

Foster City Guidelines for Smoke Management Systems

Smoke Management systems in high rise buildings and in buildings four stories or forty feet in height shall be designed to the requirements of U.B.C. 1997 edition, Section 905. Foster City's Reference documents are, "Design of Smoke Management Systems" by Klote & Milke, N.F.P.A. 92 A & B and A.S.H.R.A.E # 5.

The initial submittal documents shall have included with them a Rational Analysis complying with Section 905.2.2.1 of the 1997 U.B.C. and a complete Testing Matrix shall be submitted to the City prior to Building Permit issuance. The City Approved Job Copies shall be available during all testing and inspections.

All aspects of the Smoke Management System shall be pre-tested by the City Approved Third Party Special Inspector prior to the City's acceptance testing. It shall be proven to the City's satisfaction that all systems related to the Smoke Management System are functioning properly and are interfacing without error.

All City testing shall be done jointly with the Fire Marshal's office and the Building Inspection Division. It shall be up to the general contractor to schedule any and all joint inspections. It shall also be the general contractor's responsibility to insure that all pertinent trades including the Special Inspector are present during acceptance testing. It may also be required that the Engineer of Record and/or the Author of the Rational Analysis be present for final acceptance testing.

During the City's acceptance testing, pressure differentials across all smoke barriers shall be tested with the appropriate equipment supplied by the contractor. If each floor is an individual smoke zone, pressure difference testing shall be done at the stairwells under doors with sufficient tubing to eliminate false readings. See attachments for more detailed requirements.

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Stairwell pressurization shall be city tested as set forth below.

- 1) Relief vents shall be tested for proper operation and discharge in c.f.m.
- 2) Floors shall be properly balanced and report shall be available onsite.
- 3) All strobes and audible alarms shall be tested.
- 4) Elevator recall shall be tested.
- 5) Door opening force shall be tested simultaneously with a .05 minimum pressure differential. Door opening force shall be a maximum of 15 lbs. for pressurized stairwells per Section 1133B.2.5 of the 1998 C.B.C.

- 6) Operation of all dampers shall be tested, including access to motors.
- 7) Firefighters control panel shall be inspected for compliance with the Approved Plans and correct functions.
- 8) All City testing will be done under emergency power.

Design Methods

- Engineering Analysis required
- Analysis to include:
 - Stack effect
 - Temperature effect
 - Wind effect
 - HVAC system
 - Climate
- Doors shall be tight fitting, gasketed and rated 20 minute minimum
- Smoke dampers shall be Class 2

Stair Pressurization U.B.C. Criteria

- 0.05" W.C. fire floor to vestibule
- 0.05" W.C. vestibule to stair
- Vent at 2500 c.f.m.

System Reliability and Installation Standard Practice

Ductwork:

- Leakage test required.
- Must withstand temperature of smoke management system.

Fans:

- Withstand temperatures of system
- Belts (1.5 x design duty with 2-belt minimum)
- Motors = 1.5 x service factor

Dampers:

- Class II smoke dampers required

Power:

- A minimum of two sources is required
- Transfer switch shall be in a separate room from switchgear and/or transformers

Control Air Tubing:

- Copper
- Pressure tests by Special Inspector

Firefighters Control Panel:

- Must override automatic functions

Acceptance Testing and Reports

Architectural:

- Smoke Barrier walls, doors and other openings for location, protection and conformance with approved plans

Sprinkler System:

- System layout conforms to smoke management zoning

Fire Alarm:

- Devices that initiate smoke management are installed at their proper location and wiring is in conduit

Mechanical:

- Fans shall be installed per drawings and specifications. Dampers shall be installed and working properly with proper access. Ductwork shall be installed per approved drawings

Electrical:

- Fire alarm installation shall per approved drawings, specifications and shall meet U.B.C. Section 905 and N.E.C. Sections 725, 760 and chapter 3

REQUIRED TESTS

Ductwork:

- Leakage tests

Fans:

- Volume (CFM), Voltage/Amperage, R.P.M. and belt tension

Dampers:

- Open and close per code and specifications, motors are accessible

Control Tubing:

- Pressure tested

Generator:

- Operates on emergency power, minimum fuel requirements are met and has proper containment

Fire Alarm:

- Sequence of operation and system reliability

Energy Management:

- Sequence of operation and priority operation

Device response time tests

Pressure differential tests

Door opening force tests

All systems test

All reports shall be done in the AABC Smoke Management and Fire Life Safety Commissioning report format.

All Daily Reports shall be left onsite for the City's review.

The City of Foster City prior to any special inspection shall approve all Special Inspectors.