



Chapter 5

BLAST AREA SECURITY

AREA SECURITY

The blaster-in-charge is responsible for posting flaggers or guards and warning signs, notifying all persons in the blast area, and giving all necessary audible warning signals. The purpose of these measures is to preclude the entry of persons into the hazard zone of the blast (defined as the area within the possible flyrock perimeter) between blast loading and post-blast “All Clear.”

Effective security can only be obtained by the use of guards; signs and signals can warn people, but cannot *control* them. Guards must be posted on all routes of possible access to the hazard zone, and must be stationed beyond the probable reach of flyrock. They must be able to communicate with the blaster-in-charge so that the blast can be prevented if someone gets past them (see Signal Systems). Most importantly, guards must know what to expect from the blast. The most common failing in blast area security is not having enough guards; the second most common failing is lack of instruction to the blast area guards.

It is critical for guards to know the blasting sequence (timing, signals) and what the blast is supposed to do (a deep thump, a loud roar, or an ear-splitting bang with a lot of flyrock, etc.). They must know what procedures will apply in case of incident or accident (misfire, hangfire, approaching lightning, premature detonation). Guards must also know what to tell people whom they stop. Flaggers and guards need to be told they have the authority *and responsibility* to physically stop people from entering the hazard zone if it becomes necessary. All of this information must come from the blaster-in-charge. A guard is a member of the blasting team and it is his or her responsibility to make sure he or she can perform as such.

SIGNING

All signing must conform to the Manual of Uniform Traffic Control Devices (MUTCD) for streets and highways whenever blasting operations are conducted on any road. The “BLASTING ZONE 1000 FT” sign is intended for use in advance of any point or work site where there are explosives being used (Figure 5-1). The “TURN OFF 2-WAY RADIO” sign and “END BLASTING ZONE” sign must be used in sequence with this sign (Figure 5-2). Provisions shall be made for covering or removing the sign sequence when there are no explosives in the area or the area is otherwise secured.

Along trails or in other roadless-area blasting, the signs used need not exactly match MUTCD details and may be tailored in size, text, and placement to best serve a particular situation. However, they must still meet the intent of the MUTCD standard, which is to prevent accidents by properly warning and informing persons approaching the blasting area, at a distance adequate to their safety and the safety of the blasting crew.

SIGNAL SYSTEMS

Throughout a blast sequence, the blaster-in-charge and others in the blast area (most particularly the guards) communicate by means of signal systems. Signal systems may range from hand signals and/or shouts, using horns or whistles, to direct radio communication. OSHA mandates that regardless of other means used, there must be an audible warning system as part of the signal system. No matter what methods are used, the signal system must always meet the following minimum standards:

- a. It must be simple and understood by everyone in the vicinity. If sign text states a signal sequence, then the system used must match the message in the sign.
- b. Warnings of the impending blast, "Blasting" must be provided at least twice: five minutes before detonation, and one minute before detonation. It is recommended that three warning signals be used: one at the time of pre-blast inspection, one at the time of blasting machine hookup (at least one minute before detonation), and another 10 seconds before detonation. These signals must be different enough to be individually identifiable by the guards.
- c. The system must include an "All Clear" signal, given after the post-blast inspection and distinctly different from the warning signals.
- d. The signal system must be a "positive-response" system where the guards can effectively communicate to the blaster-in-charge any need to halt the blast prior to instant of detonation, and the blaster-in-charge can effectively acknowledge that communication.
- e. The signals must be readily identifiable by the guards, with no risk of confusion about each signal's meaning. For this reason, the use of radio communication is strongly encouraged, while the use of hand signals or voice-only signals (yelling) are strongly discouraged.

For example:

General Blasting Procedures

Brief and setup guards:

Positive response system

Layout lead wire; continuity test

"BLASTING ONE" Guards respond

Test Cap (optional)

Hookup cap to lead wire

Cap to det cord

Inspect setup

"BLASTING TWO" Guards respond

Return to initiation site

Check continuity of circuit

Lead wire to blasting machine

"BLASTING NOW" Guards respond

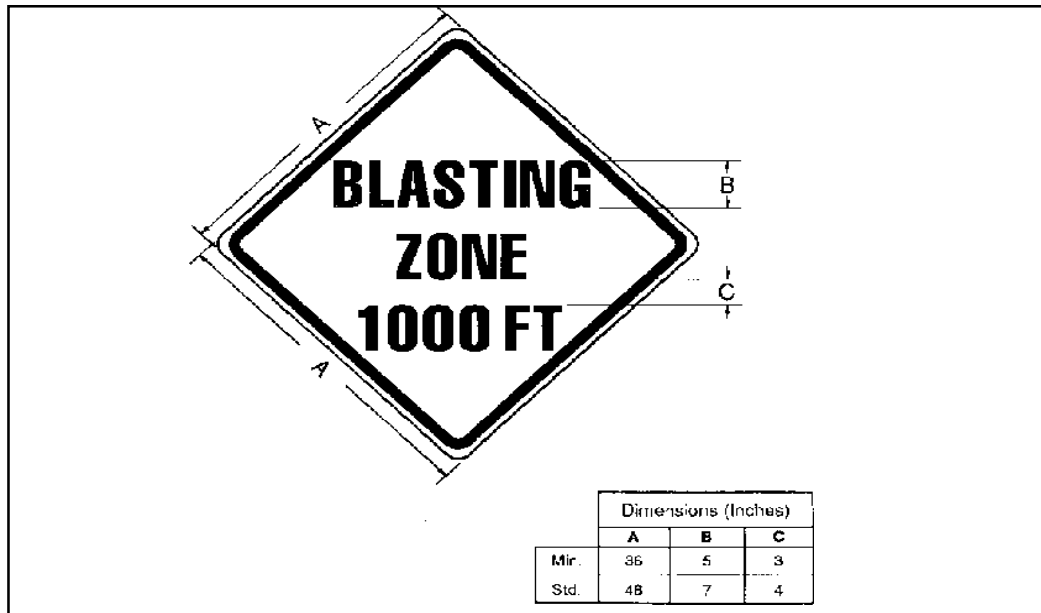
Initiate shot, "BOOM"

(if misfire, follow misfire procedures)

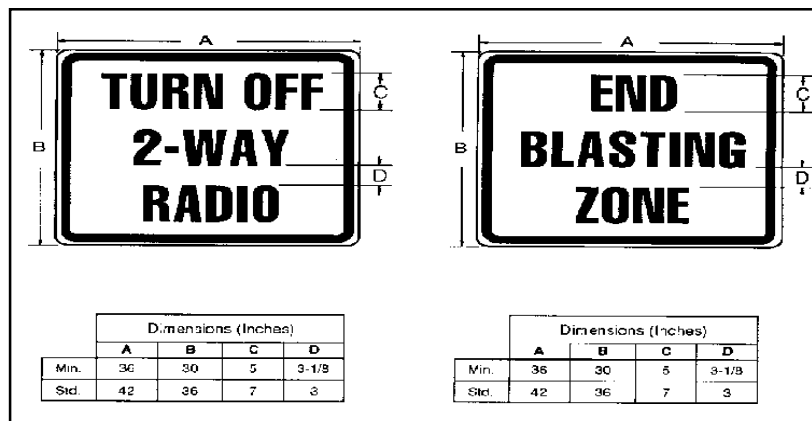
Disconnect and shunt lead wire

Inspect blasting site

"ALL CLEAR" Guards respond



(Figure 5-1) Blasting zone sign.



(Figure 5-2) Blasting zone signs.

AREA INSPECTIONS

A critical element in area security is the performance of the blast itself: Does it do what it was designed to do and in the manner anticipated? A smooth area security operation can suddenly become immensely complicated by a misfire or by fly-rock descending like giant hail in a place it was not supposed to reach. In order to help prevent this, the blaster-in-charge, alone and before anyone else enters the area, must inspect the blast site for any evidence of misfire, hangfire, or other hazardous conditions. Only after this inspection is made, and the blaster-in-charge gives the “All Clear” signal, can the area security system be relaxed. If any indication of misfire or hangfire is found, the area security system must remain in full effect until the risk of any unplanned detonation is eliminated by the blaster-in-charge.

