



**Boston Fire Department
Fire Prevention Division
1010 Massachusetts Avenue – 4th Floor
Boston, MA 02118
Tel: 617-343-2043 Fax: 617-343-2133**

Guidelines for Smoke Control System Design Review and Acceptance Testing

The Boston Fire Department reviews smoke-control systems designed and installed in the City of Boston, prior to system acceptance testing. Smoke-control systems are considered to be an important fire protection feature for both building occupants and firefighters. Additional questions regarding such systems and their requirements can be addressed with the Boston Fire Department's Fire Protection Engineering office.

This guide is meant to provide engineers and building owners with the information required for fire department review, the accepted design standards and what is necessary to prepare for a successful acceptance test.

Information Required

The designer should submit the following information for review by the BFD fire protection engineering office as applicable for all smoke-control systems, including but not limited to, stair/vestibules, arcade and corridor evacuation, elevator shafts and vaults:

1. Floor plans with stair and vestibule (if provided) location.
2. Vestibule elevation with supply and exhaust grille and smoke trap details (if provided).
3. A full mechanical set of drawings and smoke control graphic annunciator schematic with acceptance stamp by the responsible design professional.
4. Duct riser diagram.
5. Design narrative with fire alarm control matrix.
6. ASHRAE design calculations.
7. System sequence of operations.
8. Detailed acceptance test procedure as performed during pre-test.
9. Report with results, including but not limited to, of pre-test including door forces and ΔP readings, air flow rates, results for manual control HOA use and restart under emergency power with full electrical service disconnect.
10. Special inspector report as required by 780 CMR with acceptance by system design engineer that the design intent has been achieved.

Acceptable Standards

Smoke-control systems should be designed to accepted engineering practice. The Massachusetts State Building Code (780 CMR) discusses requirements for various required systems in Chapters 4, 9 and 10. The standards referenced by the code include NFPA 92B, IMC and IFC. ASHRAE's "Design of Smoke Management Systems" is an acceptable design guide.

Acceptance Testing

Upon the completion of a review of the above items, the Boston Fire Department will schedule a test of the smoke-control system. The BFD will act as a witness to the test, which will be performed by representatives of the building ownership per the procedure submitted in item 8, and the results will be compared against the results submitted in item 9.

The building ownership must have the following representation present with all the equipment on hand to perform the test:

- System design engineer
- Electrical/fire alarm contractor
- Sprinkler contractor
- Air balancers
- General contractor
- Special Inspector



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Smoke Control Test Record

Building representative must have Reps for Sprinkler, General Contractor, Fire Alarm, Electrician, Design Engineer, Special Inspector, HVAC and Air Balancer present:

- I. Pre-test Submission to Engineers for Review:**
- 1. Test procedure
- 2. Test data

- II. Physical Inspection:**
- 1. Fan intake clearance
- 2. Consistent labeling between fans/stairs/panel
- 3. Manual control at panel
- 4. Equipment status indicators at panel

- III. Testing:**
- 1. Smoke control activates via initiating devices (smoke detector, waterflow, pull station)
- 2. Smoke control restored when switched to emergency power
- 3. Manual panel controls operate as designed
- 4. in. of water differential, stair to floor per 780 CMR
- 5. 15-30 lbs. door opening force

- Enclosures only (if provided):***
- 6. Exhaust = 150% of supply in vestibules
- 7. Vestibule supply and exhaust grilles meet 780 CMR
- 8. Smoke detector on floor side of each vestibule
- 9. 0.10-0.35 inches of water differential, vestibule to stair

- Smoke evacuation only:***
- 10. Obvious movement of test smoke in accordance with design

Address _____ **Date** _____

BFD Representative _____ **Pass** _____ **Fail** _____