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Memorandum

To:	Irene Chang-Cimino, General Counsel, LMDC
From:	Anne Locke, Michael Pappalardo, Molly McDonald, Elizabeth Meade, Diane Dallal, Warren Riess, Claudia Cooney
Date:	July 25, 2010
Re:	Ship Remnant WTC – Final Eligibility Statement and Short-Term Emergency Mitigation Plan

INTRODUCTION

Archaeologists from AKRF, Inc., working for The Port Authority of New York and New Jersey (Port Authority) to monitor excavation for the Vehicular Security Center (VSC) at the World Trade Center in the parcel formerly known as 140 Liberty Street, found a portion of a ship (Ship Remnant) on the morning of July 13, 2010. A Phase IA Archaeological Resources Documentary Study of the VSC site was prepared as part of the World Trade Center Memorial and Redevelopment Plan. Since the Ship Remnant was found expert archaeologists and conservators (see list) have been consulted regarding the find.

STATEMENT OF SIGNIFICANCE

The Ship Remnant consists of half of the lower portion of the hull and measures approximately 32 ft long, 15 feet wide, and 4 feet high. The deck and upper portions of the vessel were not extant. It is hypothesized that the wood on the upper part of the ship may have been removed at the time the vessel was sunk or placed in the landfill because it was in better condition than the worm-eaten wood. The portion that appears to be the rear of the boat may have been destroyed by construction of the cut-off slurry wall for the VSC. It is not known whether portions of the ship are extant on the east side of the slurry wall.

According to Norman Brouwer, the construction suggests that the Ship Remnant is from an ocean-going vessel. Warren Riess stated that the ship may have been a small trans-Atlantic vessel or that it may have been used between New York and Virginia or Barbados. Riess said that the ship was well built, but not up to the standard for Navy Board approval and probably was, therefore, a private vessel.

Further analysis would be necessary to determine both the date that the ship was constructed and the date that the ship was sunk in the location as part of landfilling efforts. Historic maps indicate that the original shoreline in this area of Manhattan was located near modern Greenwich Street. Evidence of landfilling west of Washington Street was first seen on historic maps dating to the late 1790s and the entire project

site was completely filled in by the 1830s. Therefore, the vessel may date to the 18th century and was likely used as a landfill retaining structure in either the late 18th or early 19th century. It is likely that we will be able to determine the origin of the wood used to construct the ship, its date of manufacture, and the country where it was constructed. It is also possible that its function can be determined.

By comparison, the ship found at 175 Water Street in Lower Manhattan in 1982 was much larger and more intact. That ship was over 80 feet long and was almost complete from top to bottom. In that excavation, only 18 feet of the ship could be safely removed before the site became too dangerous. On that site, 46 people had one month to finish the work. While the Ship Remnant is less intact than the vessel found at 175 Water Street, an effort can be made to compare the two finds and to compare the Ship Remnant to other sunken vessels. Such an analysis could include condition, depth, degree of preservation, and integration with the surrounding landfill.

While, as noted above, the Ship Remnant is less intact than the ship found at 175 Water Street, documentation of the Ship Remnant is still expected to provide valuable historic information. According to Riess, we have information about ships built for the Navy around that time, but little information about non-military ships, even though the majority of the ships were built for the private sector. Shipwrights, especially in America, did not record their designs or construction details. Merchant ships were considered mundane and not worth documenting. Yet, in a developing country, these ships were all important in helping New York evolve into America's preeminent trading center. Archaeologists have studied a few Navy and fewer private ships from this time period, but Riess believes that none similar to this ship has been studied. Therefore, Riess anticipates that the Ship Remnant could provide information about historic ship design, construction, and utilization. When considered in conjunction with archival information, analysis of the Ship Remnant should provide more details about the physical and economic development of Manhattan.

In a meeting at LMDC on July 19, 2010, it was generally agreed that the Ship Remnant would be considered eligible for listing on the State and National Registers of Historic Places. (Riess and Mackey)

Next steps for the Ship Remnant were considered.

PRELIMINARY MITIGATION OPTIONS

Retain and Preserve in Situ: The remains could be left in place and either the VSC project could proceed around them or be redesigned so as to avoid disturbing the remains. Port Authority has stated that this was not feasible given the plans for the VSC. This option would also present the greatest challenges since the dewatering of the site will quickly lead to the deterioration of the wooden remains. It may be logistically challenging to preserve the remains during the long construction process. Mackey also added that any chemical change in the environment, such as a concrete wall around the remains, could have an adverse effect on the wood, causing it to disintegrate and rendering any possibility of later excavation and study impossible assuming later retrieval was feasible. Finally Mackey and Riess agreed that the value of the ship was in being studied, and that would be difficult if it were retained and walled in on the site.

Removal and Preservation in a Single Piece: Experts and site engineers consulted have suggested that removal of the ship intact would not be possible due to the fragility of the remains. As noted above, Mackey and Riess agreed that a major value of the ship was in being studied, and that would not be possible if it were to be preserved as a single piece. In terms of preservation, the chemicals could not get to all the surfaces. In terms of study, the ship has to be taken apart to understand how it was built. Both also agreed that if money were no object, they would still prefer to take the ship apart to study and preserve it. Riess noted that is what was done for the ship found at 175 Water Street. Gary McGowan, a conservator who has been at the site and consulted, has also indicated that disassembly of the Ship Remnant is necessary to maximize recovery, to allow greater control over the support and stabilization of the individual boards and beams during removal, and to allow the different materials used in the ship construction, e.g. wood and metal, to be conserved separately as per appropriate standards and methods specific to those materials.

In Situ Protection, Excavation, Disassembly, Recordation, Packaging and Removal: This strategy has been pursued to date and involves documenting the ship through drawings, photography, surveying, and 3D laser mapping. Upon completion of documentation the ship would be disassembled so that the inner and outer hulls could be similarly documented. Riess and Mackey both agreed with this strategy.

In addition, immediate conservation techniques to stabilize, prevent, or reduce further deterioration of the wood would be employed along with appropriate packaging for transport off-site.

After documentation and packaging the disassembled ship remains would be removed from the site for preservation. Possible locations for preservation and storage include Port Authority's Hangar 17 at JFK Airport, a private commercial conservation laboratory in New Jersey, a conservation laboratory at the University of Maryland, and the conservation laboratory at Texas A&M University.

FINAL SHORT-TERM EMERGENCY MITIGATION

The Ship Remnant is rapidly deteriorating since its exposure to the hot summer weather and sunlight. In view of the exigent circumstances, we recommend mapping of the Ship Remnant in situ, to be followed by excavation, disassembly, removal and storage of the Ship Remnant under climate-controlled conditions for possible later reassembly, study, and preservation at a location to be determined.

This would consist of protection, recordation, excavation, disassembly, packaging, and removal of the vessel's components and associated artifactual material from the project site. This phase would take place immediately and last approximately one to 2 weeks from the day that excavation is initiated. This phase will consist of completion of the following tasks:

Task 1. Protection

Beginning Friday, July 16, 2010, the ship remains have been kept under geotech fabric and watered periodically. On Friday, July 23, 2010, a tenting structure was placed over the ship remains to keep it out of direct sunlight until it is completely removed from the project site. In addition, the remains have been and will continue to be kept wet to avoid drying out and deterioration. Protection will continue throughout the subsequent process of recordation, excavation, and disassembly. This protection will include the following components:

- The involvement of a conservator during the excavation and disassembly process.
- The careful wrapping and packaging of each element as it is removed under the direction of the conservator.
- The removed packages will be brought to the Maryland Archaeological Conservation Laboratory (MAC LAB) as soon as possible where it will be cleaned, immersed in water, and stabilized in preparation for long-term preservation.

Task 2. Recordation and Excavation

The recordation process was initiated Tuesday, July 13, 2010, through photography and mapping of the then partially exposed ship remains. On Friday, July 16, 2010, the exposed portions of the ship remains were mapped using a laser transit and a 3-D laser system. Recordation will continue with excavation once the upper-most ship element, the ceiling deck planking is removed, and the underlying ribs are exposed. Then, the ribs will be removed and the outer hull will be recorded. Finally, the hull will be removed, allowing examination of the underlying keel and examination of the underlying fill deposits. During the procedure of removing individual ship's timbers and after ship removal, the archaeologists will carefully document the stratigraphy and sample the soils upon which the ship remains are lying. Archaeologists will water screen through ¼ inch mesh all soils removed from between the ships ribs. In addition, a 1 liter sample of the soil removed from between each pair of ribs will be retained for flotation.

Each element of the ship will be mapped, photographed, and labeled before removal.

Task 3. Disassembly

After recordation, each element of the ship will be carefully removed from the ship remains to a work area located immediately adjacent to the ship remains. An appropriate number of field personnel will be utilized to carefully move each element. Elements will be gently disassembled in order to minimize impacts to the ship elements to which it may be attached.

Task 4. Packaging

During an initial site visit by a conservator, a simple pin test was carried out on random samples to determine the degree of degradation of the wood. It was determined that although the outer portion of the wood showed extensive deterioration and decay, that a well preserved core was intact. Evaluation of the deteriorated surface indicated loss of structure from several millimeters to approximately ¼ inch in depth.

If necessary, "first-aid" will be provided by the conservation team as individual sections are removed. Each element will be evaluated to determine if splinting or other support systems would be necessary to transport these materials off site to a designated conservation facility. These supports or splinting materials may include but are not limited to plywood, ethafoam, tyvek and polyethylene sheeting. Once the individual sections have been determined to be physically stable by the conservation team, they will each be wrapped in polyethylene sheeting and ethafoam. This will add a small degree of rigidity as the polyethylene will be wrapped several times around the individual wood sections. The most critical aspect of wrapping is to maintain the necessary moisture content of the water logged wood. This would be obtained using the polyethylene sheeting to create individual packages. These individual packages will be stored in a 10 yard steel container at the site for the duration of the disassembly process and packaging. This container will be adjacent to the excavation of the hull and will be covered.

The packaged materials would then be lifted by a crane to an awaiting truck which will bring the ship elements to Hangar 17 where they will be offloaded and carefully put into another container where they will remain for up to 2 days. The container with the ship elements will be loaded onto a truck and transported to the MAC LAB. At the MAC Lab, the ship elements will be cleaned and stabilized by conservators.

Implementation of the short-term emergency mitigation plan will take between one and two weeks, exclusive of the time required for cleaning and stabilization at the MAC LAB (which is expected to take several months but may take longer depending on the findings of the Lab conservators)..

Upon completion of all work described in the short-term emergency mitigation plan, an End of Field Letter will be prepared and submitted for review to SHPO, LMDC, PANYNJ, and the New York City Landmarks Preservation Commission. The End of Field Letter will also be provided to the Advisory Council on Historic Preservation. Upon acceptance of the End of Field Letter by LMDC and SHPO, LMDC in consultation with PANYNJ and SHPO, will provide clearance for construction to resume in the location of the Ship Remnant.

Public Outreach

Information regarding the mitigation plan shall be disseminated to the public via postings on LMDC's website, including images of the work and descriptive text.

Field Team

The plan would be implemented by AKRF in cooperation with Warren Riess and his associated staff, and with support from MAC LAB, Lamont-Doherty Earth Observatory and Corinthian Data Capture, LLC. The principal members of the team will consist of the following:

A. Michael Pappalardo, AKRF, Inc.: Mr. Pappalardo would serve as the Project Manager, and the liaison among SHPO, LPC, LMDC, PANYNJ, and any other involved agencies. A number of professional AKRF archaeologists and support staff will also participate in this mitigation effort, including Diane Dallal, Molly McDonald, and Elizabeth Meade. Diane Dallal will also serve as the project's Lab Director.

Warren Riess, Ph.D. would serve as the Principal Investigator for the project. Dr. Reiss is a professor at the University of Maine and has decades of experience documenting historic vessels dating to the 18th century. His services will be provided through his company Pemaquid Art & Science.

Carrie Fulton, Cornell University, is a highly regarded specialist in the field of ancient ship analysis. Ms. Fulton will serve as Assistant Principal Investigator and will assist Dr. Reiss in ensuring that all professional standards for documentation and analysis are followed.

Gary McGowan, Cultural Preservation and Restoration, would serve as Conservator for the non-ship artifacts. Mr. McGowan is highly regarded in the field of materials preservation.

Maryland Archaeological Conservation Laboratory (MAC LAB) will provide conservation services. They have all of the staff and facilities necessary to ensure the success of the emergency mitigation plan.

Lamont-Doherty Earth Observatory will provide dendrochronology and tree genus identification. Species identification may require other specialists not yet identified.

Corinthian Data Capture, LLC will provide 3D laser mapping during field documentation.

POTENTIAL LONG-TERM MITIGATION

The question of where to display or store the ship is important to consider and resolve, after the emergency protective measures are in place. We will discuss those options in a future memorandum, but emphasize that immediate action is required in order to preserve the Ship Remnant and preserve options for future treatment and study.

Experts consulted:

Brouwer, Norman, former Maritime Historian at the South Street Seaport Museum, July 15 (site visit)

Mackey, Doug, Archaeologist, NY SHPO, July 14 (site visit), July 19 (LMDC meeting and site visit)

McGowan, Gary, Conservator, Cultural Preservation and Restoration, July 14, July 16, July 19 (site visit)

Pederson, Neil; Kevin Anchukaitis, and Brendan Buckley, Lamont-Doherty Earth Observatory, (dendrochronology experts), July 18.

Rakos, Lynne, US ACOE on DRIFT project (abandoned vessels), July 15

Reiss, Kathleen, archaeologist /illustrator, July 19 (LMDC meeting and site visits)

Reiss, Warren, archaeologist, University of Maine, excavated 175 Water Street Ship, July 15 and July 19 (LMDC meeting and site visits)

Sutphin, Amanda, Archaeologist, New York City Landmarks Preservation Commission. July 14 (site visit), July 19 (LMDC meeting and site visit)