

REPORT AND RECOMMENDATIONS ON ADDITIONAL SEARCHES FOR HUMAN REMAINS AT AND IN THE VICINITY OF THE WORLD TRADE CENTER SITE

SUBMITTED OCTOBER 27, 2006

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Overview

Pursuant to your request at our meeting on October 20, we have worked with City, State and private entities (i) to review underground areas in the vicinity of the World Trade Center site that were searched during the post-9/11 recovery effort; and (ii) to identify any additional areas that may not have been inspected where human remains could be recovered. This report describes the review that was undertaken and makes recommendations for additional searches that should be conducted in areas where human remains could be found and for a protocol that should be established for future excavations at certain locations at the WTC site as construction continues.

With respect to additional searches, we first ruled out areas where there is no basis to believe that human remains could be found and that do not warrant further review. The recommendations that follow fall into two categories: (1) areas within the confines of the WTC site where further excavation and investigation should be undertaken due to the possibility that human remains could be found; and (2) subterranean structures, buildings and rooftops in the vicinity of the WTC site that should be inspected to ensure that they do not contain human remains. The final recommendation proposes a protocol for future excavation of certain areas at the WTC site.

Background

On Wednesday, October 18, Con Edison opened a manhole¹ to an abandoned electric system that had been partially destroyed by the collapse of the North Tower to perform a routine verification that the manhole was not live. The manhole box proper was four feet below the haul road street bed and was filled with debris, which Con Edison removed. The larger debris was removed by hand and left at the site for the Port Authority contractor to remove, while the smaller debris was removed using a Con Edison vacuum truck, which returned to its base of operations on West 28th Street. On Thursday, October 19, while preparing to dispose of the larger debris, the Port Authority contractor noticed what looked like human remains. The Office of the Chief Medical Examiner (OCME), Police Department (NYPD) and Fire Department (FDNY) were contacted. Con Edison later confirmed that the vacuum truck with the smaller debris was still contained and OCME and NYPD were called to the West 28th Street facility. Human remains were found in the debris at both locations.

Con Edison then sought to identify any other subterranean structures that were part of the same abandoned electric system within the WTC site so that those locations could be searched for human remains. Based on surveys that were conducted through October 20, Con Edison identified 10 possible structures that were abandoned after the 9/11 attacks and that had to be located, excavated and searched for human remains. At our initial meeting on October 20, you requested that OCME, with the support of NYPD, FDNY, Office of Emergency Management (OEM) and the Port Authority, mobilize a search and recovery operation to sift the material recovered from Con Edison's structures. That operation commenced on October 21 and is still under way.

¹ Con Ed opened the manhole at the request of a Port Authority contractor working on the West Street haul road.

Many of the Con Edison manholes were buried under the haul road, requiring the excavation of several feet of rock and soil to expose the roof of these structures. During one of these excavations, workers noticed a layer of potential WTC debris above the manhole roof, but below the clean fill that formed the base of the haul road. In addition to identifying subterranean structures that could contain WTC debris, this discovery prompted us to consider the possibility that debris could be located under portions of the haul road and the surrounding area. Finally, because OCME was already working with the Department of Environmental Protection (DEP) and other City agencies to identify buildings and rooftops in the vicinity of the WTC site where human remains could be found, we have considered that issue as part of this analysis.

Analytical Process

On Tuesday, October 24 and Wednesday October 25, the Lower Manhattan Construction Command Center (LMCCC) and the Department of Design and Construction (DDC) convened meetings with City and State agencies and private parties who participated in the WTC recovery efforts and/or are responsible for infrastructure in the vicinity of the WTC site (see attached map). Participants at these meetings included the Port Authority, the New York State Department of Transportation (NYSDOT), Con Edison, Verizon and its subsidiary Empire City Subway (ECS), Lower Manhattan Development Corporation (LMDC) and the Battery Park City Authority. This group reviewed documents, maps and photographs depicting conditions immediately after September 11, 2001; the various stages of debris removal and roadway restoration; and the WTC site and infrastructure in the vicinity as it appears today. We engaged in lengthy and detailed discussions with those who supervised the recovery work and had first-hand knowledge of the facts and circumstances. These discussions centered on identifying those areas where the collapse of the towers crushed hard surfaces into the ground, making it particularly difficult to ensure that all the debris was removed. The group concluded that in these areas, it is possible that some debris and human remains were inadvertently buried and could remain buried today.

On Wednesday, October 25, we requested that the entities responsible for subterranean infrastructure at and in the vicinity of the WTC site, including DEP, The Metropolitan Transportation Authority (MTA), Con Edison and Verizon/ECS, identify all of their facilities and determine (i) which structures were rebuilt or newly constructed after September 11; (ii) which structures existed on September 11 and remain in active use; and (iii) which structures, if any, existed on September 11 and either have not been entered since the attacks, or have been deactivated or infrequently accessed since that time. The goal of this process was to identify subterranean structures where human remains or WTC debris from the site could be found and to develop a recommended protocol to inspect those locations. We also reviewed the Final Report of the FDNY Recovery Team that searched buildings in the vicinity of the WTC site, and we were briefed on the work DEP did in 2002 and 2003 to inspect rooftops and building exteriors in and around the WTC site.

Based upon this analysis, the group concluded that there is no basis to believe that human remains would be found and that no further investigation was necessary at the following locations:

- *West Street (proper)*: West of the haul road, the original concrete roadway remained largely intact, rendering it highly unlikely that WTC debris penetrated below the road's surface. When the New York State Department of Transportation (NYSDOT) constructed the current roadway, most of the original roadway was removed and the earth beneath was excavated several feet down before the new roadway was built on top. It is unlikely that any debris that fell onto the roadway would not have been removed as part of this process. Further, Con Edison and Verizon built extensive new systems in the areas west of the roadway to replace those that had been destroyed. We believe that West Street was cleared of WTC debris.²
- *Liberty Street*: Liberty Street was partially reconstructed from West Street to Greenwich Street by Con Edison, Verizon and DDC as part of their efforts to restore utility service in Lower Manhattan. We consider those portions of Liberty Street that have been reconstructed to be clear of WTC debris.
- *Vesey Street*: Vesey Street from West Street to Church Street was also reconstructed during the utility restoration effort and to accommodate the decision to shift the south façade of WTC 7 22 feet south. We consider Vesey Street to be clear of WTC debris.
- *WTC Bathtub*: We also consider the WTC bathtub to be clear of WTC debris. The entire existing bathtub has been excavated to the basement slab and the north and south projections have been thoroughly searched. The areas around the subway box running through the WTC Site were also completely searched and reconstructed. WTC 5 and WTC 6 remained substantially intact after the attacks until they were demolished by DDC, and the H&M structures beneath were sealed prior to September 11, removing any concern that there might be remains in the area that will become the future east bathtub.

The group further concluded that the following areas could potentially contain human remains and warrant further analysis:

- *West Street Haul Road*: The West Street haul road is a 60-foot wide stretch of pavement running the length of the WTC site (from Liberty Street to Vesey Street) along the western edge of the bathtub, just inside the current WTC site perimeter. DDC twice constructed the haul road to facilitate truck movement around the WTC site—first shortly after September 11 using millings, gravel and fill, and a second time using traditional asphalt in March 2002. The materials

² This does not include two Empire City Subway manholes that we recommend should be re-inspected in accordance with the protocol described in the recommendation below regarding subterranean structures.

used to create the original haul road were removed before the current haul road was constructed. Two areas of the haul road are of interest: (1) the area between the two projections in the slurry wall; and (2) the area south of the south projection to the north side of the Liberty Street pedestrian bridge. In both areas, the surface of West Street was crushed during the collapse of the South Tower. Once the roadway was smashed, these areas became susceptible to further crushing under the weight of the heavy construction machinery used at the site. Although the original haul road was removed and the area excavated, we concluded that it is possible that the excavation for that construction was not deep enough to guarantee that all WTC-related debris was removed. A layer of debris may still exist above the crushed original roadway surface, but below the base of the existing haul road. This could explain the discovery of WTC debris in the material recently excavated to access certain Con Edison manholes under the haul road.

- *140 Liberty Street Parcel:* The parcel of land bounded by Liberty Street, West Street, Cedar Street and Washington Street is commonly referred to as the 140 Liberty Street parcel. Prior to September 11, the only structure at the 140 Liberty Street parcel was the St. Nicholas Greek Orthodox Church, which was destroyed on September 11, while the remainder of the parcel was used as a parking lot. The parking lot was likely constructed using a few inches of macadam on fill, which would have been easily crushed by the collapsing South Tower. During the recovery effort, the 140 Liberty Street parcel was cleared of debris and paved to serve as an access road to the debris pile. The area is currently used as an access point for the ramp into the bathtub, as a staging area for construction vehicles and a place to keep construction trailers. Here, too, it is possible that the excavation for the construction of this site's current condition was not deep enough to ensure that all WTC debris was removed.
- *Surrounding Streets:* The discovery of debris inside Con Edison manholes and service boxes raises a question as to whether there are similarly situated subterranean structures in neighboring streets. Reconstruction efforts in the vicinity of the WTC have been extensive, and as much as 60-70% of the subterranean structures on the neighboring streets have been replaced or rebuilt. Nonetheless, it is possible that WTC debris or human remains could be in a subterranean structure in one of these streets, though that likelihood diminishes as the structure's distance from the WTC site increases.
- *Buildings and Rooftops in the Vicinity of the WTC site:* We reviewed the FDNY Final Recovery Team Report and consulted with FDNY to determine which buildings in the vicinity of the WTC site warrant further searches of their interiors. With respect to rooftops, DEP, using protocols approved by the federal Environmental Protection Agency, undertook inspections of a substantial number of building rooftops and exteriors in 2002 and 2003. After the discovery of human remains caught under the stone ballast on the rooftop of 130 Liberty Street (Deutsche Bank), the City conducted a thorough examination of its records and

the rooftops in the vicinity of the WTC site. This examination included a visual inspection of area rooftops by NYPD and OEM to determine if any other buildings in the immediate vicinity of the WTC site used stone ballast. This examination resulted in a determination that there are two rooftops—1 Liberty Plaza and 20 Dey Street (Millennium Hotel)—that had stone ballast which we could not confirm had been removed or replaced since September 11, 2001.

Recommendations

Based on the analysis above, LMCCC and DDC, in consultation with the City and state agencies and private utilities that participated in this review, offer the following recommendations:

1. Areas within the WTC site that warrant further review.

Based on our review, there are two primary areas that warrant further excavation within the WTC site along the periphery of the bathtub where support operations were staged or that was used as a primary means to access the bathtub (now and during the recovery effort). If debris is found at these locations we recommend that OCME sift the material for human remains in accordance with the protocols and standards that have been established for the excavation and review of the Con Edison structures that is currently under way.

- *Exploratory Excavation of the West Street Haul Road:* We recommend additional excavation on the West Street haul road. In the locations on the haul road where WTC debris was found during the current excavation of Con Edison's manholes and service boxes, excavation should be done in concentric circles until WTC debris is no longer found in the excavation. All material removed during the excavation, including fill, should be sifted for human remains. For the remainder of the haul road, DDC, in consultation with OCME, should develop a grid-based exploratory excavation program to ensure a comprehensive search of the haul road for WTC debris. If WTC debris is found at any location, excavation in concentric circles should be done in the same manner described above for locations where such debris has already been found.
- *Exploratory Excavation of the 140 Liberty Street Parcel:* The hard surface of the former parking-lot area of the 140 Liberty Street parcel was crushed by the collapse of the Towers. Today this area has been reconstructed as an access point into the bathtub, but the excavation undertaken to create that access may not have removed all WTC debris. DDC, in consultation with OCME, should develop a grid-based exploratory excavation program, similar to that for the haul road, for the entire 140 Liberty Street parcel and those portions of Liberty Street that have not been reconstructed.

2. Areas in the surrounding neighborhood that warrant further review.

- *Subterranean Structures in Neighboring Streets:* We recommend that DEP, Con Edison and Verizon/ECS conduct a visual inspection of all structures that have not been reconstructed or routinely inspected since 9/11 on streets adjacent to the WTC Site, including manholes, service boxes, sewer regulators and any other subterranean structures in the vicinity of the WTC site. The initial search area should be defined as the area bounded by Barclay Street, Broadway, Albany Street and the Hudson River, inclusive (see attached map). If debris is found in any structure, the search area in the vicinity of that structure should be expanded in a concentric-circle pattern until no WTC debris is found. If WTC debris is found during a visual inspection, OCME should be called-in to sift any debris for human remains. We also asked the MTA to identify its subterranean structures in the vicinity of the WTC site, which consisted mainly of drip pans. MTA informed us that the drip pans in this area were cleaned soon after 9/11 as part of a targeted effort, and that the pans in the vicinity are on a schedule to be cleaned every 3 years. Thus, there is no basis to believe that human remains could be found in the MTA subterranean structures and we do not recommend any further inspection of those facilities.
- *Building Interiors:* We reviewed reports of FDNY's extensive searches of buildings in the vicinity of the WTC site after the attacks and the procedure developed by OCME for the search for human remains at 130 Liberty Street (Deutsche Bank). That procedure involves an assessment by OCME of areas within the building that were damaged or exposed to the outside environment on 9/11 and a continued search for remains during the decontamination of the building. Based on our review of this material and our knowledge of affected buildings, we recommend that an inspection process that adheres to the same high standards in place at the Deutsche Bank building be undertaken during the decontamination and deconstruction of Fiterman Hall and during the decontamination and renovation of 130 Cedar Street.
- *Rooftops:* As noted above, during a recent review of rooftops in the vicinity of the WTC site, it was determined that stone ballast is located on the rooftops of 20 Dey Street (Millennium Hotel) and 1 Liberty Plaza and we could not confirm that such ballast had been removed or replaced since September 11, 2001. We have reached out to the owners of these buildings and they have requested that OCME, with the support of any necessary City and State agencies, sift the ballast for human remains. We recommend that this search be conducted as soon as is practicable in light of the operations currently under way.

3. Develop a Protocol for Future Construction.

- Finally, we recommend that a protocol be established to be included in all contracts for work in the vicinity of the WTC Site that requires an OCME presence during the initial excavation of any area that has not been excavated since September 11, 2001. The main projects affected by such a protocol would be NYSDOT's reconstruction of West Street from West Thames Street to

Chambers Street and the Port Authority's construction of the Fulton Corridor under West Street and the South Bathtub on the 140 Liberty Street parcel, which will house the Vehicle Security Center.

At your direction, the LMCCC is prepared to work with the Port Authority, City agencies, State agencies and private utilities to begin implementation of the recommendations contained in this report.

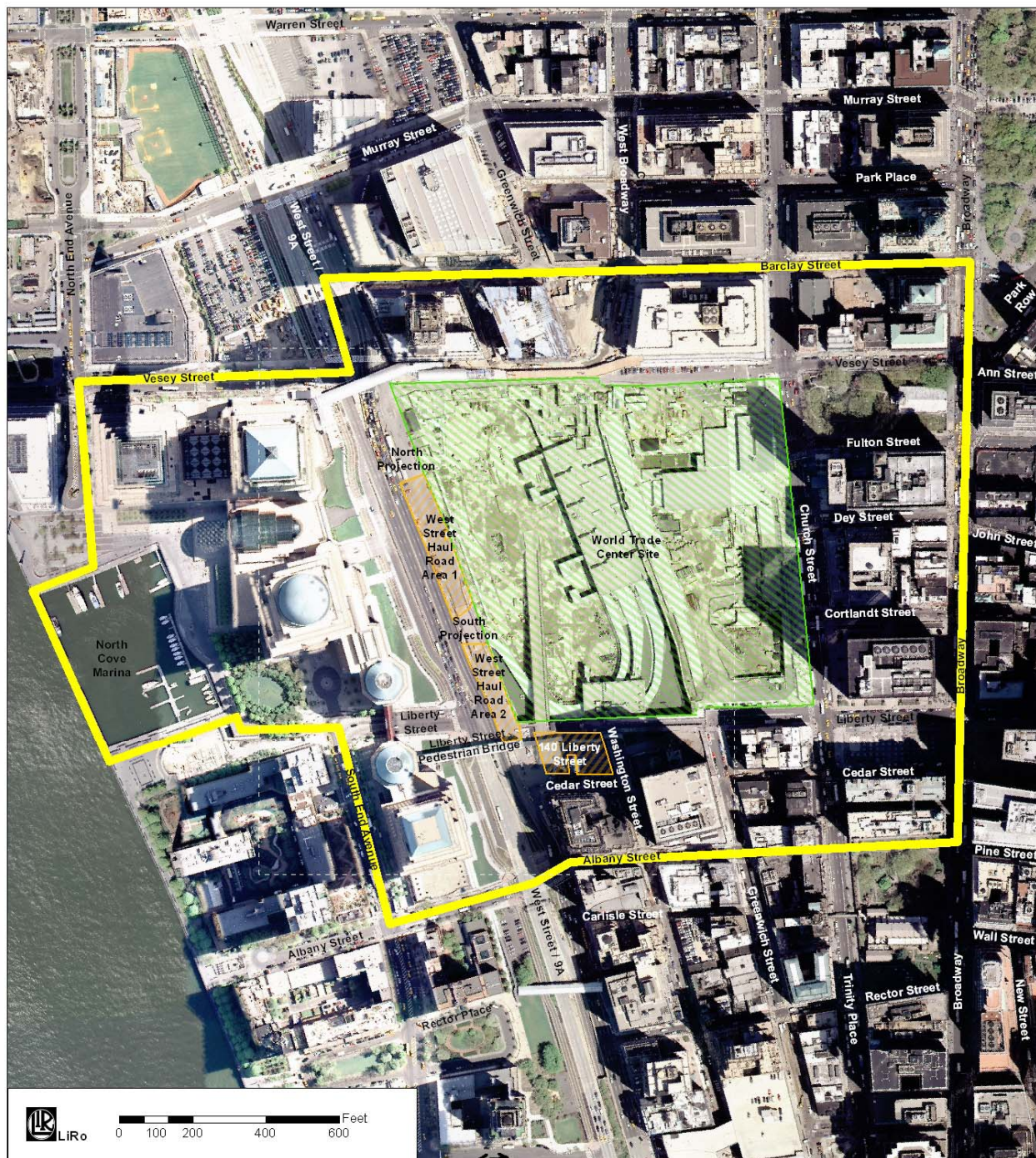


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Map of the World Trade Center Area

The basemap data used was provided by the New York City Department of Information Technology and Telecommunications.

The orthophotography shown was derived from aerial photography taken in May 2004.



Print date: 10/26/2006