



Fall Flying Season is just around the corner...



Part of the diversity of living in the Northeast is the beauty of our changing seasons. And, perhaps the most beautiful of all four seasons, is the vibrantly colorful Fall when foliage takes on assorted shades of reds, yellows and golds. These brilliant colors are your reminder that the Fall Flying Season is quickly approaching.

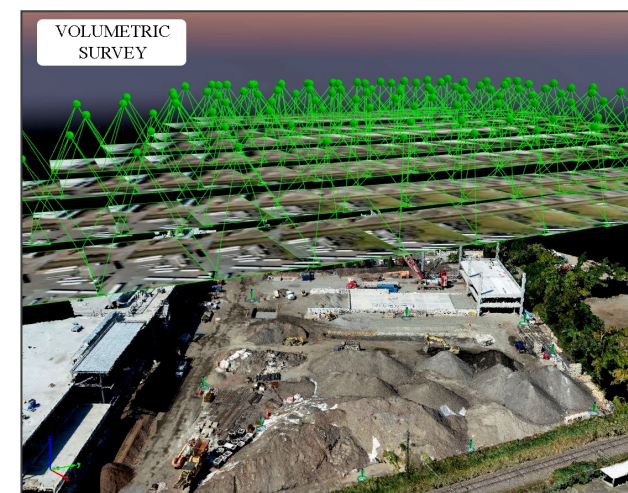
With the industry trend of falling prices for Aerial LiDAR acquisition, you may also want to consider procuring LiDAR data of your project, particularly for larger sites during the leaf-off season. The subsequent calibration and classification of the data by GEOD can be postponed until your project is fully authorized, but you will then be in a position to develop accurate and complete surveys and topographic mapping for your design and other needs.

Once those leaves have fallen, it is the best time for aerial photography projects. Generally, this is early November for the New England states and late November for areas south of Albany, New York and into New Jersey. **Call GEOD Project Managers now to assist in your project planning and aerial mapping needs, (973) 697-2122 or info@geodcorp.com**



DRONE SURVEYING AT GEOD TAKES OFF!

It has been over a year since GEOD Corporation launched our small unmanned aerial system (aka sUAS or drone) program. Many milestones had to be met in order for us to roll out this service. Various drones had to be evaluated in terms of capabilities versus cost; a Remote Pilot Certification (FAA Part 107) and FAA drone registrations were acquired; different software packages were tested and purchased for processing UAV imagery and data extraction; and putting liability and hull insurance coverages in place. We then initiated a series of test projects to establish rigorous workflows and best practices to enable us to bid projects competitively while remaining confident in achieving our clients expected accuracies.

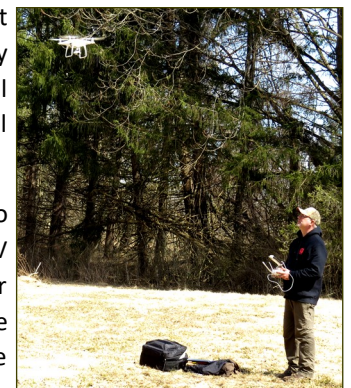


Over the past 12 months, we have completed a wide variety of projects based on sUAS captured imagery throughout the Tri-state region. Projects have ranged from those requiring still images and/or video for promotional or marketing purposes to more technical projects involving traditional terrestrial surveying and mapping services. 3D point clouds and digital surface models derived from sUAS imagery are the base products which allow us to perform traditional aerial mapping, perform volumetric studies (cut/fill), produce ortho photos, and model structures in 3D.

While these sUAS based surveys are quick and efficient, there are FAA restrictions that currently limit the areas in which sUAS's can operate. Some of these restrictions include the airspace over highways, County and Municipal roadways, bridges, stadiums, airports, federal buildings, military installations and national parks which are just some of the locations that are currently

restricted under FAA rules. In addition, TFR's (Temporary Flight Restrictions) need to be monitored in real time so as to assure flying is permitted in the target area. Prior to any flight, our sUAS pilot/planner will make sure that the airspace over the target site is safe to fly.

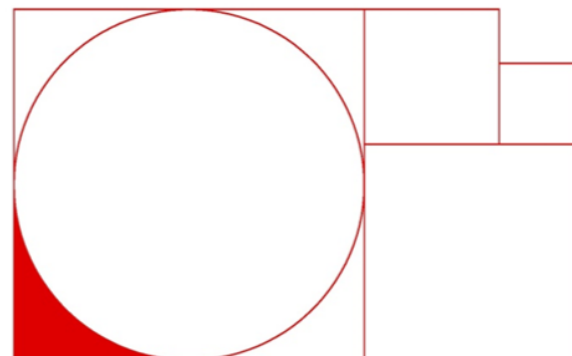
So if you think you might have a situation where a sUAS survey might be beneficial, don't hesitate to contact **GEOD's Newfoundland, NJ office at (973) 697-2122 or info@geodcorp.com** and let our UAV specialists quickly help you determine if this new emerging technology is appropriate for you. And if for some reason your project is not suitable for a drone survey, no worries – this methodology is simply one additional tool in our vast surveying toolbox! GEOD will always be able to develop a solution for even the most challenging survey task.



FALL GEOMETRY PUZZLE

For the Fall 2019 puzzle, we have opted to tease you with a relatively straightforward geometry puzzle. If, however, the solution is eluding you, feel free to ask the 4th grader at home or next door. So consider this puzzle to be a 2 for 1 deal – we give you 2 facts, and in return you provide us with 1 single fact – easy peasy, right?

In the diagram, are 4 squares, a circle and a solid filled portion to the lower left. Here are your 2 facts: 1) the smallest square has a perimeter of 12 feet and 2) the next to smallest square has sides that are 2 feet longer than those of the smallest square. The single fact we would like you to provide us is: **what is the area of the solid filled portion?**



Email your answer to marketing@geodcorp.com by midnight Friday 6th December, 2019.

A random winner will be drawn from all of the correct entries received and will win a \$200 Amazon gift card. As always, if you are precluded from accepting such a prize, we will be delighted to donate a check for \$200 to the charity of your choice. Enjoy the puzzle and good luck! Of course, the decision of the judges is final!

For our **Spring 2019** newsletter, you were asked to solve a math puzzle consisting of numbers and surveying tools.

Domenic D'Argenzio, PE from MRCE was drawn at random from the responses received and received a \$200 Amazon Gift Card.

Congratulations Domenic!

Solution:

From Lines 2 & 3:  = 5 and  = 4
Then from Line 1:  - 5 = 4 + 4 therefore  = 13
Then from Line 4:  - 4 = 13 therefore  = 17
In Line 5, if  = 4, then  = 2
Line 5 becomes 2 + 5 + 13 + 17 = ? **? = 37**

FROM THE FIELD



Rockaway River Stream Cross Sections

GEOD contracted to provide surveying services to support NJDEP in developing flood hazard data to conduct Flood Insurance Studies (FIS) to update the Flood Insurance Rate Maps for portions of Morris County, NJ. GEOD was tasked with providing the necessary land surveys to support the development of the hydraulic models. Surveys included natural valley cross-sections and all hydraulic structures such as bridges, dams, culverts, etc. Deliverables include a report with survey plan, identification of primary controls, descriptions of any ERM and/or benchmarks used or established, maps and drawings that provide the detailed survey results, survey notes containing cross sections and structural data, etc. All surveying was performed according to FEMA guidelines.

Rockfall Mitigation along Route 80, Hardwick & Knowlton Townships, Warren County, NJ



GEOD was contracted to provide time lapsed monitoring of the rock field at milepost 1.5 on the westbound side utilizing aerial imagery, aerial LiDAR and terrestrial scan data. The Aerial LiDAR was calibrated to the project datums, and classified for the ground class, which was used as the DEM to ortho rectify the aerial imagery. Stationary scan data was merged with the aerial LiDAR to complete the modelling of the vertical rock outcrop and talus field. The process will be repeated in future mobilizations to check for any movement or horizontal shifting within the rock field. All work is being prepared in NJDOT spec MicroStation V8 format.



NJ Turnpike Subsurface Utility Mapping MP 0-44

GEOD was contracted to provide subsurface utility markout services for 45 miles to locate any underground utilities crossing the NJ Turnpike from MP 0 to MP 44. Utilizing a combination of electromagnetic (EM) locators and ground penetrating radar (GPR), GEOD's certified subsurface utility technicians are scanning the shoulder of the turnpike to detect and mark-out the locations of any subsurface utilities, conduits, anomalies or structures and obstructions. All detected utilities are marked on the ground with color-coded marker paint.

Photogrammetric Mapping to support Design Engineering for Cross Camden County Trail, Camden, NJ

GEOD was contracted to provide photogrammetric mapping to support design engineering services for construction of a new 32 mile multi-use trail located across Camden County.

The project is being performed in 2 phases. For phase 1, due to the summer foliage, GEOD elected to perform the mapping using a combination of both Aerial Imagery and Aerial LiDAR (which can penetrate the foliage and return data from the ground below). The LiDAR data was classified to isolate the ground class and was used to create a digital terrain model (DTM). The Planimetric mapping is being compiled directly at 1"=20' from the imagery. All visible features will be shown. Break lines and spot elevations are being digitized and combined with the ground level plan and the ground class of LiDAR points to create a DTM in SelectCAD from which 1/2' contours will be generated. All data will be formatted in MicroStation V8 adhering to NJDOT specifications. For phase 2 of the project which will be performed after defoliation, Aerial Imagery will be used to produce the planimetrics and contours of the remainder of the trail.



Land and Aerial Surveys to support Route 15 Corridor Rockfall Mitigation for 50 sites along Route 15 in the Townships of Rockaway, Jefferson, Sparta & Lafayette, Sussex & Morris County, NJ



GEOD established a pair of primary control points for each of the 50 project areas in accordance with NJDOT Article 44, then field crews performed supplemental observations to provide the additional information required. This project was a combination of high definition laser scanning and aerial LiDAR & imagery based mapping with conventional survey methods for the purpose of rock cut remediation design. Aerial mapping was utilized for mapping the non-vertical sections of the rock face for the entire length of the corridor. Selected rockfall areas within the overall mapping limits were scanned and supplemented the aerial mapping. A DTM with 1-foot contours and planimetric file were produced based on the information gathered from aerial mapping and laser scanning for the length of the project areas. Final deliverables were in MicroStation .dgn format with a corresponding InRoads DTM. All work

was performed in accordance with the NJDOT's current standards including Standard Article 44, Article 51, the 2014 NJDOT Survey Manual, and current NJDOT CADD Manual.



ON-CALL CONTRACTS:

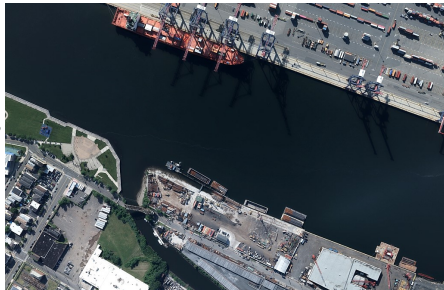


THE PORT OF AUTHORITY OF NEW YORK & NEW JERSEY

Photogrammetric Surveying Services

These two simultaneous projects were under GEOD's On-Call agreement to provide Photogrammetric Surveying Services. Initially the client's RFP called for updating existing 2008 mapping and DTM, but upon examination GEOD determined that the existing mapping was lacking 3D breakline data and recommended that all new mapping be prepared, which the client agreed to.

- [Howland Hook Marine Terminal, Staten Island, NY](#)
- [Brooklyn Marine Terminal, Brooklyn, NY](#)



GEOD provided new topographic mapping of the Howland Hook Marine Terminal and Port Ivory on Staten Island (500 acres), and for the Brooklyn Marine Terminal (230 acres). New 4.8cm GSD Aerial Imagery was acquired and a new photo control survey was conducted utilizing RTK GPS methodology. A GNSS Control Report was prepared. For the Howland Hook site, due to the large areas of phragmites GEOD elected to additionally acquire new Aerial LiDAR at a density of 10 ppm². The LiDAR was calibrated to the project control and then classified for the ground class. New Topographic Mapping was stereo compiled at 1"=40' and combined with the ground class of LiDAR data to create a DTM to generate 1' contours in AutoCAD Civil 3D, in the Port Authority's current CAD specs. All visible features including all striping were shown. Scale Rectified Orthophotography was prepared at a 3" pixel in .ecw and .jpg formats. All of the mapping and orthophotography was prepared in NY East NAD83 US ft coordinates, referenced to the NAVD88 vertical datum, and then transformed into the NY Long Island NAD83 system for a 2nd deliverable.

Subsurface Utility Markout Services to support the CSG JFK Redevelopment Project, JFK Airport, Queens, NY

GEOD was contracted to provide utility investigation and mapping services to support the Port Authority's JFK Redevelopment Program to completely redevelop, modify and expand existing facilities and infrastructure at the airport. GEOD provided invert information of more than 1200 drainage and sanitation structures by measuring structure sizes, invert information, pipe sizes and directions with picture inventory. Some structures needed additional field investigation which included pumping of water, confined space entry and subsurface marking of lines. All utility location surveys were performed using a combination of Ground Penetrating Radar (GPR) and Electro-Magnetic Pipe/Cable Locator technology (M-scoping) with duct router sonde. Deliverables include structure data sheets and associated photo mosaics in compliance with the Port Authority's CAD standards.



New York Power Authority / On Call Land Surveying Services Contract



Charles Poletti Power Project, Astoria, Queens, NY

GEOD was asked to provide a metes and bounds survey and subsurface utility markout for a 4.5 acre lot. Horizontal and vertical control was established. Field crews utilized Ground Penetrating Radar to locate and trace underground utilities. Field crews located all above ground, visible improvements and observed topographic features such as breaks in grade and top and bottom of slopes, crown of driveways, grass areas, etc. Spot grades were observed, rim/grate elevations on sanitary and drainage structures were established and invert measurements were taken and recorded as well as pipe types and sizes. GEOD field crews located the mark out and the information was incorporated into the final mapping. Mapping was provided in AutoCAD Civil 3D.

Power Line Easement Hunters Point, Queens, NY

GEOD also provided a boundary survey to establish the location of an existing power line easement. Field crews utilized a combination of Ground Penetrating Radar (GPR) and Electro-Magnetic Pipe, Cable and Box Locators (EM) to locate and trace an existing underground power line. Crews then performed a survey of the subsurface investigation findings, existing utility mark-out and physical evidence to establish the easement location. The survey information was analyzed, drafted and incorporated into the existing drawing. Mapping was provided in AutoCAD Civil 3D.

NYC Transit 'On-Call' Land Surveyor Consultant Services Contract

Jamaica Yard Expansion, Flushing, Queens, NY

Under GEOD's recent On-Call Land Surveyor Consultant Services Contract it was asked to provide a topographic and property boundary survey to support the Jamaica Yard Expansion project in Flushing Queens, NY.

GEOD crews established control in accordance with NYCTA survey control standards. A survey control report was prepared. GEOD crews obtained field locations to establish right of way and property lines. GEOD's certified survey technician provided the required deed research and compared it to field evidence to compile a property boundary survey. GEOD best fit property boundary based on survey effort and additional information obtained and prepared a topographic survey. Mapping was provided in MicroStation V8 in accordance with NYCTA standards.

