



September 16, 2009

CODE CONSULTANTS
PROFESSIONAL ENGINEERS, PC

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The Fire Protection and
Life Safety Experts

• Code Consultation
• Alarm Systems Design
• Fire Sprinkler Design

RE: AUDITORIUM EGRESS
WTC MUSEUM PAVILION
PROJECT NO. 998426.50.012

Dear Mr. Miskucza:

This letter is intended to address compliance with the Building Code of the City of New York for the egress concepts of the auditorium that is located on the Second Floor of the Pavilion.

General Information

The World Trade Center Museum Pavilion is a 3-story above-grade structure designed in accordance with the 1968 Building Code that will serve as the entry location for the below-grade "National September 11 Memorial and Museum at the World Trade Center." The Pavilion will not only be the primary entry location for the Memorial and Museum, it will also serve as the security screening center and will have limited program space on the Second Floor, including an auditorium, a family room and a light refreshment area.

The Pavilion will be separated from the below-grade Memorial and Museum by a sprinkler and draft curtain in accordance with the Department of Buildings concurrence letter for the Memorial and Museum dated October 4, 2006. The ground floor level and the Second Floor level of the Pavilion will be connected by an unenclosed circulation stair. In addition, the security screening area on the ground floor level will be separated from the circulation stair by a 2-hour fire resistance rated shutter. The third level of Pavilion (the Mechanical Floor) will be completely separated from other levels by 2-hour fire resistance rated construction.

Auditorium Design

The auditorium (F1-b occupancy) on the Second Floor level of the Pavilion has 183 fixed seats and a stage/platform for lectures (see attached plans). Due to the size of the auditorium and the proposed occupant load, the occupant load density for the space is more dense than one person per 12 square feet. Therefore, in accordance with Section 27-534 of the Building Code, the auditorium must have classified exit openings.

In accordance with Section 27-534(d)(2), not less than 60% of the exit openings must be Class 1 exits and not more than 40% must be Class 3 exits. Class 1 exits are "exit openings that are used for normal entry to the assembly space, and that open directly to a safe area or to an open exterior space." Class 3 exits are "exit openings that open from the assembly space into corridors, exit passageways, or vertical exits."

The auditorium has been designed with doors at the rear of the auditorium that will be used as the normal entry to the space. A safe area has been provided at the southeast exit door from the auditorium that provides direct access to Exit Stair 2. The floor area of the safe area is sufficient to accommodate more than 60% of the auditorium occupant load and therefore qualifies as the required Class 1 exit opening.

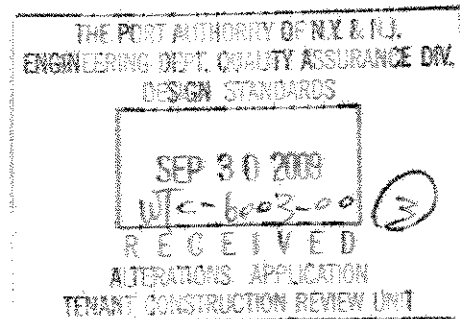


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September 16, 2009

Mr. Saroj Bhol
Manager Construction Design Standards QAD
The Port Authority of NY & NJ
Engineering Department
3 Gateway Centre – 100 Mulberry Street
3rd Floor
Newark, NJ 07102
USA



Dear Mr. Bhol:

Re: Auditorium Egress
WTC Museum Pavilion (Our project #0444-00)
TCA #6003.00 – Life Safety

Further to your request regarding the above-captioned project, please find enclosed letter prepared by "CCI Code Consultants Professional Engineers, PC", dated September 16, 2009 and drawing A0-122, dated September 16, 2009 with updated fire separations as requested.

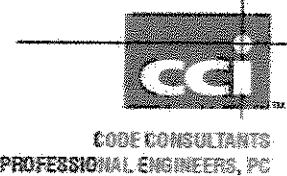
Should you have any questions, please do not hesitate to contact us.

Trusting the above is in order.

Kori Miskucza
Associate

cc: Lou Mendes
Ron Vega
David Jansen
Anne Lewison

NS11MM
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AAI
Sno



The southwest exit door from the auditorium can accommodate the remaining 40% of the auditorium occupant load. In lieu of opening into a corridor, exit passageway or vertical exit, it opens into the adjacent F-3 place of assembly which has direct access to an exit stair.

Class 3 Exit Opening

Because the exit door opens directly into another place of assembly in lieu of a corridor, exit passageway or vertical exit, as required for Class 3 exit opening, the F-3 place of assembly has been designed consistent with the requirements for a safe area, as follows:

1. The auditorium will be separated from the remainder of the building by 2-hour fire resistance rated construction.
2. Although classified as F-3 occupancies, the space outside of the auditorium on the second floor and the circulation space on the ground floor are circulation spaces that are not intended to be used as exhibit spaces for the Museum. The circulation use of these spaces is consistent with the definition of a safe area, which specifies that safe areas should be used for normal entry and may be used as corridors, lobbies, and lounges.
3. The circulation stair that connects the Ground Floor level and the Second Floor level is consistent with the requirements of Section 27-538(c) that permits unenclosed vertical exits that connect safe areas.
4. The Ground Floor level circulation area (safe area) is separated from the security screening space by a 2-hour fire resistance rated shutter.
5. Spaces classified as A, B-1, D-1 and D-2 do not open directly upon the circulation spaces, with the exception of two electrical closets adjacent to Exit Stair 1. These rooms will be separated from the circulation space by 3-hour rated construction to provide an additional level of compartmentation.
6. The F-3 circulation space has sufficient area to accommodate all occupants of the auditorium at 2 square feet per person. *40%?*

In addition to the safe area provisions noted above, the circulation space will also have the following fire protection and life safety systems:

1. A smoke control system that has been designed and analyzed using Computational Fluid Dynamics (CFD) modeling for the entire public volume of the space.
2. Egress systems that have been analyzed with computer-based models to evaluate the efficiency of the systems based on the proposed occupant loads and a series of evacuation scenarios.
3. Exit stairs that will be pressurized during emergency evacuation and that are enclosed in 2-hour fire resistant construction that is hardened to protect against damage from explosions.
4. Fire protection and life safety features, such as automatic sprinkler systems, standpipe coverage, occupant notification systems, emergency lighting and exit markings/signage.
5. Smoke detection throughout the F-3 circulation areas that is not otherwise required by the Code. The smoke detection will provide early detection of an event and initiate the automatic smoke control systems and occupant notification.

Mr. Kori Miskucza
September 16, 2009
Page 3



6. Emergency power for life safety systems, including the smoke control system, occupant notification systems, elevators and all emergency/exit lights.

With the design concepts outlined above, the exit facilitates from the auditorium comply with the requirements of the Building Code of the City of New York.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'Kevin Morin', is written over the typed name.

Kevin Morin, PE
Principal

/dmf

DRAFT

October XX, 2009

Ms. Fatma M. Amer, P. E.
First Deputy Commissioner
NYC Department of Buildings
280 Broadway, 7th Floor
New York, NY 10007

Re: World Trade Center Museum Pavilion

Dear Commissioner Amer:

Thank you for the meeting on August 26, 2009, to discuss the means of egress design of the WTC Museum Pavilion.

The pavilion, a 3-story above grade structure designed under the 1968 Code, will serve as the entrance and security screening center for the visitors to the below grade museum. The second floor of the pavilion will be used for limited program space for a family room, a light refreshment area, and an auditorium. The third level will be used as the mechanical penthouse.

The egress design of the pavilion is presented on the drawings listed below, which were discussed at the meeting and are enclosed with this letter. As suggested by you at the meeting, Level 2 Plan has been revised to provide the 2-hr fire rated separation between the auditorium and the circulation space outside it. Pursuant to the discussion at the meeting, CCI Code Consultants Professional Engineers, architect's code consultant, has specifically presented the auditorium egress concepts in the September 16, 2009, letter to the architect, which is also enclosed.

A0-121 -03	Level 1 Plan	Dated 12 Feb 09
A0-122-06	Level 2 Plan	Dated 12 Feb 09
A0-123-02	Level 3(Mechanical Penthouse) Plan	Dated 12 Feb 09

The Port Authority is of the opinion that the means of egress concept presented on the drawings and as analyzed in the letter meet the requirements of the building code. If you concur, I would appreciate your concurrence at the bottom of the letter and return of one copy.

Very truly yours,

Saroj Bhol, P. E.
Manager, Construction Design Standards

Concurred:

Fatma M. Amer, P. E.
First Deputy Commissioner

