

Structural Evaluation of the Saltaire Yacht Club

by architect Nick Petschek

Existing conditions

North building

Field inspection of the existing foundation revealed that the settling issues have been on-going for years. At various times, at least several efforts have been made to shore up the foundation, by both shimming and raising different sections. These efforts have not been comprehensive or uniform across the building and indicate that settling will continue unevenly.

South Building

The majority of the foundation of the south building was found to have not suffered the same settling problems as the north building. However, the piers beneath the northern and southern edges of the main room are being impacted by the settling of adjacent areas. To the south, the foundation under the bathrooms, storage, and grille areas was found to have settled considerably, and is impacting the southerly piers of the main room. Similarly the piers beneath the northern edge of the main room are being impacted by the settling of the north building.

Project Objectives

The goals of the immediate work emphasize correcting the existing structural problems and putting the building on the right course going forward. In that way, future maintenance costs can be minimized and the lifespan of future replacement and refurbishment work will not be undermined by the existing problems.

Structural Analysis

Analysis of the existing structures pinpointed the causes of the settling, and simultaneously uncovered the history of modifications leading to and exacerbating the present problems. The structural analysis revealed that the causes of the displacements of the foundation stemmed from the additions, modifications and alterations that had been undertaken to the original 'north' and 'south' buildings.

The analysis revealed that reposting the structure in its present configuration would be more expensive than typical, because these alterations were performed without due consideration to the distribution of loads.

The present condition of the alterations and additions to the original buildings also indicated that significant reinforcement and restoration work beyond the foundation would be required after re-leveling and reposting the building. This repair work would be particularly complicated, as some of the past alterations had been undertaken after areas of the original buildings had already undergone some settling and have since settled further.

History

The north building was most likely the older of the two buildings, and consisted of the bar / sitting area and part of today's kitchen area, with an exterior porch to the north. The "ballroom" (south building) was constructed sometime thereafter, with a covered porch along its southern edge. The south building was built approximately 8' away from the north building, and may have had a small passageway or deck connecting the two.

Over the years various alterations and additions have been undertaken to both buildings:

- 1) The north building's covered exterior porch was enclosed and a large section of the load bearing wall between the sitting area and porch removed and replaced with a beam
- 2) An addition, most likely a shed /storage area, was added to the east side of the building. Thereafter the kitchen area was expanded into this shed/storage area by removing the load bearing wall of the east side of the original building and replacing it with a beam.
- 3) The north building was expanded into the area between the north and south buildings, and the connection between the two buildings was widened. In doing so a large section of the bearing wall along the south wall of the original north building and a large section of the bearing wall along the north edge of the ballroom were removed and replaced by beams
- 4) Similar to the north building, the covered porch along the southern edge of the ballroom was enclosed at some point and converted to today's bathrooms, storage areas and grille area

Where original load bearing walls were removed, and replaced by beams, the weight distribution of the building was altered, producing concentrated loads. In turn the loads on some of the building piles were significantly increased and others decreased; this has lead to the uneven settling of parts of the building.

When the porches were enclosed, in both the north and south buildings, the deck framing was not replaced, but simply built over. Not originally designed for the additional weight, both have settled significantly.

Summary / Recommendation

As the issues behind the existing settling problems extend beyond the foundation itself, and suggest above average repair costs, project costs were reviewed with consideration to the scope of work planned in the next few years.

In analyzing whether it would be more cost effective and prudent to repair or replace the additions to the original buildings, preliminary construction cost estimates indicate that both approaches would be similar.

Repairing the existing additions to the original buildings would allow for the work to be phased over the following years. However, replacing them would provide the opportunity to correct the structural issues within the building, which have led to the existing settling problems.

Furthermore, replacing the additions would provide the opportunity to reinforce the main load bearing girders of the southern building; restore the north building to its original configuration; and better reconfigure the spaces that have been added over the years

For the reasons mentioned above it was recommended to the board that restoring the north building to its original configuration and replacing its additions would better serve the long term goals defined in the projects objectives. Doing so would be in keeping with the Village aesthetic, respect its local history, and comprehensively address the structural settling issues that have plagued the maintenance and upkeep over the years.