

## PYROTECHNICS (FIREWORKS) DISPLAY GUIDE

Version	Date	Comments
2	May, 2012	Flame Effect and Indoor Pyrotechnics Included
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### A. INTRODUCTION

All aerial fireworks, flame effects, indoor use of pyrotechnics (i.e. flame or spark producing devices) are subject to the requirements of the Virginia Statewide Fire Prevention Code (SFPC) chapter 56 and the National Fire Protection Association (NFPA) section 1123, 1126 and 160. A permit for these activities must be submitted to the Virginia State Fire Marshal's Office (SFMO). A completed permit application must be submitted to SFMO at least three weeks (15 business days) prior to the start of the event.

### B. SCOPE

This guide applies to all George Mason University employees and departments that may organize an event including the use of aerial fireworks or pyrotechnics on university property. There are no exceptions to this policy as the permits are issued by the SFMO.

### C. PERMIT APPLICATION PROCESS

A permit for aerial fireworks, pyrotechnics, and flame effects displays must be submitted to the SFMO at least 15 business days prior to the event. A permit application is available on line at [http://www.vafire.com/state\\_fire\\_marshall/fireworks.htm](http://www.vafire.com/state_fire_marshall/fireworks.htm).

Allow ample time to complete the process to ensure that permit is issued in advance of the event. All aerial fireworks displays will require road closures; approval for aerial firework displays is also required from the University Police, Parking and Transportation Services and the Environmental Health and Safety Office (EHS). Costs related to University Police staff will be the responsibility of the organization hosting the fireworks display. EHS-Fire Safety is the university point of contact for all firework displays.

### D. REQUIREMENTS FOR AREAL FIREWORK DISPLAYS

**Site Selection:** Aerial fireworks displays at the Fairfax campus are only allowed on the open space between Mason Hall and Mason Pond (See Appendix A: Fairfax Campus Aerial Fireworks Display Site). No other sites are approved for use on the Fairfax campus. Fireworks displays on other university campuses are prohibited unless pre-approved by EHS-Fire Safety and a permit has been issued by the SFMO. All aerial fireworks displays are subject to the requirements of the SFPC. Specific requirements include:

- The areas for the discharge site, display site, spectator viewing area, and the fallout area shall be inspected and approved by the authority having jurisdiction (SFMO) and EHS-Fire Safety prior to any pyrotechnics display.
- No aerial fireworks exceeding three inches in diameter are allowed to be discharged on the Fairfax Campus.
- The minimum separation distances from the discharge site to spectators, occupied buildings or vehicle parking shall be no less than 300 feet.
- No spectators or vehicle parking shall be allowed within the designated display site.
- During the period before the display, where pyrotechnic materials are present, unescorted public access to the site shall not be permitted.
- When, in the opinion of the authority having jurisdiction (i.e. SMFO or EHS-Fire Safety), a hazardous condition exists, the display shall be canceled or postponed until the condition is corrected. This includes a lack of effective crowd control or sustained winds higher than 15 mph.
- Following the display, the firing crew shall conduct an inspection of the fallout area for the purpose of locating any unexploded aerial shells or live components prior to allowing public access.

**Closures:** For secured mortars up to 3” in diameter, the majority of the Mason Pond area will be restricted to authorized personal only. Depending on the placement of the launch site, the Center for the Arts and/or Mason Hall will have to be closed to all occupants during the launch of the fireworks. The following site restrictions may be in effect; however the final decision of restricted areas will be determined by EHS-Fire Safety or the SFMO. (See Appendix B: Fairfax Campus Aerial Fireworks Display Site):

- Mason Pond Drive and its parallel sidewalk will be closed between Patriot Circle and the Parking Deck.
- No vehicle parking will be allowed on Mason Pond Drive.
- The walkway from Lot J/K will be closed between Patriot Circle and Mason Pond Drive.
- The sidewalk parallel to Patriot Circle between Mason Pond Drive and the Roanoke River Road split will be closed.
- Spectator viewing areas will be as marked on the site plan.
- Patriot Circle between Mason Pond Drive and the Roanoke River Road split will be closed.

## **E. REQUIREMENTS FOR FLAME EFFECTS**

The following guidelines must be followed whenever a flame effect is used in a university owned or leased building or on state owned property. The SFMO has the ultimate and final decision making authority over all flame effects and may change or amend these guidelines as they deem necessary. The SFMO or EHS-Fire Safety might require a pre-show demonstration of the flame effect.

## **Equipment Requirements:**

- Flame effect systems must be stored and secured when not in use.
- All flame effects must have written operating instructions and are available to the operator.
- Where flame effects use piping, the piping must be pressure tested for signs of leakage.
- The maximum quantity of flammable flame effects materials readily available for use may not exceed the quantity used in one day.
- The maximum amount of single liquid propane gas (LPG) cylinders used as flame effect fuel supply may not exceed 20 pound nominal propane capacity.
- If more than one LPG cylinder is located within a room, they shall be separated by not less than 20 feet.
- LPG cylinders shall not be connected or disconnected during the flame effect or performance.
- LPG cylinders shall not be stored inside of any building.

Portions of fire protection and life safety systems may be interrupted during the operation of the flame effects if all of the following are satisfied:

- SFMO and EHS-Fire Safety have given explicit and written approval.
- A fire watch capable of directing the operation of the building's fire protection and life safety systems is posted throughout the flame effect.
- Performers, operators, and assistants are protected by clothing or other means capable of providing protection from exposure to flame effects.
- Four or more properly classified fire extinguishers are readily accessible while a flame effect performance is conducted. The minimum number of fire extinguishers is two Class 2-pressurized water and two Class 10-BC extinguishers.
- At least one extinguisher of each class must be located on opposing sides of the performance area where flame effects are performed.
- As determined by the SFMO, standby fire personnel shall be present and supplied by additional operational equipment.

## **Post Show Operations:**

- Fire and life safety systems that are interrupted must be restored immediately after completion of the flame effect by persons trained in the operation of all aspects of the systems (i.e. EHS-Fire Safety or the Facilities Management Fire Alarm Shop).
- Immediately following the firing of any flame effect, the enable and arming signals are to be removed, all fuel and auxiliary services are to be secured and a visual inspection made of all effect hazard areas.

## **F. REQUIREMENTS FOR INDOOR PYROTECHNIC DISPLAYS**

The following guidelines must be followed whenever an indoor pyrotechnic display is used in a university owned or leased building or on state owned property. The SFMO has the ultimate and final decision making authority over all indoor pyrotechnic displays and may change or amend

these guidelines as they deem necessary. The SFMO or EHS-Fire Safety may require a pre-show demonstration of a sample of the indoor pyrotechnic display.

### **Alarms and Life Safety Systems:**

- When the use of indoor pyrotechnics requires smoke detectors and air-handling systems to be disengaged, the applicant and venue manager will appoint a responsible individual to return systems to normal operating conditions as soon as the likelihood of false alarms from the pyrotechnics has passed.
- Alarm verification as described in section 6.8.5.4.1 of NFPA 72 is allowed as a means of controlling false alarm initiations that are a result of residual particulates suspended in the air from the functioning of the pyrotechnic devices.

### **General fire protection requirements:**

- Four or more properly classified fire extinguishers are to be readily accessible while a flame effect performance is being conducted with the minimum being two Class 2-A pressurized water and two Class 10-BC extinguishers.
- At least one extinguisher of each class must be located on opposing sides of the performance area where flame effects are performed.
- A separate lockable room or facility for the preparation and storage of pyrotechnic materials and devices is provided.

### **Pyrotechnic use and firing prerequisites:**

- All pyrotechnic materials and devices used indoors must be specifically manufactured and labeled for indoor use.
- Where the device is too small to bear the proper labeling, the required information shall be printed on the instruction sheet, shipping container, or packaging.
- Upon request of the SFMO, each type of pyrotechnic must be demonstrated from the location that will be used during the performance, for the purposes of demonstrating safe distances and procedures, prior to an event.
- As may be proven by demonstration, all devices are mounted in such manner to maintain their proper positions and orientations. So when fired, the desired effects are produced and fallout does not endanger lives, results in injury, or property damage.
- Comets and mines are to be fired so the trajectory is not carried over the audience.
- Flammable materials are not to be placed within the fallout area of waterfalls and gerbs.
- As may be proven by demonstration, airbursts may be fired above the assembled audience only if:
  - The airburst is suspended by a minimum 30-gauge metal wire firmly attached to a secure support;
  - The airburst occurs at a minimum height of three times the diameter of the effect; and,
  - There shall be no burning or glowing particles below the 15-foot level above the floor.

- As may be proven by demonstration, each pyrotechnic device fired shall be separated from the audience by a minimum of 15 feet or twice the fallout radius of the device, whichever is greater, and there shall be no glowing or flaming particles within 10 feet of the audience.
- No part, projectile, or debris from the pyrotechnic material or device is to be propelled so that it damages overhead properties, overhead equipment, or the ceiling and walls of the performance area.
- Where pyrotechnics are fired, the quantity of smoke developed shall not obscure the visibility of exit signs or paths of egress and be proven during the demonstration.

### **Mixing of Binary Components:**

- Binary systems shall be mixed one unit at a time, using only the bottles supplied by the manufacturer, and only for that amount needed for immediate use.
- Binary materials shall be pre-measured and packaged by the manufacturer.
- Binary materials intended for indoor use shall be labeled for indoor use.

### **Mortars and Flash Pots:**

- Concussion mortars and effects are to be secured by placement under the stage or behind barricades to prevent access by the audience, performers, and support personnel.
- Concussion mortars and effects are to be separated from the audience by a minimum of 25 feet.
- Rotating pyrotechnic devices, such as wheels and saxons, are to be mounted securely so the rotation does not cause failure of the holder.
- As may be proven by demonstration, mortars and flash pots do not fragment or distort upon use.
- Converted electrical switch boxes, lamp sockets, lamp holders, plug fuses, and similar thin-walled, brittle devices shall not be used for concussion mortars or flash pots.

Rockets: Where rockets are launched before an audience, performers, or support personnel, the rockets shall be securely attached to a guide wire or cable of sufficient strength and flame resistance, with both ends attached and placed on an impact-resistant surface at the terminal end of the guide.

### **Firing Safe Guards, Power Sources and Communications:**

- Pyrotechnic materials must be fired using equipment specifically constructed for the purpose of firing pyrotechnic materials.
- Power sources used for firing are restricted to batteries or isolated power supplies used for firing purposes only.
- All firing systems are to be designed to ensure against accidental firing by providing at least a two-step interlock feature that prevents firing power from being supplied unless the operator enables or arms the system, and deliberately applies firing power.

- Pyrotechnic devices must be fired only when the area where the effect is to occur is in clear view of the operator or an assistant who is in direct communication with the operator.

**Post Show Operations:**

- Immediately after each performance and before any personnel remove any property related to a performance, the pyrotechnician shall verify that all pyrotechnic devices have been fired.
- Any unfired pyrotechnic materials or devices shall be fired or disposed of in accordance with the manufacturer's instructions.

## **Appendix A Definitions**

***Areal Firework Display:*** Fireworks that are launched from the ground and intended to explode in the air in an outdoor setting.

***Discharge Site:*** the area immediately surrounding the fireworks mortars used for an outdoor fireworks display.

***Display Site:*** the immediate area where a fireworks display is conducted. This includes the discharge site, fallout area, and the required separation distance from secured mortars to spectator viewing areas. The display site does not include spectator viewing areas or vehicle parking areas.

***Fallout Area:*** the area over which aerial shells are fired. The shells burst over the area and unsafe debris and malfunctioning shells fall into this area.

***Flame Effect:*** The combination of solids, liquids, or gases to produce thermal, physical, visual, or audible phenomena before an audience.

***Indoor Pyrotechnics Display:*** A firework display that is in an indoor setting and does not utilize areal fireworks.

**Appendix B: Fairfax Campus Aerial Fireworks Display Site**

