

**PHOENIX REGIONAL
STANDARD OPERATING PROCEDURES**

ROOF SECTOR

M.P. 202.06

10/24

Page 1 of 5

PURPOSE

This procedure identifies the Roof Sector's responsibilities and objectives. It will also demonstrate that fireground communication and coordination among all sectors are paramount for fireground safety when roof operations are underway.

Responsibilities for Roof Sector

Companies assigned to roof sector hold a highly valuable tactical position on the fireground. This position has multiple responsibilities. They include critical size-up from an aerial apparatus or on the roof surface as well as the ability to provide coordinated vertical ventilation, when appropriate. The key functions of a Roof Sector include:

- Determine roof type and construction materials.
- Determine roof integrity.
- Determine roof loads and structural features that impact the fire conditions, extinguishment, and/or search operations.
- Determine the presence of an attic space or horizontal void or concealed spaces.
- Determine fire extension in common attics, common void spaces, and in difficult areas to access via interior positions.
- Effective, ongoing communication of conditions with the IC, Sector Officers, and/or Engine Companies working on the interior.
- Consideration of ventilation needs and methods.
- Coordinate vertical ventilation with the IC, Sector Officers, and/or Engine Companies working on the interior.
- Consider a fire attack from the roof when the fire conditions are challenging or impossible to reach from the interior or positions on the ground.

Command should consider assigning companies to roof sector during offensive fire operations to evaluate fire/smoke conditions, roof structural conditions, and to assess the ability to vertically ventilate. Ladder Companies operating on the roof are in an advantageous position to provide a size up and information regarding the key elements of fire extension, building layout/features, endangered exposures, and structural stability.

It may be necessary to establish a Roof Sector in a position remote from the fire-involved roof to keep a watchful eye on roof conditions, where imminent collapse will occur. Such a location may be an elevated platform or an adjacent building.

Apparatus placement for Ladder Companies is a critical component. Ladder apparatus should be strategically placed to allow safe access to the roof, emergency exit from the roof, and in tactical positions that would permit effective defensive operations, if needed. In some cases, the ability to access the roof with an aerial device and be in a defensive position are impossible to do simultaneously (e.g., in big box or multi-story structures). This needs to be communicated and assessed to determine the most advantageous action based on incident conditions and the building.

**PHOENIX REGIONAL
STANDARD OPERATING PROCEDURES**

ROOF SECTOR

M.P. 202.06

10/24

Page 2 of 5

Safe roof operations are paramount. Companies assigned to Roof Sector will be supervised by the Company Officer who *must* be with the crew on the roof. Roof Sector crews must enter the roof from an established safe area and should have a secondary means of egress to exit the roof, or to a safe refuge on an unexposed and structurally sound roof surface.

The first personnel reaching the roof must quickly evaluate conditions to ensure the roof is structurally sound before attempting to work on it. The degree and extent of any signs of weakness must be considered before committing personnel above the fire. Once on the roof, the Company Officer/Sector Officer and Firefighters/Engineers must evaluate their route and progress as they proceed out on the roof. A constant re-evaluation of roof safety must be maintained throughout roof operations. Time and fire conditions will be constantly working to weaken the roof.

Commercial vs. Residential

There is a distinct difference in construction design, size, and materials between commercial and residential roof systems. Roof Sector must be aware of these differences, which could potentially impact roof operations and interior sectors.

Bowstring Roofs

No firefighter shall operate on or under a bowstring roof if there is any evidence that the fire has penetrated the attic space involving the trusses or the roof structure in any way. When the fire involves a room or contents with no evidence of structural extension, a quick, aggressive, offensive strategy may be appropriate.

Metal Roofs

Buildings with metal roofs have the potential to limit roof operations. Once the Ladder Company Officer evaluates the roof, the decision to operate on it or not will be communicated to Command. Ladder Companies will not operate on pitched metal roofs.

Single Family and Duplex - Tile Roofs

No firefighters will operate on the roof to ventilate a single-family or duplex structure fire covered with concrete or clay roof tiles. It will be necessary to develop a plan for horizontal or positive pressure ventilation with the fire attack companies and/or command.

Commercial / Multi-Story, Multi-Family Occupancy Tile Roofs

Should it be necessary for Fire Companies to gain access to the roof for size-up, search for fire extension, and/or vertical ventilation this is allowable with a clear measurement of the conditions and appropriate risk management evaluation. Extreme caution must be used when operating on these types of structures.

PHOENIX REGIONAL
STANDARD OPERATING PROCEDURES

ROOF SECTOR

M.P. 202.06

10/24

Page 3 of 5

Buildings with Photovoltaic Roof Tile

No Firefighter shall operate on the roof of a structure with photovoltaic roof tiles. This roof material and structure offers electrical hazards and surface hazards that are not conducive to firefighting activities. As with residential tile roofs, it will be necessary to develop a plan for horizontal or positive pressure ventilation with the fire attack companies and/or Command.

Vertical Ventilation

The purpose of ventilation (vertical or other) is to remove super-heated, toxic smoke from the fire area to improve tenability and the possible survivability of fire victims in coordination with an effective fire attack. Vertical ventilation can offer the most efficient form of ventilation of interior heat and gases when it is able to be done in the most advantageous position. Vertical ventilation directly over the fire compartment is the most efficient option. It minimizes the drawing of super-heated gases out of the fire compartment and into uninvolved areas of the structure, further endangering possible trapped victims.

Vertical Ventilation *initially* relieves built-up heat and smoke even when conducted ahead of an effective fire attack. However, this is a **temporary improvement period** that occurs and may be followed by a rapid deterioration of conditions if hose line operation on the fire does not occur at or near the same time. When properly coordinated with fire extinguishment, vertical ventilation provides a needed and lifesaving benefit throughout the fire building.

Vertical ventilation is best executed when sequenced simultaneous to and or immediately following an effective fire attack. Coordination for vertical ventilation simply requires communication between ventilation companies and fire attack companies. It is the responsibility of fire attack companies to get water on the fire as quickly as possible from the best position and to communicate when water is being flowed on the fire and adequate knockdown has begun. It is the responsibility of ventilation companies to ensure that water is being flowed onto the fire and that ventilation is needed.

Assumed or un-communicated expectations can place fire victims and Firefighters in dangerous conditions. Ventilation in any manner will increase the available air in the fire area and will make the fire conditions worse if not done in concert with effective water application.

Vertical ventilation will be supervised and executed by fire companies operating in Roof Sector. The objectives for Roof Sector when engaging in vertical ventilation operations include:

- Roof Sector must monitor the radio at all times.
- Determining a safe working surface
- Confirm the need for vertical ventilation in the incident action plan.

**PHOENIX REGIONAL
STANDARD OPERATING PROCEDURES**

ROOF SECTOR

M.P. 202.06

10/24

Page 4 of 5

- Coordinate the sequencing of vertical ventilation with interior fire attack crews.
- Complete ventilation cuts to achieve effective ventilation over the fire compartment.
- Consider and coordinate roof fire control operations, as conditions and access require.
- Maintain roof-top monitoring of roof structure and fire conditions; during vertical ventilation operation and exit the roof as soon as vertical ventilation objectives are achieved.
- Provide progress reports to Command.

When increased vertical ventilation is determined necessary, ventilation holes should not be made larger. Once a standard-size ventilation hole is cut and cleared, the crews must move away from that area. In some cases, more than one hole will be required to sufficiently ventilate the structure. As one hole is opened, the Roof Sector should cut additional holes a safe distance away. Crews must move from the first hole toward safer areas with each consecutive ventilation hole. Time, roof structural integrity, and overall effectiveness are critical factors in the consideration of additional ventilation holes. Often, it is absolutely not necessary or with the additional risk. This must be coordinated with Command.

It may be necessary to establish a Roof Sector in a position remote from the fire-involved roof to keep a watchful eye on roof conditions, where imminent collapse will occur. Such a location may be an elevated ladder platform or an adjacent building.

Commercial Roof Operations

Vertical ventilation on commercial buildings may not provide effective ventilation in the same manner as on residential roofs due to the size of the compartments and the volume of fuel. In non-compartmentalized large commercial structures, Roof Sector may not be able to cut vertical ventilation holes large enough to positively impact the interior conditions.

If a compartmentalized space can be identified inside a commercial occupancy and ventilation is a necessary and reasonable consideration, vertical ventilation may be warranted. This is conducted in a coordinated manner. In this instance, and when increased vertical ventilation is determined necessary, ventilation holes should not be made larger. Once a standard-size ventilation hole is cut and cleared, the crews must move away from that area. As one hole is opened, the ventilation companies should cut additional holes a safe distance away, if directly over the fire compartment. Crews must move from the first hole towards safer areas with each consecutive ventilation hole. Time, roof structural integrity, and overall effectiveness are critical factors in the consideration of additional ventilation holes. Often, it is not necessary or worth the additional risk. This must be coordinated with Command.

**PHOENIX REGIONAL
STANDARD OPERATING PROCEDURES**

ROOF SECTOR

M.P. 202.06

10/24

Page 5 of 5

Attic Fires

Roof Sector should *not* consider vertically ventilating attic fires, especially ones that have ventilation-limited smoke/fire conditions as their initial attack option. This includes fires that begin in the attic or have extended into the attic. When heavy smoke and heat are present in the attic space, the source of the fire and the extension into the attic need to be extinguished at their source. Creating ventilation openings in a ventilation-limited compartment (attic) can cause the smoke conditions to flash over. A coordinated fire attack from the roof should be considered if interior crews are unable to apply water to the attic or ventilation limited space.

Vertical Ventilation Communication

Company Officers managing roof operations must advise Command when ventilation holes are completed and report on the fire conditions in the structure below the vent hole. This report should include the following:

- Fire and smoke conditions in the attic and through the vent hole
- Any change in the roof conditions and/or structural stability

All Roof Sector personnel shall wear full protective clothing and equipment when operating above a fire. SCBA face pieces and regulator must be worn while operating above a fire, and remain in place through the decontamination process, when necessary.