



THE PORT AUTHORITY OF NY & NJ

Engineering Department

MINUTES OF MEETING

Date of Meeting: March 6, 2006
Location: NYC Department of Buildings, 280 Broadway, New York
Attendees: See Attached Attendance Sheet
Subject: WTC Memorial

Purpose:

Discuss Means of Egress and Code compliance in the WTC Memorial and Museum design with the Department of Buildings.

Discussion:

- The Memorial and the Museum are two separate facilities with separate entrances.
- The primary public areas of the Memorial are the two viewing galleries around the open reflecting pools on the footprints of the original towers, approximately 27 feet below the open plaza.
- Normal entry and exit from the Memorial is through two ramps to the Memorial Hall that is open to the viewing galleries. Due to its openness to the outside, the Memorial is classified as F-2 outdoor place of assembly.
- The exit facilities from the Memorial is provided by the two open ADA-compliant (1:12) ramps and fire rated, pressurized, and hardened exit passageways that lead to the exit stairs in hardened enclosures.
- The actual number of occupants in the Memorial will be controlled through time ticketing and the departure of visitors shall be monitored, even though the exit capacity provided significantly exceeds the occupant load prescribed in code Table 6-2.
- The normal entry to the Museum from the plaza level is through escalators that lead to a lobby approximately 20 feet below the plaza level. The Museum comprises a continuous ramp (1:20) system starting at the lobby level and terminating in a main exhibition hall at bedrock level approximately 50 feet below the lobby. High capacity escalators have been provided at the bedrock level for exiting purposes. However these escalators are not considered in the exit capacity calculation.
- The Museum is classified as F-3 assembly occupancy. The exit facilities from the Museum are provided by exit stairs and hardened, pressurized fire rated exit passageways that lead to the exit stairs in hardened enclosures.

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- The Museum exit capacity is based on projected occupancy (controlled by time-ticketing at a 5 minute interval) that is significantly lower than the occupancy load based on code Table 6-2. The code has a provision for occupant load modification; however, such modification should be justified and documented with proper design and procedures, such as time ticketing, monitoring departure of visitors, etc., for occupant load control.
- Exit passageways are permitted by code as horizontal extension of vertical exits (stairs). To facilitate emergency evacuation, the exit passageways should have enhanced photo luminescent signage and proper fresh air ventilation. Although not required by code, wherever feasible, the exit passageways should be widened to 8'-0" which is the minimum width of "safe areas."
- At the various levels of the Museum, minimum 3 independent exits where the occupant load is between 500 and 999, and minimum 4 independent exits where the occupant load is 1000 or more, are to be provided.
- Due to the complexity of multiple levels in the Museum, the exit stairs and exit passageways that can be accessed from each level, and the travel distances, should be presented in separate line diagrams for each level.
- Complexity of the site and physical restrictions necessitates use of transfer passageways between the stairs at some levels. The stairs and the exit passageways serve both the memorial and the museum. To provide additional security and safety to the evacuees, the stair discharge locations at the plaza level are placed remote from the main activity on the plaza, which makes some of the transfer passageways long. Proper evacuation plans and procedures for the Memorial and the Museum should be established and reviewed with the Fire Department.
- All exit stairs that are open at the top (subway type) at the plaza level and the open memorial ramps that also serve, as exits shall be provided with snow melting devices.
- The various levels of the Museum are open to the main lobby through the continuous ramp system. Due to this openness the ramp area and the lobby should be treated similar to an atrium and provided with fire alarm and communication system, smoke control, stand pipes, and other additional fire protection equipment that are required in an atrium.



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- A list of the enhancement in the means of egress and additional life system that are above the code requirement should be documented.
- The Port Authority will request another meeting with the Department of Buildings after all the items discussed at this meeting are incorporated in the design and plans are updated accordingly.
- The items discussed at the meeting will not impact the initial phase of construction which is scheduled to start 3/13/06 and is limited to the construction of some selected foundations.

Saroj Bhol, P.E.
Manager, Design Standards
Quality Assurance Division
The Port Authority of NY & NJ

cc: All Attendees

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

MEETING ATTENDANCE

Date: 3/6/06 TAA No: WTC 6000 Tenant: LMOC

Project: WTC MEMORIAL

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