

# BLAST DESIGN RULES OF THUMB

**HOLE DIAMETER (d)** = hole depth (H) divided by 5 to 10.

$$d(\text{in}) = H(\text{ft}) / 5 \text{ to } H(\text{ft}) / 10 \quad (\text{Usually not an option})$$

**BURDEN (B)** = 2 to 3 times the diameter.

$$B(\text{ft}) = 2 \times d(\text{in}) \text{ to } 3 \times d(\text{in}) \quad (\text{Typically } 2.5 \times d)$$

**SPACING (S)** = 1 to 2 times the burden.

$$S(\text{ft}) = 1 \times B(\text{ft}) \text{ to } 2 \times B(\text{ft}) \quad (\text{Typically } 1.5 \times B)$$

**STEMMING (T)** = 0.5 to 1.0 times the burden.

$$T(\text{ft}) = 0.5 \times B(\text{ft}) \text{ to } 1.0 \times B(\text{ft}) \quad (\text{Typically } 0.7 \times B)$$

**POWDER COLUMN (PC)** = hole depth minus stemming.

$$PC(\text{ft}) = H(\text{ft}) - T(\text{ft})$$

**LOADING DENSITY (LD)** = 0.3405 times the explosive density times the hole diameter squared.

$$LD(\text{lb}/\text{ft}) = 0.3405 \times \text{density}(\text{gm}/\text{cc}) \times d^2(\text{in}) \quad (\text{or Mfg design guide})$$

**CHARGE WEIGHT (CW)** = powder column times the loading density.

$$CW(\text{lb}) = PC(\text{ft}) \times LD(\text{lb}/\text{ft})$$

**POWDER FACTOR (PF)** = powder per hole divided by rock volume per hole.

$$PF(\text{lb}/\text{yd}^3) = CW(\text{lb}) / (B(\text{ft}) \times S(\text{ft}) \times H(\text{ft}) / 27)$$

**SCALED DISTANCE (SD)** = Distance to structure divided by square root of the charge weight.

$$SD(\text{ft}/\text{lb}^{1/2}) = \text{distance}(\text{ft}) / CW^{1/2}(\text{lb}^{1/2}) \quad (\text{Greater than } 55)$$

**PEAK PARTICLE VELOCITY (PPV)** = 438 times scaled distance to the -1.52 power.

$$PPV(\text{in}/\text{s}) = 438 \times (SD)^{-1.52} \quad (\text{Maximum expected})$$