CompassData

FEMA San Diego, California
Ground Control Project Report
February 3rd, 2016

Project Information

CDI Project Number: CDI4320
Geographic Location: San Diego, California
Number of GCPs Requested: 40
Number of GCPs Collected: 40

Project Specifications

Precision (Horizontal/Vertical): 0.213 survey feet (6.5 cm)
Coordinate System: California State Plane Zone 6
Datum: NAD 83
Zone: 11 North
Altitude Reference: MSL (Geoid12B)
Units: US Survey Feet

RTK GPS

All Ground Control Points for this project were collected using the UNAVCO Plate Boundary Observatory Real-time Network.

All Control Points were observed to determine a coordinate <6.5 cm in both horizontal and vertical to support subsequent LiDAR post-processing and bare earth deliverables generation. When cellular data was not available static observations of at least 45 minutes were collected and post-processed to <6.5 cm horizontal and vertical.

Network accuracy was checked by comparison to both static duplicate shots and NGS passive monuments.

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Summary

The purpose of this project was to locate and survey ground control points (GCPs) in the area of interest as defined by FEMA-supplied shape and kml files. The GCP coordinates are to be used to control the vertical aspect of all newly-flown LiDAR data during post-processing and subsequent deliverables creation. CompassData visited the project area, found suitable GCPs, and determined accurate coordinates for each GCP according to the customer's specifications.

Equipment

Compass Data used Trimble R8 and R10 antennas to perform the survey. These devices are accurate to within 1 cm on a position-by-position basis per Trimble specifications. Operating within the VRS network provided accurate coordinate values at or around 3 cm horizontal and vertical. CompassData has consistently demonstrated this level of accuracy on many GCP collection jobs across North and South America and Africa. Specifications for the Trimble R8 and R10 are available upon request.

Survey Methodology

Compass Data has met the required precision for this project by using a high-quality GPS receiver with differential corrections provided by a GPS base station close to the project area. The GPS antenna sat atop a bubble-leveled, fixed-height range pole that was placed over the center of the desired GCP. 180 positions (captured at a rate of one per second) were geometrically averaged to calculate a single coordinate for each GCP. All required field documentation was filled out and the points were marked on the supplied image chips. Digital pictures of each GCP location were collected in the field.

Quality Control Procedures

Compass Data selects GCPs with an unobstructed view of the sky to ensure proper GPS operation. CompassData works to avoid potential sources of multipath error such as trees, buildings, and fences that may adversely affect the GPS accuracy.

While operating within a VRS network, valid solutions are reached within seconds; however, we continue to collect additional data to ensure meeting collection specifications. To ensure accuracy, a GCP will be retaken or moved to a more suitable location if it does not meet these standards.

In addition to the aforementioned procedures, Compass Data "surveys" existing geodetic control monuments to see if our coordinates match the published coordinates to the required accuracy. These monuments are usually established by the National Geodetic Survey (NGS) in the United States. If it is found that our coordinates are outside the acceptable accuracy, the reason for the difference will be found or the GCPs will be retaken and/or adjusted by the necessary amounts. There are certain geodetic considerations that must be taken into account that affect whether a GPS-derived coordinate will line up with a survey monument, especially when these monuments reference local coordinate systems or the systems of another country. Sometimes the published coordinates for a monument are not accurate, although this is very infrequent.

Compass Data visited one or more survey monuments during the course of this project. The results of those monuments are summarized in the Accuracy Report.

Deliverables

Deliverables for this project include:

- Coordinates (in spreadsheet format)
- Image Chips (when available)
- Digital Pictures
- QA/QC Data

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Project Notes

The Horizontal and Vertical accuracies in the Accuracy Report were obtained from the Survey Report generated by Trimble Survey Controller and are reported in US Survey Feet.

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