

STANDARD BLASTING POLICY

POLICY STATEMENT

When blasting, the Storage, Transportation, Use and Record Keeping of explosives will be handled in a safe and efficient manner consistent with all applicable laws and regulations, i.e., DMME - Safety and Health Regulations - 4 VAC 25-40 and Federal Metal and Nonmetal Mine Safety and Health Regulations - 30 CFR 56 Subpart E and ATF&E Federal Explosives Law and Regulations - 5400.7

GENERAL

The following rules regarding blasting procedures will be observed by all operations. This includes fall protection under "six (6) foot rule" (refer to Policy 100-504) and use of the "Blasting Checklist" by each blaster when designing and preparing a shot.

In instances where these rules conflict with or overlap with those of local, state, or federal regulations, the blasting practice will be to abide by the more stringent regulation.

STORAGE

1. Locks and security devices will be checked or monitored daily on all explosive magazines, containing explosives.
2. Explosive inventories are to be kept at a minimum level. Maximum total inventory is determined by the Plant specific ATF&E Magazine Worksheet.
3. The explosive supplier's *DRAY Ticket* (Bill of Laden) is *Official Acquisition Record*. The *Official Acquisition Record* must be retained for five (5) years from the date of transaction.
4. Each plant will use the standard corporate "Record of Explosive Inventory" form for keeping the current count of explosives stored in each magazine. This is considered by ATF&E to be the *Daily Summary of Magazine Transactions (DSMT)*. The DSMT must be retained for five (5) years from the date of transaction.
5. A physical count of inventory will be performed to reconcile the "Record of Explosive Inventory" each time an order for explosives is placed. Reconciliations will be noted on the "Record of Explosive Inventory" form.

SHOT DESIGN

1. Shots will be laid out by a designated representative, approved by the Plant Manager.
2. Face height will be established by using a laser profiler, Abney level, burden pole and tape, or other approved means. Holes are to be drilled to a calculated depth.
3. No shot within the top twenty (20) feet of the rock formation will be drilled facing an adjoining property line, which is less than seven hundred fifty (750) feet from the blast site.
4. All drill holes will be adequately protected after being drilled. Adequate protection can be the insertion of a blasting tube into the drilled hole or covering of each hole the same day as it is drilled.
5. All drill holes will be drilled at the proper angle. The driller shall use tools or technology to ensure the proper angle is being drilled. The Blaster-in-Charge shall also apply tools, technology and collaboration with the driller to ensure every face hole is drilled as designed.
6. For each borehole intended for blasting, the driller shall produce a drill log as drilling progresses. In areas where voids, cavities or weak zones are suspected in the rock formation, the driller must inform the Plant Manager and his designated representative if such conditions are encountered when drilling. The drill log shall be signed by the driller.
- 7a. All pre-split shot designs will be reviewed, approved or executed by a Corporate Blasting Technician.
- b. Surface preparation of the area from the pre-split to the free face shall be reviewed and approved by a Corporate Blasting Technician.

LOADING THE SHOT

1. Only persons designated as ATF&E Employee Possessors or Responsible Persons may handle or transport explosives.
2. All holes must be checked for depth, water, and obstructions before loading commences.

3. It will be the responsibility of the Blaster-in-Charge to consult with and receive permission from the Plant Manager or his designated representative to begin loading the shot.
- 4a. When using non-electric detonators, the maximum pounds per delay will be 850, unless governed by local laws of the county.
- b. When using electronic detonators, the pounds per delay and timing shall be designed to produce ground vibrations less than half the level allowed by law (4 VAC 25-40-880, see modified from Figure B-1, Bureau of Mines R18507 graph) at any inhabited building not owned or leased Local laws of the county may include additional restrictions.
5. Shot delay sequence must be approved by a certified blaster and the Plant Manager or his designated representative prior to loading.
6. When using ANFO, all holes will be dry or dewatered
- 7a. All powder columns shall be initiated with two primers
- b. For non-electric downhole primers, two (2) non-electric surface detonators of the same delay must be used to initiate each powder column. Any deviation to this principle must be reviewed and approved by a Corporate Blasting Technician. [Initiation of digital detonators does not involve surface detonators.]
8. Only a mushroom-type detonation device shall be used to initiate a non-electric shot. Only the electronic blasting machine intended for use with specific electronic detonators shall be used.
9. No drill cuttings, dust, or material larger than passing a $7/8$ " sieve will be used as stemming material. Holes must have sufficient stemming.
10. In holes where a deck is to be used, the following table will be the MINIMUM amount of stemming used in each deck for these diameter holes:

<u>Hole diameter</u>	-	<u>Stemming</u>
5 1/2 inches	-	6 4 feet
6 1/2 inches	-	7 5 feet
7 5/8 inches	-	8 6 feet

11. Explosives used in each hole will be recorded on the shot loading log sheet.
12. After each stick of powder is placed in a wet hole, a depth measurement will be taken to insure continuity of detonation.

13. All blasting is planned to occur between 9:00 A.M. and 4:30 P.M. at all locations. Site specific circumstances may prescribe specific times within this range when a shot may or may not be detonated. The shot shall be fired "as soon as possible" after completion of the loading process as determined by the *Blaster-in-Charge*.
14. The Plant Manager or his designated representative must see that all associates and equipment are at a safe distance from the blast area.
15. All in-plant avenues of approach to the blasting area, and all necessary public highways will be blocked and guarded during the blast.
16. The shot firer must have a communications device providing clear communications with anyone guarding the blast area in the event that the blast must be aborted.
17. Sound a warning alarm and call neighbors as necessary prior to blast.

WARNING CYCLE

One prolonged blast of siren for 60 seconds.

Wait for 30 seconds.

One prolonged blast of siren for 60 seconds.

Shot is fired 30 seconds after last blast of siren.

The Blaster-in-Charge checks the shot results.

One prolonged blast for 30 seconds to signal "all clear".

18. **Never** will the lead-in line be connected to the initiating device until the blast area has been cleared.
19. Large boulders will be drilled and shot only with great care. Drill holes must be placed exactly as prescribed by the Blaster-in-Charge. If this is not possible, the boulder may not be shot using explosives. The drill plan and "as drilled" holes must be reviewed by a second experienced blaster to ensure their correct placement. Powder Factors must be reviewed for each hole, as drilled.

AFTER THE BLAST

1. After the shot has been initiated and the blast area appears clear, the Blaster-in-Charge, and the Plant Manager or his designated representative must check the blast area to see that all holes have fired before any other associates return to the work area.

Misfires

- A. If a misfire occurs, no person shall enter the blast area for at least 15 minutes. The blasting area shall be guarded or barricaded and posted with warning signs until the misfire has been cleared.
 - B. If a misfire occurs, appropriate personnel must be notified immediately. They are Plant management, Regional Operations management and Corporate Blasting Leadership.
 - C. A site-specific plan must be developed for the safe handling of a misfire. This plan shall be approved by Plant management, Regional Operations management and Corporate Blasting Leadership.
2. Sound the all-clear siren after all the holes in the shot have been fired.
 3. A shot report and shot loading log sheet(s) shall be filled out completely the same day of the shot and kept for at least five (5) years and be available for inspection by regulatory agencies (federal, state, and local). The seismograph report shall also be kept with the shot report.
 4. The shot loading log sheet(s) must include the shot diagram, including burden and spacing for each hole, timing of detonation for each detonator used and the explosives used in each hole. The log sheet(s) and drill log shall be kept on file with the shot report.
 5. The Plant Manager, or his designated representative, shall respond to any calls about the blast.
 6. The "*Blasting Event Report Form*" will be used to document calls from neighbors and the community regarding our blasting. Event documentation must be kept on file at each plant for at least three (3) years, plus the current year

7. Each Plant will have "*A Plan to Control the Effects of Blasting*" and act on the commitments of the Plan.
8. Any shot that produces air-overpressures or particle velocities at specific frequencies greater than half the level allowed by law (Department of Mines Minerals and Energy 4 VAC 25-40-880, modified from figure B-1, Bureau of Mines R18507 graph) at any inhabited building not owned or leased by Luck Stone Corporation will be reviewed by _____ Corporate Blaster. All phases of the shot, from the shot design, timing, loading and the drill log will be used to try to determine what may have caused the higher readings. A recommendation for change will be made and documented for the next shot in the same area or condition.
- 9a. All pre-split holes, shot independent of production blasting, shall be located by high accuracy GPS surveying.
- b. Any berming required adjacent to a pre-split shot will be constructed of appropriately spaced big rocks, or material berming. The berm must be constructed in a manor to ensure the location of the pre-split line remains visible.
10. Once a production blast has been shot to the pre-split line, the pre-split line should typically be recognizable. If not, further examination and determination shall be made using all technology currently available.

ACTION

All persons associated with the transportation, planning and using of explosives on property shall comply with this policy. It is the responsibility of each Plant Manager to assure that this policy is enforced at his plant.

Notes: Any deviation from the above policy must be approved by Plant management, Regional Operations management and Corporate Blasting Leadership.