

Client Reference

Mining | Seismic Vibration

Localised vibration levels are reduced by structural re-enforcement. The sound waves are deflected by the provision of curtain dampers. Periodic measurements are analysed and with trending compliance is achieved.



Client background

A large mining client received a number of complaints relating to residential property damage due to mining activities in the area. Consequently a potential lawsuit could have developed between the mining client and the community. Complaints ranged from human disturbance to the demolition of a residential structure.

In spite of the many varying damage criteria established in the past, it is difficult to completely isolate vibration damage from damage caused by natural settling of the building, inadequate construction, old age, etc. Even if a valid “fool proof” damage criterion were established, the critical problem remains to eliminate or considerably reduce all complaints resulting from ground vibrations. Regardless of what the prevailing legal vibration limits are within a community.

Key challenges

- Proving the mine vibrating screen had no impact on distant residential structures.
- Analysis of vibration frequencies relative to structural resonance.
- Analysis of vibration due to varying load conditions.
- Evaluating multiple vibrating screens during in-synch and out-of-synch operating conditions.
- Compliance to specifications are summarised in the table below:

Place	Human Comfort Vibration (mm/s)
Critical working areas	1
Residential	1.4
Office	4
Workshop	8

Value add

- Our assessment of the structural integrity of the vibrating screen at the mine did reveal defects.
- Once defects were detected and fixed asset life is extended and vibration on the screen structure reduced.
- The concerns of the community were addressed as it was found there was no correlation between the mining activity and housing structural defects in the neighbouring area.
- Compliance to regulations and specifications were adhered too during the assessment and legal liability was waived addressing the clients concerns.



Martec intervention

- Performed a visual inspection on vibrating screen structures and components.
- Assessed vibrating screens using vibration analysis.
- Quantified the level of vibrations experienced at the suspected source.
- Took measurements at defined locations, 500 m away and 1.5 km away.
- Tracked vibration frequencies from source to destination.
- Reported on findings with recommendations.

Tools and technology

- Vibration analyser and software
- Low frequency vibration sensors
- Fast Fourier transform frequency analysis