodate just over 11 psf as originally built, by Calderwood Engineering. If needed, I can perform a more detailed calculation which is likely to gain some live load capacity. The storage is mainly in the front and back bays, with the center bay generally clear for movement. The bays are 12'x12', or 144 square feet (SF), and 144x11= 1584# per bay of live load storage capacity. The bays that were strengthened were calculated to accommodate just over 16 psf of live load storage capacity, or 2304#.

Mr. Berry has a 1000 kg (or 2200#) crane scale, and weighed the various containers used for storage, including initially zeroing out the scale, with the following results:

Pallet box	128# (around 40" tall, wood sides)
Tall wood box	200# (around 5' tall)
Pallet with Gaylord box	60# (a 48"x40"x40" cardboard/watermelon box)
Radiator pipes	60# for a 10' length

He also weighed various loaded boxes.

There was one bay that I estimated the weight of stored material at 1400#, and Mr. Berry relocated a pair of stoves to an empty center bay to bring the estimated weight down to 1000#. The rest of the bays ranged from empty to an estimated 1200# in a bay with some boxes of books. Many of the stored boxes held light materials such as Remay, chicken feeder pails, or polystyrene packing pellets in Gaylord pallets. The short cantilevered area over the composter was fully unloaded, as requested. The storage was generally orderly and the materials well contained.

There are limited areas with old wood board flooring; these should be covered with plywood if they are used for more active storage. The rest of the flooring already has a plywood surface, including all of the center bays.

The second and third floors over the west end of the building, where the Recycling Center is set up on the first floor, were substantially vacant, except for one tank of 1000# in an otherwise empty bay.

The third floor apartment is being vacated at the end of May. In my opinion, this apartment continues to be safe to occupy, and could be occupied while any desired strengthening was done to the floors, but since it will be vacated, the loading on this floor wasn't evaluated.

I recommend installing placards showing the allowable live load weights, with 1" lettering, near the stairwells.

The repairs at the back end of the building are progressing. The concrete floor slab has been removed, and the framing has been supported using cribbing and steel framing. The deteriorated framing has been removed. The work done to date is acceptable.

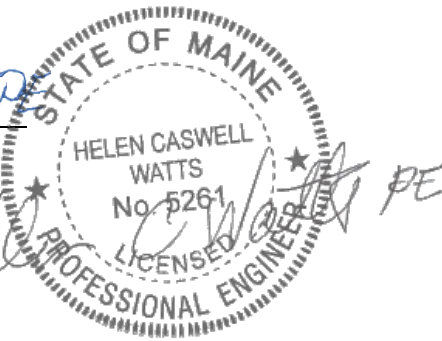
In conclusion, the first floor is safe for any loading, and the second and third floors are loaded well below the conservative load capacity estimate. The building is safe for public access, and for the workers in the Recycling Center and the Recycling Gift Shop.

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.



Helen C. Watts, PE
Senior Structural Engineer
Criterion Engineers



cc: Town of Bowdoinham
Darren Carey, CEO dcarey@bowdoinham.com
Town Manager townmanager@bowdoinham.com
Cathy Curtis curtisc@link75.org

Attachments: Photographs
Resume

**ATTACHMENT A
PHOTOGRAPHS**

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021



LIMITED BUILDING INSPECTION



Description:
North Exterior,
Recycling Setup

Photo Number
1



Description:
South Elevation

Photo Number
2

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021

LIMITED BUILDING INSPECTION



Description:

Hoist
Crane Scale

Photo Number

3



Description:

Front of crane
scale

Photo Number

4

Project Location:
**243 Post Road
Bowdoinham, Maine**

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021

LIMITED BUILDING INSPECTION



Description:
Back of crane
scale; Model
#OCS-S1

Photo Number
5



Description:
Scale is zeroed
before weighing
sample pallet
(recycled cans in
wood-sided pallet)

Photo Number
6

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021

LIMITED BUILDING INSPECTION



Description:

Sample pallet
(recycled cans in
wood-sided pallet)
= 89.5kg, or
197#.

Photo Number

7



Description:

1000# tank

Photo Number

8

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021



LIMITED BUILDING INSPECTION



Description:

Bagged
polystyrene

Photo Number

9



Description:

Empty floors, west
end of building,
second floor

Photo Number

10

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021



LIMITED BUILDING INSPECTION



Description:
Est. 500#, wood
and pews.

Photo Number
11



Description:
Est 1200# in 2
bays, Gaylord box
with chicken
feeders

Photo Number
12

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021



LIMITED BUILDING INSPECTION



Description:
Radiator piping,
est. 1200# in 2
bays

Photo Number
13



Description:
Emptied
cantilevered bay

Photo Number
14

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021



LIMITED BUILDING INSPECTION



Description:
Empty pallet boxes
+ 2 pallets of
polystyrene, est.
1200#

Photo Number
15



Description:
Third floor at west
end of building is
empty

Photo Number
16

Project Location:
243 Post Road
Bowdoinham, Maine

Photos taken by:
Helen C. Watts, P.E.

Date:
May 5, 2021



LIMITED BUILDING INSPECTION



Description:
Heaviest loaded bay estimated at 1400# before relocating 500# (2 stoves) to center bay

Photo Number
17



Description:
East end of building. Worksite is clean of debris, steel temporary support framing is supported on timber cribbing. Exposed soil is clean where viewed.

Photo Number
18

ATTACHMENT B
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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