wk
9/08/11

CANE CREEK MINE PERMIT (P-3952)

BLASTING PLAN

GUNNER-REILLY CORPORATION

Joey Reed 00535

Alabama Certified Blaster Number

BLASTING PLAN

1. Ground vibrations and airblast control

(a) Check which of the following procedures will be used to limit ground vibration.

X Maximum Peak Particle Velocity

Distance from Shot to Site	Maximum Peak Velocity
0 – 300 feet	1.25 inches /second
301 – 5,000 feet	1.00 inches/second
5,001 – beyond	0.75 inches/second

*All shots must be seismographically monitored.

___ Scaled Distance Factor

Distance from Shot to Site	Maximum Peak Velocity
0 – 300 feet	1.25 inches /second
301 – 5000 feet	1.00 inches/second
5001 – beyond	0.75 inches/second

*Seismograph monitoring is not required.

___ Modified Scale Distance Factor – approval from the Commission is required before this method can be used.

___ Blasting-level chart – approval from the Commission is required before this method can be used.

** Identify the structure used for measuring the scale distance.

(b) Check which of the following maximum levels and corresponding microphones lower frequency limitations will be used

___ 105 dB peak – c weighted – slow response*

___ 129 dB peak – 6 Hz or lower

X 133 dB peak – 2 Hz or lower

___ 134 dB peak – 0.1 Hz or lower

2. Describe what variations will be made in the blasting operations to control and correct adverse effects due to blasting.

Note: Due to some homeowners objections to having a seismograph placed on their property, we will monitor at a distance to or less than the closest occupied dwelling if this occurs. (Only with approval of the Alabama Surface Mining Commission.)

3. Blast Monitoring

(a) Describe the blast monitoring equipment to be used (make and model). Will it monitor ground vibrations, air blasts, or both?

Nomis 5400 2 Hz
Nomis 5300 2 Hz
Nomis 7000 2 Hz

*All of these machines monitor both ground vibrations and air blasts.

(b) How will monitoring equipment be installed and activated?

Equipment will be installed on a temporary basis for one individual shot or on a semi-permanent basis for 24-hour monitoring. The equipment will be activated by an individual or will be triggered by the ground vibrations or air blasts. Transducers will be buried.

(c) Show the location of blast monitoring stations on the permit map or on a separate map with a scale of 1:24,000 or smaller.

4. Is blasting proposed to be conducted within 500 feet of an active underground mine?

( ) yes (X) no

If yes, concurrence from MSHA is required.

5. Will blasting be conducted within 500 feet of an abandoned underground mine or within 1000 feet of an occupied dwelling, church, school, or other institutional building?

(X) yes ( ) no

If yes, provide the following information, either as part of the permit application or, at a later date, but before reaching the distance given above:

(a) A sketch showing the drill patterns to be used
(b) Critical dimensions, i.e.: burden, spacing, stemming, drill hole diameter, etc.
(c) Delay periods
(d) Amount of decking
(f) Type and amount of explosives to be used, including the loading weight (lbs. per foot of drill hole)
(g) Discuss the measures to be used in the blasting operations to protect the public from adverse effects of blasting
(h) Plans are to be prepared and signed by a certified blaster

6. At what times will blast operations be conducted?
Blasting will be conducted from sunrise to sunset Monday through Saturday.

7. Will blasting operations be conducted within 300 feet of an occupied dwelling, school, community, or institutional building?
( ) yes (X) no

BLASTING SAFETY (Part 3 C2)

In order to maximize safety in the direction of human presence (Corridor "X" Interstate, Dwellings & Structures), ALL secondary faces, opposite of planned burden movement (This could also be called spacing), shall be patterned to provide a minimum of 1.5 times the burden on the open face of the planned burden movement spacing.

A. (1) Prior to drilling a blast pattern, the bench will be inspected to determine if any geologic inconsistencies are present which could result in weaker zones, thus causing a blowout and flyrock. The drill pattern will be altered as needed.

(2) Prior to the charging of a blast pattern, the drill operator will be consulted to determine if any inconsistencies were encountered during the drilling of the blast pattern. If inconsistencies are found, the charging sequence will be altered to accommodate and prevent blowouts.

(3) The charge column of the blasthole will be closely monitored to ensure that the amount of blasting agents is not in excess of the allowable design

(4) Prior to detonation of blasts, the blast area will be patrolled, regulated, and blocked off by employees to prevent unauthorized entry. Blast warnings will be given prior to each blast; three (3) long horns for a five (5) minute warning, two (2) long horns for a detonation signal, one (1) long horn for an all clear signal once the blaster in charge determines that to be the case. Each blast will be visibly monitored to determine whether or not flyrock occurred. All public roads within 1,000 feet of the blast will be blocked prior to detonation. Guards will be provided with metal signs having the words "Stop – Blasting" plainly printed on them and will use a red flag for warning purposes.

(5) When blasting within 1,000 feet of the Norfolk Southern Railroad, the Chief Dispatcher of Norfolk Southern Railroad will be contacted prior to the blast to determine the rail traffic schedule. All blasts will be coordinated with the Chief Dispatcher to ensure that the track is clear and no train is scheduled to be in the immediate blast area.

SAFETY GUIDELINES WITHIN 1000 FEET OF CORRIDOR "X" RIGHT-OF-WAY

As requested in the permit for Gunner-Reilly Corporation, we are submitting the following guidelines to maximize safety when we are within 1000 feet of the right-of-way of Corridor "X". It is also understood that NO blasting will take place within 600 feet of the Corridor "X" traffic lanes.

1.) An Accurate drill log will be kept for each hole that is drilled. The log will show the depth of the hole, depth of unconsolidated material from the collar of the hole to solid material (unconsolidated material to include dirt, clay, fill material, and broken rock). The drill log should also note any mud seams or voids encountered during the drilling of the hole. The drilling log will be attached to the shot report maintained at the mine site.

2.) Stemming will be maintained at a minimum of twelve (12) feet. Stemming will always be maintained at least three (3) feet into solid rock. Example: 15 feet to solid rock will equate to eighteen (18) feet of stemming.

3.) The progression of the mine will be in such a manner that the free face is parallel to Corridor "X", or facing away from Corridor "X".

4.) Try to refrain from blasting when strong winds are blowing toward Corridor "X".

5.) To maintain the highest level of safety to those individuals traveling on Corridor "X", a spotter will be used so that the spotter can see traffic approaching from both directions on Corridor "X". The spotter will give the "all clear to shoot" signal/word to the blaster only when traffic is clear in both directions of travel. Because of the spotter giving the order to shoot when the traffic is clear, there could be a lapse of time between the warning signal and when the shot is actually fired.

TYPICAL BLAST DESIGN (Part 3 C5)

Diameter of boreholes will range from 6 3/4 inches to 7 3/8 inches.

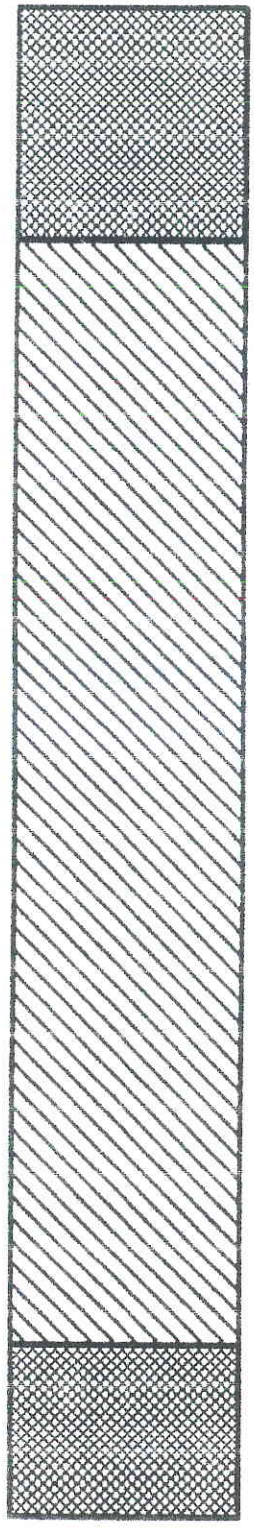
Explosives: ANFO with average density of 0.82 (12.70 lbs/ft up to 22.59 lbs/ft)
25/75 blend, density of 1.12
40/60 blend, density of 1.34
50/50 blend, density of 1.32
Emulsion, density of 1.25
Blends with density up to 1.34 (20.76 lbs/ft up to 36.91 lbs/ft)

Size of drill patterns will vary from as small as fifty (50) feet to as much as 300 feet in length. Width of the bench will typically be 120 feet. Burden distances will be between eight (8) and fifteen (15) feet and spacing will be between ten (10) and twenty (20) feet. For overburden, less than twenty (20) feet. burdens will be between twelve (12) and twenty-five (25) feet and spacing will range from eighteen (18) to thirty (30) feet for overburden in excess of twenty (20) feet and up to forty (40) feet. Overburden in excess of forty (40) feet will range from eighteen (18) to twenty-eight (28) feet and spacing will range from twenty (20) to thirty (30) feet.

Stemming will be calculated using the ash formula of 0.7 to 1.3 times the burden.
(Example: 16 B x 0.7 = 11' 2" minimum stemming)
If the ash formula is not used, a minimum of 85% of the borehole will be inert material.

A minimum inert decking will range from 5' to 8' inert material.

TYPICAL BOREHOLE

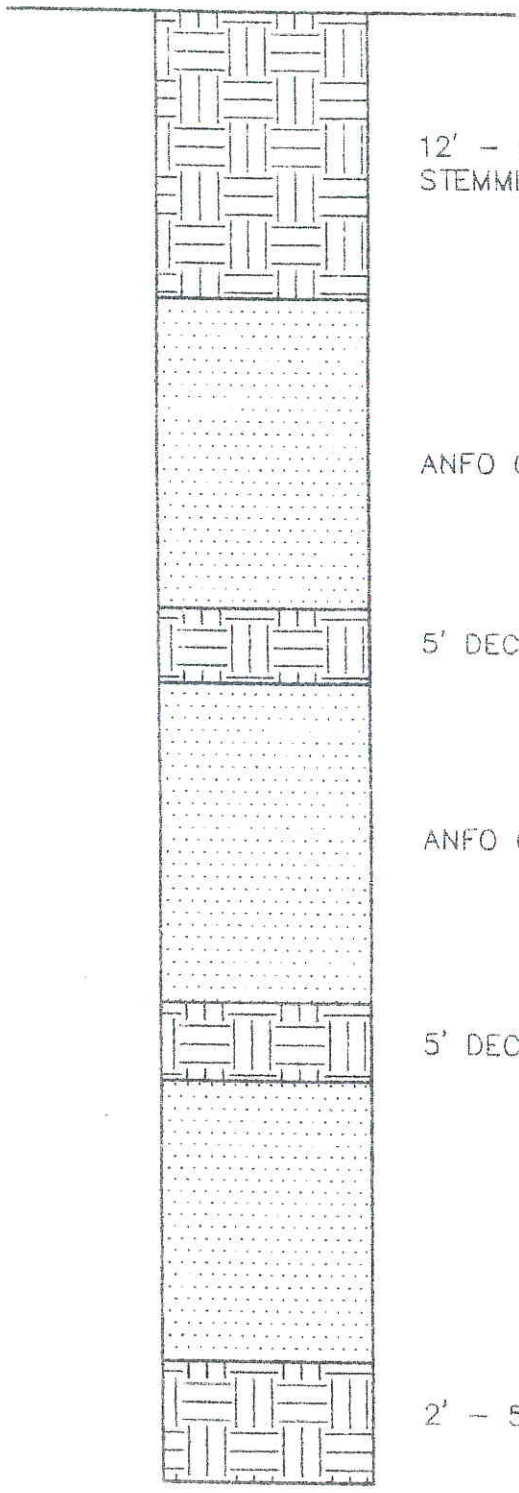


12′ Stemming

Anfo

4′ Backfill

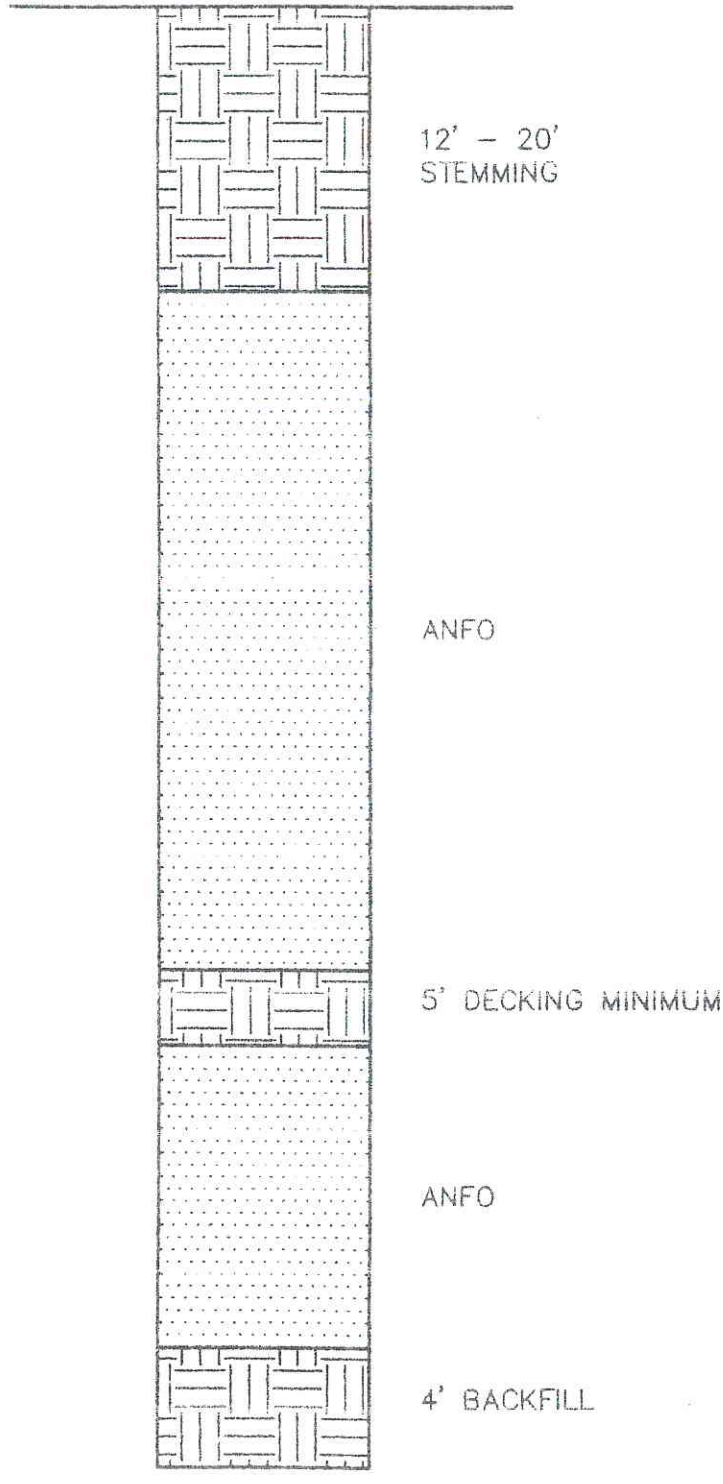
TYPICAL BOREHOLE for BLASTS BETWEEN 301 FEET and 500 FEET



NOTE:
THE NUMBER OF DECKS ARE SUBJECT TO CHANGE AS CONDITIONS REQUIRE.

TYP-BORE.DWG

TYPICAL BOREHOLE for BLASTS BETWEEN 501 FEET and 1000 FEET



NOTE:
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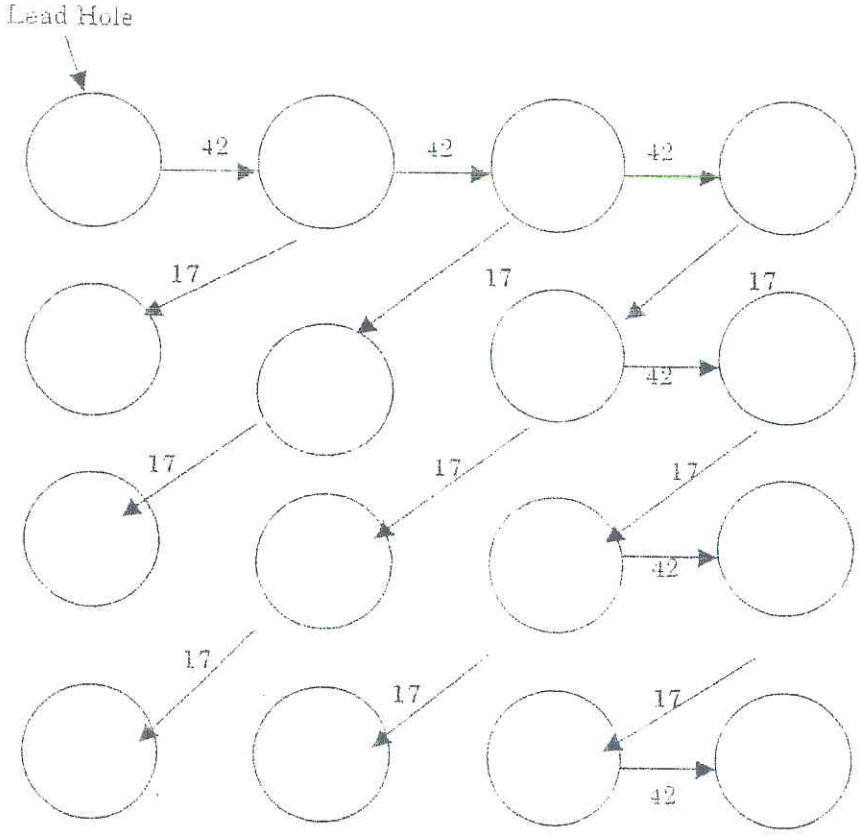
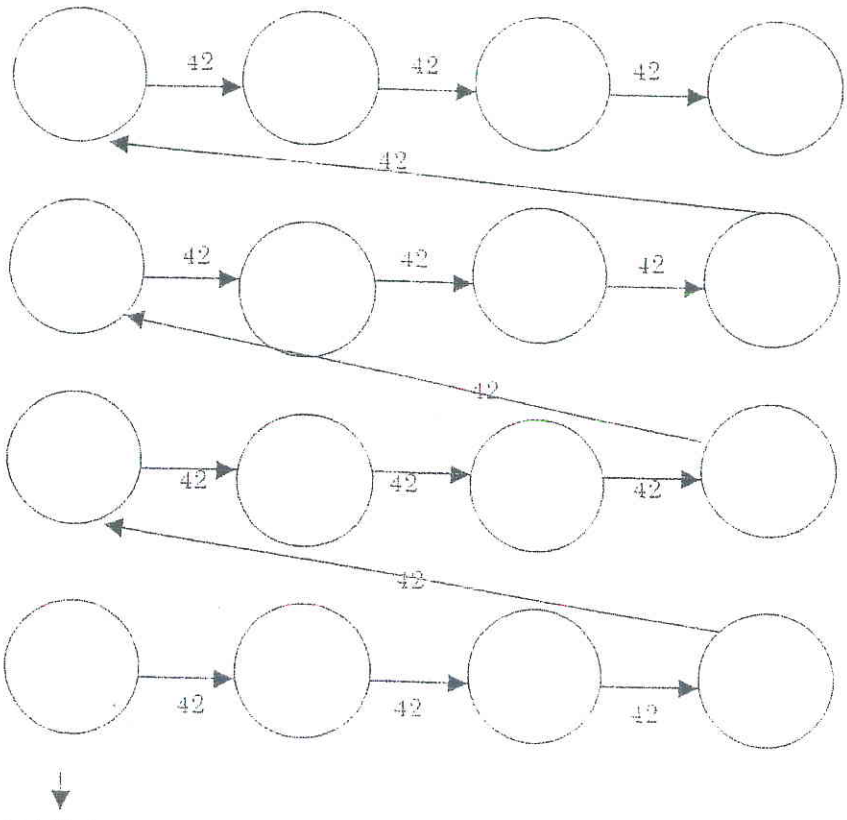
QCBCBORE.DWG

Typical Drill Pattern / and Delay pattern or a Staggered Pattern may be used.



Firing will be non – Electric. The typical surface delays for shots will be 9, 17, 42, or 100 ms delays. The typical in hole delays will be Nonel downlines 400 ms, 425 ms, 450 ms, 475ms or 500ms delays as needed. Other delay patterns may be used if a different delay pattern is needed. Rows of holes and number of holes will vary depending on the pit width and burden and spacing or Electronic detonators may be used.

Typical Drill Pattern / and Delay pattern or a staggered pattern may be used.



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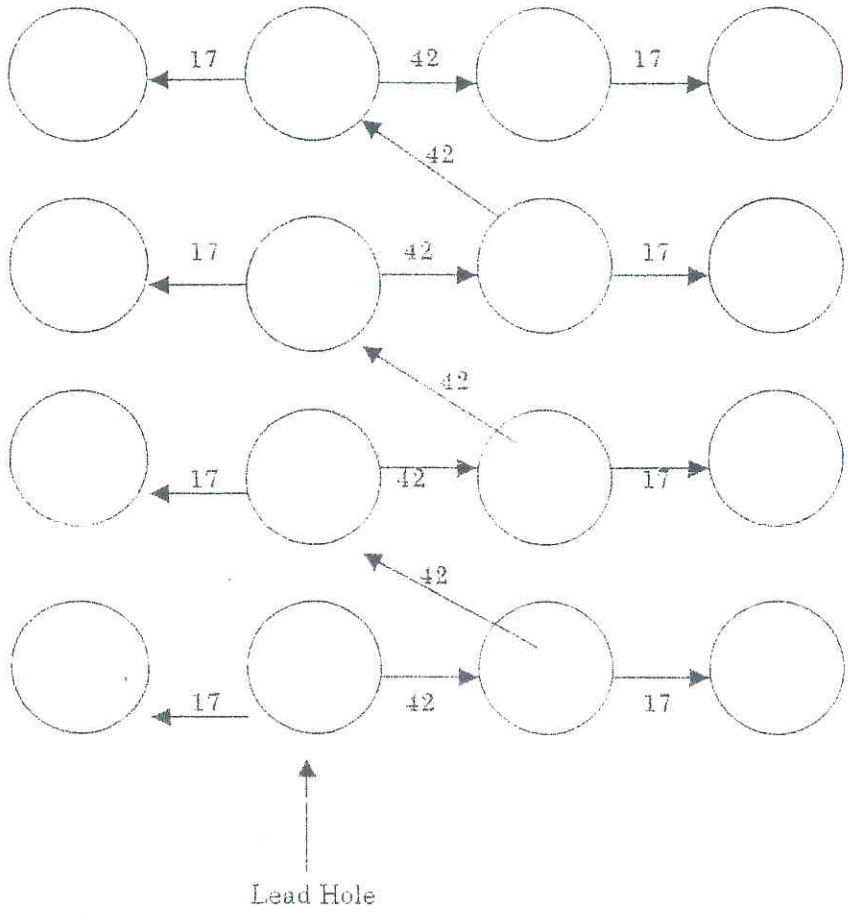

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