WHITE PLAINS SMOKE CONTROL CODE

PART 1. GENERAL REQUIREMENTS

a. **Application of Code.**

The following uniform standards and procedures shall apply to the design, installation and testing of new smoke purge systems and alterations thereto.

(1) **New uses:** Smoke Purge Systems shall be installed in the following new uses, including occupied areas and means of egress:

(i) Enclosed malls and atriums.

(ii) All theaters and auditoriums.

(iii) All Public Assembly Uses accommodating three hundred (300) persons or more.

(iv) All buildings greater than six (6) stories or seventy-five (75) feet in height.

(v) Within any building for those floors below grade that are greater than 7,500 sq. ft. in size and occupied or accessible to the public.

(vi) Institutional uses for persons whose movements are limited because of illness, physical or mental handicap.

(2) **Existing uses:** Smoke Purge Systems shall be installed in existing buildings for the uses listed in WPSCC-1a, as follows:

(i) An addition in excess of 50% of the existing building gross floor area, for which both the original building and addition shall comply.

(ii) For any existing use where there is an increase in the pre-existing legal occupancy limit.

(iii) Any change of an existing occupancy to a use listed under Section a(1). herein.

(iv) Any major alteration (i.e., removal of all walls, ceilings, etc.) in excess of 50% of the existing building gross floor area, for those uses listed under Section a(1) herein.

(3) Any modification(s) to an existing smoke purge system, including those resulting from a building (or space) alteration or addition, shall be designed so as to be fully integrated and compatible with the base building smoke purge system

b. **Permit Filing and Review Procedure.**

(1) Three (3) sets of Mechanical drawings (signed and sealed by a Licensed Professional Engineer having mechanical engineering design experience) for smoke purge systems are to be submitted to the Department of Building for review. Drawings must clearly show and identify dampers, controls and smoke purge design and be approved *prior to issuance* of a mechanical permit.

(2) Mechanical design engineer to be required to submit the following along with mechanical drawings:

(i) Design Engineer's *Affidavit* for Mechanical Work.

(ii) *Narrative description* of system operation (describing various operational modes, and addressing all design parameters listed in Item (3.) below.

c. Mechanical drawings and permit to be noted as follows: "Mechanical engineer is required to witness for verification purposes the smoke purge system test upon completion of installation and verify that the installation and operation of the system meets the intent of the mechanical design."

PART 2. SMOKE PURGE SYSTEM DESIGN PARAMETERS

a. **Smoke purge system ducts, transfers, etc. passing through fire rated partitions shall be protected as follows:**

(1) *One Hour rated wall or ceiling.*

(i) Do not provide a fire or smoke damper at wall penetration.

(ii) Sprinkler head(s) are to be installed on fire load side of wall(s),at return air transfer openings.

(2) *Two hour rated wall or ceiling.*

(i) Provide automatic combination fire/smoke damper with manual control override.

(ii) Activation - Heat link closes damper.

The damper shall be UL555S classified with low (285°F) and high limit (450°F) temperature stats and open/closed status switches. Dampers maybe electrically or pneumatically operated.

The damper shall be no smaller than sixteen (16) square inches.

b. **Conduit for Smoke Purge Control**

(1) Control wiring shall be run in metal conduit. (rigid or EMT).

(2) Pneumatic tubing must be copper.

c. **Ducts through Exitways and Within Rated Ceiling Assemblies.**

(1) Smoke purge system supply and exhaust ducts passing through a rated exitway or within a fire-rated suspended ceiling assembly shall be wrapped with thermal fiber - two (2) hour or encased in a two (2) hour rated enclosure.

(2) Trapeze hangers to be outside of thermal wrapping.

d. **Smoke Purge Fans.**

(1) Smoke Purge System fans must provide for a minimum of six (6) air changes per hour (or greater if necessary), to obtain adequate visibility within legal means of egress within ten (10) minutes of starting smoke purge. (Adequate visibility is interpreted as clear enough to see exit signs to permit a person to safely exit the building).

(2) The smoke purge fan system may be designed as either a separate fan system or as an integrated smoke purge /HVAC system, and as required by Section 4 (Building Alterations and Additions).

(3) All smoke purge fans (supply and return) and controls (including air compressors) shall be connected to the building emergency generator and adequate electric power provided for same.

(4) Manual override switches shall be provided at the fire alarm panel or fire command station panel to control both smoke purge supply and smoke purge exhaust fans separately.

Refer to Part 3 for more information.

e. **Duct Work.**

(1) All smoke purge system ducts shall be galvanized steel with minimum thickness of 22 ga. constructed in accordance with ASHRAE and SMACNA sheetmetal ductwork construction details. Flexible ductwork is not permitted in duct systems that are part of a smoke purge system (return or exhaust ductwork). Flexible duct is permitted at supply diffuser connections and at air handling equipment for vibration isolation (maximum 3 ft. length).

(2) Design and spacing of duct hangers shall be in accordance with SMACNA duct construction details but hangers to be minimum of 20 ga. steel and be of the trapeze type.

(3) Where a smoke purge enters a rated shaft, utilized as a smoke exhaust riser, N.F.P.A. requirements for a *vertical boot* shall be followed (22 inch height, directed upward within the shaft itself), or in lieu of such boot, *automatic* combination fire/smoke dampers shall be provided at such core shafts. Smoke dampers shall be operated either pneumatically or electrically as previously described in paragraph 3 (A) (2.) (a).

(4) All smoke purge system components (including ductwork) shall be clearly identified as such by stenciling the function and zone on the components, e.g. Smoke Purge Supply - Zone 2; Smoke Purge Exhaust - Zone 3; Smoke Damper No. 5; etc. Stenciling shall be 6" high red letters located (every 10 feet along duct).

f. **Smoke Purge Coverage.**

(1) Smoke purge systems shall be designed for a minimum of one (1) zone per floor.

g. **Smoke Exhaust of Interior Stairwells.**

(1) All new interior exitway stairways shall be equipped with an approved automatic smoke-actuated roof scuttle vent, or other approved automatic smoke purge system located at the uppermost ceiling thereof. Such system shall activate the building fire alarm system.

This provision shall not conflict with stair pressurization provisions of the State of New York codes.

PART 3. SEQUENCE OF OPERATION AND CONTROL FUNCTIONS

a. **Sequence of Operation.**

(1) The activation of one (1) automatic initiation device (e.g. smoke detector) or pullstation shall cause the central fire alarm system to go into alarm activation in accordance with the sequence required for the particular existing building.

(Note: If a new building or new fire alarm system contact Fire Prevention Bureau for required sequence of operation).

In addition, any combination fire/smoke dampers on the floor in alarm shall close. If the low limit temperature firestat (285°F) activates the combination fire/smoke dampers shall close.

(2) The simultaneous activation of any two (2) automatic initiation devices (e.g. smoke detectors) or one (1) heat detector or the activation of a single waterflow switch shall cause the central fire alarm system to go into alarm activation in accordance with the sequence of operation required for the particular existing building

(**Note:** If a new building or new fire alarm system contact Fire Prevention Bureau for required sequence of operation).

In addition, the smoke purge system shall automatically initiate and the following shall occur:

(i) Index all smoke dampers on the particular floor in alarm to an "open" position (supply and return) and index all other building smoke dampers (supply and return) to a "closed" position.

(ii) Index supply air handling unit(s) air handling (unit(s) or fans) to 100% outside air and return air handling unit(s) or fans to 100% spill. The return damper (between the supply and return systems) shall be fully closed.

Note: The return dampers within the air handling units that are part of a smoke purge system shall be a UL smoke damper.

The smoke purge system shall override the low limit temperature sensor on the fire smoke damper if it was activated. If the high limit temperature firestat (450°F) is activated during the purge process the fire/smoke damper shall close permanently and smoke purge will be halted.

b. **Control Functions:**

(1) *Purge manual control* shall be provided at the fire alarm panel or fire command station in the main lobby. This control shall consist of the following:

(i) A switch shall be provided for each floor or area that is part of the smoke purge system. The switch shall have three positions "on" "off" and "automatic".

(ii) The switch when indexed to the "on" position shall:

I. Index all smoke dampers on the particular floor to an open position (supply and return) and index all other building smoke dampers (supply and return) to a "closed" position.

II. Index the appropriate supply air handling unit(s)or fans to 100% outside air and the appropriate return air handling unit(s) or fans to 100% spill. The return damper (between the supply and return systems) shall be fully closed.

Note: The return dampers within the air handling units that are part of a smoke purge system shall be a UL smoke damper.

Note: The smoke control system ductwork and components shall be designed and configured to accommodate excessive static pressure that may occur during purge cycle.

(iii) The switch when indexed to the "off" position shall:

I. Index all smoke dampers on the particular floor or zone to "closed" position (supply and return).

II. Index the appropriate supply and return air handling units or fans to their normal mode of operation.

Note: The smoke control system ductwork and components shall be designed and configured to accommodate excessive ductwork static pressure that may occur during purge cycle.

(iv) The switch when indexed to the "automatic" position shall:

I. Cause the smoke purge system to be controlled automatically via the fire alarm system. Alarm initiation devices shall cause the purge system to automatically activate.

During non-alarm conditions the H.V.A.C. systems and fire/smoke dampers that are part of the smoke purge system can be controlled by a building management or similar control system(if one exists) as long as the fire alarm system has override priority.

The control switches shall not be able to override the fire/smoke damper if the high limit temperature (450°) is activated.

PART 4. SMOKE PURGE SYSTEM TEST

(1) Upon completion of system installations, the mechanical design engineer of record shall personally conduct, and oversee, for verification purpose, a field smoke purge test (in the presence of the City of White Plains Code Enforcement Officer and Fire Prevention Bureau representative).

(2) Such tests shall be conducted under both normal and emergency power conditions.

(3) Any and all necessary modification and system reinforcements (such as boosters, fans, ducts, etc.) shall be provided if smoke purge tests result in unsatisfactory performance.