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Sale, Use, Transportation and Storage of Fireworks and Special Effects

Secs. 29-357-1—29-357-16.

Repealed, December 30, 1990.

Connecticut Fireworks and Special Effects Code

Sec. 29-357-1a.

Repealed, November 24, 1999.

Sec. 29-357-1b. Introduction

Regulations of the Department of Public Safety Sections 29-357-1b to 29-357-12b, inclusive, and Sections 29-357-15a to 29-357-23a, inclusive, shall be known as the Connecticut Fireworks and Special Effects Code.

(Adopted effective November 24, 1999)

Secs. 29-357-2a—29-357-14a.5.

Repealed, November 24, 1999.

Sec. 29-357-2b. Authority having jurisdiction

For the purposes of regulations adopted by reference under Section 29-357 of the Connecticut General Statutes, “the authority having jurisdiction” means the State Fire Marshal. The State Fire Marshal is the authority having jurisdiction regarding the proper administration, application, interpretation, and modification of the requirements contained within the Connecticut Fireworks and Special Effects Code.

(Adopted effective November 24, 1999)

Sec. 29-357-3b. Variations, exemptions or modifications

The Connecticut Fireworks and Special Effects Code is not intended to prevent the use of any material, equipment, method of construction or installation procedure not specifically prescribed herein. The State Fire Marshal may grant variations or exemptions from, or approve equivalent or alternate compliance with, particular provisions of the Connecticut Fireworks and Special Effects Code, where strict compliance with such provisions would entail practical difficulty or unnecessary hardship or is otherwise adjudged unwarranted, provided any such variation or exemption or approved equivalent or alternate compliance shall, in the opinion of the State Fire Marshal, secure the public safety. Requests for variations, exemptions or modifications of any provisions of the Connecticut Fireworks and Special Effects Code, shall be in writing on a form prescribed by the State Fire Marshal. The State Fire Marshal may require the submission of sufficient supporting technical data to substantiate the proposed variation, exemption or modification.

(Adopted effective November 24, 1999)

Sec. 29-357-4b. Definitions

As used in the Connecticut Fireworks and Special Effects Code:

(1) “Amusement park” means an outdoor area used, maintained and operated as a place of recreation or amusement;

(2) “Applicant” means any person, firm or corporation requesting a permit to conduct a supervised display of fireworks or for the indoor use of pyrotechnics for

special effects by municipalities, fair associations, amusement parks, other organizations or groups of individuals or artisans in pursuit of their trade;

(3) “ASTM” means the American Society for Testing and Materials, located at 100 Barr Drive, West Conshohocken, PA 19428-2959;

(4) “Black match” means a fuse made from thread impregnated with black powder and used for igniting pyrotechnic devices;

(5) “Boxed finale” means a number of racks of mortars grouped closely together;

(6) “Break” means an individual effect from an aerial shell;

(7) “Certificate of competency” means a written assurance of an operator’s qualifications, issued by the State Fire Marshal in accordance with the provisions of Section 29-357 of the Connecticut General Statutes;

(8) “Certified” means an individual certified in accordance with the provisions of Section 29-298 of the Connecticut General Statutes;

(9) “Common fireworks” means any small fireworks device designed primarily to produce visible effects by combustion, including whistling devices, ground devices containing 50 milligrams or less of explosive composition, novelty devices and trick noise makers;

(10) “Debris” means materials remaining after the discharge of fireworks or special effects, excluding non-pyrotechnic materials such as small pieces of paper, cardboard or plastic and litter left by spectators;

(11) “Discharge site” means the area immediately surrounding the mortars used to fire aerial shells;

(12) “Display” means the set up, firing or deflagration of fireworks, including ground or aerial displays;

(13) “Fair association” means an association organized for the purpose of promoting, encouraging, improving and exhibiting agricultural and mechanical products;

(14) “Finale rack” or “aboveground rack” means a row of closely spaced mortars with an inside diameter of up to 6 inches, held in a wooden frame, and similar to a boxed finale;

(15) “Fireworks” shall have the meaning ascribed to it in Section 29-356 of the Connecticut General Statutes;

(16) “Fusee” means a friction match with a bulbous head not easily blown out;

(17) “Ground display piece” means a pyrotechnic device that functions on the ground, including fountains, Roman candles, wheels and set pieces;

(18) “HDPE” means high density polyethylene;

(19) “Inhabited building” means a building or structure regularly used in whole or in part as a place of human habitation, including any church, school, store, passenger station, airport terminal for passengers or other building or structure where people are accustomed to congregate or assemble, but excluding any building or structure occupied in connection with the manufacture of fireworks;

(20) “Lift charge” means the part of an aerial shell which actually lifts the shell into the air;

(21) “Mortar” means a metal, HDPE, fiber reinforced epoxy or heavy cardboard tube from which aerial shells are fired;

(22) “Operator” means the holder of a certificate of competency who fires off, discharges, or deflagrates fireworks or special effects;

(23) “Permit” means a written license, issued by the State Fire Marshal, for the display of fireworks or special effects;

(24) “Port fire” means a long tube containing slow-burning pyrotechnic composition that is sometimes used to ignite fireworks at outdoor fireworks displays;

(25) "Potential landing area" means the area over which aerial shells are fired and do not normally burst;

(26) "Pyrotechnics" means the display of fireworks;

(27) "Pyrotechnic composition" means any combination of chemical elements or chemical compounds capable of burning independently of the oxygen and atmosphere;

(28) "Pyrotechnic device" means any combination of materials, including pyrotechnic compositions that, by the agency of fire, produce an audible, visual, mechanical or thermal effect;

(29) "Quick match" means a black match encased in a loose fitting paper sheath for instantaneous burning;

(30) "Ready box" means a storage container for aerial fireworks, such as mines, comets and shells, at the site of a fireworks display.

(31) "Safety cap" means a paper tube that is placed over the end of the fuse of an aerial shell to protect it from accidental ignition;

(32) "Safety fallout zone" means potential landing area;

(33) "Shell" or "aerial" means a cylindrical or spherical cartridge containing pyrotechnic composition, a long fuse, and a black powder lift charge;

(34) "Special effects" means any article containing pyrotechnic composition manufactured and assembled, designed, or discharged in connection with television, theater, or motion picture productions, which may or may not be presented before live audiences. The definition of special effects may also encompass other articles containing any pyrotechnic composition used for education, recreation or entertainment purposes, which may or may not be presented before live audiences, indoors or outdoors;

(35) "Stage" means a partially enclosed portion of an assembly building which is designed or used for the presentation of displays, demonstrations, or other entertainment wherein scenery, drops, or other effects may be installed or used, and where the distance between the top of the proscenium opening and the ceiling above the stage is more than 5 feet;

(36) "Standard dimensional ratio" or "SDR" means the numerical designation of the formula used to determine the inside diameter of high density polyethylene by dividing the outside diameter by the wall thickness; and

(37) "Static set piece" means a ground display attached to a frame and connected with quick match for simultaneous ignition.

(Adopted effective November 24, 1999)

Sec. 29-357-5b. Permits to display fireworks or special effects

(a) Applications for permits for supervised displays of fireworks or the indoor use of pyrotechnics for special effects shall be made in accordance with the requirements of subsection (b) of Section 29-357 of the Connecticut General Statutes.

(b) Denial of any permit application for such display of fireworks or special effects by the police or fire chief or first selectman of the municipality in which the display is to be held shall constitute sufficient cause for the State Fire Marshal to refuse issuance of the requested permit.

(c) The State Fire Marshal shall be notified in writing of any changes in the information contained within the application not later than 24 hours before the scheduled display.

(Adopted effective November 24, 1999)

Sec. 29-357-6b. Certificate of competency required to display fireworks or special effects

(a) Applications for a certificate of competency to display fireworks or special effects shall be submitted on forms furnished by the State Fire Marshal, subject to the following requirements:

(1) The applicant shall provide evidence of at least three years of employment on a professional fireworks or special effects crew with responsibility for at least 10 supervised displays. In the case of fireworks, such displays shall include at least one finale of 100 or more 3-inch shells.

(2) Such evidence shall consist of a log book containing the date and location of each supervised display that the applicant was associated with, the applicant's responsibilities with respect to each such display, and the name, signature and license number of the operator responsible for the display.

(3) Each applicant for a certificate of competency shall produce the following: a recent photograph, fingerprints, two positive forms of identification, two personal references by persons who have known the applicant for at least five years, a letter from the chief of police of the municipality in which the applicant resides attesting to the applicant's good character and suitability to handle fireworks or special effects, and three letters from operators in the applicable field, fireworks or special effects, attesting to the applicant's competence in handling fireworks or special effects. At least one of the operators attesting to the applicant's competency shall hold a valid Connecticut certificate of competency in the specific field for which application is made.

(4) Applicants shall receive a passing grade on a written examination administered by the State Fire Marshal in order to be issued a certificate of competency.

(b) The holder of a certificate of competency shall keep such certificate in his possession whenever he handles fireworks or special effects.

(c) Following notice and the opportunity to be heard in accordance with the provisions of Chapter 54 of the Connecticut General Statutes, the State Fire Marshal may revoke a certificate of competency for any violation of the Connecticut Fireworks and Special Effects Code, or in instances where the holder's conduct or condition constitutes a threat to public safety.

(Adopted effective November 24, 1999)

Sec. 29-357-7b. Operator responsibilities

(a) When handling or firing fireworks or special effects, the operator shall assure the following:

(1) That the display is in strict compliance with all the provisions of the Connecticut Fireworks and Special Effects Code;

(2) That all fireworks or special effects are properly unloaded, stored, prepared, set, and discharged. The operator shall also ensure the proper disposition of all unfired or defective fireworks or special effects and, in determining the appropriate firing angle, he shall consider the wind direction and velocity predicted for the firing time;

(3) That all fireworks or special effects are properly inspected; and

(4) That all persons employed in connection with the fireworks or special effects display properly perform their duties and conduct themselves in a safe and appropriate manner.

(b) Two or more persons shall be on duty during a display of fireworks or special effects. At least one of them shall hold a certificate of competency, while the second

shall assist the certificate holder. The state or local fire marshal or senior fire officer at the scene may limit the number of persons in the safety fallout zone in the interests of safety.

(c) Persons serving as assistants to the operator shall be at least 18 years of age and not have had a certificate of competency suspended or revoked at the time of the display.

(d) Drugs or alcohol, persons under the influence of drugs or alcohol, or persons under the age of 18 shall be prohibited from the discharge or storage site.

(Adopted effective November 24, 1999)

Sec. 29-357-8b. Accidents, personal injury or property damage involving displays of fireworks or special effects

(a) All accidents involving fireworks or special effects that cause personal injury or property damage shall be reported to the State Fire Marshal and the local fire marshal.

(b) Personal injury accidents.

(1) The local fire marshal or, in his absence, the senior fire officer at the scene of any accident resulting in personal injury due to the use of fireworks or special effects, shall immediately notify the State Fire Marshal of such accident. The local fire marshal or senior fire officer at the scene shall also submit a detailed written report to the State Fire Marshal within 48 hours of the occurrence of such accident.

(2) Within 48 hours of the occurrence of any accident involving personal injury, the operator shall submit a detailed written report to the State Fire Marshal, which report shall include the cause and extent of injuries to any person, name and addresses of the person or persons injured, and name and addresses of the operator and his assistants.

(3) Protection of the accident scene.

Whenever an accident resulting in personal injury occurs due to the use of fireworks or special effects, all equipment and items used in the display shall be secured in place until the accident scene is released by the senior police or fire officer at the scene, the local fire marshal or the State Fire Marshal.

(c) Accidents or incidents causing property damage only.

Within 10 days of any fireworks or special effects display that results in property damage, the operator shall submit a detailed written report to the State Fire Marshal, which report shall contain the following information:

(1) The nature and extent of any property damage resulting from the discharge of fireworks or special effects;

(2) A statement regarding whether any fires were caused by the fireworks or special effects; and

(3) The manufacturer's name, type and size of any shell that failed to discharge or was otherwise defective.

(Adopted effective November 24, 1999)

Sec. 29-357-9b. Disposal of unfired shells and debris from fireworks or special effects displays

(a) Upon completion of the display, the operator shall cause to be made a complete and thorough search for any unfired fireworks or fireworks components that have failed to fire or function properly, and shall dispose of them in a safe manner.

(b) Such search shall begin at the earliest possible time following the conclusion of the display, but in no event later than the first period of daylight which follows the display. Retrieval of all unfired fireworks shall be confirmed by the senior fire officer at the display site.

(c) Any fireworks that remain unfired after the display is concluded shall be immediately disposed of or removed from the display site in a manner safe for the particular type of fireworks used.

(d) Debris from discharged fireworks shall be properly disposed of by the operator before leaving the display site.

(Adopted effective November 24, 1999)

Sec. 29-357-10b. Cancellation of fireworks or special effects displays

The local fire chief, local fire marshal, or senior law enforcement or fire officer at the display site shall be authorized to cancel any fireworks or special effects display when the behavior or condition of the operator or one or more of his assistants threatens public safety or when any condition exists which threatens public safety.

(Adopted effective November 24, 1999)

Sec. 29-357-11b. Displays of special effects

(a) Fire and police protection required at special effect displays.

(1) The local fire marshal or his certified designee shall be present at all special effects displays.

(2) Reasonable and adequate supervision of areas within the immediate vicinity of any display may be determined by the chief of police, local fire marshal, state police in areas under the jurisdiction of the Department of Public Safety, Division of State Police, or the first selectman of any municipality not having a police or fire department.

(3) Police and fire protection shall be paid for by the applicant.

(b) The following standard promulgated by the National Fire Protection Association (NFPA) is hereby adopted as part the Connecticut Fireworks and Special Effects Code:

NFPA 1126-1996

Standard for the Use of Pyrotechnics before a Proximate Audience.

This standard is available from the National Fire Protection Association, Inc., Batterymarch Park, Quincy, Massachusetts 02269.

(Adopted effective November 24, 1999)

Sec. 29-357-12b. Displays of fireworks

(a) Fire and police protection required at fireworks displays.

(1) The local fire marshal or his certified designee shall be present at all fireworks displays.

(2) Duration of police and fire personnel assignment to fireworks displays.

(A) Fire Department personnel shall remain on duty from the time that the fireworks are delivered to the display site until termination of the display and removal of all fireworks and debris from the site.

(B) Reasonable and adequate supervision of areas within the immediate vicinity of any display may be determined by the chief of police, local fire marshal, state police in areas under the jurisdiction of the Department of Public Safety, Division of State Police, or the first selectman of any municipality not having a police or fire department.

(3) Police and fire protection shall be paid for by the applicant.

(b) Days, hours and weather conditions when fireworks displays shall be prohibited.

(1) No fireworks display shall be conducted on any day between midnight and 8:00 a.m., except on July 3, July 4, December 31 and January 1.

(2) Fireworks displays shall not be held during any electrical storm or at any time when the wind consistently reaches a velocity of more than 20 miles per hour during the period when the display is to be fired. Within the allowable limits of the permit, a display may be delayed for a few minutes if a brief storm can pass in a reasonable time. The operator shall have available for use at all times a portable anemometer or similar device for measuring wind velocity.

(c) Distances from general public and structures.

(1) Members of the general public shall be restrained by a physical barrier at least 300 feet from the point at which the aerial fireworks are discharged. Only operators, their assistants and necessary emergency personnel shall be allowed inside such lines. The minimum separation distance shall be maintained from the time that fireworks are loaded into mortars until a post-display search of the site is conducted.

(2) A fireworks display of aerial shells shall be permitted only when the actual point at which fireworks are to be fired is in compliance with the following table of distances:

NOTE: THE MINIMUM SEPARATION DISTANCE FROM SPECTATORS AND INHABITED BUILDINGS SHALL NOT BE LESS THAN 300 FEET.

Mortar size in inches	Minimum distance from spectators and inhabited buildings	Other buildings, public highways, railroads	Inhabited school, hospital, church, theater, penal institution or similar institution or bulk storage facilities of explosives, flammable or toxic materials
0'' to 4''	300 feet	200 feet	500 feet
5''	350 feet	200 feet	500 feet
6''	420 feet	250 feet	600 feet
7''	490 feet	300 feet	700 feet
8''	560 feet	300 feet	800 feet
9''	630 feet	400 feet	900 feet
10''	700 feet	400 feet	1000 feet
11''	770 feet	400 feet	1100 feet
12''	840 feet	400 feet	1200 feet
Over 12''	70 feet per mortar bore inch		100 feet per mortar bore inch

(3) Ground displays of common fireworks with moving parts, the functioning height of which shall not be more than 100 feet, shall be located at least 200 feet from the general public or any inhabited building.

(4) Static set pieces containing no moving parts shall be located at least 75 feet from the general public or any inhabited building.

(5) No vehicles, water craft, amusement rides, portable structures or equipment shall be located within the safety fallout zone, except as follows:

(A) Necessary emergency equipment or equipment required for the display set up, such as a backhoe or similar equipment; or

(B) With special permission from the local fire marshal or the State Fire Marshal, if present, amusement rides placed within the safety fallout zone, provided that the rides are at least 300 feet from the discharge site, all rides located inside the safety fallout zone are shut down for the day at least one hour before the scheduled firing time, and all persons maintain required separation distances.

(6) Fireworks discharge sites shall be located 50 feet or more from any overhead obstruction, except that such discharge sites may be located within 25 feet of trees.

(7) Whenever possible, all ground display pieces and set pieces shall be positioned out of the firing range of aerial displays.

(8) No dry grass or combustibles shall be located beneath ground display pieces. If dry, the area shall be thoroughly wet down before the display.

(9) Poles for ground display pieces shall be securely placed and firmly braced to prevent accidental displacement from any cause.

(d) Temporary and prohibited storage of fireworks.

(1) No person, firm or corporation shall store fireworks or special effects in any municipality until permission for such storage has been granted by the local fire marshal.

(2) The local fire marshal shall ensure that all fireworks and special effects at display sites or awaiting public display shall be stored in a place and manner secure from fire, accidental discharge or theft.

(3) Whenever fireworks or special effects are stored at places of public display, they shall be securely locked and labeled ‘FIREWORKS NO SMOKING.’

(4) Fireworks shall not be stored in the following locations:

(A) Buildings used in whole or part as schools, theaters, churches, hospitals, workshops, residences, factories or buildings that are otherwise inhabited;

(B) Buildings where paints, oils or varnishes are manufactured or stored;

(C) Buildings where any hazardous materials, matches, turpentine, resin, or gasoline are stored or kept; or

(D) Buildings in which stoves or exposed flames are used.

(e) Safety equipment required during the display of fireworks.

(1) All operators and assistants shall wear appropriate safety equipment including, but not limited to, eye protection, ear protection and protective headgear.

(2) Any person manually discharging aerial shells or reloading shells into mortars during the display shall wear eye protection, a hard hat, long-sleeved shirt or jacket, long pants, shoes or boots, gloves and ear protection.

(f) Ready boxes.

(1) Before any firing begins, the entire complement of shells for any public display shall be brought to the firing site and stored in ready boxes at a point not less than 25 feet distance upwind from the nearest mortar.

(2) Ready boxes shall be constructed of wood, metal, heavy cardboard or plastic and arranged to open away from the mortars.

(3) A flameproof water repellent cover shall protect all ready boxes from the time that they are placed into position to the time that they are empty, except when shells are being taken from or returned to such boxes.

(g) Angle of projectile.

All fireworks that fire a projectile shall be set in such a manner that the projectile is launched as nearly vertical as possible, provided that where such fireworks are to be fired beside a lake or other large body of water, they may be directed in such a manner that falling residue will fall into the water.

(h) Electrical firing mechanisms.

(1) Power sources for firing fireworks shall be limited to batteries or individual isolated mechanisms specifically approved by a recognized national testing laboratory.

(2) Only a low voltage power source shall be permitted from the firing mechanism to the fireworks, unless the source consists of a system listed by a nationally recognized testing laboratory.

(3) Short circuit shunts shall be maintained on all electrically fired fireworks during preparatory operations, including loading, setting and adjusting. Fireworks that fail to ignite during a show shall be shunted prior to their removal.

(4) All firing switches, including battery and power-circuit types, shall be designed or altered to insure against accidental firing by providing as follows:

(A) An automatic short circuiting shunt across the firing leads until the switch is intentionally thrown to the firing position; and

(B) An automatic positive disconnection when the switch is released by the operator. Firing boxes shall be designed to prevent firing unless the switch is manually operated.

(5) Connection of any electrical firing circuit to any power supply is prohibited until all fireworks in the sequence are connected to firing leads and cleared for firing, except for circuit testers, provided that the circuit testers shall not be capable of delivering sufficient energy to cause the fireworks circuit being tested to fire. Permissible testers include galvanometers, low current multimeters, or built-in circuit testers in the firing system supplying no more than 25 miliamps.

(i) Shells.

(1) Electrical firing, chained fuse firing, or other approved types of remote firing shall be required for all shells larger than 8 inches in diameter. The operator shall be located at least 100 feet from such shells when firing.

(2) Shells shall be ignited by electrical initiation or by lighting the tip of the fuse with a fusee, torch, port fire or similar device. Electrical firing must comply with the requirements of subsection (h) of this section. As soon as the fuse is ignited, the operator shall retreat from the mortar area.

(3) The safety cap protecting the fuse shall not be removed by the operator responsible for lighting the fuse until immediately before the shell is to be fired, except where electrical or other remote-type ignition is used.

(4) The operator shall carefully observe the first shell fired to determine that its trajectory will carry it into the intended firing range and that the shell functions over, and any debris falls into, the potential landing area. Mortars shall be re-angled or reset if necessary at any time during the display.

(5) Shells shall be measured and classed only in terms of the inside diameter of the mortar from which they are designed to be shot. Shells shall be constructed so that the difference between the inside diameter of the mortar and the outside diameter of the shell is not less than 1/8 inch and not more than 1/4 inch for 2- and 3-inch shells, or not more than 1/2 inch for shells larger than 3 inches.

(6) All shells shall be inspected prior to the display by the operator. Shells shall be inspected for proper fit into the mortars. Any shell not fitting properly shall not be fired. No shell shall be forced into a firing mortar.

(7) Any shell having tears, leaks or showing signs of having been wet shall be returned to the supplier or destroyed according to manufacturer's instructions, except that minor tears on fuses may be repaired with tape.

(8) After the fireworks have been delivered to the display site, all shells shall be separated according to diameter and stored in covered containers of metal, wood,

plastic, or corrugated cardboard. Such containers shall meet the requirements of 49 CFR Part 173, U.S. Department of Transportation regulations covering the transportation of explosives and other dangerous articles by motor, rail or water.

(9) Quick match leaders for shells shall be long enough to allow not less than 6 inches of fuse to protrude from the mortar after the shell is inserted.

(10) Staple guns shall not be permitted for securing quick match that is connected to aerial shells or mines, shells, comets, rockets and similar devices.

(11) The length of the exposed black match shall not be less than 3 inches. Minimum delay time from ignition to the tip of the exposed black match and ignition of the lift charge shall not be less than 4 seconds in order to allow the operator to retreat to safety.

(12) In the event that a shell fails to ignite in the mortar, the mortar shall be left alone for at least 30 minutes. Mortars containing misfires shall be clearly identified during the display. Lighted flashlights or boxes placed over the mortar may be used for identification.

(j) Mortars: construction.

(1) Metal mortars shall be made of steel tubing, the tensile strength of which shall be at least 40,000 pounds per square inch, or from metal of equivalent strength. Cast iron or other fragmenting types of metals shall be prohibited. The mortar shall have a smooth bore and base plate equal in thickness to the tube, welded continuously around its perimeter. Aluminum mortars may be provided with bottom plugs meeting the specifications of subdivision (5) of this subsection or they may have a bottom plate which incorporates the bottom plugs and which is approved by the State Fire Marshal. No salutes or multi-break shells shall be fired out of an aluminum mortar.

(2) Mortars limited solely to firing single break shells may be made of spiral or convolute paper tubes or may be made of HDPE. Paper tubes for 3-inch shells shall have a wall thickness of not less than 3/8 inch. Paper tubes for 4-, 5- and 6-inch shells shall have a wall thickness of not less than 1/2 inch. The cross grain tensile strength of the paper shall be at least 2,300 pounds per square inch.

(3) Mortars constructed of HDPE shall be used for firing single-break shells only. HDPE mortars may be reloaded once during the display, provided that at least 75 percent of the mortar is buried in the ground.

(4) HDPE mortars shall meet the following requirements:

(A) Tube material shall be manufactured in accordance with ASTM specifications F714-97 and ASTM DD3350-98, which may be obtained from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959;

(B) ASTM wall thickness ratings or Standard Dimensional Ratios (SDR) must be clearly marked on each tube; and

(C) HDPE mortar tubes shall comply with the following SDR rating requirements:

3-inch mortars	SDR	15.5	.226 inch
4-inch mortars	SDR	21.0	.214 inch
5-inch mortars	SDR	21.0	.265 inch
6-inch mortars	SDR	21.0	.315 inch
8-inch mortars	SDR	26.0	.332 inch
10-inch mortars	SDR	32.5	.331 inch
12-inch mortars	SDR	32.5	.392 inch

(5) All tubes shall have a base plug in good condition, the thickness of which shall not be less than one-half the inside diameter of the tube. The base plug shall be securely attached to the mortar tube by the use of nails or screws. The base plug shall be of solid one-piece construction or commercially manufactured laminate with the grain parallel to the long axis of the mortar.

(6) The minimum inside length of completed mortar assemblies shall not be less than four times their inside diameter for mortars up to 7 inches inside diameter and not less than five times their inside diameter for mortars having an inside diameter greater than 7 inches.

(7) Any damaged mortar shall not be used for firing. This prohibition shall apply to split or bulged tubes, bases, seams, or loose rivets, bolts or wooden base plugs.

(k) Mortars: setting.

(1) All mortars, except finale batteries, shall be set upon a heavy plank or timber footing buried in solidly tamped clean earth, except mortars specially set as provided in subsection (l) of this section and mortars up to 6 inches in diameter, which are placed in aboveground racks as provided in subsection (n) of this section. The plank or timber requirement may be omitted for electrically fired shows or mortars which will not be reloaded during the display.

(2) Not less than 75 percent of the mortar tube length shall be placed below the normal surface of the ground.

(3) When personnel are to be in the immediate vicinity of the mortars during an outdoor fireworks display, sand bags or other suitable protection shall be placed around the mortars up to the approximate level of the mouth of the mortar in each direction where personnel could be located.

(l) Mortars: special settings.

At locations where it would be impractical to bury mortars in suitable clean earth or where there is agreement among the local fire marshal, the senior fire officer at the scene, the operator, and the State Fire Marshal, if present at the site, that the interests of public safety are met, mortars may be set for firing in approved sand-filled containers. Heavy steel drums, plastic drums or troughs constructed in accordance with the following requirements, shall be used for setting mortars:

(1) The diameter of the drum or width of the trough shall not be less than three times the diameter of the largest mortar tube;

(2) The diameter of the drum or width of the trough shall permit spaces between all mortars and the sides of the drum or trough equal to the diameter of the largest mortar. Whenever sequentially firing more than three shells, the minimum separation of mortars shall be at least four times the diameter of such shells;

(3) The depth of the drum or trough shall permit burial in clean sand of not less than 75 percent of the length of each mortar;

(4) The space between the bottom of the mortar and the container shall be filled with heavy wood blocking at least 2 inches thick. The wood blocking requirement may be omitted where the mortars are placed over solid ground and are not being reloaded during the display;

(5) The length of the trough shall permit spaces between all mortars and the end of the trough equal to the diameter of the largest mortar;

(6) The sides, ends and bottom shall be constructed of at least 3/4-inch plywood or of 2-inch boards in good condition and nailed securely with 20d common nails. Trough panels shall be secured by 1/2-inch threaded rods, through bolts or "U"-shaped brackets located in the center and at each end;

(7) The maximum length of a trough shall be 8 feet for plywood construction, or 16 feet for 2-inch board construction. Individual troughs may be positioned in continuous rows provided that they are properly secured and stable; and

(8) After the containers are set, the mortars shall be secured at an angle determined as safe for firing;

(m) Mortars: loading.

(1) Mortars shall be cleared of burning material after firing.

(2) When loaded into mortars, shells shall be held by the thick portion of their fuses and carefully lowered into the mortar. At no time shall the operator place any part of his body over the throat of the mortar.

(n) Mortars: finale racks and aboveground racks.

(1) Finale racks and aboveground racks shall be limited to mortars with an inside diameter of not more than 6 inches, which shall be set squarely upon lumber at least 2 inches thick, the width of which shall be equal to the outside diameter of the largest mortar. The ends of the rack shall be constructed of similar material. The unit shall be boxed along both sides at the top and bottom by boards of 1-inch-by-6-inch dimension or its equivalent. The assembly shall be fastened together using screws or nails of a length that shall provide a minimum of 1 1/2-inch penetration into the holding member.

(2) Aboveground set-ups may consist of as many racks as required for the display. Each rack shall be independently set, braced and secured. Cubed bracing may be employed, provided that each rack is independently secured.

(3) Whenever possible, aboveground racks shall be set up perpendicular to the location of the general public.

(o) Marine displays: special provisions.

(1) Marine displays, which are set up and loaded in Connecticut but are to be discharged at locations outside of the state, shall be subject to the provisions of this subsection.

(2) Barges.

(A) All barges and vessels used as platforms for the discharge of fireworks shall be of sturdy, seaworthy construction and shall be provided with adequate anchor, towing and mooring lines.

(B) No barge previously used for the transportation of hazardous cargo shall be used as a discharge site for fireworks unless such hazardous cargo and its residue have been properly removed.

(C) Barges without sides shall be of sufficient height from the water to keep personnel and the fireworks safe from boarding seas.

(D) Barges with decks constructed of combustible materials shall have all exposed decking covered with at least 1 inch of clean sand.

(E) Barges shall be towed to the firing location by a tug.

(F) From the time that it leaves the dock until it returns to the loading site, the barge, during shell loading of the display, shall display warning signs on both sides reading "FIREWORKS STAY CLEAR." Signs shall be at least 3 feet wide and 2 feet high, with red lettering on a white background, and characters at least 6 inches high and 2 inches apart.

(3) Barges: set-up and location on barges.

(A) Security, separation distances and fire safety requirements shall apply only during the time that fireworks are on the display site.

(B) Except during setup, fireworks shall be stored in a locked transport vehicle or set up on the barge and shall not be left unattended. The operator shall be present

during handling and loading operations and security personnel shall be present at the dock area, except where the barge is located within a larger guarded area to which the public is denied access.

(C) No personnel other than those directly responsible for loading and discharging the display shall be allowed on the display barge, except necessary emergency and private safety watch personnel in performance of their duties.

(D) No one under the age of 18 shall be allowed on the barge or in the loading area during loading operations.

(E) No smoking shall be permitted on any vessel containing fireworks or within 50 feet of fireworks loading operations or storage facilities.

(F) Each barge shall be provided with at least two Class A fire extinguishers during shell loading of the display.

(G) Warning signs prohibiting public access and smoking shall be clearly posted on shore areas near barges and storage areas.

(H) Trucks and other motor vehicles shall not be permitted to remain parked in the waterfront loading area, except when awaiting opportunity to load or discharge cargo, supplies or passengers; when loading, discharging or storing tools, equipment or materials related to the display; or when used to set up the display.

(I) The minimum separation distances provided in subsection (c) of Section 29-357-12b shall be maintained from the time fireworks loading operations begin until the completion of the display, except for shorefront buildings associated with dock operations which have been cleared and remain vacant for the duration of the fireworks loading operations.

(4) The operator shall obtain all necessary permits and approvals from the United States Coast Guard.

(5) The operator shall ensure that the required safety fallout zone is kept clear of unauthorized personnel or craft during the time that the barge is at its firing location and before and during the display.

(Adopted effective November 24, 1999)

Sec. 29-357-15a. Transportation

Sec. 29-357-15a.1. Motor vehicle transportation

Motor vehicles used for the transportation of special effects shall comply with all applicable sections of Title 49 Code of Federal Regulations and Motor Carrier Safety Regulations including but not limited to: placarding, shipping papers, route plans, parking restrictions, vehicle attendance, emergency equipment and procedures, operator training and medical certificate. Vehicles shall be properly placarded on each side and each end as required.

(Effective December 30, 1990)

Sec. 29-357-15a.2. Parking prohibition

Vehicles containing any special effects materials shall not be parked within any building at any time. Location of exterior parking locations shall be subject to the approval of the local authority having jurisdiction.

(Effective December 30, 1990)

Sec. 29-357-15a.3. Copy of permit required

No person, firm or corporation shall transport special effects materials for display within this state unless the shipment is accompanied by a copy of the permit to display the materials being shipped.

(Effective December 30, 1990)

Sec. 29-357-15a.4. Interstate shipments

Interstate shipments of special effects materials shall be in accordance with Title 49, Code of Federal Regulations.

(Effective December 30, 1990)

Sec. 29-357-16a. Reserved

**Sale and Storage of Class B and Class C
Fireworks and Special Effects**

Sec. 29-357-17a. Applications

Sec. 29-357-17a.1. Application

(a) An application for a license under section 29-364 of the Connecticut General Statutes to engage in the business of fireworks sales at the wholesale level, dealership, or jobber of fireworks, or the storage of fireworks, under the provisions of Section 29-361 of the Connecticut General Statutes shall be made on forms furnished by the state fire marshal, to said fire marshal.

(b) An application for a license to engage in the business of special effects sales at the wholesale level, dealership, or jobber of special effects, or the storage of special effects shall be made on forms furnished by the state fire marshal, to said fire marshal.

(Effective December 30, 1990)

Sec. 29-357-17a.2. Approval of officials

Prior to submission of the application to the state fire marshal, the applicant shall submit said application to the local fire marshal of the municipality within which such business is to be located. The application shall include plans for the business location and lay out, specifically detailing the storage area. If satisfied that the business location is not in violation of any local ordinances, the fire marshal shall approve the application. Failure of the local authorities to approve the application shall be a factor considered by the state fire marshal.

(Effective December 30, 1990)

Sec. 29-357-18a. Storage

Sec. 29-357-18a.1. License

No person, firm or corporation shall keep or store fireworks or special effects in any municipality until the facility is inspected by both local and state authorities. The state fire marshal shall give final approval and licensing for the facility. A separate license shall be required for each individual storage site.

(Effective December 30, 1990)

Sec. 29-357-18a.2. Prohibited places of storage

(a) Fireworks or special effects shall not be stored or kept in any building used in whole or in part as a school, theater, church, hospital, workshop, residence, factory or any inhabited building.

(b) Fireworks or special effects shall not be stored in any building where paints, oil or varnishes are manufactured or kept.

(c) Fireworks or special effects shall not be stored in any building where any hazardous materials, matches, turpentine, resin, or gasoline are stored or kept for sale.

(d) Fireworks or special effects shall not be stored in any building where stoves or exposed flames are used.

(Effective December 30, 1990)

Sec. 29-357-18a.3. Magazine requirements

Except as herein provided all Class B and Class C fireworks and special effects shall be kept in magazines which meet the requirements of these regulations.

(Effective December 30, 1990)

Sec. 29-357-18a.4. Magazine Type Class B fireworks or special effects

Class I magazines shall be required for the storage of Class B fireworks or special effects.

(Effective December 30, 1990)

Sec. 29-357-18a.5. Magazine for Class C fireworks magazines

Type I or II shall be required for the storage of Class C fireworks.

Exception: All fireworks and special effects articles and items at places of public display shall be stored in a manner and in a place secure from fire, accidental discharge and theft and in a manner approved by the local fire marshal.

(Effective December 30, 1990)

Sec. 29-357-18a.6. Storage places to be locked

All places where fireworks or special effects are stored shall be securely locked and labeled.

(Effective December 30, 1990)

Sec. 29-357-19a. Storage magazines

Storage magazines for fireworks or special effects shall be a permanent structure, such as a building, or a mobile facility such as a box trailer.

(Effective December 30, 1990)

Sec. 29-357-19a.1. Magazine construction

Magazines shall be of either masonry or metal covered wood, or fabricated metal. Magazines are to be fire resistant, theft resistant and ventilated. They are to be supported to prevent direct contact with the ground and if less than one cubic yard in size, must be securely fastened to a fixed object. The ground around the magazine must slope away for drainage and the area must be clear of all debris, dry grass or combustibles for a distance of at least 25 feet.

(Effective December 30, 1990)

Sec. 29-357-19a.2. Type I magazine

The exterior and doors are to be constructed of not less than 1/4 inch steel and lined with at least (2) two inches of hardwood. Magazines with top openings will have lids with water resistant seals or which overlap the sides by at least one inch when in a closed position.

Type II magazine. Shall be of either masonry construction, or metal covered wood or fabricated metal. The exterior and doors shall be constructed of not less than 1/8 inch metal and lined with a non-sparking material.

Wood construction magazines shall have exterior and doors constructed of not less than (2) two inch hardwood and shall be braced at corners. They should be covered with not less than twenty gauge sheet metal.

The interior of magazines shall be lined with non-sparking material. The spark producing metal shall be exposed below the top of walls in the interior.

All nails shall be blind nailed or counter sunk.
(Effective December 30, 1990)

Sec. 29-357-19a.3. Hinges and hasps

Hinges and hasps are to be attached to doors by welding, riveting or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.
(Effective December 30, 1990)

Sec. 29-357-19a.4. Locks

Each door is to be equipped with two (2) padlocks fastened in separate hasps. Padlocks must have at least five tumblers and a case hardened shackle of at least 3/8" diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks or hasps.
These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock or bar that cannot be actuated from the outside.
(Effective December 30, 1990)

Sec. 29-357-19a.5. Foundations

Shall be constructed of either brick or concrete, or cement block or wood posts. (If piers or posts are used, space under magazine shall be enclosed with metal.)
(Effective December 30, 1990)

Sec. 29-357-19a.6. Smoking and open flames

Smoking, matches, open flames or spark producing devices are not permitted.
(a) In any magazine.
(b) Within 50 feet of any magazine.
(Effective December 30, 1990)

Sec. 29-357-19a.7. Housekeeping

Magazines are to be kept clean, dry and free of grit, paper, empty packages, containers and rubbish. Floors are to be regularly swept. Brooms and other utensils used in the cleaning and maintenance of magazines must have non-sparking metal parts and may be kept in magazines.
(Effective December 30, 1990)

Sec. 29-357-19a.8. Storage

Containers are to be stored so that the markings are visible. Stocks of fireworks must be stored so that they can easily be counted and checked upon inspection. Containers must be closed while being stored. Tools for opening or closing containers must be of non-sparking materials, except that metal slitters may be used for opening fiberboard containers.
(Effective December 30, 1990)

Sec. 29-357-19a.9. Repair of magazines

Before repairing the inside of a magazine all fireworks are to be removed and placed in either:
(a) Another magazine or
(b) A safe distance from the magazine being repaired where they are to be properly guarded and protected until repairs have been completed.
(Effective December 30, 1990)

Sec. 29-357-19a.10. Lights

Electric lighting used in any fireworks storage magazine must meet the standard prescribed by the National Electrical Code as referenced in the Connecticut State Fire Safety Code.

All electrical switches are to be located outside the magazine and also meet the standards prescribed by the National Electrical Code.

Copies and invoices, work orders or similar documents which indicate that lighting complies with the National Electrical Code as referenced in the Connecticut State Fire Safety Code as indicated must be available for inspection by the state fire marshal or his designee.

(Effective December 30, 1990)

Sec. 29-357-20a. Location of magazines

Magazines used for the storage of fireworks shall be located in compliance with the Table of Distances #2.

(Effective December 30, 1990)

Sec. 29-357-20a.1. Process buildings

Buildings used for the preparation of fireworks for shipment shall be located a minimum of thirty feet from storage facilities.

(Effective December 30, 1990)

Sec. 29-357-20a.2. Table of Distances #2

<i>Class</i>	<i>Weight Fireworks</i>	<i>Inhabited Bldg.</i>	<i>Public Highway</i>	<i>Bulk Storage Flammables Liqs. & Gases</i>
B 1-3	Up to 1000	500	50	500
C 2-3	Up to 1000	200	50	200

An additional 100 feet separation shall be added for each additional 1000 pounds or part thereof.

NOTES:

1. Gross Weight
2. Net Weight of explosive and pyrotechnic composition and fuse only. Determined at rate of 2.5 lbs. explosive for each 20 lbs. of fireworks or part thereof.
3. Distances apply with or without barricades.

(Effective December 30, 1990)

Sec. 29-357-21a. Sales

Sales at the retail level are prohibited.

(Effective December 30, 1990)

Sec. 29-357-21a.1. Sales authorized

Sales authorized under section 29-361 of the general statutes shall be restricted to persons twenty-one (21) years of age and over and shall be subject to the record-keeping provisions of sections 29-357-22a to 29-357-22a.4 inclusive.

(Effective December 30, 1990)

Sec. 29-357-21a.2. Wholesale sales

Sales at the wholesale level are restricted to licensed fireworks or special effects shooters holding a valid public display permit, limited to the particular display.

(Effective December 30, 1990)

Sec. 29-357-21a.3. Sales to out of state residents

(a) Sales shall be shipped directly out of state and shall be subject to all packaging, labeling, and the transportation requirements of the U.S. Department of Transportation Interstate Title 49, Code of Federal Regulations.

(b) Sales to out of state residents shall be limited to states where sales, possession or use of said fireworks is not prohibited by law.

(Effective December 30, 1990)

Sec. 29-357-22a. Records

The licensee shall keep a record of all sales, purchases and inventories of fireworks.

(Effective December 30, 1990)

Sec. 29-357-22a.1. Sales of Class B fireworks

Records for the sale of Class B fireworks shall contain the following information:

- (a) Name and address of buyer.
- (b) State pyrotechnician's certificate number.
- (c) Display permit number and photocopy.
- (d) Number and types of fireworks sold.
- (e) Method of delivery or transportation.

(Effective December 30, 1990)

Sec. 29-357-22a.2. Sales of Class C fireworks

Sales of Class C fireworks for public displays in Connecticut shall be subject to all requirements of Section 29-357-22a.1.

(Effective December 30, 1990)

Sec. 29-357-22a.3. Records of sales to out of state residents shall contain the following information

- (a) Name and addresses of buyers.
- (b) Dates.
- (c) Amounts.
- (d) Method of delivery.

(Effective December 30, 1990)

Sec. 29-357-22a.4. Record retention schedule

Records shall be kept for a period of three (3) years and shall be available for inspection by the state fire marshal.

(Effective December 30, 1990)

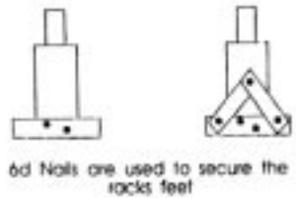
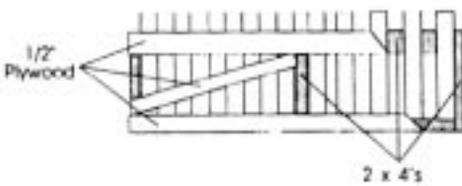
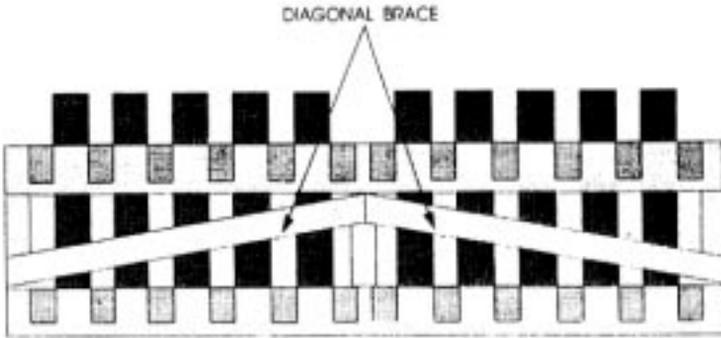
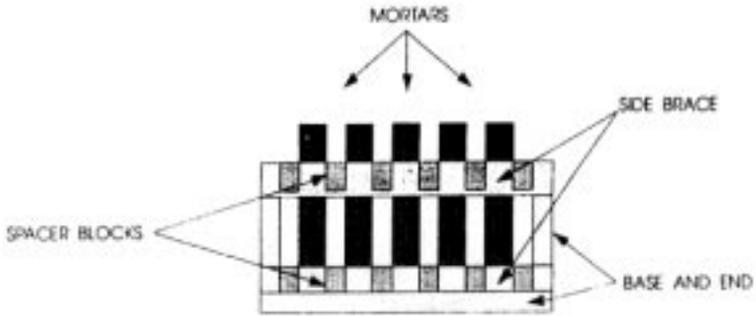
Sec. 29-357-23a. Thefts, fires, accidents

Licensee shall keep a running inventory of all fireworks and shall notify the state fire marshal of any thefts, fires or accidents occurring in connection with the storage, sale or use of fireworks. Notification shall be made immediately by phone and in writing within forty-eight (48) hours.

(Effective December 30, 1990)

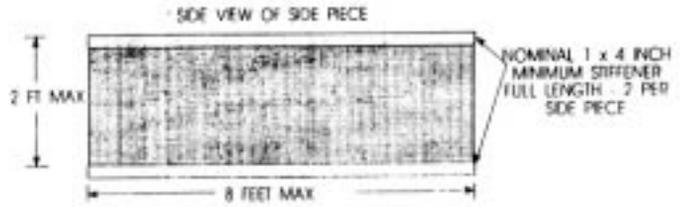
APPENDIX A

DIAGRAM OF A TYPICAL RACK

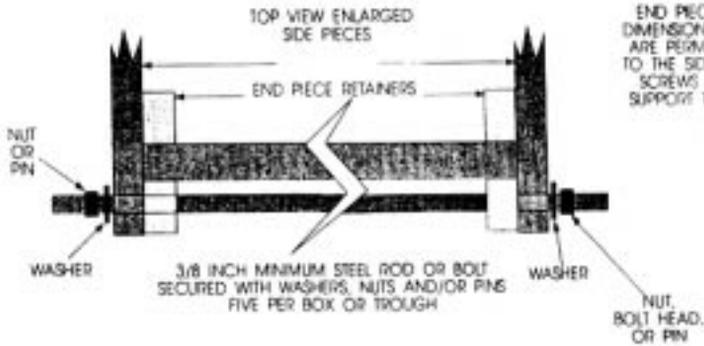


APPENDIX B

DIAGRAM OF A TYPICAL TROUGH SETTING



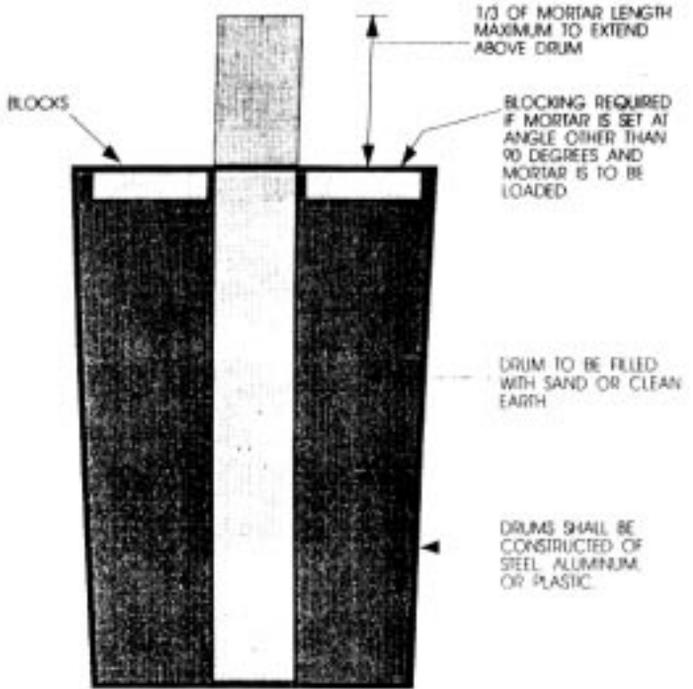
(STIFFENERS ARE NOT SHOWN FOR CLARITY)



END PIECE RETAINERS ARE DIMENSIONAL LUMBER WHICH ARE PERMANENTLY SECURED TO THE SIDE PIECES BY NAILS, SCREWS OR STAPLES AND SUPPORT THE END PIECES IN PLACE.

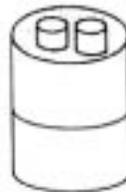
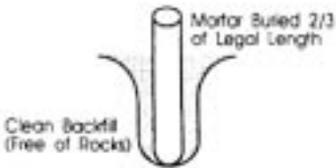
APPENDIX C

DIAGRAM OF A TYPICAL DRUM SETTING



Buried setting

Drum Setting



Mortars Covered
1/4 of Legal Length
Clean Backfill of Rock-Free
Sand or Soft Dirt

Ramping
(if Necessary)

