

Jacksonville Beach Topographic Survey

Job Number: 22-051



Survey Date: June 6, 2022

Report Date: June 23, 2022

Survey Performed for: Olsen Associates, Inc.

Arc Surveying & Mapping, Inc.

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Background

Arc Surveying and Mapping, Inc (Arc) was issued a contract by Olsen Associates, Inc., to perform topographic and aerial lidar mapping for the survey area. Utilizing a combination of data acquisition procedures including conventional survey collection, Drone Based lidar and photogrammetry, and Real Time Kinematic (RTK) GPS. The procedures utilized result in high resolution spatial data, which provide accurate control and feature data acquisition

Preparation

Special care and attention to weather conditions were taken into consideration during survey operations. To improve survey data accuracies. Ideal conditions were utilized for data acquisition. Careful consideration was taken during the planning to ensure safety of crew and equipment.

Weather Conditions: General weather conditions we fair during all survey acquisition days.

Personnel:

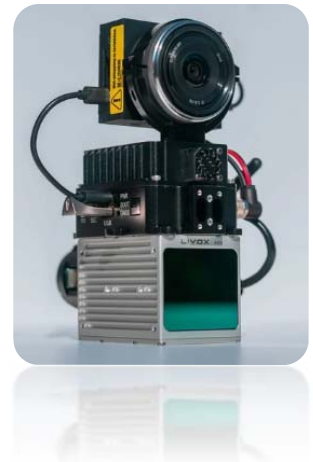
Project Manager/Drone Pilot: Rick Sawyer, P.S.M.

Data Processor: John K. Maffett, P.S.M.

CAD Drafter: Alex Sinardi S.I.T.

Equipment

- *Trimble™ R10 Integrated GNSS System*: The Trimble R10 GNSS receiver enables reliable, fast and accurate collection of survey data in the field.
- *Trimble™ S3 2" Robotic Total Station*: An accurate and reliable instrument, integrated robotic radio and popular Trimble TSC3 controller optimized for Trimble Access fld software, integrated high-capacity battery and dual charger.
- *DJI™ M300 RTK Commercial Quadcopter*: An absolute workhorse for public safety, utility, construction, inspection and many more applications. 50+ minutes of flight time, maximum transmission range of 9+ miles, and the ability to carry up to three payload cameras or sensors.
- *ROCK™ R2A*: A Livox™ Avia lidar sensor capable of collecting over 240,000 points per second, coupled with a military grade, Inertial Labs™ IMU. A Sony™ A5100 24 mega-pixel sensor is mounted for image acquisition allowing RGB overlay for full color point clouds, and seamless ortho imagery.



Geodetic Control Summary

Horizontal Control:

Florida State Plane Coordinate System, East Zone, North American Datum of 1983 (NAD83 2011).

Vertical Control:

North American Vertical Datum of 1988 (NAVD88).

Reference Benchmark:

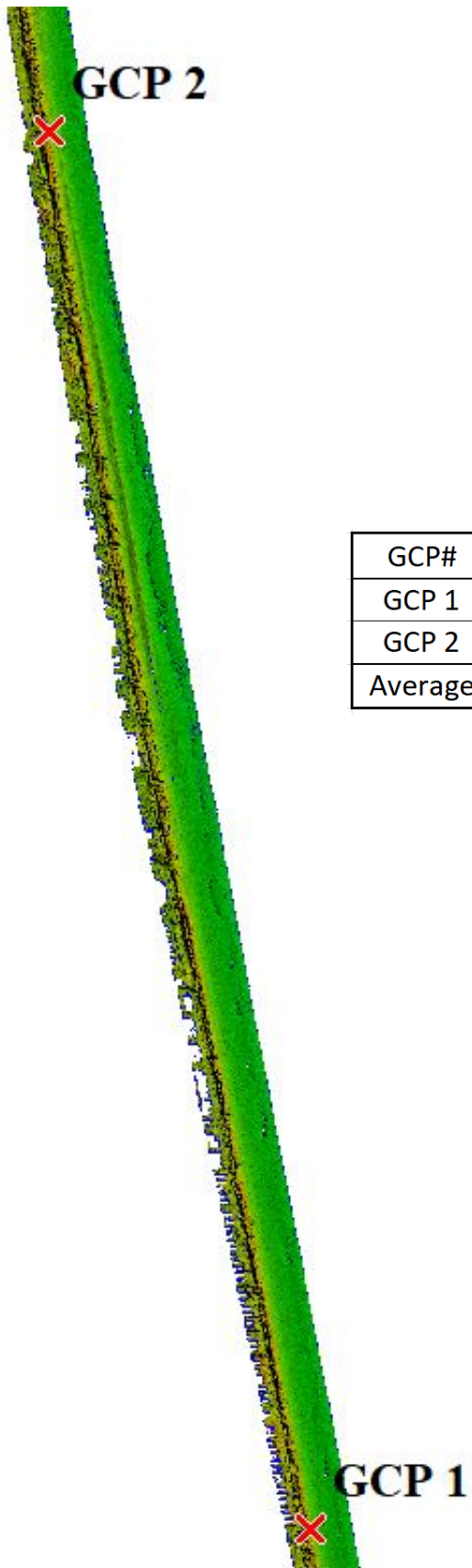
BRASS DISK "Y324"

Northing	Easting	Elevation (ft)
2165067.19	533464.81	10.57

Positioning is provided from a reference base station located at the above reference benchmark. Both the base station and M300 quadcopter are logging simultaneous GPS corrections during lidar and photogrammetry acquisition. The data is then processed utilizing PPK (Post Processed Kinematic) techniques for further analysis, editing, and processing.

Lidar Ground Control Points and Accuracies

Data is processed and referenced in Blue Marble Global Mapper



GCP#	LiDAR Elev. (ft)	Target elev. (ft)	Elev. (ft)
GCP 1	9.755	9.7244	0.0306
GCP 2	9.796	9.7774	0.0186
Average			0.0492

Deliverable Data Files

- Deliverable Digital CAD files
- .laz lidar point cloud files
- Survey Report

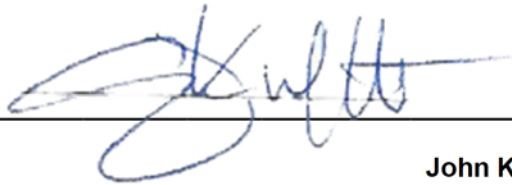
Surveyors Notes

1. Horizontal Datum is reference to Florida State Plane Coordinate System, East, Zone, North American Datum of 1983 (NAD83), being derived utilizing a Trimble Virtual Reference System (VRS) procedures, being referenced and verified to a Brass Disk stamped "Y324", having coordinates of 2165067.19, 533464.81.
2. Elevations shown hereon are in US Survey Feet and are based on the North American Vertical Datum of 1988 (NAVD88), derived using a Trimble Virtual Reference System (VRS) procedures, being referenced and verified to a Brass Disk stamped "Y324", having coordinates of 2165067.19, 533464.81.
3. Topographic digital terrain model (DTM) was generated from aerial lidar survey methods utilizing ROCK R2A LiDAR system mounted on a DJI M300 Unmanned Aerial Vehicle (UAV). The accuracy of the DTM ground surface in areas of high vegetation will vary and depend on the vegetation density. Conventionally surveyed cross sections and profiles were acquired to verify accuracies of DTM data.
4. Digital orthoimage shown here on was generated from aerial photogrammetric methods utilizing a SONY A5100 24 MP camera mounted on a DJI M300 unmanned aerial vehicle (UAV).
5. Horizontal and vertical positioning for both the aerial lidar and orthoimage are processed utilizing (PPK) post processed kinematic solutions. General accuracy for these solutions is 0.1 +/- of a foot.

Certification of Survey

The survey completed at Jacksonville Beach, Florida, and has been overseen and confirmed for compliance with State and Local Surveying Standards.

Signature: _____



John K. Maffett, PSM

This report was compiled by
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