RIGHT ANGLE
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February 24, 2023

Mr. David Hewett
Town Manager
Town of Holden Beach
110 Rothschild Lane
Holden Beach, NC 28462

Re: Evaluation of Holden Beach Pavillion
Structural Condition

Mr. Hewett,

As requested, representatives of Right Angle Engineering visited the referenced site in January of 2023 to investigate the existing framing condition as compared to the designed repairs by Criser Troutman Tanner 2010. We were provided drawing S0.1 and S1.0 "Temporary Bracing System" dated 4/20/10 and S1.0 "Column Repair Plan" dated 8/11/2010. The main purpose of this report is to determine if the designed repairs are functioning as intended since installation in 2010.

SUMMARY

Based on our investigation, we have determined that failure of the existing structure is not immediately impending, but significant repairs and/or improvements are required in the short term. We anticipate that the scope of repairs/improvements could exceed the value of the existing structure and considerations should be given to full replacement of the pavilion.

PROJECT DESCRIPTION

Building of the original pavilion structure began in 2009 with a contract for construction based on meeting current building codes and no known design drawings are on record or saved by the Town. After the initial construction of the structure was complete, the Town hired a different Contractor to add galvanized strapping, plates, and ties on the existing wood frame to completely tie the roof to the existing pile foundation. In 2010, Criser Troutman Tanner engineers developed temporary bracing system designs to provide proper strength against lateral stresses. Later in 2010, Criser Troutman Tanner developed a column repair plan to provide the required foundation for the structure. Both designs were based on design loads of roof system at 20 PSF, floors/balconies at 100 PSF, and wind velocity of 130 mph.

INVESTIGATIVE PROCEDURES

Visual observations were taken compared to the design drawings previously mentioned. It does appear that the "Temporary Bracing System" was installed per the design drawings for the structure visible above grade. No significant deficiencies were noted in these areas.

Photo 1 – Rear right side temporary bracing

Photo 2 – Rear left side temporary bracing

Investigation of the pile foundation revealed that no work had been completed as designed in the "Column Repair Plan" which had called for two sister piles to be installed at 10 locations of existing pile locations. These were located around the perimeter with connection details to the existing piles and band framing.

Photo 3 – Corner pile with no pile repairs

The roof truss system appears to have been field constructed. Observation of the framing indicates sagging over the approximately 36 foot span. The butt spliced connections with plates have significant gaps. There were also noted vertical framing elements out of plumb.

Photo 4 – Roof framing

Photo 5 – Roof Framing

Also noted during inspection are plates and hardware showing signs of corrosion from the exposure to the marine environment.

Photo 6 – Truss plate

RESULTS AND ANALYSIS

Following discussions with building inspector Tim Evans, it is our understanding that the pavilion structure was in very bad condition at the time of the structural repair designs. While it is difficult to estimate the remaining life of the existing structure as improved, it is evident that

the column repairs, which were designed by an engineer were never implemented. Although this may contribute to the sagging of the roof framing members, there are additional factors such over-spanned beams, poor connections, design flaws, corrosion, etc that are negatively impacting the structural integrity of the pavilion.

CLOSING

Based on our investigation and evaluation, the pavilion was not repaired/improved in accordance with engineered plans completed in 2010. When coupling the pile repair work with roof truss repairs, framing repairs, soon to be needed decking restoration, likely roofing replacement, and other aesthetic improvements, these costs likely approach or exceed the current value and/or replacement costs of the 14 year old structure. We would recommend that consideration be given to replacement of the existing pavilion. For the purpose of this letter report, we expect the short term to mean that either repair or replacement plans be complete within 12 months with repair, replacement or demolition occurring within the 12 subsequent months.

If you have any questions or concerns, please feel free to contact us.

For the Firm,

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