



CITY OF SAN ANTONIO

DEVELOPMENT SERVICES AND FIRE DEPARTMENTS

TO: All Development Services and Fire Department Customers

SUBJECT: **INFORMATION BULLETIN 185**
Smoke Control System Submittal Requirements

DATE: June 25, 2010 – *Revised February 27, 2012*

The Development Services Department (DSD) and San Antonio Fire Department (SAFD) have developed this information bulletin to describe the smoke control system submittal requirements per Section 909 of the 2012 *International Building Code* (IBC), as currently adopted by COSA. This information bulletin also describes the process for third (3rd) party plan review of these systems when required by DSD and SAFD per Section 104.7.2 of the 2012 *International Fire Code* (IFC), as currently adopted by COSA. This information bulletin pertains to all projects within the City where smoke control systems are required. Note that it is the owner's responsibility to retain qualified firms or individuals to conduct smoke control system design and testing.

I. General

Where required by the IBC and/or IFC, mechanical or passive smoke control systems shall meet the requirements of Section 909 of the IBC for design, installation and acceptance testing. Smoke control systems shall be designed in accordance with the applicable requirements of IBC Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents submitted to the City for plan review and permitting shall include sufficient information and detail to adequately evaluate and implement the smoke control system. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions. The City requires that a **Smoke Control Report** be provided to the City in order to adequately describe the engineered design concept and demonstrate compliance with the applicable code requirements for the smoke control system. The report shall be a bound document that is independent of design plans.

Please note that stair pressurization systems installed in accordance with 2012 IBC 1022.10 and 909.20 are considered smoke control systems and shall require a Smoke Control Report to be submitted as outlined in this information bulletin.

It is highly recommended that the owner or agent and the design engineer of record meet with DSD staff at the preliminary stages of the design process where a smoke control system will be required in order to discuss these procedures as well as the design goals,

objectives and performance criteria. Please refer to Information Bulletin 116 to set up a Preliminary Plan Review meeting for this.

II. Smoke Control Report

A Smoke Control Report must be submitted to DSD for any required smoke control system that addresses the requirements of IBC Section 909. The report shall be prepared by a qualified professional engineer (PE) licensed in Texas with experience in smoke control system design and analysis and shall use well-established principles of engineering practice to clearly demonstrate how the proposed design meets the applicable requirements of IBC/IFC. The report shall be signed and stamped by the licensed engineer, and shall, at a minimum, include the following:

- 1) General narrative description of the building. This description will include identification of building uses and occupancies as well as passive and active fire protection features that will work together with the smoke control system
- 2) Narrative description of each passive and active smoke zone. Every space in a building requiring smoke control must be identified as an active or passive smoke zone, with measurable performance criteria identified
- 3) Description of which methods will be used for each active smoke-control zone, and supporting rational analysis in accordance with IBC Section 909.4. This description will include such items as minimum required fan size, expected fire loads, ceiling heights, computer modeling (if utilized), calculations, locations of operable windows and/or doors, etc. At a minimum, the rational analysis shall include and explain how the design considers all of the following:
 - a. Design fires (size and potential fuel sources)
 - b. Stack effect
 - c. Wind effect
 - d. Temperature effect of fire
 - e. Climate
 - f. Duration of operation
 - g. Elevator piston effect, if applicable
 - h. HVAC system
- 4) Specific discussion of how smoke control will be initiated in each zone and the associated system responses. A simple and clear event matrix should be utilized.
- 5) Calculations associated with the smoke control system design and fan capacities.
- 6) Identify anticipated system performance, especially with regard to pressurized stairwells/hoistways, during stack effect conditions. Provide calculations demonstrating minimum and maximum pressure differentials to be observed during and in the absence of any stack effect. This shall also include calculations that show that maximum door opening forces for egress doors are not exceeded.
- 7) Description of smoke dampers and fire/smoke dampers, including which dampers will be supervised for damper position, the position of unsupervised dampers

- when smoke control system is active, damper positions upon loss of power, actuation temperature of fire and fire/smoke dampers.
- 8) Identification of coordinated zones for sprinkler and fire alarm systems with regard to smoke control zones.
 - 9) Identify where variable frequency drives, relief dampers (barometric / pressure sensor), etc. are to be used for smoke control equipment and method of control.
 - 10) Piston effect of elevators shall be addressed.
 - 11) Description of fire modeling or other performance-based analysis utilized in the design of the smoke control system. Purpose of the analysis, as well as associated assumptions and conclusions must be clearly identified.
 - 12) The report shall be accompanied by the architectural, mechanical, electrical and life safety drawings for the project and any other related material that supports the design of the smoke control system.

Again, please note that this list of items above may not be all that is required to demonstrate a code compliant smoke control system that meets generally accepted and well-established principles of engineering relevant to the design. It will be up to the licensed professional engineer to submit a report that includes all the necessary information to demonstrate the design is adequate.

III. Third (3rd) Party Peer Review

In accordance with Section 104.7.2 of the IFC, DSD and SAFD may require that the Smoke Control Report, or a portion thereof, be peer-reviewed by an independent 3rd Party. The 3rd Party reviewer shall be required, when deemed necessary by DSD and/or SAFD, to assist in determining that the proposed design and analysis, or portion thereof, adequately meets the applicable code requirements and agreed performance criteria. When the City determines that a 3rd party review of the Smoke Control Report or portion thereof, is required, the process below is to be followed:

- 1) The City shall communicate in writing to the customer when a 3rd party peer review of the Smoke Control Report is required per IFC Section 104.7.2 and this information bulletin. The City's communication shall clearly outline what portion(s) of the Smoke Control Report is required to be reviewed by the 3rd party reviewer.
- 2) The owner or agent shall obtain the services and provide payment to the 3rd party reviewer directly. The City shall not be responsible for the charges of the 3rd party review services per IFC Section 104.7.2.
- 3) The 3rd party reviewer shall be a PE licensed in Texas (unless otherwise approved by the City) with experience in smoke control system design and analysis. **Before engaging the services of the 3rd party reviewer, the owner or agent shall obtain approval of DSD or SAFD of the 3rd party reviewer.** If requested by the City, the 3rd party review shall submit a Curriculum Vitae or other evidence of the 3rd party reviewer's qualifications. If approved by the City, DSD or SAFD staff shall communicate this approval in writing.

- 4) All stakeholders (owner or agent, engineer of record, DSD and/or SAFD staff, etc.) shall meet in person or via conference call before the 3rd party review services are started to ensure that all parties understand their roles and responsibilities to the project, their scope of review, and to outline the expected deliverables from each party.
- 5) The PE of record shall submit the Smoke Control Report to both the City and the 3rd party reviewer for review and comment. The 3rd party reviewer shall review the Smoke Control Report, or portion thereof that they are assigned to review, to determine whether the proposed report and calculations/modeling are consistent with the City building and fire code requirements, approved design goals and well-established engineering principles. The 3rd party reviewer shall submit any review comments to both the City and the smoke control engineer in writing.
- 6) The PE of record shall adjust the design and/or analysis as needed in response to any of the 3rd party reviewer's comments. This review / revision process shall continue until the 3rd party is satisfied. Additional reviews by the 3rd party are at the expense of the owner or agent, not the City. The revised Smoke Control Report and/or responses to the 3rd party reviewer's comments shall be submitted in writing to both the City and 3rd party reviewer.
- 7) When the 3rd party reviewer is satisfied that the proposed Smoke Control Report is consistent with the City building and fire code requirements, the agreed design goals and established engineering principles, the 3rd party reviewer shall submit a letter to the City clearly stating this. This letter shall be signed and sealed by the 3rd party reviewer per the Texas PE Board Rules.
- 8) The City shall review the final Smoke Control Report and the report issued by the 3rd party reviewer to determine approval of the proposed system.

Note that these procedures are the general requirements for this process. As each situation may be different, these procedures may be altered by the City to accommodate a particular situation when warranted. This will be communicated by the DSD/SAFD staff in writing to the owner or agent and design team.

If you have any questions on this process, please contact Michael Shannon, PE, CBO, DSD Building Division Development Services Engineer at **(210) 207-5006**.