Explosive Laws & Regulations

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Colorado School of Mines

General Terms (cont.)

- 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.**
- Bullet Resistant: **Magazine wall or doors of construction resistant to penetration of a bullet of 150-grain 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.**
- Initiation System: **Combination of explosive devices and accessories (detonators, wire, cord, etc.) designed to convey a signal and initiate an explosive charge.**
- 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.**
- Permanent Storage Magazine**: Type 1 magazines or Type 2, Type 4, or Type 5 magazines that have been at the same location for longer than ninety (90) days.**
- 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.**
- Responsible Person: **A Type I permitted individual who is directly responsible for a Type II permittee's compliance with the provisions of the explosives act, 9-7-101 to 111, CRS, and any rules and regulations promulgated there under.**

General Terms

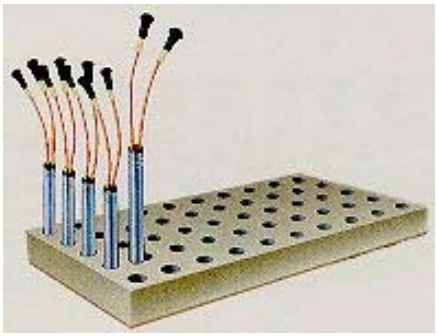
- American Table of Distances: **A quantity-distance table prepared and approved by the Institute of the Makers of Explosives, for the storage of explosive materials to determine the safe distances from inhabited buildings, public highways, passenger railways, and other stored explosive materials. See section 4.6 of these regulations.**
- 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.**
- Binary (two-component) explosive**: A blasting explosive formed by the mixing or combining of two plosophoric 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.**
- 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, Firearms, and Explosives Regulation).**
- 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 explosive charges, loaded boreholes or boreholes to be loaded**

Definitions

Explosives

Explosive Materials

Possession



Explosive*

Explosive: **Any chemical compound, mixture or device, the primary or common purpose of which is function of 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.**

*Federal Bureau of Alcohol, Tobacco, Firearms and Explosives

Explosive Materials

Federal Bureau of Alcohol, Tobacco, Firearms and Explosives

- ***Explosive Materials:*** **explosives, blasting agents,water gels and detonators. Explosive materials include, but not limited to all items in the " *List of Explosive Materials*" provided for sec. 55.23**

Explosive Materials

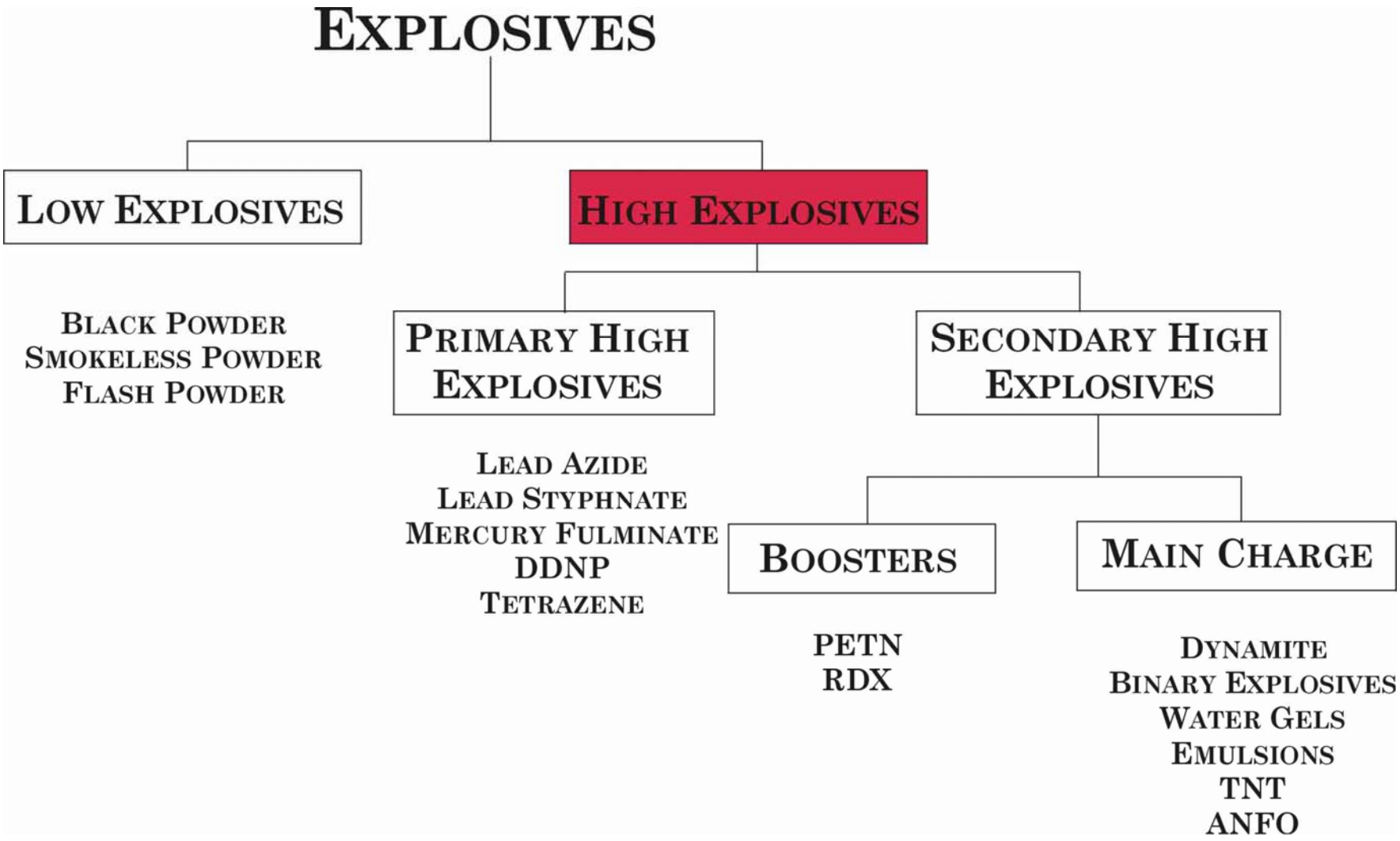
State of Colorado Division of Oil and Public Safety

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

Classifications of Explosives

- High Explosives
- Low Explosives
- Blasting Agents

- US DOT Transportation Classifications

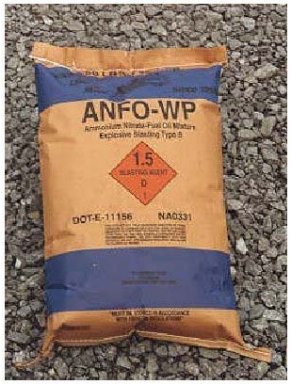

EXPLOSIVES
LOW EXPLOSIVES
HIGH EXPLOSIVES
BLACK POWDER
SMOKELESS POWDER
FLASH POWDER
PRIMARY HIGH EXPLOSIVES
SECONDARY HIGH EXPLOSIVES
LEAD AZIDE
LEAD STYPHNATE
MERCURY FULMINATE
DDNP
TETRAZENE
BOOSTERS
MAIN CHARGE
PETN
RDX
DYNAMITE
BINARY EXPLOSIVES
WATER GELS
EMULSIONS
TNT
ANFO

High Explosives

- Explosives which are characterized by a very high rate of reaction, high pressure development and 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.

Low Explosives

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



Blasting Agents

- Any material or mixture, consisting of fuel and oxidizer, had is intended for blasting and not otherwise defined as an explosives;if the finished product, as mixed for use or shipment ***cannot be detonated by means of a number 8 test blasting cap when unconfined***.

- A number 8 test blasting cap is one containing grams of a mixture of 80 percent mercury fulminate and 20 percent potassium chloride, or a blasting cap of equivalent strength.

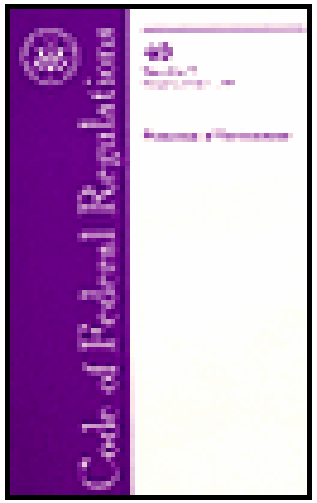
US DOT Transportation Classifications

Transporting Class 1 Materials

DOT Regulatory Overview

CFR Title 49
Code of Federal Regulations (CFR)

- **D.O.T. Hazmat Regulations**
- **Applicability:**
  - The offering (shipper) or
  - Transporting (carrier)
    - Interstate, intrastate, and foreign commerce,..



CFR 49

- Part 107 – Registration Requirements
- Part 171 - General Definitions
- Part 172 - HM Table, Special Provision, Communications,Emergency Response Info, training and Security Plans
- Part 173 – Shippers-General Requirements for Shipments and Packaging
- Part 177 - Carriage by Highway
- Part 178 - Specifications for Packaging

Hazardous Material Table

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§172.102)	(8) Packaging (§173.***)			(9) Quantity limitations		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
D	Ammonium nitrate-fuel oil mixture *containing only prilled ammonium nitrate and fuel oil.*	1.5D	NA0331	II	1.5D ..		None	62	None	Forbidden	Forbidden	10	19E
	Ammonium nitrate, liquid *(hot concentrated solution).*	5.1	UN2426	.....	5.1	B5, T7	None	None	243	Forbidden	Forbidden	D	59, 60
	Ammonium nitrate, *with more than 0.2 percent combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance.*	1.1D	UN0222	II	1.1D ..		None	62	None	Forbidden	Forbidden	10	19E
	Ammonium nitrate, *with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance.*	5.1	UN1942	III	5.1	A1, A29, IB8, IP3	152	213	240	25 kg	100 kg	A	48, 59, 60, 116
	Ammonium nitrite	Forbidden			.....		.....	.....	.....	.....	.....	.....	.....
	Ammonium perchlorate	1.1D	UN0402	II	1.1D ..	107	None	62	None	Forbidden	Forbidden	10	19E
	Ammonium perchlorate	5.1	UN1442	II	5.1	107, A9, IB6, IP2	152	212	242	5 kg	25 kg	E	58, 69, 106
	Ammonium permanganate	Forbidden			.....		.....	.....	.....	.....	.....	.....	.....
	Ammonium persulfate	5.1	UN1444	III	5.1	A1, A29, IB8, IP3	152	213	240	25 kg	100 kg	A	.....
	Ammonium picrate, *dry or wetted with less than 10 percent water, by mass.*	1.1D	UN0004	II	1.1D ..		None	62	None	Forbidden	Forbidden	10	5E, 19E
	Ammonium picrate, wetted *with not less than 10 percent water, by mass.*	4.1	UN1310	I	4.1	23, A2, N41	None	211	None	0.5 kg	0.5 kg	D	28, 36
	Ammonium polysulfide, solution	8	UN2818	II	8, 6.1	IB2, T7, TP2, TP13	None	202	243	1 L	30 L	B	12, 26, 40
	.....	.....		III	8, 6.1	IB3, T4, TP1, TP13	154	203	241	5 L	60 L	B	12, 26, 40
	Ammonium polyvanadate	6.1	UN2861	II	6.1	IB8, IP2, IP4	None	212	242	25 kg	100 kg	A	.....
	Ammonium silicofluoride, see Ammonium fluorosilicate.	.....			.....		.....	.....	.....	.....	.....		.....
	Ammonium sulfide solution	8	UN2683	II	8, 6.1, 3	IB1, T7, TP2, TP13	None	202	243	1 L	30 L	B	12, 22, 26, 100

DynoConsult

SANDVIK

Shipping Papers

- **CFR 49, §172.202 &HM Tale**
  - Proper Shipping Name
  - Hazard Class/Division
  - Identification Number
  - Packing Group (if appropriate)
  - Total Quantity and Unit of Measure

Shipping Paper

ACE Supply
1000 Washington Street
St. Louis, MO 89461

Shipped to:

United Blasters
445 South N. Street
Denver, CO 80403

Shipped Via:

Acme Carriers
9710 Hartley
Murray, MO 65255

UNITS	HM	Description f Contents	Weight
200 bxs		Explosive, blasting, Type A,1.1D, UN0081,#	XXX lbs

Emergency Number: 1-800-466-3689

This is certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulation of the Department of Transportation.

Signed:_____

D.O.T. Reg. No: XXX-XX-XXXX

Emergency Response Telephone Number

Shipping Paper Accessibility

- **CFR 49 §177.817(e)**
  - Readily available to, and recognizable by authorities in the event of accident or inspection
  - Stored as required:
  - Within immediate reach of driver….
  - Readily visible or in a holder mounted inside the driver's door, or on driver's seat when not at the vehicle's controls.

D.O.T. Hazard Class/Divisions

Hazard Class 1 Contains Six Divisions

- *Division 1.1* **-mass explosion hazard**
- *Division 1.2* **-projection hazard**
- *Division 1.3* **-fire hazard and either minor blast or projection hazard or both.**
- *Division 1.4* **-minor explosion hazard**
- *Division 1.5* **-very insensitive explosives**
- *Division 1.6* **-extremely insensitive articles with no mass explosion hazard**

Class 1

Class 2

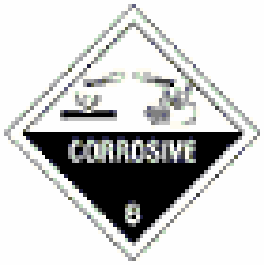
Class 3

Class 4

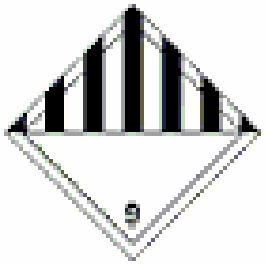
Class 5

Class 6

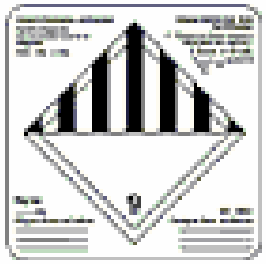
Class 7



Class 8



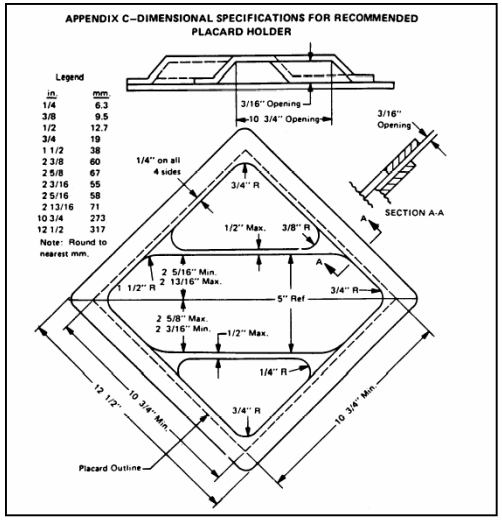
Class 9



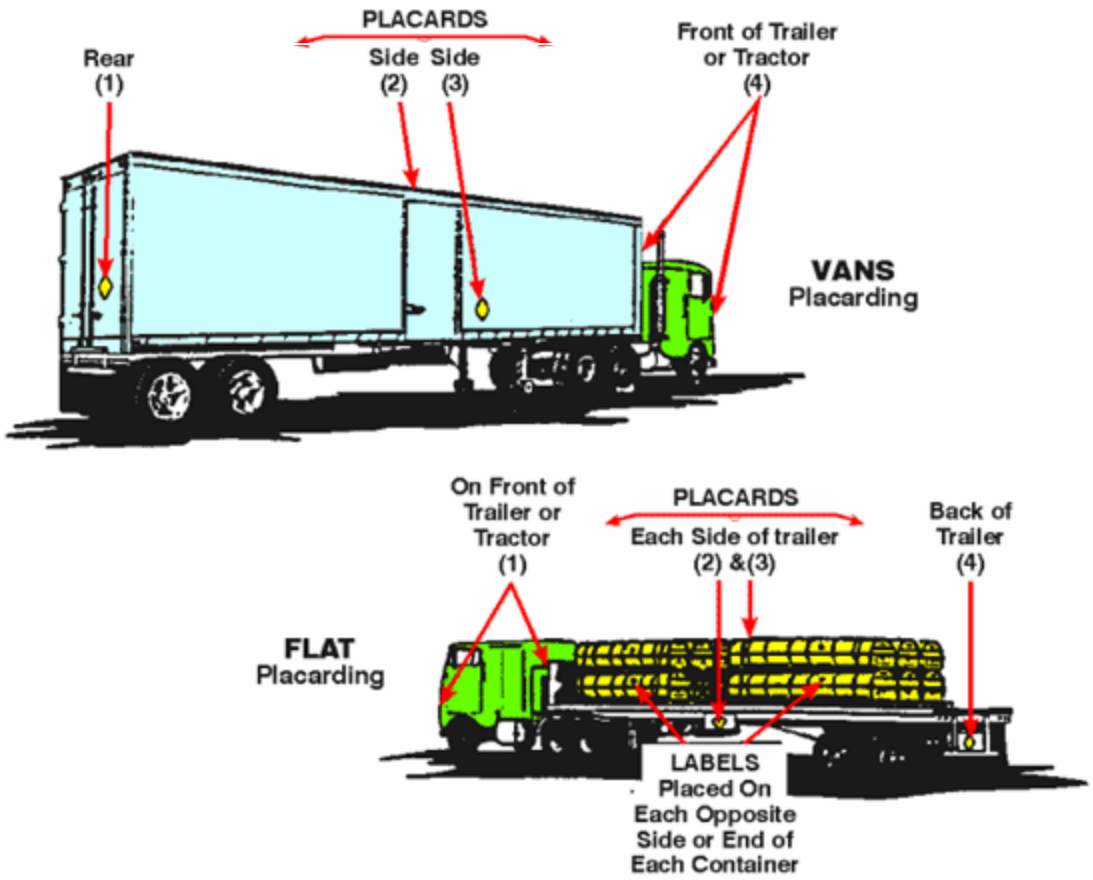
Special Provisions

Placarding

- **CFR 49 §177.823**
  - A carrier may not move a transport vehicle containing hazard material unless the vehicle is marked and placarded……



Placarding (Cont.)



Placards are just bigger labels which are placed on the outside of the vehicle. Unlike labels, there is only one placard and no information need be written on it (i.e. no TI). In fact, a placard on a vehicle is only required if the vehicle is carrying a package bearing a Yellow 3 label or LSA material. If the amount of the material being transported constitutes a highway route controlled quantity, the diamond shaped placard has a black square border surrounding it.

Placarding (Cont.)

- **Table 1- any amount**
  - Division 1.1, 1.2, 1.3

- **Table 2- exception for less than 1,001 pounds aggregate gross weight**
  - Division 1.4, 1.5, 1.6

Emergency Response Information

- **CFR 49 §172.600**
- **Information immediately available for use at all times the hazmat is present**
  - Required information
  - Form of information
  - Maintenance of information

Hazmat Employee Training

- CFR 49 §172.704
- General awareness/familiarization
- Function-specific
- Safety training
- Security awareness and in-depth
  - OSHA or EPA training
  - Initial and recurrent

Security Plans

- **CFR 49 §172.800 (new requirement in 2002)**

- **Personnel Security**
- **Unauthorized access**
- **En route security**

Federal Motor Carrier Safety Regs. (FMCSR)

- **CFR 49 §177.804**
  - Shale comply with 49 CFR part 390 through 397 (FMCSR)
  - CDL, Driver Qualifications, Parts and Accessories for Safe Operations, Inspection, Repair and Maintenance, Driving and Parking Rules

Loading and Unloading

- **CFR 49 §177.834**
  - No smoking….
  - Keep Fire away….
  - Handbreak set…
  - Use of tools…
  - Materials blocked and braced….

Class 1 Materials

- **CFR 49§ 177.835**
- **Engine stopped**
  - No material shall be loaded into or on or be unloaded from any motor vehicle with the *engine running*
- **Floors tight and lined**
  - Motor vehicles transporting Division 1.1, 1.2 or 1.3 materials shall have *tight floors*; shall have that portion of the interior in contact with the load alone with either *non-metallic material* or *non-ferrous metals*.

Mixed Packaging Requirements

- **CFR 49§173.61**
  - There are some restrictions as to what Class 1 materials may be loaded in the same package
  - This section must be checked for any prohibitions along with the segregation and compatibility tables

Compatibility Groups

- **Compatibility group letters are used to specify the controls for the transportation and storage of explosives and to prevent an increase in hazard that might result….**
- **Example:**
  - TNT mixtures- 1.1D
  - Grenades, hand- 1.1F

FMCSR Part 397
Federal Motor Carrier Safety Regulations

- Applicability
- Attendance
- Parking
- Fire
- Smoking
- Tires
- Instructions and documents
- Routing

Required Documents

- When required to be placarded:
- Federal D.O.T. Registration (49 CFR §107.600)
- State of Colorado Hazardous Materials Transportation Permit
- Shipping papers and emergency response information
- Proper Class CDL with Hazmat Endorsement

Helpful Websites

- **Hazardous Materials regulations:**

  www.hazmat.dot.gov

- **Federal Motor Carrier Safety Regulations:**

  www.fmcsa.dot.gov

Classes of Explosive Materials

- High Explosives **Explosive materials which can be caused to detonate by means of a detonator when unconfined (e.g., dynamite and detonators, cap-sensitive slurry/water gels and emulsions, and mixed binaries).**
- 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).**
- Blasting Agents **Example: Ammonium Nitrate/Fuel Oil mixture, non-cap-sensitive slurry/water gels and emulsion products**

Classification of Explosives & Storage

ALL explosive materials must be stored except:

- Those in the process of manufacture
- Those being physically handled in the operating process
- Those being used
- Those being transported

General Provisions

- (A) All explosive materials, and special industrial explosive materials, 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 flammable liquid component of a binary explosive shall be in secure storage that complies 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) Detonators shall not be stored in the same magazine in which other explosives are kept or stored except under the following circumstances:

General Provisions (Cont.)

- **(1) In a Type 1 or Type 2 magazine, detonators may be stored with delay devices, electric squibs, safety fuse, igniters, and igniter cord.**
- **(2) In a Type 4 magazine, detonators that will not mass detonate (1.4s and 1.4b classification) may be stored with 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.**
- **(3) Explosives not being used shall be kept in a locked magazine and the keys or combinations to the locks shall be unavailable to persons not holding a valid Type I permit. The Type II permit holder shall maintain an inventory and use record of all explosive materials.**

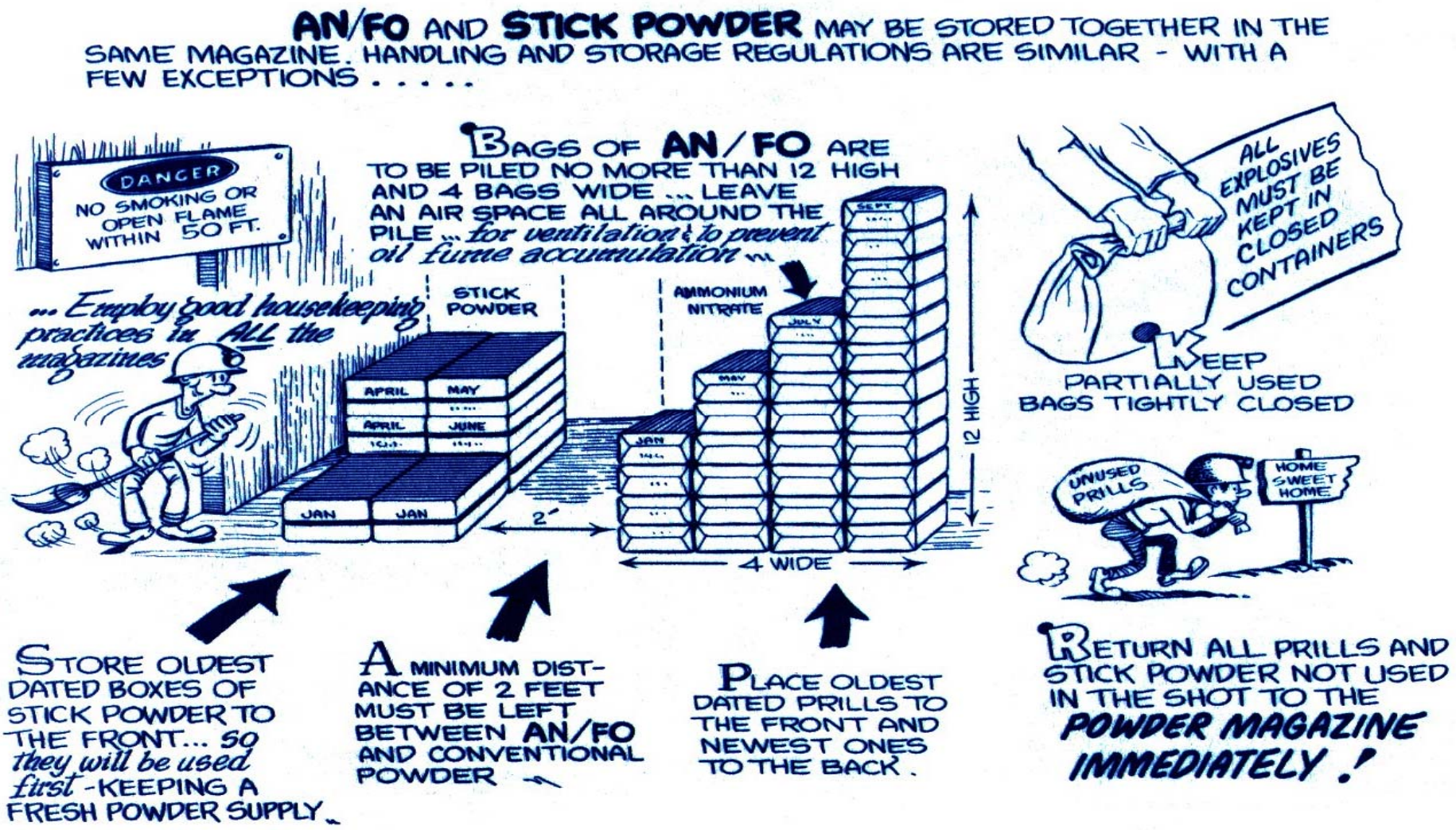
General Provisions (Cont.)

- **(5) Type I permittees shall record any receipt, removal, or return of explosives materials on inventory records within the magazine.**
- **(6) The inventory records shall be maintained on forms approved by the Division of Oil and Public Safety and shall include the type of explosive material product, manufacturer's name or brand name, identifying or date shift code, amounts received, removed from or returned to the magazine, the signature of the permittee receiving, removing or returning explosive materials, and total quantity remaining on hand.**
- **(7) Explosive materials shall be physically counted at least every thirty (30) days.**
- **(8) Explosive materials sold and received in individual unit quantities shall be inventoried as individual units.**
- **(9) Explosive materials sold and received as pounds shall be inventoried as pounds when in unopened cases, and as individual cartridges or units when in opened cases.**
- **(10)The Federal Bureau of Alcohol, Tobacco, Firearms and Explosives, 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 all outdoor magazines are located shall be posted with signs with the words "DANGER—KEEP OUT" 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) All normal access routes to outdoor explosive storage sites shall be posted with a sign with the words "DANGER- NEVER FIGHT FIRES ON THIS SITE. CALL_____" in letters at least 2" high. An emergency contact number shall be written on the sign.
- (7) Indoor magazines shall be visibly marked with the words "DANGER – KEEP FIRE AWAY."
- (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 materials 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 requiring impact or potentially spark producing methods to open or to close shall not be opened or closed in a magazine nor within 50 feet of a magazine or in close proximity to other explosive materials.
- (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, and 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 Type I permit holders experienced in the destruction of explosive materials shall be allowed to do the work of destroying explosives.

Storage of Explosives



Magazine Classification

- Type I – High/Low/BA
- Type II – High/Low/BA
- Type III – High/Low/BA
- Type IV – Low
- Type V – BA

Storage Magazine Construction by Type

4.4 Storage Magazine Construction by Type

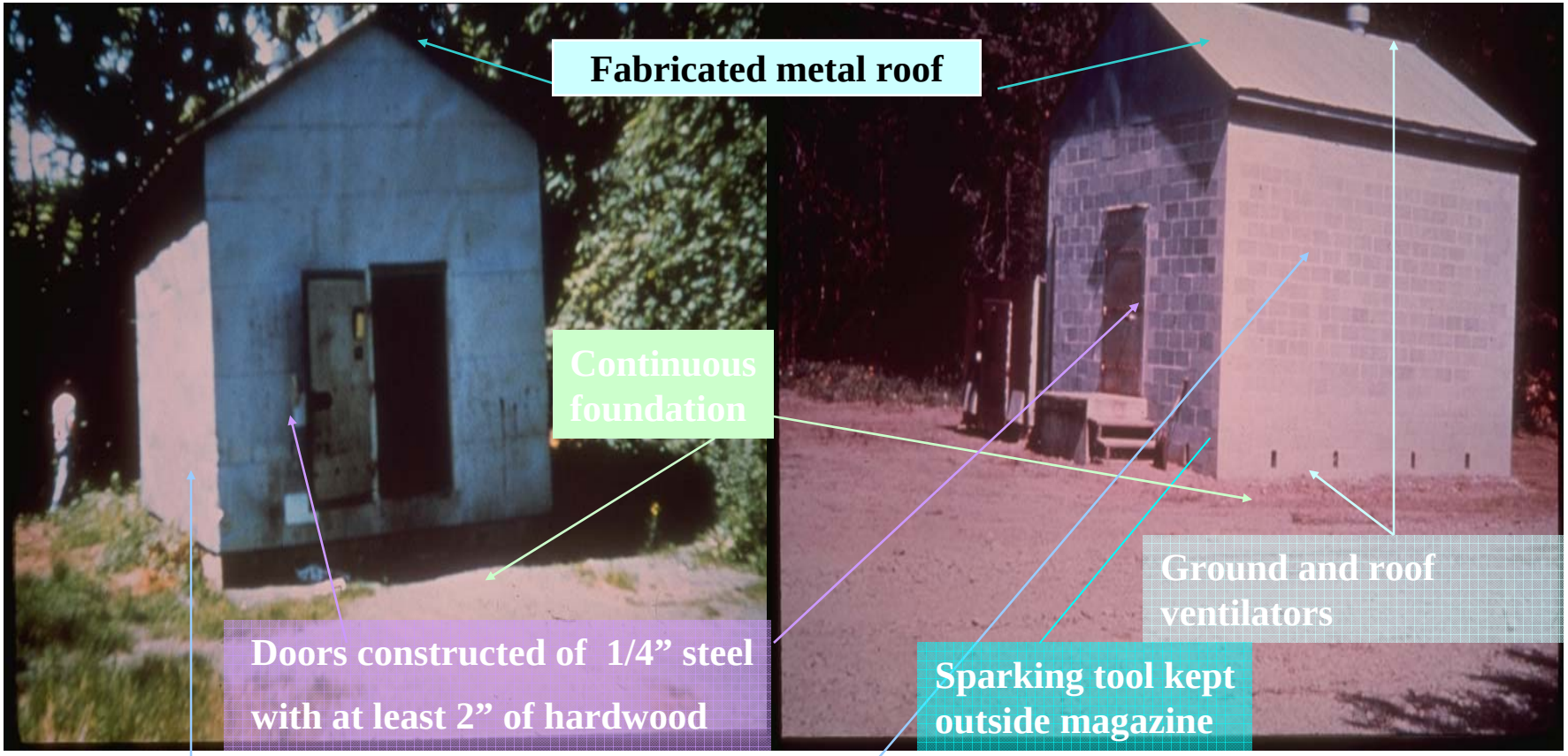
CONSTRUCTION FEATURES	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5
PERMANENT	X			X	X
PORTABLE OR MOBILE		X	X	X	X
BULLET-RESISTANT	X	X			
FIRE-RESISTANT	X	X	X	X	X(1)
THEFT- RESISTANT	X	X	X	X	X
WEATHER- RESISTANT	X	X	X	X	X
VENTILATED	X	X		X	

Common Construction Requirements

Type 1

- Permanent structure
- Bullet-resistant, fire-resistant, weather-resistant, theft-resistant and ventilated
- Constructed of masonry, metal gauge, metal-covered wood, and must have a foundation constructed of brick, concrete, cement block or metal-enclosed wooden posts

TYPE I MAGAZINES



Masonry wall construction of concrete, brick, tile, cement block, or cinder block not less than 6 inches thick. with hollow spaces filled with sand or weak concrete. Interior walls constructed of or covered with a non-sparking material.

The exterior and doors are constructed of at least 1/4 inch steel and lined with at least 2 inches of hardwood.

Wooden lattice prevents the packages of explosives from being stacked against side walls and blocking air circulation.


Note:
Nail heads covered by non-sparking material

TYPE 1 STORAGE

VENTILATION

MORE TYPE 1 STORAGE

NATIONAL ELECTRIC CODE LIGHTING

Common Construction Requirements

Type 2

- Portable structure
- Must be bullet-resistant, fire-resistant, weather-resistant, theft-resistant and ventilated
- Shall be constructed of steel lined with hardwood

TYPE II MAGAZINE

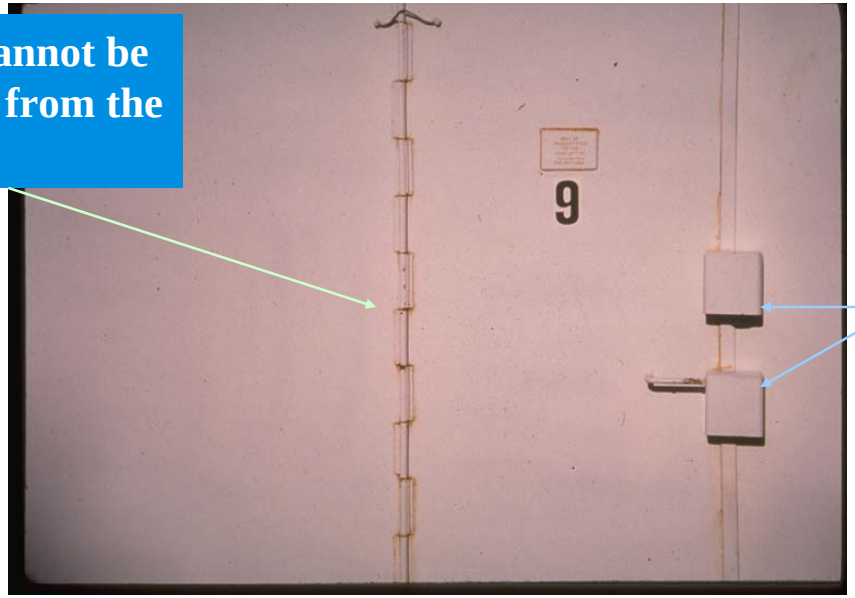
Ventilator

Door Overlap

Electrical Grounding Strap (Required by some Fed. & State Agencies)

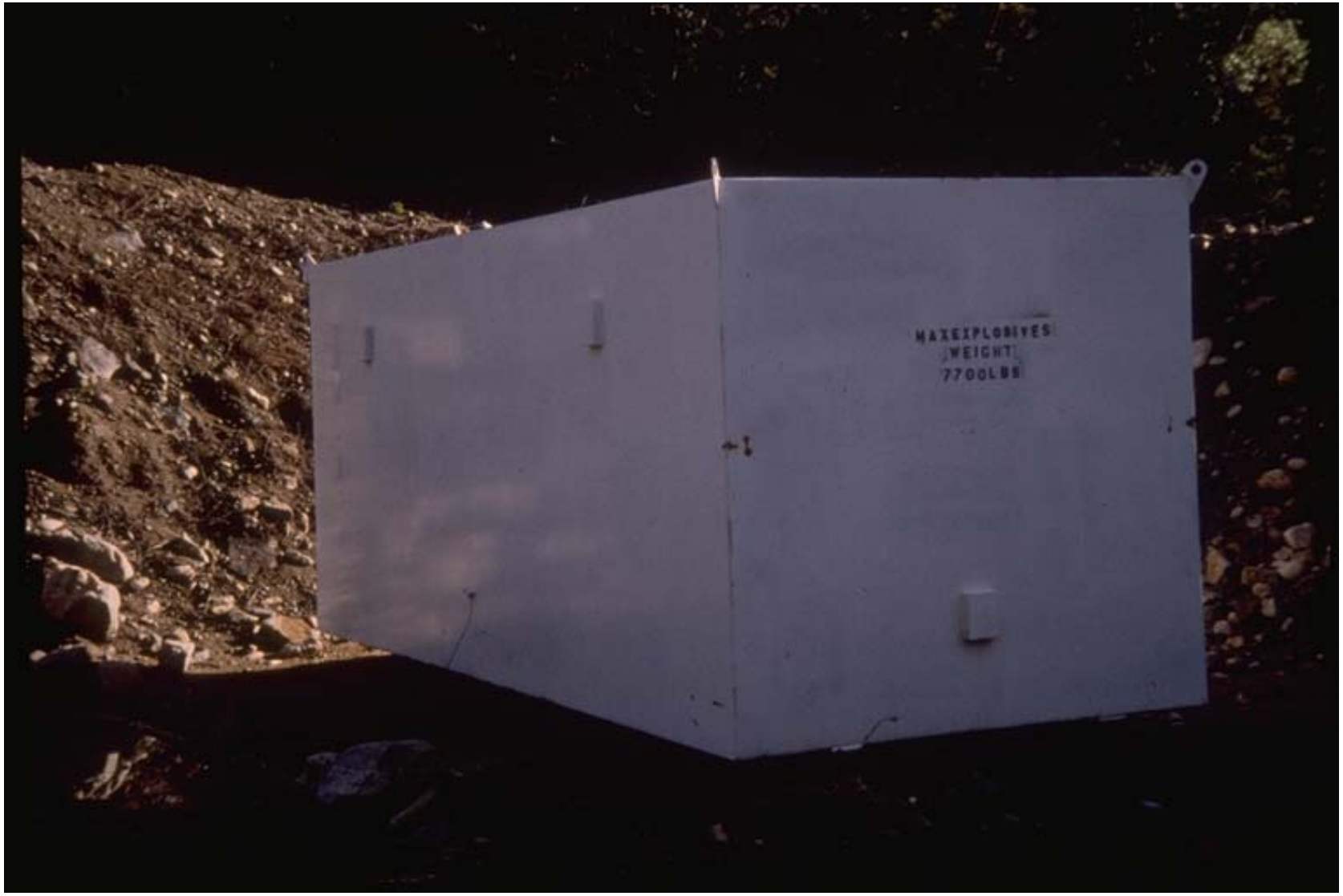
Ground sloping away from magazine for drainage.

Hinges cannot be removed from the outside.



Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples

TYPE II OUTDOOR



HINGES/HASPS 2 HOODED PADLOCKS

HOOPS / HASPS

TYPE 2 INDOOR STORAGE

TYPE 2 INDOOR STORAGE

Common Construction Requirements

Type 3

- Portable and attended structure
- Fire-resistant, weather-resistant, and theft-resistant
- Shall be constructed of steel lined with wood
- Doors must overlap by 1 inch
- A padlock required

TYPE 3 DAY BOX

Doors must overlap door openings by at least one inch. Hinges and hasps must be attached by welding, riveting, or bolting (nuts on the inside).

A Type III magazine must be fire-resistant, weather-resistant, and theft-resistant. Construction must be of of not less than 12-gauge steel, or aluminum, and lined with at least 1/2 inch plywood or 1/2 inch masonite type hardboard.

Common Construction Requirements

Type 4

- Permanent or portable structure
- Outdoor magazines must be fire-resistant, weather-resistant, and theft-resistant
- Vehicular magazines must be immobilized when unattended
- May be constructed of masonry, metal-covered wood, fabricated metal, or a combination. Doors shall be solid wood covered with metal

TYPE 4 INDOOR STORAGE

Common Construction Requirements

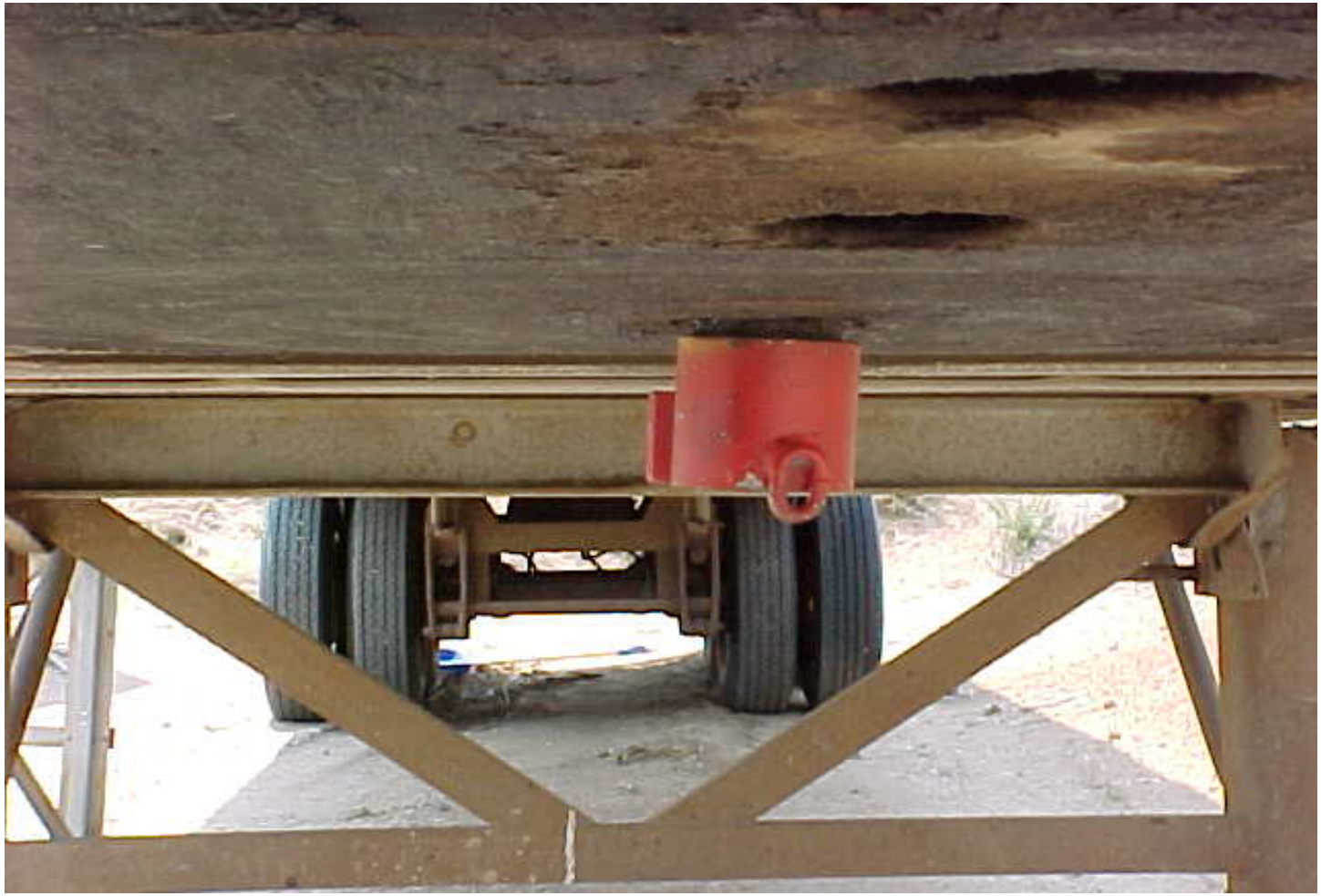
Type 5

- Permanent or portable structure
- Outdoor magazines must be weather-resistant and theft-resistant
- Vehicular magazines must be immobilized when unattended
- May be constructed of solid wood or metal

TYPE 5 OUTDOOR STORAGE – PLACARD

TYPE 5 INDOOR STORAGE

TYPE 5 OUTDOOR STORAGE



BINARY EXPLOSIVE STORAGE

Common Construction Requirements

- Hinges and hasps must be attached to doors by welding, riveting or bolting
- Locks must be protected with ¼ inch steel hoods to prevent sawing or lever action on the locks
- Locks must be two padlocks (3/8” diameter, case-hardened shackle); two mortise locks; a three-point lock; a combination mortise lock and padlock; or one mortise lock requiring two keys to open
- Electric lighting must meet National Electric Code (NFPA) standards

Common Housekeeping Requirements

- Keep magazines clean and dry
- Do not store explosives directly against walls
- No metal tools
- Keep brush cut back
- No combustible materials

NATIONAL ELECTRIC CODE LIGHTING

TOD – Table of Distances

For storage of high explosives

– Table 27CFR 555.218 specifies minimum distances for magazines from inhabited buildings, public highways, passenger railways and other magazines

For storage of low explosives

– Table 27CFR 555.219 specifies minimum distances for magazines from inhabited buildings, public highways, passenger railways and other magazines

For storage of ammonium nitrate and blasting agents

– Table 27CFR 555.220 specifies the distance between storage of donors (HE or BA) to acceptors (BA or AN)

TOD – Table of Distances

- Classify explosives involved
- Check magazine separation(s)
- Check TOD to roads/houses

Magazine Site Requirements

The land surrounding a magazine shall be kept clear of all combustible materials, trash, dried grass, leaves and other materials for a distance of at least 25 feet.

Magazine Site Requirements

Warning Signs

The premises on which magazine(s) is located shall be conspicuously marked with signs containing the words “EXPLOSIVES--KEEP AWAY” in letters at least 3 inches high. Signs shall be posted to warn any person approaching the magazine of the presence of explosives, but shall be located so that a bullet passing through the face of the sign will not strike the magazine.

Classification, Storage &Transportation of Explosives

What is wrong?

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