



DEPARTMENT OF FIRE SERVICES

A decorative graphic element consisting of a horizontal line with a gradient from dark purple to bright yellow, ending in a large, stylized arrowhead pointing to the right.

DIVISION OF FIRE SAFETY Code Compliance & Enforcement Unit



Fireworks

- Topics to be discussed:
 - Standards / Regulations
 - Permits
 - Certificates of Competency
 - Fireworks User's Certificate
 - Transportation / Delivery
 - Barriers





Fireworks

- Topics to be discussed:
 - Weather
 - Fire details
 - Display set-up
 - Marine displays
 - Post display requirements
 - Types of fireworks





527 CMR 1.00: 65.2 – Display Fireworks





Display Fireworks

- 527 CMR 1.00: 65.2 – Display Fireworks
- NFPA 1123 – Code for Fireworks Display, 2010 Edition - Incorporated by reference in its entirety - including appendix A, D and E
- NFPA 1124 – Code for the Manufacture, Transportation, Storage and Retail Sales of Fireworks and Pyrotechnics Articles – 2006 Edition



Display Fireworks

- History of NFPA 1123
 - Development began in 1975 by the American Pyrotechnic Association
 - Officially adopted by NFPA in 1978
 - Completely revised in 1990
 - Continuously revised and updated



Permits – 527 CMR: 1.12.8.39.2

- Application for permit shall be made in writing and include:
 - Name, address and phone number of sponsor
 - Date and time of display (and rain date)
 - Exact address of display
 - Site diagram (Google/Bing maps, GIS maps are acceptable)
 - * Hand drawn diagrams are unacceptable
 - Shooter information (name, address, phone number and Certificate of Competency Number)
 - Fireworks User's Certificate Number
 - Number, size and description of shells
 - Storage of shells pre-display



Permits

- Upon submittal of the permit application, the head of the fire department shall verify:
 - Valid Certificate of Competency (license)
 - Description of the display operation (site diagram, hazards, delivery route, etc.)
 - Valid Fireworks User's Certificate



License Verification

The screenshot shows a web browser window displaying the official website of the Executive Office of Public Safety and Security. The page is titled "Public Safety" and features a navigation menu with categories such as "Public Safety Agencies", "Homeland Security & Emergency Response", "Crime Prevention & Personal Safety", "Consumer Protection & Business Licensing", "Funding & Training Opportunities", "Law Enforcement & Criminal Justice", "Firearms Registration & Laws", and "Legislative Initiatives".

The main content area is titled "Department of Fire Services" and includes a "Welcome from the State Fire Marshal" section with a photo of the State Fire Marshal and a "June 2012 - DFS Briefs - Monthly Updates from the Department of Fire Services" section with a photo of fireworks. A sidebar on the left lists various organizational links, and a sidebar on the right lists "Online Services" and "News & Updates".

At the bottom of the page, the text reads: "busy 4th of July week. The following numbers may be called for immediate".



Certificate of Competency

The screenshot shows a web browser window displaying the official website of the Massachusetts Department of Fire Services (DFS). The browser's address bar shows the URL: http://elicense.chs.state.ma.us/DFS_Verification/Search.aspx?Facility=N. The website header includes the text "The Official Website of the Department of Fire Services (DFS)" and "Public Safety". Below the header, there are navigation links for "Mass.Gov Home", "State Agencies", and "State Online Services". The main content area features a red banner with the text "Welcome to the Massachusetts Department of Fire Services License Verification Site". Below this, a paragraph explains that users can verify the status of a person or a facility license and view any disciplinary action. A section titled "Person Search" contains a form with the following fields: "Profession" (dropdown menu set to "All"), "License Type" (dropdown menu set to "All"), "First Name" (text input), "Last Name" (text input), "License Number" (text input), "License Status" (dropdown menu set to "All"), "City" (text input), "State" (text input), "Zipcode" (text input), and "County" (text input). There are "Search" and "Clear" buttons at the bottom of the form. A link "Click here to search for a Facility" is also present. At the bottom of the page, a disclaimer states: "Disclaimer: The information contained in this website ('website content') is made available as a public service by the Massachusetts Department of Fire Services." The browser's status bar at the bottom right shows "100%" zoom.



Certificate of Competency

- Holder of Certificate of Competency shall:
 - Be at least 21 years of age
 - Pass a comprehensive written examination covering state laws, regulations and safety standards
 - Have held active employment for 3 years on a professional fireworks crew (min. 10 shows)
 - Have two letters of reference from a licensed pyrotechnic operator
 - Complete a recognized fireworks safety course



Fireworks User's Certificate

The screenshot shows a web browser window displaying the "License Verification Site" of the Massachusetts Department of Fire Services. The browser's address bar shows the URL: http://elicense.chs.state.ma.us/DFS_Verification/Search.aspx?Facility=Y. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The browser's toolbar shows a search bar, McAfee security icons, and various navigation icons. The website's header features a red banner with the text "The Official Website of the Department of Fire Services (DFS)" and a "Public Safety" banner with a background image of a fire truck. Below the banner is a navigation menu with links for "Mass.Gov Home", "State Agencies", and "State Online Services". The main content area has a red heading: "Welcome to the Massachusetts Department of Fire Services License Verification Site". Below this heading is a paragraph: "On this site you can verify the status of a person or a facility license and view any disciplinary action. Select a Profession and enter one or more additional fields below. Searching by license number or last name will produce the most efficient results. Otherwise, you may retrieve too large a data set to work with on your screen." Below the paragraph is a section titled "Facility Search" with a form containing the following fields: "Profession:" with a dropdown menu set to "All"; "License Type:" with a dropdown menu set to "All"; "Business Name:" with a text input field; "Manager Name:" with a text input field; "License Number:" with a text input field; "License Status:" with a dropdown menu set to "All"; "City:" with a text input field; "State:" with a text input field; "Zipcode:" with a text input field; and "County:" with a text input field. There are "Search" and "Clear" buttons at the bottom of the form. A link "Click here to search for a Person" is located to the right of the "Business Name" field. At the bottom of the page, there is a "Disclaimer" section: "Disclaimer: The information contained in this website ("website content") is made available as a public service by the Massachusetts Department of Fire Services." The browser's status bar at the bottom right shows "100%".



Fireworks User's Certificate



The Commonwealth of Massachusetts

Department of Fire Services

Pyrotechnic User Certificate

PY-001011

This is to certify that in accordance with all Massachusetts laws and regulations a Pyrotechnic User Certificate is hereby issued to:

Expiration Date: 02/15/2016

Restrictions or Secondary License Type:

[REDACTED]
[REDACTED]
[REDACTED]

State Fire Marshal

A handwritten signature in black ink, appearing to read "Stephen D. Carr".

Post in a conspicuous place. Verify the status of this Certificate at www.mass.gov/dfs



Permits

- Permit application shall be submitted in writing to the head of the fire department at least 20 days prior to the display.
- After permit has been signed by the head of the fire department, a copy shall be transmitted (mail, electronically, or fax) to the State Fire Marshal's Office within 5 days after receipt of application.



Transportation

- Shall comply with NFPA 1124 – 2006 Edition
- DOT 49 CFR



Transportation of Fireworks

- Permit to Transport Fireworks (Intrastate)
- 527 CMR 1.00 1.12.8.39

The Commonwealth of Massachusetts
Department of Fire Services
Permit to Transport Fireworks
TF-004051

This is to certify that in accordance with all Massachusetts laws and regulations a
Permit to Transport Fireworks is hereby issued to:

Expiration Date: 06/01/2016 Restrictions or Secondary License Type:

[Redacted Name]
[Redacted Address]
[Redacted City]
[Redacted State]
[Redacted Zip]

State Fire Marshal *Stephen D. Carrisi*

Post in a conspicuous place. Verify the status of this Certificate at www.mass.gov/dfs



Transportation of Fireworks

- Vehicle shall be totally enclosed at all time
- Vehicle shall constantly be attended





Transportation of Fireworks

- Enclosure shall be protected by a suitable lock





Transportation of Fireworks

- Vehicle shall be placarded on all four sides





Transportation of Fireworks

- Vehicle shall bear the owners name on each side





Transportation of Fireworks



- Vehicle shall have a portable fire extinguisher with a minimum rating of 10 B:C



Delivery of Fireworks

- Delivery of fireworks shall be made to authorized persons who are in possession of a valid Certificate of Competency
- Fireworks shall not be left unattended
- Fireworks shall be kept dry



Delivery of Fireworks

- Upon delivery of the fireworks to the display site, members of the public, the audience, spectators, and other persons shall be kept at a distance not less than those specified in the minimum separation distances.
- The fireworks crew shall be the only persons in the display area.



Display of Fireworks

- The audience shall be restrained behind a suitable barrier such as snow fencing or its equivalent.
 - Uninterrupted barrier (vertical and horizontal)
 - Not less than 40 inches in height
 - Shall clearly define the discharge area
 - Of substantial strength and support



Suitable Barriers



Snow Fencing



Suitable Barriers

Steel/metal fencing





Barriers

- Unacceptable barriers:
 - Caution tape
 - Fencing with open/unsecured gates
 - Detail police officer(s)/firefighter(s)
 - Stand alone signage



Natural Barriers

- Natural barriers such as restrictive terrain, or bodies of water, may be utilized to restrain the audience.



Natural Barriers

- Natural barriers shall be pre-approved by the State Fire Marshal's Office
- Please plan sufficient time ahead of the display
- Natural barrier approvals shall remain in effect indefinitely; provided that the display site has not changed (trees removed, shell size change, etc.)



Natural Barriers

- Natural barrier to restrain the audience





Natural Barriers



- Natural barrier to restrain the audience



Weather

- “If high winds, precipitation, or other adverse weather conditions prevail or begin such that a hazard exists in the opinion of the operator or the AHJ, the fireworks display shall be postponed or discontinued until the weather conditions improve.”



Weather



- Fireworks displays shall not be held when the wind exceeds 20 mph at ground level.



Weather



- Wind speed can be determined by utilizing an “anemometer” or another similar device



Weather

- The display shall be stopped immediately in the event that upper level wind conditions cause the fireworks debris fallout area to change and poses a threat to public safety.
- A test shot shall be provided to check for high level winds at the request of the head of the fire department or the Marshal.



Notification To Other Agencies

- Prior to the display, the competent operator (licensed shooter) shall be responsible for notifications to:
 - F.A.A. (if within 25 nautical miles of an airport)
 - United States Coast Guard where applicable
 - Other governmental agencies with the jurisdiction



Hazardous Conditions

- “Wherever, in the opinion of the AHJ or the operator, any hazardous condition exists, the fireworks display shall be stopped until the condition is corrected.”



Fire Details

- The sponsor shall be responsible for the detailing of one or more members of the fire department as may be required by the head of the fire department.
- Detail firefighter(s) should be on duty from the time the fireworks are delivered to the site until the termination of the display.



Fire Details

- Fire personnel and equipment shall remain outside the display area during the display, as well as when the show is being set up.





Separation Distances

- Distances for Outdoor Fireworks Display Sites
 - Minimum separation distances from Mortars to Spectators



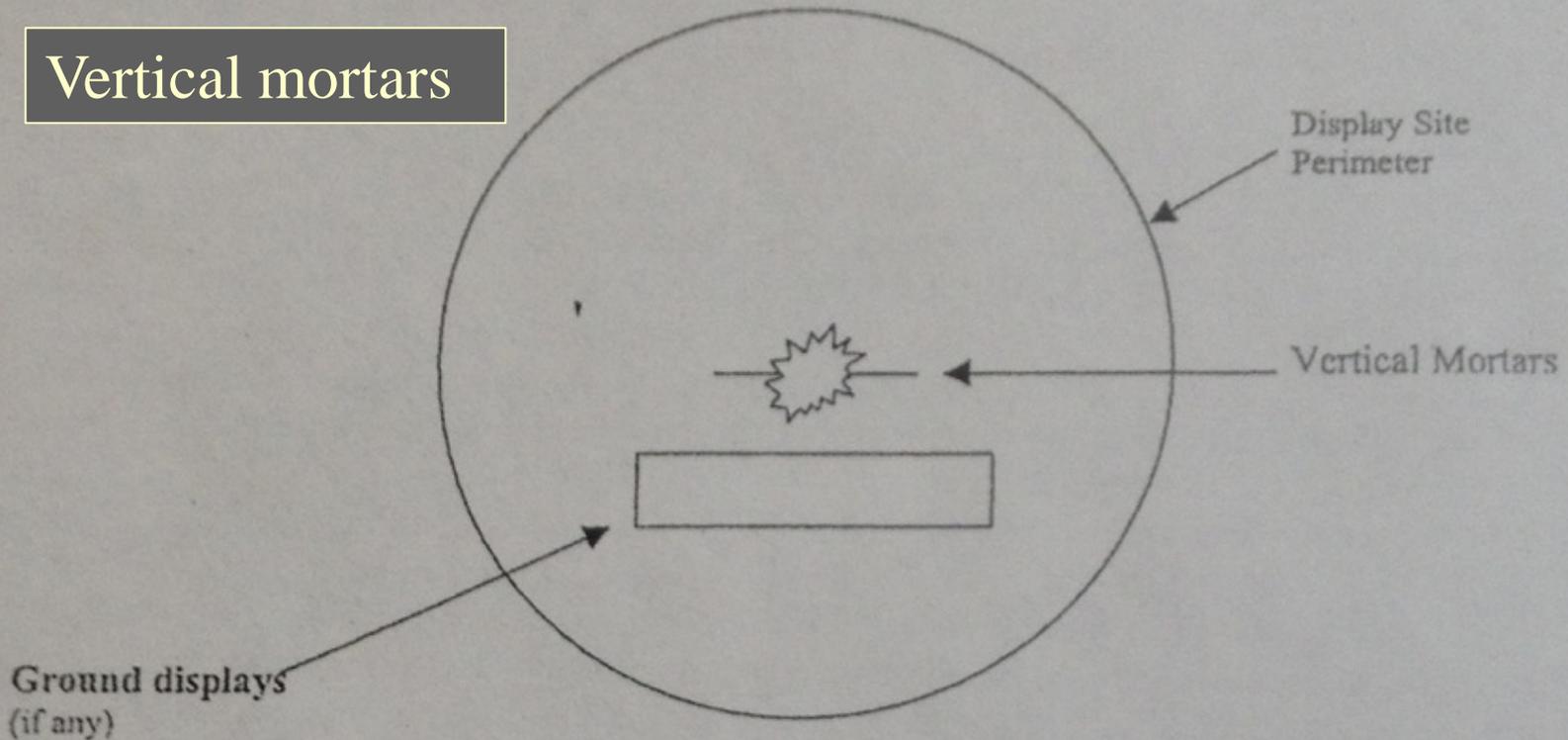
Separation Distances

- The site for outdoor land or water displays shall have at least a “70 feet per inch” radius of internal mortar diameter of the largest aerial shell to be fired.
- Example: A display with a 4” maximum sized shell shall have at least a 280 ft. separation between the largest mortars and the spectators.



Separation Distances

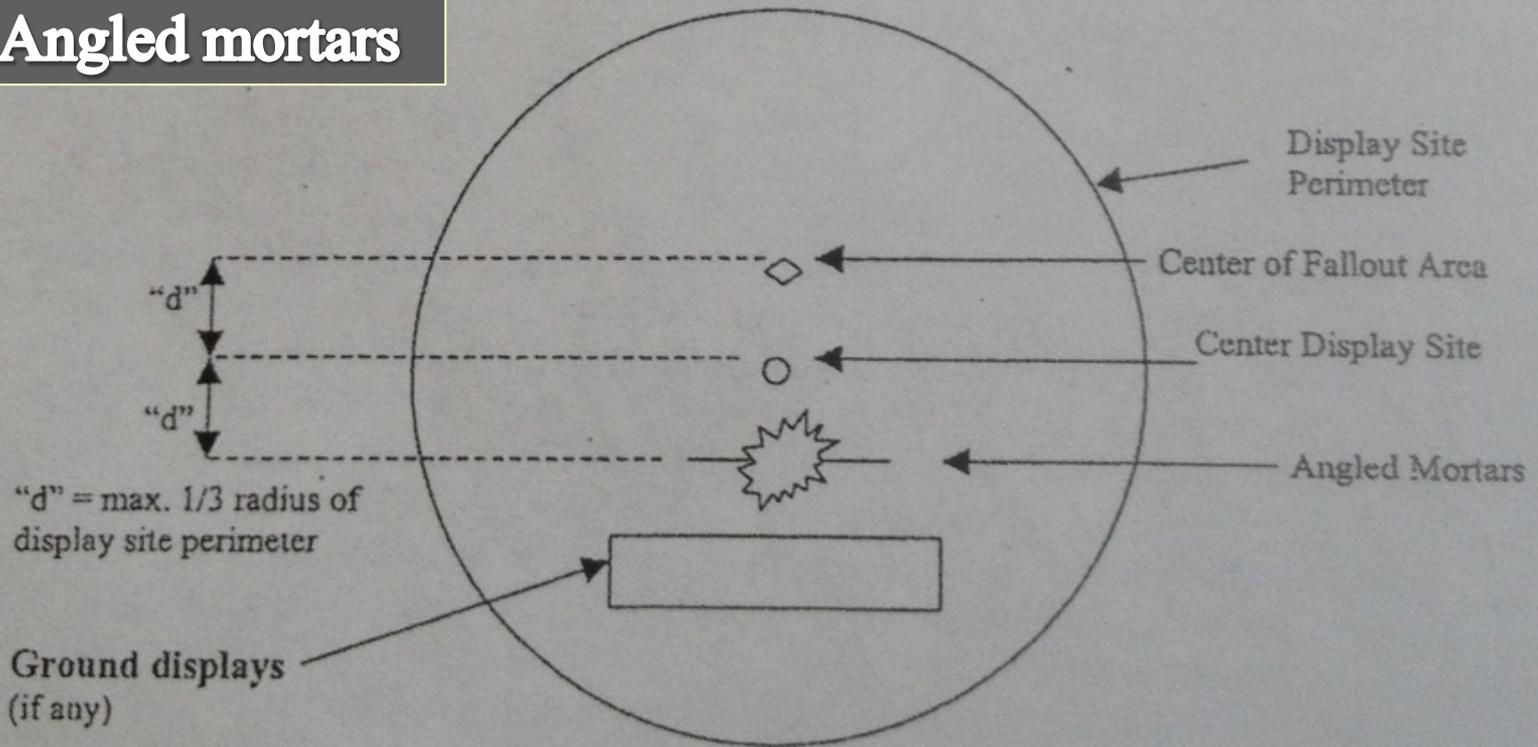
Vertical mortars





Separation Distances

Angled mortars





Multiple Shot Mortars

- Multiple shot mortars devices using less than 3” in diameter shells, such as cakes and repeaters, shall be:
 - buried 7/8 of their length in a trench, mortar trough, or sturdy drum filled with clean sand
 - or
 - Head of Fire Department may allow sandbags or racks



Separation Distances

- No spectators or spectator parking areas shall be located within the display site.
- The areas selected for the discharge site, spectator viewing area, parking areas, and the fallout area shall be inspected by the AHJ.



Separation Distances

- Dwellings, buildings and structures are allowed to be within the display site, provided that they are unoccupied (and with approval from the AHJ)
- Aerial shells shall not be discharged within 25 feet of overhead objects



Mortar Racks





Mortar Racks

- Mortars shall be separated from each other by a distance equal to $\frac{1}{2}$ the diameter of the adjacent mortar(s)
- Mortars shall be securely fastened to the mortar rack
- Parallel racks or rows of racks shall be separated by a min. distance of not less than twice the diameter of the largest mortar in an adjacent rack



Mortar Racks





Mortar Tubes

- Fiberglass reinforced epoxy (FRE) mortar tubes





Mortar Tubes

- HDPE Mortar Tubes
- (High Density Polyethylene)





Mortar Tubes



Plug at bottom of HDPE mortar tube



Mortar Tubes

- Spiral/Convolute Paper





Mortar Tubes

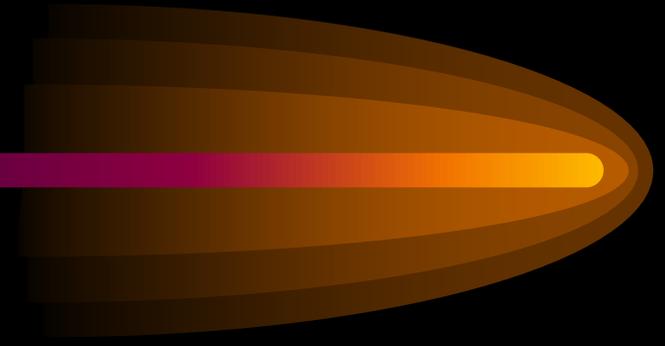
- **Steel**

- With welded seams only
- Seams shall face right or left when viewed from the front





Mortars



- Shall not be reloaded
- Shall be positioned so shells are propelled over the fallout area
- Weather resistant coverings may be placed over mouth of mortars



Mortars



Mortars shall be kept dry



Dense Pack Firing Trailers

- Shall be approved by the SFMO
- Permit sticker shall be affixed to the trailer
- Sticker placed on tongue of trailer (expires every five years)





Dense Pack Firing Trailers



Dense pack firing trailer



Dense Pack Firing Trailers



Dense pack firing trailer



Electronic Firing Units

- All electronic firing units shall be approved by the SFMO
- A permit sticker will be affixed to the panel and indicate the date of expiration (every five years)
- Shall have a key operated switch or similar device



Electronic Firing Units



Electronic Firing Units (panels)



Marine Displays

- Floating vessels and floating platforms (barges) can be permitted
 - Manned or unmanned





Marine Displays



Small fireworks barge (Approved by SFMO)



Marine Displays

- All barges shall be:
 - Of sturdy and seaworthy construction
 - Properly maintained
 - Provided with adequate towing, anchor, mooring lines

All barges shall meet the min. requirements as described in
NFPA 1123 Chapter 6



Marine Displays

- All vessels and platforms shall be:
 - Free of all nonessential combustible and flammable materials
 - Configured to safely allow the firing of the display





Marine Displays

- A fireworks crew list including their full name, home address, and job responsibilities should be submitted to the head of the fire department prior to the display
- Suitable shelter shall be provided to prevent debris from falling on personnel and provide protection from malfunctioning product as described in NFPA 1123 Chap. 6
- No unauthorized personnel on barge during the display



Marine Displays

- No smoking allowed on vessels or platforms
- Personal floatation devices (PFD's) shall be worn
- If product is loaded into mortars at dockside, the minimum separation distances shall apply at dockside and while in transit to its final destination



Marine Displays



Large fireworks barge



Marine Displays

- The area on all sides of the barge or vessel shall be free of all unauthorized personnel, vessels and water craft.



Marine Displays



- **Display area being maintained by law enforcement/fire department marine units**
 - (US Coast Guard, Mass State Police, local FD, MA Environmental Police, etc..)



Marine Displays



Fireworks barge



Marine Displays



Loading of shells



Post-Fireworks

- The licensed shooter is responsible to ensure that a thorough search of the display area is conducted to recover any unignited fireworks or remnants thereof containing explosives.
- The search is broken down into two separate parts:
 - Immediately following the display
 - A “first light” search at first available daylight



Post Fireworks





Post-Fireworks

- Following the searches, the licensed shooter shall report any and all findings to the head of the fire department
- The shooter may assign a substitute competent operator to conduct the first light search, upon approval of AHJ
- It shall be the responsibility of the licensed shooter to dispose of any and all such items in accordance with NFPA 1123 Chapter 8.2.10.2



Display Fireworks

- Classified as:
1.1G, 1.3G, 1.4G, or
1.4S by the DOT
- Typically come in sizes
ranging from 2” – 12”





Display Fireworks



- Shells greater than 12” in diameter require written approval from the Marshal



Display Fireworks



Aerial shells of various sizes



Display Fireworks

- Typical construction of an spherical aerial shell
(Shells may also be cylindrical in shape)





Display Fireworks



- Multiple shot devices



Supervised Display of Fireworks

– EFFECTIVE JANUARY 1, 2012 ALL FIREWORKS SHALL BE ELECTRICALLY FIRED.

* MANUAL HAND FIRING IS PROHIBITED *



Accidents

- In the event of an explosion, fire or other accident involving fireworks causing:
 - loss of life
 - injury to any person
 - damage to property

...the incident shall be reported, by the licensed shooter, immediately to the Marshal

 - 978-567-3375 (Normal Duty Hours M-F 8-4)
 - 508-820-2000 (Nights, Holidays & Weekends)



Accidents



Wellfleet, MA
Explosion during display set-up



Accidents





Accidents





Assistance

If you have any questions regarding fireworks, or require the response of the Code Compliance & Enforcement Unit, contact the Division of Fire Safety at:

During business hours: (978) 567-3375

After hours: (508) 820-2000



Contact Information

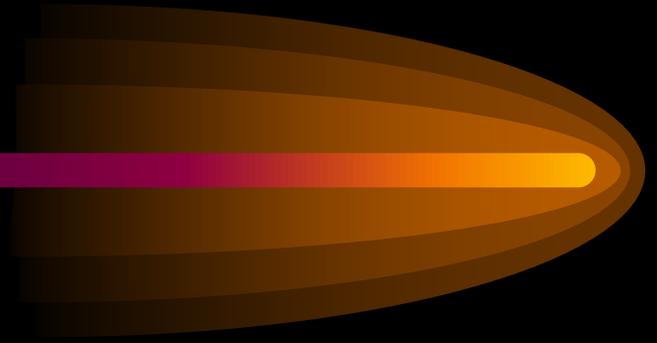


- Division Of Fire Safety
- Dave Beaudin 978-567- 3711
- Matt Allen 978-567-3371
- John Wood 978-567-3374
- John Araujo 978-567-3712
- Jordan Greene-Williams

508-427-0408



Questions?



THANK YOU