

# ***Development of legislation for earthquake affected cadastral boundaries in New Zealand***

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FIG Geoconference Cadastre 4.0, Coimbra Portugal

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# Overview

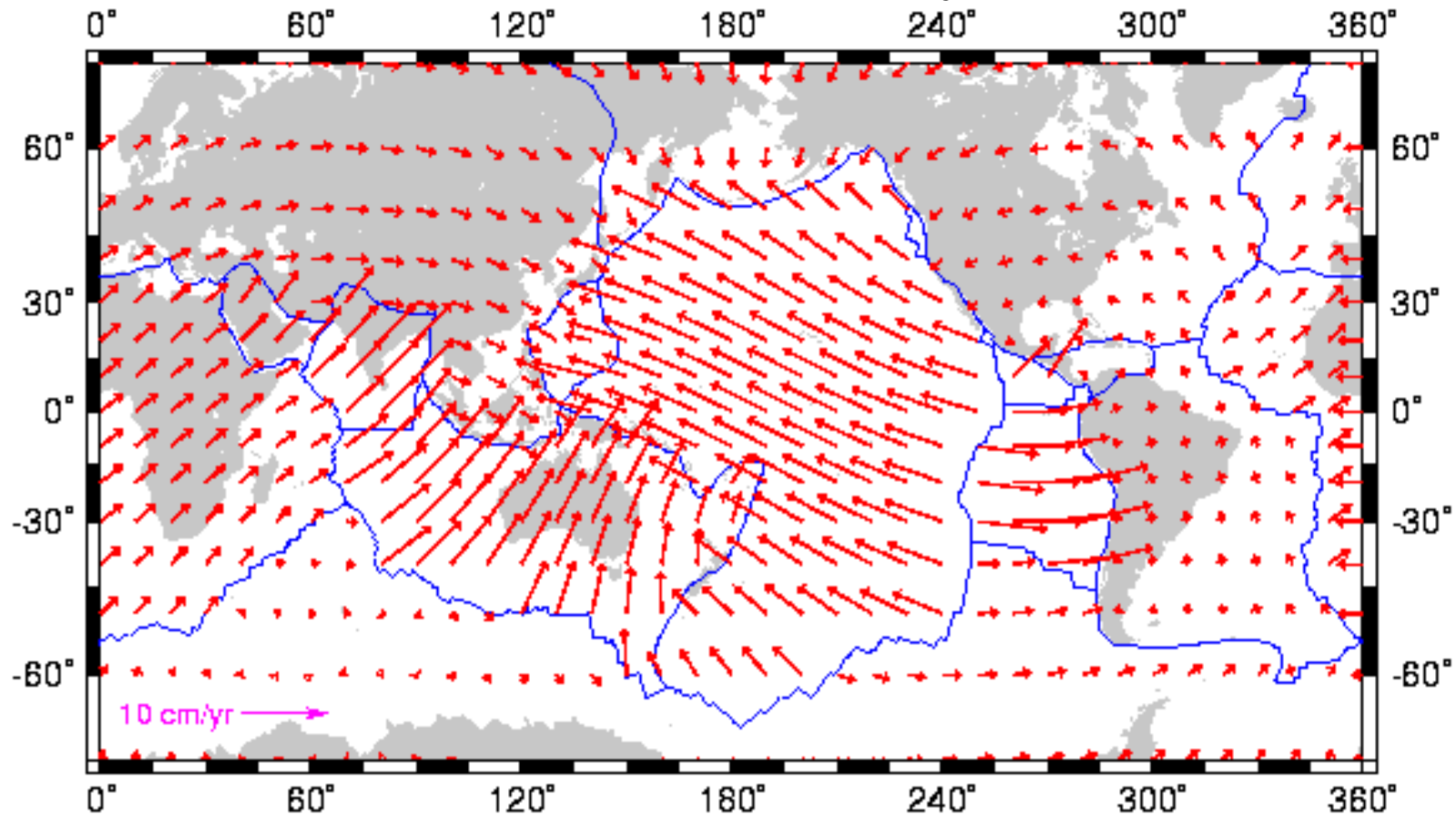
- Moveable boundaries
- Impact of earthquakes on boundaries
- The “easier” problem – movement with bedrock
- The harder problem – shallow movement of soil
- Regulations
- Legislation
- Consultation
- Issues identified

# Legal precedents on “moveable” boundaries

- Natural boundaries move “slowly and imperceptibly” with the riverbank or tidal line
  - In case of avulsion the boundaries do not move (in theory)
- Fixed (surveyed) boundaries do not move (in theory)
- Do these theories always work in the real world?
- Coordinates in the real world need to change over time as the world changes
  - Like food in the refrigerator – they slowly go off
  - As we seek more accurate “fixed” coordinates – the real world reminds us we are not fully in control
- Our theories may need refinement

# Tectonic plate motion

- Everything moves – including boundaries
- Often no-one notices - but they do move





# Landslip

- General agreement - boundaries do not move with the land in this case



# Earthquakes & boundaries (its complicated)







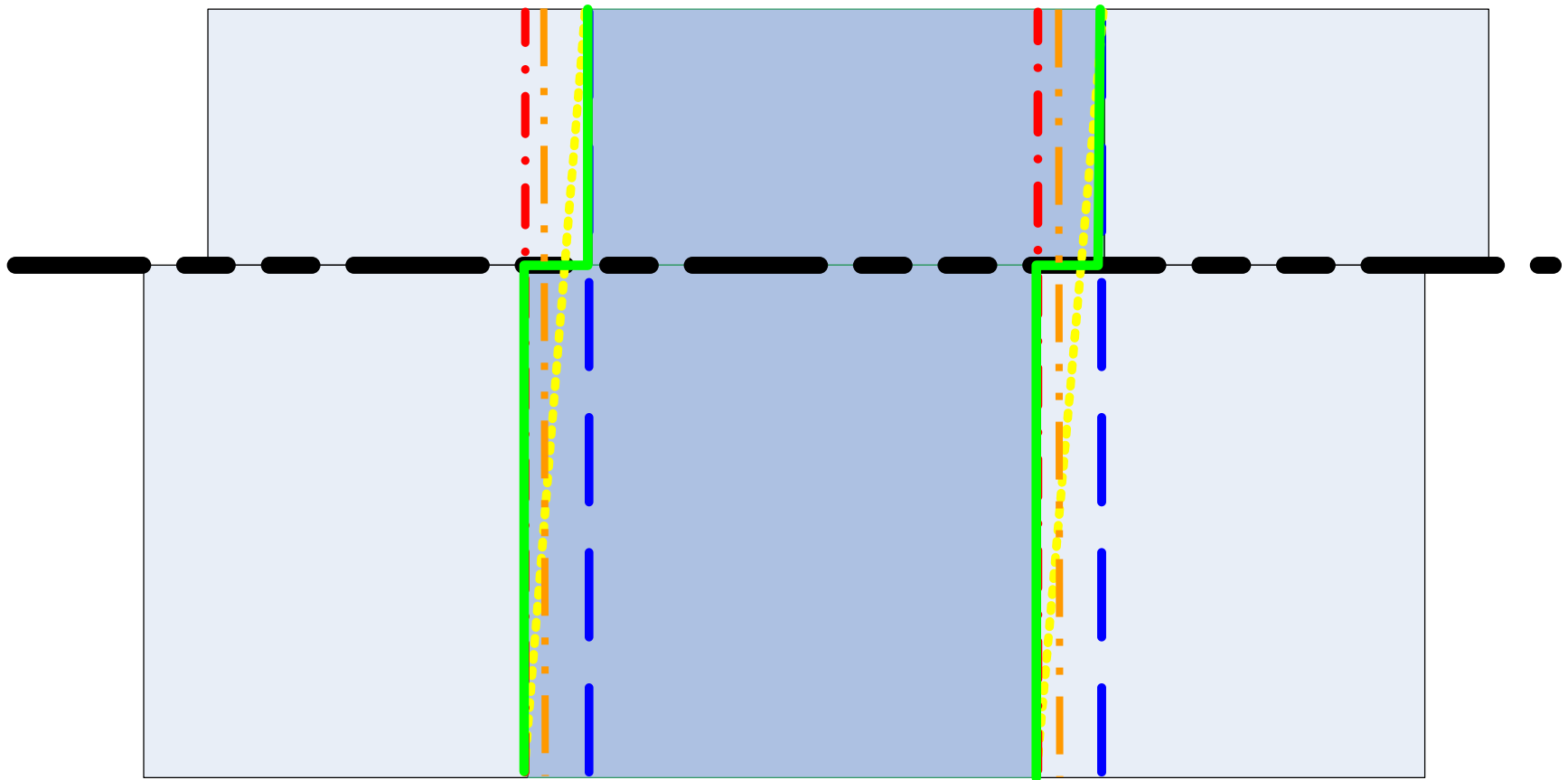
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# Deep-seated movement with bedrock – before





Deep-seated with bedrock (the easy one)  
where are the “straight-line” boundaries now?



# Amendment to survey regulations in 2012

- Straight-line boundaries across the fault trace were split, other boundaries nearby were bent or distorted
  - Surveyor-General decision – **boundaries move with the bedrock**
  - Consistent with tectonic movement of boundaries
  - New boundary angles are created where necessary
  - Regulations made after fast-track consultation with surveyors
- Did not apply to shallow movement with soil
  - Common law appears to prevail in this case



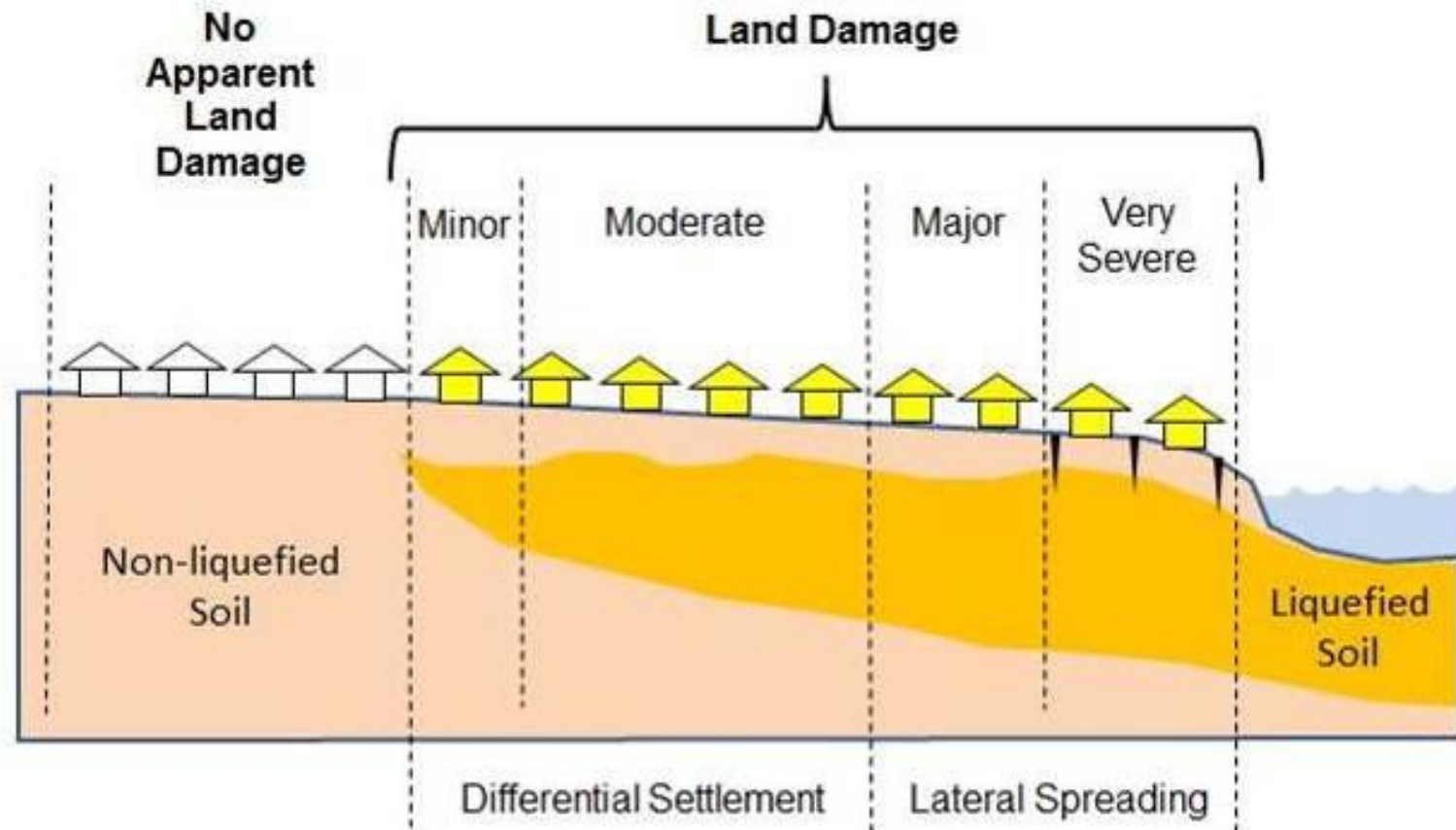
# Shallow ground movement – soil liquefaction





# Shallow ground movement – soil liquefaction

- Liquefaction of soils resulted in fences, houses, survey marks moving inconsistently by decimetres to metres
- Liquefaction occurred many times during aftershocks



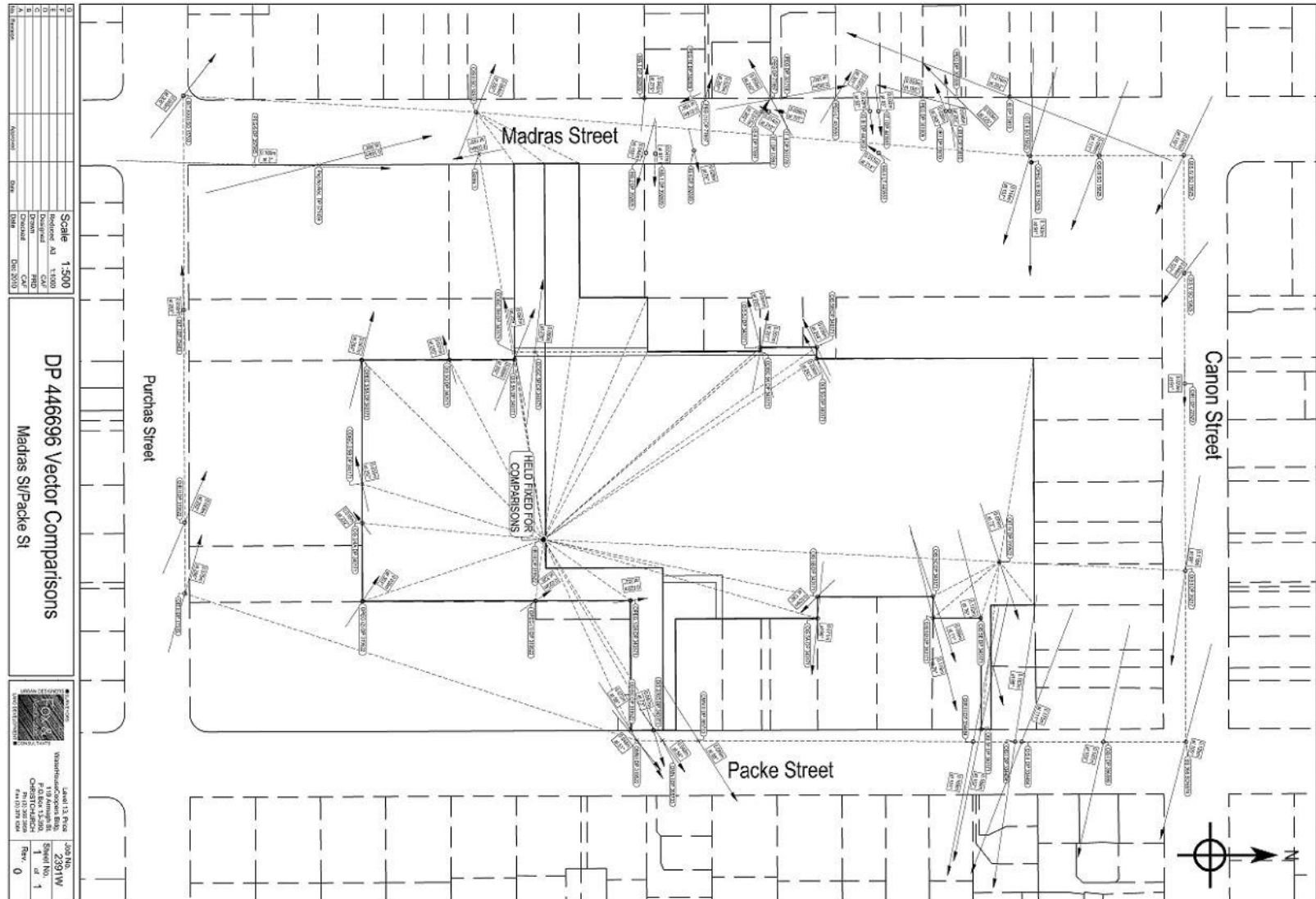
# Common law - movement of soil does not move the boundary – the peg is “disturbed”



Boundary peg & post appear to be undisturbed - however they have both moved 2.8 metres away from the front of property

# Severe difficulty for surveyors

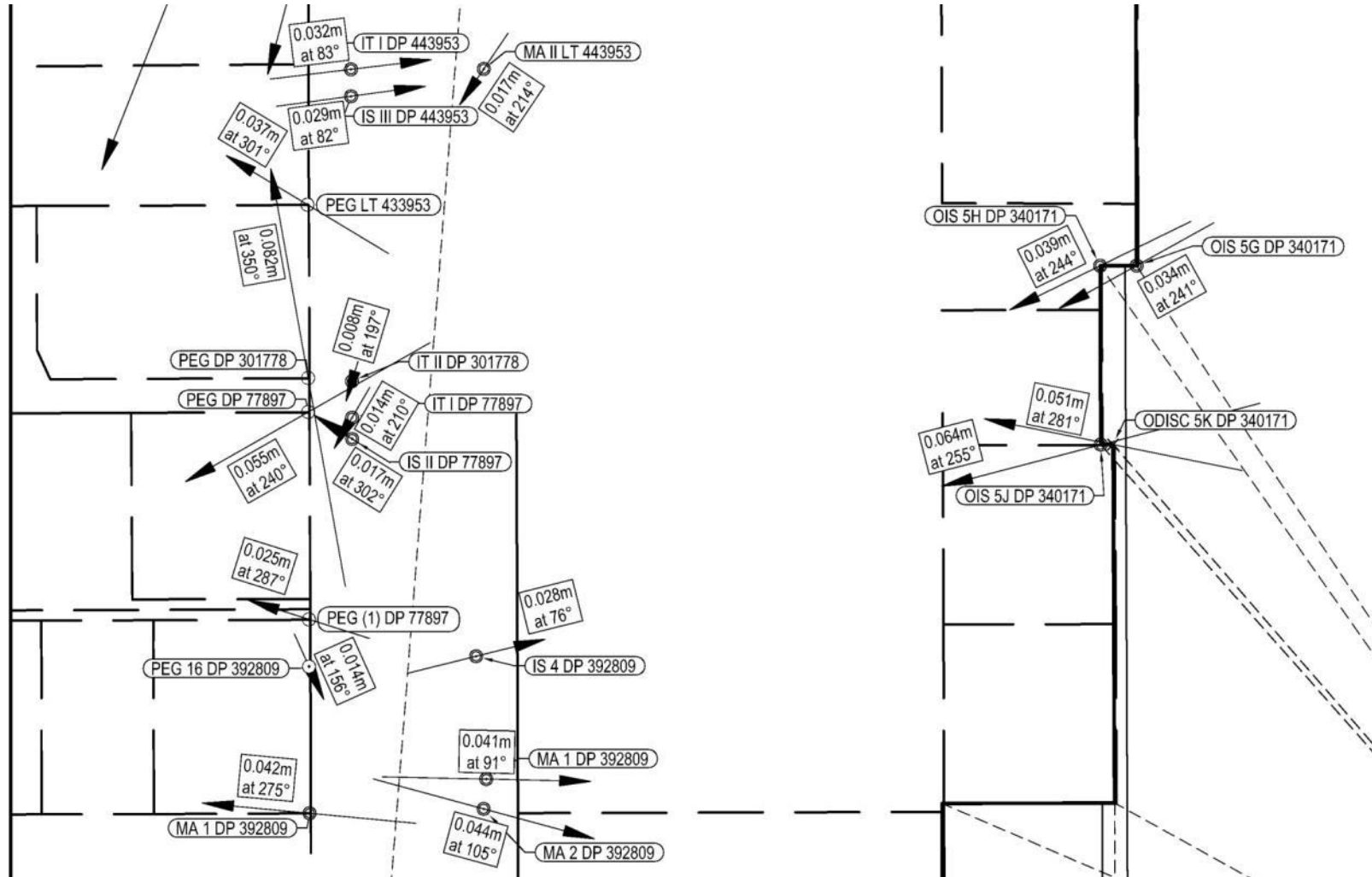
(Philip Dewar, Fox & Associates Ltd, Christchurch, NZ)



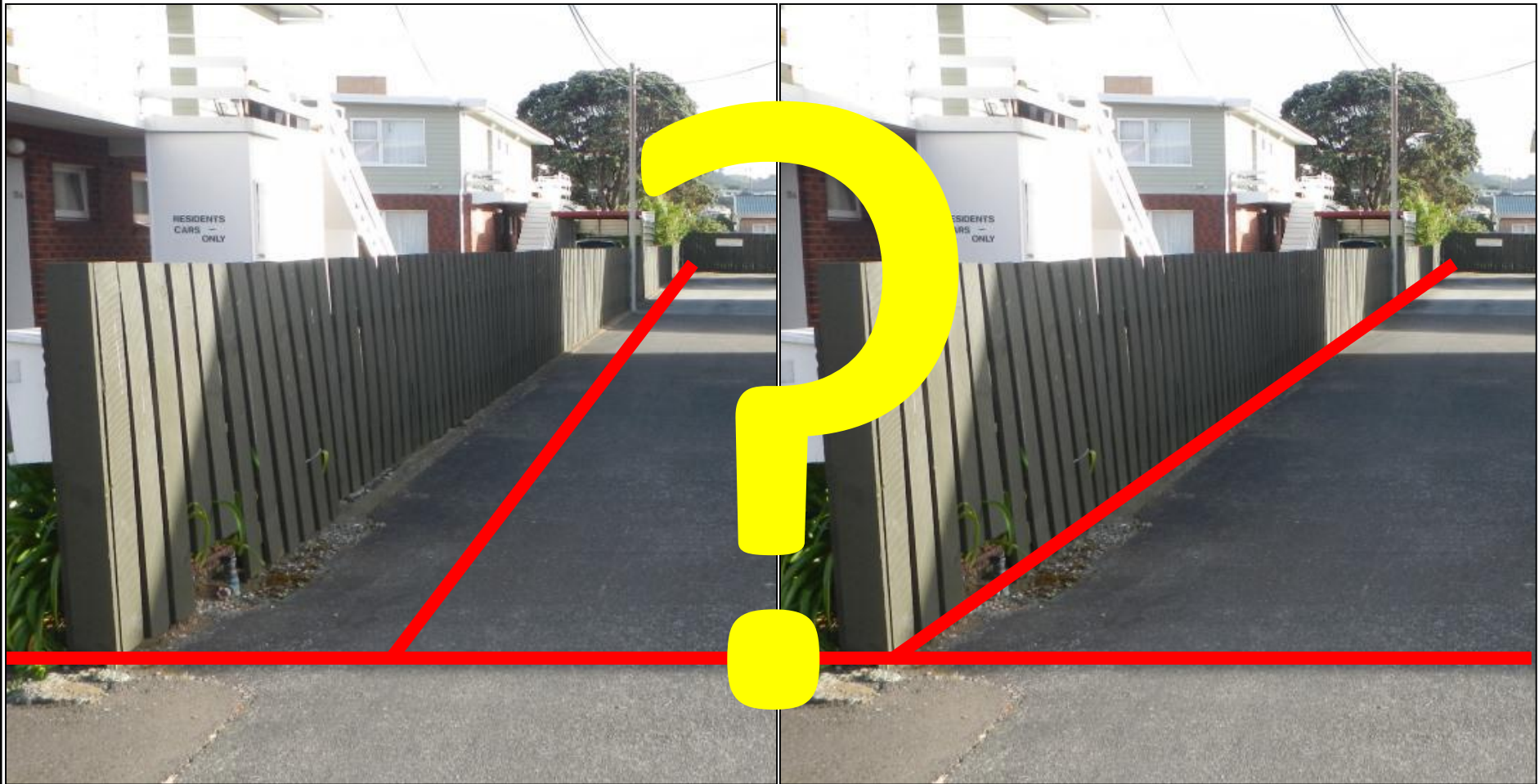


# Complex vector comparisons

(Philip Dewar, Fox & Associates Ltd, Christchurch, NZ)



# How should these boundaries move?



# Possible Solutions

	Description	Implications
<b>Status quo</b>	Surveyors are expected to apply standard practices. Case law will emerge over time to establish whether boundaries moved or did not move with the land.	Continued uncertainty and costs for all parties until case law emerges. Surveyors may continue to apply different approaches for determining legal boundaries increasing the risk of boundary disputes. This may slow down the rebuild and cost property owners more.
<b>Boundaries <b>did not</b> move with the land</b>	Accept that boundaries did not move where there was shallow land movement and clarify this through legislation (if required).	Legal boundaries will sometimes not align with physical occupation. Some assets, including completed rebuilds may need to be relocated to within the legal boundaries or land owners would need to seek boundary adjustments to realign legal title with occupation.
<b>Boundaries moved with the land</b>	Accept that boundaries in Canterbury moved where there was shallow land movement and clarify this (through legislation if required).	Legal boundaries will generally align with occupation so completed rebuilds will generally be within legal boundaries. However, boundaries, as seen on the ground, may not align with the legal boundaries recorded in the cadastre.



# Who can resolve these boundary issues?

- The Courts interpret the law as it stands
  - Courts can't change a law that doesn't work in a new situation
  - Courts reluctant to move from well-established precedent
- Lawyers interpret the law and court decisions
- Government officials operate within their powers
- Surveyors must comply with laws and regulations
- **Only Parliament can change a law that doesn't work**
  - Parliament depends on surveyors & officials for advice
  - Advice must consider long term as well as short term needs
  - Needs consultation with surveyors and other affected groups

# Canterbury Property Boundaries and Related Matters Act 2016

- A Canterbury solution
  - Only applies to boundaries affected by Canterbury earthquake sequence
- **Boundaries move with the land**
- Earlier post-earthquake surveys continue to determine boundaries
  - Some based on “boundaries move”
  - Some on “boundaries do not move”
- Conflicts are not expressly resolved
- Boundary adjustment not subject to planning approval
- Liability limited where actions undertaken in good faith
- Surveyor-General to provide guidelines



## Canterbury Property Boundaries and Related Matters Act 2016

Public Act 2016 No 40  
Date of assent 29 August 2016  
Commencement see section 2

### Contents

		Page
1	Title	2
2	Commencement	2
	<b>Part 1</b>	
	<b>Preliminary provisions</b>	
3	Purpose	2
4	Interpretation	2
5	Transitional, savings, and related provisions	3
6	Act binds the Crown	3
	<b>Part 2</b>	
	<b>Boundary movement provisions</b>	
	<i>Boundaries to be determined on basis of boundary movement</i>	
7	Application of boundary provisions	3
8	Boundaries redefined as moving with movement of land caused by Canterbury earthquakes	3
9	Approved interim survey continues to determine boundaries	4
10	Boundary adjustment that follows moved boundaries is not subdivision	4
	<i>Earlier surveys and boundary determinations</i>	
11	No liability in relation to certain earlier surveys and boundary determinations	4

# Consultation – 11 public submissions

- 3 submissions from surveyor organizations
- 3 from individual surveyors
- 1 from the Board that licenses surveyors
- NZ Law Society (in relation to land registration)
- Insurance Council (reconstruction/restoration)
- Christchurch City Council
- Company providing earthquake response services



# Issues raised in consultation

- Support for the principle that boundaries move with the land
- Some questions of detail
  - Application to water boundaries
  - Previous surveys that did not follow this principle
    - Resolution of conflicts
  - Clarity about SG Guidelines
    - Voluntary – not legally binding
  - Clarity about waiver of surveyor liability
    - Only where acting professionally and in good faith
    - Only relating to the “boundaries move” principle

# Future issues requiring collaboration for public transparency

- Surveyor-General guidelines to provide advice on application of “boundaries move” principle
  - There will be a wide range of circumstances
  - Some land may lie between previous post-earthquake surveys that were based on different principles
- Maintaining “survey-accurate” spatial coordinates
  - Cadastral coordinates in Canterbury were made survey accurate in 2000 at significant expense to government
  - In 40 seconds in 2010, all coordinates became inaccurate
  - Nearly 8M cadastral coordinates affected by several large earthquakes & aftershocks in South Island in recent years
  - Cadastre updated according to “boundaries move with bedrock” – not the broader “boundaries move with land”
  - Could citizens provide information on how the land moved?

# Questions