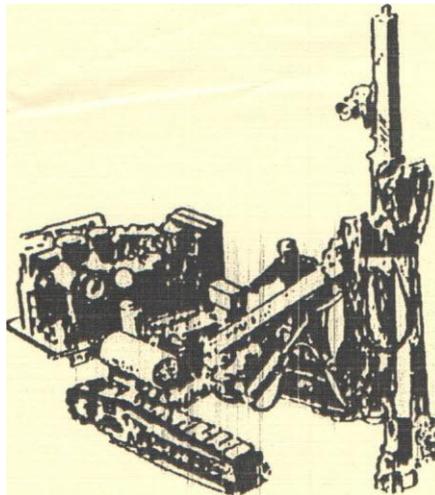


Policy Procedure and Safety Manual



Adams Contracting & Excavating, Inc.

This is to certify that I, _____, on this _____ day
of _____, 20 __, did receive a "**Policy Procedure and Safety Manual**"

for Adams Contracting & Excavating, Inc., which included the following:

Company Statement.	1
Forms and Reports	2
Preventing Misfires and Accidents	3
Handling Misfires	5
Proper Handling of Explosive Materials	7
Proper Storage of Explosive Materials	9
Proper Transportation of Explosive Materials ...	11
Project Start-Up	13
Pre-Phase Planning	15
Proper Usage of Explosive Materials	18
Preparation of Primers	21
Assembly of Primers	22
Initiation of a Blast.. ..	24
Traffic Control.	29
Drilling Operations	33
After Blast Procedures	35
Blasting Vibration Standards/ Seismic Monitoring	36
Blasting S.O.P	38
Radio Frequency Radiation Hazards	44
Toolbox Safety Meetings	45
Jobsite Security	46
Safety Plan	47
General Requirements	50
Medical.	53
Excavation and Demolition	54
Equipment Movement.. ..	55
Working Surfaces	56
Protection of the Public	57
Emergency Plan	58
Policy #1-97	64
Assignment of Responsibility	65

Employee

Witness

COMPANY STATEMENT

Our company has been in business for 10 years specializing in surface rock drilling, use of explosives, rock bolting and slope support in rock and earth. The company is fully insured and provides interested parties with copy. All employees have experience and are considered specialists in their respective trades.

Most Projects completed to date as a Sub-Contractor would be considered small to medium in size. Foundation excavation, mass rock. pipeline, utility trenches, site preparation, roadway, rock bolting, and rock bolt and gunnite slope stabilization. We have been successful in meeting schedules except for weather which can slow or prevent work from continuing. Generally, the work week will be extended to bring a project on schedule.

Our mission is to provide quality work in safe manner, on schedule, and with excellent communications at all times.

FORMS AND REPORTS

A) PURPOSE

Good planning is essential for successful results. It allows the blaster in charge to think through his blast prior to drilling and loading the holes. In addition, thorough documentation it provides the opportunity to analyze the results of our planning and to make modifications in the future.

B) ACTION TO BE TAKEN

The following forms are to be filled out by the blaster in charge or the person he delegates. The forms are to be submitted to proper authorities, if required, and are to be submitted to Adams Contracting & Excavating, Inc. office following each blast.

1. Explosive Transport Manifest. This form must be completed by the authorized employee transporting explosives from the company's magazines to the job site and for returning unused explosives from the job site to the magazines.
2. Blasting Plan. This form shall be completed by the Blaster in charge prior to each blast.
3. Blasthole Drill Log. This form is to be completed by each driller and submitted to the Blaster in Charge prior to loading of blast holes.
4. Blasthole loading Information Sheet. This form shall be completed as loading progresses.
5. Post Blast Report. This form shall be completed following the blast to analyze the results of the blast and to make modifications for future blasts.

PREVENTING MISFIRES AND ACCIDENTS

It is rare that premature or delayed shots, misfires, or blasting accidents are caused by faulty explosives, caps, fuses, or blasting accessories. When this does prove to be the case, it is almost always found that their failure was the result of carelessness in storage or handling - not because of defects during manufacture.

Human error or carelessness is unquestionably the cause of almost all misfire, premature and delayed shots, and other blasting accidents. Misfires must be regarded as serious accidents, whether or not anyone is hurt, because they add unnecessarily to the hazards of blasting. Do not deal -with a problem you are uneasy with call for other opinions.

A) THE KEYS TO AVOIDING BLASTING ACCIDENTS

1. Thoroughly understand all the recommended practices for transporting, storing, handling and using explosives.
2. Follow these recommendations, and always remain alert and pay close attention to everything you do when working with explosives.
3. Maintain an attitude of safety consciousness by always giving top priority to safety considerations.
4. Carefully organize your blasting operations so you know exactly what has to be done and the sequence in which it is to be done. Allow ample time for every task to be completed in an orderly manner, so there will be no necessity for rushing and carelessness.
5. TEST! Test your cap before making up primers; test your fuse or blasting machine; test firing wires; test your galvanometer; test your complete firing circuits; test your primer cartridges to be sure they will hold together during loading; test everything possible before to identify faulty products, equipment, or techniques before they cause problems.
6. If and when a premature shot, delayed shot, or other form of misfire occurs, follow the prescribed safe handling procedures. Regard this as evidence of carelessness or bad practices, and investigate why it happened and who was responsible. Take steps necessary to prevent a reoccurrence.
7. Never drill, bore, or pick out any explosive materials that have been misfired. Misfires should only be handled by a competent experienced person knowledgeable of the blast design, including the location and type of all explosive materials.

PREVENTING MISFIRES AND ACCIDENTS

B) COMMON CAUSES OF PREMATURE AND DELAYED SHOTS, AND OTHER MISFIRES

1. One of the most common causes of premature shots is a side-primed cartridge in which the blasting cap has been pushed almost completely through the side of the cartridge. When such a primer is loaded, the sensitive cap may be forced completely through the cartridge and be detonated by friction against the side of the borehole or a blow during loading or tamping.
2. Another cause of premature shots during loading is rough handling and severe tamping of the primer cartridge. This danger is increased greatly if the wrapper and the primer has been slit. Primers should never be slit or tamped.
3. Premature shots may also occur from lightning strikes, or other sources of electrical energy entering the blasting circuit when firing with electric caps. Lightning strikes are probably the only source of premature shots which the blaster cannot eliminate completely.
4. There have been cases where the person lighting the fuse did not realize it had ignited because of improperly preparing the fuse or an improper method of lighting which masked the ignition-spit. Make sure that fuse-ends have been freshly and properly cut, and use a lighting method which permits you to see and recognize the ignition-spit.
5. A "delayed shot" or "hangfire" is when a charge does not detonate when expected, but may explode sometime later. While not as hazardous as a premature shot, this is nevertheless a dangerous occurrence. It is also costly since blasting and other nearby operations must be suspended.
6. Explosives and caps should never be stored or conveyed together.

HANDLING MISFIRES

Working near a misfired charge is unquestionably the most dangerous operation associated with blasting. The following recommendations reduce the hazards to a minimum; however, there is always an element of danger and uncertainty in coping with a misfired charge.

1. When you have just fired a shot and are waiting for the smoke to clear before entering the blast site, examine the area from a distance to determine that all charges have fired. Be particularly alert to any sign of smoke coming from a shothole. Do not walk into a blast area as the smoke clears without examining it for evidence of misfires or other dangers.
2. If you discover evidence of a misfire, you should assume initially that it is a "delayed shot", which is likely to detonate at any second. With this in mind, you would not approach a misfired charge for a period of at least one hour unless the manufacturer recommends otherwise. Comply with federal, state, and local laws and regulations.
3. If smoke can be seen coming from the borehole, it is a "burning hole", and should not be approached for at least one hour after the last smoke is seen.
4. If electric methods of firing are being used, the blasting machine or source of electric current should be disconnected immediately. Check suspicious lead wires with a galvanometer or ohm meter and re-shunt any showing circuit.
5. Always shunt the bare wires of a misfired electric detonator by twisting them together and taping them to the metal shell to protect against extraneous sources of electrical energy.
6. Generally, the most practical and safest way to handle a misfire is to attempt to fire the shot again.
7. Sometimes, explosives from a misfired hole will have been blown or drawn from the hole by a nearby charge which fired. If this happens, great care must be taken to locate and gather up all such explosives, otherwise they might be struck by equipment at some time and explode accidentally, or may be found by children or other persons and cause a serious accident. Keep in mind that such explosives may have become sensitized by the shock or by partial detonation.

HANDLING MISFIRES (CONT'D)

8. While waiting the full hour before approaching a misfired hole, you may be pressured to reduce the time, especially if you are working on a larger project and it will cause an overall delay in the work. The delay of one hour can be extremely costly especially if personnel-and equipment at the site will be sitting idle, and it is understandable that the contractor might attempt to pressure you to shorten the waiting period. **DO NOT DO IT!** Explain that it may be a "delayed shot" and the costs in terms of compensation claims and shutdown by the authorities should an accident or violation occurs, are indeed greater than the delay time.
9. Every misfire should be followed up in an effort to identify its cause and develop the steps to be taken to prevent a reoccurrence.
10. Without a doubt, the best method of dealing with misfires is to avoid them by following the proven practices which all but eliminate their likelihood.

PREVENTION IS THE BEST CURE FOR MISFIRES

PROPER HANDLING OF EXPLOSIVE MATERIALS

A) GENERAL

1. Always use permissible explosive materials in flammable, gassy or dusty atmospheres when required by applicable federal, state, and local law and regulations.
2. Never use explosive material unless completely familiar with safety procedures, or under the direction of a qualified supervisor.
3. Never handle explosive materials during or during the approach of an electrical storm. Find a safe location away from explosive materials. When a storm is approaching, consult your supervisor; this applies to both surface and underground operations.
4. Never fight fires involving explosive materials. Remove yourself and all other persons to a safe location, and guard the area.
5. Adams Contracting & Excavating, Inc. employees will not keep explosives in their pockets, or anywhere else on their person.
6. Adams Contracting & Excavating, Inc. employees will not strike, tamper with, or attempt to remove or investigate the contents of a blasting cap or an electric blasting cap, or try to pull the wires from an electric blasting cap.
7. Adams Contracting & Excavating, Inc. employees will not allow children or other unauthorized or unnecessary persons to be present where explosives are being handled or used.

B) PACKAGING

1. Always close partially closed packages of explosive materials.
2. Always store explosives in their original package.
3. Never touch metal fasteners with metal slitters when opening packages of explosive materials.
4. Never mix different explosives in the same package.
5. Never remove explosive materials from its package, unless designed to be used in that manner.

C) PROTECTING EXPLOSIVE MATERIALS

1. Always insure that there are no foreign objects, loose powder, or moisture in the fuse detonator before inserting the safety fuse.

PROPER HANDLING OF EXPLOSIVE MATERIALS

PROTECTING EXPLOSIVE MATERIALS (CONT'D)

2. Never insert anything into a fuse detonator, except a safety fuse.
Never use explosive material that has been water soaked, even if they appear to be dried out.
3. Never investigate the contents of a detonator.
4. Never pull wires, safety fuse, shock tube, plastic tubing or detonating cord out of any detonator or delay device.
6. Never take apart or alter the contents of any explosive materials.
7. Never alter the composition of explosive materials.
8. Never expose explosive materials to sources of heat exceeding 150 degrees Fahrenheit or open flame, unless such materials or procedures for their use have been recommended for such exposure by the manufacturer.
9. Never strike explosive materials with, or allow them to be hit by, objects other than those required in loading.
10. Never allow the discharge of firearms in the vicinity of, nor shoot near explosive materials, magazines, or vehicles loaded with explosive materials.

PROPER STORAGE OF EXPLOSIVE MATERIALS

A) LOCATION OF MAGAZINES

1. Always locate explosives magazines in the most isolated places available. They should be separated from each other, and from inhabited building, highways, and railroads by distances not less than those recommended in the "American Table of Distances".
2. Never allow combustible material to accumulate within 25 feet of the magazine.
3. Never allow any lighters, matches, open flame, or other sources of ignition or volatile material within 50 feet of the magazine.
4. Never attempt to make any repair to the inside or outside of a magazine containing explosive materials.
5. Store explosives in accordance with federal, state, and local laws and regulations.

B) CONSTRUCTION OF MAGAZINES

1. Always be sure magazines are solidly built and securely locked in accordance with federal regulations to protect from weather, fire and theft. Protect from penetration by bullets and missiles as required by the classification of the explosive material.
2. Always keep the inside of the magazine clean, dry, cool and well ventilated.
3. Always post clearly visible "EXPLOSIVES - KEEP OFF" signs outside of the magazine.
 - i. Locate signs so that a bullet passing directly through them cannot hit the magazine.

C) CONTENTS OF MAGAZINES

1. Never store blasting caps or electric blasting caps in the same box, container, or magazine with other explosives. Store only explosive materials in a magazine.
2. Do not store any sparking metal or sparking metal tools in an explosives magazine.
3. Always clean up spills promptly, follow manufacturer's directions.
4. Consult the manufacturer if nitroglycerine from deteriorated explosives has leaked onto the floor of a magazine. The floor should be de-sensitized by washing thoroughly with an agent approved for that purpose.

PROPER STORAGE OF EXPLOSIVE MATERIALS

CONTENTS OF MAGAZINES (CONT'D)

5. Always rotate stocks of explosive materials so the oldest material in the magazine is used first. Consult with the manufacturer to assure that the recommended storage time of the explosive materials is being followed.
6. Never exceed recommended storage conditions and temperatures for explosive materials. Check with your supervisor or the manufacturer.
7. Never perform any type of operation in the magazine other than inspection, inventory, or bringing in or taking out explosive materials.

D) THEFT OF EXPLOSIVES

Any theft or loss of explosives or blasting agents, whether from a storage magazine or area, a vehicle in which they are being transported, a site where they are being used or from any other location, shall immediately, be reported by the person having control of such explosives or blasting agents to the Division of Labor, Public Safety Section, the local Sheriff or Police, and the Bureau of Alcohol, Tobacco and Firearms.

PROPER TRANSPORTATION OF EXPLOSIVE MATERIALS

A) GENERAL

1. Always keep matches lighters, open flame, and other sources of ignition at least 50 feet away from parked vehicles carrying explosive materials.
2. Always follow federal, state, and local laws and regulations concerning transportation.
3. Always load and unload explosive materials carefully.

B) DRIVERS

1. Must be 21 years of age.
2. Must have current ICC physical.
3. Must make sure truck is in good working condition before leaving shop area.
4. Must have acceptable driving record and current driver's license.

C) VEHICLES

1. Vehicles must be properly placarded and have headlights on at all times when transporting explosives and more than 110 gallons of fuel or any quantity of gasoline. (Gasoline cannot be transported in small containers unless they meet DOT specifications.)
2. A vehicle which contains class A or B explosives must not be parked:
 - a. on or within 5 feet of the traveled portion of a public street or highway.
 - b. on private property (including restaurants and filling stations) without knowledge of the person in charge of said property.
3. Vehicle cannot be left unattended.
4. Vehicle problems: one person is to go for help, the other is to stay with the vehicle.

D) ROUTES

1. Unless there is no alternative, a vehicle containing class A or B explosives must not be operated in heavily populated areas, tunnels, narrow streets, alleys, etc.

TRANSPORTATION OF EXPLOSIVE MATERIALS

ROUTES (CONT'D)

2. Vehicles carrying explosives must obey all city and municipal designated routes.

E) SMOKING

No person may smoke or carry a lighted cigarette on or within 50 feet of an explosives truck or blasting agent's truck, and there shall be no smoking while driving the vehicles.

F) DOCUMENTS REQUIRED

1. An explosives truck must have:
 - a. Bill of lading.
 - b. Outline of routes to be traveled.
 - c. Phone numbers of person or persons to call in case of an emergency.
 - d. Copy of daily vehicle inspection.
 - e. Insurance card.

PROJECT START-UP

PRE-JOB PLANNING

A) One of the first and easiest things to comply with at the onset of a job is the Federal and State Labor Law Posting requirements. The requirements are as follows:

1. Federal minimum wage
2. Employee Polygraph Protection Act
3. Equal Employment Opportunity
4. Job Safety & Health Protection
5. State Fair Employment
6. An emergency number listing
7. Right-to-Know (RTK) notification
8. Hazard Communication
9. Wage schedule if a Davis-Bacon job
10. Permit to use explosive materials posted at each place of operation (or a copy thereof).
11. Permit to blast carried by the certified blaster during blasting operations.

B) The Project Supervisor shall check compliance with the following before (prior to) the project starting:

1. Personal protective equipment required
2. Machine guards, equipment safety devices
3. Maintenance procedures, shop safety equipment
4. Lighting for night operations
5. Material storage and handling
6. Fire prevention, fire fighting equipment
7. Ladders, nets, overhead protection and other temporary structure safety requirements.
8. First aid and medical requirements
9. Traffic patterns, haul road layout, designated parking area
10. Engineering requirements to provide an adequate safety factor on any job-built facility
11. Sanitary requirements, drinking water
12. Trench protection
13. Electrical setup
14. Anticipated Government Compliance - OSHA, IME, EP A, etc.
- IS. Air Monitoring Equipment
16. Other

C) Hazards and control measures involving members of the public and/or their property:

1. Public vehicular traffic exposure - need for signs, barricades, flashers, flagmen, detours, traffic lights.

PROJECT START-UP

PRE-JOB PLANNING (CONT'D)

2. Public pedestrian and children - need for temporary walkways, overhead protection, watchmen, securing equipment, fencing and other methods of protection and denial of access
3. Railroad - protection required, notification to railroads of our operations, securing train schedules, flagmen, signs, warning signals, reduced speed, special insurance
4. Utilities - underground and overhead - locating and marking, de-energizing or moving lines, shoring and blocking, emergency measures" notification of schedules, special insurance
5. Blasting, pile driving - potential damage to homes, businesses, vehicles, pedestrians, pre-construction surveys, vibration tests, blasting mats, delay patterns, use of blasting logs, storage and transportation of explosives, blast warnings, special insurance. (For explosive records)

PLAN AHEAD AVOID FUTURE PROBLEMS!

PRE-PHASE PLANNING

A) SCOPE

This procedure outlines the purpose for and method of pre-phase planning - job hazard analysis and safety task assignment. This will be required for each job site, not only by Adams Contracting & Excavating, Inc. but for each subcontractor as well. An approved plan must be obtained from the subcontractor before a contract will be executed. The individual workers are to be given their safety task assignment before any phase of work is to begin on this project.

B) PURPOSE

The purpose of accident prevention pre-planning is to prevent unnecessary hazards that are likely to occur, and to make sure each contractor performing an operation will have the necessary material, equipment, and properly trained workers on hand when needed. Due to the speed at which jobs proceed, it does not allow a single operation to continue long enough to become safe through trial-and-error. To cope with safety problems peculiar to our industry, this procedure has been established so management can pre-determine the hazards, develop an appropriate plan to prevent the hazards from becoming accidents, and give the works actually performing the operation detailed safety and health instructions prior to the operation beginning.

C) RESPONSIBILITY

It is the responsibility of the Adams Contracting & Excavating, Inc. project superintendent to insure that pre-phase planning - job hazard analysis and safety task assignment is done for all divisions of work operations and activities performed on this project both by Adams Contracting & Excavating, Inc. and each subcontractor.

1. Pre-phase job hazard analysis will be developed by the field supervisory personnel who will be actually running the job(s) or operations that is being pre-planned. This analysis will be done on the attached, "Job Hazard Analysis" form.
2. The supervisory personnel referenced in CI for each respective contractor will consult and coordinate the preparation of pre-phase plans with the Adams Contracting & Excavating, Inc. project superintendent and safety coordinator to insure acceptable plans. In addition, the plans will be reviewed and updated at reasonable periods of time to include unanticipated hazards and changes in job conditions.

PRE-PHASE PLANNING

RESPONSIBILITY (CONT'D)

3. The supervisory personnel referenced in CI for each respective contractor will personally give safety task assignment (STA) training to his workers concerning the details of the job hazard analysis which they helped develop. This will also include lining up the proper tools and equipment for the training and the actual work to be performed.
4. Pre-phase planning and job hazard analysis is to be done just prior to the actual beginning of the particular phase of work. It should never be done en masse for all phases of the entire project before the project begins.

D) THE PRE-PHASE MEETING

After the responsible supervisory personnel have completed their necessary preparations and have a pre-phase job hazard analysis written out on the attached form, the Adams Contracting & Excavating, Inc. project superintendent and safety engineer/coordinator will call a pre-phase meeting. This meeting will always be attended by the supervisory personnel of the contractor submitting the plan, the project superintendent, the safety engineer/coordinator, and the area superintendents responsible for that particular phase of work. Copies of the written plan will be distributed to all those present, and the originator of the plan will be asked to go down his list of items present. The final decision either to accept the plan as written or revise the submitted plan, rests with the project superintendent. Under no circumstances is work to begin without first going through this procedure and having the job hazard analysis approved, and the safety task assignment (STA) instructions given to the workers.

1. Each phase of work on this project will utilize the pre-phase planning - job hazard analysis and safety task assignment.
2. There are no operations on this project that will be exempt from conforming to this procedure.

E) SAFETY TASK ASSIGNMENT (STA)

Before assigning a worker to any job, new or repetitive, his direct supervisor must give him STA- that is, showing and explaining to the worker the safety and health precautions and action(s) that must be taken before proceeding with the task. The information that the supervisor is relaying to

PRE-PHASE PLANNING

SAFETY TASK ASSIGNMENT -(STA) (CONT'D)

the worker is the same information used in developing the completion of the instructional meeting with the workers, each will sign and date an attendance roster which will be kept by the Adams Contracting & Excavating, Inc. site supervisor.

F) INCLUDED IN THE JOB HAZARD ANALYSIS SHOULD BE THE FOLLOWING:

1. Contractors Safety Policy or Procedures
2. The Hazard Communication Program
3. On-site training requirements
4. Emergency phone numbers and procedures
5. Recommended First Aid procedures
6. Equipment Safety requirements

PROPER USAGE OF EXPLOSIVE MATERIALS

The misuse of any explosive material can kill or injure you or others. Prevention of accidents depends on careful planning and the use of proper procedures. These guidelines are designed to help you use explosive material safely.

A) GENERAL PRECAUTIONS

1. Protecting Yourself

- a. Always keep explosive materials away from food, eyes or skin. Flush areas of contact with large quantities of water.
- b. Always avoid exposure to excessive noise from blasting. Comply with federal, state, and local laws and regulations.
- c. Always fire the shot from a position outside the blast area, away from an area where flyrock might occur.
- d. Always remain in the position away from the blast area post-blast until fumes, dusts, or mists have subsided.
- e. Never handle any explosive materials, or position yourself near explosive materials when initiating a blast.
- f. Never fire the shot in front of the blast.
- g. Never breath dust or vapors from explosive materials.

2. Protecting Others

- a. Always clear the immediate area of persons.
- b. Always post guards to prevent access to the areas.
- c. Always sound adequate warning prior to the blast.
- d. Always use a blasting mat or other protective means when blasting near residences, occupied buildings or other locations where injury to persons or damage to property could occur as a result of flyrock.
- e. Never fire a blast without a positive signal from the person in charge.

PROPER USAGE OF EXPLOSIVE MATERIALS

GENERAL PRECAUTIONS (CONT'D)

- f. Never permit anyone to handle explosive materials, or position themselves near explosive materials when a blast is to be initiated.
- 3. Protecting the Blast Area
 - a. Always clear the immediate area of vehicles, equipment, and extra explosive materials.
 - b. Always design a blast to avoid excess air blasts, ground vibration, and flyrock. Comply with federal, state, and local laws and regulations.
 - c. Never allow any source of ignition within 50 feet of a blast site except approved safety fuse lighters.

B) DRILLING

- 1. Always comply with all applicable federal, state, and local regulations relative to drilling and loading.
- 2. Always check for unfired explosive materials on surface or face before drilling.
- 3. Never drill into explosive materials, or into a blasthole that has contained explosive materials.
- 4. Never start a drill hole in a bootleg.

C) LOADING

- 1. Always check the borehole carefully with a wooden tamping pole or a measuring tape to determine its condition before loading.
- 2. Always take precautions during pneumatic loading to prevent the accumulation of static electric charges.
- 3. Never stack surplus explosives near working areas during loading.
- 4. Never place any unnecessary part of the body in front of the borehole when loading, tamping, or stemming.
- 5. Never force explosives into a borehole or through an obstruction in a borehole. Any such practice is particularly hazardous in dry holes and when the charge is primed.

PROPER USAGE OF EXPLOSIVE MATERIALS

LOADING (CONT'D)

6. Never load holes within 50 feet of drilling operations or other equipment.
7. Never drill or load holes during the approach and progress of a thunderstorm. Remove all personnel to a safe place during such periods.
8. Never load a borehole containing hot or burning materials. Temperatures above 150 degrees Fahrenheit could be dangerous.
9. Never spring a borehole near other holes loaded with explosive materials.
10. Never slit, drop, deform, or abuse the primer.
11. Never drop another cartridge directly on the primer.

D) TAMPING

1. Never tamp a primer or explosive material removed from its cartridge.
2. Never tamp explosive materials with metallic devices, except jointed non-sparking poles with nonferrous metal connectors.
3. Never tamp violently.
4. Always confine the explosives in the borehole with sand, earth, clay or other suitable noncombustible stemming material.
5. Never kink or damage safety fuse, detonating cord, shock tube, plastic tubing or wires of detonators when tamping.

PREPARATION OF PRIMERS

A) GENERAL

1. Never prepare more primers than immediately needed.
2. Never prepare primers in a magazine or near large quantities of explosive materials.
3. Never slit, drop, twist or tamp a primer.

B) PREPARING THE PRIMER

1. Always insert the detonator completely into a hole in the explosive material made with a non-sparking punch designed for that purpose, or in the capwell of a manufactured booster.
2. Always secure the detonator within the primer.
3. Always point the detonator in the direction of the main explosive charge.
4. Always secure the detonator to a primer cartridge so that no tension is placed on the cap wires, safety fuse, plastic tubing or detonating cord at the point of entry into the detonator.
5. Always be certain the detonator is fully inserted in the primer cartridge or booster, and does not protrude from it.
6. Never use a gas primer or booster if the hold for the detonator is too small.
7. Never enlarge a hole in a gas primer or booster to accept a detonator.
8. Never punch explosive material that is very hard or frozen.
9. Never force or attempt to force a detonator into explosive materials.

C) LOADING THE BOREHOLE

1. Always use the first cartridge in the borehole as the primer cartridge where 2-inch diameter or smaller cartridges are used.
2. Never drop another cartridge directly on the primer.

ASSEMBLY OF PRIMERS

A) PRIMERS WITH ELECTRIC DETONATORS

1. Small diameter cartridges (less than 4-inches in diameter).

Step 1: Punch a hole straight into one end of cartridge.

Step 2: Insert the detonator into the hole.

Step 3: Tie leg wires around the cartridge using a half hitch. Never pull the wires too tightly; this may break them or damage the insulation.

2. Large diameter cartridges (4-inches or larger in diameter).

Step 1: Punch a slanting hole from the center of one end of the cartridge coming out through the side 2 or more inches from the end.

Step 2: Fold over the live wires about 12 inches from the detonator to form a sharp bend.

Step 3: Push the folded wires through the hole starting at the end of the cartridge and coming out through the side.

Step 4: Open the folded wires and pass the loop coming over the other end of the cartridge.

Step 5: Punch another hole straight into the end of the cartridge beside the first. Insert the detonator and take up all the slack in the wires.

3. Cast Boosters

Always follow the manufacturer's recommendations for the attachment and use of detonators with cast or manufactured boosters.

B) PRIMERS WITH FUSE OR NON-ELECTRIC DETONATORS

1. Side Priming Method

Step 1: Punch a hole into the side of the cartridge. Make the hole deeper than the length of the detonator, and point it downward rather than across the cartridge.

Step 2: Insert the detonator.

ASSEMBLY OF PRIMERS

PRIMERS WITH FUSE OR NON-ELECTRIC DETONATORS (CONT'D)

Step 3: Tape the safety fuse or plastic tubing to the cartridge to prevent the detonator from being pulled out of the cartridge.

2. Reverse Priming Method

Step 1: Punch a hole straight into one end of the cartridge. Make the hole deeper than the length of the detonator.

Step 2: Insert the detonator.

Step 3: Fold back the fuse or plastic tubing over the end so that it lies along the length of the cartridge.

Step 4: Tape the fuse or plastic tubing to the cartridge.

CAUTION: If miniaturized detonating cord is used the explosives must be insensitive to initiation or the detonating cord for this method to work.

C) PRIMERS WITH DETONATING CORD

1. Detonating Cord With Cast Boosters

Always follow manufacturer's recommendations for using detonating cord with cast or manufactured boosters.

2. Miscellaneous Types of Primers

Always follow manufacturers recommendations for preparation of primers not covered elsewhere in these recommendations.

INITIATION OF A BLAST

A) ELECTRIC INITIATION

1. Preparing The Electric Blasting Circuit

- a. Always test the circuit for continuity and proper resistance using a blasting galvanometer, or an instrument specifically designed for testing electric detonators and circuits containing them.
- b. Always fire electric detonators with firing currents in the range recommended by the manufacturer.
- c. Always keep electric detonator wires or lead wires disconnected from the power source, and shunted until ready to test or fire.
- d. Always keep the firing circuit completely insulated from ground or other conductors.
- e. Always be sure that all wire ends are clean before connecting.
- f. Never use any instruments such as electricians' meters that are not specifically designed for testing blasting circuits or detonators. Such meters produce sufficient electrical energy to prematurely initiate electric detonators which can result in injury or death.
- g. Never mix electric detonators made by different manufacturers in the same circuit.
- h. Never mix electric detonators or different types in a circuit, even if made by the same manufacturer, unless such use is approved by the manufacturer.
- i. Never use aluminum wire in a blasting circuit.
- k. Never make final loop hookup to power source until all personnel are cleared of the blast area.

2. Protecting Against Extraneous Electricity

- a. Always check for stray current.
- b. Never load boreholes in open work near electric powerlines, unless the powerlines and detonator wires are anchored or are too short to reach the powerlines.

INITIATION OF A BLAST

ELECTRIC INITIATION (CONT'D)

- c. Never handle or use electric detonators:
 - 1. when stray currents are present.
 - 2. during electrical storms.
 - 3. during dust storms.
 - 4. if static electricity is present.
- d. Never use electric detonators or blasting caps near radio frequency transmitters.
- e. Never have electric power wires or cables near electric detonators, or other explosive materials, except at the time and for the purpose of firing the blast.
- f. Never open blasting machines or handle batteries near electric detonators.

B) DETONATING CORD INITIATION

1. Always use a detonating cord matched to the blasting methods, and type of explosive materials being used.
2. Always handle detonating cord as carefully as other explosive materials.
3. Always cut the detonating cord from the spool before loading the rest of the explosive material.
4. Always-use a sharp knife, razor blade, or instrument designed for cutting detonating cord.
5. Always make tight connections following manufacturer's directions.
6. Always attach detonators to detonating cord with tape, or methods recommended by the manufacturer.
7. Always point the detonators toward the direction of detonation.
8. Always attach the cord initiating detonator at least 6 inches from the cut end of the detonating cord.
9. Always use a suitable booster to initiate wet detonating cord.

INITIATION OF A BLAST

DETONATING CORD INITIATION (CONT'D)

10. Never make loops, kinks, or sharp angles in the cord which might direct the cord toward the oncoming line of detonation.
11. Never cut detonating cord with such devices as scissors, plier-type cutters, or similar instruments.
12. Never damage detonating cord prior to firing.
13. Never attach detonators for initiating the blast to detonating cord until the blast area has been cleared and secured for the blast.
14. Never use damaged detonating cord.

C) NONELECTRIC INITIATION

1. General

- a. Always follow manufacturers warnings and instructions, especially hook-up procedures and safety precautions.
- b. Always discontinue operations during the approach and progress of electrical storms.
- c. Never hold nonelectric leads during firing. This may cause injury or death.
- d. Never use tubing or detonating cord leads for any purpose other than that specified by manufacturer.

2. Miniaturized Detonating Cord System

- a. Always use explosives that are insensitive to initiation by the miniaturized detonating cord.
- b. Never join two sections of miniaturized detonating cord; a detonation will not pass through such a connection.

3. Gas Initiated System

- a. Always stay away from the blast area after connection are prepared for firing, unless the entire system is properly purged and disconnected from the primary ignition source
- b. Always use two protectors or specially designed boosters.

INITIATION OF A BLAST

NONELECTRICAL INITIATION (CONT'D)

- c. Never kink tubing,
 - d. Never smoke or allow open flame within 50 feet from blasting machines used for gas initiated systems.
4. Shock Tube Systems
- a. Always insure that shock tubing connections to detonating cord are at right angles to prevent angle-cutoffs.
 - b. Always lead shock tube to the hole in a straight line and keep it taut.
 - c. Always follow the manufacturer's recommendations when cutting and splicing shock tube units.
 - d. Never drive vehicles over shock tube.
 - e. Never tie two lengths of shock tubing together. A detonation will not pass through such a connection.

D) FUSE DETONATOR AND SAFETY FUSE INITIATION

1. General

- a. Always handle fuse carefully to avoid damaging the covering. In cold weather, warm slightly before using to avoid cracking the water proofing.
- b. Always know the burning speed of the safety fuse by conducting a test burn of the fuse in use to make sure you have time to reach safety after lighting.
- c. Never use lengths of safety fuse less than 3 feet.
- d. Never insert anything but safety fuse in a fuse type detonator.
- e. Never use fuse that has been kinked, bent sharply, or handled roughly in such a manner that the powder train may be interrupted.

2. Steps for Assembling Fuse Detonator and Fuse

Step 1: Wait until you are ready to insert fuse into fuse detonators before cutting.

INITIATION OF A BLAST

FUSE DETONATOR AND SAFETY FUSE INITIATION (CONT'D)

- Step 2: Cut off 1- to 2-inches to insure a dry end.
- Step 3: Measure correct length of fuse from roll and cut squarely across with a fuse cutter designed for this purpose, not a knife.
- Step 4: Visually inspect the inside of the detonator for foreign materials or moisture. If wet, or a foreign matter cannot be removed by pouring, do not use the Detonator. Dispose of the detonator in an approved manner.
- Step 5: Gently put the safety fuse against the powder charge.
- Step 6: Crimp the end of the fuse detonator where the fuse enters using a cap Crimper.

- a. Always cut off 1- to 2-inches to insure a dry end. Cut fuse squarely across with a proper tool designed for this purpose.
- b. Always seat the fuse lightly against the detonator charge, and avoid twisting after it is in place.
 - c. Always insure that the detonator is securely crimped to the fuse.
 - d. Always use waterproof crimp, or waterproof the fuse to detonator joint in wet work.
 - e. Always use cap crimpers to crimp the detonator to the safety fuse.
 - f. Never twist the fuse inside the detonator.
 - g. Never use a knife or teeth for crimping.
 - h. Never use an open fuse detonator for a booster.
 - i. Never cut the fuse until you are ready to insert it into the detonator.
 - j. Never crimp detonators by any means beside the cap crimper designed for the purpose.
 - k. Never attempt to remove a detonator from the fuse it is crimped to.

TRAFFIC CONTROL

A) TRAFFIC CONTROL FOR HIGHWAY AND STREET MAINTENANCE

Highway and street maintenance poses a variety of safety problems not encountered in any other field of work. The hazards normally associated with such work are multiplied by the fact that the work area is either shared by or in close proximity to the moving stream of traffic. Our safety responsibility is fivefold. We must provide the safety of:

- 1) The public - motorist, pedestrian, resident
- 2) The workers
- 3) The equipment
- 4) The public utilities
- 5) The completed work

In protecting against these hazards, the public interest and convenience must be weighed. It may be safer, more convenient, or less costly to the project to divert or interrupt the movement of traffic. Highways are productive facilities, and most users are on the highway as an essential part of getting their particular jobs done. Unnecessary inconvenience and delay to the highway user is often not only uneconomical in the overall view, but also poor public relations.

OSHA and the Department of Transportation requires compliance with the Manual on Uniform Traffic Control Devices.

Maintenance activities on roads and streets often present motorists with unexpected and unusual situations. Traffic control principles and procedures which may enhance the safety of motorists and workers at these work areas include the following:

- 1) Traffic safety should be an integral and high priority element of every project, from planning through operations and repair.
- 2) Traffic should be routed through work areas with traffic control devices comparable to those employed for normal situations whenever possible.
- 3) Traffic movement should be inhibited as little as possible.
- 4) Motorists should be guided in a clear and positive manner while approaching and traversing work areas.
- 5) Routine inspection of the traffic control elements should be performed to insure acceptable levels of traffic operations and device maintenance.
- 6) All persons responsible for the development, design, implementation, and inspection of traffic control should be adequately trained.

TRAFFIC CONTROL

TRAFFIC CONTROL FOR HIGHWAY AND STREET MAINTENANCE (CONT'D)

Typical problems which may develop in a traffic control pattern are as follows:

- 1) Insufficient advance warning
- 2) Inadequate guidance through the work zone
- 3) Unprotected hazards
- 4) Distractions to the motorist
- 5) Congestion and capacity problems

TRAFFIC CONTROL PLAN - A traffic control plan is a plan for handling traffic through a specific highway or street work zone or project.

WORK SITE - (Work Area) The work area itself is that space set apart which is delineated for use by workmen and equipment performing work and which is protected, marked, or signed to exclude vehicular and pedestrian traffic.

TRAFFIC-CONTROL - Traffic control is the process of advising motorists as to detailed requirements or conditions affecting road use at specific places and times in order that proper action may be taken and accidents or delays avoided.

TRAFFIC CONTROL DEVICES - Traffic control devices are used to slow or warn motorists of changes or possible changes in conditions. These devices are used to implement the traffic control process.

TRAFFIC CONTROL-ZONE - A traffic control zone is the entire area of the roadway which encompasses all traffic control devices used to regulate or guide motorists, behavior.

SIGNS - Signs are used to advise and warn the motorists and to instruct them as to how to proceed through the work site. Types of signs:

Regulatory Signs - Regulatory signs may be used at maintenance and work sites to advise motorists of applicable laws and regulations, These signs are typically rectangular in shape with the long dimension vertical. The standard color scheme is black lettering on a white background.

Guide Signs - Guide signs show destinations, designations, directions, distances, services, points of interest and other geographical or cultural information. These signs are rectangular with their long dimension horizontal. The standard color is white legend upon a green background.

TRAFFIC CONTROL

TRAFFIC CONTROL FOR HIGHWAY AND STREET MAINTENANCE (CONT'D)

Warning Signs - Warning signs are used to give notice of conditions that are potentially a hazard to traffic. These signs are typically diamond-shaped with one diagonal vertical. Permanent warning signs have a black legend on a yellow background. The orange color is used to indicate the temporary nature of the condition and the additional potential hazard of the work site.

Supplemental Warning Plates - Supplemental plates may be added to warning signs to provide additional information. When used they shall be placed immediately below the diamond main sign. They are not to be used by themselves.

Description Plates - Description plates are rectangular with the long dimension horizontal.

Advisory Speed Plates - Advisory speed plates are square shaped.

CHANNELIZING DEVICES - Channelizing devices are used to guide the motorist through the work site, to indicate hazardous areas and to exclude traffic from the actual work zone. Channelization devices are placed in or adjacent to the roadway to control the flow of traffic. They have distinct purposes:

- 1) Taper: Force movement of traffic from one lane to another.
- 2) Delineate: Guide the motorist to and along the safe path of travel.

~ - Conical in shape with broadened base; minimum height is 18 inches (greater on high speed roads), orange or fluorescent red-orange or yellow-orange color.

Drums - Approximately 36 inches in height and a minimum of 18 inches in diameter, horizontal, circumferential orange and white reflectorized stripes with a minimum of 2 orange and 2 white stripes.

Barricades-8 to 12 inch width of rails reflectorized with orange and white stripes on a 45 degree angle; stripes slope downward towards the side on which traffic is to pass, minimum height is 3 feet.

Barrier Wall - Portable concrete barriers may be used to provide a physical device which traffic cannot penetrate. The most widely-used concrete barrier is the precast New Jersey "safety shape." This device is usually 10 feet long and weighs approximately 5300 pounds.

TRAFFIC CONTROL

TRAFFIC CONTROL FOR HIGHWAY AND STREET MAINTENANCE (CONT'D)

Arrow Boards - The arrow board is used when a lane is closed. It tells the motorist that he should merge into the adjacent lane as shown by the direction of the arrow:

LIGHTING OR BARRICADE LIGHTS - Barricade lights are used to indicate hazards and to delineate the safe path of travel. There are three types of barricade lights:

Type A - Type A lights are low intensity flashing lights that are generally mounted on barricades. They are effective only at night.

Type B - Type B lights are high intensity flashers which are effective both day and night.

Type C - Type C lights are steady burning low-wattage lights which are used at night for delineation. They are commonly mounted on barricades or drums.

STANDARD COLORS OF SIGNS - The color coding of traffic signs is as follows:

RED	- stop or prohibition
GREEN	- indicates movements permitted; guidance for direction
BLUE	- motorist services guidance
BLACK	- regulation
WHITE	- regulation
ORANGE	- construction & maintenance warning
BROWN	- public recreation and scenic guidance

DRILLING OPERATIONS

A) PROTECTIVE EQUIPMENT

- 1) Hearing and eye protection shall be worn at all times.
- 2) Hard hats shall be worn at all times when at a work site.
- 3) Steel toed boots will be required.
- 4) Respirators should be worn while drilling.

B) LUBRICATION

Use only approved rock drill oil in oilers on air tracks and hand drills.

C) AIRLINES

- 1) Use whip checks at all air line connections.
- 2) Shut air off when hooking or unhooking air lines.

D) BITS AND STEELS

- 1) Never hammer on bits to get them loose.
- 2) Never use bent or damaged steels.
- 3) Use plenty of thread grease, it helps keep collars cool and makes them last longer.

E) MOTORIZED DRILL RIGS

- 1) Before set up:
 - a) Check for overhead power lines.
 - b) Check for underground power lines, gas lines, etc.
- 2) Drilling
 - a) Bar down loose rock from high walls and faces before drilling.
 - b) Never drill into old holes.
 - c) Make sure you start a hole straight.

DIRILLING OPERATIONS

MOTORIZED DRILL RIGS (CONT'D)

d) Watch for loose rock falling from high walls when drilling.

e) Use safety belts and lines when drilling close to a high wall.

3) Maintenance

a) Lubricate and inspect all moving parts for excessive wear (especially mast and boom pins).

b) Do not work on machine while it is running, unless work being done requires otherwise.

4) Moving

a) Lower the mast when moving long distances or over rough terrain.

b) Never move with boom extension extended.

c) Always take extra steels out of steel carriage.

d) Never allow riders on any machine.

AFTER BLAST PROCEDURES

A) DISPOSAL OF EXPLOSIVE MATERIALS

- 1) Always treat deteriorated or damaged explosive materials with special care, they may be more hazardous than explosive materials in good condition.
- 2) Always dispose of explosive materials using proper methods. Check with your supervisor or the manufacturer.
- 3) Never reuse any explosive material packaging.
- 4) Never burn explosive material packaging in a confined space.

B) BLAST GENERATED FUMES

- 1) Always assume toxic fumes are present from all blasts or burning explosive materials, and stay away until they have dissipated.
- 2) Always comply with applicable federal, state, and local laws and regulations for safe fume levels before returning to blast area.

C) REDUCING POST -BLAST FUME HAZARD

- 1) Always use the largest diameter cartridge that fits the job.
- 2) Always use water resistant explosive materials in wet conditions, and fire the blast as soon as practical after loading.
- 3) Always spray the muck pile with water in accordance with federal, state, and local laws and regulations.
- 4) Always avoid conditions that might cause explosive materials to burn rather than detonate.
- 5) Never use explosive materials that appear deteriorated or damaged.
- 6) Never use more explosive material than necessary.
- 7) Never add combustible materials to the explosive material load.
- 8) Never use combustible materials for stemming.

BLASTING VIBRATION STANDARDS/SEISMIC MONITORING

A) GROUND VIBRATION

- 1) In all blasting operations, except as otherwise authorized herein, the maximum ground vibration shall not exceed the values listed in the Maximum Allowable Peak Velocity (MAPV) Table below. The maximum ground vibration adjacent to the location of any dwelling house, public building, school, church, commercial or institutional building shall be established in accordance with either the maximum peak particle velocity limits or the scaled distance factors from the MAPV Table or by means of the Alternate Blasting Level Criteria diagram.

Distance (D) from blasting Site in feet	Maximum Allowable Peak Particle Velocity (Vmax) for Ground Vibration, in inches per second	Scaled Distance Factor to be applied without seismic monitoring
0 to 300	1.25	2
301 to 5000	1.00	50
5000 and Beyond	0.75	55
		65

- 1 - Ground vibration shall be measured as the particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements.

2 - Applicable to the scaled-distance equation.

- 2) Where seismic instrumentation is not employed, the maximum charge per delay period (W) may be determined by the formula:

$$\left(\frac{D}{D_s} \right)^2$$

Where W is the weight of explosive in pounds per delay of 8 milliseconds or more, D is the distance in feet to the nearest dwelling house, public building, school, church, commercial or institutional building and D_s is the scale distance factor.

BLASTING VIBRATION STANDARDS/SEISMIC MONITORING

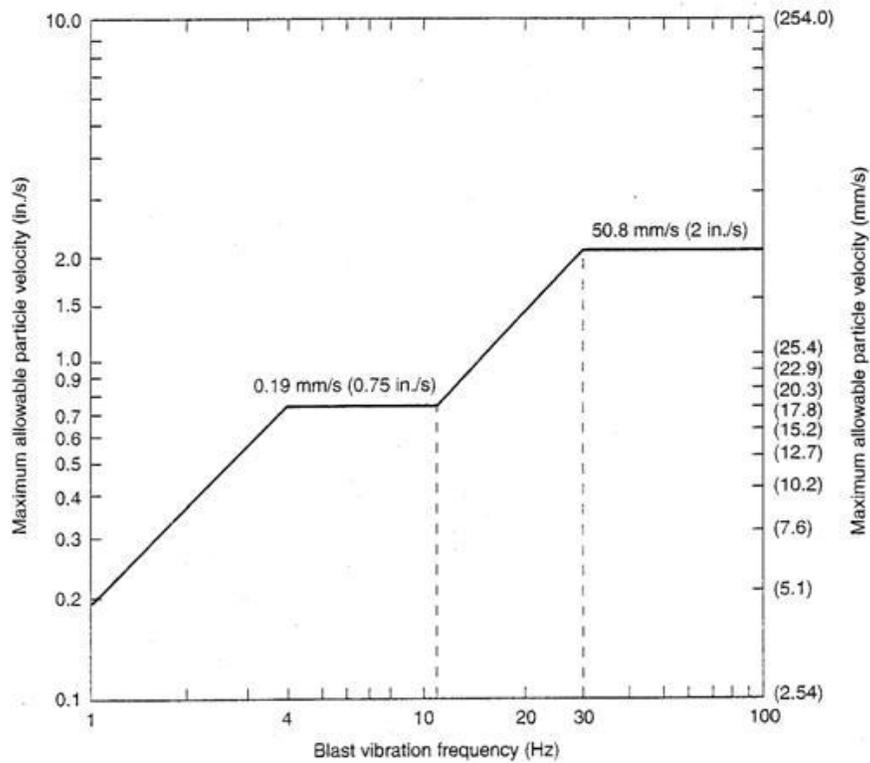
B) BLAST VIBRATION FREQUENCY

If Alternative Blasting Level Criteria Table below is used, a seismographic record including both particle velocity and vibration-frequency levels shall be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records shall be approved by the Public Safety Section before application of this alternative blasting criterion.

An Operator may use the ground vibration limits in the table to determine the maximum allowable peak particle velocity.

ALTERNATIVE BLASTING LEVEL CRITERIA

OPTIONAL PEAK PARTICLE VELOCITY GRAPH



Maximum allowable particle velocity vs. blast vibration frequency graph.

BLASTING S.O.P.

A) BLAST OPERATIONS SAFETY

- 1) Only persons trained and experienced in handling and the use of explosive materials shall direct blasting operations and related activities.
- 2) Trainees and inexperienced persons shall work only in the immediate presence of persons trained and experienced in the handling and use of explosive material.
- 3) Before loading, blastholes shall be checked and whenever possible, cleared of obstructions.
 - a) Explosives and blasting agents shall be kept separate from the detonators until loading begins.
 - b) Always make up primer at the hole to be loaded and lower it immediately.
 - c) Do not make up primers in mass production.
 - d) Explosives material shall be protected from impact and temperatures in excess of 150 degrees when taken to the blast site.
 - e) When using detonating cord to initiate another explosive, a connection shall be prepared with the detonating cord threaded through, attached securely to, or otherwise in contact with the explosive.
- 4) Explosive material shall not be loaded into blastholes with drill stem equipment or other devices that could be extracted while contacting explosive material. The use of loading hose, collar sleeves, or collar pipes is permitted.
- 5) Loading shall be continuous except for emergency situations, shift changes.
- 6) In electric blasting prior to hook up of the power source and in nonelectric blasting prior to the attachment to an initiating device, all persons shall be removed from the blast area except persons in a blasting shelter or other location that protects from concussion (shock wave) flying material, or gases.
 - a) Ample warning shall be given to allow all persons to be evacuated;
 - b) Clear exit routes shall be provided for persons firing the round; and
 - c) All access routes to the blast area shall be guarded or barricaded to prevent the passage of persons or vehicles.

BLASTING S.O.P.

BLAST OPERATIONS SAFETY (CONT'D)

- d) No work shall resume in the blast area until a post blast examination addressing potential blast- related hazards has been conducted by a person having abilities and experience that fully qualify the person to perform the duty assigned.
- 7) Initiation systems shall be used in accordance with the manufactures instructions.

B) PRIMER PROTECTION

Tamping shall not be done directly on a primer. If cartridges of explosives or blasting agents exceed 4 inches in diameter, they shall not be dropped on the primer except where the blasthole is filled with, or under water. Unused explosive material shall be moved to a protected location as soon as practical after loading operations are completed.

C) EQUIPMENT OPERATION

Vehicles and equipment shall not be driven over explosive material or initiating systems in a manner which could contact the material or system, or otherwise create a hazard.

Once loading begins, the only activity permitted within the blast site shall be activity directly related to the blasting operation, and occasional haulage activity near the base of the high wall being loaded where no other haulage access exists.

D) MISFIRES

Faces and muck piles shall be examined for misfires after each blasting operation.

E) SECURITY

Areas that shall be attended, barricaded, and posted or flagged against unauthorized entry are those in which loading are suspended or loaded holes are awaiting firing.

F) DETONATORS

- 1) All electric detonators to be fired in a round shall be from the same manufacture and have similar electrical firing characteristics. (i.e., resistance, current requirements).
- 2) Electric detonators shall be kept shunted until connected to the blasting line or wired into a blasting round;

BLASTING S.O.P.

DETONATORS (CONT'D)

Wired rounds shall be kept shunted until connected to the blasting line; and

Blasting lines shall be kept shunted until immediately before blasting.

- 3) Power sources shall be capable of delivering sufficient current to energize all electric detonators to be fired with the type of circuits used. Storage of dry cell batteries are not permitted as power sources.

G) BLASTING MACHINES

Blasting machines shall be tested, repaired, and maintained in accordance with the manufacturer's instructions.

If any part of a blast is connected in parallel, and is to be initiated from powerlines or lighting circuits, the time of current flow shall be limited to a maximum of 25 milliseconds. This can be accomplished by incorporating an arching control device in the blasting circuit, or by interrupting the circuit with an explosive device attached to one or both lead lines and indicated by a 25 millisecond delay electric detonator.

A blasting galvanometer or other instrument specifically designed for testing blasting circuits shall be used to test the following:

- 1) Continuity of each electric detonator in the blast hole prior to stemming and connection to the blasting line.
- 2) Resistance of individual series or the resistances of multiple balanced series are to be connected in parallel prior to their connection to the blasting line.
- 3) Continuity of blasting lines prior to the connection of electric detonator series.
- 4) Total blasting circuit resistance prior to connection to the power source.

A visual check of the completed circuit shall be made to insure that the components are properly aligned and connected. Safety fuse, igniter cord, detonating cord, shock or gas tubing, and similar materials which are kinked, bent sharply, or damaged shall not be used.

BLASTING S.O.P.

BLASTING MACHINES - (CONT'D)

When blasting with any nonelectric initiation system where Continuity cannot be tested, double trunklines or loop systems shall be used when possible.

When the nonelectric initiation system uses shock tube, connections with other initiation devices shall be secured in a manner which provides for uninterrupted propagation.

- 1) Factory made units shall be used as assembled and shall not be cut or disassembled except that a single splice is permitted on the lead in trunkline during dry conditions.
- 2) Connections between blastholes shall not be made until immediately prior to clearing the blast site with surface delay detonators.
- 3) When the nonelectric initiation system uses detonating cord, the line of detonating cord extending out of the blast hole shall be cut from the supply spool immediately after the attached explosive is correctly positioned in the hole.
- 4) In multiple row blasts, the trunkline layout shall be designed so that the detonation can reach each blasthole from at least two directions.
- 5) Connections shall be tight and kept at right angles to the trunkline.

Tamping and loading poles shall be of wood or other nonconductive, non-sparking material. Couplings for poles shall be non-sparking.

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H) BULK DELIVERY VEHICLES

No welding or cutting shall be performed on a bulk delivery vehicle until the vehicle has been washed down and all explosive material has been removed. Before welding or cutting on a hollow shaft, the shaft shall be thoroughly cleaned inside and out, and vented with a minimum 1/2-inch diameter opening to allow for sufficient ventilation.

BLASTING S.O.P.

- 1) Develop the blasting plan before or while drilling holes.
- 2) Ensure that leading line or blasting wire will not be thrown over a live power line by the force of the explosion.
- 3) Except for very basic delay systems, work out timing on paper. Be sure firing times are as expected.
- 4) When the plan is completed, immediately develop a material list. **KNOW WHAT YOU NEED** on shot day.
- 5) Prior to loading check with the project manager for any changed conditions and briefing.
- 6) Size up the blast site for problems that could arise at shot time.
- 7) Brief all helpers. Show them exactly what is expected of them, and how specifics will be dealt with.
- 8) Make sure everyone is familiar with the code of blasting signals, which are posted at the operation.
- 9) Take time to back out and **think!** (Talk with helpers at break about the work being done.)
- 10) Only use components designed to work together.
- 11) Always use the simplest method to accomplish the task.
- 12) Use detonating systems from the same manufacture. **DON'T MIX!**

EXAMPLE:

Ensign Backfired	Atlas
EZEDET	HANDYDET
PRIMADET	EXEL OR BLASTMASTER, MASTER DET.

- 13) Don't use M.S. trunk delays down holes.
- 14) Never use EZEDET or HANDY DET systems when planning to backfill over shot.

BLASTING S.O.P.

(CONT'D)

- 15) Never tape down hole delays to detonating cord down lines at the hole collar if cord is used with down hole delay for decking.
 - a) Place the detonator at the bottom of the hole. Extend cord up into the hole.
 - b) Be sure the cord contacts cap and in the right direction.
 - c) Be careful that the cord tails are cut off close at the hole collar.

WARNING

- 1) Never smoke or have flame producing or heat producing items within 50 feet of explosives.
- 2) Never fight a fire when there is imminent danger of it contacting explosives or blasting agents.
- 3) Perform **GOOD PLANNING**. Planning is a bench mark crucial to measuring results.
- 4) Explain in detail to all involved, "Stemming" Cap Systems, Tie-in's, etc., and why you do or don't practice different procedures during loading operations.
- 5) The responsibility connected with the everyday use of explosives is far too great to allow everyone to use them.
- 6) If you wish to be a blasting tech at Adams Contracting & Excavating, Inc., you must accept that responsibility, and the responsibility of those who work directly under you.
- 7) **NEVER** forget the awesome destructive force and potential disasters you are responsible for preventing.

RADIO FREQUENCY RADIATION HAZARDS

GENERAL PRECAUTIONS

The following list of precautions will help increase safety and reduce hazards associated with conducting electric blasting operations near radio frequency (RF) energy sources.

- 1) When blasting electrically at a fixed location, such as a quarry, make sure that there are no radio transmitters located closer to your blasting site than the applicable separation recommended. Be on the look-out for the installation of new transmitters. Check them out before they go into service to insure that they will not pose a hazard to your blasting operation.

When planning to blast electrically at a new location, as in construction work, inspect the area for RF transmitters before blasting is started. This will permit you to secure technically qualified assistance, if necessary, in planning your blasting procedures to minimize any RF hazard.

- 2) **KEEP MOBILE TRANSMITTERS AWAY FROM BLAST SITES.** Place adequate signs to remind operators to turn off transmitters when at the blast site. If two-way radios are used to provide instantaneous communication between the shotfirer and personnel guarding the approaches to the blast area, the minimum separation specified for the type transceiver used should be maintained.
- 3) Use the higher frequency bands, 450-570 MHz, for mobile transmitters if there is a choice. RF pickup is less efficient at these frequencies than at the lower frequencies.
- 4) Avoid large loops in blasting wiring by running lead wires parallel to each other and close together (preferably twisted pairs).
- 5) If loops are unavoidable, keep them small and orient them broadside towards the transmitting antenna.
- 6) Keep wires on the ground in blasting layouts. Bare connecting points should be elevated slightly to prevent current leakage.
- 7) Keep all lead lines out of the beam of directional devices such as radar or microwave relay stations.

TOOLBOX SAFETY MEETINGS, TOPICS & ATTENDANCE

A) TO BE CONDUCTED BY THE SITE SUPERVISOR

One effective method of promoting on-the-job safety is the toolbox safety meeting; a five to ten minute meeting conducted on-the-job at the crew level by the immediate Supervisor or Project Foreman.

Here are a few points to remember to make the toolbox safety meetings as effective as they can be.

- 1) First of all, hold a meeting at least once a week. Regular meetings will provide the feeling that they are a regular part of the project.
- 2) A written record of the meeting will be kept on the form provided. All employees attending should both print and sign their names on this form.
- 3) Hold the meeting right on the jobsite, preferably where the employees can sit and relax.
- 4) Limit each meeting to ten minutes or less.
- 5) Discuss only a single point or subject. This is important in keeping the employees interested.
- 6) Don't choose too broad a subject, or one that is of no interest to the employee. Gear the meeting to the specific project.
- 7) Spend some time and thought before the meeting so that you are able to stimulate discussion.
- 8) While you may open the meeting by stating the subject and presenting the hazard or problem, try to get the group to join in on the discussion and work out a solution.
- 9) Use positive approaches and conclusions whenever possible. Do not single out an employee when discussing a project problem. Be diplomatic in your approach to a problem.
- 10) Before the start of any phase of work on the project, hold a meeting to discuss the hazards or problems that might develop with this new operation.

JOBSITE SECURITY

- A) Special attention must be given to security to avoid vandalism and unnecessary exposure to the general public. Office, storage, and warehouse areas should be fenced and lighted wherever possible.
- B) Equipment should be locked and parked inside a fenced area, or in as secure a location as possible. Avoid parking equipment on any type of incline. Cabs should be locked. Ignition keys should be removed every night.
 - 1) Avoid leaving small equipment where it can easily be stolen.
 - 2) In the event of theft or loss of explosive materials, a report shall be made within 24 hours to the issuing authority, and to the local law enforcement authority.
 - 3) Provide adequate lighting in vulnerable areas to deter vandalism.
 - 4) Prior to leaving a job at night, make sure all signs and barricades are properly located, secured, and illuminated as required.
- C) Magazine sites should be selected in conformance with applicable standards issued by B.A.T.G. and I.M.E. Warning signs regarding storage of explosives and firefighting precautions are mandatory.

ADAMS CONTRACTING & EXCAVATING, INC.
SAFETY PLAN

TO ALL EMPLOYEES:

The attached safety plan is this company's operational program that will be adhered to by both management and each employee.

If the Company's equipment and explosives are used properly the risk that is assumed will be reduced to near zero.

I cannot emphasize strongly enough that safety is to your benefit. Read the document carefully and if you have any concerns, please let me know. Bryan Adams will discuss your concerns.

Safety

1. Company safety program

II. The following training will be provided to all personnel working on this project

- (1) Power tool dangers
 - (a) Air Compressor maintenance and care
 - (i) Shut off valves
 - (ii) MSHA overpressure shut off valves
 - (iii) Compressor Oil Plugs
 - 1) Danger of opening plug while system under pressure
 - 2) Air tool oil plug danger while system under pressure
 - (iv) Air line dangers
 - 1) Whip stops
 - 2) Safety clips for couplings
 - 3) Line cutting hazards
 - (v) Drills & accessories
 - 1) Loose clothing & hair hazards
 - 2) Foot collaring hazards
 - 3) Steep slope hazards
 - (vi) Grout pump & mixing system
 - 1) Mixer dangers - pinch points
 - 2) Grout pump pressure dangers
 - 3) Grout line dangers
 - 4) Power up and power down procedures
 - (b) Highwall Safety
 - (i) Rope and anchor placement hazards
 - 1) Poor rock at anchor locations
 - 2) Safe placement of anchors
 - 3) Daily rope inspections
 - 4) Rope Protector use
 - 5) Clearing of ropes
 - (ii) Personal equipment maintenance
 - 1) Equipment inspections
 - 2) Recognition of wear and fatigue
 - 3) Protective headgear, footwear, eye wear
 - 4) Proper clothing
 - (iii) Rope technique
 - 1) Knots
 - 2) Mechanical aids
 - 3) Rappelling/ Ascending techniques
 - 4) Climbing hazard

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28



- 3) High scaling techniques
- 4) Equipment dangers

C. Public Safety

- (1) Flaggers and/or barricades (as appropriate) will be utilized to keep vehicle and pedestrian traffic clear of danger areas.
- (2) Warning signs will be posted at all approaches to work areas
- (3) Two-way radio communication will be maintained between ground personnel, scalers, and rope tenders at all times.
- (4) Audible signals will be utilized for any blasting operations.

GENERAL REQUIREMENTS

A] SAFETY POLICY

Prevention of accidents and occupational illness is one of the most significant activities by Adams Contracting & Excavating, Inc. To that end, Adams Contracting & Excavating, Inc. will do everything possible to provide safe equipment, safe conditions, and a healthy work environment for our employees. Adams Contracting & Excavating, Inc. needs the cooperation and participation of every employee to create a safe work place. Every employee of Adams Contracting & Excavating, Inc. has a personal responsibility to conduct themselves in a safe and prudent manner while performing the duties of their job. The use of explosives requires extreme care to protect the work site and the public,

Our safety and health program includes:

1. Providing mechanical and physical safeguards to the maximum extent possible.
2. Conducting a program of safety and health inspection to identify and eliminate unsafe working conditions or practices, control of health hazards and to comply fully with the safety and health standards as outlined in the Code of Federal Regulations (CFR) Title 30: Mineral Resources - Mine Safety and Health Administration Publication (MSHA); CFR Title 29: Occupational Safety and Health Administration (OSHA), as well as all other applicable federal state and local authorities having jurisdiction; including owner's safety regulations.
3. Training of all employees in good safety and health practices and a continuing of the hazards which may be encountered on projects as well as special precautions which must be taken.
4. Provide personnel with the necessary protective equipment and instructions for its use and care.
5. The development and enforcement of safety and health rules and requiring that employees adhere to these rules as a condition of their employment.
6. Prompt and thorough investigation of every accident or incident, or near miss, to determine the cause and to correct the problem to prevent recurrence.

The supervisor is also responsible for ensuring that employees on his project are properly trained for the tasks which they are performing. Supervisors will also familiarize each of their employees with the specific safety regulations of that job and of this company. The supervisor also has the authority to remove any employee who is engaged in an unsafe work practices) and initiate either corrective or disciplinary procedures.

SAFETY POLICY (CONT'D)

Each employee of this company is responsible for conducting themselves in a safe and prudent manner at all times while working for the company. This includes no smoking in Company vehicles. Each employee will bring to the attention of the supervisor any unsafe condition which the employee discovers and cannot immediately remedy. Each employee is required to inform the Superintendent of any safety problem or concern where corrective action has not been taken, without fear of reprisal. He/she will sign a statement acknowledging that the information has been received and read.

B. SAFETY AND HEALTH RESPONSIBILITIES

The individual ultimately accountable for safety and health activities for Adams Contracting & Excavating, Inc. is the General Manager, Bryan Adams at the firm's office. Adams Contracting & Excavating, Inc. lead blasting technicians at projects are the individuals responsible for all day-to-day accident prevention activities.

C. COMPLIANCE WITH REGULATIONS, STANDARDS, AND CODES

Adams Contracting & Excavating, Inc. will comply with the standards and requirements outlined in U.S. Department of Labor's CFT (Code of Federal Regulations) Title 30: Mineral Resources, Mine Safety and Health Administration (MSHA) publication; and CFR Title 29: Labor, Occupational Safety and Health Administration (OSHA) publications. In addition, all applicable Federal, State, and municipal safety, health, and sanitation statutes and codes will be followed by Adams Contracting & Excavating, Inc. In the event there is a conflict between any of these provisions, the more stringent provisions always prevail.

D. SAFETY INSPECTION PROCEDURES

Our lead blasting technician and the company safety specialist perform frequent and regular safety inspections of the work site, materials, and equipment to identify unsafe circumstances and provide for a means of abatement when necessary.

E. ACCIDENT INVESTIGATION AND REPORTING PROCEDURES

All accidents, whether or not personal injuries are involved, will be reported immediately to the applicable lead blasting technician. All near miss incidents will be reported in the same manner. The lead blasting technician and safety specialist will investigate every accident and near miss incident to determine cause and prevent recurrence. This procedure will be completed as soon as it is reported regardless of the time of day or circumstances. Findings will be made available to the General Manager.

Additionally, all accidents will be reported and recorded in compliance with the record keeping requirements as outlined by MSHA, OSHA, Workers Compensation Insurance, and Adams Contracting & Excavating, Inc.

GENERAL REQUIREMENTS (CONT'D)

F. EMERGENCY PLANS

See Page 58

G. FIRE PROTECTION PLANS

Adams Contracting & Excavating, Inc. will provide sufficient fire fighting equipment on the project site and it will be marked for ease of identification and rapid accessibility.

All Adams Contracting & Excavating, Inc. equipment will maintain ten (10) pound ABC rated fire extinguishers.

Emergency response is by 911 and/or direct contact with the nearest fire department.

MEDICAL

A. FACILITIES

Adams Contracting & Excavating, Inc. will use the nearest hospital or emergency room staffed with EMTS. When away from the office area the number and location will be made available by the lead blasting technician.

Emergency response is 911.

B. TRAINING

Key supervisory personnel are knowledgeable in Standard First Aid and Cardiopulmonary Resuscitation.

C. PHYSICIAN

Adams Contracting & Excavating, Inc. will utilize the physicians at any emergency facility for all health concerns relating to our project.

D. AMBULANCE

Adams Contracting & Excavating, Inc. will utilize the 911 system for emergency response and emergency medical transport.

E. PHYSICAL QUALIFICATIONS OF EMPLOYEES

All individuals employed shall be physically qualified to perform their assigned duties in a safe manner. Employees will not knowingly be permitted or required to work while their ability or alertness is impaired because of drugs, fatigue, illness, intoxication, or other conditions that may expose either themselves or others to injury.

F. RECORDS

Adams Contracting & Excavating, Inc. will maintain current first aid treatment and medical records including:

1. A daily treatment log.
2. Cumulative individual injury records.
3. Required Workmen's Compensation records.

EXCAVATION AND DEMOLITION

A. EXCAVATIONS

1. Slide Protection. The sides of excavations over four feet in depth will be sloped to an angle of repose of not less than 3/4 foot to 1 foot vertical (i.e., 37 degrees from vertical) from the bottom of the excavation.

2. Support System. In cases where exclusive use of the proper angle of repose is not possible, additional supporting systems will be erected. The design of supporting systems (i.e., piling, cribbing, shoring, etc.) will be based upon calculations of the forces and their direction with consideration for surcharges, angle of internal friction of materials, and other pertinent characteristics of the material to be retained.

Excavated spoil piles will be placed and maintained a minimum of two feet from the edge of all excavations in order to minimize overloading on the excavated face and allow for the potential accumulation of surface encumbrances, (i.e., rocks, other materials). Whenever practical additional benching will be performed to retain falling material and aid in control of the excavation to protect against slides and cave-ins.

3. Inspections. Prior to any excavation, the site will be thoroughly inspected to determine conditions requiring special safety measures. The location of existing underground installations such as sewer, telephone, gas, water, electric line, etc., will be determined and plainly staked. Necessary arrangements will be made with the utility company or owner for the protection, removal or relocation of the underground installations. In such circumstances, excavation will be done in a manner that does not endanger the underground installation or the employees engaged in the work. Utilities left in place will be protected by barricading, shoring, suspension, or other measures as necessary.

All excavations will be inspected by a "competent person". Adams Contracting & Excavating, Inc. considers the company safety specialist to be competent and qualified to perform these inspections. The excavations will be inspected on a daily basis or as often as necessary when applicable. Circumstances that warrant additional inspection include any changes in the type of soils encountered, following rainstorms, or other hazard increasing occurrences.

4. Access. Where employees are required to enter excavation over four feet in depth; stairs, ladders, or ramps will be provided so as to require no more than 25 feet of lateral travel. When access to excavations exceeds 20 feet vertically; ramps, stairs, or personnel hoists will be provided for access.

EQUIPMENT MOVEMENT

No mobile equipment will be moved upon any road, access way, or grades unless the roadway widths, grades and curves are constructed to safely accommodate the movement of the respective vehicle or equipment.

WORKING SURFACES

A. ACCESS

Except where either permanent or temporary stairways, ramps, man hoists, or runways are provided, ladders meeting the requirements of CPR Title 29 and Title 30 will be used to provide access to all elevation.

1. The design construction, and use of all ladders, i.e., will be in accordance with CPR Title 29 and Title 30.

B. PERSONAL PROTECTIVE EQUIPMENT

Adams Contracting & Excavating, Inc. will ensure availability, proper use and maintenance of all personal protection equipment on the project site. Adams Contracting & Excavating, Inc. will also enforce its use during all phases of project completion.

THE PROTECTION OF THE PUBLIC

A. SIGNS AND BARRICADES

Adams Contracting & Excavating, Inc. will supply and maintain all necessary safety signs to be used relative to the use of explosives. AR signs used will be visible at all times when work is in progress and will be promptly removed or covered when the hazard no longer exists.

B. FLAGGING PROCEDURES

When signs do not provide adequate protection, Adams Contracting & Excavating, Inc. will provide flagmen or other appropriate traffic controls.

Flagmen directing traffic will use the signals and procedures contained in the current issue of ANSI D6.1, "Manual on Uniform Traffic Control Devices for Streets and highways".

Only employees who are dependable, trained and qualified will be used as signalmen and flagmen. Flagmen controlling traffic will wear high visibility fluorescent apparel.

C. JURISDICTIONAL APPROVALS

Signs and barricades erected by Adams Contracting & Excavating, Inc. on public highways and roads will comply with the state, county, city, and highway or street departments having jurisdiction.

Adams Contracting & Excavating, Inc. will contract with local law enforcement officials for additional traffic control, if needed.

D. CONFLICTS BETWEEN SAFETY ENTITIES

Where conflicts arise between Adams Contracting & Excavating, Inc. safety program requirements, or any other applicable and governing regulatory agency, the more stringent will govern.

EMERGENCY PLAN

I. REASON FOR PLAN

- A. Storms, natural disasters, accidents, and terrorism can affect Adams Contracting & Excavating, Inc. An emergency plan is needed to ensure the safety our employees from these hazards.

II. PURPOSE OF PLAN

- A. The purpose of this plan is to ensue effective coordinative use of Adams Contracting & Excavating, Inc. capabilities and resources in conjunction with the resources of outside agencies to:
 - 1. Maximize protection of life and property.
 - 2. Sustain survivors.
 - 3. Ensure the continuation of the company's project operations.

III. TRAINING AND PREPARATION

- A. All lead blasting technicians will successfully complete approved Red Cross First Aid Training. In addition, they will also complete an American Red Cross or American Heart Association CPR Course. CPR training will be re-certified annually, and First Aid training will be re-certified biannually. Adams Contracting & Excavating, Inc. will be responsible for all costs incurred in this training.
 - 1. Adams Contracting & Excavating, Inc. will pay the cost of the training for any other employee who enrolls and completes an approved First Aid or CPR course.
- B. Each employee will know how to shut down his/her work station in the event of evacuation, power outage, or other emergency.
- C. Every employee will receive fire extinguisher training.

IV. INDUSTRIAL ACCIDENT WITH SERIOUS INJURIES OR FATALITY

- A. PURPOSE
 - 1. To outline the actions that Adams Contracting & Excavating, Inc. employees will follow in the event of serious injuries or fatalities.
- B. RESPONSIBILITY
 - 1. The lead blasting technician is responsible for initiating and following these procedures.

EMERGENCY PLAN (CONT'D)

C. POLICY/PROCEDURES

1. Obtain medical aid for the victims. Get ambulance, fire department, rescue squad, or other emergency service units dispatched to the location. Have someone meet responding units and lead them to the victim.
2. Administer First Aid and/or CPR within your capabilities and training until more qualified persons arrive and take over.
3. Do not move the victim unless it is absolutely necessary, to prevent further injury (back or neck).
4. Notify the Adams Contracting & Excavating, Inc. office in Buckeye, Arizona, 602-386-1215 Telephone and inform one of the following individuals of the accident details:
Bryan Adams, General Manager and Safety Specialist
George Lee, Superintendent
Mary Adams
5. Notify the family of the injured worker immediately. Tell them what happened and where the victim is being treated. Offer reassurance and any assistance necessary. Above all use good judgment, discretion, and common sense when speaking to the family.
6. If a camera is available, photograph the scene. Write down what happened while it is fresh in your mind.
7. Except for rescue and emergency measures, the scene of the accident/incident shall not be disturbed or the operation resumed until authorized.
8. Assist and cooperate fully with law enforcement personnel in conducting the investigation of the accident/incident and assure availability of all information, personnel and data pertinent to the investigation.
9. Complete the injury report and hand carry it to Bryan Adams, along with any written statements and photos.
10. Do not release any information to the media, or other unauthorized persons. If questioned, say "I'm sorry, I am unable to respond to your questions". Refer to the Public Information Annex for further details.

EMERGENCY PLAN (CONT'D)

V. PUBLIC INFORMATION

A. PURPOSE

To detail how information would be disseminated to the public in an emergency.

B. SPOKESPERSON

1. The authorized spokesperson for Adams Contracting & Excavating, Inc. will be Bryan Adams. If he is unavailable, Mary Adams would be the spokesperson.
2. Other employees of Adams Contracting & Excavating, Inc. will not provide information on behalf of the company to the media, or representatives of potential adversarial parties.
3. If the media requests information from an unauthorized spokesperson, the response shall be "I'm sorry, I am unable to respond to your questions". Refer media personnel to the company spokesperson.

VI. TRAFFIC ACCIDENTS

A. PURPOSE

The purpose of this section is to outline the responsibilities and procedures of key company personnel and appropriate outside agencies in case of a traffic accident involving an Adams Contracting & Excavating, Inc. vehicle or driver.

B. RESPONSIBILITIES

1. It is the responsibility of the driver of an Adams Contracting & Excavating, Inc. vehicle involved in an accident to follow the procedures outlined below.
2. Adams Contracting & Excavating, Inc. employee driving a personal vehicle while on Adams Contracting & Excavating, Inc business time will also be responsible for following the outlined procedures below.

C. POLICY/PROCEDURES:

1. Property damage only (no injuries)
 - a) Ensure that there are no injuries.
 - b) Notify the appropriate law enforcement agency.
 - c) Notify Bryan Adams, (602) 386-1212
 - d) Do not talk about the accident with other people at the scene.
 - e) Protect and maintain the accident scene in its natural state until law enforcement officers arrive, if possible.
 - f) Cooperate with law enforcement officers, but DO NOT admit fault.

EMERGENCY PLAN (CONT'D)

2. Personal Injury or Fatalities
 - a) Notify appropriate law enforcement and medical agencies.
 - b) Provide aid to injured persons. Do not move an injured person unless it is necessary to prevent further injury.
 - c) Notify the company spokesperson and safety specialist in the Adams Contracting & Excavating, Inc. office in Buckeye, Arizona (602) 386-1215.
 - d) Do not talk about the accident with other people at the scene except law enforcement.
 - e) Protect and maintain the accident scene in its natural state until law enforcement officers arrive, if possible.
 - f) Request that law enforcement agency have accident re-constructionist respond, or that the scene be marked for a re-constructionist before things are moved.
 - g) Cooperate with law enforcement officers, but DO NOT admit fault.
 - h) Take pictures to document the scene if a camera is available.
 - i) All Adams Contracting & Excavating, Inc. employees who are involved in personal injury traffic accidents will be required to take a blood/alcohol test.

Inform the law enforcement officer at the scene that the company policy requires a blood test and that you would like assistance in getting it done.

VII. TORNADO/LIGHTNING

A. PURPOSE

To outline Adams Contracting & Excavating, Inc.'s policy if threatened by tornadoes.

B. RESPONSE

It is the responsibility of the National Weather Service to warn all citizens of any possible dangerous or extreme weather conditions.

C. POLICY/PROCEDURES

1. Upon receiving a National Weather service tornado warning affecting work area, the site will be shut down and the employees evacuated to appropriate shelter areas.
2. When lightning is detected within 10 miles, blasting operations shall cease until the area is free from lightning. All persons will be removed from the danger areas to a place of safety during such periods.
3. For Adams Contracting & Excavating, Inc. operations of significant duration, lightning will be monitored through an approved type lightning warning device capable of detecting atmospheric conditions that could provide lightning.

EMERGENCY PLAN (CONT'D)

VIII. UTILITIES ACCIDENT

A. PURPOSE

To outline the procedures to be followed if a Adams Contracting & Excavating, Inc. activity interrupts a utility service (i.e., gas, water, electric, phone, etc.),

B. RESPONSIBILITY

It is the lead blasting technician's responsibility to insure that the policies/procedures which are listed below are followed.

C. POLICY/ PROCEDURES

1. Evacuate all workers from the area of the accident if a hazardous condition exists (i.e., explosion, fire, electrocution, bum, etc.).
2. If a hazardous condition exists, notify the police for crowd control and/or local evacuation if necessary. Notify the fire department if a fire or explosion hazard exists.
3. Notify the utility company involved.
4. Notify one of the following people:

Bryan Adams, General Manager and Safety Specialist
George Lee, Superintendent

IX .. FL YROCK AND STRUCTURAL DAMAGE

A. PURPOSE

To outline the procedures if Adams Contracting & Excavating, Inc. has an unexpected collapse, cave-in, or FL YROCK incident.

B. RESPONSIBILITY

It is the responsibility of the lead blasting technician on the project to follow these procedures.

EMERGENCY PLAN (CONT'D)

C. POLICY/PROCEDURES

1. Account for all personnel and ensure their safety. If injuries have occurred, perform appropriate first aid and summon medical aid.
2. Notify appropriate emergency service agencies, (law enforcement for traffic/crowd control fire department for fire/rescue). Close the site to unauthorized personnel.
3. Notify the following persons:

 Bryan Adams, General Manager and Safety Specialist
 Mary Adams
4. Do not release information to the media. Inform them that an Adams Contracting & Excavating, Inc. spokesperson is enroute.
5. Cooperate fully with any authorities on the scene. Refer any questions to the company spokesman.

**ADAMS CONTRACTING &
EXCAVATING, INC.
POLICY #1-97**

1. After the detonation of Explosives:

It is imperative for job site safety and the general public to carefully inspect the area after the detonation of explosives. Do not enter the area after the use of explosives or until the danger of flyrock has passed. Remove all wires and tubes after it has been determined that no holes have misfired.

If a misfire occurs secure the area, notify the appropriate officials and notify the office. Any questions relative to handling a misfire should be coordinated with the office and if required, a person knowledgeable in neutralizing the situation.

Good blasting practice is the only way to prevent a misfire.

2. Proper disposal of explosive packaging.
3. Proper storage of explosive materials once it has been returned to magazine facility.

ASSIGNMENT OF RESPONSIBILITY

GENERAL MANAGER

The General Manager, Bryan Adams, is ultimately responsible for the safety of all employees at Adams Contracting & Excavating, Inc. All recommendations for safety equipment, engineering changes or changes in policy involving large capital expenditures must have the approval of the General Manager. The General Manager will receive recommendations from employees, both field and office positions, and makes decisions based on the information received.

COMP ANY SAFETY SPECIALIST

Bryan Adams is also the Company Safety Specialist and is responsible for periodically inspecting the work place for safety and health hazards. In addition, all complaints related to safety or health concerns will be routed to the safety office for investigation, recommendation or corrective action, and reply to the complainant. The safety director will also investigate all accidents which result in injury to person and property and all near miss incidents which have the potential for serious injury.

The safety director will be primarily responsible for making recommendations for review. He may also take any of his responsibilities to our Superintendent, George Lee, if more input or expert knowledge is required.

SUPERINTENDENT

The superintendent is the key link in the safety chain. The superintendent has contact with the employees on each task, as well as the overall operation. The superintendent has the authority to shut down any phase of operation under his supervision if unsafe conditions exist or develop, until they can be corrected. A safety policy and orientation will be given to each employee and a signed statement will be made clearly indicating it has been read and understood.

Index

Company Statement.	1
Forms and Reports	2
Preventing Misfires and Accidents	3
Handling Misfires	5
Proper Handling of Explosive Materials	7
Proper Storage of Explosive Materials	9
Proper Transportation of Explosive Materials	11
Project Start-Up	13
Pre-Phase Planning	15
Proper Usage of Explosive Materials	18
Preparation of Primers	21
Assembly of Primers	22
Initiation of a Blast..... ..	24
Traffic Control.	29
Drilling Operations	33
After Blast Procedures	35
Blasting Vibration Standards/ Seismic Monitoring	36
Blasting S.O.P	38
Radio Frequency Radiation Hazards	44
Toolbox Safety Meetings	45
Jobsite Security	46
Safety Plan	47
General Requirements	50
Medical.	53
Excavation and Demolition	54
Equipment Movement.	55
Working Surfaces	56
Protection of the Public	57
Emergency Plan	58
Policy #1-97	64
Assignment of Responsibility	65