



Metadata

HAMILTON CITY COUNCIL HAMILTON CITY – 2019 LiDAR SURVEY

AERIAL SURVEYS PROJECT N^o: FPFA1251

Summary

Project

An Airborne Laser Scanner survey was conducted over the Hamilton City area of interest totalling approximately 375 km². Hamilton is located in the Waikato Region of the North Island.

Data

The data was processed into various digital map data products. The products included for this dispatch contain:

- AOI
- Raw Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Hydro Flattening
- Contours
- Intensity Image
- Tile Layout

Project Report

Safety: No safety incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft on: 3 November 2019, 4 November 2019 & 5 November 2019.

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points acquired by Sounds Surveying Ltd.

Data Processing: Reduction of the ALS data proceeded without any significant problems. Laser strikes were classified into ground and non-ground points using auto algorithms across the project area.

Data Presentation: The data provided on this volume has been supplied in accordance with a specification agreed with Hamilton City Council.

Project Contacts:

Hamilton City Council Chief Data Officer: Chris Mardon (Ph. (07) 838 6588)

National Account Manager: Jenny Bakker (Ph. (09) 415 3101)

Data Acquisition

The project area is that shown in the shapefile 'LiDARMetadataHamiltonCity2019LiDAR_Fpfa1251.shp' that accompanies the dataset. A map showing this area of interest is included in Appendix A.

LiDAR survey was collected using Aerial Surveys Optech Galaxy PRIME LiDAR system.

Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 1725 m AMGL
- Scan Angle: ±20.0 degrees
- Scan Frequency: 65.0 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 55%
- Swath Points Per M²: 4.49

Sounds Surveying Ltd field surveyed check sites that were used to verify the accuracy of the processed ground dataset.

Data Processing

The LiDAR sensor positioning and orientation (POS) was determined using the collected GPS/IMU datasets and Applanix POSpac software.

Base Station Positions: PP-RTX

The POS data was combined with the LiDAR range files and used to generate LIDAR point clouds in NZTM and ellipsoidal heights. This process was undertaken using Optech LMS LiDAR processing software. The data was checked for completeness of coverage. The relative fit of data in the overlap between strips was also checked.

The height accuracy of the ground classified LiDAR points was checked using open land-cover survey check site data collected by Sounds Surveying Ltd. This was done by calculating height differences statistics between a TIN of the LiDAR ground points and the checkpoints. The standard deviation statistic is 0.029m; a RMS of 0.029m and the average difference is 0.002m. LiDAR is relative to the control check points.

StDev_DZ	Mean_DZ	RMSE_DZ	CI95_DZ
0.029	0.002	0.029	0.057

The positional accuracy of the LiDAR data has been checked by overlaying Sounds Surveying Ltd surveyed data over the LiDAR data displayed coded by intensity. The data was found to fit well in position.

The point cloud data was then classified with TerraSolid LiDAR processing software into ground and above ground returns using automated routines tailored to the project landcover and terrain.

Product Deliverables

All spatial data for this project provided in terms of New Zealand Transverse Mercator 2000 (NZTM2000) horizontal and New Zealand Vertical Datum (NZVD2016) and Moturiki 1953 (sea level). The data was converted from NZGD2000 ellipsoidal heights into the orthometric height system using the LINZ NZGeoid16 separation model. The products are tiled into NZTopo50 map sheet tiles as noted below.

The following details the folder contents:

AOI:	Extent is the limit of the project area This dataset is supplied in SHP format and DXF
Raw Point Cloud:	Contains the unclassified LiDAR point cloud points as they were prior to being classified This dataset is supplied in ASPRS LAS v1.2 format
Classified Point Cloud:	This contains the LiDAR point cloud points that have been classified This dataset is supplied in ASPRS LAS v1.2 format
Gridded DEM:	Contains 0.5 m & 1m GSD DEM data. Ground surface with hydro flattening and breaklines. This dataset is supplied in ARC_ASCII grid format
Gridded DSM:	Contains 0.5 m & 1m GSD DSM data. Ground surface model. This dataset is supplied in ARC_ASCII grid format
Contours:	Contains 0.5 m, 1 m and 5 m contours. The contours were interpolated from a smoothed TIN created using the LiDAR point cloud dataset. The contours are classified into majors and minors. Four minors to every major and shown on different levels. This dataset is supplied in SHP format and DXF
Intensity Images:	Contains the raster images created using the intensity values of the LiDAR returns. GSD of approximately 0.2 m. This dataset is supplied in GeoTIFF/TFW format
Tile Layout	Tiles is the tile layout for the project area including date of LiDAR acquisition Tile size 1:1000 sheet layout (480 x 720 m) Tile dataset is supplied in SHP format and DXF

Surface Type	Classification	Point Class
Raw	1	Unclassified
Ground	2	Ground
Above Ground	3	Low Vegetation
Above Ground	4	Medium Vegetation
Above Ground	5	High Vegetation
Above Ground	6	Buildings
Above Ground	7	Noise
Above Ground	9	Water
Above Ground	10	Bridge
Above Ground	12	Overlap
Above Ground	14	Above Ground
Above Ground	18	High Noise

All digital data supplied on eHDD_107. Data couriered to Chris Mardon, Hamilton City Council on: 30 January 2020.

If you have requirements for the data in other file formats, map projections please contact Aerial Surveys.

License/Copyright

The project has been supplied on the basis of a shared ownership structure in the end products delivered under this programme (LiDAR products) which provides Hamilton City Council with no restrictions in the use of these products. All raw data (raw LiDAR data, ground control, GNSS & IMU data) remain the sole property of Aerial Surveys, consistent with our standard terms of engagement.

Appendix A: Project Area

The tile layout is shown in red.

The project extent area is shown in blue.

