GNSS Survey Report

New York Statewide
LiDAR Acquisition
Lot 18

2018 Lot 18 LiDAR
Ground Control and Check Point
Survey Report

AXIS Geospatial, LLC
28640 Mary's Court, Suite 200
Easton, Maryland 21601
Axis Project Number 13367-1811

Date: 10/01/2018
Revised: 11/16/2018

NY18-Cayuga Oswego LiDAR Primary Gound Control Folder Explanation and Inventory

NY18 Cayuga Oswego – GNSS Survey Report- This is the primary file forming the narrative of the survey report and contains descriptions of work areas, methodologies employed and contains a listing of final coordinate values and a coordinate analysis of our positioning vs. published NGS. Page three of the GNSS Survey Report is a table of contents breaking down the file structure of the work areas and listing report file names and equivalent deliverable features.

The deliverables are grouped into four subdirectories as follows:

Data Sheets Folder- Contains field observation datasheets of the LiDAR Primary Control points

Field Data Folder- Contains the field data files of the observations in Leica proprietary format

NGS Reports Folder- Contains NYS Realtime Reference Network station datasheets

GNSS Data Sheets Folder- Detailed reporting of GNSS Intervals, GNSS Observations Report, Points Report and a Coordinate System Report

Table of Contents

Report Type	Report Names	Description
1. Coordinate System	NY LOT 18 COORDINATE SYSTEM REPORT CENTRAL ZONE UTM (M).pdf	Concise Tabulation of GNSS Observations
	NY LOT 18 COORDINATE SYSTEM REPORT CENTRAL ZONE NYSP(FT).pdf	Concise Tabulation of GNSS Observations
2. Observations	NY LOT 18 GNSS OBSERVATIONS REPORT CENTRAL ZONE UTM (M).pdf	Concise Tabulation of Final Coordinates/PID # Match
	NY LOT 18 GNSS OBSERVATIONS REPORT CENTRAL ZONE NYSP(FT).pdf	Concise Tabulation of Final Coordinates/PID # Match
3. Point Code	NY LOT 18 POINTS CODE REPORT CENTRAL ZONE UTM (M).pdf	Details related to Coordinate system values
	NY LOT 18 POINTS CODE REPORT CENTRAL ZONE NYSP(FT).pdf	Details related to Coordinate system values
4. Point History	NY LOT 18 POINTS HISTORY REPORT CENTRAL ZONE UTM (M).pdf	Field data file source information generated at data import
	NY LOT 18 POINTS HISTORY REPORT CENTRAL ZONE NYSP(FT).pdf	Field data file source information generated at data import
5. Point Quality	NY LOT 18 POINTS QUALITY REPORT CENTRAL ZONE UTM (M).pdf	Mean Coordinates & Differences
	NY LOT 18 POINTS QUALITY REPORT CENTRAL ZONE NYSP(FT).pdf	Mean Coordinates & Differences

GNSS Survey Report Narrative

September 21, 2018
Revised November 14, 2018

State of New York
Office of Information Technology Services,
GIS Program Office
10B Airline Drive
Albany, NY 12235

Attn : Francis M. Winters, Director of GIS Programs

Re: GNSS Survey Control Report-Primary Control
Axis Project # 13367-1812, Central 18 LiDAR Project Area, New York
NY Contract #C300036

Please find enclosed a series of reports, diagrams and other supporting information that forms the formal GNSS Survey Report for the referenced project. Additionally, we have included a narrative of the methodology, techniques and technical details about the equipment and technology utilized to execute the project.

Process Summary

AXIS GeoSpatial, LLC was authorized to collect airborne LiDAR data for the area of Lot 18. Based on mission planning by the project Certified Photogrammetrist, a map was provided to me for evaluation and GNSS Survey planning which contained the planned flightlines, the proposed ground control points and proposed check points. Based on available local control, the site's proximity to high order NYSNet CORS stations and the number and related geometry of surrounding Real-time Network base stations, as well as the numerous benefits of using a Real-time Network positioning solution, AXIS moved forward with mobilization for the project and configuration of my equipment to utilize The New York NYSNet Real-time GNSS Network. Based on the approximate locations of the ground control and check points needed for the dataset, I field selected a final location for each point based on a number of factors including safety concerns, visibility of the ground control point from the plane in its flight path, satellite obstructions, multipath sources and ground surface conditions. Positioning was conducted using a hybrid methodology, internally referred to as Real-time Static, which involves using a tripod or bipod mounted GNSS antenna/receiver to collect multiple sets of data at a one (1) second intervals, typically for one (1) minute per set, for each survey point. Traditional Real-time Kinematic survey practice is to take a single measurement of a point, using a rover pole. We have found that by collecting multiple sets of data on each point using a stabilized setup, accuracy and precision of the ground control points is optimized. As redundant check to all of the measurements, we measured all of the points, including the NGS control points and the survey points up to five times per occupation, with each observation being made after breaking the fixed solution and forcing re-resolution of the positioning ambiguities by the receiver. Per NYDOT specifications, all GNSS survey control points were re-occupied a minimum of twenty minutes later to confirm positioning quality with a different satellite constellation configuration. A report is attached showing the observation times, measurement statistics, and other pertinent information, including a spreadsheet detailing observed variances from published control. Results using multiple observations, and time offset re-occupations are exceptional, as borne out by the statistical analysis and aero-triangulation report.

This report is one of two documents that relate to the ground control points used for the 2018 New York State Orthophoto project. The other document is called "GNSS Survey Report, New York Statewide Orthophoto Productioin, Lot 18", 2018 Digital Orthophoto Ground Control Survey Report" and delivered under a separate cover.

Check Point Survey

Following USGS specifications (LiDAR Base Specification; Techniques and Methods, 11-B4, Page 8) citing the Positional Accuracy Standards for Digital Geospatial Data (American Society for Photogrammetry and Remote Sensing, 2014, Table C.1 Recommended Number of Checkpoints Based on Area, Page A19, Axis determined the number of Quality Check (QC) points. For this project, sixty-nine (69) Non-vegetated Vertical Accuracy (NVA) points were surveyed and fifty-six (56) Vegetated Vertical Accuracy (VVA) points were surveyed. The QC surveys were conducted as separate, fully independent mobilizations. Axis proposed and received approval for the check point sites, distributed across the work area.

At each site, a GNSS control pair was set using the approved methodology for GNSS control points. Once the observation sequences were completed and satisfactory positions obtained, Axis personnel used a Leica MS-50 robotic instrument to make terrestrial measurements to the second control point as well as the desired QC points. Each QC point was located using a two face (direct/indirect) measurement sequence and then documented with two digital photographs, detailing ground and general site conditions. Positions were recorded for the NVA and VVA check points, with attention given to randomize locations across each site as much as reasonably possible. This combined GNSS/robotic approach has several benefits, the first being reduced numbers of time intensive GNSS observations. By setting only two inter-visible GNSS control points, and performing the actual QC observations with the robot, dozens of control points can be located quickly, with very little error in positioning, across the site, without being hampered by the lack of GNSS observability in wooded areas.

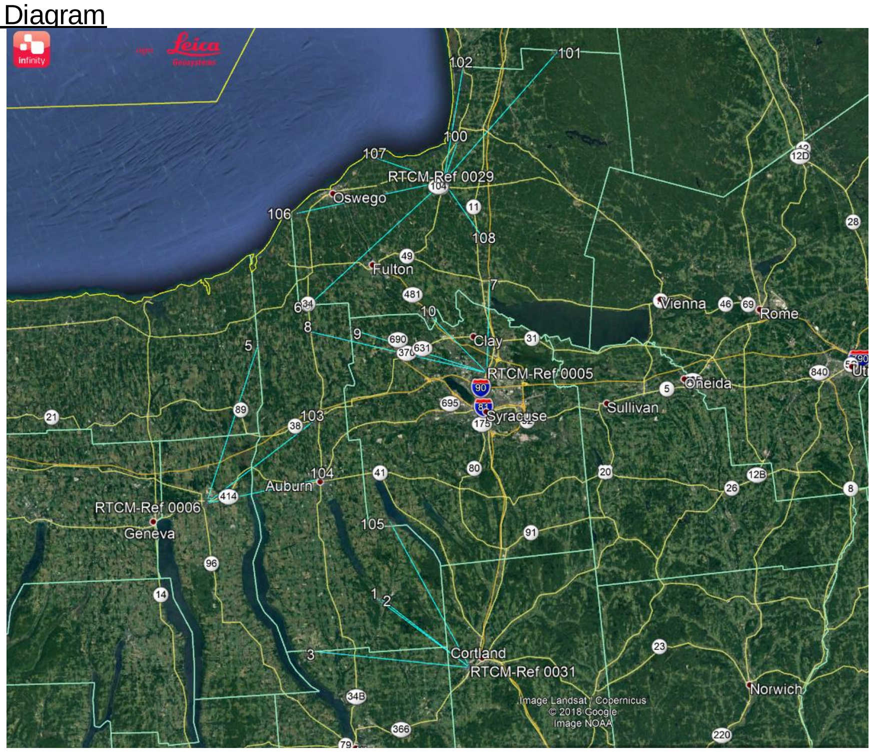
Real-time Network Positioning

UTM Zone 18 coordinates for this project were determined using the Real-time Network (RTN) NYSNet, verified with the measurements to monuments found in the National Geodetic Survey Control Point database. The use of an RTN for geodetic control involves the collection and correction of ionospheric, tropospheric, satellite clock errors and orbital errors from multiple permanent control points surrounding the observation site, resulting in high precision positional data, based on correction data from all the surrounding stations, and a positioning vector measurement from an optimized base station, generally the closest to the rover. The control points of this network are NY State Continuously Operating Reference Stations, NYSNet CORS Stations and National Geodetic Survey Continuously Operating Reference Stations or NGS CORS, and the resulting measurement vectors between the GNSS receiver and network station are direct measurements to existing, high order physical monuments, which have been vetted, documented and distributed by the State of New York and the National Geodetic Survey from their online control databases. Additional measurement data was also collected during the survey fieldwork to other high order, local national geodetic survey monuments as a supplemental verification of positioning quality.

A real-time reference frame-based positioning system by its very nature will not always match published positions of ground control points, regardless of their adjustment status, due to their original measurement methodology and accuracy classification, time passage since original observation, exposure to the elements, forces of nature and the deliberate or accidental injury to their integrity by man.

The project area contains a fairly well distributed, GNSS observable NGS control point framework, and control check in was conducted to points within the immediate project area.

NYSNet RTN Vector Diagram



Primary RTN Control Stations:

NYSNet NYMX/RTCM REF 0029	MEXICO
NYSNet NYNS/RTCM REF 0005	NORTH SYRACUSE
NYSNet NYWL/RTCM REF 0006	WATERLOO
NYSNet NYCL/RTCM REF 0031	CORTLAND

NGS Control Stations:

WEEDSPORT	AB3847	RECOVERED AS DESCRIBED
RICHLAND	AB3845	RECOVERED AS DESCRIBED
CENTRAL SQ	AB3837	RECOVERED AS DESCRIBED
H 466	OF1288	RECOVERED AS DESCRIBED
GPS 215	AB3839	RECOVERED AS DESCRIBED

Positional comparisons for both work areas are available for review, as well as detailed observations reports in the Static Mission Reports sections of this GNSS report.

Fieldwork Mobilization Dates: ~~May~~ April 2018 – August 2018

RTN Field Equipment

GNSS receiver technical data: Leica GS-15- Geodetic GNSS receiver/antenna (GPS L1/L2/L2C/L5 and L1/L2 GLONASS frequencies), Serial #1505760 firmware v. 6.13
Leica CS-20- Serial #2490713 Controller firmware/Captivate v. 2.2

Leica GS-14- Geodetic GNSS receiver/antenna (GPS L1/L2/L2C and L1/L2 GLONASS frequencies), Serial # 2806875 firmware v. 6.13
Leica CS-35- Serial # 5GTSA86661 Controller firmware/Captivate v. 2.2

Field procedure/methodology: GNSS- Multiple, redundant, multi-set observations with offset occupation times and individual ambiguity resolutions, using NYSNet real-time network with an I-Max network correction configuration for both GPS and GLONASS satellites.

Field Equipment Adjustment/Calibration/Field Checks
Laser plummets were field checked at each setup, using the precise level plate level bubble and a two-position check routine. Rotation of a laser plummet will immediately reveal any defect in the internal structure or alignment of the laser.

Instrument heights were measured using a device called a height hook, which makes a direct, vertical reading of the instrument height without concern for slant height or other problems. The height hook reading is made in millimeters, which offers an exact, high precision measurement.

No change or adjustment to any field equipment was necessary throughout the duration of this project.

Office Software
The GNSS receiver and its controller hardware interface via field software called Leica SmartWorx, which provides a user interface and workflows for collecting data, analyzing datasets, selecting results and performing other calculations, including QA/QC analysis, exporting of data and reports and organizing project data. Office software used is the full suite of Leica Geo Office, Version 8.4 (current) and Leica Infinity Version 3.0.1 (current), which provide an interface for downloading data, generating reports and performing calculations, analyzing data, and organizing and

printing project reports. Additional analysis was performed using Microsoft Excel 2010, AutoCAD Civil 3D 2016, AutoCAD Map 2016 and the Google Earth extension of Leica Infinity.

RTN Observation Methodology
Every point established during this project has a final position based on a number of individual observations at different times, each with a fresh ambiguity resolution. The total number of observations on a point is based on the observer's

analysis of the quality of those observations, known network geometry and the consistency of the results as a group. Positioning points using a number of observations helps to identify fluctuations in positioning due to base to rover vector length, varying satellite geometry due to observation window obstructions, and network cell station geometry/spacing and availability. The individual observation dates and times can be reviewed in the GNSS Observations Report, and the actual detailed observation vectors, geodetic positions, Dilution of Precision values, observation inclusion and exclusion, and related averaging information can be reviewed in the Field Book Report section of this report. Averaging of the individual observations to obtain the final position for a point is weighted by the software, based on the positional quality of each observation.

Survey point numbers were matched to the Photo ID point numbering scheme, allowing a reviewer to follow the progress of the observations as they were made on both photo control points and to document the sequencing of check in observations to NGS and local survey control points. The correlation between survey point number and the actual Photo ID number is documented in the tabulation of the Final Project Control values on page 14.

QA Testing of RTN Observations

Quality Assurance testing of the RTN data was accomplished via statistical analysis of the observations on each point, as well as using two instrument heights during observations to confirm height hook readings. A table comparing redundant observations on primary control points and NGS control points is available in the Control Analysis section of the report.

Dilution of Precision

Dilution of precision is a value of probability that directly relays the geometrical effect on GPS data acquisition. Several factors can affect DOP. These include atmospheric refraction, multipath (signal bouncing off nearby structures), satellite time and location (ephemeris errors) and other errors such as plumbing, height measurements, equipment condition, etc. Observation locations were picked after analyzing factors that may negatively impact DOP at each point. As a general guideline for field procedures, observations were conducted when field conditions showed less than 1.5 VDOP (vertical dilution of precision) and 1.0 HDOP (horizontal dilution of precision). A lower DOP yields greater confidence in the solution, and individual DOP values for each observation can be reviewed in the GNSS observation report.

Statistical Analysis & Quality Reporting

A table showing the statistical analysis and positional quality of the NGS control points is available in the Control Analysis Table starting on page 12 of this report.

Satellite Geometry and Observation Planning

The following charts were used to schedule and manage the point observation schedule during the fieldwork. Point locations were selected in the field to optimize satellite visibility, avoid multipath sources and provide the most accurate control network for the digital aero-triangulation process. The observation planning site for this project was
based on the approximate centroid of the work area, as final visibility of the satellite constellation is dictated by the individual site conditions and obstructions. Since the constellation changes daily, with satellites arriving approximately four (4) minutes earlier each successive day, the observation planning was revisited every two weeks to maintain a current status on the timing of spikes in DOP values. The chart is used in real time during the work day to optimize observations and avoid DOP spikes. The planning chart windows were restricted to working hours to enhance detail.

Samples of the planning charts for the project are presented on the following page.

Project PDOP Chart

The Positional Dilution of Precision is a numerical gauging of the quality of positions yielded by GPS and GLONASS satellites at a particular time, without consideration of ground conditions. Actual PDOP will vary from the planned values based on field conditions, such as obstructions by buildings, trees and terrain.

Project HDOP Chart

The Horizontal Dilution of Precision (HDOP) value is a numerical gauging of the quality of 2-D horizontal position yielded by GPS and GLONASS satellites at a particular time, without consideration of ground conditions. Actual HDOP will vary from the planned values based on field conditions, such as obstructions by buildings, trees and terrain.

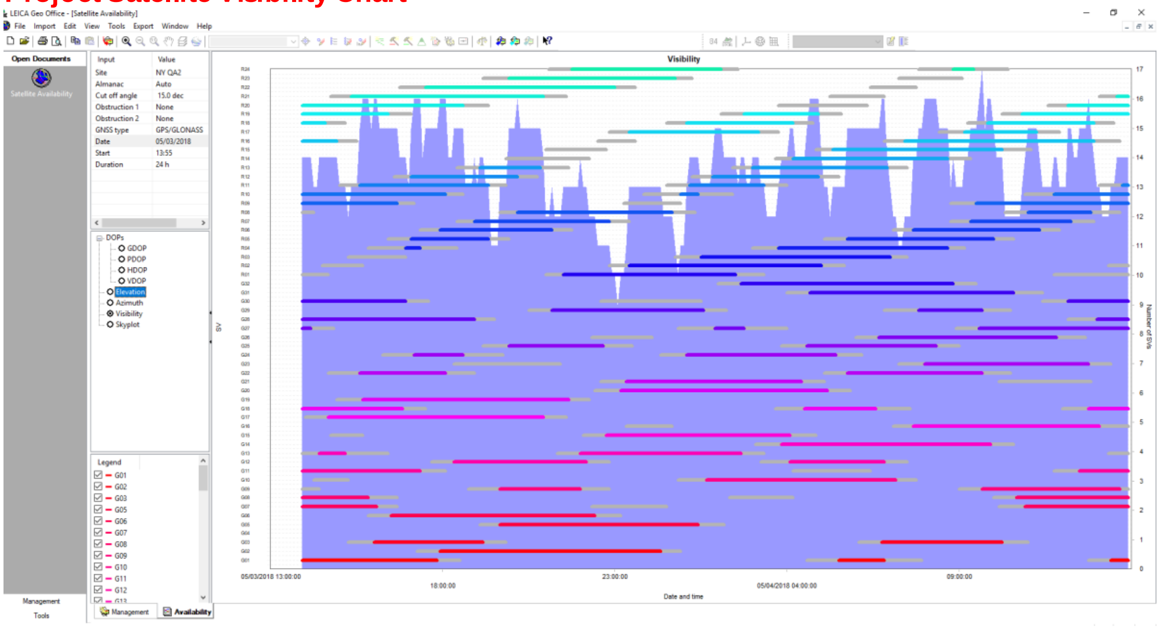
Project VDOP Chart

The Vertical Dilution of Precision (VDOP) value is a numerical gauging of the quality of 1-D vertical position yielded by GPS and GLONASS satellites at a particular time, without consideration of ground conditions. Actual VDOP will vary from the planned values based on field conditions, such as obstructions by buildings, trees and terrain.

Project GDOP Chart

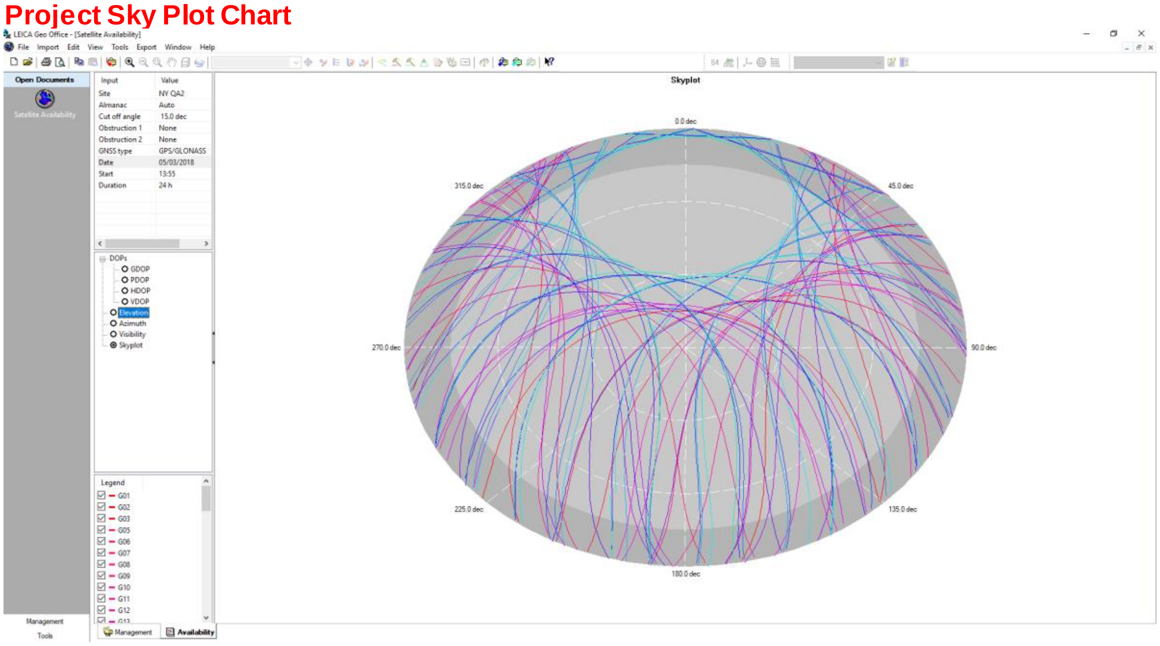
The Geometric Dilution of Precision (GDOP) value is a numerical gauging of the satellite geometry yielded by GPS and GLONASS satellites at a particular time, without consideration of ground conditions. Actual GDOP will vary from the planned values based on field conditions, such as obstructions by buildings, trees and terrain.

Project Satellite Visibility Chart



The Satellite Visibility Chart is a graphical representation of the time that individual satellites are available for observation, allowing planning for observations based on satellite constellation density and common time. The satellite visibility will vary from the planned values based on field conditions, such as obstructions by buildings, trees and terrain.

Project Sky Plot Chart



The skyplot chart is used in mission planning to assess satellite location and trajectory during a particular window in time that will be used to observe GNSS satellites. The chart shows day long trajectories of available satellites. During actual planning, the planned start and stop times of the observation are used to restrict the plotted trajectories to only their path during the observation. Satellite observability is further restricted by site obstructions.

Responsible Charge

The field work and GNSS computations for this project were conducted under the supervision of a Professional Land Surveyor, following NYDOT Photogrammetric Control Procedures, National Geodetic Survey Guidelines for GNSS Surveying using Real Time Kinematic and Real Time Networks and FGDC Guidelines for GPS Positioning. Report prepared by:

____ Date: 11-14-2018

Barry A. Gleissner, PLS, PP, CFM
Delaware Professional Land Surveyor # S6-0000691
New Jersey Professional Land Surveyor # 24GS-03448300

LOT 18; NGS QA Control Analysis Worksheet				
Horizontal Datum:	UTM 18			
Vertical Datum:	North American Vertical Datum of 1988 derived using Geoid 12B			
Units:	Meters			
Axis Geospatial Survey Points - RTN				
Pt#	Northing	Easting	Ortho Ht.	Code
4	4766840.810	371705.653	121.97	ROD WEEDSPORT
100	4821770.707	403671.571	80.752	DISK RICHLAND
7	4793201.457	408652.840	135.158	ROD CENTRAL
8	4784820.622	371819.358	142.013	ROD H 466
1	4730300.135	382417.238	222.579	GPS 215
NGS Datasheet Values				
PID	Northing	Easting	Ortho Ht.	Name
AB3847	4766840.809	371705.653	121.940	ROD WEEDSPORT
AB3845	4821770.713	403671.560	80.755	DISK RICHLAND
AB3837	4793201.463	408652.836	135.139	ROD CENTRAL
OF1288	4784820.631	371819.360	142.009	ROD H 466
AB3839	4730300.133	382417.235	221.914	GPS 215
Comparison Matrix (RTN Dataset vs. NGS Published Data)				
	▲ Northing	▲ Easting	▲ Height	
4 VS. AB3847	0.001	0.000	0.003	
100 VS. AB3845	-0.006	0.011	-0.003	
7 VS. AB3837	-0.006	0.004	0.019	
8 VS. OF1288	-0.009	-0.002	0.004	
1 VS. AB3839	0.002	0.003	0.665	
	0.005	**0.005**	**0.295**	Std. Dev.
	-0.009	**0.011**	**0.665**	Max.
	0.001	**0.000**	**0.003**	Min.
	-0.004	**0.003**	**0.138**	Average

LOT 18; NGS QA Control Analysis Worksheet				
Horizontal Datum:	NY SP CENTAL			
Vertical Datum:	North American Vertical Datum of 1988 derived using Geoid 12B			
Units:	Feet			
Axis Geospatial Survey Points - RTN				
Pt#	Northing	Easting	Ortho Ht.	Code
4	1108901.653	822409.716	400.161	ROD WEEDSPORT
100	1291106.342	923869.399	264.932	DISK RICHLAND
7	1197679.912	941993.735	443.431	ROD CENTRAL
8	1167894.919	821668.188	465.923	ROD H 466
1	989681.731	859806.561	728.078	GPS 215
NGS Datasheet Values				
PID	Northing	Easting	Ortho Ht.	Name
AB3847	1108901.66	822409.71	400.06	ROD WEEDSPORT
AB3845	1291106.36	923869.36	264.94	DISK RICHLAND

AB3837	1197679.93	941993.72	443.37	ROD CENTRAL
OF1288	1167894.95	821668.19	465.91	ROD H 466
AB3839	989681.72	859806.55	728.06	GPS 215
Comparison Matrix (RTN Dataset vs. NGS Published Data)				
	▲ Northing	▲ Easting	▲ Height	
4 VS. AB3847	-0.007	0.006	0.101	
100 VS. AB3845	-0.018	0.039	-0.008	
7 VS. AB3837	-0.018	0.015	0.061	
8 VS. OF1288	-0.031	-0.002	0.013	
1 VS. AB3839	0.011	0.011	0.018	
	0.016	**0.015**	**0.044**	Std. Dev.
	-0.031	**0.039**	**0.101**	Max.
	-0.007	**-0.002**	**-0.008**	Min.
	-0.013	**0.014**	**0.037**	Average

Horizontal Datum:		UTM Zone 18									UTM Zone 18; Meters
Vertical Datum:		North American Vertical Datum of 1988/Derived using Geoid 12B									
Units		Meters									
PT#	Northing	Easting	Ortho Ht	Pt ID	CQ 3D	CQ 2D	CQ 1D	SD North	SD East	SD Ht	Pt Descriptions
3	4,720,456.369	367,603.570	108.87	NYlidar 18-1	0.0026	0.0011	0.0023	0.0011	0.0005	0.0023	Mag nail @ end of paint stripe
2	4,729,840.231	383,644.027	225.59	NYlidar 18-2	0.0012	0.0006	0.0011	0.0006	0.0002	0.0011	Mag nail @ NW cor of blue paint
105	4,745,625.460	385,954.309	300.23	NYlidar 18-3	0.0024	0.0015	0.0020	0.0012	0.0008	0.0020	Mag nail @ end of paint stripe
104	4,755,116.867	373,134.393	234.69	NYlidar 18-4	0.030	0.0018	0.0024	0.0014	0.0012	0.0024	Mag nail @ cor of yellow paint stripe
9	4,784,749.338	380,473.903	131.99	NYlidar 18-5	0.0027	0.0022	0.0017	0.0014	0.0017	0.0017	Mag nail @ end of paint stripe
10	4,786,707.157	396,324.620	121.12	NYlidar 18-6	0.0032	0.0020	0.0024	0.0016	0.0013	0.0024	Mag nail @ cor of yellow paint stripe
108	4,800,891.553	408,357.572	146.60	NYlidar 18-7	0.0033	0.0027	0.0019	0.0019	0.0019	0.0019	Mag nail set in pavement @ intersec
101	4,838,574.663	424,712.491	391.47	NYlidar 18-8	0.0027	0.0015	0.0022	0.0008	0.0012	0.0022	Mag nail @ end of paint stripe
102	4,836,705.177	405,514.596	78.33	NYlidar 18-9	0.0034	0.0021	0.0027	0.0018	0.0011	0.0027	Mag nail @ end of paint stripe
107	4,819,163.446	387,086.770	84.50	NYlidar 18-10	0.0020	0.0011	0.0016	0.0008	0.0008	0.0016	Mag nail @ NW cor of blue paint
106	4,808,906.141	370,245.727	108.87	NYlidar 18-11	0.0030	0.0016	0.0025	0.0011	0.0012	0.0025	Mag nail @ cor of drive and road
6	4,789,903.051	371,468.860	136.88	NYlidar 18-12	0.0027	0.0016	0.0021	0.0005	0.0015	0.0021	Mag nail set in parking lot pavement
5	4,782,708.486	361,005.942	135.62	NYlidar 18-13	0.0027	0.0027	0.0017	0.0014	0.0016	0.0017	Mag nail @ end of paint stripe

Horizontal Datum:		NAD 83/NA2011 Epoch 2010.00 NY State Plane Grid (**Central** Zone)									SP Central; USFT
Vertical Datum:		North American Vertical Datum of 1988/Derived using Geoid 12B									
Units		US Survey Feet									
PT#	Northing	Easting	Ortho Ht	Pt ID	CQ 3D	CQ 2D	CQ 1D	SD North	SD East	SD Ht	Pt Descriptions
3	956,476.443	811,811.870	891.60	NYlidar 18-1	0.009	0.004	0.008	0.002	0.003	0.008	Mag nail @ end of paint stripe
2	988,248.33	863,859.724	740.15	NYlidar 18-2	0.004	0.002	0.003	0.001	0.002	0.003	Mag nail @ NW cor of blue paint
105	1,040,179.376	870,467.092	982.85	NYlidar 18-3	0.009	0.007	0.006	0.005	0.004	0.006	Mag nail @ end of paint stripe
104	1,070,527.250	827,821.934	767.89	NYlidar 18-4	0.007	0.004	0.005	0.004	0.005	0.008	Mag nail @ cor of yellow paint stripe
9	1,168,198.360	850,065.883	433.05	NYlidar 18-5	0.009	0.007	0.006	0.005	0.005	0.006	Mag nail @ end of paint stripe
10	1,175,605.958	901,948.330	397.39	NYlidar 18-6	0.010	0.007	0.008	0.004	0.005	0.008	Mag nail @ cor of yellow paint stripe
108	1,222,893.273	940,546.481	478.78	NYlidar 18-7	0.011	0.009	0.006	0.006	0.006	0.006	Mag nail set in pavement @ intersec
101	1,347,558.468	991,855.860	1,282.10	NYlidar 18-8	0.006	0.003	0.005	0.002	0.003	0.005	Mag nail @ end of paint stripe
102	1,340,221.912	928,982.253	254.82	NYlidar 18-9	0.008	0.005	0.006	0.004	0.002	0.006	Mag nail @ end of paint stripe
107	1,281,516.280	869,618.728	275.05	NYlidar 18-10	0.007	0.004	0.005	0.003	0.003	0.005	Mag nail @ NW cor of blue paint
106	1,246,813.903	815,007.307	355.01	NYlidar 18-11	0.010	0.005	0.008	0.004	0.004	0.008	Mag nail @ cor of drive and road
6	1,184,547.031	820,202.647	449.10	NYlidar 18-12	0.009	0.005	0.007	0.005	0.002	0.007	Mag nail set in parking lot pavement
5	1,160,294.578	786,324.426	444.98	NYlidar 18-13	0.009	0.007	0.006	0.005	0.004	0.006	Mag nail @ end of paint stripe