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What you should know about your Property Boundaries when the Land Moves.

Most New Zealanders will be familiar with the term "The Shaky Isles" referring to our country's frequent seismic activity because of our location at the junction of two dynamic tectonic plates.

With modern measurement technology, it is now relatively easy to establish the magnitude and direction of movements, even in a global sense. However, you may not know that your property boundaries may also distort as a result of earthquakes.

Surveyors have been undertaking cadastral (boundary) surveys in NZ for over 150 years. These surveys and the plans showing them, form an important part of the NZ cadastre – the record system which defines land ownership and property rights and is administered by Land Information NZ (LINZ). This in turn underpins the NZ economy, and allows secure property ownership and land transaction confidence.

It goes without saying that if the Crown guarantees ownership, land owners need to know what they own. This job is undertaken by Licensed Cadastral Surveyors (LCS's). LINZ further confirms compliance with survey rules and adequate land definition, by examining and approving all new surveys lodged before they are integrated into the cadastre.

The on-ground cadastre is a network of control marks such as trig stations, witness marks and boundary marks. Witness marks are often randomly placed vertically driven pieces of steel which have a measured relationship to boundaries. These are very important in re-establishing boundary positions.

It is now generally accepted that some parts of the country are moving several centimetres a year relative to others. This may not seem significant, but over 50 or 100 years this continuous earth movement can be measured in metres. However, because individual land parcels are relatively small, movement within a property is generally very small and can largely be ignored. Our survey system allows for this movement because boundaries are still defined by boundary pegs and witness marks, as the primary boundary determinant.

When the land moves in a more severe fashion (eg by earthquake), the effect on property boundaries is more marked. Where a ruptured fault line runs through a property, one part of the property is unhinged from the remainder and some form of boundary adjustment is necessary. In other cases, the property is less visibly altered but may be distorted in height or dimension.

Surveyors have for many years addressed the effects of significant earthquakes, for example in Napier, Edgecumbe or Inangahua. In the case of Napier (where all survey records were also lost in the fire following the earthquake), legislation was introduced which introduced an "Interim" title because of not only the lack of land records, but the fact that some land boundary dimensions may have changed as a result of the earthquakes.

Whilst the position of boundary and witness marks is at the top of the hierarchy of evidence which defines boundaries in NZ (along with the position of natural boundaries which are evident on the ground), there is a large amount of information which can contribute to boundary location, particularly when boundary marks no longer exist. This can include the position of occupation (buildings, fences) on or near the boundary, survey information and measurements carefully gathered by fieldwork, the mathematics or evidence found in prior surveys and the title record, an understanding of survey errors, technology etc.

The role of LCS's can therefore range from the archaeologist to the historian, and from the mathematician to the field surveyor. Boundary determination requires specialist knowledge, experience and skill. While the Courts are the ultimate arbiter. However, it is testament to the care with which LCS's undertake this work that very few cadastral definitions end up in the Court process.

Where a boundary peg rolls from the ground as a result of a localised landslip, it is reasonable to assume that the boundary is relocated in its former position.

It is therefore not surprising that LINZ, immediately following the Christchurch earthquakes made the analogy that the resultant serious liquefaction was akin to a landslip – shallow seated movement. This liquefaction has resulted in many areas of significant distortion and lateral spreading even within small residential properties.

However, what is surprising is that LINZ continued down this track even long after Government made the decision to "green zone" much of this land, and allow billions of dollars to be spent on rebuilding infrastructure. This culminated in a directive in February 2015 which required LCS's to position boundaries in mathematical pre-earthquake positions derived by LINZ, irrespective of where those boundary positions were relative to boundary marks and fences/buildings etc.

This would have been a dramatic change to existing survey practice and have significant negative effects on property owners, who may have found part of their dwelling or their fences in the neighbouring property. It was quickly rejected by surveyors, lawyers and insurers and has resulted in the Canterbury Property Boundaries and Related Matters Act 2016. This again entrenches the value of survey monuments and that boundaries indeed move with the land as a result of liquefaction.

So what does this mean for land owners? The earth is always on the move – whether it be gradual deformation, or earthquake induced movement. Boundaries move with the land – unless there is a landslip.

There is no mandatory requirement to resurvey land boundaries after an earthquake event. This may not occur for many decades when evidence of localised movement has long since disappeared eg breaks in fences, earth disturbance etc.

Landowners can choose to redefine their land at any time. After significant earthquakes, it would not be uncommon for changes (distortion, enlargement, shrinkage) to be present particularly if the property is disrupted by an active fault line. This means that property may have altered boundary dimension upon resurvey after an earthquake, but this will represent the ground truth.

LCS's generally deal with such movement to land in a pragmatic way, having evaluated all of the evidence. This may involve talking with neighbours, and looking at the effects on not only the subject land but land further afield. Survey costs when defining land which has been subject to movement may be higher. But this is the price of retaining a world class title system and security of property ownership.

As an example, movement in a boundary at a fault line in a rural situation may be dealt with in a different manner to that encountered in an urban environment. Former straight boundaries may now have angles.

In conclusion, you can be assured that (except in the case of landslip) your boundaries move with the survey monuments and the land. This means that boundary fences and buildings on or near boundaries, will continue to hold the same relationship to the boundary after land movement as they did before it.

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