

Lincoln/Haney Engineering Associates, Inc.

Structural Engineering Consultants

Michael A. Cunningham, P.E., LEED AP
Thad Gabryszewski, P.E., S.E.
Justin Desjarlais, P.E.

January 25, 2026

Mr. Owens McCullough PE, LEED AP
Senior Vice President
Sebago Technics Inc.
75 John Roberts Road, Suite 4a
South Portland, ME 04106

Re: Structural assessment of deteriorated walls
Town of Casco Sand and Salt Shed, Casco, Maine

Dear Owens:

This report is to confirm observations and provide recommendations for the Town of Casco Sand and Salt Shed located off of Leach Hill Road in Casco, Maine. We met on site at the facility on September 25, with a follow up visit on September 29, 2025.

The building is a single-story structure used to store sand and salt for the town. The shed has reinforced concrete push walls and a concrete slab on grade floor. The east and west walls support the roof structure, which consists of glulam arches, wood purlins, and a metal roof. The north and south concrete walls support the gable-ends of the shed. The gable ends are framed with nominal 2x lumber.

Observations:

The insides of concrete walls have noticeable salt staining and rust staining. The rust appears largely to come from location of form ties. When ties are cut off, the ends are usually recessed in the concrete but otherwise exposed. The exposed steel may rust easily, and lead to staining. The presence of salt increases the likelihood of rusting. Please see Photos 1 & 2 at the end of this report.

There is some horizontal cracking in the walls, with occasional rust at the cracks (Photo 2). This could be an indication that wall reinforcing is rusting. Cracks can create an opening that allows salt to more easily contact reinforcing. Walls did not have widespread rusting like this, and no spalling was observed. Concrete spalling can occur when reinforcing rusts. The rust expands, cracking concrete and pushing it away from the wall – creating a spall. Again, no spalling was observed during the visit.

The roof arches impose vertical loads and horizontal thrust loads onto the top of the concrete walls. The walls cantilever above their foundations and slab, resisting thrust loads through bending. Both the concrete of the walls and the steel reinforcing on the inside face of the walls are critical for the work of supporting the roof arches. Protecting the reinforcing is important for the life of the shed.

The staining observed during the two visits is not cause for structural concern, at this time. If left unattended, deterioration at horizontal cracks may worsen. The surface of the walls should be cleaned and coated to help protect the walls.

Vertical cracks are visible on the exterior at wall corners (Photos 3 & 4). These cracks may be a combination from shrinkage and some wall movement. The cracks have no staining at them, and do not appear to be of much concern at this time. The cracks may be cleaned of loose material and sealed to help lessen future deterioration from freeze-thaw action.

The north gable wall has been damaged, apparently by pushing sand and salt above the concrete wall (Photos 5 & 6). Wood studs and purlins are cracked. Sheathing and siding have all been pushed out and damaged. The stud wall should be repaired or rebuilt to prevent rain water and snow from entering the shed.

The north east corner siding has rusted through (Photo 7). This has likely occurred because of salts that have contacted the siding, combined with moisture from natural humidity. Siding should be patched or replaced to prevent rain water and snow from entering the shed.

There are areas of metal roofing that have become loose, most notably on the east side of the shed (Photos 8 & 9). This has likely occurred due to years of wind and weather. Over the life of the shed, screw holes may have let some water in, leading to slow deterioration of wood and screws at the purlins. Eventually the wood and/or screws could not resist suction from wind loads, and became loose. In the short term the roofing should be re-secured or replaced, to prevent water and snow from entering the facility. Roofing and fastening should be evaluated for the entire shed. Over time wind may loosen more roofing, making the situation worse.

Recommendations:

Clean and coat the push walls:

- Concrete walls should be pressure washed to remove salts
- Wire-brush rust stains to remove loose rust and materials
- After walls have dried, apply two consistent thick coats of a bituminous mastic. A continuous coating is important to help prevent salt from reaching the concrete.

Fill exterior walls cracks:

- Clean out cracks. Evaluate if the crack needs to be opened further for successful application of a sealant.
- Calked the prepared cracks with a flexible sealant.

North gable wall:

- Reframe all cracked or damaged members at the gable wall
- Re-fasten or replace damaged siding
- Rusted siding should be patched or replaced

Roofing:

- Refasten all loose roof panels. Evaluate purlins at roof damage, and replace all purlins that are deteriorated
- Have the entire roof, panels and fastening, evaluated. Purlins may also require replacement in locations.

Closing

The recommendations in this report are general in nature. Detailed design of repairs should be performed prior to construction. We will be pleased to work with you in developing these designs, if you would like.

It's been a pleasure working with you, and we hope this report addresses your needs at this time. If you have any questions or would like additional information about any of the items discussed, or need help with any other matter, we will be pleased to assist you. Our inspections were visual in nature. The entire facility was not inspected, and portions of the facility were concealed or obscured from view. The facility may have other conditions that require maintenance or restorative work. Our Opinions are limited only to the items discussed above, and other conditions, concealed or exposed, may require review and attention. If other questionable conditions are discovered, please contact us and we will be glad to review them.

Sincerely,
LINCOLN HANEY ENGINEERING



Thad Gabryszewski, PE, SE
Vice President



Photo 1: Southwest corner of inside of salt shed



Photo 2: Close up of rust staining at horizontal crack

Lincoln/Haney Engineering Associates, Inc.
(207) 729-1061 mail@lincolnhaney.com



Photo 3: Exterior crack in corner of wall - 1



Photo 4: Exterior crack in corner of wall - 2

Lincoln/Haney Engineering Associates, Inc.
(207) 729-1061 mail@lincolnhaney.com



Photo 5: Damaged north wall, from exterior



Photo 6: Damaged north wall, from interior



Photo 7: Rust in wall panels



Photo 8: Loose roof panels, north east end of shed

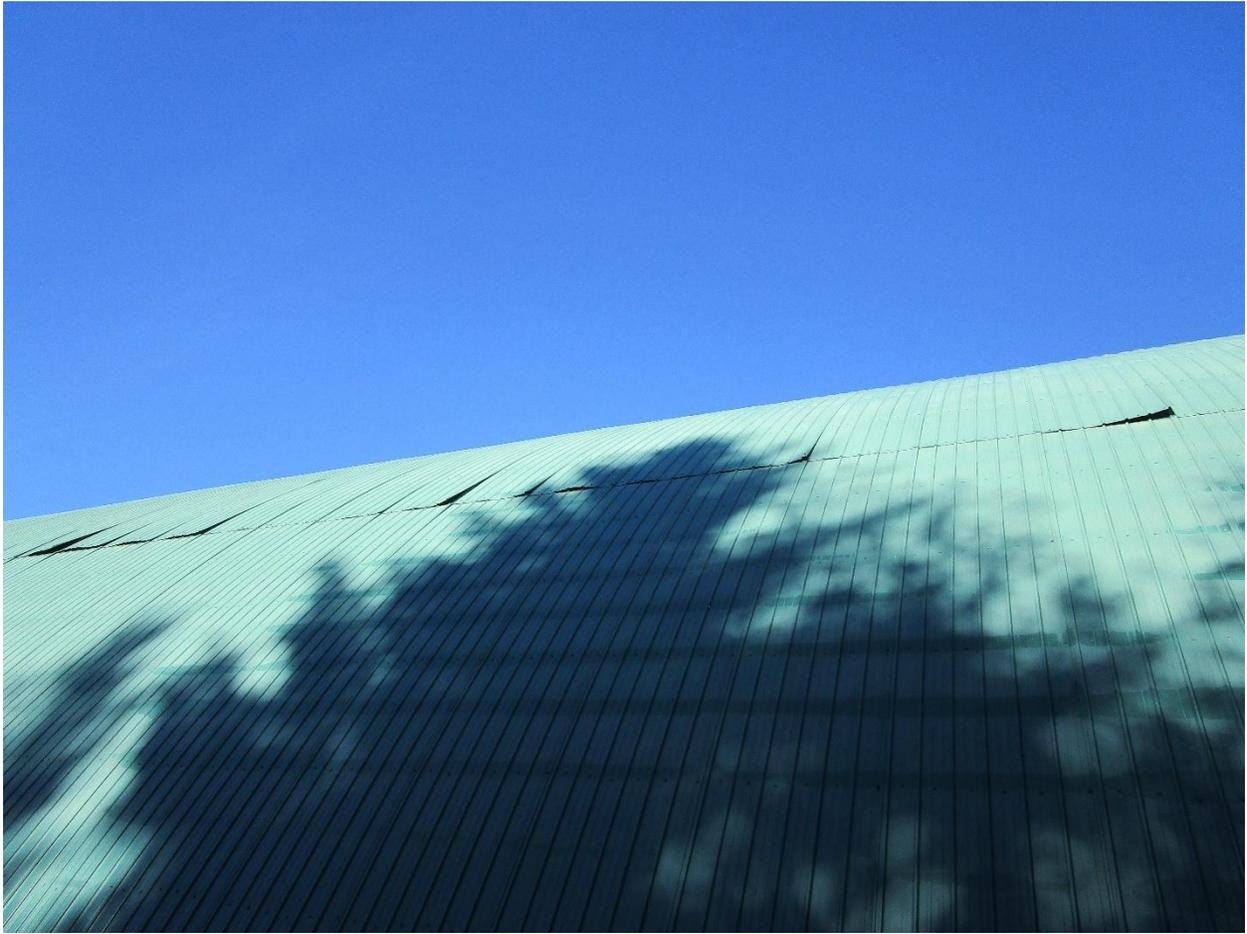


Photo 9: Loose roof panels, east side of shed