Charles Taylor ADJUSTING

Adjusters' Insight

Shaken Not Stirred - Vibrational Effects on People and Property

Much of Australia's future construction work will be carried out within crowded urban areas involving the replacement or upgrading of older buildings or the creation of new infrastructure between, over or under existing infrastructure.

One particularly negative consequence of construction activities is the unintended transmission of vibration to adjacent areas and properties. Some of the negative impacts include noise from construction equipment, loss of trade to established businesses because of restricted access caused by construction work and damage to existing structures.

Vibration damage can lead to insurance claims. In these circumstances, an adjuster who is pro-active and empathetic with a strong technical background is able to be an effective neutral third party intermediator between the Claimant, Contractor, Developer and their Liability Insurers.

In this article, Richard David, Engineering Loss Adjuster and Andrew Hodkinson, Regional Head – Australia & New Zealand of Charles Taylor Adjusting demonstrate how vibration emanating from construction sites can cause lengthy disputes with claimants affected and outline measures to avoid or diminish the risks of contemplated vibration damage to third party property.

Extensive experience in dealing with claims involving vibration shows that Contractors often give scant regard to the potential impact of vibration on adjacent structures and people. That lack of regard may be born out of a lack of awareness concerning the difficulties associated with dealing with vibration claims when they arise. Contractors can also on occasions undertake works not understanding the consequences of heavy vibration equipment used in soil compaction or even the driving of sheet piles.

The Nature of Vibration Claims

Recent claims involving alleged vibration damage all share a common feature being the Claimant. The Claimant(s) involved are invariably a private individual or company and the property belongs to that entity. In addition, the property is a residential or small commercial property and is the main asset of the Claimant. Clearly, from the outset, vibration related claims become highly personal and emotional.

Vibration related claims are therefore not dominated so much by technical considerations, albeit that these are important, but more by the nature and personality of the claimants. They have a vested interest and attachment to their property.

Claimants are by no means the weaker party in a dispute. They are aware of their ability to exert leverage over Contractors or Land Developers whom they blame for the damage. That leverage comes from their power to cause reputational damage and some Claimants are not afraid to use that power to their ends. For example, Claimants have been known to complain to their Local Council, their Local Member of Parliament and even threaten to contact the press in order to bring negative and damaging public attention to the involved Contractors and Developers.

It would however be misleading to always represent Claimants as persons who seek to make a windfall gain from their alleged loss. They can often be the bystander who now has fresh damage to their property as a result of construction works including vibration. The important consideration in dealing with such claims is to keep an open mind and cast an objective eye on the circumstances and situation of the claim.

The Temporal Argument

In our experience all claimants generally invoke what we term 'the temporal argument' in support of their claim.

This argument is relatively straightforward and is as follows: the Claimant alleges that their life prior to the event was a tranquil one and their property was free of defects of just about every kind. That tranquility was disturbed by construction work on the neighboring or nearby site that generated vibration that the Claimant personally experienced. The experience is usually described in visceral terms with one claimant describing their experience of vibration 'as an earthquake'.

Following such experiences, claimants allege that their property was so greatly disturbed that damage was inevitable and they then proceed to point out the extent of such damage. Claimants invariably emphasize that such damage did not exist prior to and could have only occurred during the period when they experienced vibration – hence the temporal argument. Some Claimants have resorted to spending a few thousand dollars on Consultants to make that point for them.

Claimants largely remain closed minded or ignorant with respect to other plausible causes giving rise to common property defects and the possibility that prior to the vibration incident, they likely had not noticed pre-existing cosmetic defects in their property.

Claimants often express disbelief and even hostility when it is suggested to them that it is most likely that their home was not free of defects prior to the incident. This hostility can be exacerbated when the Claimant was generally against the development in the first place or became irritated by other activities undertaken by the Contractor during execution of the works that negatively affected them i.e. dust.

Investigating Vibration Related Claims

It is clearly unsatisfactory for Contractors, Developers and their Liability Insurers to accept the Claimant's temporal argument at face value.

The first and obvious defense in these matters is by way of reference to the dilapidation report and it is here that Contractors and Developers often trip up.

Often no such report was commissioned prior to site works commencing. To be fair, it is often not practical or economical for a Contractor or Developer of smaller projects to carry out dilapidation surveys where numerous properties could

be affected. We have also found instances where vibration damage allegedly occurred to a property that we would not ordinarily expect to be affected. Identifying properties for dilapidation survey at the outset may therefore not necessarily guarantee that all potential claimants are identified. Furthermore if the quality and detail of the dilapidation report is poor then such documents may in fact be counterproductive from the standpoint of the Contractor.

Where dilapidation reports are provided, their value is often questioned by the Claimant because they were commissioned only after vibration inducing work commenced on site. In one instance, we were provided with a dilapidation report in the form of a video from the involved Contractor where jack-hammering noise could clearly be heard on the video soundtrack. Work on the adjacent site was already obviously well underway. The message here is that dilapidation reports are required pre-works.

In another instance, the involved Contractor commissioned a dilapidation report only after the Claimant complained to the Contractor that they were experiencing vibration at their property. Two years later, when the development was complete, the Contractor approached the Claimant seeking to resolve the matter and the Contractor commissioned a second dilapidation report to quantify the scope of 'new' damage. Unsurprisingly, the Claimants rejected the findings of all dilapidation reports leaving the Contractor in a weak position as the original property condition pre-works could not be confirmed.

The above incident also highlights another pitfall – it is a mistake not to address and resolve vibration related claims early and promptly. Leaving the resolution of a vibration related claim to the end of a project only serves to antagonize the Claimant and harden their stance.

Developing a large amount of goodwill and engagement (where possible) early on in the claim is the best antidote to prevent such claims from becoming drawn-out and unmanageable. It is also our opinion that no amount of expert opinion - however erudite - brought to bear long after the fact, can ever replace the potential good will that can be established early on in the claim cycle.

Contractors too need to be mindful that they do have the ability to cause damage during compaction works, and if alleged damage is on the balance of probability attributed to such works, then they may well hold a legal liability to the Claimant to pay compensation.

Relying on the Science

When claims do escalate, the natural inclination is to rely on the science of vibration transmission in order to establish whether the affected property was indeed within the zone of influence of damaging vibration. This is especially the case where a thorough dilapidation survey was not carried out prior to the commencement of site works.

General guidelines are provided in the literature regarding the likely extent of zones of influence for various types of construction equipment. In the first instance, a defense of a claim essentially revolves around deciding on whether the affected property is within the expected zone of influence relating to the particular item of construction equipment used on the site. This is by no means an exact science and there are many unknowns including those related to the site geology and its effect on vibration transmission. Thus we suggest that caution be used when applying such guidelines to each particular claim and where there is doubt, that doubt should best fall to the benefit of the claimant.

The literature also shows that people are very sensitive to vibration and that people become concerned about vibration long before the intensity of such vibration reaches a threshold where cosmetic damage to their property is possible. Invoking this type of defense is generally repugnant to Claimants as it inevitably downplays the importance and significance of their very personal experience of the vibration.

It is precisely this collision of science and personal experience that makes resolving vibration related claims so difficult.

The following brief discussion outlines some of the generally accepted findings in respect of vibration damage and the impact of vibration on humans.

Vibration Effects on People and Property

The basic science of vibration transmission, vibration measurement and its impact on humans and property is well explained in a publication titled 'Environmental Geotechnics' by the Institution of Civil Engineers (ICE).

Vibration from construction activities are transmitted through the ground by waves. As vibration moves through the ground, it imparts a velocity to the ground much like a point on the surface of a body of water as surface waves move past it. In the case of vibration, it is the peak particle velocity (PPV) that is of interest and as a general rule, the greater the peak particle velocity, the greater the risk of damage to buildings and the greater the impact on persons. Potential impacts are also influenced by the frequency of the vibration and whether the vibration is continuous or intermittent.

Generally speaking, the peak particle velocity of the ground surface is greatest closest to the source of the vibration and decays with distance – sometimes rapidly so. It stands to reason that at some distance away from the vibration source, the peak particle velocity reduces to zero.

For example, the plotted line in Figure 1 for vibratory rollers indicates that the peak particle measured very close to the roller is around 60mm/s. That peak particle velocity reduces to about 1/60th of that value at a distance of around 35m to 40m from the roller. At a distance of around 100m, the peak particle velocity is negligible.

Guidelines do vary, but typically cosmetic damage to residential property occurs when the peak particle velocity reaches about 5mm/sec for continuous vibration. From Figure 1, cosmetic damage to a particular residential property could occur when a vibratory roller is brought within 10m of that property. Other guidelines suggest that that distance could expand to 50m when a roller with a mass of 7 tonne or greater is used.

Figure 2 below relates to how humans experience various levels of vibration. This Figure is instructive since it shows that when the peak particle is between 1mm/s and 5mm/sec (i.e. the level of vibration where cosmetic damage to residential structures is not expected), persons would still experience clearly perceptible vibration at the very least; or annoying vibration at worst.

This supports the assertion made earlier that persons are likely to complain about vibration long before damage to their property is likely to occur.

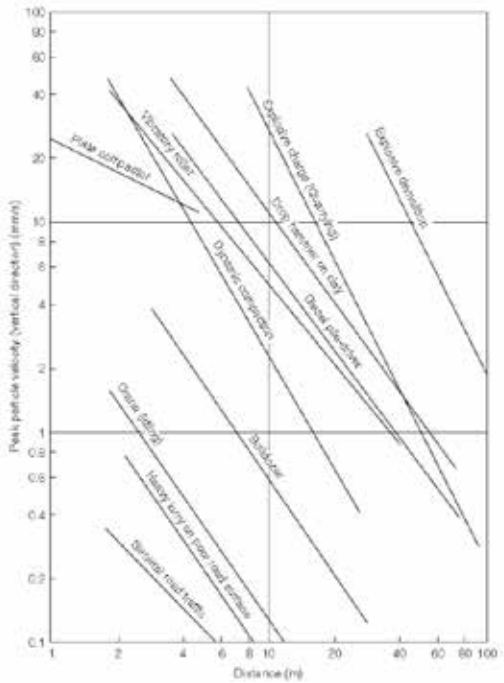

Figure 1 – Dissipation of peak particle velocity with distance from various vibration sources

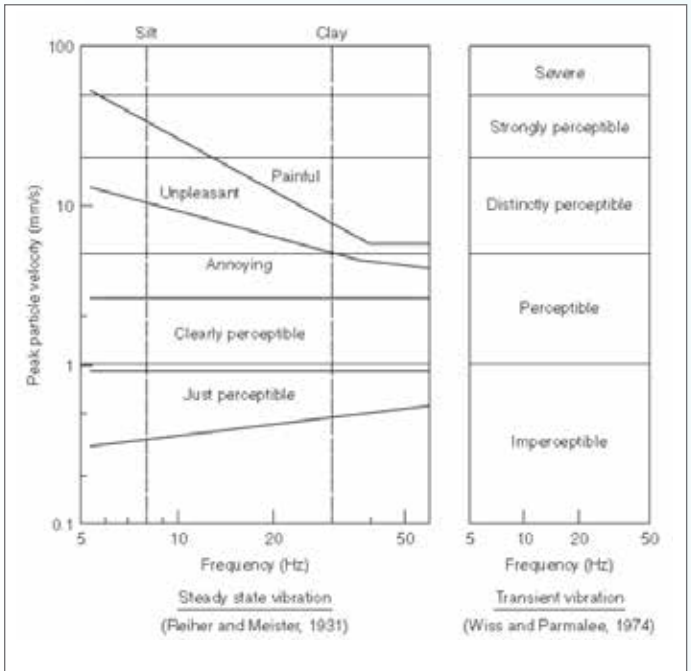

Figure 2 – Effect of Vibration on Humans

Charles Taylor ADJUSTING

Charles Taylor Adjusting (CTA) Expertise:

Adjusters have an important role to play in resolving vibration related claims.

A good Adjuster is able to be an effective intermediator between the Claimant, Contractor, Developer and their Liability Insurers. A neutral third party who is pro-active, empathetic and is able to win the trust of the Claimant can be a necessary circuit breaker to move the claim to settlement.

Such an Adjuster should have a strong technical background and interest in the topic. To this end it is common for CTA to deploy engineering adjusters who have experience in construction and civil engineering matters. A technical background in these topics is essential as such knowledge can be used to manage the expectations of the Claimant based on useful experience and understanding of vibration and the works that have been undertaken.

Above all, managing vibration related claims is much more art than science and navigating this exceptionally difficult landscape is something that CTA is well placed to do for Liability Insurers or other parties who find themselves having to investigate vibration related claims.

For further information, please contact:

Richard David BSc (Eng), MSc(Eng) MBA, CPENG, MIEAust
Engineering Loss Adjuster
richard.david@ctplc.com
T: +61 (0)8 9321 2022
M: +61 (0) 477 767 179

Andrew Hodkinson BE Mech (Hons), CPENG (2000 to 2012), ANZIIF (Snr Assoc), ACLA
Senior Engineering Resources Loss Adjuster and
Regional Head – Australia & New Zealand
andrew.hodkinson@ctplc.com
T: +61 8 9321 2022
M: +61 458 585 999

About Charles Taylor Adjusting

CTA is one of the leading loss adjusting businesses in the market. We provide loss adjusting services across energy, marine, aviation, property, casualty and special risks along with average adjusting services for ship owners. The business primarily focuses on larger and more complex commercial losses arising from major insured incidents and claims. CTA is a business of Charles Taylor Plc (www.ctplc.com) which is quoted on the London Stock Exchange (CTR).

Charles Taylor plc is a leading provider of professional services to clients across the global insurance market. The Group has been providing services since 1884 and today employs over 1,800 staff in 71 offices spread across 29 countries in the UK, the Americas, Asia Pacific, Europe the Middle East and Africa.

The Group offers services, principally on a fee-based model and operates through three businesses – Management, Adjusting and Insurance Support Services. It also own insurers in run-off. Charles Taylor's vision is to become the professional services provider of choice to the global insurance market

Our Offices

Charles Taylor has 72 offices across 29 countries, **Asia Pacific** Balikpapan, Beijing, Brisbane, Hong Kong, Jakarta, Melbourne, Mumbai, Perth, Selangor, Seoul, Shanghai, Singapore, Surabaya, Sydney, Taipei, Tokyo. **Europe** 15 UK offices (including London, Glasgow, Liverpool, Ringwood & Chelmsford), Brussels, Paris, Piraeus, Rome **Middle East** Doha, Dubai, Jeddah, Riyadh. **Africa** Cape Town **Americas** Atlanta, Bogota, Calgary, Dallas, Halifax, Houston, Lima, Mexico City, Miami, New York, Rio de Janeiro, St John's, Toronto, Vancouver.

www.ctplc.com/adjusting