

New Zealand geodetic system

Part 3 – Urgent works and protection of survey marks

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Advisory officer



The LINZ geodetic database contains approximately 100,000 marks. In addition to this, there are millions of other cadastral marks in the ground that are not recorded in the geodetic database. Many of these marks are below ground and invisible to most of us. This valuable infrastructure is the basis for our land title system, mapping and various GIS systems held by local authorities.

One of the greatest risks to the survey control system in New Zealand is damage to, or destruction of, its physical marks and beacons. LINZ offers a Survey Mark Advisory Service whereby anyone undertaking a work activity that is likely to damage or destroy a control or survey mark can notify LINZ who will identify those marks likely to be damaged or destroyed. The agency carrying out the work activity must then take the necessary steps to protect or replace any affected marks.

The loss of these marks can cause several problems, including the loss of historical connections to the cadastre which allows our property boundaries to be determined and the added costs to carry out these surveys. Our aim is to minimise this loss of marks to less than two per cent a year of the geodetic database total.

Responsibility for the reinstatement or replacement of marks damaged or destroyed by any agency or person rests with that agency or person under Section 55 of the Cadastral Survey Act 2002. A Licensed Cadastral Surveyor must oversee the reinstatement or replacement to the standards set by the Surveyor-General.

This article on the geodetic system in New Zealand details the Survey Mark Advisory Service and urgent works processes, the process of survey mark protection and looks at new steps LINZ is taking to enhance the process and help minimise the damage to or destruction of survey marks.

Damage and destruction of survey marks

In many cases the damage or destruction of survey marks is unavoidable but more often it is through unintentional ignorance of what sits below the surface of construction zones. There are many reasons for the damage to or destruction of survey marks but they include –

- Local authority upgrading services such as water and sewer mains

- Renewing footpaths and street-scaping which is now common in inner city and township redevelopment
- Laying of service plant by utility agencies such as power, gas and telecommunications
- The location of new roads and structures adjacent to or over existing marks
- Unintentional damage due to vehicular traffic – such as broken



An example of a beacon that has had a fire underneath and graffiti put on it.

or damaged cast iron covers over survey marks

- Wilful damage and vandalism, particularly prevalent on trig beacons.

In addition, many existing survey marks lie in the carriageway and due to larger volumes of traffic and the regulations around traffic management, these marks are impractical to use and have to be replaced. In more rural areas the development of lifestyle blocks has caused a problem where landowners want to establish houses on existing trig sites, therefore creating the need to establish new trigs.

General maintenance of marks, trig stations and beacons is contracted to the private sector by tender. On an annual basis LINZ budgets approximately \$300,000 on physical maintenance of this survey infrastructure.

Urgent works

Where LINZ is notified of damage to a survey mark or beacon, particularly where it is a health and safety issue, LINZ will contact a local surveyor and contract them to undertake immediate remedial actions. There have been several instances where broken survey covers, or marks dug up in the roadway or footpath and not properly filled in, have caused damage to property and personnel.

It is important that surveyors using marks reinstate them correctly after use, or if they notice damage to a mark, report this quickly to LINZ. We receive approximately 50 urgent works calls a year. Should you need to inform us of any hazards you can do this by phone on 0800 665 463 or through our web site via the 'Contact us' general enquiry form or through 'Geodetic system' or 'Survey & titles/cadastral surveys' – report damage or disturbances to survey marks.

Survey Mark Advisory Service

LINZ offers a free survey mark protection advisory service where anyone undertaking a work activity that is likely to damage or destroy control or survey marks can notify LINZ. They will identify those marks likely to be damaged or destroyed by supplying plans of those marks. The agency carrying out the work activity must then take the necessary steps to protect or replace any affected marks. These steps may include –

- Diverting works to avoid the marks
- Contacting a licensed surveyor to protect the marks by offsetting and replacing the marks
- With the permission of LINZ going ahead and destroying a mark or beacon.

You can forward on your proposed works via the LINZ website as above using the category 'Survey Mark Protection'.

Beforeudig web based service

The current survey mark advisory service has met with mixed results. It is heavily dependent on local authority requirements for Broken cast iron survey cover.



An example of an open hole left by a surveyor which is an OSH issue

beforeudig™		Sequence No	www.beforeudig.co.nz
		625484	
Utility Notification			
To:	Kelvin Tait		
Utility:	LINZ		
Email:	beforeudig@linz.govt.nz		
Please be advised the person below has requested information about underground assets in your jurisdiction. You are required to respond within 2 working days and reference the Sequence number.			
Caller Details			
Customer ID:	30559	Phone:	068715110
Contact:	Ms Lynn Hardyment	Mobile:	Not Supplied
Company:	Hastings District Council	Fax:	Not Supplied
Address:	100 Warren St, Hastings, Hawkes Bay		
Email:	lynnh@hdc.govt.nz		
Proposed Dig Site Details			
		WARNING:- The adjacent map displays the vicinity around the proposed dig site only and does not display any asset owner's pipes or cables.	
		Enquiry Date:	11/01/2010
		Dig Start Date:	15/01/2010
		Address:	244 Flaxmere Avenue, Hastings, Hawkes Bay, 4201
		Activity:	Hand Digging
		For Planning:	Yes
		Location of Workplace:	Road Reserve
		Asset Locate Required:	No
		Plans Requested:	Yes
		Work Site Information:	Not Specified
END OF TRANSMISSION – v 3.13		Job No: 133312	

Example of a notification sent out to a client upon requesting information of LINZ services.

works agencies to notify LINZ of any work being undertaken and the goodwill of works agencies such as utility companies.

A web based service introduced to New Zealand last year called Beforeudig is currently being trialled by LINZ. The advantage to works agencies using this service is that they only have to make one contact to Beforeudig which will contact all potentially affected parties on their behalf.

Before LINZ joined the Beforeudig service we would process approximately 2,500 notices a year. Now we are receiving that many notices a month. This increase is due directly to the works agencies' need to look out for the more obvious and hazardous services such as power, gas and telecommunications. LINZ is now receiving notices from works agencies who would not previously have thought to contact us.

Discussion

It is not necessary to protect every survey mark. Careful selection of terminal marks, those located at intersections and those of a higher order is more important. Our advice to clients is based on the assumption that the marks still physically exist and have not already been destroyed. However the reality is some of these marks have already gone and we have no record of this.

Maintenance of these marks is continuing and one of our obligations is the issue of health and safety, for example where lids are broken or missing creating a trip hazard. These need replacing and a network of survey firms around the country are able to undertake this work for LINZ on contract. We rely on the public and users of the geodetic system to provide us with the necessary information to keep on top of this work.

As development continues to expand, so does the number of new marks being added to our geodetic database. To enable us to keep this record up to date and relevant we need your feedback as to the status of these control marks. Please contact us if you notice marks disturbed or destroyed.

Kelvin Tait is the Survey Protection Officer and works in Customer Services and has 40 years of service in the survey industry.

