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092I/6E

## Pit Operations

The pit is being mined by conventional truck and shovel mining methods. The operation is on a seven day continuous shift basis, and moves approximately 150,000 tons per day of ore, waste and overburden. Of this, approximately 47,000 tons per day are of ore.

## Design Parameters (See attached diagram)

Mine Operations work to the following design parameters:

| | | |
|---|---|---|
| Bench Interval Height | - | 40 feet |
| Safety Berms in Rock | - | between 25 & 100 feet |
| Roadway Width | - | 100 feet |
| Roadway Gradients | - | 8 percent |
| Temporary Ramp Gradient | - | up to 10 percent |

## Drilling and Blasting

All production drilling is done with three electric powered Bucyrus-Erie 45R rotary drills, equipped to drill 9 7/8 inch diameter holes. Steel tooth rotary bits are used almost exclusively. Average bit life is about 3900 feet with a range of 1600 to 8000 feet. Approximately 15 percent of present drilling is done in overburden with the remainder in rock. Average penetration rate is 100 feet per hour.

Drill holes are laid out on a square pattern. The quartz diorite rock (mainly ore) is drilled on a 36' X 36' pattern. Overburden is drilled on a 34' X 34' pattern. The Bethsaida granodiorite rock is presently being blasted on a 28' X 28' pattern.

Subgrade drilling ranges from six feet in rock to 5 - 10 feet above grade in overburden. Staying above grade in overburden results in a tighter toe, but better stability for the shovels.

No allowance is made for overbreak. Patterns are laid out contigously. In regular areas, blasts are held to three rows deep. Essentially all blasting is cushioned. Few toe problems have been experienced.

Winter blasting involves deck loading the top section of the borehole to achieve breakage of the frost slabs.

Blasting is presently being done with a watergel slurry explosive. In the winter, water is pumped from the top of the main explsive column before stemming and placement of the deck charge of slurry. Deck charges of 150 to 200 pounds of slurry are placed 10 to 15 feet from surface. Regular drill hole cuttings are used as stemming.

All holes are double primed in the main powder column using two separate down lines of plain primacord. Deck charges are used for boosting. In the main slurry column primers are placed with one at the hole bottom and one raised 10 feet off the bottom. Double lines of E-cord are used for tieing in all holes.

Drilling and Blasting (cont'd)

Twenty-five millisecond relays are used in the tie-in for rock. Forty to forty-five millisecond delays are used in overburden to gain more ground movement. The densely fractured rock enables powder factors of 0.20 to 0.30 pounds per ton to be effective.

For blasting detail refer to the attached diagram.

Loading and Hauling

Primary excavation in the pit is carried out by five 15 cubic yard and one 22 yard electric shovels. Power for the shovels is conducted by trailing cables from skid breakers located adjacent to the pit perimeter powerline. Trailing cable voltage for the equipment is 4160 volts.

The average production rate for an operating shift is about 14,000 tons for the 15 yard shovels and 18,500 tons for the 22 yard shovel.

The haulage fleet is made up of twenty-three 120 ton capacity two axle trucks and eleven 235 ton three axle trucks. The 120 ton trucks have a horsepower capacity of 1000 hp while the 235 ton trucks are rated at 2475 hp. All haulage units are electric drive. The 120 ton units have motorized rear wheels while the 235 ton units have a traction motor on each drive axle which in turn provides conventional power distribution through a differential and planetary arrangement to the wheels.

The 120 ton units are equipped with six 30.00 x 51 tires.

The 235 ton units are equipped with ten 36.00 x 51 tires.

Average tire life is about 3,700 hours for 120's and 4,500 hours for the 235 ton trucks.

Auxiliary Open Pit Equipment

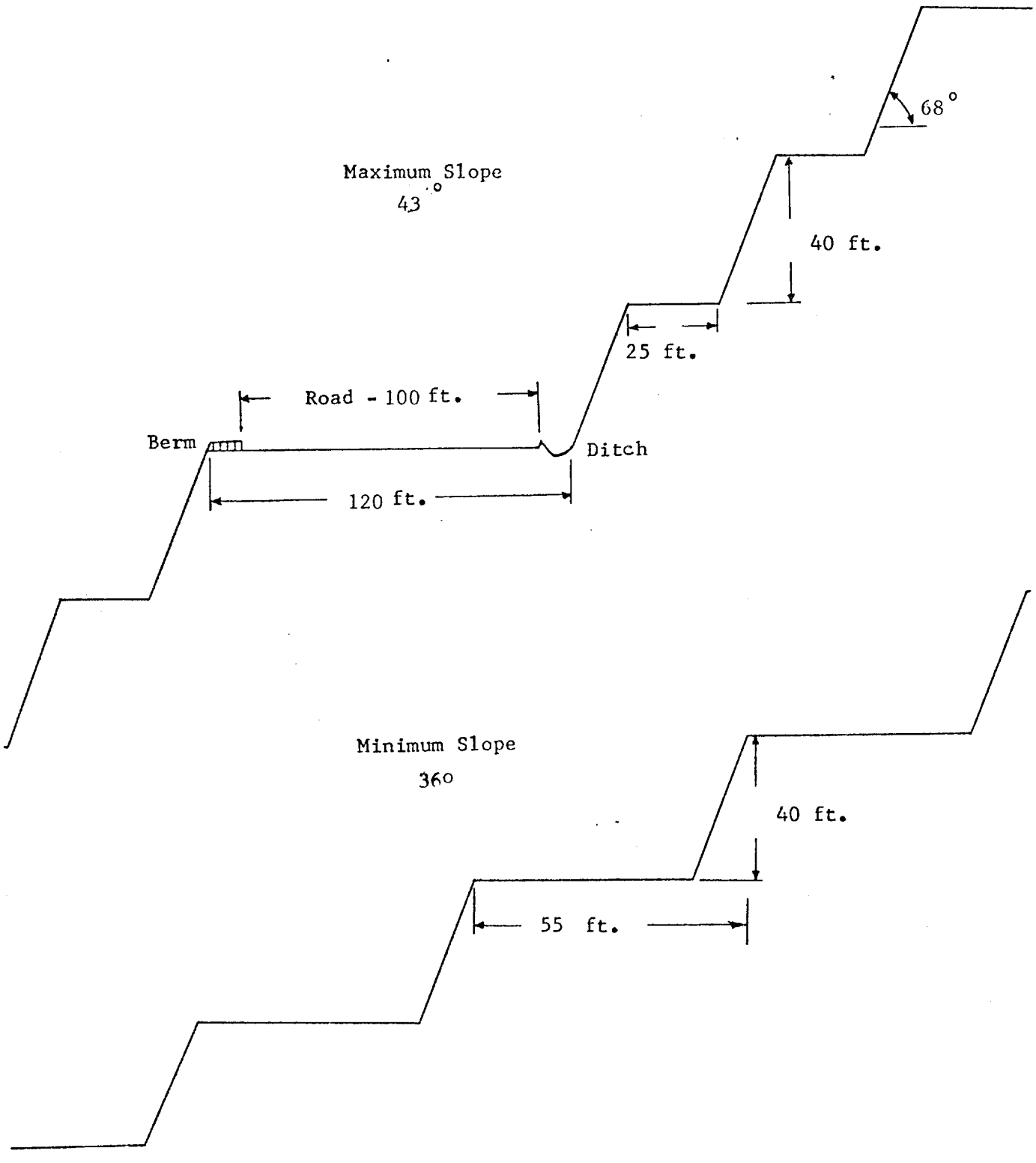
Waste dumps and stockpiles are maintained by six bulldozers, five equipped with rippers and one equipped with a winch. The cleanup around the shovels and spillage on the roads is handled by four rubber-tired dozers. Miscellaneous pioneering work and small excavation jobs are handled by two front-end loaders with 5½ cubic yard rock buckets. These loaders generally work with two 35 ton haulage trucks.

Two other 35 ton haulage trucks are equipped with 6,000 gallon water tanks with special spray nozzles for dust control on main haul roads.

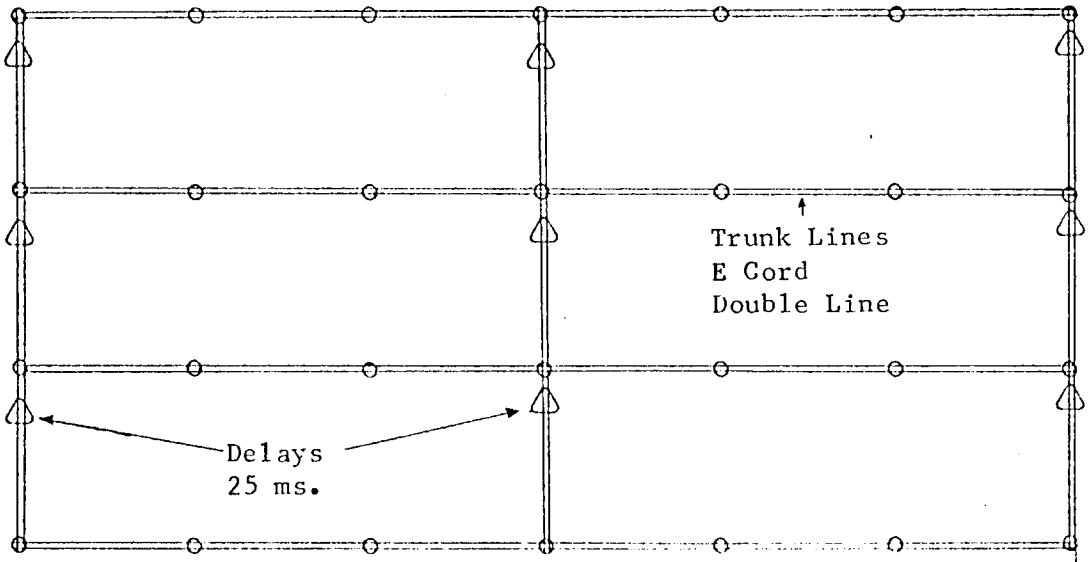
During the winter, one of these water trucks is converted to a sand/calcium spreader to maintain the roads. Miscellaneous drilling is handled with a track-mounted mobile drill. This drill is equipped with a 600 CFM compressor, a 4½ inch drill-mounted on an articulated boom and all is mounted on a war surplus M-8 tank carrier. This unit has proven very useful, mainly because of good mobility from job to job around the property.

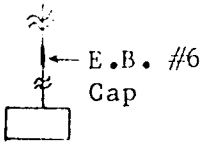
Two Dart D-600 front-end loaders equipped with high lift arms and 13 cubic yard buckets are used for blending ore.

BENCH AND ROAD DETAIL



# BLASTING PRACTICE



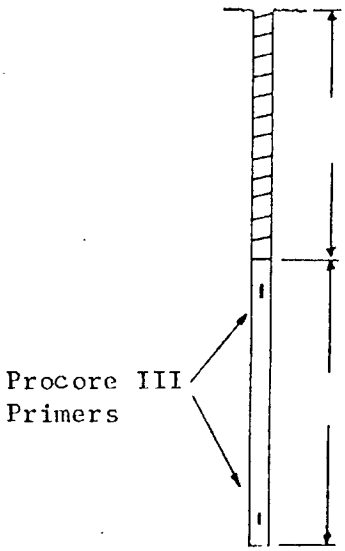




Blasting Patterns -

Square B & S = 36' X 36'
V B & S = 25' X 51'

Powder Factor - Avg. = 0.19 lbs./ton.

Summer Blasting




Subgrade varies

- Hard Rock + 6 ft.
- Softer Clays -10 ft.

Winter Blasting