

Land Information

Fact Sheet

July 2008

New Zealand Geodetic Datum 2000

LINZG25700

This fact sheet describes the New Zealand Geodetic Datum 2000 (NZGD2000) and the transformation from its predecessor NZGD1949

LINZ has published a new geodetic datum, New Zealand Geodetic Datum 2000 (NZGD2000).

NZGD2000 is the official geodetic datum for New Zealand that provides an accurate and consistent system for the spatial referencing of points and objects within New Zealand, its offshore islands, and the continental shelf. The datum is formally defined in *LINZS25000 Standard for New Zealand Geodetic Datum 2000* and replaces the New Zealand Geodetic Datum 1949 (NZGD1949).

A datum is a mathematically defined reference surface, approximating the shape of the Earth that enables calculations such as “position” and “area” to be carried out in a consistent and accurate manner. The datum is physically represented by a framework of ground monuments, such as trig stations. The positions of these monuments have been accurately measured and calculated on this reference surface.

Features of NZGD2000

- It is geocentric and compatible with satellite positioning systems.
- It is based on, and aligned with, the International Terrestrial Reference Frame 1996 (ITRF96) and uses the Geodetic Reference System 1980 (GRS80) ellipsoid.
- NZGD2000 coordinates are specified at 1 January 2000.
- The effects of slow crustal deformation caused by plate tectonics (~50 mm/year) are managed through the use of a deformation model. The deformation model enables LINZ to generate NZGD2000 coordinates from observations made at times other than the datum reference epoch.

Transformations from NZGD1949

There are three official methods to transform coordinates between NZGD1949 and NZGD2000. They are one grid and two similarity transformations and each has a different level of accuracy. Because NZGD1949 is a horizontal datum, heights cannot be transformed between datums.

Grid transformation

The transformation grid models the difference between NZGD1949 and NZGD2000. This is the most accurate transformation method (0.1 – 1.0 metres).

The grid, interpolation software and an online conversion utility can be obtained from the LINZ website.

Similarity transformations

The three and seven parameter similarity transformations are simpler than the distortion grid because they do not account for distortions within the datum. The transformations are limited to translating the datum origin, rotating the axes and scale changes. Consequently, the three and seven parameter transformations are also less accurate (five and four metres respectively).

	3 parameter	7 parameter
T_X	54.4 m	59.47 m
T_Y	-20.1 m	-5.04 m
T_Z	183.1 m	187.44 m
R_X	-	-0.470 ″
R_Y	-	0.100 ″
R_Z	-	-1.024 ″
Δs	-	-4.5993 ppm

Coordinate transformations are described in the LINZ fact sheet: *LINZG25703 Datum and Projection Transformations*.

Further information

LINZ standards, fact sheets and up-to-date information are available on the LINZ website: <http://www.linz.govt.nz>.

Further information is available from:

**Surveyor-General
Land Information New Zealand
PO Box 5501
Lambton Quay
Wellington 6145**
Email: info@linz.govt.nz