

LAKEVILLE CNE RAILROAD STATION
7 Ethan Allen Place
Lakeville, CT

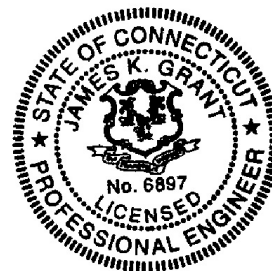
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Structural Condition Assessment



Submitted by:

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Background

James K. Grant Associates was engaged by Crosskey Architects, LLC to conduct a structural condition assessment of the Lakeville Railroad Station. The purpose of the assessment was to identify deficiencies which may compromise the structural performance of the building and require remedial work and to evaluate the feasibility of raising and/or relocating the structure. The assessment is based solely on visual observations. No probe holes into hidden spaces were made, limited structural calculations were made and no material or load testing was done. Site visits were made on August 16 and October 11, 2022.

Structural Description

The Lakeville Railroad Station is a single story, wood framed building with a full basement built in the late 19th or early 20th century. It has a mortared, rubble fieldstone foundation wall topped with several courses of brick. The thickness of the wall could not be determined but is judged to be 18"-24". Rigid styrofoam insulation conceals some of the brick, which is assumed to be at least 12" thick. There is a concrete floor slab which may have been added some time after the initial construction. Access to the basement is by a hatch on the west side of the building which has steep steps made of stone treads on brick risers. A modern steel hatch covers the steps.

The floor framing consists of 2" x 10" joists spaced 16" o.c. spanning in the north-south direction from the foundation wall to a 6" x 10" center wood beam. The joists are continuous from wall-to-wall but are notched 3" where they pass over the beam. At the foundation wall the joists are supported on a wood plate which bears on the brick wall. In some locations, the brick is built up to surround the joists. The center beam is supported on wood posts and brick piers.

The framing of the exterior walls was not exposed but is assumed to be wood studs, probably 2" x 4" @ 16" o.c., with 3/4" board sheathing on the exterior face of the studs. Wood clapboard siding covers the exterior and painted plaster on wood lath is used for the interior finish. There are ornate, spoked wood brackets spaced approximately 5 feet o.c. that help support the wide roof overhang on all sides of the building. Wood posts to which the brackets are attached are visible at each of the brackets. The interior of the building has been divided into smaller spaces by walls which are not load bearing. A dropped ceiling has been added which conceals the original wood beadboard ceiling that was attached directly to ceiling joists.

The roof structure is basically a 12/12 pitch gable roof supported on the north and south exterior walls. A small area of the roof framing at the east end of the building could be seen through access openings reached by a ladder. Rafters were not measured but appear to be 2" x 8" spaced approximately 24" o.c. Wood furring over the joists is now covered with plywood to support the asphalt shingle roofing. An 8 foot wide, low pitch, gently curved roof overhang projects beyond all the exterior walls. Its framing is not fully exposed but it appears that there are low-slope rafters that are fastened to the sides of the main roof rafters and get supported at the exterior wall plane and extend out to a beam at the edge of the overhang that is supported on the ends of the brackets. Joists spanning between the brackets provide support for the paneling on the underside of the overhang.

Observations

Foundations

The foundation walls are in good condition. There is no sign of movement in any of the stonework but some of the mortar is newer and there could have been movement or settlement in the past that required re-mortaring. There is moisture infiltration through the walls as evidenced by accumulations of fines at the base of the wall in some locations. These conditions are not significant and no remedial work is called for on the stone walls. Where exposed, the brick walls appear to be in sound condition but there is some mortar loss. The exterior wythes of the brick are buried below grade, however, and may have some deterioration due to moisture. The roof overhangs help minimize the amount of moisture exposure but the west and south sides may be more effected due to grade sloping toward the building. The brick walls should be fully exposed on the interior and exterior faces for a thorough assessment. The brick piers and chimney base are in very good condition and show no deterioration at their bottoms where the effects of rising damp are often found in building of this and older eras. The masonry steps in the hatchway are in fair condition but there is some disturbance of the brick risers, particularly the top two, that could use some resetting. The two wood posts supporting the center beam are in good condition.

Floor Framing

Insulation conceals all but the bottom few inches of the floor joists but the portions that are exposed are in very good condition. The ends of the joists are not visible in most locations and could not be evaluated. Where they penetrate into the brick wall there is a possibility that there may be some rot. Some corrective work should be anticipated. The wood sill plate could not be assessed and could also have need of rot repair in some places. The center beam is in very good condition and shows no sign of distress. A load analysis of the floor framing indicates that the joists have a live load capacity in excess of 100 pounds per square foot (psf), which allows assembly uses. The center beam, however, has two spans of about 14 and 12 feet that will require added columns in order to develop the same capacity.

Interior Walls

Some of the interior walls may have been added long after the original construction and are not bearing walls unless they are supporting the dropped ceiling that was added later. Some walls may be supporting part of the original ceiling load but it is highly unlikely that any of the interior wall are supporting roof loads. If proposed alterations involve removing walls, investigation should be conducted to be sure that supports are not being removed.

Exterior Walls

There are no signs of structural problems with the exterior walls. The roof overhangs provide protection that minimizes the effects of wet weather and water intrusion.

Roof Framing

Very little of the roof framing could be seen but based on visual observation of the main ridge line and the edge of the overhang, there is no significant deflection that would raise concerns of

the structural integrity of the roof. Its successful performance through a century or more of hurricanes and blizzards is additional proof of that. The postcard reproduction on the cover of this report shows that the north roof overhang originally extended well beyond the east and west ends of the building after transitioning to a gable form to provide a linear shelter for passengers along the track. Presumably, the extensions were removed when the train service was discontinued.

Conclusions

The Lakeville Railroad Station is in very good structural condition. The foundation walls are free of movements but there is moisture infiltration through the mortar joints that is washing fines from the mortar. Exterior drainage improvements should minimize that condition. The floor framing has no visible deficiencies and is sound underfoot. Assessment of the perimeter of the floor was limited, however, and additional inspection should be made by exposing the ends of the joists and the sill plate that supports the joists, as well as the exterior face of the brick wall on top of the foundation wall. The 12 and 14 foot spans of the center floor beam should have columns added at their centers to increase their load capacity to the 100 psf live load capacity of the joists. The roof framing does not have any visually detectable deficiencies

Raising and/or Relocation of the Building

Four options for improving the siting of the building and the accompanying structural implications were considered.

1. Raise the building 18-24" and reset it on extended foundation walls.
2. Raise it and turn it 180 degrees so the front of the building faces south.
3. Move it straight back onto a new concrete foundation with basement or crawl space.
4. Same as 3 but turn it 180 degrees.

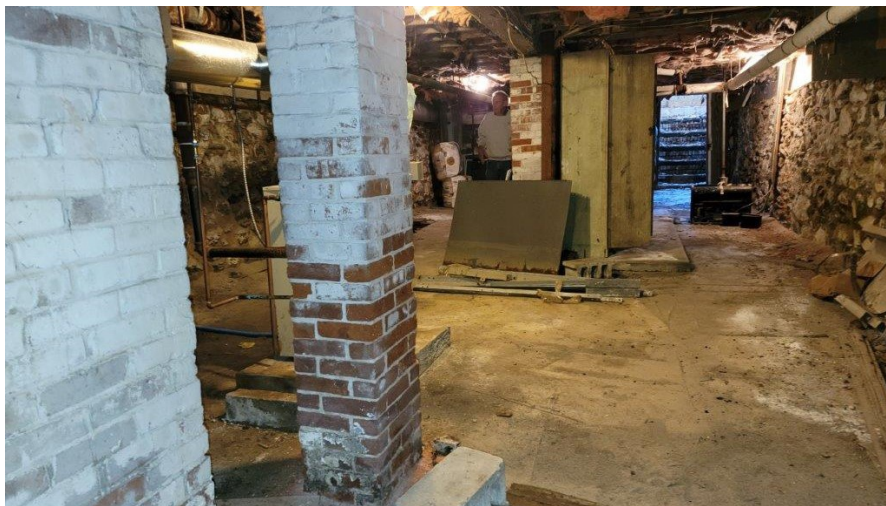
The building is in sound condition and can be raised, turned or relocated by an experienced house moving company. A consulting contractor, Four Square Post and Beam of Barkhamsted, CT, is a member of this assessment team and has brought in Wolfe House and Building Movers to visit the site and provide cost estimates for each of the options. Four Square has incorporated Wolfe's estimates into their proposal for all structural work. Refer to the proposal for details. The costs should be regarded as Reasonable Order of Magnitude (ROM) estimates for planning purposes only.



1. South elevation of Lakeville Railroad Station



2. North wall of station showing 8 foot overhang and brackets.



3. Basement view looking west. Brick chimney base and pier in foreground.



4. Fines deposited at base of foundation wall indicating moisture infiltration.



5. Floor joists bearing on center beam and 16" x 16" brick pier.



6. Center beam passing by chimney base.



7. Floor joists supported on wood sill plate bearing on brick wall on top of foundation wall.



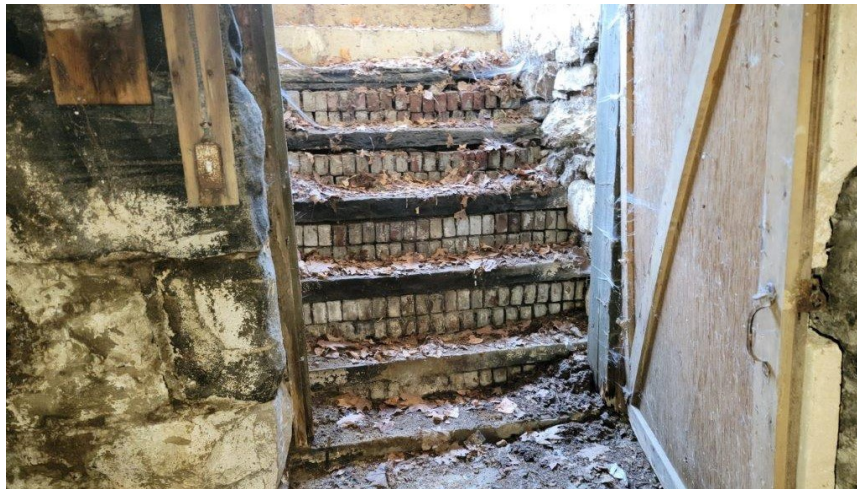
8. Southeast corner of stone foundation with brick on top of wall.



9. View of floor framing at chimney base and brick pier.



10. Brick piers and chimney base are in very good condition, no deterioration.



11. Hatchway steps require some resetting of bricks.



12. A former floor opening has been closed. Minor repairs needed.



13. Interior walls may be supporting ceiling loads. Investigate before removing or altering.



14. Existing dropped ceiling conceals original ornate ceiling.



15. Access panel to space above dropped ceiling is in the corner.



16. Original ceiling and light fixture remains above dropped ceiling.



17. Ceiling condition near chimney.



18. Limited view of roof framing. New plywood visible between original furring.