Shoreline Fire Department
Dedicated to the Protection of Life and Property

Serving the Shoreline Community for over 80 years, since 1939

Fire Prevention Division
17525 Aurora Ave N
Shoreline WA 98133
Tel. 206.533.6565

Shoreline Fire Department Standard

SHFDS 7.0
Building Smoke Control Systems
Revised 3/3/2026

7.0 General

7.1 Scope:

This standard covers the permitting, installation, inspection, testing and maintenance of Building Smoke Control Systems in the Cities of Shoreline, Kenmore Lake Forest Park and the Town of Woodway as administered by the Fire Code Official (FCO). Smoke Control Systems in buildings shall meet the requirements of the currently adopted codes and standards, unless specifically amended or noted otherwise, and as approved by the FCO.

Referenced Standards and Codes

1. NFPA 80, Standard for Fire Doors and Other Opening Protective Status.
2. NFPA 92, Standard for Smoke Control Systems
3. NFPA 105, Standard for the Installation, Upkeep and Examination of Smoke Door Assemblies.
4. NFPA 72, National Fire Alarm and Signaling Code.
5. The International Fire Code (IFC) as amended by State of Washington and the Cities of Shoreline, Kenmore, and Lake Forest Park Municipal Codes.
6. The International Building Code
7. The International Mechanical Code

7.1.1 Smoke Control Systems

1. System shall be designed under the currently adopted codes and standards.
2. System designer qualifications shall comply with currently adopted Washington State codes.
3. The minimum qualifications of the system designer and lead acceptance test personnel shall include all of the following:

    a. Smoke control conceptual analysis and overall system design shall be designed by a professional fire protection engineer competent in the design of smoke control systems.
    b. All Plans and calculations shall be stamped with a valid Washington State certificate seal identifying the appropriate level of competency.
    c. System designer qualifications shall comply with currently adopted State of Washington codes and the qualifications shall be provided when requested by the FCO.

7.1.2 Design Requirements

7.1.2.1 The following information is required on all plan submittals for review of the installation of smoke control systems.

1. Buildings or structures or parts thereof required by Section 909 of the International Fire Code to have a smoke control system or systems, shall have such systems designed in accordance with the applicable requirements of section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control system. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.
2. A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the system supporting them and the methods of construction to be utilized shall accompany the submitted construction documentation and shall include, but be limited to, the items indicated in section 909.4.1 through 909.4.7 of the current adopted International Fire Code.
3. Smoke Control systems shall be provided with standby power in accordance with Sections 909 and 2702 of the current adopted International Fire Code, International Building Code and Shoreline Fire Department Standards SHFDS 4.0 Emergency and Standby Power Systems.
4. Fire Detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907 of the current adopted International Fire Code. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.
5. In addition to meeting requirements of NFPA 70, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.
6. A firefighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in the Fire Control Room. The firefighters smoke control panel shall comply with Sections 909.16.1 through 909.16.3 of the current adopted International Fire Code.
7. System Response Time: smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Upon receipt of an alarm condition at the fire alarm control panel, fans, dampers and automatic doors shall have achieved their proper operations state and the final status shall be indicated at the smoke control panel within 90 seconds. The system response time for each component and their sequential

relationship shall be detailed in the required rational analysis and verification of their installed condition reported in the required final report.

7.1.3 Permit requirements

1. A fire permit is required for all new installations and or modification work.
2. Installation shall not begin until the permit has been issued.
3. For work being conducted in the City of Shoreline, the application for a fire construction permit is available at: Get a Permit | City of Shoreline. For work being conducted in the City of Kenmore or Lake Forest Park the application for a fire construction permit is available at: Fire Permit Application - Shoreline Fire Department.
4. Approved plans and permit inspection cards shall be available onsite for the permitted work. A permit is only valid for the contractor and work designated by the permit.
5. A smoke control conceptual analysis is required to be submitted separately from the building permit and must be approved prior to issuance of the building permit.
6. Final smoke control design shall be reviewed and approved by the fire protection engineer on record prior to the fire alarm system permit review approval.

7.1.4 Submittal Requirements

The following is a list of information required on all plan submittals for review of a Smoke control system.

1. The plan shall be drawn to 1/8" = 1.0' minimum scale. The applicant is required to submit all of the information so an accurate and timely review may be done.
2. All submittal documents shall be provided as required by the smoke control system fire permit checklist and shall include:
    a. Smoke Control Plan
    b. Must include conceptual analysis matching the building permit.
    c. Must show panel design and placement.
    d. Must include the name and qualifications of the fire protection engineer preparing the plans.
3. Other documents as required by currently adopted IFC and IBC, Section 909
    a. Detailed design report and construction drawings shall be submitted for review and approval prior to installation. The approved building permit plan set shall be used for the submittal of the detailed design report for the system. Because of the complexity of smoke control systems, it is important that the detailed design documents clearly identify the expected performance of the system. These documents must also clearly identify the expected performance of each component in the smoke control system. Components include all passive and active elements that work together to provide smoke control in accordance with currently adopted IFC and IBC Section 909.

b. The detailed design report, based on the conceptual design report, including the smoke control system rational analysis, must be prepared by a professional engineer competent in the design of smoke control systems. This rational analysis must be stamped by the professional engineer. The detailed design report shall be a bound document, independent of the design plans, and minimally include the following:
    i. A 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
    ii. A 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.
    iii. A description of which methods will be used for each active smoke control zone and supporting rational analysis in accordance with IFC Section 909.4. This description will include such items as minimum required fan size, expected fire loads, ceiling heights, computer modeling, calculations, and locations of operable windows and/or doors.
    iv. Specific discussion of how smoke control will be initiated in each zone and the associated system responses. A simple and clear event matrix shall be provided.
    v. Calculations associated with the smoke control system design and fan capacities
    vi. Identification of anticipated system performance, especially with regard to pressurized stairwells/hoist ways, during stack effect conditions. Provide calculations demonstrating minimum and maximum pressure differentials to be observed during and in the absence of any stack effect.
    vii. A description of smoke dampers and fire/smoke dampers, including which dampers will be supervised for damper position, the position of unsupervised dampers when the smoke control system is active, damper positions upon loss of power, actuation temperature of fire and fire/smoke dampers.
    viii. Identification of coordinated zones for sprinkler and fire alarm systems with regard to smoke control zones.
    ix. Identification of where variable frequency drives are to be used for smoke control equipment and the method of control.
    x. The piston effect of elevators.
    xi. A 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.

xii. Any related material that supports the design of the smoke control system.
xiii. The signature and stamp of the professional engineer responsible for the rational analysis.
xiv. Provide a detailed event matrix that includes every fire alarm and smoke control initiating device by address down one column and every fire alarm notification device (by zone), every smoke control device (e.g. fans, dampers), and every other event that must occur in order for proper operation of the smoke control system (e.g. HVAC shutdown) across the top. With prior approval, some devices may be combined. This matrix may be divided into one matrix for smoke control devices and one matrix for non-smoke control devices.

c. The following drawings must be included with the smoke control submittal:
   i. Smoke control zone drawings
   ii. Drawings depicting the fire rating of associated smoke barriers
   iii. Drawings demonstrating pressurization control and power wiring routing and protection
   iv. Drawings demonstrating fire alarm wiring routing and protection
   v. Smoke control mechanical equipment and ductwork drawings
d. The submittal for each associated permit, including architectural, mechanical, electrical, fire alarm, and fire sprinkler plans, are not required to be submitted with the smoke control plan. However, each of these associated permits shall include the following:
   i. Clear identification where passive zones and active zones are provided
   ii. Smoke zone boundaries shall be identified; these boundaries are required to be constructed as smoke barriers and shall be appropriately identified in the architectural plan set.
   iii. A concise narrative description of the smoke control system for the building and any special requirements of the design.
   iv. A letter prepared by each designer stating that their design satisfies the requirements of the smoke control system.

7.1.5 Acceptance Testing

Fire inspections are required by the Shoreline Fire Department for permitted work. For scheduling an inspection, please email the Shoreline Fire Department at inspections@shorelinefire.com. Response times and scheduling may vary depending on current workloads.

New Smoke Control Systems shall be inspected and tested by a representative from the Shoreline Fire Department. The following is a list of recommended inspection steps to perform the system acceptance:

1. Smoke Control Testing shall be per currently adopted NFPA 92 Section 8.3 through 8.73.
2. At the completion of commissioning and acceptance testing, the contractor/s responsible for commissioning shall upload all required documentation and commissioning reports into The Compliance Engine (Brycer) before the permit will be finaled and closed out.

7.1.6 System Inspection, Testing, and Maintenance

Contractors performing inspection, testing and maintenance (ITM) Shall submit all reports to The Compliance Engine within (5) five business days at the completion of work.

1. The installer shall provide to the owner/occupant instructions on how to maintain the smoke control system thru regular required inspecting, testing, and maintenance requirements as outlined in NPFA 92 8.6 periodic testing and Washington State Requirements.
2. The systems shall be tested by a person who is thoroughly knowledgeable in the operation, testing, and maintenance of smoke control systems.
3. Testing of smoke control systems shall also be conducted under standby power if applicable.