

## INTRODUCTION

Statement of Basis Purpose: These regulations are promulgated to establish rules for the use, manufacture, possession, sale, storage, transport, or disposal of explosives materials or blasting agents in the interest of the life, health, and safety of employees and the general public, as well as the protection of property.

To this end, a procedure for the granting of explosives permits is continued whereby the opportunity to use, manufacture, possess, sell, store, transport, or dispose of explosives materials is restricted to such permit holders and conditioned upon satisfactory continued compliance with these rules and regulations. Failure to comply with these rules and regulations subjects the permit holder to suspension, denial, or revocation of the permit.

Adoption of these rules and regulations is intended to greatly clarify the Division of Oil and Public Safety requirements pertaining to the use of explosive materials, to ease the burden on the permit holder where interpretation has been necessary, and to better incorporate the numerous requirements from other governmental agencies. These rules and regulations provide for uniformity of compliance and elimination of numerous areas of confusion and duplication in an effort to better serve and protect the public.

Statutory Authority: Section 9-7-105, CRS.(1998)

Repeal: All prior rules for explosive materials are hereby repealed.

Effective Date: These rules shall be effective March 3, 2002

## CHAPTER I SCOPE & DEFINITIONS

### 1.0 Purpose

This regulation is promulgated to establish minimum requirements and standards for permits to use, manufacture, possess, sell, store, transport, or dispose explosives or blasting agents in the interest of the "life, health, and safety of employees and the general public, as well as the protection of property.

### 1.1 Scope

These rules and regulations shall apply to the use, manufacture, possession, sale, storage, transportation, and disposal of explosive materials in the State of Colorado by any individual, corporation, company, firm, partnership, association, or state or local government agency.

These rules and regulations shall not apply to:

- (A) The shipment, transportation, and handling of military explosives by the Armed Forces of the United States or the State Militia.
- (B) The normal and emergency operations of any government law enforcement agency including all departments, and divisions thereof, provided they are acting in their official capacity and in the proper performance of their duties and functions.
- (C) Explosives in the forms prescribed by the official United States Pharmacopoeia or the National Formulary and used in medicines and medicinal agents.
- (D) Explosive materials while in the course of transportation by for-hire commercial carriers via railroad, water, highway, or air when the explosive materials are moving under the jurisdiction of, and in conformity with, regulations adopted by any Federal Department or

Agency.

- (E) The components for hand loading rifle, pistol, and shotgun ammunition and/or rifle, pistol, and shotgun ammunition.
- (F) The sale and use (public display) of pyrotechnics commonly known as fireworks, including signaling devices such as flares, fuses, and torpedoes.
- (G) Gasoline, fertilizers, installed propellant/powder-actuated safety devices or propellant/powder-actuated power tools.
- (H) The use and storage of model rocket motors containing a propellant weight of 62.5 grams or less and which produce less than 17.92 pound seconds of total impulse.

No permit shall be required for the occasional purchase of explosives by a person for normal agricultural purposes where such person is known by the seller of such explosives, and a record is kept of such transactions by the seller, including the specific purpose for which such explosives will be used, the location of the purposed use, the signature of the purchaser, and the certification of the seller as to his personal knowledge of the purchaser. Violation of this record requirement shall cause the seller's permit to be canceled. A permit is required for any manufacturing, storage, dealing, or non-agricultural use of explosives as outlined in Chapter III of this regulation.

No person, firm, partnership, or corporation whose possession, use, or storage of explosives for mining operations is subject to regulation by the provisions of Colorado Revised Statutes, Sections 34-24-103 and 34-21-101(f) (Colorado Mining Law), shall be subject to the provisions of the Explosive Act. A permit issued by the Division of Oil and Public Safety shall be required for the use of explosives in operations not subject to the provisions of Colorado Revised Statutes, Sections 34-24-103 and 34-21-101(0) (Colorado Mining Law).

Except as noted in the foregoing, the Division of Oil and Public Safety may approve or disapprove the location for, and limit, the quantity of explosives or blasting agents which may be loaded, unloaded, reloaded, stored, or temporarily retained at any facility within the State of Colorado.

The Division of Oil and Public Safety may issue an explosive permit for continued use for a period of time not to exceed thirty-six (36) months.

## **1.2 Definitions**

The following publications and codes are hereby incorporated by this reference in accordance with section 24-4-103(12.5), CRS:

- 27 CFR - Pan 55 1994, Alcohol, Tobacco and Firearms (April 1, 1995)
- Bureau of Alcohol, Tobacco, and Firearms, Department of the Treasury, Publication ATF P 5400.7 (June 1990), ATF- Explosives Law and Regulations.
- 49 CFR - Parts 100-177 179(inclusive) Pans 390-397 U.S. Department of Transportation
- National Electric Code, 1993 Edition, National Fire Protection Association
- Institute of Makers of Explosives Publication NO. 22 (May 1993)
- Institute of Makers of Explosives Publication NO. 20 (December 1988)
- Definition and Test Procedures for Ammonium Nitrate Fertilizer, Fertilizer Institute, May 8, 1971

These rules incorporate the editions and revisions specified. Subsequent editions and revisions have not been incorporated by this reference. The publications incorporated by this reference may be examined and a copy of them may be obtained upon request and payment of the cost of reproduction during regular business hours from the Colorado Department of Labor and Employment, Division of Oil and Public Safety, 1515 Arapahoe St. Tower 3, Suite 660, Denver, CO 80202, and may also be inspected at the state depository libraries.

The following words when used in these rules and regulations shall mean:

**Air blast:** The airborne shock wave or acoustic transient generated by an explosive.

**American Table of Distances:** A quantity-distance table prepared and approved by the institute of the makers of explosives, for the storage of explosive materials to determine the safe distances from inhabited buildings, public highways, passenger railways, and other stored explosive materials. See section 4.6 of these regulations.

**Ammonium nitrate:** The ammonium salt of nitric acid represented by the formula  $\text{nh}_4\text{no}_3$ .  
Approved storage facility (approved magazine): A facility for the storage of explosives materials conforming to the requirements of these rules and regulations.

**Attend(ed):** The physical presence of an authorized person within the-field of vision of explosives or the use of explosives.

**Authorized. Approved or Approval:** Terms which mean approved, approval, or authorized by the Director of the Division of Oil and Public Safety.

**Authorized person:** A person approved or assigned by the management to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

**Armed Charge:** An explosive cartridge that contains a detonator.

**Artificial Barricade:** An artificial mound, berm, or wall of earth of a minimum thickness of three feet, or any other approved barricade that offers equivalent protection.

**Barricaded:** The effective screening of a building or magazine containing explosive materials from another magazine or building, railway, or highway by a natural or an artificial barrier. A straight line from the top of any sidewall of the building or magazine containing explosives materials to the eave line of any magazine or building or to a point twelve feet above the center of a railway or highway shall pass through the barrier.

**Binary (two-component) explosive:** A blasting explosive formed by the mixing or combining of two phosphoric materials, for example ammonium nitrate and nitromethane.

**Black Powder:** A deflagrating or low explosive compound of an intimate mixture of sulfur, charcoal and an alkali nitrate, usually potassium or sodium nitrate.

**Blast Area:** Area of the blast within the influence of flying rock missiles, gases, vibration, and concussion.

**Blaster:** A person who is permitted by the Division of Oil and Public Safety to possess and control the use of explosives.

**Blaster-In-Charge:** A permittee who is in charge of and responsible for the loading or preparing of the explosives charges, and either physically initiates the charge or is physically present when the charge is initiated at a specific job site. This person is in charge of the planning of the blast at

a specific job site, the supervision of all persons assisting on the blast and all persons in training, and is responsible for the inventory, inventory records, and blast records for the blast.

**Blasting Agent:** An explosive material. which meets prescribed criteria for insensitivity to initiation. For storage, Title 27, Code of Federal Regulations. Section 55.11, defines a blasting agent as any material or mixture consisting of fuel and oxidizer intended for blasting, not otherwise defined as an explosive: provided that the finished product, as mixed for use or shipment, cannot be detonated by means of a No. 8 Blasting Cap when unconfined (Bureau of Alcohol, Tobacco, and Firearms Regulation). For transportation. Title 49 Code of Federal Regulations defines a blasting agent as a material designed for blasting which has been tested and found to be so insensitive that there is very little probability of accidental initiation to explosion or transition from deflagration to detonation (US Department of Transportation Regulation).

**Blasting Mat:** A mat of woven steel, wire, rope, scrap tires, or other suitable material or construction to cover blast holes for the purpose of preventing flying rock missiles.

**Blast Pattern:** The plan of the drill holes laid out for blasting; an expression of the burden distance and their relationship to each other. Synonymous with DRILL pattern.

**Blast Site:** Area where explosive material is handled during blasting operations, including the perimeter of blast holes and for a distance of 50 feet in all directions from loaded holes or holes to be loaded.

**Booster:** An explosive charge, usually of high detonation velocity and detonation pressure, designed to be used in the initiation sequence between an initiator or primer and the main charge.

**Borehole:** A hole drilled in the material to be blasted, for the purpose of containing an explosive charge, also called a blast hole or drill hole.

**Bulk Mix:** A mass of explosive material prepared for use in bulk form without packaging.

**Bulk Mix Delivery Equipment:** Equipment (usually a motor vehicle with or without mechanical ' delivery device) which transports explosive material in bulk form for mixing, or loading directly into blast holes, or both.

**Bullet Resistant:** Magazine wall of doors of construction resistant to penetration of a bullet of 150-gram M2 ball ammunition having a nominal muzzle velocity of 2,700 feet per second fired from a .30 caliber rifle from a distance of 100 feet perpendicular to the wall or door.

When a magazine ceiling or roof is required to be bullet-resistant, the ceiling or roof shall be constructed of materials comparable to the side walls or of other material which will withstand penetration of the bullet above described when fired at an angle of 45 degrees from perpendicular.

Tests to determine bullet-resistance shall be conducted on test panels or empty magazines which shall resist penetration of 5 out of 5 shots placed independently of each other in an area of at least 3 feet by 3 feet.

Examples of construction that meet this definition are given in Chapter 4, Section 4.5.

**Bullet-Sensitive Explosive Material:** Explosive material that can be detonated by 150 gram M2 ball ammunition having a nominal muzzle velocity of 2,700 feet per second when the bullet is fired from a .30 caliber rifle at a distance of not more than 100 feet and the test material, at a temperature of 70-75 degrees Fahrenheit, is placed against a backing material of ½ inch steel

plate.

**Burden:** The distance from the borehole and the nearest free face, or the distance between boreholes measured perpendicular to the spacing. Also the total amount to be blasted by a given hole, usually in Cubic yards or tons.

**Bus Wire:** Expendable heavy gauge bare copper wire used to connect detonators or series of detonators in parallel.

**Connecting Wire:** wire used to extend the firing line or leg wires in the electric blasting circuit.

**Day Box:** A portable magazine for the temporary and attended storage of explosives. Day boxes shall meet construction requirements of a Type 3 magazine.

**Dealer:** Any person engaged in the business of distributing explosive material at wholesale or retail.

**Detonating Cord:** A flexible cord containing a center core of high explosives which may be used to inmate other high explosives.

**Detonator:** Any device containing any initiating or primary explosive that is used for initiating detonation. A detonator may not contain more than 10 grams of total explosives by weight, excluding lenition or delay charges. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, blasting caps for use with safety ruses, detonating cord delay connectors, and nonelectric instantaneous and delay blasting caps which use detonating cord, shock tube, or any other replacement for electric leg wires.

**Director:** The Director of the Division of Oil and Public Safety of the Department of Labor and Employment or any designees thereof which may include certain employees of the Division of Oil and Public Safety or other persons.

**Division:** The Division of Oil and Public Safety.

**Down line:** A line of detonating cord or plastic tubing in a blast hole which transmits detonation from the truckline or surface delay system down the hole to the primer.

**Electric detonator (Blasting Cap):** A blasting detonator designed for and capable of initiation by means of an electric current.

**Emulsion:** An explosive material containing substantial amounts of oxidizers dissolved in water droplets surrounded by an immiscible fuel, or droplets of an immiscible fuel surrounded by water containing substantial amounts of oxidizer.

**Explosive:** Any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion; the term includes, but is not limited to, dynamite and other high explosives, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters.

**Explosive Materials:** These include explosives, blasting agents, and detonators. The term includes but is not limited to dynamite and other high explosives; slurries, emulsions, and water gels, black powder, initiating explosives, detonators (blasting caps), safety fuses, squibs, detonating cord, igniter cord, and igniters. Binary explosives (such as kinepak<sup>tm</sup> or execont<sup>tm</sup>), sold in two or more components, are considered an explosive material requiring a Division of Oil and Public Safety explosives permit.

**Explosive Oils:** Liquid explosive sensitizers for explosive materials. Examples include nitroglycerin, ethylene glycol dinitrate and metriol trinitrate.

**Extraneous Electricity:** Electrical energy, other than actual firing current or the test current from a blasting galvanometer, that is present at a blast site and that could enter a blasting circuit. It includes stray current, static electricity, electromagnetic waves, and time varying electric and magnetic fields.

**Fire Extinguisher Rating:** A rating set forth in the National Fire Code which may be identified on an extinguisher by a number (5,20, 70, etc.), indicating relative effectiveness, followed by a letter (A, B, C, etc.), indicating the class or classes of fires for which the extinguisher has been found to be effective.

**Fire-Resistant:** Construction designed to provide reasonable protection against fire. (For exterior walls or magazine constructed of wood, this shall mean fire resistance equivalency provided by sheet metal of not less than 26 gauge.)

**Flyrock:** Dirt, mud, stone, fragmented rock or other material that is propelled from the blast site by the force of an explosion.

**Fuse (Safety):** A flexible cord containing an internal burning medium by which fee or flame is conveyed at a continuous and uniform rate from the point of ignition to a cut end. A fuse detonator is usually attached to that end, although safety fuse may be used without a detonator to ignite material such as deflagrating explosives.

**Fuse Cap (Fuse Detonator):** A detonator which is initiated by a safety fuse or used in an avalauncher round; also referred to as an ordinary blasting cap. Synonymous with blasting cap, also see detonator.

**Fuse Lighters:** Pyrotechnic devices for the rapid and certain lighting of safety fuse.

**Fuel:** A substance which may react with oxygen to produce combustion.

**Hardwood:** Red Oak, White Oak; Hard Maple, Ash, or Hickory, free from loose knots, wind shakes, or similar defects.

**High Explosives:** Explosives which are characterized by a very high rate of reaction, high pressure development and the presence of a detonation wave, including, but not limited to, dynamite, detonating cord, cast boosters, detonators, cap-sensitive slurry, emulsion, or water gels, and mixed binaries.

**Inhabited area or building:** A building regularly occupied in whole or in part as a habitation for human beings. or any church, schoolhouse, railroad station, store, or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage, and use of explosive materials.

**Inspector:** An Inspector of the Division of Oil and Public Safety.

**Initiation:** The start of deflagration or detonation in an explosive material.

**Initiation System:** Combination of explosive devices and accessories (detonators, wire, cord, etc.) designed to convey a signal and initiate an explosive charge.

**Low Explosives:** Explosives which are characterized by deflagration or a low rate of reaction and the development of low pressure.

**Magazine:** Any building, structure, or container, other than an explosives manufacturing building, approved for the storage of explosive materials.

**Magazine Distance:** Shall mean the minimum distance permitted between any two storage magazines which is expected to prevent propagation of an explosion from one magazine to another from a blast.

**Make up room:** A room located inside an uninhabited building which shall be used for the assembly of cap and fuse or for the arming of explosive charges used in avalanche control work.

**Manufacturer:** Any individual, corporation, company, firm, partnership, association, or state or local government agency engaged in the business of manufacturing explosive materials for the purpose of sale, distribution or for his own use.

**Mass Detonation:** When a unit or any part or quantity of explosive material explodes and causes all or a substantial part of the remaining material to detonate or explode.

**Misfire:** A blast that fails to detonate completely after an attempt at initiation. This term is also used to describe the explosive material itself that has failed to detonate as planned.

**Motor Vehicle:** A vehicle, machine, tractor, semi-trailer or other conveyance propelled or drawn by mechanical power. Does not include vehicles operated exclusively on rail.

**Natural Barricade:** Natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

**Non-electric Detonator:** A detonator that does not require the use of electric energy to function.

**Oxidizer or Oxidizing Material:** A substance, such as nitrite, that readily yields oxygen or other oxidizing substances to promote the combustion of organic matter or other fuel.

**Permanent Magazines:** Type 1 magazines or Type 2, Type 4, or Type 5 Magazines that have been at the same location for longer than 90 days.

**Particle Board:** A composition board made of small pieces of wood bonded together.

**Permittee:** Any user, manufacturer, dealer, storer, or transporter of explosives for a lawful purpose, who has obtained a permit from the Division of Oil and Public Safety.

**Person:** Any individual, corporation, company, firm, partnership, association, or state or local government agency.

**Placards:** Division of Transportation-Approved (Code of Federal Regulations Title 49) signs placed on vehicles transporting hazardous materials (including explosive materials) indicating the nature of the cargo.

**Plywood:** Exterior construction-grade plywood.

**Possess:** The physical possession of explosives on one's person, or in the person's vehicle, magazine or building.

**Powder:** A common synonym for explosive materials.

**Primer:** A unit, package, or cartridge of explosives used to initiate other explosives or blasting

agents, which contains: 1) a detonator; or 2) detonating cord to which a detonator designed to initiate the detonating cord is attached.

**Propellant/Powder-Actuated Power Device:** Any tool or special mechanized device or gas generator system which is actuated by a propellant or which releases and directs work through a propellant charge.

**Public Conveyance:** Any railroad car, streetcar, ferry, cab, bus, aircraft, or other vehicle carrying passengers for hire.

**Public Highway:** Shall mean any public street, public alley, or public road. Public Highway Distance: Shall mean the minimum distance permitted between a public highway and an explosives magazine.

**Public Place:** A place which the public or a substantial number of the public has access, and includes but is not limited to highways, transportation facilities, schools, places of amusement, parks, playgrounds, and the common areas of public and private buildings and facilities.

**Purchaser:** A person who acquires explosives with adequate and full consideration in money or money's worth.

**Pyrotechnics:** Any combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects. Pyrotechnics are commonly referred to as fireworks.

**Railway:** Any steam, electric, or other railroad or railway.

**Safety Fuse:** A flexible cord containing an internal burning medium by which fire or flame is conveyed at a continuous and uniform rate from the point of ignition to a cut end. A fuse detonator is usually attached to that end, although safety fuse may be used without a detonator to ignite material such as deflagrating explosives.

**Scaled Distance (Ds):** a factor relating similar blast effects from various weight charges of explosive material at various distances. Scaled Distances referring to blasting effects is obtained by dividing the distance of concern by a fractional power of the weight of the explosive materials.

**Secured Storage:** An area which is protected from weather and is theft-resistant in compliance with the uniform fire code.

**Semi-Conductive Hose:** A hose used for pneumatic conveying of explosive materials, having an electrical resistance high enough to limit flow of stray electric currents to safe levels yet not so high as to prevent drainage of static electric charges to ground. Hose of not more than 2 megahms resistance over its entire length and of not less than 1,000 ohms per foot (3280 ohms per meter) meets this requirement.

**Sensitivity:** A physical characteristic of an explosive material, classifying its ability to be initiated upon receiving an external impulse such as impact, shock, flame, or other influence which can cause explosive decomposition.

**Shall:** Means that the rule establishes a minimum standard which is mandatory.

**Shock Tube:** A small diameter plastic tube containing used for initiating detonators. It contains only a limited amount of reactive material so that the energy that is transmitted through the tube by means of a detonation wave is guided through and confined within the walls of the tube.



**Site:** Area where active blasting is taking place.

**Slurry/Water Gel:** An explosive material containing substantial portions of a liquid, oxidizers, and fuel, plus a thickener.

**Small Arms Ammunition:** Any cartridge for shotgun, rifle, pistol, or revolver, and cartridges for propellant-actuated power device and industrial guns. Military-type ammunition containing explosive bursting charges, or any incendiary, tracer, spotting, or pyrotechnic projectile is excluded from this definition.

**Softwood:** Douglas Fir, or other wood of equal bullet-resistance, free of loose knots, wind shakes, or similar defects.

**Spacing:** The distance between boreholes. In bench blasting, the distance is measured parallel to the free face and perpendicular to the burden.

**Static Electricity:** Electric charge at rest on a person or object. It is most often produced by the contact and separation of dissimilar insulating materials.

**Stemming:** Inert material placed in a borehole on top of or between separate charges of explosive material, used for the purpose of confining explosive materials or to separate charges of explosive material in the same borehole.

**Steel:** General purpose (hot or cold rolled) low carbon steel such as specification ASTM A366 or equivalent.

**Storage:** The safekeeping of explosives in unattended magazines.

**Theft-Resistant:** Construction designed to deter illegal entry into facilities used for the storage of explosive material.

**Two-component:** See binary explosive.

**Transportation:** The conveyance or carrying of explosives from one place to another by means of a motorized vehicle or device.

**Type I User ( Blaster) Permit:** A permit issued by the Division of Oil and Public Safety to individuals involved in the use or transportation of explosives.

**Type II Permit:** A permit issued by the Division of Oil and Public Safety to corporations, companies, partnerships, firms, individuals operating a business, associations, or state or local government agencies involved in the use, purchase, sale, manufacture, transportation, or disposal of explosives.

**Type III Permit:** A permit issued by the Division of Oil and Public Safety to corporations, companies, partnerships, firms, individuals operating a business, associations, or state or local government agencies for the storage of explosives in approved magazines.

**Weather-Resistant:** Construction designed to offer reasonable protection against weather.

**U.S. Department of Transportation Explosive Classifications For The Transportation Of Explosives:**

Division 1.1: Mass Exploding (Class A explosives)

Division 1.2: Projection hazard(Class A or Class B Explosives)

Division 1.3: Fire hazard, minor blast (Class B Explosives) or projection hazard

Division 1.4: Minor explosion (Class C explosives) hazard-not mass exploding.

Division 1.5: Insensitive explosives (Blasting Agents) very little probability of initiation or of transition from burning to detonation during transport.

## **CHAPTER II GENERAL REQUIREMENTS**

### **2.1 Miscellaneous Provisions**

No person shall sell, display, or expose for sale an explosive or blasting agent on any public way or public place.

No person shall sell, give or deliver explosives to any person not in possession of a valid permit except an authorized for-hire commercial earner transporting between two valid permit holders.

Any theft or loss of explosives or blasting agents, whether from a storage magazine or area, a vehicle in which they are being transported, or from a site where they are being used, or from any other location, shall immediately (but in no event later than 24 hours) be reported by the person having control of such explosives or blasting agents to the local sheriff or local police, the Bureau of Alcohol, Tobacco, and Firearms (ATF), and Division of Oil and Public Safety, Public Safety Section.

All individuals, corporations, companies, firms, partnerships, associations, or state or local government agencies conducting an operation or activity requiring the use, possession, purchase, sale, manufacturing, storage, transportation or disposal of any explosive materials shall: 1) obtain a permit from the Division of Oil and Public Safety prior to conducting such operation or activity and shall be responsible for the results and any other consequences of any loading and firing of the explosive materials; and 2) NOT delegate either performance of the blast or accountability for such performance to another person(s).

The Division of Oil and Public Safety, Public Safety Section and local law enforcement authority shall be notified immediately by the permit holder of any accident, explosion, fire, or misuse of explosives which occurs in connection with the use, manufacture, possession, sale, transportation, storage or disposal of explosives and results in the loss of life, personal injury, or damage to any property.

The Division of Oil and Public Safety may inspect the site where any accident, explosion, fire, misuse, theft or loss of explosives occurred.

A Division of Oil and Public Safety representative may enter during normal business hours, without advance notice, the premises of any permit holder, including places of storage or use, for the purpose of inspecting or examining any records or documents required under these regulations, and any explosives material used or stored at the premises.

All corporations, companies, partnerships, firms, individuals operating a business, associations, or state or local government agencies conducting blasting operations shall have a certificate of liability insurance, be named as an also insured on another liability insurance policy, or shall have obtained a signed release of liability for damages from blasting operations from all parties who may be potentially affected by blasting operations.

## **CHAPTER III EXPLOSIVES PERMIT**

### **3.1 Basic Legal Obligations**

- (A) Except as specifically allowed by these regulations, it is unlawful for any person to use, possess, control, manufacture, purchase, sell, store, transport, or dispose of any explosive material without possessing a valid permit from the Division of Oil and Public Safety. (18-12-109) (2) (e)(9-7-101-111)CRS

### **3.2 General Provisions**

- (A) Permits issued under these rules and regulations shall be dated and numbered. Each permit will indicate class of permit, and shall be valid for up to thirty-six (36) months after the date of issue unless revoked or suspended by the Division of Oil and Public Safety, and shall be renewed on or before the expiration date. Application for renewal of permits shall be made to the Division of Oil and Public Safety prior to the renewal date to avoid possible lapse of said permit. Division of Oil and Public Safety shall send notice minimum of ninety (90) days prior to the expiration date. The failure of the permittee to receive timely notice from the Division of Oil and Public Safety shall not excuse the permittee's requirement to submit a renewal application not less than ten (10) days prior to the expiration date.
- (B) Upon notice from the Director of The Division of Oil and Public Safety or any law enforcement agency having jurisdiction, a person using, manufacturing, purchasing, selling, storing, transporting or disposing of any explosives without a permit shall immediately surrender any and all such explosives to the Division of Oil and Public Safety or to the law enforcement agency designated by the Division of Oil and Public Safety.
- (C) The Director shall require, as a condition precedent to the original issuance or renewal of any explosive permit, fingerprinting and criminal history record checks for every applicant.
- (D) Where application for an explosives permit is made in the name of a corporation, company, partnership, association, state or local government agency, or firm, the application shall also include the name of the permitted owner(s), partners) or manager(s) who will have access to explosive materials and be directly responsible for compliance with the provisions of the Explosives Act, 9-7-101 to 111, CRS, and any rules and regulations promulgated there under.
- (E) Fingerprints shall be submitted on forms provided to the applicant by the Division of Oil and Public Safety.
- (F) No person shall withhold information or make any false statement or fictitious oral or written statement or furnish or exhibit any false, fictitious, or misrepresented identification, intended or likely to deceive for the purpose of obtaining an explosives permit.
- (G) No person shall knowingly make any false entry in any record that a permit holder is required to keep pursuant to these regulations.
- (H) When a permit has expired and has not been renewed the applicable County Sheriffs Department shall be notified by the Division of Oil and Public Safety and the permit holder must turn over any remaining explosives which the permit holder is in possession of directly to the applicable law enforcement agency, or in the presence of the applicable law enforcement agency, turn over any remaining explosives which the permit holder is in possession of to a valid permit holder.
- (I) All permit holders shall take every reasonable precaution to protect their permits from loss, theft, defacement, destruction, or unauthorized duplication. The loss or theft of any permit shall be reported immediately to the local law enforcement agency and to the Division of Oil and Public Safety, Public Safety Section.
- (J) A permit holder shall notify the Division of Oil and Public Safety whenever:

- (1) There is a change in the person's permanent address;
- (2) There is a change in the name of any business possessing a permit;
- (3) The location of a permanent storage facility is changed or added.

### **3.3 Revocation, Suspension, or Denial of Permits.**

- (A) The Division of Oil and Public Safety shall not issue a permit to any individual, corporation, company, firm, partnership, association, or state or local government agency who:
- (1) Who is under twenty-one years of age;
  - (2) Has been convicted in any court of a crime punishable by imprisonment for a term exceeding one year;
  - (3) Is under indictment for a crime punishable by imprisonment for a term exceeding one year;
  - (4) Is a fugitive from justice;
  - (5) Has been convicted of a violent offense, a crime involving the illegal distribution of marijuana, or any depressant or stimulant drug, or narcotic drug, perjury, fraud, false swearing, or bomb threats; or
  - (6) Has been adjudicated developmentally disabled, mentally unstable, mentally ill or insane, or to be incompetent due to any mental disability or disease.
- (B) The Division of Oil and Public Safety shall deny or revoke and not renew the permit of any individual, corporation, company, firm, partnership, association, or state or local government agency under indictment for, or convicted of any of the following offenses:
- (1) A crime punishable by imprisonment for a term exceeding one year;
  - (2) A crime involving a violent offense, the illegal distribution of marijuana, or any depressant or stimulant drug, or narcotic drug, bomb threats, perjury, fraud, or false swearing, including making a false affidavit or statement under oath to the Division of Oil and Public Safety in an application or report; or
  - (3) A crime relating to use, manufacturing, sale, transportation, possession, or disposal of explosives.
- (C) The Division of Oil and Public Safety may revoke and not renew the permit of any individual, corporation, company, firm, partnership, association, or state or local government agency when the violation of any law or regulation relating to explosive material or the misuse of explosives materials results in loss of life or serious injury to any person.
- (D) A permit may be denied, suspended, or revoked by the Division of Oil and Public Safety because of, but not limited to the following:
- (1) Unlawful use of, or addiction to, alcohol, narcotics or illegal drugs;
  - (2) Failure to exercise reasonable safeguards resulting in hazard to life, health, or property;
  - (3) Failure to show legitimate use for a permit;

- (4) Failure to show sufficient proof of training or prior experience in the use of explosives;
  - (5) Non-compliance with an order issued by the Division within the time specified in such order;
  - (6) Proof that the permit holder or applicant advocates, or knowingly belongs to any organization or group that advocates the violent overthrow of, or violent action against any Federal, State, or local government or institution;
  - (7) Failure to comply with the Colorado explosives act, these regulations, federal and/or local explosives laws and regulations;
  - (8) Giving false information or a misrepresentation being willfully made to the Division of Oil and Public Safety and its investigators or inspectors to obtain or maintain a permit; or
  - (9) Other factors which, at the discretion of the Director of the Division of Oil and Public Safety, indicate an unfitness to hold an explosive permit in compliance with State and Federal Law and these regulations.
- (E) The Division of Oil and Public Safety shall revoke the permit of any person adjudged to be mentally unstable, ill or insane, or to be incompetent due to any mental disability or disease. The Director shall not renew the permit until the person has been legally restored to competency.

### **3.4 Procedure on Denial, Suspension, or Revocation of Explosives Permit**

- (A) In any case where the Division of Oil and Public Safety denies, suspends, or revokes a permit, the Director shall notify the applicant or permit holder in writing. Said notice shall state the reason for denial, suspension, or revocation and state that, upon a written request, a hearing shall be held. In case of revocation or suspension of a permit, the director shall notify all vendors of explosives of such revocation or suspension. (24-4-104) CRS
- (B) Upon notice of the revocation or suspension of any permit, the former permit holder shall immediately surrender to the Director of the Division of Oil and Public Safety the permit and all copies thereof. In addition, the former permit holder must surrender control of all explosive material in his/her possession to the designated law enforcement agency until a final determination on the charges is made.
- (C) The hearing shall be conducted by the Director or an Administrative Law Judge with the Division of Administrative Hearings on behalf of the Director in accordance with the procedures of 24-4-105, CRS
- (D) Any person aggrieved by a decision or order of the Director of the Division may seek judicial review pursuant to the provisions of 24-4-106, CRS
- (E) The period of denial, suspension, or revocation shall be within the sound discretion of the Director.
- (F) Any individual, corporation, company, firm, partnership, association, or state or local government agency who has been denied a permit may not reapply to the Division of Oil and Public Safety for an explosive permit within one year of the decision, unless exception is made by the Director and the applicant establishes a substantial change in circumstances to indicate fitness to hold an explosive permit in accordance with the requirements of these regulations, State and Federal law.

### **3.5 Permit Types and Classifications**

Permits are separated according to type. A permit may have more than one designated classification, however, for each and every classification requested, applicant must show legitimate use and

qualifications.

### **3.5.1 Type I User/Blaster Permit**

(A) All individuals involved in the use, blasting or disposal of explosives and/or blasting agents shall have a valid Type I user; blaster permit issued by the Division of Oil and Public Safety.

(B) For the purposes of permitting, a user; blaster is:

(1) A person who makes any or all of the following decisions:

- (a) Decides total quantity of explosives used;
- (b) Decides hole size, spacing, or depth;
- (c) Decides quantity of explosives in each hole;
- (d) Decides initiation system to be used;
- (e) Decides timing delays to be used.

(2) A person who directly supervises all personnel assisting in the use of explosives and supervises all personnel in training.

(3) A person who shall also be physically present during the use of explosives, at the point of initiation when a charge is detonated and either initiate the detonation or give the order to initiate the detonation of the charge.

(C) The classification of permits the applicant may apply for shall be:

(1) Construction;

- (a) Applicant must also apply for a Type I transporter permit, or provide to the Division of Oil and Public Safety a written and notarized plan documenting the manner in which explosives shall be transported to and from construction sites.

(2) Construction Limited;

- (a) Applicant may use or possess class 1.4, 1.5 explosives or binary products only.

(3) Quarry Operations;

(4) Avalanche Control;

(5) Geophysical exploration;

(6) Transporter;

- (a) Applicant must submit a copy of applicant's Commercial Driver's License with Hazardous Material Endorsement.

(7) Special (special use as described on the permit including Fabrication, Research and Development, Manufacturing, Demolition, Law Enforcement, Demolition, UXO, Purchasing Agent and Well Perforation, etc.)

(D) User Blaster qualifications:

- (1) The user/blaster shall be able to understand and give written and oral orders;
- (2) The user/blaster shall be qualified by reason of training, knowledge, and experience, in the field of using, transporting, possessing, storing and handling of explosives, and have a working knowledge of state, federal and local laws and regulations which pertain to explosives;
- (3) The user/blaster shall be required to submit a resume of experience or on the job training in the use of explosives of not less than one year;
- (4) The user/blaster shall be knowledgeable and competent in the use of each type of blasting method and initiation system used.

(E) The Division of Oil and Public Safety will issue a user/blaster's permit card which shall state the classifications of the permit and shall be earned by the user/blaster at all times when using, transporting, or possessing explosives and presented to authorized persons, upon request, together with valid personal identification.

### **3.5.2 Type II Permit**

(A) Corporations, companies, partnerships, firms, individuals operating a business, associations, or state or local government agencies involved in the use, purchase, sale, manufacture, transportation, or disposal of explosives shall have a valid Type II permit.

(B) Only one Type II permit shall be required of any corporation, company, partnership, firm, individual operating a business, association, or state or local government agency, and may be issued for all or any of the following classifications:

- (1) CLASSIFICATION AS A MANUFACTURER OF EXPLOSIVES authorizes the possession, manufacture, and purchase of materials required in the process of manufacturing the finished product. A corporation, company, partnership, firm, individual operating a business, association, or state or local government agency that combines compounds to manufacture an explosive is engaged in the business of manufacturing explosives shall be responsible for compliance with the provisions of the Explosives Act, 9-7-10 to 111, CRS, and any rules and regulations promulgated thereunder.
- (2) CLASSIFICATION AS A DEALER OF EXPLOSIVES authorizes the purchase, possession, and resale of explosives or blasting agents. A dealer permit is required of jobbers, wholesalers, distributors, dealers, and retailers, whether or not they physically handle, store, or have possession of the explosives or blasting agents. This permit is also required for all nonresidents who desire to sell explosives within the State of Colorado;
- (3) CLASSIFICATION AS A PURCHASER OF EXPLOSIVES authorizes the purchase and possession of explosives and blasting agents;
- (4) CLASSIFICATION AS A PURCHASER LIMITED authorizes the purchase and possession of 1.4 and 1.5 classes of explosives and binary products;
- (5) CLASSIFICATION AS A USER OF EXPLOSIVES authorizes the possession, and use of explosives and blasting agents by a corporation, company, partnership, firm, individual operating a business, association, or state or local government agency conducting an operation or activity which requires the use of such materials. User permits shall be issued for the following types of operations;

(a) Construction:

- (1) Applicant must also apply for a Type II transporter permit, or provide to the Division of Oil and Public Safety a written and notarized plan documenting the manner in which explosives shall be legally transported to and from construction sites.

(b) Construction limited:

- (1) Applicant's use and possession of explosives is limited to 1.4 and 1.5 classes of explosives and binary products.

(c) Quarry Operations;

(d) Avalanche Control;

(e) Geophysical research;

(f) Special (special use as described on the permit including Fabrication, Demolition, UXO, Well Perforation, Law Enforcement, Research and Development, etc.);

- (6) A TRANSPORTATION permit authorizes the transportation of explosive materials and blasting agents in quantities required to be placarded across or over roads within the state when such transportation is in compliance with federal, state and local transportation laws and regulations.

(a) A copy of a Hazardous Materials Transport Permit issued by the Public Utilities Commission shall be submitted with the application.

### 3.5.3 Type III Storage Permit

- (A) Corporations, companies, partnerships, firms, individuals operating a business, associations, or state or local government agencies that store explosives shall have a valid Type III permit.

- (B) Storage permits shall be issued to those persons who have approved storage magazine, sites.

- (C) Approval of a permanent storage magazine site shall include a site inspection by a Division of Oil and Public Safety representative, and written notification of the location of the permanent storage magazine site shall be made to the applicable fire district or department.

- (D) Approval of temporary magazine sites shall be made for a period of ninety (90) days upon written notification to the Division of Oil and Public Safety as to the location of the magazine site, the type(s) and supplier of the magazines being utilized, the type and quantity of explosives being stored and proof of written notification of the location of the storage magazine to the applicable fire district or department and county sheriff.

- (E) An inspection shall be required at each original permanent storage magazine site, at any added permanent storage magazine sites, and at least every sixth year of renewal of the permit.

- (F) A copy of a license or permit issued by the Federal Bureau of Alcohol, Tobacco, and Firearms and a copy of the application submitted for the license or permit may be submitted in lieu of an inspection by the Division of Oil and Public Safety.

### 3.6 Permit Application



- (A) Application for each type of original permit or renewal shall be completed on forms available from the Division of Oil and Public Safety and shall provide the following information:
- (1) The name and address of the applicant;
  - (2) The reason for desiring to use, purchase, sell, store, manufacture, transport, or dispose of explosives;
  - (3) The applicant's citizenship, if the applicant is an individual;
  - (4) If the applicant is a partnership, the names and addresses of the partners and their citizenship;
  - (5) If the applicant is a corporation, company, firm, association, or state or local government agency the names and addresses of the officers and directors thereof, and their citizenship;
  - (6) Evidence that the applicant(s) is sufficiently trained and experienced in the use, transportation, storage, sale, disposal or manufacturing of explosives;
  - (7) Such other pertinent information as the Director of the Division of Oil and Public Safety shall require to effectuate the purpose of these regulations.
- (B) Application forms may be obtained from the Public Safety Section office.
- (C) The submission of an application shall be a certification by the applicant that the applicant has read, understands, accepts these regulations, and shall comply with all requirements of these regulations.
- (D) Payment of the fee required by section 9-7-107, CRS must accompany each application for a permit.
- (E) A check or money order for the fee shall be made payable to the Division of Oil and Public Safety and submitted to the address provided on the application.
- (F) Applicant may be asked to supply additional information requested by the Division in order to verify statements in an application or in order to facilitate a Division inquiry prior to the issuance or renewal of a permit.
- (G) Each application for a manufacturer or dealer permit shall be accompanied by a copy of the applicant's current federal license issued by The Bureau of Alcohol, Tobacco, and Firearms; and a copy of all required documentation submitted to The Bureau of Alcohol, Tobacco, and Firearms.
- (H) The application for a manufacturer or dealer permit shall list the location(s) in Colorado where explosives will be manufactured or from where explosives will be sold. This shall not be required for the manufacturers of binary explosives.
- (I) A valid Type I user/blaster permit held by at least one of the individual owners, partners, officers, directors, or managers for each classification of use requested on the application shall be submitted with the application for a Type II user permit.
- (J) Each application for an original Type II permit or a renewal permit shall be accompanied by a list of employees with valid Type I user/blaster permits. The Division of Oil and Public Safety shall be notified of any changes of such employees.
- (K) An application for a storage permit shall include the location of all storage facilities, types of

magazines to be utilized, and types of explosives stored.

- (L) Each application for a Type II permit to purchase shall have a list of persons authorized to order and receive explosives on behalf of the purchaser. All authorized persons shall have a valid Type I user/blaster permit issued by the Division of Oil and Public Safety and their permit number shall be included in the application. The list of persons authorized to order and receive explosives on behalf of the purchaser shall be provided to dealers prior to the purchase of explosives.
- (M) In addition to the application form, all new applicants, all applicants requesting a change in classification of their permit, and all applicants who have not renewed their permit within 60 days after expiration will be required to submit a resume of experience in the use of explosives of not less than one year, and obtain a score of not less than 90% on a written examination prepared and administered by the Division of Oil and Public Safety. An applicant failing the examination may retake the examination at any time. An applicant failing the examination a second time must wait for a period of at least 30 days before retaking the exam.
- (N) All applicants renewing their permit are required to obtain a score of not less than 90% on a written examination prepared and administered by the Division of Oil and Public Safety every three (3) years OR provide proof of sixteen (16) hours attendance in a training course pre-approved by the Division of Oil and Public Safety.

### **3.7 Protection and Exhibition of Permits**

Permit holders shall take every reasonable precaution to protect their permits from loss, theft, defacement, destruction, or unauthorized duplication.

The loss or theft of any permit shall be reported immediately to the local law enforcement agency and to the Division of Oil and Public Safety, Public Safety Section.

Permits, or copies thereof, shall be exhibited in conformity with the following provisions:

- (A) Manufacturer - the permit shall be posted at the facility where explosives or blasting agents are manufactured. Manufacturing permits for bulk mix trucks shall be posted in the office of the permit holder.
- (B) Dealer - the permit shall be posted in the office at the location where explosives or blasting agents are sold.
- (C) Purchaser - the permit or a copy of the permit must be displayed at magazine/warehouse where explosives or blasting agents are received and stored.
- (D) User - the permit shall be posted in the main office of explosives operations.
- (E) Storage - a copy of the permit must be displayed at the office, warehouse, or in at least one magazine where explosives or blasting agents are received for storage.
- (F) User/blaster's permit card shall be earned by the user/blaster at all times when using, transporting, or possessing explosives and presented to authorized persons, upon request, together with valid personal identification.

### **3.8 Records of Transactions**

General: All permit holders shall keep a complete record of all transactions in, or operations involving explosives for five years following the year in which the transactions or operations involving explosives or blasting agents occurred. Records required by the Bureau of Alcohol, Tobacco and Firearms or delivered

to the Bureau of Alcohol, Tobacco and Firearms upon discontinued operation of a federal permittee or licensee, invoices, sales slips, delivery tickets, bills of lading, receipts, inventory records, blast plans or reports representing individual transactions will satisfy the requirements of complete records. Such papers must be retained by the permit holders unless previously delivered to the Bureau of Alcohol, Tobacco and Firearms and furnished to the Division of Oil and Public Safety during normal business hours upon request. If a permit holder is employed by another person who holds a valid permit, the records of the employer shall be deemed to satisfy these record-keeping requirements.

**3.8.1 The records of a person having a Permit to Manufacture explosives or blasting agents shall include the following information:**

- (A) Amount and kinds manufactured.
- (B) Amounts and kinds acquired for manufacture.
- (C) Names and addresses of the persons from whom acquired and dates on which acquired.
- (D) Amount and kinds sold or otherwise disposed of.
- (E) Names, addresses, and permit numbers of persons to whom sold or otherwise disposed of and dates of the sales or other dispositions.
- (F) Amounts and kinds on hand at each location at the end of each day on which there are transactions or operations.
- (G) The records kept in accordance with 6.1 (t) shall meet the record requirements for the " manufacture of binary products.

**3.8.2 The records of a person having a Permit for Dealer shall include the following information:**

- (A) Amounts and kinds acquired.
- (B) Names and addresses of persons from whom acquired and dates on which acquired.
- (C) Amounts and kinds sold or otherwise disposed of.
- (D) Names, addresses, and permit numbers of persons to whom sold or otherwise disposed of and the dates of sales or other dispositions. This requirement shall not apply to the sale of smokeless powder.

**3.8.3 A person holding a permit to Use explosives or blasting agents shall keep a daily inventory record of all explosives received and used or otherwise disposed of.**

**3.8.4 Persons holding a user/blaster permit shall keep records of explosives used in accordance with 6.1 (t) of these regulations.**

**3.9 Permit Changes**

The Division of Oil and Public Safety, Public Safety Section shall be notified immediately when:

- (A) The permanent address of a person who possesses a permit to use explosives or blasting agents is changed.
- (B) The ownership of any business possessing permits is changed.

- (C) The location of a permanent magazine is changed or added and address of the new location shall be provided.

### **3.10 Sales to Permit Holders**

- (A) When an order for explosives is placed by a purchaser, the dealer shall request proper authorization and identification from the purchaser and shall record the purchaser's permit number on sales record.
- (B) The purchaser shall provide to the dealer a list of persons authorized to order and receive explosives on behalf of the purchaser. A dealer shall not distribute explosive materials to a company or individual on the order of a person who does not appear on the up to date list of authorized permit holders and if the person does appear on the list, the dealer shall verify the identity of such person.
- (C) The authorized permit holder who physically receives the purchased explosives shall present his permit and proper identification to the dealer. The receiver of the explosives shall sign a receipt documenting the explosives received with his legal signature and permit number.
- (D) All such receipts shall be retained by the dealer for not less than five years from the date of purchase.
- (E) The dealer shall keep a record of all explosives purchased and sold as required by Federal Regulations.
- (F) Any package containing any explosive or blasting agent that is sold or is delivered for shipment by a dealer shall be properly labeled thereon to indicate its explosive classification.

## **CHAPTER IV STORAGE OF EXPLOSIVE MATERIALS**

### **4.1 Classes of Explosive Materials**

For purposes of this section, there are three classes of explosive materials. These classes, together with the description of explosive materials comprising each class, are as follows:

- (A) High Explosives - Explosive materials which can be caused to detonate by means of a blasting cap when unconfined (e.g., dynamite and detonators, cap-sensitive slurry/water gels and emulsions, and mixed binaries).
- (B) Low Explosives - Explosive materials which can be caused to deflagrate when confined (e.g., black powder, igniters, igniter cords, fuse lighters, and "special fireworks" - defined as Class B (1.3) explosives by US Department of Transportation Regulations in 49 CFR).
- (C) Blasting Agents - Example: Ammonium Nitrate/Fuel Oil mixture, non-cap-sensitive slurry/water gels and emulsion products.

### **4.2 General Provisions**

- (A) All explosive materials, detonators, blasting caps, and special industrial explosives, and any newly developed and unclassified explosive materials shall be kept in magazines which meet the requirements as defined in these regulations unless they are in the process of manufacture, being physically handled in the operating process, being used, or being transported to a place of storage or use.
- (B) High Explosives shall not be stored unattended outdoors, or in any building or structure, except in a Type 1 or Type 2 magazine.

(C) Detonators that will not mass detonate (1.4S and 1.4B classification) and are in the original and closed shipping container may also be stored in a Type 4 magazine.

(D) The requirements for the storage of binary explosives shall be:

- (1) Storage of the liquid component of a binary explosive shall be in a Type 5 magazine if stored outdoors. If stored indoors it shall be stored in secure storage in compliance with the uniform fire code.
- (2) Storage of the powder component of a binary explosive shall be in secure storage.
- (3) Liquid and powder components shall not be stored together.

(E) Blasting caps, electric blasting caps, non-electric caps, detonating primers or flame producing devices shall not be stored in the same magazine in which other explosives are kept or stored except under the following circumstances:

- (1) In a Type 1 or Type 2 magazine, detonators may be stored with delay devices, electric squibs, safety fuse, igniters, and igniter cord.

(F) Inventory and Responsibility

- (1) Magazines shall be in the charge of a valid permit holder at all times who shall be held responsible for the enforcement of all safety precautions.
- (2) All explosives shall be accounted for at all times. Explosives not being used shall be kept in a locked magazine, unavailable to persons not holding a valid permit.
- (3) The employer or Type II permit holder shall maintain an inventory and use record of all explosives. The inventory and use records shall be maintained on forms approved by the Division of Oil and Public Safety
- (4) Users/Blasters shall record any receipt or return of explosives on inventory records within the magazine.
- (5) Explosive materials shall be physically counted at least every thirty (30) days.
- (6) Detonators shall be inventoried as individual units.
- (7) Cartridge explosives shall be inventoried as pounds when in unopened cases, and as individual cartridges when in opened cases.
- (8) The Federal Bureau of Alcohol, Tobacco and Firearms, the Division of Oil and Public Safety, and local law enforcement agencies shall be notified immediately of any loss, theft, or unauthorized entry into a magazine.

(G) Surrounding Area:

- (1) The land surrounding a magazine shall be kept clear of trash, dried grass, leaves or trees (except for live trees more than ten (10) feet tall) for a distance of at least 25 feet. Living foliage used to stabilize the earthen coverings of a magazine need not be removed.
- (2) Any other combustible materials shall not be stored within 50 feet of magazines.
- (3) Smoking, matches or an open flame shall not be permitted:

- (a) In any magazine;
  - (b) Within 50 feet of any outdoor magazine; or
  - (c) Within any room containing an indoor magazine.
- (4) Firearms shall not be permitted inside of, or within 50 feet of magazines.
- (5) The premises on which the magazine(s) is located shall be posted with signs with the words "Explosives-Keep Away" in letters at least three (3) inches high. Signs shall be posted to warn any person approaching the magazine of the hazard, but shall be located so that a bullet passing through the sign will not strike the magazine(s).
- (6) Magazines located adjacent to a public area where signs may act as advertising shall not have signs containing the words "explosives," but shall be marked in such a manner as to notify emergency workers as to the danger of the contents of the magazines in case of fire.
- (H) Temporary storage at a site for blasting operations shall be located away from neighboring inhabited buildings, railways, highways, and other magazines in accordance with the American Table of Distance.
- (I) Storage within magazines
- (1) Packages of explosives shall be laid flat with top side up. Corresponding grades and brands shall be stored together in such a manner that brands and grade marks show. All stocks shall be stored so as to be easily counted and checked. Packages of explosives shall be stacked in a stable manner: When any kind of explosive is removed from a magazine for use, the oldest explosives of that particular kind shall always be taken first.
  - (2) Packages of explosives shall not be unpacked or packed in a magazine nor within 50 feet of a magazine or in close proximity to other explosive, but this restriction shall not apply to fiberboard containers.
  - (3) Tools used for opening packages of explosives shall be constructed of non-sparking materials.
  - (4) Opened packages of explosives shall be securely closed before being returned to a magazine.
  - (5) Magazines shall not be used for the storage of any metal tools nor any commodity except explosives, but this restriction shall not apply to the storage of blasting agents and non-metal blasting supplies.
  - (6) Magazine floors shall be regularly swept, kept clean, dry, free of grit, paper, empty used packages, and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from floors of magazines shall be properly disposed of. Magazine floors stained with nitroglycerin shall be cleaned according to instructions of the manufacturer.
  - (7) When any explosive has deteriorated to an extent that it is in an unstable or dangerous condition, or if nitroglycerin leaks from any explosives, then the person in possession of such explosive shall immediately proceed to destroy such explosive in accordance with the instruction of the manufacturer. Only experienced permit holders shall be allowed to do the work of destroying explosives.

- (8) When magazines need inside repairs, all explosives shall be removed and the floors cleaned. In making outside repairs, if there is a possibility of causing sparks or fire the explosives shall be removed from the magazine. Explosives removed from a magazine in order for repair shall either be placed in another class appropriate magazine or placed a safe distance from the magazine where they shall be properly guarded and protected until repairs have been completed, when they shall be returned to the magazine.
- (9) Explosives materials within a magazine are not to be placed against the interior walls and must be stored so as not to interfere with ventilation.
- (10) Any person storing explosive materials shall open and inspect his magazine at least every 7 days. This inspection need not be an inventory, but must be sufficient to determine whether there has been unauthorized entry or attempted entry into the magazine(s), or unauthorized removal of the contents.
- (11) Flammables, such as the liquid components of binary products, shall not be stored with other explosives.

#### 4.3 Summary of Storage Requirements

STORAGE TYPE	CLASSES OF EXPLOSIVE MATERIALS WHICH MAY BE STORED THEREIN
TYPE 1 (PERMANENT)	HIGH EXPLOSIVES LOW EXPLOSIVES BLASTING AGENTS
TYPE 2 (PORTABLE OR FIXED)	HIGH EXPLOSIVES LOW EXPLOSIVES BLASTING AGENTS
TYPE 3 ("DAY BOX" FOR TEMPORARY STORAGE)	HIGH EXPLOSIVES Low EXPLOSIVES BLASTING AGENTS
TYPE 4	BLASTING AGENTS LOW EXPLOSIVES DETONATORS (ORIGINAL, CLOSED CARTONS OF 1.4B AND 1.4S)
TYPE 5	BLASTING AGENTS

#### House keeping and Construction Common To All Types of Storage Facilities

ITEM	REQUIREMENTS
HINGES AND HASPS	SHALL BE ATTACHED TO DOORS BY

	WELDING OR RIVETING OR BOLTING. (NUTS ON INSIDE OF DOOR)
LOCKS	EACH DOOR SHALL BE EQUIPPED WITH: TWO MORTISE LOCKS, OR TWO PADLOCKS FASTENED IN SEPARATE HASPS AND STAPLES. OR A COMBINATION OF A MORTISE LOCK AND A PADLOCK, OR A MORTISE LOCK REQUIRING 2 KEYS TO OPEN OR A THREE POINT LOCK. LOCKS SHALL BE FIVE TUMBLER OR FIVE-BLADE. PADLOCKS SHALL BE PROTECTED WITH ¼ INCH STEEL CAPS CONSTRUCTED TO PREVENT SAWING OR LEVER ACTION ON LOCKS/HASPS. NOTE: OUTDOOR/MOBILE STORAGE FACILITIES WITH ONE STEEL. CASE-HARDENED. FIVE-TUMBLER PADLOCK. HAVING AT LEAST A 3/8 INCH DIAMETER SHACKLE, HAVE BEEN DETERMINED BY THE DIRECTOR TO MEET NECESSARY REQUIREMENT

ITEM	REQUIREMENTS
LIGHTING	ELECTRIC LIGHTING USED IN ANY MAGAZINE MUST



	<p>MEET NATIONAL ELECTRICAL CODE STANDARDS OR CONDITIONS PRESENT. ALL ELECTRIC SWITCHES MUST BE LOCATED OUTSIDE THE MAGAZINE AND COMPLY WITH THE NATIONAL ELECTRICAL CODE. BATTERY ACTIVATED SAFETY LIGHTING MAY BE USED IN ALL EXPLOSIVES MAGAZINES.</p>
HOUSE KEEPING	<p>STORAGE FACILITIES SHALL BE KEPT CLEAN, DRY, AND FREE OF GRIT. PAPER, EMPTY PACKAGES AND CONTAINERS, AND RUBBISH. EXPLOSIVE MATERIALS SHALL NOT BE PLACED DIRECTLY AGAINST INTERIOR WALLS OF A STORAGE FACILITY. BROOMS AND OTHER CLEANING UTENSILS SHALL HAVE NO SPARK-PRODUCING METAL PARTS. ONLY TOOLS MADE OF NON-SPARKING MATERIALS SHALL BE USED IN TYPES 1,2,3, AND 4 MAGAZINES. (METAL SLITTERS MAYBE USED FOR OPENING FIBERBOARD CONTAINERS. METAL TOOLS OTHER THAN</p>

	<p>NON-SPARKING TRANSFER CONVEYERS SHALL NOT BE STORED IN ANY MAGAZINE CONTAINING EXPLOSIVES.) AREA SURROUNDING STORAGE FACILITIES SHALL BE KEPT CLEAR OF RUBBISH, BRUSH, DRY GRASS OR TREES LESS THAN 10' TALL FOR NOT LESS THAN 25' IN ALL DIRECTIONS. ANY OTHER COMBUSTIBLE MATERIALS SHALL BE KEPT A DISTANCE OF NOT LESS THAN 50' FROM OUTDOOR STORAGE.</p>
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#### 4.4 Storage Magazine Construction by Type

##### Type 1 Storage

A Type 1 magazine shall be a permanent structure, e.g., a building, an igloo or Army-type structure, a tunnel, or a dugout. It shall be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated.

*Buildings:* All building-type magazines shall be constructed of masonry, wood, metal, or a combination of these materials and shall have no openings except for entrances and ventilation. The ground around building magazines shall slope away for drainage or other adequate drainage shall be provided.

*Masonry Wall Construction:* Masonry wall construction shall consist of brick, concrete, tile, cement block, or cinder block and shall be not less than 6 inches in thickness. Hollow masonry units used in construction shall have all hollow spaces filled with well-tamped, coarse, dry sand or weak concrete (at least 1 part cement - 8 parts of sand with enough water to dampen the mixture while tamping in place). Interior walls shall be constructed of, or covered with a non-sparking material.

*Fabricated Metal Wall Construction:* Metal wall construction shall consist of sectional sheets of steel or aluminum not less than 514 gauge, securely fastened to a metal framework. Metal wall construction shall be either lined inside with brick, solid cement blocks, hardwood not less than 4 inches thick, or shall have at least a 6-inch sand-fill between interior and exterior walls. Interior walls shall be constructed of, or covered with a non-sparking material.

*Wood Frame Wall Construction:* The exterior of outer wood walls shall be covered with steel or aluminum not less than #26 gauge. An inner wall of, or covered with non-sparking material shall be constructed so

as to provide a space of not less than 6 inches between the outer and inner walls. The space shall be filled with coarse, dry sand or weak concrete.

*Floors:* Floors shall be constructed of, or covered with a non-sparking material and shall be strong enough to bear the weight of the maximum quantity materials to be stored. Use of pallets covered with a non-sparking material is considered equivalent to a floor constructed of, or covered with a non-sparking material.

*Foundations:* Foundations shall be constructed of brick, concrete, cement block, stone, or wood posts. If piers or posts are used in lieu of a continuous foundation, the space under the buildings shall be enclosed with metal.

*Roof:* Except for buildings with fabricated metal roofs, the outer roof shall be covered with no less than #26 gauge steel or aluminum fastened to 7/8-inch sheathing.

*Bullet-Resistant Ceilings on Roofs:* Where it is possible for a bullet to be fired directly through the roof and into the magazine at such an angle that the bullet would strike the explosive within, the magazine shall be protected by one of following methods:

- (a) A sand tray with a layer of building paper, plastic, or other nonporous material filled with not less than 4 inches of coarse, dry sand, shall be located at the tops of inner walls covering the entire ceiling area, except that portion necessary for ventilation.
- (b) A fabricated metal roof shall be constructed of 3/16-inch thick plate steel lined with 4 inches of hardwood. (For each additional 1/16-inch of plate steel, the hardwood lining may be decreased 1 inch.)

*Doors:* All doors shall be constructed of 1/4 inch plate steel and lined with 2 inches of hardwood. Hinges and hasps shall be attached to the doors by welding, riveting, or bolting (nuts on inside of door). They shall be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with 1) two mortise locks; 2) two padlocks fastened in separate hasps and staples; 3) a combination of a mortise lock and a padlock; 4) a mortise lock that requires two keys to open; or 5) a three-point lock. Padlocks shall have at least 5 tumblers and a case-hardened shackle of at least 3/8 inch in diameter. Padlocks shall be protected with 1/4 inch sheet hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements shall 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.

*Ventilation:* Ventilation shall be provided to prevent dampness and heating of stored explosive materials. Ventilation openings shall be screened to prevent the entrance of sparks. Ventilation openings in sidewalk and foundations shall be offset or shielded for bullet-resistance purposes. Magazines having foundation and roof ventilators with the air circulating between the side walls and the floors and between the side walls and the ceiling shall have a wooden lattice lining or equivalent to prevent the packages of explosive materials from being stacked against the side walls and blocking the air circulation.

*Exposed Metal:* No sparking material shall be exposed to contact with the stored explosive materials. All ferrous metal nails in the floor and sidewalls which might be exposed to contact with explosive materials shall be blind nailed, countersunk, or covered with a non-sparking latticework or other non-sparking material.

*Igloos. Army-Type Structures. Tunnels. & Dugouts:* Igloo, Army-type structure, tunnel, and dugout magazines shall be constructed of reinforced concrete, masonry, metal, or a combination of these materials. They shall have an earth mound covering of not less than 24 inches on the top, sides, and rear

unless the ceiling or roof meets the bullet-resistant ceiling or roof requirements of this section. Interior walls shall be constructed of, or covered with a non-sparking metal. Magazines of this type shall also be constructed in conformity with the requirements of the floors, doors, locks, ventilation, and exposed metal portions outlined in this section.

ITEM	REQUIREMENTS
MASONRY WALL	SHALL BE CONSTRUCTED OF:BRICK NOT LESS THAN 6" THICK OR CONCRETE. NOT LESS THAN 6" THICK OR TILE NOT LESS THAN 6" THICK OR *CINDER BLOCK, NOT LESS THAN 6" THICK. (*HOLLOW MASONRY UNITS SHALL HAVE ALL HOLLOW SPACES FILLED WITH WELL-TAMPED COARSE DRY SAND OR WEAK CONCRETE).
METAL WALL	SECTIONAL SHEETS OF ONE OF THE FOLLOWING SHALL BE SECURELY FASTENED TO A METAL FRAMEWORK:STEEL NOT LESS THAN 14 GAUGE, OR ALUMINUM, NOT LESS THAN 14 GAUGE.SHALL BE LINED WITH:BRICK OR SOLID CEMENT BLOCKS OR HARDWOOD NOT LESS THAN 4" THICK OR SHALL HAVE AT LEAST 6" SAND FILL BETWEEN OUTER AND INNER WALLS.
WOOD WALL	EXTERIOR SHALL BE COVERED WITH EITHER:STEEL NOT LESS THAN 26

	GAUGE, OR ALUMINUM NOT LESS THAN 26 GAUGE INNER WALL SHALL BE CONSTRUCTED TO PROVIDE NOT LESS THAN 6" BETWEEN INNER AND OUTER WALLS: SPACE FILLED WITH EITHER: COARSE DRY SAND, OR WEAK CONCRETE.
FOUNDATION	SHALL BE CONSTRUCTED OF: BRICK, OR CONCRETE. OR CEMENT BLOCK, OR STONE, OR WOOD POSTS ( IF PIERS OR POSTS ARE USED, SPACE UNDERBUILDING SHALL BE ENCLOSED WITH METAL).
FLOORS	SHALL BE CONSTRUCTED OF NON-SPARKING MATERIAL AND SHALL BE STRONG ENOUGH TO BEAR THE WEIGHT OF MAXIMUM QUANTITY TO BE STORED.
ROOF	OUTER ROOF (EXCEPT FABRICATED METAL ROOFS) SHALL BE COVERED WITH: 26 GAUGE IRON FASTENED TO SEVEN-EIGHTHS INCH SHEATHING, OR 26 GAUGE ALUMINUM. FASTENED TO SEVEN-EIGHTHS INCH SHEATHING. WHERE

	<p>POSSIBLE FOR A BULLET TO BE FIRED DIRECTLY THROUGH THE ROOF INTO THE STORAGE FACILITY. THE MAGAZINE SHALL BE PROTECTED BY EITHER:A SAND TRAY, FILLED WITH NOT LESS THAN 4" OF COARSE DRY SAND, COVERING THE ENTIRE CEILING AREA(EXCEPT THAT NECESSARY FOR VENTILATION). OR FABRICATED METAL ROOF CONSTRUCTION OF 3/16" PLATE STEEL LINED WITH 4" HARDWOOD, (FOR EACH ADDITIONAL 1/16"OF PLATE STEEL, HARDWOOD MAY BE DECREASED BY 1".</p>
HINGES, HASPS, AND LOCKS	SEE CONSTRUCTION REQUIREMENTS COMMON TO ALL TYPES OF FACILITIES.
INTERIOR	SHALL BE CONSTRUCTED OF. OR COVERED WITH A NON-SPARKING MATERIAL. NO SPARKING METAL CONSTRUCTION SHALL BE EXPOSED BELOW TOP OF WALLS IN INTERIOR.ALL NAILS SHALL BE BLIND-NAILED OR COUNTERSUNK
GROUND	GROUND AROUND

	STORAGE FACILITY SHALL SLOPE AWAY FOR DRAINAGE.
VENTILATION	AIR SPACE OF 2" SHALL BE LEFT AROUND CEILING AND PERIMETER OF FLOORS, EXCEPT AT DOORWAYS. FOUNDATION VENTILATORS SHALL BE NOT LESS THAN 4" X 6". VENTS IN FOUNDATION, ROOF, OR GABLES SHALL BE SCREENED AND OFFSET, OR SHIELDED.
IGLOOS, ARMY TYPE STRUCTURES, TUNNELS, AND DUGOUTS	SHALL BE CONSTRUCTED OF REINFORCED CONCRETE, MASONRY, METAL, OR A COMBINATION OF THESE MATERIALS. SHALL HAVE AN EARTH MOUND COVERING OF NOT LESS THAN 24" ON THE TOP, SIDES. AND REAR. INTERIOR WALLS AND FLOORS SHALL BE COVERED WITH A NON-SPARKING MATERIAL. FLOOR, DOOR, LOCK, VENTILATION
LIGHTING	SEE CONSTRUCTION REQUIREMENTS COMMON TO ALL TYPES OF FACILITIES.
HOUSEKEEPING	SEE CONSTRUCTION REQUIREMENTS COMMON TO ALL TYPES OF FACILITIES.

## **Type 2 Storage**

A Type 2 magazine shall be a portable or mobile structure such as a box, skid-magazine, trailer, or semi-trailer.

### **(A) Outdoor Magazines**

*General:* Outdoor magazines shall be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated. They shall be supported to prevent direct contact with the ground and, if less than one cubic yard in size, shall be securely fastened to a fixed object. The ground around outdoor magazines shall slope away for drainage or other adequate drainage shall be provided. When unattended, vehicular magazines shall have wheels removed and shall otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Director.

*Exterior Construction:* The exterior and covers or doors shall be constructed of 1/4 inch sheet metal and shall be lined with two inches of hardwood. Magazines with top openings shall have lids with water-resistant seals or which overlap the sides by at least one inch when in a closed position.

*Hinges & Hasps:* Hinges and hasps shall be attached to the covers or doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with (1) two mortise locks; (2) two padlocks fastened in separate hasps and staples; (3) a combination of a mortise lock and a padlock; (4) a mortise lock that requires two keys to open; or (5) a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. 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.

### **(B) Indoor Magazines**

*General:* Indoor magazines shall be fire-resistant and theft-resistant if the buildings in which they are stored provide protection from the weather and from bullet penetration. Indoor magazines shall be at least one cubic yard in size, or securely fastened to a fixed object. No indoor magazine may be located in a residence or dwelling. The indoor storage of high explosives may not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the magazines are separated by a distance of 10 feet and the total quantity of all explosives material stored does not exceed 50 pounds. Blasting caps shall be stored in separate magazines.

*Exterior Construction:* Indoor magazines shall be constructed of wood or metal according to one of the following specifications:

- (a) Indoor magazines constructed of wood shall have sides, bottoms, and lids or doors constructed of two-inch wood and shall be well braced at corners. The magazines shall be covered on the exterior with sheet metal of not less than 26-gauge. Nails exposed to the interior of magazines shall be countersunk,
- (b) Indoor magazines constructed of metal shall have sides, bottom, and lids or doors constructed of at least 12-gauge metal and shall be lined inside with a non-sparking material. Edges of metal covers shall overlap sides at least one inch.



*Hinges & Hasps:* Hinges and hasps shall be attached to the covers or doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with (1) two mortise locks; (2) two padlocks fastened in separate hasps and staples; (3) a combination of a mortise lock and a padlock; (4) a mortise lock that requires two keys to open; or (5) a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with 1/2-inch steel hoods constructed so as to prevent sawing or lever action on the locks hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this paragraph, may have each door or opening locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter, if the lock hinges and hasps are securely fastened to the magazine and to the door frame. 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.

**Restrictions on Type 2 Outdoor Storage Facilities**

SIZE	SHALL BE AT LEAST 1 CUBIC YARD IN SIZE, OR SECURELY FASTENED TO A FIXED OBJECT.
GROUND	OUTDOOR STORAGE FACILITIES SHALL BE SUPPORTED IN SUCH A MANNER so AS TO PREVENT DIRECT CONTACT WITH THE GROUND. GROUND AROUND STORAGE FACILITY SHALL SLOPE AWAY FOR DRAINAGE.
CONSTRUCTION	SIDES, BOTTOMS, TOPS, AND COVERS OR DOORS SHALL BE CONSTRUCTED OF ¼ INCH STEEL AND LINED WITH 2“ HARDWOOD.
UNATTENDED STORAGE	UNATTENDED VEHICULAR STORAGE FACILITIES SHALL HAVE WHEELS REMOVED OR SHALL BE IMMOBILIZED BY KINGPIN LOCKING DEVICES.

<b>ITEM</b>	<b>REQUIREMENTS</b>
HINGES, HASPS, AND LOCKS	SEE CONSTRUCTION REQUIREMENTS COMMON TO ALL TYPES OF FACILITIES.
LIGHTING	SEE CONSTRUCTION REQUIREMENTS COMMON TO ALL TYPES OF FACILITIES.
HOUSE KEEPING	SEE CONSTRUCTION REQUIREMENTS COMMON TO -ALL TYPES OF FACILITIES.

<b>ITEM</b>	<b>REQUIREMENTS</b>
<b>LOCATION</b>	<b>NO INDOOR STORAGE FACILITY FOR STORAGE OF HIGH EXPLOSIVES SHALL BE LOCATED IN A RESIDENCE OR DWELLING. MORE THAN ONE MAGAZINE MAY BE LOCATED IN THE SAME BUILDING. NO MORE THAN A TOTAL OF 50 LBS. MAY BE STORED. DETONATORS MUST BE STORED IN A SEPARATE TYPE 2 MAGAZINE</b>
<b>QUANTITY RESTRICTIONS</b>	<b>NO INDOOR STORAGE FACILITY SHALL CONTAIN A QUANTITY OF HIGH EXPLOSIVES IN EXCESS OF 50 POUNDS OR MORE THAN 5.000 BLASTING CAPS.</b>
<b>CONSTRUCTION</b>	<b>SHALL BE OF EITHER:WOOD (SHALL HAVE SIDES, BOTTOMS, AND</b>

	<p><b>COVERS OR DOORS CONSTRUCTED OF 2” HARDWOOD AND SHALL BE WELL BRACED AT CORNERS. THEY SHALL BE COVERED WITH SHEET METAL (NOT LESS THAN 26 GAUGE) AND EXPOSED NAILS SHALL BE COUNTERSUNK).MET AL (SHALL HAVE SIDES, BOTTOMS, AND COVERS OR DOORS CONSTRUCTED OF 12-GAUGE METAL AND SHALL BE LINED INSIDE WITH A NON-SPARKING MATERIAL. EDGES OF METAL SHALL OVERLAP SIDES AT LEAST 1“).</b></p>
<b>SIZE</b>	<p><b>SHALL BE AT LEAST 1 CUBIC YARD IN SIZE, OR SECURELY FASTENED TO A FIXED OBJECT.</b></p>

**Type 3 Storage**

A *Type 3* magazine shall be a "day-box" or other portable magazine. It shall be fire-resistant, weather-resistant and theft-resistant. A *Type 3* magazine shall be constructed of number 12-gauge steel lined with either 1/2-inch plywood or 1/2-inch Masonite-type hardboard. Doors shall overlap sides by at least one inch. Hinges and hasps shall be attached by welding, riveting or bolting (nuts on inside). A single lock having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter shall be sufficient for locking purposes. Explosive materials may not be left unattended in *Type 3* magazines, but must be removed to a *Type 1* or *Type 2* magazines for unattended storage.

<b>ITEM</b>	<b>REQUIREMENTS</b>
CONSTRUCTION	NOT LESS THAN 12-GAUGE STEEL OR ALUMINUM, LINED WITH 1/2 PLYWOOD OR V4 HARDBOARD.

	DOOR OR LID MUST OVERLAP DOOR OPENING BY AT LEAST ONE INCH.
HINGES, HASPS, AND LOCKS	ONE LOCK, NO HOOD. HINGES AND HASPS TO BE ATTACHED IN SAME MANNER REQUIRED FOR OTHER STORAGE FACILITIES.
UNATTENDED STORAGE	NOT ALLOWED. EXPLOSIVE MATERIALS MUST BE REMOVED TO TYPE 1 OR TYPE 2 MAGAZINE.
LIGHTING	SEE CONSTRUCTION REQUIREMENTS COMMON FOR ALL TYPES OF FACILITIES.
HOUSE KEEPING	SEE CONSTRUCTION REQUIREMENTS COMMON FOR ALL TYPES OF FACILITIES.

#### **Type 4 Storage**

A Type 4 magazine shall be a building, igloo or Army-type structure, tunnel, dugout, box, trailer, or a semi-trailer or other mobile magazine.

##### **(A) Outdoor magazines**

*General:* Outdoor magazines shall be fire-resistant, weather-resistant, and theft-resistant and shall be at least one cubic yard in size, or securely fasted to a fixed object. The ground around outdoor • magazines shall slope away for drainage or other adequate drainage shall be provided. When unattended, vehicular magazines shall have wheels removed or shall otherwise be effectively immobilized by kingpin locking device or other methods approved by the director.

*Construction:* Outdoor magazines shall be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. Foundation shall be constructed of brick, concrete, cement block, stone, or metal or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the buildings shall be enclosed with fire-resistant material. The walls and floors shall be constructed of, or covered with, a nonsparking material or lattice work. The doors or covers shall be metal or solid wood covered with metal.

*Hinges and hasps:* Hinges and hasps shall be attached to the covers or doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with (1) two mortise locks; (2) two padlocks fastened in separate hasps and staples; (3) a combination of a mortise lock and a padlock; (4) a mortise lock that requires two keys to open; or (5) a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or a bar that cannot be actuated from the outside.

(B) Indoor Magazines

*General:* Indoor magazines shall be fire-resistant and theft-resistant shall be at least one cubic yard in size, or securely fasted to a fixed object. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine may be located in a residence or dwelling. The indoor storage of low explosives may not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the magazines are separated by a distance of 10 feet and the total quantity of all explosive materials stored does not exceed 50 pounds. Electric blasting caps that will not mass detonate shall be stored in separate magazines and the total number of caps may not exceed 5,000.

*Construction:* Indoor magazines shall be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. The-walls and floors shall be constructed of, or covered with, a nonsparking material. The doors or covers shall be metal or solid wood covered with metal.

*Hinges & Hasps:* Hinges and hasps shall be attached to the covers or doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with (1) two mortise locks; (2) two padlocks fastened in separate hasps and staples; (3) a combination of a mortise lock and padlock; (4) a mortise lock that requires two keys to open; or (5) a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this paragraph, may have each door or opening locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter, if the lock hinges and hasps are securely fastened to the magazine and to the door frame. 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.

ITEM	REQUIREMENTS
CONSTRUCTION	SHALL BE OF: MASONRY, OR METAL-COVERED WOOD, OR FABRICATED METAL, OR COMBINATIONS OF THESE MATERIALS.
DOORS OR COVERS	SHALL BE CONSTRUCTED OF: METAL. OR SOLID WOOD COVERED

	WITH METAL.
FOUNDATIONS	SHALL BE CONSTRUCTED OF:BRICK, OR CEMENT BLOCK. OR CONCRETE, OR STONE. OR WOOD POSTS.(IF PIERS OR POSTS ARE USED, SPACE UNDER BUILDINGS SHALL BE ENCLOSED WITH METAL.)
INTERIOR	SHALL BE LINED WITH NON-SPARKING MATERIAL. No SPARKING METAL CONSTRUCTION SHALL BE EXPOSED BELOW TOP OF WALLS IN INTERIOR. ALL NAILS SHALL BE BLIND-NAILED OR COUNTER-SUNK
HINGES, HASPS. AND LOCKS	SEE COMMON REQUIREMENTS.
LIGHTING	SEE COMMON REQUIREMENTS.
HOUSE KEEPING	SEE COMMON REQUIREMENTS.
SIZE	SHALL BE AT LEAST 1 CUBIC YARD IN SIZE, OR SECURELY FASTENED TO A FIXED OBJECT.

**Restrictions on Type 4 Outdoor Storage Facilities**

GROUND

GROUND AROUND STORAGE FACILITY SHALL SLOPE AWAY FOR DRAINAGE.

UNATTENDED STORAGE

UNATTENDED VEHICULAR STORAGE FACILITIES SHALL HAVE WHEELS

REMOVED OR SHALL  
BE IMMOBILIZED BY  
KINGPIN LOCKING  
DEVICES.

Restrictions on Type 4 Indoor Storage Facilities

LOCATION NO INDOOR STORAGE  
FACILITY FOR  
STORAGE OF  
BLASTING AGENTS  
SHALL BE LOCATED  
IN A RESIDENCE OR  
DWELLING.

**Type 5 Storage**

A Type 5 magazine shall be a building, igloo or army-type structure, tunnel/dugout, bin, box, trailer, or a semitrailer or other mobile facility.

(A) Outdoor Magazines

*General:* Outdoor magazines shall be weather-resistant and theft-resistant. The ground around magazines shall slope away for drainage or other adequate drainage shall be provided. When unattended, vehicular magazines shall have wheels removed or shall otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Director.

*Construction:* The doors or covers shall be constructed of solid wood or metal.

*Hinges & Hasps:* Hinges and hasps shall be attached to the covers or doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with one (1) padlock having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Indoor magazines located in secure rooms that are locked as provided in this paragraph, may have each door or opening locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter, if the lock hinges and hasps are securely fastened to the magazine and to the door frame. 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.

(B) Indoor Magazines

*General:* Indoor magazines shall be theft-resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine may be located in a residence or dwelling. Indoor magazines containing quantities of agents in excess of 50 pounds shall be subject to the tables of distances in 4.17 and 4.19 of this subpart.

*Construction:* The doors or covers shall be constructed of wood or metal.

*Hinges and hasps:* Hinges and hasps shall be attached to the covers or doors by welding,

riveting, or bolting (nuts on inside). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

*Locks:* Each door shall be equipped with one (1) padlock having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter.

Indoor magazines located in secure rooms that are locked as provided in this paragraph, may have each door or opening locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter, if the lock hinges and hasps are securely fastened to the magazine and to the door frame. 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.

<b>ITEM</b>	<b>REQUIREMENTS</b>
<b>DOORS OR COVERS</b>	<b>SHALL BE CONSTRUCTED OF EITHER SOLID WOOD OR METAL.</b>
<b>HINGES, HASPS, AND LOCKS</b>	<b>ONE LOCK PER DOOR OR COVER. NO HOODS REQUIRED ON MOBILE UNITS.</b>
<b>HOUSE KEEPING</b>	<b>SEE COMMON REQUIREMENTS.</b>

**Restrictions on Type 5 Outdoor Storage Facilities**

GROUND	GROUND AROUND STORAGE FACILITY SHALL SLOPE AWAY FOR DRAINAGE.
UNATTENDED STORAGE	UNATTENDED VEHICULAR STORAGE FACILITIES SHALL HAVE WHEELS REMOVED OR SHALL BE IMMOBILIZED BY KINGPIN LOCKING DEVICES

**Restrictions on Type 5 Indoor Storage Facilities**

LOCATION	NO INDOOR STORAGE FACILITY FOR STORAGE OF BLASTING AGENTS SHALL BE LOCATED IN A RESIDENCE OR DWELLING.
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**4.5 Location of Magazines**

- (A) Outdoor magazines in which high explosives are stored shall be located no closer to inhabited buildings, passenger railways, public highways, or other magazines in which "high explosives are stored than the minimum distances specified in the American Table of Distances for Storage of Explosive Materials in 4.6.
- (B) Outdoor magazines in which low explosives are stored shall be located no closer to inhabited buildings, passenger railways, public highways, or other magazines in which explosives are stored than toe minimum distances specified in the American Table of Distances for Storage of Low Explosives in 4.6. The distances shown there in may not be reduced by the presence of barricades.
- (C) Outdoor magazines in which blasting agents are stored shall be located no closer to inhabited buildings, passenger railways, or public highways than the minimum distances specified in the American Table of Distances for Storage of Explosive Materials in 4.6.
- (D) Ammonium nitrate and magazines in which blasting agents are stored shall be located no closer to magazines in which high explosives or other blasting agents are stored than the minimum distances specified in the American Table of Distances for the Separation of Ammonium Nitrate and Blasting Agents in 4.6. However, the minimum distances for magazines in which explosives and blasting agents are stored from inhabited buildings, etc. may not be less than the distances specified in the American Table of Distances for Storage of Explosive Materials in 4.6.

**4.6 American Table of Distance For the Storage of Explosive Material**

QUANTITY OF EXPLOSIVES (IN POUNDS)		DISTANCE IN FEET	
OVER	INHABITED BUILDING		PUBLIC HIGHWAY
	NOT OVER	BARRICADED	UNBARRICADED
0	5	70	140
5	10	90	180
10	20	110	220
20	30	125	250
30	40	140	280
40	50	150	300
50	75	170	340
75	100	190	380
100	125	200	400
125	150	215	430
150	200	235	470
200	250	255	510
250	300	270	540
300	400	295	590
400	500	320	640
500	600	340	680
600	700	355	710

700	800	375	750
800	900	390	780
900	1,000	400	800
1,000	1,200	425	850
1,200	1,400	450	900
1,400	1,600	470	940
1,600	1,800	490	980
1,800	2,000	505	1,010
2,000	2400	545	1,090
2,500	3,000	580	1,160
3,000	4,000	635	1470
4,000	5,000	685	1,370
5,000	6,000	730	1,440
6,000	7,000	770	1440
7,000	8,000	800	1.600
8,000	9,000	835	1,670
9,000	10,000	865	1,730
10,000	12,000	875	1,750
12,000	14,000	885	1,770
14,000	16,000	900	1400
16,000	18,000	940	1480
18,000	20,000	975	1,950
20,000	25,000	1,055	2,000
25,000	30,000	1,130	2,000
30,000	35,000	1,205	2,000
35,000	40,000	1,275	2,000
40,000	45,000	1.340	2,000
45,000	50,000	1,400	2.000
50,000	55,000	1,460	2,000
55,000	60,000	1.515	2,000
60,000	65,000	1,565	2,000
65,000	70,000	1,610	2,000
70,000	75,000	1,655	2,000
75,000	80,000	1,654	2,000
80,000	85,000	1,7Ji	2,004
85,000	90,000	1.7M	2,000
90,000	95,000	1,79	2.0M
95,000	100,000	1,115	2,000
100,000	110,000	U95	2,000
110,000	120,000	M95	2,000
120,000	130,000	1,17!	2.0M
130,000	140,000	I4N	2,000
140,000	150,000	WW	2,000

150,000	160,000	1435	2,000
160,000	170,000	1.1M5	2.004
170,000	180,000	1.990	2JHW
180,000	190,000	2,011	2,010
190,000	100,000	2,030	2,030
200,000	210,000	2,055	2,055
210,000	230,000	2400	2400
230,000	250,000	2455	2455
250,000	275,000	2415	2,215
275,000	300,000	2475	2475

American Table of Distance for the Storage of Low Explosives

<b>POUNDS</b>		<b>DISTANCES IN FEET</b>	
<b>OVER</b>	<b>NOT OVER</b>	<b>FROM INHABITED BUILDINGS</b>	<b>FROM PUBLIC RAILWAYS AND HIGHWAYS</b>
0	1.000	75	75
1.000	5.000	115	115
5.000	10,000	150	150
10.000	20,000	190	190
20,000	30,000	215	215
30.000	40,000	135	235
40,000	50,000	250	250
50,000	60.000	260	260
60.000	70,000	270	170
70.000	80.000	280	280
80,000	90,000	295	295
90.000	100,000	300	300
100.000	100,000	375	375
200.000	300,000	450	450

American Table of Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents

<b>DONOR WEIGHT (FOUNDS)</b>		<b>MINIMUM SEPARATION.DISTANCE OF ACCEPTOR FROM DONOR WHEN BARRICADED (FEET)</b>	
<b>OVER</b>	<b>NOT OVER</b>	<b>AMMONIUM NITRATE</b>	<b>BLASTING AGEN</b>
0	100	3	11
100	300	4	14
300	600	5	18
600	1,000	6	22

1.000	1.600	7	25
1.600	2,000	8	29
2,000	3.000	9	32
3.000	4.000	10	36
4.000	6.000	11	40
6,000	8,000	12	43
8.000	10.000	13	47
10,000	12,000	14	50
12.000	16.000	15	54
16.000	20,000	16	58
20.000	25.000	18	65
25.000	30.000	19	68
30.000	35,000	20	72
35,000	40.000	21	76
40.000	45,000	22	79
45.000	50,000	<i>a</i>	83
50.000	55,000	24	86
55.000	60,000	25	90
60.000	70,000	26	94
70.000	80,000	28	101
80.000	90,000	30	108
90.000	100,000	32	115
100.000	110,000	34	122
120.000	140.000	37	133
140,000	160.000	40	144
160.000	180.000	44	158
180,000	100,000	48	173
200,000	220.000	52	187
220,000	250,000	56	202
250.000	275,000	60	216
275,000	300.000	64	230

**EXPLANATORY NOTES ESSENTIAL TO THE APPLICATION OF THE AMERICAN TABLE OF DISTANCES FOR STORAGE OF EXPLOSIVE MATERIALS**

NOTE 1 "Explosive materials" means explosives, blasting agents and detonators.

NOTE 2 "Explosives" means any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion. For quantity and distance purposes, detonating cord of 50 grains per foot should be calculated as equivalent to 8 lbs. of high explosives per 1,000 feet. Heavier or lighter core loads should be rated proportionately.

NOTE 3 "Blasting agents" means any material or mixture, consisting of fuel and oxidizer, intended for blasting, not otherwise defined as an explosive: Provided, That the finished product, as mixed for use or shipment, cannot be detonated by means of a No. 8 test blasting cap when unconfined.

NOTE 4 "Detonator" means any device containing any initiating or primary explosive that is used for initiating detonation. A detonator may not contain more than 10 grams of total explosives by weight, excluding ignition or delay charges. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord delay connectors, and nonelectric instantaneous and delay blasting caps which use detonating cord, shock tube, or any other replacement for electric leg wires. All types of detonators in strengths through No.8 cap should be rated at 1½lbs. of explosives per 1,000 caps. For strengths higher than No.8 cap. consult the manufacturer.

NOTE 5 "Magazine" means any building, structure, or container, other than an explosives manufacturing building, approved for the storage of explosive materials.

NOTE 6 "Natural Barricade" means natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

NOTE 7 "Artificial Barricade" means an artificial mound or revetted wall of earth of a minimum thickness of three feet.

NOTE 8 "Barricaded" means the effective screening of a building containing explosive materials from the magazine or other building, railway, or highway by a natural or an artificial barrier. A straight line from the top of any sidewall of the building containing explosive materials to the eave line of any magazine or other building or to a point twelve feet above the center of a railway or highway shall pass through such barrier.

NOTE 9 "Inhabited Building" means a building regularly occupied in whole or part as a habitation for human beings, or any church, schoolhouse, railroad station, store, or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosive materials.

NOTE 10 "Railway" means any steam, electric, or other railroad or railway which carries passengers for hire.

NOTE 11 "Highway means any public street, public alley, or public road.

NOTE 12 When two or more storage magazines are located on the same property, each magazine must comply with the minimum distances specified from inhabited buildings, railways, and highways, and, in addition, they should be separated from each other by not less than the distances shown for "Separation of Magazines," except that the quantity of explosive materials contained in detonator magazines shall govern in regard to the spacing of said detonator magazines from magazines containing other explosive materials. If any two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group, must be considered as one magazine, and the total quantity of explosive materials stored in such group must be treated as if stored in a single magazine located on the site of any magazine of the group, and must comply with the minimum of distances specified from other magazines, inhabited buildings, railways, and highways.

NOTE 13 Storage in excess of 300,000 lbs. of explosive materials, in one magazine is generally not required for commercial enterprises.

NOTE 14 This Table applies only to the manufacture and permanent storage of commercial explosive materials. It is not applicable to transportation of explosives or any handling or temporary storage necessary or incident thereto. It is not intended to apply to bombs, projectiles, or other heavily encased explosives.

NOTE 15 When a manufacturing building on an explosive materials plant site is designed to contain explosive materials, such building shall be located from inhabited buildings, public highways and

passenger railways in accordance with the American Table of Distances based on the maximum quantity of explosive materials permitted to be in the building at one time.

## **AMERICAN TABLE OF DISTANCES**

The American Table of Distances applies to the manufacture and permanent storage of *commercial* explosive materials. The distances specified are those measured from the explosive materials storage facility to the inhabited building, highway or passenger railway, irrespective of property lines.

The American Table of Distances covers all *commercial* explosive materials, including, but not limited to, high explosives, blasting agents, detonators, initiating systems and explosives materials in process. The Table is not designed to be altered or adjusted to accommodate varying explosive characteristics such as blast effect, weight strength, density, bulk strength, detonation velocity, etc.

The American Table of Distances should not be used to determine safe distances for blasting work, the firing of explosive charges for testing or quality control work, or the open detonation of waste explosive materials. The American Table of Distances may be utilized as a guide for developing distances for the unconfined, open burning of waste explosive materials where the probability of transition from burning to high order detonation is improbable.

### **Notes to Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents**

NOTE 1 Recommended separation distances to prevent explosion of ammonium nitrate and ammonium nitrate-based blasting agents by propagation from nearby stores of high explosives or blasting agents referred to in the Table as the "donor." Ammonium nitrate, by itself, is not considered to be a donor when applying this Table. Ammonium nitrate, ammonium nitrate-fuel oil or combinations thereof are acceptors. If Stores of ammonium nitrate are located within the sympathetic detonation distance of explosives or blasting agents, one-half the mass of the ammonium nitrate should be included in the mass of the donor.

NOTE 2 When the ammonium nitrate and/or blasting agent is not barricaded, the distances shown in the Table shall be multiplied by six. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like which may enclose the "donor." Where storage is in bullet-resistant magazines is recommended for explosives or where the storage is protected by a bullet-resistant wall, distances and barricade thicknesses in excess of those prescribed in the American Table of Distances are not required.

NOTE 3 The distances in the Table apply to ammonium nitrate that passes the insensitivity test prescribed in the definition of ammonium nitrate fertilizer promulgated by the Fertilizer Institute;<sup>2</sup> and ammonium nitrate failing to pass said test shall be stored at separation distances determined by competent persons and approved by the authority having jurisdiction.

<sup>2</sup>Definition and Test Procedures for Ammonium Nitrate Fertilizer, Fertilizer Institute, May 8, 1971

NOTE 4 These distances apply to blasting agents which pass the insensitivity test prescribed in regulations of the U.S. Department of Transportation and the U.S. Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms.

NOTE 5 Earth, or sand dikes, or enclosures filled with the prescribed minimum thickness of earth or sand are acceptable artificial barricades. Natural barricades, such as hills or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the "donor" when the trees are bare of leaves, are also acceptable.

NOTE 6 For determining the distances to be maintained from inhabited buildings, passenger railways, and public highways, use the American Table of Distances for Storage of Explosives Materials on pages 58 and 59.<sup>1</sup>

<sup>1</sup>For construction of bullet-resistant magazines see Bureau of Alcohol, Tobacco and Firearms, Department of the Treasury, Publication ATF P 5400.7 (6/90), *ATF-Explosives Law and Regulations*.

## **CHAPTER V TRANSPORTATION OF EXPLOSIVES**

### **5.1 General Provisions**

- (A) Transportation of explosives, blasting agents, and blasting supplies on public highways, railways, and airways shall be in accordance with the provisions of Title 42 article 20 Colorado Revised Statutes and any regulations promulgated pursuant thereto; and Title 49 CFR Parts 171-179, and Parts 390-397, Motor Carriers.
- (B) Requirements for the transportation of explosives, blasting agents and blasting supplies by motorized vehicle or conveyance on job sites shall be:
- (1) No person shall smoke, or carry matches or any other flame producing device, or carry firearms or loaded cartridges while in or near a motor vehicle or conveyance transporting explosives;
  - (2) No person shall drive, load, or unload a vehicle or conveyance transporting explosives in a careless or reckless manner;
  - (3) Vehicles or conveyances transporting explosives, blasting agents or blasting supplies shall not be taken inside a garage or shop for repairs or servicing;
  - (4) Vehicles or conveyances used for transporting explosives shall be equipped to carry the load without difficulty, and shall be in good mechanical condition;
  - (5) A motor vehicle or conveyance used for transporting explosives shall be given the following inspection prior to the transportation to determine that it is in proper condition for the safe transportation of explosives:
    - (a) Fire extinguishers shall be filled and in proper working order,
    - (b) All electrical wiring shall be completely protected and securely fastened to prevent short-circuiting;
    - (c) Chassis, motor, pan, and underside of body shall be completely free of excess oil and grease;
    - (d) Fuel tank and fuel line shall be secure and have no leaks;
    - (e) Brakes, lights, horn, windshield wipers and steering apparatus shall function properly;
    - (f) Tires shall be checked for proper inflation and defects; and
    - (g) The vehicle shall be in proper condition in every other respect and acceptable for hauling explosives.
  - (6) All vehicles or conveyances used for transporting explosives shall have tight floors and any exposed spark-producing metal on the inside of the body shall be covered with wood or other non-sparking materials to prevent contact with packages of explosives.
  - (7) Packages of explosives or blasting agents shall not be loaded above the sides of an open-body vehicle or conveyance.

- (8) Explosives shall not be transported with other materials or cargoes in the same compartment. In no case shall flammable materials be carried on the same vehicle as explosives with the exception of desensitizing agents.
- (9) Each vehicle or conveyance used for transportation of explosives shall be equipped with fully charged fire extinguishers as follows:
- (a) Vehicles 14,000 pounds and over Gross Vehicle Weight (GVW) rating and tractor semi-trailer units: Two or more extinguishers with a total fire extinguisher rating of at least 4-A:70-B:C.
  - (b) Vehicles of less than 14,000 pounds GVW rating: minimum of two extinguishers with a total fire extinguisher rating of at least 4-A:20-B:C.
  - (c) Extinguishers shall be located where they will be accessible for immediate use.
- (10) Explosives shall be transferred from a disabled vehicle or conveyance to another only when proper and qualified supervision is provided. Local fire departments and police departments shall be notified in congested areas. In remote areas, they shall be notified if appropriate.
- (11) A motorized vehicle or conveyance which contains explosives or detonators shall not be parked under any of the following circumstances:
- (a) On or within 5 feet of the traveled portion of a public street or highway,
  - (b) Within 300 feet of a bridge, tunnel, building, or place where people work, assemble, or congregate, except for brief periods when the necessities of operation require the vehicle or conveyance to be parked and make it impracticable to park the vehicle or conveyance in any other place.
- (12) A motorized vehicle or conveyance transporting explosives, detonators, or blasting agents shall not be left unattended.
- (13) A motorized vehicle or conveyance shall be deemed attended only when the driver or other attendant is physically on or in the vehicle or conveyance, or has the vehicle or conveyance within the driver or attendant's field of vision and can reach the vehicle or conveyance quickly and without any kind of interference; attended also means the driver or attendant is awake, alert, and not engaged in any other duties or activities which may divert their attention from the vehicle or conveyance.
- (14) Detonators (blasting caps) may not be transported in the same vehicle or conveyance with other explosives unless:
- (a) The detonators and explosives are placed in separate Type 2 magazines secured within the body of the vehicle or conveyance;
  - (b) The detonators and explosives are placed in a suitable container and separated by 4 inches of hardwood, and the detonators are totally enclosed or confined by the hardwood construction; or
  - (c) The detonators and explosives are placed in separate suitable containers or compartments constructed in accordance with the Institute of Makers of Explosives Safety Library Publication No. 22 entitled "ME Standard for the Safe Transportation of Blasting Caps In A Vehicle with Other Explosives".



- (C) Requirements for the transportation of explosives, blasting agents, and blasting supplies to blasting areas by non-motorized means shall be:
- (1) Explosives and blasting agents shall be carried in day boxes, original containers or shall be placed in bags or containers that are water-resistant, and constructed of non-sparking and nonconductive material.
  - (2) Detonators shall be wrapped in suitable padding and carried in separate bags or containers from other explosives.

## **CHAPTER VI USE OF EXPLOSIVE MATERIALS**

### **6.1 General Provisions**

- (A) While explosives are being handled or used, smoking, matches, or any other source of fire or flame shall not be within 50 feet of the blast site. No person shall handle explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not endanger the worker or others.
- (B) When blasting is done in populated or residential areas or in close proximity to a structure, railway, or highway or any other installation that may be damaged the following precautions shall be taken:
- (1) The blast shall be covered before firing with a mat or material that is capable of preventing fragments from being thrown;
  - (2) The blast shall be loaded in compliance with the Table of Scaled Distance or be monitored by a seismograph; and
  - (3) All persons within the blast area shall be given reasonable notification prior to blasting operations.
- (C) Blasters conducting blasting operations shall take every reasonable precaution, including but not limited to warning signals, flags and barricades to insure the safety of the general public and workers.
- (D) Surface blasting operations shall be conducted during periods of daylight, when the blast area is clearly visible. Nighttime blasting operations shall be approved by the Director of the Division of Oil and Public Safety and local law enforcement agency prior to the blast. Approval shall only be granted if such approval serves the safety of the general public.
- (E) The blaster shall perform all required notification to and obtain all required permits from local jurisdictions or authorities, including, but not limited to, the County Sheriff, local fire districts and fire departments before beginning blasting operations.
- (F) Whenever blasting operations are subjected to both state and local rules, the higher standard shall apply.
- (G) Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph, steam utilities, or transportation corridors, the blaster shall notify the appropriate transportation or utility representatives at least twenty-four hours in advance of blasting, specifying the location and intended time of such blasting.
- (H) The blaster shall suspend all blasting operations and remove all persons from the blast site during the approach and progress of an electric storm.

- (I) No fire shall be fought where the fire is in imminent danger of contact with explosives. All employees shall be removed to a safe area and the fire area guarded against intruders.
- (J) Detonators or explosives shall never be carried in pockets of clothing.
- (K) Detonators shall not be inserted in explosive materials which do not have a cap well without first making a hole in the cartridge with a non-sparking punch of proper size, or the appropriate pointed handle of a cap crimper.
- (L) The detonator shall be secured within the primer so that no tension is placed on the leg wires, safety fuse, shock tube, plastic tubing or detonating cord at the point of entry into the detonator.
- (M) The detonator shall be fully inserted into the primer cartridge or booster and shall not protrude from the cartridge.
- (N) Cast primers and boosters shall not be used if the hole is too small for the detonator, and attempting to enlarge the hole in a cast primer or booster shall not be permissible.
- (O) Primers are not to be prepared in a magazine or near large quantities of explosive materials.
- (P) Explosives and blasting agents shall be kept separated from detonators until the charge is placed.
- (Q) Only non-sparking metallic slitters may be used for opening fiberboard cases.
- (R) Cartridges or packages of explosives show signs of discoloration or deterioration must be carefully set aside and properly disposed of in accordance with manufacturer's recommendations.
- (S) No explosive material shall be abandoned or left in any location for any reason, nor left in such a manner that they may easily be obtained by children or other unauthorized persons. All unused explosives shall be returned to proper storage facilities.
- (T) A record of each blast shall be kept. All records including seismograph reports shall be retained at least five years and shall be available for inspection by the Division of Oil and Public Safety, and shall contain at least the following minimum data as applicable:
  - (1) Name of company or contractor,
  - (2) Name, permit number, and signature of the blaster
  - (3) Exact location or address of the blast, date and time of detonation.
  - (4) Type of material blasted;
  - (5) Number of holes, burden and spacing\*;
  - (6) Diameter and depth of holes\*;
  - (7) Types of explosives used;
  - (8) Amount and type of explosive loaded in each hole\*;
  - (9) Total amount of each explosive used;
  - (10) Maximum amount of explosives and holes detonated within 8 milliseconds\*;

- (11) Method of firing and type of circuit;
- (12) Direction, distance in feet, and identification of the nearest dwelling, house, public building, school, church, commercial or institutional building neither owned nor leased by the person or company conducting the blasting;
- (13) Weather conditions;
- (14) Type and height or length of stemming;
- (15) A statement as to whether mats or protection against flyrock were used;
- (16) Type of delay caps used and delay periods used;
- (17) The person taking the seismograph reading shall accurately indicate exact location of the seismograph if used and shall show the distance of the seismograph from the blast;
- (18) Seismograph records, where required;
  - (a) Name of person and firm analyzing the seismograph record; and
  - (b) Seismograph reading.
- (19) Sketch of blast pattern including number of holes, burden and spacing distance, delay pattern, and if decking is used, a hole profile.

not required for special Use permit operations.

## **6.2 Drilling and Loading**

- (A) Procedures that permit safe and efficient loading shall be established before loading is started.
- (B) All drill holes shall be sufficiently large to admit freely the insertion of the cartridges of explosives.
- (C) Tamping shall be done only with wood rods or with approved plastic tamping poles without exposed metal parts, but non-sparking metal connectors may be used for jointed poles. Violent tamping shall be avoided. The primer shall never be tamped.
- (D) No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives and detonators shall be immediately returned to an authorized magazine or day box.
- (E) No explosives or blasting agents shall be left unattended on a blast site.
- (F) Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be refired before work proceeds.
- (G) No person shall be allowed to deepen drill holes which have contained explosives or blasting agents.
- (H) Holes shall not be drilled where there is a danger of intersecting a loaded or misfired hole.
- (I) Machines and all tools not used for loading explosives into bore holes shall be removed from the immediate location of holes being loaded with explosives. Equipment shall not be operated within 50 feet of loaded holes except when equipment or drills are needed to add cover or mats, or to clean or redrill existing bore holes for safety purposes.

- (J) Loaded holes shall not be left unattended.
- (K) The user/blaster shall keep an accurate, up-to-date record of explosives, blasting agents, and all blasting supplies used in a blast and shall keep an accurate running inventory of all explosives and blasting agents stored on the operation.
- (L) Pneumatic loading of blasting agents into blast holes primed with electric detonators or other static-sensitive initiation systems shall conform to the following requirements:
  - (1) A positive grounding device for the equipment shall be used to prevent the accumulation of static electricity.
  - (2) A semi-conductive hose shall be used.
  - (3) A qualified person shall evaluate all systems to assure that they will adequately dissipate static under potential field conditions.
- (M) Primers shall be made up immediately prior to placing the primer in the borehole.
- (N) Dropping or pushing a primer or any explosive with a lighted fuse attached into a borehole is prohibited.

### **6.3 Electric Initiation of Blasts**

- (A) Electric blasting caps may be used for blasting operations in congested districts, or on highways, or adjacent to highways open to traffic, except where sources of extraneous electricity make such use dangerous.
- (B) Blasting cap wires shall be kept short-circuited (shunted) until they are connected into the circuit for firing.
- (C) Signs shall be posted warning against the use of mobile radio transmitters on all adjacent highways and roads.
- (D) Mobile radio transmitters which are less than 100 feet away from electric blasting caps, when the caps are in other than original containers, shall be de-energized and effectively locked.
- (E) Electric caps shall be used in compliance with the recommendations of The Institute of the Makers of Explosives (IME) with regard to blasting in the vicinity of radio transmitters as stipulated in Radio Frequency Energy--A Potential Hazard in the Use of Electric Blasting Caps, IME Publication No. 20, December 1988.
- (F) Precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, battery contact, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity.
- (G) Before adopting any system of electrical firing, the blaster shall conduct a thorough survey for extraneous currents, and all dangerous currents shall be eliminated before any holes are loaded.
- (H) In any single blast using electric blasting caps, all caps shall be of the same style or function and be of the same manufacture.
- (I) Electric blasting shall be carried out by using blasting circuits or power circuits in accordance with the electric blasting cap manufacturer's recommendations.

- (J) The firing line shall be checked with an approved testing device at the terminals before being connected to the blasting machine or other power source.
- (K) The circuit including all caps shall be tested with an approved testing device before being connected to the firing line.
- (L) When firing a circuit of electric blasting caps, care shall be exercised to ensure that an adequate quantity of delivered current is available, in accordance with the manufacturer's recommendation.
- (M) Connecting wires and lead wires shall be insulated single solid wires of sufficient current-carrying capacity, and shall not be less than twenty gauge (American wire gauge) solid core insulated wire.
- (N) Firing line or leading wires shall be solid single wires of sufficient current carrying capacity, and shall be not less than fourteen gauge (American wire gauge) solid core insulated wire. Bus wires depends on the size of the blast, fourteen gauge (American wire gauge) copper is recommended.
- (O) The ends of lead wires which are to be connected to a firing device shall be shorted by twisting them together or otherwise connecting them before they are connected to the leg wires or connecting wires, and they shall be kept in the possession of the person who is doing the loading until loading is completed and the leg wires attached. Lead wires shall not be attached to the firing device until the blaster is ready to fire the shot and must be attached by the blaster themselves.
- (P) The ends of the leg wires on electric detonators shall be shorted in a similar manner and not separated until all holes are loaded and the loader is ready to connect the leg wires to the connecting wires or lead wires.
- (Q) When firing electrically, the insulation on all firing lines shall be adequate and in good condition.
- (R) A power circuit used for firing electric blasting caps shall not be grounded.
- (S) When firing from a power circuit, the firing switch shall be locked in the open or 'off position at all times, except when firing. It shall be so designed that the firing lines to the cap circuit are automatically short-circuited when the switch is in the off position. Keys to this switch shall be entrusted only to the blaster.
- (T) Blasting machines shall be in good condition and the efficiency of the machine shall be tested periodically to make certain that it can deliver power at its rated capacity.
- (U) When firing with blasting machines, the connections shall be made as recommended by the manufacturer of the electric blasting caps used.
- (V) The number of electric blasting caps connected to a blasting machine shall not be in excess of its rated capacity. Furthermore, in primary blasting, a parallel series or circuit shall contain no more caps than the limits recommended by the manufacturer of the electric blasting caps in use.
- (W) The blaster shall be in charge of the blasting machines, and no other person shall connect the leading wires to the machine.
- (X) Blasters, when testing circuits to charged holes, shall use only blasting testers especially designed for this purpose.
- (Y) In electrical firing, only the person making leading wire connections shall fire the shot. All connections shall be made from the bore hole back to the source of firing current, and the lead line wires shall remain shorted and not be connected to the blasting machine or other source of current until the

charge is to be fired.

(Z) After firing an electric blast from a blasting machine, the leading wires shall be immediately disconnected from the machine and short-circuited.

(ZZ) When electric blasting caps have been used, workers shall not return to misfired holes for at least thirty minutes.

#### **6.4 Safety Fuse Initiation of Blasts**

(A) A fuse mat is deteriorated or damaged in any way shall not be used.

(B) The hanging of fuse on nails or other projections which will cause a sharp bend to be formed in the fuse is prohibited.

(C) Before capping safety fuse, a short length shall be cut from the end of the supply reel so as to assure a fresh cut end in each blasting cap.

(D) Only cap crimpers specifically designed for crimping caps shall be used for attaching blasting caps to safety fuse. Crimpers shall be kept in good repair and accessible for use.

(E) No unused cap or short capped fuse shall be placed in any hole to be blasted; such unused detonators shall be removed from the working place and disposed of or stored in an approved magazine.

(F) No fuse shall be capped, or primers made up, in any magazine or near any possible source of ignition.

(G) Capping of fuse and making of primers shall only be done in a place selected for this purpose and at least one hundred feet distant from any storage magazine.

(H) The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all workers concerned with blasting.

(I) New rolls of fuse shall be tested for burn rate prior to use and all partial rolls shall be tested at least every thirty days. A record of the burn rate shall be kept by the permit holder.

(J) The length of fuse shall in accordance with the manufacturers' recommendations. In no case shall the length of fuse be less than three feet and shall not have a burn time of less than 120 seconds at the time of initiation.

(K) Igniters shall be used in accordance with the manufacturers' recommendations and shall not be attached to a fuse until the charge is at the blast site and the crew is fully prepared to light the charge.

(L) At least two persons shall be present when cap and fuse blasting is done by hand lighting methods.

(M) When blasting with safety fuses, consideration shall be given to the length and burning rate of the fuse and shall be used in accordance with the manufacturers' recommendations. A sufficient time of not less than 120 seconds, with a margin of safety, shall always be provided for the blaster to reach a place of safety.

(N) Not more than 12 fuses shall be lighted by each blaster when hand lighting devices are used. However, when two or more safety fuses in a group are lighted as one by means of igniter cord, or other similar fuse-lighting devices, they may be considered as one fuse.

- (O) Cap and fuse shall not be used for firing mud cap charges unless charges are separated sufficiently to prevent one charge from dislodging other shots in the blast.
- (P) Only sufficient primers for one day's use shall be made up at one time.
- (Q) Any loose cartridges of explosives, detonators, primers and capped fuse unused at the end of the shift shall be returned to their respective and separate magazines and locked up.
- (R) Safety fuse shall not be used in blasting operations in populated areas, public areas, or on highways, or adjacent to roads open to traffic.
- (S) When the fuse lighter has been ignited, the blaster shall assume initiation of the fuse has occurred.
- (T) If the fuse does not show evidence of initiation, the blaster shall not attempt any further initiation and retreat to a safe location for at least one hour.
- (U) When safety fuse is used, workers shall not return to a misfire for at least one hour.
- (V) If explosives are suspected of burning, all persons in the endangered area shall move to a safe location and no one shall return to the area for at least one hour after signs of burning have ceased.

#### **6.5 Non-electric Initiation of Blasts**

- (A) Blaster's shall be familiar with and follow the manufacturer's warnings and instructions, especially hook-up and safety precautions.
- (B) Operations shall be discontinued during the approach and progress of electrical storms.
- (C) Non-electric leads shall not be held during firing.
- (D) Primary initiators shall not be attached to the round or shot until after all the connections have been made and the blasting area has been cleared.
- (E) Non-electric delay detonators shall not be loaded into a hot hole or exposed to temperatures above 150°F unless specifically designed and approved by the manufacturer for higher temperatures.
- (F) Non-electric delay connectors shall not be exposed to excessive impact or friction.
- (G) Delay caps shall not be disassembled from the plastic connector block, nor shall the delay caps be used without the block.
- (H) Shock tube connections shall be at right angles to detonating cord.
- (I) Connections with other initiation devices shall be secured in a manner which provides for uninterrupted propagation.
- (J) Factory made units shall be used as assembled and shall not be cut except that a single splice is permitted on the lead-in trunkline during dry conditions.
- (K) No tool shall be used to pry on any component containing a detonator, nor shall any tool be used to open, fasten or clean out any connector containing a detonating device.
- (L) Care shall be taken to ensure that a vehicle is not driven over the tubing, connectors, or any surface delay component.

- (M) In multiple row blasts, the initiation system shall not be connected from row to row until all drilling and loading has been completed. In single row blasts, the components shall not be connected from hole to hole until all drilling and loading has been completed.
- (N) A safety line consisting of trunkline or other non-electric tubing shall be connected to the last hole in each row and shall extend beyond the area of cover in a covered or matted blast and shall be used to check for complete detonation of each row.
- (O) Before firing the shot, the blaster shall visually inspect all connections in the initiation system are made in accordance with the manufacturer's recommendations.

## **6.6 Use of Detonating Cord**

- (A) Care shall be taken to select a detonating cord consistent with the type and physical condition of the bore hole and stemming and the type of explosives used.
- (B) Detonating cord shall be handled and used with the same respect and care given other explosives.
- (C) If using a detonating type cord for blasting the double-trunk line or loop systems shall be used.
- (D) In multiple-row blasts, the trunk line lay-out shall be designed so that the detonation can reach each blast hole from at least two directions.
- (E) All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunk lines.
- (F) The line of detonating cord extending out of a bore hole or from a charge shall be cut from the supply spool before loading the remainder of the bore hole or placing additional charges.
- (G) Detonating cord shall be handled and used with care to avoid damaging or severing the cord during and after loading and hooking-up.
- (H) Detonating cord connections shall be made in accordance with the manufacturer's recommended methods. Knot-type or other cord-to-cord connections shall be made only with detonating cord in which the explosive core is dry.
- (I) Detonating cord shall be cut with a sharp knife, razor blade, or cutters designed for use with detonating cord. Scissors or plier type cutters shall not be used.
- (J) All detonating cord trunk lines and branch lines shall be free of loops, sharp kinks, or angles that direct the cord back toward the oncoming line of detonation.
- (K) All detonating cord connections shall be inspected before firing the blast.
- (L) When detonating cord millisecond-delay connectors or short-interval-delay electric blasting caps are used with detonating cord, the practice shall conform strictly to the manufacturer's recommendations.
- (M) When connecting a blasting cap or an electric blasting cap to detonating cord, the cap shall be taped or otherwise attached securely along the side or the end of the detonating cord, with the end of the cap containing the explosive charge pointed in the direction in which the detonation is to proceed.
- (N) When initiating detonating cord with cap and fuse, two fuse caps shall be required.



- (O) Detonators for firing the trunk line shall not be brought to the loading area nor attached to the detonating cord until the area has been cleared for the blast.

### **6.7 Firing the Blast**

- (A) It shall be the duty of the blaster to fix the time of blasting. The blaster shall conduct all blasting operations and no shot shall be fired without the blaster's approval.
- (B) All blasting in congested areas or in close proximity to a structure, railway, or highway or any other installation shall be covered with blasting mats or other protective material before firing, where the blasting may cause injury or damage by flying rock.
- (C) All persons within the blasting area shall be notified of the time of the blast, and moved to a safe distance or under sufficient cover. Guards shall be posted to prevent entry into the blast area.
- (D) All surplus explosives shall be removed to a safe location before blasting.
- (E) Flaggers shall be safely posted on highways which pass through the danger zone so as to stop traffic during blasting operations.
- (F) Guards shall be posted around the perimeter of the blasting area to prevent unauthorized entry into the blast area. Either visual or verbal communication must be possible between guards.
- (G) Before the blast is fired, a loud warning signal shall be given by the blaster in charge.
- (H) An inspection of the blast area to determine if all charges have detonated shall be done by the blaster before guards and flaggers are cleared by the blaster to leave their posts,

### **6.8 Misfires**

- (A) The blaster shall provide proper safeguards for excluding all unauthorized persons from the danger zone if a misfire is found.
- (B) No other work shall be done except that necessary to remove the hazard of the misfire and only those employees necessary to do the work shall remain in the danger zone.
- (C) Explosives shall not be extracted from a hole that has misfired unless it is impossible or hazardous to detonate any unexploded explosive materials by insertion of an additional primer.
- (D) If there are any misfires while using cap and fuse, all employees shall remain away from the charge for at least one hour. Misfires shall be handled under the direction of the person in charge of the blasting. All wires shall be carefully traced and a search made for the unexploded charges.
- (E) When electric blasting caps have been used, workers shall not return to the blast area for at least thirty minutes. All wires shall be carefully traced and a search made for unexploded charges.
- (F) When a completely non-electric initiation system, other than safety fuse, has been used, all employees shall remain away from the blast area for at least 15 minutes. All shock tubes shall be traced and a search made for unexploded charges.
- (G) If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location and no one shall return to the hole for at least one hour after evidence of combustion ceases.
- (H) No drilling, digging, or picking shall be permitted until all missed holes have been detonated or the

blaster in charge has approved that work can proceed.

- (l) Explosive materials recovered from misfires shall not be reused and shall be disposed of in the manner recommended by the manufacturer.

### **Blasting Vibration and Air-over Pressure Standards**

(A) In all blasting operations, blasters shall use one of the following methods to control the intensity of motion in the ground at the nearest dwelling, house, school, church, commercial or occupied building. These limits do not apply to property owned, leased, or contracted by the blaster's company or property on which the owner provides a voluntary written waiver from these restrictions.

- (1) Option 1 (Maximum allowable peak particle velocity)-the intensity of the ground motion, measured with a commercial seismograph, meeting the following standards shall not exceed the limits specified in MAPV column of Table 6.2 A.
  - (a) Monitoring instruments shall have a flat frequency response between 2 and 250Hz for particle velocity.
  - (b) The digitizing sampling rate for peak particle measurements shall be at least 1,024 samples per second.
  - (c) Seismographs shall be capable of performing a self-test of velocity transducers and printed event records shall indicate whether or not the sensor test was successful.
  - (d) Monitoring instruments shall be capable of recording particle velocities with intensities ranging from 0.02 to 5.0 inches per second.
  - (e) Monitoring systems shall be calibrated by a service center approved by the manufacturer within at least two years of the time of use. Certificates documenting date of calibration, issued by the approved service center, shall be kept by the user.
  - (f) Monitoring systems shall be capable of printing hard-copy reports showing the date and time of monitoring, the maximum peak particle velocity measurements, and plotted ppv-time waveform plots.
- (2) Option 2—(Scaled Distance)—when seismic monitoring is not performed, the maximum weight of the explosive detonating within any 8-millisecond time period shall not exceed the amount allowed by a calculation using the scaled distance factors given in Scaled Distance column of Table 6.2A.
  - (a) The following equation shall be applied when utilizing the scaled distance calculations to control blast-induced vibration.

$$W = \left( \frac{D}{Ds} \right)^2$$

Where:  $D_s$  = Scaled Distance (Mb 0.5)  $D$  = Distance from the seismograph to the nearest structure (ft)  
 $W$  = Weight of explosive detonated within any 8 millisecond window

Example: Maximum Charge Weight ( $W$ ) per Delay Calculation

Given: Scaled Distance ( $D_s$ ) = 55 Distance ( $D$ ) is 500 ft.

Maximum Charge per Delay ( $W$ ) =  $(500/55)^2 = 82.6$  lb

<b>DISTANCE FROM BLAST (FT.)</b>	<b>OPTION 1 MAPV (MAXIMUM ALLOWABLE PARTICLE VELOCITY) MEASURED AS INCHES/SECOND IN VERTICAL, TRANSVERSE, OR LONGITUDINAL DIRECTIONS.</b>	<b>OPTION 2 CALED DISTANCE FACTOR UNITS ARE FT-LB 0.5</b>
0 TO 300	2.00	50
301 to 5000	1.55	55
5001 and GREATER	1.00	65

(3) Over pressure (air blast) Limitation. Air-over pressure at the nearest dwelling house, school, church, or otherwise occupied buildings shall not exceed 133 dB (0.0129 psi). Measuring air-over pressure is not required for all blasting operations. However, due to complaints or other circumstances, the Colorado Division of Oil and Public Safety may require blasters to monitor air-over pressure. All instruments used to measure air-over pressure compliance shall:

- (a) Employ linear microphones with a flat frequency response between 2 and 200 hertz.
- (b) Have a digital sampling rate of at least 1024 samples per second.
- (c) Be capable of measuring air-over pressure from 120 to 140 dB-Linear (0.0029 to 0.029 psi).

## **CHAPTER VII AVALANCHE CONTROL**

### **7.1 General Requirements**

- (A) The use of explosives and blasting agents for avalanche control shall comply with this chapter unless explosives are used in compliance with Chapter VI.
- (B) The requirements of this chapter shall only be applicable to the use of explosives for avalanche control. The use of explosives for other purposes such as, but not limited to, demolition, site clearing, or construction shall be in compliance with Chapter VI.
- (C) Explosives and blasting agents shall not be stored, kept, assembled, combined to form armed charges, or had in any inhabited areas, structures, or buildings except in compliance with this chapter or Chapter IV.

- (D) Only blasters shall supervise the assembly, the arming of explosive components, and the detonation of explosive charges.
- (E) Each avalanche control blasting crew or team shall consist of a blaster and at least one trained assistant. The crew may consist of two blasters, but only one shall act as the blaster in charge.
- (F) Untrained personnel may accompany the blasting crew for training purposes but shall not participate in actual firing of charges until completion of training'.
- (G) The blaster in charge of each crew or team shall be responsible for all decisions made regarding preparation and placement of charges.
- (H) Blasting operations shall be conducted during periods of daylight with personnel guarding the area, or when the area has been closed. Nighttime blasting operations shall be approved by the Director of the Division of Oil and Public Safety, and approval shall only be granted if such approval serves the safety of the general public.
- (I) The blaster in charge shall preplan the escape route and all crew members shall understand the plan before igniting the charge.
- (J) No person shall accept or be given a job assignment which is beyond the individual's ability, training, or qualifications.
- (K) Cold temperatures, high winds, and heavy snowfall are conditions that should be anticipated in avalanche control blasting. These conditions shall be considered in determining a person's physical ability, training, and qualifications for conducting safe blasting operations, and in the management of safe blasting operations.

## **7.2 Training Requirements**

- (A) Type II Avalanche permit applicants shall submit a training program for personnel involved in the use, storage and transportation of explosives to the Division of Oil and Public Safety. The Division of Oil and Public Safety shall approve the training program prior to issuance of the permit.
- (B) The training program shall include at least the following:
  - (1) Requirements for the blaster in training shall be:
    - (a) A minimum of eight (8) hours classroom education and written examination to include the following:
      - (1) Explosives Regulations of The Colorado Division of Oil and Public Safety;
      - (2) Explosives Regulations of The Colorado Division of Oil and Public Safety and Federal requirements for the storage of explosives and magazine locations, inventory procedures, and magazine access;
      - (3) Safety procedures for explosives and blasting agents used within the company, including the properties and classification of each type of explosive, and consequences of the unsafe use of explosives;
      - (4) Explosives Regulations of The Colorado Division of Oil and Public Safety for preparing, handling, and using hand charges to include:
        - (a) Hand charge assembly procedures for both field arming and makeup

room arming;

- (b) Crimping procedures;
- (c) Transportation to blast site by skiing or aerial tramways for both field armed charges and make-up room armed charges;
- (d) Use of igniters, and determining successful ignition of fuse;
- (e) Misfire procedures;
- (f) Procedures for clearing and guarding the blasting area; and
- (g) Deployment of ignited hand charges.

(5) Hazard training for cornice control operations;

(6) Hazard training for avalauncher operations; and

(7) Record keeping procedures including:

- (a) Records of transactions;
- (b) Explosive inventory record keeping;
- (c) Explosive use and route log record keeping; and
- (d) Misfire documentation.

(b) Simulated Field Training for Hand Charges

(1) During weather conditions typical to avalanche control and under the supervision of a blaster, the trainee shall:

- (a) Attend demonstration with simulated components;
- (b) Attach igniters to uncapped fuse and successfully ignite fuse not less than five (5) times;
- (c) Attach igniters to uncapped fuse and twice simulate an unsuccessful attempt to light the fuse and follow the procedures for a misfire;
- (d) Attach igniters to capped fuse and successfully ignite and deploy the cap and fuse assembly not less than five (5) times;
- (e) Assemble cap and fuse, attach igniters to capped fuse, and successfully ignite and deploy the cap and fuse assembly not less than five (5) times.

(c) Field Experience Training for Hand Charges

(1) Under the supervision of a Blaster, the trainee shall:

- (a) Accompany a blasting crew on five (5) routes or the deployment of not less than twenty (20) charges as an observer;

- (b) Accompany a Blaster, as an assistant only, for the ignition and deployment of not less than twenty (20) charges; and
- (c) Accompany a Blaster and ignite and deploy not less than twenty (20) charges under the direct supervision of the blaster.

(d) Avalauncher Operator ,

(1) Trainee shall complete eight (8) hours classroom and field training before becoming an avalauncher operator. This training shall include:

- (a) Operating instructions for each type of avalauncher used;
- (b) Procedures on performing preventive maintenance inspections;
- (c) Procedures on assembly of charges
- (d) Procedures for checking the elevation, aiming, and pressure settings of the avalauncher;
- (e) Procedures for test firing the avalauncher;
- (f) Procedures for loading charges in the avalauncher;
- (g) Procedures for clearing and guarding the target area;
- (h) Emergency procedures; and
- (i) Requirements for securing the equipment.

(2) Qualifications for avalauncher operator shall be:

- (a) one year experience as a blaster in charge;
- (b) must have assisted on the avalauncher crew not less than five (5) times; and
- (c) must load and fire the avalauncher under the supervision of a qualified operator not less than ten (10)times.

(2) Requirements for Annual Refresher Training

(a) All blaster's shall attend a minimum of four (4) hours of refresher training at the beginning of each season.

(1) Classroom training shall include: ●

- (a) Review of operation techniques such as throwing techniques, air blasting, dangling charges, cornice blasting, avalauncher procedures;
- (b) Review of assembly and transportation procedures; and
- (c) Review of snow safety program.

(2) Field training shall include:

- (a) Review of initiation techniques;
- (b) Review of misfire procedures; and
- (c) A walk through of storage and make-up facilities.

(b) Annual refresher training may count towards the sixteen (16) hour requirement of Section 3.6 of these rules when the refresher training program is specifically approved by the Division of Oil and Public Safety.

### **7.3 Use of Explosives**

#### **(A) General provisions.**

- (1) While explosives are being handled or used, smoking, matches, or any other source of fire or flame shall not be within 50 feet of the blast site.
- (2) No person shall handle explosives while under the influence of intoxicating liquors, narcotics, or other controlled substances. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not influence the blaster's ability to conduct safe blasting operations.
- (3) Blasters conduct blasting operations shall take every reasonable precaution, including but not limited to warning signals, flags and barricades to insure the safety of the general public and workers.
- (4) The blaster shall suspend all blasting operations and remove all persons from the blast site during the approach and progress of an electrical storm.
- (5) No fire shall be fought where the fire is in imminent danger of contact with explosives. All employees shall be removed to a safe area and the fire area guarded against intruders.

#### **(B) Explosives**

- (1) Explosives shall have a shelf life of at least one operating season in the storage facilities in which they will be stored.
- (2) Blasting caps must be at least a No. 6 cap and no larger than a No. 8 cap except when recommended by the explosives manufacturer for a particular explosive used within a specific application.
- (3) Detonating cord used for initiating primers must be at least a 25-grain cord.
- (4) Explosives chosen must have an excellent water resistance and capable of detonation in cold temperatures.
- (5) Explosives that are damaged, show signs of deterioration, or have misfired shall not be used.
- (6) Detonators or explosives shall never be carried in pockets of clothing.
- (7) Should cartridges or packages of explosives show signs of discoloration or deterioration, such explosives must be carefully set aside and properly disposed of according to the manufacturer's recommendations.
- (8) Only non-sparking metallic slitters may be used for opening fiberboard cases.

- (9) No explosive material shall be abandoned or left in any location for any reason, nor left in such a manner that they may easily be obtained by children or other unauthorized persons. All unused explosives shall be returned to proper storage facilities.
- (10) A record of each blast shall be kept. All records shall be retained at least five years and shall be available for inspection by the Division of Oil and Public Safety, and shall contain at least the following minimum data:
- (a) Name of company or contractor;
  - (b) Date, time and location of route;
  - (c) Name, permit number and signature of blaster-in-charge of the route;
  - (d) Number of charges used on each route;
  - (e) Names of employees on each route;
  - (f) Types of explosives used;
  - (g) Total amount of each explosive used;
  - (h) Method of initiation;
  - (i) Type of Blasting (hand charge, cornice control, avalauncher);
  - (j) Weather conditions; and
  - (k) Statement noting any misfires, the location of misfires, steps taken to recover or refire any misfires, the date the misfire was found and disposed of.

#### (C) Hand Charges

##### (1) Safety Fuse

- (a) A fuse that is deteriorated or damaged in any way shall not be used.
- (b) The hanging of fuse on nails or other projections which will cause a sharp bend to be formed in the fuse is prohibited.
- (c) Pre-manufactured cap and fuse assemblies shall be used in accordance with manufacturer's requirements.
- (d) Before capping safety fuse, a minimum of one inch shall be cut from the end of the supply reel so as to assure a fresh cut end in each blasting cap.
- (e) The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all workers concerned with blasting.
- (f) New rolls of fuse shall be tested for burn rate prior to use and all partial rolls shall be tested at least every thirty days. A record of the burn rate shall be kept by the permit holder.
- (g) Only a bench or hand held cap crimpers of approved design shall be used for



attaching blasting caps to safety fuse. Crimpers shall be kept in good repair and accessible for use.

- (h) No fuse shall be capped, or primers made up, in any magazine or near any possible source of ignition.
- (i) Capping of fuse and pre-arming of charges shall only be done in a warm, dry, well-lighted make-up room that is located in accordance with the American Table of Distance from any permanent storage magazine.
- (j) Any loose cartridges of explosives, detonators, and capped fuse unused at the end of the shift shall be returned to their respective and separate magazines and locked up.
- (k) Caps, cap and fuse assemblies, armed charges, or fuse igniters shall not be carried into nor stored in any magazine containing high explosives.
- (l) In making up primers only non-sparking skewers shall be used for punching the hole in the cartridge to insert the capped fuse. No blasting cap shall be inserted in the explosives without first making a hole in the cartridge of proper size or using a standard cap crimper.

## (2) Arming of Charges With Detonators

- (a) Cast primers and boosters shall not be used if the hole is too small for the detonator, and attempting to enlarge the hole in a cast primer or booster shall not be permissible.
- (b) The detonator shall be secured within the primer so that no tension is placed on the safety fuse at the point of entry into the detonator.
- (c) The detonator shall be fully inserted into the primer cartridge or booster and shall not protrude from the cartridge.
- (d) After the cap and fuse assembly is inserted, the explosive contains a sensitive cap and is then vulnerable to premature detonation, therefore delaying the arming of a charge until just before tossing the charge should be standard procedure when wind and/or temperatures are not severe.
- (e) When arming the charge at the blast site the blaster shall:
  - (1) Insure that the cap is installed on the correct length of fuse prior to transporting to blast sites;
  - (2) Place caps in adequate protective padding or shields before placing in approved avalanche control packs;
  - (3) Place caps and explosives in separate approved avalanche control packs while transporting to the blast site;
  - (4) Fuse igniters shall not be placed inside the pack when it contains explosives or caps, but shall be carried in a separate pack;
  - (5) Insure that the detonator is secured to the charge before attaching fuse igniter.

- (f) Depending on weather condition the charges may be armed in a make-up room as follows:
- (1) All caps shall be installed on the required length of fuse before the explosive cartridges or primers are brought to the make-up area;
  - (2) Cap and fuse assemblies shall be secured correctly to each type of explosive charge being used;
  - (3) Cap and fuse assemblies shall not be attached to explosive charges until just before the time of distribution to patrol personnel;
  - (4) Each hand charge shall be placed in an area separate from the assembly area immediately after assembly completed; and
  - (5) Distribution of hand charges into approved control packs shall take place away from the assembly area.

(3) Initiation of Hand Charges

- (a) The length of fuse shall be in accordance with manufacturer's recommendations, and shall be three feet in length or have a burn time of not less 120 seconds at the time of initiation.
- (b) Igniters shall be used in accordance with manufacture's recommendations and shall not be attached to a fuse until the charge is at the blast site and the crew is fully prepared to light the charge.
- (c) At least two persons shall be present when cap and fuse blasting is done by hand lighting methods.
- (d) When blasting with safety fuses, consideration shall be given to the length and burning rate of the fuse and shall be used in accordance with manufacturer's recommendations. A sufficient time of not less than 120 seconds, with a margin of safety, shall always be provided for the blaster to reach a place of safety.
- (e) When the fuse lighter has been ignited, the blaster shall assume initiation of the fuse has occurred.
- (f) If the fuse does not show evidence of initiation, the blaster shall not attempt any further initiation of the charge but adequately mark the charge, and retreat with the blasting crew to a safe distance for not less than one hour.
- (g) After waiting at least one hour, the blaster shall:
  - (1) Determine that initiation failed and ignite the uninitiated charge; or
  - (2) Determine that the initiation was successful and dispose of the misfired explosive charge with a secondary charge.

(4) Use of detonating cord.

- (a) Detonating cord shall be handled and used with the same respect and care given other explosives.

- (b) All detonating cord knots shall be tight and all connections shall be kept at right angles.
- (c) Detonating cord shall be handled and used with care to avoid damaging or severing the cord.
- (d) Detonating cord connections shall be made in accordance with approved and recommended methods. Knot-type or other cord-to-cord connections shall be made only with detonating cord in which the explosive core is dry.
- (e) Detonating cord shall be cut with a sharp knife, razor blade, or cutters designed for use with detonating cord. Scissors or plier type cutters shall not be used.
- (f) All detonating cord connections shall be inspected before firing the blast.
- (g) When connecting a blasting cap to detonating cord, the cap shall be taped or otherwise attached securely along the side of the end of the detonating cord with the end of the cap containing the explosive charge pointed in the direction in which the detonation is to proceed.
- (h) Two fuse caps shall be required for the initiation of detonating cord with cap and fuse.
- (i) Detonators shall not be attached to the detonating cord until the area has been cleared for the blast.

(5) Avalanche Control Packs

- (a) Control packs shall be constructed of material that is water resistant, non-sparking and nonconductive.
- (b) Control packs shall have sufficient individual compartments to separate hand charges or explosive components from tools or other equipment or supplies which may be carried in the pack.
- (c) Tools or other equipment shall not be placed in compartments containing explosives.
- (d) Each compartment used for hand charges or explosive components shall have and independent means of closure.
- (e) Control packs shall be inspected daily for holes, faulty compartments or closures, and explosive residue. Packs shall not be used until adequately repaired or cleaned.
- (f) Control packs shall not be left unattended, or used for storing explosives. All explosive material shall be returned to the approved storage facility at the end of individual control routes.
- (g) Individual control team members shall not carry more than thirty-five pounds of explosive material in avalanche control packs.

(D) Avalauncher and Launcher

- (1) All personnel assigned to work on an avalauncher crew shall be trained in the following:
  - (a) All operating instructions;

- (a) Safety precautions;
  - (c) Emergency procedures; and
  - (d) Securing requirements for equipment.
- (2) All equipment shall be in good working condition and maintained as recommended by the manufacturer.
- (3) The components of projectile assemblies shall not be interchanged, and shall be assembled and used in accordance with manufacturers instructions.
- (4) All projectiles shall be inspected before transporting to the firing location. Such inspection shall include:
  - (a) Cast explosives for cracks, dents, fractures, and smooth nose surface;
  - (b) Cap wells should be clear of obstructions and debris, and centered and straight for proper alignment of the cap; and
  - (c) Fin assembly should be inspected for properly functioning components and safety items, including pressures plate, pressure plate arming wire, bore rider pin, safety pin, magnet, and firing pin.
- (5) Defective projectiles shall not be used and shall be disposed of or returned to the manufacturer.
- (6) Safety devices or components shall not be removed.
- (7) If explosives are not at least 50 feet from the Avalauncher/Launcher during firing procedures, they shall be kept in a closed Type 3 magazine.
- (8) The transport safety pin shall not be removed until just prior to inserting the projectile into the barrel.
- (9) Avalaunchers/Launchers must be fired with compressed nitrogen gas only.
- (10) Avalauncher/Launcher shall be connected to the compressed nitrogen source through a satisfactory pressure regulator.
- (11) Regulator shall be set to limit the launch pressure to the maximum recommended by the manufacturer.
- (12) The first round fired in a control mission shall be a test fire to test the proper functioning of the launcher without a projectile.
- (13) The blaster in charge, one trained assistant, and one blaster in training shall be the only personnel within 100 feet of the avalauncher/launcher during loading and firing.

(E) Misfires

- (1) An explosive charge or any part of an explosive charge that fails to detonate after initiation shall be considered a misfire.
- (2) If a misfire occurs, the blaster shall note the location of the misfired explosive, and shall not

approach the misfired explosive for at least one hour.

- (3) Explosives which are aflame or emitting smoke shall not be approached for at least one hour after evidence of combustion ceases.
- (4) The area shall remain guarded, or closed until a search of the area has been done and the misfire hazard is removed, or the blaster-in-charge pronounces the area safe.
- (5) Misfires shall be handled by the blaster-in-charge and only those employees necessary to remove the hazard and guard the area shall remain in the area.
- (6) A misfired armed charge shall be disposed of where it is found with a secondary charge.

#### **7.4 Makeup Room Requirements**

##### **(A) Location of Makeup Rooms**

- (1) Makeup rooms shall be located in accordance with the Table of Distance for the Storage of Explosives, and the quantity of explosives used to determine the distance shall be the maximum amount that will be allowed in the makeup room at any one time.
- (2) Makeup rooms shall not be located in buildings or structures that are at any time open to the public.

##### **(B) Construction of Makeup Rooms**

- (1) Interior of the makeup room shall be finished and equipped to the following minimum requirements:
  - (a) Walls shall be constructed of or covered with a non-sparking material. Nails or screws shall be countersunk, blind nailed, or covered;
  - (b) Floors shall be constructed of, or covered with, a non-sparking material;
  - (c) The building and makeup room shall be well ventilated, and the ventilation system shall discharge to the outside from the makeup room;
  - (d) The makeup table shall be constructed of non-sparking, nonconductive material; and
  - (e) The makeup table shall be located away from the area where explosives are kept before and after assembly.
- (2) The building in which the makeup room is located shall be theft-resistant and secured by at least one steel padlock having at least five tumblers and a case hardened shackle at least 3/8 inch in diameter. The door shall have hinges and hasps attached so that they cannot be removed from the outside when in the closed position with the lock in place.

##### **(C) Makeup Room Restrictions**

- (1) Heating units shall be explosion proof, dust-proof and not depend on a combustion process when properly designed and located. National Electric Code rated explosion proof and dust-proof heating units may be located inside make-up rooms.
- (2) Lighting fixtures shall be National Electric Code explosion-proof rated fixtures and all wiring shall be in sealed conduit.

- (3) Electric control switches shall be located outside the makeup room.
- (4) Electrical outlet boxes are not permissible inside the makeup room.
- (5) Smoking, matches, open flames, or flame of spark producing devices shall not be permitted inside the makeup room.
- (6) Flammable liquids or flammable compressed gases shall not be stored or had in the makeup room.
- (7) Occupancy of makeup room shall be restricted to authorized and trained personnel when explosives are present.
- (8) A makeup room shall not be used for the unattended storage of armed charges.
- (9) Explosives stored inside the makeup room must be stored in at least a Type II storage magazine suitable for indoor storage.

(D) Makeup Room House keeping

- (1) The makeup room shall be kept clean and orderly.
- (2) Metal tools shall not be used or stored in the makeup room.
- (3) Brooms used in the makeup room shall be made of non-sparking materials.
- (4) Sweepings and empty explosive containers shall be disposed of as recommended by the manufacturer.
- (5) The makeup room shall be cleaned all explosives removed before any repairs are made to the makeup room.
- (6) The makeup table or bench shall be cleaned regularly and shall be kept free of any materials or tools not used in the assembly of the charges.

## 7.5 Transportation

- (A) Transportation of explosives, blasting agents, and blasting supplies on public highways, railways, and airways shall be in accordance with the provisions of title 42 article 20 Colorado Revised Statutes and any regulations promulgated pursuant thereto; and Title 49 CFR Parts 171-179, and Parts 390-397, Motor Carriers.
- (B) Requirements for the transportation of explosives, blasting agents and blasting supplies by motorized vehicles on job sites shall be:
  - (1) No person shall smoke, or carry matches or any other flame producing device, or carry firearms or loaded cartridges while in or near a motor vehicle transporting explosives;
  - (2) No person shall drive, load, or unload a vehicle transporting explosives in a careless or reckless manner;
  - (3) Vehicles transporting explosives, blasting agents or blasting supplies shall not be taken inside a garage or shop for repairs or servicing;
  - (4) Vehicles used for transporting explosives shall be equipped to carry the load without difficulty,

and shall be in good mechanical condition;

- (5) A motor vehicle used for transporting explosives shall be inspected prior to loading to determine that it is in proper condition for the safe transportation of explosives;
  - (6) All cargo areas of vehicles used for transporting explosives shall have tight floors and any exposed spark-producing metal on the inside of the cargo area shall be covered with wood or other non-sparking materials to prevent contact with packages of explosives;
  - (7) Packages of explosives or blasting agents shall not be loaded above the sides of an open-body vehicle;
  - (8) Explosives shall not be transported with other materials or cargoes in the same compartment. In no case shall flammable materials be carried on the same vehicle as explosives;
  - (9) A motorized vehicle which contains explosives or detonators shall not be parked under any of the following circumstances:
    - (a) On or within 5 feet of the traveled portion of a public street or highway;
    - (b) On private property; and
    - (c) Within 300 feet of a bridge, tunnel, building, or place where people work, assemble, or congregate.
  - (10) A motorized vehicle transporting explosives, detonators, or blasting agents shall not be left unattended.
  - (11) A motorized vehicle shall be deemed attended only when the driver or other attendant is physically on or in the vehicle or conveyance, or has the vehicle within the driver's or attendant's field of vision and can reach the vehicle or conveyance quickly and without any kind of interference; attended also means the driver or attendant is awake, alert, and not engaged in any other duties or activities which may divert their attention from the vehicle.
  - (12) Blasting caps may not be transported in the same vehicle with other explosives unless:
    - (a) The detonators and explosives are placed in separate Type 2 magazines secured within the body of the vehicle;
    - (b) The detonators and explosives are separated by 4 inches of hardwood, and the detonators are totally enclosed or confined by the hardwood construction;
    - (c) The detonators and explosives are placed in separate suitable containers or compartments constructed in accordance with the Institute of Makers of Explosives Safety Library Publication No. 22 entitled "ME Standard for the Safe Transportation of Blasting Caps In A Vehicle with Other Explosives".
- (C) Requirements for the transportation of explosives on passenger tramways when the public is present shall be;
- (1) Explosives shall not be transported in the same enclosed passenger tramway carrier with the public.
  - (2) Transportation of explosives on non-enclosed passenger tramways shall require the

following;

- (a) Explosives shall be attended at all times.
- (b) Warning signs indicating that explosives are currently being transported on the tramway and passengers may ride the tramway at their own discretion shall be clearly posted at the tramway entrance;
- (C) Explosive warning placards indicating the classification of explosives shall be placed on the back of the tramway carrier transporting the explosives;
- (d) Passengers shall not be allowed to ride the passenger tramway in the opposing direction of the explosives.
- (e) A minimum distance of two hundred 200 feet shall be maintained in front of and behind the chair transporting explosives and chairs transporting the public.
- (f) The amount of explosives being transported shall not exceed twenty (20) pounds.
- (g) Nothing in regulation 7.5 (C) (2) is intended to limit liabilities as set forth in the Colorado Ski Safety Act (CRS 33-44-101 thru 114). B.

## **CHAPTER VIII GEOPHYSICAL OPERATIONS**

- (A) Seismic Blasting shall conform to the requirements of Chapters IV, V, and VI of these rules for the storage and transportation of all explosive materials, for the preparation of charges, for the loading of charges, and the detonation of charges.
- (B) Surface charges, above surface charges, and armed charges loaded in seismic drill holes less than 20 feet in depth shall not be left unattended.
- (C) Charges which have not been armed may be left unattended in holes less than 20 feet provided that:
  - (1) The hole has been loaded so that the charge has been anchored and cannot be removed and low energy detonating lines have been made inaccessible and capped with a hole plug;
  - (2) The charge does not exceed an amount that would cause damage to persons or property on the surface if accidentally detonated; and
  - (3) The backfill material in the loaded hole is a continuous column from the charge to the collar of the drill hole. Any drill holes in which the backfill material has bridged and the hole has not been fully backfilled shall not be left unattended.
- (D) Armed or unarmed charges loaded in seismic drill holes greater than 20 feet deep may be left unattended provided that:
  - (1) The hole has been loaded so that the charge has been anchored and cannot be removed and low energy detonating lines have been made inaccessible and capped with a hole plug;
  - (2) The charge does not exceed an amount that would cause damage to persons or property on the surface if accidentally detonated; and
  - (3) The backfill material in the loaded hole is a continuous column from the charge to the collar of the drill hole. Any drill holes in which the backfill material has bridged and the hole has not been fully backfilled shall not be left unattended.



(E) Armed and unarmed charges that are loaded in inhabited areas shall not be left unattended.

(F) Blasting signs shall be posted on roads and trails leading to the blast site.

## **CHAPTER IX BLACK POWDER EXPLOSIVES**

### **9.1 Black Powder**

(A) Black powder shall be stored in shipping containers as required by regulations of the U.S. Department of Transportation, 49 CFR, Section 173.60 as currently published. A copy of this Code is on file and can be viewed by contacting the Division of Oil and Public Safety, Public Safety Office, 1515 Arapahoe Street, Tower 3, Suite 660, Denver, CO 80202.

(B) Black powder intended for personal use shall be sold and stored according to the Uniform Fire Code (sections 77.202, 77.203, and 77.203a). A copy of this code can be viewed by contacting the Public Safety Office.