

CRABTREE VALLEY MALL
FIRE ALARM, SMOKE EVACUATION AND SPRINKLER SYSTEM

SYSTEM DESCRIPTION & OPERATIONAL SEQUENCE

INTRODUCTION

This report has been prepared for Crabtree Valley Mall to assist mall management, contractors, designers and tenants in coordination of life safety systems for new work and to assist and expedite the inspection and approval process by the City of Raleigh. The Mall fire alarm locations and addresses have been updated and are included on the drawings provided herein.

MALL

SMOKE EVACUATION

Description

The mall area is equipped with eight indoor air handlers sized for the air conditioning load having a nominal total capacity of 77,600 CFM. Four of these are on the upper level and four are on the lower level. The units on the upper level are equipped with outside and return dampers. The units on the lower level cannot access outside air. In addition, the Mall (including the food court) is equipped with six rooftop air handlers with outside and return dampers having a nominal total capacity of 67,047 CFM.

The mall area (including the food court) is also equipped with nine roof-mounted upblast exhaust ventilators rated at a total of 214,100 CFM, 8,000 CFM in Zone 4. For the purposes of shop air handlers and audible alarms, the Mall is divided into three zones of approximately equal area with a fourth zone at the South corridor outside H&M (see attached Mall plan for zone boundaries).

Operational Sequence, Smoke Control

In the event of a fire alarm from the Mall common area, all of the shop air handlers in that zone which can access outside air are signaled to go into full ventilation mode as described below, all eight of the mall exhaust fans are signaled to start exhausting air (without respect to zone) and the four Mall air handlers which are not connected to outside are signaled to stop.

Tenant Shop Pressurization Sequence

For the pressurization sequence or full ventilation mode for the shop air handlers, all safeties and operational controls are bypassed. The air handling unit fan operates; the return damper goes to the fully closed position and the outside air damper goes to the fully open position, thereby pressurizing the respective spaces with respect to the mall, flushing the byproducts of combustion into the

mall. The chilled water valves shall go fully open to provide a degree of freeze protection to the cooling coils.

FIRE ALARM SYSTEM

Mall Description

The mall is equipped with a digital addressable fire alarm control panel (FACP). In the event of an alarm condition the FACP enables the mall smoke ventilation fans, the audible/visual devices in the mall area and controls the Mall common area air handling units. The FACP sends and receives signals from the tenant shop fire alarm control panels within the respective zones, which initiate the pressurization sequence and enable the audible/visual devices in the tenant shops. The fire sprinkler riser flow switches, common area smoke detectors, Mall common area air handling unit duct detectors and anchor stores each send alarm signals to the FACP for their respective events. The FACP is located in the fire control station inside the Mall offices. The system is monitored and attended at all times by Mall security. The fire alarm control panel provides off-premise monitoring and notification of alarms.

Tenant Description

Each tenant shop is presently or shall be equipped with an addressable, digital fire alarm control panel which serves pull stations, smoke detectors and audible/visual devices located in the tenant space. For communication with the Mall fire alarm control panel (FACP), each shop is presently or in the process of being provided with an addressable control module and addressable monitor module. Regardless of the origination of the signal, any event within the zone initiates the pressurization sequence, as described above, for the shop, enables the audible/visual devices within the shops, **and initiates control of the common area fans and air handling units (verify)**. For food court tenants, to supplement the above, additional local controls are provided for the food exhaust hoods for alarm in the individual space. The control module in the tenant shop receives a signal from the main mall panel when there is an event outside the shop, but within the respective zone. The monitor module in the shop sends a signal to the main mall panel for events within the shop itself.

Tenant Operation

On an alarm in a tenant shop (smoke detector or pull station), flow of water in the fire sprinkler system, signal from a common area smoke detector, or Mall air handling unit duct detector, the Mall Fire Alarm Control Panel (FACP) responds by signaling all eight of the mall smoke exhaust fans to start, signaling the tenant shops, with in the zone, to start the pressurization (smoke evacuation) control sequence as described above and enabling the audible/visual devices in

the common area of the mall and inside the Tenant shops in the effected zone.

SHOPS

SMOKE EVACUATION SYSTEM

Description

Each tenant shop shall be equipped with one or more air handlers sized for the air conditioning load. Each of the said air handlers shall be equipped with 100% outside air and return air dampers. The return air damper is the route normally used for return air from the conditioned space in the comfort conditioning process.

The outside air damper is connected to an outside louver, roof cap or existing outside air duct sized to provide 100% of the rated air quantity of said air handler in the event of an alarms.

Pressurization Sequence, Smoke Control

In the event of an alarm in a shop the Shop FACP causes the air handling unit to initiate pressurization sequence as described above, enables the audible/visual devices and sends a signal to the Mall FACP. The Mall FACP sends signals to the tenant shops in the zone to initiate the pressurization sequence, and all of the mall exhaust fans (without respect to zone) are signaled to start exhausting air.

FIRE ALARM SYSTEM

Operational Sequence, Fire Alarm

On an alarm in a tenant shop (smoke detector or pull station), the local fire alarm panel in the individual tenant shop responds by activating tenant shop audible/visual devices, initiating the pressurization sequence and notifying the Mall Fire Alarm Control Panel (FACP) fire alarm control panel of the alarm through the addressable monitor module. The Mall FACP responds by signaling all eight of the mall smoke exhaust fans to start, and signaling the air handling units in the tenant shops to start the pressurization (smoke evacuation) control sequence as described above.

ANCHOR STORES

SMOKE CONTROL SYSTEMS

The anchor stores (Hudson Belk, Belk Men's Store, Sears, and Macy's) are equipped with independent systems not connected to air systems in the Mall. The anchor store FACP is connected to the mall FACP through a monitor module located in the common area of the mall. In the event of an alarm inside an anchor store the mall FACP is notified through the monitor module. The Mall FACP notifies the tenant stores within the effected zone to initiate the pressurization sequence and

activates the Mall exhaust fans and controls the air handlers.

A fire alarm signal from Hudson Belk will activate Zone 1; Belk Men's Store will activate Zones 1 and 4; a fire alarm signal from Sears will activate Zones 2 and 3; and a fire alarm signal from Macy's will activate Zone 3. See the attached drawings.

FIRE ALARM SYSTEM

The anchor stores are equipped with independent fire alarm and smoke ventilation systems. The monitor and control modules in Hudson Belk, Belk Men's Store, Sears, and Macy's are connected to the Mall Fire Alarm and Control Panel (FACP) to receive the information on alarm from the anchor stores and to transmit information on alarm to the anchor store fire alarm control panel. The anchor store fire alarm panels respond appropriately.

FIRE SPRINKLER SYSTEM

In the event of a detection of flow in any of the several mall fire sprinkler risers, an alarm is received by the Mall fire alarm control panel, all mall exhaust fans are started, the audible/visual devices in the zone of alarm are sounded, and the shop air handling units in the affected zone are signaled to start the smoke ventilation sequence. In the event of a sprinkler system valve being closed, the Mall fire alarm control panel receives a supervisory signal that indicates that a fire sprinkler system valve has been tampered with and may be inoperative.