

**GLACIER BAY LIDAR MAPPING SUPPORT**  
**SE ALASKA GLACIER BAY/GUSTAVUS, ALASKA**  
**SURVEYING AND MAPPING REPORT**

**Prepared for:**

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Field Project dates: July 22<sup>nd</sup> through July 28<sup>th</sup>, 2019

**REPORT DATA AUGUST 12, 2019**

**GLACIER BAY LIDAR MAPPING SUPPORT JULY 2019**

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**LIST OF ACRONYMS**

CORS .....	Continuously Operating Reference Station
FBK.....	Survey Digital Field Book File
GCP.....	Ground Control Point
GNSS .....	Global Navigation Satellite System
LGO .....	Leica Geo Office
NGS.....	National Geodetic Survey
NOAA.....	National Oceanic and Atmospheric Administration
NPS .....	National Park Service
NTP.....	Notice to Proceed
OPUS .....	Online Positioning User Service
QC.....	Quality Control
QSI.....	Quantum Spatial Incorporated
RFP .....	Request for Proposal
TBC.....	Trimble Business Center
USC&GS.....	U.S. Coast & Geodetic Survey

# **HORIZONTAL & VERTICAL CONTROL SUMMARY**

## **1.0 INTRODUCTION**

This project consists of locating and establishing Ground Control Points (GCP), and Quality Control (QC) points throughout Glacier Bay, Alaska to support the Aerial Mapping being performed by Quantum Spatial Incorporated (QSI). DOWL was hired by QSI as the independent subconsultant to perform these services. Incidental to these services was also the recovery and establishing of survey control to perform the above described services. Numerous National Geodetic Survey (NGS) monuments, and National Oceanic and Atmospheric Administration (NOAA) benchmarks were recovered and included in our control network. QSI provided DOWL with a list and general area of the requested QC and GCP data sets, and efforts were made to collect data in those areas. In certain instances, with recommendation from the National Park Service (NPS), certain areas were moved to better fit environmental conditions and for safety reasons.

## **2.0 HORIZONTAL CONTROL SUMMARY**

A field survey was performed by DOWL from July 22, 2019 through July 28, 2019, under the supervision of A. William Stoll, PLS #12041. Before mobilizing to the field, Willie performed a robust search of the NGS record to determine existing monuments near to the desired locations. A list was compiled of monuments that would be the static primary control points for this project. Also, a thorough review of the Continuously Operating Reference Stations (CORS) was reviewed to determine which would be beneficial to have in the record.

After careful reconnaissance and recovery of local control, it was decided that the optimal location for a DOWL project control station was at the park service building. A control station was established to effectively work as a CORS station while on site. The averaged data from three days of Global Navigation Satellite System (GNSS) was sent to the NGS Online Positioning User Service (OPUS). The results of the OPUS solutions were then averaged, and that position was held for all data processing. A GNSS network was processed using Leica Geo Office (LGO) minimally constrained to that OPSU solution. Independent OPUS solutions were also processed for 16 of the control stations within the network and those values were compared to the local LGO network. The mean of those 16 points was 0.006 meters, with a max value of 0.07 meters, minimum value of 0.05 meters and a 95% confidence interval of 0.02 meters.

## **3.0 HORIZONTAL CONTROL STATEMENT**

### **COORDINATE SYSTEM:**

Coordinates are NAD83(2011)(2010.0000) Alaska State Plane Zone 1 Meters. Coordinates are based on the average of three OPUS derived solutions at Control Point 1 . The averaged OPUS solution was held in a minimally constrained network adjustment.

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### 4.0 VERTICAL CONTROL SUMMARY

Elevations are NAVD88 as determined by Geoid 12B expressed in Meters. Elevations are based on the average of three OPUS derived solutions at Control Point 1. The averaged OPUS solution was held in a minimally constrained network adjustment.

### 5.0 QUALITY ASSURANCE

Quality Assurance (QA) methods and procedures outlined in the statement of services were reviewed with our staff and adhered to. Some examples of QA methods include the following:

- All equipment utilized during this project was checked for accuracy, and adjusted when necessary, prior to commencing any work.
- Redundant distance measurements were made in feet and meters.
- Tripods with optical plummet tribrachs or laser plummet tribrachs were used to set up over the points while measuring all control.
- For each conventional total station set up (FBK), and daily GPS RTK rover, check shots were taken on control points at the beginning, end, and periodically during each session or day.

### 6.0 SURVEYOR'S CERTIFICATION

I, A. William Stoll, Alaska Land Surveyor #12041, do hereby certify that the information contained herein is the result of work performed by me or by others working under my direct supervision.



A. William Stoll, PLS  
Alaska Professional Land Surveyor No. 12041

April 28, 2020  
Date

