



CITY OF BLAINE
SAFETY SERVICES
Fire Inspections
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SMOKE CONTROL SYSTEMS

An engineered smoke control system is an integral part of a facility's fire protection features and must be serviced on an annual basis to ensure system preparedness.

Due to the technical nature of engineered smoke control systems, testing must be performed by either by highly trained mechanical contractors or fire protection engineers, and be witnessed by the fire marshal.

Smoke control systems shall be maintained in accordance with the manufacturer's instructions and Minnesota State Fire Code Sec. 909.20.1– 909.20.5 as summarized below:

- An approved maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests.
- Mechanical smoke-exhaust systems shall be operated and tested at least annually by a licensed mechanical contractor. Documentation of proper operation (as designed) for each component throughout the engineered smoke removal system shall be recorded. *Example: Water flow switch activation/alarm signal sent to monitoring company, delay timer begins for louvers, hatches and exhaust fans, make-up air louvers open, hatches open, exhaust fans start up.*
- Operational testing of smoke control systems shall include all equipment such as initiating devices, fans, dampers, controls, doors and windows. Tests shall be performed on primary and standby power conditions.
- Dedicated smoke control systems shall be operated, including each control sequence, semi-annually.
- Non-dedicated smoke control systems shall be operated, including each control sequence, annually.
- Written records of testing and maintenance shall be maintained on the premises. The records shall include dates of all maintenance activity and identification of the servicing personnel.

ORIGINAL SYSTEM DESIGN PARAMETERS

System Type

- Manual system
- Automatic system (interconnected to waterflow with 5-10 minute delay)
- System also used for comfort air
- Other _____

General

Commodity class _____

Storage height and arrangement _____

Clearance to ceiling _____

Square footage of storage _____

Aisle width _____

Sprinkler head type and temperature _____

Exhaust Air

Number of fans _____

CFM per fan _____

RPMs required for each fan to achieve required CFM _____

Total CFM provided by fans _____

Make Up Air

Total square feet of make up air required _____

Make up air provided by louvers, overhead doors, or man doors, other (Circle One)

Number of openings and number of square feet each _____

Control Panel

Type and location of control panel _____

VISUAL INSPECTION

Have there been any changes in the commodity, storage arrangement, or building from the original design parameters? If yes, what?

-
-
- Power supply is located on the supply side of main building disconnect.
 - Power supply is labeled SMOKE EVAC SYSTEM.
 - Overcurrent protection is locked in the open position.
 - Fans are numbered on roof and on the underside.
 - Cabinet is labeled SMOKE CONTROL PANEL.
 - A fan location map is located at the smoke control panel.
 - Control switches are numbered to correspond with fan numbers.
 - Operational instructions are located in the panel.
 - The Knox box contains a key for the smoke control cabinet.
 - Makeup air louvers or doors are unobstructed.
 - Doors used for make up air labeled to not be obstructed.
 - All wiring runs on the building exterior or is thermally protected.

Problems noted:

EXHAUST AIR FAN TEST

Fan #1: _____ RPM _____ CFM

Fan #2 _____ RPM _____ CFM

Fan #3 _____ RPM _____ CFM

Fan #4 _____ RPM _____ CFM

Fan #5 _____ RPM _____ CFM

Fan #6 _____RPM _____CFM

Fan #7 _____RPM _____CFM

Fan #8 _____RPM _____CFM

Problems noted:

OPERATIONAL SEQUENCE TEST

Operational tests must be conducted a minimum of three times with the building on **normal power** and a minimum of three time with the building **main service disconnected**.

Manual Test for All Systems

- Each fan operates individually.
- Multiple fans operate together.
- All make up air opens when each single fan is turned on individually and when multiple fans are turned on.
- All make up air shuts down when fans are shut off.

Additional Test Requirements for Automatic System

- System operation is delayed 5 – 10 minutes from start of sprinkler waterflow.
- Each fan can be manually activated to override the delay.
- When fans are activated manually all make up air opens.
- When fans start automatically, each fan can be shut off manually.
- Each fan can be restarted manually.
- System continues to operate both manually and automatically when the alarm system is silenced.
- System continues to operate both manually and automatically when the sprinkler waterflow is shut off.

- All make up air opens when each single fan is turned on individually and when multiple fans are turned on.
- Dry outdoor sprinkler systems do not initiate automatic sequence.
- All make up air shuts down when fans are shut off.

Problems noted:

INSPECTION AND TEST RESULTS

	<u>Passed Test</u>	<u>Retest Required</u>
Original design information adequate.	Yes / No	Yes / No
Visual Inspection	Yes / No	Yes / No
Exhaust Air Fan Test	Yes / No	Yes / No
Operational Sequence Test	Yes / No	Yes / No
Other	Yes / No	Yes / No

Comments: _____

Mechanical Contractor or Engineer

Name _____ Date _____

Company Name _____ Phone Number _____

Address _____

Fire Inspector

Name _____ Date _____

Note: Upon failure of an inspection, a re-inspection must be scheduled and a \$50 re-inspection fee will apply.

Definitions:

-Dedicated smoke control system: A ventilation system designed for the sole purpose of removing smoke from a building or area and not utilized for any other ventilation function.

-Non-dedicated smoke control system: A ventilation system that is utilized for multiple purposes such as heating and cooling as well as for smoke removal from a building or area.

-Control sequence: The chronological order in which the components of an engineered smoke removal system operate.

General:

Smoke control systems shall be maintained in accordance with the manufacturer's instructions and MSFC, Sec. 909.20.1– 909.20.5 as summarized below.

An approved maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests.

Mechanical smoke-exhaust systems shall be operated and tested at least annually by a licensed mechanical contractor. Documentation of proper operation (as designed) for each component throughout the engineered smoke removal system shall be recorded. *Example: Water flow switch activation/alarm signal sent to monitoring company, delay timer begins for louvers, hatches and exhaust fans, make-up air louvers open, hatches open, exhaust fans start up.*

Operational testing of smoke control systems shall include all equipment such as initiating devices, fans, dampers, controls, doors and windows. Tests shall be performed on primary and standby power conditions.

Dedicated smoke control systems shall be operated, including each control sequence, semi-annually. Non-dedicated smoke control systems shall be operated, including each control sequence, annually.

Written records of testing and maintenance shall be maintained on the premises. The records shall include dates of all maintenance activity and identification of the servicing personnel.