



NOISE MAPPING AUSTRALIA
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PENV2
BLAST MODULE DESCRIPTION.

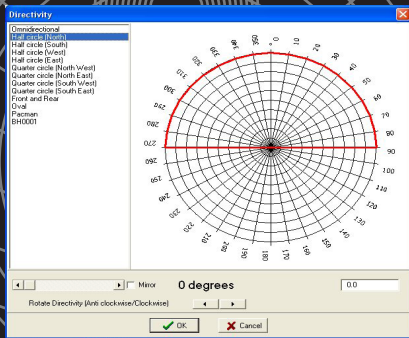
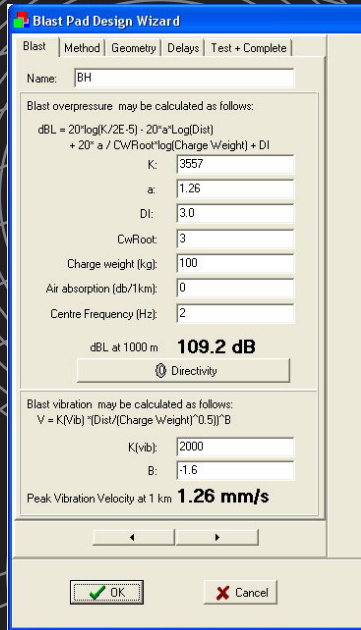


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PENV2 is a 3D environmental noise model having blasting noise and vibration, road traffic, railway and environmental noise modules and using a DTM. ■ The blast module comprises an intuitive graphical interface and calculation module.

■ The blast pad design may be entered manually or imported from a blast pad library. ■ Blasts may also be imported from packages. A blast pad design can be achieved with just a few key strokes. ■ The blast pad model can easily make designs comprising thousands of blast holes ■ Data to be entered includes stemming height, number of decks, location of centre of deck, explosive type, weight strength, bulk strength, charge weight, delay times and overall depth of blast hole ■ The blast hole diameter is needed for charge calculations and stemming model includes de- warnings ■ The various common as ANFO, Heavy and watergel. ■ The many standard de- surface delays and for the inderdeck delay times.



■ The blast hole diameter is needed for charge calculations and stemming model includes de- warnings ■ The various common as ANFO, Heavy and watergel. ■ The many standard de- surface delays and for the inderdeck delay times.

■ Blasting Noise & Vibration Module The blasting noise module is based the Environmental noise module. ■ Blast overpressure distance attenuation is calculated using the equation $20 \cdot a \cdot \log(\text{Distance})$. The a factor is site specific with the default value being 1.26. ■ The other attenuation factors (air absorption, barrier attenuation etc.) are automatically calculated via the environmental model at the centre frequency noted in the data entry screen. ■ The user may also nominate a directivity pattern for each hole. The default is omnidirectional. There are a number of alternative patterns and these may be modified. ■ The vibration model uses the propagation equation $k \cdot (\text{distance} / \text{square root}(\text{Charge Weight}))^B$. ■ This model has been verified in quarries and open cut coal mines. ■ As an option a more sophisticated "seed waveform" model has been developed as a plugin. The plugin comes from Heilig & Partners Consulting Engineers (Blasting). This model calculates the vibration and air overpressure by adding a "seed" vibration wave form at the individual blast hole arrival times based on path distance and the blasting delay. A sensitivity analysis of the resultant blasting waveform is carried out to assess the statistical variability of the likely vibration and noise levels. ■ For blasting in highly sensitive areas this method provides a greater level of confidence in the predictions. ■ Calculations may be at several receptor points or over a calculation grid for contouring. For test a blast prior to firing the point calculation method is more time effective.