Completion Report DraFt

Section III Text (Columns and Bases – Front Entrance)

Sources: 1995 Conditions assessment, Dec 1997 interim report, and www.acksite.com (Dirk Van Lieu)

Part one: Prior Condition report of East Façade

A thorough conditions assessment was undertaken for the United Methodist Church of Nantucket in April of 1995. At that time it was recognized that a number of structural problems existed. The causes of these were numerous and the decision was taken to address each in a prioritized, phased work plan.

Settlement cracking and moisture penetration on the east façade were severe. As a result, the water shedding system and the foundation were restored in the first phase of the project. (See interim report 1997). The cracking patterns seen on the column bases were ultimately traced to the roof system, which in 1845 was changed from hip to gable.

The present roof structure comprises the pediment and portico on the east façade and was constructed as an a stylistic modernization and show of the Church's prominence. The original roof is a superior example of hip framing, but was never intended to support the massive gable roof that extends from it. The supporting members of the gable were undersized, too few in number, and incorrectly spaced to carry the roof load. Consequently, the original timbers of the hip roof were compromised (fig 9 IR97 and below).

Figure 1: Standing on hipped roof with gable roof above

Figure 2: undersized members are inadequate to support gable. Columns are taking the weight.

Figure 3: Detail of poor construction methods

Figure 4: Roof details under the hipped roof. Note the size of the original timbers

Figure 5: Here undersized outriggers struggle under their loads

The effects of uneven weight distribution were further evident in the columns and bases that support the pediment. The scrolled volutes at the top of the columns show cracks resulting from the roof-load. It should also be noted that water, which had breached the column added additional weight that was not included in the original carrying capacity of the columns.

Figure 6: General conditions of bases prior to Phase II

Figure 7: Missing mortar and cracking are the result of loading

The pedestals bases suffered from various types of deterioration, resulting from improper calculation of the load, as well as water infiltration. Where the pedestals were clad in wood, rot occurred as a result of water penetration (fig 37 CA95). Without historic photographs, it is impossible to say whether or not the wooden cladding is original.

Figure 8: Water infiltration through columns has rotted wood bases

The narrower stone bases on each corner had very little paint remaining on them. This was due to water runoff and the corrosive effects of fungal growth. The entire corner of the northeast face is missing paint. It was obvious that water streamed over these bricks. Apparently, some repair repointing had been done on this section of the northeast corner pedestal.

Other column pedestals showed signs of similar damage and inappropriate repair. Missing mortar joints in a step cracking pattern were noted on the east face of the third column from the left (facing the building) (Also see fig 39 CA95). This indicated some settlement again due to the burden of the load, water damage, or most likely a combination of the two. Just above this section of step cracking, the wooden surround of the top of the base showed signs of water infiltration. The corner seam failed and abraded paint was common on this pedestal.

We originally suspected that water damage from a failed shedding system was the sole cause of the masonry and base deterioration noted. The addition of modern mortars and infill also contributed to the problems on the bases and pedestals.

Figure 9: Detail of masonry failures, fungal and mold growth and bad mortar match

Masonry units were covered with fungal and mold growth especially where the stairs met the pedestals. Cracked and missing bricks were seen in this area where moisture was held in the masonry units because of improper ventilation at the juncture of the stair. A band of repair mortar had been applied four courses above the missing brick. The mortar was high in Portland cement content, likely making it stronger than the masonry units themselves. This may also have contributed to the cracking and missing joints in the area. Replacement of the wood and re-pointing of the masonry on this base were suggested as well (figs 41-42 CA95).

The southeast corner suffered from similar problems. Improper re-pointing, mold growth, and water damage were common here. The presence of organic growth prevented the brick from drying out, which facilitated the deterioration of the base. Step cracking and brick displacement occurred.

The re-pointing that was done in repair appears to have been done without considering the strength of the mortar or the appropriate color. Joint size also failed to receive consideration (figs 43-45 CA95). Proper mortar matching is essential to the stability of any masonry construction of repair. When improper mortar is used, the variation in tensile and structural strength can have a profoundly negative effect on the integrity of masonry units, as evidenced on these brick piers.

Although it was originally planned to address the masonry issues in the first phase of restoration, the conclusion was that the roof loading was equally at fault for the condition of the bases as was the inappropriate mortar and repointing. Therefore, in phase II, we decided to deal with the retrofit of the roof in two stages. First, we would remove the load from the columns through the stabilization and rebuilding of the piers and insertion of structural posts within the columns, then to address the roof itself. With the help of MHC, the piers and columns are now able to support the gable end. In stage 2 of this phase, we shall retrofit the roof itself adding appropriate strength and bracing missing in the construction of 1845.

Figure 10: Partly crushed and missing bricks lead to a closer examination of causes.

Figure 11: Detail of conditions found

Part Two: Restoration in Progress

The goal of the second phase of restoration was to strengthen the column bases and supports so that they would be able to sustain the loads from the gable end. As was evident in the conditions in 1995 which continued to worsen through 1998, the bases had failed and the volutes were splaying slightly. Wood grain under the microscope had warped from the loads as well as water damage.

The first step in the process was to stage the front of the building. The concept behind the stabilization was to remove the brick piers and rebuild them first sinking helical anchors then creating a concrete form which would be faced with brick. The columns would have to be suspended during the process. The firm of Coastal Engineering working with Billy McEarchen came up with a safe and effective way not only of supporting the columns but of placing the column bases and the granite slabs into place.

What follows is a summary of conditions found when we began to expose the areas beneath the columns and then a summary of each week of work.

Figure 12: Weather conditions allowed work to proceed in late January, 2000

It had been a toss up by the engineer of which work was best to do first: the columns/bases or the roof itself. As fund raising and visibility to maximize that are paramount concerns, the board chose to start with the work that the public could see. The hope was to finish the column work in time for spring so that the visitors to the Island could see that progress was indeed being made.

The steps and porch were removed. This allowed closer inspection of the conditions at the back of the column bases.

Figure 13 and 14: Steps removed prior to demolition and staging. The bases were made of three different materials: granite for the outer columns, concrete on the right two, and wood on the left.

Figure 15: Inspection reveals columns supported by rubble. It turned out also that only 3 columns has central post supports remaining.

gure 16: Slate roof tiles found tween brick pedestal and wood

Figure 17: Well intentioned 6X6 posts were to carry pedimen Now shims are loose

Figure 18: Wood bases now severely deteriorated

Figure 19: Stone base is cracked and brick support is failed

Figure 20: Looking up inside column, no more support

Figure 21: all manner of supports were used over time

Figure 22: A variety of materials made up the bases**.**

In the initial conditions survey of 1995, the column bases were found to be made of different types of materials including concrete and brownstone. Historic photos determined that the original bases were made of wood. Removal of the existing bases helped to reveal conditions inside the columns and their pedestals. With the existing conditions now assessed behind and underneath the column bases, we could be sure that the diagnosis and remedy were appropriate to the problems.

Figure 23: Removal of the bases allowed for inspection of the bottoms of the columns. Here the wood is largely intact. Note that rabbeting was used to secure column to base

Figure 24: Bracing minimized column movement prior to demolition.

While we have combined the conditions in this report, it should be noted that only two columns were braced and their bases replaced at any one time. This allowed for maximum support for the others. The process began with scaffolding and then tightly banded with timbers to prevent any shifting when their pedestals were removed. Helical anchors were driven in beneath where the new bases would be constructed to provide optimal footing support with minimal ground intrusion. The process of stabilization and reconstruction described here was repeated for each of the six columns.

Figure 25: The first helical support is positioned

Figure 26: A pressure gauge is used to ensure that the depth of at least 8 inches and pressure are sufficient. The gauge indicated 1700psi.

Figure 27: 3 anchor caps and rebar are welded together before footing is poured.

Figure 28: The footing is poured to create the foundation for the pedestal and to help to take the weight of the gable roof.

Figure 29: A form was created for each of the pedestals. This was secured with steel straps

Figure 30 and Figure 31: Forms are filled with concrete mix

Figure 32: While the column is still suspended, 6X6 wooden support is positioned within the column for further stability and to prevent the load from sitting on the historic column itself. The granite slab is temporarily placed on top of the footing.

Engineering and careful calculation were a big part of this process. Weekly evaluations of the work were undertaken by the LPC in consultation with project engineer, Coastal Engineering. All materials were selected to match those found in historic photographs.

Figure 33 and 34: Mortar samples were made up by the mason for LPC approval based on the mortar analysis report provided by Jablonski-Berkowitz Conservation in New York. While the color and texture were matched, the hardness was made to be compatible with the new brick selected to face the pedestals.

Figure 35: An acid wash over the brick removes final debris

Figure 36: The back of one of the reconstructed pedestals prior to the acid wash

Figure 37: The new mahogany base is fitted into place but will remain suspended until the granite cap for the pedestal is finally positioned.

Figure 38: The base is centered. Note the cleats further securing the interior post. Where possible connectors were used to graft new pieces to existing posts.

Figure 39: Here is a mock up of the final pedestal and base system. Note that the base is made in three pieces and that it is suspended until the final positioning of the granite cap.

Figure 40: The column remains braced so no movement or shifting can occur

Figure 41: Mortar bed is applied before granite slab is repositioned.

Figure 42: Final mortar is applied beneath granite cap

While the decking was removed and the foundation of the front façade was exposed, the decision was made to parge the foundation wall. Wire mesh and parging were coated over the pourous and failing bricks in order to seal them and the church interior from further moisture penetration and damage.

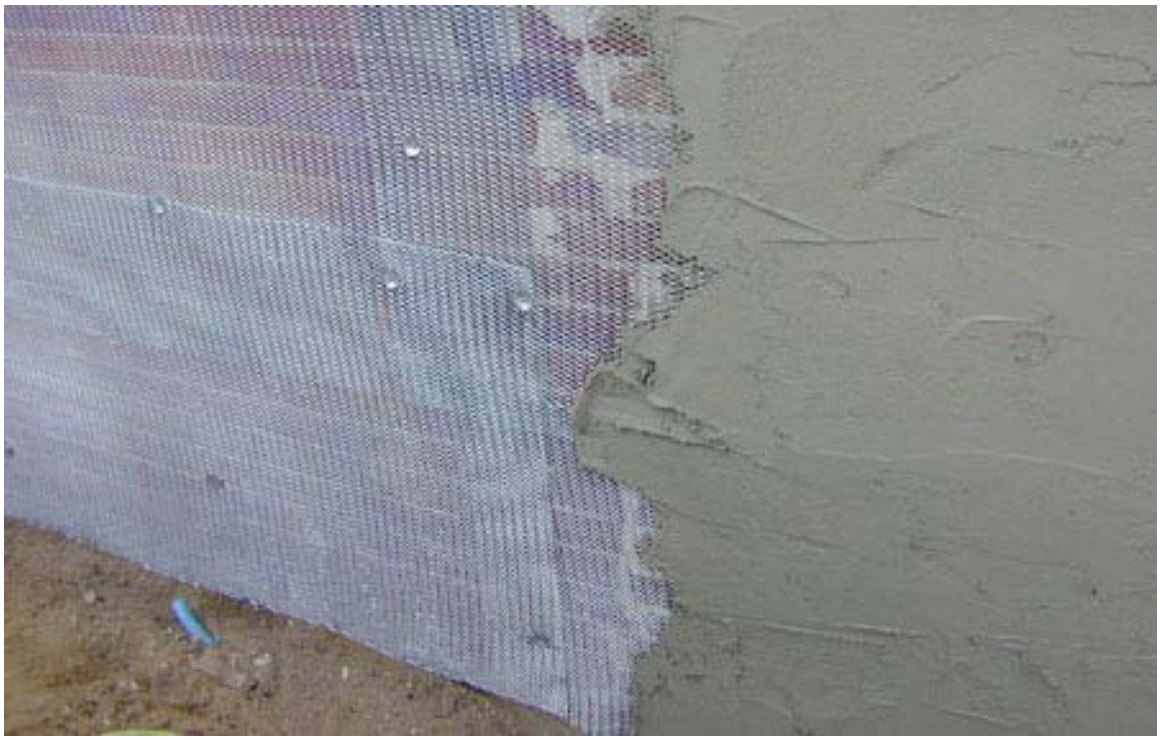

Figure 43: A skim coat of parging is applied to front façade foundation

Figure 44: Progress continued on the façade until all columns could resume their loads.

The final step in the process was to replace the decking and stairs. This was done during the last two weeks of April. The 2 Centre Street Board is presently deciding on the hand rail system to be used. Historic photographs will be presented to assist in the selection process. Now that the columns and deck have been completed the work on retrofitting the roof will begin. This work is scheduled to start in mid-July following all of the permitting. A generous contribution from the Tuppancy Harris foundation is enabling this work to be undertaken. We hope to install proper steps and catwalks in the attic to show students, interested members of the public and potential donors the incredible roof structures and explain how they are in fact an important representation of the cultural evolution of the Island as well as a unique historic feature of this wonderful building. All of us at the 2 Centre Street Restoration are ever so grateful for the continuing support of MHC on this project.

Part Three: Survey of completed work

Project introduction and History

The building has been in continual use since 1823. In those one hundred and seventy-two years, it has been used for activities, from political rallies to housing two community theaters and a coffee-house today. Its unique location at the top of Main Street on Nantucket makes it the perfect community gathering place and is certainly seen by all those who come to visit our island. The building is one of the few survivors of the catastrophic fire that consumed much of the town in 1846. Since that time, it has undergone many minor modifications. But the past twenty-five years have been difficult for the structure. Due to inflationary and recessional pressures on the small year round community, the building has not seen the type of continual care necessary to properly maintain such an historic structure. It is to the credit of its original builders, and certainly a prime argument for its preservation, that it remains in a condition that can be saved. Many of us who have explored this building stand in awe of its massive frame of mortise and tenon construction. It is precisely because of the strength of the framing members of the original 1823 roof that the poorly constructed roof addition of 1840 has not failed. Huge dowels some two feet in length have been driven through equally impressive framing members. The dramatic facade, front porch, and six columns reach out and tug at everyone who passes by this unique and monumental edifice.

Architectural History

1800 Original Methodist Church built on Fair Street.

1822 Peleg Mitchell sold Center Street property to Dr. Bartlett.

1823 Building completed and dedicated.

1830 Cellar rented to Jared Coffin.

1836 Aisle divided males from females. Trees removed from front yard.

1837 Cellar renovations begun to accommodate additional vestry space.

1840 Facade alterations performed in Greek Revival Style. (Coleman)
Interior alterations included lowering the pulpit.
Two pitched gable roof built over four pitched hip.

1844 Orientation of pews and pulpit reconfigured from East to West.
West gallery removed and second wall built over the original.
Pews at the rear of the church stepped, while side pews were raised.
Stairway to second level gallery added to the northeast corner of the Church.

1845 West end pews lowered. Changes made to the altar.
Cast iron column supports added to north and south galleries.

1846 Fire swept through downtown Nantucket, the Church suffered little damage.
Walk installed on the roof ridge.

1856 Traditional whale oil lighting replaced by gas fixtures.

1858 Repairs made to the exterior columns.

1859 Appleton organ installed in East gallery.

1866 Ventilators cut into floor in the center of side aisle.

1874 Eight pews removed to accommodate new stoves.
Trompe l'oeil mural painted on West wall (currently hidden by the organ)
A vestry begun in the basement of the Church.

1879 Basement vestry completed and occupied.

1893 Stair constructed from balcony to basement.
Organ moved to west end of church, covering Trompe L'oeil mural. Platform built at altar.Vestry enlarged by one-third, and entry moved to Rose Lane.

1901 Gas lamps hung from balcony.

1904 Maintenance performed on exterior columns and gutters.
Second floor space constructed above vestibule, extending into sanctuary at balcony level. Alterations made to pulpit. Addition of stairs and doors, blocking access from original stair. Pews removed in southwest corner to accommodate a new exit.

1909 Continued exterior maintenance performed.

1937 Basement excavated to provide more headroom for kitchen and bathroom.

1949 White coffered enclosure built for choir behind altar.
Interior stair repair and construction. Chimneys on west facade removed.

1954 Steel sections and wood beams replaced.

1959 The 160th anniversary of the Nantucket Methodist Church. The day was celebrated with he arrival of Bishop John Wesley Lord, and his wife. 1960's Basement renovations inclusive of foundation reinforcement and kitchen renovation.

1969 Historic American Building Survey documentation done.

1970 Dedication of Wesley Fellowship Hall in basement.

1981 Further documentation of the Church by Preservation Institute: Nantucket
Since 1981, only routine maintenance of the church occurred. No major structural alterations were made

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1992 Updated analysis of Church by Preservation Institute: Nantucket

1995 Building is placed on the Historic Massachusetts list of 10 Most Endangered Properties in the Commonwealth. The Two Centre Street Restoration Project, Inc. is formed to begin the preservation Process.

1996 Massachusetts Preservation Projects Fund grant application is submitted.

1997 An award of $93,000 is received for the first phase of stabilization. Stabilization work performed.
A second request for MPPF funding is drafted

1998 Continued fund raising and solicitation of donor support. Completion of stabilization work.
Received award of $60,000 plus an additional $40,000 from MPPF Round IV. Interim report submitted on completion of first stage of work.

1999 Work was begun late in 1999 to repair the columns are piers as requested work items in the round IV grant. Hillary Clinton and Richard Moe visit the site. Aggressive fund raising campaign is initiated under new Chairman, Bill Ferrall.

2000 May, 2000 work is completed on columns and porch. Donation from Tuppancy Harris is received allowing completion of the roof retrofit as described in the Round IV application.