



Metadata

NELSON CITY COUNCIL

NELSON REGION – 2020/21 LiDAR SURVEY

AERIAL SURVEYS PROJECT No: FPFA1292

Summary

Project

An Airborne Laser Scanner survey was conducted over the Nelson area totalling approximately 455 km². The area of capture is located in the Nelson Region of the South Island.

Data

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

- AOI
- Unclassified Raw Point Cloud
- Classified Ground Point Cloud
- Classified Above Ground Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Intensity Image
- Contours
- Triangular Irregular Network
- Hydro-breaklines
- Tile Layout
- File Listing
- Metadata Report (this report)

Project Report

Safety: No safety Incidents were reported during the project.

Acquisition: Airborne Laser Scanner (ALS) data was acquired from a fixed wing aircraft.

Ground Support: GPS base station data was provided by Global Surveys Ltd and LINZ base stations. The ground check points were 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 Nelson City Council.

Project Contacts:

Nelson City Council Team Leader GIS: Kilmeny Stephens (Ph. (03) 546 0252)

Aerial Surveys Business Development Manager: Steve Smith (Ph. (09) 415 3101)

Data Acquisition

The project area is that shown in the shapefile 'NelsonRegion_2020-21_LiDAR_Fpfa1292_DatasetExtent.shp' that accompanies the dataset. A map showing this area of interest is included in Appendix A.

Capture Dates

The LiDAR survey was captured on the following dates:

10, 11, 13, 22 January 2021; 05 March 2021; 29 April 2021; 22, 24 June 2021.

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

Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 1800 m AMGL
- Scan Angle: ± 19 degrees
- Scan Frequency: 88.5 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 35%
- Swath Points Per M²: 8

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.

Benchmarks: pprtx

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 0.04 m; a RMS of 0.04 m and the average difference is 0.004 m. LiDAR is relative to the control check points.

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 land cover 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). 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
- Unclassified Raw Point Cloud: Contains the unclassified LiDAR point cloud points as they were prior to being classified
This dataset is supplied in ASPRS LAS and ASCII XYZI format
- Classified Ground Point Cloud: Contains the LiDAR point cloud points that have been classified as ground returns and includes intensity map
This dataset is supplied in ASPRS LAS and ASCII XYZI format
- Classified Above Ground Point Cloud: Contains the LiDAR point cloud points that have been classified as above ground returns and includes intensity map
This dataset is supplied in ASPRS LAS and ASCII XYZI format
- Classified Point Cloud: This contains the classified LiDAR point clouds
This dataset is supplied in SHP format

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	Low Noise
Above Ground	9	Water
Above Ground	10	Bridge
Above Ground	12	Overlap
Above Ground	14	Above Ground
Above Ground	18	High Noise

- Gridded DEM: Contains the gridded ground surface (1 m separation grid)
This dataset is supplied in raster GeoTIFF format
- Gridded DSM: Contains the gridded top of surface (1 m separation grid)
This dataset is supplied in raster GeoTIFF format
- Breaklines: Breaklines representing all hydro-flattened features
This dataset is supplied in SHP format
- Flight Lines: Flight lines as ESRI polygons
This dataset is supplied in SHP format

Contours:	Contains 0.5 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
Triangular Irregular Network:	This dataset is supplied in ESRI TIN ADF format
Tile Layout:	Tiles is the tile layout for the project area Tile size 1:1,000 sheet layout (480 m x 720 m) Tile dataset is supplied in SHP format and DXF
LiDAR Final Report:	Supplied in PDF format
File Listing:	Supplied in TXT format
Metadata Report:	Supplied in PDF format

All digital data supplied on e-HDD. Data was couriered to Kilmeny Stephens, Nelson City Council, on 03/08/2021.

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

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Appendix A: Project Area

The tile layout is shown in red.

The project extent area is shown in blue.

