



**CITY OF NEWPORT BEACH**  
**COMMUNITY DEVELOPMENT DEPARTMENT**  
**BUILDING DIVISION**

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**Guidelines for Smoke Management Systems**

Smoke Management systems in high rise buildings, atriums and where required by the Uniform Building Code shall be designed to the requirements of U.B.C. 1997 edition, Section 905.

The initial submittal documents shall have included with them a Rational Analysis complying with Section 905.2.2 of the 1997 U.B.C., a description of the smoke control system and sequence of operation and a complete Testing Matrix. 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 a 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 acceptance testing shall be done jointly with the Fire Marshall's office and the Building Inspection Division. It shall be the responsibility of 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 is also required that the Mechanical Engineer of Record and/or the Author of the Rational Analysis be present for final acceptance testing.

During the City 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.

Stairwell pressurization shall be 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-inch water gage 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. Firefighter's control panel shall be inspected for compliance with the approved plans and correct functions.
8. All 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

## U.B.C. Criteria for Stair Pressurization

- 0.05-inch water gage positive pressure, vestibule to floor
- 0.05-inch water gage negative pressure, vestibule to stair enclosure.
- Vent at 2500 c.f.m. at design pressure located at top of stair enclosure

## System Reliability and Installation Standards

### Ductwork:

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

### Fans:

- Withstand temperature of system
- Belts (1.5 x number of required belts with 2-belt minimum)
- Motors = 1.15 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 verified 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 be per approved drawings, specifications and shall meet U.B.C. Section 905 and N.E.C. Articles 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, motor are accessible

Control Tubing:

- Pressure tested

Generator:

- Test Operation, 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 differentials tests

Door opening force tests

All systems test