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FEEDBACK::

NZVD2016 for Cadastral Surveys

To: **Surveyor-General**
Toitu Te Whenua / Land Information NZ
sgrulesreview@linz.co.nz

This feedback is on behalf of the *Institute of Cadastral Surveying (*ICS).

The ICS is an organisation whose membership is actively engaged in cadastral surveying. Our members undertake many types of surveys that require consideration of the third dimension (height). We understand horizontal and vertical datums and the relationships between datums.

This response represents the collected consensus views of the ICS Membership.

We thank you for the opportunity to provide feedback on the proposal to make the use of NZVD2016 mandatory for cadastral surveys (where a height reference datum is required).

General

- The ICS **supports the proposal** to transition NZVD2016 to be specified in CSR 2021 Schedule 5 as the single official vertical datum for cadastral surveys.

- We understand that **LVDs will remain supported** by Toitu Te Whenua/Land Information NZ as valid datums for various purposes – and that they are "just" being removed from Schedule 5 of the CSR 2021.

- The proposed **timeframe to implement the change is acceptable** to the ICS (1-July-2024). However, this may impact on territorial and local authorities who require LVD datum levels on documents including LT datasets.

- NZ Surveyors (generally) can understand datums and advise and assist clients and councils accordingly.
    - We are required to provide height information to Councils – for new build (minimum) floor levels and for the determination of height limited boundaries. The level datum required is sometimes prescribed by Council, or can be presented as a "Local", "LINZ" or "False" datum levels.

- We provide elevation data to Clients and their agents – including architects - to assist with development and building design. These levels (and their datum) then carry through the design process via build plans through to councils and are then referenced in the set-out, build, and certification process.
- We provide rich data to Clients and their agents involved with various types of positioning surveys that capture and provide x,y,z coordinates for infrastructure design and asset capture, and which populate their GIS databases. The level datum required is often prescribed by these Clients – to match their existing database or recording model datum.

1.0 Overview

- Section 1.2 – Timeframe: The three-stage proposal and timeframe, with implementation from early 2024, is acceptable from our data supplier (surveyor) point-of-view.
  However, this timeframe may challenge territorial and local authorities where they require or expect LVD datum levels, and where these levels need to match land transfer datasets prior to their certification sign-off.

- Section 1.3 – Considerations: The following comments from our Members may be useful during your considerations:
  a. Using the on-line LINZ NZ Coordinate Conversions tool is a simple, flexible, and efficient way for surveyors to convert data from one system to another. This tool could be promoted more to assist surveyors (for themselves and their clients).
  b. Transformation parameters will need to be maintained and retained. There may be instances where historical level data will need to be reviewed or analysed, to determine and confirm past site or build level derivations.
  c. What extent of canvassing of the expectations of cadastral users has there been? When was the cadastral surveying community consulted? And if only about half of councils have adopted NZVD2016 in the eight years since the implementation of it, then that would signal that there are some fundamental issues with their systems/process that are restricting them to adopting new datum (unless it is sheer ambivalence?).
  d. The cadastre is predominantly a 2D record – historically and current. We are aware that there is a LINZ vision to develop a 3D cadastre. However, as the bulk of cadastral datasets submitted will always be 2D, then any driver for a 3D cadastral system will need to be carefully considered – especially if it comes as a cost to 2D users.

- Section 1.4 - Council Uptake: Also reiterated in the Foreword and Section 3.2, there are references to Councils uptake in adopting NZVD2016 as a vertical datum. Variously it is described as "many" and "not all". We requested an indication of the numbers of councils that have adopted NZVD2016 as their vertical datum and were advised that the recent statistics are 33/78 councils (42%), with an additional 5 councils (5%) actively working on implementation.
  We suspect that one of the main reasons that Councils are reluctant to adopt a new level datum, is the fact that their historical records will be based on an official LVD – or a local absolute datum (eg: CCC Drainage Datum). The reluctance to transition to NZVD2016 will be based on the view that there is a significant cost to transition - in terms of training and education of staff and suppliers; and potentially needing duplicate processes and systems until the transition is complete. We understand that LINZ are providing a high level of support in these cases – which is all you can do.

- Section 1.4 – Territorial Authorities: There are additional users of vertical datums beyond Territorial Authorities. These include Regional Councils; Port Authorities; and Infrastructure Agents (eg: Orion NZ Ltd – electrical distribution network managers). These agencies also have established databases of historical information and records – often (now) captured into their respective GIS.

We are aware that some Territorial Local Authorities (Regional Councils) are still using LVDs for things like flood hazard assessments and are requiring development applications to be in terms of a stipulated LVD. This is relevant to the proposed change of Schedule 5 of the CSR2021, if these prescribed LVD levels/datums flow on to cadastral definitions which are required to be presented in terms of NZVD2016.

2.0 The Proposal

- Section 2 – Proposal: One official vertical datum is proposed.
  It is presumed that current 13 LVDs will not be eliminated, and that they will always be available for specific (non-cadastral) use and transformation parameters will continue to be maintained and available to the public.

- Section 2.1 – Summary: The proposal indicates that NZVD2016 datum will be the only official survey datum.
  This is acceptable only if this is in relation to the Cadastral Survey Rules 2021.

- Section 2.2 – Height transformation information: The information and tools that enables ready transformation of heights between LVDs and NZVD2016 is invaluable to surveyors – and likely other users.

- Section 2.2 - NZVD2016 in CSDs: It is noted that NZVD2016 has been used on around 30% of cadastral survey datasets that are required to reference a height datum. We requested an indication of the actual *number of plans* this percentage represents and were advised that the June/July 2023 figures were 16 and 22 (32% and 38%) respectively, as compared with 34 and 36 (68% and 62%) respectively for "Other" datums. The linear trendline of NZVD2016 dataset transition is approximately +1% (29% to 30%) between May-2020 and July-2023.
  This trendline is very flat – if not stagnant. Mandating NZVD2016 as the only official datum for cadastral surveys will certainly deliver the desired outcome – 100% of CSDs.
  However, the actual numbers of datasets with height datums is a much smaller percentage of the total datasets presented each year. Say 6-700 height datum plans per year against 12-15,000 total CSDs per year = ~5%. So, the impact on enforcement of NZVD2016 will likely have a similarly small impact on users – especially assuming only a small number of those ~5% of plans reporting level information will have issues regarding presenting their datasets in NZVD2016.

3.0 Discussion

- Section 3 – Discussion: The initial sentence states that NZVD2016 will be *"the only datum…for use as an official datum."*
  This is acceptable only if *"for cadastral surveys"* is implicit as part of that statement.

- Section 3.1 – Changes: The changes (and date of implementation) are understood and surveyors as measurement professionals should be able to cope with this.

- Section 3.2 – Why change?: It is stated that continuing CSDs in terms of LVDs have become increasingly problematic over time.
  Problematic for whom? – If the problems are with the suppliers (eg: surveyors) or Users (eg: clients and councils) then greater education is required; if the problems are with LINZ databases, then perhaps the LINZ systems and visions need to be revised. After all, should it not be the user that dictates what the want (assuming they know what they are asking for!).

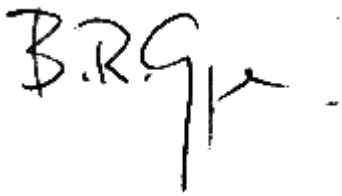
- Section 3.2 – Advantages: The advantages noted are relevant.
  An additional advantage of NZVD2016 for a survey user is that there are a significant number of more NZVD2016 marks presenting a greater network density in urban areas* compared with LVD marks. [* for the major metropolitan areas at least].

4.0 Summary and Timing

- Section 4 – Dispensation: It is noted that dispensation in terms of s47(5) of the CSA 2002 can be requested.
  This is an adequate and acceptable contingency in circumstances where it is unreasonable to deliver NZVD2016 values – as long as dispensation is not unreasonably withheld.

We trust that the feedback outlined above will be useful as you develop the Decision Report. If further clarification of any of the points outlined above is required, please contact the ICS Secretary (secretary@ics.org.nz).

Signed:



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