

Cadastral Survey Rules 2021

Requisitions and Compliance Challenges

Tony Nikkel

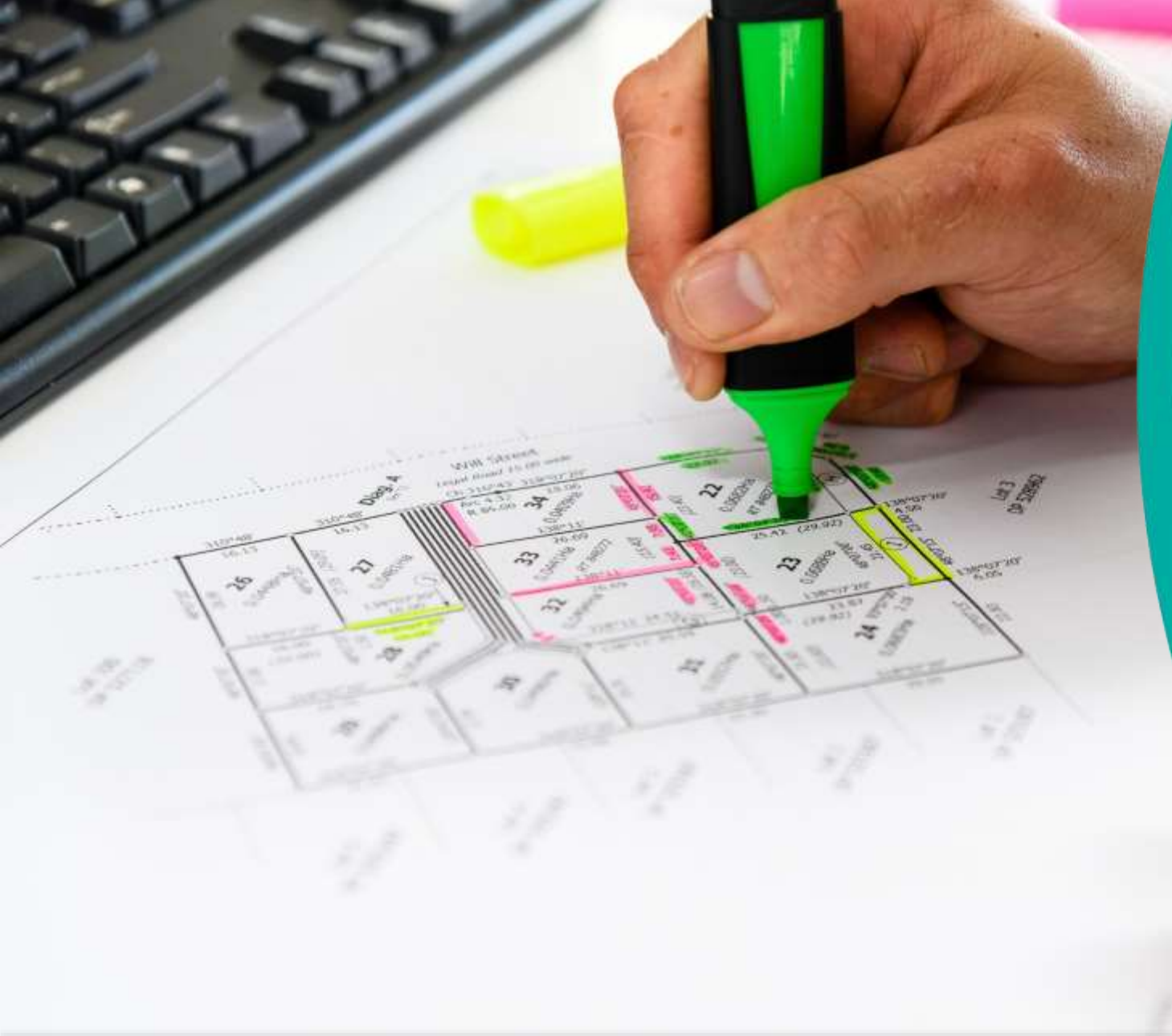
Licenced Cadastral Surveyor
Property Rights LINZ

27 August 2022

Compliance Challenges

- Risk Based Approach to validation
- Water Boundaries
- Schedule/Memorandum
- Boundaries in Conflict
- Content of a CSD
- Requisition issues discussion





Risk Based Approach to CSD Validation

Risk Based Approach

- LINZ does not check everything
- High Risk Complex CSDs have more thorough checks

		Severity/Consequence		
		Slightly harmful (1)	Harmful (2)	Extremely harmful (3)
Likelihood	Highly unlikely (1)	Trivial risk (Score 1)	Tolerable risk (Score 2)	Moderate risk (Score 3)
	Unlikely (2)	Tolerable risk (Score 2)	Moderate risk (Score 4)	Substantial risk (Score 6)
	Likely (3)	Moderate risk (Score 3)	Substantial risk (Score 6)	Intolerable risk (Score 9)

Risk Based Approach

- Some QA checking is automated (Business Rules)
- Some QA checking uses manual checklists

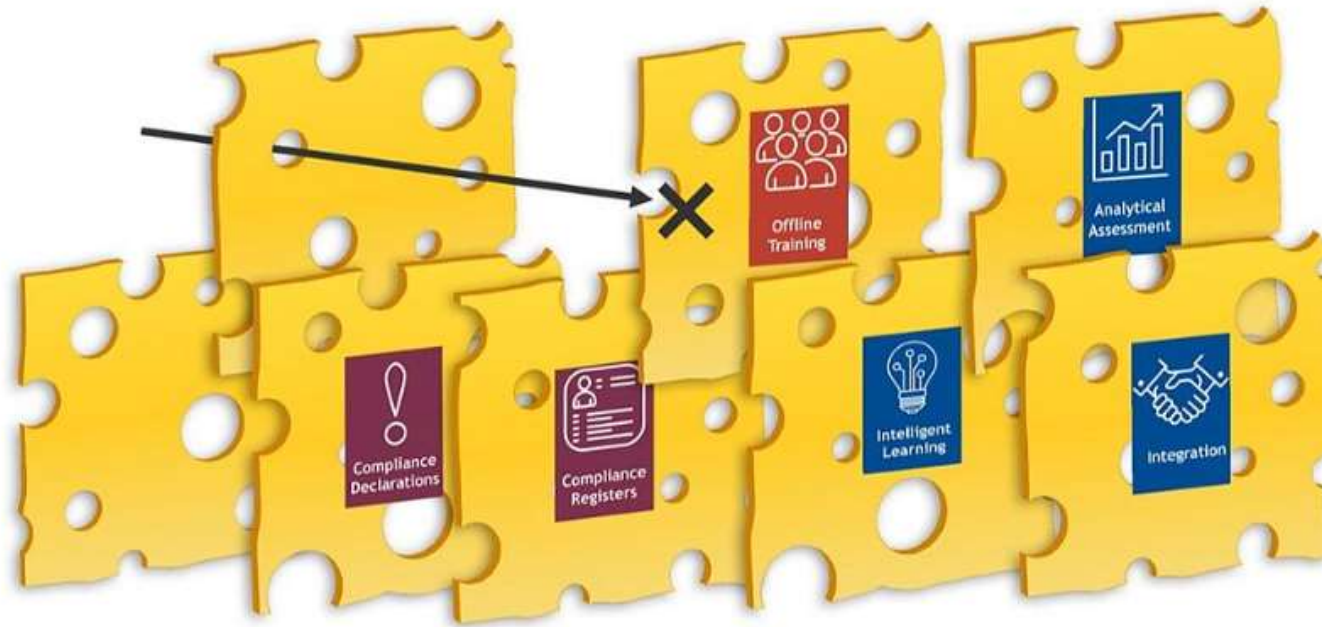


It is important to address and report on:

- automated pre-validation C-rule warnings, and
- adjustment report test failures

Risk Based Approach

- Does an item not requisitioned on a prior CSD indicate the process is inconsistent or flawed?



What layers of defence can reduce compliance risks?

Risk Based Approach

- Does a minor requisition item void the rule?
- If the interpretation of the rule is not clear then ...
 - Call or email the PRA and ask for clarification
 - Review LINZ RCS 2021 rules clarification & Guidance
 - Email the LINZ OSG team
SGRulesReview@linz.govt.nz





Water Boundaries Common Requisition Themes

Adopted Water Boundary Requests

75 Adopted information to match source

(1) All adopted information ... must be copied from its **source** without change.

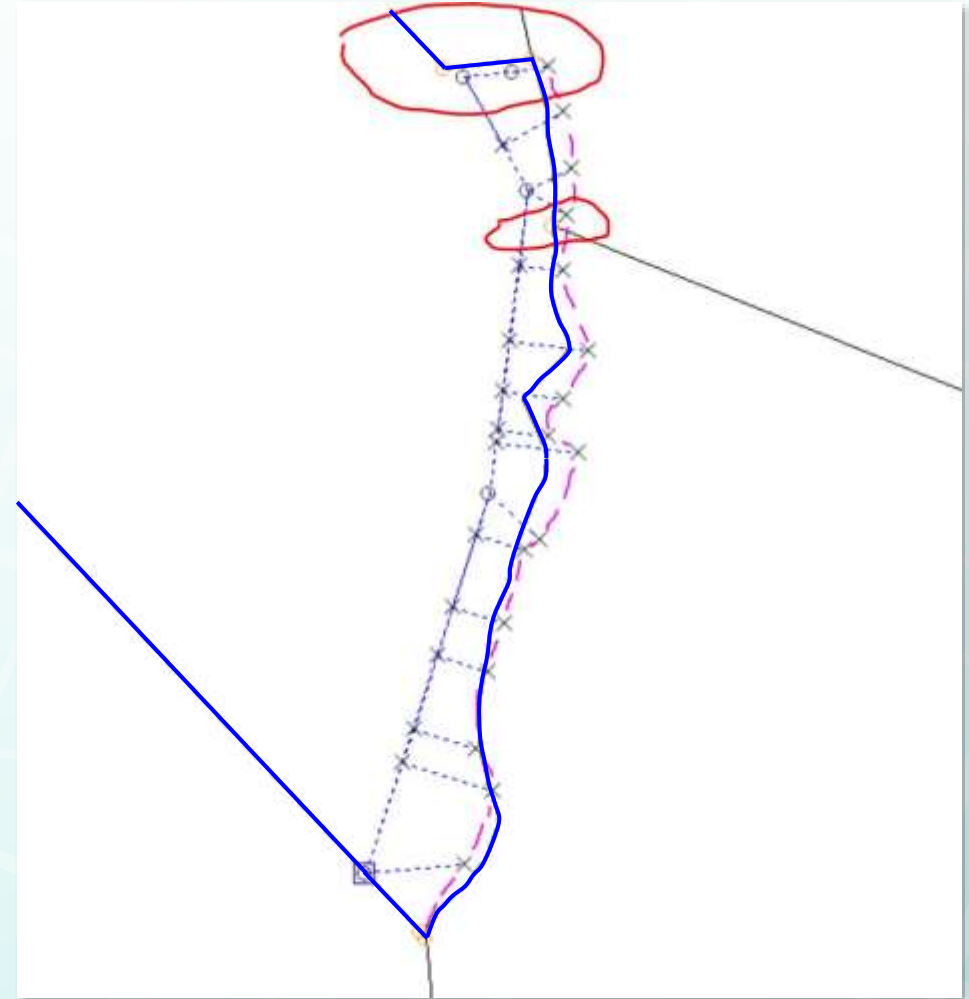
(2) The **source** is—

(b) for a water boundary, a water centre-line boundary, or an irregular boundary, the CSD that **measured** or **defined that boundary**.



Adopted Water Boundary Requests

- The wrong CSD adoption source has been used
- Adopted boundary does not match the shape and spatial depiction of source data
- Boundary has been adopted directly from LoL without sufficient checks to confirm reliability against the source



Water Boundaries – The Rules

10 (1) Water boundaries

Boundary to follow landward margin

(1) A **water boundary** must follow the landward **margin** of—

- (a) a river bed or a stream bed; or
- (b) a lake bed; or
- (c) a tidal area.



It is important to describe the physical feature of the margin for a new water boundary or an adopted water boundary if known

Water Boundary Movement – Accretion & Erosion

10 (2) Water boundaries

Accretion and erosion

(2) If the **margin** of a water body **has moved** as a result of accretion or erosion—

(a) any **erosion** which affects the water boundary **must be accounted for** unless the boundary is accepted under rule 15; and

(b) subject to paragraph (a), the boundary **may** be adopted in its previously defined position if entitlement to accretion is not being claimed

Water Boundary Movement – Avulsion & Diversion

10 (3) Water boundaries

Avulsion and artificial diversion/reclamation

(3) **If the margin** of a water body **has moved** by processes other than accretion or erosion, the existing water boundary **may be**—

(a) adopted and set in its previously defined position as an **irregular boundary**; or

(b) converted to one or more right-line boundaries.

Water Boundary Movement Requisitions

Two main water boundary movement requisition areas —

- i. The **potential** for water boundary movement has not been fully addressed – rule 29(2)
- ii. The **potential** for water boundary movement has not been fully reported on – rules 72(k) & (l)

Water Boundary Movement - Rule 29 (2)

29(2) The position of a water boundary, a water centre-line boundary, or an irregular boundary, including an adopted boundary, **must be determined** to a sufficient level of accuracy to take into account—

- (a) the risk of **overlap or ambiguity** in boundaries, including a water boundary on the other side of the water body
- (c) the **potential** for the **margin** of the water body to **move** and for the water related boundary to move or become permanent as a result of that movement
- (d) the nature of the **physical feature** that defines the water body margin

Water Boundary Movement – Rules 72 (k) & (l)

72 The survey report **must** contain

72 (k) information about **the accuracy of the determination** of any water boundary, water centre-line boundary, or irregular boundary, and the factors taken into account, as specified in **rule 29(2)**:

72 (l) any information as to **why** the **physical margin** of the water body is no longer coincident with an adopted water boundary:

Water Boundary Movement – How to Assess

- So how do we determine if there is potential for water boundary movement in relation to existing water boundaries?
- Survey fix
- Aerial Imagery
- Lidar/remote sensing data
- Visual inspection

*Then complete a comparison
to the adopted position*

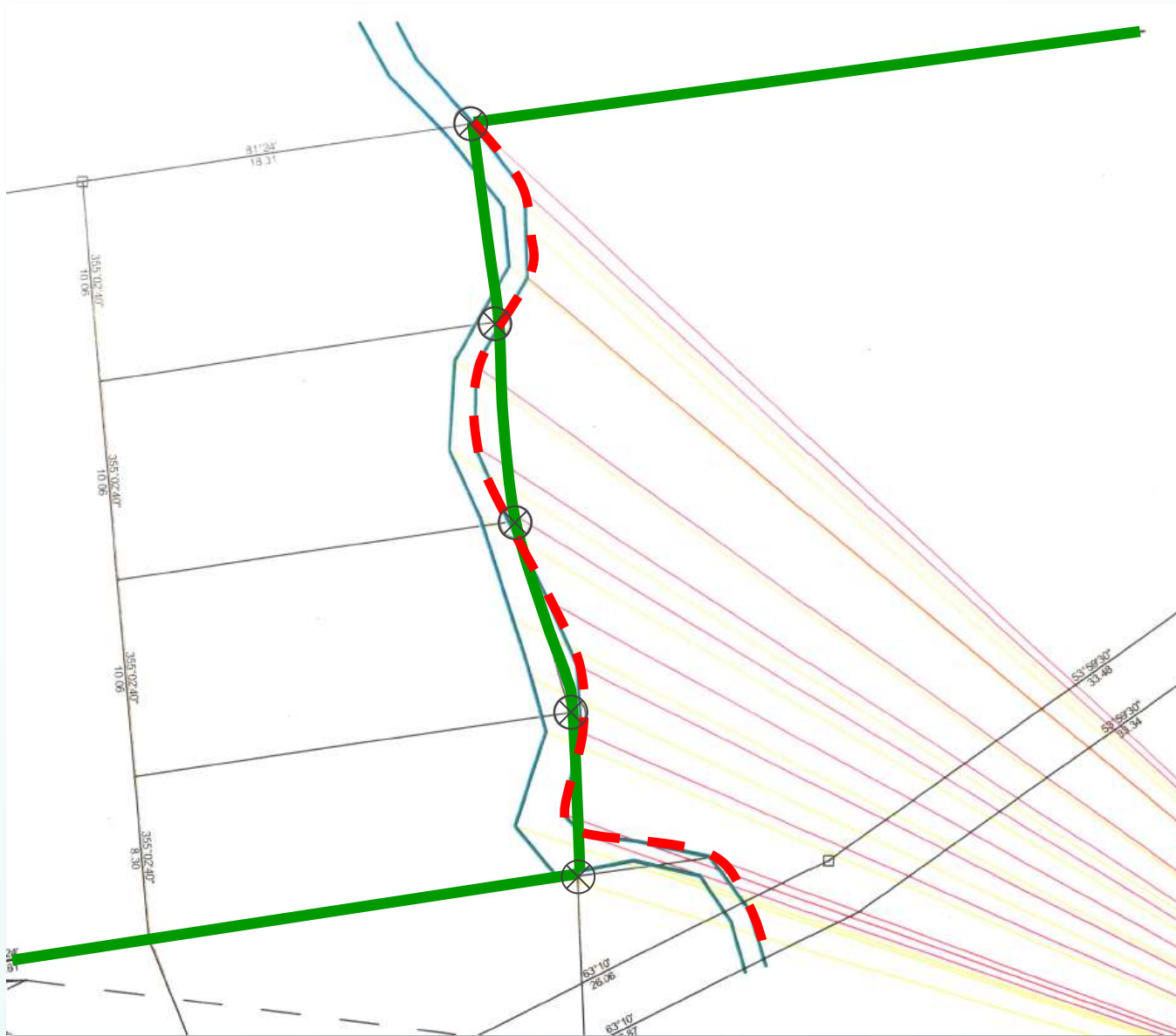


“One of these things is not like the other”



Water Boundary Movement - Example

- Are there any obvious conflicts with this boundary annotation?



Water Boundary Movement - Example

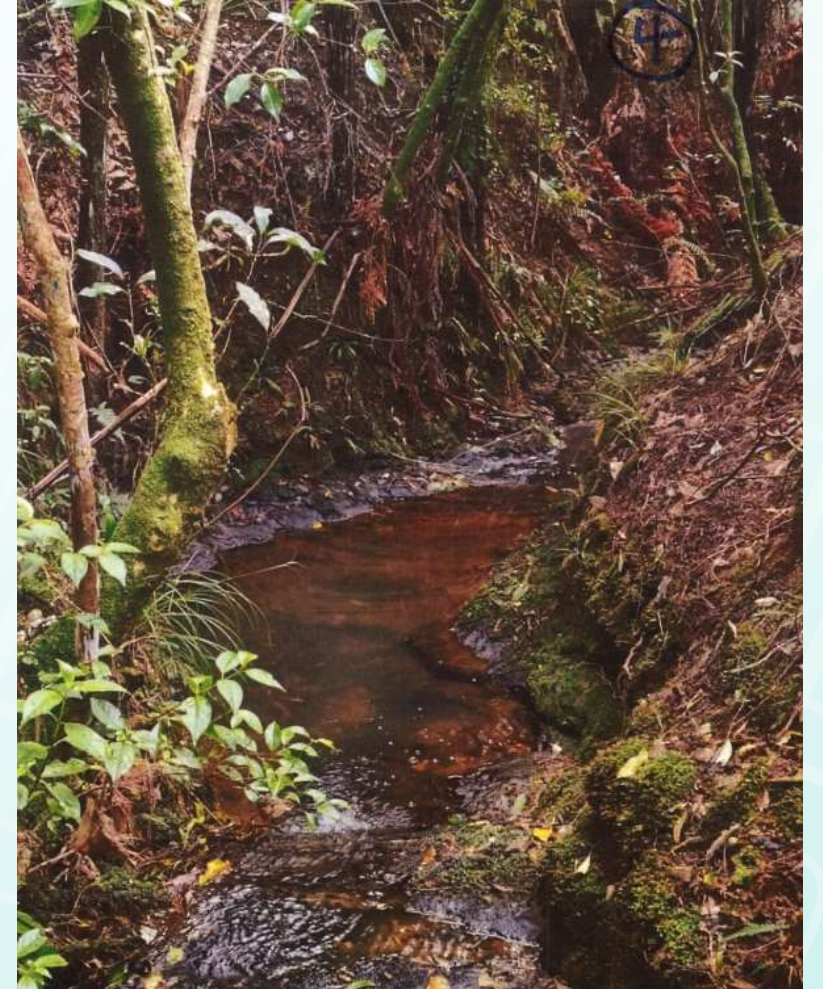
What advice is applicable?

- Accretion?
- Erosion?
- Artificial diversion?
- Better fix?

Water Boundary Movement - Example



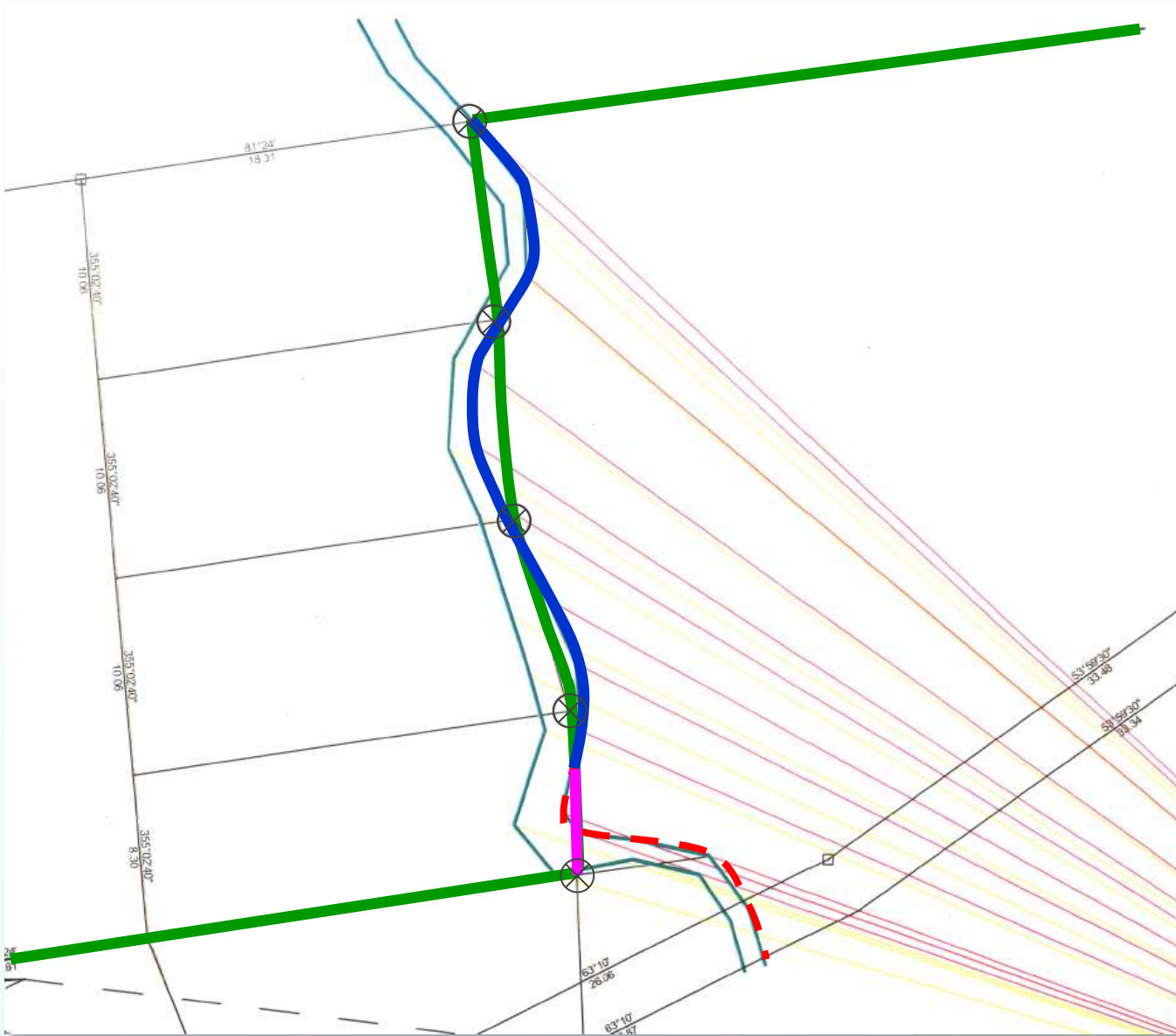
- *Accurate determination of water margin*
- *Visual inspection*
- *Detailed reporting*
- *Logical interpretation of the evidence supporting the definition*



Water Boundary Movement - Example

Conclusion:

- Better fix (*blue*)
- Right-lined artificial diversion (*magenta*)



Water Boundary Questions – Accretion & Erosion



- Erosion has to be dealt with
- Accretion not being claimed has to be reported on
- Required CSD boundary annotations need to be shown

Water Boundary Requisitions – Avulsion & Diversion

- Former water boundary is not captured as an irregular boundary, or right-lined
- CSD boundary annotation is missing or incorrect



104 Boundary Annotations - A title diagram **must** prominently depict ...

Table 8 Boundary annotations for title diagrams

Boundary	Annotation
Water centre-line boundary	“Boundary follows centre-line of stream/river”
Water boundary, including where it is a height limited boundary	<i>[Description of legal water boundary]</i>
An adopted water boundary that has become an irregular boundary under rule 10(3)(a)	“Former water boundary not coincident with water’s edge”
An adopted water boundary where accretion is not being claimed under rule 10(2)(b)	“Adopted boundary not coincident with water’s edge”

Water Boundary Requests - Class of Boundary

- Boundary class of AD, BD or CD not captured for right-line intersection with water, water centre-line or irregular boundary – Rule 30
- Accurate water boundary record not attached - Rule 71(f)
 - <https://www.linz.govt.nz/kb/935#content-water>



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Search Copy



Identifier **NL9B/836**
Land Registration District **Nelson**
Date Issued **30 November 1983**

Prior References

NL7C/1233
Estate **Fee Simple**
Area **5927 square metres more or less**
Legal Description **Lot 90 Deposited Plan 14849**
Proprietors **John Smith and Mary Smith**

Interests

261375.8 Easement Certificate specifying the following easements - 1.8.1986 at 2.10 per			
Type	Servient Tenement	Easement Area	Dominant Tenement
Drain sewage	Lot 99 Deposited Plan 12615 - CT NL7C/1237	0- DP 12615	Lot 90 Deposited Plan 14849 - Section
Drain sewage	Lot 97 Deposited Plan 12615 - CT NL7C/1235	49 DP 12615	Lot 90 Deposited Plan 14849 - Section
Drain sewage	Lot 98 Deposited Plan 12615 - CT NL7C/1236	49 DP 12615	Lot 90 Deposited Plan 14849 - Section
203583.5 Easement Certificate specifying the following easements - 1.8.1986 at 2.10 per			
Type	Servient Tenement	Easement Area	Dominant Tenement
Drain sewage	Lot 99 Deposited Plan 12615 - CT NL7C/1237	0- DP 12615	Lot 90 Deposited Plan 14849 - Section
Drain sewage	Lot 97 Deposited Plan 12615 - CT NL7C/1235	49 DP 12615	Lot 90 Deposited Plan 14849 - Section
Drain sewage	Lot 98 Deposited Plan 12615 - CT NL7C/1236	49 DP 12615	Lot 90 Deposited Plan 14849 - Section

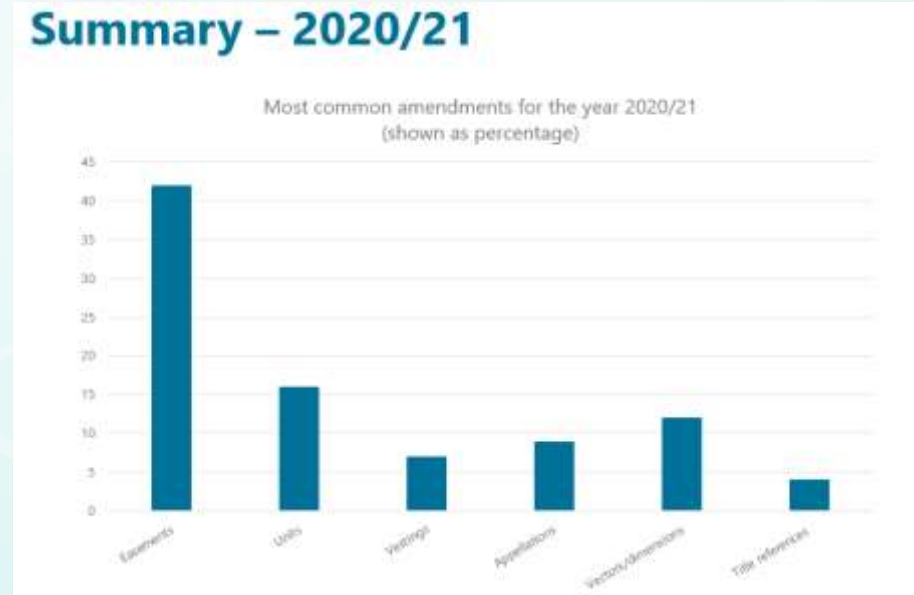
Statutory Restriction



Schedule/ Memorandum

Schedule Memorandum - Validation challenges

- Consistently high on the top 10 list of requisitions
- High rate of post-approval amendments



Schedule Memorandum – What to check for?

- Correct use of Schedule and Memorandum tables
- Correct ST, DT, purpose, creating document
- Burdened and Benefitted table headers
- Dealing with all the existing subject interests

Existing Interests – What is required?

94 Existing easement information

(1) A title plan must include information about every existing **subject** easement that is to be retained (**whether in part or whole**) and,

- How do we check this?
 - Record of Title memorials
 - Survey Plans
 - Instruments

Existing Interests



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Limited as to Parcels
Search Copy



Interests

Subject to a right of way over the within land created by Conveyance 1691 (5D/354) - 6.12.1858 at 10:20 am

Subject to a right of way over the within land created by Conveyance 3908 (9D/762) - 9.10.1861 at 1:00 pm

343579 Certificate pursuant to Section 232 of The Municipal Corporations Act 1933 that the above-described land is served by a private drain - 6.7.1951 at 12.09 pm

Subject to a right of way and a right to convey gas, water, electricity, telecommunications and computer media and a right to drain water and sewage over the within land created by Easement Instrument 11685957.3 - 27.2.2020 at 3:13 pm

11731492.3 Surrender of the right of way created by Conveyance 1691 (5D/354) as appurtenant to Part Town Section 178 City of Christchurch in CT CB385/219 - 30.4.2020 at 10:29 am

10811420.2 Surrender of the right of way created by Conveyance 1691 (5D/354) as appurtenant to part Lot 2 DP 15600 (RT CB543/253) - 11.6.2020 at 4:14 pm

10811420.3 Surrender of the right of way created by Conveyance 3908 (9D/762) as appurtenant to part Lot 2 DP 15600 (RT CB543/253) - 11.6.2020 at 4:14 pm

Subject to a right of way over the within land created by Easement Instrument 10811420.6 - 11.6.2020 at 4:14 pm

11773205.4 Mortgage to ASB Bank Limited - 3.7.2020 at 3:39 pm

Existing Interests – Supporting documents

The screenshot displays a software application window with a menu bar at the top containing: File, Edit, Search, Map View, Map Utilities, Tools, Favourites, Window, and Help.

On the left is a file tree under the 'Titles' folder. The tree structure is as follows:

- Titles
 - CB364/127 - Current (No Diagram)
 - Historic Title
 - Title Search (With Diagram)
 - Title Plan
 - Pending Dealings
 - Registered Owners
 - Current Interests
 - CVY 1691 (5D/354)
 - CVY 3908 (9D/762)
 - CERT 343579
 - Structured Text
 - Image
 - EI 11685957.3
 - Structured Text
 - Image
 - PSE 11731492.3
 - Structured Text
 - Image
 - PSE 10811420.2
 - PSE 10811420.3
 - EI 10811420.6
 - M 11773205.4

Two blue boxes highlight specific items in the tree: one around the 'CB364/127 - Current (No Diagram)' sub-folder and its children, and another around the 'CERT 343579' sub-folder and its children.

On the right side of the window, there is a toolbar with icons for zooming, panning, and other navigation functions. Below the toolbar, two document pages are displayed side-by-side, labeled 'Page 1' and 'Page 2'. 'Page 1' contains a document with text and a small image. 'Page 2' contains a large, dark, irregular shape, possibly a map or a diagram.

Existing Interests – What is required?

Land Registration District

Canterbury

Survey Number

Territorial Authority (the Council)

Christchurch City

Schedule of Existing Easements

Last Edited: 11 May 2022 21:38:37

<u>Purpose</u>	<u>Shown</u>	<u>Burdened Land (Servient Tenement)</u>	<u>Creating Document Reference</u>
Right of Way	B	Lot 4	CVY 1691 (5D/354)
	B	Lot 4	CVY 3908 (9D/762)
Right of way, rights to drain water and sewage and rights to convey gas, water, electricity, telecommunications and computer media	B	Lot 4	EI 11685957.3
Right of Way	B	Lot 4	EI 10811420.6

Schedule Memorandum – What else to check for?

- Confirm if an existing easement is spatially defined?
- Confirm if a centreline easement has a width?
- Confirm existing easements to be surrendered?

Existing Easements to be surrendered – r 92 (h)

92 A title plan must include—

(h) details of any easement to be surrendered and covenant to be revoked, including the creating document reference for each;

Existing Easements to be surrendered – r 92 (h)

Schedule of Existing Easements to be Surrendered

Last Edited: 14 Jun 2022 20:25:03

<u>Purpose</u>	<u>Shown</u>	<u>Burdened Land</u> <u>(Servient Tenement)</u>	<u>Creating Document Reference</u>
Right to transmit electricity and telecommunications	Area C DP 559837	Lot 1 DP 559837	EI 12144602.2
	Area D DP 559837	Lot 1 DP 559837	EI 12144602.2

Notes

Last Edited: 14 Jun 2022 20:25:49

The right of way, right to transmit electricity and telecommunications easement created by EI12144602.2 over parts marked A and B on DP 559837 is to be partially surrendered as it relates to Lot 1 DP 559837 (RT 986793) as burdened land and Lot 2 DP 559837 (RT 986794) as benefitted land.



Boundaries in conflict



Boundaries in Conflict

6 Duty of surveyor

a cadastral surveyor **must**—

(c) use all **relevant** evidence to determine the **correct position** of the boundary and boundary points **in relation** to other boundaries and boundary points.

Part to the Parts

- ✓ How does the survey fit into the surrounding work
- ✓ No gaps or overlaps created



Boundaries in Conflict

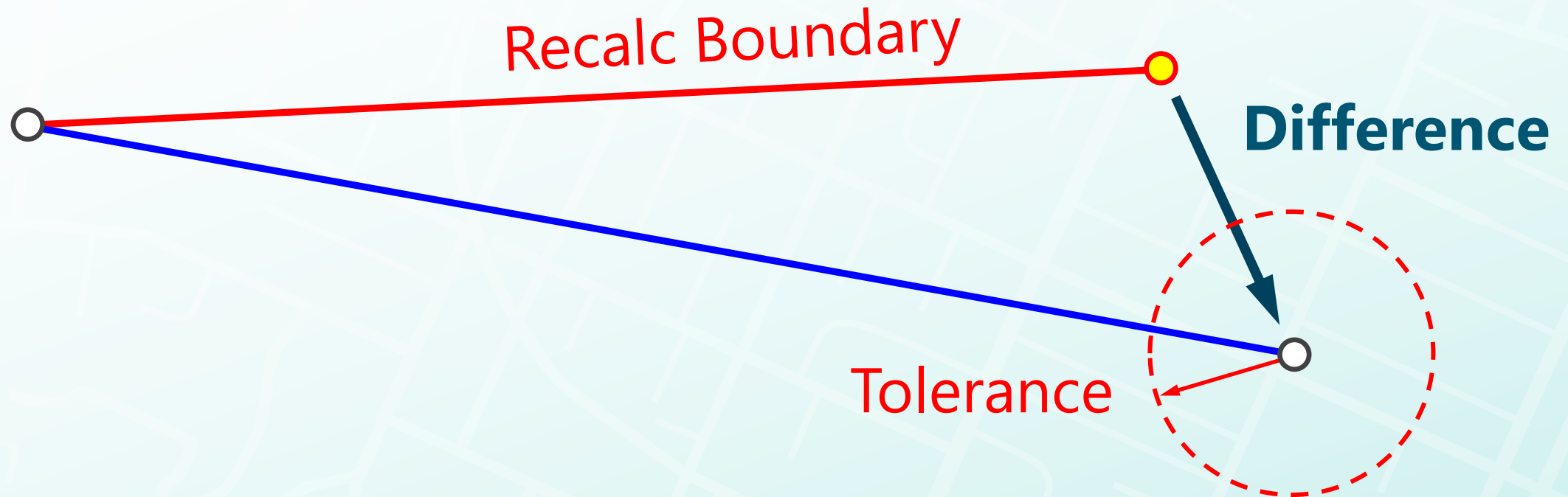
What is the difference between a recalculated boundary and one that is in conflict?

- **recalculated boundary** - is an adjusted boundary with a difference that is within the required accuracy tolerance
- **boundary in conflict** - is a boundary where the difference exceeds the applicable accuracy standards

Refer to CSR 2021 Schedule 2

Boundaries in Conflict

- The recalculated difference includes both the bearing and distance components



Recalculated Boundaries

If recalculated boundaries are within tolerance and there are no conflicts:

- **include** in the survey report a description of the difference and why the boundary has been recalculated
- **confirm** that the recalculated boundary **is not** in conflict
- **select** the appropriate attribute under the CSD survey submission options

Does this survey: contain boundaries that have been recalculated in excess of applicable accuracy requirements?

☐ Yes

☒ No

Boundaries in Conflict Requisitions

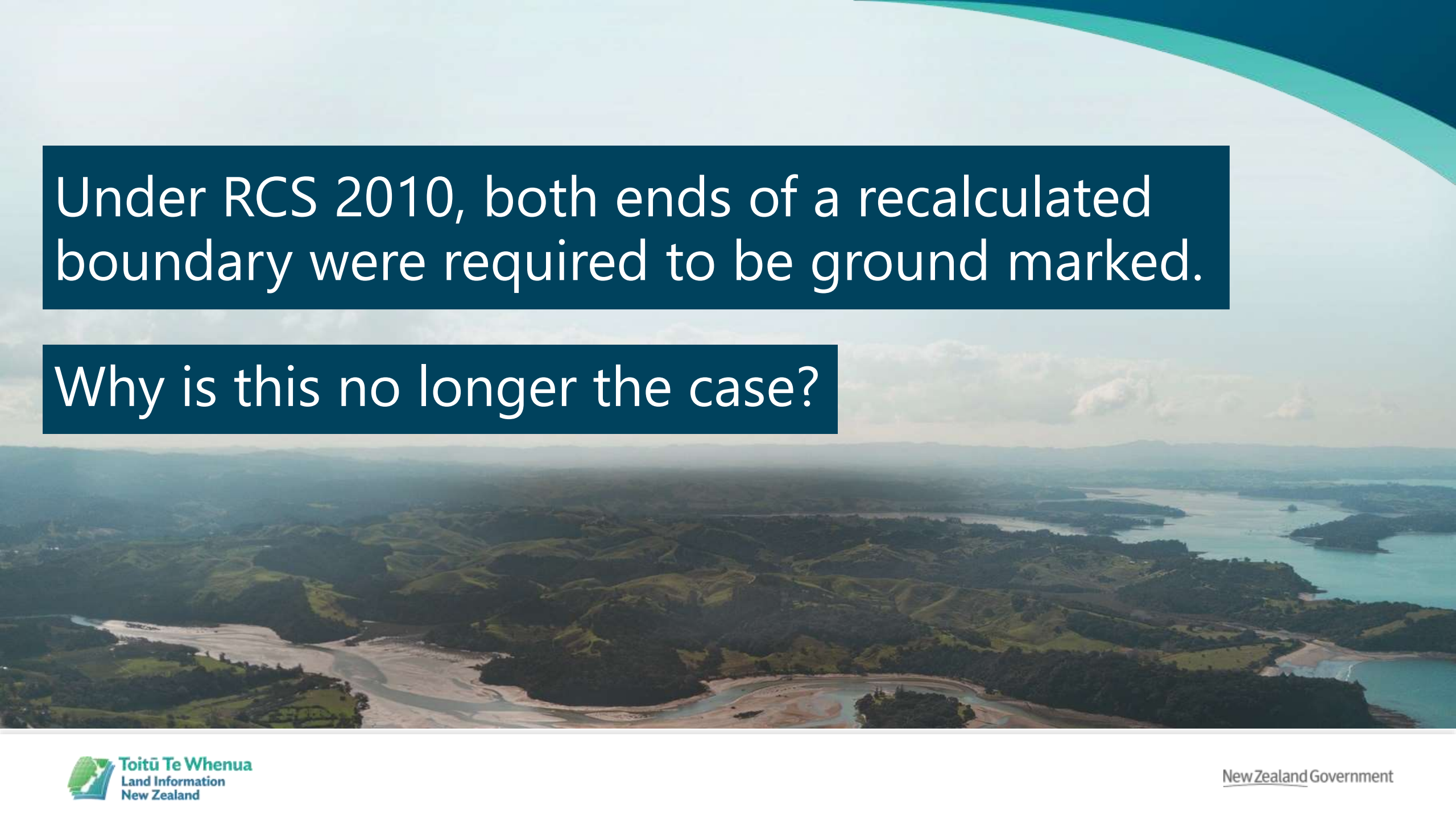
If recalculated boundaries exceed tolerance and are in conflict:

- **report fully** under 'conflict' the difference and how it has been resolved - rule 72(2)(f)
- **include** in the report the magnitude of the difference
- **select** the appropriate attribute under the CSD survey submission options

Does this survey: contain boundaries that have been recalculated in excess of applicable accuracy requirements?

☒ Yes

☐ No

An aerial photograph of a coastal landscape. In the foreground, a wide, light-colored river or estuary winds through green, rolling hills. The hills are covered in dense vegetation. In the background, a large body of water, likely a bay or harbor, is visible, surrounded by more hills and some small islands. The sky is overcast with soft clouds. A dark blue curved graphic element is in the top right corner.

Under RCS 2010, both ends of a recalculated boundary were required to be ground marked.

Why is this no longer the case?

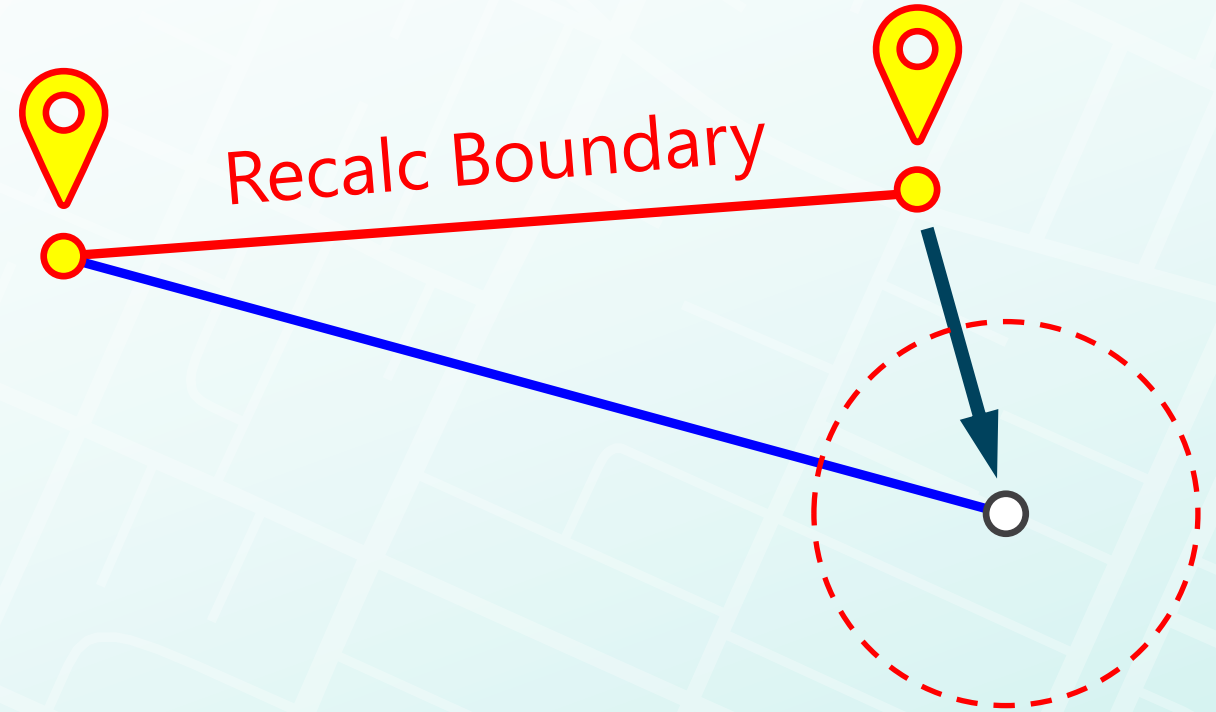
Boundaries and boundary points in conflict

RCS 2010

6.2(a)(vi) and 7.1(b)

each boundary point on a **boundary** ... subject to conflict ... must be marked

This required **both end points** of the boundary in conflict to be ground marked.



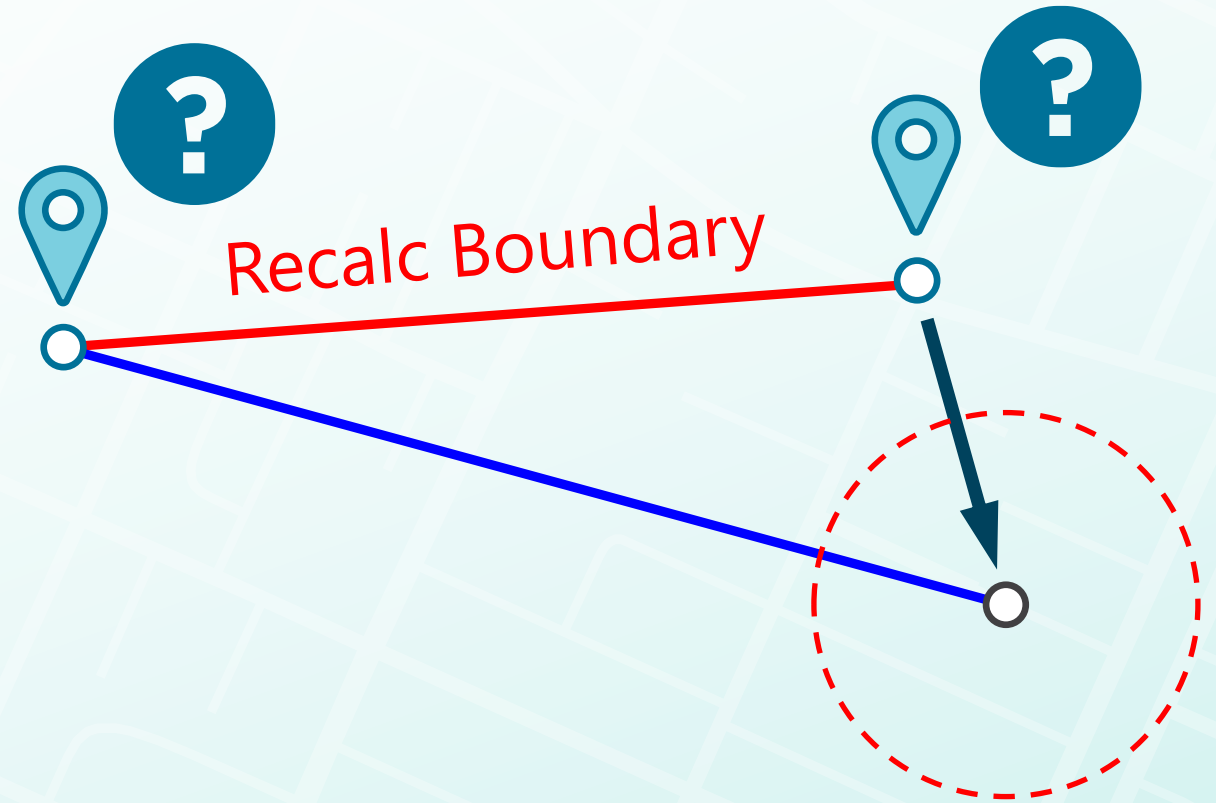
Boundaries in Conflict

CSR 2021

35(2)(a)

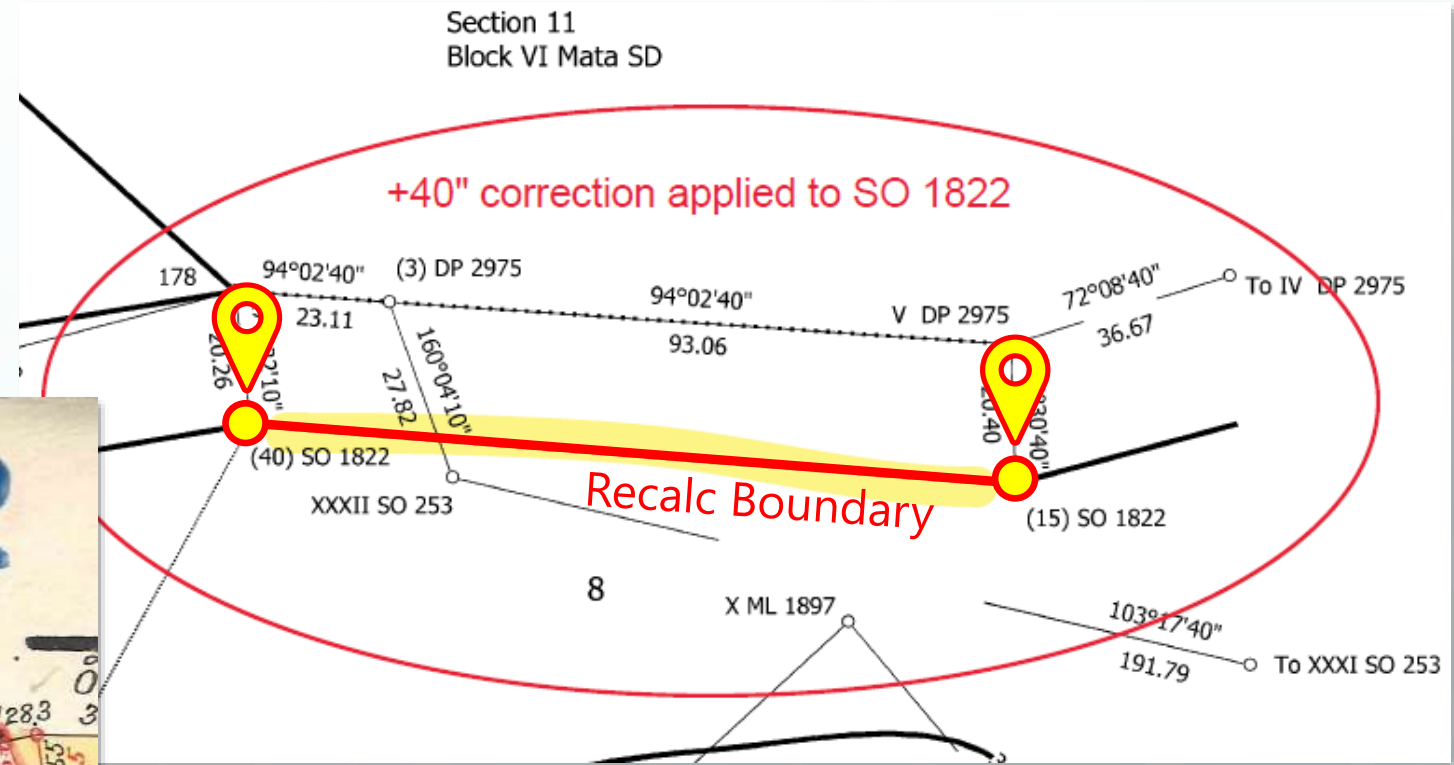
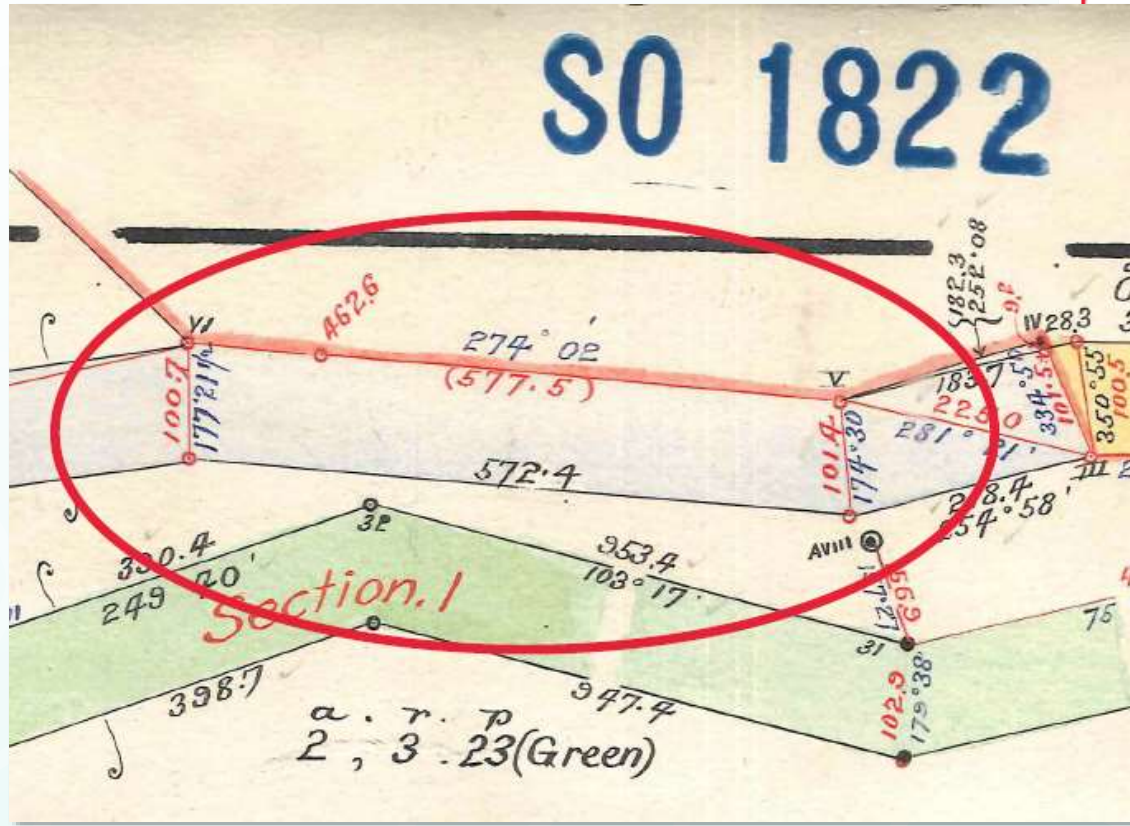
a **boundary point** that is subject to conflict ... must be marked

The emphasis on ground marking has now shifted to assessing if the **boundary points** are in conflict?



Example of boundary in conflict

Boundary conflict confirmed by checking field notes and adjacent parcels

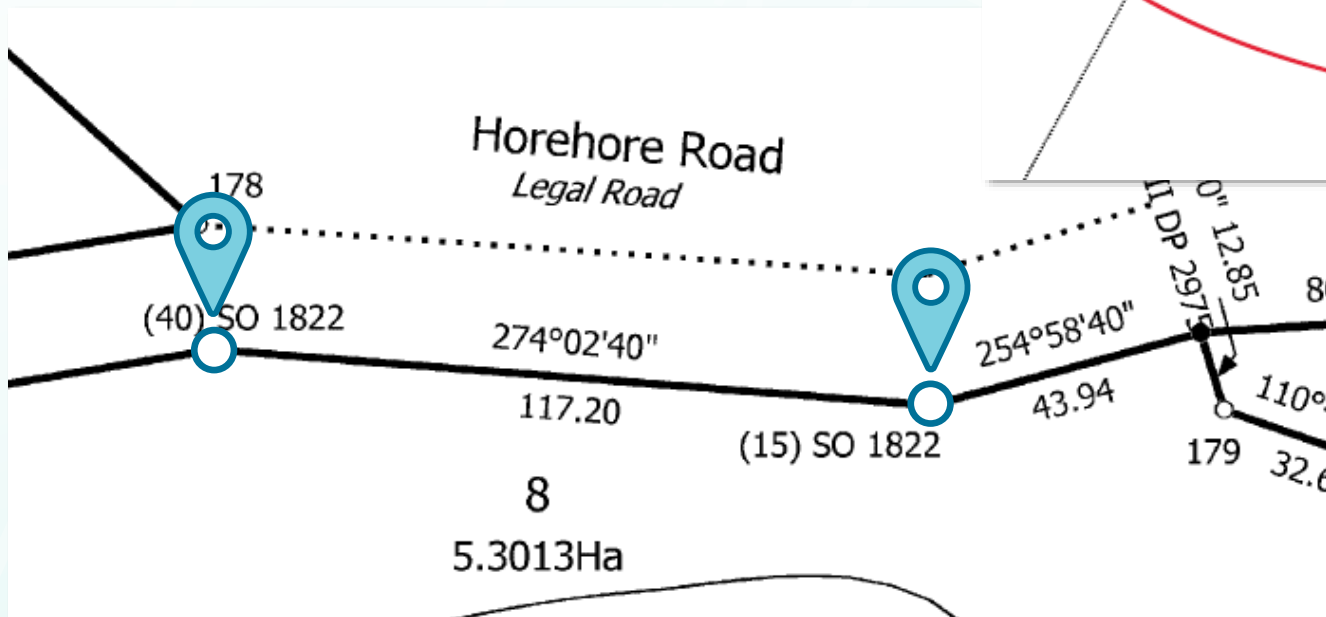
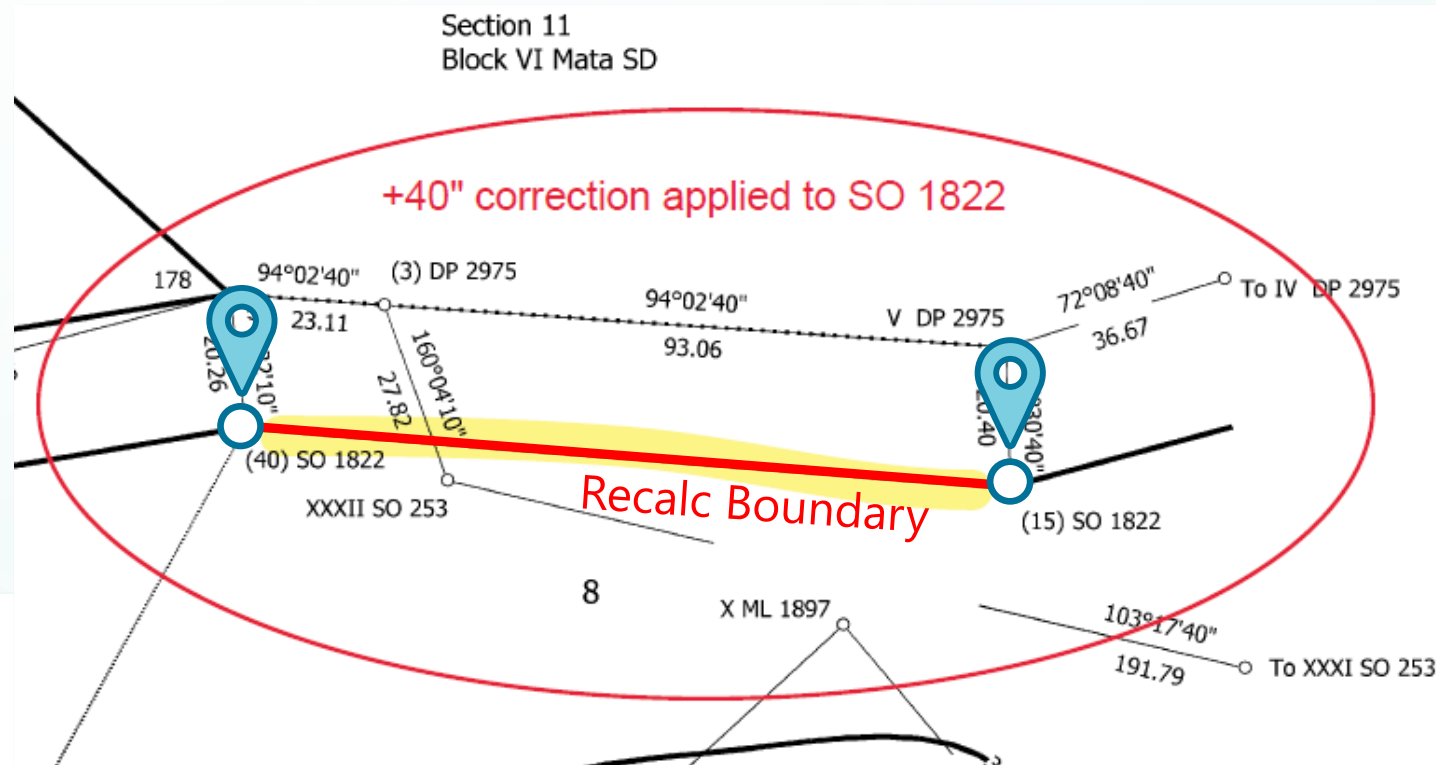


	Bearing	Distance		
Start				
	354.30	101.4	metres	+
	274.02	577.5	metres	+
	177.2130	100.7	metres	+
			metres	+
Misclose	274°01'53"	582.59		RF 1:1

Conclusion:

The boundary is in conflict and needs to be recalculated

The boundary points **are not** in conflict and can be adopted





Content of a CSD



Content of a CSD

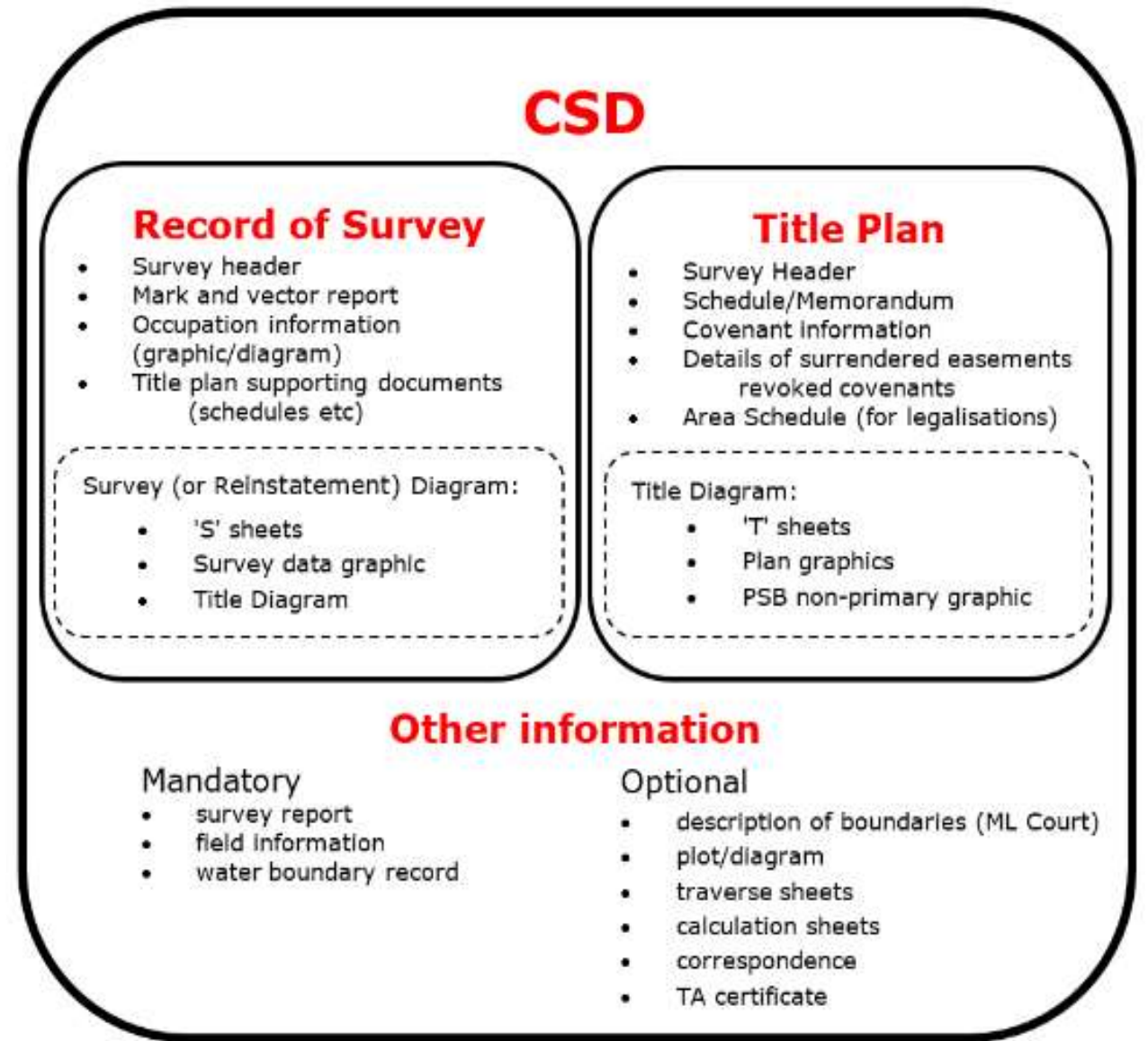
Cadastral survey datasets

Subpart 1—Generic CSD requirements (Inc other info)

Subpart 2—Record of survey requirements

Subpart 3—Survey diagram requirements

Subpart 4—Title plan requirements



Content of a CSD

Record of Survey

- Survey header
- Mark and vector report
- Occupation information (graphic/diagram)
- Title plan supporting documents (schedules etc)

Survey (or Reinstatement) Diagram:

- 'S' sheets
- Survey data graphic
- Title Diagram

Title Plan

- Survey Header
- Schedule/Memorandum
- Covenant information
- Details of surrendered easements
revoked covenants
- Area Schedule (for legalisations)

Title Diagram:

- 'T' sheets
- Plan graphics
- PSB non-primary graphic

Content of a CSD

Other Information

Mandatory

- survey report
- field information
- water boundary record

Optional

- Description of boundaries (ML court)
- plot/diagram
- traverse sheets
- calculation sheets
- correspondence
- TA certificate



Whiteboard List of CSD Validation Issues



Sir Arthur Tyndall and companion, Alexander Turnbull Library, Wellington, New Zealand

Whiteboard List

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Whiteboard List

- Boundary reinstatements – *correct line type?*
 - Adjustment report test failures – *what is acceptable?*
 - Accurate water boundary record – *what is it?*
 -
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 -

Thank you
Any Questions ?





The new old rules



Sir Arthur Tyndall and companion, Alexander Turnbull Library, Wellington, New Zealand



Summary: Field Information

Field information has been recorded and retained for over the past 150 years

Field information:

- has high evidential value and importance
- is part of the official record
- must now be included in the CSD
- must include all relevant field measurements and information
- must be in a usable form



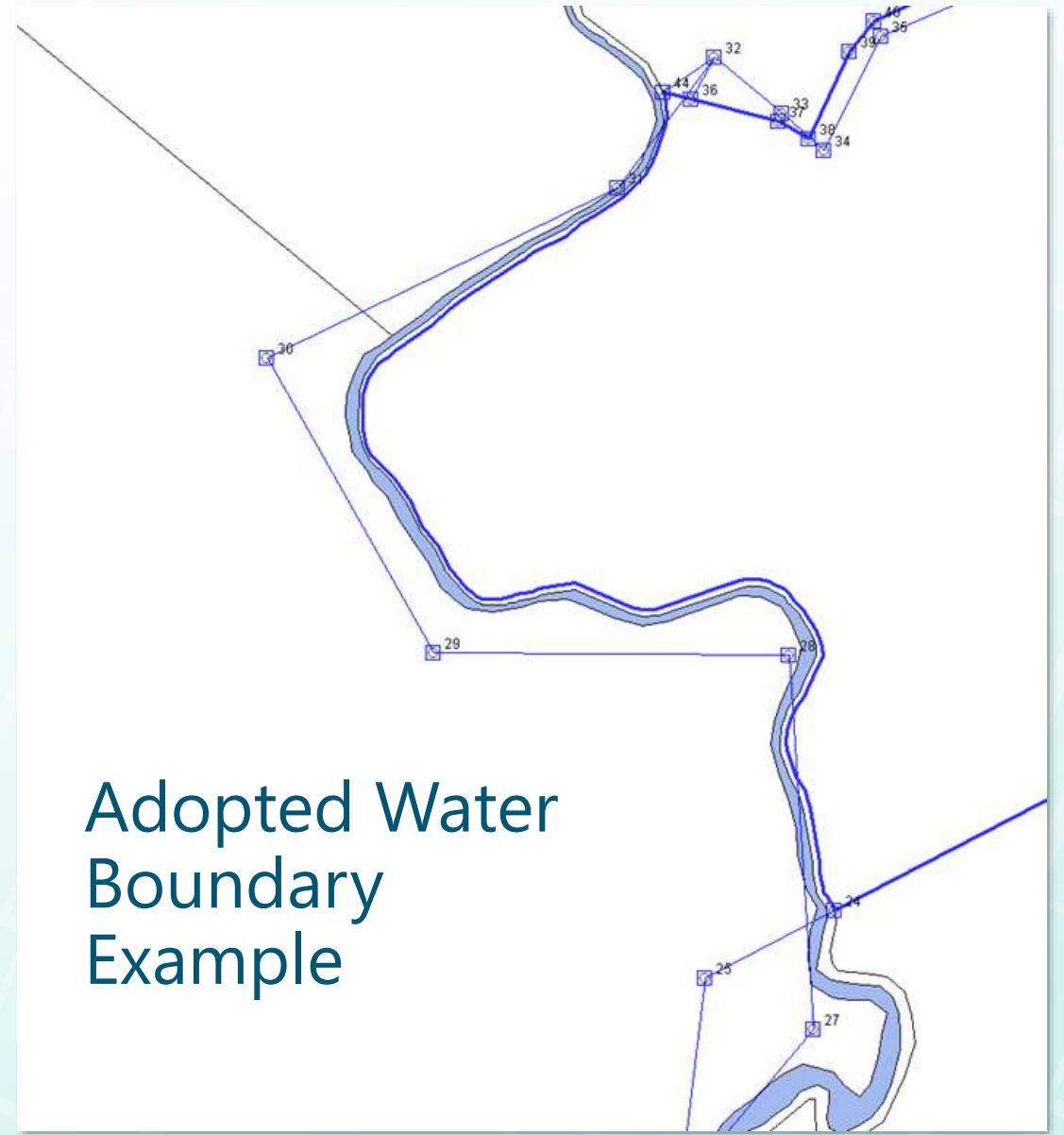
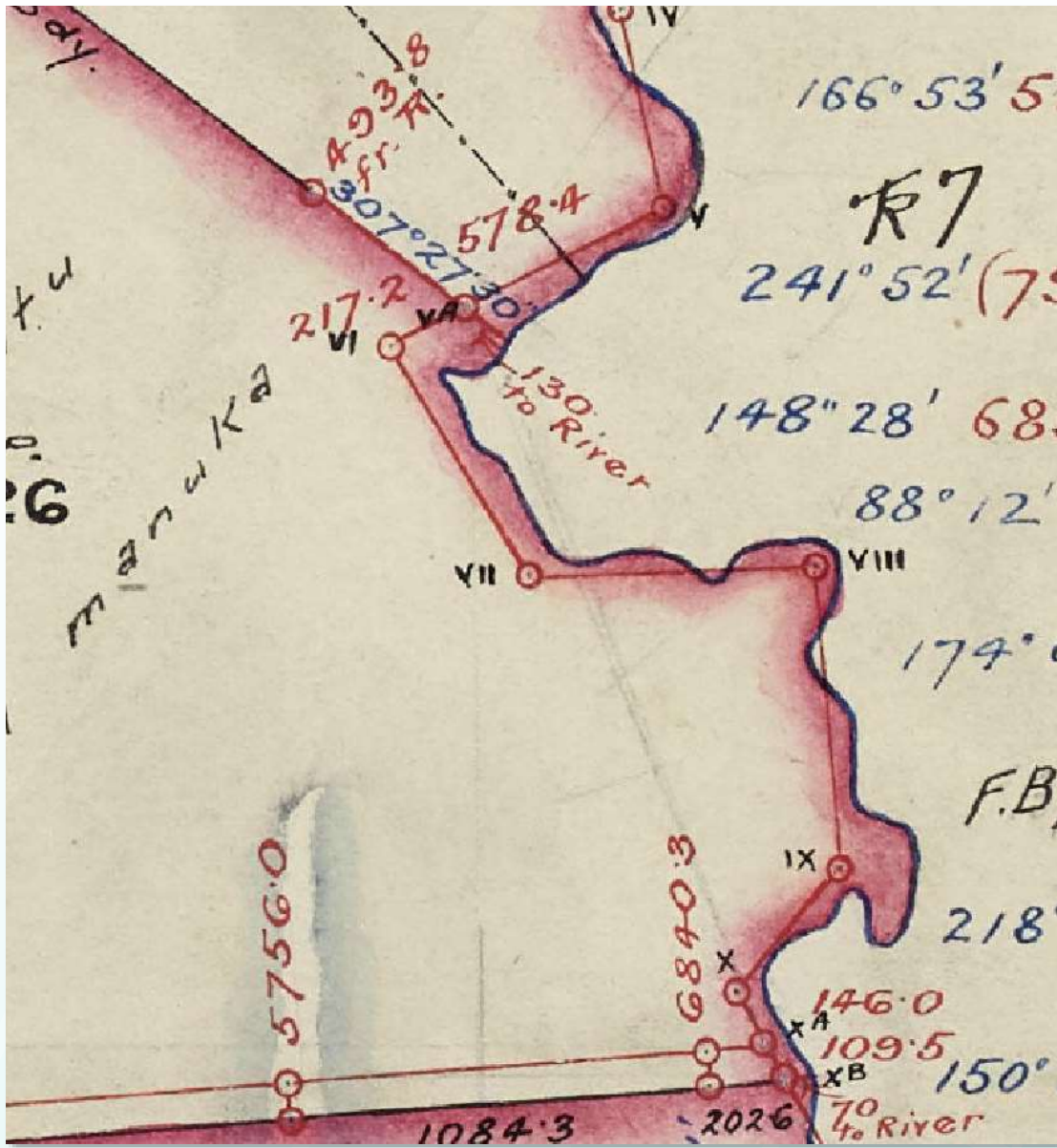
Field Information:

- General information
- Setup information and parameters
- Mark information
- Measurements
- Independent checks
- Other information

Field Information Details	GNSS	Total Station	Other Technology
Project Details	<i>Sufficient details to identify the project</i>		
Job name	✓	✓	✓
Datum	✓	✓	✓
Projection	✓	✓	✓
Instrument details (Model & Serial Number)	✓	✓	✓
Measurement Station Details (From Point) <i>(e.g. GNSS Base Station, Total Station or Other Technology setup point details)</i>	<i>These details should be repeated for each new instrument station setup</i>		
GNSS Base station and Total Station setup details including horizontal coordinate and elevation of setup point	✓	✓	✗
Information regarding control and calibration points and techniques used to control the scale and orientation of the measured data <i>(e.g. GNSS calibration point, Total Station backsight/resection points and Other Technology methodology and calibration points used)</i>	✓	✓	✓

<https://www.linz.govt.nz/kb/935#content-field>

Measured Points Details (To Point) <i>(Measurement details for each measured point)</i>	<i>These details should be grouped into sets of correlative data measured from each separately identified measurement station setup</i>		
Point number or name of measured point	✓	✓	✓
Grid Bearing and Ellipsoidal Distance <i>(if available)</i>	✓	✓	✓
Coordinate Pair <i>(only if no bearing and distance is available)</i>	✓	✗	✓
Elevation <i>(can be approximate for 2D surveys)</i>	✓	✓	✓
Survey mark name or feature code of measured point	✓	✓	✓
Measurement Pole or Target Height	✓	✓	✓
Number of epochs used to determine a GNSS measured vector	✓	✗	✗
Face right or left used to determine a Total Station measured vector	✗	✓	✗
Prism or reflector-less constant used to determine a Total Station measured vector	✗	✓	✗
Horizontal Precision of measured vector or position	✓	✗	✓
Vertical Precision of measured vector or position	✓	✗	✓
PDOP for a GNSS measured vector	✓	✗	✗
Number of satellites used to determine a GNSS measured vector	✓	✗	✗
Date	✓	✓	✓
Time	✓	✓	✗



Adopted Water Boundary Example