



## Metadata

### ENVIRONMENT Canterbury

### Canterbury – 2019-25 PGF LiDAR SURVEY

#### Block 5

**AERIAL SURVEYS PROJECT No: FPFA1267**

#### *Summary*

##### *Project*

An Airborne Laser Scanner survey was conducted over the Canterbury areas of interest totalling approximately 1568.3 km<sup>2</sup>. This area covering approximately 382 km<sup>2</sup> covers Schedule C.

##### *Data*

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

- AOI
- Ground Control Data
- Raw Point Cloud
- Classified Point Cloud
- Gridded DEM
- Gridded DSM
- Hydro-Flattening Breaklines
- Flight Line Shapefiles
- 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 Environment Canterbury.

##### **Project Contacts:**

ECAN Team Leader, Geospatial Services: Iain Campion (Ph. (03) 367 7175)

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### Data Acquisition

The project area is that shown in the shapefile 'Canterbury\_2019-25\_LiDAR\_Block5\_TileExtent.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:

2022-07-02
2022-07-03
2022-09-15

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

#### Survey Specification:

- Scanner: Optech Galaxy PRIME
- Flying Height: 2,100 m AMGL
- Scan Angle FOV: 38.0 degrees
- Scan Frequency: 62 Hz
- Pulse Rate: 400 kHz
- Swath Overlap: 35%
- Swath Points Per M<sup>2</sup>: 2
- Project Points per M2: 4

### Data Processing

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

#### Base Station Positions: 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

Type	StDev_DZ	Mean_DZ	RMSE_DZ	CI95_DZ
Control	0.031	-0.009	0.033	0.065
Check	0.028	-0.011	0.03	0.059

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 a sparse triangular irregular network (TIN) from the supplied LiDAR points and then classified according to required classes by using automatic iterative process followed by manual correction. Terrascan's inbuilt macros with different parameters were used to classify low points, ground points, buildings, temporary features and finally vegetation.

The Digital Elevation (DEM) was derived using a point to TIN and TIN to Raster process, using a Natural Neighbour interpolation. Hydro flattening was performed as per part 7 of PGF version New Zealand National Aerial Lidar Base Specification Jan 2020.

Areas of low cropping have been identified and a proprietary method was used to correctly classify ground and vegetation in those areas.

### *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
Ground Control Data:	All ground control data after survey undertaken This dataset is supplied in ASCII and JPG format
Raw Point Cloud:	Contains the unclassified LiDAR point cloud points as they were prior to being classified This dataset is supplied in ASPRS LAZ v1.4 format
Classified Point Cloud:	Contains the LiDAR point cloud points that have been classified This dataset is supplied in ASPRS LAS v1.4 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	18	High Noise

Gridded DEM:	Contains the gridded ground surface (1 m separation grid) This dataset is supplied in raster GeoTIFF format
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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
Tile Layout:	Tiles is the tile layout for the project area Tile size 1:1,000 sheet layout (480 x 720 m) Tile dataset is supplied in SHP format
File Listing:	Supplied in TXT format
Metadata Report:	Supplied in PDF format

All digital data supplied via the ECAN Azure Site. Data was uploaded to Environment Canterbury on 28 March 2023.

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

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Environment Canterbury intends to release the data under Creative Commons license (CC BY). In doing so any data that is shared, copied or distributed must have the required acknowledgements and attributions for the ortho imagery and DEM products provided in this project.



### *Appendix A: Project Area*

The tile layout (1018 tiles) for the supplied Block 5 is shown in red.  
Neighbouring blocks are shown in black.

