



Executive Summary

Hawk Mountain Ranger School Facilities Mapping

Prepared by Location Laboratories for the Pennsylvania Wing Civil Air Patrol

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Introduction

This document summarizes the final mapping project conducted by Nikolas Hawley, GISP for GGS 308 Field Mapping Techniques. The purpose of the final project was to be a culminating project utilizing field mapping techniques learned during the course.

Objective

The objective of the selected project was to create an updated facility reference map for the Hawk Mountain Ranger School (HMRS) Search & Rescue Training Facility of the Pennsylvania Wing (PAWG), Civil Air Patrol (CAP). The ultimate goal is to eventually develop a detailed spatial database of all structures and features within the facility's property boundary in accordance with the Department of Defense's (DoD) Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE).

Conclusion

This project was a good initial run and means of justifying the need for a more sophisticated and more accurate survey of the facility. Although sub-inch level precision is not necessarily required for the intent of the eventual desired map product, or even SDSFIE standards, 8.7m accuracy of feature geolocation is too poor. Further investment and work will be needed to achieve the desired objective.

Background

No detailed facility reference map exists for the HMRS facility's base camp aside from a property boundary survey conducted in 2001 with approximated locations for existing internal features at the time. There has been much construction on the facility since then, along with an increase in facility use.

Process

This initial run at the project was conducted utilizing ArcGIS Field Maps, digital compass, and smartphone GPS on an iPhone XR to collect geolocations and physical orientation of primary features. The initial plan was to collect all data digitally as GPS points, including all polygon and polyline

dimensions. It was quickly realized that the accuracy of these collected datapoints (averaging 8.7 meters Circular Error Probability) was not sufficient for the level of detail ultimately desired. Instead of conducting all data collection with the iPhone GPS (entire polygon and polyline vertices) only a single point was collected for each feature in a relative uniform position (NW corner for polygons, Northern endpoint for lines). The rest of the features' dimensions were measured to 1ft precision utilizing a canvas measuring tape. This manually collected data was later digitized and referenced to the appropriate GPS datapoint for each appropriate feature to create polygon and line features.

Recommendations

For higher level of detail of actual feature locations, a more accurate method will be required. This could consist of one of the following:

- A. Higher accuracy GPS (GNSS RTK)
- B. Survey equipment (Total Station)

Each of these instruments are available to rent by the day from various survey retail stores in the DC Metro area. Additionally, discrepancies were discovered between the 2001 boundary survey plat and available digital parcel geometry. It is recommended that these discrepancies be investigated further in order to rectify any potential errors in real property value.

For more information

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