

Land Information

Fact Sheet

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New Zealand Geodetic Datum 2000 Meridional Circuits

This fact sheet explains Meridional Circuits defined in terms of New Zealand Geodetic Datum 2000.

28 Meridional Circuits in Terms of NZGD2000 Approved

LINZ has approved the development of 28 new meridional circuits in terms of NZGD2000 on Transverse Mercator projections.

In August 1998 Land Information New Zealand approved the adoption and implementation of a new geocentric datum, New Zealand Geodetic Datum 2000 (NZGD2000). One of the major effects of this new datum is that the coordinates (latitude and longitude) of points in terms of the new datum will change by approximately 200m relative to the old datum.

For cadastral surveys in terms of NZGD2000 the 28 new meridional circuits will replace the existing circuits which are in terms of New Zealand Geodetic Datum 1949 (NZGD49). The decision was made following discussion and consultation with users, and an evaluation of options against business drivers.

The characteristics of the new projections are:

- The new circuits will be referred to as "<name> Circuit 2000" eg Wellington Circuit 2000, to distinguish them from the existing circuits.
- The origins of latitude and longitude of the NZGD2000 circuit projections will be almost the same as their NZGD49 equivalents being rounded down to the nearest second.
- The central meridian scale factors of the NZGD2000 circuit projections will be the same as those of their NZGD49 equivalents.
- The false origin coordinates of NZGD2000 circuit projections will be

100,000m greater than their NZGD49 equivalents being 800,000m N and 400,000m E. This will reduce the risk of confusion between the NZGD2000 and NZGD49 projections.

- The initial stations of the NZGD49 projections will not be located at the origin of the NZGD2000 circuit projections. Therefore the new projections will not have initial stations.
- The NZGD2000 circuit projections will be based on, and will use in calculations, the GRS 80 ellipsoid associated with NZGD2000, rather than the international ellipsoid associated with NZGD49. The SI Standard for the metre will be adopted.

What is a Meridional Circuit?

Each meridional circuit is a defined region of the country. A transverse mercator projection¹ has been defined for each circuit to enable surveyed points within the area to be projected and computed onto a plane surface. Each circuit has a defined origin and a scale factor of 1.0 except for North Taieri (0.99996) and Mt. Eden (0.9999).

Definition of New Circuits

The spheroid adopted for NZGD2000 is the Geodetic Reference System 1980 (GRS80) spheroid.

Semi-Major Axis	6 378 137 m
Flattening	1/298.257222101
Datum	NZGD2000
Projection	Transverse Mercator
False Northing	800 000m N
False Easting	400 000m E

¹Map projections are used to enable the curved surface of the spheroid to be represented on a flat sheet of paper.

Circuit Descriptions

Name	Mount Eden 2000
Origin Latitude	36 52 47 S
Origin Longitude	174 45 51 E
Scale Factor	0.9999
Name	Bay of Plenty 2000
Origin Latitude	37 45 40 S
Origin Longitude	176 27 58 E
Scale Factor	1.0
Name	Poverty Bay 2000
Origin Latitude	38 37 28 S
Origin Longitude	177 53 08 E
Scale Factor	1.0
Name	Hawkes Bay 2000
Origin Latitude	39 39 03 S
Origin Longitude	176 40 25 E
Scale Factor	1.0
Name	Taranaki 2000
Origin Latitude	39 08 08 S
Origin Longitude	174 13 40 E
Scale Factor	1.0
Name	Tuhirangi 2000
Origin Latitude	39 30 44 S
Origin Longitude	175 38 24 E
Scale Factor	1.0
Name	Wanganui 2000
Origin Latitude	40 14 31 S
Origin Longitude	175 29 17 E
Scale Factor	1.0
Name	Wairarapa 2000
Origin Latitude	40 55 31 S
Origin Longitude	175 38 50 E
Scale Factor	1.0
Name	Wellington 2000
Origin Latitude	41 18 04 S
Origin Longitude	174 46 35 E
Scale Factor	1.0
Name	Collingwood 2000
Origin Latitude	40 42 53 S
Origin Longitude	172 40 19 E
Scale Factor	1.0
Name	Nelson 2000
Origin Latitude	41 16 28 S
Origin Longitude	173 17 57 E
Scale Factor	1.0
Name	Karamea 2000
Origin Latitude	41 17 23 S
Origin Longitude	172 06 32 E
Scale Factor	1.0
Name	Buller 2000
Origin Longitude	41 48 38 S
Origin Longitude	171 34 52 E
Scale Factor	1.0

Name	Grey 2000
Origin Latitude	42 20 01 S
Origin Longitude	171 32 59 E
Scale Factor	1.0
Name	Amuri 2000
Origin Latitude	42 41 20 S
Origin Longitude	173 00 36 E
Scale Factor	1.0
Name	Marlborough 2000
Origin Latitude	41 32 40 S
Origin Longitude	173 48 07 E
Scale Factor	1.0
Name	Hokitika 2000
Origin Latitude	42 53 10 S
Origin Longitude	170 58 47 E
Scale Factor	1.0
Name	Okarito 2000
Origin Latitude	43 06 36 S
Origin Longitude	170 15 39 E
Scale Factor	1.0
Name	Jacksons Bay 2000
Origin Latitude	43 58 40 S
Origin Longitude	168 36 22 E
Scale Factor	1.0
Name	Mount Pleasant 2000
Origin Latitude	43 35 26 S
Origin Longitude	172 43 37 E
Scale Factor	1.0
Name	Gawler 2000
Origin Latitude	43 44 55 S
Origin Longitude	171 21 38 E
Scale Factor	1.0
Name	Timaru 2000
Origin Latitude	44 24 07 S
Origin Longitude	171 03 26 E
Scale Factor	1.0
Name	Lindis Peak 2000
Origin Latitude	44 44 06 S
Origin Longitude	169 28 03 E
Scale Factor	1.0
Name	Mount Nicholas 2000
Origin Latitude	45 07 58 S
Origin Longitude	168 23 55 E
Scale Factor	1.0
Name	Mount York 2000
Origin Latitude	45 33 49 S
Origin Longitude	167 44 19 E
Scale Factor	1.0
Name	Observation Point 2000
Origin Latitude	45 48 58 S
Origin Longitude	170 37 42 E
Scale Factor	1.0

Name	North Taieri 2000
Origin Latitude	45 51 41 S
Origin Longitude	170 16 57 E
Scale Factor	0.99996
Name	Bluff 2000
Origin Latitude	46 36 00 S
Origin Longitude	168 20 34 E
Scale Factor	1.0

The Impact of NZGD2000 Meridional Circuits: coordinates will change

The coordinates (northing and easting) of a point in terms of NZGD2000 Meridional Circuits, when compared with the NZGD49 circuit coordinates, will change by approximately 100 km north and 100 km east. This will be mainly due to the change in false origin but also, to a lesser extent, due to the NZGD49 → NZGD2000 datum shift and the rounding of the origin of latitude and longitude.

NOTE: TO AVOID CONFUSION, USERS OF CIRCUIT COORDINATES MUST KNOW WHICH DATUM THE COORDINATES ARE IN TERMS OF.

Time frame for implementation

The new meridional circuits will be implemented for cadastral surveys as the *Landonline* project introduces automated systems from 1 March 2000.

Further information

Details on the rationale behind the decision for the new circuits is available on the LINZ internet site at:
<http://www.linz.govt.nz/publications/osg>
 (see OSG Technical Report 8)
 As the circuits are developed, further information will become available from:

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